

Green Capital Needs Assessment and Replacement Reserve Analysis

Prepared for:

Connecticut Housing and Finance Authority
999 West Street
Rocky Hill, CT 06067

and

Recap Real Estate Advisors
38 Chauncy Street, Suite 600
Boston, MA 02111



38 Chauncy Street, Suite 600 | Boston, MA 02111
T: 617.338.9484 | F: 617.338.9422

on-site-insight.com



Pompey Hollow

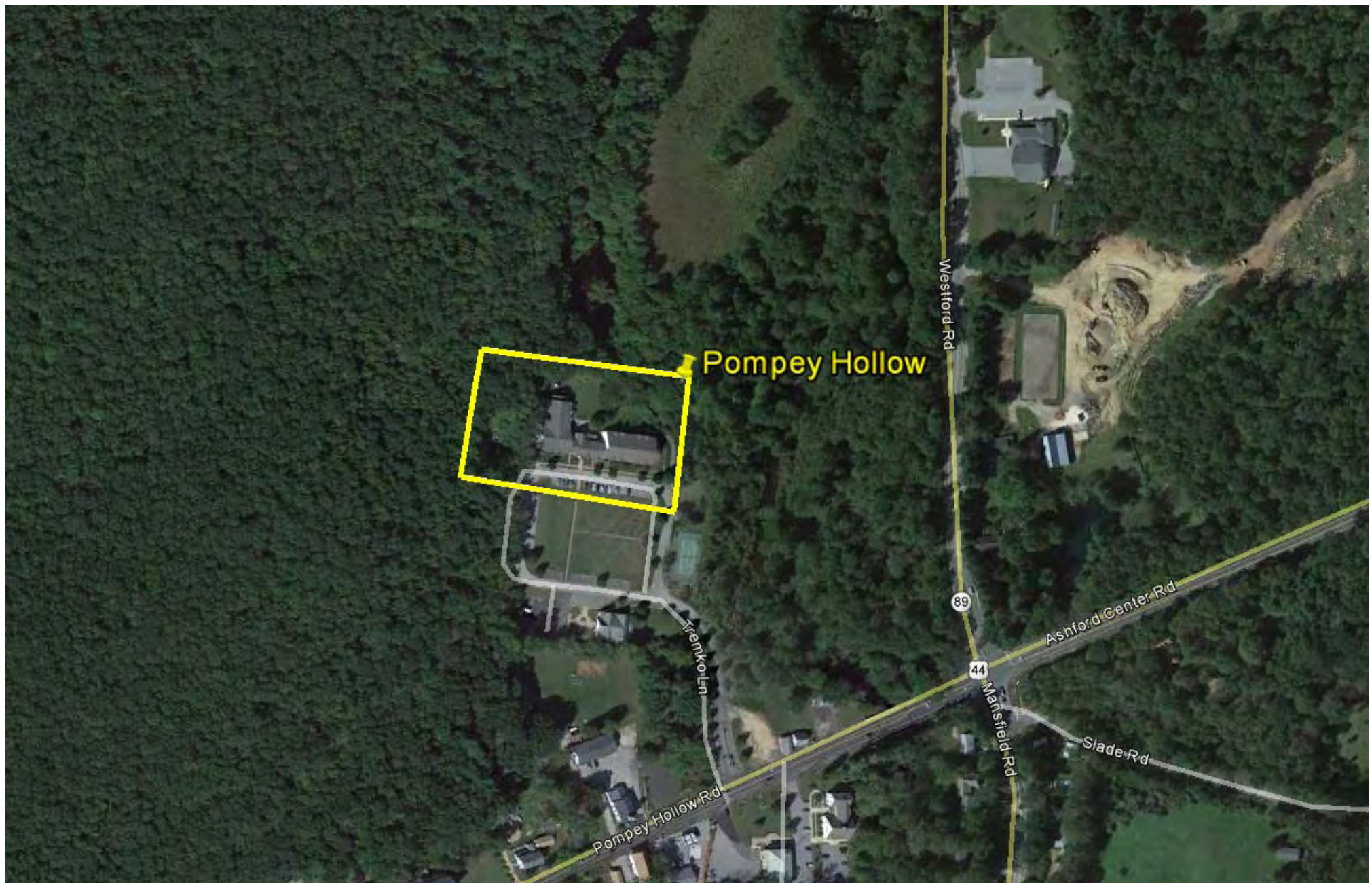
CHFA # 95002D

Ashford Housing Authority

Ashford, CT

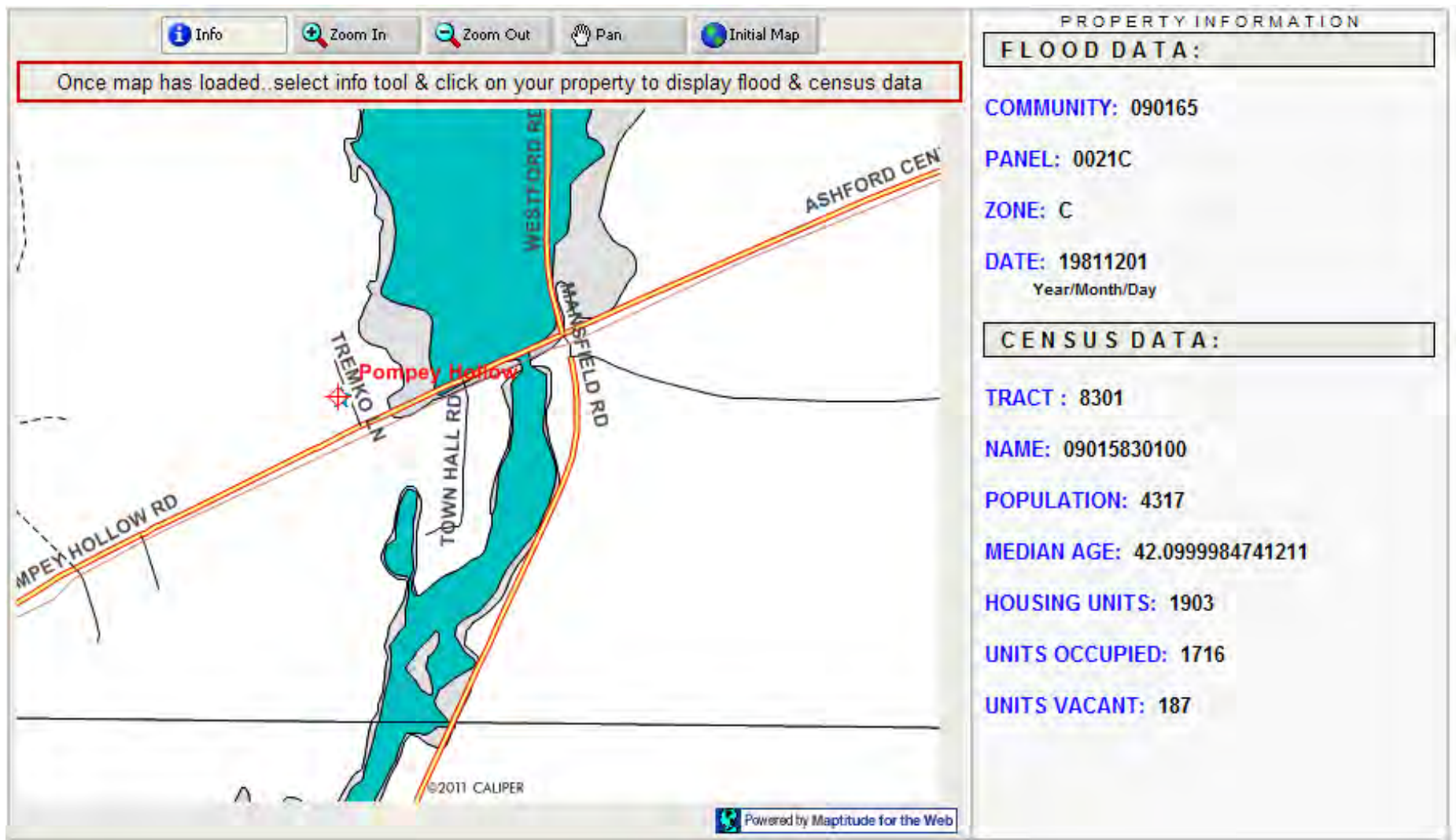
May 2, 2013

Final Report



Pompey Hollow

49 Tremko Lane
Ashford, CT 06278



Pompey Hollow

49 Tremko Lane
Ashford, CT 06278

Zone C = 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 the Ashford Housing Authority and Connecticut Housing Finance Authority (CHFA). 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.

Conventional Summary

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 \$1,131,852 in current dollars (\$35,370/unit), or \$1,615,485 (\$50,484/unit) in inflated dollars.

Current reserves would be outpaced in each year of the plan. However a cash infusion of \$700K in Year 1 coupled with contribution increases in Years 2 through 4 (\$120/unit/year) would fully fund the plan.

Executive Summary

Green Summary

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 \$1,231,161 in current dollars (\$38,474/unit), or \$1,732,076 (\$54,127/unit) in inflated dollars.

Current reserves would be outpaced throughout the entire plan. However a cash infusion of \$800K in Year 1 coupled with contribution increases in Years 2 through 4 (\$120/unit/year) would fully fund the plan.

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:

Energy and Water Conservation Measures (EWCMs):

In the report, 10 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

Executive Summary

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 is 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.

Green Measures (GMs):

The report identifies 4 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.

Executive Summary

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.

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.

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.

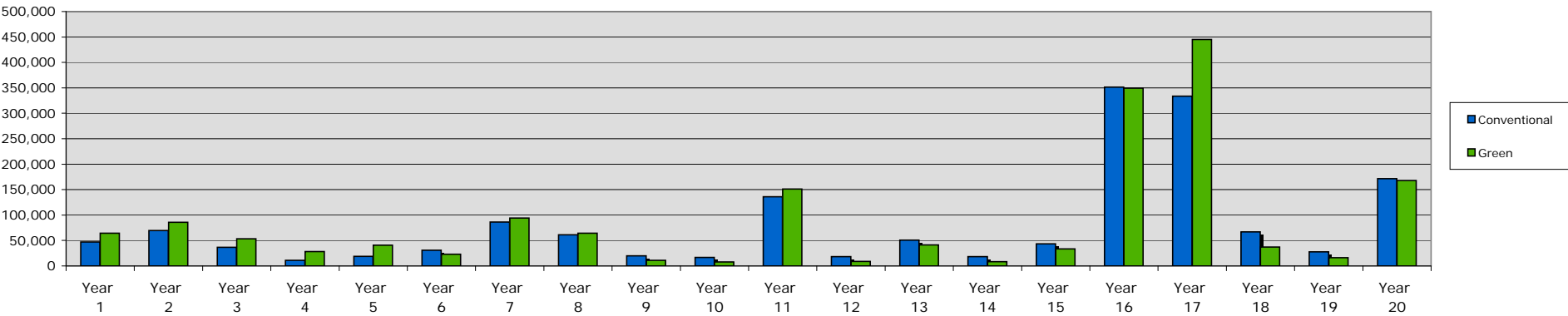
Executive Summary

Dashboard

Property Data

Location:	Ashford, CT
Year Built:	1994
Number of Units:	32
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:	41,460
Resident Population (estimated):	34

	BTUs/yr	Conversion	lbs CO ₂	lbs CO ₂ / Res
Heating	1,329,773,871	x 0.000161	213,527	6,280
DHW	210,498,493	x 0.000161	33,801	994
Electricity	379,061,471	x 1.582917	175,805	5,171
Total	1,919,333,836		423,133	12,445

Replacement Reserve Analysis

Conventional

- Plan #1: Capital costs exceed reserves throughout the entire plan.
- Plan #2: Infusion of \$750K increase in reserves of \$120/unit/year in Years 2 through 4.

Green

- Plan #1: Capital costs exceed reserves in each year of the plan.
- Plan #2: Infusion of \$925K; increase in reserves of \$120 unit/year in Years 2 through 4.

Health and Safety

Hazardous Materials

	Identified	Location / Notes
Lead Based Paint (LBP):	None	n/a
Asbestos Containing Materials (ACMs):	None	n/a
Mold:	None	n/a

Indoor Ventilation

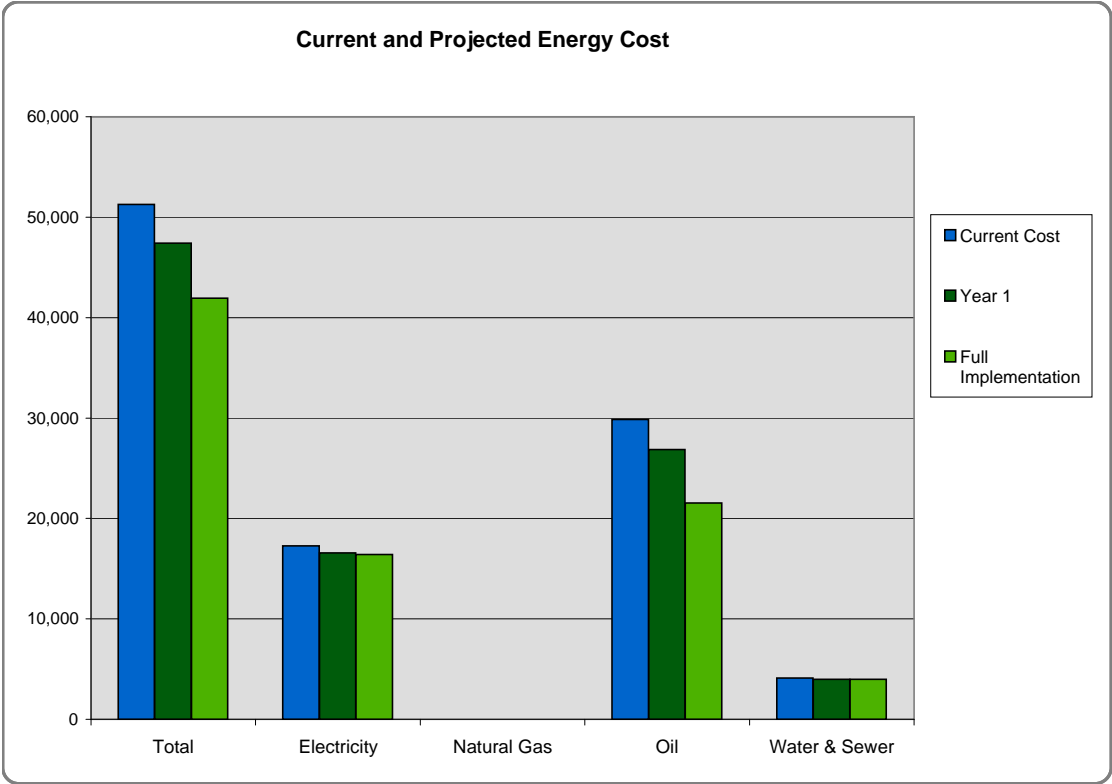
Operable windows, bathroom exhaust fans, 2 common area air handlers

Indoor Air Quality (IAQ)

	Design Specification	Actual Read	Notes
Air Flow Rate	4000 cfm (AHUs)	not measured	Common area only
Thermal Comfort	68-77F	71-74.8F	Common & Apts
Carbon Monoxide	0	0	No CO measured
Carbon Dioxide	<1,000 ppm	493-628 ppm	Common & Apts

Executive Summary

Energy Savings



Energy Intensity / Benchmarking Data

Building Square Footage: 41,460

Heating Degree Days: 6,158

	Amount	Units	BTUs/yr	Energy Intensity (BTUs/(HDDs x SF))
Heating	9,636	gallons	1,329,773,871	5
Cooling	0	therms	0	0
DHW	1,525	gallons	210,498,493	1
Electricity	111,097	kWh	379,061,471	1
Total			1,919,333,836	8

	Gallons/yr	Gallons/sf/yr
Water	735,090	18

Energy Usage Summary

Utility	Current Usage	Current Cost	Projected Usage	Projected Cost	% Savings
Electricity	111,097 kWh	\$17,278	105,591 kWh	\$16,422	5.0%
Natural Gas	0 therms	\$0	0 therms	\$0	n/a
Oil	9,584 gallons	\$29,868	6,914 gallons	\$21,548	27.9%
Water & Sewer	735,090 gallons	\$4,113	710,562 gallons	\$3,976	3.3%
Total		\$51,259		\$41,945	18.2%

Executive Summary

Green Improvement Plan

Measure	Upfront Cost	EUL	Simple SIR ¹	Incremental Cost ²	Green NPV ⁴	Annual Utility Savings								Recommended Timing
						Electric		Gas		Oil		Water & Sewer		Total \$
						KWh	\$	Therms	\$	Gallons	\$	Gallons	\$	

Recommended EWCMs (Based on Financial Analysis)

Interactive Group															
EWCM 2 High Efficient Boilers	78,372	30	1.13	9,330	13,706					951	2,963			2,963	Year 11
EWCM 4 Fiberglass Doors	4,080	35	1.34	285	2,440					50	156			156	Year 16
EWCM 5 Fiberglass Windows	61,824	35	1.25	4,314	34,274					708	2,206			2,206	Year 16
EWCM 6 LED Exit Signs	1,080	30	5.39	1,080	2,099	2,129	331			(44)	(137)			194	Immediate
EWCM 7 Interior Lights	920	30	7.64	920	2,732	1,927	300			(21)	(65)			234	Immediate
EWCM 8 Common Refrigerator	720	15	0.94	50	445	370	58			(4)	(12)			45	Year 15
EWCM 10 Progr. Thermostats	6,464	20	9.93	3,395	39,362					1,030	3,210			3,210	Immediate
Interactive Group Total ⁵	153,460			19,374		4,426	688			2,670	8,320			9,009	
EWCM 1 Site Lighting	595	35	4.37	595	705	478	74							74	Immediate
EWCM 3 Motors	8,820	25	0.27	220	1,174	602	94							94	Year 6
EWCM 9 High Eff Toilets	15,426	30	0.27	1,076	1,173							24,528	137	137	Immediate
EWCM Subtotal	178,301			21,265		5,506	856	0	0	2,670	8,320	24,528	137	9,314	

Recommended GMs (Based on Financial Analysis)

GM 2 Common Area Linoleum	61,872	25		22,683	10,616	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Year 7
GM 3 Apt Floors	113,737	25		10,340	29,394	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Immediate
GM Subtotal	175,609			33,023		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	

Total	353,910			54,288		5,506	856	0	0	2,670	8,320	24,528	137	9,314	
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Optional Actions ⁶

GM 1 Metal Roof	166,344	40		80,489	(47,220)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Immediate
GM 4 Stone Countertops	30,525	30		18,776	(9,843)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	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.
- Carried in the plan due to health, safety, environmental, and/or energy benefit, despite negative NPV.

Narrative

Pompey Hollow is a single two-story building designed for elderly residents. The building contains a total of 32 one-bedroom units including a pair of accessible units; all apartments are accessed through a series of interior common hallways and stairwells. The building was originally constructed in 1994.

Site

Site Surface

Pompey Hollow is located on a large, parcel of land in Ashford, CT. The site includes an asphalt-paved access road with similarly paved parking areas, concrete walkways that encompass the building, compact fluorescent lighting along the walkways and roadway, and surrounding lawns with flowerbeds. This facility also has an on-site leaching field for sewage treatment. Previously, it also had a well water system for domestic water supply, which has recently been replaced with municipal-supplied domestic water.

Roadways and Parking Areas		
Existing conditions	Capital needs	Green alternative
The roadway and parking lot appear to be in good condition, with only minor cracks observed.	The plan includes the cost for surface repairs (crackfilling, sealcoating, and parking lot re-striping) in Years 3, 8, and 13. Resurfacing costs are shown toward the end of the plan in Year 17.	For future repaving, consider a lighter colored asphalt material. The lighter asphalt material decreases heat retention associated with darker asphalt materials and therefore reduces the heat island effect and allows for a cooler, more comfortable site for the residents and visitors alike. Typically, lighter-colored asphalt paving is not more expensive than dark asphalt materials, and therefore, no premium is carried in the plan for this work. Open pavers are shown as the green alternative for the parking areas,

Narrative

Existing conditions	Capital needs	Green alternative
		<p>which also address the heat island effect and promotes adequate drainage.</p> <p>No green alternative is carried for the crack-fill and sealcoat work; however, it is recommended that a low volatile organic compound (VOC) and/or recycled-content paint (content should be at least 50%; VOCs should not exceed 250 grams per liter) is used during the restriping process.</p>

Walkways

Existing conditions	Capital needs	Green alternative
The concrete walkways appear to be in good condition, with no appreciable damage (cracks or spalling) observed.	The plan anticipates future repairs in Year 15, on a small portion of the walkways.	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. We are uncertain about local market circumstances with regard to it. A separate cost option is not shown for this here.

Narrative

Exterior Lighting

Existing conditions	Capital needs	Green alternative
There are pole-mounted and bollard mounted compact fluorescent lamps (CFLs) along the walkway and roadway to provide lighting for residents.	The CFLs, which appear to be cold-weather rated, are to be addressed as an operating concern throughout the plan.	The green alternative to help achieve even greater energy savings than the CFLs is to retrofit the existing lighting with comparable LED fixtures. LED lighting has a significantly longer useful life and lower energy usage than CFLs. Also, this lighting source produces a yellowish-white light, comparable to incandescent lighting. (See EWCM 1)

Landscaping

Existing conditions	Capital needs	Green alternative
The site features a well-maintained lawn and garden beds.	The plan includes an allowance for replanting and pruning in Year 11.	The green alternative would be to replace the existing landscaping with a Xeriscape, which employs native and adaptive plantings that require significantly less water and fertilizers than traditional lawns and garden beds.

Narrative

Mechanical Room

The central mechanical room contains the oil-fired heating and domestic hot water (DHW) systems. The heating system consists of a pair of hydronic boilers, governed by a Telemate energy management system (EMS). A pair of base-mounted 2 horsepower (hp) pumps are used (lead/standby manner) to distribute the hydronic heat throughout the facility. The DHW system has been recently upgraded with a high efficiency boiler (86%), an insulated storage tank, and a pair of fractional horsepower pumps. Additionally, the DHW boiler has a plate & frame heat exchanger to enable this boiler to augment the hydronic boiler plant. Fuel oil is stored in a 10,000 gallon fiberglass underground storage tank (UST) that is in a gravel-filled vault and includes a fuel oil leakage monitoring system.

Boilers

Existing conditions	Capital needs	Green alternative
The hydronic boilers, recently upgraded with new burners, are expected to perform reliably throughout the first half of the plan. The EMS uses outside air (OA) and return water temperature inputs to govern the boiler plant performance.	The boilers are to be replaced in Year 11, after 30 years of use. The plan also includes the cost to replace the EMS in Year 11.	Replacing the boilers with high efficiency boilers could provide energy savings, based on a higher combustion efficiency, approaching 86%. (See EWCM 2)
One of the hydronic pumps was being repaired at the time of the inspection. The metal flues appear to be in good condition; no missing, loose, or damage flue sections were observed.	The pumps are to be replaced in Year 6.	The pumps can be upgraded with premium efficient motors to reduce electric consumption without sacrificing performance. (See EWCM 3)

Narrative

Domestic Hot Water		
Existing conditions	Capital needs	Green alternative
The DHW system has been upgraded with a high efficiency boiler (86% combustion efficiency) and an insulated storage tank.	The DHW boiler, storage tank, and pumps, are expected to perform reliably throughout most of the plan; future replacement costs are shown in Year 20.	Green option is in place for the boiler and tank. See EWCM 3 for the DHW pump motors.

Narrative

Building Mechanical and Electrical Systems

The major building systems include fire suppression, distribution piping systems for hydronic heat, domestic hot and cold water, and sanitary wastewater, as well as heating and ventilation and air conditioning (HVAC), electrical, fire detection, security, and elevators.

Fire Suppression

Existing conditions	Capital needs	Green alternative
The fire suppression system features a 25 hp firewater pump and a 10,000 gallon firewater storage tank.	The plan includes the cost to add a backflow preventer in Year 1, to keep stagnant sprinkler water from possibly flowing back into the potable water system.	No green alternative shown.

Common Area HVAC Systems

Existing conditions	Capital needs	Green alternative
Each of the two original split direct expansion (DX) air conditioning units provides 4 tons of cooling to portions of the common area, via the pair of air handlers (AHUs).	The split DX units and the AHUs have reached the end of their useful lives and are to be replaced in the first year of the plan.	The green alternative is to replace the split DX units with comparable Energy Star-rated units. There did not appear to be sufficient utility data to accurately model the cooling savings, however there is a benefit to utilizing replacement air conditioning systems that have a higher Seasonal Energy Efficiency Ratio (SEER) rating.

Narrative

Electrical

Existing conditions	Capital needs	Green alternative
<p>The electric main system features Square D equipment and panels. No exposed wires or missing breakers were observed. A diesel-powered Kohler generator is used to provide 100 kW of emergency power. Also, some of the common area lighting appears to have special ballasts which can store power to in turn provide lighting during a power outage.</p> <p>The central fire alarm system is governed by a FCI fire alarm control panel (FACP), and the main entrance has intercom panel to help control visitor access throughout this facility.</p>	<p>The generator is to be overhauled in Year 2, to help ensure its reliable performance for the remaining years of its 35-year useful life. The plan also shows the generator being replaced in Year 16.</p> <p>The fire alarm system and the intercom panel are also approaching the end of their respective useful lives and are to be upgraded in Year 2 of the plan.</p>	<p>No green alternatives shown.</p>

Elevators

Existing conditions	Capital needs	Green alternative
<p>A single hydraulic elevator provides access to each floor of this building. The elevator is maintained by a full service contract.</p>	<p>The cost to add an air conditioner to help maintain adequate space temperatures in the elevator equipment room is shown in Year 1. Also, the elevator cab interior and door operators are to be refurbished in Years 6 and 16. The plan also anticipates a major upgrade of the elevator in Year 16.</p>	<p>No green alternative is shown.</p>

Narrative

Building Architectural Systems

Building Exterior

Pompey Hollow consists of a single walk-up building (two stories plus a partial basement) build. The building is constructed on a poured concrete foundation; there is also a basement area under the core section of the building. No issues were observed or reported with regard to the building framing and it should be monitored going forward. Exterior walls feature brick and vinyl siding sections. Windows are vinyl-framed with double glazing. The roof is pitched, covered with architectural shingles, and the attic has R-38 insulation level. The building also has insulated metal exterior doors and a roll-up garage door which also serves as the service door to the basement.

Siding		
Existing conditions	Capital needs	Green alternative
The exterior siding appears to be in good condition, with no signs of mortar loss or deterioration observed on the brick sections, nor were there any signs of vinyl siding damage observed. There were areas of vinyl siding that require cleaning.	The vinyl siding is to be power washed initially in Year 1, with future cycles shown in Years 8 and 15. The plan includes an allowance for anticipated brickwork repairs (repointing) in Year 16.	No green alternative shown.

Narrative

Doors		
Existing conditions	Capital needs	Green alternative
Most of the insulated metal doors appear to be in good condition. Repainting of doors is to be addressed as an operating concern.	<p>The garage/service door is shown being replaced in Year 11 after 25 years of use.</p> <p>The main and secondary common doors are to be replaced in the second half of the plan in Year 16.</p>	<p>The green option would be to replace the entry doors with fiberglass models.</p> <p>Fiberglass doors are more durable to metal or wood doors since they are resistant to rusting, impact-related damage, and deterioration associated with wood or metal options. Not only are they more durable, but they also lower operations costs since they don't require periodic painting, and therefore have a lower life cycle cost than the traditional alternatives.</p> <p>Insulated fiberglass doors often have higher insulating qualities compared to conventional flush wood or metal models, and therefore reduce heat loss. Typically, insulated fiberglass doors can attain R-Values of at least R-5. (See EWCM 4)</p>

Narrative

Windows

Existing conditions	Capital needs	Green alternative
Vinyl framed double-glazed windows appear to be in good condition. None of these windows had signs of fogging (an indication of failed window glazing seals allowing moisture to get trapped in between the glazing layers).	Based on the age of the windows, the plan includes an allowance for anticipated glazing replacement (for possible window seal failure) starting in Year 2. Window replacement is shown in the second half of the plan in Year 16.	Replacement of the windows with fiberglass-framed, double-glazed models with a low-E (low emissivity) coating, and a gas fill between the glazing layers (EWCM #5). 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

Roof		
Existing conditions	Capital needs	Green alternative
<p>The building has a pitched roof, covered recently with architectural shingles and has gutters and downspouts for roof drainage. There were no signs or reports of active roof leaks. The listed insulation level in the attic is R-38 which is excellent by today's standards and represents the green alternative for roof insulation.</p>	<p>Replacement of the existing roof covering is shown in Year 17.</p>	<p>A metal roof was evaluated as a green measure in terms of a longer useful life than the architectural shingles. The existing insulation level addresses the energy savings component. However in terms of a longer lasting roof surface, the metal roof option is not considered to be cost-effective. (See GM 1)</p>

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 stormwater run-off, they are much more expensive than conventional systems, and we see too many questions about performance and maintenance.

Narrative

Building Interior Common Areas

The building interior includes the common hallways and stairwells, several community areas, a management office, a public laundry facility, and a set of public restrooms including a shower room (roll-in shower). Wall and ceiling surfaces are painted drywall 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 cycles at no additional premium. Most of the common areas with the exception of the stairways have carpeting of vinyl composite tile (VCT) floor covering. The stairways have concrete treads and landings, considered to be the green alternative.

Flooring

Existing conditions	Capital needs	Green alternative
The carpeting and VCT throughout the building is in good condition, with no appreciable signs of significant wear or damage.	The floor covering replacement costs are shown every ten years starting in Year 7.	Replacement of the VCT and carpeting with a linoleum product is considered to be the green alternative. 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 and carpet counterpart. 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 existing flooring. (See GM 2)

Narrative

Lighting

Existing conditions	Capital needs	Green alternative
<p>Fluorescent lighting fixtures are used primarily throughout the common areas, with most being energy efficient fluorescent fixtures (T8 U-lamps and T8 3 foot lamps with energy efficient ballasts). The exceptions are the basement area lighting (T12 lamps) and the recessed cans with PAR lamps in the lobby. The exit signs have compact fluorescent lamps.</p>	<p>The lighting fixtures are to be maintained as operating concerns throughout the plan; no fixture replacements are anticipated.</p>	<p>The existing T12 fluorescent fixtures can be replaced with comparable T8 lamps and electronic ballasts. This green option requires less electricity with out reducing light output. T8 lamps with electronic ballasts are being shown as the upgrade. The PAR lamps are to be replaced with LED-PAR lamps, reducing the electric consumption by almost 80%. (See EWCM 7)</p> <p>The exit signs are to be replaced with LED-type exit signs, producing a significant energy savings and providing a long-lasting lighting source. (See EWCM 6)</p>

Narrative

Common Appliances, Toilets, and Furnishings

Existing conditions	Capital needs	Green alternative
The community kitchen includes a frost-free refrigerator, wood cabinets, and laminated particleboard countertops. The public restrooms, including the shower room, include low flush toilets (1.6 gallon per flush or gpf) and a low flow showerhead (in the shower room). Furnishings throughout the common areas include tables, chairs, audio-visual equipment, and recreational facilities.	The plan includes an allowance to replace the toilets in Year 11. Kitchen appliances and finishes, and common area furniture is to be replaced in Year 15.	The refrigerator could be replaced with an Energy Star-rated refrigerator to reduce electric consumption. This opportunity is shown in EWCM 8. The common countertops were also considered for replacement with stone countertops, which offer a longer useful life. However, the proposed cost for the stone countertop outweighs the longevity benefit as shown in GM 4 (included with apartment kitchen countertops). The low flush toilets could also be replaced with high efficient toilets (1.28 gpf). These toilets will reduce water consumption, as shown in EWCM 9 (which also includes apartment toilets).

Narrative

Dwelling Units

During the course of the assessment, OSI inspected 3 units which represented all unit types and conditions. 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.

Finishes		
Existing conditions	Capital needs	Green alternative
Each unit features painted walls and ceilings, hollow core interior and closet doors. Living areas, bathrooms, and kitchens have VCT flooring. Most of these finishes were found to be in good condition, an indication of some of the continuing upgrades that have occurred.	Apartment repainting and any entry, interior or closet door replacement are to be addressed as operating concerns. VCT replacement is shown over a 15-year cycle, starting in Years 1 and 16.	The existing VCT is to be replaced with a linoleum product. This product will offer a substantially longer useful life than the VCT. Additionally, the linoleum product should help to improve indoor air quality (IAQ) by being easier to clean and maintain, and being significantly more resistant to dust accumulation (see GM 3).

Narrative

Bathrooms

Existing conditions	Capital needs	Green alternative
<p>Bathrooms have a fiberglass bathtub with a fiberglass tub surround, and an anti-scald mixing valve. Ventilation is provided via a ceiling-mounted exhaust fan. Low-flow showerheads (2.0 gallons per minute (gpm) or less) are in place, and existing toilets are rated at 1.6 gallons per flush (gpf). Bathrooms also have wall-hung sinks.</p>	<p>Exhaust fans are shown being replaced in Year 5. The plan also shows toilet replacement starting in Year 11, and tub and sink replacements starting toward the end of the plan in Year 18.</p>	<p>The one viable green option for bathrooms is to replace the existing 1.6 gpf toilets with high efficiency 1.28 gpf toilets, shown in Year 11. (See EWCM 9).</p> <p>Bathrooms could also be upgraded with variable speed exhaust fans, designed to react to humidity (moisture) level variations. These fans are controlled by a humidistat and will automatically adjust their fan speed and exhaust rate to match the variations in humidity levels. This item was not included as part of the TREAT energy model, but should be discussed at the client review meeting.</p>

Narrative

Kitchens

Existing conditions	Capital needs	Green alternative
Kitchens have wood cabinets, laminated particleboard countertops, frost-free refrigerators, recirculating rangehoods, and 30-inch electric ranges.	<p>The cabinets are in good condition and are expected to continue to provide reliable performance throughout most of the plan; cabinet replacement is shown starting in Year 20. Countertop replacement starts in Years 1 and 13. The plan also shows the costs to replace the ranges starting in Year 6. Refrigerator replacements start in Years 1 and 16. The rangehoods are to be replaced throughout the plan starting in Year 1. Additionally, the plan includes the cost to add portable fire extinguishers to the underside of each rangehood.</p> <p>These extinguishers, which are designed to react to high heat conditions (grease fires), are to be added in Year 1 and replaced every six years.</p>	<p>The refrigerators could also be replaced with comparable Energy Star rated units, which significantly reduce energy consumption. This green opportunity was not included as part of the TREAT energy model because the apartments are individually-metered (no apartment utility bills were available).</p> <p>Replacing the existing cabinets with comparable FSC-certified wood cabinets starting in Year 20 will reduce the existence of formaldehyde gases (from adhesives used with laminated particleboard products), and as well provide a product that has a longer useful life. This opportunity was not included as a green measure because with the exception of the increased cost for the certified wood cabinets, all other key parameters (e.g. useful life) are the same.</p>

Narrative

		Stone countertops were considered as the green alternative to the existing countertops, primarily because of a longer useful life. However this opportunity was not shown to be cost-effective. (See GM 4)
--	--	--

Unit Mechanical and Electrical

Existing conditions	Capital needs	Green alternative
<p>Hydronic baseboard sections are used throughout the apartments, each controlled by a wall-mounted thermostat (one per apartment).</p> <p>Each apartment has its own circuit breaker panel and there is a hardwired smoke detector in the living area of the apartments.</p>	<p>The existing thermostats are to be replaced in the near-term, in Year 5. The plan also includes an allowance, starting in Year 11, to replace baseboard sections.</p> <p>Also, smoke detectors are to be added to all bedrooms and existing apartment smoke detectors replaced in Year 3. Future replacement of all apartment smoke detectors is shown in Year 13.</p>	<p>The green plan includes the cost to upgrade each apartment with a programmable thermostat to govern hydronic baseboard heat. These thermostats, when properly used can control space temperatures to match occupant's preference, including a night setback and time-of-day use.</p> <p>(See EWCM 10).</p>

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:

- Domestic hot water temperatures were recorded at 120°F. 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 at some of the common areas. The entire building has operable windows to provide fresh air. There is a series of rooftop exhaust fans used to remove stale air from bathrooms and the community kitchen. The exhaust fans appear to be in continuous operation.

Narrative

Temperature, Humidity, Carbon Dioxide (CO₂)

Space temperature and humidity are the key components for comfort level. Temperature and relative humidity was measured in 5 conditioned spaces (management office, dwelling unit, common hallway). The temperature of the conditioned spaces ranged between 71.2-74.8°F db, and the humidity ranged from 12.7 to 17.1% 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 suspected 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			N/A No mechanical ventilation
Community Room	Not measured	4000 cfm	N/A No mechanical ventilation
Office			N/A No mechanical ventilation
Apartment			N/A No mechanical ventilation

Narrative

Table B. Carbon Dioxide:

Space	Actual Read	Design Specification	Notes
Hallways / Stairwells	592 ppm	< 1,000 ppm	Conditioned space
Community Room	493 ppm	< 1,000 ppm	Conditioned space
Community Kitchen	499 ppm	< 1,000 ppm	Conditioned space
Laundry	515 ppm	< 1,000 ppm	Conditioned space
Apartment 107	628 ppm	< 1,000 ppm	Conditioned space

Table C. Carbon Monoxide:

Conditioned Space	Actual Read	Design Specification	Notes
Hallways / Stairwells	0 ppm	≈0 ppm	Conditioned space
Community Room	0 ppm	≈0 ppm	Conditioned space
Mechanical Room	0 ppm	≈0 ppm	Combustion equipment (boilers)
Apartment #107	0 ppm	≈0 ppm	Conditioned space

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 \$1,131,852 in current dollars (\$35,370/unit), or \$1,615,485 (\$50,484/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 \$35,985 on December 31, 2012. Annual contributions are currently \$12,352 per year, or \$309 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 starting in Year 2.

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 \$700,000 in outside capital in Year 1 to help fund near term capital needs. Additionally, annual contributions are to be increased by \$120/unit (\$10/unit/month) in Years 2 through 4. Contributions are then indexed at 3%. 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 \$1,231,161 in current dollars (\$38,474/unit), or \$1,732,076 (\$54,127/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 \$35,985 on December 31, 2012. Annual contributions are currently \$12,352 per year, or \$309 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 throughout the entire 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 \$800,000 in outside capital in Year 1 to help fund near term capital needs. Additionally, annual contributions are to be increased by \$120/unit (\$10/unit/month) in Years 2 through 4. Contributions are then indexed at 3%. 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 February 6th, 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 David Jackson. Mr. Jackson is a Building Performance Institute (BPI)-certified energy auditor, and LEED Green Associate accredited. Mr. Jackson 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.



A view from the main access road into the site.



A view from the visitor's parking lot.



This concrete walkway leads up to the main building entrance.



The building is clad with brick and vinyl siding.



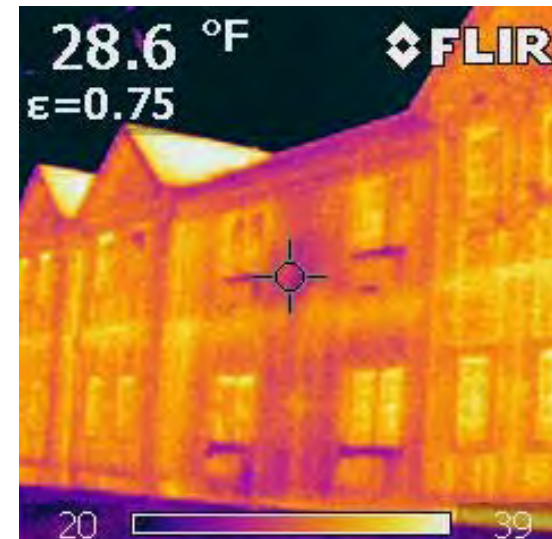
The roof is pitched and covered with architectural shingles.



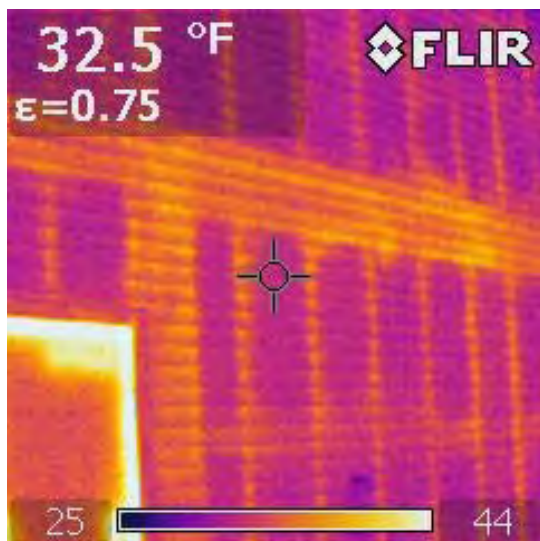
One of the secondary doors that should be repainted.



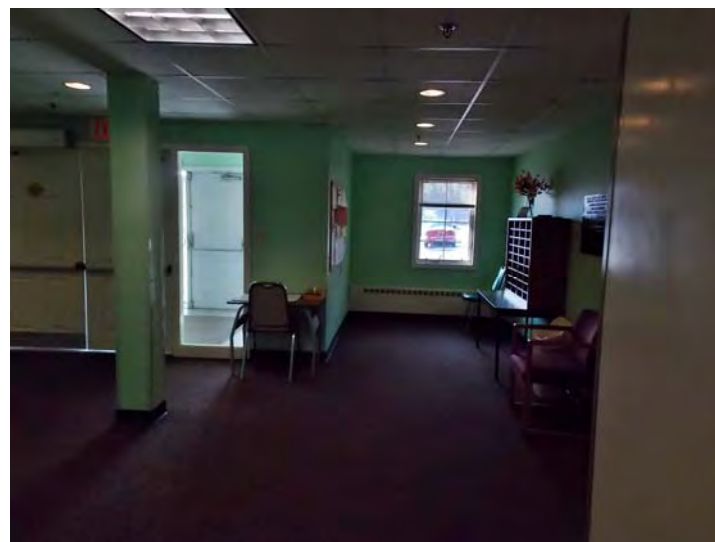
A section of vinyl siding that needs to be power washed.



An infra-red image of the rear elevation.
The brighter yellow indicates greater heat loss.



This infra-red image of a vinyl exterior wall section shows the pattern (dark bands) where wall insulation is present.



This is the main lobby, which includes the mail area.



One of the common hallways.



Occupancy sensors are used in the common hallways to control the lighting. During unoccupied periods, 50% of the lights will be turned off; once someone is in the hallway, all of the lights are turned on.



There is also a common shower room, which includes this roll-in shower.



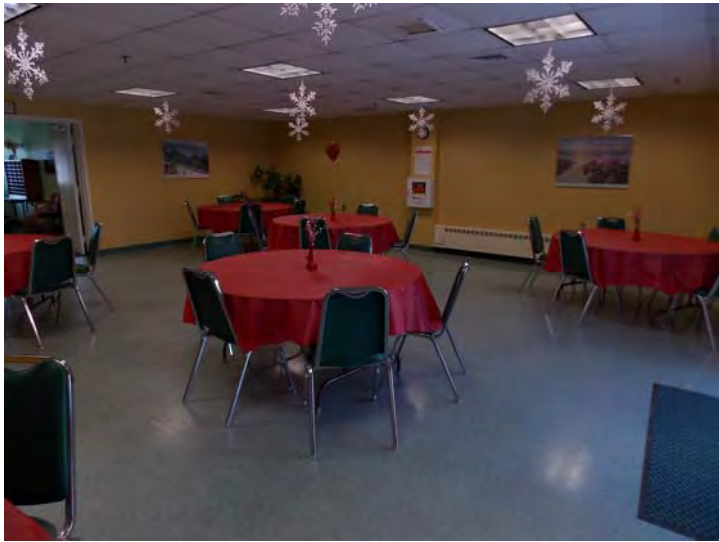
One of the public restrooms.



There are several community spaces; this is the Arts and Crafts Room which also includes this pool table.



A view of the community kitchen.



This is the community room.



The laundry features a pair of front-loading washers and two electric dryers.



Kitchens have wood cabinets, laminated particleboard countertops, electric ranges, and VCT flooring.



Wall ovens are used in the accessible kitchens.



The accessible kitchen also includes a cooktop, lowered cabinets, and a workspace (countertop) with adequate knee space.



Bathrooms have wall-hung sinks and VCT flooring. The bathtub/shower includes an anti-scald mixing valve (arrow).



Through-wall sleeves are provided for unit air conditioners.



Each apartment has its own circuit breaker panel.



A view of the DHW boiler (arrow) and one of the hydronic heat boilers (green).



This is the DHW storage tank.



These are the hydronic circulating pump. In the background are the well-water pumps and storage tanks, no longer in use.



This is the firewater pump. It does not appear that a backflow preventer is in place (to keep stagnant sprinkler water from possibly contaminating the potable water).



A pair of air-cooled condensers, part of two split DX air conditioning systems.



This is the central fire alarm control panel.

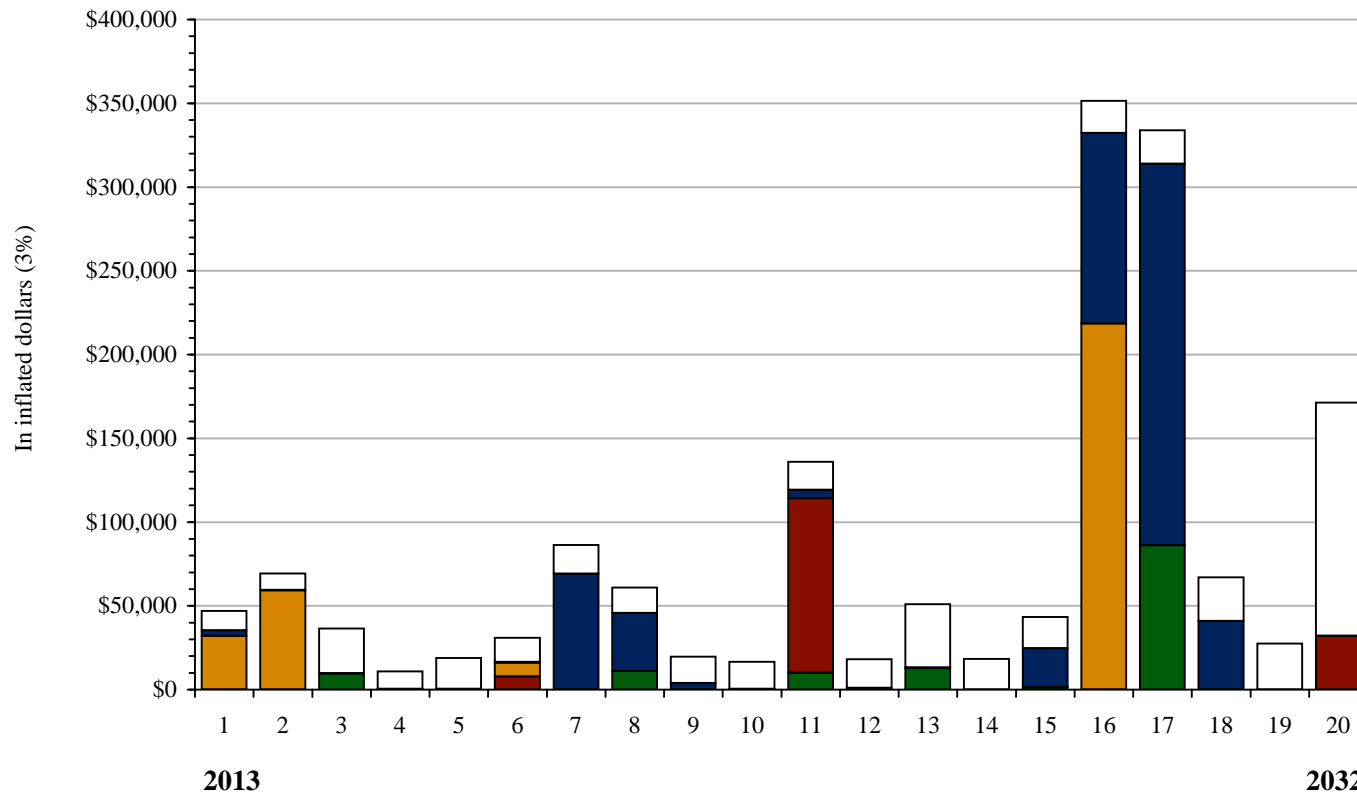


A view of the elevator's hydraulic pump station.

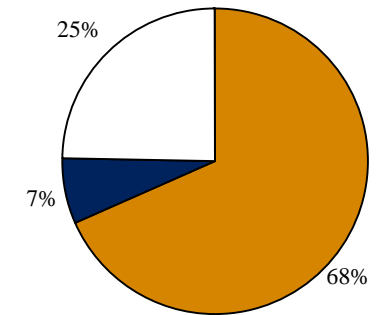


This diesel-powered generator produces 100 kW of emergency power.

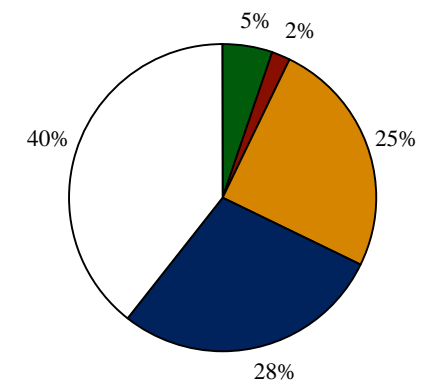
Capital Needs Summary - *Conventional*



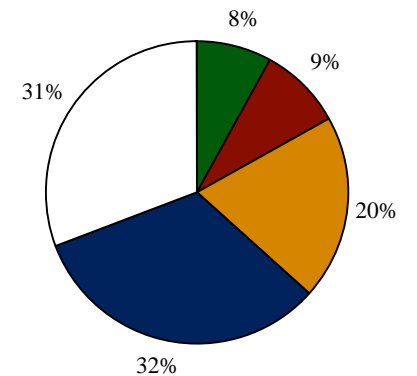
Pompey Hollow



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		\$20,513 or \$641/unit	\$130,881 or \$4,090/unit
Mechanical Room		\$7,767 or \$243/unit	\$144,154 or \$4,505/unit
Building Mech. & Elec.	\$32,150 or \$1,005/unit	\$99,561 or \$3,111/unit	\$318,105 or \$9,941/unit
Building Architectural	\$3,167 or \$99/unit	\$112,635 or \$3,520/unit	\$524,042 or \$16,376/unit
Dwelling Units	\$11,642 or \$364/unit	\$157,003 or \$4,906/unit	\$498,303 or \$15,572/unit
In inflated dollars:	\$46,958 or \$1,467/unit	\$397,478 or \$12,421/unit	\$1,615,485 or \$50,484/unit
In current dollars:	\$46,958 or \$1,467/unit	\$352,588 or \$11,018/unit	\$1,131,852 or \$35,370/unit

Capital Needs Summary - *Conventional*

OSI Ref: 13084
 Property Age: 19 Years
 Financing: CHFA

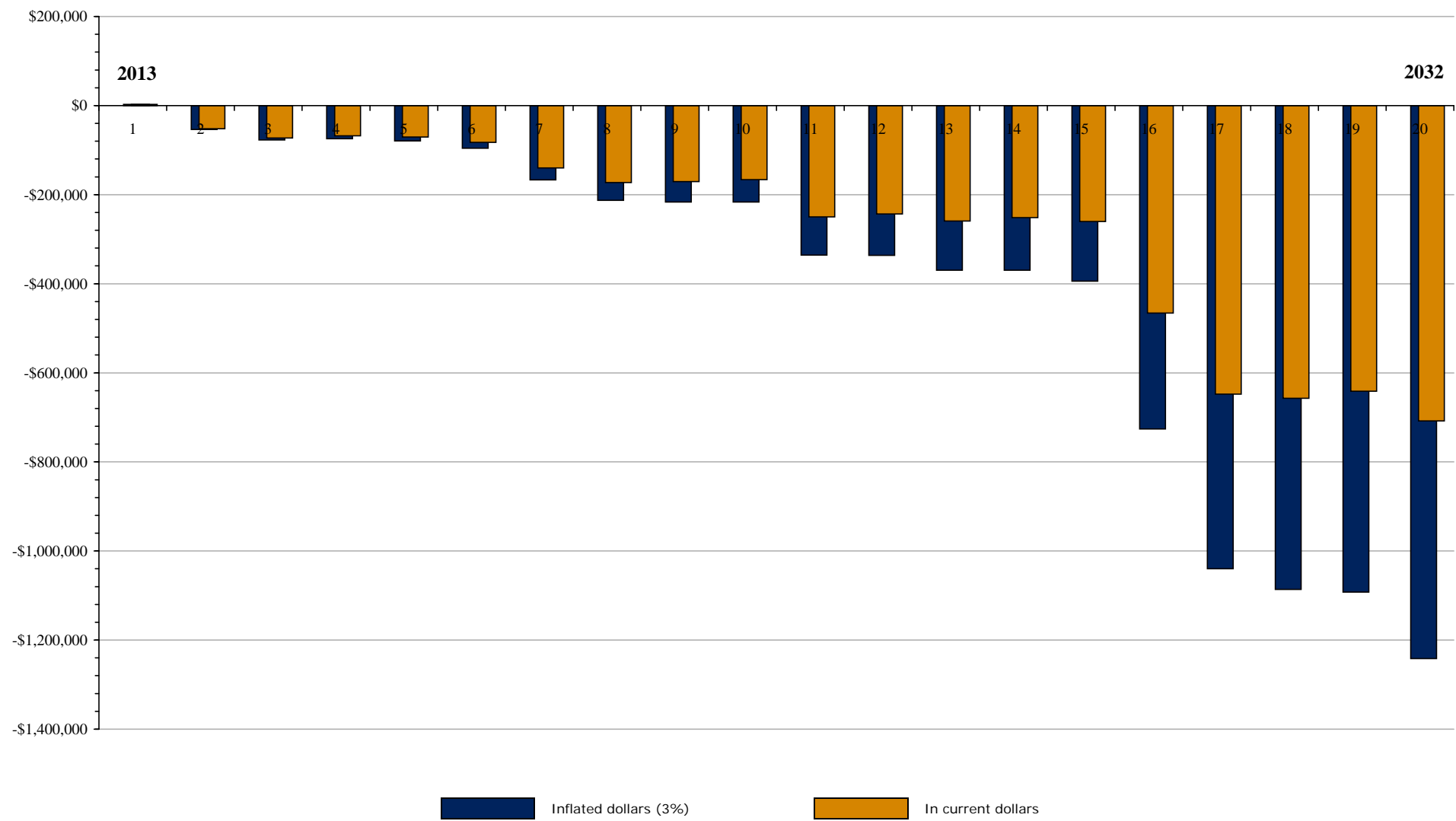
Residential Buildings: 1
 Total Number of Units: 32
 Occupancy: Elderly

	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										
Surface	\$0	\$0	\$9,500	\$0	\$0	\$0	\$0	\$11,013	\$0	\$0
Site Distribution Systems	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Site Sub-Total	\$0	\$0	\$9,500	\$0	\$0	\$0	\$0	\$11,013	\$0	\$0
Mechanical Room										
Boilers	\$0	\$0	\$0	\$0	\$0	\$7,767	\$0	\$0	\$0	\$0
Boiler Room Systems	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Mechanical Sub-Total	\$0	\$0	\$0	\$0	\$0	\$7,767	\$0	\$0	\$0	\$0
Building Mech. & Electrical										
Mechanical	\$29,650	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Electrical	\$0	\$59,122	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Elevators	\$2,500	\$0	\$0	\$0	\$0	\$8,289	\$0	\$0	\$0	\$0
Mechanical & Electrical Sub-Total	\$32,150	\$59,122	\$0	\$0	\$0	\$8,289	\$0	\$0	\$0	\$0
Building Architectural										
Structural and Exterior	\$3,167	\$278	\$286	\$295	\$304	\$313	\$322	\$4,227	\$342	\$352
Roof Systems	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Halls, Stairs, Lobbies	\$0	\$0	\$0	\$0	\$0	\$0	\$32,889	\$30,371	\$0	\$0
Community Spaces	\$0	\$0	\$0	\$0	\$0	\$0	\$35,967	\$0	\$3,522	\$0
Building Architectural Sub-Total	\$3,167	\$278	\$286	\$295	\$304	\$313	\$69,178	\$34,598	\$3,864	\$352
Dwelling Units										
Living Areas	\$5,447	\$5,610	\$5,779	\$5,952	\$6,130	\$6,314	\$6,504	\$6,699	\$6,900	\$7,107
Bathrooms	\$665	\$685	\$705	\$726	\$4,710	\$771	\$794	\$817	\$842	\$867
Kitchens	\$5,530	\$3,718	\$3,830	\$3,945	\$4,063	\$7,412	\$9,927	\$7,864	\$8,100	\$8,343
Mechanical & Electrical	\$0	\$0	\$16,465	\$0	\$3,782	\$0	\$0	\$0	\$0	\$0
Dwelling Units Sub-Total	\$11,642	\$10,013	\$26,779	\$10,623	\$18,685	\$14,497	\$17,225	\$15,380	\$15,842	\$16,317
Total Capital Costs	\$46,958	\$69,413	\$36,565	\$10,918	\$18,989	\$30,866	\$86,403	\$60,991	\$19,705	\$16,669

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	
\$10,079	\$0	\$12,767	\$0	\$1,308	\$0	\$86,215	\$0	\$0	\$0	Site Systems
\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	Surface
										Site Distribution Systems
\$10,079	\$0	\$12,767	\$0	\$1,308	\$0	\$86,215	\$0	\$0	\$0	Site Sub-Total
\$104,210	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	Mechanical Room
\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$32,177	Boilers
										Boiler Room Systems
\$104,210	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$32,177	Mechanical Sub-Total
\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	Building Mech. & Electrical
\$0	\$0	\$0	\$0	\$0	\$75,561	\$0	\$0	\$0	\$0	Mechanical
\$0	\$0	\$0	\$0	\$0	\$142,982	\$0	\$0	\$0	\$0	Electrical
										Elevators
\$0	\$0	\$0	\$0	\$0	\$218,544	\$0	\$0	\$0	\$0	Mechanical & Electrical Sub-Total
\$3,252	\$374	\$385	\$0	\$4,790	\$113,556	\$0	\$0	\$0	\$0	Building Architectural
\$0	\$0	\$0	\$0	\$0	\$0	\$137,772	\$0	\$0	\$0	Structural and Exterior
\$0	\$0	\$0	\$0	\$0	\$0	\$44,200	\$40,816	\$0	\$0	Roof Systems
\$1,653	\$509	\$0	\$0	\$18,451	\$0	\$45,649	\$0	\$0	\$0	Halls, Stairs, Lobbies
										Community Spaces
\$4,905	\$883	\$385	\$0	\$23,241	\$113,556	\$227,620	\$40,816	\$0	\$0	Building Architectural Sub-Total
\$7,320	\$7,540	\$7,766	\$7,999	\$8,239	\$8,486	\$8,741	\$9,003	\$9,273	\$9,551	Dwelling Units
\$3,097	\$3,190	\$3,286	\$3,384	\$3,486	\$3,591	\$3,698	\$9,469	\$6,961	\$7,686	Living Areas
\$4,852	\$4,997	\$7,885	\$5,301	\$5,461	\$5,624	\$5,793	\$5,967	\$9,415	\$119,957	Bathrooms
\$1,478	\$1,523	\$18,906	\$1,615	\$1,664	\$1,714	\$1,765	\$1,818	\$1,873	\$1,929	Kitchens
										Mechanical & Electrical
\$16,747	\$17,250	\$37,842	\$18,300	\$18,849	\$19,415	\$19,997	\$26,256	\$27,521	\$139,123	Dwelling Units Sub-Total
\$135,942	\$18,133	\$50,994	\$18,300	\$43,398	\$351,514	\$333,832	\$67,072	\$27,521	\$171,300	Total Capital Costs

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



Current Replacement Reserve Balance: **\$35,985**
Adjusted Replacement Reserve Balance: **\$35,985**
Current annual contributions to reserve accounts: **\$12,352**

At the end of Year One, Reserve Balances are projected to be: **\$2,643**
At the end of Year 20, Reserve Balances are projected to be: **(\$1,241,460)**
Unmet needs projected in most years of the plan

Replacement Reserve (RR) Analysis: *Plan One - 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:		\$12,352 or \$386/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	\$35,985	\$2,643	(\$53,777)	(\$77,041)	(\$74,259)	(\$79,138)	(\$95,470)	(\$166,903)	(\$212,474)	(\$216,298)
(B) Annual Funding										
Contributions Indexed at 3%	\$386	\$398	\$410	\$422	\$434	\$447	\$461	\$475	\$489	\$504
(C) Additional Unit Contributions										
(D) Total Annual Reserve Funding	\$12,352	\$12,723	\$13,104	\$13,497	\$13,902	\$14,319	\$14,749	\$15,191	\$15,647	\$16,117
(E) Interest on Reserves at 3%	\$1,265	\$270	\$197	\$202	\$209	\$215	\$221	\$228	\$235	\$242
Total Funds Available	\$49,602	\$15,636	(\$40,476)	(\$63,341)	(\$60,149)	(\$64,604)	(\$80,500)	(\$151,483)	(\$196,592)	(\$199,939)
(F) Total Capital Cost	\$46,958	\$69,413	\$36,565	\$10,918	\$18,989	\$30,866	\$86,403	\$60,991	\$19,705	\$16,669
(G) Reserve Balances	\$2,643	(\$53,777)	(\$77,041)	(\$74,259)	(\$79,138)	(\$95,470)	(\$166,903)	(\$212,474)	(\$216,298)	(\$216,609)
Outside Capital:										
Adjusted Reserve Balances	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Notes:

1. Starting reserve balance is \$35,985.
2. Annual contribution is \$12,352.
3. Capital costs outpace reserves starting in Year 2.

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

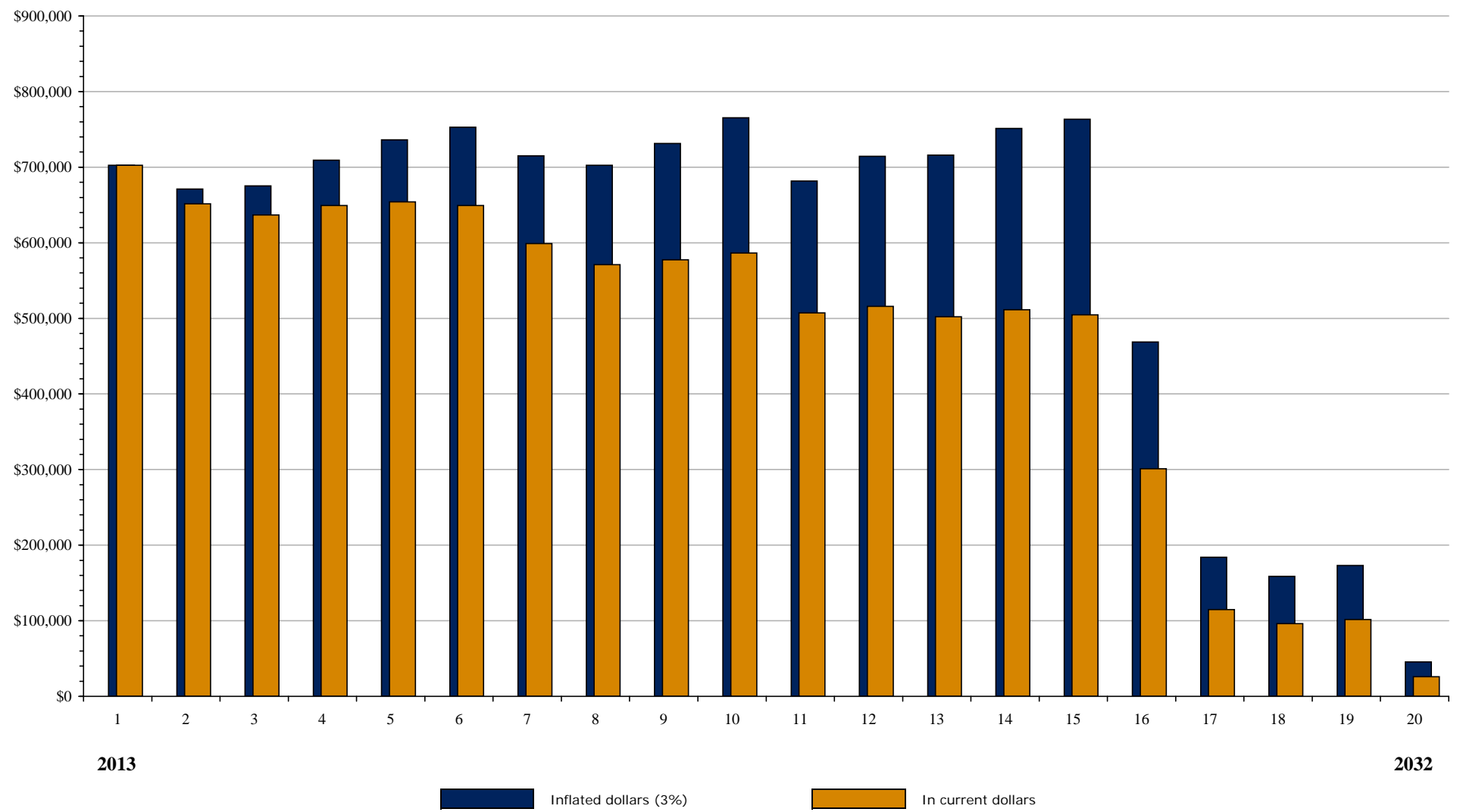
Line C, Additional Contributions allows for material adjustments in annual RR funding that would enable the property to meet all projected needs out of reserves through Year 20.

**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 (\$1,241,460)					This is (\$38,796)per unit in inflated dollars or (\$22,125) per unit in uninflated dollars				
Projected annual funding to reserves is \$21,659					This is \$677 per unit in inflated dollars or \$386 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
(\$216,609)	(\$335,701)	(\$336,480)	(\$369,598)	(\$369,487)	(\$393,921)	(\$725,903)	(\$1,039,617)	(\$1,085,967)	(\$1,092,144)
\$519	\$534	\$550	\$567	\$584	\$601	\$619	\$638	\$657	\$677
\$16,600	\$17,098	\$17,611	\$18,139	\$18,684	\$19,244	\$19,821	\$20,416	\$21,028	\$21,659
\$249	\$256	\$264	\$272	\$280	\$289	\$297	\$306	\$315	\$325
(\$199,760)	(\$318,347)	(\$318,605)	(\$351,187)	(\$350,523)	(\$374,389)	(\$705,784)	(\$1,018,895)	(\$1,064,623)	(\$1,070,160)
\$135,942	\$18,133	\$50,994	\$18,300	\$43,398	\$351,514	\$333,832	\$67,072	\$27,521	\$171,300
(\$335,701)	(\$336,480)	(\$369,598)	(\$369,487)	(\$393,921)	(\$725,903)	(\$1,039,617)	(\$1,085,967)	(\$1,092,144)	(\$1,241,460)
\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

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



Current Replacement Reserve Balance: **\$35,985**
Adjusted Replacement Reserve Balance: **\$35,985**
Current annual contributions to reserve accounts: **\$12,352**

At the end of Year One, Reserve Balances are projected to be: **\$702,643**
At the end of Year 20, Reserve Balances are projected to be: **\$45,426**
All projected capital needs are met throughout the plan

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

<div> <div>Reserve Funding In Year 1</div> <div> 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. </div> </div>										
Starting Balance:		\$35,985 or \$1,125/unit								
Contributions to Reserves:		\$12,352 or \$386/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	\$35,985	\$702,643	\$671,120	\$675,398	\$709,348	\$736,245	\$752,811	\$715,097	\$702,447	\$731,509
(B) Annual Funding										
Contributions Indexed at 3%	\$386	\$398	\$518	\$638	\$758	\$780	\$804	\$828	\$853	\$878
(C) Additional Unit Contributions		\$120	\$120	\$120						
(D) Total Annual Reserve Funding	\$12,352	\$16,563	\$20,403	\$24,243	\$24,243	\$24,970	\$25,719	\$26,490	\$27,285	\$28,104
(E) Interest on Reserves at 3%	\$1,265	\$21,328	\$20,440	\$20,626	\$21,644	\$22,462	\$22,970	\$21,850	\$21,483	\$22,367
Total Funds Available	\$49,602	\$740,534	\$711,963	\$720,266	\$755,235	\$783,677	\$801,500	\$763,438	\$751,215	\$781,980
(F) Total Capital Cost	\$46,958	\$69,413	\$36,565	\$10,918	\$18,989	\$30,866	\$86,403	\$60,991	\$19,705	\$16,669
(G) Reserve Balances	\$2,643	\$671,120	\$675,398	\$709,348	\$736,245	\$752,811	\$715,097	\$702,447	\$731,509	\$765,311
Outside Capital:	\$700,000									
Adjusted Reserve Balances	\$702,643	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Notes:

1. Same starting reserve balance and annual contribution as shown in Plan 1.
2. An infusion of \$700K is shown in Year 1.
3. Annual contribution is increased by \$120 per year in Years 2 through 4.
4. Plan is fully funded.

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

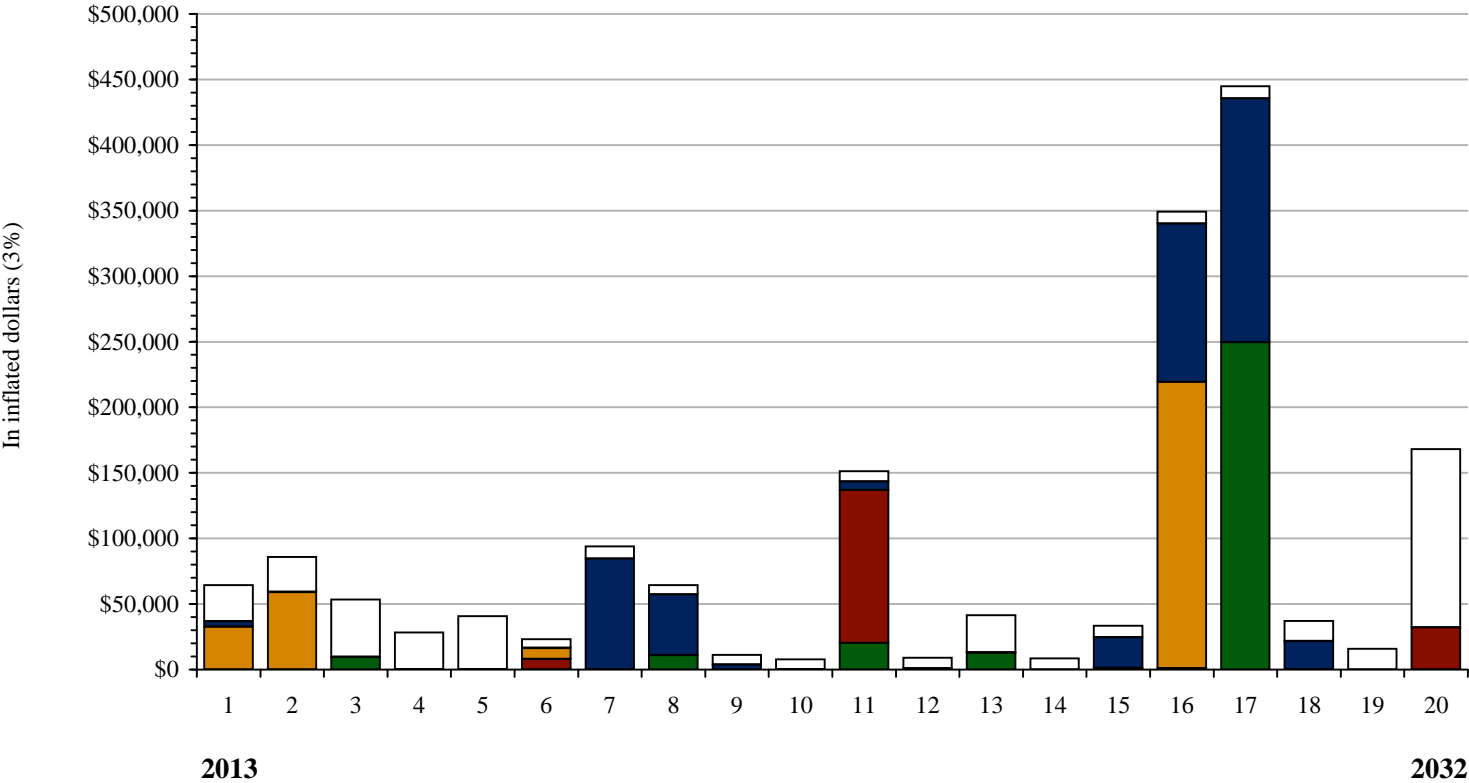
Line C, Additional Contributions allows for material adjustments in annual RR funding that would enable the property to meet all projected needs out of reserves through Year 20.

**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

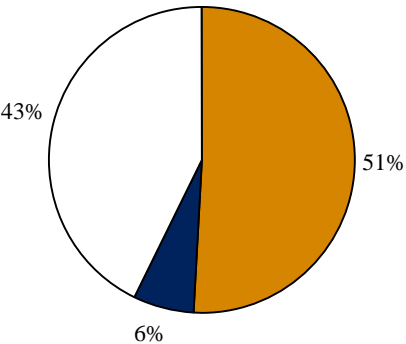
Replacement Reserve (RR) Analysis: *Plan Two - Conventional*

Reserve Funding In Year 20										
Projected replacement reserve balance is \$45,426					This is \$1,420 per unit in inflated dollars or \$810 per unit in uninflated dollars					
Projected annual funding to reserves is \$37,769					This is \$1,180 per unit in inflated dollars or \$673 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)
\$765,311	\$681,709	\$714,290	\$715,896	\$751,178	\$763,384	\$468,832	\$184,147	\$158,734	\$173,194	
										Annual Funding (B)
\$905	\$932	\$960	\$988	\$1,018	\$1,049	\$1,080	\$1,113	\$1,146	\$1,180	
										Additional Unit Contributions (C)
\$28,947	\$29,815	\$30,710	\$31,631	\$32,580	\$33,557	\$34,564	\$35,601	\$36,669	\$37,769	Total Annual Reserve Funding (D)
\$23,394	\$20,899	\$21,889	\$21,951	\$23,024	\$23,405	\$14,583	\$6,058	\$5,312	\$5,762	Interest on Reserves at 3% (E)
\$817,651	\$732,423	\$766,889	\$769,478	\$806,782	\$820,346	\$517,979	\$225,806	\$200,715	\$216,726	Total Funds Available
\$135,942	\$18,133	\$50,994	\$18,300	\$43,398	\$351,514	\$333,832	\$67,072	\$27,521	\$171,300	Total Capital Cost (F)
\$681,709	\$714,290	\$715,896	\$751,178	\$763,384	\$468,832	\$184,147	\$158,734	\$173,194	\$45,426	Reserve Balances (G)
\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	

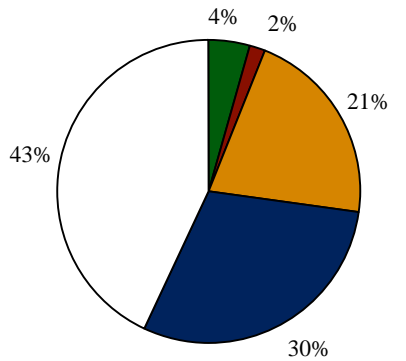
Capital Needs Summary - Green



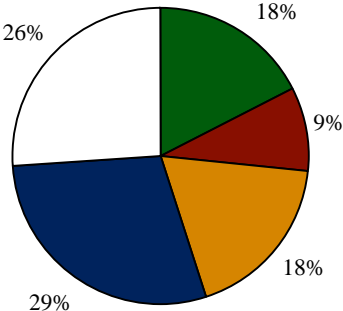
Pompey Hollow



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		\$20,513 or \$641/unit	\$305,365 or \$9,543/unit
Mechanical Room		\$7,941 or \$248/unit	\$156,989 or \$4,906/unit
Building Mech. & Elec.	\$32,800 or \$1,025/unit	\$100,211 or \$3,132/unit	\$318,755 or \$9,961/unit
Building Architectural	\$4,087 or \$128/unit	\$140,985 or \$4,406/unit	\$500,453 or \$15,639/unit
Dwelling Units	\$27,603 or \$863/unit	\$203,769 or \$6,368/unit	\$450,513 or \$14,079/unit
In inflated dollars:	\$64,490 or \$2,015/unit	\$473,418 or \$14,794/unit	\$1,732,076 or \$54,127/unit
In current dollars:	\$64,490 or \$2,015/unit	\$426,237 or \$13,320/unit	\$1,231,161 or \$38,474/unit

Capital Needs Summary - *Green*

OSI Ref: **13084**
 Property Age: **19 Years**
 Financing: **CHFA**

Residential Buildings: **1**
 Total Number of Units: **32**
 Occupancy: **Elderly**

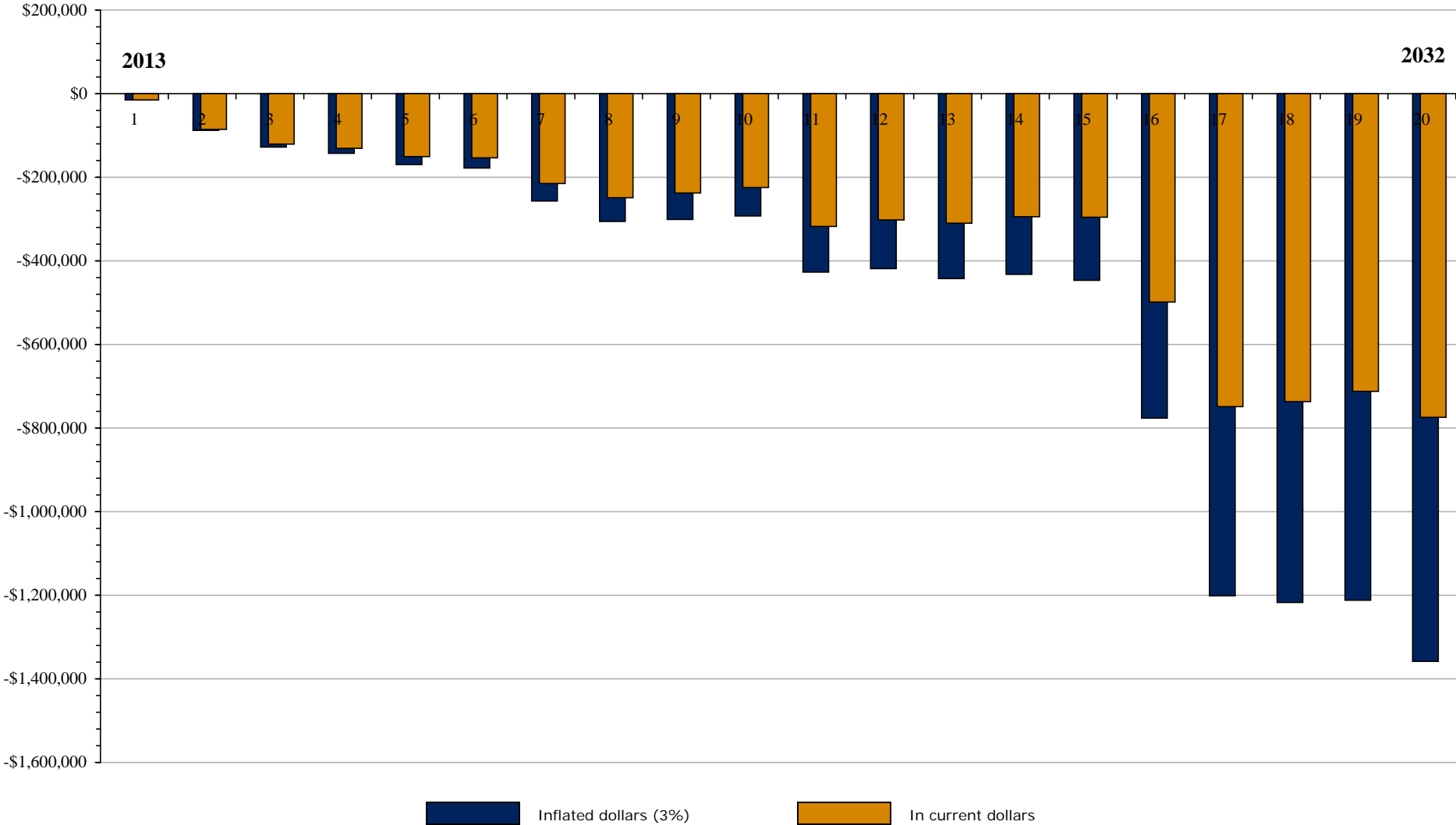
	2013 Year 1	2014 Year 2	2015 Year 3	2016 Year 4	2017 Year 5	2018 Year 6	2019 Year 7	2020 Year 8	2021 Year 9	2022 Year 10
Site Systems										
Surface	\$0	\$0	\$9,500	\$0	\$0	\$0	\$0	\$11,013	\$0	\$0
Site Distribution Systems	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Site Sub-Total	\$0	\$0	\$9,500	\$0	\$0	\$0	\$0	\$11,013	\$0	\$0
Mechanical Room										
Boilers	\$0	\$0	\$0	\$0	\$0	\$7,941	\$0	\$0	\$0	\$0
Boiler Room Systems	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Mechanical Sub-Total	\$0	\$0	\$0	\$0	\$0	\$7,941	\$0	\$0	\$0	\$0
Building Mech. & Electrical										
Mechanical	\$30,300	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Electrical	\$0	\$59,122	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Elevators	\$2,500	\$0	\$0	\$0	\$0	\$8,289	\$0	\$0	\$0	\$0
Mechanical & Electrical Sub-Total	\$32,800	\$59,122	\$0	\$0	\$0	\$8,289	\$0	\$0	\$0	\$0
Building Architectural										
Structural and Exterior	\$3,167	\$278	\$286	\$295	\$304	\$313	\$322	\$4,227	\$342	\$352
Roof Systems	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Halls, Stairs, Lobbies	\$920	\$0	\$0	\$0	\$0	\$0	\$44,374	\$42,201	\$0	\$0
Community Spaces	\$0	\$0	\$0	\$0	\$0	\$0	\$40,081	\$0	\$3,522	\$0
Building Architectural Sub-Total	\$4,087	\$278	\$286	\$295	\$304	\$313	\$84,778	\$46,428	\$3,864	\$352
Dwelling Units										
Living Areas	\$17,975	\$18,514	\$19,069	\$19,641	\$20,231	\$0	\$0	\$0	\$0	\$0
Bathrooms	\$2,193	\$2,259	\$2,327	\$2,397	\$6,728	\$0	\$0	\$0	\$0	\$0
Kitchens	\$7,435	\$5,681	\$5,851	\$6,026	\$6,207	\$6,631	\$9,122	\$7,034	\$7,245	\$7,463
Mechanical & Electrical	\$0	\$0	\$16,465	\$0	\$7,275	\$0	\$0	\$0	\$0	\$0
Dwelling Units Sub-Total	\$27,603	\$26,454	\$43,712	\$28,065	\$40,441	\$6,631	\$9,122	\$7,034	\$7,245	\$7,463
Total Capital Costs	\$64,490	\$85,854	\$53,498	\$28,360	\$40,745	\$23,173	\$93,900	\$64,475	\$11,109	\$7,815

Pompey Hollow

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	
\$20,159	\$0	\$12,767	\$0	\$1,308	\$927	\$249,692	\$0	\$0	\$0	Site Systems
\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	Surface
										Site Distribution Systems
\$20,159	\$0	\$12,767	\$0	\$1,308	\$927	\$249,692	\$0	\$0	\$0	Site Sub-Total
\$116,749	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	Mechanical Room
\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$32,300	Boilers
										Boiler Room Systems
\$116,749	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$32,300	Mechanical Sub-Total
\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	Building Mech. & Electrical
\$0	\$0	\$0	\$0	\$0	\$75,561	\$0	\$0	\$0	\$0	Mechanical
\$0	\$0	\$0	\$0	\$0	\$142,982	\$0	\$0	\$0	\$0	Electrical
										Elevators
\$0	\$0	\$0	\$0	\$0	\$218,544	\$0	\$0	\$0	\$0	Mechanical & Electrical Sub-Total
\$3,252	\$374	\$385	\$0	\$4,790	\$120,720	\$0	\$0	\$0	\$0	Building Architectural
\$0	\$0	\$0	\$0	\$0	\$0	\$137,772	\$0	\$0	\$0	Structural and Exterior
\$1,451	\$0	\$0	\$0	\$0	\$0	\$25,678	\$21,738	\$0	\$0	Roof Systems
\$1,777	\$509	\$0	\$0	\$18,527	\$0	\$22,494	\$0	\$0	\$0	Halls, Stairs, Lobbies
										Community Spaces
\$6,481	\$883	\$385	\$0	\$23,317	\$120,720	\$185,944	\$21,738	\$0	\$0	Building Architectural Sub-Total
\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	Dwelling Units
\$2,369	\$2,440	\$2,514	\$2,589	\$2,667	\$2,747	\$2,829	\$8,573	\$5,829	\$6,520	Living Areas
\$3,945	\$4,064	\$6,923	\$4,311	\$4,440	\$4,574	\$4,711	\$4,852	\$8,266	\$127,297	Bathrooms
\$1,478	\$1,523	\$18,906	\$1,615	\$1,664	\$1,714	\$1,765	\$1,818	\$1,873	\$1,929	Kitchens
										Mechanical & Electrical
\$7,793	\$8,027	\$28,342	\$8,515	\$8,771	\$9,034	\$9,305	\$15,244	\$15,968	\$135,746	Dwelling Units Sub-Total
\$151,181	\$8,910	\$41,494	\$8,515	\$33,396	\$349,225	\$444,941	\$36,982	\$15,968	\$168,045	Total Capital Costs

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



Current Replacement Reserve Balance: **\$35,985**
Adjusted Replacement Reserve Balance: **\$35,985**
Current annual contributions to reserve accounts: **\$12,352**

At the end of Year One, Reserve Balances are projected to be: **(\$14,888)**
At the end of Year 20, Reserve Balances are projected to be: **(\$1,358,130)**
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	\$35,985	(\$14,888)	(\$87,828)	(\$128,026)	(\$142,686)	(\$169,319)	(\$177,959)	(\$256,888)	(\$305,944)	(\$301,171)
(B) Annual Funding										
Contributions Indexed at 3%	\$386	\$398	\$410	\$422	\$434	\$447	\$461	\$475	\$489	\$504
(C) Additional Unit Contributions										
(D) Total Annual Reserve Funding	\$12,352	\$12,723	\$13,104	\$13,497	\$13,902	\$14,319	\$14,749	\$15,191	\$15,647	\$16,117
(E) Interest on Reserves at 3%	\$1,265	\$191	\$197	\$202	\$209	\$215	\$221	\$228	\$235	\$242
Total Funds Available	\$49,602	(\$1,975)	(\$74,527)	(\$114,326)	(\$128,575)	(\$154,785)	(\$162,988)	(\$241,469)	(\$290,062)	(\$284,813)
(F) Total Capital Cost	\$64,490	\$85,854	\$53,498	\$28,360	\$40,745	\$23,173	\$93,900	\$64,475	\$11,109	\$7,815
(G) Reserve Balances	(\$14,888)	(\$87,828)	(\$128,026)	(\$142,686)	(\$169,319)	(\$177,959)	(\$256,888)	(\$305,944)	(\$301,171)	(\$292,628)
Outside Capital:										
Adjusted Reserve Balances	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Notes:

1. Starting reserve balance is \$35,985.
2. Annual contribution is \$12,352.
3. Capital costs outpace reserves throughout the entire plan.

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

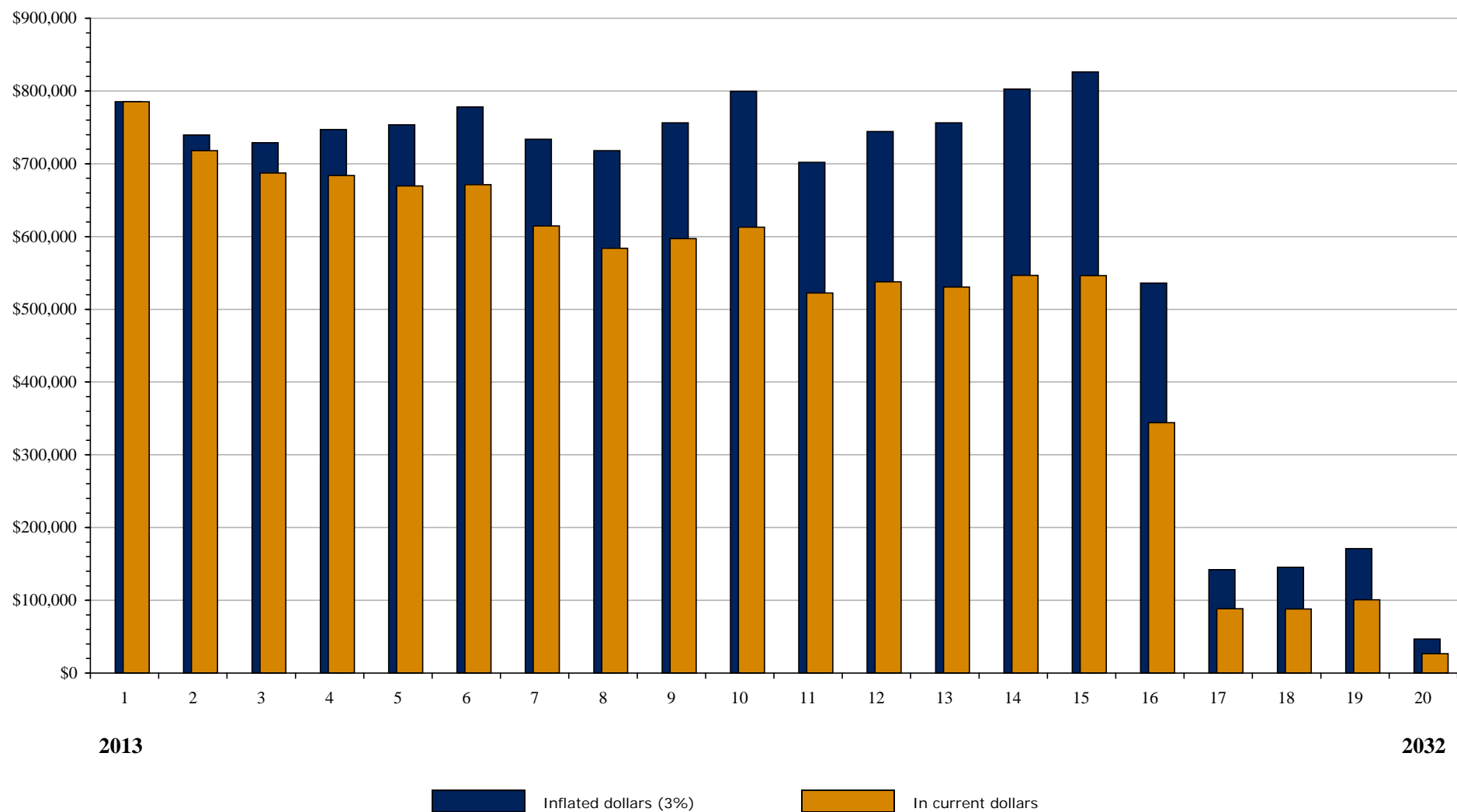
Line C, Additional Contributions allows for material adjustments in annual RR funding that would enable the property to meet all projected needs out of reserves through Year 20.

**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 (\$1,358,130)					This is (\$42,442)per unit in inflated dollars or (\$24,204) per unit in uninflated dollars					
Projected annual funding to reserves is \$21,659					This is \$677 per unit in inflated dollars or \$386 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)
(\$292,628)	(\$426,960)	(\$418,515)	(\$442,134)	(\$432,238)	(\$446,670)	(\$776,362)	(\$1,201,185)	(\$1,217,444)	(\$1,212,068)	Starting Replacement Reserves
										Annual Funding (B)
\$519	\$534	\$550	\$567	\$584	\$601	\$619	\$638	\$657	\$677	Contributions Indexed at 3%
										Additional Unit Contributions (C)
\$16,600	\$17,098	\$17,611	\$18,139	\$18,684	\$19,244	\$19,821	\$20,416	\$21,028	\$21,659	Total Annual Reserve Funding (D)
\$249	\$256	\$264	\$272	\$280	\$289	\$297	\$306	\$315	\$325	Interest on Reserves at 3% (E)
(\$275,779)	(\$409,605)	(\$400,640)	(\$423,722)	(\$413,274)	(\$427,137)	(\$756,244)	(\$1,180,463)	(\$1,196,100)	(\$1,190,084)	Total Funds Available
\$151,181	\$8,910	\$41,494	\$8,515	\$33,396	\$349,225	\$444,941	\$36,982	\$15,968	\$168,045	Total Capital Cost (F)
(\$426,960)	(\$418,515)	(\$442,134)	(\$432,238)	(\$446,670)	(\$776,362)	(\$1,201,185)	(\$1,217,444)	(\$1,212,068)	(\$1,358,130)	Reserve Balances (G)
\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	

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



Current Replacement Reserve Balance: **\$35,985**

Adjusted Replacement Reserve Balance: **\$35,985**

Current annual contributions to reserve accounts: **\$12,352**

At the end of Year One, Reserve Balances are projected to be: **\$785,112**

At the end of Year 20, Reserve Balances are projected to be: **\$46,637**

All projected capital needs are met throughout the plan

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

Reserve Funding In Year 1										
Starting Balance:		\$35,985 or \$1,125/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:		\$12,352 or \$386/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	\$35,985	\$785,112	\$739,623	\$729,022	\$747,139	\$753,415	\$778,188	\$733,738	\$718,164	\$756,294
(B) Annual Funding										
Contributions Indexed at 3%	\$386	\$398	\$518	\$638	\$758	\$780	\$804	\$828	\$853	\$878
(C) Additional Unit Contributions		\$120	\$120	\$120						
(D) Total Annual Reserve Funding	\$12,352	\$16,563	\$20,403	\$24,243	\$24,243	\$24,970	\$25,719	\$26,490	\$27,285	\$28,104
(E) Interest on Reserves at 3%	\$1,265	\$23,802	\$22,495	\$22,234	\$22,778	\$22,977	\$23,731	\$22,410	\$21,954	\$23,110
Total Funds Available	\$49,602	\$825,476	\$782,520	\$775,498	\$794,159	\$801,361	\$827,638	\$782,638	\$767,403	\$807,508
(F) Total Capital Cost	\$64,490	\$85,854	\$53,498	\$28,360	\$40,745	\$23,173	\$93,900	\$64,475	\$11,109	\$7,815
(G) Reserve Balances	(\$14,888)	\$739,623	\$729,022	\$747,139	\$753,415	\$778,188	\$733,738	\$718,164	\$756,294	\$799,693
Outside Capital:	\$800,000									
Adjusted Reserve Balances	\$785,112	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Notes:

1. Same starting reserve balance and annual contribution as shown in Plan 1.
2. An infusion of \$800K is shown in Year 1.
3. Annual contribution is increased by \$120 per year in Years 2 through 4.
4. Plan is fully funded.

*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 \$46,637					This is \$1,457 per unit in inflated dollars or \$831 per unit in uninflated dollars				
Projected annual funding to reserves is \$37,769					This is \$1,180 per unit in inflated dollars or \$673 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
\$799,693	\$701,884	\$744,293	\$756,299	\$802,578	\$826,328	\$535,953	\$142,173	\$145,592	\$171,211
\$905	\$932	\$960	\$988	\$1,018	\$1,049	\$1,080	\$1,113	\$1,146	\$1,180
\$28,947	\$29,815	\$30,710	\$31,631	\$32,580	\$33,557	\$34,564	\$35,601	\$36,669	\$37,769
\$24,425	\$21,504	\$22,789	\$23,163	\$24,566	\$25,293	\$16,597	\$4,799	\$4,918	\$5,703
\$853,065	\$753,203	\$797,792	\$811,093	\$859,724	\$885,178	\$587,114	\$182,574	\$187,179	\$214,683
\$151,181	\$8,910	\$41,494	\$8,515	\$33,396	\$349,225	\$444,941	\$36,982	\$15,968	\$168,045
\$701,884	\$744,293	\$756,299	\$802,578	\$826,328	\$535,953	\$142,173	\$145,592	\$171,211	\$46,637
\$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	8,600 sf	2.10	\$18,060		≈3	20	17	in 1 Year	Asphalt paved, in good condition Resurface in Year 17
Roadways (Green)	8,600 sf	5.75	\$49,450	\$31,390	19	20	17	in 1 Year	Resurface using pourous asphalt
Parking	16,984 sf	2.10	\$35,666		≈3	20	17	in 1 Year	Asphalt paved, in good condition Resurface in Year 17
Parking (Green)	16,984 sf	6.25	\$106,150	\$70,484	19	20	17	in 1 Year	Resurface using open pavers
Crack-Fill and and and Sealcoat	25,584 sf	0.35	\$8,954		19	5	3 /8 /13	in 1 Year	Minor cracks observed. Repair allowance (crackfill, sealcoat, re-stripe)
	2,660 sf				19				Concrete walkways, in good condition
Pedestrian Paving	133 sf	6.50	\$865		19	20	15	in 1 Year	Repair allowance
	2,660 sf				19				
Pedestrian Paving (Green)	133 sf	6.50	\$865	\$0	19	20	15	in 1 Year	Use recycled concrete for future repairs
Fencing - 1	lf								
Fencing - 1 (Green)	lf								
Fencing - 2	lf								
Fencing - 2 (Green)	lf								
Retaining Walls	lf								
Site Lighting-Walkway	7 ea				19	20			Bollard-style lighting with CFL (13 watt each) Maintain out of Operating
Site Lighting-Walkway (Green)	7 ea	40.00	\$280		19	35	16	in 1 Year	Replace existing CFLs w/6 watt LEDs See EWCM 1
Site Lighting-Roadway	7 ea				19	20			Pole-mounted (10 ft height) w/CFLs (26 watts) Maintain out of Operating
Site Lighting-Roadway (Green)	7 ea	45.00	\$315		19	35	16	in 1 Year	Replace existing w/16 watt LEDs See EWCM 1
Landscaping	1 ls	7500.00	\$7,500		19	20	11	in 1 Year	Surrounding lawn/flowerbeds, in good condition Allowance to replant and prune
Landscaping (Green)	1 ls	15000.00	\$15,000	\$7,500	19	20	11	in 1 Year	Replace existing w/Xeriscape (local plantings) Minimum maintenance and water use. Discuss
Miscellaneous	ea								
Miscellaneous (Green)	ea								
Site Distribution Systems	1 ls				19	50			Septic system w/leaching field, municipal water Maintain out of Operating

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	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$28,981	\$0	\$0	\$0
Roadways (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$79,353	\$0	\$0	\$0
Parking	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$57,234	\$0	\$0	\$0
Parking (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$170,340	\$0	\$0	\$0
Crack-Fill and and and Sealcoat	\$0	\$0	\$9,500	\$0	\$0	\$0	\$0	\$11,013	\$0	\$0	\$0	\$0	\$12,767	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Pedestrian Paving	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,308	\$0	\$0	\$0	\$0	\$0
Pedestrian Paving (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,308	\$0	\$0	\$0	\$0	\$0
Fencing - 1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Fencing - 1 (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Fencing - 2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Fencing - 2 (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Retaining Walls	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Site Lighting-Walkway	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Site Lighting-Walkway (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$436	\$0	\$0	\$0	\$0
Site Lighting-Roadway	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Site Lighting-Roadway (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$491	\$0	\$0	\$0	\$0
Landscaping	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$10,079	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Landscaping (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$20,159	\$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
Site Distribution Systems	\$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								
Boilers - 1	2 ea	34,521	\$69,042		19	30	11 in 1 Year	Peerless boilers (1555 MBH ea), new burners 78% eff Replace in Year 11
Boilers - 1 (Green)	2 ea	39,186	\$78,372	\$9,330	19	30	11 in 1 Year	Replace existing w/higher efficient oil-fired boilers (86% eff). See EWCM 2
Controls	1 ls	8,500	\$8,500		≈3	15	11 in 1 Year	Telemate 22 EMS (OA and return water temp input Replace in Year 11
Controls (Green)	ea							Green option in place
Hydronic Circulating Pumps	2 ea	3,350	\$6,700		19	25	6 in 1 Year	Base-mounted 2 hp pumps, 82.5% eff, one being repaired. Replace Year 1
Hydronic Circulating Pumps (Green)	2 ea	3,425	\$6,850	\$150	19	25	6 in 1 Year	Replace existing w/premium efficient pump motors in Year 1
Chilled Water Pumps	ea							
Chilled Water Pumps (Green)	ea							
Cooling Water Pumps	ea							
Cooling Water Pumps (Green)	ea							
Heating Water Pumps - 1	ea							
Heating Water Pumps - 1 (Green)	ea							
Combustion Air	1 ls				19	30		Ducted air source Maintain out of Operating
Combustion Air (Green)	ea							
Flue Exhaust	1 ls				19	30		Metal flues, no missing or loose sections observed Maintain out of Operating
Flue Exhaust (Green)	ea							
Condensate & Feed Water	ea							
Miscellaneous	ea							
Miscellaneous (Green)	ea							
Miscellaneous	ea							
Miscellaneous (Green)	ea							

Pompey Hollow
MECHANICAL ROOM

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	\$92,787	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Boilers - 1 (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$105,325	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Controls	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$11,423	\$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
Hydronic Circulating Pumps	\$0	\$0	\$0	\$0	\$0	\$7,767	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Hydronic Circulating Pumps (Green)	\$0	\$0	\$0	\$0	\$0	\$7,941	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Chilled Water Pumps	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Chilled Water Pumps (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Cooling Water Pumps	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Cooling 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	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Heating Water Pumps - 1 (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Combustion Air	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Combustion Air (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	1 ea				19	25			No active leaks or corrosion observed
Boiler Room Piping/Valves (Green)	ea								Maintain out of Operating
3-Way Valve & Controller	ea								
3-Way Valve & Controller (Green)	ea								
Heat Exchanger	1 ea				1	25			Plate & Frame heat exchanger for DHW
Heat Exchanger (Green)	ea								Maintain out of Operating
DHW Generation - 1	1 ea	12600.00	\$12,600		1	20	20	in 1 Year	Oil-fired Aiello Systems 2000 high eff boiler
DHW Generation - 1 (Green)	ea								85% eff, Future replacement in Yr 20
DHW Generation - 2	ea								Green option in place
DHW Generation - 2 (Green)	ea								
DHW Storage - 1	1 ea	3850.00	\$3,850		1	20	20	in 1 Year	Insulated 119 gallon storage tank
DHW Storage - 1 (Green)	ea								Future replacement in Year 20
DHW Storage - 2	ea								
DHW Storage - 2 (Green)	ea								
DHW Pumps - 1	2 ea	950.00	\$1,900		1	20	20	in 1 Year	In-line 1/12 hp each, std eff
DHW Pumps - 1 (Green)	2 ea	985.00	\$1,970	\$70	1	20	20	in 1 Year	Replace in Year 20
DHW Pumps - 2	ea								Replace existing w/premium efficient pump motors
DHW Pumps - 2 (Green)	ea								In Year 20
Well-water Pumps/Storage	1 ea				19	25			Original system offline and abandoned in place
Well-water Pumps/Storage (Green)	ea								
Fuel Oil Storage Tank	1 ea				19	40			10,000 gallon fiberglass UST in concrete vault
									with gravel fill and leakage monitor. Operating

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	\$0	\$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	\$22,094
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	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$6,751
DHW Storage - 1 (Green)	\$0	\$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
DHW Pumps - 1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,332
DHW Pumps - 1 (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,454
DHW Pumps - 2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
DHW Pumps - 2 (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Well-water Pumps/Storage	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Well-water Pumps/Storage (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Fuel Oil Storage Tank	\$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	_____ ea	_____	_____		_____	_____	_____	_____	
Building Fire Suppression	_____ 1 ls	_____ 6850.00	_____ \$6,850		_____ 19	_____ 35	_____ 1	_____ in 1 Year	10,000 gal water storage tank w/25 hp pump Add backflow preventer
Building Distribution Systems	_____ 1 ls	_____	_____		_____ 19	_____ 50	_____	_____	
Common Area A/C	_____ 2 ea	_____ 5250.00	_____ \$10,500		_____ 19	_____ 20	_____ 1	_____ in 1 Year	Lenox split DX 4 ton air conditioning systems Replace in Year 1
Common Area A/C (Green)	_____ 2 ea	_____ 5575.00	_____ \$11,150	_____ \$650	_____ 19	_____ 20	_____ 1	_____ in 1 Year	Replace existing w/higher SEER (eff) a/c units in Year 1 (Energy Star rated)
Common Area AHUs	_____ 2 ea	_____ 6150.00	_____ \$12,300		_____ 19	_____ 20	_____ 1	_____ in 1 Year	Air handlers w/hydronic and cooling coils Replace in Year 1
Common Area AHUs (Green)	_____ 2 ea	_____	_____		_____ 19	_____ 20	_____	_____	
Building HVAC Systems - 3	_____ ea	_____	_____		_____	_____	_____	_____	
Building HVAC Systems - 3 (Green)	_____ ea	_____	_____		_____	_____	_____	_____	
Building Vent. & Exhaust	_____ 1 ls	_____	_____		_____ 19	_____ 20	_____	_____	Maintain out of Operating
Building Vent. & Exhaust (Green)	_____ ea	_____	_____		_____	_____	_____	_____	
Cold Water Booster Pumps	_____ ea	_____	_____		_____	_____	_____	_____	
Cold Water Booster Pumps (Green)	_____ ea	_____	_____		_____	_____	_____	_____	

BUILDING ELECTRICAL

Building Power Wiring	_____ 1 ls	_____	_____		_____ 19	_____ 99	_____	_____	Square D equipment and panels Maintain out of Operating
	_____ 1	_____ 48500.00	_____ \$48,500		_____ 19	_____ 35	_____ 16	_____ in 1 Year	Diesel-powered Kohler 100 kW generator. Overhaul
Emergency Generator	_____ 1 ea	_____ 5500.00	_____ \$5,500		_____ 19	_____ 35	_____ 2	_____ in 1 Year	in Year 2, replace in Year 16
Emergency Lights	_____ 1 ea	_____	_____		_____ 19	_____ 10	_____	_____	Hallway lights w/special ballasts Maintain out of Operating
Smoke / Fire Detection	_____ 1 ls	_____ 43400.00	_____ \$43,400		_____ 19	_____ 20	_____ 2	_____ in 1 Year	FCI FACP governs hardwired detection/alarm devices Upgrade in Year 2
Signaling / Communication	_____ 1 ls	_____ 8500.00	_____ \$8,500		_____ 19	_____ 20	_____ 2	_____ in 1 Year	Intercom panel at main entrance, voice only Upgrade

BUILDING ELEVATORS

Shafts and Doorways	_____ 1 ea	_____	_____		_____ 19	_____ 30	_____	_____	Montgomery hydraulic elevator Maintained by full service contract
Cabs	_____ 1 ea	_____ 7150.00	_____ \$7,150		_____ 4	_____ 10	_____ 6 16	_____ in 1 Year	Cab interior and door operators not in service contract Refurbish in Years 6 and 16
Controller/Dispatcher	_____ 1 ea	_____ 2500.00	_____ \$2,500		_____ 19	_____ 20	_____ 1	_____ in 1 Year	Add air conditioning to equipment room
Machine Room Equipment	_____ 1 ea	_____ 84625.00	_____ \$84,625		_____ 19	_____ 35	_____ 16	_____ in 1 Year	Major upgrade in Year 16

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	\$6,850	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Building Distribution Systems	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Common Area A/C	\$10,500	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Common Area A/C (Green)	\$11,150	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Common Area AHUs	\$12,300	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Common Area AHUs (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Building HVAC Systems - 3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Building HVAC Systems - 3 (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Building Vent. & Exhaust	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Building Vent. & Exhaust (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Cold Water Booster Pumps	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Cold Water Booster Pumps (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	\$5,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$75,561	\$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	\$0	\$44,702	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Signaling / Communication	\$0	\$8,755	\$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	\$0	\$0	\$0	\$0	\$0	\$8,289	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$11,139	\$0	\$0	\$0	\$0
Controller/Dispatcher	\$2,500	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Machine Room Equipment	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$131,843	\$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	2,728	lf				19	50				Basement under core of bldg w/concrete walls & floor Monitor
Framing		ls									
Slab		sf									
Miscellaneous		ea									
BUILDING EXTERIOR											
Exterior Common Doors	2	ea	690.00	\$1,380		19	35	16	in	1 Year	Insulated metal doors, double leaf Replace in Year 16.
Exterior Common Doors (Green)	2	ea	741.75	\$1,484	\$104	19	35	16	in	1 Year	Replace existing w/fiberglass doors. Increased insulation level, less maintainance.EWCM 4
Exterior Secondary Doors - 2	7	ea	345.00	\$2,415		19	35	16	in	1 Year	Insulated metal doors Replace in Year 16
Exterior Secondary Doors - 2 (Green)	7	ea	370.88	\$2,596	\$181	19	35	16	in	1 Year	Replace existing w/fiberglass doors. Increased insulation level, less maintainance.EWCM 4
Glass Sliding Doors		ea									
Glass Sliding Doors (Green)		ea									
Garage Door (Roll up)	1	ea	2150.00	\$2,150		19	25	11	in	1 Year	Roll-up door, provides basement service access Replace in Year 11
Storm Doors		ea									
	33,092	sf				19					Brick section, no signs of mortar loss or cracks
Exterior Walls -1	1,655	sf	7.00	\$11,582		19	50	16	in	1 Year	Future allowance for repointing
Exterior Walls -1 (Green)		sf									
Exterior Walls - 2	10,556	sf	0.30	\$3,167		19	40	1 8 15	in	1 Year	Vinyl siding sections; some areas with dirt and growth Power wash in Years 1, 8, and 15
Exterior Walls - 2 (Green)		sf									
Exterior Walls - 3		sf									
Trim, Soffit, Fascia		lf									
Trim, Soffit, Fascia (Green)		lf									
Exterior Ceilings		sf									
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
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	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,150	\$0	\$0	\$0	\$0
Exterior Common Doors (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,311	\$0	\$0	\$0	\$0
Exterior Secondary Doors - 2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,762	\$0	\$0	\$0	\$0
Exterior Secondary Doors - 2 (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4,045	\$0	\$0	\$0	\$0
Glass Sliding Doors	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Glass Sliding Doors (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Garage Door (Roll up)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,889	\$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 -1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$18,045	\$0	\$0	\$0	\$0
Exterior Walls -1 (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Exterior Walls - 2	\$3,167	\$0	\$0	\$0	\$0	\$0	\$0	\$3,895	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4,790	\$0	\$0	\$0	\$0
Exterior Walls - 2 (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Exterior Walls - 3	\$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 - 1	162	ea	355.00	\$57,510		19	35	16	in 1 Year	Vinyl-framed double glazed windows Replace in Year 16
Windows - 1 (Green)	162	ea	381.63	\$61,824	\$4,314	19	35	16	in 1 Year	Replace existing w/fiberglass-framed insulated windows (argon gas-filled). See EWCM 5.
Windows - 2		ea								
Windows - 2 (Green)		ea								
Window Glazing	41	ea	80.00	\$3,240		19	15	2	over 12 Years	Window repair and Glazing replacement allowance (fogged windows)
Window Glazing (Green)		ea								
Window Lintels		ea								
Unit Balconies		ea								
Unit Balconies (Green)		ea								
Unit Patios		ea								
Unit Patios (Green)		ea								
Building Mounted Lighting		ea								
Building Mounted Lighting (Green)		ea								
ROOF SYSTEMS										
Structure	21,464	sf				19	50			Wood framed with wood decking Monitor
Roof Covering - 1	21,464	sf	4.00	\$85,855		≈4	20	17	in 1 Year	Pitched roofing w/architectural shingles Replace in Year 17, R38 insulation
Roof Covering - 1 (Green)	21,464	sf	7.75	\$166,344	\$80,489	19	40		Years	Replace existing w/metal roof (longevity LCC? Not cost-effective, see GM 1.
Roof Covering - 2		sf								
Roof Covering - 2 (Green)		sf								
Roof Covering - 3		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 - 1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$89,599	\$0	\$0	\$0	\$0
Windows - 1 (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$96,320	\$0	\$0	\$0	\$0
Windows - 2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Windows - 2 (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Window Glazing	\$0	\$278	\$286	\$295	\$304	\$313	\$322	\$332	\$342	\$352	\$363	\$374	\$385	\$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	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Building Mounted Lighting (Green)	\$0	\$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 - 1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$137,772	\$0	\$0	\$0
Roof Covering - 1 (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Roof Covering - 2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$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 and Ceilings	22,847 sf	1.15	\$26,304		Varies	10	7	17	over 2 Years	Ceiling tiles and painted walls, in good condition Replace tiles and repaint walls in Years 7 and 17
Hallway Walls and Ceilings (Green)	22,847 sf	1.15	\$26,304	\$0	Varies	10	7	17	over 2 Years	Use low VOC paints and materials
Hallway Floors - 1	7,695 sf	3.00	\$23,085		Varies	10	7	17	over 2 Years	Carpeted, in good condition Replace in Years 7 and 17
Hallway Floors - 1 (Green)	7,695 sf	5.50	\$42,323	\$19,238	Varies	25	7		over 2 Years	Replace existing w/faux wood linoleum. Longer life See GM 2
Hallway Lighting	58 sf				19	20				T8 U-lamps w/occupancy sensor control Maintain out of Operating
Hallway Lighting (Green)	58 sf				19	20				Green option in place
Exit Fixtures	27 ea				19	20				PL (compact fluorescent lighting source) 13 watts each Maintain out of Operatig
Exit Fixtures (Green)	27 ea	40.00	\$1,080		19	30	11		in 1 Year	Replace existing w/ LED lighting source, 4 watts each longer EUL. See EWCM 6
Basement Lighting	16 ea				19	20				Two-light T12 F30s (3 ft lamps) Maintain out of Operatig
Basement Lighting (Green)	16 ea	45.00	\$720		19	20	1		in 1 Year	Retrofit existing w/T8 lamps and electronic ballasts See EWCM 7
Hallway Doors										
Lobby Lighting	5 ea				19	20				Recessed cans w/65 watt incandescent lamps Maintain out of Operating
Lobby Lighting (Green)	5 ea	40.00	\$200		19	30	1		in 1 Year	Replace existing with LED 17 watt PAR lamps Designed for recessed fixtures. See EWCM 7
STAIRS										
Stair Walls and Ceilings	3,906 sf	0.62	\$2,422		3	10	7	17	in 1 Year	Painted walls and ceilings Repaint
Stair Walls and Ceilings (Green)	3,906 sf	0.62	\$2,422	\$0	3	10	7	17	in 1 Year	Use low VOC paints
Stair Floors	690 sf	0.62	\$428		3	10	7	17	in 1 Year	Painted and sealed concrete landings and treads Repaint
Stair Floors (Green)	690 sf	0.62	\$428	\$0	3	10	7	17	in 1 Year	Use low VOC paints
Stair Interior Lighting	16 ea				19	10				Two light F25T8s (3 ft lamps) Maintain out of Operating
Stair Interior Lighting (Green)	16 ea				19	10				Green option in place
Stair Doors	1 ls				19	25				Maintain out of Operating
Stair Railings	1 ls				19	20				Maintain out of Operating

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 and Ceilings	\$0	\$0	\$0	\$0	\$0	\$0	\$15,704	\$16,175	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$21,105	\$21,738	\$0	\$0
Hallway Walls and Ceilings (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$15,704	\$16,175	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$21,105	\$21,738	\$0	\$0
Hallway Floors - 1	\$0	\$0	\$0	\$0	\$0	\$0	\$13,782	\$14,196	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$18,522	\$19,078	\$0	\$0
Hallway Floors - 1 (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$25,268	\$26,026	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Hallway Lighting	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Hallway Lighting (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Exit Fixtures	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Exit Fixtures (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,451	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Basement Lighting	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Basement Lighting (Green)	\$720	\$0	\$0	\$0	\$0	\$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
Lobby Lighting	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Lobby Lighting (Green)	\$200	\$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	\$2,892	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,886	\$0	\$0	\$0
Stair Walls and Ceilings (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$2,892	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,886	\$0	\$0	\$0
Stair Floors	\$0	\$0	\$0	\$0	\$0	\$0	\$511	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$686	\$0	\$0	\$0
Stair Floors (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$511	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$686	\$0	\$0	\$0
Stair Interior Lighting	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Stair Interior Lighting (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 / MAIL FACILITIES												
Lobby Walls & Ceilings	1,150	sf	2.23	\$2,565		3	10	7	17	in	1 Year	Ceiling tiles and painted walls, in good condition Replace tiles and repaint walls in Years 7 and 17
Lobby Walls & Ceilings (Green)	1,150	sf	2.23	\$2,565	\$0	3	10	7	17	in	1 Year	Use low VOC paints and materials
Lobby Floors	238	sf	3.00	\$714		3	10	7	17	in	1 Year	Carpeted, in good condition Replace in Years 7 and 17
Lobby Floors (Green)	238	sf	5.50	\$1,309	\$595	3	25	7		in	1 Year	Replace existing w/faux wood linoleum. Longer life See GM 2
COMMUNITY ROOM / OFFICE												
Walls and Ceilings	7,798	sf	1.02	\$7,973		3	10	7	17	in	1 Year	Ceiling tiles and painted walls, in good condition Replace tiles and repaint walls in Years 7 and 17
Walls and Ceilings (Green)	7,798	sf	1.02	\$7,973	\$0	3	10	7	17	in	1 Year	Use low VOC paints and materials
Floor Covering	2,982	sf	4.60	\$13,715		3	10	7	17	in	1 Year	VCT flooring in most areas, carpeting in lounge Replace
Floor Covering (Green)	2,982	sf	5.50	\$16,398	\$2,683	3	25	7		in	1 Year	Replace existing w/faux wood linoleum. Longer life See GM 2
Appliances, Finishes, Furnishings	1	ls	12198.40	\$12,198		Varies	20	15		in	1 Year	Refrigerator, range, countertops, wood cabinets, common area furniture. Replacement allowance
Appliances, Finishes, Furn (Green)	1	ls	12248.65	\$12,249	\$50	Varies	20	15		in	1 Year	Energy Star refrig (EWCM 8), stone countertop (GM 4) replace other appli/furnt in kind.
Common Area Lighting	53	ea				19	20					T8 fluorescent lamps (2 ft, U-lamps) Maintain out of Operating
Common Area Lighting (Green)	53	ea				19	20					Green option in place
PUBLIC LAUNDRY / RESTROOMS												
Walls and Ceilings	3,023	sf	1.15	\$3,480		3	10	7	17	in	1 Year	Ceiling tiles and painted walls, in good condition Replace tiles and repaint walls in Years 7 and 17
Walls and Ceilings (Green)	3,023	sf	1.15	\$3,480	\$0	3	10	7	17	in	1 Year	Use low VOC paints and materials
Floor Covering	335	sf	5.00	\$1,675		Varies	15	7		in	1 Year	VCT Replace
Floor Covering (Green)	335	sf	5.50	\$1,843	\$168	Varies	25	7		in	1 Year	Replace existing w/faux wood linoleum. Longer life See GM 2
Laundry Equipment	1	ls	2780.00	\$2,780		Varies	12	9		in	1 Year	Two front loading washers, two electric dryers Replacement allowance
Laundry Equipment (Green)		ls				Varies						
Restroom Fixtures / Accessories	1	ea	368.00	\$368		Varies	20	12		in	1 Year	Mirrors, grab bars, etc. Replacement allowance
Toilets	3	ea	410.00	\$1,230		19	30	11		in	1 Year	Low flush toilets (1.6 gpf) Replace in Year 11
Toilets (Green)	3	ea	440.75	\$1,322	\$92	19	30	11		in	1 Year	Replace existing with high efficiency toilets (1.28 gpf) See EWCM 9

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 / MAIL FACILITIES																				
Lobby Walls & Ceilings	\$0	\$0	\$0	\$0	\$0	\$0	\$3,062	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4,115	\$0	\$0	\$0
Lobby Walls & Ceilings (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$3,062	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4,115	\$0	\$0	\$0
Lobby Floors	\$0	\$0	\$0	\$0	\$0	\$0	\$853	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,146	\$0	\$0	\$0
Lobby Floors (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$1,563	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
COMMUNITY ROOM / OFFICE																				
Walls and Ceilings	\$0	\$0	\$0	\$0	\$0	\$0	\$9,520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$12,794	\$0	\$0	\$0
Walls and Ceilings (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$9,520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$12,794	\$0	\$0	\$0
Floor Covering	\$0	\$0	\$0	\$0	\$0	\$0	\$16,376	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$22,008	\$0	\$0	\$0
Floor Covering (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$19,580	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Appliances, Finishes, Furnishings	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$18,451	\$0	\$0	\$0	\$0	\$0
Appliances, Finishes, Furn (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$18,527	\$0	\$0	\$0	\$0	\$0
Common Area Lighting	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Common Area Lighting (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
PUBLIC LAUNDRY / RESTROOMS																				
Walls and Ceilings	\$0	\$0	\$0	\$0	\$0	\$0	\$4,156	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$5,585	\$0	\$0	\$0
Walls and Ceilings (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$4,156	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$5,585	\$0	\$0	\$0
Floor Covering	\$0	\$0	\$0	\$0	\$0	\$0	\$2,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Floor Covering (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$2,200	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Laundry Equipment	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,522	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Laundry Equipment (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Restroom Fixtures / Accessories	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$509	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Toilets	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,653	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Toilets (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,777	\$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	32 ea				19	30				Solid core Maintain out of Operating
Unit Interior Doors	64 ea				19	25				Hollow core Maintain out of Operating
Unit Closet Doors	128 ea				19	25				Hollow core Maintain out of Operating
Unit Walls and Ceilings	83,478 sf				Varies	10				Painted surfaces Maintain out of Operating
Unit Walls and Ceilings (Green)	83,478 sf				Varies	10				Use Low VOC paints
Living Area Floors - 1	16,341 sf	5.00	\$81,703		Varies	15	1 16	over 15 Years		VCT, in good condition Replace starting in Years 1 and 16
Living Area Floors - 1 (Green)	16,341 sf	5.50	\$89,873	\$8,170	Varies	25	1	over 5 Years		Replace existing with faux wood linoleum starting in Year 1. See GM 3
Living Area Floors - 2	sf									
Living Area Floors - 2 (Green)	sf									
BATHROOMS										
Bathroom Floors	1,994 sf	5.00	\$9,970		Varies	15	1 16	over 15 Years		VCT, in good condition Replace starting in Years 1 and 16
Bathroom Floors (Green)	1,994 sf	5.50	\$10,967	\$997	Varies	25	1	over 5 Years		Replace existing with faux wood linoleum starting in Year 1. See GM 3
Bathtub and Shower	32 ea	1720.00	\$55,040		Varies	30	18	over 20 Years		Fiberglass tubs with surround Future replacement starts in Year 18
Bathtub and Shower (Green)	ea									
Bathroom Vanity	ea									
Bathroom Vanity (Green)	ea									
Bathroom Sinks	32 ea	420.00	\$13,440		19	30	18	over 20 Years		Wall-hung sinks, in good condition Future replacements start in Year 18
Bathroom Toilets	32 ea	410.00	\$13,120		19	30	11	over 8 Years		Low flush toilets (1.6 gpf) Replace starting in Year 11
Bathroom Toilets (Green)	32 ea	440.75	\$14,104	\$984	19	30	11	over 8 Years		Replace existing with high efficiency toilets (1.28 gpf)
Ventilation & Exhaust	32 ea	110.00	\$3,520		Varies	20	5	in 1 Year		Ceiling mounted fans Replace in Year 5
Ventilation & Exhaust (Green)	32 ea	118.25	\$3,784	\$264	Varies	20	5	in 1 Year		Replace existing with humidistat controlled variable speed exhaust fans. Discuss
Accessories	32 ea	184.00	\$5,888		Varies	10	20	over 20 Years		Towel bars, mirrors, etc. Replace starting in Year 1

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	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Unit Interior Doors	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Unit Closet Doors	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
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 - 1	\$5,447	\$5,610	\$5,779	\$5,952	\$6,130	\$6,314	\$6,504	\$6,699	\$6,900	\$7,107	\$7,320	\$7,540	\$7,766	\$7,999	\$8,239	\$8,486	\$8,741	\$9,003	\$9,273	\$9,551
Living Area Floors - 1 (Green)	\$17,975	\$18,514	\$19,069	\$19,641	\$20,231	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Living Area Floors - 2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Living Area Floors - 2 (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
BATHROOMS																				
Bathroom Floors	\$665	\$685	\$705	\$726	\$748	\$771	\$794	\$817	\$842	\$867	\$893	\$920	\$948	\$976	\$1,005	\$1,036	\$1,067	\$1,099	\$1,132	\$1,165
Bathroom Floors (Green)	\$2,193	\$2,259	\$2,327	\$2,397	\$2,469	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Bathtub and Shower	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4,549	\$4,685	\$4,826
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	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,111	\$1,144	\$1,178
Bathroom Toilets	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,204	\$2,270	\$2,338	\$2,408	\$2,481	\$2,555	\$2,632	\$2,711	\$0	\$0
Bathroom Toilets (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,369	\$2,440	\$2,514	\$2,589	\$2,667	\$2,747	\$2,829	\$2,914	\$0	\$0
Ventilation & Exhaust	\$0	\$0	\$0	\$0	\$3,962	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Ventilation & Exhaust (Green)	\$0	\$0	\$0	\$0	\$4,259	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Accessories	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$516

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	2,345	sf	5.00	\$11,725		Varies	15	1	16	over 15 Years	VCT, in good condition Replace starting in Years 1 and 16
Kitchen Floors (Green)	2,345	sf	5.50	\$12,898	\$1,173	Varies	25	1		over 5 Years	Replace existing with faux wood linoleum starting in Year 1. See GM 3
Kitchen Cabinets	32	ea	2025.00	\$64,800		≈5	25	20		in 1 Year	Wood cabinets, in good condition Replace starting in Year 20
Kitchen Cabinets (Green)	32	ea	2176.88	\$69,660	\$4,860	≈5	25	20		in 1 Year	Replace existing with FSC-certified wood cabinets Discuss
Kitchen Cabinets		ea									
Kitchen Cabinets (Green)		ea									
Kitchen Countertops	32	ea	356.04	\$11,393		Varies	12	1	13	over 12 Years	Laminated particleboard, in good condition Replace starting in Years 1 and 13
Kitchen Countertops (Green)	32	ea	925.00	\$29,600	\$18,207	Varies	30			Years	Replace existing with solid stone countertops, longer EUL. See GM 4
Range	32	ea	435.00	\$13,920		19	25	6		over 5 Years	30-inch electric ranges, in good condition Replace starting in Year 6
Range (Green)		ea									
Range		ea									
Range (Green)		ea									
Refrigerator	32	ea	670.00	\$21,440		19	15	1	16	over 15 Years	Frost-free Replace
Refrigerator (Green)	32	ea	720.25	\$23,048	\$1,608	19	15	1	16	over 15 Years	Replace existing with Energy Star refrigerators
Refrigerator		ea									
Refrigerator (Green)		ea									
Dishwasher		ea									
Dishwasher (Green)		ea									
Rangehood and Vent	32	ea	281.00	\$8,992		Varies	20	1		over 20 Years	Recirculating Replace
Rangehood Fire Extinguishers	32	ea	60.00	\$1,920		ADD	6	1	7 13 19	in 1 Year	Portable cannisters w/ magnetic clip, Reacts to high heat (grease fires). Discuss
Miscellaneous		ea									
Miscellaneous (Green)		ea									

DWELLING UNITS--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
KITCHENS																				
Kitchen Floors	\$782	\$805	\$829	\$854	\$880	\$906	\$933	\$961	\$990	\$1,020	\$1,050	\$1,082	\$1,114	\$1,148	\$1,182	\$1,218	\$1,254	\$1,292	\$1,331	\$1,371
Kitchen Floors (Green)	\$2,580	\$2,657	\$2,737	\$2,819	\$2,903	\$0	\$0	\$0	\$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	\$113,627
Kitchen Cabinets (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$122,149
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	\$949	\$978	\$1,007	\$1,037	\$1,069	\$1,101	\$1,134	\$1,168	\$1,203	\$1,239	\$1,276	\$1,314	\$1,354	\$1,394	\$1,436	\$1,479	\$1,524	\$1,569	\$1,616	\$1,665
Kitchen Countertops (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	\$3,227	\$3,324	\$3,424	\$3,527	\$3,632	\$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
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	\$1,429	\$1,472	\$1,516	\$1,562	\$1,609	\$1,657	\$1,707	\$1,758	\$1,811	\$1,865	\$1,921	\$1,979	\$2,038	\$2,099	\$2,162	\$2,227	\$2,294	\$2,362	\$2,433	\$2,506
Refrigerator (Green)	\$1,537	\$1,583	\$1,630	\$1,679	\$1,729	\$1,781	\$1,835	\$1,890	\$1,946	\$2,005	\$2,065	\$2,127	\$2,191	\$2,256	\$2,324	\$2,394	\$2,466	\$2,540	\$2,616	\$2,694
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	\$450	\$463	\$477	\$491	\$506	\$521	\$537	\$553	\$570	\$587	\$604	\$622	\$641	\$660	\$680	\$700	\$721	\$743	\$765	\$788
Rangehood Fire Extinguishers	\$1,920	\$0	\$0	\$0	\$0	\$0	\$2,293	\$0	\$0	\$0	\$0	\$0	\$2,737	\$0	\$0	\$0	\$0	\$0	\$3,269	\$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	32	ea	105.00	\$3,360		Varies	20	5	in 1 Year	Manual wall-mounted thermostats Replace in Year 5
Unit Thermostats (Green)	32	ea	202.00	\$6,464	\$3,104	Varies	20	5	in 1 Year	Replace existing with programmable thermostats. Discuss
Unit Air Conditioning		If								
Unit Air Conditioning (Green)		If								
Unit Radiation	32	ea	687.50	\$22,000		19	30	11	over 20 Years	Hydronic baseboard, in good condition Replacement allowance starts in Year 11
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	32	ea				19	50			Circuit breaker panels, no missing breakers Circuit breaker panels, monitor
Unit Wiring	32	ea				19	50			Maintain out of Operating
Unit Security Call System		ea								
Unit Smoke/Fire Detection	32	ea	380.00	\$12,160		Varies	10	13	in 1 Year	Hardwired heat detector, replace existing and add smoke to bdrms in Yr 3; replace all iin Year 13
Unit Smoke/Fire Detection	32	ea	485.00	\$15,520		Varies	10	3	in 1 Year	
Unit Lighting		If								
Unit Lighting (Green)		If								
Unit Lighting		ea								
Unit Lighting (Green)		ea								
Miscellaneous		ea								

DWELLING UNITS--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
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	\$3,782	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Unit Thermostats (Green)	\$0	\$0	\$0	\$0	\$7,275	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Unit Air Conditioning	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Unit Air Conditioning (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Unit Radiation	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,478	\$1,523	\$1,568	\$1,615	\$1,664	\$1,714	\$1,765	\$1,818	\$1,873	\$1,929
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	\$0	\$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	\$16,465	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,337	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Unit Lighting	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Unit Lighting (Green)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Unit Lighting	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Unit Lighting (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

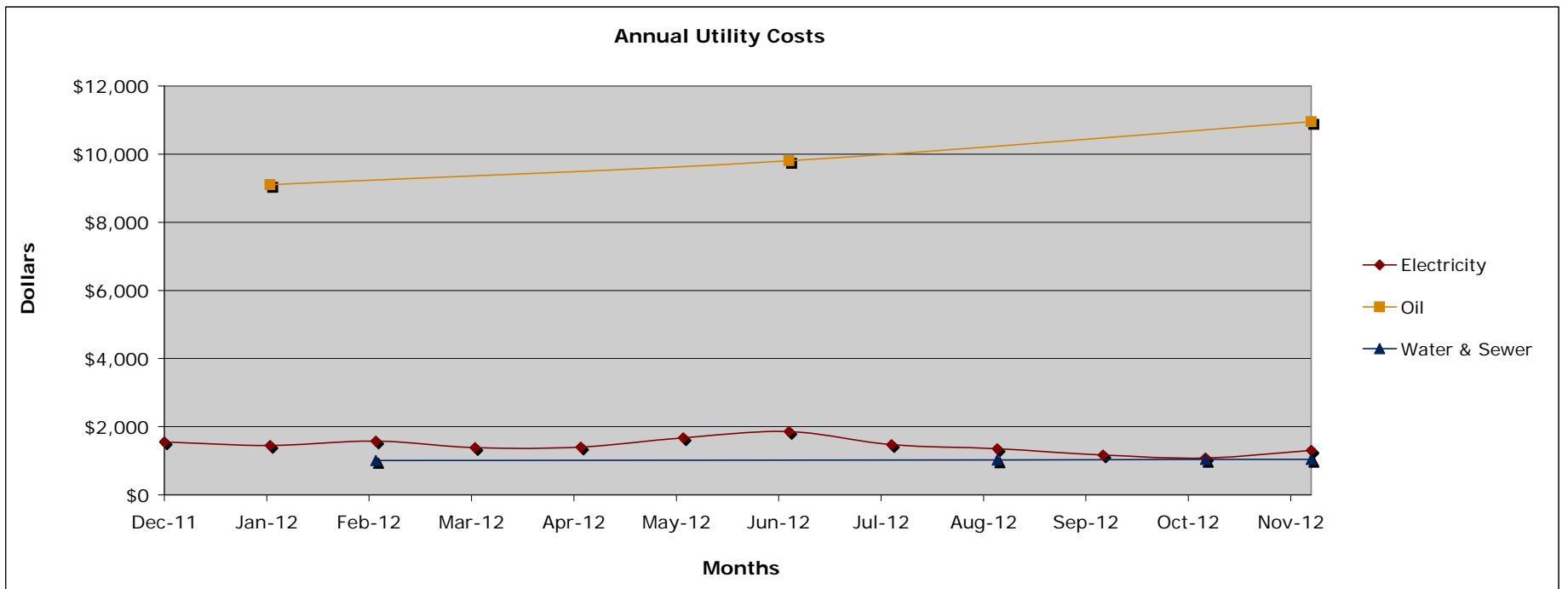
Energy Analysis

Utility Usage

Pompey Hollow

The energy analysis portion of this Energy Audit examines utility bills for the most recent 12 months to summarize at electricity, fuel oil, and water use. This property uses a leeching field to sewer wastewater. The cost spikes for fuel oil and water correspond to the purchase dates of these services. The following table and charts show the utility information by utility source, and by monthly and annual consumption.

	ELECTRICITY		NATURAL GAS		WATER / SEWER				OIL		TOTAL
	kWh	\$	Therms	\$	Gallons	Water \$	Sewer \$	Total \$	Gallons	\$	
Nov-12	9,541	\$1,302			183,772	\$982	\$56	\$1,038	3,612	\$10,954	\$13,295
Oct-12	7,401	\$1,078			183,772	\$982	\$56	\$1,038			\$2,117
Sep-12	8,053	\$1,172									\$1,172
Aug-12	9,048	\$1,353			183,772	\$982	\$42	\$1,024			\$2,376
Jul-12	9,898	\$1,471									\$1,471
Jun-12	11,042	\$1,854							3,097	\$9,808	\$11,662
May-12	10,003	\$1,676									\$1,676
Apr-12	8,693	\$1,403									\$1,403
Mar-12	8,621	\$1,384									\$1,384
Feb-12	9,985	\$1,577			183,772	\$982	\$30	\$1,012			\$2,590
Jan-12	8,949	\$1,452							2,875	\$9,106	\$10,558
Dec-11	9,863	\$1,556									\$1,556
Total	111,097	\$17,278			735,090	\$3,928	\$184	\$4,113	9,584	\$29,868	\$51,259
<i>Unit Cost</i>		<i>\$0.156</i>						<i>\$0.00559</i>		<i>\$3.12</i>	



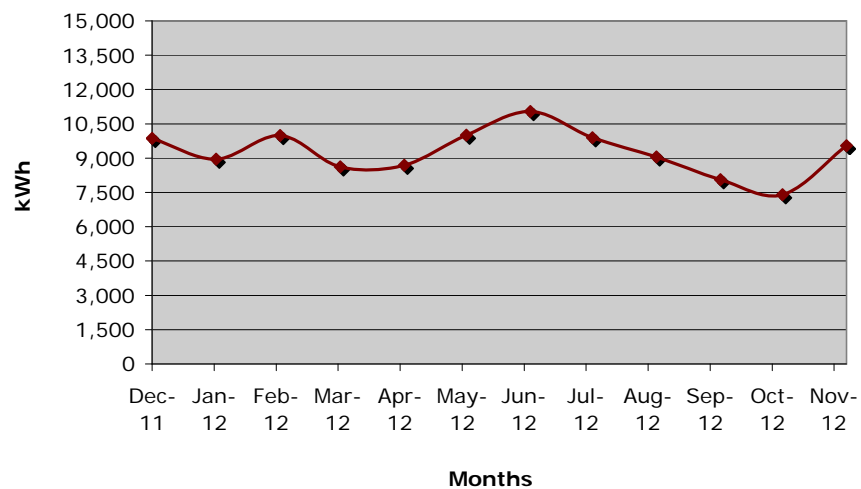
Energy Analysis

Utility Usage, By Type

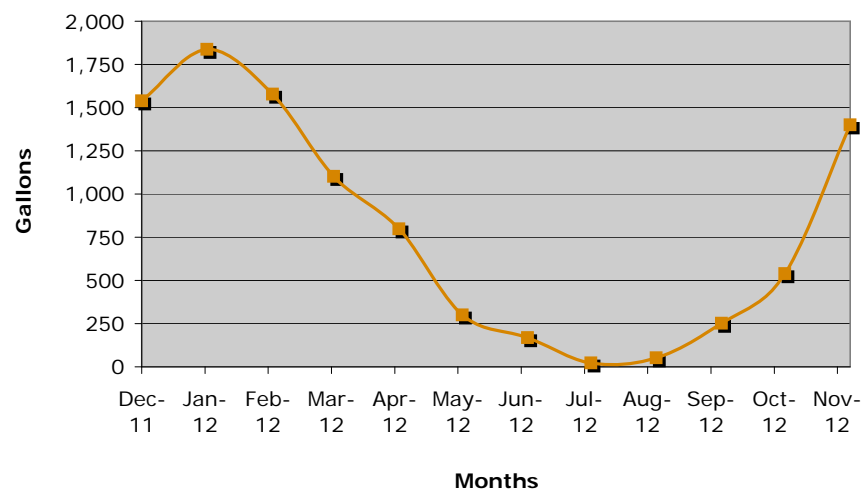
Pompey Hollow

Below are graphic presentations of annual usage by utility type for the property. Fuel oil usage profile has been adjusted to match the pattern of heating degree days. Water usage corresponds to the average usage between purchase periods.

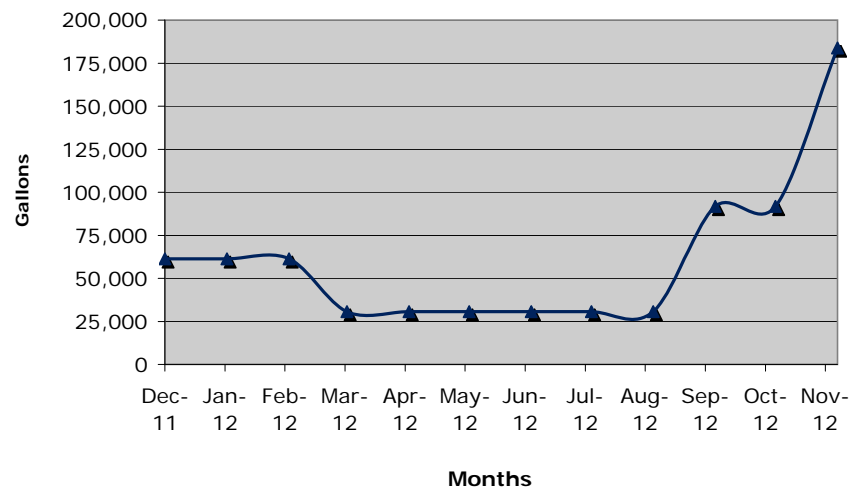
Electricity



Oil



Water & Sewer

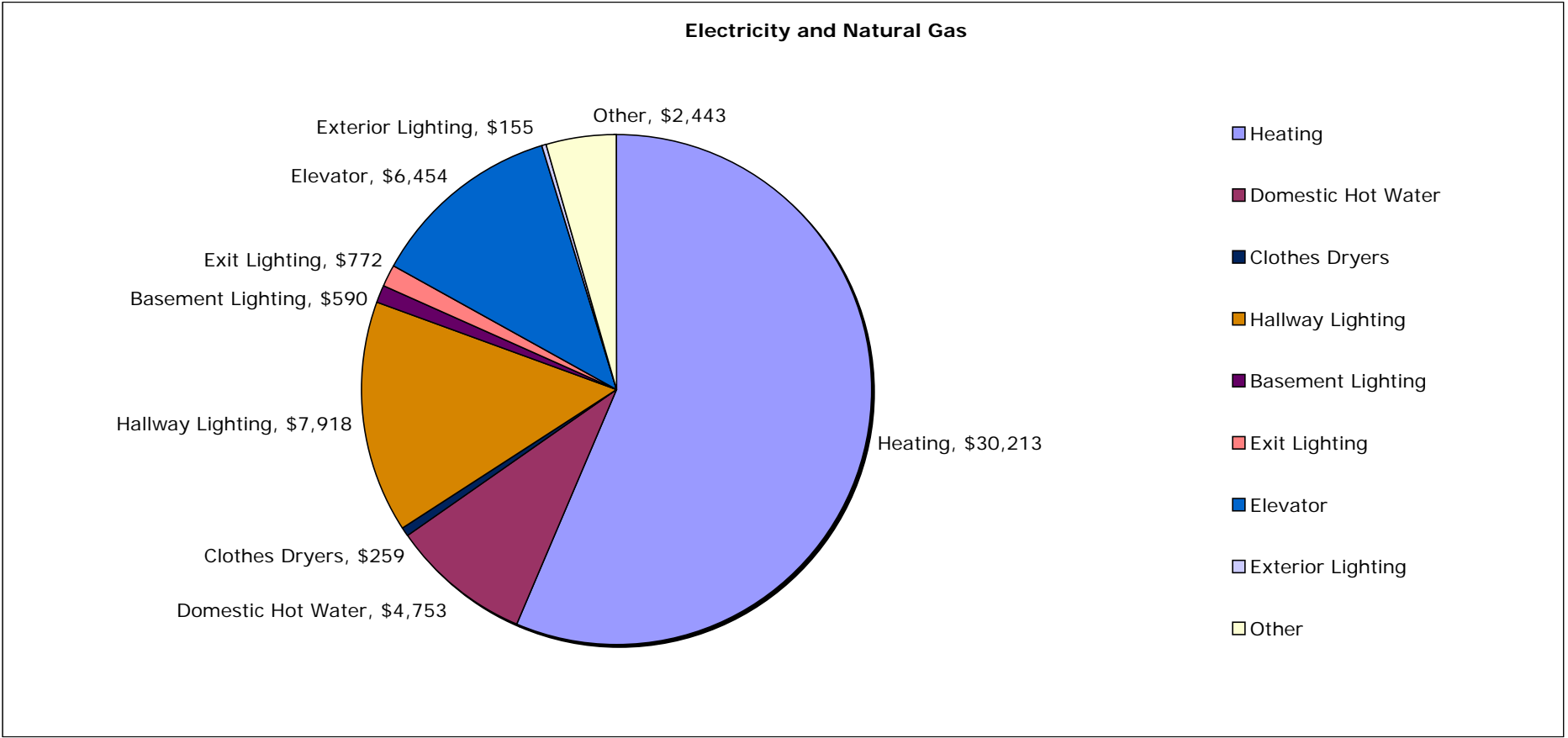


Energy Analysis

Disaggregated End Uses

Pompey Hollow

Fuel 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 based on the calculated loads and not the billed loads.



End Use	Utility	Annual Cost	Annual Usage (kWh)	Annual Usage (gallons)	Annual Usage (btu)
Heating	Fuel Oil	\$30,213		9,695	1,351,457,497
Domestic Hot Water	Fuel Oil	\$4,753		1,525	212,609,570
Clothes Dryers	Electricity	\$259	1,665		5,682,120
Hallway Lighting	Electricity	\$7,918	50,912		173,710,529
Basement Lighting	Electricity	\$590	3,794		12,943,826
Exit Lighting	Electricity	\$772	4,964		16,936,667
Elevator	Electricity	\$6,454	41,498		141,592,290
Exterior Lighting	Electricity	\$155	997		3,400,497
Other	Electricity	\$2,443	15,708		53,596,214

Energy Analysis

Notes

Pompey Hollow

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

General

The property is master metered for fuel oil, water, and common area electricity (hallways, office, community spaces). The dwelling units are individually metered for electricity consumption.

Fuel Oil

Fuel oil shows a normal consumption pattern, with spikes during the heating season since the property utilizes fuel oil for heating purposes.

Electricity

Electric demand (not shown) and usage increases in the warmer months suggesting an increase due to space cooling.

Water and Sewer

Water usage is shown as the average usage between payment periods. Also, this property uses a leaching field; sewerage costs that are listed in the utility table reflect an additional local usage charge from the water utility.

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: **34**

Space Types

Units, Common Areas	Square Footage:	38,330	Conditioned:	Yes
Basement	Square Footage:	3,135	Conditioned:	Yes

Utility Metering

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

Infiltration

Infiltration Condition	Tight, Leaky:	Average
Infiltration Rate	ACH:	0.6

Architectural

Wall Insulation	Type:	None	R-Value:	R-19
Roof Insulation	Type:	Cellulose	R-Value:	R-38
Exterior Doors 1	Type:	Flush Metal	R-Value:	R-3
Exterior Doors 2	Type:	Wood/Glass	R-Value:	
Windows 1	Type:	Aluminum	U-Factor:	0.5
Windows 2	Type:	Wood	U-Factor:	

Heating and Cooling

Temperature Control:

Occupied Heating Temp	Degrees F:	74
Occupied Cooling Temp	Degrees F:	N/A
Unoccupied ¹ Heating Temp	Degrees F:	68
Unoccupied ¹ Heating Time	Hours / Day:	8

Boilers / DHW Generation:

Boiler 1	Type:	Fuel Oil, Water	Capacity:	1555 MBH	Efficiency:	79%
Domestic Hot Water 1	Type:	Fuel Oil, Water	Capacity:	300 MBH	Efficiency:	86%

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

Water & Sewer

Domestic Hot Water:

DHW Daily Usage	Gallons/Resident:	18
DHW Delivery Temp	Degrees F:	120

Domestic Cold Water:

Showerheads	Gallons / Minute:	2.0<
Toilets	Gallons / Flush:	1.6
Irrigation	Gallons / Year:	None

Lighting Loads

Hallway	Type:	Fluorescent	Wattage:	61-64	Hours per Day:	24
Storage	Type:	T8	Wattage:	32	Hours per Day:	10
Common Kitchen	Type:	T8	Wattage:	60	Hours per Day:	1
Exit Lighting	Type:	Fluorescent	Wattage:	13	Hours per Day:	24
Community / Office	Type:	Fluorescent	Wattage:	61	Hours per Day:	4-8
Exterior	Type:	Fluorescent	Wattage:	13-26	Hours per Day:	10

Appliances, Miscellaneous Loads

Range	Energy Star (Y/N):	no	Usage per Year:	2409 kWh
Refrigerator	Energy Star (Y/N):	No	Usage per Year:	844 kWh
Laundry	Energy Star (Y/N):	No	Usage per Year:	4500 kWh
Miscellaneous Load			Usage per Year:	6920 kWh

Simple Payback Analysis

EWCM #1 Upgrade Exterior Lighting

Replacement Costs

A. Total cost to replace existing CFLs with LED lighting

\$595.00

Utility Cost

Electricity: \$0.16

Fuel Oil: \$0.00

Existing Types / Usage

Description	Wattage per Fixture	Number of Fixtures	Lighting Hours/Day	Usage Days/Year	Usage kWh/Year	Usage \$/Year
Type 1: Pole-mounted CFLs	26	7	11	365	731	\$113.65
Type 2: Bollard-mounted CFLs	13	7	11	365	365	\$56.82
Type 3:					0	\$0.00
Type 4:					0	\$0.00
Type 5:					0	\$0.00

Total: 1,096 \$170.47

Proposed Green Types / Usage

Description	Wattage per Fixture	Number of Fixtures	Lighting Hours/Day	Usage Days/Year	Usage kWh/Year	Usage \$/Year
Type 1: Pole-mounted LEDs	16	7	11	365	450	\$69.94
Type 2: Bollard-mounted LEDs	6	7	11	365	169	\$26.23
Type 3:					0	\$0.00
Type 4:					0	\$0.00
Type 5:					0	\$0.00

Total: 618 \$96.16

Annual Electric Savings

1,630,202 BTUs

477.79 kWh

Savings = 477.79 x \$0.16 = \$74.31/yr

Annual Fuel Oil Savings¹

0 BTUs

0.00 therms

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

Annual Net Cost Savings

\$74.31 + \$0.00 = \$74.31

5. Simple Payback

\$595.00 / \$74.31 = 8.01 yrs

Additional Notes/Comments:

Exterior lighting, no impact on heating usage.

Simple Payback Analysis

EWCM #2 Replace Boiler

Description

Replace existing oil-fired boilers with high efficiency oil-fired boilers.

Replacement Costs

	Type	Cost
A. Proposed Conventional:	Standard Efficiency Boilers	\$69,042
B. Proposed Green:	High Efficiency Boilers	\$78,372
C. Incremental Cost Between Proposed Conventional and Proposed Green:		\$9,330.00

Boiler Efficiencies

A. Existing Efficiency:	79%
B. Conventional Efficiency:	82%
C. Green Efficiency:	86%

Annual Utility Cost

	Existing	Conventional	Green
	1,337,884,753 btus	1,268,896,589 btus	1,206,656,366 btus
	9694.82 gallons	9194.90 gallons	8743.89 gallons
Utility Cost	\$3.12/gallon	\$3.12/gallon	\$3.12/gallon
Heating Cost	\$30,212.55	\$28,654.64	\$27,249.11

Annual Savings: Existing to Conventional

$$\text{Savings} = \$30,212.55 - \$28,654.64 = \$1,557.91/\text{yr}$$

Annual Savings: Conventional to Green

$$\text{Savings} = \$28,654.64 - \$27,249.11 = \$1,405.53/\text{yr}$$

Annual Savings: Existing to Green

$$\text{Savings} = \$1,557.91 + \$1,405.53 = \$2,963.44/\text{yr}$$

Simple Payback: Conventional

$$\$69,042.00 / \$1,557.91 = 44.3 \text{ yrs}$$

Simple Payback: Green

$$\$78,372.00 / \$2,963.44 = 26.4 \text{ yrs}$$

Incremental Payback: Conventional to Green

$$\$9,330.00 / \$1,405.53 = 6.6 \text{ yrs}$$

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 Efficiency Motors	\$8,600.00
B. Proposed Green:	Premium Efficiency Motors	\$8,820.00
C. Incremental Cost Between Proposed Conventional and Proposed Green:		\$220.00

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	.746	1.4920	3100	100%	82.5%	11,213	\$1,744
Heat P2			.746	0.0000		100%		0	\$0
Heat P3			.746	0.0000		100%		0	\$0
Heat P4			.746	0.0000		100%		0	\$0
DHW P1	2	0.083	.746	0.0622	4500	100%	78.5%	713	\$111
DHW P2			.746	0.0000		100%		0	\$0
DHW P3			.746	0.0000		100%		0	\$0
Totals:								11,925	\$1,855

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	.746	1.4920	3100	100%	87.0%	10,633	\$1,654
Heat P2			.746	0.0000		100%		0	\$0
Heat P3			.746	0.0000		100%		0	\$0
Heat P4			.746	0.0000		100%		0	\$0
DHW P1	2	0.083	.746	0.0622	4500	100%	81.0%	691	\$107
DHW P2			.746	0.0000		100%		0	\$0
DHW P3			.746	0.0000		100%		0	\$0
Totals:								11,323	\$1,761

Annual Savings: Existing to Proposed Green

$$\text{Savings} = \$1,854.68 - \$1,761.06 = \$93.62 / \text{yr}$$

Simple Payback: Existing to Proposed Green

$$\$220.00 / \$93.62 = 2.3 \text{ yrs}$$

Simple Payback Analysis

EWCM #4 Replace Exterior Doors

Replacement Costs		
	Type	Cost
A. Proposed Conventional	Solid core metal doors	\$3,795.00
B. Proposed Green	Fiberglass Doors	\$4,079.66
C. Incremental Cost Between Proposed Conventional and Proposed Green		\$284.66

Existing Conditions

General: Existing doors are flush metal models. Insulating quality of existing doors estimated at no greater than R-3.

A. Door Type:

B. Total Area of Doors: sf

C. Utility Cost: Oil \$3.12 /gallon

R-Value

A. Existing: 3

B. Conventional: 3

C. Green: 5

Annual Savings: Existing to Conventional

0 BTUs

0.00 gallons

Savings = \$3.12 x 0.00 = \$0.00 /yr

Annual Savings: Conventional to Green

6,970,000 BTUs

50.00 gallons

Savings = \$3.12 x 50.00 = \$155.82 /yr

Annual Savings: Existing to Green

6,970,000 BTUs

50.00 gallons

Savings = \$0.00 + \$155.82 = \$155.82 /yr

Simple Payback: Conventional

\$3,795.00 / \$0.00 = n/a yrs

Simple Payback: Green

\$4,079.66 / \$155.82 = 26.2 yrs

Incremental Payback: Conventional to Green

\$284.66 / \$155.82 = 1.8 yrs

Additional Notes:

Simple Payback Analysis

EWCM #5 Replace Windows

Replacement Costs		Type	Cost
A. Proposed Conventional:		Vinyl Framed Double Glazed	\$57,510.00
B. Proposed Green:		Fiberglass Framed Dbl Glazed Insulated	\$61,824.06
C. Incremental Cost Between Proposed Conventional and Proposed Green:			\$4,314.06

Existing Conditions	
General: Slider models have poor fit and allow for appreciable air infiltration. Remaining models in fair condition with limited air infiltration.	
A. Window Type:	
B. Total Area of Windows:	
C. Utility Cost:	Oil \$3.12 /gallon

U-Factor ¹	
A. Existing:	0.50
B. Conventional:	0.50
C. Green:	0.33

Annual Savings: Existing to Conventional	
	0 BTUs
	0.00 gallons
Savings =	\$3.12 x 0.00 = \$0.00 /yr

Annual Savings: Conventional to Green	
	98,695,200 BTUs
	708.00 gallons
Savings =	\$3.12 x 708.00 = \$2,206.38 /yr

Annual Savings: Existing to Green	
	98,695,200 BTUs
	708.00 gallons
Savings =	\$0.00 + \$2,206.38 = \$2,206.38 /yr

Simple Payback: Conventional				
\$57,510.00	/	\$0.00	=	n/a yrs
Simple Payback: Green				
\$61,824.06	/	\$2,206.38	=	28.0 yrs
Incremental Payback: Conventional to Green				
\$4,314.06	/	\$2,206.38	=	2.0 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 Convert Exit Lighting

Replacement Costs

A. Total cost to convert fluorescent exit signs to LED exit signs

\$1,080.00

Utility Cost

Electricity: \$0.16

Fuel Oil \$3.12

Existing Types / Usage

Description	Wattage per Fixture	Number of Fixtures	Lighting Hours/Day	Usage Days/Year	Usage kWh/Year	Usage \$/Year
Type 1: Exit Signs w/PL lamps	13	27	24	365	3,075	\$478.20
Type 2:					0	\$0.00
Total:					3,075	\$478.20

Proposed Green Types / Usage

Description	Wattage per Fixture	Number of Fixtures	Lighting Hours/Day	Usage Days/Year	Usage kWh/Year	Usage \$/Year
Type 1: Retrofitted Exits w/LED	4	27	24	365	946	\$147.14
Type 2:					0	\$0.00
Total:					946	\$147.14

Annual Electric Savings

7,263,056 BTUs

2128.68 kWh

Savings = 2,128.68 x \$0.16 = \$331.06 /yr

Annual Fuel Oil Savings¹

-6,133,600 BTUs

-44.00 gallons

Savings = -44.00 x \$3.12 = -\$137.12 /yr

Annual Net Cost Savings

\$331.06 + -\$137.12 = \$193.94

5. Simple Payback

\$1,080.00 / \$193.94 = 5.57 yrs

Additional Notes/Comments:

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

Simple Payback Analysis

EWCM #7 Convert Lighting - Common Area

Replacement Costs

A. Total cost to convert T12 and Incandescent lighting to T8 and LED, respectively \$920.00

Utility Cost

Electricity: \$0.16
Fuel Oil \$3.12

Existing Types / Usage

	Description	Wattage per Fixture	Number of Fixtures	Lighting Hours/Day	Usage Days/Year	Usage kWh/Year	Usage \$/Year
Type 1:	Basement 2L-T12s F30s	65	16	10	365	3,796	\$590.37
Type 2:	Recessed Cans-PAR	65	5	10	365	1,186	\$184.49
Type 3:						0	\$0.00
Type 4:						0	\$0.00
Type 5:						0	\$0.00
Total:					4,982	\$774.86	

Proposed Green Types / Usage

	Description	Wattage per Fixture	Number of Fixtures	Lighting Hours/Day	Usage Days/Year	Usage kWh/Year	Usage \$/Year
Type 1:	Bsmt 2L-T8s F25s	47	16	10	365	2,745	\$426.88
Type 2:	Recessed Cans PAR-LED	17	5	10	365	310	\$48.25
Type 3:						0	\$0.00
Type 4:						0	\$0.00
Type 5:						0	\$0.00
Total:					3,055	\$475.13	

Annual Electric Savings

6,575,606 BTUs
1,927.20 kWh

Savings = 1,927.20 x \$0.16 = \$299.73/yr

Annual Fuel Oil Savings¹

-2,927,400 BTUs
-21.00 gallons

Savings = -21.00 x \$3.12 = -\$65.44/yr

Annual Net Cost Savings

\$299.73 + -\$65.44 = \$234.28

5. Simple Payback

\$920.00 / \$234.28 = 3.93 yrs

Additional Notes/Comments:

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

Simple Payback Analysis

EWCM #8 Replace Refrigerators - Common Area

Replacement Costs

A. Proposed Conventional	\$670.00
B. Proposed Green	\$720.25
C. Incremental Cost Between Proposed Conventional and Proposed Green	\$50.25

Electricity:	\$0.16
Fuel Oil:	\$3.12

Existing Conditions

A. Existing refrigerator type	Frost-free
B. Number of refrigerators	1
C. Average annual energy use per refrigerator	884 kWh / Year
D. Total annual energy use	884.00 kWh / Year
E. Total annual operational cost	\$137.48 \$ / Year

Proposed Conventional Conditions

A. Proposed standard refrigerator type	Frost-free
B. Number of refrigerators	1
C. Average annual energy use per refrigerator	884 kWh / Year
D. Total annual energy use	884.00 kWh / Year
E. Total annual operational cost	\$137.48 \$ / Year

Proposed Green Conditions

A. Proposed green refrigerator type	Energy Star FF
B. Number of refrigerators	1
C. Average annual energy use per refrigerator	514 kWh / Year
D. Total annual energy use	514.00 kWh / Year
E. Total annual operational cost	\$79.94 \$ / Year

Annual Savings: Existing to Proposed Conventional

Electricity:	\$0.16	x	0.00	=	\$0.00	\$ / Year
Fuel Oil ¹ :	\$3.12	x	0.00	=	\$0.00	\$ / Year
Total:				=	\$0.00	\$ / Year

Annual Savings: Proposed Conventional to Proposed Green

Electricity:	\$0.16	x	370.00	=	\$57.54	\$ / Year
Fuel Oil ¹ :	\$3.12	x	-4.00	=	-\$12.47	\$ / Year
Total:				=	\$45.08	\$ / Year

Annual Savings: Existing to Proposed Green

Electricity:	\$0.16	x	370.00	=	\$57.54	\$ / Year
Natural Gas ¹ :	\$3.12	x	-4.00	=	-\$12.47	\$ / Year
Total:				=	\$45.08	\$ / Year

Simple Payback: Conventional

1B	\$670.00	/	10	\$0.00	=	n/a	yrs
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Simple Payback: Green

\$720.25	/	\$45.08	=	15.98	yrs
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Incremental Payback: Proposed Conventional to Proposed Green

\$50.25	/	\$45.08	=	1.11	yrs
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Additional Notes/Comments:

¹Negative fuel oil savings attributed to decrease in heating gain from the reduced refrigerator wattage; therefore, additional natural gas required for space heating in these areas.

Simple Payback Analysis

EWCM #9 Replace Toilets - Common and Apartments

Replacement Costs

A. Proposed Conventional	\$14,350.00
B. Proposed Green	\$15,426.25
C. Incremental Cost Between Proposed Conventional and Proposed Green	\$1,076.25

Existing Conditions

A. Total number of existing toilets	35	
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:	\$0.0056	(\$/gal)

Proposed Conditions: Conventional Models

A. Total number of toilets	35	
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:	\$0.0056	(\$/gal)

Proposed Conditions: Green Models

A. Total number of toilets	35	
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:	\$0.0056	(\$/gal)

Annual Water Use: Existing Models

$$35 \times 10 \times 365 = 122,640 \text{ gal/yr}$$

Annual Water Use: Proposed Conventional Models

$$35 \times 10 \times 365 = 122,640 \text{ gal/yr}$$

Annual Water Use: Proposed Green Models

$$35 \times 8 \times 365 = 98,112 \text{ gal/yr}$$

Annual Savings: Existing to Proposed Conventional Models

$$122,640 - 122,640 \times \$0.01 = \$0.00 \text{ \$/yr}$$

Annual Savings: Proposed Conventional to Proposed Green Models

$$122,640 - 98,112 \times \$0.01 = \$137.23 \text{ \$/yr}$$

Annual Savings: Existing to Proposed Green Models

$$\$0.00 + \$137.23 = \$137.23 \text{ \$/yr}$$

Simple Payback: Conventional

$$\$14,350.00 / \$0.00 = \text{n/a} \text{ yrs}$$

Simple Payback: Green

$$\$15,426.25 / \$137.23 = 112.41 \text{ yrs}$$

Incremental Payback: Proposed Conventional to Proposed Green Models

$$\$1,076.25 / \$137.23 = 7.84 \text{ yrs}$$

Additional Notes/Comments: This worksheet includes 3 public toilets.

Simple Payback Analysis

EWCM #10 Install Programmable Thermostats - Dwelling Units

Installation Costs		
A. Proposed Conventional	Manual Thermostats	\$3,675.00
B. Proposed Green	Programmable Thermostats	\$7,070.00
C. Incremental Cost Between Proposed Conventional and Proposed Green		\$3,395.00

Utility Costs	
Fuel Oil:	\$3.12

Existing Conditions	
A. Occupied heating temperature	73°F
B. Unoccupied (setback) heating temperature	73°F
C. Unoccupied (setback) time	0 hrs / day

Proposed Conventional Conditions	
A. Occupied heating temperature	73°F
B. Unoccupied (setback) heating temperature	73°F
C. Unoccupied (setback) time	0 hrs / day

Proposed Green Condition	
A. Occupied heating temperature	73°F
B. Unoccupied (setback) heating temperature	68°F
C. Unoccupied (setback) time	8 hrs / day

Annual Savings: Existing to Proposed Conventio	
	0 btus
	0.00 gallons
Savings =	\$3.12 x 0.00 = \$0.00 /yr

Annual Savings: Conventional to Proposed Gree	
	143,582,000 btus
	1030.00 gallons
Savings =	\$3.12 x 1030.00 = \$3,209.85 /yr

Annual Net Cost Savings	
	\$0.00 + \$3,209.85 = \$3,209.85

Simple Payback: Conventional			
\$3,675.00	/	\$0.00	= n/a yrs
Simple Payback: Green			
\$7,070.00	/	\$3,209.85	= 2.20 yrs
Incremental Payback: Proposed Conventional to Proposed Green Models			
\$3,395.00	/	\$3,209.85	= 1.06 yrs

Additional Notes/Comments:	
1. The worksheet estimates that the facility is in use 365 days/year	
2. Unoccupied (setback) temperatures and times are subject to proper resident usage.	

Life Cycle Cost Analysis

Energy and Water Conservation Measure (EWCM): # 1

Upgrade Exterior Lights

CFL Fixtures

vs.

LED Fixtures

(Conventional Product)

(Green Product)

STEP ONE: PRODUCT COMPARISON

Calculated Life Cycle Term

35

Conventional Product:

CFL Fixtures

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	Pole-mounted CFLs	7	ea	\$0.00		20	1	1.8		
Maintain	Bollard-mounted CFLs	7	ea	\$0.00		20	1	1.8		
Utility Cost	Electric Usage	1,096	kWh	\$0.16	\$170	1	1	35.0	\$10,307	\$2,981
Total Life Cycle Cost									\$10,307	\$2,981

Energy Savings

Net Life Cycle Cost after Energy Savings									\$10,307	\$2,981
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Green Product:

LED Fixtures

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	Pole-mounted LEDs	7	ea	\$40.00	\$280	35	1	1.0	\$280	\$280
Install/Replace	Bollard-mounted LEDs	7	ea	\$45.00	\$315	35	1	1.0	\$315	\$315
Utility Cost	Electric Usage	618	kWh	\$0.16	\$96	1	1	35.0	\$5,814	\$1,682
Total Life Cycle Cost									\$6,409	\$2,277

Energy Savings

Net Life Cycle Cost after Energy Savings									\$6,409	\$2,277
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ECONOMIC RETURN ANALYSIS

Green NPV	\$705
Green IRR	17.5%

PRODUCT RECOMMENDATION

Recommendation based on Economic Return Analysis

Green Product: LED Fixtures

Override with Green Product? No

Final Product Choice

Green Product: 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

Upgrade Exterior Lights

STEP TWO: REPLACEMENT TIMING

Remaining Useful Life of Existing Product

0

Final Product Choice

Green Product:

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	Pole-mounted LEDs	7	ea	\$40.00	\$280	35	1	1.0	\$280	\$280
Install/Replace	Bollard-mounted LEDs	7	ea	\$45.00	\$315	35	1	1.0	\$315	\$315
Utility Cost	Electric Usage	618	kWh	\$0.16	\$96	1	1	35.0	\$5,814	\$1,682
Total Life Cycle Cost									\$6,409	\$2,277
<i>Energy Savings</i>										
Net Life Cycle Cost after Energy Savings									\$6,409	\$2,277

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): # 2

High Efficient Oil-fired Boilers

Standard Efficiency Boilers

vs.

High Efficiency Boilers

(Conventional Product)

(Green Product)

STEP ONE: PRODUCT COMPARISON

Calculated Life Cycle Term

30

Conventional Product:

Standard Efficiency Boilers

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	Std Efficient boilers	2	ea	34,521	\$69,042	30	1	1.0	\$69,042	\$69,042
Utility Cost	Oil Usage	9194.90	gals	\$3.12	\$28,655	1	1	30.0	\$1,363,256	\$469,643
Total Life Cycle Cost									\$1,432,298	\$538,685

Energy Savings

Net Life Cycle Cost after Energy Savings									\$1,432,298	\$538,685

Green Product:

High Efficiency Boilers

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	High Efficient Boilers	2	ea	39,186	\$78,372	30	1	1.0	\$78,372	\$78,372
Utility Cost	Oil Usage	8743.89	gals	\$3.12	\$27,249	1	1	30.0	\$1,296,388	\$446,606
Total Life Cycle Cost									\$1,374,760	\$524,978

Energy Savings

Net Life Cycle Cost after Energy Savings									\$1,374,760	\$524,978

ECONOMIC RETURN ANALYSIS

Green NPV	\$13,706
Green IRR	21.1%

PRODUCT RECOMMENDATION

Recommendation based on Economic Return Analysis

Green Product: High Efficiency Boilers

Override with Green Product? No

Final Product Choice

Green Product: High Efficiency Boilers

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

High Efficient Oil-fired Boilers

STEP TWO: REPLACEMENT TIMING

Remaining Useful Life of Existing Product

10

Replacement Year

11

Final Product Choice

Green Product:

High Efficiency Boilers

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	High Efficient Boilers	2	ea	\$39,186.00	\$78,372	30	1	1.0	\$78,372	\$78,372		
Utility Cost	Oil Usage	8,744	gals	\$3.12	\$27,249	1	1	30.0	\$1,296,388	\$446,606		
Total Life Cycle Cost											\$1,374,760	\$524,978
<i>Energy Savings</i>												
Net Life Cycle Cost after Energy Savings											\$1,374,760	\$524,978

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	High Efficient Boilers	2	ea	\$39,186.00	\$78,372	30	11	0.7	\$43,762	\$42,179		
Utility Cost	Oil Usage	8,744	gals	\$3.12	\$27,249	1	11	20.0	\$984,007	\$224,413		

Expenses for Current Product Through Useful Life

Utility Cost	Current Oil Usage	9694.82	gals	\$3.12	\$30,213	1	1	10.0	\$346,353	\$246,358		
Total Life Cycle Cost											\$1,374,123	\$512,949
<i>Energy Savings</i>												
Net Life Cycle Cost after Energy Savings											\$1,374,123	\$512,949

ECONOMIC RETURN ANALYSIS

Timing NPV	(\$12,029)
Timing IRR	4.52%

TIMING RECOMMENDATION

Replacement Year:	11
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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): # 3

High Efficient Pump Motors

Standard Efficient Motors

vs.

High Efficient Motors

(Conventional Product)

(Green Product)

STEP ONE: PRODUCT COMPARISON

Calculated Life Cycle Term 25

Conventional Product:

Standard Efficient Motors

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	Hydronic Circ Pumps	2	ea	\$3,350.00	\$6,700	25	1	1.0	\$6,700	\$6,700
Install/Replace	DHW Circ Pumps	2	ea	\$950.00	\$1,900	20	1	1.3	\$2,435	\$2,179
Utility Cost	Electric Usage	11,925	kWh	\$0.16	\$1,855	1	1	25.0	\$67,620	\$27,813
Total Life Cycle Cost									\$76,755	\$36,693

Energy Savings

Net Life Cycle Cost after Energy Savings									\$76,755	\$36,693
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Green Product:

High Efficient Motors

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	High Eff Circ Pumps	2	ea	\$3,425.00	\$6,850	25	1	1.0	\$6,850	\$6,850
Install/Replace	High Eff DHW Pumps	2	ea	\$985.00	\$1,970	20	1	1.3	\$2,525	\$2,260
Utility Cost	Electric Usage	11,323	kWh	\$0.16	\$1,761	1	1	25.0	\$64,207	\$26,409
Total Life Cycle Cost									\$73,582	\$35,519

Energy Savings

Net Life Cycle Cost after Energy Savings									\$73,582	\$35,519
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ECONOMIC RETURN ANALYSIS

Green NPV	\$1,174
Green IRR	79.3%

PRODUCT RECOMMENDATION

Recommendation based on Economic Return Analysis

Green Product: High Efficient Motors

Override with Green Product? No

Final Product Choice

Green Product: High Efficient Motors

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

High Efficient Pump Motors

STEP TWO: REPLACEMENT TIMING

Remaining Useful Life of Existing Product

5

Replacement Year

6

Final Product Choice

Green Product:

High Efficient Motors

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	High Eff Circ Pumps	2	ea	\$3,425.00	\$6,850	25	1	1.0	\$6,850	\$6,850
Install/Replace	High Eff DHW Pumps	2	ea	\$985.00	\$1,970	20	1	1.3	\$2,525	\$2,260
Utility Cost	Electric Usage	11,323	kWh	\$0.16	\$1,761	1	1	25.0	\$64,207	\$26,409
Total Life Cycle Cost									\$73,582	\$35,519

Energy Savings

Net Life Cycle Cost after Energy Savings									\$73,582	\$35,519

Replacement at End of Remaining Useful Life

Year

6

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
Install/Replace	High Eff Circ Pumps	2	ea	\$3,425.00	\$6,850	25	6	0.8	\$5,156	\$4,965
Install/Replace	High Eff DHW Pumps	2	ea	\$985.00	\$1,970	20	6	1.0	\$2,284	\$1,554
Utility Cost	Electric Usage	11,323	kWh	\$0.16	\$1,761	1	6	20.0	\$54,857	\$18,382

Expenses for Current Product Through Useful Life

Utility Cost	Current Electric Usage	11,925	kWh	\$0.16	\$1,855	1	1	5.0	\$9,847	\$8,454
Total Life Cycle Cost									\$72,144	\$33,356

Energy Savings

Net Life Cycle Cost after Energy Savings									\$72,144	\$33,356

ECONOMIC RETURN ANALYSIS

Timing NPV	(\$2,163)
Timing IRR	n/a

TIMING RECOMMENDATION

Replacement Year:	6
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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): # 4

Fiberglass Doors

Metal Doors

vs.

Fiberglass Doors

(Conventional Product)

(Green Product)

STEP ONE: PRODUCT COMPARISON

Calculated Life Cycle Term

35

Conventional Product:

Metal Doors

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	Double Leaf Metal Doors	2	ea	\$690.00	\$1,380	35	1	1.0	\$1,380	\$1,380
Install/Replace	Single Leaf Metal Doors	7	ea	\$345.00	\$2,415	35	1	1.0	\$2,415	\$2,415

Total Life Cycle Cost

\$3,795

\$3,795

Energy Savings

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Net Life Cycle Cost after Energy Savings

\$3,795

\$3,795

Green Product:

Fiberglass Doors

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	Fiberglass Dbl Leaf Doors	2	ea	\$741.75	\$1,484	35	1	1.0	\$1,484	\$1,484
Install/Replace	Fiberglass Sgl Leaf Doors	7	ea	\$370.88	\$2,596	35	1	1.0	\$2,596	\$2,596

Total Life Cycle Cost

\$4,080

\$4,080

Energy Savings

Utility Cost	Fuel Oil Savings	50	gallons	\$3.12	(\$156)	1	1	35.0	(\$9,421)	(\$2,725)
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Net Life Cycle Cost after Energy Savings

(\$5,341)

\$1,355

ECONOMIC RETURN ANALYSIS

Green NPV	\$2,440
Green IRR	127.6%

PRODUCT RECOMMENDATION

Recommendation based on Economic Return Analysis

Green Product: Fiberglass Doors

Override with Green Product? No

Final Product Choice

Green Product: Fiberglass Doors

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): # 4

Fiberglass Doors

STEP TWO: REPLACEMENT TIMING

Remaining Useful Life of Existing Product	15
Replacement Year	16

Final Product Choice	
Green Product:	Fiberglass Doors

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	Fiberglass Dbl Leaf Doors	2	ea	\$741.75	\$1,484	35	1	1.0	\$1,484	\$1,484		
Install/Replace	Fiberglass Sgl Leaf Doors	7	ea	\$370.88	\$2,596	35	1	1.0	\$2,596	\$2,596		
Total Life Cycle Cost										\$4,080	\$4,080	
Energy Savings												
Utility Cost	Fuel Oil Savings	50	gallons	\$3.12	(\$156)	1	1	35.0	(\$9,421)	(\$2,725)		
Net Life Cycle Cost after Energy Savings										(\$5,341)	\$1,355	

Replacement at End of Remaining Useful Life				Year	16							
Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted		
Install/Replace	Fiberglass Dbl Leaf Doors	2	ea	\$741.75	\$1,484	35	16	0.6	\$574	\$602		
Install/Replace	Fiberglass Sgl Leaf Doors	7	ea	\$370.88	\$2,596	35	16	0.6	\$1,005	\$1,053		

Expenses for Current Product Through Useful Life												
Total Life Cycle Cost										\$1,579	\$1,655	
Energy Savings												
Utility Cost	Fuel Oil Savings	50	gallons	\$3.12	(\$156)	1	16	20.0	(\$6,523)	(\$1,012)		
Net Life Cycle Cost after Energy Savings										(\$4,944)	\$642	

ECONOMIC RETURN ANALYSIS

Timing NPV	(\$712)
Timing IRR	5.43%

TIMING RECOMMENDATION

Replacement Year:	16
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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): # 5

Fiberglass Framed Insulated Windows

Vinyl Framed Dbl Glazed Windows

vs.

Fiberglass Framed Dbl Glazed Insulated

(Conventional Product)

(Green Product)

STEP ONE: PRODUCT COMPARISON

Calculated Life Cycle Term 35

Conventional Product:

Vinyl Framed Dbl Glazed Windows

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 Framed Windows	162	ea	\$355.00	\$57,510	35	1	1.0	\$57,510	\$57,510
Total Life Cycle Cost									\$57,510	\$57,510

Energy Savings

Net Life Cycle Cost after Energy Savings									\$57,510	\$57,510

Green Product:

Fiberglass Framed Dbl Glazed Insulated

Cost over Life Cycle (EUL)

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

Life Cycle Costs

Install/Replace	Fiberglass Framed	162	ea	\$381.63	\$61,824	35	1	1.0	\$61,824	\$61,824
Total Life Cycle Cost									\$61,824	\$61,824

Energy Savings

Utility Cost	Fuel Oil Saved	708	gals	\$3.12	(\$2,206)	1	1	35.0	(\$133,403)	(\$38,588)
Net Life Cycle Cost after Energy Savings									(\$71,578)	\$23,236

ECONOMIC RETURN ANALYSIS

Green NPV	\$34,274
Green IRR	110.8%

PRODUCT RECOMMENDATION

Recommendation based on Economic Return Analysis

Green Product: Fiberglass Framed Dbl Glazed Insulated

Override with Green Product? No

Final Product Choice

Green Product: Fiberglass Framed Dbl Glazed Insulated

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

Fiberglass Framed Insulated Windows

STEP TWO: REPLACEMENT TIMING

Remaining Useful Life of Existing Product

15

Replacement Year

16

Final Product Choice

Green Product:

Fiberglass Framed Dbl Glazed Insulated

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	Fiberglass Framed	162	ea	\$381.63	\$61,824	35	1	1.0	\$61,824	\$61,824
Total Life Cycle Cost									\$61,824	\$61,824

Energy Savings

Utility Cost	Fuel Oil Saved	708	gals	\$3.12	(\$2,206)	1	1	35.0	(\$133,403)	(\$38,588)
Net Life Cycle Cost after Energy Savings									(\$71,578)	\$23,236

Replacement at End of Remaining Useful Life

Year

16

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
Install/Replace	Fiberglass Framed	162	ea	\$381.63	\$61,824	35	16	0.6	\$23,935	\$25,077

Expenses for Current Product Through Useful Life

Total Life Cycle Cost									\$23,935	\$25,077

Energy Savings

Utility Cost	Fuel Oil Saved	708	gals	\$3.12	(\$2,206)	1	16	20.0	(\$92,366)	(\$14,337)
Net Life Cycle Cost after Energy Savings									(\$68,431)	\$10,740

ECONOMIC RETURN ANALYSIS

Timing NPV	(\$12,496)
Timing IRR	4.94%

TIMING RECOMMENDATION

Replacement Year:	16
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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): # 6

LED Exit Signs

Fluorescent (PL) Exit Signs

vs.

LED Exit Signs

(Conventional Product)

(Green Product)

STEP ONE: PRODUCT COMPARISON

Calculated Life Cycle Term

30

Conventional Product:

Fluorescent (PL) Exit Signs

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	PL Exit Signs	27	ea	\$0.00		20	1	1.5		
Utility Cost	Electric Usage	3,075	kWh	\$0.16	\$478	1	1	30.0	\$22,751	\$7,838
Total Life Cycle Cost									\$22,751	\$7,838

Energy Savings

Net Life Cycle Cost after Energy Savings									\$22,751	\$7,838

Green Product:

LED Exit Signs

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 Exit Signs	27	ea	\$40.00	\$1,080	30	1	1.0	\$1,080	\$1,080
Utility Cost	Electric Usage	946	kWh	\$0.16	\$147	1	1	30.0	\$7,000	\$2,412
Utility Cost	Fuel Oil Usage	44	gallons	\$3.12	\$137	1	1	30.0	\$6,524	\$2,247
Total Life Cycle Cost									\$14,604	\$5,739

Energy Savings

Net Life Cycle Cost after Energy Savings									\$14,604	\$5,739

ECONOMIC RETURN ANALYSIS

Green NPV	\$2,099
Green IRR	25.5%

PRODUCT RECOMMENDATION

Recommendation based on Economic Return Analysis

Green Product: LED Exit Signs

Override with Green Product? No

Final Product Choice

Green Product: LED Exit Signs

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

LED Exit Signs

STEP TWO: REPLACEMENT TIMING

Remaining Useful Life of Existing Product

0

Final Product Choice

Green Product:

LED Exit Signs

Immediate Replacement

									Cost over Life Cycle (EUL)	
Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
Install/Replace	LED Exit Signs	27	ea	\$40.00	\$1,080	30	1	1.0	\$1,080	\$1,080
Utility Cost	Electric Usage	946	kWh	\$0.16	\$147	1	1	30.0	\$7,000	\$2,412
Utility Cost	Fuel Oil Usage	44	gallons	\$3.12	\$137	1	1	30.0	\$6,524	\$2,247
Total Life Cycle Cost									\$14,604	\$5,739
<i>Energy Savings</i>										
Net Life Cycle Cost after Energy Savings									\$14,604	\$5,739

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): # 7

Upgrade Interior Lights

T12 Fluorescent and PAR Lamps

vs.

T8 Fluorescent and LED PAR Lamps

(Conventional Product)

(Green Product)

STEP ONE: PRODUCT COMPARISON

Calculated Life Cycle Term

30

Conventional Product:

T12 Fluorescent and PAR Lamps

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	Bsmt 2L-T12 F30s	16	ea	\$0.00		20	1	1.5		
Maintain	Recessed Cans PARs	5	ea	\$0.00		20	1	1.5		
Utility Cost	Electric Usage	4,982	kWh	\$0.16	\$775	1	1	30.0	\$36,864	\$12,700
Total Life Cycle Cost									\$36,864	\$12,700

Energy Savings

Net Life Cycle Cost after Energy Savings									\$36,864	\$12,700
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Green Product:

T8 Fluorescent and LED PAR Lamps

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	Bsmt Retrofit 2L-T8s	16	ea	\$45.00	\$720	20	1	1.5	\$1,172	\$908
Install/Replace	Recessed Cans LED PARs	5	ea	\$40.00	\$200	30	1	1.0	\$200	\$200
Utility Cost	Electric Usage	3,055	kWh	\$0.16	\$475	1	1	30.0	\$22,605	\$7,787
Utility Cost	Fuel Oil Usage	21	gallons	\$3.12	\$65	1	1	30.0	\$3,114	\$1,073
Total Life Cycle Cost									\$27,090	\$9,968

Energy Savings

Net Life Cycle Cost after Energy Savings									\$27,090	\$9,968
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ECONOMIC RETURN ANALYSIS

Green NPV	\$2,732
Green IRR	38.1%

PRODUCT RECOMMENDATION

Recommendation based on Economic Return Analysis

Green Product: T8 Fluorescent and LED PAR Lamps

Override with Green Product? No

Final Product Choice

Green Product: T8 Fluorescent and LED PAR Lamps

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

Upgrade Interior Lights

STEP TWO: REPLACEMENT TIMING

Remaining Useful Life of Existing Product

Final Product Choice

Green Product: T8 Fluorescent and LED PAR Lamps

Immediate Replacement

									Cost over Life Cycle (EUL)	
Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
Install/Replace	Bsmt Retrofit 2L-T8s	16	ea	\$45.00	\$720	20	1	1.5	\$1,172	\$908
Install/Replace	Recessed Cans LED PARs	5	ea	\$40.00	\$200	30	1	1.0	\$200	\$200
Utility Cost	Electric Usage	3,055	kWh	\$0.16	\$475	1	1	30.0	\$22,605	\$7,787
Utility Cost	Fuel Oil Usage	21	gallons	\$3.12	\$65	1	1	30.0	\$3,114	\$1,073
Total Life Cycle Cost									\$27,090	\$9,968
Energy Savings										
Net Life Cycle Cost after Energy Savings									\$27,090	\$9,968

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): # 8

Common Area Refrigerator Upgrade

Frost-Free Refrigerator

vs.

Frost-Free Energy Star Refrigerator

(Conventional Product)

(Green Product)

STEP ONE: PRODUCT COMPARISON

Calculated Life Cycle Term

15

Conventional Product:

Frost-Free Refrigerator

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	Frost-Free Refrigerator	1	ea	\$670.00	\$670	15	1	1.0	\$670	\$670
Utility Cost	Electric Usage	884	kWh	\$0.16	\$137	1	1	15.0	\$2,557	\$1,511
Total Life Cycle Cost									\$3,227	\$2,181

Energy Savings

Net Life Cycle Cost after Energy Savings									\$3,227	\$2,181

Green Product:

Frost-Free Energy Star Refrigerator

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 Refrigerator	1	ea	\$720.25	\$720	15	1	1.0	\$720	\$720
Utility Cost	Electric Usage	514	kWh	\$0.16	\$80	1	1	15.0	\$1,487	\$879
Utility Cost	Fuel Oil Usage	4	gallons	\$3.12	\$12	1	1	15.0	\$232	\$137
Total Life Cycle Cost									\$2,439	\$1,736

Energy Savings

Net Life Cycle Cost after Energy Savings									\$2,439	\$1,736

ECONOMIC RETURN ANALYSIS

Green NPV	\$445
Green IRR	900.8%

PRODUCT RECOMMENDATION

Recommendation based on Economic Return Analysis

Green Product: Frost-Free Energy Star Refrigerator

Override with Green Product? No

Final Product Choice

Green Product: Frost-Free Energy Star Refrigerator

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.

STEP TWO: REPLACEMENT TIMING

Remaining Useful Life of Existing Product

14

Replacement Year

15

Final Product Choice

Green Product:

Frost-Free Energy Star Refrigerator

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 Refrigerator	1	ea	\$720.25	\$720	15	1	1.0	\$720	\$720		
Utility Cost	Electric Usage	514	kWh	\$0.16	\$80	1	1	15.0	\$1,487	\$879		
Utility Cost	Fuel Oil Usage	4	gallons	\$3.12	\$12	1	1	15.0	\$232	\$137		
Total Life Cycle Cost										\$2,439	\$1,736	
<i>Energy Savings</i>												
Net Life Cycle Cost after Energy Savings										\$2,439	\$1,736	

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	Energy Star Refrigerator	1	ea	\$720.25	\$720	15	15	0.1	\$73	\$25		
Utility Cost	Electric Usage	514	kWh	\$0.16	\$80	1	15	1.0	\$121	\$41		
Utility Cost	Fuel Oil Usage	4	gallons	\$3.12	\$12	1	15	1.0	\$19	\$6		
Total Life Cycle Cost										\$2,561	\$1,513	
<i>Expenses for Current Product Through Useful Life</i>												
Utility Cost	Current Electric Usage	884	kWh	\$0.16	\$137	1	1	14.0	\$2,349	\$1,440		
Total Life Cycle Cost										\$2,561	\$1,513	
<i>Energy Savings</i>												
Net Life Cycle Cost after Energy Savings										\$2,561	\$1,513	

ECONOMIC RETURN ANALYSIS

Timing NPV	(\$223)
Timing IRR	2.15%

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): # 9

Install High Efficiency Toilets

Low Flush Toilets (1.6 gpf)

vs.

High Efficiency Toilets (1.28 gpf)

(Conventional Product)

(Green Product)

STEP ONE: PRODUCT COMPARISON

Calculated Life Cycle Term 30

Conventional Product:

Low Flush Toilets (1.6 gpf)

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	Low Flush Toilets	35	ea	\$410.00	\$14,350	30	1	1.0	\$14,350	\$14,350
Utility Cost	Water Usage	122,640	gallons	\$0.0056	\$686	1	1	30.0	\$32,644	\$11,246
Total Life Cycle Cost									\$46,994	\$25,596

Energy Savings

Net Life Cycle Cost after Energy Savings									\$46,994	\$25,596

Green Product:

High Efficiency Toilets (1.28 gpf)

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	High Eff Toilets	35	ea	\$440.75	\$15,426	30	1	1.0	\$15,426	\$15,426
Utility Cost	Water Usage	98,112	gallons	\$0.0056	\$549	1	1	30.0	\$26,115	\$8,997
Total Life Cycle Cost									\$41,542	\$24,423

Energy Savings

Net Life Cycle Cost after Energy Savings									\$41,542	\$24,423

ECONOMIC RETURN ANALYSIS

Green NPV	\$1,173
Green IRR	17.7%

PRODUCT RECOMMENDATION

Recommendation based on Economic Return Analysis

Green Product: High Efficiency Toilets (1.28 gpf)

Override with Green Product? No

Final Product Choice

Green Product: High Efficiency Toilets (1.28 gpf)

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

Install High Efficiency Toilets

STEP TWO: REPLACEMENT TIMING

Remaining Useful Life of Existing Product	10
Replacement Year	11

Final Product Choice	High Efficiency Toilets (1.28 gpf)
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	High Eff Toilets	35	ea	\$440.75	\$15,426	30	1	1.0	\$15,426	\$15,426		
Utility Cost	Water Usage	98,112	gallons	\$0.01	\$549	1	1	30.0	\$26,115	\$8,997		
Total Life Cycle Cost										\$41,542	\$24,423	
<i>Energy Savings</i>												
Net Life Cycle Cost after Energy Savings										\$41,542	\$24,423	

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	High Eff Toilets	35	ea	\$440.75	\$15,426	30	11	0.7	\$8,614	\$8,302		
Utility Cost	Water Usage	98,112	gallons	\$0.01	\$549	1	11	20.0	\$19,823	\$4,521		

<i>Expenses for Current Product Through Useful Life</i>												
Utility Cost	Water Usage	122,640	gallons	\$0.0056	\$686	1	1	10.0	\$7,866	\$5,595		
Total Life Cycle Cost										\$36,303	\$18,418	
<i>Energy Savings</i>												
Net Life Cycle Cost after Energy Savings										\$36,303	\$18,418	

ECONOMIC RETURN ANALYSIS

Timing NPV	(\$6,005)
Timing IRR	n/a

TIMING RECOMMENDATION

Replacement Year:	11
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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): # 10

Install Programmable Thermostats

Manual Thermostats

vs.

Programmable Thermostats

(Conventional Product)

(Green Product)

STEP ONE: PRODUCT COMPARISON

Calculated Life Cycle Term 20

Conventional Product:

Manual Thermostats

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	Manual Thermostats	32	ea	\$105.00	\$3,360	20	1	1.0	\$3,360	\$3,360
Total Life Cycle Cost									\$3,360	\$3,360

Energy Savings

Net Life Cycle Cost after Energy Savings									\$3,360	\$3,360

Green Product:

Programmable Thermostats

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	Programmable T-stats	32	ea	\$202.00	\$6,464	20	1	1.0	\$6,464	\$6,464
Total Life Cycle Cost									\$6,464	\$6,464

Energy Savings

Utility Cost	Fuel Oil Savings	1,030	gallons	\$3.12	(\$3,210)	1	1	20.0	(\$86,250)	(\$42,466)
Net Life Cycle Cost after Energy Savings									(\$79,786)	(\$36,002)

ECONOMIC RETURN ANALYSIS

Green NPV	\$39,362
Green IRR	n/a

PRODUCT RECOMMENDATION

Recommendation based on Economic Return Analysis

Green Product: Programmable Thermostats

Override with Green Product? No

Final Product Choice

Green Product: Programmable Thermostats

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): # 10

Install Programmable Thermostats

STEP TWO: REPLACEMENT TIMING

Remaining Useful Life of Existing Product
Replacement Year

4
5

Final Product Choice

Green Product: Programmable Thermostats

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	Programmable T-stats	32	ea	\$202.00	\$6,464	20	1	1.0	\$6,464	\$6,464
Total Life Cycle Cost									\$6,464	\$6,464

Energy Savings

Utility Cost	Fuel Oil Savings	1,030	gallons	\$3.12	(\$3,210)	1	1	20.0	(\$86,250)	(\$42,466)
Net Life Cycle Cost after Energy Savings									(\$79,786)	(\$36,002)

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	Programmable T-stats	32	ea	\$202.00	\$6,464	20	5	0.8	\$5,008	\$4,822

Expenses for Current Product Through Useful Life

Total Life Cycle Cost									\$5,008	\$4,822

Energy Savings

Utility Cost	Fuel Oil Savings	1,030	gallons	\$3.12	(\$3,210)	1	5	16.0	(\$72,821)	(\$30,492)
Net Life Cycle Cost after Energy Savings									(\$67,813)	(\$25,669)

ECONOMIC RETURN ANALYSIS

Timing NPV	\$10,333
Timing IRR	104.60%

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

Metal Roof

Architectural Shingled Roof

vs.

Metal Roof

(Conventional Product)

(Green Product)

STEP ONE: PRODUCT COMPARISON

Calculated Life Cycle Term

40

Conventional Product:

Architectural Shingled Roof

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	Architectural Shingles	21,464	sf	\$4.00	\$85,855	20	1	2.0	\$240,918	\$119,123

Total Life Cycle Cost

\$240,918

\$119,123

Energy Savings

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Net Life Cycle Cost after Energy Savings

\$240,918

\$119,123

Green Product:

Metal Roof

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	Metal Roof	21,464	sf	\$7.75	\$166,344	40	1	1.0	\$166,344	\$166,344

Total Life Cycle Cost

\$166,344

\$166,344

Energy Savings

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Net Life Cycle Cost after Energy Savings

\$166,344

\$166,344

ECONOMIC RETURN ANALYSIS

Green NPV	(\$47,220)
Green IRR	3.3%

PRODUCT RECOMMENDATION

Recommendation based on Economic Return Analysis

Conventional Product: Architectural Shingled Roof

Override with Green Product?

No

Final Product Choice

Conventional Product: Architectural Shingled Roof

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

Metal Roof

STEP TWO: REPLACEMENT TIMING

Remaining Useful Life of Existing Product
Replacement Year

16
17

Final Product Choice

Conventional Product: Architectural Shingled Roof

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	Architectural Shingles	21,464	sf	\$4.00	\$85,855	20	1	2.0	\$240,918	\$119,123
Total Life Cycle Cost									\$240,918	\$119,123

Energy Savings

Net Life Cycle Cost after Energy Savings									\$240,918	\$119,123

Replacement at End of Remaining Useful Life

Year

17

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
Install/Replace	Architectural Shingles	21,464	sf	\$4.00	\$85,855	20	17	1.2	\$169,079	\$44,983

Expenses for Current Product Through Useful Life

Total Life Cycle Cost									\$169,079	\$44,983

Energy Savings

Net Life Cycle Cost after Energy Savings									\$169,079	\$44,983

ECONOMIC RETURN ANALYSIS

Timing NPV	(\$74,140)
Timing IRR	n/a

TIMING RECOMMENDATION

Replacement Year:	17
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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):

2

Linoleum Flooring in Common Areas

Carpeting and VCT Flooring

vs.

Linoleum (faux wood)

(Conventional Product)

(Green Product)

STEP ONE: PRODUCT COMPARISON

Calculated Life Cycle Term

25

Conventional Product:

Carpeting and VCT 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	Common Hallways	7,695	sf	\$3.00	\$23,085	10	1	2.5	\$72,340	\$42,700
Install/Replace	Lobby	238	sf	\$3.00	\$714	10	1	2.5	\$2,237	\$1,321
Install/Replace	Community Areas	2,982	sf	4.60	\$13,715	10	1	2.5	\$42,977	\$25,369
Install/Replace	Laundry/Restroom	335	sf	\$5.00	\$1,675	10	1	2.5	\$5,249	\$3,098

Total Life Cycle Cost

\$122,804

\$72,488

Energy Savings

Net Life Cycle Cost after Energy Savings									\$122,804	\$72,488

Green Product:

Linoleum (faux wood)

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-Halls	7,695	sf	\$5.50	\$42,323	25	1	1.0	\$42,323	\$42,323
Install/Replace	Linoleum-Lobby	238	sf	\$5.50	\$1,309	25	1	1.0	\$1,309	\$1,309
Install/Replace	Linoleum-Comm Areas	2,982	sf	\$5.50	\$16,398	25	1	1.0	\$16,398	\$16,398
Install/Replace	Linoleum-Laundry/RR	335	sf	\$5.50	\$1,843	25	1	1.0	\$1,843	\$1,843

Total Life Cycle Cost

\$61,872

\$61,872

Energy Savings

Net Life Cycle Cost after Energy Savings									\$61,872	\$61,872

ECONOMIC RETURN ANALYSIS

Green NPV	\$10,616
Green IRR	11.6%

PRODUCT RECOMMENDATION

Recommendation based on Economic Return Analysis

Green Product: Linoleum (faux wood)

Override with Green Product? No

Final Product Choice

Green Product: Linoleum (faux wood)

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

Linoleum Flooring in Common Areas

STEP TWO: REPLACEMENT TIMING

Remaining Useful Life of Existing Product
Replacement Year

6
7

Final Product Choice

Green Product: Linoleum (faux wood)

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	Linoleum-Halls	7,695	sf	\$5.50	\$42,323	25	1	1.0	\$42,323	\$42,323
Install/Replace	Linoleum-Lobby	238	sf	\$5.50	\$1,309	25	1	1.0	\$1,309	\$1,309
Install/Replace	Linoleum-Comm Areas	2,982	sf	\$5.50	\$16,398	25	1	1.0	\$16,398	\$16,398
Install/Replace	Linoleum-Laundry/RR	335	sf	\$5.50	\$1,843	25	1	1.0	\$1,843	\$1,843
Total Life Cycle Cost									\$61,872	\$61,872

Energy Savings

Net Life Cycle Cost after Energy Savings									\$61,872	\$61,872

Replacement at End of Remaining Useful Life

Year

7

Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
Install/Replace	Linoleum-Halls	7,695	sf	\$5.50	\$42,323	25	7	0.8	\$29,887	\$28,590
Install/Replace	Linoleum-Lobby	238	sf	\$5.50	\$1,309	25	7	0.8	\$924	\$884
Install/Replace	Linoleum-Comm Areas	2,982	sf	\$5.50	\$16,398	25	7	0.8	\$11,580	\$11,077
Install/Replace	Linoleum-Laundry/RR	335	sf	\$5.50	\$1,843	25	7	0.8	\$1,301	\$1,245

Expenses for Current Product Through Useful Life

Total Life Cycle Cost									\$43,693	\$41,796

Energy Savings

Net Life Cycle Cost after Energy Savings									\$43,693	\$41,796

ECONOMIC RETURN ANALYSIS

Timing NPV	(\$20,076)
Timing IRR	n/a

TIMING RECOMMENDATION

Replacement Year:	7
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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 Flooring in Apartments

VCT Flooring

vs.

Linoleum Flooring

(Conventional Product)

(Green Product)

STEP ONE: PRODUCT COMPARISON

Calculated Life Cycle Term

25

Conventional Product:

VCT 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	Living Area VCT	16,341	sf	\$5.00	\$81,703	15	1	1.7	\$153,631	\$113,099
Install/Replace	Bathroom VCT	1,994	sf	\$5.00	\$9,970	15	1	1.7	\$18,747	\$13,801
Install/Replace	Kitchen VCT	2,345	sf	\$5.00	\$11,725	15	1	1.7	\$22,047	\$16,231

Total Life Cycle Cost

\$194,425

\$143,131

Energy Savings

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Net Life Cycle Cost after Energy Savings

\$194,425

\$143,131

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	Living Area Linoleum	16,341	sf	\$5.50	\$89,873	25	1	1.0	\$89,873	\$89,873
Install/Replace	Bathroom Linoleum	1,994	sf	\$5.50	\$10,967	25	1	1.0	\$10,967	\$10,967
Install/Replace	Kitchen Linoleum	2,345	sf	\$5.50	\$12,898	25	1	1.0	\$12,898	\$12,898

Total Life Cycle Cost

\$113,737

\$113,737

Energy Savings

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Net Life Cycle Cost after Energy Savings

\$113,737

\$113,737

ECONOMIC RETURN ANALYSIS

Green NPV	\$29,394
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):

3

Install Linoleum Flooring in Apartments

STEP TWO: REPLACEMENT TIMING

Remaining Useful Life of Existing Product

0

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	Living Area Linoleum	16,341	sf	\$5.50	\$89,873	25	1	1.0	\$89,873	\$89,873
Install/Replace	Bathroom Linoleum	1,994	sf	\$5.50	\$10,967	25	1	1.0	\$10,967	\$10,967
Install/Replace	Kitchen Linoleum	2,345	sf	\$5.50	\$12,898	25	1	1.0	\$12,898	\$12,898
Total Life Cycle Cost									\$113,737	\$113,737
<i>Energy Savings</i>										
Net Life Cycle Cost after Energy Savings									\$113,737	\$113,737

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):

4

Install Solid Stone Countertops

Laminated Particleboard Countertops

vs.

Stone Countertops

(Conventional Product)

(Green Product)

STEP ONE: PRODUCT COMPARISON

Calculated Life Cycle Term

30

Conventional Product:

Laminated Particleboard Countertops

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	LPB Countertops	33	ea	356.04	\$11,749	12	1	2.5	\$38,541	\$20,682

Total Life Cycle Cost

\$38,541

\$20,682

Energy Savings

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Net Life Cycle Cost after Energy Savings

\$38,541

\$20,682

Green Product:

Stone Countertops

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	Stone Countertops	33	ea	\$925.00	\$30,525	30	1	1.0	\$30,525	\$30,525

Total Life Cycle Cost

\$30,525

\$30,525

Energy Savings

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Net Life Cycle Cost after Energy Savings

\$30,525

\$30,525

ECONOMIC RETURN ANALYSIS

Green NPV	(\$9,843)
Green IRR	2.5%

PRODUCT RECOMMENDATION

Recommendation based on Economic Return Analysis

Conventional Product: Laminated Particleboard Countertops

Override with Green Product?

No

Final Product Choice

Conventional Product: Laminated Particleboard Countertops

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 Solid Stone Countertops

STEP TWO: REPLACEMENT TIMING

Remaining Useful Life of Existing Product

0

Final Product Choice

Conventional Product:

Laminated Particleboard Countertops

Immediate Replacement

									Cost over Life Cycle (EUL)	
Action	Description	Quantity	Unit	Unit Cost	Total Cost	EUL	First Year	Cycles	Inflated	Discounted
Install/Replace	LPB Countertops	33	ea	\$356.04	\$11,749	12	1	2.5	\$38,541	\$20,682
Total Life Cycle Cost									\$38,541	\$20,682
<i>Energy Savings</i>										
Net Life Cycle Cost after Energy Savings									\$38,541	\$20,682

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

David Jackson

Name

Senior Associate/Mechanical Specialist

Title

January 28, 2011

Date