OUR ISLAND HOME Existing Building Systems Evaluations



Our Island Home Town of Nantucket 9 East Creek Road Nantucket, MA 02554

SED Associates Corp. 132 Lincoln Street Boston, MA 02111

April 2014

REPORT TABLE OF CONTENTS

		PAGE
I.	EXECUTIVE SUMMARY	3
II.	INTRODUCTION	5
III.	OBSERVATIONS- EXISTING CONDITIONS	6-10
IV	EVALUATED SYSTEMS DESCRIPTIONS	11-14
V.	CONCLUSIONS and RECOMMENDATIONS	14-17
APPE	NDICES:	18
A.	Observed Temperatures	19
В.	Existing Equipment Inventory	20-40
	Boiler (B-1)	20
	Boiler (B-2)	21
	Boiler (B-3)	22
	Combustion Exhaust Fan	23
	Fuel Oil Pumps	24
	Main Hot Water Circulation Pumps	25
	Common Area 3-ton Ductless AC Units	26
	Common Area 5-ton Ductless AC Units	27
	Core Area AC	28
	Kitchen Area Ductless AC Units	29
	Heat Recovery Ventilator	30
	Zone Hot Water Circulation Pumps	31
	Dining Room Zone Circulation Pump	32
	Resident Rooms Fin Tube Radiation & Thermostats	33
	Dining Room Fin Tube Radiation & Thermostats	34
	Laundry Area Fans & Hoods	35
	Kitchen Hood Make-up Air Unit	36
	Kitchen Area Exhaust Fans	37
	Domestic Hot Water Heaters (Direct Fired Type)	38
	Domestic Hot Water Heaters (Storage Type)	39
	Attic Mechanical Room Exhaust Fan	40
C.	2013 Energy Usage Summary	41
D.	HVAC Loads Analysis	42-48
E.	Domestic Water Storage Tank Analysis	49
F.	Energy Conservation Measures	50-53
G.	System Budget Costs	54-56

I. EXECUTIVE SUMMARY

SED Associates Corp. was retained by the Town of Nantucket to perform an assessment of the Our Island Home (OIH) existing HVAC, plumbing and electrical systems present conditions. Its expected useful life and applicable energy conservation measures. The assessment was performed at the Client's request using methods and procedures consistent with standard industry procedures. This report is exclusively for the use and benefit of the Client. This report is not for the use or benefit of, nor may it be relied upon by any other person or entity, for any purpose without the advance written consent of SED.

Summary of Existing Energy Performance

Building's Annual Energy Consumption	4,459,830 kBtu
Total Annual Energy Costs	\$137,859

SED has determined that the facility current heating boilers are insufficient to meet existing heating demand, see Appendix D HVAC Load Analysis.

SED has identified four Energy Conservation Measures (ECMs) for this property. The savings for each measure are calculated using standard engineering methods followed in the industry, and detailed calculations for ECM are provided in Appendix F for reference. In addition to the consideration of the interactive effects, SED has applied a 10% contingency to the implementation costs to account for potential cost overruns during the implementation of the ECMs.

The following table summarizes the recommended ECMs in terms of description, investment cost, energy consumption reduction, and cost savings.

Summary of Recommended Energy Conservation Measures (ECIVI #5 & #4)

Total Projected ECM Initial Investment	\$34,900
Estimated Annual Cost Savings	\$9,919
Net Effective Payback	3.5yrs.
Estimated Annual Energy Savings	16%
Estimated Annual Cost Savings	7%

SED recommendation based upon our evaluations and analysis; and to combine the above noted ECM's with the following system replacement/upgrades:

- 1. Replace the existing individual fin-tube radiation self-contained thermostats.
- 2. Replace the existing central heat recovery unit with three (3) new DOAS-ERV.
- 3. Replace the existing boiler heating, domestic hot water heaters and pumps.
- 4. Replace fuel oil circulation pump, OP-1.
- 5. Replace existing propane direct fired domestic hot water heaters.

Current Massachusetts Department of Public Health (DPH) requirement is to have air conditioning in all residence areas and will need to be incorporated into any long term plans for the facility. The existing facility has limited air conditioning mainly the general interior 'core area' that provides the facility administration/nursing support services, common sitting areas at the end of the corridor, main residence lounge, etc.

Estimated installation costs are based on SED experience on similar projects and industry standard cost estimating tools including *RS Means*. In developing the installed costs, SED also considered the area correction factors for labor rates for Nantucket, MA. Since actual installed costs may vary widely for particular installation based on labor & material rates at time of installation, SED does not guarantee installed costs herein. We strongly encourage the owner to confirm these cost estimates independently. SED does not guarantee the costs savings estimated in this report. SED shall in no event be liable should the actual energy savings vary from the savings estimated herein.

II. INTRODUCTION

This study evaluated the short and long term options for the HVAC (heating, ventilation and air conditioning), plumbing and electrical systems present conditions and expected useful life systems as they relate to the occupants comfort and the building energy usage.

SED looked at both the general physical and age of the equipment in addition to the current operational status. No testing was performed services limited to observations only.

Facility Description:

Building Description

OIH was constructed in 1980 with major dining addition in 2002 having a total gross area of 20,000 sq.ft. This is a single story wood framed, slab on grade reinforced concrete floor with partial attic/mechanical space and fully accessible attic. The building is fully heated with partial air conditioning.

This is a 45-bed facility with central support areas consisting of bathing, dining, laundry, kitchen, nurse call center and related administrative areas.

Utilities

Propane Gas Supply Company is Yeats Gas/Suburban Propane Electric Supply Company is National Grid, rate G2. Fuel Oil Supply Company, no.2 type, Harbor Fuel Oil Corp. Water and sewer services, Town of Nantucket's Sewer Department through its agent the Wannacomet Water Company.

Schedules

Occupancy: 24-hours per day, 365 days per year. Equipment: Occupied mode 24-hours per day, 365 days per year.

III.OBSERVATIONS-EXISTING CONDITIONS

SED conducted site visits during November 2013 and late January 2014 to allow for the obtaining existing systems data and its visual observations while operating.

General envelope observations-

- Wood frame construction; walls 5.5" fiberglass, attic floor 10" fiberglass/blow-in insulation.
- Entry vestibules have been retrofitted with sliding doors to cut down on the outside air infiltration.
- Excessive outside air flow was observed during the site observations, mainly around the entry areas that will contribute to the 'cold temperatures' within the building. *See observed temperature under appendix A*.
- Attic vents are block-off in winter to cut down on the outside air infiltration.

Electrical-

- Service size is 800amps, 120/208-3phs. Appears to be sufficient for the current connected loads, facility personnel didn't not any issues with this system other than the need for more outlets.
- Lighting system was upgraded by National grid as part of an energy conservation program in 2011.
- Emergency generator rated at 45KW, 158amps. System typically services the heating system, limited egress lighting, sewage ejector and the kitchen freezer & cooler units. Unit fuel source is a dedicated 330 gallon oil storage tank located in the shed with gthe generator.

<u>Plumbing</u>- see appendix B Existing Equipment Inventory for additional information

- Building water service with meter, combined site service with the fire line 8"connecting to the town system. Splits inside the building to 3"cold water feed to the building distribution system.
- Building sanitary, 6" connected to the town system. Building system pumped from a duplex sewage ejector.
- Fixtures are of the older 2.5-3gpf units. Central bathing facilities are located in the east & west wings for use by the residence. In addition each wing has a dedicated tub/shower unit within a residence room.
- Central hot water heating units, oil fired generate 180deg, F hot water. This higher temperature required for the laundry and is reduced with mixing valve station to provide lowered tempered water to the kitchen and general fixtures.
- Bathing areas had supplemental/replacement direct fired tank less propane hot water heaters added to provide hot water and with adequate flow to meet these rooms demand. *Facility personnel noted unit were installed to meet both a demand and to address the issue of the delivery time of hot water to the bathing/shower equipment.*
- Propane storage tanks, multi-units service the kitchen cooking, laundry and the direct fired hot water heaters.
- Kitchen fixtures discharge thru dedicated grease interceptors located within the kitchen area.

<u>HVAC</u>- see appendix B Existing Equipment Inventory for equipment data and additional information.

The building has 100% heating coverage with limited air conditioning for the core/nursing area, residence sitting areas, a classroom and a three support spaces- medical records, computer server and dry goods storage.

- Central boiler hot water heating system, oil fired units with main circulation pumps and dedicated zone pumps.
- Heat within the individual residence rooms and spaces is by fin tube hot water radiators with self-contained thermostatic valves in each room/space.
- Common areas and entries have dedicated hot water cabinet unit heaters with built-in fans and controls.
- Heating, Ventilation and Air Conditioning systems consist of; General ventilation is provided by a central heat recovery unit with a supply and exhaust air fans; hot water coil and temperature controls to maintain a discharge set point. This unit provides both the supply and exhausts air throughout the residence areas of the facility with supply air into the residence bed area and exhaust out the toilet room. Unit has no air conditioning.

The kitchen hood has a dedicated un-tempered make-up air supply fan unit with direct connection to the hood and a roof mounted exhaust fan. The dishwasher hood has a dedicated exhaust fan. The cart wash area has a dedicated exhaust fan.

Laundry room has a dedicated wall exhaust fan and intake damper.

Core area, entry/nurse station has dedicated air handling unit with electric coil, refrigerant coil and a spilt condenser. Unit provides heating & cooling with dehumidification for the serviced areas.

Dining room has dedicated air handling unit with refrigerant coil and a spilt condenser.

Limited air conditioning is by means of small dedicated split heat pump units that service the common sitting areas, classroom and the kitchen area support offices only.

- Central aboveground fuel oil storage tank, 2,000 gallon capacity installed in 2011 to replace the original underground unit. Oil provides for the building heat and domestic hot water mainly the laundry and kitchen related to dish washing.
- There is no central building energy management system. The automatic temperature controls system consist of individual dedicated control systems as follows;

Boilers are equipment with an automatic start/stop and hot water outdoor reset controller that varies the supply water temperature based upon the outside temperature. The reset water range is 160-200deg.F. The lower temperature range is due to the cast iron boilers which require a minimum 140deg.F return water temperature.

Pump controls is limited to the boiler room main pumps which provide for outside air temperature pump start, lead-lag operation manual operation. *Zone pumps, per facility personnel, are left on year round due to the lack of automatic controls.*

Heat recovery unit, factory packaged, with built-in face & bypass control, duct thermostats to maintain the supply discharge air temperature at a fixed set point that is manually adjustable.

Kitchen hood exhaust fan is manually started/stopped with the make-up air and dishwasher hood exhaust fan interlocked to operate whenever the kitchen hood exhaust fan runs. The cart wash area fan is manually started/stopped.

Core area unit is controlled by a space mounted thermostat that cycles the electric heating coil and condensing unit compressor to maintain set point temperature, manually adjustable. The electric heat and condensing unit are interlocked to prevent simultaneous operation.

Attic mechanical room 'cooling' exhaust fan is thermostatically controlled to open a motorized intake damper and run whenever the space exceeds its set point temperature, manually adjustable. The mechanical room heating is maintained by a thermostatically controlled hot water unit heater.

Residence and dining room fin tube radiation has self-contained thermostatic valves that maintain room/space set point temperatures.

Common areas, corridors and entry's temperature is maintained by the cabinet unit's thermostat that cycles the fan.

Dining room cooling air conditioning unit is controlled by a space mounted thermostat that cycles the condensing unit compressor to maintain set point temperature, manually adjustable.

Limited air conditioning is by means of small dedicated split heat pump are controlled by space/room thermostat.

Existing Building Benchmarking using Utility Data

A. The 2013 energy usage was as follows; see appendix C2013 Energy Usage Summary.



Typical benchmarks, EPA Portfolio manager and Commercial Buildings Energy Consumption Survey (CBECS, 2003 revised 2008) compare utility usage of this building to similar types. The Portfolio manager is an EPA tool that rates your building against similar buildings.

CBECS is a database of existing buildings and their characteristics and is commonly used as bases of energy use and comparison to establish energy benchmarks.

Building Information		Performance Ratings Annual			Operating Cost/Sq.Ft.					
	EPA Bldg.	Area	Existing	Energ	y Intensity (Kbtu/sqft)	2013	2013	2013	Total
Building Type	Туре	(Sq.Ft.)	EPA Rank	Existing	Medium	Energy Star	Electric	Oil	Propane	TULAI
Nursing Home	Senior Care	20,000	17	204.3	159.4	132.3	\$2.61	\$3.64	\$0.64	\$6.89
Weather Information		Electric and Fuel Usage Annual Energy		y Use Indices						
			Actual	Actual	Actual	Normalized	Normalized			
			Electric	Oil	Propane	Total Fuel	Site Total			
Year	HDD	CDD	(kBTU)	(kBTU)	(kBTU)	(kBTU)	(kBTU/sqft)			
2013	5400	116	1,261,541	2,700,835	497,454	4,169,509	208.5			
30 yr.ave.	5776	104								

Terms that is used in the table above:

- Building type; the type of building being examined.
- EPA Building Type: EPA Portfolio building type.
- Building total gross area sq.ft.
- EPA rank: EPA's portfolio manager benchmarking tool. The scale is 1 to 100, with an average building ranking of 50.
- Energy intensity kBTU/sqft: measure of the annual amount of energy used to operate this facility.
- Operating cost per sq.ft. area: 2013 base year.
- Degree & heating days are base 65deg.F; cooling days are 70deg.F.
- Heating Degree Days: an indication of how cold the year was with higher HDD indicating a colder year.
- Cooling Degree Days: an indication of how warm the year was with a higher CDD indicating a warmer year.
- Actual Electric kBTU: amount of electric used during the year, measured in in kBTU which is 1000 BTU or 1/100 of therm. Conversion of electric is 3.413 kBTU/kWh.
- Actual Fuel, Oil or Propane kBTU: amount of heating energy used during the year, fuel measured in kBTU which is 1000 BTU or 1/100 of therm.
- Normalized Total Fuel kBTU: the total energy (electric, oil, propane) used during the year and normalized to 30 year averages based on HDD.
- Normalized Site Total kBTU/sqft: 30 year average of the total heating energy use per year (kBTU) divided by the building gross square footage.
- Normalized values are used to provide a common usage bases of the year to year weather variances which are based on 30 year average weather data.

Comments on the above charts and spreadsheet,

The building annual energy usage is divided into three categories based on type; Oil at 61%, electric at 28% and propane at 11%. The oil has peak usage during the heating months from September thru late April with a drop-off to the non-heating months that is mostly attributable to the domestic hot water usage for the laundry/kitchen.

This building higher normalized energy intensity value of 208.5 kBTU/sqft as compared to the medium facility of 159.4 kBTU/sqft is a measure of its energy usage which for this existing facility is indicative of a poor envelope and poor performance of its systems.

This building would need to reduce its energy usage by 55% to receive the minimum rating of '75' Energy Star Award.

IV. EVALUATIONS

The report evaluations are separated into two general categories of equipment and energy conservation measures. These categories will have both indirect and direct effects on each other that cannot be evaluated on its own but offer potential savings and long term usage when combined.

Existing equipment evaluations see appendix B Existing Equipment Inventory for equipment data and additional information and observations.

- 1. Boilers (B-1, 2 & 3), cast iron type, installed 2000 (approximate) with issue to date that have included
 - Boiler units have been discontinued by manufacture with the continued availability of replacement parts from the manufacturer unknown.
 - Boiler #1combustion chamber gasket failure resulting in hot gas leakage/burn thru its cover.
 - Boiler #3 burner unit replaced and the related flue.

Condition of the existing boilers is fair. Oil fired boilers such as this one have system cast iron section sealing issues between each boiler section as they approach the end of their useful life and in the 15 year old range. Each boiler section is connected by neoprene seals at three internal areas inside the boiler sections. These gaskets are used to connect each section to the other for water tightness. As they age and by firing # 2 oil the by-products of burning # 2 oil are sulfur and vanadium. As the boiler ages the residues land on the edges of the neoprene gaskets and as the boiler heats/cools over a period of time any moisture inside the combustion chamber mixes with the sulfur to create sulfuric acid. This acid then starts to 'eat away' at the neoprene gasket and eventually the boiler starts to leak between the sections. It can be re-gasket as observed on unit #1. If that area leaks for a long time (usually2-3 months) then the water has eroded/corroded the cast iron gasket captured seal port and then the boiler should be replaced. Current observations are that the boilers are not leaking. These opinions are from past experiences with boilers that fire # 2 oil and are over 15 + years old which your boiler is there in that range.

- Comment: while the tested combustion efficiency of these units is 84-85% the overall thermal efficiency as a measure of the 'heat' delivered to meet the building load is typically around 75-80%. This is due to a combination of boiler radiation heat loss to the boiler room and the limited to opening the range of the hot water reset temperature due to the cast iron material. Replacement is recommended.
- 2. Boilers (B-1, 2 & 3) issue with regards to sufficient boiler heating capacity. Facility personnel noted that on winter days below 15deg.F the HRV unit is shut down to prevent cold air from being discharged into the room below its set point temperature. SED observed space temperatures ranging 68-72deg.F at an outside temperature of 16-19deg.F, see appendix A. Observed Temperatures

Our analysis indicated the following (see appendix D HVAC Loads Analysis for additional data). Design winter outside temperature 9deg.F.

- Original calculated building load without the dining addition is 879,833 BTUH at interior temperature 70deg.F.
- Corrected calculated building load with dining addition is 1,126,403 BTUH at interior temperature 70deg.F..
- Calculated building load with dining addition is 1,218,731 BTUH at the current DPH required interior temperature of 75deg.F.
- Comment This analysis indicates that the existing boiler plant capacity can only adequately heat this facility down to an outside ambient temperature between 15-20deg.F. Replacement is recommended with increased heating capacity of 1,218,731 BTUH (minimum). See Domestic Hot Water Heaters, Storage Type hereinafter for additional comments on sizing with indirect hot water heating.
- 3. Main Heating System Circulation & Zone Pumps (P-1 thru P-9). These are constant speed units that should be upgraded to newer energy efficient units with DC- Electronically Commutated Motor (ECM). These units when coupled with the proper controls allow for direct variation of the system flow which will vary due to the building/space heating loads.
- Comment The useful like of these units vary from 0-9 years. The zone pumps are pipe in a secondary loop with balanced return flow that is works marginally and is a waste of energy since it uses a 2nd pump to force the water flow thru the zone.
- 4. Oil Circulation Pumps (OP-1 & 2). Units are fully functional at this time. OP-2 was replaced in 2014.

Comment Replacement of OP-1 has exceeded its useful service life and should be replaced.

- 5. Core Area AC. Unit is fully functional at this time.
- Comment: This unit is the only piece of equipment that supply's fresh and tempered (heated & cooled) air to the central core area that also included the nurse's station. This unit has exceeded its useful service life and should be replaced. Replacement compressors using this refrigerant are being phased out of manufacturing and in the foreseeable future may become unavailable.
- 6. Dining Area AC. Unit is fully functional at this time.
- Comment: This unit uses a refrigerant, R-22, that is no longer made and will become harder if not impossible to obtain as a replacement due to any system leakage. Replacement compressors using this refrigerant are being phased out of manufacturing and in the foreseeable future may become unavailable.

- 7. General Usage Areas Ductless Split Units (5 units) Units are fully functional at this time.
- Comment: This unit uses a refrigerant, R-22, that is no longer made and will become harder if not impossible to obtain as a replacement due to any system leakage. Replacement compressors using this refrigerant are being phased out of manufacturing and in the foreseeable future may become unavailable.
- 8. Kitchen Ductless AC units (3 units). Units are fully functional at this time. The dry goods storage unit was replaced in 2013 and that unit uses R-410a as a refrigerant.
- Comment: Two of these units use refrigerant, R-22, that is no longer made and will become harder if not impossible to obtain as a replacement due to any system leakage. Replacement compressors using this refrigerant are being phased out of manufacturing and in the foreseeable future may become unavailable.
- 9. Central energy recovery unit ventilator (HRV), installed 1980 with issues to date that have included the following items;.
 - Unit has been discontinued by manufacture with the continued availability of replacement parts from the manufacturer unknown.
 - Unit controls have been repaired over time on as needed bases.
 - Dampers, face & by-pass not operational.
 - Unit access for normal maintenance is limited that has resulted in limited filter replacement and no cleaning of the heat exchanger core. It was observed that the core has dust/dirt buildup of the surfaces resulting in a loss of the unit efficiency.
 - Unit is shutoff when the outside temperature is below 10deg.F to prevent cold air being supplied to the residence rooms per the facility operator. This is caused in part due to the lack of sufficient heat from the boiler heating system.
 - Minimum dehumidification of the fresh outside supply air provided thru the heat exchanger only. Estimate that this unit would need to have 25tons of mechanical cooling to meet an indoor temperature of 75def.F/50% humidity.
- Comment: current performance issues includes the lack of heating on colder days, no air condition to dehumidify the summer supply air, service issues and unit being discontinued by the manufacture.

10. Kitchen Make-up unit. Unit is fully functional at this time. Comment: unit has exceeded its useful service life.

11. Kitchen Exhaust Fans: Units are fully functional at this time. Comment: units have exceeded their useful service life

12. Attic Mechanical Fan: Unit is fully functional at this time. Comment: unit has exceeded its useful service life.

13. Laundry Area Exhaust Fan and Intake: Unit is fully functional at this time. Comment: Units were installed within the past 5-6 years.

14. Combustion Exhaust Fan: Unit is fully functional at this time. Comment: unit has exceeded its useful service life.

15. Residence & Dining Room thermostats: Majority of units are functional at this time. Comment: unit has exceeded its useful service life.

- 16. Domestic hot water heaters, storage tank type (2 units) in the boiler room: Units are fully functional at this time.
- Comment: The units are coming up on its useful service life and owner replaced these in 2007 after earlier replacement units from 2000(?) were replaced. Owner has noted issue with servicing since it requires taking both off line at the same time leaving the facility without its main source of domestic hot water. Replacement should evaluate the replacement for these units as an indirect type connected to the replacement boiler system.

The current domestic water heating system capacity is provided from the central boiler room oil fired storage tanks with a combined recovery of 332gal/hour and the propane directed fired units with a combined recovery of 576 gal/hour. This is in compliance with current DPH guidelines, see Appendix E.

17. Domestic hot water heaters, direct fired tank less type (2 units): Units are fully functional at this time.

Comment: unit has exceeded its useful service life.

V. CONCLUSIONS and RECOMMENDATIONS

Considering the projects requirement to reduce its energy usage and that ownership is to remain unchanged, and also the unpredictable cost of future energy, those options which minimize energy consumption should be considered favorable if they occur within a reasonable timeline. To accomplish this simple payback was calculated for the analyzed option which does not consider the cost of salvage values of the individual option. Applicable energy conservation measures evaluated included;

Energy Conservation Measures (ECM):

ECM#1: Replace zone constant speed units with variable frequency drive ECM motors.

Electric Savings:	2,628KWH x 6 pumps	=15,768KWH
Cost Savings:	\$368 x 6 pumps	= \$2,208.00
Replacement Cost:	6 units x \$350.00	= \$2,100.00 (materials)
	6 units, piping and access.	= \$ 700.00 (materials)
	1 man x 2 days;16 hrs x \$75.	/hr.= <u>\$1,200.00</u> (labor mech+elect)
		\$4,000.00
a: 1 1 1 64		

Simple payback: \$4,000/\$2,208= 1.8 yrs.

ECM#2: Replace main constant speed units with variable frequency drive ECM motors. One pump is a stand-by unit.

Electric Savings:	2,366KWH	
Cost Savings:	\$331.00	
Replacement Cost:	2 x \$1,500.00	= \$3,000.00 (materials)
	units, piping and access.	= \$1,200.00 (materials)
	1 man x 2 days; 16 hrs x \$75	$5/hr = \frac{1,200.00}{1,200.00}$ (labor mech + elect)
	-	\$5,400.00
Simple payback: \$5,4	400/\$331=16.3 yrs.	

ECM#3: Replace main constant speed units with variable frequency drive ECM motors and eliminate the zone pumps. Elimination of the zone pumps will need to include minor piping modification once these pumps are eliminated.

Electric savings	3,137KWH x 6 pumps= 18,	822KWH (see ECM#1 analysis data)			
Electric Savings:	2,366KWH (see ECM#2 analysis data)				
Cost Savings:	(18,822KWH + 2,366KWH)	x \$0.14/KWH= \$2,966.00			
Replacement Cost:	demo. 6 units x \$250.00	= \$1,500.00 (materials)			
-	new 2 pumps x \$1,500.00	= \$3,000.00 (materials)			
	units, piping and access.	= \$1,200.00 (materials)			
	2 man x 2 days; 32 hrs. x \$75	$5/hr = \frac{$2,400.00}{100}$ (labor mech + elect)			
		\$8,100.00			

Simple payback: \$8,100/\$2,966= 2.7 yrs.

ECM#4: Replace the existing oil fired domestic hot water heaters with indirect units with heating hot water from the new boilers.

Electric Savings:		156KWH (estimated based u	pon existing burner's usage)
Cost Savin	gs:	\$219.00	
Oil Savin	gs:	1,937 gallons	
Cost Savin	gs:	\$6,953.00	
Replacement Cost: 2 units		x \$6,500.00	= \$13,000.00 (materials)
	2 units	, piping and accessories	= \$ 6,000.00 (materials)
	2 men	x 5 days; 80 hrs. x \$75/hr.	= \$ 6,000.00 (labor mech.)
	1 man	x 3 days; 24 hrs. x \$75/hr.	= <u>\$ 1,800.00</u> (labor. elect.)
			\$26,800.00

Simple payback: \$26,800/(\$6,953+\$219.00) = 3.7 yrs.

Recommendations:

The priority items that are listed will require action now or in the in the near future. Individual equipment and/or system replacement is recommended due to its current age or condition which will improve the facility energy performance and avoid interruption due to unscheduled component failure and assure long term usage of the facility. Several of the existing individual pieces of equipment that are not listed for action at this time while functional at this time have

exceeded their useful service life and have not been deemed as critical should be considered for additional action due to their age.

1. Room fin-tube radiators, self-contained thermostats have all exceed their service life and should be replaced. Replacement will provide for improved temperature control and space comfort.

Replacement Cost: 41 units x \$65/unit=\$2,665.00 (material)1 man x 3 days; 24 hrs. x \$75/hr.=\$1,800.00 (labor)\$4,465.00

2. Main Heating System Circulation & Zone Pumps (P-1 thru P-8) see ECM#3.

3.	Oil Circulation Pumps (OP-1 & 2). Replacement of	OP-1	
	Replacement Cost: 1 pump unit with motor	=\$	750.00 (material)
	piping and accessories	=\$	250.00 (materials)
	1 man x 1 days; 8 hrs. x \$75/hr.	= <u>\$</u>	600.00 (labor)
		\$1	,600.00

 Central energy recovery unit ventilator (HRV) replace in-kind due to its poor performance and current condition. Existing unit, similar capacity without air conditioning, physical size and arrangement.
Replacement cost: \$194,610 (see appendix G)

Replacement cost: \$194,610 (see appendix G)

5. Central energy recovery unit ventilator (DOAS-ERV) replacement, three (3) smaller capacity units dedicated to the three residence wins with heating and air conditioning. Note, air conditioning sized for dehumidification of the outside air not intended to treat the complete occupied space.

Replacement cost: \$181,820 (see appendix G)

Combustion Exhaust Fan: replace if existing boilers & domestic hot water heaters remain.
Fan unit not required for the new boilers and domestic hot water heaters selection.
Replacement Cost: fan with motor =\$1,800.00 (material)

tan with motor	=\$1,800.00 (material)
Fan draft controller	=\$ 400.00(material)
Flue modification	=\$1,000.00 (material)
2 man x 2 days; 16 hrs. x \$75/hr.	= <u>\$1,200.00</u> (labor)
	\$4,400.00

7. Domestic hot water heaters, storage tank type (2 units): see ECM#4. Replacement Cost \$26,800.00

8.	Domestic hot water	heaters, direct fired tank less t	type (2 uni	ts):
	Replacement Cost:	2 units	=\$3	,500.00 (material)
		Flue modification	=\$	500.00 (material)

Flue modification	=\$ 500.00 (material)
piping and accessories	=\$ 500.00 (materials)
2 man x 2 days; 16 hrs. x \$75/hr.	= <u>\$1,200.00</u> (labor)
	\$5,700.00

9. Boiler system replacement, sized to provide building heating, individual flues and indirect domestic hot water. Due to the limited existing boiler room size and the proposed boilers sizing and quantity requires that the indirect hot water heaters (2- units 119 gallon, 30-inch dia.) tanks be located in the adjoining storage room.

•	Indirect domestic hot water h	neaters	\$	26,800.00	(see ECM#4)
•	New tempering valve with p	iping	\$	2,500.00	
•	New main pumps with ECM	motors & controls	\$	8,100.00	(see ECM#3)
		Subtotal	\$	37,400.00	
		General Conditions	\$	0.00	
		Mobilization	\$	0.00	
		Coordination	\$	1,870.00	
		Phasing	\$	0.00	
		Subtotal	\$	39,270.00	
		Profit (15%)	\$	5,891.00	
		Subtotal	\$	45,161.00	
		Bonding (2%)	\$	903.00	
		Const. allowance	\$	0.00	
		Total	\$ -	46,064.00	
•	Boilers and related work		\$ <u>1</u>	53,561.00	(see appendix G)
		System Total	\$1	99,625.00	

Notes:

- 1. Boilers, cast iron units that allow low return water temperatures of 100deg.F are manufactured by Viessmann, Buderus, DeDietrich. Selection of one of these manufactures would eliminate the need for a hot water return control system that prevents boiler shock associated with low return water temperatures.
- 2. Indirect water heaters, Turbomax.
- 3. Pumps, ECM motors with built-in controls; manufacture Grundfos, Wilo.

Conclusions

Based upon the evaluation and analysis as performed for this report SED recommend the following minimum course of action for facility priority items;

1. Replace the existing individual fin-tube radiation self-contained thermosets	\$ 4,500.00.
2. Replace the existing central heat recovery unit with three(3) new DOAS-ER	RV \$182,000.00.
3. Replace the existing boiler heating, domestic hot water heater and pumps	\$200,000.00
4. Replace fuel oil circulation pump, OP-1	\$ 1,600.00
5. Replace existing propane direct fired domestic hot water heaters	<u>\$ 5,700.00</u>
Tota	al \$393,800.00

The remainder of the existing equipment while exceeding the projected useful service life are still fully functional and were not noted by facility as an issue for either maintenance or service. These items should be replaced on an as need bases.

APPENDICES:

- A. Observed Temperatures
- B. Existing Equipment Inventory
- C. 2013 Energy Usage
- D. HVAC Load Analysis, Summary
- E. Domestic Water Storage Tank Analysis
- F. Energy Conservation Measures, Analysis
- G. System Budget Costs



Appendix A: Observed Temperatures(January 2014)

<u>Appendix B: Existing Equipment Inventory</u> Useful service life as estimated by ASHRAE- HVAC Applications (2011)

<u> </u>	50.	uı	501 110		ub 050	innuc	u by m		111110	1 1	Υľ	neu		(2011	/		
FA	СП	JTY	: OUR IS	LAND H	OME										DATE: JA	AN 2014	
вс	ILI	ER ð	& BURNE	R #1													
Ye	ar Iı	nstalle	ed: 2000?		Manufact	urer:Weil-	Mclain			Buri	ner.	Manf	acturer: Ca	urlin			
Lo	atic	n. p	oiler room		ModelW	GO-8				Mo	del(0B-3	00				
E.			Terrar Cart	Tours	Sim. 2211	MDII				C:	. 2.	2 1-	00				
Eq	upn	ient.	Type: Cast	Iron	Size: 251	мып				Size	. 2.2	s gpn		100 1 1			
Fu	el: N	o . 2	01							Elec	trica	al: 1/6	hp motor,	120-1ph			
_																	
EX	IST	INC	G CONDI	TIONS A	ND DEFI	CIENCIE	IS										
Y	\mathbf{N}	NA								Y	Ν	$\mathbf{N}\mathbf{A}$					
			BOILER	1									BURNE	R			
х			Is the pipi	ing insulate	d complete	and in go	od condition?	?		х			Is the pipi	ng in good	condition?	,	
	x		Are there	visual sign	s of leaks i	n water fix	el or combust	ion exhhaust?		x			Is the mot	or in good	condition?	,	
v			Are the d	rain and ca	faty values	properly	piped?						FIECTR	ICAL			
x			Alcuicui		incry varves	property	sipeu.				37		LLECIN		· 0		
A			is the pipi	ng in good	condition?						л		is the mot	or nign em	ciency?		
х			Are the va	alves in goo	od conditio	n?				х			Is ther a lo	ocalized dis	sconnect?		
	х		Are there	valve tags	?								PLUMBI	ING			
х			Are there	sufficient p	oressure ga	uges?				х			Are ther le	ocalized dr	ains?		
х			Are there	sufficuent	temperatur	e sensors?	•			х			Is there pi	ped make-	up water?		
х	1		Is the flue	and breec	hing insulat	ion in goo	d condition?			х			Is there a	backflow p	preventer o	on the mak	e-up line?
х	1		Is there a	combustii	on air sourc	e?				х			Is there a	PRV on th	er make-u	p water lir	ne?
	x		Is the roo	m under a	negative pr	essure ve	rsus surround	ling spaces?		x			Is the fuel	piping in g	ood condit	tion?	
v			Is there a	CEE aroun	d equipmer	at?							MAINTE	INANCE			
A			Is there at								37			ANCE		. 11	9
A			Overall co		ean, clutter	firee ?					л		is the syst	em now di	agram mot		om?
х	_		Is there pi	roper air c	ontrol devi	ces (air sej	perator, expa	nsion tank, air v	ents)?	х			Is the O+	M located	nerby or in	n a file?	
х			Is barome	etric dampe	er in good o	condition?				х			Is there a	service co	ntractor?		
х			Are system	m controls	operationa	1?				х			Is recent of	combustior	n efficiency	test poste	d or on file?
SТ	AN	DRA	AD AND O	CODE IS	SUES												
х			Is the flue	and breec	hing installe	ed per cod	e, pitch & ler	ngth?				х	Is unit cur	rent energy	/ code con	pliant?	-
х			Is the con	nbustion ai	r source co	de compli	ant?	-		х			Is emerge	ncy power	a requiren	nnt?	
x			Is boiler e	auipped w	/ith HI & I	O water c	utoffs?						Ū				
x			Is fuel cut	off device	installed?												
			13 fuel eut	on de vice	listance.												
						TOP THE	-										
ΕŅ	DO	JF E	QUIPME	NT USEF	UL SERV	VICE LIF	E										
U	eful	Life								Us	eful	Life					
	11		cast iron b	ooiler, ben	chmark is 2	25 years					2		controls b	enchmark	is 16 years		
	1		burner, be	enchmark i	is 15 years						4		burner mo	tor benchr	mark is 18	years	
EN	ER	GY	CONSER	VCATIO	N MEASU	URES											
x	1		End of use	eful life, rei	place with	new higher	efficiency un	its.									
						0											
Cr		100	TTC.		1		1										
a	•1 V1	VIEP 1	15:														
-		1.	Boiler has	had section	on seal failu	re with bu	rn thru, patch	ed.									
		2.	System co	ontroller: T	ekmar 254	, 4 stages	boiler,										
		-	outside w	ater reset a	& system s	tart											<u> </u>
		3.	Unit mode	el discontir	ued by ma	nufactuer,	replacemnt u	nit not compatal	ble.								
									_			-	200				
		-						SHELL THALAIM			1					-	
													4				
		CALCUMA D										III					
-								COMPANY Fin				100					
											11				-		
							1		100		1		/		THE REAL PROPERTY.		
													-	1	a second		
		1					- 1			- 1			-	-			
					57.			1. 22 2 4					COR.	100			
					Sec.				0		-	-	and a state of	The second			
								2. martin Providence		1	57	36	A State			See.	17 participant
										- 27	1	1.1	-		and the		
		100	3					and the second		3		- 2			- Statistic and		
-		1.8	1	100			Sec.			C	-	-		and h		-	
				D05-	and the second s				100 million			-					
—			-	BOILER	SIDEPAN	NEL BUR	N THRU					BUR	INER				+
1																	

FA	CIL	ITY:	OUR ISLAND H	OME								DATE: J	AN 2014			
<u>BC</u>	ILF	R &	BURNER #2													
Yea	ar In	stalle	d: 2000?	Manufact	urer:Weil-1	Mclain		Bu	mer,	Manf	facturer: Carlin					
Loc	atio	n: bo	iler room	Model:W	GO-8			Mo	del:0	2B-30	00					
Equ	upm 1. N	ent I	ype: Cast Iron	Size: 2311	мвн			Size	e: 2.:	s gpn	ha motor 120 1ab					
Fue	er in	5. 2 0	011					Ele	cirica	11: 1/0	np motor, 120-1pn					
EX	IST	ING	CONDITIONS A	ND DEFI	I CIENCIF	s			-				_			
Y	N	NA				~		Y	Ν	NA					_	
			BOILER	1		1					BURNER	1	1	1		
х			Is the piping insulate	d complete	and in go	od conditio	on?	X	Γ		Is the piping in good	l condition	?			
	х		Are there visual sign	is of leaks in	n water, fue	el or comb	ustion exhhaust?	X			Is the motor in good	l condition	?			
Х			Are the drain and sa	fety valves	properly p	piped?					ELECTRICAL					
х			Is the piping in good	l condition?					х		Is the motor high eff	ficiency?				
Х			Are the valves in go	od conditio	n?			Х			Is ther a localized di	isconnect?				
	Х		Are there valve tags	?							PLUMBING					
Х			Are there sufficient j	pressure gai	uges?			X			Are ther localized d	rains?				
Х			Are there sufficuent	temperature	e sensors?			X			Is there piped make	-up water	?			
Х			Is the flue and breed	hing insulat	ion in good	d condition	1?	Х			Is there a backflow	preventer	on the mak	e-up line?		
X			Is there a combustii	on air sourc	e?			X			Is there a PRV on the	her make-	up water lin	e?		
	X		Is the room under a	negative pr	ressure ve	rsus surrou	inding spaces?	X			Is the fuel piping in g	good cond	ition?			
X			Is there accss aroun	d equipmer	nt?						MAINTENANCE			2		
X			Overall condition, c	lean, clutter	tree?			v	х		Is the system flow d	hagram me	ounted in roo	om?	_	
X V			Is there proper air c	ontrol devic	ces (air sei	perator, ex	pansion tank, air vents)?	X	-		Is the O+M located	nerby or	in a file?		_	
A V			Are system controls	operationa	12			A V	-		Is there a service co	n efficience	v test noste	d or on file?	_	
Α			Are system controls	operationa	1.			A			is recent combusto	II CHICKENC	y test poster		_	
ST	ANI	DRA	D AND CODE IS	SUES	1				-				_			
X			Is the flue and breed	hing installe	ed per cod	e, pitch &	length?		t i	х	Is unit current energ	v code co	mpliant?			
х			Is the combustion ai	r source co	de compli	ant?	0	X			Is emergency powe	r a require	mnt?			
х			Is boiler equipped v	vith HI & L	O water c	utoffs?									_	
х			Is fuel cutoff device	installed?												
EN	DO	F E	QUIPMENT USE	FUL SERV	/ICE LIF	Е										
Us	eful	Life						U	seful	Life						
	11		cast iron boiler, ben	chmark is 2	5 years				2		controls benchmark	is 16 year	rs			
	1		burner, benchmark	is 15 years					4		burner motor bench	mark is 18	years		_	
EN	ER	GYC	CONSERVCATIO	N MEASU	JRES		•		_							
х			End of useful life, re	place with r	new higher	efficiency	units.		-							
			ma						-				_			
cc	MIN	1	15:	alama 25 1	1 at	hoiler			-				_			
		1.	system controller: 1	ekmar 254	, 4 stages	ooner,			-							
		2	Unit model discorti-	wed by more	nufactuor	renkcom	t unit not compatable									
		<i></i>	Sinc model discontil	Incu by Hild	nanactuer,	replacemin	a aan nor comparable.		-							
										N IS		-				
			117	3	-		3/10		-	12		-		and the second		
			MART								1		6	E F		
				-						R	-					
					-				M		2 E					
				$-\mathbf{n}$	Reas		15.		D		(a, (a,)) ===					
						5								E State		
			WEIL-MALE	UN O	STAR S					1			Tres			
									N	1				and the second		
			Contraction of the second seco				C		1			1				
		2	16		all and a	Ball			1		Cor	Par				
		+	Gia		ullin	Es-					- Alt			66.00		
		F					Continues .							The second		
			and and the second	Laborate Contractor		STATISTICS.	Com Com	1			3	2		ALL EL		
									-							
			DUDNED						-			DOVOT		OLLER		
			BUKNER						-		HEATING BOILE	k syste	MCONTR	OLLEK	_	

FA	CIL	ITY	OUR ISLAND H	OME									DATE: JA	AN 2014		
во	ILF	R ð	& BURNER #3													
Yea	Inst	alled	: 2000?	Manufactu	rer:Weil-Mc	lain		Burr	ner, N	Manfac	turer: Becke	t				
Loca	ation	: boi	ler room	Model:WG	iO-8			Mod	del: A	AFG						
Εqι	iipm	ent 7	Гуре: Cast Iron	Size: 2311	MBH			Size	e: 2.3	3 gph						
Fue	l: N	o. 2	oil					Elec	etrica	al: 1/6	hp motor,	120-1ph				
EX	IST	INC	G CONDITIONS AN	ND DEFI	CIENCIE	s										
Y	Ν	NA						Y	Ν	NA						
			BOILER								BURNE	R				
х			Is the piping insulated	d complete	and in goo	od conditio	n?	х			Is the pipi	ng in good	condition?			1
	х		Are there visual signs	s of leaks i	n water, fue	l or combu	stion exhhaust?	х			Is the mot	or in good	condition?			1
х			Are the drain and sat	fety valves	properly p	iped?					ELECTR	RICAL				ĺ
х			Is the piping in good	condition?	, , , , ,				х		Is the mot	or high effi	ciencv?			1
х			Are the valves in goo	od conditio	n?			х			Is ther a lo	ocalized di	sconnect?			ĺ
	x		Are there valve tags	?							PLUMB	ING				Ĺ
x			Are there sufficient n	ressure oa	uges?			x			Are ther k	ocalized dr	ains?			
x			Are there sufficuent t	emperatur	e sensors?			x			Is there ni	ned make.	un water?			ĺ
v			Is the flue and breed	hing insulat	ion in good	l condition)	v			Is there a	backflow i	ap water.	n the make	un line?	1
v			Is there a combustiio	n air sourc		reorandon		v			Is there a	PRV on th	or make_u	n water line	2° up m.e.	1
Δ	v		Is the room under a	nogotivo pr			nding analogo?	v			Is the fuel	nining in g	ood oordit	jon?		
v	4		Is there across around	a a cuinne	weine ver	sus surrou	ning spaces:	Α	-	-	MAINT	FIPING II 9	oou condii			
A V			Is there access around	i equipmer	II.'				v		MAINT				9	
A			Overall condition, ck	ean, clutter	rree /			W 7	л		Is the syst	em now di	agram mot	inted in roc	om?	-
X			Is there proper air co	ontrol devic	ces (air sep	erator, exp	bansion tank, air vents)?	X		-	Is the O+	M located	nerby or in	n a file?		
X			Is barometric dampe	er in good c	condition?			X			Is there a	service co	ntractor?			-
х			Are system controls	operationa	d?		1	 х			Is recent of	combustior	n efficiency	test postec	i or on file?	
ST	ANI	DRA	AD AND CODE ISS	SUES						_						
х			Is the flue and breech	hing installe	ed per code	e, pitch & l	ength?			X	Is unit cur	rent energy	code con	pliant?		
х			Is the combustion air	source co	de complia	ant?		Х			Is emerge	ncy power	a requiren	nnt?	~	
Х			Is boiler equipped w	ith HI & L	O water cu	atoffs?										
х			Is fuel cutoff device i	installed?	-	-					ļ					
EN	DC)F E	QUIPMENT USEF	UL SERV	VICE LIF	E										
Us	eful	Life						Us	seful	l Life						
	11		cast iron boiler, benc	hmark is 2	25 years				2		controls b	enchmark	is 16 years			
	1		burner, benchmark is	s 15 years					4		burner mo	otor benchi	nark is 18	years		1
EN	ER	GY	CONSERVCATION	N MEASU	URES											
х			End of useful life, rep	place with r	new higher	efficiency u	inits.									
со	MN	1EN	NTS:													
		1.	System controller: Te	ekmar 254	, 4 stages l	boiler.										
			outside water reset &	& system st	tart											
		2.	Burner refurrbished	& flue renk	aced on the	e unit 01/24	/2014									
		3	Unit model discontin	ued by ma	nufactuer i	renlacemnt	unit not compatable									
		5	- m nigaei discondin			- pacerian	not computitole.									
_					Territoria					1	1				1.4	
										п	• *					
		-		-	There are a	~					100	a Marine			and the second s	
		-1			-							1000	1		100 100	
				N IT	-				U	1		1-1-1	1.2000 - 1.		10.2	
							T		w	. 1	6		100000000	4	19	
		-			15 E		0	-	1		1/2 li	Section 2			and the second se	
		-1		7						1	hund	AL PROPERTY		10		
				- UT				-			all the second	Vin			A DESCRIPTION OF THE OWNER OF THE	
			A Provent	ACCURE.	- UN		1 the			-	e glu	Inter	1	Repar	-	
		_				al-	-			19	4	he has	1	-	and a second	
			- ville	-	-	-								-		
													-			
										_						
			BOILER	NEW FLU	JE					BUR	NER REF	URBISHE	D			

FACILII	Y: OUR I	ISLAND I	IOME													DATE: J	AN 2014				
COMBU	STION A	IR EXHA	UST FAI	N																	
Year Insta	ulled: 2000	?					Manufact	turer: V	Whitty Co. Inc.	(obsolete)											
Location:	boiler roon	n					Tag/Mod	iel/Car	pacity	(,											
Type: sino	le fan .cons	stant volun	n				Electrical	ŀ 1/2 h	n 12-1nh 173	28 RPM											
-)									r, r.,												
FXISTIN	C COND	ITIONS	ND DF	FICIENC	TES																
v	N	NA NA		i i cii z i c	11.5						v	N	NA	1							
1	IN	INA			TINIT						1	IN	19/4	ATC							
v			AIK HA	NDLING	UNII			2			v			Directo				2		-	
<u>л</u>			Is the flue	insulated	complete a	na in good	condition?	/			А			Does the	system na	ive automat	ic controls	!		_	
X			Is the flue	in good c	ondition?									-							
<u>X</u>			Unit in go	od conditi	on?									ELECT	RICAL					_	
X			Is there a	ccss aroun	id equipment	nt?						X		Is the mo	tor high el	ticiency?				_	
X			Are autor	natic damp	pers in good	d condition	n & operati	ing?			X			Is ther a	ocalized d	lisconnect?				_	
X			Overall c	ondition, c	lean, clutter	free, no v	ibration or	noise?	?			х		Does the	unit have	a VSD?					
	X		Are syste	m controls	operationa	ıl?								PLUMB	ING						
											X			Are ther	localized of	lrains?					
														MAINT	ENANCI	Ε					
												х		Is the sys	tem flow o	liagram mo	unted in ro	om?			
									-			х		Is the O+	M located	1 nerby or i	n a file?		-		
												х		Is there a	service c	ontractor?					
STAND	RAD AND	CODE I	SSUES																		
		X	Current c	ode comp	liant?																
	X		Is emerge	ncy powe	r a requiren	nnt?															
		x	Is unit cu	rent energ	y code con	npliant?															
END OF	EOUIPM	ENT USI	FUL SE	RVICEL	IFE																
	Useful Life	· · · · · · · · · · · · · · · · · · ·										Useful Life		1							
	0		fan unit b	enchmark	is 25 years							0	-	motor be	nchmark i	s 18 vears					1
		1	ian and o	CIRCINITEUR	is 25 years.							•		motor be		s to years	1			1	
ENEDCY	CONSE	DVCATE	N MEA	SUDES																	
LIVERG	CONSE	KVCAII	JIN MILLA	SUKES																	
																		1			J
00000																					
соммі	2N15:																				
		1.	Manufact	ure out of	bussmess, o	obsolete.															
		2.	Exteriors	urface cor	rison																
		3.	Draft fan	controller	not workin	ng, fan run	s 24/7.														
		STATE OF	1	5										-		A Cal Inc.	1				
				5				1					-		- in		1.				
	7/		10	17	200		-	1								11/					
	1					0	-1					*	1.000		1	1102					
						21	1							1		K.B.					
		-	The second	0 450		0	1									a a	The second second	-			
			-	7	-												199	F.N.2.			
	1		-	-	- CAR	29 1										1-12					
		1		1900		7			3												
			K	- Law	A CONCEPT				2				0					Section in a			
	F					P. P. Cont	2	and and							7			Cart of Car			
	5	-	-	Par .	- and	1	-	1.00						1	Mr.						
			IN	-			III The second	-	1					1	Ref.						
	1 9	-	TH		-			V	1							-	A.				
	and I		1 H.		10-00 Sec.	-		2001						13		Transmission	and the second division of the second divisio				
		DRAFT F	AN											DRAFT	FAN CO	NTROLLE	R				
						11				1											
					110	3/	-	110	//	#											
					11	1		1		/											
					11	12	/														
					1		//	and a													
					1	/	Configuration of the			a											
							See	1													
					16		S Inches			to 1											
						2	-														
									T												
					man																
					1000					A DECEMBER OF											
									ALC: NOT	and the second											
							COMBU	ISTIC	N AIR INTAL	KE											
							combu														

FACILII	Y: OUR	ISLAND	HOME									DATE: JA	AN 2014				
OIL PUN	4PS: OP-1	1 & OP-2															
Year Insta	alled: Varie	s		Manufacturer:Suntec													
Location:	boiler roor	n		Model: JP6A													
Casing: C	ast Iron			Size: 24 GPH @ 100F	PSIG												
Impeller: S	Steel (rotar	y)		Electrical: 1/3 hp moto	r, 120-1ph (1725R	RPM)											
		VITANA		ma													
EXISTIN	IG COND	THONS	AND DEFICIENCI	ies -		-											
Ŷ	N	NA	DUDAD				Ŷ	N	NA	ATC							
		N/	PUMP		P2 0			N.		AIC					_		
v		х	Is the piping insulated	d complete and in good	condition?			А		Does the	system hav	ve automati	c controls?				
X			Is there sufficient put	mp head pressure?						FLECTI	ICAL						
X			Is the piping in good	condition?				N.		ELECIE	CAL						
X			Is there accss around	a equipment?			v	Λ		Is the mot	tor high eff	hciency?					
А	v		Are the valves in goo	od condition?			А	v		Is ther a b	ocalized di	sconnect?					
v	•		Are there sufficient a					л		DUIMP	DIC NC	e a vSD?					
А		v	Are there sufficient p	termeneture concorre there			v			Ano those 1	nuo	maine 9					
v		А	Quarall condition of	aan chittar fraa?	mometers :		А			MAINT		,					
А	x		Is there any excess r	ump vibration?				x		Is the even	tem flow d	iaoram moi	inted in roo	am?			
	А	v	Ara sustam controls	operational?				x		Is the O	M located	norby or in	a fla?	ли:			
		л	Are system controls	operational:	1			x		Is there a	service co	ntractor?	i a me :				
								А		is uncre a	Service co	nitractor :					
STANDI		CODE	SCIES														
JANDI	AIAL	X	Current code compli	iant?													
x		~	Is emergency nower	a requiremet?													
		x	Is unit current energy	v code compliant?													
				,													
END OF	EOUIPM	ENT US	EFUL SERVICE LI	FE													
	Useful Life	,	1			- T		Useful Life		1							
	0		OP-1 pump, pipe-m	ounted benchmark is 20	0 years.			20		OP-2 put	np, pipe-n	nounted ber	nchmark is	20 years.			
					-									-			
ENERGY	Y CONSE	RVCATI	ON MEASURES	· · · · · ·													
х			End of useful life, rep	blace with new higher ef	fliciency units.												
сомми	ENTS:																
		1.	OP-1, original unit.														
		2.	OP-2, unit replaced	2014.													
		3.	Pumps are manually	operated, year round ru	unning.												
					0												
			100			200											
		0				. 7											
And	-	-	11			100	a ser per s										
			11		//									-			
			1			_											
	-	_				-											
	100																
-		-				- CO	-			1.				-			
		2-	A	1				-									
2.5	10	10	1	2	States of States		and the second	2					-				
1 W		100-	A Preserve and A Preserve	return I wanted and		Tim	-				-	-	F	6		1	
55			ALL AND ADDRESS OF ADDRESS	STATE OF COM	1000		2	1	ER.			1 10				100	
	A		Contraction of the local				1200	_	No.	-	100					M. Te	
5			- 19		The second			1			and and	- 1 90		-			
24				140	and part of the							-	5				
			Contraction of the	- no lie	and Silling	12.00			1	-	and the	\geq	10000				
	1		and the second	STATES IN					120								
			Statistics of	TO STAR	Salar Maria				1		-	1					
			and the second	and a state of the					-	-							
PAR.			Sale and and and						-								
			THE REAL PROPERTY OF	STATE OF BRIDE	man and the	A AL			-								
												-					
			OP-1 & 2								OIL FIL	TERING S	YSTEM-S	TORAGE TAN	<u>IK</u>		

FACILIT	Y: OUR I	SLAND	HOME											DATE: JA	N 2014	
MAIN H	OT WAT	ER CIRC	ULATIO	N PUMP	S : P-7 &	P-8(STAN	D-BY)									
Year Insta	lled: 2005	?			Manufact	urer:TACC)									
Location:	boiler roon	n			Model: 1	515										
Casing: Ca	ast Iron				Size: 32C	PM @ 32	FT.HD									
Impeller: C	ast Bronz	e			Electrical	1/2 hp mo	otor, 120-1	ph (1725RPM)								
											_					
EXISTIN	G COND	ITIONS .	AND DE	FICIENC	IES											
Y	N	NA							Y	N	NA					
			PUMP									ATC				
X			Is the pip	ing insulate	d complete	and in go	od conditio	on?		X		Does the	system hav	e automatic	: controls?	
X			Is there su	ufficient pu	mp head p	ressure?			_							
X			Is the pip	ing in good	condition'	2						ELECTR	ICAL			
X			Is there a	ccss aroun	d equipme	nt?				X		Is the mot	or high effi	ciency?		
X			Are the v	alves in go	od conditio	n?			X			Is ther a k	calized dis	sconnect?		
N/	X		Are there	valve tags	?	0			_	X		Does the	pump have	a VSD?		
х	v		Are there	sufficient p	oressure ga	uges ?		9	v			PLUMB	ung			
v	Λ		Are there	suncuent		sensors, u	termomete	IS ?	Λ			Are ther is	ENANCE	ains?	_	_
Λ	v		Uverall co	Shallon, cl	ean, ciutter	tion?				v		MAIN II	am floru di		ntad in roc	
	A V		Are evete	iny excess j		.19			-	A V		Is the O	M loosted	agram mou	a file?	411?
	А		Are syste	meonuois	operationa			1	-	A V		Is there a	w localed	ntractor?	a me :	
										A	ļ	13 ulcie a	Service co.			
STANDR	AD AND	CODE I	SSUES													
5111101		X	Current c	ode compl	iant?											
x			Is emerge	ency power	a requirer	nnt?										
		х	Is unit cur	rent energ	y code cor	npliant?										
						-			_							
END OF	EQUIPM	ENT USI	EFUL SEI	RVICE LI	IFE											
	Useful Life									Useful Life	e					
	1		pump, pip	pe-mounted	l benchma	rk is 10 ye	ars.			2		controls b	enchmark	is 16 years		
ENERGY	CONSE	RVCATI	ON MEA	SURES					_							
X			End of us	eful life, re	place with	new higher	efficiency	units.								
X			Consider	replacemn	t with ECM	1 units with	n autoadap	t controls	_		_					
									_							
COMME	INTS:	•														
		1.	Automati	c controls p	part of the	boiler syste	em Tekmar	controller, start-s	top only		-					
		2.	Manual se	election of	pump sequ	encing, ne	xt up desig	nated by cup.	_		-					
		3.	Pump P-	l (top) mot	or replaced	2009?										
		4.	Pressure	gauge miss	ing P-2(bo	ttom)						_				
				11		286	-120-	A STATE AND A	and the second second	111						
			5			111		A MARTIN	T	T						
			1.0			G			11	11						
									11	11						
				W. F.	T	Res	2	PG	DH4.	111		-				
					~ 11	Par -			D	41						
				a_	24	101			VA							
			Sec			"==		A CONTRACTOR OF THE OWNER	-							
			-P	and the second	R. (A	Line -	The		222D							
			1			12	-4	2-1-		T						
				-			374	MIR		V.A						
					T		· ·			1						
			2		- 6	-		1 mil		12						
			Th		110	OK	-	1. Cimp		-						
				1	100	She	-	and the second second	4	0						
			No.						A							
					T	70.		1- th								
					PUMPS											

FACILII	Y: OUR I	SLAND I	HOME						DATE: JAN 2014	
2 TON D	UCTIES		C TVDICAL FOD THDEF UNI	те						
<u>5 ION D</u>	UCILES:	5 SPLIT	AC- I IPICAL FOR THREE UNI	<u>15</u>	<u> </u>					
Year Insta	alled: 2003			Manufact	urer: Carrier		0.00			
Location:	common a	rea; north,	east & west end-of-corridors	Model: 40	QAB036 (INDOOR), 38HDC03	0(00100	OR)			
Type: sing	gle zone due	tless AC u	init with remote condenser	Size: not a	ipplicable					
Cooling: 3	ton, refrig	erant R-22		Capacity:	840CFM @ 0.25inWC. (INDOO	(R)	-			
Heating: n	one			Electrical:	indoor tan 1/6 hp motor, 208-1ph	(1725RPN	/) 			
				Electrical:	oudoor condenser 1/8 hp motor, 2	208-1ph (1	725RPM)			
		TIONS	AND DEFICIENCIES							
EAISTIN	N N	NA	AND DEFICIENCIES			V	N	NA		
¥.	N	NA	DUCTIESEAC			Y	N	NA	ATC	
	v		DUCILESS AC		9	v			ATC	
v	Λ		Is the piping insulated complete and	n good condido	n?	Λ			Does the system have automatic controls?	
X			Is the piping in good condition?							
X			Are the valves in good condition?				N/		ELECTRICAL	
X			Is there accss around equipment?			N/	А		Is the motor high efficiency?	
х			Indood unit in good condition?			Λ			Is ther a localized disconnect?	
		X	Are automatic dampers in good con	lition & operatir	ng?		X		Does the unit have a VSD?	
X			Outdoor unit in good condition?						PLUMBING	
X			Refrigeration systems & associated	controls in good	condition?	X			Are ther localized drains?	
		X	Energy revovery installed & operatin	g?					MAINTENANCE	
X			Overall condition, clean, clutter free,	no vibration or	npoise?		X		Is the system flow diagram mounted in room?	
<u> </u>		X	Are there valve tags?				X	I	Is the O+M located nerby or in a file?	
x	L		Are system controls operational?			Ļ	x	ļ	Is there a service contractor?	
		06-								
STAND	AD AND	CODE I	SSUES							
L		X	Current code compliant?			4				
	X		Is emergency power a requiremnt?			-				
		X	Is unit current energy code compliar	t?]				
END OF	EQUIPM	ENT USI	FUL SERVICE LIFE			<u> </u>				
	Useful Life						Useful Life	e		
	9		indoor unit motor benchmark is 20 y	ears.			9		outdoor unit compressor benchmark is 20 years	
						-				
ENERGY	Y CONSE	RVCATI	JN MEASURES		l.					
соммі	ENTS:									
		1.	Refrigeration is R-22 no longer man	factured, replac	emnt refrigerents not compatable.					
		2.	Exterior insulation splitting apart.							
	1200		and the second of the							
		States -			-					
	1.01			Second Second					AD	
	100-		and the second	19/1			P Malli			
	27							-		
	61									
			EVIT		ant hitting				Ne have	b
	7		CAIP		K. Human	STATISTICS.	manager /			
							-			
		-	1121 1121		Carl She Hill	. 6	Tes?	1. M		
			3+ 3			12-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-	1	1.2.3		
		-	and the second second	19 3 C						
			CHNOLOGIES NO.2							
			RRIER TO COMPLETE THE INSTA							
			NO. 3781V12147 INDOOR USE	FOR ONLY 36N2	TECHNOLOG	BIES				
			OTVINO IS ACIDUMUS CON REFRIGE	ANT: FAN	MOCEL No ISBHDC0303	21		SUITA	LE FOR	NE CONTRACTOR
		EAN HOLD	R 1 1 208/230 1 60 1.3 1/6 0	124 UNIT	HICH PSI 300	RE GAGE	2068	REFRIC R.22 5.4 LBS	ERANT 2.4 Kg	nitizer
	and the second		THE ACIPHINAL FLA. HP	TUO Y	COMPR 1 208/230 FAN MOTOR GTY VOL	15 AC PH	17.9 B8.0 HZ FL 60 0	A HIP 70 04	TRW OUT H2T BO	
	1000		OTY VOLTS ACPHINZ FLA	w out al	POWER SUPPLY VO	AMAX	208/230 FUSE/HACH	TYPECD	THEDMOSTAT	
	Star 1	MIN CKT	AMP IS MAX, FUSE THACK TYPE CO	AMPINS	CHARGE BYSTEM HEP	TED	CURLENCE POR	THE REPORT OF TH	THERMOSTAT	
			PPLY VOLTS 208/230 PHILT	HZ BD .	CONDOMINATION OF CONTRACT	(CAS		
			RANGE 253 HAX 187	HIN		6	and mession	Canton Inter	4.4	
			LS.A.	4004500512 REV #	KANDE IN MISSION	1 SHEREWOOD				
		41975		and a second						
		NIDC 07	CONDENSEE		OUTDOOD SOUTO	ED				
		INDOOR	CONDENSER		OUTDOOR CONDENS	<u>EK</u>				

FACILIT	TY: OUR	ISLAND	HOME							DAT	TE: JAN 2014	
<u>5 TON D</u>	OUCTLES	S SPLIT	AC- TYPICAL FOR TWO UNITS									
Year Insta	alled: 2003			Manufac	urer: Carrier							
Location:	north traini	ing room &	nurse station sitting area.	Model: 4	0QAB060 (INDOOR), 38HDC06	0(OUTDC	OOR)					
Type: sing	gle zone du	ctless AC	init with remote condenser	Size: not	applicable							
Cooling: 5	5 ton, refrig	erant R-22		Capacity	850CFM @ 0.25inWC. (INDOO	R)						
Heating: n	none			Electrical	indoor fan 1/4 hp motor, 208-1ph	(1725RPN	A)					
				Electrical	: oudoor condenser 1/8 hp motor, 2	08-1ph (1	725RPM)					
EXISTIN	IG COND	DITIONS	AND DEFICIENCIES			-						
Y	N	NA				v	N	NA				
			DUCTLESS AC			_			ATC			
	x		Is the piping insulated complete and in g	ood conditio	n?	X			Does the	system have auto	omatic controls?	
х			Is the piping in good condition?									
х			Are the valves in good condition?						ELECT	RICAL		
X			Is there accss around equipment?				X		Is the mo	otor high efficiency	y?	
х			Indood unit in good condition?			X			Is ther a	localized disconne	ect?	
		x	Are automatic dampers in good conditio	n & operati	ng?		X		Does the	unit have a VSD	1?	
X			Outdoor unit in good condition?						PLUME	ING		
X			Refrigeration systems & associated cont	rols in good	condition?	X			Are ther	localized drains?		
	-	X	Energy revovery installed & operating?						MAINT	ENANCE		
<u>X</u>		v	Overall condition, clean, clutter free, no	vibration or	npoise?		X v		Is the sys	tem flow diagram	n mounted in room?	
v		<u> </u>	Are usere valve lags?			-	X V		Is the O	-ivi located nerby	or in a me?	
			Are system controls operational?				А		is ulere a	service contracto	017	
STANDI	RAD AND) CODE I	SSUES			-						
		X	Current code compliant?									
	x		Is emergency power a requiremnt?									
		x	Is unit current energy code compliant?									
END OF	EQUIPM	IENT USI	EFUL SERVICE LIFE									
	Useful Life	·			ļ		Useful Life	,				
	9		indoor unit motor benchmark is 20 years	3.	1		9		outdoor	unit compressor b	penchmark is 20 year	rs
						_						
ENERG	Y CONSE	RVCAID	UN MEASURES	1		_						
соммі	ENTS:											
		1.	Refrigeration is R-22 no longer manufac	tured, repla	cemnt refrigerents not compatable.	-						
		2.	Exterior insulation splitting apart.									
_										and the second		
-					-					and the second		
_ <				-				-				
				41111			AINOTH			and .		
	100				The State of the second					1		
	-		and the second s	2								
		1			and harmon	AND A DESCRIPTION OF THE OWNER OF			1X-6	Bi tat		
					A AND	TRACTOR OF TRACTOR		-			in	
					A CONTRACTOR OF THE OWNER			1	-		In the second	
Entra I				1.1.1		in Internet	1. Al	Se 14	a 203	-30	100	
		*		1		2015年1月	1	1. 1. 1. 1.	1.19-30			
					100	UNICED	Mr.	No. N		a menanna		
						ACARRIER					team O	$\frac{2}{2}$
		-		-					AND THE		dilla 🖉	
-	-		me in another						NELVI I		110	
	C	CARMIER	DESTREE OCCUPYONERS THE WEIGHLARCON BUTTED						SS. S.2.Kg SECUMPTE	R CERTIFICATION		1000
	Heres	AL NO MEST	THE DAGE BOO PRE REFRICERANT FAN						1 HOLES		-	DIGISANI.
	INDOX FAN AR	OTON T 18	COLTO AC PHILICS TAA 112 118 1124						111113		C anno	a United Address Figurences &
*	INDOO FAN MO	TOR 2 20	1 1 1 13 18 124									
	ELECTR	IC POTY V	MAX FUSE / HACR TYPE CB AMP 15								THERMOSTA	AT
	POWER S	SUPPLY IV	251 MAX 187 MINE									
	CHARGE S	SYSTEM PER	INSTALLATION INSTRUCTIONS	18 +			City Histor	Read Street		HUNGELENNEN		
	MADE IN	U.S.A						W. I Jank	-	Manager Harden		
nan s	der's.	uping !!	and the second second second						1	Bellevener anner		
Contraction of	Call St.	1000		2.99						THE RECEIPTION OF THE PARTY OF		
		INDOOR	CONDENSER		OUTDOOR CONDENS	FR						
					<u>CONDENS</u>	<u></u>						

FACILII	Y: OUR I	ISLAND	HOME													DATE: JA	AN 2014		
CORE A	REA AC																		
Year Insta	illed: 1980	(indoor), u	nknown (o	utdoor)			Manufact	urer: Carrie	er (indoor unit)	Bryant (ou	itdoor unit)								
Location:	attic mecha	anical roon	l maa ruith aa	moto cond	-		Model: 40	JAS-036											
Cooling: 3	ton refrig	erant R-22		mote cond	ensei		Canacity:	1300CFM	1 @ 0.60inWC	' (INDOC)R)								
Heating: 3	.6 KW, ek	ectric (208	-3ph)				Electrical:	indoor fan	1/3 hp motor,	120-1ph (1725RPM	I)							
U							Electrical:	oudoor co	ondenser 1/3 hp	motor, 12	20-1ph (17	25RPM)							
EXISTIN	IG COND	ITIONS	AND DEF	ICIENCI	ES														
Y	N	NA									Y	N	NA						
v			AIK HAP	NDLING	UNII	d complete	and in oo	od conditio	n?		v			AIC Does the	antem hou	a automati	a controle?)	_
X			Is the pipi	ng & ductw	vork in good	condition?	and in goo	ou conditio	11?		А			Does uie :	system nav	e automau	c controis :		_
X			Are the va	lves in goo	d condition?	contaiton.								ELECTR	ICAL				
Х			Is there ac	css around	l equipment?							Х		Is the mot	or high effi	iciency?			
Х			Indood un	it in good c	condition?						Х			Is ther a k	ocalized dis	sconnect?			
Х			Are auton	atic dampe	ers in good c	ondition &	operating	?				х		Does the	unit have a	VSD?			
X			Outdoor u	init in good	condition?									PLUMB	NG				_
X		v	Refrigerati	on systems	s & associate	ed controls	in good co	ondition?			X			Are ther k	ocalized dr	ains?			
v		<u>х</u>	Energy rev	overy insta	alled & opera	ating? aa no vibr	ation or no	oica?				v		MAIN II	en flow di	iaoram moi	inted in roa	om?	-
		x	Are there	valve taos?	, can canter m	ee, no vidr	aon or up	one :				X		Is the O+	M located	nerby or ir	na file?		
X			Are syster	n controls o	operational?							X		Is there a	service con	ntractor?			
STAND	RAD AND	CODEI	SSUES																
		x	Current co	ode complia	ant?														
	X		Is emerger	ncy power	a requiremnt	1?													
		X	Is unit curi	rent energy	code compl	iant?													
END OF	FOLIDM	IENT USI	THE SEE	VICEID	FF														
END OF	Useful Life	LIVI USI		VICE LI								Useful Life		1					
	0		indoor uni	t motor ber	nchmark is 2	0 years.	l					??		outdoor u	nit compre	ssor bench	ımark is 20) years	
																		ſ	
ENERGY	Y CONSE	RVCATI	ON MEAS	SURES															
X			End of use	ful life, rep	lace with nev	w higher ef	ficiency un	its.			X			Consider	retrofitting	with centra	al VRZ due	ctless system.	
COMMI	ENTS:	1	11-5 4-	1.41		c	1												
		2	Refrigerati	ion is R-22	no longer m	anufacture	1 replacer	nnt refrigen	ents not comma	utable									
		2.	reingerun	511 5 11 22	no ionger in	linditetare	а, термеет	in remiger	ento not compa	and it.									
				71	1	100	1	1				111		in the					
				SI				1						~					11
			~	1			1				++				10-				
		~1/		1 .					-			m		CHERNY A	China C			SAIL I	
			1						<		14	110	- 198			and a			
			1								11			1. S.			HL.	11-1-11	
		A		11	-4						4		1					La la	
		AL	- 1/				~						a fait			-51	1.11	The st	
		1	11/			1		The P					-				21	a thin	
			100	231	4		1						1- AZ	-				/ Hinth	
		(CA)	1 20	79					1			100	1 3.		4	-		1: 11	1.1
_			11	4		P	-									1.00	20/2	1 1/ 1	11
													1.1	288				Auge -	(11)
												1	1						1/2
		T to									-								a second
			INDOOR	FAN CO	ILN UNIT									OUTDOO	OR CONE	DENSER			
					The second	2													
									1										
					-	-													
									1										
											UNIT SP.	ACE THE	RMOSTA	T					
								-											

FACILI	TY: OUR	ISLAND I	HOME										DATE: JA	AN 2014		
<u>KITCHI</u>	EN AREA	DUCTLE	SS SPLIT AC- TY	PICAL FOR	R THREE UN	ITS_										
Year Inst	alled: 2006	,2012			Man	ufacturer: Friedrich(Dry	Goods), Heat Co	ntroller (C	Computer S	Server, M	edical Reco	rds)				
Location:	kitchen are	ea			Mod	el: Friedrich MR09CIH	I (OUTDOOR), H	leat Conti	roller A-HN	MC09AS	OUTDOO	R)				
Type: sing	gle zone du	ctless AC i	init with remote cond	lenser	Size:	not applicable										
Cooling: 9	9000 BIU	H, retrigera	nt R-22		Capa	acity: VARIES										
Cooling: 9	9000 BTUH,	retrigeran	t R-410a Dry Goods.		Elect	rical: VARIES	1/51 . 10	0 1 1 /1/	7250010							
Heating: r	none				Elect	rical: oudoor condenser	r 1/6 hp motor, 12	0-1ph (1	/25RPM)							
FXISTI	NG CONT	DITIONS	AND DEFICIENC	IFS												
V	N	NA	IND DEFICIENC	11.5			F	v	N	NA	1					
-			DUCTLESS AC						11	T T T	ATC					
	x		Is the piping insulate	d complete a	and in good cor	ndition?		x			Does the s	system hav	e automati	c controls	?	
x			Is the piping in good	condition?								.,			-	
X			Are the valves in go	od condition	?						ELECTR	ICAL				
x			Is there accss aroun	d equipment	?				x		Is the mot	or high effi	ciency?			
х			Indood unit in good	condition?				X			Is ther a lo	calized dis	connect?			
		x	Are automatic damr	ers in good	condition & on	eratino?			x		Does the	init have a	VSD?			
x	x		Outdoor unit in good	d condition?	condition ee op	orading.					PLUMB	NG				
х			Refrigeration system	is & associat	ed controls in g	good condition?		Х			Are ther k	calized dr	ains?			
		X	Energy revovery inst	talled & ope	rating?						MAINTH	ENANCE				
Х			Overall condition, cl	lean, clutter f	ree, no vibratio	n or npoise?			X		Is the syst	em flow di	agram moi	inted in ro	om?	
		X	Are there valve tags	?					X		Is the O+l	M located	nerby or it	n a file?		
X			Are system controls	operational	?				X		Is there a	service con	ntractor?			
STAND	RAD ANI	O CODE I	SSUES													
		X	Current code compl	liant?												
	Х		Is emergency power	r a requirem	nt?											
		X	Is unit current energ	y code comp	oliant?											
END OF	FEQUIPM	IENT USI	FUL SERVICE L	IFE												
	Useful Life	e							Useful Life							
	7		outdoor unit compre	essor benchn	nark is 15 years	3			12		outdoor u	nit compre	ssor bench	ımark is 1	5 years	
ENERG	Y CONSE	RVCATI	ON MEASURES			ľ										
COMM	ENTS:															
		1.	Refrigeration is R-22	2 no longer r	nanufactured, n	eplacemnt refrigerents n	not compatable.									
		2.	Exterior insulation sp	plitting apart.												
		3.	Medical records uni	t has exterior	r corrision.											
				and the second se	The sector of th		-				and the second second					
			-	THE R.	TIT					THE THE	(inter					
			1 1 1 1 1			-				1 Maria	all shares					
			Jarris francis	TT				C P	THE	A SHARE						
			1 Per Person	-1-1-	THE REAL PROPERTY		ALL STREET, MILLING	Real Property	- The second		- 13	in the				
			(FIL)						The state	- 7		Varia I				
			Form	MEM		I Long Top						1. 164				
			18 miles	ALL STREET	And a state			in here	-	-						
			1000 M	KING .					1 AT	À	-					
					1			-18								
				- 1							E	-				
					and I						the second	100				
									2	and the	Hand !	and a				
							-			-71	Nonder 1	0				
						the state of the	and the second	and the second second		1 st	- States	in the second				
				-	and and a second		100		- t -							
			A REAL		and the second	in the second	Kana Aliza									
				1910												
			18	9								10				
		1	A REAL	Contra Contra		and the second sec	-				10.0	ant				
				L DEGGE	20	00100000	DI JED			0000						
			MEDICA	AL RECORI	<u>_8</u>	COMPUTER SE	KVER		DRY	GOODS	_					
			(2006?)			(2006?)				(2013)					
						OUTDOOD CO	NDENGERG									
						<u>OUTDOOK CO</u>	NDENSEKS									

FACILIT	V. OUD I	CI AND	HOME								DATE. L	NI 2014		
FACILII	1: OUK I	SLAND	HOME								DATE. JA	AIN 2014		
HEAT RI	ECOVER	Y VENTI	LATOR(AIR-TO-AIR)											
Year Insta	lled: 1980			Manufact	urer: Des Champs (now Munters)									
Location: a	attic mecha	nical roon	1	Model: P	V10 with ten(10) Series 74-1000-6	8A6C Z-I	Duct Heat I	Recovery r	nodules.					
T			· · · · · · · · · · · · · · · · · · ·	D	525 488 DTHU (
Type. Fas	e type air-t	o-all fia,	constant volumin.	Recovery	. 555,488 BTOH (Willer)									
Cooling: N	one			Capacity:	11,855 CFM @ 0.60inWC. (IND	OOR)								
Heating: re	covery wit	th supplen	ental hot water coil	Electrical	supply fan 15 hp motor, 208-3ph (1725RPM	1)							
Heating Co	oil: 644,17	4 BTUH		Electrical	exhaust fan 5 hp motor, 208-3ph (1725RPM	D							
EXISTIN	GCOND	ITIONS	AND DEFICIENCIES											
N/	N					*7								
Y	N	NA				Y	N	NA						
			HRV						ATC					
	х		Is the piping & ductwork insulated comp	lete and in g	good condition?	X			Does the	system hav	e automati	c controls?	?	
	x		Is the piping & ductwork in good conditi	on?										
v			And the sector is a set of a sector of						ELECTI	ICAL				
Λ			Are the valves in good condition?						ELECII	dCAL				
X			Is there accss around equipment?				X		Is the mo	tor high effi	ciency?			
	х		Unit in good condition?			X			Is ther a l	ocalized dis	sconnect?			
	х		Are automatic damners in good condition	n & onerati	10?		X		Does the	unit have a	VSD?			
v			Free dational de datapers in good contails	i ce operata	*5·				DIIMB	INC				
л Т			Energy revovery installed & operating?						LUMB					
X			Overall condition, clean, clutter free, no	nbration or	noise?	X			Are ther	ocalized dr	ains?			
		х	Are there valve tags?						MAINT	ENANCE				
X			Are system controls operational?				X		Is the sys	tem flow di	agram mou	inted in roo	om?	
							x	1	Is the O	M located	nerby or *	1 a file?	I	
									13 110 01		neroy of a			
							X		Is there a	service con	ntractor?			
STANDR	AD AND	CODE I	SSUES											
		v	Comment and a comment?			-								
		А	Current code compliant?											
	х		Is emergency power a requiremnt?											
		Х	Is unit current energy code compliant?											
			a, 1											
END OF	EQUIPM	ENT USI	EFUL SERVICE LIFE											
1	Useful Life						Useful Life							
	0		fan unit benchmark is 25 years				0		motor be	nchmark is	18 years			
	0		an unit benefiniare is 25 years.		1		,		motor be	ICHIRCIN IS	10 years			
ENERGY	CONSE	RVCATI	ON MEASURES											
Х			replacemnt with new energy recovery un	it										
COMME	INTS:													
		1.	Unit model discontinued by manufactuer.	replacemn	unit not compatable.									
		2	Unit controls have been undated, damp	ers not wor	king coils and HX dirty, etc.									
		2.	onit controls have been updated, damp		king, cons and fix dirty, etc,									
							and the second second							
									-					
	Sec. 24, 111	100000000				1000					100			
			Contraction of the second											
					1				-	1				
					A CONTRACTOR OF A CONTRACTOR O				and a		-			
					Discourse of the second					1.1				
			A R R COMP											
			11								100			
			and some on Taxa											
			240.000											
					and the second second									
_							1		1		ALC: N			
								6			I	and the second	1	
							Fre	2		P.S				
		10			LOP 1		-	- /	1	Carl I				
			and the second se		and a state of the			100	art and					
					North Contraction		1 1 1	1	-		1 Sugar	and a	-	
					Cine Cine						1000	1AN P		
												1 Mar		
		UN	THE REAL PROPERTY AND A DECIMAL OF A DECIMALO OF A DECIMALO OF A DECIMALO OF A DECIMAL OF A DECIMAL OF A DECI					The second s					No.	
	1	W								1	2		1	
	1	I							10	11				
		I								1				
		H			N				in	1				
			HRV UNIT					-	in the second	1				
			HRV UNIT					1 de	1 and a	1				
		UD	HRV UNIT					1 de	-					
			HRV UNIT					k	-	1.				
		10	HRV UNIT					1 de	PIPING					
	<u></u>		HRVUNIT					1 de	PIPING					
		I	HRV UNIT					1 de la	PIPING					
		I	HRV UNIT					1 de la	PIPING					
			HRV UNIT						PIPING					
			HRV UNIT					H	PIPING					
			HRV UNIT						PIPING					
	-		HRV UNIT 					H	PIPING					
	-		HRV UNIT		INSIDE /	AT HX		H	PIPING					
			HRV UNIT		INSIDE /	AT HX			PIPING					
			HRV UNIT 		INSIDE /	AT HX			PIPING					
			HRV UNIT		INSIDE /	AT HX			PIPING					

FACILIT	Y: OUR	ISLAND	HOME											DATE: JA	AN 2014	
ZONE W	ATED CI	DCIT AT		ADS . D 1	North D (West D	2 Stond	by P 4 F	oct D 5	South	8. D	6 HDV				
ZONE W	Hadi Varia		TION FUN	ars : r-1	Norui,r-2	west, P	s stand-	-бу,г-4 г.	ast ,r-5	South	a r-	<u>-о пку.</u>				
Location	attia maab	s miael room			Model: 11		,									
Casing C	attic meena	ancarroon	1		Size: 7GP	12 M @ 10E	т нр (т	(unical)								
Impeller: (ast Bronz	e			Electrical	1/3 hp mo	tor 120	-1 nh (34)	50RPM) (Typic						
inipener. e					Licetteal.			- ipii (54.		(Typic						
EXISTIN	G COND	ITIONS .	AND DEF	FICIENC	IES											
Y	N	NA	1						Y	Ν	NA					
			PUMP									ATC				
х			Is the pipi	ng insulate	d complete	and in goo	od condi	tion?		х		Does the	system hav	e automati	c controls?	?
х			Is there su	ufficient pu	np head pi	ressure?										
х			Is the pipi	ng in good	condition?							ELECTE	RICAL			
х			Is there ac	cess aroun	1 equipmer	nt?				х		Is the mot	or high eff	iciency?		
X			Are the va	alves in goo	od conditio	n?			X			Is ther a l	ocalized di	sconnect?		
	х		Are there	valve tags	?					X		Does the	pump have	a VSD?		
X			Are there	sufficient p	ressure ga	uges?						PLUMB	ING			
	X		Are there	sufficuent	temerature	sensors, th	nermome	eters?	X			Are ther l	ocalized di	ains?		
X			Overall co	ondition, cl	ean, clutter	free?						MAINT	ENANCE			-
	X		is there ar	iy excess p	ump vibra	tion /				A V		Is the syst	em now d	agram mou	inted in roo	om?
	А		Are system	m controls	operationa	1/	1	1		A V		Is the O+	M located	nerby or if	1 a me?	
										л		is there a	service co	nitractor?		
STANDE	DAD AND	CODEI	SCIES													
STANDE	KAD ANL	V CODE I	Current c	ode compl	iant?				1							
x		А	Is emerge	ncy power	a requiren	ant?										
		x	Is unit cur	rent energy	v code con	nliant?										
			is the othe	ioni onoig.	code con	p										
END OF	EOUIPM	ENT USI	EFUL SEF	RVICE LI	FE											
	~ Useful Life	;	1						Us	eful Life						
	3		P-1, pum	p, pipe-mo	unted bend	hmark is 1	0 years.			9		P-4, pum	p, pipe-mo	unted ben	chmark is 1	0 years.
	0		P-2, pum	p, pipe-ma	unted bend	hmark is 1	0 years.			9		P-5, pum	p, pipe-ma	unted bena	chmark is 1	0 years.
	2		P-3, pum	p, pipe-mo	unted bend	hmark is 1	0 years.			1		P-6, pum	p, pipe-mo	unted ben	chmark is 1	0 years.
ENERGY	CONSE	RVCATI	ON MEAS	SURES												
X			Replace w	vith new hi	gher efficie	ncy units.										
X			Consider	replacemn	with ECM	1 units with	n autoada	apt contro								
COMME	ENTS:															
		1.	P-1: Pump	p bearing &	k motor re	placed 200	07.		4.	P-4 &	P-5:	Unit replac	ed 2013.			
		2.	P-2: Pum	p bearing &	k motor re	placeed 20	03.		5.	P-6: P	ump r	replaced 20	005, motor	replaced 2	2008.	
		3.	P-3: Pumj	p replaced	2004, mot	or replace	d 2006.		6.	Manua	l year	r round ope	eration 24/	7.		
									No.	2	-	-	-			
		-	-	PI V										832		
	the I			N-W									6			
	1		-						8	E P						
	1	1 0	12 110	340								mail	aulth			
	C 1			Side of		74			2		-		E III	<u></u>		
	(The	5-11-07				A.					31	11-3	HATOR& BI	ACED Y	and -	
		2 4	(assessed as a	= 1		10			1	and a	0		3/25/07	and in the		<u>P-2</u>
			-	1 1 1 1 1	1		P-1			and the		9 1 1		No.		_
	T			and the second	-	Ra				DE.			-	-		
	-			UNIT VIEW	and the second	13			1	12.	-		P	4.4		
				and a look of		150				12-			-	and the	-	
										liter	E.		10		-	
	2	1	1						-	Tenter	12-	- N		P	1	
	37									(The second			T		
	6	M retrief 14	Motor Repub		-1-		<u>P-3</u>		-	4		41				<u>P-4</u>
I	and the second			100				_							al al	
	-	-		P P P	-			_		- 1		15		T		
				5-4										PERTABLE.		
	1			1						18		L.I		1000		
				(ATT A							Sa	Winner and		NA		
	The last		1		ANT OF						4			117	100	
			F	· dru mip	2	*										
					1	6	<u>P-5</u>			The	-		2			<u>P-0</u>
							-	_								

FACILIT	Y: OUR	ISLAND I	HOME											DATE: JA	AN 2014		
ZONE W	ATER CI	RCULAT	ION PUN	MPS : P-9	Dining R	<u>oom.</u>											
Year Insta	alled: 2003	3			Manufact	urer:TAC	0										
Location:	storage clo	oset outside	of dining	room.	Model: 00	08											
Casing: C	ast Iron				Size: 6GF	м @ 131	FT.HD										
Impeller: (Cast Bronz	e			Electrical:	1/25 hp 1	notor, 120	-1ph (3450RPM	4)								
EXISTIN	G COND	ITIONS .	AND DE	FICIENC	IES												
Y	Ν	NA							Y	N	NA						
			PUMP									ATC					
х			Is the pip	ing insulate	d complete	e and in go	od conditi	on?		X		Does the	system hav	e automati	c controls?		-
X			Is there su	ufficient pu	mp head pi	ressure?											
X			Is the pip	ing in good	condition?	2						ELECTE	LICAL				
X			Is there a	ccss aroun	d equipmer	nt?			N/	X		Is the mot	or high eff	ciency?			
х	v		Are the v	alves in go	od conditio	n?			х	v		Is ther a lo	ocalized di	- VCD2			
	A V		Are mere	valve tags	!	0				Λ		Does the	pump nave	a vSD?			
	A V		Are there	suncient	pressure ga	uges ?	4	9	v			PLUNIB.	ung	- : 9			
v	Λ		Ale mere	ondition -1	lean abitta	free?	mennomet	C15 /	Λ			MAINTER	TNANCE	ail18 (
	v		Is there or	ny excess :	numn vihro	tion?				v		Is the even	em flow d	aoram mor	inted in roy	om?	
	x		Are sveto	m controls	oneration	19				x		Is the O	M located	nerby or in	na file?		
	А		. ne syste		operationa					x		Is there a	service co	ntractor?	a me :		
								-	-			15 there u	Service co				
STANDI	RAD AND	O CODE I	SSUES			1											
		X	Current c	ode compl	liant?	-											
x			Is emerge	ency power	r a requiren	nnt?											
		х	Is unit cur	rent energ	y code con	npliant?											
END OF	EQUIPM	IENT USI	EFUL SEI	RVICE LI	IFE												
	Useful Life	e								Useful Life	e						
	0		pump, pip	pe-mounted	d benchma	rk is 10 ye	ears.										
ENERGY	Y CONSE	RVCATI	ON MEA	SURES													
х			End of us	eful life, rej	place with	new highe	r efficiency	vunits.									
X			Consider	replacemn	t with ECM	1 units wit	h autoadap	pt controls	_								
COMMI	ENTS:																
		1.	Located i	n closet ce	iling outside	e of dining	g room.										
		2.	Manual y	ear round o	operation, o	continous.											
							-					1					
																	+
																	+
																	+
									20								
					-		H	HOLT HO	ODEL		114						
				EN	843542	R	AWAT	PRESS	3 8	7.7 #	11111						
			TAUV	S B B B B B B B B B B B B B B B B B B B	AREA DI	DUCK N	St North	UREIZ	No O	SE	3						
			WATER	NC:	ON PULLIC	C + P	Enclos Mulous	101	APPM	ULA	0						
			2	BACUL	NDOOR HO		NG	E S S	100 Par	C.	â						
			ų	ATINGPON	TAL USE O	A BEEN	SHO	Ŷ		-							
				UNI I	ALL MILE	NO NO	R BB		- Contraction								
					SA			-									
				-													
							<u>P-9</u>										

FACILI	Y: OUR I	SLAND I	HOME											DATE: JA	N 2014		
RESIDE	NCE ROO	OM RAD	IATOR &	THERMOS	TAT (TY	PICAL)											
Year Insta	alled: 1980				Manufact	urer: Vulca	n?										
Location:	residence r	m. and co	mmon spac	ces	Model: F	S?											
					Size: 600	BTUH per	foot (a	ctive length)									
					Electrical	none											
EXISTIN	IG COND	ITIONS .	AND DEF	TCIENCIES													
Y	N	NA							Y	N	NA	1					
			PUMP									ATC					
X			Is the pipi	ng insulated co	omplete and	l in good c	onditior	1?	X			Does the	system hav	e automati	c controls?		
х			Is the pipi	ng in good cor	ndition?												
х			Unit cover	rs in good con	dition?							ELECTH	RICAL				
X			Is there ac	css around eq	uipment?					Х		Is the mo	or high eff	iciency?			
X			Are the va	alves in good c	ondition?				X			Is ther a l	ocalized di	sconnect?			
X			Overall co	ondition, clean,	clutter free	e?				Х		Does the	pump have	a VSD?			
х			Are system	m controls ope	erational?							PLUMB	ING				
									X			Are ther l	ocalized di	ains?			
											1	MAINT	ENANCE				
										х		Is the sys	em flow d	iagram mot	inted in roc	om?	
										X	1	Is the O+	M located	nerby or ir	ı a file?		
										X		Is there a	service co	ntractor?			
STANDI	RAD AND	CODE I	SSUES														
		X	Current co	ode compliant	?												
		Х	Is emerge	ncy power a r	equiremnt?												
		Х	Is unit cur	rent energy co	de complia	nt?											
END OF	EQUIPM	ENT USI	EFUL SEF	RVICE LIFE													
	Useful Life	:								Useful Life							
	0		radiator, b	enchmark is 2	5 years.					0		self-conta	ined therm	ostat, benc	hmark is 1	0 years.	
ENERG	Y CONSE	RVCATI	ON MEAS	SURES													
X			End of use	eful life, replac	e self-conta	ained thern	nostatic	valves									
соммі	ENTS:																
				State of the second	a starting												
			-	Carlor Carlo	1	2.000											
	-	-	-	1000													
100												1					
				2							-(0:					
8			and the									and the second s					
		and the second				and a											
						1 mar											
					-	and the second											
	SELF-CC	<u>NTAI</u> NE	D <u>THE</u> RM	IOSTAIC VA	LVE				SELF-CO	<u>ONTA</u> INE	<u>D TH</u> ERN	<u>IOSTAIC</u>	SPACE S	<u>ENSO</u> R			

FACILI	TY: OUR I	SLAND I	HOME											DATE: JA	AN 2014	
<u>DINING</u>	ROOM F	RADIATO)R & TH	ERMOSTAT	(TYPICA	<u>L)</u>										
Year Insta	alled: 2003				Manufact	urer: Slant	t-Fin?									
Location:	dining roon	n			Model: N	lulkti/Pak	80?									
					Size: 840	BTUH pe	r foot (ac	tive length)						1		
					Electrical	none										
		_														
EXISTIN	NG COND	ITIONS A	AND DEI	TCIENCIES								_				
Y	N	NA							Y	N	NA					
			PUMP									ATC				
X			Is the pipi	ng insulated co	mplete and	1 in good	condition	!	X			Does the	e system ha	ve automati	c controls	!
X			Is the pipi	ng in good con	dition?							FLECT	DICAL			
A V			Unit cover	rs in good cond	lition?					v		ELEC I	KICAL	ioionor/2		
x			Are the v	alves in good of	andition?				x	А		Is ther a	localized d	icicity:		
x			Overall co	undition clean	clutter free	a?			24	x		Does the	pump hav	a VSD?		
		x	Are system	n controls one	rational?							PLUME	SING	ou (bb)		
			i ne syste.	n conuon ope					x			Are ther	localized d	rains?		
												MAINT	TENANCE			
										х		Is the sy	stem flow d	iagram mou	inted in ro	om?
										х		Is the O	+M located	nerby or in	n a file?	
										х		Is there a	a service co	ontractor?		
STANDI	RAD AND	CODE	SSUES													
		X	Current co	ode compliant?												
		Х	Is emerge	ncy power a re	quiremnt?											
		X	Is unit cur	rent energy coo	te complia	int?										
												_				
END OF	EQUIPM	ENT USH	EFUL SEF	RVICE LIFE					_			_				
	Useful Life									Useful Life	e	10		<u> </u>		
	12		radiator, t	enchmark is 2	5 years.	1		1		0	1	self-cont	ained thern	iostat, benc	hmark is l	0 years.
ENEDC	VCONSE	DVCATI	N MEA	SUDES									_			
ENERG	I CONSE	AVCAIN	End of use	oful life replace	self-cont	ained them	mostatic v	ahas								
	-		Liki of us	olui me, replace	sen cona		mostate v	uives					_			
соммі	ENTS:															
comm																
			A.M.		entities.	-111	-									
				-	ante		1						-			
			19934						THE OWNER OF THE OWNER OF					_		
			mile		B								2			
		/	1999		-					**	1		100		-	
		07	Salles.	-							101	ANT THE				
		-	1923							-	all'					
		-					and the second			Surger 2						
					Change -	COL STAN			a long						58	
				ALC: DEPENDENT		a la constitu							E.S.			
	DADITO	>						-								
		<u>×</u>					_		SELE CO	NTANE	D THERN		SPACES	ENSOP		
							-		<u>SELF-CC</u>	AN LAUNE		105 IAIC	. SI ACE S	LINGOR		
							1				1	1	1	1	1	1

FACILI	TY: OUR I	SLAND I	IOME											DATE: J	AN 2014		
LAUND	RYAREA	FANS &	HOODS														
Year Inst	alled: 1980	? & 2010					Manufactu	rer: unknown	_								
Location:	exterior wa	ull 	-				Tag/Mode	l/Capacity/Electrical	1								
Type: sin	gie ian, cons	stant volun	n.				unkonown	L									
EXISTI	NG COND	ITIONS .	AND DEFIC	CIENCIE	es												
Y	N	NA								Y	N	NA					
			AIR HAND	LING U	NIT								ATC				
X			Is the ductwo	ork insulat	ted comp	lete and in	good cond	ition?		x			Does the system	have automat	ic controls?	?	
Х			Is the ductw	ork in go	od condit	ion?											
X			Is there accs	s around o	equipmer	ıt?							ELECTRICAL				
X			Unit in good	condition	?						X		Is the motor high	efficiency?			
X			Are automati	ic damper	rs in good	l condition	& operatin	g?		X			Is ther a localized	disconnect?			
X			Overall cond	ition, clea	in, clutter	free, no vi	bration or r	ioise?			x		Does the unit hav	/e a VSD?			
X			Are system c	controls of	perationa	I?							PLUMBING				
										X			Are ther localized	i drains?			_
<u> </u>											v		Is the system flow	v diagram ma	unted in re-	om?	_
											X		Is the O+M loca	ted nerby or i	n a file?		
<u> </u>											x		Is there a service	contractor?			
												l					
STAND	RAD AND	CODE I	SSUES														
		X	Current code	e complia	nt?					1							
	X		Is emergency	power a	requiren	int?											
		х	Is unit curren	t energy c	code con	pliant?											
END OF	EQUIPM	ENT USI	EFUL SERV	ICE LIF	Е												
	Useful Life										Useful Life	•					
	22		fan unit benc	hmark is 2	25 years.						15		motor benchmar	k is 18 years			
	0		fan unit benc	hmark is 2	25 years.						0		motor benchmar	k is 18 years			
ENEDC	VCONSE	DVCAT	NI MEACH	DEC													
LIVENG	I CONSE	K VCAIN	JN MEASU	REO													
сомм	ENTS:																
00		1.	Intake and e	xhaust ho	ods adde	d recently.	past year.	to comply with DPH	I requirements.								
								1,									
				-		in the second se	20										
											all the						
							1		-			M M					
			- States			11				7.999	and a	the life					
		_		and the second			n.				PRO ALCONT						
			-	_		-			1. TP		Call State	June of					
						P			1 -	THE STORE	CARD IN THE	THE PROPERTY.					
					1.	F			J. The	网络西洋	AN AN	and the second	1				
				_			-		UIN		T MARS MIL	The second	1	ALC: NOT	Contraction of the local division of the loc		
									ALL PLAN		200		TE Lines	and the	and the second		
			1	9		-	4			R.S.	Caria	1.62		翻	Con Sta		
						1	-	the state of the			N. E.	Mathe					
									The second		1.	No. of Concession, Name	1	学目.			
						100	THE OWNER OF				AP -	THE OWNER WHEN	1 200	·》·目			
					-			101			STAT			70			
				-Ann	1 4			- ALT		-	The			田川	-		
					Allo			1		P				· II ;		100	
			and the second				1.00	A DO		~		140					
					- 93		(In-			A LET	1						
							Mico	1	A HAND	The state	-		ALL MANT	-			
							1	Contraction of the local	and the second	Tom 7		- AL	ALL THE				
								6 4 - 4	and the second second			None Include			teri ones tri li		
													UDODS				
							LAUNDR	Y KOOM EXTERI	IOR WALL- F	ANS, INT	AKE & E	XHAUST	HUUDS				
i	1					1	1							1	1	1	

FACILI	FY: OUR	ISLAND	HOME								DATE: JA	N 2014		
						TO AID								
Voor Inst	alled: 1080	UPAIK	UNITHEAT RECOVER	<u>Y VENTILA</u>	Manufact	IU-AIK) war: McOuay (now Dakin)								
Location:	attic mach	nical roor			Model: L	VE106cv								
Type: since	de fan con	stant volur	1		Capacity	2310 CFM @ 1 75inWC								
Cooling: 1	None	Stan Yoka			Electrical:	supply fan 1.5 hp motor, 208-3ph	(1725RPN	10						
Heating: N	None				Liccultur	supply and the up motor, 200 opri		.,						
EXISTIN	NG COND	ITIONS	AND DEFICIENCIES											
Y	N	NA					Y	Ν	NA					
			AIR HANDLING UNIT	,						ATC				
X			Is the ductwork insulated c	omplete and in	n good cond	lition?	X			Does the system	have automati	c controls?		
X			Is the ductwork in good co	ondition?										
X			Is there accss around equip	oment?						ELECTRICAL				
	X		Unit in good condition?					X		Is the motor high	efficiency?			
X			Are automatic dampers in g	good condition	ı & operatir	ng?	X			Is ther a localized	disconnect?			
X			Overall condition, clean, cl	utter free, no v	ibration or	noise?		X		Does the unit hav	e a VSD?			
X			Are system controls operat	tional?						PLUMBING				
							X			Are ther localized	drains?			
										MAINTENAN	Æ			
	L							X		Is the system flow	diagram mou	inted in roo	m?	
								X		Is the O+M locat	ed nerby or ir	a file?		
						Í.		X		Is there a service	contractor?			
CTAND		CODE	act the											
STANDI	KAD ANL	V CODE I	SSUES				-							
	v	л		-i										
	Λ	v	Is unit current energy code	compliant?			-							
		л	is the current chergy code	compitant:										
END OF	FOUIPM	ENT US	FUL SERVICE LIFE											
2.12 01	Useful Life							Useful Life						
	0		fan unit benchmark is 25 ve	ears.				0	-	motor benchmark	is 18 years			
ENERG	Y CONSE	RVCATI	ON MEASURES											
X			replacemnt with new make	e-up air unit wi	th VFD									
COMMI	ENTS:													
		1.	Unit model discontinued by	manufactuer,	replacemnt	unit not compatable.								
		2.	Unit controls have been up	odated, dampe	ers not wor	king, coils and HX dirty, etc,								
				100				10	-	_	120			
						-	~		F-	1		h-		
			R. R. P.		- de	the second secon				774		No sta		
						CR STORE AND A		11				-		
			8	1	Alles	8		16	V			in the second		
		1	1. 6	Barris	13 50	1	11				A DECK	F	1	
				1	L				2			and the second second	1	
								-	•				1000	
				11-		1								
								Ī	-					
									=>				Carlie Viel	
0			ALL .							G				
		and the second			10								A DECEMBER OF	
4		353	and the second second		A.								and the second second	
					MAKE U	P AIR UNIT								

FACILII	Y: OUR	ISLAND	HOME								DATE: JAN	2014		
KITCHE	N AREA	EXHAU	ST FANS											
Year Insta	alled: 1980				Manufac	cturer: Loren Cook								
Location:	attic				Tag/Mo	del/Capacity/Electrical								
Type: sing	de fan, con	stant volu	nn.		EF-1 C	ooking Hood, unknown,3800CF	M@1.00inW0	C, 1.5hp(2	08-3ph).					
					EF-2 Di	shwasher Hood, L2, 600CFM@	0.75inWC, 1	/4hp(120-	1 ph).					
					EF-3 W	ashdown Area, CVD, 200CFM	@0375inWO	C, 1/12hp(120-1ph).					
EXISTIN	IG CONE	DITIONS	AND DEFICIENC	TES										
v	N	NA	1				v	N	NA					
-			AIR HANDLING	LINIT			-			ATC				
v			Is the dustwork ins	ulated complete	and in good as	adition?	v			Doos the sustam he	un automatia (ontrols?		
A V			Is the ductwork lifs		and in good co.	KIROIT?	A			Does the system ha	ve automatic c	onuois :		
A V			Is the ductwork in							FIECEBICAL				
A			Is there accss around	na equipment?						ELECTRICAL				
X			Unit in good condit	ion?				X		Is the motor high ef	ticiency?			
X			Are automatic dam	pers in good cor	dition & opera	ing?	X			Is ther a localized d	isconnect?			
X			Overall condition, o	clean, clutter free	, no vibration o	r noise?		X		Does the unit have	a VSD?			
X			Are system control	s operational?						PLUMBING				
		L					X			Are ther localized d	rains?			
										MAINTENANCI	5			
								X		Is the system flow of	liagram mount	ed in room?	?	
								Х		Is the O+M located	l nerby or in a	file?		
								Х		Is there a service co	ontractor?			
					ĺ									
STAND	RAD ANI	CODE	ISSUES											
		X	Current code comp	bliant?										
	x		Is emergency powe	er a requiremnt?										
		x	Is unit current energy	v code complia	nt?									
				50										
END OF	FOUR	IENT US	FEIT SERVICE I	IFF										
LID OF	Lachillif		EF OL SER VICE I	AT L				Looful Li	6.	-				
		-	6	- 25				Osciul Li	ie .		19			
	U		ian unit benchmark	is 25 years.				U		motor benchinark i	s is years			
ENERGY	Y CONSE	RVCAT	ON MEASURES						-					
X			replacemnt with ne	w unit with ECN	f motor.									
							_							
COMMI	ENTS:	_												
		1.	Unit model disconti	inued by manufac	tuer, replacem	nt unit not compatable.								
		-		-A										
		1	1 AT			- lab	-	-						
			1 1		-	11								
			1 3 2			And the second second								
			17											
			MAR Y		1 and 100		1 107							
		No.	- All	Later The second		AND THE REAL								
				aver a			1							
			STOR .		- 11/2-									
		No.	450		1 million									
		-	73		16 1									
						6 43.								
					-	1.15								
						T-Start I								
			1005		100									
				001	A P		- La							
			1 1 1 1	1	1.3									
			211											
			28		A CONTRACT	Constanting of the local division of the loc	sel'	6						
				2	and the state	and the second second	7-2							
			1 1				Street of the second second							
				1	The second second									
						Carlos and								
					EE A A	EE 2		-						
					<u>EF-2 &</u>	<u>11-3</u>								
1														

FÆ	C	LII	Y: OUR ISLAN	ID HOME								DATE:	JAN 201	4	
р	ЭM	ES	FIC WATER H	EATERS (DWF	I-3& 4)										
Ye	arl	nsta	illed: 2006	Manufacturer: N	oritz		Bu	rne	r. Ma	anfacture	r: Noritz				
Lo	cat	ion:	bathing rooms	Model:N-084M-1	DV		M	odel	I: NA	`					
Ec	uip	men	t Type: Direct	Size: not applicat	ble		Fir	ing	Rate	e: 236,000) BTUH				
Fu	el:	Prop	ane	Capacity: flow 4	.8gpm at 8	0deg.F rise	Ele	ectri	ical:	1amp, 12	0-1ph				
		Î									-				
E	XIS	TIN	G CONDITIO	NS AND DEFIC	CIENCIES										
Y	Ν	NA					Y	Ν	NA						
			TANK							BURNI	ER				
X			Is the piping insu	ulated complete a	nd in good	condition?	X			Is the pi	ping in g	ood con	dition?		
X			Are there visual	signs of leaks in v	vater,fuel o	r combustion exhhaust?	X			Is the m	otor in g	ood con	dition?		
X			Are the drain and	a safety valves pro	operly pipe	ed?	_		37	ELECI	RICAL	, 	0		
л v	_		Are the volves in	good condition?			v		А	Is the m	lo colizo	d diagon	cy?		
л	v		Are there valves in	age?			-			IS THE A	RING	a discon	nect?		
	x		Are there sufficie	ago:	es?		x			Are then		d drains?	,		
	x		Are there sufficu	ent temperature s	ensors?		x			Is there	piped m	ake-up w	vater?		
х			Is the flue and bi	reeching insulation	n in good c	ondition?			х	Is there	a backfle	ow preve	enter on t	he make-up line	
х			Is there a combu	stiion air source?					х	Is there	a PRV o	n ther m	ake-up w	ater line?	
	х		Is the room unde	er a negative press	sure versu	s surrounding spaces?	х			Is the fu	el piping	in good	conditio	n?	
	х		Is there accss are	ound equipment?						MAINT	(ENAN)	CE			
х			Overall condition	n, clean, clutter fro	ee?			х		Is the sy	stem flo	w diagra	m mount	ed in room?	
Х			Is there proper a	ir control devices	(air sepera	tor, expansion tank, air	v		х	Is the O	+M loca	ted nerb	y or in a	file?	
		х	Is barometric da	mper in good cor	ndition?		_		Х	Is there	a service	e contrac	tor?		
х			Are system cont	rols operational?	1		_		X	Is recen	t combu	stion effi	ciency te	st posted or on	
an		-		N YOOY IDO											
SI V		UDR	AD AND COD	E ISSUES		- it - h - f - h			v	T			1 1	i+9	
л v			Is the nue and bi	reeching installed	per code,		v		А	Is unit c	urrent er	lergy coc	ie compi	1ant ?	
л	-	v	Is the combusito	a with HI & LO	water cuto	.: fc9	-			18 emerg	gency po		quiterini	2	
		X	Is fuel cutoff dev	vice installed?	water euto	15.									
	_														
EI	ND	OF	EQUIPMENT	USEFUL SERV	ICE LIFE	C									
Us	eful	Life					Us	eful	Life						
	2		heat exchanger, l	benchmark is 10 y	years										
													,		
		~ ~ -													
E	NE:	RG	Y CONSERVCA	ATION MEASU	RES		-								
х			End of useful life	e, replace.			_								
C	224	NAE	NTC.												
C	J 1V1	1	Unit model disco	ontinued by manu	factuer rei	alacempt unit not compa	table								
			Child Hioder diset			nacemin unit not compa									
							1000			1.1.1	1				
				A DOMESTIC						* Seat of the					
										P-1					
				CR WINEY AND DO						North L					
				A THE REAL PROPERTY OF						0.40					
				a.e.						-					
				The second second						-					
					and the second										
				11					-	11 1	1				
				A AN						-1	2				
				1 20	*								-		
													-		
												A			
					The last					-		5			
			DWH-3	: OTPT BATH			W	EST	ΓВА	ATHING					
				ALWATS HUT	NET NO THE .										
			Event Hern Anno MATT ANERE 15177 Aven An	And independent for first and an	Col Automotic										
			for all fam		process survey consect sources										
			Record Second Se	2) Cales Ver R. 12-Max Net241 Harr R. 12-Max Sector	er nege		-								
			Electrical Reing MacAutor Trans ANS 221 (13.5	AC 122 VAL BRI Arr Bit Tay-Ris 1204 DRI	nd paralleling TED Insular antipi		-								
			FTGR YOLDIN EA Drive of states of States of States	All y and a set of the	Performance Share setting strang of the		-								
				SPOLINES CLARANCES TO COMPLETENCE	1										
			Provide Description Text for	And and a set and a set and a set and a set a se	N										
			Test the	10 - 100 AM CAL	and the second s		-								
			Little And	I was seen with this											
				DWH-3:DATA			-								
	_									1			1		

FA	сп	ITY	OUR ISLAND HO	OME								DATE: JA	AN 2014	
DU Ves	n In	<u>estalle</u>	C WATER HEATE	Anufacturer: BOCI	ĸ		Bu	mer	Man	facturer Co	arlin			
Loc	atio	n: ho	viler room	Model:73E	ix.		Mc	del:	Elite.	EZ-2	а шт			
Equ	ipm	ent T	Type: storage	Size: 67 gallon			Firi	ng R	ate: 1	.75 gph				
Fue	l: N	o. 2 (oil	Capacity: recovery 2	258 gph at 90)deg.F rise	Ele	ctric	al: 1/6	hp motor,	120-1ph			
	_						_							
EX V	IST N	ING	CONDITIONS AF	ND DEFICIENCIE	8		v	N	NA	1				
-	11	14/1	TANK				-	11	1471	BURNEI	R			
х			Is the piping insulated	l complete and in goo	od condition?	•	x			Is the pipi	ng in good	l condition?	?	
х			Are there visual signs	s of leaks in water, fue	l or combust	ion exhhaust?	Х			Is the mot	or in good	l condition?	?	
х			Are the drain and saf	fety valves properly p	iped?					ELECTR	RICAL			
	х		Is the piping in good	condition?				X		Is the mot	or high eff	ficiency?		
А	v		Are the valves in goo	od condition?			A			Is ther a lo	NC	sconnect?		
	X		Are there sufficient p	ressure gauges?			x			Are ther le	ocalized d	rains?		
	х		Are there sufficuent t	emperature sensors?			X			Is there pi	iped make	-up water?	2	
х			Is the flue and breech	ning insulation in good	l condition?				х	Is there a	backflow	preventer o	on the make	e-up line?
х			Is there a combustiio	n air source?					х	Is there a	PRV on the	her make-u	ıp water line	e?
	X		Is the room under a r	negative pressure ver	sus surround	ling spaces?	X			Is the fuel	piping in g	good condi	tion?	
v	х		Is there accss around	equipment?				v		MAINTI Io the quet	ENANCE		unted in soc	2002
X			Is there proper air co	ontrol devices (air sep	erator, expan	nsion tank, air vents)?		Λ	x	Is the O+	M located	nerby or i	n a file?	
	х		Is barometric dampe	r in good condition?	,			1	x	Is there a	service co	ontractor?		
х			Are system controls	operational?					х	Is recent of	combustio	n efficiency	test posted	d or on file?
ST/	N I	DRA	D AND CODE ISS	SUES	5101	4.0			87	x 5			r .0	
л Х			Is the combustion air	source code complia	e, pitch & len	igun?	x		л	Is unit cur Is emerge	nev nowe	r a requirer	npitant?	
		х	Is boiler equipped w	ith HI & LO water cu	itoffs?							1		
		х	Is fuel cutoff device i	nstalled?						1				
EN	D ()FE	QUIPMENT USEF	UL SERVICE LIFI	E				T :6.					
Us	3	Lie	storage tank, benchn	nark is 10 years			0	11	Life	burner me	otor bench	mark is 18	vears	
	8		burner, benchmark is	s 15 years					·				J	
EN	ER	GY	CONSERVCATION	N MEASURES										
x			End of useful life, rep	blace with indirect type	e storage tan	ık.		-						
CO	M	леn	175.											
0		1.	Nearby piping has ex	ternal service corrisio	on.		4.		Co	mmon flue	vent requ	ires shudo	wn both un	its to service.
		2.	Poor combustion pro	cess as noted by bac	kdraft damp	er soot.								
		3.	DWH-2, burner con	troller replaced, date	unknown.			-		_				
									1					
									~			11		
				1 A						Real Property in) 🛔			
												5		
									T	4-1				
												12		
								1	U			-		
							- 1			-				
					1			-27	A	A dame of a	1 st			
			DWH-1							DWH-2				
			Be					A	11		1	No.		
					- Carlos				1	-		ALC: NO		
			The state	-				1			ALC-	W I		
									-		- Col	CIVE N		
					and the second				No.			and the second		
								100	1	*R-C- @	CO CO	1		
			The second	STALL FILL				1	1		E	- 11/		
									1	-		1/1/2		
									100					
			and the second s							1	35			
											-			
			DWH PIPING				DV	ин с	сом	BUSTION	BACK I	DRAFT DA	AMPER	

FACILII	Y: OUR	ISLAND	HOME											DATE: JA	AN 2014	
ATTIC N	IECHAN	ICAL RO	OM EXI	IAUST FA	<u>N</u>		Manufaat	men Dome Discour								
rear insta	attic						Manufactu	lrer: Barry Blower								
Type: sing	de fan con	stant volun	nn				FE-1 Atte	Mechanical Room BVB	182 3000		0inWC 1	hn(208-3nl	h)			
Type.ong	, com	buint volum							102,5000		011110,1					
EXISTIN	IG CONE	DITIONS	AND DE	FICIENCI	ES											
Y	N	NA							Y	N	NA					
			AIR HA	NDLING	UNIT							ATC				
X			Is the du	ctwork insu	ilated com	plete and in	good con	dition?	X			Does the	system ha	ve automati	c controls?	
A V			Is there a	cess around	l equipme	1011? nt?						FIFCTE	ICAL			
x			Unit in or	od conditic	n?	ut.				x		Is the mot	for high ef	ficiency?		
x			Are autor	natic damp	ers in ano	1 condition a	& oneratin	ισ?	X			Is ther a k	ocalized d	isconnect?		
x			Overall c	ondition, cl	ean, clutter	free, no vib	oration or 1	noise?		X		Does the	unit have	a VSD?		
												PLUMB	ING			
									X			Are ther l	ocalized d	rains?		
												MAINT	ENANCI	2		
									<u> </u>	X		Is the syst	em flow o	liagram mou	inted in room	m?
										X		Is the O+	M located	1 nerby or ir	n a file?	
				1		1				X		Is there a	service co	ontractor?		
STANDI	2 A D A NT	CODE I	SSUES													
JIII(DI		x	Current c	ode compli	ant?				1							
	X		Is emerge	ency power	a requirer	nnt?			1							
		х	Is unit cu	rrent energy	code cor	npliant?										
END OF	EQUIPM	IENT USI	EFUL SE	RVICE LI	FE											
	Useful Life	e								Useful Life	e					
	0	1	fan unit b	enchmark is	s 25 years					0		motor ber	nchmark i	s 18 years		
	CONCE	DYCLTL	ONMEA	CUDEC					_							
ENERG: X	CONSE	RVCAII	renlacen	our with new	unit with	FCM motor	r									
			repateen													
соммі	ENTS:															
		1.	Unit mod	el discontin	ued by ma	nufactuer, re	eplacemnt	unit not compatable.								
							1					1				
								10								
							-			-	1					
								-			1200					
								and the second				44				
		-										-				
		100					- 1	-				1				
		1					-	THE REAL	-			-				
										1.4						
										1.1		1				
					-			-	1000							
	- 11	-		-		-			0	-	-					
	-				-			(1	100	10	200					
	- 11			-	-	-	-	100		1 1						
			F		1	100	1	201	12	41						
				-				1	17	Surger Street of the local division of the l	2					
	-					15	-	-	J.	-	1					
					X	-			1	-	-					
								and the second second	0/	Summer of the local division of the local di	-					
									1	/						
									1							
								1000	-							
				ATTIC M	IECHANI	CAL ROO										
1																

	UnitCost	(\$/kwh)	0.13310	0.13499	0.13980	0.13791	0.14554	0.14962	0.14537	0.14683	0.14061	0.14158	0.14020	0.13931	0.14144	
	Total Cost	(\$)	3,854.71	3,876.97	3,858.51	4,324.76	4,133.25	4,081.70	6,035.79	5,391.74	4,825,88	4,032.13	3,802.26	4,045.46	52,263.16	
	Supplier	Cost (\$)	1,966.38	1,950.09	1,874.04	2,129.34	1,928.36	1,852.31	2,819.21	2,493.29	2,330.33	1,933.79	1,841.45	1,971.82	25,090.41	
ELECTR	NGRID	Cost(\$)	1,888.33	1,926,88	1,984.47	2,195.42	2,204.89	2,229.39	3,216.58	2,898.45	2,495.55	2,098.34	1,966.81	2,073.64	27,178.75	
	Usage	(Kw)	28,960	28,720	27,600	31,360	28,400	27,280	41,520	36,720	34,320	28,480	27,120	29,040	369,520	
	Demand	(Kw)	61.6	60.8	61.6	60.8	56.0	72.0	81.6	80.8	76.8	68.0	58.4	58.4	66.4	
	Unit Cost	\$/gallon	2.2450	2.2500	2.2590	2.2989	2.5314	2.3240	2.2778	2.3899	2.4158	2.3402	2.4192	2.4743	2.3578	
PROPANE	Total	Cost(\$)	1,075.36	947.93	940.88	940.48	1,535.32	896.83	934.14	1,025.26	939.76	1,441.78	1,029.13	1,134.97	12,841.84	
	Usage	(Gallons)	479.00	421.30	416.50	409.10	606.50	385.90	410.10	429.00	389.00	616.10	425.40	458.70	5,446.60	
	Unit Cost	(\$/gallon)	3,8632	4.0136	3.7508	3.5534	3.5182	3.5219	3.5863	3.6747	3.7086	3.6790	3.6888	3.8102	3.7360	
OIL	Total Cost	(\$)	9,118.78	9,313.60	9,368.87	7,419.47	4,401.29	3,083.05	2,911.36	2,700.87	4,270.40	4,140.36	5,926.08	10,099.42	72,753.55	
	Usage	(Gallons)	2,360	2,321	2,498	2,088	1,251	875	812	735	1,152	1,125	1,607	2,651	19,474	
	Manah	MOILU	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	12 MONTH	

Appendix C: 2013 Energy Usage

	ſ			Manual N. 5th Edition	on. Abridged	Version • Fo	rm N1				Γ
4		Project Name	13130 Our Island Home Core	Heating Design 99% DB	0	Heating Desig	n Space DB	75	Heating Tems	o. Difference	8
1		Design State	Massachusetts	Cooling Design 1% DB	8	Cooling Desig	n Space DB	75	Cooling Temp	o. Difference	¢
	1	Design City	New Bedford	Coincident Wet Bulb	71	Rel Hum Desi	on Space %	80	Design Graint	s Difference	2
	Ć	Type of Load	Zone	Elevation	8	La foude		41	Daily Range		M
		Square Feet	784 AG Volume 7056	Allitude Correction Factor	-	Design Month		Jul & Aug	Design Hour o	of Day	3:00 PM
Type of Exposure			Construction Number & Des	Icription	Panel Faces	Heating	M Cooling	Net Area or Lendb	Heating	Bhih Cla Sensible	Cig Latent
dracent a	۰										
	Δ										
Windows	0										
-	υ										
Glass	•										
Doors	- '				ļ						
	•										
	•				ſ	I					Ι
	•										
Stutiens	0										
	σ										
	•										T
	•										
Wood & Metal	0 (
	,				ļ	I					I
daman a	•				ļ						
	a (Ţ			Ι		T	
Abread	» T				ſ						
Orade	•										
Walls	•										
	•										
	£										
Partition Walls	<u>e</u>										
	g										
Lookup	-	16B-19ad Cellin	ng Under Verted Allic, No radiant barr	rier, Dark Asphalt Shingles, R-2	6	2.24	1.19	784	1,759	903	
Celings	<u>0</u>				_						
Lookup	•										
	•										
	0										
Floors	υ										
	•										
	-	Idhind Extension								2 042	T
	-	Oconosints & Pl	too too							3.750	3000
	0	Office Equipment	nt							1215	
Internal	υ	Food Service B	quipment and investigated Loads								
	•	Blower Heat (Bi	uliding Load)								
Loomup		Infitation				0.26	0.14		2,220	181	8
Lookup		Supply Duct Lo.	ad								
L comu		Ventilation Lot	8 4				CF.U	8 0/6	018 870	00 314	2.08,847
		Blower Heat (Ec	suitment Load)		ſ		5	and a		451	
								Total Loads	652,849	107,786	210,018

Appendix D: HVAC Load Analysis

	ľ				and the state of t	A because and	Vanian - En	and he				ſ
1		Devised Manual	13130 Overleitend Home Division	ſ	Manford Parlian 0004 DD		Handoo Desig	Conce DD	74	Manhood Taxaba	Discourse	90
1		Design State	Massechusens	Γ	Coding Design services	*	Cooling Date	n Space DB	2	Cooline Terre	Difference	8
	,	Design City	Manu Bardined		Consideration Mark Budy	8 7	Bel Hum Desi	In Space (2	Design Gains	a Difference	2 3
	1	Type of Load	Zone	Γ	Elevation	8	a finde		4	Daily Rance		2
		Square Feet	1765 AG Volume 12	5912	Alitude Correction Factor	-	Design Month		Jul & Aug	Design Hour	of Day	3:00 PM
Tune of Exposure	Γ		Construction Number &	Description	8	Parriel	Ŧ	N	Not Area		Bhih	
amendum in adda				dimension in		Faces	Heating	Cooling	orLength	Heating	Cig Sensible	Cig Latent
Incomp 4	•	1c-cuf-cDouble	pane, fixed sash, insulated fiberg	glass		North	36.96	24.12	111.0	4,104	2,678	
	۵	1c-cuf-cDouble	pane, fixed sash, insulated fiberg	glass		South	36.96	62.18	111.0	4,104	6,904	
	o	1c-cuf-c Double	pane, fixed sash, insulated fiberg	glass		East	36.96	49.42	45.6	1,685	2,253	
WINDOWS	σ											
a lo	0											
Lood	•											
	0											
	£											
Lookup	4											
	۵											
Skyinhis	0											
	τ 4											
	•	Change of the second					00 00	00.01	0.000	0100		I
A Locate	•	11J Metal, Fiber	glass com			East	39,60	12.60	88	2,218	8	
Wood & Metal	۵											
Doors	o											
Locoupt		12E-2sm Frame	wall, Metal studs, R-19 cavey, R-	-2 Board	, wood sheathing, siding	East	6.01	200	308	1,838	613	
	۵	12E-2sm Frame	wall, Metal studs, R-19 cavity, R-	1-2 Board	, wood sheathing, siding	South	6.01	1.18	468	2,811	100	
	o	12E-2sm Frame	well, Metal studs, R-19 cavity, R-	-2 Board	, wood sheathing, siding	North	6.01	0.36	468	2,811	170	
Above	σ											
Grade	0											
5 MIRA	-											
	•											
	£											
Partition Walls	<u>e</u> ,											
	ä											
Lookup	•	17B-10w R-13 m	of decking, dead air space, R-19	9 ceiling			1.45	0.55	1,788	2,567	972	
Celings	•											
												Ι
	•				I							
	a 0											
Floors	υ											
	•											
	•	22A-ph Slab on	Grade, No Edge Insulation, Light	WetSol			77.88		\$	10,747		
Loosup	•	Lighting Fixtures									6,635	
	۵	Occupants & Pla	unts								13,200	13,200
Internal	0	Office Equipmen									2,740	
	0	Food Service Eq	upment and investigated Loads									T
	•	BIOMOF HOAT (BU)	(peor Bub)									
Locaup		Infitment					0.23	0.12		4,426	88	8
Lookup		Supply Duct Loa	2									
		Return Duct Loa	0						000	000 AV	000	0.000
		Vernianon Load						8	8	014/07	0,000	760/0
daman]	Diower i rees (su)	n primera scored.						Total Loads	62.723	44,458	22,028

	ſ			Í	MANUAL AND ADDRESS OF ADDRES ADDRESS OF ADDRESS OF ADDR	Abstract	Variation - En	and Mit				ſ
1		Decision Manual	19190 Overletend Lines		Handon Design 0004 DD		Manford David	Conce DD	74	Maniford Tank	Discourse	90
1		Division State	Macanhurama		Cooling Design and UK DR	•	Cooling Date	n Spare DB	2	Cooline Terre	Difference	8
		Design City	New Redford		Coincident Wet Rub	3 2	Bel Hum Desi	an Spece %	2 8	Design Grain	a Difference	2
	1	Type of Load	Zone		Elevation	8	La flude		4	Daily Range		2
		Square Feet	4116 AG Volume	37044	Alitude Correction Factor	-	Design Month		Jul & Aug	Design Hour	of Day	3:00 PM
Type of Exposure	Г		Construction Num	mber & Description	, with	Panel	Ŧ	M	Not Area		Bhih	
	1					Faces	Heating	Cooling	orLength	Heating	Cig Sensible	Cig Latent
	æ	1c-cuf-cDouble	pane, fixed assh, Wood o	x wood dad		North	8.8	24.12	840	3,105	2,026	
	۵	1c-cuf-cDouble	pane, fixed sash, Wood or	x wood dad		South	36.96	62.18	126.0	4,667	7,834	
and and a second se	0	1c-cuf-cDouble	pane, fixed sash, Wood o	r wood diad		East	36.98	49.42	21.0	778	1,008	
SWOOMA	σ											
Glass	•											
Doors	•											
	0											
A AND IN	e 1											
d moon a	a 1											
	a 0											
skydus	υ											
	•											
droom 4	-	11J Metal, Floer	glass Com			South	39,60	12.60	21.0	832	292	
Wood & Metal	۵											
Doors	0											
I noom		12E-2sm Frame	wall, Metal studs, R-19 ca	avity, R-2 Boart	1, wood sheathing, siding	West	6.01	0.64	661	3,970	421	
	۵	12E-2sm Frame	wall, Metal studs, R-19 ca	avity, R-2 Boan	1, wood sheathing, siding	East	6.01	200	661	3,970	1,323	
	0	12E-2am Frame	well, Metal studs, R-19 ca	avity, R-2 Boan	1, wood sheathing, siding	North	6.01	0.36	204	3,027	8	
Above	σ											
Grade	•											
	- •											
	•											
	: 7											
Partition Walls	3											
Lookup		16B-19ad Cellin	g Under Vented Attic, No r	radiant barrier,	Dark Asphalt Shingles, R-19		2.24	1.19	4,116	9,236	4,898	
Calinos	Δ											
	0											
Lookup	æ											
	• م											
Floors	v											
	۰											
	-	22A-ph Slab on	Grade, No Edge Insulation	n, Light Wet So	-		77.88		200	15,576		
droom	8	Lighting Fixtures									15,451	
	۵	Occupants & Pla	antis								6,500	4,400
Internal	o	Office Equipmen	1								6,380	
	υ,	Food Service Ec	pulpment and Investigated	Loads		T						T
010001	P	DIOMOR FROM (DU	(need noted)			T	9 B B	900	_	14 000	5 115	10 112
dama'r		Inniveron				T	8	80		077'0/	0//'c	12,140
Lookup		Supply Duct Los	8 3			T						I
		Ventilation Load co-				T		0.50				I
		Ricker Haat (Fo	uinment Load)			ſ		E			2 666	I
	٦	had some a station of	formation and and and			Γ			Total Loads	120,369	53,652	16,545

	ſ				Manual N Chi Lefting	Abstract	Vanion - En	And Add	l			ſ
1		Devised Manual	19130 Overlationed Linear Mode		Handon Design 0004 DD		Manford Pasio	an Green DB	74	Manhood Translation	Distance	90
1		Distant State	Macanhurama		Cooling Design serve by	*	Cooling Date	n Space DB	2	Cooline Tam	Difference	8
	/	Design City	New Ractional		Coincident Wet Rub	3 2	Bel Hum Desi	m Spece %	2 2	Design Gasin	a Difference	2
	1	Type of Load	Zone		Elevation	8	La fluide		4	Daily Ranoa		2
		Square Feet	4002 AG Volume	36288	Alitude Correction Factor	-	Design Month		Jul & Aug	Design Hour	of Day	3:00 PM
Type of Exposure			Construction Number	A Description	ion	Panel	Ŧ	2	Net Area		Bhuh	
amendum in adda	1					Faces	Heating	Cooling	orLength	Heating	Cig Sensible	Cig Latent
Loomup	•	1c-cuf-c Double	pane, fixed sash, Wood or wo	od dad		East	36,96	49.42	840	3,105	4,151	
	۵	1c-cuf-cDouble	pane, fixed sash, Wood or wo	oddad		West	36.96	66.04	126.0	4,667	8,321	
and and a second	0	1c-cuf-cDouble	pane, fixed assh, Wood or wo	od dad		North	36.98	24.12	21.0	776	506	
SWOOMA	P											
Glass	•											
Doors	•											
	•											
	•											
dimon 4	a 1											
	a 0											
skydus	υ											
	۰											
droom 4		11J Metal, Floor	glass Com			East	39,60	12.60	21.0	203	266	
Wood & Metal	۵											
Doors	0											
Locoupt		12E-2am Frame	wall, Metal studs, R-19 cavity,	, R-2 Boart	1, wood sheathing, siding	West	6.01	0.64	848	3,892	413	
	۵	12E-2sm Frame	wall, Metal studs, R-19 cavity,	. R-2 Board	d, wood sheathing, siding	East	6.01	200	648	3,892	1,297	
	o	12E-2sm Frame	well, Metal studs, R-19 cavity,	. R-2 Board	1, wood sheathing, siding	North	6.01	0.36	468	2,811	170	
Above	σ											
epero epero	•											
S HOAL	-											
•	•											
	e 1											
Partition Walls	28											
Lookup	1	16B-19ad Celling	2 Under Vented Attic: No radia	and barrier.	Dark Aschalt Shindles, R-19		2.24	1.19	4 032	9.048	4.798	
	•											
Celings	0											
Lookup	8											
	۵											
	0											
LICOL	•											
·	•	22A-ph Sisb on (Grade. No Edge Insulation. Lik	oht Wet So	-		77.88		8	15.576		
I Lookup	æ	Lighting Rixtures									16,137	
	۵	Occupants & Pla	ints								4,750	3,800
Inde mal	0	Office Equipmen									6,250	
	σ	Food Service Eq	upment and investigated Los	5								
	•	Blower Heat (But	liding Load)									
Locaup		Infitment					0/-1	0.86		74,479	97/20	12,023
Lookup		Supply Duct Loa										
0.000		Kenum Duct Loa						nav				
		Vension Load	a bonan () and)			I		5			0 660	
-	1	Diversi I men (me	a patrent scored.						Total Loads	119.067	54,367	15,823
									a second s	And and a second se		

	ſ				and the state of t	Abulation	Manadana - En	100				ſ
1		Decision Manual	191900 October Manual Long	6 10 Th	Manada Pasion cold PD	a former f	Manford Paris	A Concer PD	76	the Local Sector	Discourse	90
		Design State	Macanhurama		Cooling Design 454 DR		Cooline Device	n Space DB	2 %	Cooline Territor	Difference	8
	1	Design City	New Backord		Coincident Wet Bulb	3 5	Rel Hum Desi	on Scace %	2 8	Design Grain	s Difference	2 3
5 S	٢	Type of Load	Zone		Elevation	8	La flude		ŧ	Daily Range		×
		Square Feet	4032 AG Volum	me 36265	Alitude Correction Factor	÷	Design Month		Jul & Aug	Design Hour (of Day	3:00 PM
Type of Exposure	Γ		Construction N	Aumber & Descrip	tion	Panel	H	M	Not Area		Bun	2
	٩	Annual Double	name freed such White	d or wood dad		Faces	20,000	GT DT	01 L MIGUN	LUDI V		VIG LONGIN
	•	foor Control	mana frand each Who	d or wood dad		Miner	36.06	00.04	105.0	3,000	8 004	
	9		DOAL THERE PAY I MINE			100AL	00100	5.00	1000	0000	totio	
Windows	0											
ه (•											
Glass	-											
	0											
	£											
Lookup	•											
	۵											
Skylahts	0											
	•											
	•	11.1 Metal, Fber	data Core			West	30.60	12.60	21.0	628	386	I
Wood & Manual	•											
Doors	9 U											
drocon 4	•	12E-2sm Frame	wall, Metal studs, R-19	Cavity, R-2 Board	d, wood sheathing, siding	West	6.01	0.64	848	3,892	413	
	•	12E-2sm Frame	wall. Metal studs. R-19	cavity, R-2 Board	1. wood sheathing, siding	East	6.01	200	648	3,892	1.297	
	o	12E-2sm Frame	wall, Metal studs, R-19	Cavity, R-2 Board	1, wood sheathing, siding	South	6.01	1.18	8	2,811	125	
Above	σ											
Orade	•											
Walls	•											
	•											
	£											
Partition Walls	2											
	g											Ι
Loosup	•	16B-19ad Cellin	g Under Vermed Alfic, N	to radiant barrier,	Dark Asphalt Shingles, R-19		2.24	1.19	4,032	9,048	4,798	
Celings	• ۵											
Lookup	•											I
	Δ											
	0											
Floors	υ											
	•	100 100	And the Star burger	Construction of the second					~	10 010		
	-	Long By the set of the	Grade, No Eque Insue	non, uga ver se			811		8	0/0/01	15 137	I
	•										10,101	
	•	Occupants & FIL									4,700	3,000
Intermal	τυ	Cimical Equipment	11 Literature and land lancard lands	and I marks		I					1 876	1 105
	9 0	Blower Heat (Bu	(iding Load)									8
Loosup		Infibation					1.70	0.86		74,479	5,720	12,023
and a second		Supply Duct Loa	8									
drugon A		Return Duct Loa	8									
Locoup		Ventilation Load						CFM				
I noom		Blower Heat (Eq	uipment Load)								2,809	
									Total Loads	119,067	58,988	16,928

	ſ				and the first state of the second	Abstract	Vanian - En	A MARK				ſ
1		Designed Manual	19190 October International Witness		Manual Indian Cold DD		Manford Dario	an Source DB	74	the disc Tam	C Distance	90
1		Design State	Macanchuradia		Continu Design and UK DR		Cooling Date	n Space DB	2	Cooline Tame	Difference	8
		Design City	New Radford		Coincident Wet Rub	3 5	Bel Hum Desi	m Spece %	2 2	Design Gain	a Difference	2
	1	Type of Load	Zone		Elevation	8	La fluide		4	Daily Ranoa		2
		Square Feet	4002 AG Volume	36288	Alitude Correction Factor	-	Design Month		Jul & Aug	Design Hour	of Day	3:00 PM
Type of Exposure	Γ		Construction Number	r & Descrip	for	Panel	Ŧ	2	Net Area		Bhuh	
	1					Faces	Heating	Cooling	orLength	Heating	Cig Sensible	Cig Latent
- Locaup	•	1c-cut-cDouble	pane, fixed assh, Wood or wo	bed dad		North	8.8	24.12	840	3,105	2,026	
	Ω	1c-cut-cDouble	pane, fixed sash, Wood or wo	bed dad		South	36.98	62.18	126.0	4,657	7,834	
Mendance	o	1c-cuf-cDouble	pane, fixed sash, Wood or wo	bod dad		East	36.96	49.42	21.0	776	1,008	
A NINGONS	σ											
Glass	•											
Door	•											
	•											
	£											
Lookup	•											
	۵											
Skylahts	0											
	• •											
	•	ALL UNK PROPERTY	MAR Com		Ī	Control	00 00	02 64	0.46	000		
damon a		I D MONTH LINE					10160	12.00	212	8	8	
Wood & Metal	•											
	,	And Dam Party	tion of the state of the state	0.0	titer of the affile of the		5 Q Q	100	100	010	POP.	
damage a		MURU U87-371	well, Mietell actuda, In- 19 Centry	N-4 DOM	Current and and and the second the	No.	100	5	8	0,8,0	174	
	۵	12E-2sm Frame	wall, Metal studs, R-19 cavity	r, R-2 Boan	d, wood sheathing, siding	East	6.01	28	8	3,970	1,323	
	o	12E-2am Frame	well, Metal studs, R-19 cavity	v, R-2 Boan	d, wood sheathing, siding	North	6.01	0.36	ŝ	3,027	8	
Above	Ð											
Wats	•											
	•											
1												
	1					ſ						
Partition Walls	28											
Lookup	•	16B-19ad Celling	3 Under Verned Allic, No radiu	ant barrier.	Dark Asphalt Shingles, R-19		2.24	1.19	4.116	9226	4,898	
	•											
Cettings	o											
Lookup	-											
	۵											
	0											
LICOL	•											
	• •	22A-ch Slab on	Grada No Edua Insulation Li	ohi Wat So			77.88		000	15.578		
droom -	•	Lighting Fixtures				ſ					15,451	
	•	Occupants & Pla	antis								6.600	4.400
]	0	Office Equipmen									6,380	
Infle mail	υ	Food Service Eq	lupment and Investigated Los	stor								
	0	Blower Heat (Bu	(Iding Load)									
Loomp		Infibation					227	1.17		105'66	7,783	16,357
Lookup		Supply Duct Los	2									
damas -		Return Duct Loa	8									
Loosup		Ventilation Load						CFM				
Loosupper Loo		Blower Heat (Eq.	uipment Load)								2,655	
									Total Loads	144,656	55,757	20,757

weater data.				w/vent							56.4 tons
(SM) ASHAREV	ndoor 75/75)	(BTUH)	Latent	210,018	16,545	15,823	16,928	20,757	280,071	22,028	302,099
85db/71wb	I Loading (I	Coolir	Sensible	107,786	23'652	54,367	886'85	55,757	330,550	44,458	375,008
g.F(WN) &:	Calculated	Heating	(BTUH)	652,849	120,369	119,067	119,067	144,656	1,156,008	62,723	1,218,731
eratures; 9de				w/vent.							56.4 tons
t Design Temp	door 70/75)	(BTUH)	Latent	210,018	16,545	15,823	16,928	20,757	280,071	22,028	302,099
ior Ambier	loading (in	lilooo	Sensible	107,786	23'652	24,367	886'85	55,757	330,550	44,458	800'SLE
Imation: Exter	Calculated	Heating	(HUTB)	603,391	111,250	110,047	110,047	133,697	1,068,432	57,971	1,126,403
f Home Heating & Cooling Sum		Area	Tag	Core-Nursing Area	East	North	South	West	Original 1979 Bldg. Total	Dining, 2002 Addition	Final, Required
Our Island											

0 879,833 Original Design 1979 calc. as noted on plans

			3 tons, including ventilation	3 tons	15tons; 3units		3 tons		6.8 tons, including ventilation	38.8 tons	•
pment	Cooling, Total	(BTUH)	36,000	36,000	180,000	0	36,000	288,000	81,600	369,600	
talled Equi	ting	K Provided	108.7%	S1.6%	75.8%	%¥'9E	%¥'05	84.7%	127.5%	86.9%	
Ins	Hear	(HUTB)	656,170	57,400	83,400	40,100	67,400	904,470	73,920	978,390	
0			Core-Nursing Area	East	North	South	West	Original 1979 Bidg. Total	Dining, 2002 Addition	Final, Required	

Selected boiler capacity 1979

0

Original Design 1979 calc. 908,500 103.3%

Domestic Hot Water Sizing - Attachment

ASHRAE - HVAC Applications (2011) Chap.50 Service Water Heating

#13130

System providing 180deg.F water to the the laundry & kitchen with mixing valve for nursing bed/general at 130deg.F.

Existing System:

Adjusted				166 gph@140deg.F rise	242,000 Btuh
Selected	2	BOCK, oll fired	73E	258 gph @ 90deg F rise	242,000 Btuh
	đ	Manuf	Model	Recovery, each	Input, each

Dept of Public Health(DPH) Current Guidelines Domestic Water Sizing (105 CMR 151.720)

Temperature Adjusted	Gallons Required	211	180	203	765
	Gallons Required	293	180	203	929
	No. of Beds	45	45	45	Total
Recovery Rate	Gal/hr/bed	6.5	4	4.5	
		Patient Area	Food Prep(Kitchen)	Laundry	

C. Selection Based Required Recovery

믕
594 821,816 C
Total Recovery, gph Boiler (BTUH) @85% eff.

Combined Building & Domestic Boiler Slaing: Based on Fig. 27 SED Design Load at 70 deg.F indoor temperature: 1,126,403 BTUH

SED Design Load at 75 deg F indoor temperature: 1,218,731 BTUH

U
nest
ð
oad
Ъ
8
ded

Added Boiler Load: Domestic					Domestic
Water Temp. Rise	Bidg Load (MBH)	DWH Load(MBH)	RATIO	FACTOR	Load(BTUH)
1. CW 140deg.Frise	1127	822	0.73	0.65	534
2. CW 140deg.Frise	1219	822	0.67	09:00	493

Boiler Size with Indierct Domestic Load

Option #1: 1,661 BTUH Option #2: 1,712 BTUH

Appendix F: Energy Conservation Measures (ECM): Analysis

- ECM#1: Replace zone constant speed units with variable frequency drive ECM motors.
- ECM#2: Replace main constant speed units with variable frequency drive ECM motors.
- ECM#3: Replace main constant speed units with variable frequency drive ECM motors and delete the zone circulation pumps.
- ECM#4: Replace existing oil fired domestic water heaters with indirect units using the boiler water for heating.

Energy Conservation Measure #1

VSD Calculator for Pumps P1-P6

Nameplate Efficiency 85 % Motor Load at Pump Design GPM 80 %	Annual Operating Hours Type of Flow Control Cost of Electricity	7248 Bypass, Recirculation Valve 0.14 \$/kWh
Duty Cycle Low Pump Loading Percent of Capacity Percent of Time at		
(cfm) this Capacity 23 % 22 % 38 % 21.3 % 53 % 22 %		
68 % 20.3 % 83 % 10 % 98 % 3.7 % 100 % 0.5 %		
100 96 0.2 96 100 96 0 96 100 96 0 96		

Outputs
Energy and Cost savings Current Annual Energy use 3,137 VSD Annual Energy Use 509 kWh/yr Annual Energy Savings 2,628 kWh/yr Annual Cost Savings 368

Energy Conservation Measure #2

Inputs				
	Namsplate Horsepower Namsplate Efficiency Motor Load at Pump Design C Duty Cycle Low Pu	0.50 hp 85 % 80 % mp Losding	Annual Operating Hours Type of Flow Control Cost of Electricity	7248 Bypass, Recirculation Valve 0.14 S&Wh
	Percent of Capacity 1 (cfm) 23 % 38 % 53 % 68 % 83 % 98 % 100 % 100 %	Percent of Time at this Capacity 22 % 21.3 % 20.3 % 10 % 3.7 % 0.5 % 0.2 %		
Ontrast	100 %	0%		
ouputs	Energy and Cost savings Current Annual Energy use VSD Annual Energy Use Annual Energy Savings Annual Cost Savings	3,137 kWh/yr 771 kWh/yr 2,366 kWh/yr 331 \$/yт		

VSD Calculator for Pumps P7 & P8

Energy Conservation Measure #4

Energy Usage 2013: Assuming summer months is for the domestic usage which includes the kitchen, laundry and general sins/lavatories; excluding the showers which have dedicated propane hot water heaters.

Month	Usage (Gallons)	Total Cost (\$)	Unit Cost (\$/gallon)
Jun-13	875	3,083.05	3.5219
Jul-13	812	2,911.36	3.5863
Aug-13	735	2,700.87	3.6747
	2,422	8,695.28	3.5898
Average	807	\$2,898.43	3.5898

US Dept. of Energy (DOE) estimates energy savings for indirect hot water heaters of 15-25% as compared to a standard hot water storage tank.

Estimated average monthly usage 807 gallons x 12 months = 9,684 gallons. Estimated Savings; 9,684 gallons x 0.20=1,937 gallons

Appendix G: System Budget Costs

#1: Boiler oil fired unit with indirect domestic hot water selected for increased building load rated at 1,712,000BTUH.				
Demolition existing boiler & horizontal. flue	\$4,500			
Demolition hazardous material	\$0	By others		
Demolition piping, limited	\$3,500	boiler room disconnects, only		
Demolition oil piping	\$1,500	from filter to boiler		
New Boilers Hot water, oil fired with burner (qty 3) & controls	\$55,000	material & labor		
Piping and accessories	\$8,500	new and modify existing connections		
Oil piping and accessories	\$1,500	connect into existing		
New flues run in existing chimney (qty 3)	\$6,000	assuming existing vertical chimneys adequate		
Electrical	\$4,000	existing modification & new		
Rigging	\$3,500	new boilers		
Insulation, boiler room piping	\$5,000			
Closeout (as builts, O+M, etc.)	\$1,500			
Subtotal	\$94,500			
General Conditions(10%)	\$ 9,450	Mechanical contractor as GC		
Mobilization(5%)	\$ 4,725			
Coordination(5%)	\$ 4,725			
Phasing (5%)	\$ 4,725	allowance working and maintaining active domestic hot water system		
Subtotal	\$118,125			
Profit (15%)	\$ 17,719			
Subtotal	\$135.,844			
Bonding(2%)	\$ 2,717			
Const. allowance	\$ 15,000	pending final design		
Total	\$153,561			

#2: Heat Recovery Ventilator (HRV) replacement in-kind.			
Demolition existing units	\$10,000	Unit located in attic, to be removed and disposed.	
Demolition hazardous material	\$0	By others	
Modification to attic ductwork distribution, limited	\$7,500	new and modify existing connections	
ERV' to match existing	\$85,000	With heating only.	
Piping and accessories	\$9,500	new and modify existing connections	
Electrical	\$ 3,600	new and modify existing connections	
Rigging	\$6,500	new units, in attic	
Insulation, new ductwork & piping	\$4,000		
Closeout (as builts, O+M, etc.)	\$1,500		
Subtotal	\$127,600		
General Conditions(10%)	\$ 12,760	Mechanical contractor as GC	
Mobilization(5%)	\$ 6,380		
Coordination(5%)	\$ 6,380		
Phasing (5%)	\$ 6,380	allowance working and maintaining active ventilation system	
Subtotal	\$146,740		
Profit (15%)	\$ 29,348		
Subtotal	\$176,088		
Bonding(2%)	\$ 3,522		
Const. allowance	\$ 15,000	pending final design	
Total	\$194,610		

#3: Heat Recovery Ventilator (HRV) replacement with three smaller units having limited air				
conditioning for dehumification.				
Demolition existing units	\$ 2,500	Unit located in attic, to be abandoned in		
		place. Disconnect piping, electrical &		
		ductwork as required		
Demolition hazardous material	\$ 0	By others		
Modification to attic ductwork	\$ 5,000	Related to the installation of new		
distribution, limited		dedicated ERV's.		
ERV'w with limited dehumidifying	\$ 75,000	material attic mounted, 3 tons cooling &		
cooling capacity (Qty. 3)		15MBH heating		
Piping and accessories	\$ 10,500	new and modify existing connections		
Electrical	\$ 8,500	existing modification & new		
Rigging	\$ 5,500	new units, in attic		
Insulation, new ductwork & piping	\$ 5,000			
Closeout (as builts, O+M, etc.)	\$ 1,500			
Subtotal	\$113,500			
General Conditions(10%)	\$ 11,350	Mechanical contractor as GC		
Mobilization(5%)	\$ 5,675			
Coordination(5%)	\$ 5,675			
Phasing (5%)	\$ 5,675	allowance working and maintaining active ventilation system		
Subtotal	\$141,875			
Profit (15%)	\$ 21,282			
Subtotal	\$163,157			
Bonding(2%)	\$ 3,663			
Const. allowance	\$ 15,000	pending final design		
Total	\$181,820			

#3: Heat Recovery Ventilator (HRV) replacement with three smaller units having limited air