



# Comprehensive Energy Audit For Village of Solomon Tribal Office



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Prepared For  
**Village of Solomon**

**September 12, 2018**

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## **PREFACE**

The purpose of this report is to provide guidance to reduce operating costs and enhance the sustainability of this facility. The report assesses the current energy usage of the facility, provide options for reducing the amount of energy used, and evaluate the cost versus benefit of each option.

Discussions of site-specific concerns, financing options, general facility information, and an energy efficiency action plan are also included in this report.

## **ACKNOWLEDGMENTS**

The Alaska Native Tribal Health Consortium (ANTHC) Rural Energy Initiative gratefully acknowledges the assistance of Deilah Johnson, IGAP Coordinator for the Village of Solomon, and Elizabeth Johnson, Secretary of the Village of Solomon and President of the Solomon Native Corporation.

## **LIMITATIONS OF THIS STUDY**

The building modeling software AkWarm© was used to create a virtual representation of the Village of Solomon Tribal Office. The model is then used to test the cost effectiveness of different energy efficiency measures (EEMs) like LED lighting and insulation improvements. The AkWarm© software calculates the annual cost savings and payback period for the investment, and then ranks all EEMs based on their payback period.

There are limitations using this software, which may affect the accuracy of the EEMs cost savings. This report should serve as a guide when deciding which EEMS to pursue further. A certified professional in that field should verify all EEMs and installation costs before construction begins.

# OVERVIEW

This report was prepared for the Village of Solomon Council. The scope of the audit focused on the Village of Solomon Tribal Office. The scope of this report is a comprehensive energy study, which included an analysis of building shell, interior and exterior lighting systems, heating and ventilation systems, and electrical loads. Data was collected during an on-site survey and through interviews with members of the Village of Solomon.

The Village of Solomon Tribal Office has about 1,083 square feet of total floor space. The building is divided between the office and meeting space, a two-story garage, and two rented apartments. Only the tribal office was audited for this report.

## ENERGY BASELINE

Based on unsubsidized electricity and fuel oil prices in effect at the time of the audit, the total predicted energy costs are about \$5,350 per year. This includes \$3,737 for electricity, and an estimated \$1,614 for #1 fuel oil.

The State of Alaska Power Cost Equalization (PCE) program provides a subsidy to rural communities across the state to lower electricity costs and make energy affordable in rural Alaska. The Village of Solomon Tribal Office does not receive a PCE subsidy.

Annual Energy Costs by Fuel Type

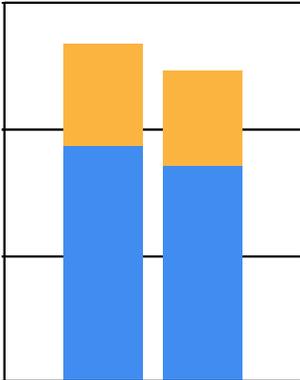


Table 1 lists the predicted annual energy usage before and after the proposed retrofits for the Village of Solomon Tribal Office. These figures were estimated by AkWarm, because utility data was not available for the space.

**Table 1: Predicted Annual Energy Use for the Village of Solomon Tribal Office**

Predicted Annual Fuel Use			
Fuel Use	Existing Building	With Proposed Retrofits	Total Savings
Electricity	14,022 kWh	12,951 kWh	1,071 kWh
#1 Oil	346 gallons	327 gallons	19 gallons

## PROPOSED ENERGY EFFICIENCY MEASURES (EEM)

Table 2 below summarizes the energy efficiency measures analyzed for the Village of Solomon Tribal Office. Listed are the estimates of the annual savings, installed costs, and two different financial measures of investment return: the Savings Investment Ratio (SIR) and the retrofits’ Simple Payback. Green

highlighted cells are high priority measures, yellow are medium priority, and orange highlighted cells are the lowest priority recommendations.

**Table 2: Priority List – Energy Efficiency Measures**

Rank	Feature	Improvement Description	Annual Energy Savings <sup>1</sup>	Installed Cost	Savings to Investment Ratio, SIR <sup>2</sup>	Simple Payback (Years) <sup>3</sup>
1	Water Service Line Circulation Pump	Unplug the circulation pump when outdoor air temperatures are above 40°F to 50°F. Estimated energy savings: 33%.	\$73	\$7	132.41	0.1
2	Programmable Thermostat: Main Entrance and Office Area	Program the thermostat to reduce the temperature to 60° F when the office is unoccupied.	\$79	\$25	42.37	0.3
3	Programmable Thermostat: Back Conference Room and Laundry Area	Program the thermostat to reduce the temperature to 60° F when the office is unoccupied.	\$59	\$25	31.72	0.4
4	Lighting: Storage Room and Bathroom	Replace the 100 W incandescent bulbs with energy efficient, LED equivalents.	\$7 + \$14 Maint. Savings	\$20	7.89	1.0
5	Lighting: Back Conference Room	Replace the 60 W incandescent bulbs with energy efficiency, LED equivalents.	\$0 + \$5 Maint. Savings	\$6	6.88	1.1
6	Other Electrical: Coffee Maker	Turn off coffeemaker after brewing. Keep fresh coffee in an insulated carafe.	\$7	\$40	1.50	5.5
7	Heating and Domestic Hot Water	Clean and tune boiler and hot water tank. Replace the existing hot water circulator with a variable speed, electrically commutated pump. Install a hot water heater jacket to reduce heat loss. Install faucet aerators to reduce hot water consumption.	\$165	\$1,530	1.47	9.3

Rank	Feature	Improvement Description	Annual Energy Savings <sup>1</sup>	Installed Cost	Savings to Investment Ratio, SIR <sup>2</sup>	Simple Payback (Years) <sup>3</sup>
8	Air Tightening	Install weather-stripping around all windows and the exterior door. Replace the sweeps at the bottom of the exterior door. Re-caulk windows as needed. Install insulating gaskets behind the electrical socket and light switch faceplates on exterior walls. Energy savings reflect a 5% reduction in draft.	\$19	\$293	0.59	15.7
<b>TOTAL for all measures</b>			<b>\$408 + \$19 Maint. Savings</b>	<b>\$1,945</b>	<b>2.77</b>	<b>4.6</b>
<b>TOTAL for medium and high priority measures</b>			<b>\$390 + \$19 Maint. Savings</b>	<b>\$1,652</b>	<b>3.16</b>	<b>4.0</b>

**Table Notes:**

<sup>1</sup> Maintenance savings were calculated by determining the approximate number and cost of fluorescent bulbs that would need to be replaced over the lifetime of an equivalent LED bulb, and then adding that subtotal to the cost of labor for changing each bulb. The total was divided over the lifespan of the LED equivalent bulb. Note: the LED lifespan is capped at 30 years.

A value of \$25 per hour was estimated for local labor. The length of time for changing each bulb was estimated at 10 minutes.

<sup>2</sup> Savings to Investment Ratio (SIR) is a life-cycle cost measure calculated by dividing the total savings over the life of a project (expressed in today’s dollars) by its investment costs. The SIR is an indication of the profitability of a measure: the higher the SIR, the more profitable the project. An SIR greater than 1.0 indicates a cost-effective project (i.e. more savings than cost). Remember that this profitability is based on the position of that Energy Efficiency Measure (EEM) in the overall list and assumes that the measures above it are implemented first.

<sup>3</sup> Simple Payback (SP) is a measure of the length of time required for the savings from an EEM to payback the investment cost, not counting interest on the investment and any future changes in energy prices. It is calculated by dividing the investment cost by the expected first-year savings of the EEM.

**Additional Recommendations (not included in Table 2)**

Thermal curtains: Installing thermally insulating or heavy curtains may reduce air/heat loss through the windows. Close curtains when a room is not in use.

Shrink wrap plastic: Install plastic around the windows to reduce draft during the winter.

Energy conservation: Hand dry or allow dishes to air dry instead of using the dishwasher's heated dry cycle.

Energy conservation: Turn off all computers, monitors, and printers when the office is closed.

## **FACILITY DESCRIPTION**

### **Building Occupancy Schedule**

The approximately 1,083 square foot Village of Solomon Tribal Office was constructed in the 2010s. The building is multi-use: the tribal office is housed on the first floor and two private residences occupy the second floor. A two-story attached garage is about one third of the overall footprint. The Village of Solomon Tribal Office is typically occupied Monday through Friday from 8:30 AM to 5:00 PM.

### **Description of Building Shell**

The exterior walls are assumed to be constructed of 2x6 timber framing with 16" on-center spacing. The exterior walls are sided with vinyl siding. The building walls are assumed to be insulated with R-30 fiberglass batt between the studs with about 2" of rigid foam insulating sheathing.

The Village of Solomon Tribal Office is built above grade on pads. The floor is assumed to be insulated with R-38 fiberglass batt with 2" rigid foam board on the exterior.

Typical windows throughout the building are low-E, double pane glass filled with N<sub>2</sub>/Argon gases. None of the four windows in the tribal office space have storm windows. Only one window is south facing.

The tribal office main entrance door is an insulated fiberglass door. It did not have a storm door at the time of the site visit.

The building roof was outside of the scope of this audit.

### **Description of Heating and Cooling Plants**

The heating system used in the building is:

#### **Oil-fired Boiler**

Nameplate Information:	Energy Kinetics EK-1
Fuel Type:	#1 Oil
Input Rating:	117,300 BTU/hr.
Steady State Efficiency:	87 %
Idle Loss:	1.5 %

Heat Distribution Type: Water  
Boiler Operation: All Year



Oil-fired boiler.

### **Space Heating Distribution System**

Heat is distributed throughout the Village of Solomon Tribal Office via radiant baseboard heaters.

The building is divided into nine heating zones. Each zone is regulated by a programmable thermostat that is tied to a central Energy Kinetics controller. When heat is called by a zone, a solenoid valve opens and heated glycol is pumped to the zone by a TACO circulation pump.

### **Domestic Hot Water System**

Presently, potable water is continuously circulated between the building and the water main by a Grundfos 15-18 SF circulation pump. This pump may be disconnected when the outdoor air temperature is above 40°F to 50°F. The Nome Joint Utility System provides a courtesy notice to its customers, announcing when it is safe to unplug the circulation pump.

Hot water is produced in an 80-gallon Energy Kinetics System 2000 indirect hot water heater. Hot water is circulated continuously throughout the building by a Grundfos UP15-29SU.



**Water service connection circulation pump (right) and the hot water circulation pump (left). The Nome Joint Utility System will announce when it safe to unplug the water service circulation pump.**

### **Description of Building Ventilation System**

The Village of Solomon Tribal Office ventilation system consists of a small, three-speed bathroom fan. The fan is controlled manually, and can set to 20 CFM, 40 CFM, or 60 CFM.

The ventilation systems in the two apartments were not included in this assessment.

### **Lighting**

There are about 17 light fixtures inside and on the exterior of the building. The lights use an estimated 521 kWh annually.

**Table 3: Lighting in the Village of Solomon Tribal Office**

<b>Lighting</b>	<b>Number of Bulbs</b>	<b>Fixture Type</b>	<b>Location(s)</b>
12 W LED Bulbs	11	Recessed overhead lighting	Main entrance and office area, kitchenette, back conference room
10 W LED Bulbs	3	Recessed overhead lighting	Main entrance and office area

100 W Incandescent Bulbs	1	Surface mounted lighting	Storage room, bathroom
60 W Incandescent Bulbs	1	Recessed overhead lighting	Back conference room

*Note: There is a six-bulb vanity above the stacked washer and dryer units. This light fixture was not included in the energy audit model, because it is unlikely that this fixture is used often. These bulbs could be replaced at a later time by wattage equivalent LED bulbs.*

## **Major Equipment**

Below is a list of the major equipment in the Village of Solomon Tribal Office. The appliances and equipment use an estimated 9,630 kWh annually.

**Table 4: Major Appliances and Equipment in the Village of Solomon Tribal Office**

<b>Equipment</b>	<b>Rating (Watts)</b>	<b>Annual Usage (kWh)</b>
Whirlpool Top-freezer Refrigerator	747.5 (full load)	411
Whirlpool Electric Stove/Oven	8,500 (stove top)	221.8
Whirlpool Microwave	1,800	234.8
Whirlpool Dishwasher	972 (full load)	50.7
Mr. Coffee 12-cup Coffee Maker	900 (full load)	58.7
Maytag Washer	1,440	77
Maytag Dryer	2,880	308.2
Genuine Joe Water Cooler	540.5	4,738
Vacuflow Central Vacuum Cleaner	1,320	17.2
Desktop Computers and Monitors	980 (total)	2,301.1
Wireless Modems and Router	189 (total)	192.6
Desktop Printers	1,980 (total)	258.3
Small Office Appliances	117.6 (total)	15.3
Water Service Circulation Pump	85	745.1

## **PROJECT FINANCING**

The total estimated cost of the recommended EEM's is \$1,945. The payback for the implemented EEM's is approximately 4.6 years. ANTHC is willing to assist the Village of Solomon with acquiring funds to complete the scope of work recommended in this energy audit.

There are several options for financing energy efficiency projects within the State of Alaska. These include the use of grants, loans, and other funding opportunities. Below is some information on potential funding opportunities.

**Energy Efficiency Revolving Loan Program** – This is a loan administered by the Alaska Housing Finance Corporation (AHFC) for use by any applicant who is also the owner of the building where the work will

take place. It provides a loan for permanent energy-efficiency projects with a completion window of one year.

**Sustainable Energy Transmission and Supply Program** – This is a loan administered by the Alaska Energy Authority (AEA) for a government, business, or other organized body of people. It provides a loan for energy-efficiency or power transmission or distribution projects.

**USDA-RD Communities Facilities Direct Loan & Grant Program** - This is a loan or grant provided by the US Department of Agriculture – Rural Development (USDA-RD) for any essential community facility in a rural area. It provides a loan or grant to develop essential community facilities with upgrades or equipment for improvement.

## **MEASUREMENT AND VERIFICATION**

The actual results of these recommendations can be measured by collecting and monitoring energy use. This information is available on the monthly bills provided by the local electric utility and the local fuel oil supplier. Collecting data and performing a historical comparison is the simplest method of validating the energy and cost savings seen by the measures. Additionally, active remote monitoring systems are available that can collect and store data regarding energy and fuel usage. These systems allow the user to track the usage in real time and can be shared more easily with partners across the state.

# APPENDICES

## *Appendix A – Scanned Energy Billing Data*

### 1. Utility Billing Data

No data was available for the Village of Solomon Tribal Office. The annual energy usage data presented above is based on estimates provided by AkWarm.

## Appendix B – Energy Audit Report – Project Summary

ENERGY AUDIT REPORT – PROJECT SUMMARY	
General Project Information	
PROJECT INFORMATION	AUDITOR INFORMATION
<b>Building:</b> Village of Solomon Tribal Office	<b>Auditor Company:</b> Alaska Native Tribal Health Consortium
<b>Address:</b> Box 2053	<b>Auditor Name:</b> Kelli Whelan
<b>City:</b> Nome	<b>Auditor Address:</b> 4500 Diplomacy Drive Anchorage, AK 99508
<b>Client Name:</b> Elizabeth Johnson	
<b>Client Address:</b> Box 2053 Nome, Alaska 99762	<b>Auditor Phone:</b> (907) 729-3723
<b>Client Phone:</b> (907) 443-4985	<b>Auditor FAX:</b>
<b>Client FAX:</b>	<b>Auditor Comment:</b>
Design Data	
<b>Tribal Office Area:</b> 1,083 square feet	<b>Design Space Heating Load:</b> Design Loss at Space: 1,872 BTU/hour with Distribution Losses: 1,971 BTU/hour Plant Input Rating assuming 82.0% Plant Efficiency and 25% Safety Margin: 3,004 BTU/hour Note: Additional Capacity should be added for DHW and other plant loads, if served.
<b>Typical Occupancy:</b> 4 people	<b>Design Indoor Temperature:</b> 70° F (office average)
<b>Actual City:</b> Nome	<b>Design Outdoor Temperature:</b> -26.1° F
<b>Weather/Fuel City:</b> Nome	<b>Heating Degree Days:</b> 13,764° F-days
Utility Information	
<b>Electric Utility:</b> Nome Joint Utilities Systems	<b>Bulk Fuel Provider:</b> Unknown
<b>Average Annual Cost/kWh:</b> \$0.265/kWh	<b>Average Annual Cost/gallon:</b> \$4.66/gal.

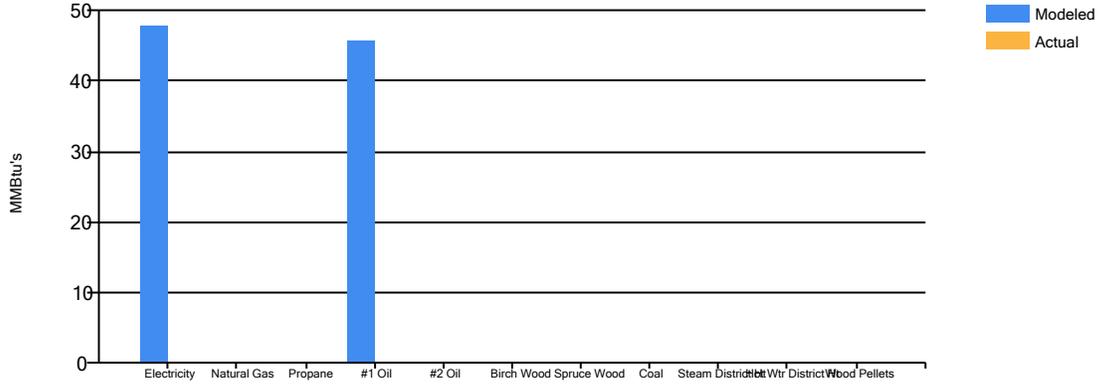
Annual Energy Cost Estimate								
Description	Space Heating	Water Heating	Ventilation Fans	Lighting	Refrigeration	Other Electrical	Service Fees	Total Cost
Existing Building	\$505	\$1,738	\$1	\$137	\$108	\$2,802	\$60	<b>\$5,350</b>
With Proposed Retrofits	\$307	\$1,640	\$1	\$129	\$107	\$2,699	\$60	<b>\$4,942</b>
Savings	\$198	\$98	\$0	\$8	\$1	\$103	\$0	<b>\$408</b>

Building Benchmarks			
Description	EUI (kBtu/sq. ft.)	EUI/HDD (Btu/sq. ft./HDD)	ECI (\$/sq. ft.)
Existing Building	86.4	6.28	\$4.94
With Proposed Retrofits	80.7	5.86	\$4.56
EUI: Energy Use Intensity - The annual site energy consumption divided by the structure's conditioned area. EUI/HDD: Energy Use Intensity per Heating Degree Day. ECI: Energy Cost Index - The total annual cost of energy divided by the square footage of the conditioned space in the building.			

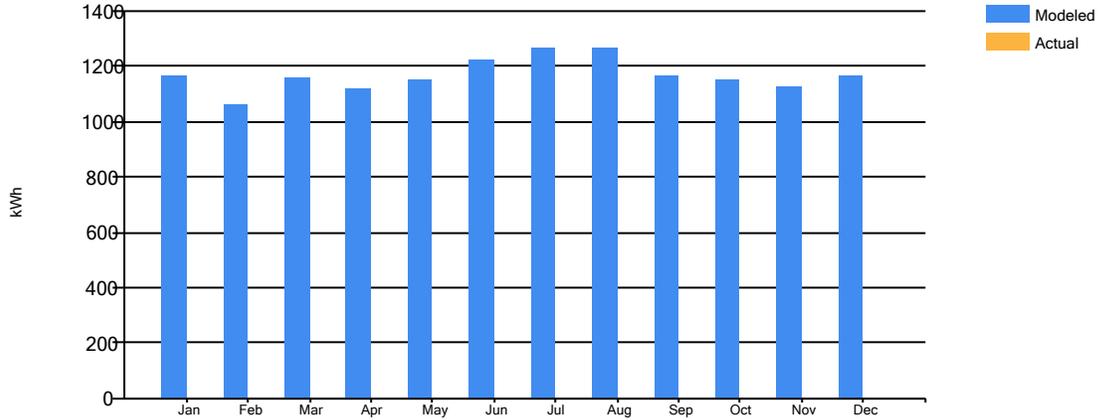
## Appendix C – Actual Fuel Use versus Modeled Fuel Use

The graphs below show the modeled energy usage results of the energy audit process compared to the actual energy usage report data. The model was completed using AkWarm modeling software. The blue bars are AkWarm’s prediction of fuel and electric use. No utility data was available for the Village of Solomon Tribal Office.

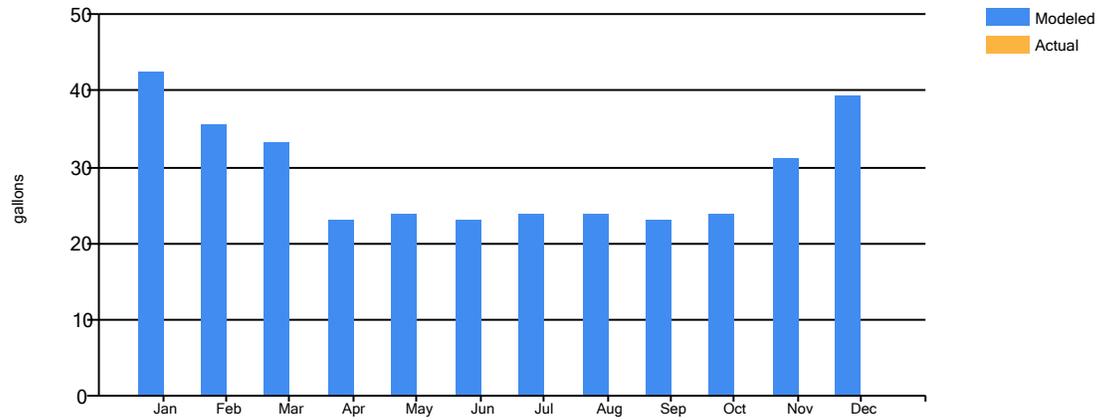
### Annual Fuel Use



### Electricity Fuel Use



### #1 Fuel Oil Fuel Use



## Appendix D - EUI Calculation Details

The Nome Joint Utilities Systems currently provides electricity to the residents of Nome as well as to all commercial and public facilities. The local fuel distributor is unknown.

The average cost for each type of fuel used in this building is shown in Table D-1 below. This figure includes all surcharges, subsidies, and utility customer charges:

**Table D-1: Energy Cost Rates for each Fuel Type**

Average Energy Cost (as of June 2018)	
Description	Average Energy Cost
Electricity	\$ 0.36/kWh
#1 Oil	\$ 4.80/gallons

Table D-2 shows the calculated results for the building Energy Use Index (EUI), which determines the total energy usage for a type of building for comparison with other buildings of the same type. This allows the user to determine the relative energy use of a building in relation to others of the same type or use.

**Table D-2: EUI Building Calculations for the Village of Solomon Tribal Office**

Energy Type	Building Fuel Use per Year	Site Energy Use per Year, kBTU	Source/Site Ratio	Source Energy Use per Year, kBTU
Electricity	14,022 kWh	47,855	3.340	159,837
#1 Oil	346 gallons	45,708	1.010	46,165
<b>Total</b>		<b>93,564</b>		<b>206,003</b>
BUILDING AREA 1,083 Square Feet				
BUILDING SITE EUI 86 kBTU/ft <sup>2</sup> /yr.				
<b>BUILDING SOURCE EUI 190 kBTU/ft<sup>2</sup>/yr.</b>				
* Site - Source Ratio data is provided by the Energy Star Performance Rating Methodology for Incorporating Source Energy Use document issued March 2011.				

Table D-3 shows information on common energy use benchmarks used to characterize the efficiency of a building.

**Table D-3: Building Benchmarks for the Village of Solomon Tribal Office**

Building Benchmarks			
Description	EUI (kBTU/sq. ft.)	EUI/HDD (BTU/sq. ft./HDD)	ECI (\$/sq. ft.)
Existing Building	86.4	6.28	\$4.94
With Proposed Retrofits	80.7	5.86	\$4.56
EUI: Energy Use Intensity - The annual site energy consumption divided by the structure's conditioned area. EUI/HDD: Energy Use Intensity per Heating Degree Day. ECI: Energy Cost Index - The total annual cost of energy divided by the square footage of the conditioned space in the building.			

## Appendix E – Materials List and Labor Estimation

Tables E-1 and E-2: ANTHC Materials List and Cost Estimation for the Village of Solomon Tribal Office EEM’s

Energy Retrofit	Required Materials	Quantity <sup>a</sup>	Cost per Item	Total Materials Cost	Total Project Cost <sup>b</sup>
Air sealing	Weather stripping, caulking	-	-	\$100.00	\$293
	Electrical socket and light switch gaskets (14-pack)	2	\$2.28	\$4.60	
	Door sweeps	1	\$30.19	\$30.20	
Lighting	100 W LED equivalents (daylight; 8-pack)	1	\$40.32	\$40.32	\$71
	60 W LED equivalents (soft white; 4-pack)	1	\$6.97	\$7.00	
Heating and Domestic Hot Water	Clean and tune boiler, hot water tank	-	-	\$300.00	\$1,530
	Variable speed circulation pumps	1	\$172.00	\$172.00	
	¾" Foam pipe insulation (3' each; 4-pack)	5	\$3.47	\$17.40	
	1" Foam pipe insulation (6' each)	5	\$2.13	\$10.70	
	Foil-faced tape	1	\$7.88	\$7.88	
	R-6.7 Hot water heater blanket	1	\$28.56	\$28.60	
	Faucet aerators	2	\$3.69	\$7.40	
	Teflon tape	1	\$3.50	\$3.50	
Other	Insulated carafe	1	\$35.00	\$35.00	\$40

<sup>a</sup> 10% surplus included.

<sup>b</sup> Project costs include materials, freight (15% of materials cost, and labor).

	<b>Contactor (construction, heating specialist)</b>	<b>Local Labor</b>
<b>Category</b>	<b>Cost (\$)</b>	<b>Cost (\$)</b>
Labor	500	242
Materials	472	292
Freight	71	44
Travel <sup>c</sup>	-	-
Indirect <sup>d</sup>	313	-
<b>Subtotal</b>	<b>\$1,356</b>	<b>\$578</b>
	<b>Grand Total</b>	<b>\$1,934</b>

<sup>c</sup> Several local contractor companies available in Nome.

<sup>d</sup> Indirect rate is 30% (of the total estimated labor, travel, materials, and freight costs). This represents an estimate of contractor profit, insurance, and bonding costs.

## Appendix F – Example Materials

### 1. Air Sealing

#### [Socket and Light Switch Gaskets](#)

### Specifications

#### Dimensions

Product Depth (in.)	.125	Product Width (in.)	2.5
Product Height (in.)	4		

#### Details

Application Type	Switch Plate	Package Quantity	14
Color Family	White	Returnable	90-Day
Color/Finish	White	Shape	Rectangle
Electrical Product Type	Wall Plate	Wall Plate Configuration	1-Decorator / Rocker / 1-Duplex
Features	No Additional Features	Wall Plate Deco Style	Standard/Contractor
Included	No additional components or accessories are included	Wall Plate Material	Metal
Number of Gangs	1		

#### Warranty / Certifications

Certifications and Listings	1-UL Listed	Manufacturer Warranty	1 Year
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### 2. Lighting Recommendations

#### [100 Watt LED Equivalent Bulbs](#)

### Specifications

#### Dimensions

Bulb Diameter (In.)	2.36	Product Height (in.)	4.37
Product Depth (in.)	4.92	Product Width (in.)	2.48

#### Details

Actual Color Temperature (K)	5000	Light Bulb Features	Energy Saving
Average Life (hours)	10950	Light Bulb Shape Code	A19
Bulb Construction	Plastic	Lighting Technology	LED
Bulb Shape	Standard	Lumens (Brightness)	1500
Bulb Type	Household	Number of Bulbs Included	8
Color Rendering Index (CRI)	80	Returnable	90-Day
Color Temperature	Daylight	Specialty Bulb Type	Household / General Purpose
Indoor/Outdoor	Indoor	Wattage (Watts)	14
Light Bulb Base Code	E26	Wattage Equivalence	100
Light Bulb Base Type	Medium		

#### Warranty / Certifications

Manufacturer Warranty	3 Year Warranty		
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## [60 Watt LED Equivalent Bulbs](#)

### Specifications

#### Dimensions

Bulb Diameter (in.)	2.375	Product Height (in.)	6.89
Product Depth (in.)	2.40	Product Width (in.)	2.40

#### Details

Actual Color Temperature (K)	2700	Light Bulb Features	Energy Saving
Average Life (hours)	10000	Light Bulb Shape Code	A19
Bulb Construction	Plastic	Lighting Technology	LED
Bulb Shape	Standard	Lumens (Brightness)	800
Bulb Type	Household	Number of Bulbs Included	4
Color Rendering Index (CRI)	80	Returnable	90-Day
Color Temperature	Soft White	Specialty Bulb Type	Household / General Purpose
Indoor/Outdoor	Indoor	Wattage (Watts)	8.5
Light Bulb Base Code	E26	Wattage Equivalence	60
Light Bulb Base Type	Medium		

#### Warranty / Certifications

Manufacturer Warranty	This item has 3 year warranty. Please see the back of the package for details.		
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### 3. Heating and Domestic Hot Water Recommendations

#### [3/4" Foam Pipe Insulation](#)

### Specifications

#### Dimensions

Maximum compatible pipe size (in.)	.75	Product Length (in.)	1.75
Product Depth (in.)	1.75	Product Width (in.)	9.0
Product Height (in.)	36.0		

#### Details

Accessory Type	Insulation	Minimum compatible pipe size (in.)	.75
Compatible Pipe Material	Polyethylene	Pipe or Fitting Product Type	Accessory
Features	Fire Rated,Self-Sealing	Product Weight (lb.)	.375lb
Insulation R-Value	3.0	Returnable	90-Day

#### Warranty / Certifications

Manufacturer Warranty	90 Days		
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## [1" Foam Pipe Insulation](#)

# Specifications

### Dimensions

Maximum compatible pipe size (in.)	1	Product Length (in.)	72.00 in
Product Depth (in.)	72	Product Width (in.)	2.24 in
Product Height (in.)	2.24 in		

### Details

Accessory Type	Insulation	Minimum compatible pipe size (in.)	1
Compatible Pipe Material	Copper	Pipe or Fitting Product Type	Accessory
Features	Self-Sealing	Product Weight (lb.)	.155lb
Insulation R-Value	2.9		

### Warranty / Certifications

Manufacturer Warranty	None		
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## [R-6.7 Hot Water Heater Jacket](#)

# Specifications

### Dimensions

Coverage Area (sq. ft.)	25	Product Length (ft.)	6.25 ft
Product Depth (in.)	2	Product Thickness (in.)	2 in
Product Height (in.)	75	Product Width (in.)	48

### Details

Formaldehyde Free	Yes	Product Weight (lb.)	6lb
Insulation Application Type	Garage	Returnable	90-Day
Insulation R-Value	6.7	Roll or Batt	Roll
Insulation Type	Recycled Denim	Vapor Retardant	No
Product Type	Blanket/Jacket		

### Warranty / Certifications

Warranty Information	1 Yr Limited Warranty		
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## [Faucet Aerators](#)

# Specifications

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### Dimensions

Product Depth (in.)	0.909	Product Width (in.)	0.909
Product Height (in.)	0.689		

### Details

Application	Bathroom Sink,Kitchen Sink	Material	Brass
Color/Finish	Chrome	Plumbing Part Type	Aerator
Color/Finish Family	Chrome	Tamper Resistant	No
Fits Faucet Brand	All Brands	Thread Pitch (Threads Per Inch)	27
Flow Rate	1.5 gal (US)/min	Thread Size (In.)	15/16x55/64
Flow Restrictor	Yes	Thread Type	Dual-Threaded

### Warranty / Certifications

Manufacturer Warranty	Limited 1-year warranty		
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***Appendix G – Additional Photos of the Village of Solomon Tribal Office***



**Village of Solomon Tribal Office exterior.**



**Attached two-story garage.**



**Exterior subfloor under the office appears to be in excellent condition.**



**Plumbing was not insulated in the boiler room. Installing foam insulation around the copper pipe would prevent heat loss through the hot water lines. Insulation would also prevent condensation build-up on the cold water pipes.**



Programmable thermostats make night and weekend temperature setbacks easy. Typically, 60° F is the recommended setback temperature for offices and residences, except during extreme cold weather events. The setback temperature should be higher in these cases to compensate for a higher rate of heat loss out of the building.