PHYSICAL NEEDS ASSESSMENT AND ENERGY AUDIT

HOUSING AUTHORITY OF BERGEN COUNTY

One Bergen County Plaza, Floor 2
Hackensack, New Jersey 07601
George Stavrou

PHYSICAL NEEDS ASSESSMENT AND ENERGY AUDIT

of

BROOKSIDE GARDENS

293 Murray Hill Terrace
Bergenfield, New Jersey 07621

PREPARED BY:

EMG
222 Schilling Circle, Suite 275
Hunt Valley, Maryland 21031
800.733.0660
www.emgcorp.com

EMG CONTACT:

Edward Beeghly
Program Manager
800.733.0660, x7607
ebeeghly@emgcorp.com

EMG Project #: 107534.13R-007.308
Date of Report: September 6, 2014
On site Date: April 7, 2014

Replacement Reserves Report

Bergen-Brookside Gardens-GPNA
6/2/2014

Report Section	Location Description	ID	Cost Description	Lifespan (EUL)	EAge	RUL	Quantity	Unit	Unit Cost	Subtotal	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	Deficiency Repair Estimate
3.2	Hallway	240095	D2018 Replace drinking fountain with ADA dual level	15	14	1	1	EA	$1,485.00	$1,485		$1,485															$1,485				**$2,970**
5.2	Asphalt paving	248934	G2022 Seal Coat and stripe asphalt, no repairs	5	3	2	4.5	10000 SF	$3,425.02	$15,413			$15,413					$15,413					$15,413					$15,413			**$61,650**
5.2	Parking lot and drive aisles	240096	G2022 Asphalt- overlay 1"	25	15	10	40718	SF	$0.50	$20,359											$20,359										**$20,359**
5.5	Gazebo	240100	B2011 Paint existing wood siding, one coat, spray with medium prep and clean up	10	2	8	240	SF	$1.40	$336									$336										$336		**$672**
5.5	Gazebo	240099	B2013 Lath Wall Cladding - Shade House	25	14	11	2	SQ	$450.00	$900												$900									**$900**
6.3	Building roof	240101	B3011G Single Ply EPDM with insulation, fully adhered 45 mills, including demo	20	8	12	234	SQ	$705.35	$165,052													$165,052								**$165,052**
6.8	Throughout common areas	240104	C3011 Paint interior walls, CMU,including surface prep	7	5	2	25000	SF	$0.89	$22,250			$22,250							$22,250							$22,250				**$66,750**
6.8	Throughout building common areas	240103	C3024 Replace Vinyl tile	18	10	8	401	SY	$67.75	$27,168									$27,168												**$27,168**
6.8	Hallways and common areas	240102	C3025 Replace carpet, standard commercial, medium traffic	8	6	2	1097	SY	$59.90	$65,710			$65,710								$65,710								$65,710		**$197,131**
6.8	Throughout building	240106	C3031 Paint ceilings	20	10	10	8774	SF	$1.79	$15,705											$15,705										**$15,705**
6.8	Throughout building	240105	C3032 Replace acoustical ceiling tile system, fire rated,including demo	20	14	6	78.5	CSF	$498.00	$39,093							$39,093														**$39,093**
6.8	Laundry room	240109	E1016 Coin operated washer standard	15	4	11	8	EA	$1,819.00	$14,552												$14,552									**$14,552**
6.8	Laundry room	240111	E1016 Coin operated dryer 30lb	15	2	13	6	EA	$3,966.00	$23,796														$23,796							**$23,796**
6.8	Laundry room	240110	E1016 Replace commercial washers 30 lb	20	4	16	1	EA	$12,420.00	$12,420																	$12,420				**$12,420**
6.8	Community room kitchen	240107	E1094 Refrigerator	15	6	9	1	EA	$661.00	$661										$661											**$661**
6.8	Community room kitchen	240108	E1094 Range	20	6	14	1	EA	$630.50	$631															$631						**$631**
7.1	Boiler room	240323	D3021 Replace water boiler, gas 2000 to 2312 MBH	30	27	3	3	EA	$37,100.00	$111,300				$111,300																	**$111,300**
7.1	Across drive isle on northern side	240329	D3032 Replace air cooled condenser, 50 ton	15	5	10	1	EA	$28,225.00	$28,225											$28,225										**$28,225**
7.1	Mechanical closet adjacent to community room	240332	D3041 Replace air handler fans, 3,500 to 4,000 CFM	15	10	5	1	EA	$9,525.00	$9,525						$9,525															**$9,525**
7.1	Boiler room	240327	D3041 Air handler 18,000-20,000 CFM	15	13	2	1	EA	$37,925.00	$37,925			$37,925															$37,925			**$75,850**
7.1	Boiler room	240335	D3044 Circulation Pump, 7 to 10 HP	20	16	4	2	EA	$11,175.00	$22,350					$22,350																**$22,350**
7.1	Adjacent to main entrance	240331	D3052 Pad-Mounted Condenser 10-ton	15	10	5	1	EA	$8,280.00	$8,280						$8,280															**$8,280**
7.2	Boiler room	240336	D2023 Water Heater 130-Gallon Commercial	15	13	2	4	Each	$8,670.00	$34,680			$34,680															$34,680			**$69,360**
7.2	Boiler room	248935	D2023 Water Heater 130-Gallon Commercial	15	8	7	4	Each	$8,670.00	$34,680								$34,680													**$34,680**
7.5	Both elevators	240337	D1011 Replace passenger cab finishes	20	9	11	2	EA	$14,560.00	$29,120												$29,120									**$29,120**
7.6	In fire protection rm	240338	D4012 Fire pump electric 1000 GPM	25	21	4	1	Each	$23,200.00	$23,200					$23,200																**$23,200**
7.6	Adjacent to boiler room	240339	D5037 Fire alarm panel	15	9	6	1	EA	$3,906.00	$3,906							$3,906														**$3,906**
8.1	Throughout tenant units	240343	C3011 Paint and patch interior walls, drywall	7	3	4	160000	SF	$0.84	$134,400					$134,400							$134,400							$134,400		**$403,200**
8.1	Throughout tenant units	240341	C3024 Replace Vinyl tile	18	9	9	1068	SY	$67.75	$72,357										$72,357											**$72,357**
8.1	Throughout tenant units	240340	C3025 Carpet, remove and replace in house	8	4	4	8206	SY	$50.58	$415,059					$415,059								$415,059								**$830,119**
8.1	Tenant unit ceilings	240342	C3031 Paint ceilings	20	12	8	89025	SF	$1.79	$159,355									$159,355												**$159,355**
8.2	Every tenant unit	248937	E1094 Refrigerator	15	12	3	70	EA	$661.00	$46,270				$46,270															$46,270		**$92,540**
8.2	Every tenant unit	248936	E1094 Range, replace	20	7	13	70	EA	$630.50	$44,135														$44,135							**$44,135**
8.2	Every tenant unit	240345	E1094 Refrigerator	15	7	8	70	EA	$661.00	$46,270									$46,270												**$46,270**
8.2	Every tenant unit	240344	E1094 Range, replace	20	12	8	65	EA	$630.50	$40,983									$40,983												**$40,983**
8.4	Every tenant bathroom	240347	D2011 Replace Residential Grade water closet with 1.6 GPF unit	25	24	1	135	Each	$447.00	$60,345		$60,345																			**$60,345**
8.4	Every tenant bathroom	240346	E2012 Remove wall hung lav, install vanity cabinet,countertop and sink	20	12	8	135	EA	$769.21	$103,843									$103,843												**$103,843**
9	Storage shed	240097	B2011 Paint existing wood siding, one coat, spray with medium prep and clean up	10	4	6	384	SF	$1.40	$538							$538											$538			**$1,075**
9	Storage shed	240098	B3011 Asphalt shingles, removal and replacement with premium grade	30	14	16	1.5	SQ	$430.00	$645																		$645			**$645**
10	Every unit kitchen and bathroom	241581	D2014 Install low flow sink aerator	12	12	0	270	EA	$15.00	$4,050	$4,050												$4,050								**$8,100**
10	Every unit bathroom	241580	D2017 Install low flow shower head	10	10	0	135	Each	$43.00	$5,805	$5,805										$5,805										**$11,610**
Totals, Unescalated											**$9,855**	**$61,830**	**$175,978**	**$157,570**	**$595,009**	**$17,805**	**$43,537**	**$50,093**	**$377,954**	**$95,268**	**$135,805**	**$178,972**	**$599,574**	**$67,931**	**$631**	**$0**	**$37,338**	**$88,018**	**$246,716**	**$0**	**$2,939,883**
Location Factor (1.00)											**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Totals, Escalated (3.0% inflation, compounded annually)											**$9,855**	**$63,685**	**$186,695**	**$172,181**	**$669,688**	**$20,641**	**$51,985**	**$61,608**	**$478,781**	**$124,303**	**$182,510**	**$247,739**	**$854,849**	**$99,759**	**$954**	**$0**	**$59,916**	**$145,480**	**$420,018**	**$0**	**$3,850,647**

TABLE OF CONTENTS

CERTIFICATION

EMG has completed a Physical Needs Assessment (PNA) and an Energy Audit of the subject property, Brookside Gardens, located at 293 Murray Hill Terrace in Bergenfield, New Jersey. The PNA and Energy Audit were performed on April 7, 2014.

The PNA and Energy Audit were performed at the Housing Authority's request using methods and procedures consistent with good commercial and customary practice conforming to ASTM E2018-01, *Standard Guide for Property Condition Assessments: Baseline Property Condition Assessment Process*. Within this Physical Needs Assessment Report, EMG's follows the ASTM guide's definition of User, that is, the party that retains EMG for the preparation of a baseline PNA of the subject property. A User may include, without limitation, a purchaser, potential tenant, owner, existing or potential mortgagee, lender, or property manager of the subject property.

This report is exclusively for the use and benefit of the Client identified on the first page of this report. The purpose for which this report shall be used shall be limited to the use as stated in the contract between the client and EMG.

This report is not for the use or benefit of, nor may it be relied upon by, any other person or entity without the advance written consent of EMG.

The opinions EMG expresses in this report were formed utilizing the degree of skill and care ordinarily exercised by any prudent architect or engineer in the same community under similar circumstances. EMG assumes no responsibility or liability for the accuracy of information contained in this report which has been obtained from the Client or the Client's representatives, from other interested parties, or from the public domain. The conclusions presented represent EMG's professional judgment based on information obtained during the course of this assignment. EMG's evaluations, analyses and opinions are not representations regarding the building design or actual value of the property. Factual information regarding operations, conditions and test data provided by the Client or their representative has been assumed to be correct and complete. The conclusions presented are based on the data provided, observations made, and conditions that existed specifically on the date of the assessment.

EMG certifies that EMG has no undisclosed interest in the subject property, EMG's relationship with the Client is at arm's-length, and that EMG's employment and compensation are not contingent upon the findings or estimated costs to remedy any deficiencies due to deferred maintenance and any noted component or system replacements.

EMG's PNA cannot wholly eliminate the uncertainty regarding the presence of physical deficiencies and the performance of a subject property's building systems. Preparation of a PNA in accordance with Public Housing Modernization Standards Handbooks 7485.2 is intended to reduce, but not eliminate, the uncertainty regarding the potential for component or system failure and to reduce the potential that such component or system may not be initially observed. This PNA was prepared recognizing the inherent subjective nature of EMG's opinions as to such issues as workmanship, quality of original installation, and estimating the remaining useful life of any given component or system. It should be understood that EMG's suggested remedy may be determined under time constraints, formed without the aid of engineering calculations, testing, exploratory probing, the removal of materials, or design. Furthermore, there may be other alternate or more appropriate schemes or methods to remedy the physical deficiency. EMG's opinions are generally formed without detailed knowledge from individuals familiar with the component's or system's performance.

Any questions regarding this report should be directed to Edward Beeghly at ebeeghly@emgcorp.com or at 800.733.0660, x7607.

Prepared by: David Jacques, Field Observer

Reviewed by: 

Solomon Rosenbaum, PE, CEM,
Technical report Reviewer
For Edward Beeghly
Program Manager

1. EXECUTIVE SUMMARY

1.1. SUMMARY OF FINDINGS

The Housing Authority of Bergen County contracted with EMG to conduct a Physical Needs Assessment (PNA) and Energy Audit of the subject property, Brookside Gardens, located at 293 Murray Hill Terrace in Bergenfield, New Jersey. The PNA was performed on April 7, 2014.

The multi-family property has one 6-story apartment building containing 135 apartment units. The building area is approximately 122,669 square feet. The site area is approximately 2.1 acres. Construction of the property was completed in 1979.

Summary of Physical Needs Assessment:

On site amenities include recreation rooms, a community center, a library, and one laundry room.

Generally, the property appears to have been constructed within industry standards in force at the time of construction, to have been well maintained during recent years, and is in good overall condition.

According to property management personnel, the property has had a limited capital improvement expenditure program over the past three years, primarily consisting of generator, switchgear, repointing of brick veneer, and installation of three domestic hot water boilers. Supporting documentation was not provided but some of the work is evident.

There are a number of Priority Deficiency Costs that have been identified during the evaluation period. These needs are identified in the various sections of this report and are summarized in the attached Replacement Reserves Report.

Summary of Energy Audit:

EMG has conducted an Energy Audit on the Brookside Gardens. The study included a review of the building's construction features, historical energy and water consumption and costs, review of the building envelope, HVAC equipment, heat distribution systems, lighting, and the building's operational and maintenance practices.

EMG has identified eight Energy Conservation Measures (ECMs) for this property. The savings for each measure are calculated using standard engineering methods followed in the industry, and detailed calculations for ECM are provided in Appendix H for reference. A 10% discount in energy savings was applied to account for the interactive effects amongst the ECMs. In addition to the consideration of the interactive effects, EMG has applied a 15% contingency to the implementation costs to account for potential cost overruns during the implementation of the ECMs

Summary of Financial Information for Recommended Energy Conservation Measures

Item	Estimate
Total Projected Initial ECM Investment	$ 286,263 *(In Current Dollars)*
Estimated Annual Cost Savings Related to ECMs	$39,247 *(In Current Dollars)*
Net Effective ECM Payback	7.29 years

1.2. FOLLOW UP RECOMMENDATIONS

No additional evaluation is necessary.

1.3. OPINIONS OF PROBABLE COST

This section provides estimates for the repair and capital reserves items noted within this Physical Needs Assessment (PNA).

These estimates are based on invoice or bid documents provided either by the Owner/facility and construction costs developed from construction resources such as *R.S. Means* and *Marshall & Swift,* EMG's experience with past costs for similar properties, city cost indexes, and assumptions regarding future economic conditions.

1.4. METHODOLOGY

Physical Needs Assessment:

Based upon site observations, research, and judgment, along with referencing Expected Useful Life (EUL) tables from various industry sources, EMG opines as to when a system or component will most probably necessitate replacement. Accurate historical replacement records, if provided, are typically the best source of information. Exposure to the elements, initial quality and installation, extent of use, the quality and amount of preventive maintenance exercised, etc., are all factors that impact the effective age of a system or component. As a result, a system or component may have an effective age that is greater or less than its actual chronological age. The Remaining Useful Life (RUL) of a component or system equals the EUL less its effective age. Projections of Remaining Useful Life (RUL) are based on continued use of the Property similar to the reported past use. Significant changes in tenants and/or usage may affect the service life of some systems or components.

The evaluation period identified in this report is defined as 20 years.

The physical condition of building component to be repaired is typically defined as being in one of five categories: Priority One through Five. For the purposes of this report, the following definitions are used:

Priority One - These items are to be addressed as Immediate. Items in this category require immediate action and include corrective measures to:

1. Correct life safety and/or code hazards
2. Repair item permitting water leaks into the building or structure
3. Repair mold or mildew conditions
4. Down unit repairs
5. Further study investigations

Priority Two - These items are to be addressed within the next 1 year. Items in this category require corrective measures to:

1. Return a system to normal operation
2. Stop deterioration to other systems
3. Stop accelerated deterioration
4. Replace items that have reached or exceeded their useful service life
5. ADA/UFAS deficiencies

Priority Three - These items are to be addressed within the next 2-3 years. Items in this category, if not corrected expeditiously, will become critical in the next several years. Items in this category include corrective measures to:

1. Stop intermittent interruptions
2. Correct rapid deterioration
3. Replace items that will reach or exceed their useful service life

4. Correct functionality and/or aesthetic issues that are not critical

Priority Four - These items are to be addressed within the next 3-5 years. Items in this category include conditions requiring appropriate attention to preclude predictable deterioration or potential downtime and the associated damage or higher costs if deferred further.

Priority Five - These items are to be addressed within 6-20 years. Items in this category represent a sensible improvement to the existing conditions. These are not required for the most basic function of the facility; however, Priority 5 projects will improve overall usability and/or reduce long-term maintenance costs.

Energy Audit:

All of the recommended ECMs are broken into two major categories:

1. **No/Low Cost Recommendations**: No/Low cost is defined as any project with initial investment of less than $1000
2. **Capital Cost Recommendations**: Capital cost defined as any project with initial investment greater than $1000

EMG screens ECMs based on the payback criteria.

Simple Payback Period –The number of years required for the cumulative value of energy or water cost savings less future non-fuel or non-water costs to equal the investment costs of the building energy or water system, without consideration of discount rates. ECMs with a payback period greater than the Expected Useful Life (EUL) of the project are not typically recommended, as the cost of the project will not be recovered during the lifespan of the equipment. These ECMs are recommended for implementation during future system replacement. At that time, replacement may be evaluated based on the premium cost of installing energy efficient equipment.

$$Simple\ Payback = \frac{Initial\ Cost}{Annual\ Savings}$$

2. PHYSICAL NEEDS ASSESSEMENT - PURPOSE AND SCOPE

2.1. PURPOSE

The purpose of this Physical Needs Assessment (PNA) is to assist the Client in evaluating the physical aspects of this property and how its condition may affect the soundness of the Client's financial decisions over time. For this PNA, representative samples of the major independent building components were observed and their physical conditions were evaluated. This included site and building exteriors, representative interior common areas, and a representative sample of the apartment units. Apartment unit observations include a minimum of 50 percent of the vacant units and all of the down units.

The property management staff and code enforcement agencies were interviewed for specific information relating to the physical property, code compliance, available maintenance procedures, available drawings, and other documentation. The property's systems and components were observed and evaluated for their present condition. EMG completed the *Systems and Conditions Table*, which lists the current physical condition and estimated remaining useful life of each system and component present on the property, as observed on the day of the site visit. The estimated costs for repairs and/or capital reserves are included in the enclosed cost tables. All findings relating to these opinions of probable costs are included in the narrative sections of this report.

The physical condition of building systems and related components are typically defined as being in one of three conditions: Good, Fair, or Poor, or a combination thereof. For the purposes of this report, the following definitions are used:

Good	=	Satisfactory as-is. Requires only routine maintenance over the evaluation period. Repair or replacement may be required due to a system's estimated useful life.
Fair	=	Satisfactory as-is. Repair or replacement is required due to current physical condition and/or estimated remaining useful life.
Poor	=	Immediate repair, replacement, or significant maintenance is required.

2.2. DEVIATIONS FROM THE ASTM E2018-01 GUIDE

ASTM E2018-01, *Standard Guide for Property Condition Assessments: Baseline Property Condition Assessment Process* requires that any deviations from the Guide be so stated within the report. EMG's probable cost threshold limitation is reduced from the Guide's $3,000 to $2,000, thus allowing for a more comprehensive assessment on smaller scale properties. Therefore, EMG's opinions of probable costs that are individually less than a threshold amount of $2,000 are omitted from this PNA. However, comments and estimated costs regarding identified deficiencies relating to life/safety or accessibility items are included regardless of this cost threshold.

In lieu of providing written record of communication forms, personnel interviewed from the facility and government agencies are identified in Section 2.5. Relevant information based on these interviews is included in Sections 2.5, 3.1, and other applicable report sections.

2.3. ADDITIONAL SCOPE CONSIDERATIONS

Items required by ASTM E2018-01 and Fannie Mae's *Exhibit III Specific Guidance to the Property Evaluator* are included within the Physical Needs Assessment (PNA). Additional "non-scope" considerations were addressed at the recommendation of EMG and subsequent contract with the Client. These additional items are identified as follows:

- Property disclosure information was obtained from the EMG's Pre-Survey Questionnaire
- An assessment of accessibility utilizing EMG's Accessibility Checklist.
- A limited visual assessment and review of the property for mold growth, conditions conducive to mold growth, and evidence of moisture in accessible areas of the property
- Provide a statement on the property's Remaining Useful Life
- Provide cross reference indexing between cost tables and report text
- Determination of FEMA Flood Plain Zone for single address properties

2.4. PROPERTY'S REMAINING USEFUL LIFE ESTIMATE

Subject to the qualifications stated in this paragraph and elsewhere in this report, the Remaining Useful Life (RUL) of the property is estimated to be not less than 35 years. The Remaining Useful Life estimate is an expression of a professional opinion and is not a guarantee or warranty, expressed or implied. This estimate is based upon the observed physical condition of the property at the time of EMG's visit and is subject to the possible effect of concealed conditions or the occurrence of extraordinary events such as natural disasters or other "acts of God" that may occur subsequent to the date of EMG's site visit.

The Remaining Useful Life for the property is further based on the assumption that: (a) the immediate repairs, short term repairs, and future repairs for which replacement reserve funds are recommended are completed in a timely and workman-like manner, and (b) a comprehensive program of preventive and remedial property maintenance is continuously implemented using an acceptable standard of care. The Remaining Useful Life estimate is made only with regard to the expected physical or structural integrity of the improvements on the property, and no opinion regarding economic or market conditions, the present or future appraised value of the property, or its present or future economic utility, is expressed by EMG.

2.5. PERSONNEL INTERVIEWED

The following personnel from the facility and government agencies were interviewed in the process of conducting the PNA:

Name and Title	Organization	Phone Number
Richard Goddin Property Manager	Housing Authority of Bergen County	201.954.4558
David Moody Housing Inspection Specialist	Bureau of Housing Inspection	609.633.6225

The PNA was performed with the assistance of Richard Goddin, Property Manager, Housing Authority of Bergen County, the on site Point of Contact (POC), who was cooperative and provided information that appeared to be accurate based upon subsequent site observations. The on site contact is completely knowledgeable about the subject property and answered all questions posed during the interview process. The POC's management involvement at the property has been for the past 11 years.

2.6. DOCUMENTATION REVIEWED

Prior to the PNA, relevant documentation was requested that could aid in the knowledge of the subject property's physical improvements, extent and type of use, and/or assist in identifying material discrepancies between reported information and observed conditions. The review of submitted documents does not include comment on the accuracy of such documents or their preparation, methodology, or protocol. The following documents were provided for review while performing the PNA:

- Site plan
- Floor plan
- Capital improvement summary
- Building blueprints
- Utility bills

No other documents were available for review. The Documentation Request Form is provided in Appendix E.

2.7. PRE-SURVEY QUESTIONNAIRE

A Pre-Survey Questionnaire was sent to the POC prior to the site visit. The questionnaire is included in Appendix E. Information obtained from the questionnaire has been used in preparation of this PNA.

2.8. WEATHER CONDITIONS

Weather conditions at the time of the site visit were clear, with temperatures in the 60s (°F) and light winds.

3. CODE INFORMATION, ACCESSIBILITY, AND MOLD

3.1. CODE INFORMATION, FLOOD ZONE AND SEISMIC ZONE

According to David Moody of the Bureau of Housing Inspection, there are no outstanding building code violations on file. The Building Department does not have an annual inspection program. They only inspect new construction, work that requires a building permit, and citizen complaints. A copy of the original Certificate of Occupancy was requested, but was not available.

According to David Moody of the Bureau of Housing Inspection, there are no outstanding fire code violations on file. The most recent inspection was conducted by the Fire Department in May 2013. The Fire Department inspects the property on an annual basis.

According to the Flood Insurance Rate Map, published by the Federal Emergency Management Agency (FEMA) and dated September 30, 2005, the property is located in Zone X, defined as an area outside the 500-year flood plain with less than 0.2% annual probability of flooding. Annual Probability of Flooding of Less than one percent.

3.2. ADA ACCESSIBILITY

Section 504 of the Rehabilitation Act of 1973 is a Federal accessibility law that was enacted on June 2, 1988. Section 504 applies to multi-family properties that have 15 or more units. The property must have a minimum of five percent mobility accessible units and two percent of the units for visual / audio hearing impairments. Exceptions can be considered due to undue financial burdens or structural restrictions. However, the exceptions do not relieve the recipients from compliance utilizing other units/buildings or other methods to achieve reasonable accommodations.

Reasonable Accommodations as described in 24 CFR 8.4(b)(i), 8.24 and 8.33 are described as follows: When a family member requires an accessible feature(s) or policy modification to accommodate a disability, property owners must provide such feature(s) or policy modification unless doing so would resulting in a fundamental alteration in the nature of its program or result in a financial and administrative burden.

The Uniform Federal Accessibility Standard (UFAS) 24 CFR part 40 was adopted by HUD and made effective October 4, 1984. The UFAS applies only to new construction or to alterations to the existing buildings. Alterations are defined as work that costs 50 percent or more of the building's value when the work performed occurs within a twelve month period. Apartments modified for mobility impaired residents are to comply with UFAS.

Generally, Title III of the Americans with Disabilities Act (ADA) prohibits discrimination by entities to access and use of "areas of public accommodations" on the basis of disability. Generally the rental office and access from the site to the rental office must be maintained and operated to comply with the Americans with Disabilities Act Accessibility Guidelines (ADAAG). Buildings completed and occupied after January 26, 1992 are required to comply fully with ADAAG. Existing facilities constructed prior to this date are held to the lesser standard of complying to the extent allowed by structural feasibility and the financial resources available; otherwise a reasonable accommodation must be made.

During the PNA, observations and sample measurements for accessibility were conducted. The scope of the observations is set forth in the EMG Accessibility Checklist provided in Appendix D. It is understood by the Client that the observations described herein does not comprise an Accessibility Compliance Survey of every unit and only those units where access was provided by the client were reviewed. Only a representative sample of areas were observed and, other than as shown on the accessibility checklist, actual measurements were not taken to verify compliance.

The accessibility standards that apply to the Property are Section 504, UFAS and where applicable, the ADA for access to the rental office. However, as the property is not new construction, or completing substantial rehabilitation or other rehabilitation, the property is only required to complete reasonable accommodations. Property management stated that Section 504 requests are completed on an individual case-by-case basis. Based on EMG's observations and interview of the Property Manager, the property is generally compliant with Section 504. Presently, 9.6 percent of the units are defined as accessible for individuals with mobility impairments according to property management. There are three units at present which have visual / audio modifications, thus exceeding the two percent accessible requirements of Section 504.

Based on EMG's assessment, the property is in general compliance with the requirements of Section 504 and the ADA.

Based on EMG's assessment, an additional zero units should be made accessible to residents with mobility impairments and zero units should be modified for residents who have visual / audio impairments.

In addition, although defined as accessible, non-compliant components and features were observed throughout the designated accessible units, accessible routes, general site, and common areas. Consideration should be given to correcting these features and components to comply 24 CFR 8.23 (b) *Other Alternations.* It is recommended that MCHA modify their Barrier Removal Plan / Transition Plan to incorporate EMG's findings noted in the following categories.

Based on EMG's observations, the facility generally appeared to be accessible as stated within the defined priorities of Section 504, UFAS and the ADA.

Paths of Travel

- Current drinking fountain does not meet ADA requirements, requires replacement with ADA dual level drinking fountain.

Corrections of these conditions should be addressed from a liability standpoint, but are not necessarily code violations. The UFAS and Americans with Disabilities Act Accessibility Guidelines concern civil rights issues as they pertain to the disabled and are not a construction code, although many local jurisdictions have adopted the Guidelines as such. The cost to address the achievable items noted above is detailed in the Replacement Reserves Report. Unless Life/Safety (Immediate Repair) is a concern, the accessible improvements are defined as short term improvements (Year 1).

3.3. MOLD

As part of the PNA, EMG completed a limited, visual assessment for the presence of visible mold growth, conditions conducive to mold growth, or evidence of moisture in readily accessible areas of the property. EMG interviewed property personnel concerning any known or suspected mold contamination, water infiltration, or mildew-like odor problems.

This assessment does not constitute a comprehensive mold survey of the property. The reported observations and conclusions are based solely on interviews with property personnel and conditions observed in readily accessible areas of the property at the time of the assessment. Sampling was not conducted as part of the assessment.

EMG did not note any visual indications of the presence of visible mold growth, conditions conducive to mold growth, or evidence of moisture in any readily accessible areas of the property.

4. EXISTING BUILDING EVALUATION

4.1. APARTMENT UNIT TYPES AND UNIT MIX

The gross area measurements in the chart below are an approximation, are based on information provided by on site personnel, and are not based on actual measurements. Due to the varying methods that could be utilized by others to derive square footage, the area calculations in the chart below do not warrant, represent, or guarantee the accuracy of the measurements.

Apartment Unit Types and Mix		
Quantity	**Type**	**Floor Area**
120	1 Bedroom/1 Bathroom	617 SF
15	2 Bedrooms/1 Bathroom	999 SF
There are currently three vacant units.		
There are currently 0 down units.		
135	**TOTAL**	

4.2. APARTMENT UNITS OBSERVED

Over twenty percent of the apartment units were observed in order to establish a representative sample and to gain a clear understanding of the property's overall condition. Other areas accessed included the exterior of the property, a representative sample of the roofs, and the interior common areas. The following apartments were observed.

Apartment Units Observed		
Unit/Floor	**Type**	**Comments**
108	1 Bedroom/1 Bathroom	Occupied. Good condition. Vinyl tile in fair condition.
112	1 Bedroom/1 Bathroom	Occupied. Good condition.
212	1 Bedroom/1 Bathroom	Occupied. Good condition.
208	1 Bedroom/1 Bathroom	Occupied. Good condition.
207	1 Bedroom/1 Bathroom	Occupied. Fair condition. Carpet is stained badly.
205	1 Bedroom/1 Bathroom	Occupied. Good condition.
202	2 Bedroom/1 Bathroom ADA	Occupied. Poor condition. Carpet is badly stained and baseboard heater cover has been removed in bedroom.
214	1 Bedroom/1 Bathroom	Occupied. Good condition.
216	1 Bedroom/1 Bathroom	Occupied. Good condition.
218	1 Bedroom/1 Bathroom	Occupied. Good condition.
222	1 Bedroom/1 Bathroom	Occupied. Good condition. New carpet.
322	1 Bedroom/1 Bathroom	Occupied. Good condition.
316	1 Bedroom/1 Bathroom	Occupied. Good condition.
313	1 Bedroom/1 Bathroom ADA	Occupied. Good condition.

Apartment Units Observed		
Unit/Floor	**Type**	**Comments**
304	1 Bedroom/1 Bathroom	Occupied. Good condition.
307	1 Bedroom/1 Bathroom	Occupied. Good condition.
308	1 Bedroom/1 Bathroom	Occupied. Good condition.
309	1 Bedroom/1 Bathroom	Occupied. Good condition.
312	1 Bedroom/1 Bathroom	Occupied. Good condition.
410	1 Bedroom/1 Bathroom	Occupied. Good condition.
404	1 Bedroom/1 Bathroom	Occupied. Good condition.
402	2 Bedroom/1 Bathroom	Occupied. Good condition.
414	1 Bedroom/1 Bathroom ADA	Occupied. Good condition.
420	1 Bedroom/1 Bathroom	Occupied. Good condition.
423	1 Bedroom/1 Bathroom	Occupied. Good condition.
425	1 Bedroom/1 Bathroom	Occupied. Good condition.
521	1 Bedroom/1 Bathroom	Occupied. Good condition.
501	1 Bedroom/1 Bathroom	Occupied. Good condition.
508	1 Bedroom/1 Bathroom	Occupied. Good condition.
515	1 Bedroom/1 Bathroom	Occupied. Good condition.
609	1 Bedroom/1 Bathroom	Occupied. Good condition.
612	1 Bedroom/1 Bathroom	Occupied. Good condition.

All areas of the property were available for observation during the site visit.

A “down unit” is a term used to describe a non-rentable apartment unit due to poor conditions such as fire damage, water damage, missing appliances, damaged floor, wall or ceiling surfaces, or other significant deficiencies. According to the POC, there are no down units.

5. SITE IMPROVEMENTS

5.1. UTILITIES

The following table identifies the utility suppliers and the condition and adequacy of the services.

Site Utilities		
Utility	**Supplier**	**Condition & Adequacy**
Sanitary sewer	Bergenfield	Good & adequate
Storm sewer	United Water	Good & adequate
Domestic water	United Water	Good & adequate
Electric service	PSEG	Good & adequate
Natural gas service	PSEG	Good & adequate

Observations/Comments:

- According to the POC, the utilities provided are adequate for the property.

5.2. PARKING, PAVING, AND SIDEWALKS

The main entrance drive is located along Murray Hill Terrace on the north side of the property. The parking areas and drive aisles are paved with asphaltic concrete. The entrance driveway aprons are paved with concrete.

Based on a physical count, parking is provided for 64 cars. The parking ratio is.47 spaces per apartment unit. Thirty-nine of the parking stalls are located in open lots. Twenty-five of the parking stalls are sheltered by carports. Four handicapped-accessible parking stalls are located adjacent to the building, two of which are reserved for vans.

Type Space	Number of Spaces
Open Self Park	60
Handicapped-accessible	4
Total	**64**

The sidewalks throughout the property are constructed of cast-in-place concrete. Cast-in-place concrete steps with metal handrails are located at grade changes.

The curbs and gutters are constructed of cast-in-place concrete. Surface runoff is directed to swales along the drive aisles.

Observations/Comments:

- The asphalt pavement is in fair condition. There are isolated areas of failure and deterioration, such as alligator cracking and localized depressions are found throughout the site. All of the paving must be overlaid with new asphalt paving in order to maintain the integrity of the overall pavement system. The cost of this work is included in the Replacement Reserves Report.

- In addition to aforementioned overlay, seal coating and striping will be required during the assessment period. The cost of this work is included in the Replacement Reserves Report.
- The concrete pavement is in good condition. There are no significant signs of cracks or surface deterioration. Epoxy sealing of minor cracks will be required over the assessment period as part of the property management's routine maintenance program.
- The concrete curbs, gutters, and sidewalks throughout the property are in good condition. Routine cleaning and maintenance will be required over the assessment period.

5.3. DRAINAGE SYSTEMS AND EROSION CONTROL

Storm water from the roofs, landscaped areas, and paved areas flows into on site inlets and catch basins with underground piping connected to the municipal storm water management system.

Observations/Comments:

- There is no evidence of storm water runoff from adjacent properties. The storm water system appears to provide adequate runoff capacity. There is no evidence of major ponding or erosion.

5.4. TOPOGRAPHY AND LANDSCAPING

The property slopes gently down from the west side of the property to the east property line.

The landscaping consists of trees, shrubs, and grasses. Flower beds are located throughout the site.

Small garden plots are at the east of the building for tenant use.

Surrounding properties include a school, apartment buildings, and residential homes.

Brick retaining walls are located at the south side of property adjacent to the building.

Observations/Comments:

- The topography and adjacent uses do not appear to present conditions detrimental to the property.
- The landscape materials are in good condition and will require routine maintenance over the assessment period.
- The retaining walls are in good condition. Routine maintenance will be required over the assessment period.

5.5. GENERAL SITE IMPROVEMENTS

Property identification is provided by a wood sign mounted on a post adjacent to the main entrance drive. Street address numbers are displayed on the exterior elevations.

Site lighting is provided by metal street light standards. The light standards are spaced along the drive aisles throughout the parking areas. Light fixtures mounted on metal poles are located along walkways and drive aisles throughout the property.

Exterior building illumination is provided by light fixtures surface-mounted on the exterior walls. A wall-mounted light fixture is located adjacent to each apartment unit's entrance door and patio or balcony door.

A small screened in gazebo exists adjacent to the rear parking.

Dumpsters are located in the parking area and are placed on concrete pads.

Observations/Comments:

- The property identification signs are in good condition. Routine maintenance will be required over the assessment period.
- The exterior site and building light fixtures are in good condition. Routine maintenance will be required over the assessment period.
- The gazebo is in good condition. Based on the estimated Remaining Useful Life (RUL), the gazebo will require painting and new screens over the assessment period. The cost of this work is included in the Replacement Reserves Report.
- The dumpsters are owned and maintained by the building owner. The dumpster slabs are in good condition and will require routine maintenance over the assessment period.

6. BUILDING ARCHITECTURAL AND STRUCTURAL SYSTEMS

6.1. FOUNDATIONS

Based on structures of similar size, configuration, and geographic location, it is assumed that the foundations consist of reinforced concrete slabs-on-grade with integral perimeter footings, interior footings, and column pad footings bearing directly on the soil.

Observations/Comments:

- The foundations and footings could not be directly observed during the site visit. There is no evidence of movement that would indicate excessive settlement.

6.2. SUPERSTRUCTURE

The building has load-bearing, concrete masonry unit (CMU), exterior and interior walls, and interior steel columns, supporting the upper floors and roofs.

The upper floors are reinforced, cast-in-place, concrete slabs supported by cast-in-place concrete beams.

The roofs are constructed of cast-in-place concrete and are supported by concrete beams and steel beams.

Observations/Comments:

- The superstructure is exposed in some locations, allowing for limited observation. Walls and floors appear to be plumb, level, and stable. There are no significant signs of deflection or movement.

6.3. ROOFING

The primary roofs are classified as flat. The roofs are finished with a EPDM rubberized roofing membrane. The roofs are insulated with rigid insulation boards.

Storm water is drained from the roofs by internal drains. The drains discharge to the underground storm drainage system.

There are no attics. The ceilings of the upper floor apartment units are the bottom side of the roof diaphragm.

Observations/Comments:

- The roof finishes are approximately eight years old. Information regarding roof warranties or bonds are not available. The roofs are maintained by an outside contractor.
- The fields of the roofs are in good condition. Based on the estimated Remaining Useful Life (RUL), the roof membranes will require replacement over the assessment period. The cost of this work is included in the Replacement Reserves Report.
- According to the POC, there are no active roof leaks. There is no evidence of active roof leaks.
- There is no evidence of roof deck or insulation deterioration. The roof substrate and insulation should be inspected during any future roof repair or replacement work.

- There is no evidence of fire retardant treated plywood (FRT) and, according to the POC, FRT plywood is not used.
- The roof flashings are in good condition and will require routine maintenance over the assessment period.
- Roof drainage appears to be adequate. Clearing and minor repair of drain system components should be performed regularly as part of the property management's routine maintenance program.
- The roof vents are in good condition and will require routine maintenance over the assessment period.

6.4. EXTERIOR WALLS

The exterior walls are finished with brick masonry veneer.

Building sealants (caulking) are located between dissimilar materials, at joints, and around window and door openings.

Observations/Comments:

- The exterior finishes are in good condition and will require routine maintenance over the assessment period. According to the POC, the brick veneer was repointed and sealed with a protective coating approximately three years ago.
- The sealant is flexible, smooth, and in good condition and will require routine maintenance over the assessment period.

6.5. EXTERIOR AND INTERIOR STAIRS

The interior stairs are constructed of steel and have closed risers and metal treads. The handrails and balusters are constructed of metal.

The exterior stairs are constructed of reinforced concrete. The handrails and balusters are constructed of metal.

Observations/Comments:

- The exterior and interior stairs, balusters, and handrails are in good condition and will require routine maintenance over the assessment period.

6.6. WINDOWS AND DOORS

The windows are vinyl-framed, double-glazed double-hung units and have exterior screens.

The apartment unit entrance doors are painted metal doors set in wood frames. Exterior entrance doors to the apartments contain cylindrical locksets with lever handle hardware, security chains, keyed deadbolts, spy-eyes and door bells.

Observations/Comments:

- According to the POC, the property does not experience a significant number of complaints regarding window leaks or window condensation. There is no evidence of window leaks or condensation. The windows and screens are in good condition and will require routine maintenance over the assessment period.
- The exterior doors and door hardware are in good condition and will require routine maintenance over the assessment period.

- The windows and curtain walls are in good condition and will require routine maintenance over the assessment period, they were replaced six years ago.

6.7. PATIO, TERRACE, AND BALCONY

Not applicable. There are no patios, terraces, or balconies.

6.8. COMMON AREAS, ENTRANCES, AND CORRIDORS

The game room furnishings include a pool table, a ping pong table, chairs, tables, a television, and wall decorations.

The community center furnishings include chairs, tables, a television, three computers, and wall decorations. The common area kitchen is equipped with residential-style appliances, including a refrigerator, range, and microwave.

Apartment unit entrances are accessed from corridors beyond the lobby and from corridors on each floor.

Two common area restrooms are located on the first floor.

A laundry rooms is located on the first floor. There are a total of nine washing machines and six clothes dryers. A laundry sink and change machine is provided in the laundry room.

The following table identifies the interior common areas and generally describes the finishes in each common area.

Common Area	Floors	Walls	Ceilings
Game room	Carpet and vinyl tile	Painted drywall	Suspend T-Bar with acoustic tiles
Community center	Vinyl tile	Painted CMU	Suspend T-Bar with acoustic tiles
Corridor	Carpet	Painted CMU and painted drywall	Painted concrete
Laundry Room	Sheet vinyl	Painted CMU	Painted concrete
Common Area Kitchen	Vinyl tile	Painted drywall and ceramic tile	Suspend T-Bar with acoustic tiles
Common Area Restroom	Ceramic tile	Ceramic tile wainscots and wallpaper	Suspend T-Bar with acoustic tiles
Elevator lobbies	Carpet	Painted CMU	Suspend T-Bar with acoustic tiles
Main lobby	Ceramic tile	Painted drywall	Suspend T-Bar with acoustic tiles

Observations/Comments:

- The common areas were last renovated approximately nine years ago.

- The interior finishes in the common areas are in fair to good condition. Based on the estimated Remaining Useful Life (RUL), the common area carpet and vinyl tile will require replacement during the assessment period. The cost of this work is included in the Replacement Reserves Report. Interior painting and wall finish replacement will also be required during the assessment period. The cost of this work is included in the Replacement Reserves Report. Based on the estimated Remaining Useful Life (RUL), the ceiling tiles will require replacement during the assessment period. The cost of this work is included in the Replacement Reserves Report.
- The common areas kitchen appliances are in fair to good condition. Based on the estimated Remaining Useful Life (RUL), some of the kitchen appliances will require replacement over the assessment period. The cost of this work is included in the Replacement Reserves Report.
- The washers and dryers are in good condition. Based on the estimated Remaining Useful Life (RUL), some of the washers and dryers will require replacement over the assessment period. The cost of this work is included in the Replacement Reserves Report.

7. BUILDING MECHANICAL AND ELECTRICAL SYSTEMS

7.1. BUILDING HEATING, VENTILATING, AND AIR-CONDITIONING (HVAC)

Hot water for the central heating system is supplied by three oil-fired, hot water boilers. Each boiler has a rated input capacity of 1,632,000 to 1,904,000 BTUH and are located in the boiler room.

Circulating pumps provide hot water to each temperature-controlled space by a two-pipe distribution system. The hot water supplies the baseboard heaters.

Cooling in the common areas is provided by high-capacity, air handling units, equipped with cooling coils. The air handling units are located in mechanical closets and are supplied by two pad-mounted condenser units. The cooling equipment uses R-22 as a refrigerant.

Through-the wall, air-conditioning units are located in each tenant space. The air conditioner units are tenant supplied, air condenser sleeves are provided by owner.

Air distribution in the common areas is provided to supply air registers via ducts concealed above the ceilings. Return air grilles are located in each space.

Natural ventilation is provided by operable windows. Mechanical ventilation is provided in the bathrooms by ceiling exhaust fans.

The stairwells, bathrooms, and other areas are ventilated by mechanical exhaust fans. Large capacity ventilation fans are mounted on the roof and are connected by concealed ducts to each ventilated space.

Heating at entrance vestibules is provided by hydronic wall heaters.

Observations/Comments:

- The property does not have a dedicated HVAC repair and maintenance contractor.
- Records of the installation, maintenance, upgrades, and replacement of the HVAC equipment have been maintained since the property was first occupied.
- The HVAC equipment varies in age. HVAC equipment is reportedly replaced on an "as-needed" basis.
- The boilers appear to be in fair condition. Based on its estimated Remaining Useful Life (RUL), the three boilers will require replacement during the assessment period. The cost of this work is included in the Replacement Reserves Report.
- The air handler units appear to be in fair condition. Based on its estimated Remaining Useful Life (RUL), the air handler units will require replacement during the assessment period. The cost of this work is included in the Replacement Reserves Report.
- The condensers appear to be in fair to good condition. Based on its estimated Remaining Useful Life (RUL), the condensers will require replacement during the assessment period. The cost of this work is included in the Replacement Reserves Report.
- The circulation pumps appear to be in fair condition. Based on its estimated Remaining Useful Life (RUL), the circulation pumps will require replacement during the assessment period. The cost of this work is included in the Replacement Reserves Report.
- The mechanical ventilation system and equipment appear to be in good condition and will require routine maintenance during the assessment period. Equipment or component replacements can be performed as part of the property management's routine maintenance program.

7.2. BUILDING PLUMBING

The plumbing systems include the incoming water service, the cold water piping system, and the sanitary sewer and vent system. The risers and the horizontal distribution piping are copper. The soil and vent systems are PVC and cast iron.

The water meters are located in vaults adjacent to the public streets.

Domestic hot water is supplied by three gas-fired boilers. Each boiler has a rated input capacity of 299,000 BTUH and is located in the secondary boiler room.

The boilers lead to eight indirect-fired, 120-gallon water heaters which provide domestic water throughout building.

The restrooms have commercial-grade fixtures and accessories including water closets and lavatories.

Observations/Comments:

- The plumbing systems appear to be well maintained and in good condition. The water pressure appears to be adequate. The plumbing systems will require routine maintenance during the assessment period.
- There is no evidence that the property uses polybutylene piping for the domestic water distribution system.
- The pressure and quantity of hot water appear to be adequate.
- The boilers appear to be in good condition and will require routine maintenance during the assessment period.
- The water heaters appear to be in good condition. Based on their estimated Remaining Useful Life (RUL), the water heaters will require replacement during the assessment period. The cost of this work is included in the Replacement Reserves Report.
- The accessories and fixtures in the common area restrooms are in good condition and will require routine maintenance during the assessment period.

7.3. BUILDING GAS DISTRIBUTION

Gas service is supplied from the gas main on the adjacent public street. The gas meters and regulators are located along the exterior walls of the building. The gas distribution piping within the building is malleable steel (black iron).

Observations/Comments:

- The pressure and quantity of gas appear to be adequate.
- The gas meters and regulators appear to be in good condition and will require routine maintenance during the assessment period.
- Only limited observation of the gas distribution piping can be made due to hidden conditions. The gas piping appears to be in good condition.

7.4. BUILDING ELECTRICAL

The electrical supply lines run overhead to a pad-mounted transformer, which feed interior-mounted electrical meters.

The main electrical service size is 2,000 amps, 120/208 volt three-phase four-wire alternating current (AC). The electrical wiring is copper, installed in metallic conduit. Circuit breaker panels are located throughout the building.

A diesel-powered 156 KVA emergency electrical generator is located in mechanical room. The generator provides back-up power for elements of the fire and life safety systems and HVAC systems. The fuel tank is an above-ground tank located at exterior of building.

Observations/Comments:

- The on site electrical systems up to the meters are owned and maintained by the respective utility company.
- The electrical service and capacity appear to be adequate for the property's demands.
- The switchgear, circuit breaker panels, and electrical meters appear to be in good condition and will require routine maintenance during the assessment period.
- The generator is in good condition and is reportedly tested on a weekly basis. According to the POC, the generator was installed in 2013. The generator will require routine maintenance over the assessment period.

7.5. BUILDING ELEVATORS AND CONVEYING SYSTEMS

There are a total of two traction passenger elevators. The elevators were manufactured by Reuland. The elevators have a rated capacities of 2,000 and 2,500 pounds and a speed of 50 fpm. The elevator machinery is located in a penthouse at the top of the shaft.

Each elevator cab has vinyl-tiled floors, plastic-laminated and stainless steel wall panels, and recessed ceiling light fixtures. The doors are fitted with electronic safety stops. Emergency communication equipment is provided in each cab.

Observations/Comments:

- According to the POC, the elevators, and their responsiveness, provide adequate service. The elevators are serviced by Standard Elevator Company on a routine basis. The elevator machinery and controls are the originally installed system. The elevators will require routine maintenance over the assessment period.
- The elevators are inspected on an annual basis by the municipality, and a certificate of inspection is on file in the management office.
- According to the POC, the emergency communication equipment in the elevators is functional. Equipment testing is not within the scope of a Property Condition Assessment.
- The finishes in the elevator cabs appear to be in good condition. Based on the estimated Remaining Useful Life (RUL), some of the cab finishes will require replacement over the assessment period. The cost of this work is included in the Replacement Reserves Report.
- The elevator controls and machinery are in good condition. Routine maintenance will be required during the assessment period.

7.6. FIRE PROTECTION SYSTEMS

The fire protection systems consist of a wet-pipe sprinkler system for the common areas, a wet standpipe with fire department hose valves and connections in each stair tower, portable fire extinguishers, smoke detectors, pull stations, and alarm horns. Hardwired smoke detectors are located throughout the common areas and in each apartment unit. The nearest fire hydrants are located along the property's drive aisles and are approximately 40 feet from the building.

Fire sprinkler risers are located in a fire protection equipment room. The system is equipped with a fire pump rated at 500 gallons per minute. The system is also equipped with a backflow preventers.

Common areas and corridors are equipped with battery back-up exit lights, illuminated exit signs, pull stations, alarm horns, and strobe light alarms.

A central fire alarm panel is located in the vicinity of the boiler room and monitors the pull stations, smoke detectors, and flow switches. The alarm panel also sounds the alarm and automatically notifies the monitoring service or the fire department in the event of trouble.

Observations/Comments:

- Information regarding fire department inspection information is included in Section 3.1.
- The fire extinguishers are serviced annually and appear to be in good condition. The fire extinguishers were serviced and inspected within the last year.
- The pull stations and alarm horns appear to be in good condition and will require routine maintenance over the assessment period.
- Smoke detector replacement is considered to be routine maintenance.
- Exit sign and emergency light replacement is considered to be routine maintenance.
- According to the POC, the central alarm panel is in good condition and is serviced regularly by a qualified fire equipment contractor. Based on inspection documents displayed by the panel, the central alarm panel has been inspected within the last year.
- The fire pump appears to be in fair condition. Based on the estimated Remaining Useful Life (RUL), the fire pump will require replacement over the assessment period. The cost of this work is included in the Replacement Reserves Report.
- The central alarm panel appears to be in good condition. Based on the estimated Remaining Useful Life (RUL), the central alarm panel will require replacement over the assessment period. The cost of this work is included in the Replacement Reserves Report.

8. DWELLING UNITS

8.1. INTERIOR FINISHES

The following table generally describes the interior finishes in the apartment units:

Typical Apartment Finishes			
Room	**Floor**	**Walls**	**Ceiling**
Living room	Carpet	Painted drywall	Painted concrete
Kitchen	Vinyl tile	Painted drywall	Painted concrete
Bedroom	Carpet	Painted drywall	Painted concrete
Bathroom	Ceramic tile	Painted drywall, ceramic tile tub surround, and ceramic tile wainscot	Painted concrete

The interior doors in each apartment unit are painted hollow-core wood doors set in wood frames. Wardrobe closets are accessed by bi-fold doors.

Observations/Comments:

- The residential units are typically renovated upon tenant turnover. The renovation generally consists of floor finish cleaning or replacement, interior painting, general cleaning, and repair or replacement of any damaged items.
- The interior finishes in the apartment units are in fair to good condition. Based on the estimated Remaining Useful Life (RUL), the carpet and vinyl flooring will require replacement over the assessment period. The cost of this work is included in the Replacement Reserves Report.
- The wall and ceiling finishes in tenant units is in fair to good condition. Based on the estimated Remaining Useful Life (RUL), the units will require painting over the assessment period. The cost of this work is included in the Replacement Reserves Report.
- The interior doors and door hardware are in good condition and will require routine maintenance.
- The closet doors are in fair condition and will require routine maintenance.

8.2. DWELLING APPLIANCES

Each apartment unit kitchen typically includes the following appliances:

Appliance	Comment
Refrigerator	Defrosting
Range	Electric
Hood	Ducted
Dishwasher	Not provided
Disposal	Not provided

The kitchen cabinets are constructed of wood. The countertops are wood and have a plastic-laminated finish.

Observations/Comments:

- According to the POC, apartment appliances are reportedly replaced on an "as needed" basis.
- The kitchen appliances appear to be in good condition. Based on their estimated Remaining Useful Life (RUL), some of the kitchen appliances will require replacement over the assessment period. The cost of this work is included in the Replacement Reserves Report.
- The kitchen cabinets are approximately 10 years old are in good condition. Some cabinets will require refinishing or replacement over the assessment period. This work is considered to be routine maintenance.
- The kitchen countertops are approximately 10 years old are in good condition. Some countertops will require refinishing or replacement over the assessment period. This work is considered to be routine maintenance.

8.3. HVAC

Heating is provided by hot water baseboard heaters, which are supplied by the central hot water system detailed in Section 7.1. The radiant units are individually controlled by integral thermostats.

Air-conditioning equipment is not provided. Most tenants have through-the wall air-conditioning units mounted in provided air conditioner sleeves.

Natural ventilation is provided by operable windows. Mechanical ventilation is provided in the bathrooms by ceiling exhaust fans.

Observations/Comments:

- The baseboard heaters appear to be in good condition and will require routine maintenance over the assessment period.
- The ceiling exhaust fans appear to be in good condition and will require routine maintenance over the assessment period.

8.4. PLUMBING

The bathrooms include a water closet, an enameled-steel bathtub, and a lavatory.

Domestic hot water is supplied by the central system described in Section 7.2.

Observations/Comments:

- The bathroom fixtures are in good condition and will require minor replacements routine maintenance over the assessment period.
- The bathtubs are in good condition and will require routine maintenance.
- The water closets appear to be in fair condition. Based on their estimated Remaining Useful Life (RUL) and as a water conservation measure, the water closets will require replacement over the assessment period. The cost of this work is included in the Replacement Reserves Report.
- Although not tested, there is no indication through observations or discussions with staff and residents that the pressure and quantity of hot water are inadequate.

8.5. ELECTRICAL

The electrical service to the 1 bedroom units is 225 amps and the 2 bedroom units is 260 amps. A circuit breaker panel inside each unit supplies the air conditioner, appliances, receptacles, and light fixtures.

The apartment units have incandescent and fluorescent light fixtures. Each apartment unit has at least one cable television outlet and telephone jack.

Observations/Comments:

- The apartment unit light fixtures are in good condition. Light fixture replacement is considered to be routine maintenance.
- The current electrical system at the Project Site is in good overall condition and is adequately configured with regard to "provided" versus "demanded" electrical capacity for each apartment unit.

8.6. FURNITURE, FIXTURES AND EQUIPMENT (FF&E)

Not applicable. There are no furnished apartments.

9. OTHER STRUCTURES

A storage shed is located at the rear of building. The storage shed is a pre-manufactured wood structure set on a concrete slab.

Observations/Comments:

- The storage shed is in fair condition. Based on the estimated Remaining Useful Life (RUL), the storage shed will require repainting and roof shingle replacement over the assessment period. The cost of this work is included in the Replacement Reserves Report.

10. ENERGY AUDIT - PURPOSE AND SCOPE

The purpose of this Energy Audit is to provide Brookside Gardens with a baseline of energy usage, the relative energy efficiency of the facility, and specific recommendations for Energy Conservation Measures. Information obtained from these analyses may be used to support a future application to an Energy Conservation Program, Federal and Utility grants towards energy conservation, as well as support performance contracting, justify a municipal bond-funded improvement program, or as a basis for replacement of equipment or systems

The energy audit consisted of an on site visual assessment to determine current conditions, itemize the energy consuming equipment (i.e.Boilers, Make-Up Air Units, DHW equipment); review lighting systems both exterior and interior; and review efficiency of all such equipment. The study also included interviews and consultation with operational and maintenance personnel. The following is a summary of the tasks and reporting that make up the Energy Audit portion of the report.

The following is a summary of the tasks and reporting that make up the Energy Audit portion of the report.

ENERGY AND WATER USING EQUIPMENT

- EMG has surveyed the common areas, office areas, maintenance facilities and mechanical rooms to document utility-related equipment, including heating systems, cooling systems, air handling systems and lighting systems.

BUILDING ENVELOPE

- EMG has reviewed the characteristics and conditions of the building envelope, checking insulation values and conditions. This review also includes an inspection of the condition of walls, windows, doors, roof areas, insulation and special use areas. Where we anticipated significant losses, we utilized infrared thermographs to analyze heat loss across the envelope.

RECOMMENDATIONS FOR ENERGY SAVINGS OPPORTUNITIES

- Based on the information gathered during the on site assessment, the utility rates, as well as recent consumption data and engineering analysis, EMG has identified opportunities to save energy and provide probable construction costs, projected energy/utility savings and provide a simple payback analysis.

ANALYSIS OF ENERGY CONSUMPTION

- Based on the information gathered during the on site assessment and a minimum of one year of utility billing history, EMG has conducted an analysis of the energy usage of all equipment, and identified which equipment is using the most energy and what equipment upgrades may be necessary. As a result, equipment upgrades or replacements are identified that may provide a reasonable return on the investment and improve maintenance reliability.

ENERGY AUDIT PROCESS

- Interviewing staff and review plans and past upgrades
- Performing an energy audit for each use type
- Performing a preliminary evaluation of the utility system
- Analyzing findings, utilizing ECM cost-benefit worksheets
- Making preliminary recommendations for system energy improvements and measures
- Estimating initial cost and changes in operating and maintenance costs based on implementation of energy efficiency measures
- Ranking recommended cost measures, based on the criticality of the project and the largest payback

11. ENERGY CONSERVATION MEASURES

EMG has identified eight Energy Conservation Measures (ECMs) for this property.

Priority	Brief description of ECM	Initial Investment	Annual Savings	Payback Period (yrs)	Component EUL (yrs)
1	Replace Incandescent Lighting with CFLs in Common Areas	$195	$1,663	0.1	5
2	Replace Incandescent Fixtures at Building Entry Lights with LED Wall Packs	$1,430	$1,138	1.3	5
3	Replace Incandescent Lighting with Energy Star Light Fixtures in Apartments	$57,947	$12,402	4.7	5
4	Replace Inefficient Boilers -1813334 Btu/hr	$108,800	$11,898	9.1	25
5	Replace Older Refrigerators with Energy Star Rated Refrigerators	$46,320	$4,922	9.4	15
6	Replace Older Plumbing Fixtures with Low Flow Devices	$53,865	$5,705	9.4	20
7	Replace Older Inefficient Air Conditioners- 10 ton units	$10,764	$939	11.5	15
8	Replace Fluorescent Fixtures in Common Areas with T-8 Bulbs & Electronic Ballasts	$6,942	$581	11.9	15

12. UTILITY ANALYSIS

Establishing the energy baseline begins with an analysis of the utility cost and consumption of the building. Utilizing the historical energy data and local weather information, we evaluate the existing utility consumption and assign it to the various end-uses throughout the buildings. The Historical Data Analysis breaks down utilities by consumption, cost and annual profile.

This data is analyzed, using standard engineering assumptions and practices. The analysis serves the following functions:

- Allows our engineers to benchmark the energy and water consumption of the facilities against consumption of efficient buildings of similar construction, use and occupancy.
- Generates the historical and current unit costs for energy and water
- Provides an indication of how well changes in energy consumption correlate to changes in weather.
- Reveals potential opportunities for energy consumption and/or cost reduction. For example, the analysis may indicate that there is excessive, simultaneous heating and cooling, which may mean that there is an opportunity to improve the control of the heating and cooling systems.

By performing this analysis and leveraging our experience, our engineers prioritize buildings and pinpoint systems for additional investigation during the site visit, thereby maximizing the benefit of their time spent on site and minimizing time and effort by the customer's personnel.

Utility Rates used for Cost Analysis

Electricity (Blended Rate)	Natural Gas	Water / Sewer
$.12/kWh	$.62/CCF	$ 4.59/CCf

The data analyzed provides the following information: 1) breakdown of utilities by consumption, 2) cost and annual profile, 3) baseline consumption in terms of energy/utility at the facility, 4) the Energy Use Index, or Btu/sq ft, and cost/sq ft. For multiple water meters, the utility data is combined to illustrate annual consumption for each utility type.

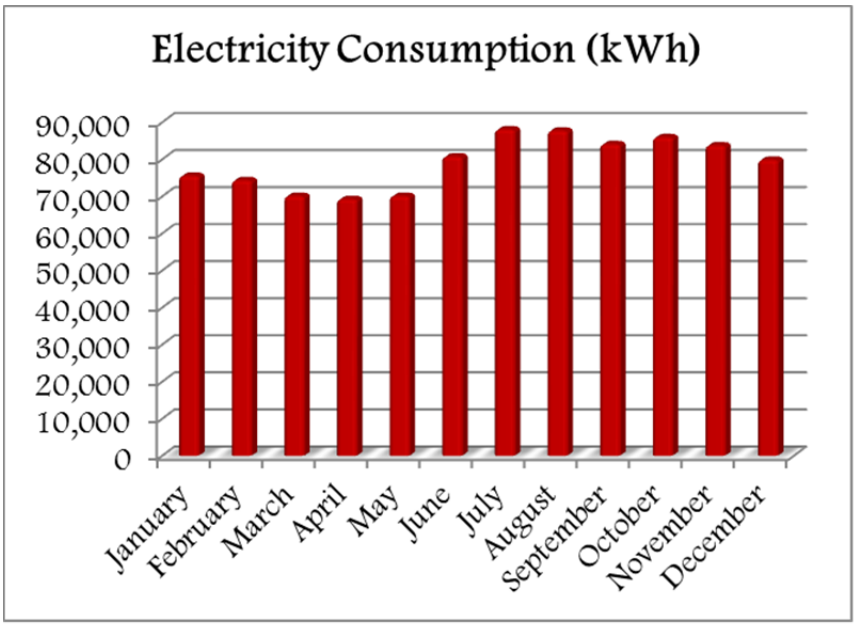
12.1. ELECTRICITY

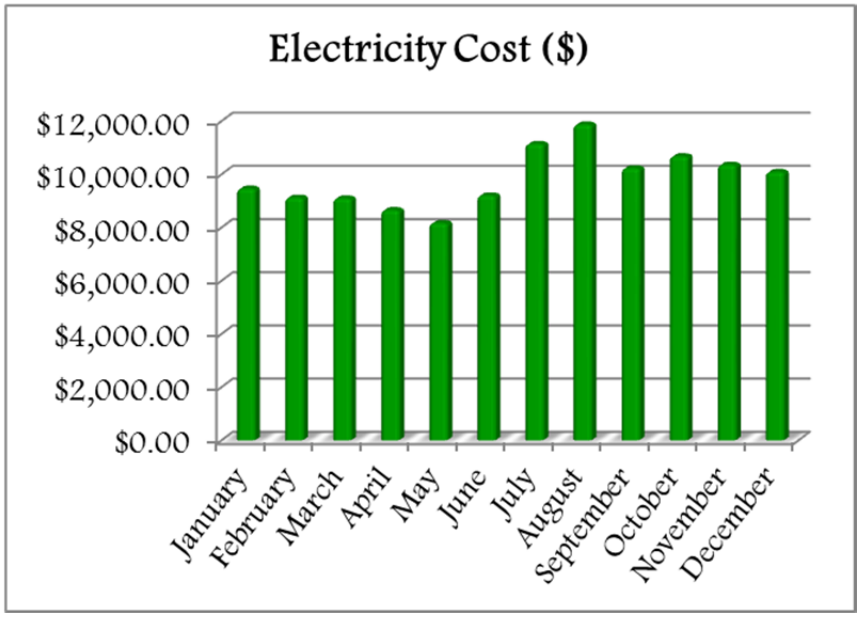
PSEG satisfies the electricity requirements of the facility.

Based on the 2013 electric usage and costs, the average price paid during the year was $0.12 per kWh. The total annual electricity consumption for the 12-month period analyzed is 950,529 kWh for a total cost of $118,138.

Electricity Consumption and Cost Data

Start Date	Consumption (kWh)	Unit Cost	Total Cost
January	75,629	$0.13	$9,468.00
February	74,429	$0.12	$9,128.00
March	70,187	$0.13	$9,100.00
April	69,345	$0.12	$8,661.00
May	70,178	$0.12	$8,168.00
June	80,823	$0.11	$9,213.00
July	88,151	$0.13	$11,147.50
August	87,806	$0.14	$11,878.50
September	84,155	$0.12	$10,233.00
October	86,040	$0.12	$10,683.00
November	83,834	$0.12	$10,364.00
December	79,956	$0.13	$10,094.00
Total	**950,529**	**$0.12**	**$118,138.00**


Electricity Consumption (kWh)
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
January
February
March
April
May
June
July
August
September
October
November
December


Electricity Cost ($)
$12,000.00
$10,000.00
$8,000.00
$6,000.00
$4,000.00
$2,000.00
$0.00
January
February
March
April
May
June
July
August
September
October
November
December

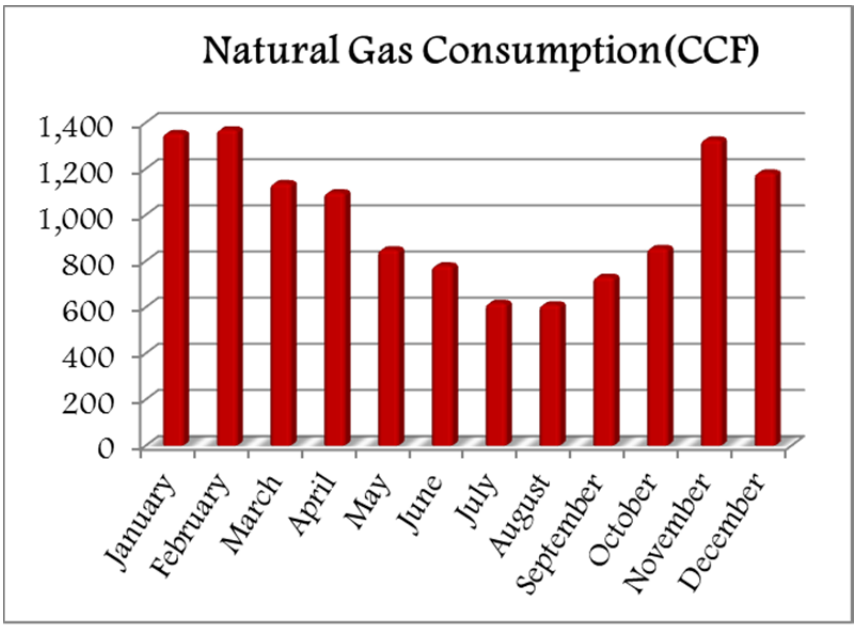
12.2. NATURAL GAS

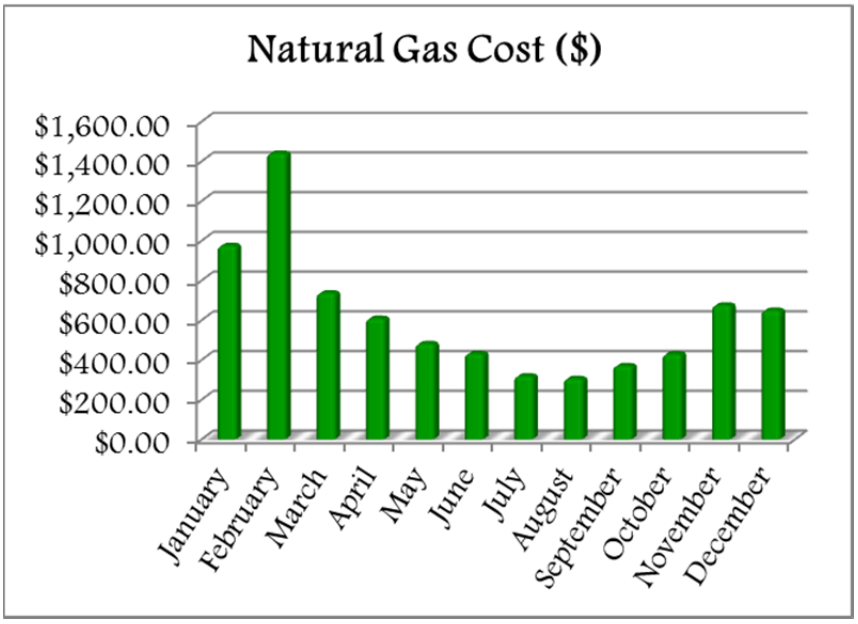
PSEG satisfies the natural gas requirements of the facility are satisfied by.

Based on the 2013 natural gas usage and costs, the average price paid during the year was $.62 per CCF. The total annual natural gas consumption for the 12-month period analyzed is 11,913 CCF for a total cost of $7,417.

Natural Gas Consumption and Cost Data

Start Date	Delivery (CCF)	Unit Cost	Total Cost
January	1,354	$0.72	$975.00
February	1,370	$1.05	$1,440.00
March	1,137	$0.65	$736.00
April	1,097	$0.55	$608.00
May	850	$0.57	$481.00
June	780	$0.55	$431.00
July	618	$0.51	$318.00
August	611	$0.50	$305.00
September	731	$0.51	$370.00
October	856	$0.50	$429.00
November	1,326	$0.51	$675.00
December	1,183	$0.55	$649.00
Total	**11,913**	**$0.62**	**$7,417.00**


Natural Gas Consumption(CCF)
1,400
1,200
1,000
800
600
400
200
0
January
February
March
April
May
June
July
August
September
October
November
December


Natural Gas Cost ($)
$1,600.00
$1,400.00
$1,200.00
$1,000.00
$800.00
$600.00
$400.00
$200.00
$0.00
January
February
March
April
May
June
July
August
September
October
November
December

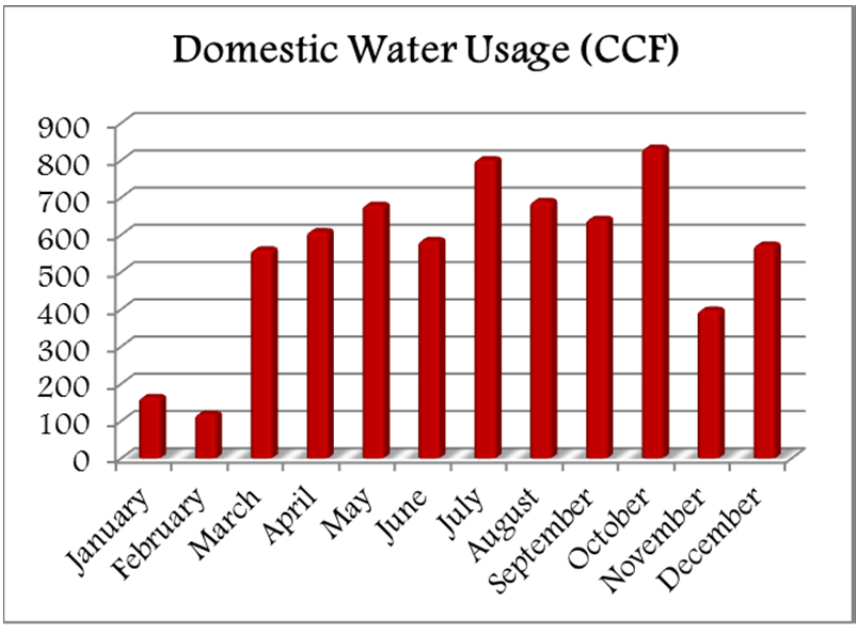
12.3. WATER AND SEWER

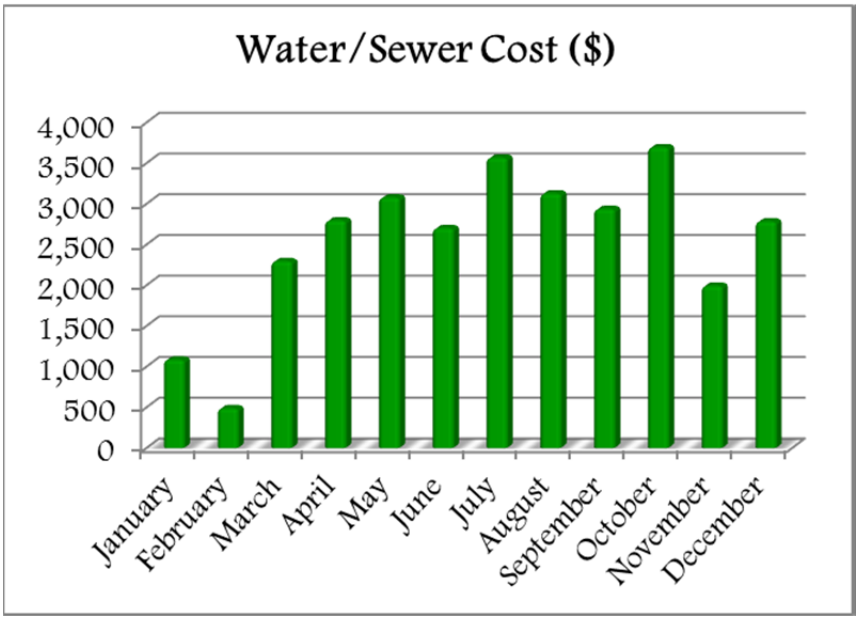
United Water satisfies the Water and Sewer requirements of the facility.

Based on the 2013 water and sewer usage and costs, the average price paid during the year was $4.59 per CCF. The total annual water and sewer consumption for the 12-month period analyzed is 6,655 CCF for a total cost of $30,549.

Water and Sewer Consumption and Cost Data

Start Date	Consumption (CCF)	Unit Cost	Total Cost
January	164	$6.62	1,086
February	119	$4.10	488
March	560	$4.10	2,296
April	609	$4.59	2,796
May	680	$4.53	3,078
June	585	$4.62	2,701
July	802	$4.45	3,567
August	690	$4.53	3,128
September	642	$4.57	2,937
October	833	$4.44	3,695
November	398	$5.01	1,993
December	573	$4.86	2,784
Total	**6,655**	**$4.59**	**$30,549.00**


Domestic Water Usage (CCF)
900
800
700
600
500
400
300
200
100
0
January
February
March
April
May
June
July
August
September
October
November
December


Water/Sewer Cost ($)
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
January
February
March
April
May
June
July
August
September
October
November
December

13. HUD BENCHMARKING

The HUD Benchmarking tools provide a comparison of the energy and water consumption at multi-family properties against HUD's portfolio. The benchmarking tools take into account the property location, size, and configuration to rank the subject property amongst similar building. The result is a percentile score which indicates the percentage properties that the building performing better than. A score of 50 indicates average performance, while a score of 75 would indicate that the property is performing better than 75% of peer buildings.

The results from the utility analysis and the HUD Water Benchmarking Tool indicate that the subject property is slightly above the average benchmark for water consumption with a 63 out of 100 as scored against peers.

HUD Residential Water Use Benchmarking Tool

For single-family, semi-detached, row/townhouse, multi-family walk-up and elevator buildings.

The HUD Residential Water Use Benchmarking Tool quantifies the performance of a user-defined building relative to the family of HUD residential buildings. A score of 75 denotes performance at the top 25th percentile of HUD residential buildings. A score of 50 denotes performance at the 50th percentile (in the middle) of HUD residential buildings. For definitions or help on the terms below, simply click on any underlined text. Click on "Return" text to come back to this page.

Directions: Provide entries in the gray spaces below with your building description and annual water consumption.

Building Description ORNL 8/22/2007

Building Name: Brookside Gardens (optional entry)

5-digit Zip Code: 07621 Not Sure?

Mapping Location: Hackensack, NJ

	Gross Floor Area of Building(s) (ft2)	Building(s) is Single-Family Detached or Semi-Detached? (Y/N)	Is Residents Water Use Paid Directly by the PHA? (Y/N)	Number of Units in Building(s)	Number of Units in Building(s) with In-Unit Laundry Hookups or Central Laundry Access?	How Many Buildings share this Water Meter?
Building Description:	122,669	Y	Y	135	135	1

Annual Consumption

Building Annual Water Use:	4,978,285	(gallons/year)
Building Annual Water Use Cost:	30,549	($/year)
Average Annual Water Cost:	$0.6	($/100 gallons)

Results

	Your Building	HUD Typical
Score Against Peers	63	50
Annual Water Use (gal/year)	4,978,285	6,521,584
Annual Water Use Intensity (gal/ft2-year)	40.6	53.2
Annual Water Cost Intensity ($/ft2-year)	0.25	0.33
Total Annual Water Cost ($/year)	30,549	40,019

The results from the utility analysis and the HUD Energy Benchmarking Tool indicate that the subject property is slightly below average for energy consumption with a 60 out of 100 as scored against peers.

HUD Residential Energy Use Benchmarking Tool

For single-family, semi-detached, row/townhouse, multi-family walk-up, and elevator buildings.

The HUD Residential Energy Use Benchmarking Tool quantifies the performance of a user-defined building relative to the family of HUD residential buildings. A score of 75 denotes performance at the top 25th percentile of HUD residential buildings. A score of 50 denotes performance at the 50th percentile (in the middle) of HUD residential buildings. For definitions or help on the terms below, simply click on any underlined text. Click on "Return" to come back to this page.

Directions: Provide entries in ALL the grey spaces that apply for your Building Description and Annual Energy Consumption.

Building Description — Preliminary: 9/17/07

Building Name: Brookside Gardens (optional entry)

5-digit Zip Code: 07621 Not Sure?

Mapping Location: Hackensack, NJ

Heating Degree Days: 4888

Cooling Degree Days: 1201

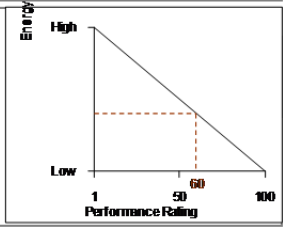
	Gross Floor Area (ft2)	Total Number of Units	Is This a Multifamily Building with Central Laundry? (Y/N)	Is this a Multi-Family Walkup Building? (Y/N)	Heated Floor Area (ft2)	Year Built
Building Description:	122,669	135	Y	Y	122,669	1979

Annual Consumption

	Electricity	Gas	#2 Fuel Oil	#4 Fuel Oil	District Steam	District Hot Water	Propane
Select Units:	kWh	100 CF	Gal	Gal	kLbs	MMBtu	Gal
Energy	950,529	11,913					
Cost ($)	118,138	7,417					
Calculated unit cost:	$0.12 $/kWh	$0.62 $/CCF	$/gallon	$/gallon	$/klbs	$/MBtu	$/gallon

Results

	Your Building	HUD Typical
Score Against Peers	60	50
Building Site Energy Use (kBtu/year)	4,470,244	5,037,184
Site Energy Use Intensity (kBtu/ft2-year)	36.4	41.1
Energy Cost Intensity ($/ft2-year)	1.02	1.15
Total Annual Energy Cost ($/year)	125,555	141,479



14. RECOMMENDED OPERATIONS AND MAINTENANCE PLAN

The quality of the maintenance and the operation of the facility's energy systems have a direct effect on its overall energy efficiency. Energy-efficiency needs to be a consideration when implementing facility modifications, equipment replacements, and general corrective actions. The following is a list of activities that should be performed as part of the routine maintenance program for the property. These actions, which have been divided into specific and general recommendations, will insure that the energy conservation measures identified in this report will remain effective. The following general recommendations should be continued or implemented.

Building Envelope

1. Caulking and weather stripping functional and effective at all times
2. Walls observed periodically and holes patched in the building envelope as required
3. Windows inspected periodically for damaged panes and failed thermal seals
4. Automatic door closing mechanisms repaired and adjusted as needed

Heating and Cooling

1. Air filters inspected periodically and replaced prior to excessive visual buildup (May increase filter costs, but will reduce fan energy costs)
2. Boiler tubes inspected and cleaned annually
3. Temperature settings reduced in unoccupied areas and set points seasonally adjusted.
4. Control valves and dampers checked for functionality monthly and repaired, when needed
5. Equipment inspected for worn or damaged parts as part of a monthly maintenance check
6. Ductwork visually inspected and checked for leaks or damaged insulation as part of a monthly maintenance check
7. Hot air registers and return air ductwork clean and unobstructed
8. Air dampers operating correctly

Domestic Hot Water

1. Domestic water heater temperature set to the minimum temperature required
2. Hot water piping checked routinely for damaged insulated and leaks
3. Tank-type water heaters flushed monthly

Lighting

1. Over-lit areas managed by bi-level switching or photocell controls
2. Only energy-efficient replacement lamps used and in-stock for replacement
3. Lighting fixture reflective surfaces and translucent covers clean
4. Walls clean and bright to maximize lighting effectiveness
5. Timers and/or photocells operating correctly on exterior lighting

Existing Equipment and Replacements

1. Refrigerator and freezer doors closed and sealed correctly
2. Kitchen exhaust fans only used when needed or timers installed to limit operation
3. Office/ computer equipment either in the "sleep" or "off" mode when not used
4. All other recommended equipment specific preventive maintenance actions conducted

15. APPENDICES

APPENDIX A: Photographic Record
APPENDIX B: Site Plan
APPENDIX C: Supporting Documentation
APPENDIX D: EMG Accessibility Checklist
APPENDIX E: Pre-Survey Questionnaire
APPENDIX F: Acronyms
APPENDIX G: Glossary of Terms-Energy Audits
APPENDIX H: Energy Conservation Measures

APPENDIX A:
PHOTOGRAPHIC RECORD

EMG PHOTOGRAPHIC RECORD

Project No.: 107534.13R-007.308 **Project Name: Brookside Gardens**

Photo #1:	Front, western elevation

Photo #2:	Left side, northern elevation

Photo #3:	Rear, eastern elevation

Photo #4:	Right side, southern elevation

Photo #5:	Roof overview

Photo #6:	Parking overview

EMG PHOTOGRAPHIC RECORD

Project No.: 107534.13R-007.308 **Project Name: Brookside Gardens**

Photo #7:	Covered parking area located at rear of building under the first floor

Photo #8:	Drive lane on north side of building

Photo #9:	ADA ramp at north side of building

Photo #10:	Drainage system

Photo #11:	Garden beds throughout site

Photo #12:	Small garden plots on eastern side of property for tenants

EMG PHOTOGRAPHIC RECORD

Project No.: 107534.13R-007.308 **Project Name: Brookside Gardens**

Photo #13:	Site signage

Photo #14:	Pole lighting throughout property

Photo #15:	Small storage shed on eastern side of property

Photo #16:	Screened gazebo at east side of property

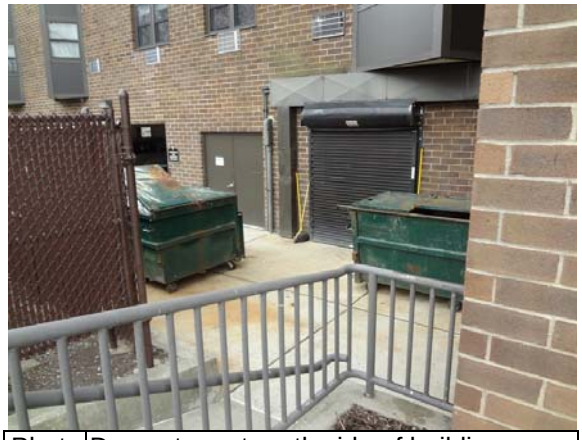


Photo #17:	Dumpsters at north side of building

Photo #18:	Superstructure decking

EMG PHOTOGRAPHIC RECORD

Project No.: 107534.13R-007.308 **Project Name: Brookside Gardens**

Photo #19:	Roof of eastern wing

Photo #20:	Exhaust fan

Photo #21:	Brick veneer recently repointed and coated, surface mounted lighting

Photo #22:	Typical exterior stair and handrails, service doors

Photo #23:	Interior fire escape stairwell

Photo #24:	Typical double hung windows throughout site

EMG PHOTOGRAPHIC RECORD

Project No.: 107534.13R-007.308 **Project Name: Brookside Gardens**

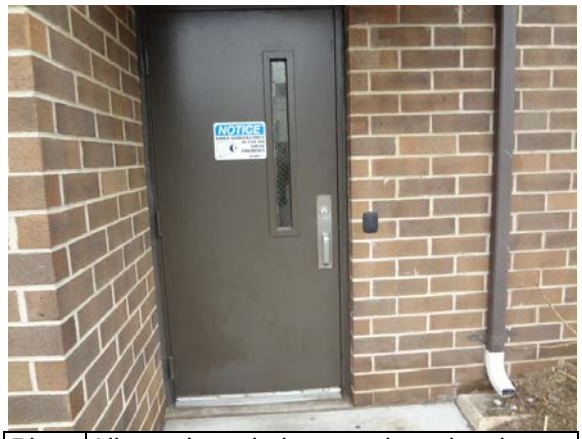


Photo #25:	All exterior exit doors and service doors are metal

Photo #26:	Community center computer room

Photo #27:	Main community center area

Photo #28:	Game room

Photo #29:	Community center kitchen

Photo #30:	Main lobby

EMG PHOTOGRAPHIC RECORD

Project No.: 107534.13R-007.308 **Project Name: Brookside Gardens**

Photo #31:	Common area bathroom

Photo #32:	Elevator lobby and hallway

Photo #33:	Main air handler

Photo #34:	Domestic water boilers

Photo #35:	Water heaters connected to domestic boilers

Photo #36:	HVAC boilers

EMG PHOTOGRAPHIC RECORD

Project No.: 107534.13R-007.308 **Project Name: Brookside Gardens**

Photo #37:	Smaller condenser for community room air handler

Photo #38:	Large condenser at north side of property

Photo #39:	Gas meter assembly

Photo #40:	Electric meters in boiler room

Photo #41:	Generator located in ground level

Photo #42:	Elevators are located next to each other

EMG PHOTOGRAPHIC RECORD

Project No.: 107534.13R-007.308 **Project Name: Brookside Gardens**

Photo #43:	Elevator machinery

Photo #44:	Fire system

Photo #45:	Strobes throughout building

Photo #46:	Unit kitchen

Photo #47:	Unit living room

Photo #48:	ADA bathroom

EMG PHOTOGRAPHIC RECORD

Project No.: 107534.13R-007.308 **Project Name: Brookside Gardens**

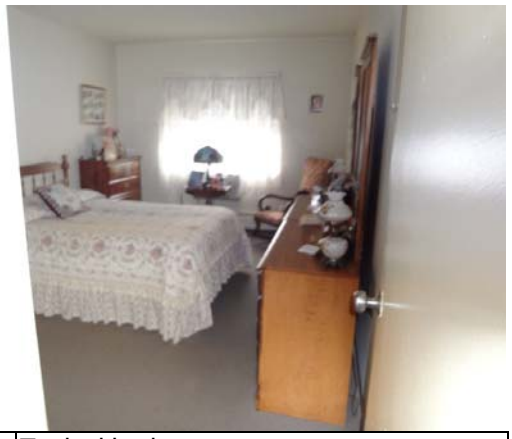


Photo #49:	Typical bedroom

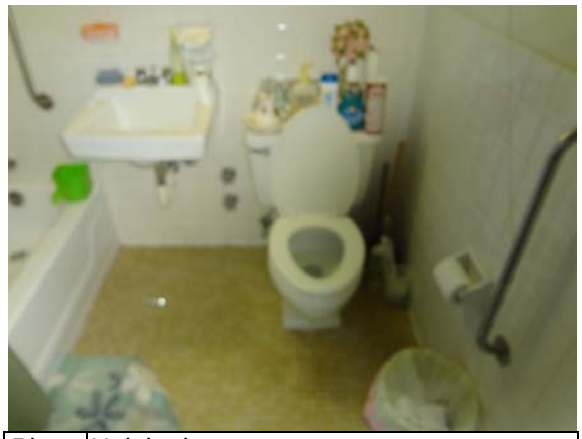
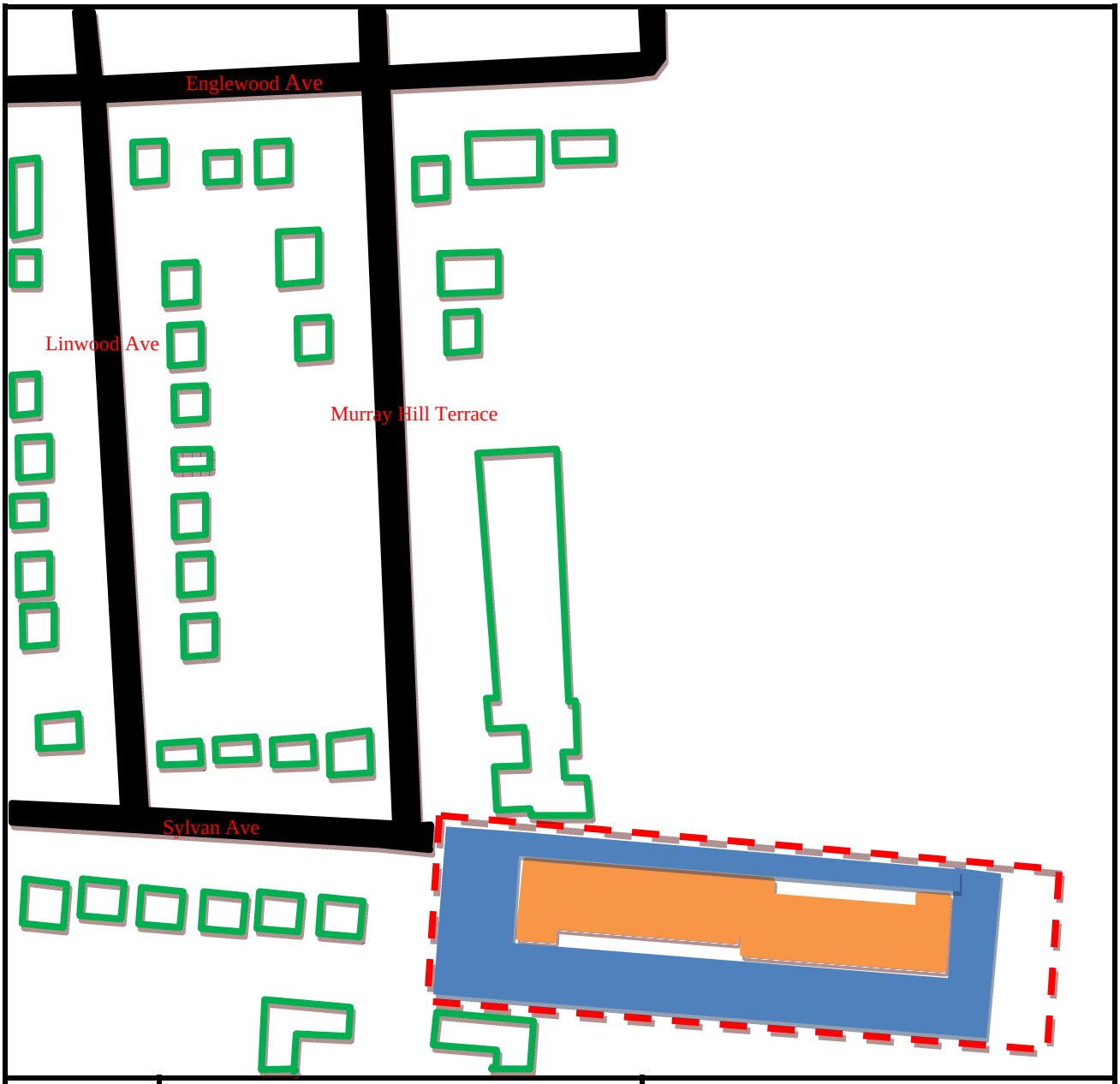


Photo #50:	Unit bathroom

APPENDIX B:
SITE PLAN

Site Plan



Key:
Red-Property border
Black-Main roads
Green-Surrounding buildings
Blue-Parking and drive lanes
Orange-Site building

Not drawn to scale.
The north arrow indicator is an approximation of 0° North.

Project Number:
107534.13R-007.308

Project Name:
Brookside Gardens

On-Site Date:

April 7, 2014

APPENDIX C:
SUPPORTING DOCUMENTATION

THIS APPENDIX IS INTENTIONALLY LEFT BLANK.

APPENDIX D:
EMG ACCESSIBILITY CHECKLIST

EMG ACCESSIBIILITY CHECKLIST

Property Name: Brookside Gardens

Date: 4/7/14

Project Number: 107534.13R-007.308

EMG Accessibility Checklist						
UFAS/ADA Accessibility						
	Building History	**Yes**	**No**	**N/A**	**Unk**	**Comments**
1.	Has the management previously completed an accessibility review?	√				
2.	Does an accessibility compliance plan exist for the property?	√				
3.	Has the plan been reviewed/approved by outside agencies (engineering firms, building department, other agencies)?			√		
4.	Have any accessibility related complaints been received in the past?		√			

	Building Access	**Yes**	**No**	**N/A**	**Comments**
1.	Are there an adequate number (per regulation) of wheelchair accessible parking spaces available at the rental office (96” wide/ 60” aisle)	√			
2.	Is there at least one wheelchair accessible van parking space (96” wide/ 96” aisle) for every 8 standard accessible spaces?	√			
3.	Are accessible parking spaces located on the shortest accessible route of travel from an accessible building entrance?	√			
4.	Does signage exist directing you to wheelchair accessible parking and an accessible building entrance?	√			
5.	Is there a ramp from the parking to an accessible building entrance (1:12 slope or less)	√			
6.	If the main entrance is inaccessible, are there alternate accessible entrances?	√			
7.	Is the accessible entrance doorway at least 32” wide?	√			
8.	Is the door handle easy to open? (lever/push type knob, no twisting required, no higher than 48” above floor)	√			
9.	Are entry doors other than revolving doors available?	√			

EMG Accessibility Checklist					
	Rental office	**Yes**	**No**	**N/A**	**Comments**
1.	Is the entry door to the rental office 3'wide with no step or threshold over ½" tall?	√			Conference room used
2.	Is there a counter or table at 30" high for wheelchair access to fill out a rental application?	√			
3.	Is there clearance behind the counter for an employee in a wheelchair?	√			
	Building Corridors and Elevators	**Yes**	**No**	**N/A**	**Comments**
1.	Is the path of travel free of obstructions and wide enough for a wheelchair (at least 60" wide)?	√			
2.	Are floor surfaces firm, stable and slip resistant (carpets wheelchair friendly)?	√			
3.	Do obstacles (phones, fountains, etc.) protrude no more than 4" into walkways or corridor?		√		However, current fountain should be replaced with ADA dual level machine
4.	Are elevators controls low enough to be reached from a wheelchair (48" front approach/54" side approach)?	√			
5.	Are there raised elevator markings in Braille and standard alphabet for the blind?	√			
6.	Are there audible signals inside cars indicating floor changes?	√			
7.	Do elevator lobbies have visual and audible indicators of the cars arrival?	√			
8.	Does the elevator interior provide sufficient wheelchair turning area (51" x 68" minimum)?	√			
9.	Is at least one wheelchair accessible public phone available?	√			
10	Are wheelchair accessible facilities (restrooms, exits, etc.) identified with signage?	√			
	Common Area Restrooms	**Yes**	**No**	**N/A**	**Comments**
1.	Are common area public restrooms located on an accessible route?	√			
2.	Are pull handles push/pull or lever type?	√			Lever
3.	Are access doors wheelchair accessible (at least 32" wide)?	√			
4.	Are public restrooms large enough for wheelchair turnaround (60" turning diameter)?	√			
5.	Are stall doors wheelchair accessible (at least 32" wide)?	√			

EMG Accessibility Checklist					
	Common Area Restrooms (cont.)	**Yes**	**No**	**N/A**	**Comments**
6.	If stalls are to narrow can the toilet room be converted to a single occupant toilet room?			√	
7.	Are grab bars provided in toilet stalls (33”-36” above floor)?	√			
8.	Do sinks provide clearance for a wheelchair to roll under (29” clearance)?	√			
9.	Are sink handles operable with one hand without grasping, pinching or twisting?	√			
10.	Are exposed pipes under sink sufficiently insulated against contact?	√			
11.	Are soap dispensers, towel, etc. reachable (48” from floor for frontal approach, 54” for side approach)?	√			
12.	Is the base of the mirror no more than 40” off floor?	√			
	Common Area Kitchen	**Yes**	**No**	**N/A**	**Comments**
1.	In a “U”-shaped kitchen is there 60” clear floor space width?			√	
2.	In a “U”-shaped kitchen with base cabinet removed from beneath sink, is there a minimum of 40” width?			√	
3.	In a “L”-shaped kitchen, is there a 40” width minimum maintained?	√			
4.	Are countertops a maximum of 24” deep and 36” high?	√			
5.	Knee space beneath cabinetry is 30” wide and 27” high.	√			
6.	Is insulation installed below sinks on piping?	√			
7.	Are adaptable units equipped with removable or retractable cabinetry fronts beneath sink or stove?	√			
	Common Area Laundry rooms	**Yes**	**No**	**N/A**	**Comments**
1.	Are the laundry rooms located on an accessible route?	√			
2.	Are the door handles push/pull or lever type?	√			
3.	Are the access doors wheelchair accessible (at least 32” clear width)?	√			
4.	Are laundry rooms large enough for wheelchair turnaround (60” turning diameter)?	√			
5.	Is there a front load washing machine	√			

EMG Accessibility Checklist					
	Common Area Laundry rooms (cont.)	**Yes**	**No**	**N/A**	**Comments**
6.	If clothes folding tables are provided is one section at 32” high with a clear area below the table?	√			
Fair Housing Accessibility / Section 504					
	Access to Unit	**Yes**	**No**	**N/A**	**Comments**
1.	Property management reports that the number of units currently accessible and those adaptable meet FHA requirements of all ground floor units or 100% for a high rise.	√			
2.	Are 5% of the units fully accessible to those individuals with mobility impairments and 2% of units accessible to those individuals with audio / visual impairments?	√			
3.	Are there any barriers or structural restrictions preventing access to the building?		√		
4.	Are the accessible units on an accessible route?	√			
5.	Is the apartment entry corridor 36” wide, door 32” wide (frame to frame), threshold height less than ½”, and appropriate door hardware present?	√			
	Unit Living Space	**Yes**	**No**	**N/A**	**Comments**
1.	Is there access throughout unit?	√			
2.	Are electrical outlets 15” minimum above floor minimum?	√			
3.	Are environmental controls and switches 48” maximum above floor or lower?	√			
	Unit Bathroom	**Yes**	**No**	**N/A**	**Comments**
1.	Is entry door at least 32” wide frame-to-frame?	√			
2.	Are switches & outlets in accessible locations?	√			
3.	Are bathroom walls around the toilet and tub/shower reinforced?	√			
4.	Is there a 30” x 48” clear floor space outside of door swing area?	√			
5.	Is there a 56” x 48” clear floor space in front of toilet (48” out from wall toilet is hung against)?	√			
6.	Is there a 30” x 48” clear floor space in front of lavatories (30” deep from front of counter)?	√			

EMG Accessibility Checklist					
	Unit Bathroom (cont.)	**Yes**	**No**	**N/A**	**Comments**
7.	Is there a 30” x 48” clear floor space in front of tub/shower (30” out from tub/shower)?	√			
8.	Is vanity a maximum of 24” deep and 36” high?	√			
9.	Knee space beneath sink is 30” wide and 27” high.	√			
10.	Is shower stall 36”x 42” minimum with small lip?	√			
11.	Is insulation installed below sinks on piping?	√			
	Unit Kitchen	**Yes**	**No**	**N/A**	**Comments**
1.	In a “U”-shaped kitchen is there 60” clear floor space width?			√	
2.	In a “U”-shaped kitchen with base cabinet removed from beneath sink, is there a minimum of 40” width?			√	
3.	In a “L”-shaped kitchen, is there a 40” width minimum maintained?	√			
4.	Are countertops a maximum of 24” deep and 36” high?	√			
5.	Knee space beneath cabinetry is 30” wide and 27” high.	√			
6.	Is insulation installed below sinks on piping?	√			Required in adaptable unit regardless of occupancy.
7.	Are adaptable units equipped with removable or retractable cabinetry fronts beneath sink or stove?	√			

It is understood by the Client that the limited observation described herein does not comprise a full ADA Compliance Survey, and that such a survey is beyond the scope of EMG’s Physical Condition Assessment. Only a representative sample of areas was observed and, other than as shown on the accessibility checklist, actual measurements were not taken to verify compliance.

ADAAG CRITERIA

Total Parking in Lot	Required Minimum Number of Accessible Spaces
1 to 25	1
26 to 50	2
51 to 75	3
76 to 100	4
101 to 150	5
151 to 200	6
201 to 300	7
301 to 400	8
401 to 500 501 to 1000	9 2% of total
1001 and over	20 plus 1 for each 100 over 1000

For further information or a copy of the Americans with Disabilities Act Accessibility Guidelines contact 1-800-949-4ADA

APPENDIX E:
PRE-SURVEY QUESTIONNAIRE

BEL

PROPERTY CONDITION ASSESSMENT: PRE-SURVEY QUESTIONNAIRE

This questionnaire must be completed by the property owner, the owner's designated representative, or someone knowledgeable about the subject property. ***The completed form must be presented to EMG's Field Observer on the day of the site visit.*** If the form is not completed, EMG's Project Manager will require ***additional time*** during the on-site visit with such a knowledgeable person in order to complete the questionnaire. During the site visit, EMG's Field Observer may ask for details associated with selected questions. This questionnaire will be utilized as an exhibit in EMG's final Property Condition Report.

Name of person completing questionnaire: RICH GOODWIN.

Association with property: MGR.

Length of association with property: 11 YRS.

Date Completed: 1-29-14

Phone Number: 201 954 4558

Property Name: BROOKSIDE GARDENS

EMG Project Number:

Directions: Please answer all questions to the best of your knowledge and in good faith. Please provide additional details in the Comments column, of add backup documentation for any *Yes* responses.

	INSPECTIONS	DATE LAST INSPECTED	LIST ANY OUTSTANDING REPAIRS REQUIRED
1	Elevators	12-12-13 TOWN ANNUAL. 2-14 CONTRACTOR MONTHLY	
2	HVAC, Mechanical, Electric, Plumbing		ONGOING
3	Life-Safety/Fire	10-28-13 TOWN 1-21-14 CONTR.	ANNUAL + 1/4LY SYSTEMS. MONTHLY EXTINGUISHERS
4	Roofs	MONTHLY	
	QUESTION		**RESPONSE**
5	List any major capital improvement within the last three years.		GENERATOR + SWITCH GEAR UPGRADES
6	List any major capital expenditures planned for the next year.		NONE.
7	What is the age of the roof(s)?		APPROX 8 YRS.
8	What building systems (HVAC, roof, interior/exterior finishes, paving, etc.) are the responsibilities of the tenant to maintain and replace?		AIR CONDITIONERS IN SLEEVES BEDRM. ROOMS

Mark the column corresponding to the appropriate response. Please provide additional details in the Comments column, or backup documentation for any *Yes* responses. (**NA** indicates "*Not Applicable*", **Unk** indicates "*Unknown*")

	QUESTION	RESPONSE				COMMENTS
		Y	N	Unk	NA	
9	Are there any unresolved building, fire, or zoning code issues?		X			
10	Are there any "down" or unusable units?		X			
11	Are there any problems with erosion, stormwater drainage or areas of paving that do not drain?		X			
12	Is the property served by a private water well?		X			
13	Is the property served by a private septic system or other waste treatment systems?		X			
14	Are there any problems with foundations or structures?		X			
15	Is there any water infiltration in basements or crawl spaces?		X			
16	Are there any wall, or window leaks?		X			
17	Are there any roof leaks?		X			
18	Is the roofing covered by a warranty or bond?	X				20 YR MANUFACTURERS EPDM.
19	Are there any poorly insulated areas?		X			
20	Is Fire Retardant Treated (FRT) plywood used?				X	
21	Is exterior insulation and finish system (EIFS) or a synthetic stucco finish used?		X			
22	Are there any problems with the utilities, such as inadequate capacities?		X			
23	Are there any problems with the landscape irrigation systems?		X			
24	Has a termite/wood boring insect inspection been performed within the last year?		X			
25	Do any of the HVAC systems use R-11, 12, or 22 refrigerants?		X	X		POSS. in TENANT APTS

Mark the column corresponding to the appropriate response. Please provide additional details in the Comments column, or backup documentation for any *Yes* responses. (**NA** indicates "*Not Applicable*", **Unk** indicates "*Unknown*")

	QUESTION	RESPONSE				COMMENTS
		Y	N	Unk	NA	
26	Has any part of the property ever contained visible suspect mold growth?		X			
27	Is there a mold Operations and Maintenance Plan?		X			
28	Have there been indoor air quality or mold related complaints from tenants?		X			
29	Is polybutylene piping used?		X			
30	Are there any plumbing leaks or water pressure problems?		X			
31	Are there any leaks or pressure problems with natural gas service?		X			
32	Does any part of the electrical system use aluminum wiring?		X			
33	Do Residential units have a less than 60-Amp service?		X			
34	Do Commercial units have less than 200-Amp service?		N/A		X	
35	Are there any recalled fire sprinkler heads (Star, GEM, Central, Omega)?		X			
36	Is there any pending litigation concerning the property?		X			
37	Has the management previously completed an ADA review?	X				504 compliance 5 YRS AGO
38	Have any ADA improvements been made to the property?	X	\			ADA from renovations approx 9 YRS AGO.
39	Does a Barrier Removal Plan exist for the property?		X			
40	Has the Barrier Removal Plan been approved by an arms-length third party?				X	
41	Has building ownership or management received any ADA related complaints?		X			
42	Does elevator equipment require upgrades to meet ADA standards?		X			

Mark the column corresponding to the appropriate response. Please provide additional details in the Comments column, or backup documentation for any *Yes* responses. (**NA** indicates *"Not Applicable"*, **Unk** indicates *"Unknown"*)						
QUESTION		**RESPONSE**				**COMMENTS**
		Y	N	Unk	NA	
43	Are there any problems with exterior lighting?	X	~~X~~			NOT LED BULBS & BALLASTS FAIL AFFORDABLY
44	Are there any other significant issues/hazards with the property?		X			
45	Are there any unresolved construction defects at the property?		X			

Signature of person Interviewed or completing form

1-29-14
Date

PROPERTY CONDITION ASSESSMENT: DOCUMENT REQUEST

On the day of the site visit, provide EMG's Field Observer access to all of the available documents listed below. Provide copies if possible. Your timely compliance with this request is greatly appreciated.

- A site plan, preferably 8 1/2" X 11", which depicts the arrangement of buildings, roads, parking stalls, and other site features.
- Diagram floor plan of each floor level at 8 1/2" X 11" with room numbers.
- Any available construction documents (blueprints) for the original construction of the building or for any tenant improvement work or other recent construction work.
- X For commercial properties, provide a tenant list which identifies the names of each tenant, vacant tenant units, the floor area of each tenant space, and the gross and net leasable area of the building(s).
- For apartment properties, provide a summary of the apartment unit types and apartment unit type quantities, including the floor area of each apartment unit as measured in square feet. 1BR. 616 SqFT 2 BR. 807-836 SqFT.
- X For hotel or nursing home properties, provide a summary of the room types and room type quantities.
- Copies of Certificates of Occupancy, building permits, fire or health department inspection reports, elevator inspection certificates, roof or HVAC warranties, or any other similar, relevant documents.
- The names of the local utility companies which serve the property, including the water, sewer, electric, gas, and phone companies. BSEE [redacted]
- The company name, phone number, and contact person of all outside vendors who serve the property, such as mechanical contractors, roof contractors, fire sprinkler or fire extinguisher testing contractors, and elevator contractors. Absolute
- A summary of recent (over the last 5 years) capital improvement work which describes the scope of the work and the estimated cost of the improvements. Executed contracts or proposals for improvements. Historical costs for repairs, improvements, and replacements. None.
- Records of system & material ages (roof, MEP, paving, finishes, and furnishings).
- Any brochures or marketing information. None
- Appraisal, either current or previously prepared. ~~none~~ Absolute
- Current occupancy percentage and typical turnover rate records (for commercial and apartment properties). Level. Mgt
- Previous reports pertaining to the physical condition of property. 2009 CNA + 504.
- ADA survey and status of improvements implemented.
- Current / pending litigation related to property condition. None

ENERGY AUDIT : PRE-SURVEY QUESTIONNAIRE

This questionnaire must be completed by the property owner, management point of contact or other person knowledgeable about the subject property.

The completed form must be presented to EMG's Field Observer on or before the site visit.

If the form is not completed, EMG's Project Manager will require additional time during the on-site visit in order to complete the questionnaire. During the site visit, EMG's Field Observer may ask for details associated with selected questions. This questionnaire will be utilized as an exhibit in EMG's final report.

Housing Authority: OF BERGEN CTY	Address:
Owner, if other than Authority: Housing Development Corp of BC.	Address:
Name of Subject Site: Brookside Gardens	Residential Buildings: 1 Common Buildings: — Other Buildings: SHED + GAZEBO.
Address: 293 Murray Hill Terr.	City, State, Zip: Bergenfield NJ 07621
Building Manager: Rich Goodin.	Phone: 201 954 4558
Maintenance Manager: N/A	Phone:
Energy Management Coordinator: N/A.	Phone:

Building Description (circle all that apply)

(Masonry) - Wood framed – (Steel framed) – Curtain wall

Detached – Townhouse – Low-rise – (Mid-rise) – High-rise

Basement – Crawl Space – Attic – (Flat Roof) – (Slope Roof)

Number of:

___ Efficiencies 120 One BR 15 Two BR ____ Three BR ___ Four BR ____ Five BR ____ Six BR ____ SRO

Date of original completion 1979

Dates of significant renovations _____

Describe:

Other uses on this site

___ Rental Office
X Community Service Offices
X Common Laundry
X Common Meeting-Activity
___ Common Kitchen
Residential or Commercial
___ Daycare
___ Training Education
___ Gym Fitness Recreation
X Maintenance Storage
___ Other, Specify:

Anticipated Modifications or Changes In Use in the next 15 yrs:

Heating Boiler Replacement + Oil Tank Removal

Have there been previous Energy Audits or Retrofit Programs? X Yes __No

Date _____

Agency _____

Scope _____

Are related Energy Audit or Retrofit documents available?

Any additional Energy Investment Programs? _____

Does the Institution Have an ongoing energy management program? ___Yes ___No

Utilities			
	Utility Supplier to the Site	Master Metered	Tenant Metered
Electric	PSEG		X
Natural/LP Gas	PSEG	X	
Fuel Oil			
Other DIESEL FUEL	RACHELES MICHELLES Fuel	X	
Domestic Water	RIDGE wood WATER	X	
Sewer	RIDGE wood	N/A.	

- Utility data is required for the most recent available 12 month period. EMG can provide you with Excel form to assist you in supplying this data. Request this form from your Program Manager.
- Tenant paid data is required for best evaluation results. At minimum a representative sample of actual tenant consumption and cost is required for the 12 month period.

Tenant Utility Cost Paid By		
	Landlord or Housing Authority	Tenant
Heating		X
Cooling		X
Domestic Hot Water	X	
Water Supply	X	
Sewer	X	

Unk = Unknown, NA = Not Applicable	Yes	No	Unk	NA	Comments
1. Does the boiler or furnaces seem to be oversized for the property (i.e. – cycles on and off often)?		X			
2. Do any of the gas fired boilers, furnaces, or water heaters have vent or flue dampers?		X			
3. Does the boiler have outdoor reset controls?	X				
4. Does the County pay for the tenant gas or oil consumption?		X			
5. Are low-flow faucet aerators and shower heads installed on all or most faucets and showers?	X				
6. Are the water closets low-flow (1.6 gpf)?		X			
7. Are the motors used for the elevators	X				

Unk = Unknown, NA = Not Applicable	Yes	No	Unk	NA	Comments
high-efficiency motors?		X			
8. Are the motors used for the ventilation systems (i.e. - air handlers, fan coils, etc.) high-efficiency motors?		X			
9. Are the motors used for the hydronic heating system (i.e. – pumps) high-efficiency motors?	X				
10. Are the motors used for the hydronic cooling system (i.e. – pumps, chillers, cooling tower fan) high-efficiency motors?	X				
11. Is there any uninsulated heating water, chilled water, or domestic hot water piping in unconditioned spaces such as mechanical rooms, basements, or storage areas?		X			
12. Is a booster pump required to maintain water pressure at the property?		X			
13. Are laundry room washing machines fixed to cold rinse only?		X			
14. Are there any wall or window leaks?		X			
15. Are there any poorly insulated areas?		X			
16. Do the utilities (electric, gas, sewer, water) provide adequate service?	X				
17. Are HVAC systems at the property inspected and maintained, at a minimum, annually?	X				
18. Is the HVAC equipment more than ten years old?	X	X			
19. Are the water heaters/boilers more than ten years old?	X	N/A			HEATING BLRS OIL FIRED.
20. Are the any leaks or pressure problems with natural gas service?		X			
21. Is the electrical service adequate?	X				
22. Are there any emergency electrical generators?	X				
23. Are there any large UPS battery systems?		X			
24. Are there any vacant buildings or significant building areas?		X			
25. Is there anything else that EMG should know about when assessing this property? If so, what?		X			

On the day of the site visit, provide EMG's Field Observer access to all of the available documents listed below. Provide copies if possible.

INFORMATION REQUIRED

1. All available construction documents (blueprints) for the original construction of the building or for any tenant improvement work or other recent construction work.

2. A site plan, preferably 8 1/2" X 11", which depicts the arrangement of buildings, roads, parking stalls, and other site features.

3. For commercial properties, provide a tenant list which identifies the names of each tenant, vacant tenant units, the floor area of each tenant space, and the gross and net leasable area of the building(s).

4. For apartment properties, provide a summary of the apartment unit types and apartment unit type quantities, including the floor area of each apartment unit as measured in square feet.

5. For hotel or nursing home properties, provide a summary of the room types and room type quantities.

6. Copies of Certificates of Occupancy, building permits, fire or health department inspection reports, elevator inspection certificates, roof or HVAC warranties, or any other similar, relevant documents.

7. The names of the local utility companies which serve the property, including the water, sewer, electric, gas, and phone companies.

8. The company name, phone number, and contact person of all outside vendors who serve the property, such as mechanical contractors, roof contractors, fire sprinkler or fire extinguisher testing contractors, and elevator contractors.

9. A summary of recent (over the last 5 years) capital improvement work which describes the scope of the work and the estimated cost of the improvements. Executed contracts or proposals for improvements. Historical costs for repairs, improvements, and replacements.

10. Records of system and material ages (roof, MEP, paving, finishes, furnishings).

11. Any brochures or marketing information.

12. Appraisal, either current or previously prepared.

13. Current occupancy percentage and typical turnover rate records (for commercial and apartment properties).

14. Previous reports pertaining to the physical condition of property.

15. ADA survey and status of improvements implemented.

16. Current / pending litigation related to property condition.

Your timely compliance with this request is greatly appreciated.

APPENDIX F:
ACRONYMS

ASTM E2018-01 ACRONYMS

ADA - The Americans with Disabilities Act
ASTM - American Society for Testing and Materials
BOMA - Building Owners and Managers Association
BUR - Built-up Roofing
DWV – Drainage, Waste, Ventilation
EIFS - Exterior Insulation and Finish System
EMF – Electro Magnetic Fields
EMS - Energy Management System
EUL - Expected Useful Life
FEMA - Federal Emergency Management Agency
FFHA - Federal Fair Housing Act
FIRMS - Flood Insurance Rate Maps
FRT- Fire Retardant Treated
FOIA - U.S. Freedom of Information Act (5 USC 552 et seq.) and similar state statutes.
FOIL - Freedom of Information Letter
FM - Factory Mutual
HVAC - Heating, Ventilating and Air-conditioning
IAQ - Indoor Air Quality
MEP – Mechanical, Electrical and Plumbing
NFPA - National Fire Protection Association
PNA – Capital Needs Assessment
PCR - Property Condition Report
PML - Probable Maximum Loss
RTU - Rooftop Unit
RUL - Remaining Useful Life
STC – Sound Transmission Class
UBC – Uniform Building Code

APPENDIX G:
GLOSSARY OF TERMS-ENERGY AUDITS

Glossary of Terms and Acronyms-Energy Audit

ECM – Energy Conservation Measures are projects recommended to reduce energy consumption. These can be No/Low cost items implemented as part of routine maintenance or Capital Cost items to be implemented as a capital improvement project.

Initial Investment – The estimated cost of implementing an ECM project. Estimates typically are based on R.S. Means Construction cost data and Industry Standards.

Annual Energy Savings – The reduction in energy consumption attributable to the implementation of a particular ECM. These savings values do not include the interactive effects of other ECMs.

Cost Savings – The expected reduction in utility or energy costs achieved through the corresponding reduction in energy consumption by implementation of an ECM.

Simple Payback Period –The number of years required for the cumulative value of energy or water cost savings less future non-fuel or non-water costs to equal the investment costs of the building energy or water system, without consideration of discount rates.

EUL – Expected Useful Life is the estimated lifespan of a typical piece of equipment based on industry accepted standards.

RUL – Remaining Useful Life is the EUL minus the effective age of the equipment and reflects the estimated number of operating years remaining for the item.

SIR - The savings-to-investment ratio is the ratio of the present value savings to the present value costs of an energy or water conservation measure. The numerator of the ratio is the present value of net savings in energy or water and non-fuel or non-water operation and maintenance costs attributable to the proposed energy or water conservation measure. The denominator of the ratio is the present value of the net increase in investment and replacement costs less salvage value attributable to the proposed energy or water conservation measure. It is recommended that energy-efficiency recommendations be based on a calculated SIR, with larger SIRs receiving a higher priority. A project typically is recommended only if the SIR is greater than or equal to 1.0, unless other factors outweigh the financial benefit.

Life Cycle Cost - The sum of the present values of (a) **I**nvestment costs, less salvage values at the end of the study period; (b) Non-fuel operation and maintenance costs: (c) Replacement costs less salvage costs of replaced building systems; and (d) Energy and/or water costs.

Life Cycle Savings – The sum of the estimated annual cost savings over the EUL of the recommended ECM, expressed in present value dollars.

Building Site Energy Use Intensity - The sum of the total site energy use in thousands of Btu per unit of gross building area. Site energy accounts for all energy consumed at the building location only not the energy consumed during generation and transmission of the energy to the site.

Building Source Energy Use Intensity – The sum of the total source energy use in thousands of Btu per unit of gross building area. Source energy is the energy consumed during generation and transmission in supplying the energy to your site.

Building Cost Intensity - This metric is the sum of all energy use costs in dollars per unit of gross building area.

Greenhouse Gas Emissions - Although there are numerous gases that are classified as contributors to the total for Greenhouse Emissions, the scope of this energy audit focuses on carbon dioxide (CO_2). Carbon dioxide enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and also as a result of other chemical reactions (e.g., manufacture of cement).

APPENDIX H:
ENERGY CONSERVATION MEASURES

Energy Conservation Measure
Replace Incandescent Lighting with Energy Star Light Fixtures in Apartments

This analysis is for replacment of standard incandescent light fixtures with Energy Star fixtures in the apartments. Average annual usage and 15 Watt CFL replacement bulbs are assumed.

Step 1	Cost Information			
	Cost of installingEnergy Star fixtures (Green)		57947.40	$
	Cost of installing Incandescent (Traditional)		18225.00	$
Step 2	Transfer the following information from the Survey:			
4-13	**a** Number of dwelling units:		135	
	b Total number of light fixtures to be replaced:		405	
	c Average number of hours/day lights are in use:		8	
5-9	**d** Cost of electricity:		$0.12	$/kWh
Step 3	Lighting Energy Consumption			
	Existing/Traditional Consumption (60 Watt Incandescent)			
	0.120 kW/fixture x 405 Fixtures x 2738 hrs/year =		133043	kWh/yr
	Green Consumption (13 Watt CFL)			
	0.030 kW/fixture x 405 Fixtures x 2738 hrs/year =		33261	kWh/yr
Step 4	Estimate annual energy savings vs. Traditional:			
	2a: 133043 - 3: 33261 =		99782	kWh/yr
Step 5	Calcualte annual cost savings vs. Traditional:			
	Cost Savings: 4: 99781.88 x 2b: 0.12 =		12401.55	$/yr
	Cost Differential: 57947.40 - 18225.00 =		39722.40	$/yr
Step 6	Calculate payback period:			
	Simple Payback Period: 1: 57947.40 / 5: 12401.55 =		**4.67**	yrs

Energy Conservation Measure
Replace Incandescent Lighting with CFLs in Common Areas

This analysis is for replacment of standard incandescent light bulbs with CFL bulbs in the common areas. The average annual usage and standard replacement bulb size are assumed.

Step 1	Cost Information			
	Cost of installing CFLs (Green)	195.00	$	
	Cost of installing Incandescent (Traditional)	39.00	$	
Step 2	Transfer the following information from the Survey:			
4-13	**a** Number of incandescent fixtures in common areas:	65		
	b Total number of light bulbs to be replaced:	65		
	c Average number of hours/day bulbs are in use:	12		
5-9	**d** Cost of electricity:	$0.12	$/kWh	

Step 3 Lighting Energy Consumption

Existing/Traditional Consumption (60 Watt Incandescent)

0.060	x	65	x	4380	=	17082	kWh/yr
kW/bulb		# of bulbs		hrs/year			

Green Consumption (13 Watt CFL)

0.013	x	65	x	4380	=	3701	kWh/yr
kW/bulb		# of bulbs		hrs/year			

Step 4 Estimate annual energy savings vs. Traditional:

		2a		3			
		17082	-	3701	=	13381	kWh/yr

Step 5 Calcualte annual cost savings vs. Traditional:

	4		2b			
Cost Savings	13380.90	x	0.12	=	1663.07	$/yr
Cost Differential	195.00	-	39.00	=	156.00	$/yr

Step 6 Calculate payback period:

	1		5			
Simple Payback Period	195.00	/	1663.07	=	**0.12**	yrs

Energy Conservation Measure
Replace Incandescent Fixtures at Building Entry Lights with LED Wall Packs

This analysis is for replacment of the incandescent light bulbs at the apartment entrances with LED wall packs. The average annual usage and existing bulb size are assumed.

Step 1 Cost Information

	Cost of installing LEDs (Green)	1430.00	$
	Cost of installing Incandescent (Traditional)	660.00	$

Step 2 Transfer the following information from the Survey:

4-13	**a**	Number of apartment entry lgihts	22	
	b	Total number of light bulbs to be replaced:	22	
	c	Average number of hours/day bulbs are in use:	12	
5-9	**d**	Cost of electricity:	$0.12	$/kWh

Step 3 Lighting Energy Consumption

Existing/Traditional Consumption (Incandescent)

0.100	x	22	x	4380	=	9636	kWh/yr
kW/bulb		# of bulbs		hrs/year			

Green Consumption (5 Watt LED)

0.005	x	22	x	4380	=	482	kWh/yr
kW/bulb		# of bulbs		hrs/year			

Step 4 Estimate annual energy savings vs. Traditional:

2a		3			
9636	-	482	=	9154	kWh/yr

Step 5 Calcualte annual cost savings vs. Traditional:

	4		2b			
Cost Savings	9154.20	x	0.12	=	1137.74	$/yr
Cost Differential	1430.00	-	660.00	=	770.00	$/yr

Step 6 Calculate payback period:

Simple Payback Period	1430.00	/	1137.74	=	**1.26**	yrs

Energy Conservation Measure
Replace Inefficient Boilers - 1813334 Btu/hr

Step 1 Obtain total cost of replacing the heating plant, including equipment, labor, structural alterations, etc.

	$108,800	$

Step 2 Transfer the following information from the Survey:

a	Regional Annual heating equipment hours:		1,170	hours
b	Input Capacity of Existing Boilers		1,813,334	Btu/hr
c	Number of Boilers		3	
d	Combustion efficiency of existing boilers		69	%
e	Cost of heating fuel:	Natural Gas:	$0.62	$/ccf

Step 3 Estimate annual energy consumption of Existing Boiler:

Existing Boiler Input Rate:	1813334.00	/	102700.00	=	17.66	ccf/hr
Annual Operating Hours:					1,170	hours
Standard Boiler Consumption:					20658	ccf
Existing Boiler Ratio to Standard:	80	/	69	=	1.16	
Existing Boiler Consumption:	1.16	x	20658.24	=	23952	ccf

Step 4 Estimate annual energy consumption of Condensing Boiler:

	3		2a			
Existing Boiler Output:	23952	x	0.69	=	16527	ccf
New Boiler Efficiency:					94	%
New Boiler Input:	16527	/	0.94		17581	ccf

Step 5 Calculate annual energy and cost savings:

	4		2c			
Energy Saved per Boiler:	23952	-	17581	=	6370	ccf
Total Energy Saved:	6370	x	3.00	=	19110	ccf
Cost Savings:	19110	x	0.62	=	$11,898	$/yr

Step 6 Calculate payback period:

	$108,800	/	$11,898	=	**9.14**	yrs

Energy Conservation Measure

Replace Older Plumbing Fixtures with Low Flow Devices

Input Data:

Step 1

Number of residents	170	
Total annual use days	365	

	Water closet		**Sinks**	**Shower**
Existing water controls in gallons per use	3.5		2	2.5
low -flow water controls in gallons per use	1.6		1.5	2
Low-flow replacement cost	$320.00		$4.00	$75.00

Step 2

	Quantity		Daily Usage Assumption	
Total number of old water closets	135		5.0	flushes
Total number of sinks to be upgraded	135		6.0	minutes
Total number of shower heads to be upgraded	135		12.6	minutes
Total Water Rate	$ 0.0061	/gal		

Step 3

Calculations:

Water conservation method	Total to be replaced	Cost of replacement	Total cost
Replace existing with low flow water closets	135	$320	$43,200.00
Install aerators on existing faucet controls	135	$4	$540.00
Replace existing shower heads	135	$75	$10,125.00
		Total	**$53,865.00**

Results

Annual Savings	Annual time used	Gallons saved	Annual cost savings	Payback
Annual water closet flushes (flushes)	248,200	471,580	$2,893.83	14.9282898
Annual sink use (minutes)	295,650	147,825	$907.12	0.595288593
Annual shower use (minutes)	620,500	310,250	$1,903.84	5.31820324
	Total	929,655	**$5,704.80**	
	Simple Payback		**9.44**	years

Energy Conservation Measure
Replace Older Refrigerators with Energy Star Rated Refrigerators

Step 1a Obtain total cost of replacing the older refrigerators with Energy Star rated refrigerators:

80	Units	x	$579	each	=	$46,320 (Green Cost)

Step 1b Obtain total cost of replacing the older refrigerators with traditional refrigerators:

80	Units	x	$629	each	=	$50,320 (Traditional Cost)

Step 2 Refrigerator and Utility Information:

a	Total number of refrigerators to be replaced	80	
b	Useful Life refrigerators:	15	years
c	Average age of existing refrigerators:	29	years
d	Remaining Life of existing refrigerators:	0	years
e	Cost of electricity:	0.124286581	$/kWh

Step 3 Existing Refrigerator Model: *GE*
Approximate annual energy use of each existing refrigerator: 850.00 kWh/yr

Step 4 Traditional Refrigerator Model: *Frigidaire FFTR1515LW*
Approximate annual energy use of each traditional refrigerator replacement: 443.00 kWh/yr

Step 5 Green Refrigerator Model: *Frigidaire FFHT1515LW (Energy Star)*
Approximate annual energy use of each old green refrigerator replacement: 355.00 kWh/yr

Step 6 Calculate Annual Savings vs. Existing Refrigerators:

Energy Savings per Unit:	850	-	355	=	495	kWh/yr
Total Energy Savings	80	x	495	=	39,600	kWh/yr
Total Cost Savings:	39600	x	0.12	=	$4,921.75	$/yr

Step 7 Calculate Annual Savings vs. Traditional Refrigerators:

Energy Savings per Unit:	443	-	355	=	88	kWh/yr
Total Energy Savings	80	x	88	=	7,040	kWh/yr
Total Cost Savings:	7040	x	0.12	=	$874.98	$/yr

Simple Payback Period	$46,320	/	$4,922	=	**9.4**	years

Energy Conservation Measure
Replace Older Inefficient Air Conditioners - 10 ton units

Step 1	Obtain total cost of replacing existing air conditioners with efficient units:								
	1	Air Conditioners x	$10,764	per unit			$10,764	$	
Step 2	Transfer the following information from the Survey:								
4-55	**a**	SEER rating of existing AC units:					8	SEER	
4-56	**b**	Cooling capacity of existing AC units:					10	Tons	
4-54	**c**	Number of existing AC units:					1		
5-9	**d**	Cost of electricity:					0.124286581	$/kWh	
Step 3									
Table 1	Annual cooling hours						1007		
Step 4	Existing seasonal energy efficiency ratio (SEER):								
							8		
Step 5	Calculate existing energy use per air conditioner:								
		Cooling Hrs		(kBtu)		SEER			
		1007	x	120.00	/	8	=	15105	kWh/yr
Step 6	Calculate new energy use per air conditioner:								
		Cooling Hrs		(kBtu)		SEER			
		1007	x	120.00	/	16	=	7552.5	kWh/yr
Step 7	Estimate annual energy savings:								
		5		6		2c			
		15105	-	7552.50	x	1.00	=	7552.5	kWh/yr
Step 8	Calculate annual cost savings:								
				7		2d			
				7553	x	0.12	=	938.6744066	$/yr
Step 9	Calculate payback period:								
				1		8			
				10764.00	/	938.67	=	**11.47**	yrs

Energy Conservation Measure
Replace Fluorescent Fixtures in Common Areas with T-8 Bulbs & Electronic Ballasts

This analysis is for replacment of the T-12 fluorescent lighting with T-8 Lamps and Electronic Ballasts in the common areas. An average annual usage and standard replacement bulb size are assumed.

Step 1 Cost Information

Cost of Replacing Fixtures w/ T-8 & Electronic Ballast	6942.00	$
Cost of Replacing Fixtures w/ T-12 & Electronic Ballast	5785.00	$

Step 2 Transfer the following information from the Survey:

b	Total number of light fixtures to be replaced:	89	
c	Existing Watts per bulb	40	
d	Number of linear bulbs per fixture	2	
e	Average number of hours/day bulbs are in use:	12	
f	Cost of electricity:	$0.12	$/kWh

Step 3 Lighting Energy Consumption

Traditional Consumption *T-12 Fluorescent - 40 Watt*

0.040	x	178	x	4380	=	31186	kWh/yr
kW/bulb		# of bulbs		hrs/year			

Traditional Consumption *T-12 Fluorescent - 34 Watt*

0.034	x	178	x	4380	=	26508	kWh/yr
kW/bulb		# of bulbs		hrs/year			

Green Consumption *T-8 Fluorescent - 28 Watt*

0.028	x	178	x	4380	=	21830	kWh/yr
kW/bulb		# of bulbs		hrs/year			

Step 4 Estimate annual energy savings vs. Traditional:

2a		3			
26508	-	21830	=	4678	kWh/yr

Step 5 Calcualte annual cost savings vs. Traditional:

	4		2b			
Cost Savings	4677.84	x	0.12	=	581.39	$/yr
Cost Differential	6942.00	-	5785.00	=	1157.00	$/yr

Step 6 Calculate payback period:

	1		5			
Simple Payback Period	6942.00	/	581.39	=	**11.94**	yrs