

FACILITY CONDITION ASSESSMENT AND LEVEL I ENERGY AUDIT

CITY OF BURLINGTON

645 Pine Street
Burlington, Vermont 05402
Martha Keenan



FACILITY CONDITION ASSESSMENT AND LEVEL I ENERGY AUDIT

of FIRE STATION #5

23 Ferguson Avenue
Burlington, Vermont 05401

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EMG Project #: 110226.14R-005.294
Date of Report: February 27, 2015
On site Date: September 24, 2014

Immediate Repairs Report
Fire Station #5
2/27/2015The logo for EMG, consisting of the letters 'EMG' in white on a dark green square background.

Report Section	ID	Cost Description	Quantity	Unit	Unit Cost	Subtotal	Deficiency Repair Estimate *
5.2	293579	Concrete pavement replace	1961	SF	\$8.09	\$15,864	\$15,864
5.2	293568	Grind Down Concrete	2	EA	\$1,500.00	\$3,000	\$3,000
Immediate Repairs Total							\$18,864

* Location Factor (1.0) included in totals.

Replacement Reserves Report

Fire Station #5
2/27/2015



Report Section	ID	Cost Description	Lifespan (EUL)	EAge	RUL	Quantity	Unit	Unit Cost	Subtotal	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Deficiency Repair Estimate				
5.2	293579	G2012 Concrete pavement replace	30	30	0	1961	SF	\$8.09	\$15,864	\$15,864																				\$15,864				
5.2	293568	G2013 Grind Down Concrete	25	25	0	2	EA	\$1,500.00	\$3,000	\$3,000																				\$3,000				
5.2	293572	G2022 Crack sealing and seal coating of the asphalt	5	2	3	427	SY	\$3.56	\$1,520				\$1,520					\$1,520				\$1,520					\$1,520			\$6,080				
6.4	293564	B2011 General painting cost per SF, minor prep work, single story bldg. (up to 15 feet)	10	9	1	1600	SF	\$2.42	\$3,872		\$3,872										\$3,872									\$7,744				
6.4	293571	B2011 Pressure wash existing masonry	10	9	1	3200	SF	\$1.74	\$5,568		\$5,568										\$5,568									\$11,136				
6.4	293570	B2011 Caulking, expansion joints, 1"x1/2", remove and replace	15	6	9	270	LF	\$6.31	\$1,704										\$1,704											\$1,704				
6.5	293566	G2014 Guard rail-metal-paint	10	6	4	65	LF	\$8.00	\$520					\$520										\$520						\$1,040				
6.6	293563	B2011 Scrape and paint exterior metal	7	2	5	375	SF	\$1.56	\$585						\$585							\$585							\$585	\$1,755				
6.6	293560	B2021 Aluminum window replacement, 2-0 x 4-0, operable	25	19	6	28	Each	\$576.00	\$16,128							\$16,128														\$16,128				
7.1	293389	D3041 Replace fan coil unit 5 ton	15	4	11	1	EA	\$3,895.00	\$3,895												\$3,895									\$3,895				
7.1	293396	D3041 Ductless split system heat pump, wall or ceiling mount, 3/4 to 1-ton	15	6	9	1	EA	\$2,146.00	\$2,146										\$2,146											\$2,146				
7.1	314965	D3042 Exhaust fan, utility set, corrosive fume resistant, 1200 to 2180 CFM	15	6	9	1	EA	\$2,855.00	\$2,855										\$2,855											\$2,855				
7.1	293416	D3044 Replace water source unit heater with fan 62.5 MBH	30	23	7	1	EA	\$848.00	\$848								\$848													\$848				
7.1	314954	D3044 Replace In-Line Centrifugal Hydronic Pump, 1/4 to 1/3 HP, Cast Iron, Flanged	15	7	8	1	EA	\$1,366.00	\$1,366									\$1,366												\$1,366				
7.1	314930	D3044 Replace water source unit heater with fan 62.5 MBH	30	23	7	2	EA	\$848.00	\$1,696								\$1,696													\$1,696				
7.1	314955	D3044 Replace In-Line Centrifugal Hydronic Pump, 1/4 to 1/3 HP, Cast Iron, Flanged	15	7	8	1	EA	\$1,366.00	\$1,366									\$1,366												\$1,366				
7.1	314956	D3052 Pad-Mounted Condenser 5-ton	15	4	11	1	EA	\$4,691.00	\$4,691												\$4,691									\$4,691				
7.2	314929	D2023 Water heater, Indirect fired, 45 to 55 gallons	20	3	17	1	EA	\$3,197.00	\$3,197																	\$3,197				\$3,197				
7.4	293419	D5092 Generator, Natural Gas, 20 to 40 kW, replace	25	23	2	1	Each	\$20,670.00	\$20,670			\$20,670																		\$20,670				
8.1	293576	B2011 General painting cost per SF, minor prep work, single story bldg. (up to 15 feet)	10	6	4	3600	SF	\$2.42	\$8,712					\$8,712									\$8,712							\$17,424				
8.1	293569	B2031A Refinish glazed wood doors	4	2	2	16	EA	\$112.00	\$1,792			\$1,792			\$1,792					\$1,792			\$1,792				\$1,792			\$8,960				
8.1	293567	C3024 Rubber flooring, special colors	18	6	12	100	SF	\$14.98	\$1,498													\$1,498								\$1,498				
8.1	293559	C3024 Replace Vinyl tile	18	11	7	210	SY	\$67.75	\$14,228							\$14,228														\$14,228				
8.1	293574	C3025 Replace carpet, standard commercial, medium traffic	8	6	2	8	SY	\$59.90	\$479			\$479								\$479							\$479			\$1,438				
8.1	293575	E1093A Casework, base cabinets, kitchen, stainless steel counter top	20	15	5	15	LF Front	\$168.88	\$2,533					\$2,533																\$2,533				
8.2	293580	E1094 Dishwasher	10	6	4	1	EA	\$880.00	\$880					\$880										\$880						\$1,760				
8.2	293577	E1094 Range, replace	20	11	9	1	EA	\$630.50	\$631										\$631											\$631				
8.2	293561	E1094 Refrigerator	15	11	4	1	EA	\$676.90	\$677					\$677														\$677	\$1,354					
Totals, Unescalated										\$18,864	\$9,440	\$22,941	\$1,520	\$10,789	\$3,118	\$17,920	\$16,772	\$4,252	\$7,335	\$2,271	\$18,026	\$2,083	\$1,520	\$11,904	\$0	\$0	\$3,197	\$3,791	\$1,262	\$157,006				
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	\$0	\$0	\$0	\$0
Totals, Escalated (3.0% inflation, compounded annually)										\$18,864	\$9,723	\$24,338	\$1,661	\$12,143	\$3,615	\$21,397	\$20,627	\$5,386	\$9,571	\$3,052	\$24,952	\$2,970	\$2,232	\$18,006	\$0	\$0	\$5,284	\$6,454	\$2,213	\$192,490				

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CERTIFICATION

The City of Burlington, Vermont retained EMG to perform this Facility Condition Assessment and Level I Energy Audit in connection with its Fire Station #5, 23 Ferguson Avenue, Burlington, Vermont, the "Property". It is our understanding that the primary interest of The City of Burlington, Vermont is to locate and evaluate materials and building system defects that might significantly affect the value of the property and to determine if the present Property has conditions that will have a significant impact on its continued operations.

The conclusions and recommendations presented in this report are based on the brief review of the plans and records made available to our Project Manager(s) during the site visit, interviews of available property management personnel and maintenance contractors familiar with the Property, appropriate inquiry of municipal authorities, our Project Manager's walk-through observations during the site visit, and our experience with similar properties.

No testing, exploratory probing, dismantling or operating of equipment or in depth studies were performed unless specifically required under Section 2 of this report. This assessment did not include engineering calculations to determine the adequacy of the Property's original design or existing systems. Although walk-through observations were performed, not all areas were observed (See Section 4.2 for areas observed). There may be defects in the Property, which were in areas not observed or readily accessible, may not have been visible, or were not disclosed by management personnel when questioned. The report describes property conditions at the time that the observations and research were conducted.

Any reuse or distribution of this report without such consent shall be at The City of Burlington, Vermont and the recipient's sole risk, without liability to EMG.

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1. EXECUTIVE SUMMARY

1.1. PROPERTY INFORMATION AND GENERAL PHYSICAL CONDITION

The property information is summarized in the table below. More detailed descriptions may be found in the various sections of the report and in the Appendices.

Property Information	
Address:	23 Ferguson Avenue, Burlington, Vermont 05401
Year constructed:	1991
Current owner of property:	City of Burlington, Vermont
Management Point of Contact:	City of Burlington, Martha Keenan, Capital Improvement Program Manager 802.540.0701 phone
Property type:	Fire station
Site area:	0.4 Acres
Gross floor area:	7,328 Square Feet
Number of buildings:	1
Number of stories:	2
Parking type and number of spaces:	4 spaces in open lots
Building construction:	Masonry bearing walls and wood-framed roofs
Roof construction:	Combination hipped roofs with asphalt shingles
Exterior Finishes:	Brick and concrete panel veneer
Heating and/or Air-conditioning:	Split system fan coil unit with hot water heat and pad-mounted condensers
Fire and Life/Safety:	Fire sprinklers, hydrants, smoke detectors, alarms, extinguishers, and strobes
Dates of visit:	September 24, 2014
Point of Contact (POC):	Martha Keenan
Assessment and Report Prepared by:	Scott Lattimer and Cheyenne Irby
Reviewed by:	George Luce Technical Report Reviewer gluce@emgcorp.com 800.733.0660 x6261

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

According to property management personnel, the property has had an active capital improvement expenditure program over the past three years, primarily consisting of HVAC upgrades. The work was evident during the site visit.

Summary of Energy Audit:

EMG has conducted an Energy Audit on Fire Station #5. 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 8 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	\$ 36,199 <i>(In Current Dollars)</i>
Estimated Annual Cost Savings Related to ECMs	\$ 3,311 <i>(In Current Dollars)</i>
Net Effective ECM Payback	10.93 years
Estimated Annual Energy Savings	36.21%
Estimated Annual Cost Savings	25.37%

1.2. SPECIAL ISSUES AND FOLLOW-UP RECOMMENDATIONS

As part of the FCA, a limited assessment of accessible areas of the building(s) was performed to determine the presence of mold, conditions conducive to mold growth, and/or evidence of moisture. Property personnel were interviewed concerning any known or suspected mold, elevated relative humidity, water intrusion, or mildew-like odors. Sampling is not a part of this assessment.

There are no visual indications of the presence of mold growth, conditions conducive to mold growth, or evidence of moisture in representative readily accessible areas of the property.

The following issues should be considered:

- Verify that all warranties are transferable.
- Verify that any alterations, installations, or other improvements since the project was first constructed and occupied have been properly permitted and approved by municipal agencies.
- Verify that no defective materials or equipment are used at the property.

Copies of the documents listed below should be obtained:

- All roof, equipment and system warranties/guarantees and transfers. Manufacturers often levy a warranty transfer fee and require that the equipment or system be in pristine condition in order to provide such transfers. This requirement often necessitates upgrades, repairs, or servicing.
- All available site and building construction drawings and specifications.
- All government documents such as Certificates of Occupancy, permits, zoning variances, easements, tax receipts, and other pertinent records.



1.3. OPINIONS OF PROBABLE COST

Cost estimates are attached at the front of this report (following the cover page).

These estimates are based on Invoice or Bid Document/s provided either by the Owner/facility and construction costs developed by 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.

Opinions of probable costs should only be construed as preliminary, order of magnitude budgets. Actual costs most probably will vary from the consultant's opinions of probable costs depending on such matters as type and design of suggested remedy, quality of materials and installation, manufacturer and type of equipment or system selected, field conditions, whether a physical deficiency is repaired or replaced in whole, phasing of the work (if applicable), quality of contractor, quality of project management exercised, market conditions, and whether competitive pricing is solicited, etc. ASTM E2018-08 recognizes that certain opinions of probable costs cannot be developed within the scope of this guide without further study. Opinions of probable cost for further study should be included in the PCR.

1.3.1. 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.

Where quantities could not be derived from an actual take-off, lump sum costs or allowances are used. Estimated costs are based on professional judgment and the probable or actual extent of the observed defect, inclusive of the cost to design, procure, construct and manage the corrections.

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 the 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.

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

1.3.2. Immediate Repairs and Short Term Costs

Immediate repairs are opinions of probable costs that require immediate action as a result of: (1) material existing or potential unsafe conditions, (2) material building or fire code violations, or (3) conditions that, if not addressed, have the potential to result in, or contribute to, critical element or system failure within one year or will most probably result in a significant escalation of its remedial cost.

Short term costs are opinions of probable costs to remedy physical deficiencies, such as deferred maintenance, that may not warrant immediate attention, but that require repairs or replacements, which should be undertaken on a priority basis in addition to routine preventive maintenance. Opinions of probable costs may include costs for testing, exploratory probing, and further analysis should this be deemed warranted by the consultant. The performance of such additional services is beyond the FCA scope of work. Generally, the time frame for such repairs is within one to two years. Short Term costs are included in the Replacement Reserves Report.

1.3.3. Replacement Reserves

Replacement Reserves are for recurring probable expenditures, which are not classified as operation or maintenance expenses. The replacement reserves should be budgeted for in advance on an annual basis. Replacement Reserves are reasonably predictable both in terms of frequency and cost. However, Replacement Reserves may also include components or systems that have an indeterminable life but, nonetheless, have a potential for failure within an estimated time period.

Replacement Reserves exclude systems or components that are estimated to expire after the reserve term and are not considered material to the structural and mechanical integrity of the subject property. Furthermore, systems and components that are not deemed to have a material effect on the use of the Property are also excluded. Costs that are caused by acts of God, accidents, or other occurrences that are typically covered by insurance, rather than reserved for, are also excluded.

Replacement costs are solicited from ownership/property management, EMG's discussions with service companies, manufacturers' representatives, and previous experience in preparing such schedules for other similar facilities. Costs for work performed by the ownership's or property management's maintenance staff are also considered.

EMG's reserve methodology involves identification and quantification of those systems or components requiring capital reserve funds within the assessment period. The assessment period is defined as the effective age plus the reserve term. Additional information concerning system's or component's respective replacement costs (in today's dollars), typical expected useful lives, and remaining useful lives were estimated so that a funding schedule could be prepared. The Replacement Reserves Schedule presupposes that all required remedial work has been performed or that monies for remediation have been budgeted for items defined in the Immediate Repairs Report.

2. PURPOSE AND SCOPE

2.1. PURPOSE

EMG was retained by the client to render an opinion as to the Property's current general physical condition on the day of the site visit.

Based on the observations, interviews and document review outlined below, this report identifies significant deferred maintenance issues, existing deficiencies, and material code violations of record at municipal offices that affect the Property's use. Opinions are rendered as to its structural integrity, building system condition and the Property's overall condition. The report also notes building systems or components that have realized or exceeded their typical expected useful lives.

The physical condition of building components is typically defined as being in one of three categories: Good, Fair, and Poor. For the purposes of this report, the following definitions are used:

- Good = Satisfactory as-is. Requires only routine maintenance during the assessment 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. SCOPE

The standard scope of the Facility Condition Assessment includes the following:

- Visit the Property to evaluate the general condition of the building and site improvements, review available construction documents in order to familiarize ourselves with, and be able to comment on, the in-place construction systems, life safety, mechanical, electrical, and plumbing systems, and the general built environment.
- Identify those components that are exhibiting deferred maintenance issues and provide cost estimates for Immediate, Short Term, and Replacement Reserves based on observed conditions, maintenance history and industry standard useful life estimates. This will include the review of documented capital improvements completed within the last five-year period and work currently contracted for, if applicable.
- Provide a full description of the Property with descriptions of in-place systems and commentary on observed conditions.
- Provide a general statement of the subject Property's compliance to National Building Code Accessibility standards. This will not constitute a full survey, but will help identify exposure to issues and the need for further review.
- Perform a limited assessment of accessible areas of the building(s) for the presence of mold, conditions conducive to mold growth, and/or evidence of moisture. EMG will also interview Project personnel regarding the presence of any known or suspected mold, elevated relative humidity, water intrusion, or mildew-like odors. Potentially affected areas will be photographed. Sampling will not be considered in routine assessments.
- List the current utility service providers.
- Review maintenance records and procedures with the in-place maintenance personnel.

- Observe a representative sample of the interior tenant spaces/units, including vacant spaces/units, in order to gain a clear understanding of the property’s overall condition. Other areas to be observed include the exterior of the property, the roofs, interior common areas, and mechanical, electrical and elevator equipment rooms.
- Appropriate inquiries of municipal officials regarding the existence of pending unresolved building or fire code violations on file, and a determination of the current zoning category, flood hazard area, and seismic zone for the Property.
- Provide recommendations for additional studies, if required, with related budgetary information.
- Tenant responsibility for maintenance, repair or replacement of finishes, fixtures, or equipment is not addressed by this scope of services.
- Provide an Executive Summary at the beginning of this report with cost estimates as a quick, user-friendly summary of the Property’s condition and the assigned costs by category. These costs are tied to the report sections where reference to the issues are clearly defined and expanded.

2.3. PERSONNEL INTERVIEWED

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

Name and Title	Organization	Phone Number
Martha Keenan Capital Improvement Program Manager	City of Burlington	802.540.0701
Sybil Thomas Burlington Code Enforcement Department	Burlington Code Enforcement Office	802.863.0442
Nic Anderson Planning and Zoning Clerk	Burlington Planning Department	802.865.7188
Meghan Sweeney Administrative Assistant	Burlington Fire Department	802.865.5387
Martha Keenan Capital Improvement Program Manager	City of Burlington	802.540.0701

The FCA was performed with the assistance of Martha Keenan, Capital Improvement Program Manager, City of Burlington, 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 most questions posed during the interview process. The POC’s management involvement at the property has been for the past 7 months.

2.4. DOCUMENTATION REVIEWED

Prior to the FCA, 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 Documentation Request Form is provided in Appendix E.

Although Appendix E provides a summary of the documents requested or obtained, the following list provides more specific details about some of the documents that were reviewed or obtained during the site visit.

- Summary of recent capital improvements

2.5. PRE-SURVEY QUESTIONNAIRE

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

2.6. WEATHER CONDITIONS

On the day of the site visit, September 24, 2014, the weather was clear, with temperatures in the 80s (°F) and light winds.

3. CODE INFORMATION AND ACCESSIBILITY

3.1. CODE INFORMATION, FLOOD ZONE AND SEISMIC ZONE

According to Sybil Thomas of the Burlington Code Enforcement Department, 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 Certificates of Occupancy were requested but were not available.

Based on a review of the zoning classification information at the Burlington Planning and Zoning Department, the property is located within the downtown mixed use, zoning district and appears to be a conforming use.

According to Meghan Sweeney of the Burlington Fire Department, there are no major outstanding fire code violations on file. The most recent inspection was conducted by the Fire Department was within the current year.

According to information obtained from the appraisal, the property is not located in a flood hazard zone. FEMA flood map 50007C0254D of July 18, 2011 shows the site to be in Zone X.

According to the 1997 Uniform Building Code Seismic Zone Map of the United States, the property is located in Seismic Zone 2A, defined as an area of low to moderate probability of damaging ground motion.

According to the Wind Zone Map, published by the Federal Emergency Management Agency (FEMA), the property is located in Zone II and is not located in a Hurricane-Susceptible Region or Special Wind Region.

3.2. ADA ACCESSIBILITY

Generally, Title III of the Americans with Disabilities Act (ADA) prohibits discrimination by entities to access and use of "areas of public accommodations" and "commercial facilities" on the basis of disability. Regardless of its age, these areas and facilities 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 the ADAAG. Existing facilities constructed prior to this date are held to the lesser standard of compliance to the extent allowed by structural feasibility and the financial resources available. As an alternative, a reasonable accommodation pertaining to the deficiency must be made.

During the FCA, a limited visual observation for ADA accessibility compliance was conducted. The scope of the visual observation was limited to those areas set forth in *EMG's Abbreviated Accessibility Checklist* provided in Appendix D of this report. It is understood by the Client that the limited observations described herein does not comprise a full ADA Compliance Survey, and that such a survey is beyond the scope of EMG's undertaking. Only a representative sample of areas was observed and, other than as shown on the Abbreviated Accessibility Checklist, actual measurements were not taken to verify compliance. The scope of the visual observation did not include any areas within tenant spaces.

At a fire station property, there are no areas considered a public accommodation. The general public does not interact with the services offered at this facility.

The facility generally appears to be accessible as stated within the defined priorities of Title III of the Americans with Disabilities Act.

A full ADA Compliance Survey may reveal aspects of the property that are not in compliance.

4. EXISTING BUILDING ASSESSMENT

4.1. TENANT UNIT TYPES

All 7,328 square feet of the building is occupied by the Burlington Fire Department.

4.2. TENANT UNITS OBSERVED

Most of the building was observed in order to gain a clear understanding of the property's overall condition. Other areas accessed included the exterior of the property and the roof.

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	City of Burlington	Good
Storm sewer	City of Burlington	Good
Domestic water	City of Burlington	Good
Electric service	Burlington Electric Department	Good
Natural gas service	Vermont Gas Systems	Good

Observations/Comments:

- The utilities appear to be adequate for the property. There are no unique, on site utility systems such as, septic systems, water or waste water treatment plants, or propane gas tanks.

5.2. PARKING, PAVING, AND SIDEWALKS

The main entrance drive is located along Ferguson Avenue on the north side of the property. The parking area is paved with asphaltic concrete. The parking area is located at the rear of the building and is accessed via a service drive along the east side of the building.

Based on a physical count, parking is provided for 4 cars. The parking ratio is 1.8 spaces per thousand square feet of floor area. All the parking stalls are located in open lots.

The sidewalks throughout the property are constructed of cast-in-place concrete. There are localized areas of brick paving.

The curbs and gutters are constructed of cast-in-place concrete. Surface runoff is directed to swales along the landscaped areas, which border the paved areas.



Observations/Comments:

- The property does not have a dedicated paving repair and maintenance contractor. On site personnel maintain the paving and flatwork or a contractor is retained when required.
- Service drive and parking area - The asphalt pavement is in good to fair condition. There are no significant signs of cracks or surface deterioration. In order to maximize the pavement life, pothole patching, crack sealing, seal coating, and re-striping of the asphalt paving will be required during the assessment period. The cost of this work is included in the Replacement Reserves Report.

- Driveway for fire engines - The asphalt pavement is in poor condition. The weight of the fire engines has worn wheel treads into the asphalt pavement. Because of the weight of the fire engines it is recommended that the driveway be replaced with concrete paving similar to Central Fire Station. The cost of this work is included in the Replacement Reserves Report.
- The concrete pavement is in good to fair condition. There are no significant signs of cracks or surface deterioration. Epoxy sealing of minor cracks will be required during the assessment period as part of the property management's routine maintenance program. There are some localized areas where the concrete pavement has shifted and heaved up from the ground creating a tripping hazard. These areas of the sidewalk will require repair during the assessment period. The cost of this work is included in the Replacement Reserves Report.
- The concrete curbs throughout the property are in good condition. Routine cleaning and maintenance will be required during the assessment period.

5.3. DRAINAGE SYSTEMS AND EROSION CONTROL

Storm water from the roof and paved areas flows across the surface into the adjacent public street.

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 east side of the property to the west property line.

The landscaping consists of trees, shrubs, and grasses.

Landscaped areas are irrigated as needed by hand.

Surrounding properties include residential developments.

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 during the assessment period.



5.5. GENERAL SITE IMPROVEMENTS

Property identification is provided by a monument sign that is mounted to the exterior elevation of the building.

Site lighting is provided by metal street light standards along public streets.

Exterior building illumination is provided by light fixtures surface-mounted on the exterior walls. Recessed light fixtures are located in the exterior soffits.

A perimeter fence is located along the south property lines. The fence is constructed of painted wood boards and wood posts.



Observations/Comments:

- The property and tenant identification signs are in good condition. Routine maintenance will be required during the assessment period.
- The exterior site and building light fixtures are in good condition. Routine maintenance will be required during the assessment period.
- The site fencing is in good condition and will require routine maintenance during the assessment period. Painting is considered to be routine maintenance.

6. BUILDING ARCHITECTURAL AND STRUCTURAL SYSTEMS

6.1. FOUNDATIONS

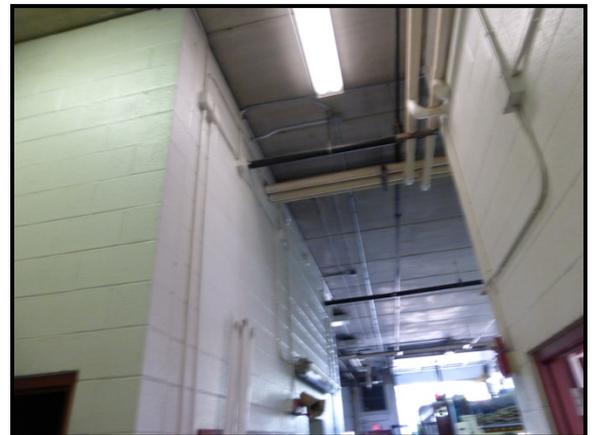
Based on structures of similar size, configuration, and geographic location, it is assumed that the foundations consist of conventional reinforced concrete spread footings, which support wall and column loads.

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 concrete masonry unit (CMU) exterior bearing walls and interior steel columns, which support the upper floor and roof diaphragms. The upper floors are topped with light weight concrete. The roofs are sheathed with plywood over wood rafters and wood joists.



Observations/Comments:

- The superstructure is exposed in some locations, which allows 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 roof is a hipped roof. The roofs are finished with asphalt shingles over asphalt-saturated paper. The roofs have sheet metal flashing elements. The roofs are insulated with fiberglass batts.

The roofs drain over the eaves to paved and landscaped areas.

The attics are ventilated by soffit vents. Attic access is provided by a scuttle hole located in the upper floor common areas.



Observations/Comments:

- The property does not have a dedicated roof repair and maintenance contractor. On site personnel maintain the roofs or a contractor is retained when required.
- The roof finishes are original to the building.
- The roof membranes are in good to fair condition. Based on their estimated Remaining Useful Life (RUL), the roof membranes will require replacement during the assessment period. The cost of this work is included in the Replacement Reserves Report.
- 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).
- The roof flashings are in fair condition. Some of the flashing, where the flat roof meets the wall of the main volume of the building has failed. There is evidence of water infiltration into the stairwell walls. The flashing will require replacement during 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 during the assessment period.
- There is no evidence of moisture, water intrusion, or excessive daylight in the attics. The insulation in the attics appears to be adequate.

6.4. EXTERIOR WALLS

The exterior walls are finished with brick masonry veneer and concrete veneer. The soffits are concealed and are finished with painted plywood.

Horizontal and vertical bands of sealant are installed at glazing joints, spandrel panel joints, and at joints between finish transitions.

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



Observations/Comments:

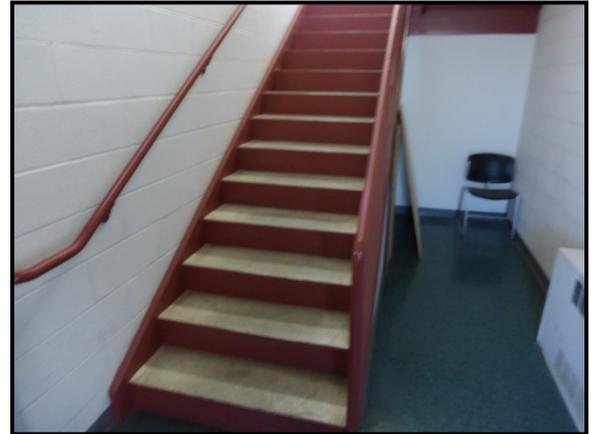
- The exterior finishes are in good condition. Painting and patching will be required during the assessment period. The cost of this work is included in the Replacement Reserves Report.
- The exterior walls of stained and weathered will require pressure washing during the assessment period. The cost of this work is included in the Replacement Reserves Report.
- The sealant is in good condition and will require replacement during the assessment period. The cost of this work is included in the Replacement Reserves Report.

6.5. EXTERIOR AND INTERIOR STAIRS

The interior stairs are constructed of steel with concrete filled steel pan treads. The handrails and balusters are constructed of metal.

Observations/Comments:

- The interior stairs, balusters, and handrails are in good condition and the handrails and balusters will require repainting during the assessment period. The cost of this work is included in the Replacement Reserves Report.



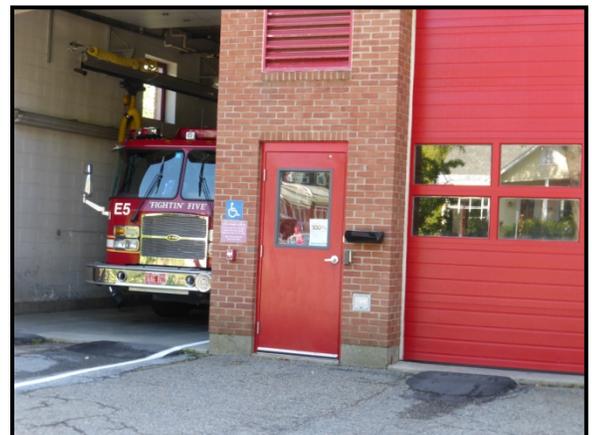
6.6. EXTERIOR WINDOWS AND DOORS

The windows are aluminum-framed, double-glazed hopper units.

The entrance door is a painted metal door with a glazed center panel set in a metal frame. The door has cylindrical locksets with knob handle hardware and keyed deadbolts.

The service doors are painted metal doors set in metal frames. The doors have cylindrical locksets with knob handle hardware.

A total of two overhead doors are located at the front of the building and provides access to the fire stations vehicle bays. The overhead doors are flush-paneled metal doors and are equipped with automatic openers.



Observations/Comments:

- There is no evidence of window leaks or window condensation. The windows are in good to fair condition and based on their estimated useful life, they will require replacement during the assessment period. The cost of this work is included in the Replacement Reserves Report.
- The exterior doors and door hardware are in good condition and will require repainting during the assessment period. The cost of this work is included in the Replacement Reserves Report.
- The overhead doors are in good condition and will require repainting during the assessment period. The cost of this work is included in the Replacement Reserves Report.

6.7. PATIO, TERRACE, AND BALCONY

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

6.8. COMMON AREAS, ENTRANCES, AND CORRIDORS

For interior finishes see Section 8.1

7. BUILDING MECHANICAL AND PLUMBING SYSTEMS

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

Heating and cooling are provided in the building by a horizontally suspended direct expansion fan coil unit with hot water heat. The corresponding condensing unit has a capacity of four tons. The cooling equipment uses R-410A as a refrigerant.

Air distribution is provided to supply air registers by ducts concealed above the ceilings. Return air grilles are located in each space. The heating and cooling systems are controlled by local thermostats.

Hot water for the central heating system is supplied by one gas-fired, hot water boiler. The boiler has a rated input capacity of 155,000 BTUH and is located in the basement.

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

The one-story portion of the building is heated by hot water baseboard heat and cooled by a ductless split air conditioner and is not supplied by the fan coil unit serving the main second floor living quarters.

The restrooms and other areas are ventilated by mechanical exhaust fans.

The garage equipment bay is equipped with a Plymovent mechanical ventilation system. The system consists of an exhaust fan and a network of sheet metal ducts. The fans are automatically controlled by carbon monoxide sensors.



Observations/Comments:

- The property does not have a dedicated HVAC repair and maintenance contractor. On site personnel maintain the HVAC equipment or a contractor is retained when required.
- Records of the installation, maintenance, upgrades, and replacement of the HVAC equipment have not been maintained since the property was first occupied.
- The HVAC equipment appears to vary in age. HVAC equipment is reportedly replaced on an "as-needed" basis.
- The common area HVAC equipment appears to be in good condition. Based on its estimated Remaining Useful Life (RUL), the fan coil unit will require replacement during the assessment period. The cost of this work is included in the Replacement Reserves Report.
- The boiler appears to be in good condition. Based on its estimated Remaining Useful Life (RUL), the boiler will require replacement during the assessment period. The cost of this work is included in the Replacement Reserves Report.
- The hot water unit heaters serving the garage equipment bay appear to be in good condition. Based on its estimated Remaining Useful Life (RUL), the hot water unit heaters will require replacement during the assessment period. The cost of this work is included in the Replacement Reserves Report.

- The ductless split air-conditioning unit appears to be in good condition. Based on its estimated Remaining Useful Life (RUL), the window air-conditioning unit 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 AND DOMESTIC HOT WATER

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 meter is located in the basement mechanical room.

Domestic hot water is supplied by the HVAC system's boiler. The central hot water system consists of a circulating pumps and a package 55-gallon insulated storage tank with built-in heat exchanger.

The common area restrooms have a combination of 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 package hot water heat exchanger storage tank appears to be in good condition. Based on its estimated Remaining Useful Life (RUL), the storage tank 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 good condition. Based on their 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 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 meter and regulator 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 meter and regulator 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 underground to pole-mounted transformer, which feed exterior-mounted electrical meters.

The main electrical service size is 200 amps, 120/240 volt single-phase three-wire alternating current (AC). The electrical wiring is copper, installed in metallic conduit. Circuit breaker panels are located throughout the building.

Observations/Comments:

- A natural gas-powered 10 KVA emergency electrical generator is located in the basement. The generator provides back-up power for elements of the fire and life safety systems and tenant-installed equipment.

Observations/Comments:

- The on site electrical systems up to the meter are owned and maintained by the electric 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. The generator will require routine maintenance over the assessment period.



7.5. BUILDING ELEVATORS AND CONVEYING SYSTEMS

Not applicable. There are no elevators or conveying systems.

7.6. FIRE PROTECTION AND SECURITY SYSTEMS

The fire protection system consists of a wet-pipe sprinkler system, a wet standpipe with fire department hose valves and connections, portable fire extinguishers, smoke detectors, pull stations, and alarm horns. Siamese connections are located on the exterior of the building. Hard-wired smoke detectors are located throughout the common areas. The nearest fire hydrants are located along the public streets bordering the property.

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

Fire sprinkler risers are located in the basement. The system is equipped with a back flow preventer.

A central fire alarm panel is located on the main level 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.

Interior fire exit stairwells are accessed from the corridors. The walls of the fire stairwells are exposed masonry. The stairs discharge at the ground floor, directly to the exterior of the building.



Observations/Comments:

- Information regarding the fire sprinkler inspection contractor was requested but was not provided by the maintenance personnel.
- Information regarding the fire alarm inspection contractor was requested but was not provided by the maintenance personnel.
- Information regarding fire department inspection information is included in Section 3.1.
- The fire sprinklers appear to be in good condition and are inspected by a qualified contractor on a routine basis. The fire sprinklers will require routine maintenance during the assessment period.
- 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 during the assessment period.
- Smoke detector replacement is considered to be routine maintenance.
- Exit sign and emergency light replacement is considered to be routine maintenance.
- The central alarm panel appears to be in good condition and is serviced regularly by a qualified fire equipment contractor. Equipment testing is not within the scope of a Facility Condition Assessment.
- The exit stairwells appear to be constructed in accordance with applicable codes in force at the time of construction.
- The stairwell doors and door hardware are fire-rated. Components bearing certification labels are displayed on the doors.

8. INTERIOR SPACES

8.1. INTERIOR FINISHES

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

Typical Tenant Unit Finishes			
Room	Floor	Walls	Ceiling
Vehicle bay	Concrete	Painted CMU	Unfinished concrete
Office	Vinyl tile	Painted CMU	Suspended T-bar system with acoustical tiles
Kitchen	Vinyl tile	Painted drywall	Suspended T-bar system with acoustical tiles
Dining room	Vinyl tile	Painted drywall	Suspended T-bar system with acoustical tiles
Corridor 1 st floor	Vinyl tile	Painted CMU	Suspended T-bar system with acoustical tiles
Corridor 2 nd floor	Vinyl tile	Painted drywall	Suspended T-bar system with acoustical tiles
1 st floor restroom	Vinyl tile	Painted drywall	Suspended T-bar system with acoustical tiles
2 nd floor restroom	Ceramic tile	Painted drywall	Suspended T-bar system with acoustical tiles
Common room	Carpet and Vinyl tile	Painted drywall	Painted drywall
Fire fighter sleeping quarters	Vinyl tile	Painted drywall	Suspended T-bar system with acoustical tiles
Gym 1 st Floor	Vinyl tile	Painted CMU	Suspended T-bar system with acoustical tiles
Gym 2 nd Floor	Rubber tiles	Painted CMU	Suspended T-bar system with acoustical tiles

The interior doors are stained hollow-core wood doors set in metal frames. The interior doors have cylindrical locksets with lever handle hardware.

Observations/Comments:

- The interior finishes are good to fair condition. Repainting and some of the interior finishes will require replacement during 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 refinishing during the assessment period during the assessment period. The cost of this work is included in the Replacement Reserves Report.

8.2. COMMERCIAL KITCHEN EQUIPMENT

The kitchen is equipped with residential kitchen appliances, fixtures, and equipment. The equipment is owned and maintained by the fire department.

The kitchen includes the following major appliances, fixtures, and equipment:



Appliance	Comment
Refrigerators	Up-right
Freezers	None
Ranges	Gas
Ovens	Gas
Griddles / Grills	None
Fryers	None
Hood	Exhaust ducted to exterior
Dishwasher	Yes
Microwave	Yes
Ice Machines	None
Steam tables	None
Work tables	None
Shelving	Acrylic laminate topped wood cabinets

Observations/Comments:

- The kitchen appliances appear to be in good condition. Based on their estimated Remaining Useful Life (RUL), the range refrigerator and dishwasher will require replacement during the assessment period. The cost of this work is included in the Replacement Reserves Report.
- The kitchen counter tops and cabinets are in good to fair condition and will require replacement during the assessment period. The cost of this work is included in the Replacement Reserves Report.

8.3. HVAC

Not applicable. See Section 7.1. for descriptions and comments regarding the HVAC systems.

8.4. PLUMBING

Not applicable. See Section 7.2. for descriptions and comments regarding the building plumbing systems.

8.5. ELECTRICAL

Not applicable. See Section 7.4. for descriptions and comments regarding the building electrical systems.

9. OTHER STRUCTURES

Not applicable. There are no major accessory structures.

10. ENERGY AUDIT - PURPOSE AND SCOPE

The purpose of this Energy Audit is to provide the City of Burlington 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.

The approach taken in this energy audit began with a benchmarking analysis of the building and associated building systems by:

1. Developing an energy baseline that becomes the basis for the energy savings plan and cost savings plan.
2. Gathering utility data for each building and benchmarking against models by square footage, by facility use and type of structure.

The energy audit consisted of an on site visual assessment to determine current conditions, itemize the energy consuming equipment (i.e. Boilers, split system cooling, DHW equipment); review lighting systems both exterior and interior; and review efficiency of all such equipment. The study also included interviews and consultation with operations and maintenance personnel.

11. FACILITY OVERVIEW AND EXISTING CONDITIONS

11.1. BUILDING OCCUPANCY

Typically, 2 - 15 people occupy the facility 24 hours.

Facility Occupancy (avg. people/day)	24
Standard Operating Hours/day	24
Maintenance/ Staff Hours/day	24

Summary of Facility Operating Hours

	Hours Open to the Public	Hours Open to Employees
Monday-Friday	-	24
Saturday	-	24
Sunday	-	24

11.2. BUILDING ENVELOPE

The building envelope consists of the exterior shell, made up of the walls, windows, roof, and floor. The envelope provides building integrity and separates the exterior from the interior conditioned space.

Foundation:

Based on structures of similar size, configuration, and geographic location, it is assumed that the foundations consist of cast-in-place concrete perimeter wall footings with concrete masonry foundation walls.

Structure:

The building has load-bearing, concrete masonry unit (CMU) exterior walls and interior steel columns. The upper floors and roofs are constructed with wood joists and are sheathed with plywood.

Exterior Walls:

The exterior walls are finished with a brick masonry veneer.

Roof:

The primary roofs are steeply sloped. The roofs are finished with asphalt shingles over asphalt-saturated paper.

Windows:

The windows are aluminum-framed, double-glazed hopper units.

Doors:

The entrance door is a painted metal door with a glazed center panel set in a metal frame. The door has cylindrical locksets with knob handle hardware and keyed deadbolts.

A total of two overhead doors are located at the front of the building and provides access to the fire stations vehicle bays. The overhead doors are flush-paneled metal doors and are equipped with automatic openers.

The glazing is single paned. Weather stripping was observed around the door openings. The weather stripping was observed to be in good condition. Caulking was observed at the perimeter of the door frames. The caulking was observed to be in good condition.

The service doors are painted metal doors set in metal frames. The doors have cylindrical locksets with knob handle hardware.

11.3. BUILDING HEATING, VENTILATION AND AIR-CONDITIONING (HVAC)

Heating:

The facility is heated by a central natural gas-fired hot water boiler. The boiler has a rated input capacity of 155,000 BTUH and is located in the basement.

Cooling:

The facility is cooled by a fan coil unit with remote air cooled condensing unit. The air cooled condensing unit has a nominal rating of 5 tons and uses R-134A as a refrigerant.

Air Distribution:

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

Heating and cooling are provided in the common areas by horizontal fan coil unit equipped with DX cooling and hot water heating coils. The fan coil unit is located in a mechanical room located on the second floor and is supplied with heated water by the central system.

Air distribution is provided to supply air registers by ducts concealed above the ceilings. Return air grilles are located in adjacent to the fan coil unit. The heating and cooling system is controlled by local thermostats.

Space Ventilation:

The restrooms and other areas are ventilated by mechanical exhaust fans.

The garage equipment bay is equipped with a Plymovent mechanical ventilation system. The system consists of an exhaust fan and a network of sheet metal ducts. The fans are automatically controlled by carbon monoxide sensors.

11.4. BUILDING LIGHTING

Space Lighting:

The building has commercial grade tubular florescent lighting through the facility.

Lighting Controls:

The facility does not have any automatic lighting controls on internal light fixtures.

Exterior Lighting:

Utility-owned wood light poles along the street provide site lighting

Surface-mounted light fixtures on the exterior walls provide the exterior building with site illumination.

Exterior lighting remains on from dusk to dawn.

Emergency Lighting:

The building emergency light fixtures and "EXIT" fixtures are continuously energized. In the event of a power failure, the emergency battery in each fixture will be activated to power these fixtures. The EXIT signs in the facility consist of LED fixtures.

11.5. BUILDING ELEVATORS AND CONVEYING SYSTEMS

Not applicable. There are no elevators or conveying systems.

11.6. BUILDING DOMESTIC WATER

The water meter is located in the basement mechanical room.

The HVAC system's boiler supplies the domestic hot water. The central hot water system consists of a package heat exchanger with an 80-gallon insulated storage tank and circulating pumps.

The common area restrooms have a combination of commercial and residential grade fixtures and accessories, including water closets and lavatories. The toilets consist of water closets and flush valves. The typical flush volume was 3.5 GPF. The lavatories are equipped with aerators rated at 2.0 GPM. The lavatories are operated by manual controls. The shower heads have a rated capacity of 2.5 GPM.

11.7. BUILDING NATURAL GAS AND ELECTRICITY

Natural Gas:

The building is connected to the natural gas utility (Vermont Gas). The gas main on the adjacent public street supplies the natural gas service. The gas meter and regulator are located along the exterior walls of the building. The gas distribution piping within the building is malleable steel (black iron).

The facility is individually metered for natural gas.

Electricity:

The main electrical service size is 200 amps, 120/240-volt, single-phase, three-wire alternating current (AC). The electrical wiring is copper, installed in metallic conduit. Circuit breaker panels are located throughout the building.

The facility is individually metered for electricity.

Emergency Electricity Generator:

A natural gas-engine-driven 10 kVA emergency electrical generator is located in the basement mechanical room. The generator provides back-up power for elements of the fire and life safety systems and tenant-installed equipment.

12. ENERGY CONSERVATION MEASURES

EMG has identified 8 Energy Conservation Measures (ECMs) for this property.

List of Recommended Energy Conservation Measures For First Station #5												
ECM #	Description of ECM	Projected Initial Investment	Estimated Annual Energy Savings		Estimated Annual Water Savings	Estimated Cost Savings	Estimated Annual O&M Savings	Total Estimated Annual Cost Savings	Simple Payback	S.I.R.	Life Cycle Savings	Expected Useful Life (EUL)
			Natural Gas	Electricity								
		\$	Therms	kWh	kgal	\$	\$	\$	Years		\$	Years
No/Low Cost Recommendations												
1	Install Low Flow Faucet Aerators Details: In All Sink And Lavatory Faucets	\$156	51	0	11	\$136	\$0	\$136	1.15	7.40	\$1,001	10
2	Control External Air Leakage In Commercial Buildings Details: Seal Penetrations And Joints	\$745	320	237	0	\$442	\$22	\$464	1.61	5.31	\$3,211	10
3	Replace Existing Refrigerator(s) With Energy Star Certified Refrigerator(s) Details: Update Refrigerator In Kitchen	\$611	0	821	0	\$138	\$0	\$138	4.44	2.69	\$1,034	15
4	Replace Existing Dishwashers With High Efficiency Dishwashers Details: Use Energy Star Equipment	\$500	12	203	1	\$58	\$0	\$58	8.67	0.98	-\$8	10
Totals for No/Low Cost Items		\$2,013	383	1,261	12	\$773	\$22	\$795	2.53			
Capital Cost Recommendations												
1	Install Low Flow Restroom Flush Tank Toilets Details: Replace Existing With Energy Star	\$3,245	0	0	70	\$460	\$0	\$460	7.06	2.11	\$3,597	20
2	Replace External Windows Details: Upgrade Windows To More Efficient Models	\$15,400	1,069	974	0	\$1,506	\$15	\$1,521	10.12	1.94	\$14,419	30
3	Improve Attic Insulation Levels Details: Increase Insulation To R-49	\$8,370	544	403	0	\$751	\$8	\$759	11.03	2.33	\$11,151	50
4	Replace Existing Washing Machines With Energy Star Certified Washing Machines Details: In The Wash Area	\$2,450	0	720	4	\$145	\$0	\$145	16.94	0.70	-\$724	15
Total For Capital Cost		\$29,465	1,613	2,098	73	\$2,862	\$23	\$2,885	10.21			
	<i>Interactive Savings Discount @ 10%</i>		-200	-336	-9	-\$363	-\$4	-\$368				
	<i>Total Contingency Expenses @ 15%</i>	\$4,722										
Total for Improvements		\$36,199	1,797	3,023	77	\$3,271	\$40	\$3,311	10.93			

13. 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.

Based upon the utility information provided about the Fire Station #5, the following energy rates are utilized in determining existing and proposed energy costs.

Utility Rates used for Cost Analysis

Electricity (Blended Rate)	Natural Gas	Water / Sewer
\$0.17/kWh	\$1.26 /therm	\$6.58/kGal

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.

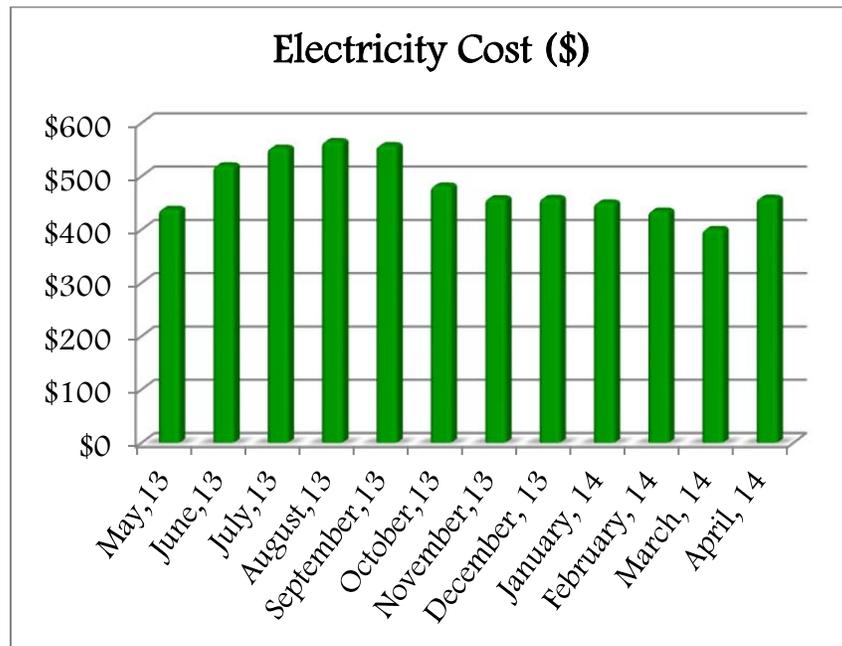
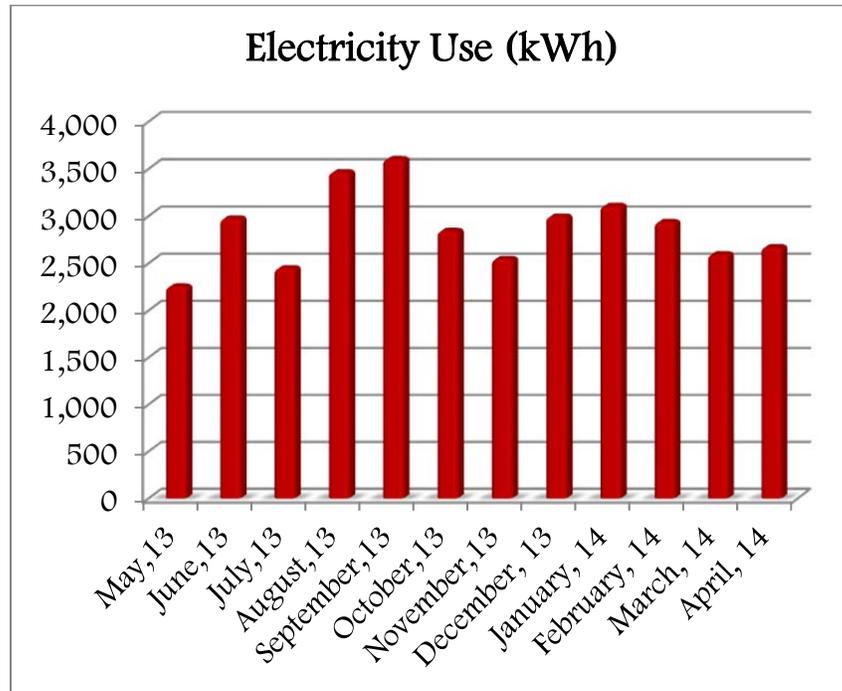
13.1. ELECTRICITY

Burlington Electric satisfies the electricity requirements of the facility.

Electricity Consumption and Cost Data

Based on the 2013 electric usage and costs, the average price paid during the year was \$0.17 per kWh. The total annual electricity consumption for the 12-month period analyzed is 34,424 kWh for a total cost of \$5,779.

Billing Month	Consumption (kWh)	Unit Cost/kWh	Total Cost
May,13	2,253	\$0.19	\$439
June,13	2,973	\$0.17	\$520
July,13	2,446	\$0.23	\$553
August,13	3,463	\$0.16	\$565
September,13	3,602	\$0.15	\$558
October,13	2,842	\$0.17	\$482
November,13	2,544	\$0.18	\$458
December, 13	2,993	\$0.15	\$459
January, 14	3,108	\$0.14	\$450
February, 14	2,936	\$0.15	\$435
March, 14	2,594	\$0.15	\$401
April, 14	2,670	\$0.17	\$459
Total	34,424	\$0.17	\$5,779



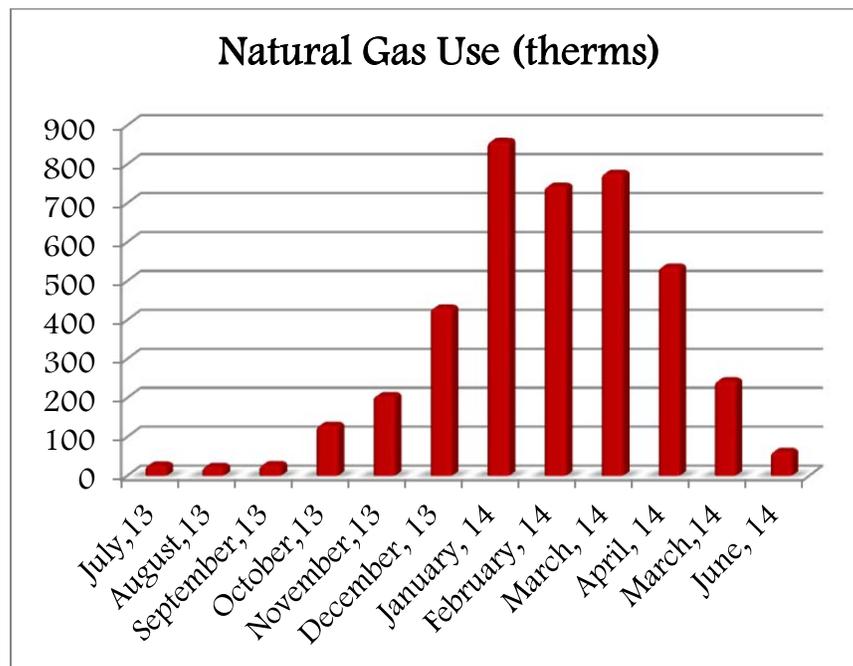
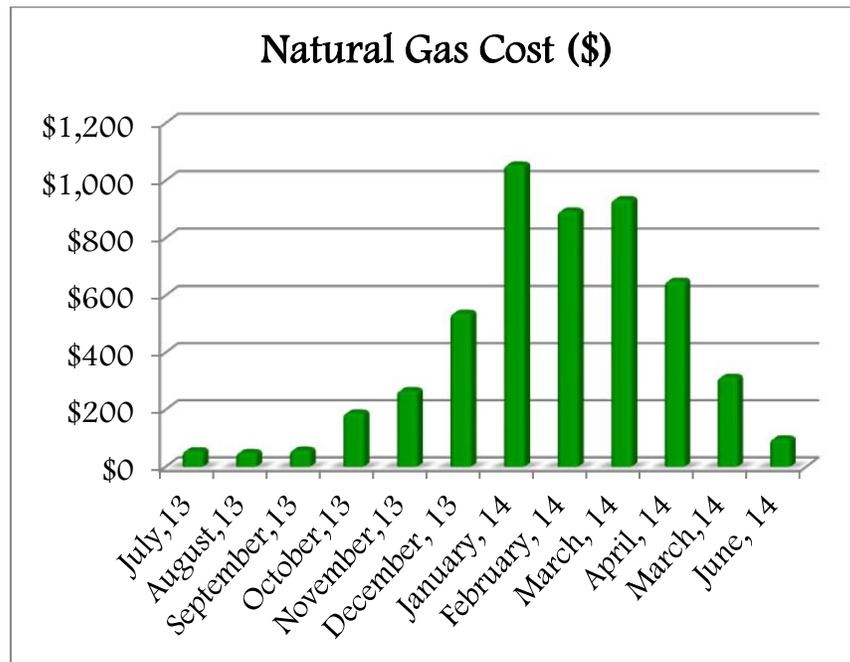
13.2. NATURAL GAS

Vermont Gas satisfies the natural gas requirements of the facility are satisfied by.

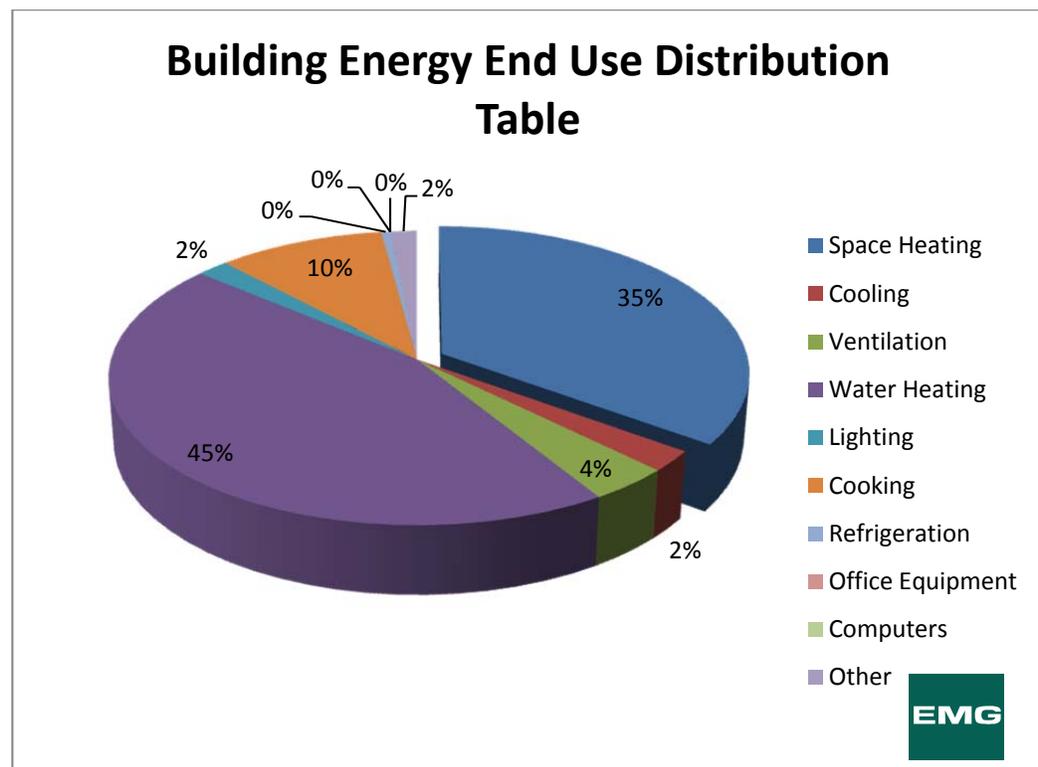
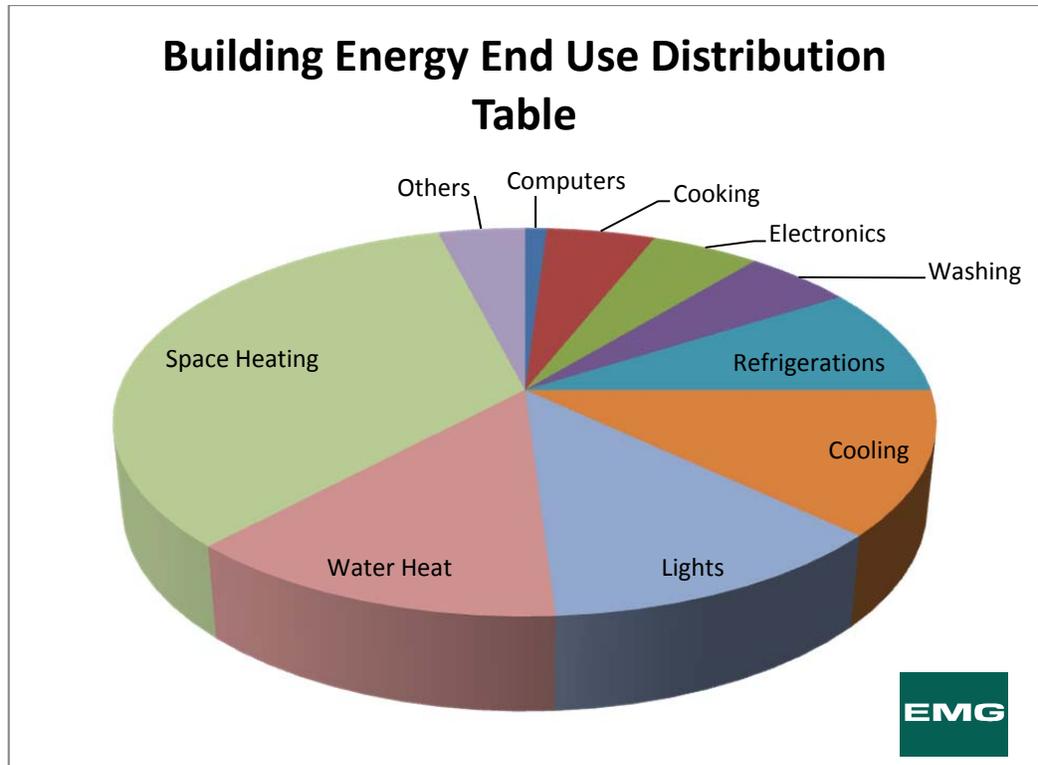
Natural Gas Consumption and Cost Data

Based on the 2013 natural gas usage and costs, the average price paid during the year was \$1.26 per therm. The total annual natural gas consumption for the 12-month period analyzed is 4,071 therms for a total cost of \$5,114.

Billing Month	Consumption (Therms)	Unit Cost/Therm	Total Cost
July,13	28	\$2.05	\$57
August,13	24	\$2.13	\$51
September,13	29	\$2.05	\$59
October,13	130	\$1.46	\$190
November,13	206	\$1.30	\$268
December, 13	431	\$1.25	\$539
January, 14	859	\$1.23	\$1,056
February, 14	744	\$1.20	\$895
March, 14	777	\$1.20	\$935
April, 14	536	\$1.21	\$651
March,14	244	\$1.29	\$314
June, 14	63	\$1.57	\$99
Total	4,071	\$1.26	\$5,114



14. END USE ENERGY DISTRIBUTION



15. APPENDICES

APPENDIX A: Photographic Record

APPENDIX B: Site Plan

APPENDIX C: Supporting Documentation

APPENDIX D: EMG Abbreviated Accessibility Checklist

APPENDIX E: Pre Survey Questionnaires and Documentation Request Checklist

APPENDIX F: Terminology

APPENDIX G: Glossary of Terms-Energy Audits

APPENDIX H: Energy Conservation Measures

**APPENDIX A:
PHOTOGRAPHIC RECORD**



EMG PHOTOGRAPHIC RECORD

Project No.: 110266.14R-005.294

Project Name: Fire Station #5



Photo #1:	Main signage
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Photo #2:	Front elevation
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Photo #3:	Right elevation
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Photo #4:	Rear elevation
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Photo #5:	Left elevation
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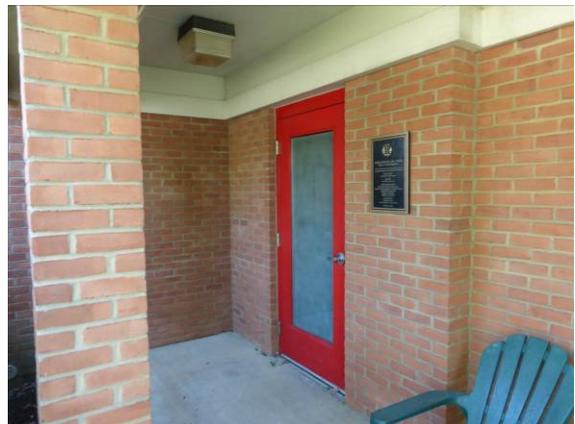


Photo #6:	Main entrance
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EMG PHOTOGRAPHIC RECORD

Project No.: 110266.14R-005.294

Project Name: Fire Station #5



Photo #7:	Exterior doors
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Photo #8:	Sidewalk
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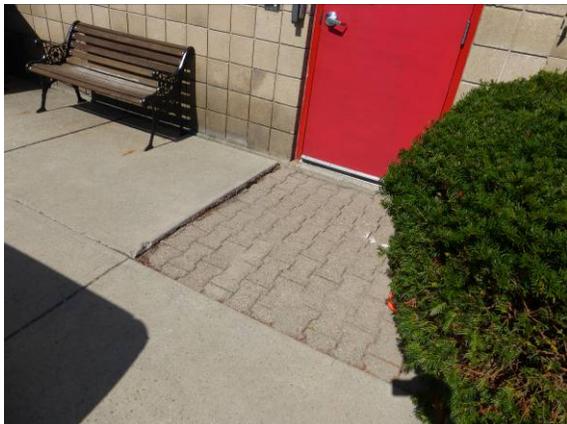


Photo #9:	Sidewalk detail
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Photo #10:	Service drive
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Photo #11:	Parking area
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Photo #12:	Roofing detail
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EMG PHOTOGRAPHIC RECORD

Project No.: 110266.14R-005.294

Project Name: Fire Station #5



Photo #13:	Vehicle bay
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Photo #14:	First floor restroom
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Photo #15:	Rear of vehicle bay
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Photo #16:	Corridor
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Photo #17:	Storage and mechanical room
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Photo #18:	Second floor restroom
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EMG PHOTOGRAPHIC RECORD

Project No.: 110266.14R-005.294

Project Name: Fire Station #5



Photo #19: Second floor restroom



Photo #20: Gym



Photo #21: Dining room



Photo #22: Common room



Photo #23: Kitchen



Photo #24: Fire pole



EMG PHOTOGRAPHIC RECORD

Project No.: 110266.14R-005.294

Project Name: Fire Station #5



Photo #25: Fire fighter sleeping quarters



Photo #26: Laundry and storage

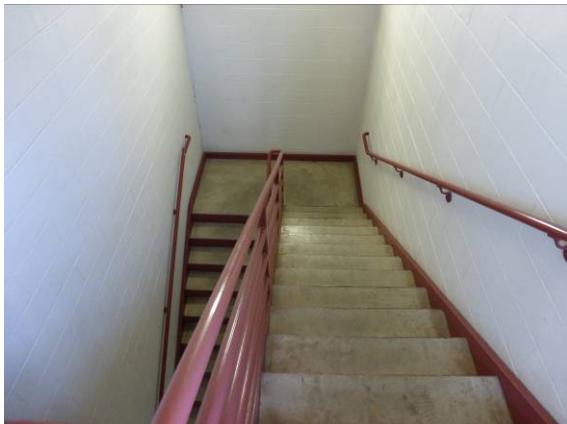


Photo #27: Stair well



Photo #28: Window detail



Photo #29: Ceiling detail



Photo #30: Overhead doors



EMG PHOTOGRAPHIC RECORD

Project No.: 110266.14R-005.294

Project Name: Fire Station #5



Photo #1:	Natural gas meter at west elevation
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Photo #2:	Hot water gas boiler and domestic hot water tank located in the first floor mechanical room
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Photo #3:	Vertical second floor fan coil unit with hot water heating coil located in the second floor mechanical room
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Photo #4:	Air cooled condensing unit located at the west elevation
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Photo #5:	Fan coil unit located in the first floor office area
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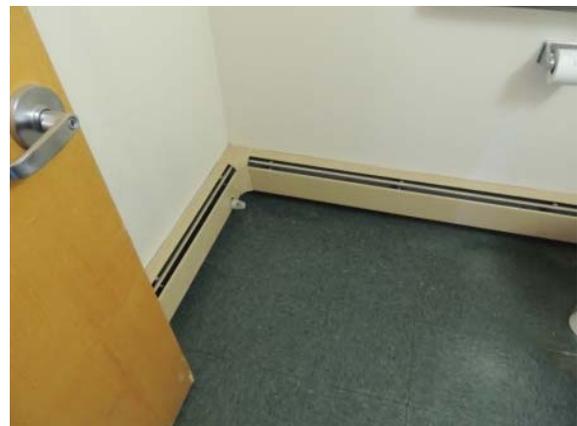


Photo #6:	Hot water base board heat located on the first floor
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EMG PHOTOGRAPHIC RECORD

Project No.: 110266.14R-005.294

Project Name: Fire Station #5



Photo #7: Hot water unit heater located in the garage equipment bay



Photo #8: Hot water unit heater located in the garage equipment bay



Photo #9: Exhaust ventilation fan located in the garage equipment bay



Photo #10: Exhaust ventilation louver located in the garage equipment bay



Photo #11: Thermostat located in the second floor living quarters



Photo #12: Vehicle engine exhaust system located in the garage equipment bay



EMG PHOTOGRAPHIC RECORD

Project No.: 110266.14R-005.294

Project Name: Fire Station #5



Photo #13: Vehicle engine exhaust system at west elevation



Photo #14: Boiler exhaust located west elevation



Photo #15: Fire department sprinkler connection at west elevation



Photo #16: Sprinkler alarm and generator exhaust at west elevation



Photo #17: Ductless mini split air conditioner located in the first floor workout room



Photo #18: Ductless mini split air cooled condensing unit at west elevation



EMG PHOTOGRAPHIC RECORD

Project No.: 110266.14R-005.294

Project Name: Fire Station #5



Photo #19: Fan cabinet unit located in the first floor workout room



Photo #20: Radiator located in first floor hallway

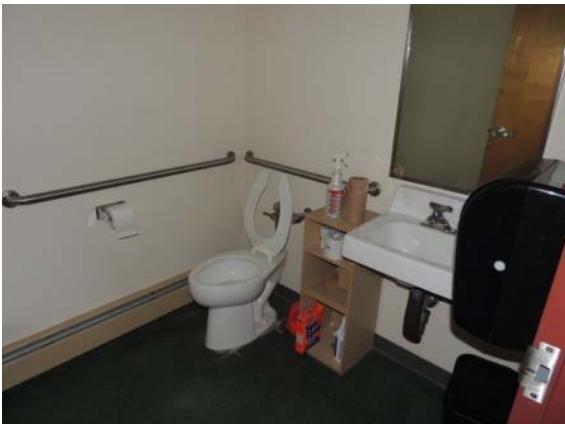


Photo #21: First floor restroom located near workout room



Photo #22: Second floor restroom located in living quarters



Photo #23: Second floor restroom located in living quarters

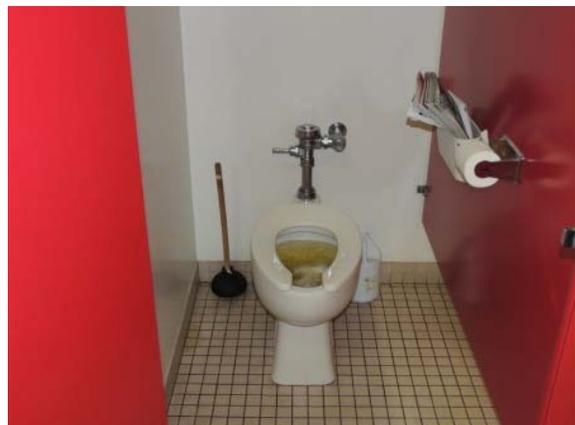


Photo #24: Second floor restroom located in living quarters



EMG PHOTOGRAPHIC RECORD

Project No.: 110266.14R-005.294

Project Name: Fire Station #5



Photo #25: Second floor restroom located in living quarters



Photo #26: Kitchen located in second floor living quarters



Photo #27: Kitchen located in second floor living quarters



Photo #28: Second floor living quarters



Photo #29: Second floor sleeping room



Photo #30: First floor workout room



EMG PHOTOGRAPHIC RECORD

Project No.: 110266.14R-005.294

Project Name: Fire Station #5



Photo #31:	Exterior light at main north elevation
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Photo #32:	Exterior light at rear south entrance
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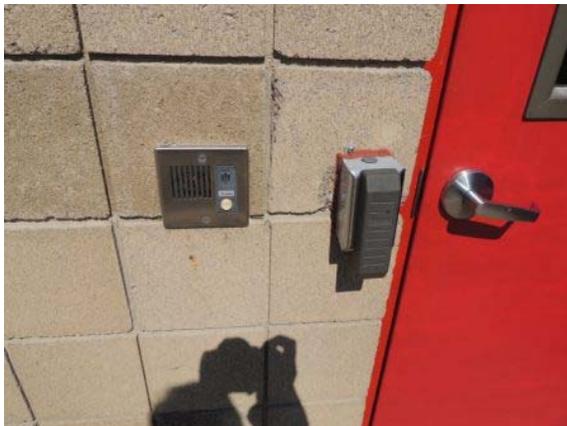


Photo #33:	Security entry at rear south elevation
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Photo #34:	Porch lighting at main north elevation
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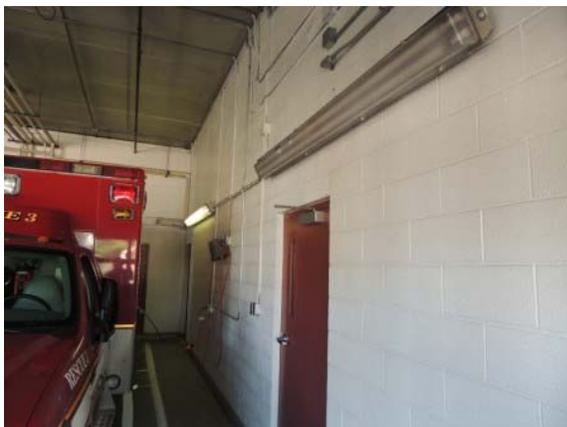


Photo #35:	Wall mounted lighting located in garage equipment bay
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Photo #36:	Typical exit sign
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EMG PHOTOGRAPHIC RECORD

Project No.: 110266.14R-005.294

Project Name: Fire Station #5



Photo #37: Typical emergency lighting



Photo #38: Emergency backup generator located in the first floor mechanical room



Photo #39: Incoming electrical service located in the first floor mechanical room



Photo #40: Generator transfer switch



Photo #41: Fire alarm panel

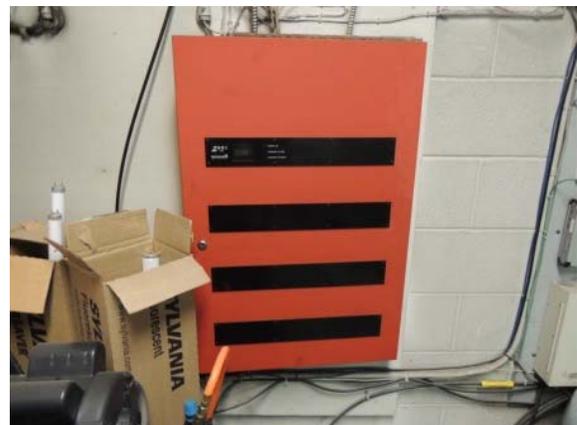


Photo #42: Fire alarm panel



EMG PHOTOGRAPHIC RECORD

Project No.: 110266.14R-005.294

Project Name: Fire Station #5



Photo #43:	Typical fire alarm with strobe
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Photo #44:	Typical pull station
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Photo #45:	Typical fire alarm sensor
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Photo #46:	Fire alarm located in the garage equipment bay
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Photo #47:	Fire alarm located in the second floor living quarters
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Photo #48:	Communications area located in the second floor living quarters
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EMG PHOTOGRAPHIC RECORD

Project No.: 110266.14R-005.294

Project Name: Fire Station #5



Photo #49: Incoming water and sprinkler service located in the first floor mechanical room



Photo #50: Typical sprinkler



Photo #51: Typical sprinkler



Photo #52: Typical fire extinguisher



Photo #53: Vehicle exhaust system located in the garage equipment bay



Photo #54: Laundry area located in the first floor equipment storage area

**APPENDIX B:
SITE PLAN**

Site Plan



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

Project Number:
110266.14R-005.294

Project Name:
Fire Station #5

On-Site Date:
September 24, 2014

**APPENDIX C:
SUPPORTING DOCUMENTATION**

RECORD OF COMMUNICATION

Date: September 24, 2014
Recorded by: Cheyenne Irby
Project Name: Fire Station #5
Project Number: 110266.14R-005.294

Communication with: Sybil Thomas
of: Burlington Code Enforcement Office
Phone: 802.863.0442

Communication via:

Telephone Conversation
Discussions During Site Inspection
✓ Office Visitation/Meeting

Re:

Outstanding violations, Certificate of Occupancy, and other record information.

Summary of Communication:

See Section 2.5 for information regarding the Point of Contact

RECORD OF COMMUNICATION

Date: September 24, 2014
Recorded by: Cheyenne Irby
Project Name: Fire Station #5
Project Number: 110266.14R-005.294

Communication with: Nic Anderson
of: Burlington Planning and Zoning Department
Phone:

Communication via:

- Telephone Conversation
- Discussions During Site Inspection
- Office Visitation/Meeting

Re:

Outstanding violations, Certificate of Occupancy, and other record information.

Summary of Communication:

See Section 2.3 and 3.1 for information regarding the Point of Contact

RECORD OF COMMUNICATION

Date: September 24, 2014
Recorded by: Cheyenne Irby
Project Name: Fire Station #5
Project Number: 110266.14R-005.294

Communication with: Meghan Sweeney
of: Burlington Fire Department
Phone: 802.865.5387

Communication via:

Telephone Conversation
Discussions During Site Inspection
✓ Office Visitation/Meeting

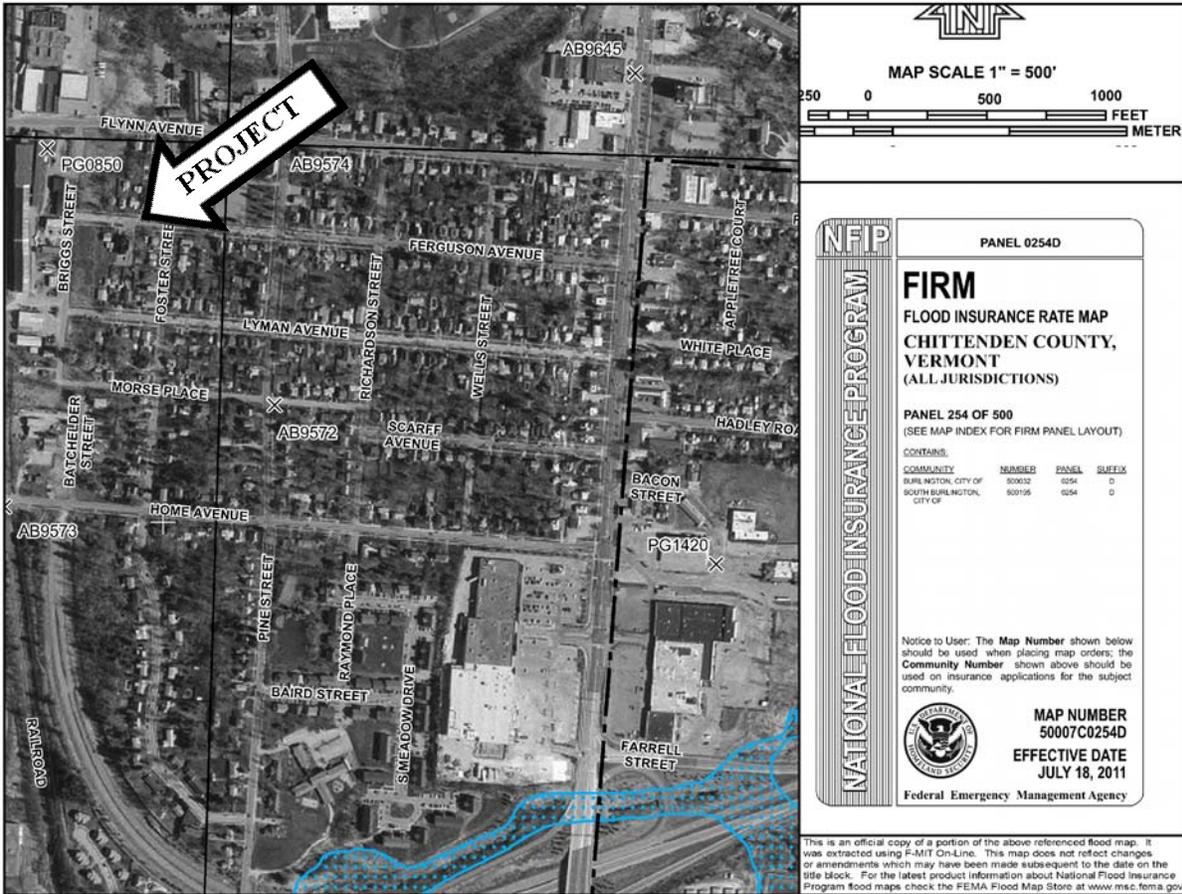
Re:

Outstanding fire code violations and inspection history

Summary of Communication:

See Section 2.3 and 3.1 for information regarding the Point of Contact

Flood Map



Source:

FEMA Map Number: 50007C0254D
Dated: July 18, 2011

Project Number:

110266.14R-005.294



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

Project Name:

Fire Station #5

On-Site Date:

September 24, 2014

**APPENDIX D:
EMG ABBREVIATED ACCESSIBILITY CHECKLIST**



FACILITY CONDITION ASSESSMENT

& LEVEL I ENERGY AUDIT

110266.14R-005.294

Property Name: Fire Station #5
 Date: September 24, 2014
 Project Number: 110266.14R-005.294

EMG Abbreviated Accessibility Checklist					
	Building History	Yes	No	N/A	Comments
1.	Has the management previously completed an ADA review?			✓	The fire station is generally not assessable to the general public
2.	Have any ADA improvements been made to the property?			✓	
3.	Does a Barrier Removal Plan exist for the property?			✓	
4.	Has the Barrier Removal Plan been reviewed/approved by an arms-length third party such as an engineering firm, architectural firm, building department, other agencies, etc.?			✓	
5.	Has building ownership or management received any ADA related complaints that have not been resolved?			✓	
6.	Is any litigation pending related to ADA issues?			✓	
	Parking	Yes	No	N/A	Comments
1.	Are there sufficient parking spaces with respect to the total number of reported spaces?			✓	
2.	Are there sufficient van-accessible parking spaces available (96" wide/ 96" aisle for van)?			✓	
3.	Are accessible spaces marked with the International Symbol of Accessibility? Are there signs reading "Van Accessible" at van spaces?			✓	
4.	Is there at least one accessible route provided within the boundary of the site from public transportation stops, accessible parking spaces, passenger loading zones, if provided, and public streets and sidewalks?			✓	
5.	Do curbs on the accessible route have depressed, ramped curb cuts at drives, paths, and drop-offs?			✓	
6.	Does signage exist directing you to accessible parking and an accessible building entrance?			✓	



EMG Abbreviated Accessibility Checklist					
	Ramps	Yes	No	N/A	Comments
1.	If there is a ramp from parking to an accessible building entrance, does it meet slope requirements? (1:12)			✓	
2.	Are ramps longer than 6 ft complete with railings on both sides?			✓	
3.	Is the width between railings at least 36 inches?			✓	
4.	Is there a level landing for every 30 ft horizontal length of ramp, at the top and at the bottom of ramps and switchbacks?			✓	
	Entrances/Exits	Yes	No	N/A	Comments
1.	Is the main accessible entrance doorway at least 32 inches wide?			✓	
2.	If the main entrance is inaccessible, are there alternate accessible entrances?			✓	
3.	Can the alternate accessible entrance be used independently?			✓	
4.	Is the door hardware easy to operate (lever/push type hardware, no twisting required, and not higher than 48 inches above the floor)?			✓	
5.	Are main entry doors other than revolving door available?			✓	
6.	If there are two main doors in series, is the minimum space between the doors 48 inches plus the width of any door swinging into the space?			✓	
	Paths of Travel	Yes	No	N/A	Comments
1.	Is the main path of travel free of obstruction and wide enough for a wheelchair (at least 36 inches wide)?			✓	
2.	Does a visual scan of the main path reveal any obstacles (phones, fountains, etc.) that protrude more than 4 inches into walkways or corridors?			✓	
3.	Are floor surfaces firm, stable, and slip resistant (carpets wheelchair friendly)?			✓	
4.	Is at least one wheelchair-accessible public telephone available?			✓	
5.	Are wheelchair-accessible facilities (toilet rooms, exits, etc.) identified with signage?			✓	
6.	Is there a path of travel that does not require the use of stairs?			✓	



EMG Abbreviated Accessibility Checklist					
	Paths of Travel (cont.)	Yes	No	N/A	Comments
7.	If audible fire alarms are present, are visual alarms (strobe light alarms) also installed in all common areas?			✓	
	Elevators	Yes	No	N/A	Comments
1.	Do the call buttons have visual signals to indicate when a call is registered and answered?			✓	
2.	Are there visual and audible signals inside cars indicating floor change?			✓	
3.	Are there standard raised and Braille marking on both jambs of each host way entrance?			✓	
4.	Do elevator doors have a reopening device that will stop and reopen a car door if an object or a person obstructs the door?			✓	
5.	Do elevator lobbies have visual and audible indicators of car arrival?			✓	
6.	Does the elevator interior provide sufficient wheelchair turning area (51" x 68")?			✓	
7.	Are elevator controls low enough to be reached from a wheelchair (48 inches front approach/54 inches side approach)?			✓	
8.	Are elevator control buttons designated by Braille and by raised standard alphabet characters (mounted to the left of the button)?			✓	
9.	If a two-way emergency communication system is provided within the elevator cab, is it usable without voice communication?			✓	
	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?			✓	
3.	Are there audible and visual fire alarm devices in the toilet rooms?			✓	
4.	Are corridor access doors wheelchair-accessible (at least 32 inches wide)?			✓	
5.	Are public restrooms large enough to accommodate a wheelchair turnaround (60" turning diameter)?			✓	
6.	In unisex toilet rooms, are there safety alarms with pull cords?			✓	

EMG Abbreviated Accessibility Checklist					
	Restrooms (cont.)	Yes	No	N/A	Comments
7.	Are stall doors wheelchair accessible (at least 32" wide)?			✓	
8.	Are grab bars provided in toilet stalls?			✓	
9.	Are sinks provided with clearance for a wheelchair to roll under (29" clearance)?			✓	
10.	Are sink handles operable with one hand without grasping, pinching or twisting?			✓	
11.	Are exposed pipes under sink sufficiently insulated against contact?			✓	
12.	Are soap dispensers, towel, etc. reachable (48" from floor for frontal approach, 54" for side approach)?			✓	
13.	Is the base of the mirror no more than 40" from the floor?			✓	

**APPENDIX E:
PRE SURVEY QUESTIONNAIRES AND
DOCUMENTATION REQUEST CHECKLIST**

PROPERTY CONDITION ASSESSMENT : PRE-SURVEY QUESTIONNAIRE

This questionnaire should be completed by someone knowledgeable about the subject property. *The completed form should 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: _____

Pete Brown

Association with property: _____

Length of association with property: _____

Date Completed: _____

Phone Number: _____

Building Name: _____

F&S

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

	INSPECTIONS	DATE LAST INSPECTED	LIST ANY OUTSTANDING REPAIRS REQUIRED
1	Elevators	0	
2	HVAC, Mechanical, Electric, Plumbing	NEW	
3	Life-Safety/Fire		sprinkler - August extinguishers - January fire alarm - March
4	Roofs	NEW	
QUESTION		RESPONSE	
5	List any major capital improvement within the last three years.	roof, HVAC, boiler, insulation	
6	List any major capital expenditures planned for the next year.		
7	What is the age of the roof(s)?	NEW	

8	What building systems (HVAC, roof, interior/exterior finishes, paving, etc.) are the responsibilities of contractors to replace?	All
---	--	-----

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

QUESTION		RESPONSE				COMMENTS
		Y	N	NA	Unk	
9	Are there any unresolved building, or fire 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	X			STORMWATER is
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				
19	Are there any poorly insulated areas?	X				walls
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			

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

QUESTION		RESPONSE				COMMENTS
		Y	N	NA	Unk	
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			SPIDERS
25	Do any of the HVAC systems use R-11, 12, or 22 refrigerants?					?
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				tested
29	Is polybutylene piping used?				X	
30	Are there any plumbing leaks or water pressure problems?	X				domestic water feed
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 any Commercial units have less than 200-Amp service?		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				
38	Have any ADA improvements been made to the property?		X			
39	Does a Barrier Removal Plan exist for the property?		X			

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

QUESTION		RESPONSE				COMMENTS
		Y	N	NA	Unk	
40	Has the Barrier Removal Plan been approved by an arms-length third party?		X			
41	Have there been any ADA or Section 504 related complaints?				X	
42	Does elevator equipment require upgrades to meet ADA standards?			X		
43	Are there any problems with exterior lighting?	X				
44	Are there any other significant issues/hazards with the property?		X			
45	Are there any unresolved construction defects at the property?		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

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 & 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.

Energy Audit 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 provided on or before 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 report.

Name of Institution:		
Name of Building:	PS#5	Building #:

Unk = Unknown, NA = Not Applicable	Yes	No	NA	Unk	Comments
1. Are the plumbing fixtures Low Flow (Below 2.0GPM, 1.6GPF)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2. Are there any vacant buildings or significant building areas?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3. Do tenants pay for utilities at leased properties?					
4. Does the owner pay for exterior site lighting electricity?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Site Information					
Primary Heating System & Fuel?	993				
Secondary Heating System & Fuel?	electric				
Primary Cooling System & Capacity?	1991				
Year of Construction?	13				
No. of Stories?	Floors.				
Total Site Area?	Acres				
Total Building Area?	Sqft				
Area Heated (%)	100				
Area Cooled (%)	100				
Total Conditioned Area (%)	60				
	Elec.	Natural Gas	Propane	No.2 Oil	Dist. Steam
Primary Heating Fuel?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Secondary Heating Fuel?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Domestic Water Heater Fuel?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		

Building Occupancy/Schedule		
Facility Occupancy (avg. people ea. day)	2	
After Hours Facility Occupancy (avg. people ea. day)	2	
Standard Building Occupancy Timing	24/7 : AM/PM - : AM/PM	
Maintenance Staff Hours	24/7 : AM/PM - : AM/PM	
	Hours open to Public	Hours open to Staff
Monday	: AM/PM - : AM/PM	: AM/PM - : AM/PM
Tuesday	: AM/PM - : AM/PM	: AM/PM - : AM/PM
Wednesday	: AM/PM - : AM/PM	: AM/PM - : AM/PM
Thursday	: AM/PM - : AM/PM	: AM/PM - : AM/PM
Friday	: AM/PM - : AM/PM	: AM/PM - : AM/PM
Saturday	: AM/PM - : AM/PM	: AM/PM - : AM/PM
Sunday	: AM/PM - : AM/PM	: AM/PM - : AM/PM
Number of Months the Facility Operates in a Year?	12 Months	
Estimated Percentage of Male Staff and Guests (%)	100 %	



Energy Audit Pre-Survey Questionnaire

Building Structure							Additional Comments?
		Y/N		Y/N		Y/N	
Roof Type:	Pitched?	X	Flat		Both		
Attic Insulation:	Batt		Cellulose	X	Fiberglass		
Window Frame:	Wooden		Vinyl		Metal	X	
Window Glazing:	Single		Double	X	Triple		
Structure	Wooden	X	Metal	X	Conc.		BRICK

Building Lighting			
Type of Linear Fluorescent Lamps? (T8/T12)	T8	Exterior Lighting Control (Timer/Photocell)	YES
Type of Common Lamps? (Incan/CFLs)	LED	Exterior Light Timing	12 Hr
Lighting Sensors? (Y/N)	X	EXIT Lights (Incan/Fluor/LED)	

Other Systems			
	Qty	Selection	Additional Comments?
# of Elevators	0	Hydraulic/Traction	
# of Electric Meters	1	Master/Sub	
# of Nat. Gas Meters	1	Resi/Commercial/Indust.	
# of Water Meters	1		
# of Backup Generator	1	Generator Fuel?	gas

Issues or Concerns That EMG Should Know About?	
1.	RAMP
2.	
3.	

Items Provided to EMG Auditors				
	Yes	No	N/A	Additional Comments?
Access to All Mechanical Spaces	X			
Access to Roof/Attic Space	X			
Access to Building As-Built Drawings				
Access to last 12/24 Months Utility Data	X			
Access to last 12/24 Month Water & Sewer Bills				

REQUEST FOR DOCUMENTATION

On the day of the site visit, provide EMG's Field Observer the documents listed below. Signify which documents will be copied, available for review at the site, not available, or not applicable by placing a check mark in the appropriate columns. Also provide this completed checklist.

		Copies Provided	Reviewed at Site	Not Available	Not Applicable
1	Maintenance Contractor List. Provide the company name, phone number, and contact person of all maintenance contractors who serve the property, such as mechanical contractors, roof contractors, fire sprinkler and fire alarm testing contractors, and elevator contractors.	✓			
2	Construction Documents (Blueprints). Provide all available construction documents for the original construction of the building or for any tenant improvement work or other recent construction work.			✓	
3	Site plan. Provide a site plan, preferably 8 1/2" X 11", which depicts the arrangement of buildings, roads, parking stalls, and other site features.			✓	
4	Certificates of Occupancy and original Building Permits.			✓	
5	Tenant List. 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).			✓	
6	Apartment Unit Summary. For apartment properties, provide a summary of the apartment unit types and quantities, including the floor area of each apartment unit as measured in square feet.			✓	
7	Hotel & Nursing Home Room Summary. For hotel or nursing home properties, provide a summary of the room types and room type quantities, including the floor area of each room type.			✓	
8	Occupancy Percentage. Provide the current occupancy percentage and typical turnover rate records (for commercial and apartment properties).			✓	
9	Inspection Documents and Certificates. Fire, building, and health department inspection reports and elevator inspection certificates.			✓	
10	Warranties. Roof and HVAC warranties, or any other similar relevant documents.			✓	
11	Utility Companies. The names of the local utility companies which serve the property, including the water, sewer, electric, gas, and phone companies.			✓	
12	Capital Improvement Summary. A summary of recent (over the last 5 years) capital improvement work which describes the scope of the work and the cost of the improvements.			✓	
13	Proposed Improvements. Pending contracts or proposals for future improvements.			✓	
14	Historical Costs. Costs for repairs, improvements, and replacements.			✓	
15	Records. Records of system & material ages (roof, MEP, paving, finishes, furnishings).			✓	
16	Brochures or Marketing Information.			✓	
17	Appraisal, either current or previously prepared.			✓	
18	Previous reports pertaining to the physical condition of property.			✓	
19	ADA survey and status of improvements implemented.			✓	
20	Litigation. Current / pending litigation related to property condition.			✓	

**APPENDIX F:
TERMINOLOGY**

The following are definitions of terms utilized in this report.

TERMINOLOGY	
Actual Knowledge	Information or observations known first hand by EMG.
ADA	The Americans with Disabilities Act
Ancillary Structures	Structures that are not the primary improvements of the Property but which may have been constructed to provide support uses.
Appropriate Inquiry	A requests for information from appropriate entity conducted by a Freedom of Information Letter (FOIL), verbal request, or by written request made either by fax, electronic mail, or mail. A good-faith one time effort conducted to obtain the information in light of the time constraints to deliver the FCA.
ASTM	American Society for Testing and Materials
Base Building	That portion of the building (common area) and its systems that are not typically subject to improvements to suit tenant requirements.
Baseline	A minimum scope level of observation, inquiry, research, documentation review, and cost estimating for conducting a Facility Condition Assessment as normally conducted by EMG.
BOMA	Building Owners & Managers Association
Building	Referring to the primary building or buildings on the Property, which are within the scope of the FCA as defined under Section 2.
Building Codes	A compilation of rules adopted by the municipal, county and/or state governments having jurisdiction over the Property that govern the property's design &/or construction of buildings.
Building Department Records	Information concerning the Property's compliance with applicable Building, Fire and Zoning Codes that is readily available for use by EMG within the time frame required for production of the Facility Condition Assessment.
Building Systems	Interacting or interdependent components that comprise a building such as structural, roofing, side wall, plumbing, HVAC, water, sanitary sewer and electrical systems.
BUR	Built Up Roof
Client	The entity identified on the cover of this document as the Client.
Commercial Real Estate	Real property used for industrial, retail, office, agricultural, other commercial, medical, or educational purposes, and property used for residential purposes that has more than four (4) residential dwelling units.
Commercial Real Estate Transaction	The transfer of either a mortgage, lease, or deed; the re-financing of a commercial property by an existing mortgagee; or the transferring of an equity interest in commercial property.
Component	A piece of equipment or element in its entirety that is part of a system.
Consultant	The entity or individual that prepares the Facility Condition Assessment and that is responsible for the observance of, and reporting on the physical condition of Commercial Property.
Dangerous or Adverse Conditions	Situations which may pose a threat or possible injury to the Project Manager, or those situations which may require the use of special protective clothing, safety equipment, access equipment, or any precautionary measures.
Deferred Maintenance	Deficiencies that result from postponed maintenance, or repairs that have been put off until a later time and that require repair or replacement to an acceptable condition relative to the age of the system or property.
Dismantle	To take apart; disassemble; tear down any component, device or piece of equipment that is bolted, screwed, secured, or fastened by other means.
DWV	Drainage Waste Ventilation

TERMINOLOGY	
EIFS	Exterior Insulation and Finish System
EMS	Energy Management System
Engineering	Analysis or design work requiring extensive formal education, preparation and experience in the use of mathematics, chemistry, physics, and the engineering sciences as provided by a Professional Engineer licensed to practice engineering by any state of the 50 states.
Expected Useful Life (EUL)	The average amount of time in years that a system or component is estimated to function when installed new.
FEMA	Federal Emergency Management Agency
FFHA	Federal Fair Housing Act
Fire Department Records	Information generated or acquired by the Fire Department having jurisdiction over the Property, and that is readily available to EMG within the time frame required for production of the FCA.
FIRM	Flood Insurance Rate Maps
FM	Factory Mutual
FOIA	U.S. Freedom of Information Act (5 USC 552 et seq.)
FOIL	Freedom of Information Letter
FRT	Fire Retardant Treated
Guide	A series of options or instructions that do not recommend a specific course of action.
His	Referring to either a male or female Project Manager, or individuals interviewed by the Project Manager.
HVAC	Heating, Ventilating & Air-conditioning
IAQ	Indoor Air Quality
Immediate Repairs	Physical deficiencies that require immediate action as a result of: (i) existing or potentially material unsafe conditions, (ii) significant negative conditions impacting tenancy/marketability, (iii) material building code violations, or (iv) poor or deteriorated condition of critical element or system, or (v) a condition that if left "as is", with an extensive delay in addressing same, has the potential to result in or contribute to critical element or system failure within one (1) year.
Interviews	Interrogatory with those knowledgeable about the Property.
Material	Having significant importance or great consequence to the asset's intended use or physical condition.
MEP	Mechanical, Electrical, and Plumbing
NFPA	National Fire Protection Association
Observations	The results of the Project Manager's Walk-through Survey.
Observe	The act of conducting a visual, unaided survey of items, systems or conditions that are readily accessible and easily visible on a given day as a result of the Project Manager's walk-through.
Obvious	That which is plain or evident; a condition that is readily accessible and can be easily seen by the Project Manager as a result of his Walk-through without the removal of materials, moving of chattel, or the aid of any instrument, device, or equipment.
Owner	The entity holding the deed to the Property that is the subject of the FCA.
FCA	Facility Condition Assessment, the Purpose and Scope of which is defined in Section 2. of this report.

TERMINOLOGY	
Physical Deficiency	<p>Patent, conspicuous defects, or significant deferred maintenance of the Property's material systems, components, or equipment as observed during the Project Manager's Walk-through Survey.</p> <p>Material systems, components, or equipment that are approaching, have realized, or have exceeded their typical Expected Useful Life (EUL); or, that have exceeded their useful life result of abuse, excessive wear and tear, exposure to the elements, or lack of proper or adequate maintenance.</p> <p>This definition specifically excludes deficiencies that may be remedied with routine maintenance, miscellaneous repairs, normal operating maintenance, and conditions that do not present a material deficiency to the Property.</p>
PML	Probable Maximum Loss
Practically Reviewable	Information that is practically reviewable means that the information is provided by the source in a manner and form that, upon examination, yields information relevant to the property without the need for extraordinary analysis of irrelevant data.
Practice	A definitive procedure for performing one or more specific operations or functions that does not produce a test result.
Primary Improvements	The site and building improvements that are of fundamental importance with respect to the Property.
Project Manager	The individual Professional Engineer or Registered Architect having a general, well rounded knowledge of all pertinent site and building systems and components that conducts the on site visit and walk-through observation.
Property	The site and building improvements, which are specifically within the scope of the FCA to be prepared in accordance with the agreement between the Client and EMG.
Readily Accessible	Those areas of the Property that are promptly made available for observation by the Project Manager without the removal of materials or chattel, or the aid of any instrument, device, or equipment at the time of the Walk-through Survey.
Reasonably Ascertainable	Information that is publicly available, provided to EMG's offices from either its source or an information research/retrieval concern, practically reviewable, and available at a nominal cost for either retrieval, reproduction or forwarding.
Recreational Facilities	Spas, saunas, steam baths, swimming pools, tennis courts, playground equipment, and other exercise, entertainment, or athletic facilities.
Remaining Useful Life (RUL)	<p>The consultant's professional opinion of the number of years before a system or component will require replacement or reconditioning. The estimate is based upon observation, available maintenance records, and accepted EUL's for similar items or systems.</p> <p>Incident weather, exposure to the elements, demand on the system, quality of installation, extent of use, and the degree and quality of preventive maintenance exercised are all factors that could impact the RUL of a system or component. As a result, a system or component may have an effective age greater or less than its actual age. The RUL may be greater or less than its Expected Useful Life (EUL) less actual age.</p>
Replacement Costs	Costs to replace the system or component "in kind" based on Invoices or Bid Documents provided by the current owner or the client, construction costs developed by construction resources such as <i>Means</i> and <i>Dodge</i> , EMG's experience with past costs for similar properties, or the current owner's historical incurred costs.
Replacement Reserves	Major recurring probable expenditures, which are neither commonly classified as an operation or maintenance expense. Replacement Reserves are reasonably predictable both in terms of frequency and cost. However, they may also include components or systems that have an indeterminable life but nonetheless have a potential liability for failure within the reserve term.
RTU	Rooftop Unit

TERMINOLOGY	
RUL	Remaining Useful Life (See definition)
Short Term Repair Costs	Opinions of Costs to remedy Physical Deficiencies, such as deferred maintenance, that may not warrant immediate attention, but requiring repairs or replacements that should be undertaken on a priority basis, taking precedence over routine preventive maintenance work within a zero to one year time frame. Included are such Physical Deficiencies resulting from improper design, faulty installation and/or substandard quality of original system or materials. Components or systems that have realized or exceeded their Expected Useful Life (EUL) that may require replacement to be implemented within zero to one-year time frame are also included.
Shut-Down	Equipment or systems that are not operating at the time of the Project Manager's Walk-through Survey. Equipment or systems may be considered shutdown if it is not in operation as a result of seasonal temperatures.
Significant	Important, material, and/or serious.
Site Visit	The visit to the property by EMG's Project Manager including walk-through visual observations of the Property, interviews of available project personnel and tenants (if appropriate), review of available documents and interviews of available municipal personnel at municipal offices, all in accordance with the agreement for the Facility Condition Assessment.
Specialty Consultants	Practitioners in the fields of engineering, architecture; or, building system mechanics, specialized service personnel or other specialized individuals that have experience in the maintenance and repair of a particular building component, equipment, or system that have acquired detailed, specialized knowledge in the design, assessment, operation, repair, or installation of the particular component, equipment, or system.
Structural Component	A component of the building, which supports non-variable forces or weights (dead loads) and variable forces or weights (live loads).
Suggested Remedy	A preliminary opinion as to a course of action to remedy or repair a physical deficiency. There may be alternate methods that may be more commensurate with the Client's requirements. Further investigation might make other schemes more appropriate or the suggested remedy unworkable. The suggested remedy may be to conduct further research or testing, or to employ Specialty Consultants to gain a better understanding of the cause, extent of a deficiency (whether observed or highly probable), and the appropriate remedy.
Survey	Observations as the result of a walk-through scan or reconnaissance to obtain information by EMG of the Property's readily accessible and easily visible components or systems.
System	A combination of interacting or interdependent components assembled to carry out one or more functions.
Technically Exhaustive	The use of measurements, instruments, testing, calculations, exploratory probing or discover, and/or other means to discover and/or troubleshoot Physical Deficiencies, develop scientific or Engineering findings, conclusions, and recommendations. Such efforts are not part of this report unless specifically called for under Section 2.2.
Term	Reserve Term: The number of years that Replacement Reserves are projected for as specified in the Replacement Reserves Cost Estimate.
Timely Access	Entry provided to the Project Manager at the time of his site visit.
UST	Underground Storage Tank

TERMINOLOGY

Walk-through Survey	The Project Manager's site visit of the Property consisting of his visual reconnaissance and scan of readily accessible and easily visible components and systems. This definition connotes that such a survey should not be considered in depth, and is to be conducted without the aid of special protective clothing, exploratory probing, removal of materials, testing, or the use of special equipment such as ladders, scaffolding, binoculars, moisture meters, air flow meters, or metering/testing equipment or devices of any kind. It is literally the Project Manager's walk of the Property and observations.
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**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) Investment 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 thousand 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 thousand 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 (CO₂). 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**

UIC		Replace Existing Dishwashers With High Efficiency Dishwashers	
EAA3		Details: Use Energy Star equipment	
Number of Dishwashers To Be Replaced	<input type="text" value="1"/> Qty	Enter Estimated Loads/ Week / Washer	<input type="text" value="7"/> Qty
Existing			
Select Type of Existing Model	<input type="text" value="Typical 2000 Model"/> (Select)		
Estimated Annual kWh Consumption / Unit:	<input type="text" value="434"/> (Kwh)		
Estimated Annual Hot Water Consumption/ Unit:	<input type="text" value="3,094"/> (Gal)		
Proposed Energy Star Qualified Dishwasher			
Estimated Annual kWh Consumption of Proposed Machine:	<input type="text" value="231"/> (Kwh)		
Estimated Annual Hot Water Consumption of Proposed Machine:	<input type="text" value="1,820"/> (Gal)		
Energy, Water & Cost Saving			
Water Savings			
Annual Hot Water Savings Per Unit	<input type="text" value="1,274"/> Gal	Total Annual Hot Water Savings:	<input type="text" value="1.27"/> Kgal
Current Water Tariff	<input type="text" value="\$6.58"/> \$/Kgal	Total Annual Water Cost Savings	<input type="text" value="\$8.38"/> \$\$
Energy Savings			
Annual Kwh Savings Per Unit	<input type="text" value="203"/> kWh	Total Annual Kwh Savings	<input type="text" value="203"/> kWh
Current Electrical Tariff	<input type="text" value="\$0.17"/> \$/kWh	Total Annual Electric Cost Savings	<input type="text" value="\$34.08"/> \$\$
Hot Water Based Energy Savings			
Select Type of Hot Water Heating Fuel	<input type="text" value="Natural Gas"/>	Energy Factor of DWH:	<input type="text" value="0.54"/> EF
Cost of Heating Fuel (\$\$/Unit)	<input type="text" value="\$1.26"/> \$/Therm	Hot Water Supply Temperature <small>(140F in Most Cases)</small>	<input type="text" value="125.00"/> F
Energy Savings From Hot Water	<input type="text" value="1,208"/> kBtu	Energy Savings From Hot Water	<input type="text" value="12"/> Therms
Total Cost Savings From Hot Water	<input type="text" value="\$15"/> \$\$		
COST ANALYSIS			
Total Annual Cost Savings:	<input type="text" value="\$58"/> \$\$		
Total Installation Cost Including, Eco Friendly Disposal Of Existing Dishwashers (\$\$)	<input type="text" value="1"/> No. of Units	<input type="text" value="\$50.00"/> Disposal Tax	<input type="text" value="\$450"/> Unit Cost
			<input type="text" value="\$500"/> Total Cost
Simple Return on Investment	<input type="text" value="8.67"/> Yrs		
Note- Average Life of a Dishwasher is 10-15 Years			
Type of Recommendation	<input type="text" value="No/Low Cost ECM Recommendation"/>		

Disclaimer: PREPARED BY EMG, JANUARY 2014, INFORMATION CONTAINED IN THIS DOCUMENT IS PRIVILEGED AND CONFIDENTIAL "TRADE SECRET" AND IS THE SOLE PROPERTY OF EMG CORP. THIS MATERIAL MUST BE CONSIDERED PRIVILEGED AND CONFIDENTIAL BY ALL PARTIES PRIVY.

ECM DESCRIPTION:			
<p>A dishwasher built before 1994 wastes more than 10 gallons of water per cycle. A new, energy star qualified dishwasher will save, on average, 1,300 gallons of water over its lifetime. New dishwasher models consume 4.25 gallons per cycle for compact sized dishwashers for capacities of lower than 8 place settings and six serving piece and 5.8 gallons per cycle for standard sized dishwashers of higher capacity. Newer models also contain wash cycle options that provide the option of using less water with a shorter cycle for slightly soiled place settings and serving pieces. Water consumption can also be greatly reduced if dishes are scraped off and not rinsed before loading into dishwasher, dishwashers and detergents are designed to do the complete cleaning. Energy star qualified dishwashers are 10% more efficient than non-qualified models and are more efficient than models that simply meet the federal minimum standard for energy efficiency</p>			
Summary:			
Initial Investment:	\$500	Simple Payback:	8.67
Annual Cost Savings:	\$58		

UIC	Install Low Flow Shower Heads	
EAP1	Details: Replace existing shower heads with low flow types	
Total Number of Shower Heads To Be Replaced	<input type="text" value="2"/>	
No. of Shower Days/Year	<input type="text" value="100"/>	
No. of Residents	<input type="text" value="5"/>	
Estimated Time Per Shower	<input type="text" value="8.10"/>	Mins
GPM of Existing Shower Head	<input type="text" value="2.5"/>	GPM
GPM of Proposed Shower Head *	(Select) <input type="text" value="1.75"/>	GPM
<small>*Federal Law Requires all new shower heads to have a max flow rate of 2.5 GPM)</small>		
Water & Energy Savings Calculations		
Property Location in United States	<input type="text" value="Northern Localities"/>	
Select Type of Water Heater Fuel	(Select) <input type="text" value="Natural Gas"/>	
Average Hot Water Discharge Temperature	<input type="text" value="120.00"/>	°F
Annual Water Savings <small>(Assuming 1 shower/day/person for 365 days a year)</small>	<input type="text" value="3"/>	kGal
Energy Factor of Domestic Hot Water Heater:	<input type="text" value="0.93"/>	EF
Equivalent Heating Fuel Energy savings:	<input type="text" value="2,177"/>	kBtu
Cost Savings Calculations		
Equivalent Heating Fuel Savings Natural Gas	<input type="text" value="22"/>	Therms
Water Tariff (\$/1000 Gal)	<input type="text" value="\$6.58"/>	\$/kGal
Annual Cost Savings In Form of Water	<input type="text" value="\$20"/>	\$\$
Annual Energy Savings From Water Heater	<input type="text" value="\$27"/>	\$\$
Estimated Total Annual Cost Savings	<input type="text" value="\$47"/>	\$\$
Estimated Installation Costs		
Estimated Total Installation Cost	<input type="text" value="\$95"/>	\$\$
Simple Payback Period	<input type="text" value="2.00"/>	Years
Type of Recommendation	<input type="text" value="No/Low Cost ECM Recommendation"/>	

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ECM EXPLANATION:

By reducing the flow of water coming off the shower heads, savings can be generated in the form of reduced water and sewer costs. Additional savings can be realized via reduction in the demand for hot water. Currently Federal law requires all new shower heads to have a maximum flow rate of 2.5 GPM.

EMG recommends replacing the existing shower heads with new low flow shower heads as mentioned above. The proposed ECM shall also result in an annual energy saving in form of reduction in water heating bills.

Summary:

Initial Investment:	\$95	Simple Payback:	2.00
Annual Cost Savings:	\$47.33		

UIC	Install Low Flow Faucet Aerators			
EAP2	Details: In all sink and lavatory faucets			
Property Type:	<input type="text" value="Residential"/>	Estimated No. of Operational Weeks	<input type="text" value="52"/>	
No. of Occupants	<input type="text" value="5"/>	Number of Occupied Days/Week (Max 7)	<input type="text" value="7"/>	
KITCHEN FAUCETS		BATHROOM FAUCETS		
Do You Want To Replace Kitchen Faucets Aerators	<input type="text" value="Yes"/> (Select)	Do You Want To Replace Bathroom Faucets Aerators	<input type="text" value="Yes"/> (Select)	
Total Number of Faucet Aerators To Be Replaced	<input type="text" value="1"/>	Total Number of Faucet Aerators To Be Replaced	<input type="text" value="4"/>	
Total Number of Faucets To Be Replaced:	<input type="text" value="0"/>	Total Number of Faucets To Be Replaced:	<input type="text" value="0"/>	
GPM of Existing Faucet Aerators	<input type="text" value="2.2"/> GPM	GPM of Existing Faucet Aerators	<input type="text" value="2"/> GPM	
GPM of Proposed Faucet Aerator	<input type="text" value="1"/> GPM	GPM of Proposed Faucet Aerator	<input type="text" value="1"/> GPM	
Estimated Number of Uses Per Day	<input type="text" value="4"/>	Estimated Number of Uses Per Day	<input type="text" value="6"/>	
Estimated Time Per Faucet Use <small>8.1 Min/Person/day @AWWA</small>	<input type="text" value="0.49"/> Mins	Estimated Time Per Faucet Use <small>8.1 Min/Person/day @AWWA</small>	<input type="text" value="0.74"/> Mins	
Annual Water Savings From Kitchen Faucets	<input type="text" value="2.59"/> kGal	Annual Water Savings From Bathroom Faucets	<input type="text" value="4.85"/> kGal	
WATER & ENERGY SAVING CALCULATION		COST SAVING CALCULATION		
Select Type of Water Heater Fuel:	<input type="text" value="Natural Gas"/> (Select)	Property Location in United States	<input type="text" value="Northern Localities"/>	
Energy Factor of Domestic Hot Water Heater:	<input type="text" value="0.93"/> EF	Heating Fuel Tariff	<input type="text" value="\$1.26"/> \$/Therm	
Hot Water Discharge Temperature at Faucet	<input type="text" value="120.00"/> °F	Water Tariff (\$/1000 Gal)	<input type="text" value="\$6.58"/> \$/kGal	
Equivalent Heating Fuel Savings: <small>Savings Discounted by 15% to Account For Cold Water Use</small>	<input type="text" value="45"/> Therms	Annual Cost Savings In Form of Water	<input type="text" value="\$49"/> \$	
Annual Water Savings	<input type="text" value="7.44"/> kGal	Annual Energy Savings From Water Heater	<input type="text" value="\$57"/> \$	
COST BENEFIT ANALYSIS				
Estimated Total Annual Cost Savings	<input type="text" value="\$106"/> \$\$	Estimated Total Installation Cost	<input type="text" value="\$156"/> \$\$	
Simple Payback Period	<input type="text" value="1.48"/> Years	Type of Recommendation	<input type="text" value="No/Low Cost ECM Recommendation"/>	

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ECM EXPLANATION:

By reducing the flow of water coming from the restroom faucets, aerators can generate energy savings at low cost and with easy installation. The savings generated would be in the form of reduced water and sewer costs and at the same time aerators would save energy by reducing the demand for hot water. The average faucet has a flow rate of about 2 to 4 GPM. Adding a screw-in faucet aerator reduces the flow to 0.5 to 1.5 GPM in the bathroom and 2.2 GPM in the kitchen. In addition to saving energy and water, the "foamier" water that comes from faucet aerators wets objects better than water from a faucet with no aerator, which tends to bounce off the object rather than thoroughly wetting it.

EMG recommends replacing the proposed faucet aerators with new low flow aerators as mentioned above. The proposed ECM shall also result in an annual energy saving in form of reduction in water heating bills.

Summary:

Initial Investment: \$156.38 Estimated Annual Cost Savings: \$105.97 Simple Payback Period (Yrs): 1.48

UIC		Install Low Flow Restroom Flush Tank Toilets	
EAP3		Details: Replace existing with Energy Star	
EXISTING CONDITION			
Total Occupants:		20	
Number of Water Closets To Be Replaced		1	
Number of Occupied Days Per Week (Max 7)		7	
Number of Occupied Weeks/Year (Max 52)		52	
Estimated Restroom Usage/Individual/Day		4	(Select)
<small>5.05 flushes/person/day@American Water Works Association (AWWA)</small>			
PROPOSED RETROFIT/REPLACEMENT			
Water Closets With External Flush Tanks			
Existing Gallons Per Flush Ratings For Water Closet Flushes		1.60	GPF
GPF of Proposed New Low Flow Water Closet Fixture*		1.28	GPF
<small>*(Federal Law Requires All Flushes Not To Exceed 1.6 GPF)</small>			
Water & Cost Saving Calculations			
Water Savings By The Use of Low Flow Water Closet Flush Valves/Day		25.60	gal
Total Annual Water Savings in gallons		9.32	kgal
Cost Savings Calculations			
Enter Water Tariff Rate (\$/1000Gal)		\$6.58	\$\$
Estimated Cost Savings From Water		\$61	\$\$
Estimated Cost of Retrofit			
Estimated Total Cost For Retrofit**		\$649	\$\$
<small>**\$549/WC replacement</small>			
Simple Pay Back Period		10.58	Yrs
Type of Recommendation		No/Low Cost ECM Recommendation	

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ECM EXPLANATION:

The highest water utilization at any home/office occurs in the restrooms. It is estimated that on an average a normal human being uses the restroom at least four times a day. Keeping with the global water conservation objectives, federal law prohibits use of any new water closet flushes over 1.6 GPF.

Existing toilets can be retrofitted with pressure-assisted flush technology to reduce the flush rate to 1.0 GPF or less. Though water efficient these toilets make considerable amount of noise as this involves release of pressurized air during the course of flushing. Thus making them unpopular among residential properties.

Thus EMG recommends replacing the existing high flow toilets with new low flow 1.28GPF rated flush tank toilets, which are comparatively more water efficient at the same time considerably quieter as compared to the pressure assisted technology retrofitted toilets.

Summary:

Initial Investment:	\$649	Simple Payback:	10.58	Years
Annual Cost Savings:	\$61			