

Green Capital Needs Assessment and Replacement Reserve Analysis

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Kirtland Commons

CHFA # 77007D

Deep River Housing Authority
Deep River, CT

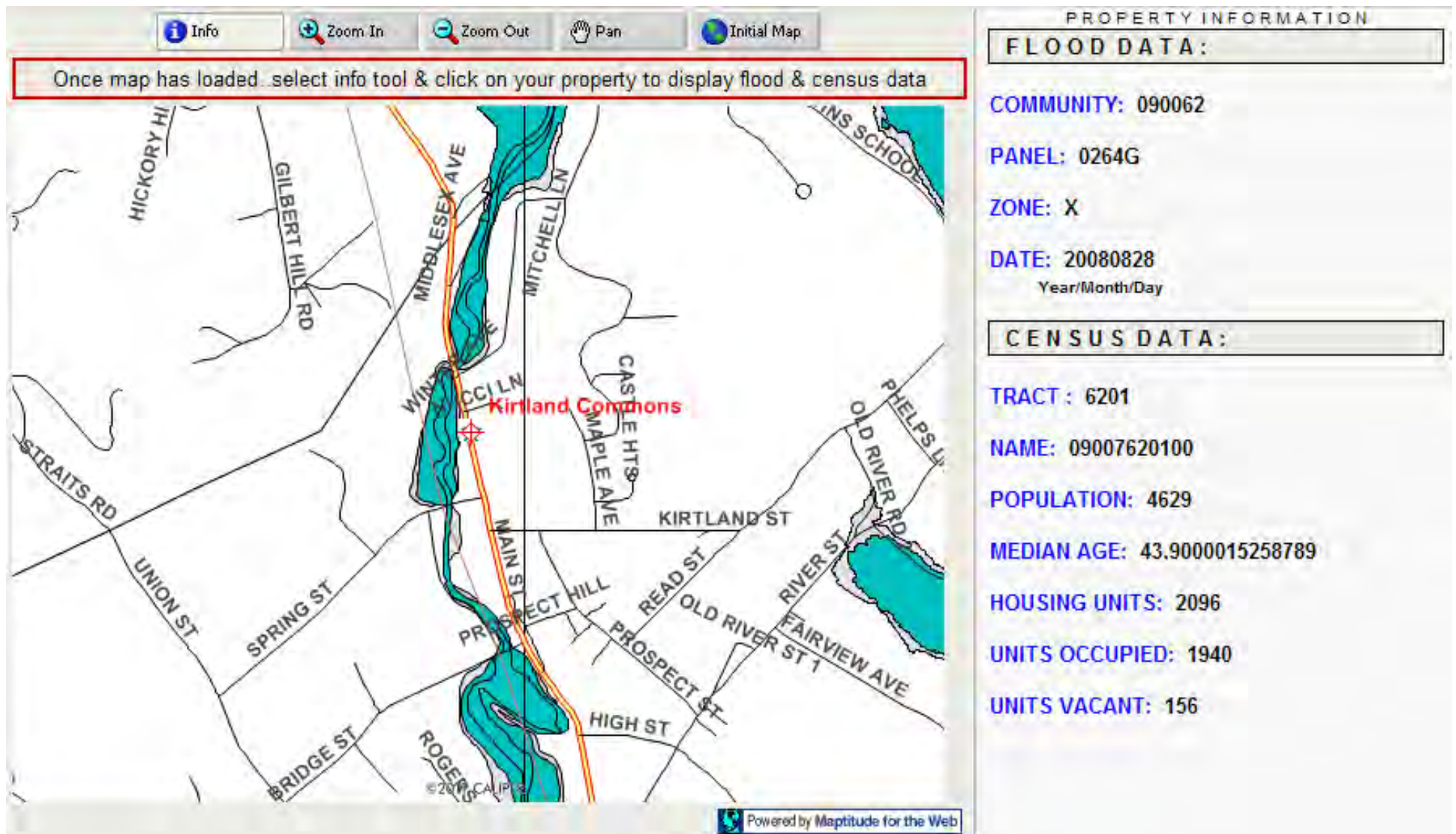
May 9, 2013

Final Report



Kirtland Commons

60 Main Street
Deep River, CT 06417



Kirtland Commons

60 Main Street
Deep River, CT 06417

Zone X = Outside the 500-year floodplain and
Outside the 1% and 0.2% annual chance floodplains

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HOW TO READ THIS REPORT

The report is divided into two sections: "Findings and Recommendations" and "Supporting Data".

Findings and Recommendations: The three elements comprising this section constitute the main content of the report. A comprehensive list of the recommended green options and their benefits, and a snapshot of key energy findings, are included in the Executive Summary. Additional detail regarding the property's existing conditions, current and future capital needs, and green recommendations are illustrated in the narrative and photo pages.

Supporting Data: These nine sections contain the support data and calculations used in determining the feasibility of the green recommendations. Hard costs estimates and replacement/repair timing are presented in the capital needs worksheets. The Capital Needs Summaries and Replacement Reserve Analyses highlight the total 20-year capital costs for both the conventional and green scenarios pitted against current funding circumstances. Cost-benefit analyses are included in the Simple Payback and Life Cycle Cost "cut sheets" at the end of the report.

Executive Summary

Overview and Goals

This Green Capital Needs Assessment (GCNA) has been undertaken on behalf of Connecticut Housing Finance Authority. It is aimed at determining the development's current and prospective physical circumstances, on both a traditional and green basis. A traditional CNA focuses on those capital activities that reasonably can be expected to ensure that a property is viable and in good condition over a twenty-year horizon. In a traditional CNA, it is common for On-Site Insight (OSI) to informally comment on maintenance practices, or suggest discretionary upgrades that might affect operations, marketability, or occupant well being. This GCNA is aimed at more rigorously and more formally identifying green alternatives to conventional replacement of major components and systems. It offers options aimed at helping:

- improve energy and water efficiency,
- reduce operating and capital costs through the use of durable materials and improved maintenance,
- safeguard indoor environmental quality (IEQ) for residents, and
- reduce the property's environmental impact.

We see a number of sensible green opportunities, now and in the future, to replace existing elements with more durable and/or environmentally friendly materials and technology. In both the narrative and detailed capital needs worksheets that follow, conventional and green capital activities are presented in parallel. Capital needs summaries are presented separately for conventional and green models. The green opportunities described in the plan fall into one of two categories: energy and water conservation measures (EWCMS), or green measures (GMs), expanded in detail below:

Executive Summary

A Note on NPV

Net present value (NPV) is the difference in total life cycle costs between the conventional recommendation and the green recommendation. The EWCMs and GMs that carry a negative NPV are viewed as cost-prohibitive, despite potential environmental benefits or additional energy savings. In this report, OSI does not recommend measures that carry a negative NPV.

Energy and Water Conservation Measures (EWCMs):

In the report, 11 energy and water conservation measures (EWCMs) are identified. Energy and water conservation measures are upgrades and improvements to existing mechanical and electrical systems that have a direct impact on energy consumption, and therefore potential utility (electric, gas, oil, water, sewer) savings if implemented appropriately. As part of the inspection process, the property's utility data was analyzed. This information is then used as part of the EWCM recommendation and calculation process.

Certain EWCMs are interactive. In order to achieve the projected annual energy savings for an interactive group, the EWCMs must be implemented in concert with one another. If any of the interactive EWCMs are deferred or foregone, there may be a significant impact on the utility savings outlook. For example, replacement of an inefficient boiler system may not achieve projected utility savings associated with that system if inefficient windows remain in place.

The energy conservation measure specifications (i.e. boiler efficiencies, R-values, U-values) presented in this plan are mostly derived from the International Energy Code and the American Society of Heating, Refrigeration and Air-Conditioning (ASHRAE) Handbook. These measures represent one conceptual option; various alternatives may yield different results. It must be noted that a number of factors may affect the estimated annual energy savings and simple payback periods, and therefore the figures outlined in this report are not guaranteed.

Executive Summary

Green Measures (GMs):

The report identifies 8 Green Measures (GMs). Green measures are replacements of existing materials and systems that do not have a direct impact on energy consumption; however, they represent opportunities to reduce capital and operational expenditures in the future due to increased durability, enhanced performance, and increased expected useful life (EUL) potential. Additionally, if implemented properly, GMs can improve indoor environmental quality and can benefit resident and staff health, safety, and well-being.

The life cycle costs for the GMs are calculated in the attached worksheets with the comparative life cycle cost for the conventional replacement alternatives. Other GMs included in the plan do not represent enhanced performance or extended expected useful lives, and therefore the life cycle costs for these GMs are not calculated. Many of the projected savings are based on certain performance and EUL criteria for the respective systems and materials. Several factors may impede upon the expected performance and may skew the estimated savings. In this case, the savings presented in the plan are estimated and cannot be guaranteed.

Building Modeling Methodology:

This report uses an energy model created in TREAT to determine the energy loads (electric and fossil fuel uses including heating, domestic hot water, and non-heating systems) for this property. The TREAT model is based on building-specific construction, HVAC systems, and other building systems (i.e. lighting, appliances, etc.) as identified by the inspection team. The energy model also incorporates 12 months of utility bills, and matches weather data to the utility billing period.

Using the SUNREL™ energy simulation software developed by the National Renewable Energy Laboratory (NREL), TREAT calculates energy uses on an hourly basis (again factoring in weather/climate, existing HVAC systems, and internal gains) for an entire year. The result produces calculated energy use for the property, and proposed energy savings for identified measures. The energy savings are shown both independently and with full interaction of all measures.

Executive Summary

Additional measures such as water usage, which is currently not modeled in TREAT, have been presented using OSI's existing utility models. Also, since TREAT evaluates the building as a whole, it is possible that measures reduce electric consumption, could also show an increase in heating requirements (i.e. lighting reduction reduces heat typically produced by the original lighting system and in turn would require an increase to the heating load). The calculated loads (electricity, natural gas) are reconciled against billed utility loads within a 10% margin.

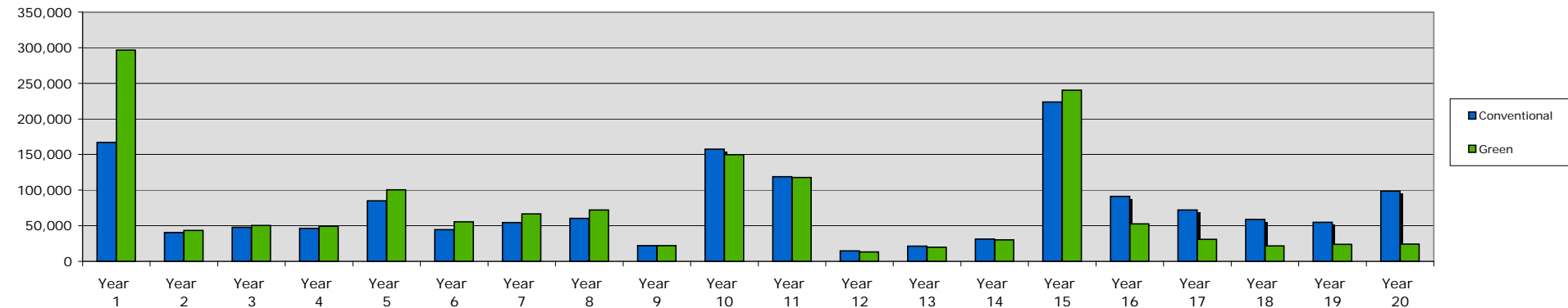
Executive Summary

Dashboard

Property Data

Location:	Deep River
Year Built:	1993
Number of Units:	26
Number of Buildings:	1

Comparison of Capital Needs - Conventional vs. Green



Environmental Impact

(Total Carbon Release Based on Current Annual Energy Usage)

Building Square Footage:	30,374
Resident Population (estimated):	32

	BTUs/yr	Conversion	lbs CO ₂	lbs CO ₂ / Res
Gas	0	x 11.023100	0	0
Oil	1,345,186,767	x 11.023100	148,281	4,634
Electricity	400,159,360	x 1.582917	185,590	5,800
Total	1,745,346,127		333,871	10,433

Health and Safety

Hazardous Materials

	Identified	Location / Notes
Lead Based Paint (LBP):	Not tested	Not likely due to age
Asbestos Containing Materials (ACMS):	Not tested	Not likely due to age
Mold:	Not observed	-

Indoor Ventilation

Bathroom and kitchen ducted grills to rooftop exhaust fans.

Indoor Air Quality (IAQ)

	Design Specification	Actual Read	Notes
Air Flow Rate	-	Not Measured	-
Thermal Comfort	68 - 72	69 - 76	-
Carbon Monoxide	0	0	One unit/hallway
Carbon Dioxide	<1000	904 - 970	Whole building

Replacement Reserve Analysis

Conventional

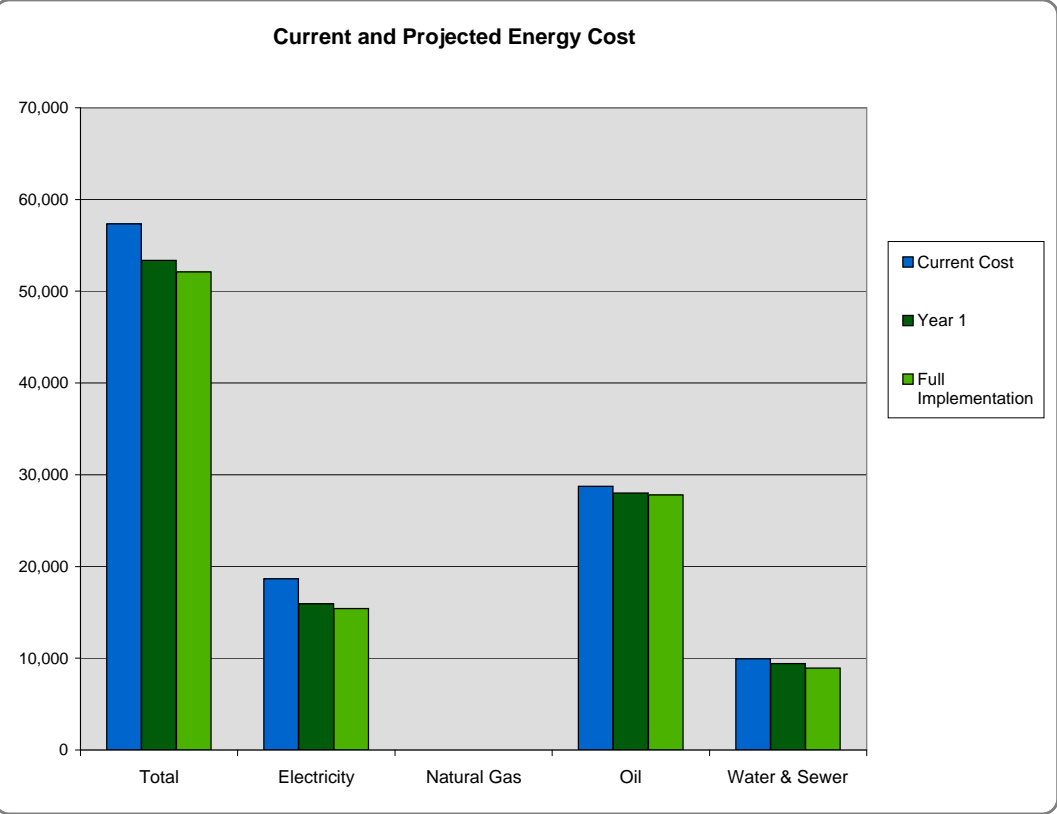
- Plan #1: Capital costs exceed reserves in all years of the plan.
- Plan #2: Infusion of \$858,000 (\$33,000/unit) in Year 1.

Green

- Plan #1: Capital costs exceed reserves in all years of the plan.
- Plan #2: Infusion of \$910,000 (\$35,000/unit) in Year 1.

Executive Summary

Energy Savings



Energy Intensity / Benchmarking Data

TREAT Modeled Data

Building Square Footage: 30,374

Heating Degree Days: 5,390

TREAT Model

	Amount	Units	BTUs/yr	Energy Intensity (BTUs/(HDDs x SF))
Heating	7,594	gal	1,058,616,559	6
Cooling	0	kWh	0	0
DHW	3,657	gal	509,739,477	3
Electricity	117,280	kWh	400,159,360	2
Total			1,968,515,396	12

	Gallons/yr	Gallons/sf/yr
Water	1,168,000	38

Energy Usage Summary

Billing Data

Utility	Current Usage	Current Cost	Projected Usage	Projected Cost	% Savings
Electricity	117,280 kWh	\$18,671	96,731 kWh	\$15,400	17.5%
Natural Gas	0 therms	\$0	0 therms	\$0	n/a
Oil	9,650 gallons	\$28,757	9,328 gallons	\$27,799	3.3%
Water & Sewer	1,168,000 gallons	\$9,928	1,048,601 gallons	\$8,913	10.2%
Total		\$57,356		\$52,111	9.1%

Executive Summary

Green Improvement Plan

						Annual Utility Savings										
Measure	Upfront Cost	EUL	Simple SIR ¹	Incremental Cost ²	Green NPV ⁴	Electric		Gas		Oil		Water & Sewer		Total \$	Recommended Timing	
						KWh	\$	Therms	\$	Gallons	\$	Gallons	\$			
Recommended EWCMS (Based on Financial Analysis)																
Interactive Group																
EWCM 2 & 4 - Replace Heating & DHW	110,800	15	3.07	74,464	230,934					7,619	22,704			22,704	Immediate	
EWCM 3 - Replace Pump Motors	9,245	15	0.26	645	1,317	1,009	161							161	Immediate	
EWCM 5 - Replace Doors	1,484	35		104	1,147					24	72			72	Year 14	
EWCM 6 - Replace Windows	3,808	30	4.16	3,808	4,788					177	527			527	Immediate	
EWCM 9 - Convert Lighting	13,590	20	2.51	13,590	12,935	10,498	1,671			12	36			1,707	Immediate	
EWCM 10 - Replace Washing Machines	1,398	12	10.19	98	11,018	3,346	533			45	133	61,256	521	1,186	Year 2	
EWCM 12 - Showerheads	537	20	20.40	537	66					70	208	39,857	339	547	Immediate	
Interactive Group Total ⁵	140,861			93,245			2,206				958		860	4,024		
EWCM 1 - Convert Lighting	26,101	20	0.82	1,821	14,830	6,693	1,066							1,066	Immediate	
EWCM 11 - Replace Toilets	11,460	25	0.34	800	150,723							18,220	155	155	Immediate	
EWCM Subtotal	178,421			95,866		6,693	3,272	0	0	0	958	18,220	1,015	5,244		
Recommended GMs (Based on Financial Analysis)																
GM 3 - Carpet Floors	17,056	25		7,753	152	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Immediate	
GM 4 - Vinyl Floors	7,156	25		651	1,849	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Immediate	
GM 5 - Community Cabinetry	5,563	25		388	373	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Immediate	
GM 6 - Linoleum	100,672	25		9,152	26,017	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Immediate	
GM Subtotal	130,447			17,944		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		
Total	308,868			113,810		6,693	3,272	0	0	0	958	18,220	1,015	5,244		
Optional Actions																
EWCM 8 - Roof Insulation	74,195	20	0.00	16,862	(10,476)									0	Future	
GM 1 - Pervious Pavers	93,255	30	0.00	67,144	(55,542)									0	Immediate	
GM 2 - Metal Tile Roof	33,345	50	0.00	19,305	(12,444)									0	Immediate	
GM 7 - Cabinetry	100,620	25	0.00	7,020	(7,020)									0	Immediate	
GM 8 - Countertops	31,200	25	0.00	14,743	(759)									0	Immediate	

Notes:

- Simple SIR is calculated as (Total Annual Savings * Estimated Useful Life) / Upfront Cost.
- Incremental Cost is the difference in cost between the green and conventional alternatives.
- Green SIR (Savings to Investment Ratio) is a relative measure that reflects the ratio of total savings to total investment of Green vs. Conventional. Unlike Simple SIR, this calculation takes into account maintenance costs, inflation, discounting, and differences in expected useful life.
- Green NPV is the net present value of installing a green vs. conventional product.
- Interactive group total recognizes full interaction of all measures based on the TREAT model.

Narrative

Kirtland Commons is a development designed for occupancy by the elderly. The buildings contain a total of 26 units, all of which are access through a series of interior stairwells and hallways. The twenty-six units are all one-bedroom apartments. The building was originally constructed in 1993.

Site

Site Surface

Kirtland Commons is located on a small parcel of land in Waterbury, CT. The site features two parking areas and attractively landscaped lawn areas. No capital costs are carried for landscaping improvements, as they are understood to be handled from operations. If, at some future date, management contemplates re-landscaping, OSI recommends attention to sustainable design. Conventional landscaping relies on large lawns, non-native species, extensive irrigation, and heavy use of fertilizers and pesticides. This type of landscaping also tends to be labor-intensive. There are design features that can enhance soil quality and reduce storm water run-off and pollution. Such measures can also minimize water usage, maintenance costs, and green waste.

Roadways and Parking Areas		
Existing conditions	Capital needs	Green alternative
A parking area is located on either side of the building. The parking areas feature original asphalt paved surfaces exhibiting some cracking and minor settlement.	Future costs to resurface the parking area are shown in Year 3. Costs to crack-fill, seal coat, and restripe the asphalt parking area as needed throughout the plan.	GM #1 Consider installing pervious pavers. Pervious pavers reduce storm water run off and can reduce the heat island effect caused by darker pavers.

Narrative

Pedestrian Walkways		
Existing conditions	Capital needs	Green alternative
The walkways were observed to be in good overall condition.	Costs are shown for as needed repair/replacement throughout the plans timeframe.	Repairs and replacements using Portland cement with at least 20% recycled-content materials is recommended. This measure increases the durability and strength of the concrete and reduces greenhouse gas emissions associated with cement production. Where contractors are familiar with the product, there is little or no incremental cost to this option, however we are uncertain about local market circumstances with regard to this. A separate cost option is not shown for this here.

Narrative

Fencing & Gates

Existing conditions	Capital needs	Green alternative
A painted metal fence runs along part of the property line. The fence was observed to be in fair condition. The generator is enclosed by a shadow box wood fence.	Costs to replace the generator enclosure are shown in Year 10. The metal fencing/rail is in fair condition exhibiting minor rust and should be addressed from operations.	Install FSC certified wood fencing in place of the existing wood fencing.

Site Lighting

Existing conditions	Capital needs	Green alternative
The parking area is illuminated by pole mounted high-pressure sodium fixtures. The pedestrian walkway feature new bollard lighting. The lights are controlled by photocells. Building mounted wallpacks provide security lighting around the property.	Costs to replace the pole mounted lighting are shown in Year 1 of the plan. Future costs are shown for wallpacks and bollard lighting based on expected useful lives.	EWCM #1 Replace the existing fixtures with high efficiency LED models. LEDs use significantly less electricity and have a longer expected useful life than traditional HID fixtures.

Narrative

Accessibility

Existing conditions	Capital needs	Green alternative
The site parking area lacks compliant parking spaces, and the ramp providing access to the gazebo is not compliant.	The designated parking spaces must be restriped to comply with accessibility requirements.	No green alternatives.
The laundry equipment is not compliant and is incorrectly positioned in the laundry room. The community room cabinetry is positioned too high. The public restroom dimensions are not sufficient to support a fully compliant design.	Request compliant laundry equipment from vendor and reposition. Lower cabinetry and enlarge knee hole space. Costs are shown to convert the two existing restrooms into one fully complaint restroom.	No green alternatives.
Dwelling units are largely complaint with ADA accessibility standards. Restroom sinks must be repositioned, pipes must be insulated, and compliant lever hardware must be installed. Cabinets must be altered to comply with reach limits.	Costs are shown to make necessary accessibility upgrades in Year 1 of the plan.	No green alternatives.

Narrative

Mechanical Room

The boiler and hot water heater serving the development are located in the central mechanical room. The central mechanical room contains the two Weil McLain boilers and pumps. A pair of air handlers with split system heat pumps and domestic hot water storage tanks are also located in the mechanical room.

Boilers

Existing conditions	Capital needs	Green alternative
The two atmospheric (standard efficiency boiler) Weil McLain oil-fired boilers (each rated at 448MBH were functioning as designed on the day of the assessment. The boilers were replaced in 2008.	Costs are shown to replace the boiler in Year 20 of the plan.	EWCM #2 (Model at management request) Install unit level heat pumps. Energy Star rated electric backup air source heat pumps could be installed in each unit. The split system heat pumps would eliminate the use of oil for space heating. However, there would be an increase in electricity used for space heating. Costs associated with electricity usage for space heating with electric heat pumps are not shown.

Narrative

Pumps

Existing conditions	Capital needs	Green alternative
Heating water is circulated by two base mounted, two horsepower circulator pumps. The heating pumps have replacement seals and original pump motors. Domestic hot water is circulated by fractional horsepower pumps.	Replace heating pumps in Year 7 of the plan. Costs are shown to replace the domestic hot water pumps in Years 10 and 14.	EWCM #3 Install premium efficiency motors and micro VFD (variable frequency drive) pumps. The high efficiency pumps will use less electricity than conventional motors.

Domestic Hot Water

Existing conditions	Capital needs	Green alternative
Two Weil McLain indirect storage tanks provide domestic hot water for the development. The tanks were replaced in 2008. No problems were observed or reported.	Replacement costs are shown in Year 10 of the plan.	EWCM #4 Install a dedicated domestic hot water boiler. Currently the heating boilers fire to produce domestic hot water. The boilers are oversized for summer domestic hot water heating. Install a properly sized boiler to produce domestic hot water.

Narrative

Building Mechanical and Electrical Systems

The major building systems include fire suppression, distribution piping systems for hydronic heat, domestic hot and cold water, sanitary wastewater, and natural gas services, as well as electrical, elevator and fire detection.

Commercial Kitchen Equipment		
Existing conditions	Capital needs	Green alternative
The commercial kitchen features commercial grade cooking and storage equipment and stainless steel surfaces. The refrigerators are newer Energy Star models. The original electric range is in fair condition. No problems were reported with the commercial kitchen equipment.	Costs are shown in Years 5-14 for as needed equipment replacement.	No green alternatives.

Narrative

Building HVAC

Existing conditions	Capital needs	Green alternative
Two American Standard air handlers and split system air conditioners serve the community room and office. The condensers are original to the development.	Costs to replace the condensers are shown in Years 1 and 16. The air handlers should be handled from operations.	There was not a significant cooling load spike in summer months to model high efficiency air conditioning. That said, consider installing high efficiency condensers (SEER 15 or greater) to reduce electricity used to provide space cooling.

Emergency Generator

Existing conditions	Capital needs	Green alternative
Information regarding the exact size of the generator could not be obtained. The oil-fired generator is estimated to be rated for 175kW.	Future replacement costs are shown in Year 15 of the plan.	No green alternative.

Narrative

Fire Alarm Control Panel

Existing conditions	Capital needs	Green alternative
The Fire-lite MS 5012 fire alarm control panel is original to the development. No problems were observed or reported. That said, the fire alarm control panel has exceeded its expected useful life.	Costs to replace the fire panel are shown in Year 1.	No green alternative.

Elevator

Existing conditions	Capital needs	Green alternative
The 25 horsepower hydraulic elevator is original to the property. Although the elevator is maintained under a full service contract, site staff reports frequent problems.	Costs are shown to add mechanical room air conditioning. Overheating controls is a common cause of the “miss signaling” reported by site staff. Future elevator replacement costs are shown in Year 11 of the plan.	No green alternative.

Narrative

Building Architectural Systems

Building Exterior

Kirtland Commons is one four-story building with a total of 26 apartments. The building is constructed on a poured concrete foundation. No issues were observed or reported with regard to the building framing and it should be monitored going forward.

Doors		
Existing conditions	Capital needs	Green alternative
The main entrance door to the building is a double leaf metal/glass door located on the west side of the building. Similar single leaf metal/glass egress doors are located in the north and south side of the development. Site staff reported problems with the entryway doors.	Costs to replace doors are shown in Year 1 and 15 of the plan. Costs to replace the door openers are shown in Year 10 of the plan.	EWCM #5 Replace the doors with high efficiency insulated fiberglass models. Insulated fiberglass models with reduce heat loss in winter months and require less maintenance than conventional metal models.

Narrative

Siding		
Existing conditions	Capital needs	Green alternative
The brick façade was observed to be in good overall condition. Minimal mortar loss was observed and no cracking brick was seen on the day of the assessment.	Costs are shown in Years 1, 8, and 15 of the plan	Repairs and replacements using Portland cement with at least 20% recycled-content materials is recommended. This measure increases the durability and strength of the concrete and reduces greenhouse gas emissions associated with cement production. Where contractors are familiar with the product, there is little or no incremental cost to this option, however we are uncertain about local market circumstances with regard to this. A separate cost option is not shown for this here.

Narrative

Windows / Curtain Walls

Existing conditions	Capital needs	Green alternative
The property features double glazed, wood framed windows. Most of the windows are double or triple wide models observed to be in fair overall condition.	Costs are shown to replace all windows with comparable double pane, single-hung models in Year 10.	EWCM #6 Consider replacing windows with fiberglass-framed, double-glazed models with a low-E (low emissivity) coating, and a gas fill between the glazing layers. The low-e coating will reflect heat from entering the building during the summer, and can reflect radiant infrared energy from escaping the building during the heating months. A gas fill (such as argon) between the glazing layers will reduce heat transfer through the glass similar to the low-e coating. It is recommended that the windows be monitored and appropriately caulked going forward to keep air infiltration to a minimum.

Narrative

Building Mounted Lighting

Existing conditions	Capital needs	Green alternative
100 watt high pressure sodium wall packs and larger 150watt wallpacks are located at each entryway to the building.	Costs to replace the wallpacks are shown in Years 1 and 16.	EWCM#1 Install high efficiency LED replacement.

Roof

Existing conditions	Capital needs	Green alternative
The main roof structure is a flat rubber membrane covered surface that was replaced in 2008. No roof leaks were reported at the time of the assessment. The pitched asphalt roof sections are covered with composite shingles. Minor storm damage was observed on the south west corner of the roof.	Future replacement costs area shown in Year 15 of the plan.	GM #2 Consider replacing the traditional composite shingle roofing with long-lived metal tile roofing. The metal tile roof should be a light color to help reflect heat and reduce the heat island effect. EWCM #7 Add additional XPS flat roof insulation during the roof replacement.

Narrative

Note:

We do not, as yet, recommend a ‘green vegetative roof’ – the installation of soil and vegetation on a waterproof membrane - as an option. While these may also reduce roof temperatures and cooling loads and reduce storm water run-off; they are much more expensive than conventional systems, and we see too many questions about performance and maintenance.

Building Interior Common Areas

The building interior includes the common hallways and stairwells, a management office, and a public laundry facility. Wall and ceiling surfaces are painted drywall or wallpapered throughout. Allowances are shown throughout the plan for as-needed repairs and painting. As a green measure, the plan specifies low-VOC or recycled-content paint for painting and low VOC adhesives and wallpaper products are shown at no additional premium.

Interior Finishes

Existing conditions	Capital needs	Green alternative
The limited interior common areas feature painted ceiling (with some suspended tile sections) and walls.	Costs are shown to paint interior walls in Years 1 and 11. The first floor walls were painted in 2008. Future painting costs are shown in Years 7 and 14.	Specify low volatile organic compound (VOC) and/or recycled-content paint (content should be at least 50% recycled; VOCs should not exceed 250 grams per liter). In addition specify low VOC wallpaper and adhesives.

Narrative

Existing conditions	Capital needs	Green alternative
<p>Hallways, some community rooms and the office area feature carpeted floor coverings.</p> <p>The laundry room, dining room, and restrooms feature vinyl flooring products.</p>	<p>Costs to replace vinyl and carpet flooring are shown as needed throughout the plan based on expected useful lives.</p>	<p>GM #3 and #4</p> <p>Replace vinyl/carpet flooring with linoleum products. Linoleum is a natural product (containing linseed oil, powdered wood or cork, ground limestone, resin binders, natural jute backing), which has been found to be more durable than its vinyl tile counterpart.</p> <p>Linoleum tile hardens over time and therefore becomes less susceptible to scratching and cracking. Installation of linoleum has a lower annual life cycle cost than vinyl and keeps the vinyl product out of our landfills in the future.</p>

Narrative

Interior Lighting

Existing conditions	Capital needs	Green alternative
Interior lighting is a mix of two and four foot T8 fluorescent fixtures.	Maintain from Operating	EWCM #8 Retrofit existing fixtures with LED lamps and occupancy sensors in some of the support/common rooms. LED lamps will reduce utility costs and reduce operations costs.

Common Area Cabinetry

Existing conditions	Capital needs	Green alternative
Laminated particleboard cabinets are located in the commercial kitchen (2008) and community room (1993).	Replacement costs are shown as needed based on twenty year expected useful lives.	GM #5 Cabinets are shown being replaced with a comparable green product such as bamboo or wood cabinets that are certified by the Forest Stewardship Council (FSC).

Narrative

Laundry room		
Existing conditions	Capital needs	Green alternative
The laundry room features non Energy Star washers and electric dryers. The equipment is owned by the development.	Replace in kind.	EWCM #9 Replace with Energy Star models from the vendor. High-efficiency models (specifically, models with an Energy Star rating) utilize less water (as much as 40% less) than traditional washing machines, and the lower demand for hot water also has an energy-savings component. No green recommendation is included for the dryers, since no high-efficiency models are available.

Narrative

Dwelling Units

During the course of the assessment, OSI gained access to 3 units accounting for 12% of the total. These were distributed among all unit types. A sample of this size is felt to be sufficient given the age, tenancy, design, and location of the development. Additional information about units and capital replacements was obtained from discussions with residents during inspections and additional capital history forms submitted by management.

Living Area Finishes		
Existing conditions	Capital needs	Green alternative
Units feature painted walls and ceilings.	Operating	<p>Specify low VOC products when refinishing interior surfaces.</p> <p>Conventional paint, wallpaper, and adhesives contain thousands of chemicals, many of which are know toxins. Some of the most harmful chemicals are volatile organic compounds (VOCs).</p> <p>VOCs are unstable, carbon-containing compounds that readily vaporize into the air causing air pollution and poor indoor air quality.</p>

Narrative

Existing conditions	Capital needs	Green alternative
Unit living areas, kitchens and bedrooms feature VCT covered areas. Most VCT is understood to be original to the development.	Costs are shown to replace the VCT as needed throughout the plan based on a fifteen year expected useful life.	GM #6 Replace vinyl/carpet flooring with linoleum products. Linoleum is a natural product (containing linseed oil, powdered wood or cork, ground limestone, resin binders, natural jute backing), which has been found to be more durable than its vinyl tile counterpart.

Bathrooms

Existing conditions	Capital needs	Green alternative
Some damage was observed with respect to the original fiberglass tubs and surrounds. Bathroom showers feature 2.0gpm showerheads.	Costs are shown to replace the tubs as needed throughout the plan.	EWCM #11 Install low flow 1.7 gpm showerheads to reduce water consumptions and domestic hot water use.

Narrative

Existing conditions	Capital needs	Green alternative
Bathrooms feature wall hung sinks. The sinks are original to the development.	Replacement costs are shown throughout the plan.	No green alternative.
Dwelling unit toilets are 1.6 gpf low flow models. Some of the toilets have been replaced with dual flush models.	Costs to replace the toilets are shown as needed.	EWCM #10 Replace 1.6 gpf models with high efficiency 1.28 gpf models to achieve the maximum water savings.

Kitchens

Existing conditions	Capital needs	Green alternative
Kitchen cabinets are plywood models with Laminated particleboard (LPB) countertops. All cabinetry dates back to original construction of the development. Most cabinets were observed to be in fair to poor condition.	Costs to replace cabinets and countertops are shown starting in Year 5. Future countertop replacements costs are shown starting in Year 15 of the plan. Costs to replace the rangehoods are shown concurrent with cabinet replacement.	GM #7 Cabinets are shown being replaced with a comparable green product such as bamboo or wood cabinets that are certified by the Forest Stewardship Council (FSC).

Narrative

Existing conditions	Capital needs	Green alternative
		GM #8 Replace countertops with either a recycled content solid stone surface.
Units feature 30-inch electric ranges and frost-free Energy Star refrigerators. The refrigerators were all recently replaced.	Costs are shown for as needed replacement.	No green alternatives.

Unit Mechanical

Existing conditions	Capital needs	Green alternative
Unit thermostats were all replaced in 2008.	Future replacement costs are shown starting in Year 15 of the plan.	No green alternative recommended.
Hydronic baseboard radiators are mostly original to the development.	Costs are shown throughout the plan to replace damaged, missing, or rusted sections of the radiator covers.	No suitable green alternative

Narrative

Unit Electrical

Existing conditions	Capital needs	Green alternative
Dwelling units feature living area smoke detectors and carbon dioxide detectors.	Costs are shown to install bedroom smoke detectors starting in Year 1. Future replacement costs are shown starting in Years 8 and 15.	No green alternative.
The emergency pull chains are original to the development.	Costs to repair/replace the pull chains are shown over the first ten years of the plan.	No green alternative.

Narrative

Health and Safety

Resident and Staff Concerns:

As part of the assessment, the property was examined for potential resident and staff health and safety concerns.

Lead-Based Paint and Asbestos:

- OSI did not conduct any testing for asbestos containing material (ACMs) or for lead-based paint (LBP). Therefore, this section should not be interpreted as a comprehensive or conclusive identification of ACMs or LBP. No areas or components containing LPBs or ACMs were identified or reported.

Other Health and Safety Issues:

- DHW temperatures should be in the range of 110°F to 130°F; at temperatures of 140°F, burns (scalding) can occur.

Indoor Air Quality:

Ventilation (Common Areas and Apartments):

This building has mechanically supplied fresh air and exhaust. Each occupied space has a series of operable windows to provide fresh air. The exhaust ducts located in each unit (bathrooms and kitchen).

Narrative

Temperature, Humidity, Carbon Dioxide (CO₂)

Space temperature and humidity are the key components for comfort level. Temperature and relative humidity was measured in conditioned spaces (management office, dwelling unit, common hallway). The temperature of the conditioned spaces ranged between 69-72°F db, and the humidity ranged from 21-28% rH.

Carbon dioxide levels were measured during the inspection, and are included in Table B below. Carbon Monoxide was also tested during the inspection and is included in Table C below.

Mold and airborne concerns:

No mold was observed on the interior of the apartments, nor in any common spaces at the property.

Reporting:

The tables below describe actual conditions versus design specifications for flow rate and carbon dioxide. The “Notes” column describes a possible reason for a discrepancy between these values where applicable.

Table A. Flow Rate:

Conditioned Space	Actual Read	Design Specification	Notes
Hallways / Stairwells			Not measured
Community Room			N/A No mechanical ventilation
Office			N/A No mechanical ventilation
Apartment			Not measured

Narrative

Table B. Carbon Dioxide:

Space	Actual Read	Design Specification	Notes
Hallways / Stairwells	980	< 1,000 ppm	Conditioned space
Office	10234	< 1,000 ppm	Conditioned space
Apartment	904	< 1,000 ppm	Conditioned space
Apartment	857	< 1,000 ppm	Conditioned space

Table C. Carbon Monoxide:

Conditioned Space	Actual Read	Design Specification	Notes
Hallways / Stairwells		≈0 ppm	Carbon Monoxide level was not measured.
Community Room		≈0 ppm	Carbon Monoxide level was not measured.
Office			Carbon Monoxide level was not measured.
Apartment		≈0 ppm	Carbon Monoxide level was not measured.

Narrative

Capital Needs Summary, Replacement Reserve Analysis - *Conventional*

Future capital actions are based on useful life expectations and assume continued effective maintenance and physical management. The timing of actions by system (including quantities and costs) is also presented in the Capital Needs Worksheet. Costs for the twenty-year plan total \$1,151,150 in current dollars (\$44,275/unit), or \$1,510,945 (\$58,113/unit) in inflated dollars.

Two approaches to funding the property's physical needs through replacement reserves are presented in the Replacement Reserve Analysis section of the report, with accompanying graphics.

Plan #1 presents current capital funding circumstances. The development is estimated to have a replacement reserve balance of \$95,765 on December 31, 2012. Annual contributions are currently \$12,857 per year, or \$494 per unit. From OSI's experience, this is seen as an inadequate funding level for a property of this age and complexity. For planning purposes here, these contributions are shown being indexed at 3% for inflation going forward. Under this scenario, the property's needs exceed reserves in all years of the plan.

Plan #2, as one alternative, is aimed at fully meeting projected needs through Year 20. It starts with the same annual funding assumptions outlined above. The plan calls for an infusion of \$858,000 in outside capital in Year 1 to help fund near term capital needs. This is one hypothetical option, and is included for illustrative purposes only. No assumptions are made about its viability; various alternatives might achieve similar results.

Narrative

Capital Needs Summary, Replacement Reserve Analysis - *Green*

Future capital actions are based on useful life expectations and assume continued effective maintenance and physical management. The timing of actions by system (including quantities and costs) is also presented in the Capital Needs Worksheet. Costs for the twenty-year plan total \$1,199,907 (\$46,150/unit) in current dollars, or \$1,498,434 (\$57,632/unit) in inflated dollars.

Two approaches to funding the property's physical needs through replacement reserves are presented in the Replacement Reserve Analysis section of the report, with accompanying graphics.

Plan #1 presents current capital funding circumstances. The development is estimated to have a replacement reserve balance of \$95,765 on December 31, 2012. Annual contributions are currently \$12,857 per year, or \$494 per unit. From OSI's experience, this is seen as an inadequate funding level for a property of this age and complexity. For planning purposes here, these contributions are shown being indexed at 3% for inflation going forward. Under this scenario, the property's needs exceed reserves in all years of the plan.

Plan #2, as one alternative, is aimed at fully meeting projected needs through Year 20. It starts with the same annual funding assumptions outlined above. The plan calls for an infusion of \$910,000 in outside capital in Year 1. This is one hypothetical option, and is included for illustrative purposes only. No assumptions are made about its viability; various alternatives might achieve similar results.

Narrative

Additional Notes:

1. The Physical Assessment of the property was conducted on April 3rd, 2013. Members of the management and site staff provided information on the property's current condition, recent repairs, and near-term needs. Additional information was provided by informal interviews with residents during the dwelling unit evaluation portion of the assessment. We would like to thank site staff for their assistance.
2. OSI was represented on this assignment by Daniel Iles. Mr. Iles is a Building Performance Institute (BPI)-certified energy auditor, and LEED Green Associate accredited. Mr. Iles complied with the applicable professional standards for ethics as defined by the BPI Code of Ethics during the assessment process.
3. Regular updates of this plan are recommended to ensure careful monitoring of major building systems and to adjust the program to accommodate unanticipated circumstances surrounding the buildings, operations, and/or occupants.



Typical Property signage



View of the lower (resident only) parking lot



View of the gazebo and lawn area



Example of rusted base to a pole mounted light fixture



View of the rear courtyard



Typical railing/guardrail system



View of the central boiler plant



View of the two indirect domestic hot water storage tanks



One of two heating water circulator pumps



The emergency generator



Hydraulic elevator package



View of the fire alarm control panel



Typical building architecture



View of the rear elevation



Cracking/hard expansion joint caulking



Typical siding and brick condition;
good overall condition



View of the main entryway



View of a rusted window lintel



View of the roof surface



Lobby area



The dinning room



The commercial kitchen



View of a public restroom



Community room cabinetry



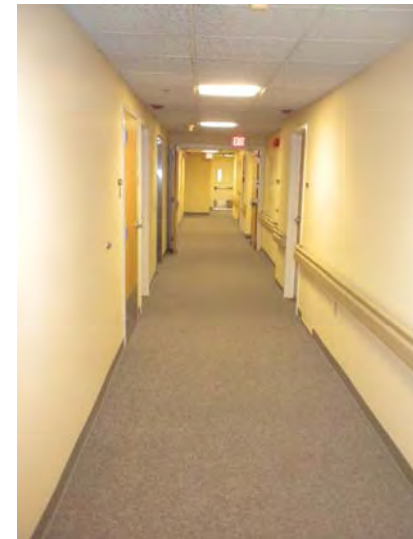
The community room



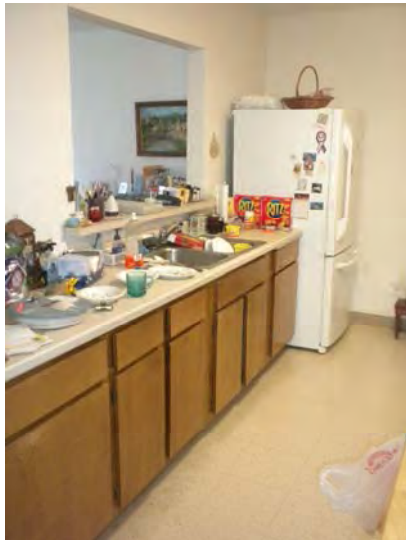
Elevator cab finishes



View of the stairwell conditions



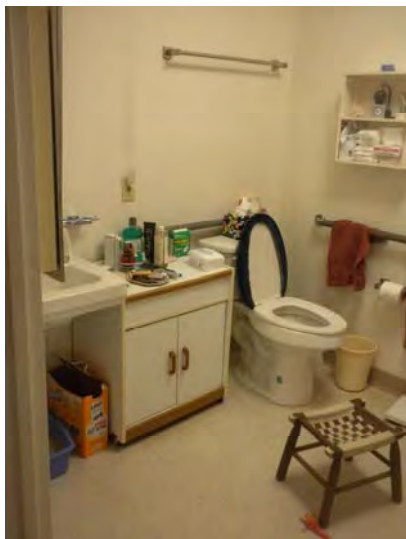
Typical hallway view



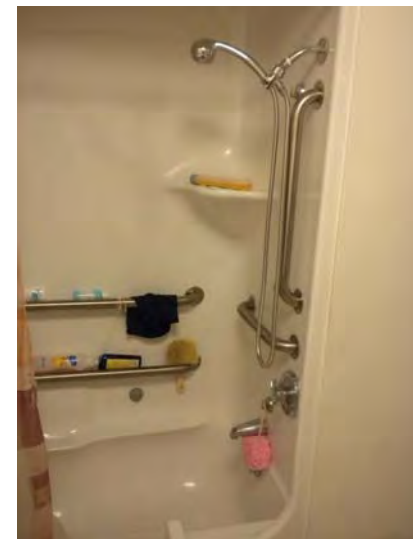
Typical unit cabinetry and refrigerator



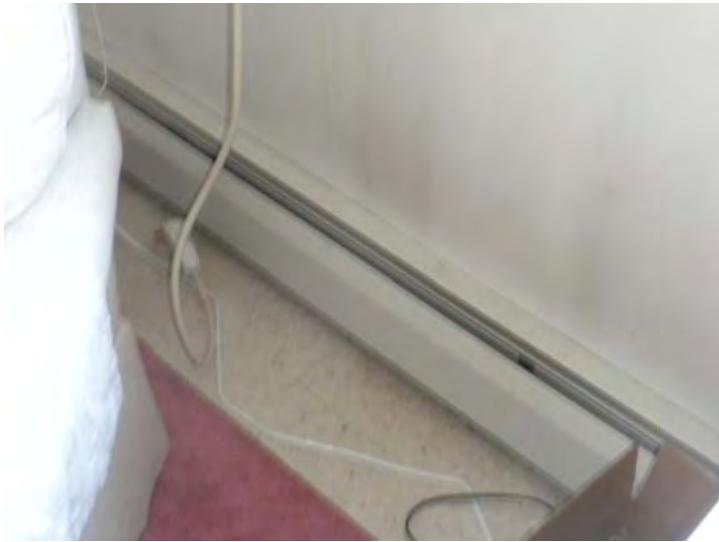
View of cabinetry and electric range



Typical bathroom layout



Example of a tub and surround

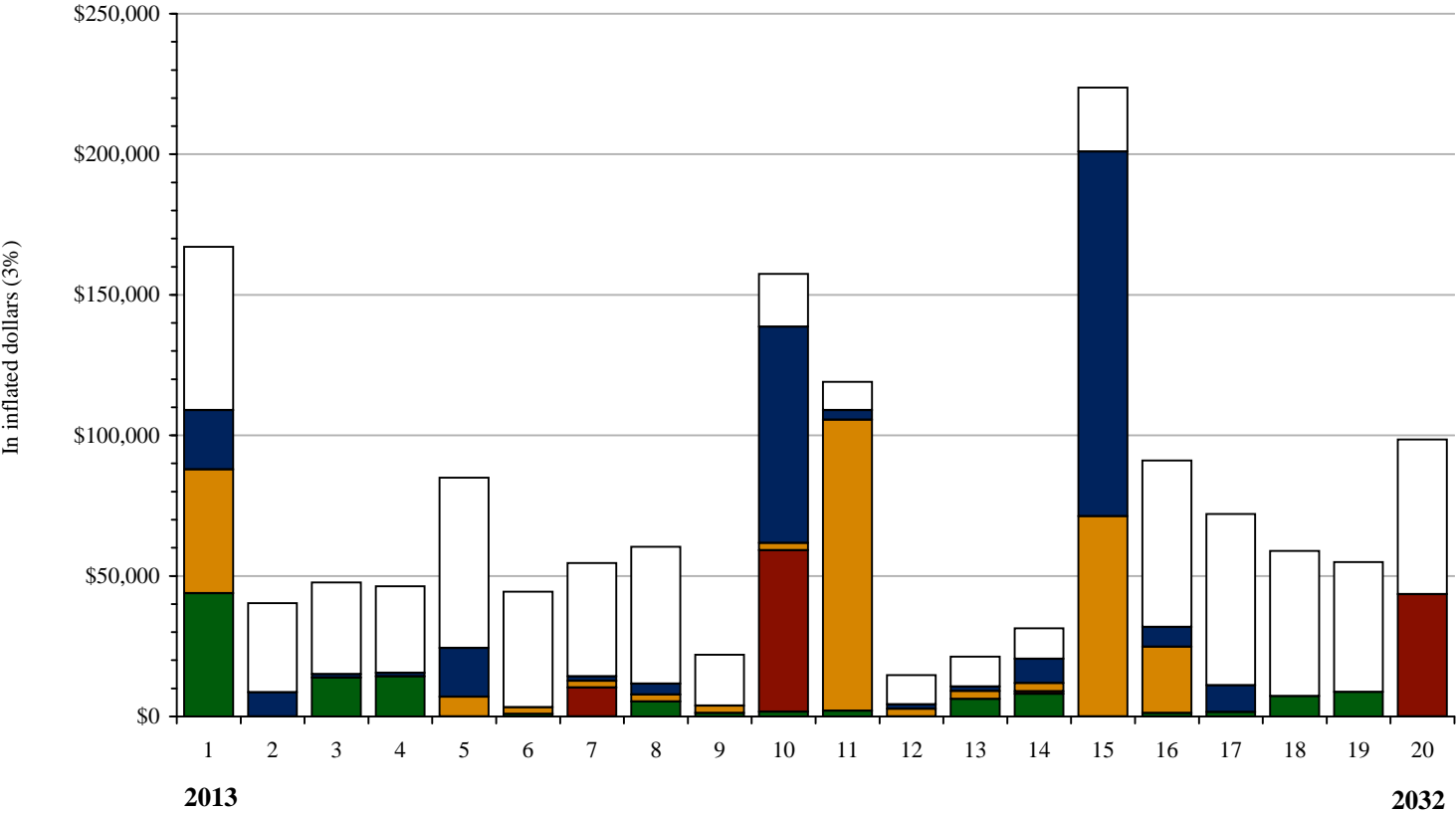


Hydronic baseboard heat

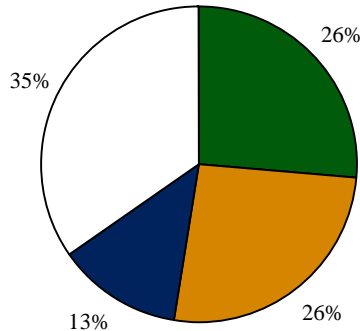


Unit circuit breaker

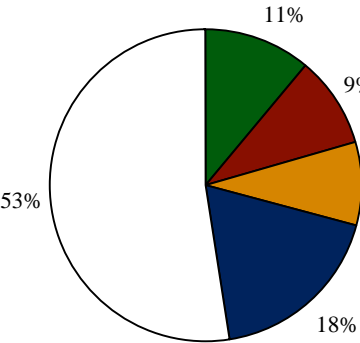
Capital Needs Summary - Conventional



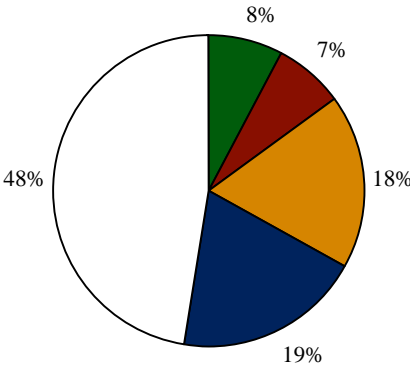
Kirtland Commons



Year One Distribution



Ten Year Distribution



Twenty Year Distribution

Total Costs by Building System (inflated dollars)

	Year 1	Years 1-10	Years 1-20
Site Systems & Accessibility	\$43,874 or \$1,687/unit	\$81,252 or \$3,125/unit	\$116,378 or \$4,476/unit
Mechanical Room		\$67,633 or \$2,601/unit	\$112,039 or \$4,309/unit
Building Mech. & Elec.	\$44,050 or \$1,694/unit	\$63,338 or \$2,436/unit	\$270,222 or \$10,393/unit
Building Architectural	\$21,088 or \$811/unit	\$132,128 or \$5,082/unit	\$293,408 or \$11,285/unit
Dwelling Units	\$58,069 or \$2,233/unit	\$380,808 or \$14,646/unit	\$718,897 or \$27,650/unit
In inflated dollars:	\$167,081 or \$6,426/unit	\$725,159 or \$27,891/unit	\$1,510,945 or \$58,113/unit
In current dollars:	\$167,081 or \$6,426/unit	\$640,194 or \$24,623/unit	\$1,151,150 or \$44,275/unit

Capital Needs Summary - *Conventional*

OSI Ref: **13268**
 Property Age: **20 Years**
 Financing: **CHFA**

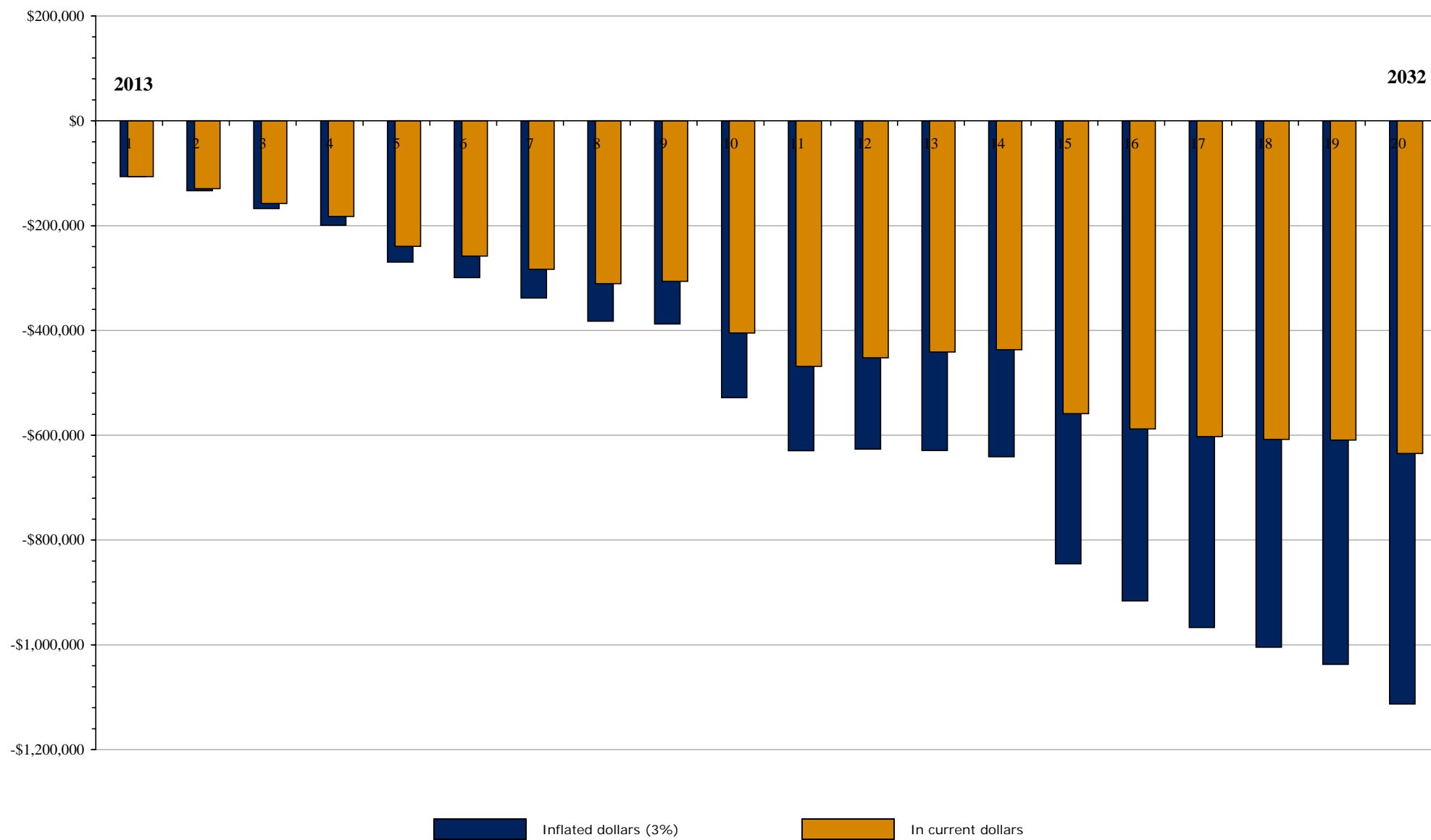
Residential Buildings: **1**
 Total Number of Units: **26**
 Occupancy: **Elderly**

	2013 Year 1	2014 Year 2	2015 Year 3	2016 Year 4	2017 Year 5	2018 Year 6	2019 Year 7	2020 Year 8	2021 Year 9	2022 Year 10
Site Systems & Accessibility										
Surface	\$43,874	\$0	\$13,851	\$14,266	\$0	\$924	\$0	\$5,352	\$1,267	\$1,717
Accessibility	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Site Sub-Total	\$43,874	\$0	\$13,851	\$14,266	\$0	\$924	\$0	\$5,352	\$1,267	\$1,717
Mechanical Room										
Boilers	\$0	\$0	\$0	\$0	\$0	\$0	\$10,269	\$0	\$0	\$39,143
Boiler Room Systems	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$18,221
Mechanical Sub-Total	\$0	\$0	\$0	\$0	\$0	\$0	\$10,269	\$0	\$0	\$57,364
Building Mech. & Electrical										
Mechanical	\$12,500	\$0	\$0	\$0	\$6,978	\$2,319	\$2,388	\$2,460	\$2,534	\$2,610
Electrical	\$16,900	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Elevators	\$14,650	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Mechanical & Electrical Sub-Total	\$44,050	\$0	\$0	\$0	\$6,978	\$2,319	\$2,388	\$2,460	\$2,534	\$2,610
Building Architectural										
Structural and Exterior	\$7,541	\$0	\$0	\$0	\$0	\$0	\$0	\$3,851	\$0	\$72,761
Roof Systems	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Halls, Stairs, Lobbies	\$1,136	\$1,170	\$1,205	\$1,241	\$12,792	\$0	\$1,670	\$0	\$0	\$0
Community Spaces	\$12,410	\$7,482	\$0	\$0	\$4,628	\$0	\$0	\$0	\$0	\$4,241
Building Architectural Sub-Total	\$21,088	\$8,652	\$1,205	\$1,241	\$17,420	\$0	\$1,670	\$3,851	\$0	\$77,001
Dwelling Units										
Living Areas	\$17,098	\$17,611	\$18,139	\$18,684	\$19,244	\$3,425	\$1,354	\$1,395	\$1,437	\$1,480
Bathrooms	\$2,257	\$2,325	\$2,394	\$2,466	\$8,258	\$6,396	\$6,588	\$6,785	\$6,989	\$7,199
Kitchens	\$7,022	\$7,232	\$7,449	\$7,673	\$31,026	\$29,244	\$30,122	\$31,025	\$0	\$0
Mechanical & Electrical	\$31,693	\$4,525	\$4,660	\$2,007	\$2,067	\$2,129	\$2,193	\$9,453	\$9,737	\$10,029
Dwelling Units Sub-Total	\$58,069	\$31,693	\$32,643	\$30,829	\$60,595	\$41,194	\$40,256	\$48,659	\$18,162	\$18,707
Total Capital Costs	\$167,081	\$40,345	\$47,699	\$46,337	\$84,993	\$44,437	\$54,583	\$60,322	\$21,963	\$157,399

Costs on these pages are aggregated by category from the Capital Needs worksheets which follow. Total capital costs on these pages are carried forward to line F of the Replacement Reserve Analysis(es) that follow.

2023 Year 11	2024 Year 12	2025 Year 13	2026 Year 14	2027 Year 15	2028 Year 16	2029 Year 17	2030 Year 18	2031 Year 19	2032 Year 20	
\$2,080	\$0	\$6,205	\$8,077	\$0	\$1,242	\$1,605	\$7,193	\$8,725	\$0	Site Systems & Accessibility
\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	Surface Accessibility
\$2,080	\$0	\$6,205	\$8,077	\$0	\$1,242	\$1,605	\$7,193	\$8,725	\$0	Site Sub-Total
\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$43,551	Mechanical Room
\$0	\$0	\$0	\$855	\$0	\$0	\$0	\$0	\$0	\$0	Boilers
										Boiler Room Systems
\$0	\$0	\$0	\$855	\$0	\$0	\$0	\$0	\$0	\$43,551	Mechanical Sub-Total
\$2,688	\$2,768	\$2,852	\$2,937	\$0	\$19,475	\$0	\$0	\$0	\$0	Building Mech. & Electrical
\$0	\$0	\$0	\$0	\$71,243	\$0	\$0	\$0	\$0	\$0	Mechanical
\$100,794	\$0	\$0	\$0	\$0	\$4,129	\$0	\$0	\$0	\$0	Electrical
										Elevators
\$103,482	\$2,768	\$2,852	\$2,937	\$71,243	\$23,603	\$0	\$0	\$0	\$0	Mechanical & Electrical Sub-Total
\$0	\$0	\$0	\$0	\$5,780	\$0	\$0	\$0	\$0	\$0	Building Architectural
\$0	\$0	\$0	\$0	\$107,957	\$0	\$0	\$0	\$0	\$0	Structural and Exterior
\$1,527	\$1,573	\$1,620	\$4,494	\$6,314	\$0	\$2,245	\$0	\$0	\$0	Roof Systems
\$1,883	\$0	\$0	\$4,083	\$9,623	\$6,986	\$7,196	\$0	\$0	\$0	Halls, Stairs, Lobbies
										Community Spaces
\$3,410	\$1,573	\$1,620	\$8,577	\$129,675	\$6,986	\$9,440	\$0	\$0	\$0	Building Architectural Sub-Total
\$1,524	\$1,570	\$1,617	\$1,665	\$1,715	\$23,803	\$24,517	\$25,252	\$26,010	\$26,790	Dwelling Units
\$7,415	\$7,637	\$7,866	\$8,102	\$661	\$3,516	\$3,622	\$3,730	\$3,842	\$22,650	Living Areas
\$0	\$0	\$0	\$0	\$8,937	\$20,144	\$20,749	\$21,371	\$15,008	\$4,103	Bathrooms
\$1,105	\$1,138	\$1,172	\$1,208	\$11,469	\$11,813	\$12,167	\$1,359	\$1,400	\$1,442	Kitchens
										Mechanical & Electrical
\$10,044	\$10,345	\$10,656	\$10,975	\$22,782	\$59,276	\$61,054	\$51,713	\$46,260	\$54,985	Dwelling Units Sub-Total
\$119,015	\$14,686	\$21,332	\$31,422	\$223,699	\$91,108	\$72,099	\$58,906	\$54,985	\$98,536	Total Capital Costs

Replacement Reserve (RR) Analysis: *Plan One - Conventional*



Current Replacement Reserve Balance: **\$46,015**
Adjusted Replacement Reserve Balance: **\$46,015**
Current annual contributions to reserve accounts: **\$12,857**

At the end of Year One, Reserve Balances are projected to be: **(\$106,636)**
At the end of Year 20, Reserve Balances are projected to be: **(\$1,112,901)**
Unmet needs projected in most years of the plan

Replacement Reserve (RR) Analysis: *Plan One - Conventional*

Reserve Funding In Year 1										
Starting Balance:		\$46,015 or \$1,770/unit		Replacement Reserve (RR) analysis starts here with the starting RR balance reported, or imputed, to have been on hand at the start of Year 1, and current annual RR contributions. The projections below reflect Starting RR Balance (Line A), plus the Total Annual RR Contributions (Line D) and Interest Earnings on RR (Line E), minus Total Annual Capital Costs (Line F), taken from the CNS above. This is expressed arithmetically as (A+D+E)-F=G, Year-End Balances, then carries forward to Line A of the following Year.						
Contributions to Reserves:		\$12,857 or \$494/unit								
	2013 Year 1	2014 Year 2	2015 Year 3	2016 Year 4	2017 Year 5	2018 Year 6	2019 Year 7	2020 Year 8	2021 Year 9	2022 Year 10
(A) Reserve Balances										
Starting Replacement Reserves	\$46,015	(\$106,636)	(\$133,540)	(\$167,395)	(\$199,472)	(\$269,777)	(\$299,086)	(\$338,087)	(\$382,360)	(\$387,791)
(B) Annual Funding										
Contributions Indexed at 3%	\$494	\$509	\$525	\$540	\$557	\$573	\$590	\$608	\$626	\$645
(C) Additional Unit Contributions										
(D) Total Annual Reserve Funding	\$12,857	\$13,243	\$13,640	\$14,049	\$14,470	\$14,905	\$15,352	\$15,812	\$16,287	\$16,775
(E) Interest on Reserves at 3%	\$1,573	\$199	\$205	\$211	\$217	\$224	\$230	\$237	\$244	\$252
Total Funds Available	\$60,445	(\$93,195)	(\$119,695)	(\$153,135)	(\$184,784)	(\$254,649)	(\$283,504)	(\$322,038)	(\$365,829)	(\$370,765)
(F) Total Capital Cost	\$167,081	\$40,345	\$47,699	\$46,337	\$84,993	\$44,437	\$54,583	\$60,322	\$21,963	\$157,399
(G) Reserve Balances	(\$106,636)	(\$133,540)	(\$167,395)	(\$199,472)	(\$269,777)	(\$299,086)	(\$338,087)	(\$382,360)	(\$387,791)	(\$528,164)
Outside Capital:										
Adjusted Reserve Balances	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

*ANNUAL RR CONTRIBUTIONS are shown being indexed for inflation at the % specified above except when Additional Contributions are called for.

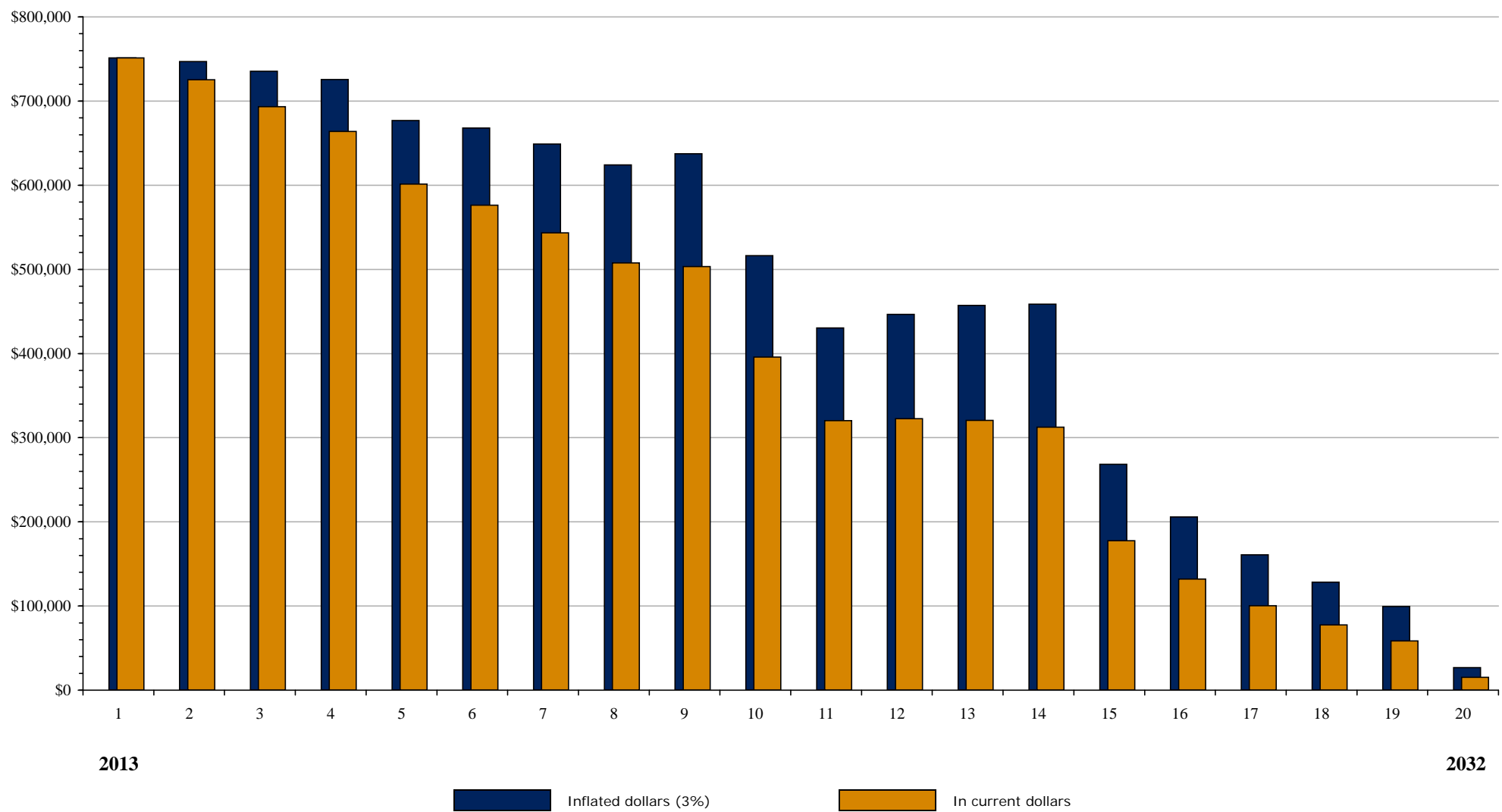
Line C, Additional Contributions allows for material adjustments in annual RR funding that would enable the property to meet all projected needs out of reserves through Year 20.

**INTEREST EARNINGS ON RESERVES are calculated on 100% of starting balances and on 50% of the total annual contribution for the year at the rate shown

Replacement Reserve (RR) Analysis: *Plan One - Conventional*

Reserve Funding In Year 20										
Projected replacement reserve balance is (\$1,112,901)					This is (\$42,804)per unit in inflated dollars or (\$24,410) per unit in uninflated dollars					
Projected annual funding to reserves is \$22,544					This is \$867 per unit in inflated dollars or \$494 per unit in current dollars					
2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	
Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	
										Reserve Balances (A)
(\$528,164)	(\$629,641)	(\$626,264)	(\$628,989)	(\$641,247)	(\$845,208)	(\$915,984)	(\$967,143)	(\$1,004,479)	(\$1,037,248)	
										Annual Funding (B)
\$665	\$684	\$705	\$726	\$748	\$770	\$794	\$817	\$842	\$867	
										Additional Unit Contributions (C)
\$17,278	\$17,797	\$18,331	\$18,881	\$19,447	\$20,030	\$20,631	\$21,250	\$21,888	\$22,544	Total Annual Reserve Funding (D)
\$259	\$267	\$275	\$283	\$292	\$300	\$309	\$319	\$328	\$338	Interest on Reserves at 3% (E)
(\$510,626)	(\$611,577)	(\$607,658)	(\$609,826)	(\$621,508)	(\$824,877)	(\$895,043)	(\$945,574)	(\$982,263)	(\$1,014,365)	Total Funds Available
\$119,015	\$14,686	\$21,332	\$31,422	\$223,699	\$91,108	\$72,099	\$58,906	\$54,985	\$98,536	Total Capital Cost (F)
(\$629,641)	(\$626,264)	(\$628,989)	(\$641,247)	(\$845,208)	(\$915,984)	(\$967,143)	(\$1,004,479)	(\$1,037,248)	(\$1,112,901)	Reserve Balances (G)
\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	

Replacement Reserve (RR) Analysis: *Plan Two - Conventional*



Current Replacement Reserve Balance: **\$46,015**

Adjusted Replacement Reserve Balance: **\$46,015**

Current annual contributions to reserve accounts: **\$12,857**

At the end of Year One, Reserve Balances are projected to be: **\$751,364**

At the end of Year 20, Reserve Balances are projected to be: **\$26,720**

All projected capital needs are met throughout the plan

Infusion of outside capital of \$858,000 (\$33,000/unit).

Replacement Reserve (RR) Analysis: *Plan Two - Conventional*

Reserve Funding In Year 1										
Starting Balance:		Replacement Reserve (RR) analysis starts here with the starting RR balance reported, or imputed, to have been on hand at the start of Year 1, and current annual RR contributions. The projections below reflect Starting RR Balance (Line A), plus the Total Annual RR Contributions (Line D) and Interest Earnings on RR (Line E), minus Total Annual Capital Costs (Line F), taken from the CNS above. This is expressed arithmetically as (A+D+E)-F=G, Year-End Balances, then carries forward to Line A of the following Year.								
Contributions to Reserves:										
	2013 Year 1	2014 Year 2	2015 Year 3	2016 Year 4	2017 Year 5	2018 Year 6	2019 Year 7	2020 Year 8	2021 Year 9	2022 Year 10
(A) Reserve Balances										
Starting Replacement Reserves	\$46,015	\$751,364	\$747,001	\$735,556	\$725,546	\$677,007	\$668,009	\$649,047	\$624,246	\$637,542
(B) Annual Funding										
Contributions Indexed at 3%	\$494	\$509	\$525	\$540	\$557	\$573	\$590	\$608	\$626	\$645
(C) Additional Unit Contributions										
(D) Total Annual Reserve Funding	\$12,857	\$13,243	\$13,640	\$14,049	\$14,470	\$14,905	\$15,352	\$15,812	\$16,287	\$16,775
(E) Interest on Reserves at 3%	\$1,573	\$22,740	\$22,615	\$22,277	\$21,983	\$20,534	\$20,271	\$19,709	\$18,972	\$19,378
Total Funds Available	\$60,445	\$787,346	\$783,256	\$771,883	\$762,000	\$712,445	\$703,631	\$684,568	\$659,505	\$673,695
(F) Total Capital Cost	\$167,081	\$40,345	\$47,699	\$46,337	\$84,993	\$44,437	\$54,583	\$60,322	\$21,963	\$157,399
(G) Reserve Balances	(\$106,636)	\$747,001	\$735,556	\$725,546	\$677,007	\$668,009	\$649,047	\$624,246	\$637,542	\$516,296
Outside Capital:	\$858,000									
Adjusted Reserve Balances	\$751,364	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Notes:

Infusion of outside capital of \$858,000 (\$33,000/unit).

*ANNUAL RR CONTRIBUTIONS are shown being indexed for inflation at the % specified above except when Additional Contributions are called for.

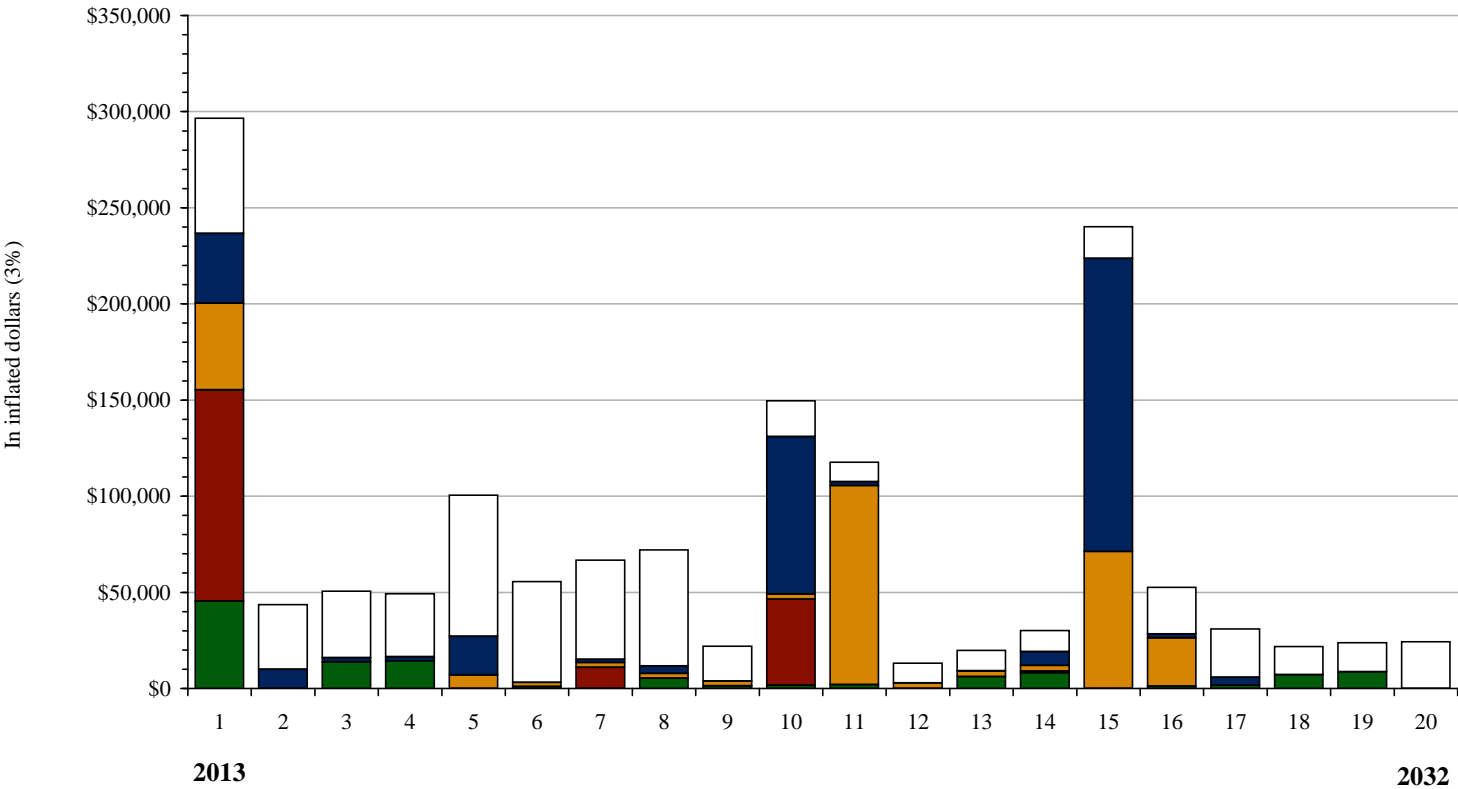
Line C, Additional Contributions allows for material adjustments in annual RR funding that would enable the property to meet all projected needs out of reserves through Year 20.

**INTEREST EARNINGS ON RESERVES are calculated on 100% of starting balances and on 50% of the total annual contribution for the year at the rate shown

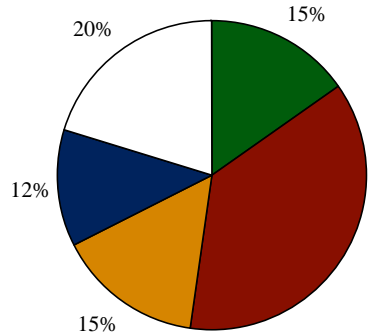
Replacement Reserve (RR) Analysis: *Plan Two - Conventional*

Reserve Funding In Year 20									
Projected replacement reserve balance is \$26,720					This is \$1,028 per unit in inflated dollars or \$586 per unit in uninflated dollars				
Projected annual funding to reserves is \$22,544					This is \$867 per unit in inflated dollars or \$494 per unit in current dollars				
2023 Year 11	2024 Year 12	2025 Year 13	2026 Year 14	2027 Year 15	2028 Year 16	2029 Year 17	2030 Year 18	2031 Year 19	2032 Year 20
									</

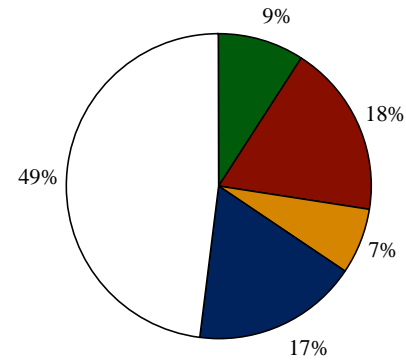
Capital Needs Summary - Green



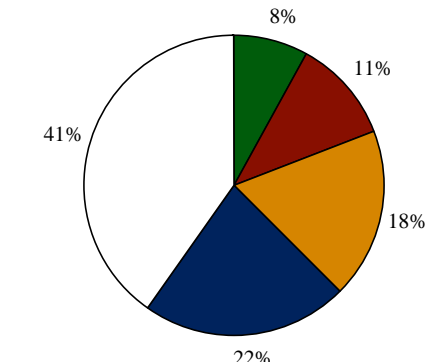
Kirtland Commons



Year One Distribution



Ten Year Distribution



Twenty Year Distribution

Total Costs by Building System (inflated dollars)

	Year 1	Years 1-10	Years 1-20
Site Systems & Accessibility	\$45,416 or \$1,747/unit	\$82,794 or \$3,184/unit	\$117,920 or \$4,535/unit
Mechanical Room	\$109,900 or \$4,227/unit	\$165,631 or \$6,370/unit	\$166,550 or \$6,406/unit
Building Mech. & Elec.	\$44,988 or \$1,730/unit	\$64,275 or \$2,472/unit	\$272,621 or \$10,485/unit
Building Architectural	\$36,430 or \$1,401/unit	\$158,447 or \$6,094/unit	\$326,428 or \$12,555/unit
Dwelling Units	\$59,900 or \$2,304/unit	\$435,518 or \$16,751/unit	\$597,573 or \$22,984/unit
In inflated dollars:	\$296,633 or \$11,409/unit	\$906,664 or \$34,872/unit	\$1,481,092 or \$56,965/unit
In current dollars:	\$296,633 or \$11,409/unit	\$815,552 or \$31,367/unit	\$1,199,907 or \$46,150/unit

Capital Needs Summary - *Green*

OSI Ref: 13268
 Property Age: 20 Years
 Financing: CHFA

Residential Buildings: 1
 Total Number of Units: 26
 Occupancy: Elderly

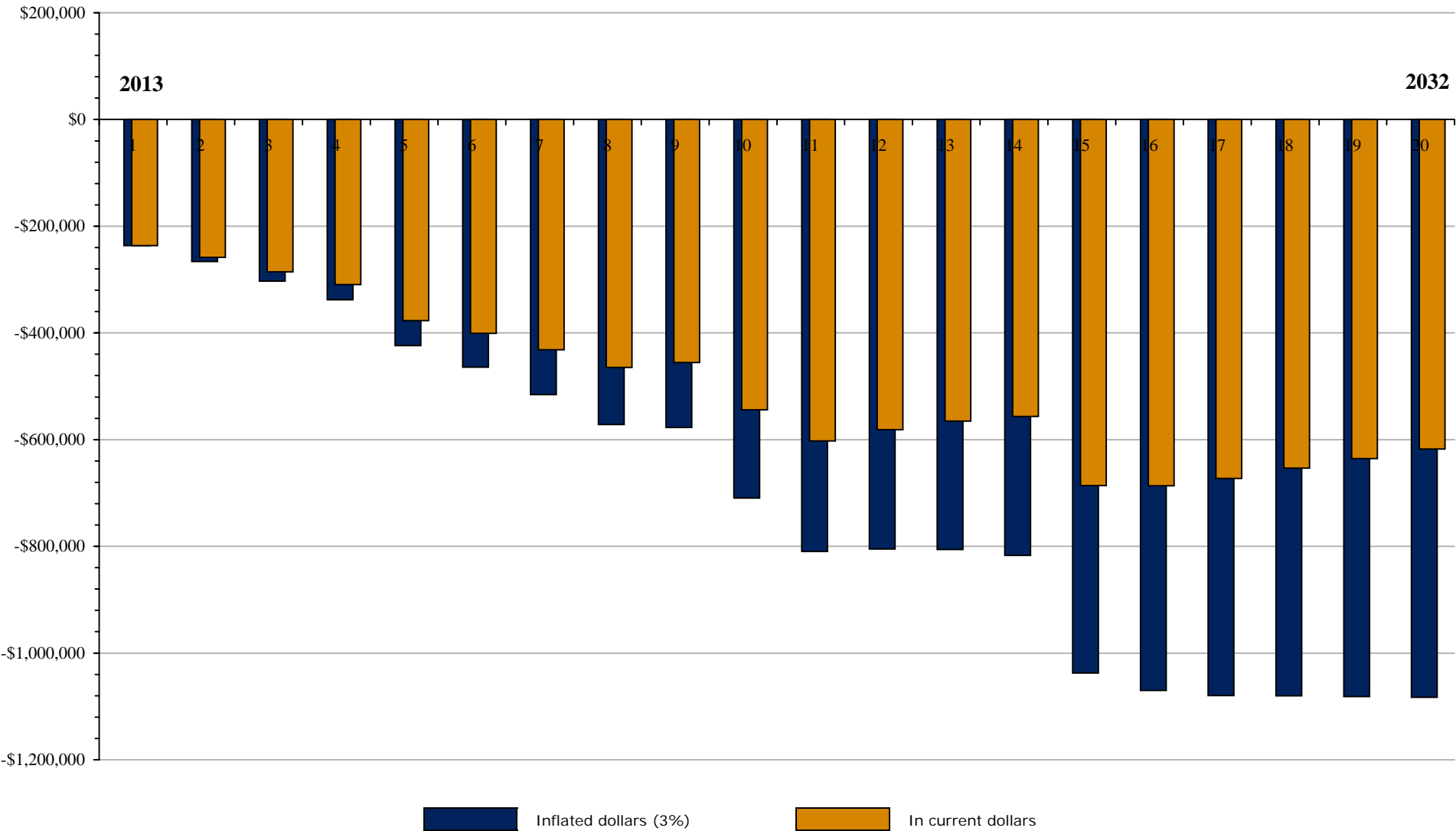
	2013 Year 1	2014 Year 2	2015 Year 3	2016 Year 4	2017 Year 5	2018 Year 6	2019 Year 7	2020 Year 8	2021 Year 9	2022 Year 10
Site Systems & Accessibility										
Surface	\$45,416	\$0	\$13,851	\$14,266	\$0	\$924	\$0	\$5,352	\$1,267	\$1,717
Accessibility	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Site Sub-Total	\$45,416	\$0	\$13,851	\$14,266	\$0	\$924	\$0	\$5,352	\$1,267	\$1,717
Mechanical Room										
Boilers	\$90,100	\$0	\$0	\$0	\$0	\$0	\$11,039	\$0	\$0	\$39,143
Boiler Room Systems	\$19,800	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$5,548
Mechanical Sub-Total	\$109,900	\$0	\$0	\$0	\$0	\$0	\$11,039	\$0	\$0	\$44,692
Building Mech. & Electrical										
Mechanical	\$13,438	\$0	\$0	\$0	\$6,978	\$2,319	\$2,388	\$2,460	\$2,534	\$2,610
Electrical	\$16,900	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Elevators	\$14,650	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Mechanical & Electrical Sub-Total	\$44,988	\$0	\$0	\$0	\$6,978	\$2,319	\$2,388	\$2,460	\$2,534	\$2,610
Building Architectural										
Structural and Exterior	\$7,872	\$0	\$0	\$0	\$0	\$0	\$0	\$3,851	\$0	\$77,728
Roof Systems	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Halls, Stairs, Lobbies	\$15,603	\$2,073	\$2,135	\$2,199	\$15,334	\$0	\$1,670	\$0	\$0	\$0
Community Spaces	\$12,955	\$7,917	\$0	\$0	\$4,868	\$0	\$0	\$0	\$0	\$4,241
Building Architectural Sub-Total	\$36,430	\$9,990	\$2,135	\$2,199	\$20,202	\$0	\$1,670	\$3,851	\$0	\$81,969
Dwelling Units										
Living Areas	\$18,513	\$19,068	\$19,640	\$20,229	\$20,836	\$3,425	\$1,354	\$1,395	\$1,437	\$1,480
Bathrooms	\$2,439	\$2,512	\$2,587	\$2,665	\$8,463	\$6,396	\$6,588	\$6,785	\$6,989	\$7,199
Kitchens	\$7,256	\$7,473	\$7,697	\$7,928	\$42,044	\$40,321	\$41,531	\$42,777	\$0	\$0
Mechanical & Electrical	\$31,693	\$4,525	\$4,660	\$2,007	\$2,067	\$2,129	\$2,193	\$9,453	\$9,737	\$10,029
Dwelling Units Sub-Total	\$59,900	\$33,578	\$34,585	\$32,829	\$73,410	\$52,271	\$51,666	\$60,410	\$18,162	\$18,707
Total Capital Costs	\$296,633	\$43,568	\$50,571	\$49,295	\$100,590	\$55,513	\$66,763	\$72,073	\$21,963	\$149,694

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Costs on these pages are aggregated by category from the Capital Needs worksheets which follow. Total capital costs on these pages are carried forward to line F of the Replacement Reserve Analysis(es) that follow.

2023 Year 11	2024 Year 12	2025 Year 13	2026 Year 14	2027 Year 15	2028 Year 16	2029 Year 17	2030 Year 18	2031 Year 19	2032 Year 20	
\$2,080	\$0	\$6,205	\$8,077	\$0	\$1,242	\$1,605	\$7,193	\$8,725	\$0	Site Systems & Accessibility
\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	Surface Accessibility
\$2,080	\$0	\$6,205	\$8,077	\$0	\$1,242	\$1,605	\$7,193	\$8,725	\$0	Site Sub-Total
\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	Mechanical Room
\$0	\$0	\$0	\$920	\$0	\$0	\$0	\$0	\$0	\$0	Boilers
										Boiler Room Systems
\$0	\$0	\$0	\$920	\$0	\$0	\$0	\$0	\$0	\$0	Mechanical Sub-Total
\$2,688	\$2,768	\$2,852	\$2,937	\$0	\$20,935	\$0	\$0	\$0	\$0	Building Mech. & Electrical
\$0	\$0	\$0	\$0	\$71,243	\$0	\$0	\$0	\$0	\$0	Mechanical
\$100,794	\$0	\$0	\$0	\$0	\$4,129	\$0	\$0	\$0	\$0	Electrical
										Elevators
\$103,482	\$2,768	\$2,852	\$2,937	\$71,243	\$25,064	\$0	\$0	\$0	\$0	Mechanical & Electrical Sub-Total
\$0	\$0	\$0	\$0	\$5,858	\$0	\$0	\$0	\$0	\$0	Building Architectural
\$0	\$0	\$0	\$0	\$133,463	\$0	\$0	\$0	\$0	\$0	Structural and Exterior
\$113	\$117	\$120	\$2,950	\$2,911	\$0	\$2,245	\$0	\$0	\$0	Roof Systems
\$1,883	\$0	\$0	\$4,226	\$10,201	\$1,919	\$1,976	\$0	\$0	\$0	Halls, Stairs, Lobbies
										Community Spaces
\$1,996	\$117	\$120	\$7,175	\$152,433	\$1,919	\$4,221	\$0	\$0	\$0	Building Architectural Sub-Total
\$1,524	\$1,570	\$1,617	\$1,665	\$1,715	\$1,767	\$1,820	\$1,875	\$1,931	\$1,989	Dwelling Units
\$7,415	\$7,637	\$7,866	\$8,102	\$661	\$681	\$701	\$722	\$744	\$20,860	Living Areas
\$0	\$0	\$0	\$0	\$2,714	\$10,089	\$10,391	\$10,703	\$11,024	\$0	Bathrooms
\$1,105	\$1,138	\$1,172	\$1,208	\$11,469	\$11,813	\$12,167	\$1,359	\$1,400	\$1,442	Kitchens
										Mechanical & Electrical
\$10,044	\$10,345	\$10,656	\$10,975	\$16,559	\$24,349	\$25,080	\$14,659	\$15,099	\$24,291	Dwelling Units Sub-Total
\$117,601	\$13,230	\$19,832	\$30,084	\$240,235	\$52,574	\$30,905	\$21,852	\$23,823	\$24,291	Total Capital Costs

Replacement Reserve (RR) Analysis: *Plan One - Green*



Current Replacement Reserve Balance: **\$46,015**
Adjusted Replacement Reserve Balance: **\$46,015**
Current annual contributions to reserve accounts: **\$12,857**

At the end of Year One, Reserve Balances are projected to be: **(\$236,188)**
At the end of Year 20, Reserve Balances are projected to be: **(\$1,083,047)**
Unmet needs projected in most years of the plan

Replacement Reserve (RR) Analysis: *Plan One - Green*

		Reserve Funding In Year 1									
		Starting Balance:		Replacement Reserve (RR) analysis starts here with the starting RR balance reported, or imputed, to have been on hand at the start of Year 1, and current annual RR contributions. The projections below reflect Starting RR Balance (Line A), plus the Total Annual RR Contributions (Line D) and Interest Earnings on RR (Line E), minus Total Annual Capital Costs (Line F), taken from the CNS above. This is expressed arithmetically as (A+D+E)-F=G, Year-End Balances, then carries forward to Line A of the following Year.							
		Contributions to Reserves:									
		2013 Year 1	2014 Year 2	2015 Year 3	2016 Year 4	2017 Year 5	2018 Year 6	2019 Year 7	2020 Year 8	2021 Year 9	2022 Year 10
(A)	Reserve Balances										
	Starting Replacement Reserves	\$46,015	(\$236,188)	(\$266,315)	(\$303,042)	(\$338,077)	(\$423,979)	(\$464,365)	(\$515,546)	(\$571,569)	(\$577,001)
(B)	Annual Funding										
	Contributions Indexed at 3%	\$494	\$509	\$525	\$540	\$557	\$573	\$590	\$608	\$626	\$645
(C)	Additional Unit Contributions										
(D)	Total Annual Reserve Funding	\$12,857	\$13,243	\$13,640	\$14,049	\$14,470	\$14,905	\$15,352	\$15,812	\$16,287	\$16,775
(E)	Interest on Reserves at 3%	\$1,573	\$199	\$205	\$211	\$217	\$224	\$230	\$237	\$244	\$252
	Total Funds Available	\$60,445	(\$222,747)	(\$252,471)	(\$288,782)	(\$323,389)	(\$408,851)	(\$448,783)	(\$499,496)	(\$555,039)	(\$559,974)
(F)	Total Capital Cost	\$296,633	\$43,568	\$50,571	\$49,295	\$100,590	\$55,513	\$66,763	\$72,073	\$21,963	\$149,694
(G)	Reserve Balances	(\$236,188)	(\$266,315)	(\$303,042)	(\$338,077)	(\$423,979)	(\$464,365)	(\$515,546)	(\$571,569)	(\$577,001)	(\$709,669)
	Outside Capital:										
	Adjusted Reserve Balances	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

*ANNUAL RR CONTRIBUTIONS are shown being indexed for inflation at the % specified above except when Additional Contributions are called for.

Line C, Additional Contributions allows for material adjustments in annual RR funding that would enable the property to meet all projected needs out of reserves through Year 20.

**INTEREST EARNINGS ON RESERVES are calculated on 100% of starting balances and on 50% of the total annual contribution for the year at the rate shown

Replacement Reserve (RR) Analysis: *Plan One - Green*

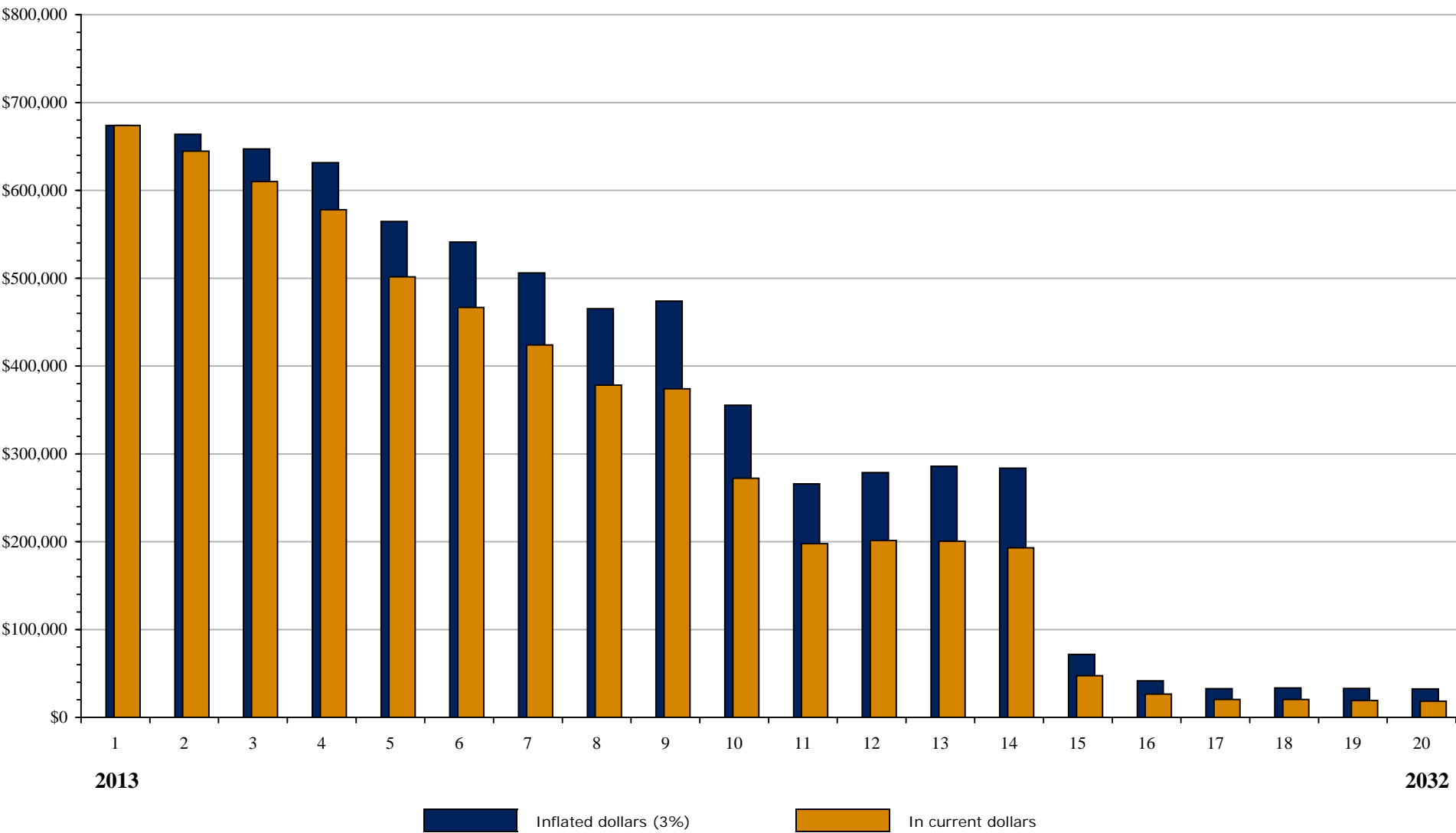
Reserve Funding In Year 20

Projected replacement reserve balance is **(\$1,083,047)** This is (\$41,656) per unit in inflated dollars or (\$23,756) per unit in uninflated dollars

Projected annual funding to reserves is **\$22,544** This is \$867 per unit in inflated dollars or \$494 per unit in current dollars

2023 Year 11	2024 Year 12	2025 Year 13	2026 Year 14	2027 Year 15	2028 Year 16	2029 Year 17	2030 Year 18	2031 Year 19	2032 Year 20	
										Reserve Balances (A)
(\$709,669)	(\$809,732)	(\$804,899)	(\$806,125)	(\$817,045)	(\$1,037,541)	(\$1,069,784)	(\$1,079,749)	(\$1,080,032)	(\$1,081,639)	Starting Replacement Reserves
										Annual Funding (B)
\$665	\$684	\$705	\$726	\$748	\$770	\$794	\$817	\$842	\$867	Contributions Indexed at 3%
										Additional Unit Contributions (C)
\$17,278	\$17,797	\$18,331	\$18,881	\$19,447	\$20,030	\$20,631	\$21,250	\$21,888	\$22,544	Total Annual Reserve Funding (D)
\$259	\$267	\$275	\$283	\$292	\$300	\$309	\$319	\$328	\$338	Interest on Reserves at 3% (E)
(\$692,131)	(\$791,669)	(\$786,293)	(\$786,961)	(\$797,306)	(\$1,017,210)	(\$1,048,844)	(\$1,058,180)	(\$1,057,815)	(\$1,058,756)	Total Funds Available
\$117,601	\$13,230	\$19,832	\$30,084	\$240,235	\$52,574	\$30,905	\$21,852	\$23,823	\$24,291	Total Capital Cost (F)
(\$809,732)	(\$804,899)	(\$806,125)	(\$817,045)	(\$1,037,541)	(\$1,069,784)	(\$1,079,749)	(\$1,080,032)	(\$1,081,639)	(\$1,083,047)	Reserve Balances (G)
\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	

Replacement Reserve (RR) Analysis: *Plan Two - Green*



Current Replacement Reserve Balance: **\$46,015**

Adjusted Replacement Reserve Balance: **\$46,015**

Current annual contributions to reserve accounts: **\$12,857**

At the end of Year One, Reserve Balances are projected to be: **\$673,812**

At the end of Year 20, Reserve Balances are projected to be: **\$32,407**

All projected capital needs are met throughout the plan

Infusion of outside capital of \$910,000 (\$35,000/unit) in Year 1.

Replacement Reserve (RR) Analysis: *Plan Two - Green*

		Reserve Funding In Year 1									
		Starting Balance:		Replacement Reserve (RR) analysis starts here with the starting RR balance reported, or imputed, to have been on hand at the start of Year 1, and current annual RR contributions. The projections below reflect Starting RR Balance (Line A), plus the Total Annual RR Contributions (Line D) and Interest Earnings on RR (Line E), minus Total Annual Capital Costs (Line F), taken from the CNS above. This is expressed arithmetically as (A+D+E)-F=G, Year-End Balances, then carries forward to Line A of the following Year.							
		Contributions to Reserves:									
		2013 Year 1	2014 Year 2	2015 Year 3	2016 Year 4	2017 Year 5	2018 Year 6	2019 Year 7	2020 Year 8	2021 Year 9	2022 Year 10
(A)	Reserve Balances										
	Starting Replacement Reserves	\$46,015	\$673,812	\$663,899	\$647,089	\$631,467	\$564,509	\$541,059	\$506,110	\$465,269	\$473,795
(B)	Annual Funding										
	Contributions Indexed at 3%	\$494	\$509	\$525	\$540	\$557	\$573	\$590	\$608	\$626	\$645
(C)	Additional Unit Contributions										
(D)	Total Annual Reserve Funding	\$12,857	\$13,243	\$13,640	\$14,049	\$14,470	\$14,905	\$15,352	\$15,812	\$16,287	\$16,775
(E)	Interest on Reserves at 3%	\$1,573	\$20,413	\$20,122	\$19,623	\$19,161	\$17,159	\$16,462	\$15,420	\$14,202	\$14,465
	Total Funds Available	\$60,445	\$707,467	\$697,660	\$680,762	\$665,099	\$596,572	\$572,872	\$537,342	\$495,758	\$505,036
(F)	Total Capital Cost	\$296,633	\$43,568	\$50,571	\$49,295	\$100,590	\$55,513	\$66,763	\$72,073	\$21,963	\$149,694
(G)	Reserve Balances	(\$236,188)	\$663,899	\$647,089	\$631,467	\$564,509	\$541,059	\$506,110	\$465,269	\$473,795	\$355,341
	Outside Capital:	\$910,000									
	Adjusted Reserve Balances	\$673,812	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Notes:

Infusion of outside capital of \$910,000 (\$35,000/unit) in Year 1.

*ANNUAL RR CONTRIBUTIONS are shown being indexed for inflation at the % specified above except when Additional Contributions are called for.

Line C, Additional Contributions allows for material adjustments in annual RR funding that would enable the property to meet all projected needs out of reserves through Year 20.

**INTEREST EARNINGS ON RESERVES are calculated on 100% of starting balances and on 50% of the total annual contribution for the year at the rate shown

Replacement Reserve (RR) Analysis: *Plan Two - Green*

Reserve Funding In Year 20										
Projected replacement reserve balance is \$32,407					This is \$1,246 per unit in inflated dollars or \$711 per unit in uninflated dollars					
Projected annual funding to reserves is \$22,544					This is \$867 per unit in inflated dollars or \$494 per unit in current dollars					
2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	
Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	
										Reserve Balances (A)
\$355,341	\$265,938	\$278,750	\$285,886	\$283,543	\$71,553	\$41,456	\$32,735	\$33,435	\$32,830	Starting Replacement Reserves
										Annual Funding (B)
\$665	\$684	\$705	\$726	\$748	\$770	\$794	\$817	\$842	\$867	Contributions Indexed at 3%
										Additional Unit Contributions (C)
\$17,278	\$17,797	\$18,331	\$18,881	\$19,447	\$20,030	\$20,631	\$21,250	\$21,888	\$22,544	Total Annual Reserve Funding (D)
\$10,919	\$8,245	\$8,637	\$8,860	\$8,798	\$2,447	\$1,553	\$1,301	\$1,331	\$1,323	Interest on Reserves at 3% (E)
\$383,539	\$291,980	\$305,718	\$313,627	\$311,788	\$94,030	\$63,641	\$55,287	\$56,654	\$56,698	Total Funds Available
\$117,601	\$13,230	\$19,832	\$30,084	\$240,235	\$52,574	\$30,905	\$21,852	\$23,823	\$24,291	Total Capital Cost (F)
\$265,938	\$278,750	\$285,886	\$283,543	\$71,553	\$41,456	\$32,735	\$33,435	\$32,830	\$32,407	Reserve Balances (G)
\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	

Projected Capital Needs Over Twenty Years

SITE SYSTEMS

Replacement Items	Quantity		Cost / Unit in 2013 \$	Total Cost in 2013 \$	Total Premium	AGE (Years)	EUL (Years)	Replacement Schedule (Year of action AND duration of project)			Notes				
SURFACE															
Roadways and Parking	12,434	sf	2.10	\$26,111		20	23	3	over	2	Years	Asphalt paved parking areas - original surfaces Costs to resurface			
Roadways and Parking (Green)	12,434	sf	7.50	\$93,255	\$67,144	20	30		over	2	Years	Install pervious pavers			
Pedestrian Paving	2,552											Concrete paved surfaces - fair to good condition			
Pedestrian Paving	128	sf	6.25	\$797		20	30	1	/6	/11	/16	in	1	Year	Repair/Replace section of walkway as needed
Pedestrian Paving (Green)	128	sf	6.25	\$797	\$0	20	30	1	/6	/11	/16	in	1	Year	Specify recycled content/portland cement
Crack-Fill and Sealcoat	12,434	sf	0.35	\$4,352		20	5	1	/8	/13	/18	in	1	Year	Costs to restripe, crack-fill, and sealcoat
Fencing	56	sf	23.50	\$1,316		20	30	10				in	1	Year	Shadow box wood enclosure around generator Future replacement costs
Fencing (Green)	56	sf	23.50	\$1,316	\$0	20	30	10				in	1	Year	Specify FSC certified wood
Fencing	286	lf				20	35								Metal railing and gaurdrail - minor surface rust Repair/maintain from operating
Fencing (Green)		lf													
Site Lighting	5	ea	1025.00	\$5,125		1	20	19				in	1	Year	Bollard lighting - recently replaced
Site Lighting	8	ea	2570.00	\$20,560		20	20	1				in	1	Year	Pole mounted shoebox fix. Rust at base of poles
Site Lighting (Green)	5	ea	1025.00	\$5,125		1	20	19				in	1	Year	In-kind future replacement
Site Lighting (Green)	8	ea	2762.75	\$22,102	\$1,542	20	20	1				in	1	Year	Install LED replacements
Retaining Walls	154	lf													Good condition, minor deterioration at edges
Retaining Walls	1	ls	1000.00	\$1,000		20	8	1	/9	/17		in	1	Year	Repair allowance
Site Amenities	1	ls	5500.00	\$5,500		6	20	14				in	1	Year	Gazebo repairs and site signage replacement
Site Amenities (Green)	1	ls	5500.00	\$5,500	\$0	6	20	14				in	1	Year	Specify FSC wood and Low Voc Paints
ACCESSIBILITY															
Site	1	ls	750.00	\$750		20	10	1	/11			in	1	Year	Parking -striping and ramp at wood gazebo
Site (Green)		ls													
Common Areas	1	ea	10100.00	\$10,100		20	20	1				in	1	Year	Restroom toilets too close to sinks; lower cabinetry, enlarge knee space;
Common Areas (Green)		ea													
Dwelling Units	3	ea	2105.00	\$6,315		20	20	1				in	1	Year	Bathroom lower sinks, lever hardware, insulate pipes, lower base cabinets, insulate pipes, lower wall shelves
Dwelling Units (Green)		ea													
Miscellaneous		ls													

Replacement Items	Year 1 2013	Year 2 2014	Year 3 2015	Year 4 2016	Year 5 2017	Year 6 2018	Year 7 2019	Year 8 2020	Year 9 2021	Year 10 2022	Year 11 2023	Year 12 2024	Year 13 2025	Year 14 2026	Year 15 2027	Year 16 2028	Year 17 2029	Year 18 2030	Year 19 2031	Year 20 2032
SURFACE																				
Roadways and Parking	\$0	\$0	\$13,851	\$14,266	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Roadways and Parking (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Pedestrian Paving	\$797	\$0	\$0	\$0	\$0	\$924	\$0	\$0	\$0	\$0	\$1,072	\$0	\$0	\$0	\$0	\$1,242	\$0	\$0	\$0	\$0
Pedestrian Paving (Green)	\$797	\$0	\$0	\$0	\$0	\$924	\$0	\$0	\$0	\$0	\$1,072	\$0	\$0	\$0	\$0	\$1,242	\$0	\$0	\$0	\$0
Crack-Fill and Sealcoat	\$4,352	\$0	\$0	\$0	\$0	\$0	\$0	\$5,352	\$0	\$0	\$0	\$0	\$6,205	\$0	\$0	\$0	\$0	\$7,193	\$0	\$0
Fencing	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,717	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Fencing (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,717	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Fencing	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Fencing (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Site Lighting	\$20,560	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$8,725	\$0
Site Lighting (Green)	\$22,102	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$8,725	\$0
Retaining Walls	\$1,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,267	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,605	\$0	\$0	\$0
Site Amenities	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$8,077	\$0	\$0	\$0	\$0	\$0	\$0
Site Amenities (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$8,077	\$0	\$0	\$0	\$0	\$0	\$0
ACCESSIBILITY																				
Site	\$750	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,008	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Site (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Common Areas	\$10,100	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Common Areas (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Dwelling Units	\$6,315	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Dwelling Units (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Miscellaneous	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Projected Capital Needs Over Twenty Years

MECHANICAL ROOM

Replacement Items	Quantity	Cost / Unit in 2013 \$	Total Cost in 2013 \$	Total Premium	AGE (Years)	EUL (Years)	Replacement Schedule (Year of action AND duration of project)			Notes
BOILERS										
										Weil Mclain oil boiler rated at 448MBH
Boilers - 1	2 ea	12,418	\$24,836		5	25	20	in	1 Year	Future replacement costs
Boilers - 1 (Green)	1 ea	90,100	\$90,100	\$65,264	20	20	1	in	1 Year	Install Energy Star air source electric heatpumps
Fuel Storage	1 ea	30,000	\$30,000		20	30	10	in	1 Year	3000 gallon underground oil tank
Fuel Storage (Green)	ea									Costs to replace
Boilers - 3	ea									
Boilers - 3 (Green)	ea									
Controls	ea									
Controls (Green)	ea									
Boiler Water Pumps	ea									
Boiler Water Pumps (Green)	ea									
Heating Water Pumps - 1	2 ea	4,300	\$8,600		20	27	7	in	1 Year	Basemounted 2 horsepower pumps (new seals)
Heating Water Pumps - 1 (Green)	2 ea	4,623	\$9,245	\$645	20	20	7	in	1 Year	Future replacement costs (86%)
Heating Water Pumps - 2	ea									Install premium efficiency pump motors (88.5%)
Heating Water Pumps - 2 (Green)	ea									
Flue Exhaust	1 ea				20	20				Metal flue - atmospherically vented - Monitor
Flue Exhaust (Green)	ea									
Condensate & Feed Water	ea									
Miscellaneous	ea									
Miscellaneous (Green)	ea									
Miscellaneous	ea									
Miscellaneous (Green)	ea									

Costs projected at 3%

Replacement Items	Year 1 2013	Year 2 2014	Year 3 2015	Year 4 2016	Year 5 2017	Year 6 2018	Year 7 2019	Year 8 2020	Year 9 2021	Year 10 2022	Year 11 2023	Year 12 2024	Year 13 2025	Year 14 2026	Year 15 2027	Year 16 2028	Year 17 2029	Year 18 2030	Year 19 2031	Year 20 2032
BOILERS																				
Boilers - 1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$43,551
Boilers - 1 (Green)	\$90,100	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Fuel Storage	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$39,143	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Fuel Storage (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Boilers - 3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Boilers - 3 (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Controls	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Controls (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Boiler Water Pumps	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Boiler Water Pumps (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Heating Water Pumps - 1	\$0	\$0	\$0	\$0	\$0	\$0	\$10,269	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Heating Water Pumps - 1 (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$11,039	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Heating Water Pumps - 2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Heating Water Pumps - 2 (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Flue Exhaust	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Flue Exhaust (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Condensate & Feed Water	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Miscellaneous	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Miscellaneous (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Miscellaneous	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Miscellaneous (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Projected Capital Needs Over Twenty Years

MECHANICAL ROOM--*continued*

Replacement Items	Quantity		Cost / Unit in 2013 \$	Total Cost in 2013 \$	Total Premium	AGE (Years)	EUL (Years)	Replacement Schedule (Year of action AND duration of project)		Notes
BOILER ROOM SYSTEMS										
Boiler Room Piping/Valves		ea								
Boiler Room Piping/Valves (Green)		ea								
3-Way Valve & Controller	1	ea	3000.00	\$3,000		5	15	10	in 1 Year	Recently replaced mixing valve Future repalcement costs
3-Way Valve & Controller (Green)		ea								
Heat Exchanger		ea								
Heat Exchanger (Green)		ea								
DHW Generation - 1		ea								
DHW Generation - 1 (Green)		ea								
DHW Generation - 2		ea								
DHW Generation - 2 (Green)		ea								
DHW Storage - 1	2	ea	4900.00	\$9,800		5	15	10	in 1 Year	119 gallon Weil Mclain in-direct storage tanks Future replacement costs
DHW Storage - 1 (Green)	1	ls	19800.00	\$19,800	\$10,000	5	20	1	in 1 Year	High effieincy insulated storage tank
DHW Storage - 2		ea								
DHW Storage - 2 (Green)		ea								
Domestic Hot Water Pumps - 1	1	ea	582.50	\$583		1	15	14	in 1 Year	Fractional horsepower pumps Future replacement costs
DHW Pumps -1 (Green)	1	ea	626.19	\$626	\$44	1	15	14	in 1 Year	Install micro VFD pumps
Domestic Hot Water Pumps - 2	2	ea	582.50	\$1,165		5	15	10	in 1 Year	Fractional horsepower pumps Future repalcement costs
DHW Pumps - 2 (Green)	2	ea	626.19	\$1,252	\$87	5	15	10	in 1 Year	Install micro VFD pumps
Miscellaneous		ea								
Miscellaneous (Green)		ea								
Miscellaneous		ea								

MECHANICAL ROOM--continued

Costs projected at 3%

Replacement Items	Year 1 2013	Year 2 2014	Year 3 2015	Year 4 2016	Year 5 2017	Year 6 2018	Year 7 2019	Year 8 2020	Year 9 2021	Year 10 2022	Year 11 2023	Year 12 2024	Year 13 2025	Year 14 2026	Year 15 2027	Year 16 2028	Year 17 2029	Year 18 2030	Year 19 2031	Year 20 2032
BOILER ROOM SYSTEMS																				
Boiler Room Piping/Valves	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Boiler Room Piping/Valves (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3-Way Valve & Controller	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,914	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3-Way Valve & Controller (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Heat Exchanger	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Heat Exchanger (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
DHW Generation - 1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
DHW Generation - 1 (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
DHW Generation - 2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
DHW Generation - 2 (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
DHW Storage - 1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$12,787	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
DHW Storage - 1 (Green)	\$19,800	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
DHW Storage - 2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
DHW Storage - 2 (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Domestic Hot Water Pumps - 1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$855	\$0	\$0	\$0	\$0	\$0	\$0
DHW Pumps -1 (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$920	\$0	\$0	\$0	\$0	\$0	\$0
Domestic Hot Water Pumps - 2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
DHW Pumps - 2 (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,634	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Miscellaneous	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Miscellaneous (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Miscellaneous	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Projected Capital Needs Over Twenty Years

BUILDING MECHANICAL AND ELECTRICAL

Replacement Items	Quantity	Cost / Unit in 2013 \$	Total Cost in 2013 \$	Total Premium	AGE (Years)	EUL (Years)	Replacement Schedule (Year of action AND duration of project)		Notes
BUILDING MECHANICAL									
Compactors	1 ea				20	20			Abandoned in place - not used
Building Fire Suppression	1 ls				20	35			City pressure w/ backflow preventer Monitor
Commercial Kitchen Equipment	1 ls	20000.00	\$20,000		20	25	5	over 10 Years	Commercial Kitchen equipment Costs to replace as needed
Building HVAC Systems	1 ea				20	25			American Standard air handler Operating
Building HVAC Systems (Green)	ea								
Building HVAC Systems	1 ea	7500.00	\$7,500		20	15	1 16	in 1 Year	7.5 ton American Standard condenser Costs to replace
Building HVAC Systems (Green)	1 ea	8062.50	\$8,063	\$563	20	15	1 16	in 1 Year	
Building HVAC Systems	1 ea				20	25			American Standard air handler Operating
Building HVAC Systems (Green)	ea								
Building Vent. & Exhaust	1 ea	5000.00	\$5,000		20	15	1 16	in 1 Year	5 ton Trane condenser Costs to replace
Building Vent. & Exhaust (Green)	1 ea	5375.00	\$5,375	\$375	20	15	1 16	in 1 Year	
Exhaust Fans	5 ea	950.00	\$950		20	25	5	in 1 Year	Large kitchen exhaust - no problems
Exhaust Fans	5 ea	650.00	\$3,250		20	25	5	in 1 Year	Bathroom and unit exhaust fans - no problems
Exhaust Fans (Green)	ea								
BUILDING ELECTRICAL									
Building Power Wiring	ls								Monitor
Emergency Generator	1 ea	47100.00	\$47,100		20	35	15	in 1 Year	Estimated size of 175kW Future replacement costs
Emergency Lights	ea								Generator powered lamps - monitor
Smoke / Fire Detection	1 ls	16900.00	\$16,900		20	20	1	in 1 Year	Fire-lite MS 5012 fire alarm control panel Future upgrade costs
Signaling / Communication	ls								
BUILDING ELEVATORS									
Shafts and Doorways	1 ea				20	35			Monitor
Cabs	1 ea	12000.00	\$12,000		20	15	1	in 1 Year	Original cab interiors Costs to refurbish
Controller/Dispatcher/Equipment	1 ea	75000.00	\$75,000		20	30	11	in 1 Year	Problems reported Costs to replace
Machine Room Air Conditioning	1 ea	2650.00	\$2,650		ADD	15	1 16	in 1 Year	Common miss signal and service problems Costs to add air conditioning to control room

BUILDING MECHANICAL AND ELECTRICAL

Costs projected at 3%

Replacement Items	Year 1 2013	Year 2 2014	Year 3 2015	Year 4 2016	Year 5 2017	Year 6 2018	Year 7 2019	Year 8 2020	Year 9 2021	Year 10 2022	Year 11 2023	Year 12 2024	Year 13 2025	Year 14 2026	Year 15 2027	Year 16 2028	Year 17 2029	Year 18 2030	Year 19 2031	Year 20 2032
BUILDING MECHANICAL																				
Compactors	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Building Fire Suppression	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Commercial Kitchen Equipment	\$0	\$0	\$0	\$0	\$2,251	\$2,319	\$2,388	\$2,460	\$2,534	\$2,610	\$2,688	\$2,768	\$2,852	\$2,937	\$0	\$0	\$0	\$0	\$0	\$0
Building HVAC Systems	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Building HVAC Systems (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Building HVAC Systems	\$7,500	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$11,685	\$0	\$0	\$0	\$0
Building HVAC Systems (Green)	\$8,063	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$12,561	\$0	\$0	\$0	\$0
Building HVAC Systems	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Building HVAC Systems (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Building Vent. & Exhaust	\$5,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$7,790	\$0	\$0	\$0	\$0
Building Vent. & Exhaust (Green)	\$5,375	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$8,374	\$0	\$0	\$0	\$0
Exhaust Fans	\$0	\$0	\$0	\$0	\$4,727	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Exhaust Fans (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
BUILDING ELECTRICAL																				
Building Power Wiring	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Emergency Generator	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$71,243	\$0	\$0	\$0	\$0	\$0
Emergency Lights	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Smoke / Fire Detection	\$16,900	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Signaling / Communication	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Shafts and Doorways	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Cabs	\$12,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Controller/Dispatcher/Equipment	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$100,794	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Machine Room Air Conditioning	\$2,650	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4,129	\$0	\$0	\$0	\$0

Projected Capital Needs Over Twenty Years

BUILDING ARCHITECTURE

Replacement Items	Quantity		Cost / Unit in 2013 \$	Total Cost in 2013 \$	Total Premium	AGE (Years)	EUL (Years)	Replacement Schedule (Year of action AND duration of project)			Notes
STRUCTURE											
Foundation	382	lf				20	50				Concrete foundation - monitor
Framing	1	ls				20	70				Monitor
Slab		sf									
Miscellaneous		ea									
BUILDING EXTERIOR											
Exterior Common Doors	1	ea	690.00	\$690		20	35	1		in 1 Year	Double leaf M/G entrance doors - recent problems Replace main entrance door
Exterior Common Doors (Green)	1	ea	741.75	\$742	\$52	20	35	1		in 1 Year	Install high eff. Insulated fiberglass
Exterior Common Doors	2	ea	345.00	\$690		20	35	15		in 1 Year	Single leaf M/G door - fair cond. Future replacement costs
Exterior Common Doors (Green)	2	ea	370.88	\$742	\$52	20	35	15		in 1 Year	
Automatic Door Openers	2	ea	2500.00	\$5,000		5	15	10		in 1 Year	Motorized door opener Replace
Automatic Door Openers (Green)		ea									
Service Doors	2	ea				20	25				Metal service doors Operating
Storm Doors		ea									
Exterior Walls	10,020	sf									Brick - good overall condition
Exterior Walls	501	sf	6.25	\$3,131		20	35	1 8 15		in 1 Year	Repair/Pointing allowance
Exterior Walls (Green)	501	sf	6.25	\$3,131	\$0	20	35	1 8 15		in 1 Year	Specify recycled content/portland cement
Exterior Walls	4,584	sf				20	20				Vinyl siding at top floor - Org. growth on North side Operating
Exterior Walls (Green)		sf									
Exterior Walls		sf									
Trim, Soffit, Fascia	382	lf				20	20				Vinyl soffit areas - operating
Trim, Soffit, Fascia (Green)		lf									
Exterior Ceilings		sf									
Miscellaneous		ea									
Miscellaneous (Green)		ea									

BUILDING ARCHITECTURE

Costs projected at 3%

Replacement Items	Year 1 2013	Year 2 2014	Year 3 2015	Year 4 2016	Year 5 2017	Year 6 2018	Year 7 2019	Year 8 2020	Year 9 2021	Year 10 2022	Year 11 2023	Year 12 2024	Year 13 2025	Year 14 2026	Year 15 2027	Year 16 2028	Year 17 2029	Year 18 2030	Year 19 2031	Year 20 2032
STRUCTURE																				
Foundation	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Framing	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Slab	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Miscellaneous	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
BUILDING EXTERIOR																				
Exterior Common Doors	\$690	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Exterior Common Doors (Green)	\$742	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Exterior Common Doors	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,044	\$0	\$0	\$0	\$0	\$0
Exterior Common Doors (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,122	\$0	\$0	\$0	\$0	\$0
Automatic Door Openers	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$6,524	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Automatic Door Openers (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Service Doors	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Storm Doors	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Exterior Walls	\$3,131	\$0	\$0	\$0	\$0	\$0	\$0	\$3,851	\$0	\$0	\$0	\$0	\$0	\$0	\$4,736	\$0	\$0	\$0	\$0	\$0
Exterior Walls (Green)	\$3,131	\$0	\$0	\$0	\$0	\$0	\$0	\$3,851	\$0	\$0	\$0	\$0	\$0	\$0	\$4,736	\$0	\$0	\$0	\$0	\$0
Exterior Walls	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Exterior Walls (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Exterior Walls	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Trim, Soffit, Fascia	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Trim, Soffit, Fascia (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Exterior Ceilings	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Miscellaneous	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Miscellaneous (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Projected Capital Needs Over Twenty Years

BUILDING ARCHITECTURE--*continued*

Replacement Items	Quantity	Cost / Unit in 2013 \$	Total Cost in 2013 \$	Total Premium	AGE (Years)	EUL (Years)	Replacement Schedule (Year of action AND duration of project)			Notes
BUILDING EXTERIORS (cont.)										
Windows	27 ea	1065.00	\$28,755		20	30	10	in	1 Year	Triple wide, double hung, double pane, wood framed Future replacement costs
Windows (Green)	27 ea	1144.88	\$30,912	\$2,157	20	30	10	in	1 Year	Install insulated fiberglass models
Windows	31 ea	710.00	\$22,010		20	30	10	in	1 Year	double wide, double hung, double pane, wood framed Future replacement costs
Windows (Green)	31 ea	763.25	\$23,661	\$1,651	20	30	10	in	1 Year	Install insulated fiberglass models
Window Glazing	ea									
Window Glazing (Green)	ea									
Window Lintels	ea									
Unit Balconies	ea									
Unit Balconies (Green)	ea									
Unit Patios	ea									
Unit Patios (Green)	ea									
Building Mounted Lighting	8 ea	465.00	\$3,720		20	20	1	in	1 Year	HID wall packs 100Watt HPS Costs to replace fixtures
Building Mounted Lighting (Green)	8 ea	499.88	\$3,999	\$279	20	20	1	in	1 Year	Install LED models (25watt)
ROOF SYSTEMS										
Structure	10,255 sf				20	50				Monitor
Roof Covering	6,745 sf	8.50	\$57,333		5	20	15	in	1 Year	Rubber membrane roof covering - good condition Future replacement costs
Roof Covering (Green)	6,745 sf	11.00	\$74,195	\$16,863	5	20	15	in	1 Year	Install an additional 2-inches of XPS
Roof Covering - 2	3,510 sf	4.00	\$14,040		5	20	15	in	1 Year	Asphalt roof covering - good cond. Minor storm damage Future costs to replace
Roof Covering - 2 (Green)	3,510 sf	9.50	\$33,345	\$19,305	5	50				Costs to replace asphalt
Roof Covering - 3	0 sf									
Skylights	ea									
Penthouses	ea									

BUILDING ARCHITECTURE--continued

Costs projected at 3%

Replacement Items	Year 1 2013	Year 2 2014	Year 3 2015	Year 4 2016	Year 5 2017	Year 6 2018	Year 7 2019	Year 8 2020	Year 9 2021	Year 10 2022	Year 11 2023	Year 12 2024	Year 13 2025	Year 14 2026	Year 15 2027	Year 16 2028	Year 17 2029	Year 18 2030	Year 19 2031	Year 20 2032
BUILDING EXTERIORS (cont.)																				
Windows	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$37,519	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Windows (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$40,333	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Windows	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$28,718	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Windows (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$30,872	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Window Glazing	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Window Glazing (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Window Lintels	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Unit Balconies	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Unit Balconies (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Unit Patios	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Unit Patios (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Building Mounted Lighting	\$3,720	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Building Mounted Lighting (Green)	\$3,999	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
ROOF SYSTEMS																				
Structure	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Roof Covering	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$86,721	\$0	\$0	\$0	\$0	\$0
Roof Covering (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$112,227	\$0	\$0	\$0	\$0	\$0
Roof Covering - 2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$21,237	\$0	\$0	\$0	\$0	\$0
Roof Covering - 2 (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Roof Covering - 3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Skylights	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Penthouses	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Projected Capital Needs Over Twenty Years

BUILDING ARCHITECTURE--*continued*

Replacement Items	Quantity	Cost / Unit in 2013 \$	Total Cost in 2013 \$	Total Premium	AGE (Years)	EUL (Years)	Replacement Schedule (Year of action AND duration of project)			Notes
HALLS										
Hallway Walls	543 sf	0.62	\$337		10	10	1	11	over 4 Years	Painted walls - fair to poor condition Costs to paint one floor per year
Hallway Walls (Green)	543 sf	0.62	\$337	\$0	10	10	1	11	over 4 Years	Specify low VOC paint
Hallway Floors	1,403 sf	3.00	\$4,208		10	10	1	11	over 4 Years	Carpet covered hallways - fair condition Costs to replace carpeting
Hallway Floors (Green)	1,403 sf	5.50	\$7,714	\$3,506	10	25	1		over 4 Years	Install natural linoleum
Hallway Ceilings	1,403 sf				20	20				Ceiling tiles Operating
Hallway Ceilings (Green)	sf									
Hallway Walls	2,256 ea	0.62	\$1,399		3	10	7	17	in 1 Year	First floor walls - good condition Future painting costs
Hallway Walls (Green)	2,256 ea	0.62	\$1,399	\$0	3	10	7	17	in 1 Year	Specify low VOC paint
Hallway Floors	750 ea	3.00	\$2,250		5	10	5	15	in 1 Year	Carpet covered hallways - fair condition Costs to replace carpeting
Hallway Floors (Green)	750 ea	5.50	\$4,125	\$1,875	5	25	5		in 1 Year	Install natural linoleum
Hallway Doors	ea									
Interior Lighting	1 ls				20	20				Maintain fluorescent fixtures
Interior Lighting (Green)	1 ls	13590.00	\$13,590	\$13,590	20	20	1		in 1 Year	Install LED lamps and occupancy sensors
STAIRS										
Stair Walls and Ceilings	6,208 sf	0.62	\$3,849		1	15	14		over 2 Years	Painted walls and ceiling - low traffic area Future painting costs
Stair Walls and Ceilings (Green)	6,208 sf	0.62	\$3,849	\$0	1	15	14		over 2 Years	Specify low VOC paint
Stair Floors	768 sf	5.00	\$3,840		20	25	5		in 1 Year	VCT flooring - good cond. Low traffic Future replacement costs
Stair Floors (Green)	768 sf	5.50	\$4,224	\$384	20	30	5		in 1 Year	Install natural linoleum flooring
Stair Treads	112 ea	47.10	\$5,275		20	25	5		in 1 Year	Future replacement costs
Stair Treads (Green)	ea									
Stair Doors	ea									
Stair Railings	ea									

BUILDING ARCHITECTURE--continued

Costs projected at 3%

Replacement Items	Year 1 2013	Year 2 2014	Year 3 2015	Year 4 2016	Year 5 2017	Year 6 2018	Year 7 2019	Year 8 2020	Year 9 2021	Year 10 2022	Year 11 2023	Year 12 2024	Year 13 2025	Year 14 2026	Year 15 2027	Year 16 2028	Year 17 2029	Year 18 2030	Year 19 2031	Year 20 2032
HALLS																				
Hallway Walls	\$84	\$87	\$89	\$92	\$0	\$0	\$0	\$0	\$0	\$0	\$113	\$117	\$120	\$124	\$0	\$0	\$0	\$0	\$0	\$0
Hallway Walls (Green)	\$84	\$87	\$89	\$92	\$0	\$0	\$0	\$0	\$0	\$0	\$113	\$117	\$120	\$124	\$0	\$0	\$0	\$0	\$0	\$0
Hallway Floors	\$1,052	\$1,083	\$1,116	\$1,149	\$0	\$0	\$0	\$0	\$0	\$0	\$1,414	\$1,456	\$1,500	\$1,545	\$0	\$0	\$0	\$0	\$0	\$0
Hallway Floors (Green)	\$1,928	\$1,986	\$2,046	\$2,107	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Hallway Ceilings	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Hallway Ceilings (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Hallway Walls	\$0	\$0	\$0	\$0	\$0	\$0	\$1,670	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,245	\$0	\$0	\$0
Hallway Walls (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$1,670	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,245	\$0	\$0	\$0
Hallway Floors	\$0	\$0	\$0	\$0	\$2,532	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,403	\$0	\$0	\$0	\$0	\$0
Hallway Floors (Green)	\$0	\$0	\$0	\$0	\$4,643	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Hallway Doors	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Interior Lighting	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Interior Lighting (Green)	\$13,590	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
STAIRS																				
Stair Walls and Ceilings	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,826	\$2,911	\$0	\$0	\$0	\$0	\$0
Stair Walls and Ceilings (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,826	\$2,911	\$0	\$0	\$0	\$0	\$0
Stair Floors	\$0	\$0	\$0	\$0	\$4,322	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Stair Floors (Green)	\$0	\$0	\$0	\$0	\$4,754	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Stair Treads	\$0	\$0	\$0	\$0	\$5,937	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Stair Treads (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Stair Doors	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Stair Railings	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Projected Capital Needs Over Twenty Years

BUILDING ARCHITECTURE--*continued*

Replacement Items	Quantity		Cost / Unit in 2013 \$	Total Cost in 2013 \$	Total Premium	AGE (Years)	EUL (Years)	Replacement Schedule (Year of action AND duration of project)			Notes
LOBBIES / Community Kitchen											
Walls & Ceilings	2,045	sf	0.62	\$1,268		5	10	5	15	in 1 Year	Painted walls and ceilings Future costs to paint
Walls & Ceilings (Green)	2,045	sf	0.62	\$1,268	\$0	5	10	5	15	in 1 Year	Specify low VOC paint
Floors	725	sf				20	15				Ceramic tile - operating
Floors (Green)		sf									
COMMUNITY ROOM / PUBLIC LAUNDRY / RESTROOMS / DINNING ROOM											
Walls and Ceilings	3,973	sf	0.62	\$2,463		20	15	1	16	over 2 Years	Painted walls and ceilings - fair condition Costs to paint & repair
Walls and Ceilings (Green)	3,973	sf	0.62	\$2,463	\$0	20	15	1	16	over 2 Years	Specify low VOC paint
Floor Covering	1,301	sf	5.00	\$6,505		20	15	1	16	over 2 Years	VCT covered floors - original Costs to replace flooring
Floor Covering (Green)	1,301	sf	5.50	\$7,156	\$651	20	25	1		over 2 Years	Specify linoleum products
Kitchen Cabinets	1	ea	2250.00	\$2,250		5	20	15		in 1 Year	Laminated particleboard cabinets in Commercial Kitch.
Kitchen Cabinets	1	ea	2925.00	\$2,925		20	20	1		in 1 Year	Laminated particleboard cabinets in Community Kitch
Kitchen Cabinets (Green)	1	ea	2418.75	\$2,419		5	25	15		in 1 Year	Specify FSC certified cabinets
Kitchen Cabinets (Green)	1	ea	3144.38	\$3,144	\$219	20	25	1		in 1 Year	Specify FSC certified cabinets
Laundry Equipment	2	ea	740.00	\$1,480		10	12	2	14	in 1 Year	Electric dryers - costs to replace
Laundry Equipment	2	ea	650.00	\$1,300		10	12	2	14	in 1 Year	Non Energy Star washers - costs to replace
Laundry Equipment (Green)	2	ea	740.00	\$1,480		10	12	2	14	in 1 Year	Install Energy Star washers
Laundry Equipment (Green)	2	ea	698.75	\$1,398	\$98	10	12	2	14	in 1 Year	
OFFICE / COMMUNITY ROOM											
Walls and Ceilings	2,260	sf	0.62	\$1,401		10	10	1	11	in 1 Year	Painted walls and ceilings - good condition Costs to paint
Walls and Ceilings (Green)	2,260	sf	0.62	\$1,401	\$0	10	10	1	11	in 1 Year	Specify low VOC painting
Floor Covering	948	sf	3.00	\$2,844		5	10	5	15	in 1 Year	Carpet Costs to replace
Floor Covering (Green)	948	sf	3.23	\$3,057	\$213	5	10	5	15	in 1 Year	Specify low VOC Green Label Plus products
Office Fire Curtains	2	ea	1800.00	\$3,600		20	20	1		in 1 Year	Replace motors concurrant with fire alarm control panel
Office Fire Curtains (Green)		ea									
Community Room Furnishings	1	ea	3250.00	\$3,250		5	15	10		in 1 Year	Costs to replace tables, couches, and chairs
Miscellaneous		ea									
Miscellaneous (Green)		ea									

BUILDING ARCHITECTURE--continued

Costs projected at 3%

Replacement Items	Year 1 2013	Year 2 2014	Year 3 2015	Year 4 2016	Year 5 2017	Year 6 2018	Year 7 2019	Year 8 2020	Year 9 2021	Year 10 2022	Year 11 2023	Year 12 2024	Year 13 2025	Year 14 2026	Year 15 2027	Year 16 2028	Year 17 2029	Year 18 2030	Year 19 2031	Year 20 2032
LOBBIES / Community Kitchen																				
Walls & Ceilings	\$0	\$0	\$0	\$0	\$1,427	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,918	\$0	\$0	\$0	\$0	\$0
Walls & Ceilings (Green)	\$0	\$0	\$0	\$0	\$1,427	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,918	\$0	\$0	\$0	\$0	\$0
Floors	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Floors (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
COMMUNITY ROOM / PUBLIC LAUNDRY / RESTROOMS / DINNING ROOM																				
Walls and Ceilings	\$1,232	\$1,269	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,919	\$1,976	\$0	\$0	\$0
Walls and Ceilings (Green)	\$1,232	\$1,269	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,919	\$1,976	\$0	\$0	\$0
Floor Covering	\$3,253	\$3,350	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$5,067	\$5,219	\$0	\$0	\$0
Floor Covering (Green)	\$3,578	\$3,685	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Kitchen Cabinets	\$2,925	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,403	\$0	\$0	\$0	\$0	\$0
Kitchen Cabinets (Green)	\$3,144	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,659	\$0	\$0	\$0	\$0	\$0
Laundry Equipment	\$0	\$2,863	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4,083	\$0	\$0	\$0	\$0	\$0	\$0
Laundry Equipment (Green)	\$0	\$2,964	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4,226	\$0	\$0	\$0	\$0	\$0	\$0
OFFICE / COMMUNITY ROOM																				
Walls and Ceilings	\$1,401	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,883	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Walls and Ceilings (Green)	\$1,401	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,883	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Floor Covering	\$0	\$0	\$0	\$0	\$3,201	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4,302	\$0	\$0	\$0	\$0	\$0
Floor Covering (Green)	\$0	\$0	\$0	\$0	\$3,441	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4,624	\$0	\$0	\$0	\$0	\$0
Office Fire Curtains	\$3,600	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Office Fire Curtains (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Community Room Furnishings	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4,241	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Miscellaneous	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Miscellaneous (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Projected Capital Needs Over Twenty Years

DWELLING UNITS

Replacement Items	Quantity	Cost / Unit 2013.00	Total Cost in 2013 \$	Total Premium	AGE (Years)	EUL (Years)	Replacement Schedule (Year of action AND duration of project)		Notes
LIVING AREA FINISHES									
Unit Hallway Doors	26 ea	420.00	\$10,920		20	30	1	over 6 Years	Wood doors in metal frames - damage, problematic Costs to replace
Unit Interior Doors	52 ea	110.00	\$5,720		20	25	1	over 20 Years	Interior passage doors Costs to replace as needed
Unit Closet Doors	52 ea	326.20	\$16,962		20	25	1	over 20 Years	Bifold closet doors Costs to replace as needed
Unit Walls and Ceilings	75,296 sf				20	5			Painted walls and ceilings Operating
Unit Walls and Ceilings (Green)	sf								
Living Area Floors	14,144 sf	5.00	\$70,720		20	15	1 16	over 5 Years	VCT flooring throughout units - original Costs to replace
Living Area Floors (Green)	14,144 sf	5.50	\$77,792	\$7,072	20	25	1	over 5 Years	Install natural linoleum products
Living Area Floors	sf								
Living Area Floors (Green)	sf								
BATHROOMS									
Bathroom Floors	1,820 sf	5.00	\$9,100		20	15	1 16	over 5 Years	VCT flooring throughout units - original Costs to replace
Bathroom Floors (Green)	1,820 sf	5.50	\$10,010	\$910	20	25	1	over 5 Years	Install natural linoleum products
Bathtub and Shower	26 ea	1720.00	\$44,720		20	25	5	over 10 Years	Fiberglass tubs and surrounds - fair cond. Costs to replace
Bathtub and Shower (Green)	ea								
Bathroom Vanity	ea								
Bathroom Vanity (Green)	ea								
Bathroom Sinks	26 ea	420.00	\$10,920		20	25	1	over 25 Years	Wall hung sinks - good overall condition replacement allowance
Bathroom Toilets	26 ea	410.00	\$10,660		5	25	20	in 1 Years	1.6 gpf models Operating
Bathroom Toilets (Green)	26 ea	440.75	\$11,460	\$11,460	5	25	20	in 1 Years	Install 1.28gpf models
Ventilation & Exhaust	ea								Ducted to rooftop exhaust
Ventilation & Exhaust (Green)	ea								
Medicine Cabinets	26 ea	234.00	\$6,084		20	25	5	over 10 Years	Costs to replace medicine cabinets

DWELLING UNITS

Costs projected at 3%

Replacement Items	Year 1 2013	Year 2 2014	Year 3 2015	Year 4 2016	Year 5 2017	Year 6 2018	Year 7 2019	Year 8 2020	Year 9 2021	Year 10 2022	Year 11 2023	Year 12 2024	Year 13 2025	Year 14 2026	Year 15 2027	Year 16 2028	Year 17 2029	Year 18 2030	Year 19 2031	Year 20 2032
LIVING AREA FINISHES																				
Unit Hallway Doors	\$1,820	\$1,875	\$1,931	\$1,989	\$2,048	\$2,110	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Unit Interior Doors	\$286	\$295	\$303	\$313	\$322	\$332	\$341	\$352	\$362	\$373	\$384	\$396	\$408	\$420	\$433	\$446	\$459	\$473	\$487	\$502
Unit Closet Doors	\$848	\$874	\$900	\$927	\$955	\$983	\$1,013	\$1,043	\$1,074	\$1,107	\$1,140	\$1,174	\$1,209	\$1,245	\$1,283	\$1,321	\$1,361	\$1,402	\$1,444	\$1,487
Unit Walls and Ceilings	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Unit Walls and Ceilings (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Living Area Floors	\$14,144	\$14,568	\$15,005	\$15,456	\$15,919	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$22,036	\$22,697	\$23,378	\$24,079	\$24,802
Living Area Floors (Green)	\$15,558	\$16,025	\$16,506	\$17,001	\$17,511	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Living Area Floors	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Living Area Floors (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
BATHROOMS																				
Bathroom Floors	\$1,820	\$1,875	\$1,931	\$1,989	\$2,048	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,836	\$2,921	\$3,008	\$3,098	\$3,191
Bathroom Floors (Green)	\$2,002	\$2,062	\$2,124	\$2,188	\$2,253	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Bathtub and Shower	\$0	\$0	\$0	\$0	\$5,033	\$5,184	\$5,340	\$5,500	\$5,665	\$5,835	\$6,010	\$6,190	\$6,376	\$6,567	\$0	\$0	\$0	\$0	\$0	\$0
Bathtub and Shower (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Bathroom Vanity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Bathroom Vanity (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Bathroom Sinks	\$437	\$450	\$463	\$477	\$492	\$506	\$522	\$537	\$553	\$570	\$587	\$605	\$623	\$641	\$661	\$681	\$701	\$722	\$744	\$766
Bathroom Toilets	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$18,692
Bathroom Toilets (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$20,094
Ventilation & Exhaust	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Ventilation & Exhaust (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Medicine Cabinets	\$0	\$0	\$0	\$0	\$685	\$705	\$726	\$748	\$771	\$794	\$818	\$842	\$867	\$893	\$0	\$0	\$0	\$0	\$0	\$0

Projected Capital Needs Over Twenty Years

DWELLING UNITS--*continued*

Replacement Items	Quantity	Cost / Unit in 2013 \$	Total Cost in 2013 \$	Total Premium	AGE (Years)	EUL (Years)	Replacement Schedule (Year of action AND duration of project)				Notes
KITCHENS											
Kitchen Floors	2,340 sf	5.00	11,700		20	15	1	16	over 5 Years	VCT flooring throughout units - original Costs to replace	
Kitchen Floors (Green)	2,340 sf	5.50	12,870	\$1,170	20	25	1		over 5 Years	Install natural linoleum products	
Kitchen Cabinets	26 ea	3600.00	93,600		20	25	5		over 4 Years	Plywood cabinets - fair overall condition Costs to replace	
Kitchen Cabinets (Green)	26 ea	3870.00	100,620	\$7,020	20	25	5		over 4 Years	Install FSC certified wood cabinets	
Kitchen Cabinets	ea										
Kitchen Cabinets (Green)	ea										
Kitchen Countertops	26 ea	632.96	16,457		20	10	15		over 4 Years	Solid surface countertops Costs to replace	
Kitchen Countertops (Green)	26 ea	1200.00	31,200	\$14,743	20	25	5		over 4 Years	Install recycled solid surface materials	
Range	26 ea	345.00	8,970		5	20	15		over 5 Years	30-inch electric ranges Costs to replace	
Range (Green)	ea										
Range	ea										
Range (Green)	ea										
Refrigerator	26 ea	720.25	18,727		12	15	1	16	over 4 Years	Energy Star refrigerators installed in 2001 Costs to replace in-kind	
Refrigerator (Green)	ea										
Refrigerator	ea										
Refrigerator (Green)	ea										
Dishwasher	ea										
Dishwasher (Green)	ea										
Rangehood and Vent	26 ea	281.00	7,306		20	25	5		over 4 Years	Costs to replace concurrent with cabinetry	
Disposals	ea										
Miscellaneous	ea										
Miscellaneous (Green)	ea										

Costs projected at 3%

Replacement Items	Year 1 2013	Year 2 2014	Year 3 2015	Year 4 2016	Year 5 2017	Year 6 2018	Year 7 2019	Year 8 2020	Year 9 2021	Year 10 2022	Year 11 2023	Year 12 2024	Year 13 2025	Year 14 2026	Year 15 2027	Year 16 2028	Year 17 2029	Year 18 2030	Year 19 2031	Year 20 2032
KITCHENS																				
Kitchen Floors	\$2,340	\$2,410	\$2,483	\$2,557	\$2,634	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,646	\$3,755	\$3,868	\$3,984	\$4,103
Kitchen Floors (Green)	\$2,574	\$2,651	\$2,731	\$2,813	\$2,897	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Kitchen Cabinets	\$0	\$0	\$0	\$0	\$26,337	\$27,127	\$27,941	\$28,779	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Kitchen Cabinets (Green)	\$0	\$0	\$0	\$0	\$28,312	\$29,162	\$30,036	\$30,937	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Kitchen Cabinets	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Kitchen Cabinets (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Kitchen Countertops	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$6,223	\$6,410	\$6,602	\$6,800	\$0	\$0
Kitchen Countertops (Green)	\$0	\$0	\$0	\$0	\$8,779	\$9,042	\$9,314	\$9,593	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Range	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,714	\$2,795	\$2,879	\$2,965	\$3,054	\$0
Range (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Range	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Range (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Refrigerator	\$4,682	\$4,822	\$4,967	\$5,116	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$7,294	\$7,513	\$7,738	\$7,970	\$0
Refrigerator (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Refrigerator	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Refrigerator (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Dishwasher	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Dishwasher (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Rangehood and Vent	\$0	\$0	\$0	\$0	\$2,056	\$2,117	\$2,181	\$2,246	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Disposals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Miscellaneous	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Miscellaneous (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Projected Capital Needs Over Twenty Years

DWELLING UNITS--*continued*

Replacement Items	Quantity		Cost / Unit in 2013 \$	Total Cost in 2013 \$	Total Premium	AGE (Years)	EUL (Years)	Replacement Schedule (Year of action AND duration of project)			Notes
IN-UNIT MECHANICAL											
Unit Warm Air Furnaces		ea									
Unit Warm Air Furnaces (Green)		ea									
Unit Thermostats	26	ea	105.00	\$2,730		5	20	15	over 3 Years	Wall mounted thermostats Future replacement costs	
Unit Thermostats (Green)		ea									
Plumbing Shut-Off Valves	26	ea				20	25				
Plumbing Shut-Off Valves (Green)		ea									
Unit Radiation	598	lf	27.50	\$16,445		20	30	1	over 20 Years	Hydronic baseboard Costs to replace covers as needed	
Unit Radiation (Green)		ea									
Unit Domestic Hot Water		ea									
Unit Domestic Hot Water (Green)		ea									
Miscellaneous		ea									
Miscellaneous (Green)		ea									
IN-UNIT ELECTRICAL											
Unit Electrical Panel	26	ea				20	50			GE electric circuit breaker panels - no problems Monitor	
Unit Wiring	26	ea				20	50			Monitor	
Unit Security Call System	52	ea	195.00	\$10,140		20	20	1	over 10 Years	ECAS pull chain - no problems Replace as needed	
Unit Smoke/Fire Detection	26	ea	1050.00	\$27,300		ADD	20	1	in 1 Year	Convert local ring to addressible system	
Unit Smoke/Fire Detection	52	lf	190.00	\$9,880		0	7	8 15	over 3 Years	Future smoke detector replacement costs	
Unit Smoke/Fire Detection (Green)		lf									
Carbon Monoxide Detection	26	ea	295.00	\$7,670		Add	7	1 8 15	over 3 Years	Costs to install CO detectors in each unit	
Carbon Monoxide Detection (Green)		ea									
Miscellaneous		ea									

Costs projected at 3%

Replacement Items	Year 1 2013	Year 2 2014	Year 3 2015	Year 4 2016	Year 5 2017	Year 6 2018	Year 7 2019	Year 8 2020	Year 9 2021	Year 10 2022	Year 11 2023	Year 12 2024	Year 13 2025	Year 14 2026	Year 15 2027	Year 16 2028	Year 17 2029	Year 18 2030	Year 19 2031	Year 20 2032
IN-UNIT MECHANICAL																				
Unit Warm Air Furnaces	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Unit Warm Air Furnaces (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Unit Thermostats	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,376	\$1,418	\$1,460	\$0	\$0	\$0
Unit Thermostats (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Plumbing Shut-Off Valves	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Plumbing Shut-Off Valves (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Unit Radiation	\$822	\$847	\$872	\$898	\$925	\$953	\$982	\$1,011	\$1,042	\$1,073	\$1,105	\$1,138	\$1,172	\$1,208	\$1,244	\$1,281	\$1,319	\$1,359	\$1,400	\$1,442
Unit Radiation (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Unit Domestic Hot Water	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Unit Domestic Hot Water (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Miscellaneous	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Miscellaneous (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
IN-UNIT ELECTRICAL																				
Unit Electrical Panel	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Unit Wiring	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Unit Security Call System	\$1,014	\$1,044	\$1,076	\$1,108	\$1,141	\$1,176	\$1,211	\$1,247	\$1,285	\$1,323	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Unit Smoke/Fire Detection	\$27,300	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Unit Smoke/Fire Detection	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4,050	\$4,172	\$4,297	\$0	\$0	\$0	\$0	\$4,981	\$5,131	\$5,285	\$0	\$0	\$0
Unit Smoke/Fire Detection (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Carbon Monoxide Detection	\$2,557	\$2,633	\$2,712	\$0	\$0	\$0	\$0	\$3,144	\$3,239	\$3,336	\$0	\$0	\$0	\$0	\$3,867	\$3,983	\$4,103	\$0	\$0	\$0
Carbon Monoxide Detection (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Miscellaneous	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

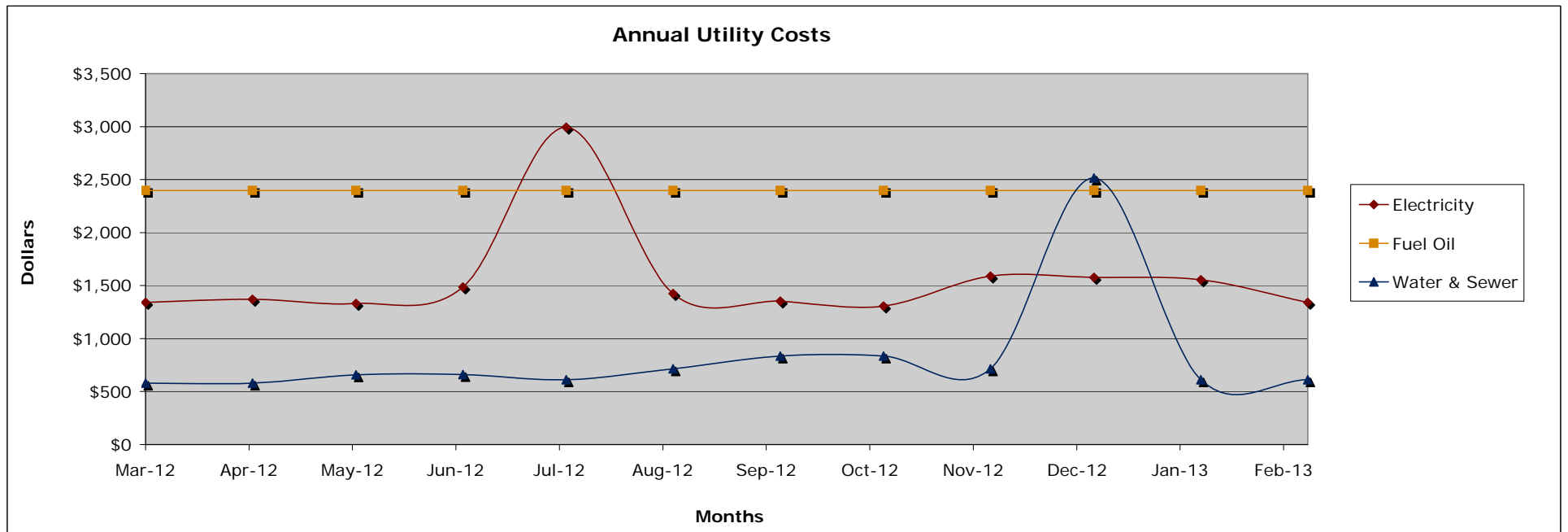
Energy Analysis

Utility Usage

Kirtland Commons

The energy analysis portion of this GCNA examines utility bills for the most recent 12 months to summarize at electricity, natural gas, and water/sewer use. The following table and charts show the utility information by utility source, and by mon

	ELECTRICITY		NATURAL GAS		WATER / SEWER				OIL		TOTAL
	kWh	\$	Therms	\$	Gallons	Water \$	Sewer \$	Total \$	Gallons	\$	
Feb-13	9,360	\$1,342			74,000	\$612	\$0	\$612	804	\$2,396	\$4,350
Jan-13	10,480	\$1,556			74,000	\$612	\$0	\$612	804	\$2,396	\$4,564
Dec-12	10,640	\$1,578			310,000	\$2,515	\$0	\$2,515	804	\$2,396	\$6,490
Nov-12	10,720	\$1,588			82,000	\$714	\$0	\$714	804	\$2,396	\$4,699
Oct-12	8,800	\$1,307			96,000	\$836	\$0	\$836	804	\$2,396	\$4,539
Sep-12	9,120	\$1,354			96,000	\$836	\$0	\$836	804	\$2,396	\$4,586
Aug-12	9,600	\$1,424			82,000	\$714	\$0	\$714	804	\$2,396	\$4,535
Jul-12	10,080	\$2,995			74,000	\$612	\$0	\$612	804	\$2,396	\$6,003
Jun-12	10,160	\$1,486			74,000	\$659	\$0	\$659	804	\$2,396	\$4,542
May-12	9,280	\$1,330			74,000	\$659	\$0	\$659	804	\$2,396	\$4,386
Apr-12	9,680	\$1,371			66,000	\$579	\$0	\$579	804	\$2,396	\$4,346
Mar-12	9,360	\$1,342			66,000	\$579	\$0	\$579	804	\$2,396	\$4,317
Total	117,280	\$18,671			1,168,000	\$9,928	\$0	\$9,928	9,650	\$28,757	\$57,356
Unit Cost		\$0.159						\$0.00850		2.98000829	

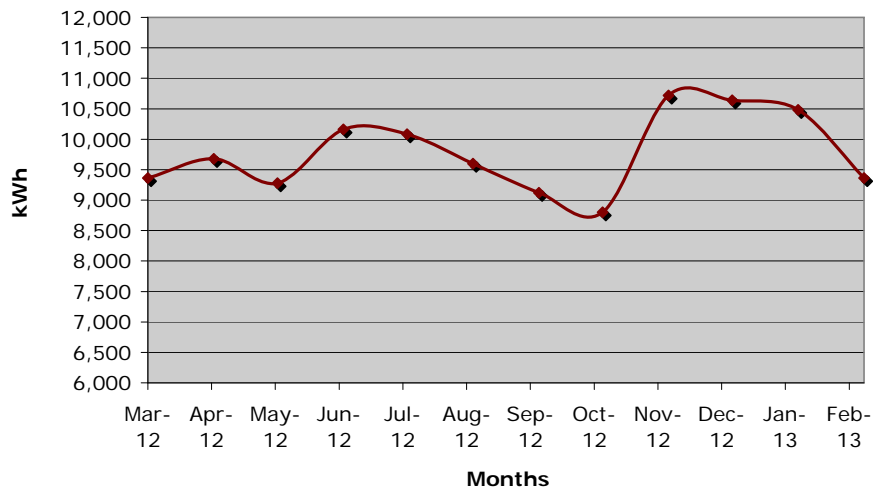


* quantities in red were estimated due to incomplete utility information.

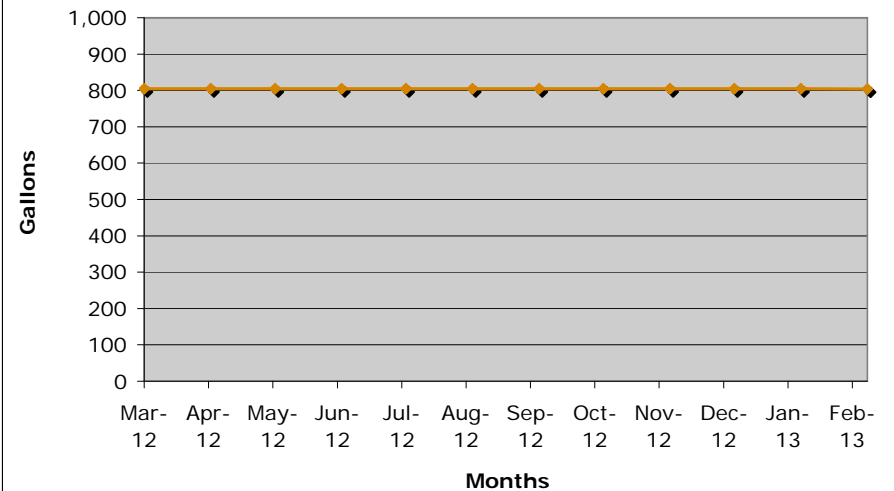
Energy Analysis
Utility Usage, By Type
Kirtland Commons

Below are graphic presentations of annual usage by utility type for the property.

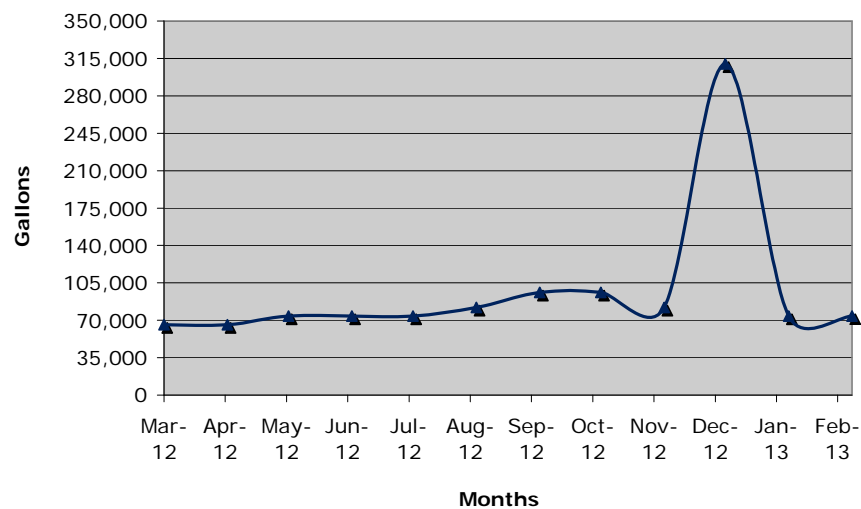
Electricity



Fuel Oil



Water & Sewer

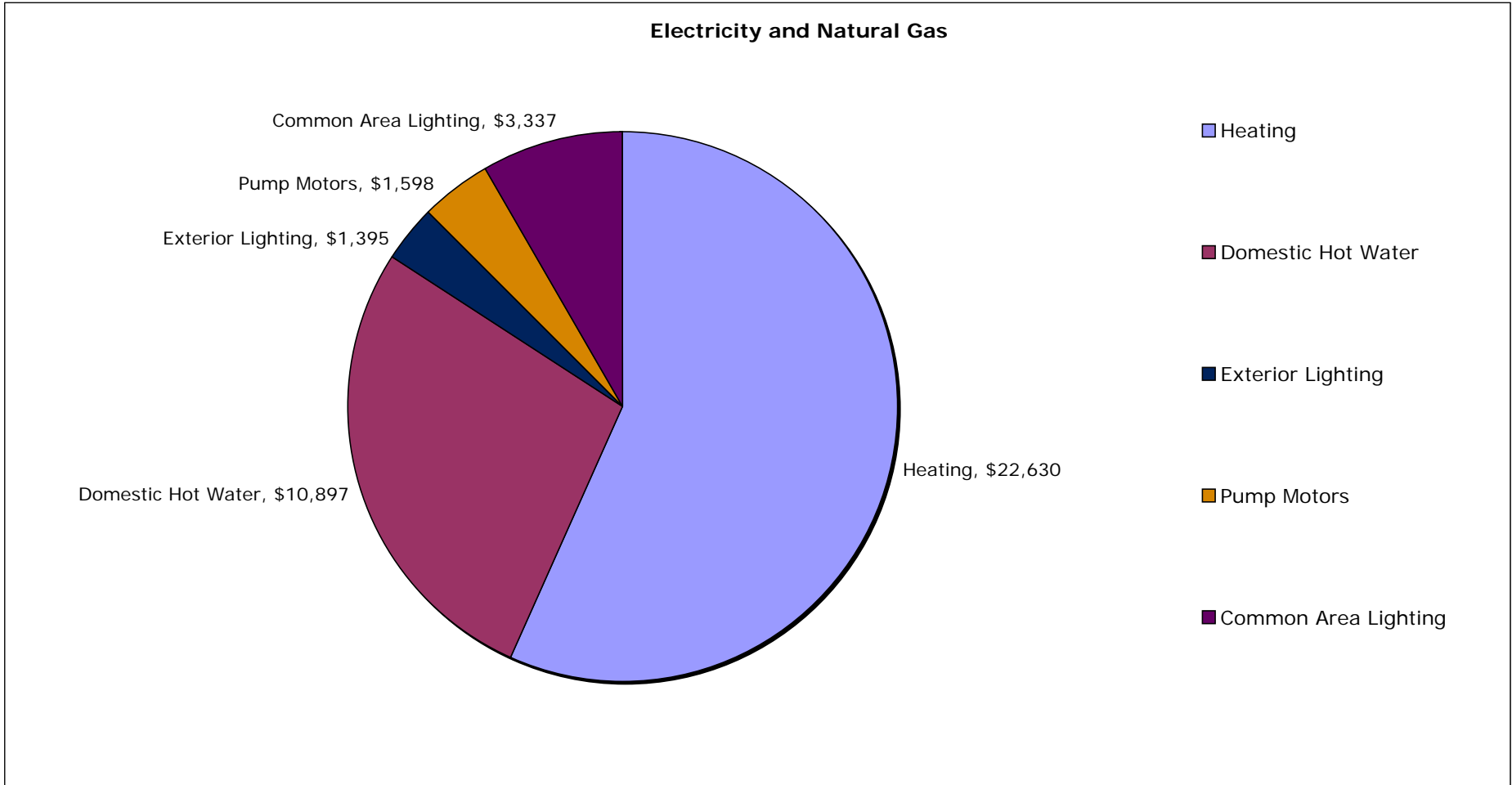


Energy Analysis

Disaggregated End Uses

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#2 Heating oil is used for space heating and domestic hot water generation. Electricity is used for all other services and appliances. The following chart illustrates the disaggregated costs based on the end uses. Please note: the estimated end uses are base



End Use	Utility	Annual Cost	Annual Usage (kWh)	Annual Usage (therms)	Annual Usage (btu)
Heating	#2 Oil Gallons	\$22,630		7,594	1,058,616,559
Domestic Hot Water	#2 Oil Gallons	\$10,897		3,657	509,739,477
Exterior Lighting	Electricity	\$1,395	8,760.01		29,889,144
Pump Motors	Electricity	\$1,598	10,037		34,247,687
Common Area Lighting	Electricity	\$3,337	20,961		71,517,228

Energy Analysis

Notes

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Below are notes regarding the property metering schedule, general billing information, and specific usage details by utility type.

General

The property is master metered water and sewer, and common area electricity (hallways, office, community spaces). The dwelling units are individually metered for electricity consumption. The property uses #2 Heating Oil for space heating.

Heating Oil

Detailed oil usage could not be obtained. The total annual usage was devied evenly into all twelve months for the purposes of this analysis. TREAT energy modeling software adjusts monthly consumption to reflect normalized weather information and redistributed accordignly.

Electricity

Electricity is generally higher in the winter months, presumably to a higher demand for lighting caused by daylight savings time. A few of the summer months, particularly June, are showing high usage for electricity. It is assumed that these summer spikes are due to increased cooling loads for community spaces.

Water and Sewer

Water and sewer is billed every other month. Complete water consumption data could not be obtained. Missing months were estimated for the purposed of this analysis.

Energy Assumptions Table

Below are the energy assumptions by category that were used as inputs for the TREAT model for the property.

These energy assumptions are based on the following:

1. The physical inspection of the property
2. Diagnostic testing conducted during the inspection
3. The historic utility billing information
4. The building blueprints/plans
5. Information provided by site management and maintenance staff

General

Property Type (Family, Elderly, Commercial): **Elderly**
 Resident Population Persons: **26**

Space Types

Units, Common Areas	Square Footage:	30,374	Conditioned:	Yes
Basement	Square Footage:	0	Conditioned:	No

Utility Metering

Common Spaces	Utility Type:	Electricity	Individual, Master:	Master
Whole Building	Utility Type:	Oil	Individual, Master:	Master
Whole Building	Utility Type:	Water/Sewer	Individual, Master:	Master
Dwelling Units	Utility Type:	Electricity	Individual, Master:	Individual

Infiltration

Infiltration Condition	Tight, Leaky:	Average
Infiltration Rate	ACH:	0.65

Architectural

Wall Insulation	Type:	Fiberglass	R-Value:	R-13
Roof Insulation	Type:	Fiberglass	R-Value:	R-19
Exterior Doors 1	Type:	Flush Metal	R-Value:	< R-5
Exterior Doors 2	Type:	Wood/Glass	R-Value:	< R-5
Windows 1	Type:	Aluminum	U-Factor:	0.55

Heating and Cooling

Temperature Control:

Occupied Heating Temp	Degrees F:	72
Occupied Cooling Temp	Degrees F:	N/A
Unoccupied ¹ Heating Temp	Degrees F:	N/A
Unoccupied ¹ Heating Time	Hours / Day:	N/A

Boilers / DHW Generation:

Boiler 1	Type:	Oil-fired	Capacity:	448 MBH	Efficiency:	85%
Boiler 2	Type:		Capacity:		Efficiency:	
Boiler 3	Type:		Capacity:		Efficiency:	
Domestic Hot Water 1	Type:	In-direct	Capacity:		Efficiency:	85%
Domestic Hot Water 2	Type:		Capacity:		Efficiency:	

¹Unoccupied temps/times based on opportunity for savings based on programmable thermostats

Water & Sewer

Domestic Hot Water:

DHW Daily Usage	Gallons/Resident:	38
DHW Delivery Temp	Degrees F:	120

Domestic Cold Water:

Showerheads	Gallons / Minute:	2.5
Toilets	Gallons / Flush:	1.6
Irrigation	Gallons / Year:	None

Lighting Loads

Hallway	Type:	Fluorescent	Wattage:	26-56	Hours per Day:	24
Storage	Type:	T8	Wattage:	32	Hours per Day:	10

Appliances, Miscellaneous Loads

Refrigerator	Energy Star (Y/N):	Yes	Usage per Year:	336
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Simple Payback Analysis

EWCM #1 Convert Lighting - Exterior

Replacement Costs

A. Total cost to convert Exterior lighting to LED models:

\$26,101.00

Utility Cost

Electricity: \$0.16

Existing Types / Usage

Description	Wattage per Fixture	Number of Fixtures	Lighting Hours/Day	Usage Days/Year	Usage kWh/Year	Usage \$/Year
Type 1: Parking Area Lighting	150	8	12	365	5,256	\$836.78
Type 2: Wallpacks	100	8	12	365	3,504	\$557.85
Type 3:					0	\$0.00
Type 4:					0	\$0.00
Type 5:					0	\$0.00
Total:				8,760	\$1,394.63	

Proposed Green Types / Usage

Description	Wattage per Fixture	Number of Fixtures	Lighting Hours/Day	Usage Days/Year	Usage kWh/Year	Usage \$/Year
Type 1: Parking Area Lighting	34	8	12	365	1,191	\$189.67
Type 2: Wallpacks	25	8	12	365	876	\$139.46
Type 3:					0	\$0.00
Type 4:					0	\$0.00
Type 5:					0	\$0.00
Total:				2,067	\$329.13	

Annual Electric Savings

22,835,288 BTUs

6,692.64 kWh

Savings = 6,692.64 x \$0.16 = \$1,065.50/yr

Annual Oil Savings¹

0 BTUs

0.00 gallons

Savings = 0.00 x \$0.00 = \$0.00/yr

Annual Net Cost Savings

\$1,065.50 + \$0.00 = \$1,065.50

5. Simple Payback

\$26,101.00 / \$1,065.50 = 24.50 yrs

Simple Payback Analysis

EWCM #2 Replace Heating System

Description:

Currently the development is heated by two oil-fired hot water boilers. The boilers are each rated at 448 MBH. This worksheet evaluates the potential benefit resulting from replacing the existing system with unit level Energy Star Air Source Heatpumps.

Replacement Costs

	Type	Cost
A. Proposed Conventional:	In-Kind Replacement	\$24,836.00
B. Proposed Green:	Install Air Source Heatpumps	\$91,000.00
C. Incremental Cost Between Proposed Conventional and Proposed Green:		\$66,164.00

Central Heating System

A. Existing:	Oil-fired
B. Proposed Conventional:	Oil-fired
C. Proposed Green:	Air Source Heatpumps

Oil Consumption

	Existing	Conventional	Green
	Oil	Oil	Oil
	1,058,616.559 btus	1,058,616.559 btus	0 btus
	7594.09 gallons	7594.09 gallons	0.00 gallons
Utility Cost	\$2.98/gallon	\$2.98/gallon	\$2.98/gallon
Heating Cost	\$22,630.46	\$22,630.46	\$0.00

Electric Consumption

	Existing	Conventional	Green
	Electric	Electric	Electric
	0 btus	0 btus	394,741.104 btus
	0.00 kWhs	0.00 kWhs	115692.00 kWhs
Utility Cost	\$0.16/kWh	\$0.16/kWh	\$0.16/kWh
Cooling Cost	\$0.00	\$0.00	\$18,418.65

Annual Savings: Existing to Conventional

Savings = \$22,630.46 - \$22,630.46 = \$0.00/yr

Annual Savings: Conventional to Green

Savings = \$22,630.46 - Resident Paid Utility Bills \$0.00 = \$22,630.46/yr

Annual Savings: Existing to Green

Savings = \$0.00 + \$22,630.46 = \$22,630.46/yr

Simple Payback: Conventional

\$24,836.00 / \$0.00 = N/A yrs

Simple Payback: Green

\$91,000.00 / \$22,630.46 = 4.0 yrs

Incremental Payback: Conventional to Green

\$66,164.00 / \$22,630.46 = 2.9 yrs

Simple Payback Analysis

EWCM #3 Replace Pump Motors

Description: This worksheet calculates the annual savings and simple payback of replacing existing pump motors with comparable premium efficient motors.

Methodology: Energy usage for each motor is calculated by converting the motor's horsepower (hp) rating to kilowatts (kW), and multiplying the kW value by the annual hours of use, and dividing this amount by the motor's efficiency:

$$\{ (\text{hp}) \times (0.746 \text{ kW/hp}) \times (\text{hours}) \} \div (\text{Motor efficiency})$$

Replacement Costs

	Type	Cost
A. Proposed Conventional:	Standard Eff. Pumps	\$8,600.00
B. Proposed Green:	Premium Eff. Pumps	\$9,245.00
C. Incremental Cost Between Proposed Conventional and Proposed Green:		\$645.00

Utility Cost

Electricity: \$0.16

Existing Conditions

Existing Motor	Quantity	Size: hp	Conversion Factor kW/hp	kW per Motor	Usage hrs/Yr	Load	Existing Efficiency	Total Usage kWh	Operational Cost \$
Heat P1	2	2.00	.746	1.4920	2540	100%	80.0%	9,474	\$1,508
Heat P2	3	0.04	.746	0.0298	4380	100%	70.0%	560	\$89
Heat P3			.746	0.0000		100%		0	\$0
Heat P4			.746	0.0000		100%		0	\$0
DHW P1			.746	0.0000		100%		0	\$0
DHW P2			.746	0.0000		100%		0	\$0
DHW P3			.746	0.0000		100%		0	\$0
Totals:								10,034	\$1,598

Proposed Green Conditions

Existing Motor	Quantity	Size: hp	Conversion Factor kW/hp	kW per Motor	Usage hrs/Yr	Load	Proposed Efficiency	Total Usage kWh	Operational Cost \$
Heat P1	2	2.00	.746	1.4920	2540	100%	88.5%	8,564	\$1,363
Heat P2	3	0.04	.746	0.0298	4380	100%	85.0%	461	\$73
Heat P3			.746	0.0000		100%		0	\$0
Heat P4			.746	0.0000		100%		0	\$0
DHW P1			.746	0.0000		100%		0	\$0
DHW P2			.746	0.0000		100%		0	\$0
DHW P3			.746	0.0000		100%		0	\$0
Totals:								9,026	\$1,437

Annual Savings: Existing to Proposed Green

$$\text{Savings} = \$1,597.51 - \$1,436.90 = \$160.61 / \text{yr}$$

Simple Payback: Existing to Proposed Green

$$\$645.00 / \$160.61 = 4.0 \text{ yrs}$$

Simple Payback Analysis

EWCM #4 Replace Domestic Hot Water Boiler

Description

Currently domestic hot water is produced by the heating boilers and passed through two in-direct storage tanks with integral heat exchangers. This worksheet evaluated to potential benefit from replacing the heating boilers with dedicated domestic hot wat boilers.

Replacement Costs

	Type	Cost
A. Proposed Conventional:	In-kind Replacement	\$9,800.00
B. Proposed Green:	Install Dedicated Hot Water Boilers	\$19,800.00
C. Incremental Cost Between Proposed Conventional and Proposed Green:		\$10,000.00

Annual Utility Cost

	Existing	Conventional	Green
	509,739,477 btus	509,739,477 btus	506,267,393 btus
	3656.67 gallons	3656.67 gallons	3631.76 gallons
Utility Cost	\$2.98/gallon	\$2.98/gallon	\$2.98/gallon
Heating Cost	\$10,896.90	\$10,896.90	\$10,822.68

Annual Savings: Existing to Conventional

Savings = \$10,896.90 - \$10,896.90 = \$0.00/yr

Annual Savings: Conventional to Green

Savings = \$10,896.90 - \$10,822.68 = \$74.22/yr

Annual Savings: Existing to Green

Savings = \$0.00 + \$74.22 = \$74.22/yr

Simple Payback: Conventional

\$9,800.00 / \$0.00 = N/A yrs

Simple Payback: Green

\$19,800.00 / \$74.22 = 266.8 yrs

Incremental Payback: Conventional to Green

/ \$74.22 = 0.0 yrs

Simple Payback Analysis

EWCM #5 Replace Exterior Glass Doors

Replacement Costs		Type	Cost
A. Proposed Conventional:		Metal/Glass Doors (Standard)	\$1,380.00
B. Proposed Green:		Double Pane Fiberglass Models	\$1,483.50
C. Incremental Cost Between Proposed Conventional and Proposed Green:			\$103.50

Existing Conditions	
General: Single pane glass with uninsulated metal frames.	
A. Door Type:	Metal
B. Total Area of Windows:	32 sf
C. Utility Cost:	Oil \$2.98 /gallon

U-Factor ¹	
A. Existing:	1.13
B. Conventional:	1.13
C. Green:	0.40

Annual Savings: Existing to Conventional	
	0 BTUs
	0.00 gallons
Savings =	\$2.98 x 0.00 = \$0.00 /yr

Annual Savings: Conventional to Green	
	3,345,600 BTUs
	24.00 gallons
Savings =	\$2.98 x 24.00 = \$71.52 /yr

Annual Savings: Existing to Green	
	3,345,600 BTUs
	24.00 gallons
Savings =	\$0.00 + \$71.52 = \$71.52 /yr

Simple Payback: Conventional				
\$1,380.00	/	\$0.00	=	N/A yrs
Simple Payback: Green				
\$1,483.50	/	\$71.52	=	20.7 yrs
Incremental Payback: Conventional to Green				
\$103.50	/	\$71.52	=	1.4 yrs

Additional Notes:	
¹ The U-Factors were derived from the 2001 ASHRAE Fundamentals Handbook, based on the specifications in the plan	

Simple Payback Analysis

EWCM #6 Replace Windows

Replacement Costs		Type	Cost
A. Proposed Conventional:		Wood Framed, Double Pane	\$50,765.00
B. Proposed Green:		Insulated Fiberglass Models	\$54,573.00
C. Incremental Cost Between Proposed Conventional and Proposed Green:			\$3,808.00

U-Factor ¹			
A. Existing:			0.55
B. Conventional:			0.55
C. Green:			0.33

Annual Savings: Existing to Conventional					
					0 BTUs
					0.00 gallons
Savings =	\$2.98	x	0.00	=	\$0.00/yr

Annual Savings: Conventional to Green					
					24,534,400 BTUs
					176.00 gallons
Savings =	\$2.98	x	176.00	=	\$524.48/yr

Annual Savings: Existing to Green					
					24,534,400 BTUs
					176.00 gallons
Savings =	\$2.98	+	\$524.48	=	\$527.46/yr

Simple Payback: Conventional					
	\$50,765.00	/	\$0.00	=	N/A yrs
Simple Payback: Green					
	\$54,573.00	/	\$527.46	=	103.5 yrs
Incremental Payback: Conventional to Green					
	\$3,808.00	/	\$524.48	=	7.3 yrs

Additional Notes:

1 The U-factors were derived from the 2001 ASHRAE Fundamentals Handbook, based on the specifications in the plan

Simple Payback Analysis

EWCM #7 Add Roof Insulation

Replacement Costs		Type	Cost
A. Proposed Conventional:		Maintain Existing	\$ 57,333.00
B. Proposed Green:		Install Additional Roof Insulation (XPS)	\$ 74,195.00
C. Incremental Cost Between Proposed Conventional and Proposed Green:			\$ 16,862.00

Existing Conditions			
A. Roof area:		6,745	sf
B. Type of existing roof structure:		Flat	
C. Utility Cost:	Oil	\$2.98	/gallon
D. Existing Heating Efficiency:		84%	

R-Value		
A. Existing:		R-25
B. Conventional:		R-25
C. Proposed Green:		R-38

Annual Savings: Existing to Conventional			
			0 BTUs
			0.00 gallons
Savings =	\$2.98	x	0.00 = \$0.00 /yr

Annual Savings: Conventional to Green			
			22,582,800 BTUs
			162.00 gallons
Savings =	\$2.98	x	162.00 = \$482.76 /yr

Annual Savings: Existing to Green			
			22,582,800 BTUs
			162.00 gallons
Savings =	\$0.00	x	\$482.76 = \$482.76 /yr

Simple Payback: Conventional					
	\$57,333.00	/	\$0.00	=	N/A yrs
Simple Payback: Green					
	\$74,195.00	/	\$482.76	=	153.7 yrs
Incremental Payback: Conventional to Green					
	\$16,862.00	/	\$482.76	=	34.9 yrs

Simple Payback Analysis

EWCM #8 Convert Lighting - Common Area

Replacement Costs

A. Total cost to convert flourescent lamps to LED and add occupancy sensors:

\$13,590.00

Utility Cost

Electricity: \$0.16

Oil: \$2.98

Existing Types / Usage

	Description	Wattage per Fixture	Number of Fixtures	Lighting Hours/Day	Usage Days/Year	Usage kWh/Year	Usage \$/Year
Type 1:	2ft T8 Fluorescent Lamps	34	41	24	365	12,211	\$1,944.11
Type 2:	4ft T8 Fluorescent Lamps	68	42	8	365	8,340	\$1,327.69
Type 3:	4ft T8 Fluorescent Lamps	68	22	0.75	365	410	\$65.20
Type 4:						0	\$0.00
Type 5:						0	\$0.00
Total:					20,960	\$3,337.00	

Proposed Green Types / Usage

	Description	Wattage per Fixture	Number of Fixtures	Lighting Hours/Day	Usage Days/Year	Usage kWh/Year	Usage \$/Year
Type 1:	2ft T8 LED Lamps	20	41	24	365	7,183	\$1,143.60
Type 2:	4ft T8 LED Lamps	30	42	7	365	3,219	\$512.53
Type 3:	4ft T8 LED Lamps	30	22	0.25	365	60	\$9.59
Type 4:						0	\$0.00
Type 5:						0	\$0.00
Total:					10,463	\$1,665.71	

Annual Electric Savings

35,818,374 BTUs

10,497.77 kWh

Savings = 10,497.77 x \$0.16 = \$1,671.29/yr

Annual Oil Savings¹

-1,672,800 BTUs

-12.00 gallons

Savings = -12.00 x \$2.98 = -\$35.76/yr

Annual Net Cost Savings

\$1,671.29 + -\$35.76 = \$1,635.53

5. Simple Payback

\$13,590.00 / \$1,635.53 = 8.31 yrs

Additional Notes/Comments:

¹Negative Oil savings attributed to decrease in heating gain from the reduced lighting load (wattage); therefore, additional Oil required for space heating in these areas.

Simple Payback Analysis

EWCM #9 Replace Washing Machines

1. Replacement Costs

A. Proposed Conventional	\$1,300.00
B. Proposed Green	\$1,397.50
C. Incremental Cost Between Proposed Conventional and Proposed Green	\$97.50

2. Existing Conditions

A. Total number of inefficient washing machines	2
B. Estimated number of total annual cycles/washer ¹	2080

3. Annual Energy and Water Use Existing Models

	Annual energy use ²		Utility cost		Total annual cost
Oil (gallons):	88.60	x	\$2.98	=	\$264.03
Electric (kWh):	5780	x	\$0.16	=	\$920.20
Water/Sewer (gal):	99,944.00	x	\$0.01	=	\$849.50
					3
					\$2,033.73

4. Annual Energy and Water Use Proposed Conventional Models

	Annual energy use ²		Utility cost		Total annual cost
Oil (gallons):	88.60	x	\$2.98	=	\$264.03
Electric (kWh):	5780.00	x	\$0.16	=	\$920.20
Water/Sewer (gal):	99,944.00	x	\$0.0085	=	\$849.50
					4
					\$2,033.73

5. Annual Energy and Water Use Proposed Green Models

	Annual energy use ²		Utility cost		Total annual cost
Oil (gallons):	44.00	x	\$2.98	=	\$131.12
Electric (kWh):	2434.00	x	\$0.16	=	\$387.50
Water/Sewer (gal):	38,688.00	x	\$0.0085	=	\$328.84
					5
					\$847.46

6. Annual Savings: Existing to Proposed Conventional

3		4		6	
\$2,033.73	-	\$2,033.73	=	\$0.00	/yr

7. Annual Savings: Proposed Conventional to Proposed Green

4		5		7	
\$2,033.73	-	\$847.46	=	\$1,186.27	/yr

8. Annual Oil Savings²

Cost/therm	x	gallons	=	\$0.00	/yr
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9. Simple Payback: Existing to Proposed Green

\$1,397.50	/	(\$0.00 + \$1,186.27)	=	N/A	yrs
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Incremental Payback: Proposed Conventional to Proposed Green

\$97.50	/	\$1,186.27	=	N/A	yrs
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Additional Notes/Comments:

¹ This worksheet assumes that on average, residents use the washing machines 1-2 times per week (≈2080 loads per year, or 1,040 loads per machine)

² Negative Oil savings attributed to decrease in heating gain from the reduced washing machine energy use; therefore, additional Oil required for space heating in these areas.

Costs are not carried for washing machine replacement, since the laundry equipment is maintained under the terms of a leasing agreement; the efficacy of this measure depends on the availability of Energy Star rated equipment from the lessor.

Simple Payback Analysis

EWCM #10 Replace Toilets - Common Area

Replacement Costs

A. Proposed Conventional	\$10,660.00
B. Proposed Green	\$11,459.50
C. Incremental Cost Between Proposed Conventional and Proposed Green	\$799.50

Existing Conditions

A. Total number of existing toilets	26	
B. Average gallons per flush:	1.6	
C. Estimated total number of flushes per day:	6.0	
D. Estimated total daily usage per toilet:	10	gal/day
E. Estimated number of days per year facility in use:	365	
F. Cost of water and sewer:	\$0.0085	(\$/gal)

Proposed Conditions: Conventional Models

A. Total number of toilets	26	
B. Average gallons per flush:	1.6	
C. Estimated total number of flushes per day	6.0	
D. Estimated total daily usage per toilet:	10	gal/day
E. Estimated number of days per year facility in use:	365	
F. Cost of water and sewer:	\$0.0085	(\$/gal)

Proposed Conditions: Green Models

A. Total number of toilets	26	
B. Average gallons per flush:	1.28	
C. Estimated total number of flushes per day	6.0	
D. Estimated total daily usage per toilet:	8	gal/day
E. Estimated number of days per year facility in use:	365	
F. Cost of water and sewer:	\$0.0085	(\$/gal)

Annual Water Use: Existing Models

$$26 \times 10 \times 365 = 91,104 \text{ gal/yr}$$

Annual Water Use: Proposed Conventional Models

$$26 \times 10 \times 365 = 91,104 \text{ gal/yr}$$

Annual Water Use: Proposed Green Models

$$26 \times 8 \times 365 = 72,883 \text{ gal/yr}$$

Annual Savings: Existing to Proposed Conventional Models

$$91,104 - 91,104 \times \$0.01 = \$0.00 \text{ \$/yr}$$

Annual Savings: Proposed Conventional to Proposed Green Models

$$91,104 - 72,883 \times \$0.01 = \$154.87 \text{ \$/yr}$$

Annual Savings: Existing to Proposed Green Models

$$\$0.00 + \$154.87 = \$154.87 \text{ \$/yr}$$

Simple Payback: Conventional

$$\frac{\$10,660.00}{\$0.00} = \text{N/A} \text{ yrs}$$

Simple Payback: Green

$$\frac{\$11,459.50}{\$154.87} = 73.99 \text{ yrs}$$

Incremental Payback: Proposed Conventional to Proposed Green Models

$$\frac{\$799.50}{\$0.00} = \text{\#DIV/0!} \text{ yrs}$$

Simple Payback Analysis

EWCM #11 Replace Showerheads - Dwelling Units

Installation Costs

Costs to install low-flow (1.7 gpm) showerheads: \$536.50

Utility Costs

Water & Sewer: \$0.0085
Oil: \$2.98

Existing Conditions

A. Number of showerheads 26
B. Number of showers per day per showerhead 1
C. Average number of minutes per shower 14.00
D. Showerhead flowrate 2.00

Proposed Green Conditions

A. Number of showerheads 26
B. Number of showers per day per showerhead 1
C. Average number of minutes per shower 14.00
D. Showerhead flowrate 1.70

Annual Usage: Existing

Water & Sewer

365 x 26 x 1 x 14 x 2.00

Total Domestic Cold Water Usage: 265,720 gal / Year

Oil

Total Domestic Hot Water Usage¹: 212,576 gal / Year

212576.00 x 65 x 8.335 = 115,168,362 btus / Year²
115168362.40 / 139,400 = 826.17 gallons / Year

Annual Usage: Proposed Green

Water & Sewer

365 x 26 x 1 x 14 x 1.70

Total Domestic Cold Water Usage = 225,862 gal / Year

Oil

Total Domestic Hot Water Usage¹ = 180,690 gal / Year

180,690 x 70 x 8.335 = 105,423,347 btus / Year²
105,423,347 / 139,400 = 756.27 gallons / Year

Annual Savings: Existing to Proposed Green

Water & Sewer: 265,720.00 - 225,862.00 = 39,858.00 gal / Year

\$0.0085 x 39,858.00 = \$338.78 \$ / Year

Oil: 826.17 - 756.27 = 69.91 gallons / Year

\$2.98 x 69.91 = \$208.32 \$ / Year

Simple Payback: Green

\$536.50 / (\$338.78 + \$208.32) = 0.98 yrs

Additional Notes/Comments:

¹Total domestic hot water usage represents 80% of domestic cold water usage for showers (20% cold water and 80% hot water to reach 110° desired water temperature).

²btus per year calculated from the following values:

A: 65 = Temperature increase between cold water (55°) and hot water delivery (120°)

B: 8.335 = Energy (in btus/gal) to heat domestic hot water per degree Fahrenheit

Life Cycle Cost Analysis

Energy and Water Conservation Measure (EWCM): # 1

Convert Lighting - Exterior

In-Kind Replacement

vs.

Install LED Fixtures

(Conventional Product)

(Green Product)

STEP ONE: PRODUCT COMPARISON

Calculated Life Cycle Term 20

Conventional Product:

In-Kind Replacement

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
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Life Cycle Costs

Install/Replace	Parking Area Lighting	8	ea	\$2,570.00	\$20,560	20	1	1.0	\$20,560	\$20,560
Install/Replace	HID Wallpacks	8	ea	\$465.00	\$3,720	20	1	1.0	\$3,720	\$3,720
Install/Replace	Lamps	16	ea	\$45.00	\$720	4	1	5.0	\$4,624	\$2,553
Utility Cost	Electricity	8,760	kWh	\$0.16	\$1,395	1	1	20.0	\$37,474	\$18,451

Total Life Cycle Cost \$66,379 \$45,284

Energy Savings

Net Life Cycle Cost after Energy Savings									\$66,379	\$45,284

Green Product:

Install LED Fixtures

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
--------	-------------	----------	------	-----------	------------	-----	------------	--------	----------	------------

Life Cycle Costs

Install/Replace	Parking Area Lighting	8	ea	\$2,762.75	\$22,102	20	1	1.0	\$22,102	\$22,102
Install/Replace	HID Wallpacks	8	ea	\$499.88	\$3,999	20	1	1.0	\$3,999	\$3,999
Utility Cost	Electricity	2,067	kWh	\$0.16	\$329	1	1	20.0	\$8,842	\$4,354

Total Life Cycle Cost \$34,943 \$30,455

Energy Savings

Net Life Cycle Cost after Energy Savings									\$34,943	\$30,455

ECONOMIC RETURN ANALYSIS

Green NPV	\$14,830
Green IRR	3099.4%

PRODUCT RECOMMENDATION

Recommendation based on Economic Return Analysis

Green Product: Install LED Fixtures

Override with Green Product? No

Final Product Choice

Green Product: Install LED Fixtures

Notes:

1. Analysis performed using a discount rate of 8.00% and an inflation rate of 3.00% for both expenses and energy costs.
2. Green NPV and Green IRR are relative measures comparing Green vs. Conventional implementation.

Energy and Water Conservation Measure (EWCM): # 1 Convert Lighting - Exterior

STEP TWO: REPLACEMENT TIMING

Remaining Useful Life of Existing Product

0

Final Product Choice

Green Product:

Install LED Fixtures

Immediate Replacement

									Cost over Life Cycle (EUL)	
Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
Install/Replace	Parking Area Lighting	8	ea	\$2,762.75	\$22,102	20	1	1.0	\$22,102	\$22,102
Install/Replace	HID Wallpacks	8	ea	\$499.88	\$3,999	20	1	1.0	\$3,999	\$3,999
Utility Cost	Electricity	2,067	kWh	\$0.16	\$329	1	1	20.0	\$8,842	\$4,354
Total Life Cycle Cost									\$34,943	\$30,455
<i>Energy Savings</i>										
Net Life Cycle Cost after Energy Savings									\$34,943	\$30,455

ECONOMIC RETURN ANALYSIS

Timing NPV	n/a
Timing IRR	n/a

TIMING RECOMMENDATION

Replacement Year: 1

Notes:

1. Analysis performed using a discount rate of 8.00% and an inflation rate of 3.00% for both expenses and energy costs.
2. Timing NPV and Timing IRR are relative measures comparing Immediate Replacement vs. Replacement at End of Remaining Useful Life.

Life Cycle Cost Analysis

Energy and Water Conservation Measure (EWCM): 2 & 4

Replace Heating & Domestic Hot Water System

In-Kind Replacement

vs.

Install Air Source Heatpumps

(Conventional Product)

(Green Product)

STEP ONE: PRODUCT COMPARISON

Calculated Life Cycle Term 25

Conventional Product:

In-Kind Replacement

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
--------	-------------	----------	------	-----------	------------	-----	------------	--------	----------	------------

Life Cycle Costs

Install/Replace	Oil-Fired Boilers	2	ea	\$12,418.00	\$24,836	25	1	1.0	\$24,836	\$24,836
Maintain	Boiler Service	2	ea	\$850.00	\$1,700	10	10	1.6	\$3,817	\$1,582
Install/Replace	Storage Tanks	2	ea	\$4,900.00	\$9,800	15	1	1.7	\$18,428	\$13,566
Utility Cost	DHW and Heating Oil	11,251	gal	\$2.98	\$33,527	1	1	25.0	\$1,222,383	\$502,785

Total Life Cycle Cost \$1,269,463 \$542,769

Energy Savings

Net Life Cycle Cost after Energy Savings									\$1,269,463	\$542,769

Green Product:

Install Air Source Heatpumps

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
--------	-------------	----------	------	-----------	------------	-----	------------	--------	----------	------------

Life Cycle Costs

Install/Replace	Air Source Heatpumps	1	ls	\$91,000.00	\$91,000	15	1	1.7	\$171,114	\$125,969
Install/Replace	Storage Tanks	2	ea	\$4,900.00	\$9,800	15	1	1.7	\$18,428	\$13,566
Install/Replace	Dedicated Boiler	1	ea	\$10,000.00	\$10,000	25	1	1.0	\$10,000	\$10,000
Utility Cost	DHW and Heating Oil	3,632	gal	\$2.98	\$10,823	1	1	25.0	\$394,587	\$162,300

Total Life Cycle Cost \$594,128 \$311,835

Energy Savings

Net Life Cycle Cost after Energy Savings									\$594,128	\$311,835

ECONOMIC RETURN ANALYSIS

Green NPV	\$230,934
Green IRR	46.4%

PRODUCT RECOMMENDATION

Recommendation based on Economic Return Analysis

Green Product: Install Air Source Heatpumps

Override with Green Product? No

Final Product Choice

Green Product: Install Air Source Heatpumps

Notes:

1. Analysis performed using a discount rate of 8.00% and an inflation rate of 3.00% for both expenses and energy costs.
2. Green NPV and Green IRR are relative measures comparing Green vs. Conventional implementation.

Energy and Water Conservation Measure (EWCM): 2 & 4

Replace Heating & Domestic Hot Water System

STEP TWO: REPLACEMENT TIMING

Remaining Useful Life of Existing Product
Replacement Year

19
20

Final Product Choice

Green Product:

Install Air Source Heatpumps

Immediate Replacement

Year

1

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
Install/Replace	Air Source Heatpumps	1	ls	\$91,000.00	\$91,000	15	1	1.7	\$171,114	\$125,969
Install/Replace	Storage Tanks	2	ea	\$4,900.00	\$9,800	15	1	1.7	\$18,428	\$13,566
Install/Replace	Dedicated Boiler	1	ea	\$10,000.00	\$10,000	25	1	1.0	\$10,000	\$10,000
Utility Cost	DHW and Heating Oil	3,632	gal	\$2.98	\$10,823	1	1	25.0	\$394,587	\$162,300
Total Life Cycle Cost									\$594,128	\$311,835

Energy Savings

Net Life Cycle Cost after Energy Savings									\$594,128	\$311,835

Replacement at End of Remaining Useful Life

Year

20

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
Install/Replace	Air Source Heatpumps	1	ls	\$91,000.00	\$91,000	15	20	0.4	\$48,578	\$19,471
Install/Replace	Storage Tanks	2	ea	\$4,900.00	\$9,800	15	20	0.4	\$5,232	\$2,097
Install/Replace	Dedicated Boiler	1	ea	\$10,000.00	\$10,000	25	20	0.2	\$2,086	\$1,627
Utility Cost	DHW and Heating Oil	3,632	gal	\$2.98	\$10,823	1	20	6.0	\$122,755	\$23,512

Expenses for Current Product Through Useful Life

Utility Cost	Oil Usage	7,619	gal	\$2.98	\$22,705	1	1	19.0	\$570,271	\$291,159
Total Life Cycle Cost									\$748,921	\$337,866

Energy Savings

Net Life Cycle Cost after Energy Savings									\$748,921	\$337,866

ECONOMIC RETURN ANALYSIS

Timing NPV \$26,031
Timing IRR 11.38%

TIMING RECOMMENDATION

Replacement Year:

1

Notes:

1. Analysis performed using a discount rate of 8.00% and an inflation rate of 3.00% for both expenses and energy costs.
2. Timing NPV and Timing IRR are relative measures comparing Immediate Replacement vs. Replacement at End of Remaining Useful Life.

Life Cycle Cost Analysis

Energy and Water Conservation Measure (EWCM): # 3

Replace Pump Motors

In-Kind Replacements

vs.

High Eff. And Micro VFD Models

(Conventional Product)

(Green Product)

STEP ONE: PRODUCT COMPARISON

Calculated Life Cycle Term 20

Conventional Product:

In-Kind Replacements

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
--------	-------------	----------	------	-----------	------------	-----	------------	--------	----------	------------

Life Cycle Costs

Install/Replace	Two Horsepower Pumps	2	ea	\$4,300.00	\$8,600	20	1	1.0	\$8,600	\$8,600
Install/Replace	Fractional Horsepower	3	ea	\$582.50	\$1,748	15	1	1.3	\$2,427	\$2,132
Utility Cost	Electricity	10,034	kWh	\$0.16	\$1,597	1	1	20.0	\$42,924	\$21,134

Total Life Cycle Cost \$53,951 \$31,867

Energy Savings

Net Life Cycle Cost after Energy Savings									\$53,951	\$31,867

Green Product:

High Eff. And Micro VFD Models

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
--------	-------------	----------	------	-----------	------------	-----	------------	--------	----------	------------

Life Cycle Costs

Install/Replace	Two Horsepower Pumps	2	ea	\$4,623.00	\$9,246	20	1	1.0	\$9,246	\$9,246
Install/Replace	Micro VFD's	3	ea	\$626.19	\$1,879	15	1	1.3	\$2,609	\$2,292
Utility Cost	Electricity	9,026	kWh	\$0.16	\$1,437	1	1	20.0	\$38,612	\$19,011

Total Life Cycle Cost \$50,467 \$30,550

Energy Savings

Net Life Cycle Cost after Energy Savings									\$50,467	\$30,550

ECONOMIC RETURN ANALYSIS

Green NPV	\$1,317
Green IRR	29.3%

PRODUCT RECOMMENDATION

Recommendation based on Economic Return Analysis

Green Product: High Eff. And Micro VFD Models

Override with Green Product? No

Final Product Choice

Green Product: High Eff. And Micro VFD Models

Notes:

1. Analysis performed using a discount rate of 8.00% and an inflation rate of 3.00% for both expenses and energy costs.
2. Green NPV and Green IRR are relative measures comparing Green vs. Conventional implementation.

Energy and Water Conservation Measure (EWCM): # 3

Replace Pump Motors

STEP TWO: REPLACEMENT TIMING

Remaining Useful Life of Existing Product
Replacement Year

10

11

Final Product Choice

Green Product:

High Eff. And Micro VFD Models

Immediate Replacement

Year

1

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
Install/Replace	Two Horsepower Pumps	2	ea	\$4,623.00	\$9,246	20	1	1.0	\$9,246	\$9,246
Install/Replace	Micro VFD's	3	ea	\$626.19	\$1,879	15	1	1.3	\$2,609	\$2,292
Utility Cost	Electricity	9,026	kWh	\$0.16	\$1,437	1	1	20.0	\$38,612	\$19,011
Total Life Cycle Cost									\$50,467	\$30,550

Energy Savings

Net Life Cycle Cost after Energy Savings									\$50,467	\$30,550

Replacement at End of Remaining Useful Life

Year

11

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
Install/Replace	Two Horsepower Pumps	2	ea	\$4,623.00	\$9,246	20	11	0.5	\$4,319	\$3,877
Install/Replace	Micro VFD's	3	ea	\$626.19	\$1,879	15	11	0.7	\$1,427	\$915
Utility Cost	Electricity	9,026	kWh	\$0.16	\$1,437	1	11	10.0	\$22,139	\$7,294

Expenses for Current Product Through Useful Life

Total Life Cycle Cost									\$27,885	\$12,086

Energy Savings

Net Life Cycle Cost after Energy Savings									\$27,885	\$12,086

ECONOMIC RETURN ANALYSIS

Timing NPV (\$18,463)
Timing IRR n/a

TIMING RECOMMENDATION

Replacement Year:

11

Notes:

1. Analysis performed using a discount rate of 8.00% and an inflation rate of 3.00% for both expenses and energy costs.
2. Timing NPV and Timing IRR are relative measures comparing Immediate Replacement vs. Replacement at End of Remaining Useful Life.

Life Cycle Cost Analysis

Energy and Water Conservation Measure (EWCM): # 5

Replace Exterior Glass Doors

Metal/Glass Door

vs.

Insulated Fiberglass, Double Pane

(Conventional Product)

(Green Product)

STEP ONE: PRODUCT COMPARISON

Calculated Life Cycle Term 35

Conventional Product: Metal/Glass Door

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
--------	-------------	----------	------	-----------	------------	-----	------------	--------	----------	------------

Life Cycle Costs

Install/Replace	Replace Existing Doors	1	ls	\$1,380.00	\$1,380	35	1	1.0	\$1,380	\$1,380

Total Life Cycle Cost \$1,380 \$1,380

Energy Savings

Net Life Cycle Cost after Energy Savings									\$1,380	\$1,380

Green Product: Insulated Fiberglass, Double Pane

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
--------	-------------	----------	------	-----------	------------	-----	------------	--------	----------	------------

Life Cycle Costs

Install/Replace	Install Insulated Fiberglass	1	ls	\$1,483.50	\$1,484	35	1	1.0	\$1,484	\$1,484

Total Life Cycle Cost \$1,484 \$1,484

Energy Savings

Utility Cost	Oil	24	gal	\$2.98	(\$72)	1	1	35.0	(\$4,324)	(\$1,251)
Net Life Cycle Cost after Energy Savings									(\$2,841)	\$233

ECONOMIC RETURN ANALYSIS

Green NPV	\$1,147
Green IRR	233.4%

PRODUCT RECOMMENDATION

Recommendation based on Economic Return Analysis

Green Product: Insulated Fiberglass, Double Pane

Override with Green Product? No

Final Product Choice

Green Product: Insulated Fiberglass, Double Pane

Notes:

1. Analysis performed using a discount rate of 8.00% and an inflation rate of 3.00% for both expenses and energy costs.
2. Green NPV and Green IRR are relative measures comparing Green vs. Conventional implementation.

Energy and Water Conservation Measure (EWCM): # 5 Replace Exterior Glass Doors

STEP TWO: REPLACEMENT TIMING

Remaining Useful Life of Existing Product
Replacement Year

14
15

Final Product Choice

Green Product: Insulated Fiberglass, Double Pane

Immediate Replacement

Year

1

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
Install/Replace	Install Insulated Fiberglass	1	ls	\$1,483.50	\$1,484	35	1	1.0	\$1,484	\$1,484
Total Life Cycle Cost									\$1,484	\$1,484

Energy Savings

Utility Cost	Oil	24	gal	\$2.98	(\$72)	1	1	35.0	(\$4,324)	(\$1,251)
Net Life Cycle Cost after Energy Savings									(\$2,841)	\$233

Replacement at End of Remaining Useful Life

Year

15

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
Install/Replace	Install Insulated Fiberglass	1	ls	\$1,483.50	\$1,484	35	15	0.6	\$623	\$646

Expenses for Current Product Through Useful Life

Total Life Cycle Cost									\$623	\$646

Energy Savings

Utility Cost	Oil	24	gal	\$2.98	(\$72)	1	15	21.0	(\$3,102)	(\$502)
Net Life Cycle Cost after Energy Savings									(\$2,479)	\$144

ECONOMIC RETURN ANALYSIS

Timing NPV (\$89)
Timing IRR 7.14%

TIMING RECOMMENDATION

Replacement Year: 15

Notes:

1. Analysis performed using a discount rate of 8.00% and an inflation rate of 3.00% for both expenses and energy costs.
2. Timing NPV and Timing IRR are relative measures comparing Immediate Replacement vs. Replacement at End of Remaining Useful Life.

Life Cycle Cost Analysis

Energy and Water Conservation Measure (EWCN): # 6

Replace Windows

Wood Framed, Double Glazed

vs.

Fiberglass, Double Glazed w/ Argon

(Conventional Product)

(Green Product)

STEP ONE: PRODUCT COMPARISON

Calculated Life Cycle Term 30

Conventional Product:

Wood Framed, Double Glazed

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
--------	-------------	----------	------	-----------	------------	-----	------------	--------	----------	------------

Life Cycle Costs

Install/Replace	Replace Existing	1	ls	\$50,765.00	\$50,765	30	1	1.0	\$50,765	\$50,765

Total Life Cycle Cost \$50,765 \$50,765

Energy Savings

Net Life Cycle Cost after Energy Savings									\$50,765	\$50,765

Green Product:

Fiberglass, Double Glazed w/ Argon

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
--------	-------------	----------	------	-----------	------------	-----	------------	--------	----------	------------

Life Cycle Costs

Install/Replace	High Eff. Models	1	ls	\$54,573.00	\$54,573	30	1	1.0	\$54,573	\$54,573

Total Life Cycle Cost \$54,573 \$54,573

Energy Savings

Utility Cost	Oil	176	gal	\$2.98	(\$524)	1	1	30.0	(\$24,952)	(\$8,596)
Net Life Cycle Cost after Energy Savings									\$29,621	\$45,977

ECONOMIC RETURN ANALYSIS

Green NPV	\$4,788
Green IRR	19.2%

PRODUCT RECOMMENDATION

Recommendation based on Economic Return Analysis

Green Product: Fiberglass, Double Glazed w/ Argon

Override with Green Product? No

Final Product Choice

Green Product: Fiberglass, Double Glazed w/ Argon

Notes:

1. Analysis performed using a discount rate of 8.00% and an inflation rate of 3.00% for both expenses and energy costs.
2. Green NPV and Green IRR are relative measures comparing Green vs. Conventional implementation.

Energy and Water Conservation Measure (EWCM): # 6 Replace Windows

STEP TWO: REPLACEMENT TIMING

Remaining Useful Life of Existing Product

Final Product Choice

Green Product: Fiberglass, Double Glazed w/ Argon

Immediate Replacement

									Cost over Life Cycle (EUL)	
Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
Install/Replace	High Eff. Models	1	ls	\$54,573.00	\$54,573	30	1	1.0	\$54,573	\$54,573
Total Life Cycle Cost									\$54,573	\$54,573
Energy Savings										
Utility Cost	Oil	176	gal	\$2.98	(\$524)	1	1	30.0	(\$24,952)	(\$8,596)
Net Life Cycle Cost after Energy Savings									\$29,621	\$45,977

ECONOMIC RETURN ANALYSIS

Timing NPV	n/a
Timing IRR	n/a

TIMING RECOMMENDATION

Replacement Year: 1

Notes:

1. Analysis performed using a discount rate of 8.00% and an inflation rate of 3.00% for both expenses and energy costs.
2. Timing NPV and Timing IRR are relative measures comparing Immediate Replacement vs. Replacement at End of Remaining Useful Life.

Life Cycle Cost Analysis

Energy and Water Conservation Measure (EWCM): # 7

Roof Insulation

Maintain Existing

(Conventional Product)

vs.

Add XPS During Roof Replacement

(Green Product)

STEP ONE: PRODUCT COMPARISON

Calculated Life Cycle Term 20

Conventional Product:

Maintain Existing

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
--------	-------------	----------	------	-----------	------------	-----	------------	--------	----------	------------

Life Cycle Costs

Install/Replace	Rubber membrane roof	6,745	sf	\$8.50	\$57,333	20	1	1.0	\$57,333	\$57,333

Total Life Cycle Cost \$57,333 \$57,333

Energy Savings

Net Life Cycle Cost after Energy Savings									\$57,333	\$57,333

Green Product:

Add XPS During Roof Replacement

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
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Life Cycle Costs

Install/Replace	Rubber membrane roof	6,745	sf	\$8.50	\$57,333	20	1	1.0	\$57,333	\$57,333
Install/Replace	3-Inches XPS	6,745	sf	\$2.50	\$16,863	20	1	1.0	\$16,863	\$16,863

Total Life Cycle Cost \$74,195 \$74,195

Energy Savings

Utility Cost	Oil	162	gal	\$2.98	(\$483)	1	1	20.0	(\$12,972)	(\$6,387)
Net Life Cycle Cost after Energy Savings									\$61,223	\$67,808

ECONOMIC RETURN ANALYSIS

Green NPV	(\$10,476)
Green IRR	(2.4%)

PRODUCT RECOMMENDATION

Recommendation based on Economic Return Analysis

Conventional Product: Maintain Existing

Override with Green Product? No

Final Product Choice

Conventional Product: Maintain Existing

Notes:

1. Analysis performed using a discount rate of 8.00% and an inflation rate of 3.00% for both expenses and energy costs.
2. Green NPV and Green IRR are relative measures comparing Green vs. Conventional implementation.

Energy and Water Conservation Measure (EWCM): # 7 Roof Insulation

STEP TWO: REPLACEMENT TIMING

Remaining Useful Life of Existing Product	14
Replacement Year	15

Final Product Choice	
Conventional Product:	Maintain Existing

Immediate Replacement				Year	1						Cost over Life Cycle (EUL)	
Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted		
Install/Replace	Rubber membrane roof	6,745	sf	\$8.50	\$57,333	20	1	1.0	\$57,333	\$57,333		
Total Life Cycle Cost										\$57,333	\$57,333	
<i>Energy Savings</i>												
Net Life Cycle Cost after Energy Savings										\$57,333	\$57,333	

Replacement at End of Remaining Useful Life				Year	15							
Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted		
Install/Replace	Rubber membrane roof	6,745	sf	\$8.50	\$57,333	20	15	0.3	\$16,348	\$13,219		
Total Life Cycle Cost										\$16,348	\$13,219	
<i>Expenses for Current Product Through Useful Life</i>												
Total Life Cycle Cost										\$16,348	\$13,219	
<i>Energy Savings</i>												
Net Life Cycle Cost after Energy Savings										\$16,348	\$13,219	

ECONOMIC RETURN ANALYSIS

Timing NPV	(\$44,114)
Timing IRR	n/a

TIMING RECOMMENDATION

Replacement Year:	15
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Notes:

1. Analysis performed using a discount rate of 8.00% and an inflation rate of 3.00% for both expenses and energy costs.
2. Timing NPV and Timing IRR are relative measures comparing Immediate Replacement vs. Replacement at End of Remaining Useful Life.

Life Cycle Cost Analysis

Energy and Water Conservation Measure (EWCM): # 8

Convert Lighting - Common Area

Maintain Existing

(Conventional Product)

vs.

Install LED and Occ. Sensors

(Green Product)

STEP ONE: PRODUCT COMPARISON

Calculated Life Cycle Term 20

Conventional Product:

Maintain Existing

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
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Life Cycle Costs

Install/Replace	Fluorescent Lamps	210	ea	\$8.50	\$1,785	6	1	3.3	\$7,414	\$4,416
Utility Cost	Electricity	20,960	kWh	\$0.16	\$3,337	1	1	20.0	\$89,664	\$44,148

Total Life Cycle Cost \$97,078 \$48,563

Energy Savings

Net Life Cycle Cost after Energy Savings									\$97,078	\$48,563

Green Product:

Install LED and Occ. Sensors

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
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Life Cycle Costs

Install/Replace	LED Lamps	210	ea	\$60.00	\$12,600	20	1	1.0	\$12,600	\$12,600
Install/Replace	Occupancy Sensors	18	ea	\$55.00	\$990	20	1	1.0	\$990	\$990
Utility Cost	Electricity	10,463	kWh	\$0.16	\$1,666	1	1	20.0	\$44,759	\$22,038

Total Life Cycle Cost \$58,349 \$35,628

Energy Savings

Net Life Cycle Cost after Energy Savings									\$58,349	\$35,628

ECONOMIC RETURN ANALYSIS

Green NPV	\$12,935
Green IRR	20.9%

PRODUCT RECOMMENDATION

Recommendation based on Economic Return Analysis

Green Product: Install LED and Occ. Sensors

Override with Green Product? No

Final Product Choice

Green Product: Install LED and Occ. Sensors

Notes:

1. Analysis performed using a discount rate of 8.00% and an inflation rate of 3.00% for both expenses and energy costs.
2. Green NPV and Green IRR are relative measures comparing Green vs. Conventional implementation.

Energy and Water Conservation Measure (EWCM): # 8

Convert Lighting - Common Area

STEP TWO: REPLACEMENT TIMING

Remaining Useful Life of Existing Product

Final Product Choice

Green Product:

Install LED and Occ. Sensors

Immediate Replacement

									Cost over Life Cycle (EUL)	
Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
Install/Replace	LED Lamps	210	ea	\$60.00	\$12,600	20	1	1.0	\$12,600	\$12,600
Install/Replace	Occupancy Sensors	18	ea	\$55.00	\$990	20	1	1.0	\$990	\$990
Utility Cost	Electricity	10,463	kWh	\$0.16	\$1,666	1	1	20.0	\$44,759	\$22,038
Total Life Cycle Cost									\$58,349	\$35,628
Energy Savings										
Net Life Cycle Cost after Energy Savings									\$58,349	\$35,628

ECONOMIC RETURN ANALYSIS

Timing NPV	n/a
Timing IRR	n/a

TIMING RECOMMENDATION

Replacement Year:	1
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Notes:

1. Analysis performed using a discount rate of 8.00% and an inflation rate of 3.00% for both expenses and energy costs.
2. Timing NPV and Timing IRR are relative measures comparing Immediate Replacement vs. Replacement at End of Remaining Useful Life.

Life Cycle Cost Analysis

Energy and Water Conservation Measure (EWCM): # 9

Replaces Washing Machines

In-kind Replacement

vs.

Energy Star Replacements

(Conventional Product)

(Green Product)

STEP ONE: PRODUCT COMPARISON

Calculated Life Cycle Term 12

Conventional Product:

In-kind Replacement

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
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Life Cycle Costs

Install/Replace	In-Kind Replacement	2	ea	\$650.00	\$1,300	12	1	1.0	\$1,300	\$1,300
Utility Cost	Oil	89	gal	\$2.98	\$264	1	1	12.0	\$3,747	\$2,474
Utility Cost	Electricity	5,780	kWh	\$0.16	\$920	1	1	12.0	\$13,060	\$8,623
Utility Cost	Water	99,944	gal	\$0.01	\$850	1	1	12.0	\$12,056	\$7,960

Total Life Cycle Cost \$30,163 \$20,357

Energy Savings

Net Life Cycle Cost after Energy Savings									\$30,163	\$20,357

Green Product:

Energy Star Replacements

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
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Life Cycle Costs

Install/Replace	Energy Star Replacement	2	ea	\$698.75	\$1,398	12	1	1.0	\$1,398	\$1,398
Utility Cost	Oil	44	gal	\$2.98	\$131	1	1	12.0	\$1,861	\$1,229
Utility Cost	Electricity	2,434	kWh	\$0.16	\$388	1	1	12.0	\$5,499	\$3,631
Utility Cost	Water	38,688	gal	\$0.01	\$329	1	1	12.0	\$4,667	\$3,081

Total Life Cycle Cost \$13,425 \$9,338

Energy Savings

Net Life Cycle Cost after Energy Savings									\$13,425	\$9,338

ECONOMIC RETURN ANALYSIS

PRODUCT RECOMMENDATION

Recommendation based on Economic Return Analysis

Green Product: Energy Star Replacements

Override with Green Product? No

Final Product Choice

Green Product: Energy Star Replacements

Notes:

1. Analysis performed using a discount rate of 8.00% and an inflation rate of 3.00% for both expenses and energy costs.
2. Green NPV and Green IRR are relative measures comparing Green vs. Conventional implementation.

Energy and Water Conservation Measure (EWCM): # 9

Replaces Washing Machines

STEP TWO: REPLACEMENT TIMING

Remaining Useful Life of Existing Product
Replacement Year

1
2

Final Product Choice

Green Product:

Energy Star Replacements

Immediate Replacement

Year

1

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
Install/Replace	Energy Star Replacement	2	ea	\$698.75	\$1,398	12	1	1.0	\$1,398	\$1,398
Utility Cost	Oil	44	gal	\$2.98	\$131	1	1	12.0	\$1,861	\$1,229
Utility Cost	Electricity	2,434	kWh	\$0.16	\$388	1	1	12.0	\$5,499	\$3,631
Utility Cost	Water	38,688	gal	\$0.01	\$329	1	1	12.0	\$4,667	\$3,081
Total Life Cycle Cost									\$13,425	\$9,338

Energy Savings

Net Life Cycle Cost after Energy Savings									\$13,425	\$9,338

Replacement at End of Remaining Useful Life

Year

2

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
Install/Replace	Energy Star Replacement	2	ea	\$698.75	\$1,398	12	2	0.9	\$1,278	\$1,264
Utility Cost	Oil	44	gal	\$2.98	\$131	1	2	11.0	\$1,730	\$1,098
Utility Cost	Electricity	2,434	kWh	\$0.16	\$388	1	2	11.0	\$5,112	\$3,244
Utility Cost	Water	38,688	gal	\$0.01	\$329	1	2	11.0	\$4,338	\$2,752

Expenses for Current Product Through Useful Life

Total Life Cycle Cost									\$12,458	\$8,357

Energy Savings

Net Life Cycle Cost after Energy Savings									\$12,458	\$8,357

ECONOMIC RETURN ANALYSIS

Timing NPV (\$981)
Timing IRR n/a

TIMING RECOMMENDATION

Replacement Year:

2

Notes:

1. Analysis performed using a discount rate of 8.00% and an inflation rate of 3.00% for both expenses and energy costs.
2. Timing NPV and Timing IRR are relative measures comparing Immediate Replacement vs. Replacement at End of Remaining Useful Life.

Life Cycle Cost Analysis

Energy and Water Conservation Measure (EWCM): # 10

Replace Toilets

Maintain Existing

(Conventional Product)

vs.

Install 1.28gpf Models

(Green Product)

STEP ONE: PRODUCT COMPARISON

Calculated Life Cycle Term 25

Conventional Product:

Maintain Existing

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
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Life Cycle Costs

Maintain	maintian	26	ea	\$410.00	\$10,660	1	1	25.0	\$388,656	\$159,860
Utility Cost	Water	91,104	gal	\$0.01	\$774	1	1	25.0	\$28,233	\$11,613

Total Life Cycle Cost \$416,889 \$171,473

Energy Savings

Net Life Cycle Cost after Energy Savings									\$416,889	\$171,473

Green Product:

Install 1.28gpf Models

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
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Life Cycle Costs

Install/Replace	Install 1.28gpf Models	26	ea	\$440.75	\$11,460	25	1	1.0	\$11,460	\$11,460
Utility Cost	Water	72,883	gal	\$0.01	\$619	1	1	25.0	\$22,586	\$9,290

Total Life Cycle Cost \$34,046 \$20,750

Energy Savings

Net Life Cycle Cost after Energy Savings									\$34,046	\$20,750

ECONOMIC RETURN ANALYSIS

Green NPV	\$150,723
Green IRR	1731.0%

PRODUCT RECOMMENDATION

Recommendation based on Economic Return Analysis

Green Product: Install 1.28gpf Models

Override with Green Product? No

Final Product Choice

Green Product: Install 1.28gpf Models

Notes:

1. Analysis performed using a discount rate of 8.00% and an inflation rate of 3.00% for both expenses and energy costs.
2. Green NPV and Green IRR are relative measures comparing Green vs. Conventional implementation.

Energy and Water Conservation Measure (EWCN): # 10 Replace Toilets

STEP TWO: REPLACEMENT TIMING

Remaining Useful Life of Existing Product	19
Replacement Year	20

Final Product Choice	Install 1.28gpf Models
Green Product:	

Immediate Replacement				Year	1						Cost over Life Cycle (EUL)	
Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted		
Install/Replace	Install 1.28gpf Models	26	ea	\$440.75	\$11,460	25	1	1.0	\$11,460	\$11,460		
Utility Cost	Water	72,883	gal	\$0.01	\$619	1	1	25.0	\$22,586	\$9,290		
Total Life Cycle Cost										\$34,046	\$20,750	
<i>Energy Savings</i>												
Net Life Cycle Cost after Energy Savings										\$34,046	\$20,750	

Replacement at End of Remaining Useful Life				Year	20							
Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted		
Install/Replace	Install 1.28gpf Models	26	ea	\$440.75	\$11,460	25	20	0.2	\$2,390	\$1,864		
Utility Cost	Water	72,883	gal	\$0.01	\$619	1	20	6.0	\$7,026	\$1,346		
Total Life Cycle Cost										\$9,417	\$3,210	
<i>Expenses for Current Product Through Useful Life</i>												
Total Life Cycle Cost										\$9,417	\$3,210	
<i>Energy Savings</i>												
Net Life Cycle Cost after Energy Savings										\$9,417	\$3,210	

ECONOMIC RETURN ANALYSIS

Timing NPV	(\$17,539)
Timing IRR	n/a

TIMING RECOMMENDATION

Replacement Year:	20
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Notes:

1. Analysis performed using a discount rate of 8.00% and an inflation rate of 3.00% for both expenses and energy costs.
2. Timing NPV and Timing IRR are relative measures comparing Immediate Replacement vs. Replacement at End of Remaining Useful Life.

Life Cycle Cost Analysis

Energy and Water Conservation Measure (EWCM): # 11

Install Low Flow Showerheads

Maintain Existing

(Conventional Product)

vs.

Install 1.7gpm Models

(Green Product)

STEP ONE: PRODUCT COMPARISON

Calculated Life Cycle Term 1

Conventional Product:

Maintain Existing

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
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Life Cycle Costs

Maintain	Maintain	26	ea	\$0.00		1	1	1.0		
Utility Cost	Water	265,720	gal	\$0.01	\$2,259	1	1	1.0	\$2,259	\$2,259
Utility Cost	Oil	826	gal	\$2.98	\$2,462	1	1	1.0	\$2,462	\$2,462

Total Life Cycle Cost \$4,721 \$4,721

Energy Savings

Net Life Cycle Cost after Energy Savings									\$4,721	\$4,721

Green Product:

Install 1.7gpm Models

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
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Life Cycle Costs

Maintain	Maintain	26	ea	\$18.50	\$481	1	1	1.0	\$481	\$481
Utility Cost	Water	225,862	gal	\$0.01	\$1,920	1	1	1.0	\$1,920	\$1,920
Utility Cost	Oil	756	gal	\$2.98	\$2,254	1	1	1.0	\$2,254	\$2,254

Total Life Cycle Cost \$4,654 \$4,654

Energy Savings

Net Life Cycle Cost after Energy Savings									\$4,654	\$4,654

ECONOMIC RETURN ANALYSIS

Green NPV	\$66
Green IRR	n/a

PRODUCT RECOMMENDATION

Recommendation based on Economic Return Analysis

Green Product: Install 1.7gpm Models

Override with Green Product? No

Final Product Choice

Green Product: Install 1.7gpm Models

Notes:

1. Analysis performed using a discount rate of 8.00% and an inflation rate of 3.00% for both expenses and energy costs.
2. Green NPV and Green IRR are relative measures comparing Green vs. Conventional implementation.

Energy and Water Conservation Measure (EWCM): # 11

Install Low Flow Showerheads

STEP TWO: REPLACEMENT TIMING

Remaining Useful Life of Existing Product

0

Final Product Choice

Green Product:

Install 1.7gpm Models

Immediate Replacement

									Cost over Life Cycle (EUL)	
Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
Maintain	Maintain	26	ea	\$18.50	\$481	1	1	1.0	\$481	\$481
Utility Cost	Water	225,862	gal	\$0.01	\$1,920	1	1	1.0	\$1,920	\$1,920
Utility Cost	Oil	756	gal	\$2.98	\$2,254	1	1	1.0	\$2,254	\$2,254
Total Life Cycle Cost									\$4,654	\$4,654
<i>Energy Savings</i>										
Net Life Cycle Cost after Energy Savings									\$4,654	\$4,654

ECONOMIC RETURN ANALYSIS

Timing NPV	n/a
Timing IRR	n/a

TIMING RECOMMENDATION

Replacement Year:	1
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Notes:

1. Analysis performed using a discount rate of 8.00% and an inflation rate of 3.00% for both expenses and energy costs.
2. Timing NPV and Timing IRR are relative measures comparing Immediate Replacement vs. Replacement at End of Remaining Useful Life.

Life Cycle Cost Analysis

Green Measure (GM):

1

Pervious Pavers

Asphalt Material

vs.

Pervious Pavers

(Conventional Product)

(Green Product)

STEP ONE: PRODUCT COMPARISON

Calculated Life Cycle Term 31

Conventional Product:

Asphalt Material

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
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Life Cycle Costs

Install/Replace	Traditional Asphalt	12,434	sf	\$2.10	\$26,111	20	1	1.6	\$44,751	\$33,395

Total Life Cycle Cost \$44,751 \$33,395

Energy Savings

Net Life Cycle Cost after Energy Savings									\$44,751	\$33,395

Green Product:

Pervious Pavers

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
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Life Cycle Costs

Install/Replace	Pervious Pavers	12,434	sf	\$7.50	\$93,255	30	2	1.0	\$96,053	\$88,938

Total Life Cycle Cost \$96,053 \$88,938

Energy Savings

Net Life Cycle Cost after Energy Savings									\$96,053	\$88,938

ECONOMIC RETURN ANALYSIS

Green NPV	(\$55,542)
Green IRR	267.9%

PRODUCT RECOMMENDATION

Recommendation based on Economic Return Analysis

Conventional Product: Asphalt Material

Override with Green Product? No

Final Product Choice

Conventional Product: Asphalt Material

Notes:

1. Analysis performed using a discount rate of 8.00% and an inflation rate of 3.00% for both expenses and energy costs.
2. Green NPV and Green IRR are relative measures comparing Green vs. Conventional implementation.

Green Measure (GM):

1

Pervious Pavers

STEP TWO: REPLACEMENT TIMING

Remaining Useful Life of Existing Product
Replacement Year

2

3

Final Product Choice

Conventional Product:

Asphalt Material

Immediate Replacement

Year

1

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
Install/Replace	Traditional Asphalt	12,434	sf	\$2.10	\$26,111	20	1	1.6	\$44,751	\$33,395
Total Life Cycle Cost									\$44,751	\$33,395

Energy Savings

Net Life Cycle Cost after Energy Savings									\$44,751	\$33,395

Replacement at End of Remaining Useful Life

Year

3

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
Install/Replace	Traditional Asphalt	12,434	sf	\$2.10	\$26,111	20	3	1.5	\$42,875	\$29,488

Expenses for Current Product Through Useful Life

Total Life Cycle Cost									\$42,875	\$29,488

Energy Savings

Net Life Cycle Cost after Energy Savings									\$42,875	\$29,488

ECONOMIC RETURN ANALYSIS

Timing NPV (\$3,907)
Timing IRR n/a

TIMING RECOMMENDATION

Replacement Year: 3

Notes:

1. Analysis performed using a discount rate of 8.00% and an inflation rate of 3.00% for both expenses and energy costs.
2. Timing NPV and Timing IRR are relative measures comparing Immediate Replacement vs. Replacement at End of Remaining Useful Life.

Life Cycle Cost Analysis

Green Measure (GM):

2

Roof Covering

Composite Asphalt Shingle

vs.

Install Metal Tile

(Conventional Product)

(Green Product)

STEP ONE: PRODUCT COMPARISON

Calculated Life Cycle Term 50

Conventional Product:

Composite Asphalt Shingle

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
--------	-------------	----------	------	-----------	------------	-----	------------	--------	----------	------------

Life Cycle Costs

Install/Replace	Asphalt Composite Shingle	3,510	sf	\$4.00	\$14,040	20	1	2.5	\$55,318	\$20,901

Total Life Cycle Cost \$55,318 \$20,901

Energy Savings

Net Life Cycle Cost after Energy Savings									\$55,318	\$20,901

Green Product:

Install Metal Tile

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
--------	-------------	----------	------	-----------	------------	-----	------------	--------	----------	------------

Life Cycle Costs

Install/Replace	Metal Tile	3,510	sf	\$9.50	\$33,345	50	1	1.0	\$33,345	\$33,345

Total Life Cycle Cost \$33,345 \$33,345

Energy Savings

Net Life Cycle Cost after Energy Savings									\$33,345	\$33,345

ECONOMIC RETURN ANALYSIS

Green NPV	(\$12,444)
Green IRR	3.4%

PRODUCT RECOMMENDATION

Recommendation based on Economic Return Analysis

Conventional Product: Composite Asphalt Shingle

Override with Green Product? No

Final Product Choice

Conventional Product: Composite Asphalt Shingle

Notes:

1. Analysis performed using a discount rate of 8.00% and an inflation rate of 3.00% for both expenses and energy costs.
2. Green NPV and Green IRR are relative measures comparing Green vs. Conventional implementation.

Green Measure (GM):

2

Roof Covering

STEP TWO: REPLACEMENT TIMING

Remaining Useful Life of Existing Product
Replacement Year

14

15

Final Product Choice

Conventional Product:

Composite Asphalt Shingle

Immediate Replacement

Year

1

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
Install/Replace	Asphalt Composite Shingle	3,510	sf	\$4.00	\$14,040	20	1	2.5	\$55,318	\$20,901
Total Life Cycle Cost									\$55,318	\$20,901

Energy Savings

Net Life Cycle Cost after Energy Savings									\$55,318	\$20,901

Replacement at End of Remaining Useful Life

Year

15

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
Install/Replace	Asphalt Composite Shingle	3,510	sf	\$4.00	\$14,040	20	15	1.8	\$47,641	\$9,757

Expenses for Current Product Through Useful Life

Total Life Cycle Cost									\$47,641	\$9,757

Energy Savings

Net Life Cycle Cost after Energy Savings									\$47,641	\$9,757

ECONOMIC RETURN ANALYSIS

Timing NPV	(\$11,144)
Timing IRR	(2.38%)

TIMING RECOMMENDATION

Replacement Year:	15
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Notes:

1. Analysis performed using a discount rate of 8.00% and an inflation rate of 3.00% for both expenses and energy costs.
2. Timing NPV and Timing IRR are relative measures comparing Immediate Replacement vs. Replacement at End of Remaining Useful Life.

Life Cycle Cost Analysis

Green Measure (GM):

3

Install Linoleum Floors

Carpet

vs.

Linoleum

(Conventional Product)

(Green Product)

STEP ONE: PRODUCT COMPARISON

Calculated Life Cycle Term

25

Conventional Product:

Carpet

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
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Life Cycle Costs

Install/Replace	Hallways	2,153	sf	\$3.00	\$6,459	10	1	2.5	\$20,240	\$11,947
Install/Replace	Office and Community	948	sf	\$3.00	\$2,844	10	1	2.5	\$8,912	\$5,261

Total Life Cycle Cost

\$29,152

\$17,208

Energy Savings

Net Life Cycle Cost after Energy Savings									\$29,152	\$17,208

Green Product:

Linoleum

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
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Life Cycle Costs

Install/Replace	Hallways	2,153	sf	\$5.50	\$11,842	25	1	1.0	\$11,842	\$11,842
Install/Replace	Office and Community	948	sf	\$5.50	\$5,214	25	1	1.0	\$5,214	\$5,214

Total Life Cycle Cost

\$17,056

\$17,056

Energy Savings

Net Life Cycle Cost after Energy Savings									\$17,056	\$17,056

ECONOMIC RETURN ANALYSIS

Green NPV	\$152
Green IRR	8.2%

PRODUCT RECOMMENDATION

Recommendation based on Economic Return Analysis

Green Product: Linoleum

Override with Green Product? No

Final Product Choice

Green Product: Linoleum

Notes:

1. Analysis performed using a discount rate of 8.00% and an inflation rate of 3.00% for both expenses and energy costs.
2. Green NPV and Green IRR are relative measures comparing Green vs. Conventional implementation.

Green Measure (GM):

3

Install Linoleum Floors

STEP TWO: REPLACEMENT TIMING

Remaining Useful Life of Existing Product

Final Product Choice

Green Product:

Linoleum

Immediate Replacement

									Cost over Life Cycle (EUL)	
Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
Install/Replace	Hallways	2,153	sf	\$5.50	\$11,842	25	1	1.0	\$11,842	\$11,842
Install/Replace	Office and Community	948	sf	\$5.50	\$5,214	25	1	1.0	\$5,214	\$5,214
Total Life Cycle Cost									\$17,056	\$17,056
<i>Energy Savings</i>										
Net Life Cycle Cost after Energy Savings									\$17,056	\$17,056

ECONOMIC RETURN ANALYSIS

Timing NPV	n/a
Timing IRR	n/a

TIMING RECOMMENDATION

Replacement Year:

1

Notes:

1. Analysis performed using a discount rate of 8.00% and an inflation rate of 3.00% for both expenses and energy costs.
2. Timing NPV and Timing IRR are relative measures comparing Immediate Replacement vs. Replacement at End of Remaining Useful Life.

Life Cycle Cost Analysis

Green Measure (GM):

4

Install Linoleum

Vinyl Products

vs.

Linoleum

(Conventional Product)

(Green Product)

STEP ONE: PRODUCT COMPARISON

Calculated Life Cycle Term 25

Conventional Product:

Vinyl Products

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
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Life Cycle Costs

Install/Replace	Vinyl	1,301	sf	\$5.00	\$6,505	15	1	1.7	\$12,232	\$9,005

Total Life Cycle Cost \$12,232 \$9,005

Energy Savings

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Net Life Cycle Cost after Energy Savings \$12,232 \$9,005

Green Product:

Linoleum

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
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Life Cycle Costs

Install/Replace	Linoleum	1,301	sf	\$5.50	\$7,156	25	1	1.0	\$7,156	\$7,156

Total Life Cycle Cost \$7,156 \$7,156

Energy Savings

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Net Life Cycle Cost after Energy Savings \$7,156 \$7,156

ECONOMIC RETURN ANALYSIS

Green NPV	\$1,849
Green IRR	19.3%

PRODUCT RECOMMENDATION

Recommendation based on Economic Return Analysis

Green Product: Linoleum

Override with Green Product? No

Final Product Choice

Green Product: Linoleum

Notes:

1. Analysis performed using a discount rate of 8.00% and an inflation rate of 3.00% for both expenses and energy costs.
2. Green NPV and Green IRR are relative measures comparing Green vs. Conventional implementation.

Green Measure (GM):

4

Install Linoleum

STEP TWO: REPLACEMENT TIMING

Remaining Useful Life of Existing Product

Final Product Choice

Green Product:

Linoleum

Immediate Replacement

									Cost over Life Cycle (EUL)	
Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
Install/Replace	Linoleum	1,301	sf	\$5.50	\$7,156	25	1	1.0	\$7,156	\$7,156
Total Life Cycle Cost									\$7,156	\$7,156
<i>Energy Savings</i>										
Net Life Cycle Cost after Energy Savings									\$7,156	\$7,156

ECONOMIC RETURN ANALYSIS

Timing NPV	n/a
Timing IRR	n/a

TIMING RECOMMENDATION

Replacement Year:

1

Notes:

1. Analysis performed using a discount rate of 8.00% and an inflation rate of 3.00% for both expenses and energy costs.
2. Timing NPV and Timing IRR are relative measures comparing Immediate Replacement vs. Replacement at End of Remaining Useful Life.

Life Cycle Cost Analysis

Green Measure (GM):

5

Community Kitchen Cabinets

Laminated Particleboard Cabinets

vs.

Install FSC Certified Wood Cabinetry

(Conventional Product)

(Green Product)

STEP ONE: PRODUCT COMPARISON

Calculated Life Cycle Term 25

Conventional Product:

Laminated Particleboard Cabinets

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
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Life Cycle Costs

Install/Replace	Laminated Particleboard	1	ea	\$2,250.00	\$2,250	20	1	1.3	\$2,883	\$2,581
Install/Replace	Laminated Particleboard	1	ea	\$2,925.00	\$2,925	20	1	1.3	\$3,748	\$3,355

Total Life Cycle Cost \$6,632 \$5,936

Energy Savings

Net Life Cycle Cost after Energy Savings									\$6,632	\$5,936

Green Product:

Install FSC Certified Wood Cabinetry

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
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Life Cycle Costs

Install/Replace	FSC Certified Cabinetry	1	ea	\$2,418.75	\$2,419	25	1	1.0	\$2,419	\$2,419
Install/Replace	FSC Certified Cabinetry	1	ea	\$3,144.38	\$3,144	25	1	1.0	\$3,144	\$3,144

Total Life Cycle Cost \$5,563 \$5,563

Energy Savings

Net Life Cycle Cost after Energy Savings									\$5,563	\$5,563

ECONOMIC RETURN ANALYSIS

Green NPV	\$373
Green IRR	13.1%

PRODUCT RECOMMENDATION

Recommendation based on Economic Return Analysis

Green Product: Install FSC Certified Wood Cabinetry

Override with Green Product? No

Final Product Choice

Green Product: Install FSC Certified Wood Cabinetry

Notes:

1. Analysis performed using a discount rate of 8.00% and an inflation rate of 3.00% for both expenses and energy costs.
2. Green NPV and Green IRR are relative measures comparing Green vs. Conventional implementation.

Green Measure (GM):

5

Community Kitchen Cabinets

STEP TWO: REPLACEMENT TIMING

Remaining Useful Life of Existing Product

Final Product Choice

Green Product:

Install FSC Certified Wood Cabinetry

Immediate Replacement

									Cost over Life Cycle (EUL)	
Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
Install/Replace	FSC Certified Cabinetry	1	ea	\$2,418.75	\$2,419	25	1	1.0	\$2,419	\$2,419
Install/Replace	FSC Certified Cabinetry	1	ea	\$3,144.38	\$3,144	25	1	1.0	\$3,144	\$3,144
Total Life Cycle Cost									\$5,563	\$5,563
<i>Energy Savings</i>										
Net Life Cycle Cost after Energy Savings									\$5,563	\$5,563

ECONOMIC RETURN ANALYSIS

Timing NPV	n/a
Timing IRR	n/a

TIMING RECOMMENDATION

Replacement Year:	1
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Notes:

1. Analysis performed using a discount rate of 8.00% and an inflation rate of 3.00% for both expenses and energy costs.
2. Timing NPV and Timing IRR are relative measures comparing Immediate Replacement vs. Replacement at End of Remaining Useful Life.

Life Cycle Cost Analysis

Green Measure (GM):

6

Dwelling Units - Linoleum

Vinyl Flooring

vs.

Linoleum Flooring

(Conventional Product)

(Green Product)

STEP ONE: PRODUCT COMPARISON

Calculated Life Cycle Term 25

Conventional Product:

Vinyl Flooring

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
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Life Cycle Costs

Install/Replace	Vinyl Flooring	18,304	sf	\$5.00	\$91,520	15	1	1.7	\$172,091	\$126,689

Total Life Cycle Cost \$172,091 \$126,689

Energy Savings

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Net Life Cycle Cost after Energy Savings \$172,091 \$126,689

Green Product:

Linoleum Flooring

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
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Life Cycle Costs

Install/Replace	Linoleum	18,304	sf	\$5.50	\$100,672	25	1	1.0	\$100,672	\$100,672

Total Life Cycle Cost \$100,672 \$100,672

Energy Savings

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Net Life Cycle Cost after Energy Savings \$100,672 \$100,672

ECONOMIC RETURN ANALYSIS

Green NPV	\$26,017
Green IRR	19.3%

PRODUCT RECOMMENDATION

Recommendation based on Economic Return Analysis

Green Product: Linoleum Flooring

Override with Green Product? No

Final Product Choice

Green Product: Linoleum Flooring

Notes:

1. Analysis performed using a discount rate of 8.00% and an inflation rate of 3.00% for both expenses and energy costs.
2. Green NPV and Green IRR are relative measures comparing Green vs. Conventional implementation.

Green Measure (GM):

6

Dwelling Units - Linoleum

STEP TWO: REPLACEMENT TIMING

Remaining Useful Life of Existing Product

Final Product Choice

Green Product:

Linoleum Flooring

Immediate Replacement

									Cost over Life Cycle (EUL)	
Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
Install/Replace	Linoleum	18,304	sf	\$5.50	\$100,672	25	1	1.0	\$100,672	\$100,672
Total Life Cycle Cost									\$100,672	\$100,672
<i>Energy Savings</i>										
Net Life Cycle Cost after Energy Savings									\$100,672	\$100,672

ECONOMIC RETURN ANALYSIS

Timing NPV	n/a
Timing IRR	n/a

TIMING RECOMMENDATION

Replacement Year:	1
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Notes:

1. Analysis performed using a discount rate of 8.00% and an inflation rate of 3.00% for both expenses and energy costs.
2. Timing NPV and Timing IRR are relative measures comparing Immediate Replacement vs. Replacement at End of Remaining Useful Life.

Life Cycle Cost Analysis

Green Measure (GM):

7

Kitchen Cabinets

Plywood Cabinets

vs.

FSC Certified Cabinetry

(Conventional Product)

(Green Product)

STEP ONE: PRODUCT COMPARISON

Calculated Life Cycle Term 25

Conventional Product: Plywood Cabinets

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
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Life Cycle Costs

Install/Replace	Plywood Models	26	ea	\$3,600.00	\$93,600	25	1	1.0	\$93,600	\$93,600

Total Life Cycle Cost \$93,600 \$93,600

Energy Savings

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Net Life Cycle Cost after Energy Savings \$93,600 \$93,600

Green Product: FSC Certified Cabinetry

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
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Life Cycle Costs

Install/Replace	FSC Certified Cabinets	26	ea	\$3,870.00	\$100,620	25	1	1.0	\$100,620	\$100,620

Total Life Cycle Cost \$100,620 \$100,620

Energy Savings

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Net Life Cycle Cost after Energy Savings \$100,620 \$100,620

ECONOMIC RETURN ANALYSIS

Green NPV	(\$7,020)
Green IRR	n/a

PRODUCT RECOMMENDATION

Recommendation based on Economic Return Analysis

Conventional Product: Plywood Cabinets

Override with Green Product? No

Final Product Choice

Conventional Product: Plywood Cabinets

Notes:

1. Analysis performed using a discount rate of 8.00% and an inflation rate of 3.00% for both expenses and energy costs.
2. Green NPV and Green IRR are relative measures comparing Green vs. Conventional implementation.

Green Measure (GM):

7

Kitchen Cabinets

STEP TWO: REPLACEMENT TIMING

Remaining Useful Life of Existing Product
Replacement Year

4

5

Final Product Choice

Conventional Product:

Plywood Cabinets

Immediate Replacement

Year

1

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
Install/Replace	Plywood Models	26	ea	\$3,600.00	\$93,600	25	1	1.0	\$93,600	\$93,600
Total Life Cycle Cost									\$93,600	\$93,600

Energy Savings

Net Life Cycle Cost after Energy Savings									\$93,600	\$93,600

Replacement at End of Remaining Useful Life

Year

5

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
Install/Replace	Plywood Models	26	ea	\$3,600.00	\$93,600	25	5	0.8	\$74,905	\$72,633

Expenses for Current Product Through Useful Life

Total Life Cycle Cost									\$74,905	\$72,633

Energy Savings

Net Life Cycle Cost after Energy Savings									\$74,905	\$72,633

ECONOMIC RETURN ANALYSIS

Timing NPV	(\$20,967)
Timing IRR	n/a

TIMING RECOMMENDATION

Replacement Year:

5

Notes:

1. Analysis performed using a discount rate of 8.00% and an inflation rate of 3.00% for both expenses and energy costs.
2. Timing NPV and Timing IRR are relative measures comparing Immediate Replacement vs. Replacement at End of Remaining Useful Life.

Life Cycle Cost Analysis

Green Measure (GM):

8

Countertops

Solid Surface Tops

vs.

Recycled Solid Surface Tops

(Conventional Product)

(Green Product)

STEP ONE: PRODUCT COMPARISON

Calculated Life Cycle Term 25

Conventional Product:

Solid Surface Tops

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
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Life Cycle Costs

Install/Replace	Corian Countertops	26	ea	\$632.96	\$16,457	10	1	2.5	\$51,570	\$30,441

Total Life Cycle Cost \$51,570 \$30,441

Energy Savings

Net Life Cycle Cost after Energy Savings									\$51,570	\$30,441

Green Product:

Recycled Solid Surface Tops

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
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Life Cycle Costs

Install/Replace	Recycled Paper Tops	26	ea	\$1,200.00	\$31,200	25	1	1.0	\$31,200	\$31,200

Total Life Cycle Cost \$31,200 \$31,200

Energy Savings

Net Life Cycle Cost after Energy Savings									\$31,200	\$31,200

ECONOMIC RETURN ANALYSIS

Green NPV	(\$759)
Green IRR	7.5%

PRODUCT RECOMMENDATION

Recommendation based on Economic Return Analysis

Conventional Product: Solid Surface Tops

Override with Green Product? No

Final Product Choice

Conventional Product: Solid Surface Tops

Notes:

1. Analysis performed using a discount rate of 8.00% and an inflation rate of 3.00% for both expenses and energy costs.
2. Green NPV and Green IRR are relative measures comparing Green vs. Conventional implementation.

Green Measure (GM):

8

Countertops

STEP TWO: REPLACEMENT TIMING

Remaining Useful Life of Existing Product

0

Final Product Choice

Conventional Product:

Solid Surface Tops

Immediate Replacement

									Cost over Life Cycle (EUL)	
Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
Install/Replace	Corian Countertops	26	ea	\$632.96	\$16,457	10	1	2.5	\$51,570	\$30,441
Total Life Cycle Cost									\$51,570	\$30,441
<i>Energy Savings</i>										
Net Life Cycle Cost after Energy Savings									\$51,570	\$30,441

ECONOMIC RETURN ANALYSIS

Timing NPV	n/a
Timing IRR	n/a

TIMING RECOMMENDATION

Replacement Year:	1
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Notes:

1. Analysis performed using a discount rate of 8.00% and an inflation rate of 3.00% for both expenses and energy costs.
2. Timing NPV and Timing IRR are relative measures comparing Immediate Replacement vs. Replacement at End of Remaining Useful Life.

Statement of Delivery

ON-SITE INSIGHT, Inc. (and/or its representatives) hereby certifies that, this Green Capital Needs Assessment (the “GCNA” or the “Report”) is delivered subject to the following terms and conditions:

1. This report and analysis are based upon observations for the visible and apparent condition of the building and its major components on the date of the fieldwork. Although care has been taken in the performance of this assessment, ON-SITE INSIGHT, Inc (and/or its representatives) makes no representations regarding latent or concealed defects that may exist and no warranty or guarantee is expressed or implied. This report is made only in the best exercise of our ability and judgment.
2. We have undertaken no formal evaluations of environmental concerns, including but not limited to asbestos containing materials (ACMs), lead based paint, chlorofluorocarbons (CFCs), polychlorinated biphenyls (PCBs), and mildew/mold.
3. Conclusions in this report are based on estimates of the age and normal working life of various items of equipment and/or statistical comparisons. Actual conditions can alter the useful life of any item. When an item needs immediate replacement depends on many factors, including previous use/misuse, irregularity of servicing, faulty manufacturer, unfavorable conditions, Acts of God and unforeseen circumstances. Certain components that may be working when we made our inspection might deteriorate or break in the future without notice.
4. To prepare this report, we used historic data on capital activities and costs, blueprints (when available), and current prices for capital actions. We have not independently verified this information, have assumed that it is reliable, but assume no responsibility for its accuracy.
5. Unless otherwise noted in the report, we assume that all building components meet code requirements in force when the property was built.
6. If accessibility issues are referenced in the report, the site elements, common areas, and dwelling units at the development were examined for compliance with the requirements of the Uniform Federal Accessibility Standards (UFAS), and for Massachusetts properties, the Massachusetts Architectural Accessibility Board (AAB). The methodology employed in undertaking this examination is adapted from a Technical Assistance Guide (TAG-88-11) titled “Supplemental Information About the Section 504 Transition Plan Requirements” published by the Coordination and Review section of the U.S. Department of Justice Civil Rights Division, and the AAB Rules and Regulations, 521 CMR effective July 10, 1987. The Guide also incorporates the requirements of UFAS, published, April 1, 1988 by the General Services Administration, the Department of Defense, the Department of Housing and Urban Development, and the U.S. Postal Service. Changes in legislation and/or regulations may make some observations moot.

7. Response Actions and estimated costs of responses were developed by ON-SITE INSIGHT, Inc. If additional structural work is necessary, costs for some Response Actions may exceed estimates. Whenever the Response Action is to remove, reposition, or modify walls, a competent structural engineer should be retained before any work is done, because such investigation may disclose that a Response Action is either more costly than estimated, or is not possible.
8. Conclusions reached in this report assume current and continuing responsible ownership and competent property management.
9. Regular updates of this plan are recommended to ensure careful monitoring of major building systems and to adjust the program to accommodate unanticipated circumstances surrounding the buildings, operations, and/or occupants.

Signed,



Signature

Daniel Iles
Name

Associate
Title

January 27, 2012
Date