AKTPEERLESS

Rental Assistance Demonstration (RAD): PHYSICAL CONDITION ASSESSMENT

743-749 North Maple Road, Ann Arbor, Michigan 48103

PREPARED FOR Norstar Development USA, LP
733 Broadway
Albany, NY 12207

AND The Ann Arbor
Housing Commission
727 Miller Ave
Ann Arbor, MI 48103

PROJECT # 9698U

PIC # MI064

DATE March 17, 2015

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1.0 OVERVIEW OF RPCA

AKT Peerless Environmental & Energy Services (AKT Peerless) was commissioned by Norstar Development USA, L.P. (Client) on behalf of the Ann Arbor Housing Commission (AAHC) to conduct a Rental Assistance Demonstration (RAD) Physical Condition Assessment (PCA) on the property referred to as North Maple Duplexes located at 743-749 North Maple Road in Ann Arbor, Washtenaw County, Michigan (subject property). The RAD PCA was conducted in accordance with the Department of Housing and Urban Development (HUD) *Rental Assistance Demonstration (RAD): Physical Condition Assessment Statement of Work and Contractor Qualifications*, Version 2, December 2013.

1.1 Summary of Report

The following RAD PCA report includes the following parts:

- **Part 1: PCA Report Comparing Traditional and Green Requirements**
- **Part 2: Energy Audit**
- **Part 3: Utility Consumption Baseline**

1.2 RPCA Excel Tool

The completed RPCA Excel Tool was provided to AAHC for the North Maple Duplexes location.

1.3 Acknowledgement Sections

Following each report identified in Section 1.1 above, an acknowledgement section is included. The acknowledgement section contains the following information:

- Certification that report preparers meet the RPCA qualifications
- Acknowledgement of delivery and review of RPCA required deliverables

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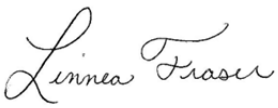
2.1 Acknowledgements of Part 1: Physical Condition Assessment Report Comparing Traditional and Green Requirements

The Physical Condition Assessment Report Comparing Traditional and Green Requirements Report and Excel RPCA Model were completed by Linnea Fraser and Deanna Hutsell of AKT Peerless. AKT Peerless certifies that the report preparers meet the qualifications identified in the RAD Physical Condition Assessment Statement of Work and Contractor Qualifications Part 1.1 (Version 2, December 2013).



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Date: March 17, 2015 .

Part 1 Report and Excel RPCA Model were Received and Reviewed by Lender / Owner:

Lori Harris
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2.0 Part 1: Physical Condition Assessment Report Comparing Traditional and Green Requirements

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Rental Assistance Demonstration (RAD): PART 1: PHYSICAL CONDITION ASSESSMENT

743-749 North Maple Road, Ann Arbor, Michigan 48103

PREPARED FOR Norstar Development USA, LP
733 Broadway
Albany, NY 12207

PROJECT # 9698U-1-196

DATE March 17, 2015

ON BEHALF OF The Ann Arbor Housing Commission
727 Miller Ave
Ann Arbor, MI 48103

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FIGURES

APPENDICES

1.0 EXECUTIVE SUMMARY

1.1 Summary of Findings

AKT Peerless Environmental & Energy Services (AKT Peerless) was commissioned by Norstar Development USA, L.P. (Client) on behalf of the Ann Arbor Housing Commission (AAHC) to conduct a Rental Assistance Demonstration (RAD) Physical Condition Assessment (PCA) on the property referred to as "North Maple Duplexes" located at 743-749 North Maple Road in Ann Arbor, Washtenaw County, Michigan (subject property).

The site visit was conducted on February 10, 2015.

This low-rise residential complex consists of two, 2-story duplex buildings, housing a total of 4,836 gross SF and 4 apartments. The buildings were constructed in 1995. There are a total of four (4) three bedroom, one bathroom units at the site.

Generally, the property appears to have adhered to relevant building codes and industry standards at the time of construction. Given the limitations of facilities staff, the property appears to be properly maintained and is in fair-to-good overall condition.

Given the nature of the property's use, AKT Peerless identified a list of "Critical Needs," as defined by the Department of Housing and Urban Development (HUD)'s RAD PCA (RPCA) guidelines.

1.2 Critical Needs Summary

The RPCA Statement of Work defines critical items to include:

1) Remedies for exigent health and safety hazards or code violations;
2) Correction of conditions that adversely affect ingress or egress;
3) Correction of conditions preventing sustaining occupancy;
4) Correction of accessibility deficiencies.

Critical repair items were not identified at the subject property.

1.3 Professional Evaluation(s) Recommended for Further Investigation

No additional evaluations are recommended at this time.

1.4 Opinions of Probable Cost

The estimates for the repair, replacement and proposed modernizations can be found in the "Cap Needs Input" tab of RPCA tool, located in Appendix A of this report.

1.5 RAD PCA Considerations and Approach

Based upon site observations, research, professional judgment, along with referencing Expected Useful Life (EUL) criteria established through Fannie Mae and other industry standards, AKT Peerless expresses an opinion as to when a system or component will most likely necessitate replacement.

Typically, for standard components with standard maintenance, the EUL table, often provided by the Lender, is used to determine a system or a component's Effective Remaining Life by deducting the age

from anticipated EUL. However, this is not done automatically. AKT Peerless evaluates components with unusually good original quality or exceptional maintenance and occasionally estimates a longer useful life. Alternatively, if a component has been poorly maintained or was of below standard original quality, the useful life may be estimated to be shorter than expected. Consequently, the evaluator applies his or her professional judgment in making a determination of the Effective Remaining Life.

After a determination has been made on a system or a component's Effective Remaining Life, it is input into the RPCA tool in the "Cap Needs Input" tab in the relevant line item. This tab directly populates corresponding tabs, which result in the outputs described throughout this report. The corresponding tabs, including (but not limited to) the 20 Year Detail, 20 Year Schedule, and Rehab Specifications, are attached to this report and can be found in Appendix A.

The evaluation period, per the RPCA tool and statement of work, is defined as 20 years.

The RPCA Statement of Work establishes five categories of repairs, replacements, maintenance items and items for improvement. AKT Peerless utilized these categories as a method for evaluating the facilities:

A) **Critical Needs**
    a. See 1.2
B) **Repair/Rehab items (Short Term Physical Needs)**
    a. The cost of repairs, replacements, and significant deferred and other maintenance items that will need to be addressed within 12 months of closing
    b. This category is not intended to include items that are not broken but may need replacement in the near future
C) **Market Comparable Improvements**
    a. The PCA contractor may include repairs or improvements (based on discussion with Lender/Owner or Lender's appraiser) that are necessary for marketability in the list of Repair/Rehab needs
    b. The repairs/improvements should be necessary for the project to retain its market position as an affordable project in a decent, safe and sanitary condition
D) **Long-term Physical Needs/Reserve Items**
    a. Major maintenance and replacement items that are required to maintain the project's physical integrity over the next twenty (20) years
E) **Reserve Costs**
    a. The Initial Deposit to the Reserve for Replacement Account based on the cost of "Near Term" replacement and major maintenance needs of the Project

2.0 INTRODUCTION

AKT Peerless Environmental & Energy Services (AKT Peerless) was commissioned by Norstar Development USA, L.P. (Client) on behalf of the Ann Arbor Housing Commission (AAHC) to conduct a Rental Assistance Demonstration (RAD) Physical Condition Assessment (PCA) on the property referred to as "North Maple Duplexes" located at 743-749 North Maple Road in Ann Arbor, Washtenaw County, Michigan (subject property).

This PCA was conducted in accordance with: (1) guidelines established by the American Society for Testing and Materials (ASTM) in the *Standard Guide for Property Condition Assessments: Baseline Property Condition Assessments* (ASTM Standard Practice E 2018-08), (2) Fannie Mae document: *Physical Needs Assessment Guidance to the Property Evaluator* (Exhibit 1), and (3) the Department of Housing and Urban Development (HUD) *Rental Assistance Demonstration (RAD): Physical Condition Assessment Statement of Work and Contractor Qualifications*, Version 2, December 2013.

2.1 Purpose

The purpose of the RAD PCA (RPCA) is to complete a PCA that meets the RAD Physical Condition Assessment Statement of Work Issued by the US Department of Housing and Urban Development (HUD) on October 2012 and updated on December 2013. This included observation and documentation of the conditions and possible defects of readily visible materials and building systems which might significantly affect the value of the property, and to evaluate if conditions exist which may have a significant impact on the continued operation of the facility. The observations, findings, and conclusions within this report are based on professional judgment and information obtained during the course of this assessment. It is understood that Client will use the information provided in this report to assist in decisions regarding the continued operation of the subject property.

2.2 Scope of Services

This RPCA was conducted in accordance with AKT Peerless' Proposal for a RPCA (Proposal Number PE-16420), dated September 11, 2014, and is based on the Statement of Work Issued by the US Department of Housing and Urban Development (HUD) in October 2012. The RPCA Statement of Work has been updated by HUD on December 2013 and AKT Peerless' scope of work will meet Version 2, December 2013. No deviations have been made from the scope of work.

This Report is based on a site visit, in which AKT Peerless performed a visual, non-intrusive and non-destructive evaluation of various external and internal building components, in addition to reviews of original and "as-built" plans and specifications for the subject property, and available information from trade physical element reports. Representative samples of the major building components were observed and physical conditions evaluated in general accordance with ASTM E2018-08. These systems include site development, building structure, building exterior and interior areas; mechanical, electrical, and plumbing systems, conveyance systems, life safety/fire protection, and general ADA compliance. Photographs were taken to provide a record of general conditions of the facility, as well as the specific deficiencies observed. The PCA report is not a building code, safety, regulatory or environmental compliance inspection.

AKT Peerless observed the interior spaces to determine their general character and condition. During the site visit we interviewed the available site personnel and/or property managers to add or confirm information. AKT Peerless reviewed available drawings or site documentation to confirm the general

character of the construction. AKT Peerless also made inquiries to the local building department, zoning department and fire department.

If any additional information is encountered concerning the facility, it should be forwarded to AKT Peerless for possible re-evaluation of the assumptions, conclusions and recommendations presented herein. The recommendations and opinions of cost provided herein are for observed deficiencies based on the understanding that the facility will continue operating in its present occupancy classification.

This Report is based on the evaluator's judgment of the physical condition of the components, their ages and their expected useful life (EUL). The conclusions presented are based upon the evaluator's professional judgment. The actual performance of individual components may vary from a reasonably expected standard and will be affected by circumstances that occur after the date of the evaluation.

The Report does not identify minor, inexpensive repairs or maintenance items which are part of the property owner's current operating budget so long as these items appear to be addressed on a regular basis. The report does identify infrequently occurring maintenance items of significant cost, such as exterior painting, deferred maintenance and repairs and replacements that normally involve major expense or outside contracting.

The following terms are used throughout the report and are defined as follows:

- **EXCELLENT:** New or like new
- **GOOD**: Average to above-average condition for the building system or material assessed, with consideration of its age, design, and geographical location.
- **FAIR**: Average condition for the building system evaluated. Satisfactory; however, some short term and/or immediate attention is required or recommended.
- **POOR**: Below average condition for the building system evaluated; requires immediate repair, significant work or replacement anticipated to return the building system or material to an acceptable condition

Unless stated otherwise in this report, the systems reviewed are considered to be in good condition and their performance appears to be satisfactory.

2.3 Limitations and Exceptions

The information obtained from external sources, to the extent it was relied upon to form AKT Peerless' opinion about the condition of the site and structures, was assumed to be complete and correct. AKT Peerless cannot be responsible for the quality and content of information from these sources. However, based on a review of readily available and reasonably ascertainable information, AKT Peerless concluded that these limitations/data gaps should not materially limit the reliability of the report and that a thorough documentation of the subject site's condition has been conducted.

Information regarding the cost schedules for any specific property feature is based on AKT Peerless' professional opinion. The precise costs associated with replacing or repairing any referenced building or property structure can vary by items including but not limited to owner selection of product or equipment, vendor, economic conditions, or competitive bidding process. AKT Peerless recommends that the client contact an entity specializing in a particular architectural or engineering discipline to develop precise material/equipment specifications and cost estimates.

2.4 User Reliance

This report was prepared solely for the benefit of Norstar, AAHC, and HUD and no other party or entity shall have any claim against AKT Peerless due to the performance or nonperformance of the services presented herein. Only Norstar, AAHC and HUD may rely upon this report for the sole purpose of obtaining financing, providing refinancing, acquisition of the subject site, lease of the subject site, or sale of the subject site. Any other parties seeking reliance upon this report must obtain AKT Peerless prior written approval. AKT Peerless specifically renounces any and all claims by parties asserting a third party beneficiary status.

3.0 APPLICABLE CODES, GUIDELINES, AND ACCESSIBILITY STANDARDS

3.1 Building and Fire Code Compliance

During this assessment, AKT Peerless conducted a review of City of Ann Arbor Building Department records available through the City's website. The review of City records did not reveal any documentation for past or open building code violations.

AKT Peerless also contacted the City of Ann Arbor Fire Department to obtain information on fire code, life safety, or environmental issues pertaining to the subject property. A response received indicated the fire department does not possess files associated with the subject property.

3.2 Americans with Disability Act (ADA) and Section 504 UFAS Compliance

The subject property is defined as a multi-family residential facility, providing “affordable” and “federally-assisted” housing. As such, there are accessibility requirements that must be adhered to for these types of facilities. Considerations include the following guidelines, standards, and/or requirements:

- The Fair Housing Act design and construction requirements
- Section 504 of the Rehabilitation Act of 1973
- The Americans with Disabilities Act of 1990

The Fair Housing Amendments Act (FHA) of 1988, prohibits discrimination in housing on the basis of race, color, religion, sex, handicap, familial status, or national origin. The Act also requires reasonable modification to dwellings, reasonable accommodation in policies or handicapped people, and the design and first construction of certain new, multi-family dwellings scheduled for first occupancy after March 13, 1991, meet certain adaptability and accessibility requirements.

Section 504 of the Rehabilitation Act of 1973 applies to all Federally assisted programs, facilities and housing and establishes accessibility standards per HUD requirements in 24 CFR Part 8, which generally follows the Uniform Federal Accessibility Standard (UFAS).

HUD regulations implementing Section 504 at 24 CFR 8.22(a) require that new construction of multifamily projects be designed and constructed to be readily accessible to and usable by persons with disabilities. Multifamily housing projects are defined at 24 CFR 8.3 as "projects containing five or more dwelling units." Both the individual units and the common areas in the building must be accessible.

Multifamily buildings that were completed and occupied after January 23, 1993 are required to fully comply with ADAAG. Existing facilities constructed prior to this date are held to a lesser standard of complying, to the extent allowed by structural feasibility and the financial resources available, or a reasonable accommodation must be made.

The subject property was first occupied in 1995; however, the multifamily complex only contains four units, two in each building. As such, it is not required to comply with provisions in Section 504/UFAS and under the FHA; however, it is possible for HUD to prescribe a higher number of accessible units if requested and upon demonstration of need.

AKT Peerless conducted a limited visual observation for ADA and accessibility compliance. Currently, the site is generally not accessible from the street to the property entrances. The two lower level units are

potentially accessible as there are no stairs to access the units, except for a concrete step that can be replaced in the future. The kitchen is accessible and the bathroom could possibly be re-worked into an accessible unit. Regardless of the number of units, these areas and facilities must be maintained and operated to comply with the Americans with Disabilities Act Accessibility Guidelines (ADAAG).

In this case, the facility's leasing office (offsite) must at least partially comply with ADA provisions, to the extent readily achievable– and appears to do so. Should the AAHC choose to pursue future accessibility upgrades (which would exceed existing requirements) and deem them financially feasible at the subject property, these improvements would likely include the following:

- Construction of a handicap accessible parking space and associated signage;
- Modifications to site pathways;
- Modifications to interior/exterior walls; and
- Moving and re-installing some interior/exterior unit doors

3.3 Floodplain

AKT Peerless reviewed a Flood Insurance Rate Map (FIRM), published by the Federal Emergency Management Agency (FEMA), to determine if the subject property is located within a 100-year flood zone. According to review of Panel 241 of 585, Community Panel 26161C0241E, dated April 3, 2012, the subject property is located in an area determined to be outside of the 500-year floodplain. A copy of the Flood Insurance Rate Map of the general project area is provided as Appendix D.

3.4 Seismic Zone

The subject site has been determined to be in Seismic Zone 1, on a scale of 0 to 4, with 0 representing the least severity, and 4 the greatest in terms of ground acceleration as compared to gravity. Zone 1 has a one in ten chance of experiencing an earthquake that will achieve a peak acceleration of one-tenth the acceleration of gravity within the next 50 years.

3.5 Environmental Concerns

AKT Peerless conducted a limited visual survey during the walk-through and no directly observed potential on-site environmental hazards were observed. No documented lead-based paint (LBP) or asbestos testing had been identified prior to conducting this PCA.

A Phase I Environmental Site Assessment was completed in September of 2014 by Environmental Consulting Solutions, LLC (ECS). One controlled recognized environmental condition (CREC) was identified at the North Maple complex (701-749 North Maple Road) involving ongoing offsite contamination/remediation. A Land Resource Use Restriction (LRUR) is encompassing the subject property. The LRUR restricts the installation of potable water wells on the subject property. Monitoring wells were located on the subject property to monitor groundwater from an abandoned extraction well. The compound of concern, 1-4 Dioxane, is not highly volatile and vapor encroachment concerns would not be applicable. ECS did not recommend further investigation.

Additionally, ECS hired Compliance Inc. to perform a radon sampling test in the subject property. Eight total radon samplers were placed in the individual units. Radon was not detected at levels above U.S. EPA's recommended action level for radon mitigation (4 pCi/l) in any of the areas tested at North Maple Duplexes.

An environmental survey and professional evaluation of the entire site was conducted by AKT Peerless. Because the subject building was not constructed prior to 1978, a LBP inspection and asbestos survey of the subject property were not completed.

AKT Peerless has completed an Environmental Concerns and the Environmental Restrictions Checklist based on a limited visual survey during the walk-through and environmental reports conducted by AKT Peerless , ECS, and Compliance Inc.

Refer to Appendix E for a copy of Form 4.4 Environmental Restrictions Checklist.

3.6 Green Building Standard(s)

AKT Peerless investigated opportunities to improve energy efficiency, maximize water efficiency, use re-used and recycled materials where practical, safeguard the indoor air quality of the property, be of less harm to the environment generally, and remove/re-use replaced materials and construction debris appropriately.

Specifically, AKT Peerless worked with the project team to utilize and reference the Enterprise Green Communities green building standard as a guideline and framework for making decisions on goal setting, areas to make green improvements, and overall implementation strategy.

The Enterprise Green Communities Criteria Checklist is referenced throughout this document.

4.0 PROPERTY DESCRIPTION

The following sections summarize the site description and physical setting of the subject property.

4.1 Subject Property Location

The subject property is located at 743-749 North Maple Road in Ann Arbor, Washtenaw County, Michigan. The subject property is owned by AAHC and is improved with two, 2-story buildings. The site area is approximately 0.43 acres. Construction of the property was completed in 1995.

Refer to Figure 1, Subject Property Location Map and Figure 2 Topographic Location Map. Photographs of the subject property and significant features are included in Appendix B.

4.2 Subject Property Characteristics

The subject property includes two, 2-story affordable housing residential apartment buildings commonly known as North Maple Duplexes. The interior of the subject property consists of four three-bedroom apartment units. The vacancy rate for this property over the period January 2014 - January 2015 was 0%.

4.3 Description of Structures and Other Improvements

General information regarding the on-site buildings (the subject buildings) is presented in the following table:

Table 4-1 Subject Buildings: North Maple Duplexes

Total Leasable Area	4,612 square feet
Structure	Standard wood frame construction
Exterior Wall	Vinyl siding and brick veneer
Roof	Asphalt shingle roofs
Foundation	Cement masonry units (block) – crawlspace
HVAC	Individual gas fired furnaces; no AC at tenant units
Electrical	None
Vertical Transportation	None

Table 4-2 Subject Buildings: Apartment Unit Types and Mix

Quantity	Type	Gross Floor Area (Square Feet)
4	3 Bedroom / 1 Bathroom	1,273

No additional structures are located on the subject property.

Table 4-3 Subject Buildings: Apartment Units Observed

Type	Units Observed
3 Bedroom / 1 Bathroom	743, 749

5.0 SITE ELEMENTS

The following sections summarize the physical conditions associated with the exterior portions of the subject property.

5.1 Topography

According to the USGS' Topographic Map of the Ann Arbor West, Michigan Quadrangle, which was published in 2011, the subject property is situated at approximately 950 feet above the National Geodetic Vertical Datum (NGVD). The subject property's topography slopes to the southeast.

5.2 Storm Water Drainage

The storm water system is managed through Washtenaw County. Storm water runoff from the roof is directed through roof drains into downspouts that feed a mixture of splash blocks, pop up drains, and underground piping connected to the municipal system. Storm water catch basins, which are also connected to the municipal system, are located within the parking lot and landscaped areas on the subject property.

Green Building Alternatives/Considerations:

#	Item	Recommended (for Study)	Already Exists	Appears Infeasible	Comments/Notes
3: Site Improvements					
1.2b	Surface Stormwater Management	X		X	Undue financial burden - Partial may be feasible

5.3 Ingress and Egress

Description:

Ingress and egress for the subject property is provided via an asphalt driveway off North Maple Road which leads to two asphalt parking pads. Each lower tenant unit has two entrances, located on the front and side of the respective building. Each upper tenant unit has one entrance off the front exterior deck. The threshold entries to each unit are elevated. Cast-in-place concrete walkways connect the front decks of the subject buildings to the sidewalk in front.

Assessment:

The existing vehicle ingress and egress location is in poor condition where the asphalt-paved parking areas exist and has signs of aging and wear. Concrete walkways throughout the property appear to be in generally good condition. The number and location of the site access points appear to be sufficient relative to the size and use of the property.

Recommendation:

Repair and maintenance of the asphalt pavement and entrance doors are discussed further in Sections 5.4 and 6.3. Please refer to the attached Capital Needs Input, 20 Year Detail, 20 Year Schedule and Rehab Specifications for additional information on condition, rehab costs and capital reserves.

Green Building Alternatives/Considerations:

#	Item	Recommended (for Study)	Already Exists	Appears Infeasible	Comments/Notes
1: Integrative Design					
1.2b	Universal Design (Substantial and Moderate Rehab only)	X		X	Undue financial burden - 10% not feasible
2: Location + Neighborhood Fabric					
2.9	Walkable Neighborhoods: Connections to Surrounding Neighborhood - Rural/Tribal/Small Towns	X	X		Explore add'l pathway(s)

5.4 Paving, Curbing, and Parking

Description:

The main access drives and parking lot consist of an asphalt paved access way off North Maple Road which leads to two asphalt parking pads. Each of the two separate parking pads appears to have room for three parking spaces. Concrete walkways connect the front decks of the subject buildings to the sidewalk in front. The date of the most recent seal coating and re-striping was unknown.

Assessment:

Overall, the asphalt drive area and parking pads appear to be in poor condition. It was also noted that the accessible path of travel requires maintenance and repair.

Recommendation:

Approximately 60% of the asphalt parking area is in need of patching and repair. Seal coating of the entire asphalt pavement area is recommended as a rehab item. In addition, capital reserves should be considered for future expansion, maintenance, and/or replacement and repair of paved areas. Please refer to the attached Capital Needs Input, 20 Year Detail, 20 Year Schedule and Rehab Specifications for additional information on condition, rehab costs and capital reserves.

Green Building Alternatives/Considerations:

#	Item	Recommended (for Study)	Already Exists	Appears Infeasible	Comments/Notes
6: Materials Beneficial to the Environment					
6.9b	Reduced Heat-island Effect: Paving	X		X	Any new areas could be high albedo

5.5 Flat Work

Description:

The pedestrian walkways associated with the subject property consist of cast-in-place concrete construction.

Assessment:

The flat work surrounding the building was observed to be in good condition.

Recommendation:

Continued maintenance of the concrete walkways around the subject property as part of normal facility operations is recommended to avoid degradation and possible trip hazards.

Green Building Alternatives/Considerations:

#	Item	Recommended (for Study)	Already Exists	Appears Infeasible	Comments/Notes
6: Materials Beneficial to the Environment					
6.9b	Reduced Heat-island Effect: Paving	X			May be possible to replace certain sidewalks w/open grid; could be financially infeasible

5.6 Landscaping and Appurtenances

Description:

Landscape features include grass and deciduous trees. Mulched areas with decorative shrubs are located near the buildings at the subject property.

Assessment:

Visual observation of the vegetation was limited by the presence of snow cover.

Recommendation:

Continued maintenance of landscaping as part of normal facility operations is also recommended. In addition, capital reserves should be considered for tree removal and future landscaping maintenance (i.e., tree trimming, landscape improvements). Please refer to the attached Capital Needs Input, 20 Year Detail, 20 Year Schedule and Rehab Specifications for additional information on condition, rehab costs and capital reserves.

Green Building Alternatives/Considerations:

#	Item	Recommended (for Study)	Already Exists	Appears Infeasible	Comments/Notes
3: Site Improvements					
3.4	Landscaping	X			Replace only those areas with site work being done (50% native)
6: Materials Beneficial to the Environment					
3.4	Recycling Storage for Multifamily Project	X			Provide permanent area for collection and storage of recyclable materials

5.7 Recreational Facilities

There are no recreational facilities associated with the property.

5.8 Utilities

Description:

The following utilities are associated with the subject property. Utilities associated with the subject property are located underground.

- Water and sanitary sewer are provided by the City of Ann Arbor.
- Enclosed storm water drains are provided by Washtenaw County.
- Electric service is provided by DTE Energy Company through below-ground lines.
- Natural gas is provided by DTE Gas Company
- Telephone service is available to the subject property through several providers.

Assessment:

All utilities appear to be adequately servicing the subject property. The main electrical disconnects are located on the exterior of the buildings, adjacent to the meters. These disconnects are locked with pad locks.

Recommendation:

It is recommended that main breakers are added to the electrical panels that are located in the tenant units. Continued maintenance of utilities associated with the subject property as part of normal facility operations is recommended.

6.0 STRUCTURAL FRAME AND BUILDING ENVELOPE

The following sections summarize the physical conditions associated with the building envelope and structural elements of the subject buildings.

6.1 Foundation

Description:

Observations of the subject property indicate the foundations of the subject buildings consists of a trench footing with cement masonry unit (CMU) foundation walls. There are also CMU piers on spread footings that support a beam in the middle of the building.

The subject buildings are equipped with crawl spaces that are accessible through floor hatches located in the utility rooms.

Assessment:

Overall, the foundations of the subject buildings appeared to be in good condition.

Recommendation:

The CMU piers should be grouted solid as specified in the original construction documents. The building foundations should be observed as routine building operations.

Green Building Alternatives/Considerations:

#	Item	Recommended (for Study)	Already Exists	Appears Infeasible	Comments/Notes
7: Healthy Living Environment					
7.14	Integrated Pest Management	X			Seal all wall, floor, joint penetrations to prevent pest entry. This should include repair of all damaged or missing vent screens to the crawl space.

6.2 Building Frame

Description:

Both buildings located on the subject property are wood-framed.

Assessment:

No evidence of structural failure or deficiencies was noted, and all framework, floors, and decks appeared to be in fair to good condition.

Recommendation:

The building exterior and interior structural supports should be observed as routine building operations for indications of frame issues. The contractor onsite may recommend additional supports.

Green Building Alternatives/Considerations:

#	Item	Recommended (for Study)	Already Exists	Appears Infeasible	Comments/Notes
6: Materials Beneficial to the Environment					
6.8	Certified, Salvaged, and Engineered Wood Products	X		X	Only minor replacements/upgrades required

6.3 Exterior (Above Grade) Walls

Description:

The exterior walls of the subject buildings consist of vinyl siding on the upper story and brick veneer on the lower story. The exterior windows are dual-paned vinyl windows and exterior doors are insulated hollow core metal doors with aluminum storm doors. Aluminum gutters and combined PVC and aluminum downspouts are used for storm water removal.

Assessment:

The vinyl siding and brick veneer generally appeared to be in fair condition. Windows appeared to be in poor condition. The majority of the window screens are torn or missing. The exterior doors were determined to be in fair condition, however at least 3 appear to be in poor condition. At least 20% of aluminum gutters and corresponding fascia appears to need repair and replacement. At least 40% of the aluminum and PVC downspouts appear to need repair and replacement.

Recommendation:

Caulk and seal openings at vinyl siding/exterior envelope is recommended as a rehab item. Replacement of 40% of the gutters and 40% of the downspouts is recommended as a rehab item. Replacement of exterior doors and frames in all of the units is recommended as a rehab item. Control air leakage through air sealing, as specified in the Energy Audit, is recommended as a rehab item. Replacement of all tenant units windows with Energy Star rated windows in each unit is recommended as a rehab item.

Prepare, prime and paint all exposed steel lintels over windows with rust preventative paint to protect lintels from further corrosion is recommended as an on-going maintenance item. In addition, capital reserves should be considered for future, cleaning and/or re-caulking of the building exteriors.

Please refer to the attached Capital Needs Input, 20 Year Detail, 20 Year Schedule and Rehab Specifications for additional information on condition, rehab costs and capital reserves.

Green Building Alternatives/Considerations:

#	Item	Recommended (for Study)	Already Exists	Appears Infeasible	Comments/Notes
5: Energy Efficiency					
5.1c	Building Performance Standard: Single family and Multi-family (three stories or fewer)	X			Must be equivalent to a Home Energy Rating System (HERS) Index score of 85
5.2	Additional Reductions in Energy Use	X			Add R-Value and increase building tightness for higher performance

6: Materials Beneficial to the Environment					
6.6	Recycled Content Material	X			Composite and Recycled Content materials available for exterior use and insulation
6.7	Regional Materials Selection	X			Should be pursued when feasible

6.4 Roofing

Description:

The roofs are gabled type, with one main gable and two small gables on the back of each building. The roofing system is asphalt shingles, and these appear to be original. The roofing system has surpassed its expected useful service life and the existing shingles show signs of deterioration; including cupping and breakdown of granular coating. This deterioration is more pronounced on the south side of the building, where it is exposed to more direct UV and heat radiation from the sun.

The interior side of the roof was observed from the attic. Roof sheathing appears to be 1/2" oriented strand board (OSB) and determined to be in fair condition.

The roofs slope to aluminum gutters affixed to the buildings as part of the aluminum covered facia and soffit assembly.

Assessment:

The asphalt shingle roof system has surpassed its expected useful service life.

Recommendation:

Re-roof existing roofing system is recommended as a rehab item. Please refer to the attached Capital Needs Input, 20 Year Detail, 20 Year Schedule and Rehab Specifications for additional information on condition, rehab costs and capital reserves.

Green Building Alternatives/Considerations:

#	Item	Recommended (for Study)	Already Exists	Appears Infeasible	Comments/Notes
5: Energy Efficiency					
5.1c	Building Performance Standard: Single family and Multi-family (three stories or fewer)	X			Must be equivalent to a Home Energy Rating System (HERS) Index score of 85
5.2	Additional Reductions in Energy Use	X			Add R-Value and increase building tightness for higher performance
6: Materials Beneficial to the Environment					
6.6	Recycled Content Material	X			Composite and Recycled Content materials available for exterior use and insulation
6.7	Regional Material Selection	X			Should be pursued when feasible

6.5 Exterior and Interior Stairs

There are no interior stairs at the subject property.

Exterior stairs are considered part of the deck and covered in the next section.

6.6 Patio, Terrace, and Balcony

Description:

Each lower unit contains a cast-in-place concrete patio at the front entrance of the unit. Each upper unit contains a wood stairway and wood deck at the front entrance of the unit.

Assessment:

The concrete patio areas are in fair condition. The pressure treated wood decks are in fair to poor condition. The railings and balusters are painted, and the paint has deteriorated, the hand rail surfaces are weathered and rough to the touch. Railings show lateral play (looseness) in some areas.

Recommendation:

Repair or replace any hardware components contributing to lose railings with excessive lateral play, and brace as required. Prepare, sand, and paint all railing and baluster components. Please refer to the attached Capital Needs Input, 20 Year Detail, 20 Year Schedule and Rehab Specifications for additional information on condition, rehab costs and capital reserves.

Green Building Alternatives/Considerations:

#	Item	Recommended (for Study)	Already Exists	Appears Infeasible	Comments/Notes
6: Materials Beneficial to the Environment					
6.1	Low/No VOC Paints and Primers	X			When stairs are refinished, use low/no VOC paints and stains
6.7	Regional Material Selection	X			Should be pursued when feasible
6.8	Certified, Salvaged, and Engineered Wood Products	X			At time of replacement

7.0 INTERIOR ELEMENTS

The following sections summarize the physical conditions associated with the interior of the subject building.

7.1 Unit Types and Unit Mix/Building Area

Description:

North Maple Duplexes has 4 three-bedroom, one bathroom apartments. None of the four dwelling units have been renovated for handicap accessibility. All four dwelling units were occupied as of the date of the site inspection.

Interior finishes vinyl/composite material in bathtub surround areas, wood trim, 4-inch vinyl cove base, one-foot by one-foot resilient VCT floor tiles in the kitchens, ceramic floor tile or VCT in the bathrooms, and carpet. Vinyl dual-paned windows were present throughout the dwelling units.

According to site representatives, interior renovations have occurred in units when they are turned over including flooring replacement, painting, and closet door replacement in some situations.

Each unit contains a series of appliances including:

- a refrigerator
- a gas range and oven
- an under-sink garbage disposal

The individual units also have kitchen cabinetry, which primarily consists of wood veneer and laminate counter tops, and bathrooms are fitted with vanity and medicine cabinets. Kitchen sinks are stainless steel, bathroom fixtures are generally enamel coated steel or porcelain. Bathroom and kitchen flooring includes resilient floor tiles or ceramic tile. The walls of the tub stalls are covered with a vinyl material.

Each individual tenant unit is fitted with insulated hollow metal entry doors. Closet doors and interior doors are solid core wood and generally have a painted finish.

Assessment:

The entry doors, interior doors, closets, range hoods, sinks, refrigerators, ranges, and medicine cabinets were observed to be in generally fair condition. Most of the windows, bathroom exhaust fans, cabinets, and countertops, although functional, are at or beyond their EUL and show wear and tear due to use and age.

The painted surfaces in the units need repainting and the majority need updating.

Recommendation:

Replacement or repair of the following items is recommended as an immediate cost:

- Replace existing bathroom exhaust fans with high-efficiency exhaust fans in each unit
- Tenant Unit Cabinets - Wall and Base in each unit
- Counter Tops, Sinks + plumbing attachments in each unit
- Kitchen floor covering (749)

- Range Hood - recirculating (745,747,749)
- Removal of garbage disposal in each unit
- Bath Counter Tops and Sinks in each unit
- Bath Vanities in each unit
- Interior Solid Core Doors (745,747,749)
- Living Area Resilient Floor Tile (749)
- Prep and paint surfaces (745, 747, 749)
- Bedroom Resilient Floor Tile (749)
- Laundry Room Floorcovering - (747, 749), 58 SF each
- Hardware and track replacement for 15 bi-fold closet doors
- Additional insulation in each top tenant unit attics
- Integrate a pest management policy

Continued maintenance of finishes and fixtures in dwelling units is recommended. In addition, capital reserves are included for future maintenance and/or replacement of remaining finishes and fixtures. Please refer to the attached Capital Needs Input, 20 Year Detail, 20 Year Schedule and Rehab Specifications for additional information on condition, rehab costs and capital reserves.

Green Building Alternatives/Considerations:

#	Item	Recommended (for Study)	Already Exists	Appears Infeasible	Comments/Notes
5: Energy Efficiency					
5.4	ENERGY STAR Appliances	X			For all applicable appliances
6: Materials Beneficial to the Environment					
6.1	Low/No VOC Paints and Primers	X			On all paintable surfaces
6.2	Low/No VOC Adhesives and Sealants	X			Should be pursued when feasible
6.6	Recycled Content Material	X			Composite and Recycled Content materials available for many interior components - cost may limit product selection
6.7	Regional Material Selection	X			Should be pursued when feasible
6.8	Certified, Salvaged, and Engineered Wood Products	X			Applicable to Kitchen and Bath improvements and replacements
7: Healthy Living Environment					
7.1	Composite Wood Products that Emit Low/No Formaldehyde	X			Applicable to Kitchen and Bath improvements and replacements
7.2	Environmentally Preferable Flooring	X			Strategic/limited use of carpet
7.3	Environmentally Preferable Flooring: Alternative Sources	X		X	Non-vinyl, non-carpet floor coverings on all floors - may be cost prohibitive and difficult for sound control
7.9b	Mold Prevention: Surfaces	X			Use materials w/durable, cleanable surfaces in Kitchens and Bathrooms
7.9c	Mold Prevention: Tub and Shower Enclosures	X			Use moisture resistant drywall (non-paper faced)

7.2 Common Areas

There are no interior common areas associated with the subject property.

8.0 MECHANICAL, PLUMBING AND ELECTRICAL SYSTEMS

The following sections summarize the physical conditions associated with the mechanical and electrical systems at the subject building.

8.1 Plumbing

Description:

Potable water supply piping is copper, while drainage appears to be PVC and/or cast iron. Piping associated with the subject buildings was installed during construction in 1995.

Domestic hot water is supplied by individual, gas-fired, 40-gallon, hot water tanks located in the mechanical rooms of the tenant units. These tanks have been replaced as necessary from approximately the mid-2000s to present, and replacements are typically power vent models.

Individual tenant units have porcelain toilets, sinks, and tubs. Tub surrounds are vinyl. Kitchen fixtures include stainless steel sinks. The faucet fixtures are generally chrome plated steel.

Assessment:

The plumbing system is operational, with sufficient water pressure at the time of inspection.

No evidence of significantly obsolete equipment, evidence of leaking or deteriorated piping or sewage backup problems was noted or reported. No evidence of polybutylene, ABS, or lead supply piping was observed.

As stated previously, none of the units have had accessibility upgrades. Should the AAHC deem them financially feasible and choose to pursue future accessibility upgrades (which would exceed existing requirements) at the subject property, these improvements would likely include bathroom accessibility upgrades (i.e. pipe insulation, call buttons, etc.) to provide a barrier free environment.

Recommendation:

Replacement or repair of the following items is recommended as rehab items:

- Insulation of hot water lines
- Replace toilets to low flow units in each unit

Upon upgrade, continued maintenance of plumbing systems is recommended. Clean and re-caulk tub surrounds is recommended as immediate and on-going maintenance.

Green Building Alternatives/Considerations:

#	Item	Recommended (for Study)	Already Exists	Appears Infeasible	Comments/Notes
4: Water Conservation					
4.1	Water-Conserving Fixtures	X	X		Use low flow Toilets, Showerheads, Kitchen and Bathroom faucets
4.2	Advanced Water-Conserving Appliances and Fixtures	X			Should be pursued when feasible; flow rates more aggressive
4.3	Water Reuse	X		X	Treatment on site would create undue financial burden at this location
5: Energy Efficiency					
5.7b	Photovoltaic/Solar Hot Water Ready	X		X	Site, building orientation and decentralized system design may prohibit use of solar thermal
7: Healthy Living Environment					
7.8	Combustion Equipment	X			Specify power-vented or direct vent
7.9b	Mold Prevention: Water Heaters	X	X		Adequate drainage; may require replacement of floor drains

8.2 Heating

Description:

Each apartment is equipped with a natural gas-fired furnace, located in the laundry / mechanical room each unit. The majority of these furnaces (3 of the 4) were installed in 2011, and have an input capacity of 45 kBtu/hr and a 90% efficiency rating. The multi-stage furnace in unit #749 was installed in 2010, and has an input capacity of 66 kBtu/hr and a 90% efficiency rating. Heated supply air is generated from the furnace and distributed through insulated ducts located in the attic for upper units and in the crawl space for lower units. Each furnace is controlled by a non-programmable thermostat.

Fresh air appears to be supplied by operable windows and natural infiltration. Mechanical exhaust is limited to the bathrooms, with overhead exhaust fans ducted to the outside.

Assessment:

The furnace units reportedly operate normally; however, they are standard efficiency units.

Recommendation:

The following is recommended as a rehab item:

- Identify and close/seal abandoned exhaust vents at each building
- Install programmable thermostats to allow for night setbacks.

In the future, new units installed should comply with Air Conditioning Contractors of America (ACCA) Manual J sizing requirements. Please refer to the Energy Audit for more detail regarding the ground

source heat pump analysis and completed ACCA Manual J calculations. Please refer to the attached Capital Needs Input, 20 Year Detail, 20 Year Schedule and Rehab Specifications for additional information on condition, rehab costs and capital reserves

Green Building Alternatives/Considerations:

#	Item	Recommended (for Study)	Already Exists	Appears Infeasible	Comments/Notes
5: Energy Efficiency					
5.1c	Building Performance Standard: Single family and Multifamily (three stories or fewer)	X			Must be equivalent to a Home Energy Rating System (HERS) Index score of 85 - high efficiency furnaces
5.2	Additional Reductions in Energy Use	X			Install high efficiency heating equipment - 95% or better AFUE
5.3	Sizing of Heating and Cooling Equipment	X			Size equipment to ACCA Manual J
7: Healthy Living Environment					
7.8	Combustion Equipment	X			Specify power-vented or direct vent

8.3 Air Conditioning and Ventilation

Description:

Central air conditioning is not provided to the subject buildings. Several units have at least one air window air-conditioning unit and the residents supply the window air-conditioning units.

Assessment:

Many of the AAHC commission residents are disabled and elderly or have health issues that are exacerbated by hot and humid weather.

The Great Lakes Adaptation Assessment for Cities estimates that the number hot days reaching 90 degrees or more in Southeast Michigan will increase to 30-50 days per year due to global climate changes.

Therefore, the AAHC wants to ensure each unit has air conditioning.

Recommendation:

Installing a high-efficiency conventional split-system for cooling is recommended. This will meet the needs of the AAHC and residents. In addition, replacement of manual thermostats with energy management thermostats is recommended.

New units installed should comply with Air Conditioning Contractors of America (ACCA) Manual J sizing requirements. Please refer to the Energy Audit for more detail regarding the ground source heat pump analysis and completed ACCA Manual J calculations. Please refer to the attached Capital Needs Input, 20 Year Detail, 20 Year Schedule and Rehab Specifications for additional information on condition, rehab costs and capital reserves.

Green Building Alternatives/Considerations:

#	Item	Recommended (for Study)	Already Exists	Appears Infeasible	Comments/Notes
5: Energy Efficiency					
5.1c	Building Performance Standard: Single family and Multifamily (three stories or fewer)	X			Must be equivalent to a Home Energy Rating System (HERS) Index score of 85
5.2	Additional Reductions in Energy Use	X			Install high efficiency cooling equipment with a 14.5 or greater SEER rating
5.3	Sizing of Heating and Cooling Equipment	X			Size equipment to ACCA Manual J
7: Healthy Living Environment					
7.8	Combustion Equipment	X			Specify power-vented or direct vent

8.4 Electrical

Description:

The subject building is provided electricity by DTE through underground service. Each unit has its own circuit breaker panel with 100-amp service. Facility wiring is copper and overload protection is provided by circuit breakers. Main disconnects are located on the exterior of the building at the meter location; disconnects are locked.

Interior tenant unit lighting is provided by standard socket fixtures.

Exterior lighting consists of 50 watt high pressure sodium wall-mounted light (7 total) and one retrofitted 14 watt LED wall-mounted light. HID technology is considered standard efficiency and can be upgraded. The exterior lighting is reported to be operated by photo-sensors.

Assessment:

In general, the electrical systems for the subject building, including switchboards, panel boards, lighting and wiring systems, appear to be in good condition and sufficiently sized for the structure and use.

Exterior lighting was not visible during the daylight hours.

Recommendation:

Addition of main circuit breaker within the tenant space electrical panel is recommended. Replace standard efficiency lamps/non-functioning with Compact Fluorescent Lamp (CFL) lamps throughout the tenant units. Replace standard efficiency fixtures at kitchen sinks with high-efficiency fixtures and lamps. Replace remaining exterior wall mount HID fixtures with LED fixtures.

Continued maintenance of electrical systems is recommended. Replacement of fixtures to high-efficiency CFL pin-type fixtures throughout the tenant units should be considered. Please refer to the attached Capital Needs Input, 20 Year Detail, 20 Year Schedule and Rehab Specifications for additional information on condition, rehab costs and capital reserves.

Green Building Alternatives/Considerations:

#	Item	Recommended (for Study)	Already Exists	Appears Infeasible	Comments/Notes
5: Energy Efficiency					
5.2	Additional Reductions in Energy Use	X			Install high efficiency equipment
5.5a	Efficient Lighting: Interior Units	X			Follow Energy Star MFHR guidance
5.5b	Efficient Lighting: Common Areas and Emergency Lighting	X			Follow Energy Star MFHR guidance
5.5c	Efficient Lighting: Exterior	X			Follow Energy Star MFHR guidance
5.7a	Renewable Energy	X		X	On site electric generation likely financially infeasible - site, orientation and scale issues
5.7b	Photovoltaic/Solar Hot Water Ready	X		X	On site electric generation likely financially infeasible - site, orientation and scale issues

9.0 VERTICAL TRANSPORTATION

There is no vertical transportation at the subject property.

10.0 LIFE SAFETY AND FIRE PROTECTION

Description:

Each tenant unit is equipped with a smoke detector located in the laundry/mechanical room, hallways and each bedroom. Plug-in carbon monoxide detectors were observed in the laundry/mechanical room of the tenant units.

Assessment:

In general, the smoke detectors were observed to be in good condition. Plug-in carbon monoxide detectors were also observed to be in good condition.

Recommendation:

Continued maintenance of smoke detectors and carbon monoxide detectors is recommended. Please refer to the attached Capital Needs Input, 20 Year Detail, 20 Year Schedule and Rehab Specifications for additional information on condition, rehab costs and capital reserves.

11.0 ADDITIONAL CONSIDERATIONS

No additional considerations were included as part of this RPCA.

12.0 DOCUMENT REVIEW AND INTERVIEWS

The following subsections document information associated with the subject property obtained by AKT Peerless during document reviews and interviews.

12.1 Document Review

AKT Peerless was able to obtain property information from City of Ann Arbor and AAHC property management. This information included general building construction components (blueprints), some limited facility diagrams, information on several building permits, building photographs, and a previous capital improvement summary. Copies of select building permits are provided in Appendix C. Additional records reviewed are provided under separate cover.

12.2 Interviews

During the course of this assessment, AKT Peerless interviewed Mr. Lance Mitchell, the Facilities & Maintenance Property Manager for AAHC, and Mr. Levi Clark, Facilities Technician for AAHC. Mr. Mitchell has been associated with the subject property for approximately three years and Mr. Clark has been associated with the subject property for approximately one year. Information provided by Mr. Mitchell and Mr. Clark is referenced throughout this report.

13.0 OPINIONS OF PROBABLE COST

Refer to Appendix A for the RPCA tool including the Capital Needs Input, 20 Year Detail, 20 Year Schedule and Rehab Specifications for additional information on condition, rehab costs and capital reserves.

14.0 SIGNATURES

Linnea Fraser, E.I.T.
Project Consultant
AKT Peerless Environmental Services
Illinois Region
Phone: 773.993.3998
Fax: 248.615.1334

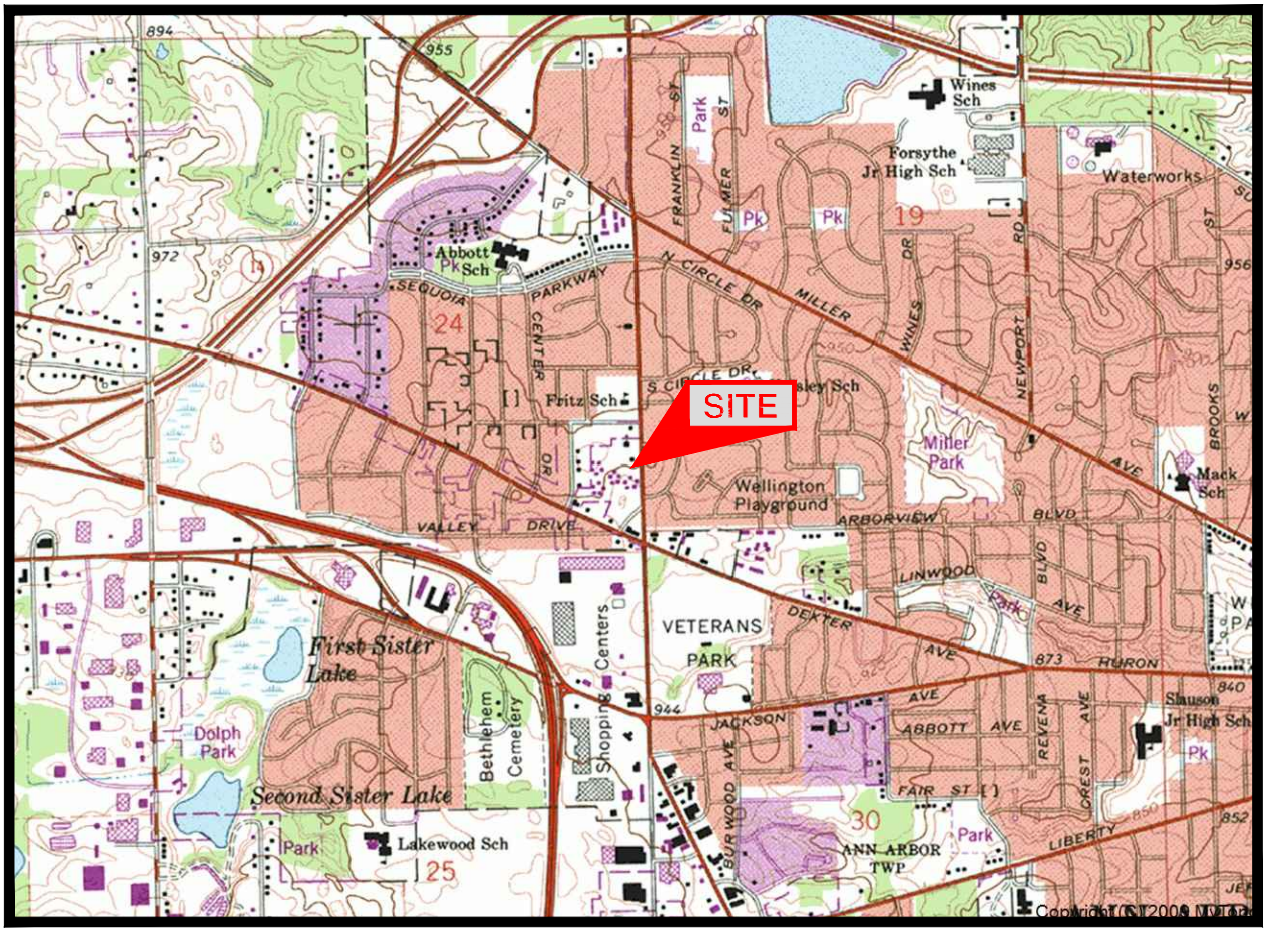
Jeremy McCallion, LEED AP
Sustainability Services Director
AKT Peerless Environmental Services
Southeast Michigan Region
Phone: 248.615.1333
Fax: 248.615.1334

Figures

ANN ARBOR WEST QUADRANGLE

MICHIGAN - WASHTENAW COUNTY

7.5 MINUTE SERIES (TOPOGRAPHIC)



T.2 S.-R.5 E.

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 0 1 KILOMETER

MICHIGAN
QUADRANGLE LOCATION

IMAGE TAKEN FROM 1965 U.S.G.S. TOPOGRAPHIC MAP
PHOTOREVISED 1983

AKTPEERLESS

ILLINOIS MICHIGAN OHIO GEORGIA

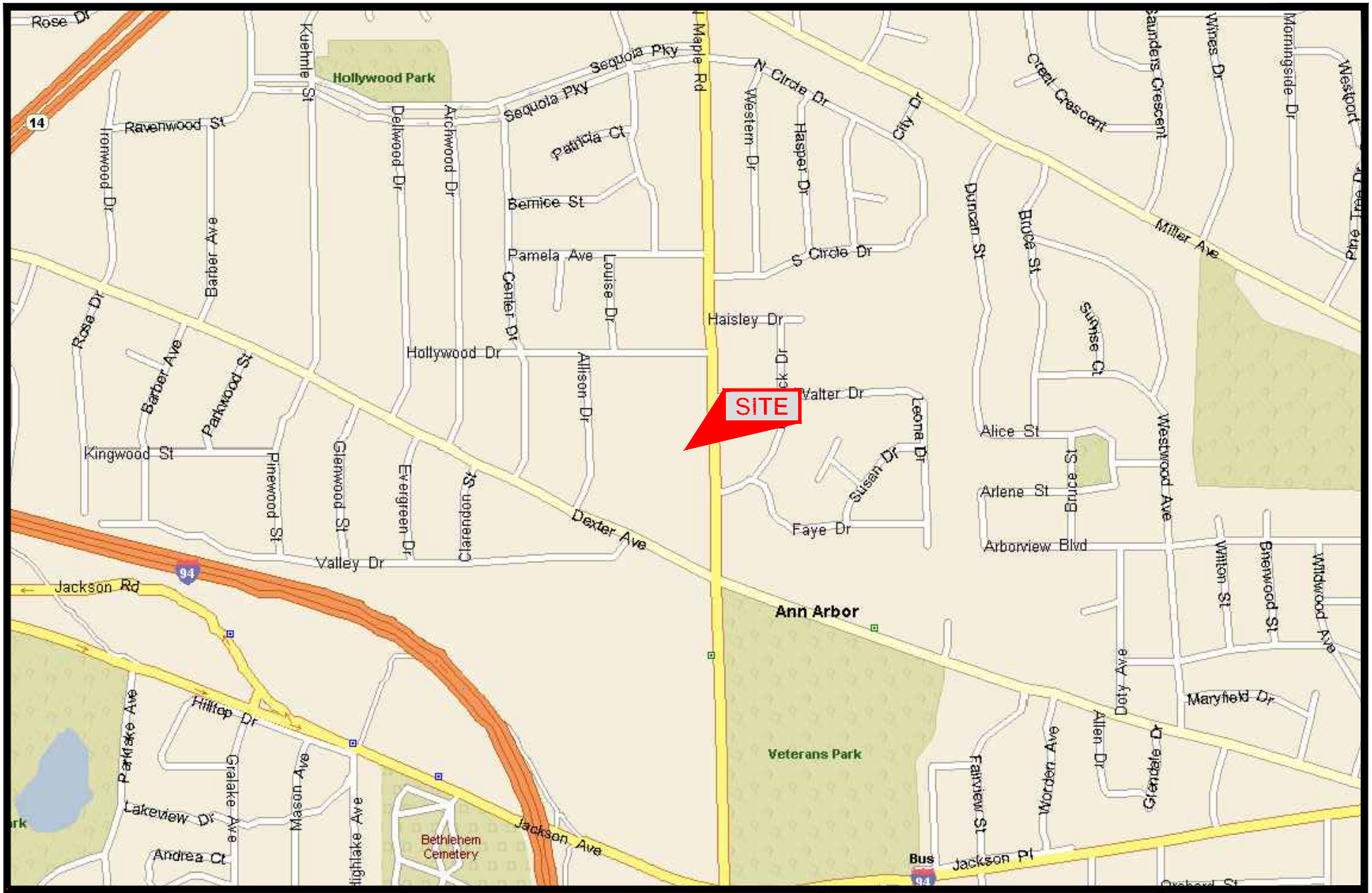
www.aktpeerless.com

TOPOGRAPHIC LOCATION MAP

743-749 NORTH MAPLE ROAD
ANN ARBOR, MICHIGAN
PROJECT NUMBER : 9698U-1-196

DRAWN BY: DDB
DATE: 3/13/2015

FIGURE 1



AKTPEERLESS

ILLINOIS MICHIGAN OHIO GEORGIA

www.aktpeerless.com

SUBJECT PROPERTY LOCATION MAP

743-749 NORTH MAPLE ROAD
ANN ARBOR, MICHIGAN
PROJECT NUMBER : 9698U-1-196

LEGEND

N
W E
S

DRAWN BY: DDB
DATE: 3/13/2015

FIGURE 2

AKTPEERLESS

Appendix A

RAD PCA Tool

AKTPEERLESS

Appendix B

Reconnaissance Photographs

PHOTOGRAPH NO. 1: TYPICAL VIEW OF TENANT UNIT BUILDING

PHOTOGRAPH NO. 2: TYPICAL VIEW OF REAR OF TENANT BUILDING

AKTPEERLESS

RECONNAISSANCE PHOTOGRAPHS

743-749 NORTH MAPLE RD.
ANN ARBOR, MICHIGAN

TAKEN BY: L. FRASER
DATE: 02.10.2015

PROJECT NUMBER:
9698U-1-196

PHOTOGRAPH NO. 3: TYPICAL VIEW OF LANDSCAPING AND FLATWORK THROUGHOUT SUBJECT PROPERTY

PHOTOGRAPH NO. 4: TYPICAL VIEW OF SUBJECT PROPERTY PARKING LOT

AKTPEERLESS

RECONNAISSANCE PHOTOGRAPHS

743-749 NORTH MAPLE RD.
ANN ARBOR, MICHIGAN

TAKEN BY: L. FRASER
DATE: 02.10.2015

PROJECT NUMBER:
9698U-1-196

PHOTOGRAPH NO. 5: CLOSE UP OF DETERIORATED AREA IN PARKING LOT

PHOTOGRAPH NO. 6: TYPICAL VIEW OF ROOFS (SOUTH FACING)

AKTPEERLESS

RECONNAISSANCE PHOTOGRAPHS

743-749 NORTH MAPLE RD.
ANN ARBOR, MICHIGAN

TAKEN BY: L. FRASER
DATE: 02.10.2015

PROJECT NUMBER:
9698U-1-196

PHOTOGRAPH NO. 7: TYPICAL VIEW OF DECK COMPONENTS

PHOTOGRAPH NO. 8 VIEW OF HOT WATER HEATER IN UNIT 743

AKTPEERLESS

RECONNAISSANCE PHOTOGRAPHS

743-749 NORTH MAPLE RD.
ANN ARBOR, MICHIGAN

TAKEN BY: L. FRASER
DATE: 02.10.2015

PROJECT NUMBER:
9698U-1-196

PHOTOGRAPH NO. 9: TYPICAL VIEW OF FURNACES IN TENANT UNITS (749)

PHOTOGRAPH NO. 10: TENANT UNIT 749 KITCHEN

AKTPEERLESS

RECONNAISSANCE PHOTOGRAPHS

743-749 NORTH MAPLE RD.
ANN ARBOR, MICHIGAN

TAKEN BY: L. FRASER
DATE: 02.10.2015

PROJECT NUMBER:
9698U-1-196

PHOTOGRAPH NO. 11: TENANT UNIT 743 BATHROOM

PHOTOGRAPH NO. 12: EXHAUST FAN IN TENANT UNIT 749 BATHROOM

AKTPEERLESS

RECONNAISSANCE PHOTOGRAPHS

743-749 NORTH MAPLE RD.
ANN ARBOR, MICHIGAN

TAKEN BY: L. FRASER
DATE: 02.10.2015

PROJECT NUMBER:
9698U-1-196

PHOTOGRAPH NO. 13: TYPICAL VIEW OF ATTIC SPACE

PHOTOGRAPH NO. 14: TENANT UNIT 749 WATER DAMAGED HALLWAY FLOORING

AKTPEERLESS

RECONNAISSANCE PHOTOGRAPHS

743-749 NORTH MAPLE RD.
ANN ARBOR, MICHIGAN

TAKEN BY: L. FRASER
DATE: 02.10.2015

PROJECT NUMBER:
9698U-1-196

PHOTOGRAPH NO. 15: TYPICAL VIEW OF TENANT UNIT THERMOSTAT

PHOTOGRAPH NO. 16: TYPICAL INTERIOR VIEW OF TENANT UNIT WINDOWS

AKTPEERLESS

RECONNAISSANCE PHOTOGRAPHS

743-749 NORTH MAPLE RD.
ANN ARBOR, MICHIGAN

TAKEN BY: L. FRASER
DATE: 02.10.2015

PROJECT NUMBER:
9698U-1-196

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Appendix C

Municipal Records

CITY OF ANN ARBOR, MICHIGAN

301 E. Huron Street, P.O. Box 8647, Ann Arbor, Michigan 48107-8647

Phone (734)794-6140 Fax (734)994-8296

www.a2gov.org

City Clerk

February 24, 2015

Linnea Fraser
280 Shuman Boulevard, Suite 170
Naperville, IL 60563
Via Email: fraserl@aktpeerless.com

Subject: Freedom of Information Act Request received February 17, 2015
15-052 Fraser

Dear Ms. Fraser:

I am responding to your request under the Michigan Freedom of Information Act received February 17, 2015 for fire department records for 743,745, 747, 749 North Maple Road. Your request is denied. Your request is denied to the extent that the records do not exist.

If you receive written notice that your request has been denied, in whole or in part, under Section 10 of the Act, you may, at your option either: (1) submit to the City Administrator a written appeal that specifically states the word “appeal” and identifies the reason(s) for reversal of the disclosure denial; or (2) file a lawsuit in the circuit court to compel the City’s disclosure of the record. If after judicial review, the circuit court determines that the City has not complied with the Act, you may be awarded reasonable attorneys’ fees and damages as specified under the Act.

If you have any questions concerning this response, please contact Jennifer Alexa, Deputy Clerk, at 734-794-6140.

Sincerely,

Jacqueline Beaudry
City Clerk

PERMIT NO: MECH11-0532 ON-LINE PERMIT

ANN ARBOR
301 E. Huron St., MI 48104

INSPECTION REQUEST LINE
734.794.6263
OR
SCHEDULE INSPECTION ON-LINE
eTRAKiT

PERMIT TYPE
MECHANICAL

PERMIT SUB-TYPE
MECHANICAL

JOB VALUE **0**

APN **09-08-24-400-011**

DESCRIPTION
REPLACE 3 FURNACES & #745 & 747

APPLIED DATE
3/21/2011

APPROVED DATE
3/21/2011

ISSUED DATE
3/21/2011

PERMIT INFORMATION

SITE
743 N MAPLE RD
Ann Arbor, MI 48103

APPLICANT
Alltemp Htg & Clg Co Inc
1262 Clarita
Ypsilanti MI 48198

OWNER
CITY OF ANN ARBOR
* PO BOX 8647
Ann Arbor MI 48107

CONTRACTOR
Alltemp Htg & Clg Co Inc
1262 Clarita
Ypsilanti MI 48198

FEE SUMMARY

MECHANICAL PERMIT FEES	$200.00
Total Fees Collected:	$200.00

NOTE: This job copy of this permit shall be kept on the job site to make the required entries thereon. The permit will expire if work is not started in 180 days, is abandoned, or does not receive an inspection for more than 180 days. Additional fees will be collected to renew expired permits. This is a Building Permit when properly filled out, signed and validated, and is not transferable. Construction Hour: Construction is limited to the hours of 7:00am to 7:00pm each day. No work shall be performed on certain holidays (MMC V-213-3(b)).

LICENSED CONTRACTORS DECLARATION

I hereby affirm under penalty of perjury that I am licensed under provisions of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code, and my license is in full force and effect.
License No: Expiration Date: Contractor:

OWNER-BUILDER DECLARATION

I hereby affirm under penalty of perjury that I am exempt from the contractors license Law for the following reason (Sec. 7031.5, Business and Professions Code: Any city or county which requires a permit to construct, alter, improve, demolish, or repair any structure, prior to its issuance, also requires the applicant for such permit to file a signed statement that he or she is licensed pursuant to the provisions of the Contractors License Law (Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Pofessions Code) or that he or she is exempt therefrom and the basis for the alleged exemption. Any violation of Section 7031.5 by an applicant for a permit subjects the applicant to a civil penalty of not more than five hundred dollars ($500).):

_____ I, as owner of the property, or my employees with wages as their sole compensation, will do the work, and the structure is not intended or offered for sale (Sec. 7044, Business and Professions Code: The Contractors License Law does not apply to an owner or property who builds or improves thereon, and who does such work himself or herself or through his or her own employees, provided
that such improvements are not intended or offered for sale. If, however, the building or improvement is sold within one year of completion, the owner-builder will have the burdon of proving that he or she did not build or improve for the purpose of sale.)

_____ I, as owner of the property, am exclusively contracting with licensed contractors to construct the project (Sec. 7044, Business and Professions Code: The Contractors License Law does not apply to an owner or Property who builds or improves thereon, and who contracts for such projects with a contractor(s) licensed pursuant to the Contractors License Law.)
I am exempt under Sec. _____ B.P.C. for this reason _____
DATE _____ OWNER _____

WORKERS COMPENSATION DECLARATION

I hereby affirm under penalty of perjury one of the following declarations:
_____ I have and will maintain a certificate of consent to self-insure for workers' compensation, as provided for by Section 3700 of the Labor Code, for the performance of the permit is issued.

_____ I have and will maintain workers' compensation insurance, as required by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued. My workers' compensation insurance carrier and policy number are:
Carrier/Policy No: _____
(This section need not be completed if the permit is for one hundred dollars ($100) or less).
_____ I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any number so as to become subject to the workers' compensation laws or California, and agree that if I should become subject to the workers' compensation provisions of Section 3700 of the Labor Code, I shall forthwith comply with those provisions.
DATE _____ APPLICANT: _____
WARNING: FAILURE TO SECURE WORKERS' COMPENSATION COVERAGE IS UNLAWFUL, AND SHALL SUBJECT AN EMPLOYER TO CRIMINAL PENALTIES AND CIVIL FINES UP TO ONE HUNDRED THOUSAND DOLLARS ($100,000), IN ADDITION TO THE COST OF COMPENSATION, DAMAGES AS PROVIDED FOR IN SECTION 3706 OF THE LABOR CODE, INTEREST, AND ATTORNEY'S FEES.

CONSTRUCTION LENDING AGENCY

I hereby affirm under penalty of perjury that there is a construction lending agency for the performance of the work for which this permit is issued (Sec. 3097, Civ. C.).
DATE _____ APPLICANT: _____

INSPECTION SUMMARY

_____ **MECH FINAL
_____ **MECH FINAL

* I certify that I have read this application and state that the above information is correct. I agree to comply with all city ordinances and state laws relating to building construction, and hereby authorize representatives of this city to enter upon the above-mentioned property for inspection purposes.

SIGNATURE OF APPLICANT OR AGENT :_____ **DATE** _____

Permit Finaled Date: _____ **Inspector Name:** _____ **Signature:** _____

02/13/2015
4:04 PM

Permit No.	MECH11-0532	**Permit Type**	MECHANICAL	**Site Address**	743 N MAPLE RD Ann Arbor, MI 48103

Applied	03/21/2011	**Applicant**	Alltemp Htg & Clg Co Inc
Approved	03/21/2011	**Owner**	CITY OF ANN ARBOR
Issued	03/21/2011	**Contractor**	Alltemp Htg & Clg Co Inc
Parent Permit No.		**Description**	REPLACE 3 FURNACES & #745 & 747
		Notes	

Date of Inspection	Inspection Type	Inspector	Result	Remarks	Notes
05/06/2011	**MECH FINAL	PAPPAS VERN	PASS		(5/6/2011 10:49 AM VP) 743, 745, & 747 all approved. VP
05/06/2011	**MECH FINAL	PAPPAS VERN	PASS		

PERMIT NO: CR6155 ON-LINE PERMIT

ANN ARBOR
301 E. Huron St., MI 48104

INSPECTION REQUEST LINE
734.794.6263
OR
SCHEDULE INSPECTION ON-LINE
eTRAKiT

PERMIT TYPE
RENTAL

PERMIT SUB-TYPE
DUPLEX

JOB VALUE **0**

APN **09-08-24-400-011**

DESCRIPTION

APPLIED DATE
10/29/2012

APPROVED DATE

ISSUED DATE

PERMIT INFORMATION

SITE 743 N MAPLE RD
Ann Arbor, MI 48103

APPLICANT

OWNER CITY OF ANN ARBOR
* PO BOX 8647
Ann Arbor MI 48107

CONTRACTOR

FEE SUMMARY

NOTE: This job copy of this permit shall be kept on the job site to make the required entries thereon. The permit will expire if work is not started in 180 days, is abandoned, or does not receive an inspection for more than 180 days. Additional fees will be collected to renew expired permits. This is a Building Permit when properly filled out, signed and validated, and is not transferable. Construction Hour: Construction is limited to the hours of 7:00am to 7:00pm each day. No work shall be performed on certain holidays (MMC V-213-3(b)).

LICENSED CONTRACTORS DECLARATION

I hereby affirm under penalty of perjury that I am licensed under provisions of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code, and my license is in full force and effect.
License No: Expiration Date: Contractor:

OWNER-BUILDER DECLARATION

I hereby affirm under penalty of perjury that I am exempt from the contractors license Law for the following reason (Sec. 7031.5, Business and Professions Code: Any city or county which requires a permit to construct, alter, improve, demolish, or repair any structure, prior to its issuance, also requires the applicant for such permit to file a signed statement that he or she is licensed pursuant to the provisions of the Contractors License Law (Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Pofessions Code) or that he or she is exempt therefrom and the basis for the alleged exemption. Any violation of Section 7031.5 by an applicant for a permit subjects the applicant to a civil penalty of not more than five hundred dollars ($500).):

_____ I, as owner of the property, or my employees with wages as their sole compensation, will do the work, and the structure is not intended or offered for sale (Sec. 7044, Business and Professions Code: The Contractors License Law does not apply to an owner or property who builds or improves thereon, and who does such work himself or herself or through his or her own employees, provided
that such improvements are not intended or offered for sale. If, however, the building or improvement is sold within one year of completion, the owner-builder will have the burdon of proving that he or she did not build or improve for the purpose of sale.)

_____ I, as owner of the property, am exclusively contracting with licensed contractors to construct the project (Sec. 7044, Business and Professions Code: The Contractors License Law does not apply to an owner or Property who builds or improves thereon, and who contracts for such projects with a contractor(s) licensed pursuant to the Contractors License Law.)
I am exempt under Sec. _____ B.P.C. for this reason _____
DATE _____ OWNER _____

WORKERS COMPENSATION DECLARATION

I hereby affirm under penalty of perjury one of the following declarations:
_____ I have and will maintain a certificate of consent to self-insure for workers' compensation, as provided for by Section 3700 of the Labor Code, for the performance of the permit is ussued.

_____ I have and will maintain workers' compensation insurance, as required by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued. My workers' compensation insurance carrier and policy number are:
Carrier/Policy No: _____
(This section need not be completed if the permit is for one hundred dollars ($100) or less).
____ I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any number so as to become subject to the workers' compensation laws or California, and agree that if I should become subject to the workers' compensation provisions of Section 3700 of the Labor Code, I shall forthwith comply with those provisions.
DATE _____ APPLICANT: _____
WARNING: FAILURE TO SECURE WORKERS' COMPENSATION COVERAGE IS UNLAWFUL, AND SHALL SUBJECT AN EMPLOYER TO CRIMINAL PENALTIES AND CIVIL FINES UP TO ONE HUNDRED THOUSAND DOLLARS ($100,000), IN ADDITION TO THE COST OF COMPENSATION, DAMAGES AS PROVIDED FOR IN SECTION 3706 OF THE LABOR CODE, INTEREST, AND ATTORNEY'S FEES.

CONSTRUCTION LENDING AGENCY

I hereby affirm under penalty of perjury that there is a construction lending agency for the performance of the work for which this permit is issued (Sec. 3097, Civ. C.).
DATE _____ APPLICANT: _____
* I certify that I have read this application and state that the above information is correct. I agree to comply with all city ordinances and state laws relating to building construction, and hereby authorize representatives of this city to enter upon the above-mentioned property for inspection purposes.
SIGNATURE OF APPLICANT OR AGENT :_____ **DATE** _____

INSPECTION SUMMARY

Permit Finaled Date: _____	Inspector Name: _____	Signature: _____

PERMIT NO: CR6156 ON-LINE PERMIT

ANN ARBOR
301 E. Huron St., MI 48104

INSPECTION REQUEST LINE
734.794.6263
OR
SCHEDULE INSPECTION ON-LINE
eTRAKiT

PERMIT TYPE
RENTAL

PERMIT SUB-TYPE
DUPLEX

JOB VALUE **0**

APN **09-08-24-400-011**

DESCRIPTION

APPLIED DATE

APPROVED DATE

ISSUED DATE

PERMIT INFORMATION

SITE 743 N MAPLE RD
Ann Arbor, MI 48103

APPLICANT

OWNER CITY OF ANN ARBOR
* PO BOX 8647
Ann Arbor MI 48107

CONTRACTOR

FEE SUMMARY

NOTE: This job copy of this permit shall be kept on the job site to make the required entries thereon. The permit will expire if work is not started in 180 days, is abandoned, or does not receive an inspection for more than 180 days. Additional fees will be collected to renew expired permits. This is a Building Permit when properly filled out, signed and validated, and is not transferable. Construction Hour: Construction is limited to the hours of 7:00am to 7:00pm each day. No work shall be performed on certain holidays (MMC V-213-3(b)).

LICENSED CONTRACTORS DECLARATION

I hereby affirm under penalty of perjury that I am licensed under provisions of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code, and my license is in full force and effect.
License No: Expiration Date: Contractor:

OWNER-BUILDER DECLARATION

I hereby affirm under penalty of perjury that I am exempt from the contractors license Law for the following reason (Sec. 7031.5, Business and Professions Code: Any city or county which requires a permit to construct, alter, improve, demolish, or repair any structure, prior to its issuance, also requires the applicant for such permit to file a signed statement that he or she is licensed pursuant to the provisions of the Contractors License Law (Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Pofessions Code) or that he or she is exempt therefrom and the basis for the alleged exemption. Any violation of Section 7031.5 by an applicant for a permit subjects the applicant to a civil penalty of not more than five hundred dollars ($500).):

_____ I, as owner of the property, or my employees with wages as their sole compensation, will do the work, and the structure is not intended or offered for sale (Sec. 7044, Business and Professions Code: The Contractors License Law does not apply to an owner or property who builds or improves thereon, and who does such work himself or herself or through his or her own employees, provided
that such improvements are not intended or offered for sale. If, however, the building or improvement is sold within one year of completion, the owner-builder will have the burdon of proving that he or she did not build or improve for the purpose of sale.)

_____ I, as owner of the property, am exclusively contracting with licensed contractors to construct the project (Sec. 7044, Business and Professions Code: The Contractors License Law does not apply to an owner or Property who builds or improves thereon, and who contracts for such projects with a contractor(s) licensed pursuant to the Contractors License Law.)
I am exempt under Sec. _____ B.P.C. for this reason _____
DATE _____ OWNER _____

WORKERS COMPENSATION DECLARATION

I hereby affirm under penalty of perjury one of the following declarations:
_____ I have and will maintain a certificate of consent to self-insure for workers' compensation, as provided for by Section 3700 of the Labor Code, for the performance of the permit is ussued.

_____ I have and will maintain workers' compensation insurance, as required by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued. My workers' compensation insurance carrier and policy number are:
Carrier/Policy No: _____
(This section need not be completed if the permit is for one hundred dollars ($100) or less).
____ I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any number so as to become subject to the workers' compensation laws or California, and agree that if I should become subject to the workers' compensation provisions of Section 3700 of the Labor Code, I shall forthwith comply with those provisions.
DATE _____ APPLICANT: _____
WARNING: FAILURE TO SECURE WORKERS' COMPENSATION COVERAGE IS UNLAWFUL, AND SHALL SUBJECT AN EMPLOYER TO CRIMINAL PENALTIES AND CIVIL FINES UP TO ONE HUNDRED THOUSAND DOLLARS ($100,000), IN ADDITION TO THE COST OF COMPENSATION, DAMAGES AS PROVIDED FOR IN SECTION 3706 OF THE LABOR CODE, INTEREST, AND ATTORNEY'S FEES.

CONSTRUCTION LENDING AGENCY

I hereby affirm under penalty of perjury that there is a construction lending agency for the performance of the work for which this permit is issued (Sec. 3097, Civ. C.).
DATE _____ APPLICANT: _____
* I certify that I have read this application and state that the above information is correct. I agree to comply with all city ordinances and state laws relating to building construction, and hereby authorize representatives of this city to enter upon the above-mentioned property for inspection purposes.
SIGNATURE OF APPLICANT OR AGENT :_____ **DATE** _____

INSPECTION SUMMARY

Permit Finaled Date: _____	Inspector Name: _____	Signature: _____

PERMIT NO: MECH10-1113 ON-LINE PERMIT

ANN ARBOR
301 E. Huron St., MI 48104

INSPECTION REQUEST LINE
734.794.6263
OR
SCHEDULE INSPECTION ON-LINE
eTRAKiT

PERMIT TYPE
MECHANICAL

PERMIT SUB-TYPE
MECHANICAL

JOB VALUE **0**

APN **09-08-24-400-011**

DESCRIPTION
Replace water heater

APPLIED DATE
6/8/2010

APPROVED DATE
6/8/2010

ISSUED DATE
6/8/2010

PERMIT INFORMATION

SITE	745 N MAPLE RD Ann Arbor, MI 48103
APPLICANT	Accurate Comfort Systems LLC 306 N Grove Ypsilanti MI 48198
OWNER	CITY OF ANN ARBOR * PO BOX 8647 Ann Arbor MI 48107
CONTRACTOR	Accurate Comfort Systems LLC 306 N Grove Ypsilanti MI 48198

FEE SUMMARY

MECHANICAL PERMIT FEES	$39.00
MIN PERMIT FEE 2008	$1.00
Total Fees Collected:	$40.00

NOTE: This job copy of this permit shall be kept on the job site to make the required entries thereon. The permit will expire if work is not started in 180 days, is abandoned, or does not receive an inspection for more than 180 days. Additional fees will be collected to renew expired permits. This is a Building Permit when properly filled out, signed and validated, and is not transferable. Construction Hour: Construction is limited to the hours of 7:00am to 7:00pm each day. No work shall be performed on certain holidays (MMC V-213-3(b)).

LICENSED CONTRACTORS DECLARATION

I hereby affirm under penalty of perjury that I am licensed under provisions of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code, and my license is in full force and effect.

License No: Expiration Date: Contractor:

OWNER-BUILDER DECLARATION

I hereby affirm under penalty of perjury that I am exempt from the contractors license Law for the following reason (Sec. 7031.5, Business and Professions Code: Any city or county which requires a permit to construct, alter, improve, demolish, or repair any structure, prior to its issuance, also requires the applicant for such permit to file a signed statement that he or she is licensed pursuant to the provisions of the Contractors License Law (Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Pofessions Code) or that he or she is exempt therefrom and the basis for the alleged exemption. Any violation of Section 7031.5 by an applicant for a permit subjects the applicant to a civil penalty of not more than five hundred dollars ($500).):

_____ I, as owner of the property, or my employees with wages as their sole compensation, will do the work, and the structure is not intended or offered for sale (Sec. 7044, Business and Professions Code: The Contractors License Law does not apply to an owner or property who builds or improves thereon, and who does such work himself or herself or through his or her own employees, provided
that such improvements are not intended or offered for sale. If, however, the building or improvement is sold within one year of completion, the owner-builder will have the burdon of proving that he or she did not build or improve for the purpose of sale.)

_____ I, as owner of the property, am exclusively contracting with licensed contractors to construct the project (Sec. 7044, Business and Professions Code: The Contractors License Law does not apply to an owner or Property who builds or improves thereon, and who contracts for such projects with a contractor(s) licensed pursuant to the Contractors License Law.)

I am exempt under Sec. _____ B.P.C. for this reason _____

DATE _____ OWNER _____

WORKERS COMPENSATION DECLARATION

I hereby affirm under penalty of perjury one of the following declarations:

_____ I have and will maintain a certificate of consent to self-insure for workers' compensation, as provided for by Section 3700 of the Labor Code, for the performance of the permit is issued.

_____ I have and will maintain workers' compensation insurance, as required by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued. My workers' compensation insurance carrier and policy number are:

Carrier/Policy No: _____

(This section need not be completed if the permit is for one hundred dollars ($100) or less).

_____ I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any number so as to become subject to the workers' compensation laws or California, and agree that if I should become subject to the workers' compensation provisions of Section 3700 of the Labor Code, I shall forthwith comply with those provisions.

DATE _____ APPLICANT: _____

WARNING: FAILURE TO SECURE WORKERS' COMPENSATION COVERAGE IS UNLAWFUL, AND SHALL SUBJECT AN EMPLOYER TO CRIMINAL PENALTIES AND CIVIL FINES UP TO ONE HUNDRED THOUSAND DOLLARS ($100,000), IN ADDITION TO THE COST OF COMPENSATION, DAMAGES AS PROVIDED FOR IN SECTION 3706 OF THE LABOR CODE, INTEREST, AND ATTORNEY'S FEES.

CONSTRUCTION LENDING AGENCY

I hereby affirm under penalty of perjury that there is a construction lending agency for the performance of the work for which this permit is issued (Sec. 3097, Civ. C.).

DATE _____ APPLICANT: _____

INSPECTION SUMMARY

_____ **MECH FINAL
_____ **MECH FINAL

* I certify that I have read this application and state that the above information is correct. I agree to comply with all city ordinances and state laws relating to building construction, and hereby authorize representatives of this city to enter upon the above-mentioned property for inspection purposes.

SIGNATURE OF APPLICANT OR AGENT :_____ **DATE** _____

Permit Finaled Date: _____ **Inspector Name:** _____ **Signature:** _____

02/13/2015
4:07 PM

Permit No.	MECH10-1113	**Permit Type**	MECHANICAL	**Site Address**	745 N MAPLE RD Ann Arbor, MI 48103

Applied	06/08/2010	**Applicant**	Accurate Comfort Systems LLC
Approved	06/08/2010	**Owner**	CITY OF ANN ARBOR
Issued	06/08/2010	**Contractor**	Accurate Comfort Systems LLC
Parent Permit No.		**Description**	Replace water heater
		Notes	

Date of Inspection	Inspection Type	Inspector	Result	Remarks	Notes
09/23/2010	**MECH FINAL	ANDREWS MILT	PASS		
06/30/2010	**MECH FINAL	PAPPAS VERN	NO ENTRY	Etrakit Inspection Request	Notes:Call first Contact Name: Phil Myers Site Address: 745 N MAPLE RD Phone: 734-732-8551 Email: Myersypsil@AOL.com

PERMIT NO: MECH12-2336 ON-LINE PERMIT

ANN ARBOR
301 E. Huron St., MI 48104

INSPECTION REQUEST LINE
734.794.6263
OR
SCHEDULE INSPECTION ON-LINE
eTRAKiT

PERMIT TYPE
MECHANICAL

PERMIT SUB-TYPE
MECHANICAL

JOB VALUE **0**

APN **09-08-24-400-011**

DESCRIPTION
Remove and Replace Water Heater

APPLIED DATE
12/19/2012

APPROVED DATE
12/19/2012

ISSUED DATE
12/19/2012

PERMIT INFORMATION

SITE	747 N MAPLE RD Ann Arbor, MI 48103
APPLICANT	Haley Mechanical 1535 Baker Rd. Dexter MI 48130
OWNER	CITY OF ANN ARBOR * PO BOX 8647 Ann Arbor MI 48107
CONTRACTOR	Haley Mechanical 1535 Baker Rd. Dexter MI 48130

FEE SUMMARY

MECHANICAL PERMIT FEES	$65.00
Total Fees Collected:	$65.00

NOTE: This job copy of this permit shall be kept on the job site to make the required entries thereon. The permit will expire if work is not started in 180 days, is abandoned, or does not receive an inspection for more than 180 days. Additional fees will be collected to renew expired permits. This is a Building Permit when properly filled out, signed and validated, and is not transferable. Construction Hour: Construction is limited to the hours of 7:00am to 7:00pm each day. No work shall be performed on certain holidays (MMC V-213-3(b)).

LICENSED CONTRACTORS DECLARATION

I hereby affirm under penalty of perjury that I am licensed under provisions of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code, and my license is in full force and effect.
License No: Expiration Date: Contractor:

OWNER-BUILDER DECLARATION

I hereby affirm under penalty of perjury that I am exempt from the contractors license Law for the following reason (Sec. 7031.5, Business and Professions Code: Any city or county which requires a permit to construct, alter, improve, demolish, or repair any structure, prior to its issuance, also requires the applicant for such permit to file a signed statement that he or she is licensed pursuant to the provisions of the Contractors License Law (Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Pofessions Code) or that he or she is exempt therefrom and the basis for the alleged exemption. Any violation of Section 7031.5 by an applicant for a permit subjects the applicant to a civil penalty of not more than five hundred dollars ($500).):

_____ I, as owner of the property, or my employees with wages as their sole compensation, will do the work, and the structure is not intended or offered for sale (Sec. 7044, Business and Professions Code: The Contractors License Law does not apply to an owner or property who builds or improves thereon, and who does such work himself or herself or through his or her own employees, provided
that such improvements are not intended or offered for sale. If, however, the building or improvement is sold within one year of completion, the owner-builder will have the burdon of proving that he or she did not build or improve for the purpose of sale.)

_____ I, as owner of the property, am exclusively contracting with licensed contractors to construct the project (Sec. 7044, Business and Professions Code: The Contractors License Law does not apply to an owner or Property who builds or improves thereon, and who contracts for such projects with a contractor(s) licensed pursuant to the Contractors License Law.)
I am exempt under Sec. _____ B.P.C. for this reason _____
DATE _____ OWNER _____

WORKERS COMPENSATION DECLARATION

I hereby affirm under penalty of perjury one of the following declarations:
_____ I have and will maintain a certificate of consent to self-insure for workers' compensation, as provided for by Section 3700 of the Labor Code, for the performance of the permit is issued.

_____ I have and will maintain workers' compensation insurance, as required by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued. My workers' compensation insurance carrier and policy number are:
Carrier/Policy No: _____
(This section need not be completed if the permit is for one hundred dollars ($100) or less).
_____ I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any number so as to become subject to the workers' compensation laws or California, and agree that if I should become subject to the workers' compensation provisions of Section 3700 of the Labor Code, I shall forthwith comply with those provisions.
DATE _____ APPLICANT: _____
WARNING: FAILURE TO SECURE WORKERS' COMPENSATION COVERAGE IS UNLAWFUL, AND SHALL SUBJECT AN EMPLOYER TO CRIMINAL PENALTIES AND CIVIL FINES UP TO ONE HUNDRED THOUSAND DOLLARS ($100,000), IN ADDITION TO THE COST OF COMPENSATION, DAMAGES AS PROVIDED FOR IN SECTION 3706 OF THE LABOR CODE, INTEREST, AND ATTORNEY'S FEES.

CONSTRUCTION LENDING AGENCY

I hereby affirm under penalty of perjury that there is a construction lending agency for the performance of the work for which this permit is issued (Sec. 3097, Civ. C.).
DATE _____ APPLICANT: _____

INSPECTION SUMMARY

_____ **MECH FINAL
_____ **MECH FINAL

* I certify that I have read this application and state that the above information is correct. I agree to comply with all city ordinances and state laws relating to building construction, and hereby authorize representatives of this city to enter upon the above-mentioned property for inspection purposes.

SIGNATURE OF APPLICANT OR AGENT :_____ **DATE** _____

Permit Finaled Date: _____ **Inspector Name:** _____ **Signature:** _____

02/13/2015
4:08 PM

Permit No.	MECH12-2336	**Permit Type**	MECHANICAL	**Site Address**	747 N MAPLE RD Ann Arbor, MI 48103
Applied	12/19/2012	**Applicant**	Haley Mechanical		
Approved	12/19/2012	**Owner**	CITY OF ANN ARBOR		
Issued	12/19/2012	**Contractor**	Haley Mechanical		
Parent Permit No.		**Description**	Remove and Replace Water Heater		
		Notes			

Date of Inspection	Inspection Type	Inspector	Result	Remarks	Notes
02/14/2013	**MECH FINAL	RATLIFF DON	PASS	eTRAKiT Inspection Request	please call when you are 30 minutes out. Contact Name: henry haley Site Address: 747 N MAPLE RD Phone: (734) 904-2556 e-Mail: hhaley@haleymechanical.com
01/18/2013	**MECH FINAL	RATLIFF DON	FAILED	eTRAKiT Inspection Request	please call Lance from Ann Arbor housing when you are 30 minutes out. 734-474-6789. thank you:) Contact Name: Lance Mitchell Site Address: 747 N MAPLE RD Phone: (734) 474-6789 e-Mail: adettling@haleymechanical.com (1/18/2013 9:50 AM DR) no answer at the door...we could not go in, because the resident needs a 48-hour advance notice and Lance did not know of this inspection ahead of time, so the resident was not notified.

PERMIT NO: MECH10-2594 ON-LINE PERMIT

ANN ARBOR
301 E. Huron St., MI 48104

INSPECTION REQUEST LINE
734.794.6263
OR
SCHEDULE INSPECTION ON-LINE
eTRAKiT

PERMIT TYPE
MECHANICAL

PERMIT SUB-TYPE
MECHANICAL

JOB VALUE **0**

APN **09-08-24-400-011**

DESCRIPTION
Replace Furnace

APPLIED DATE
12/15/2010

APPROVED DATE
12/15/2010

ISSUED DATE
12/15/2010

PERMIT INFORMATION

SITE	749 N MAPLE RD Ann Arbor, MI 48103
APPLICANT	Fuller Heating Co 777 S Wagner Rd. Ann Arbor MI 48103
OWNER	CITY OF ANN ARBOR * PO BOX 8647 Ann Arbor MI 48107
CONTRACTOR	Fuller Heating Co 777 S Wagner Rd. Ann Arbor MI 48103

FEE SUMMARY

MECHANICAL PERMIT FEES	$100.00
Total Fees Collected:	$100.00

NOTE: This job copy of this permit shall be kept on the job site to make the required entries thereon. The permit will expire if work is not started in 180 days, is abandoned, or does not receive an inspection for more than 180 days. Additional fees will be collected to renew expired permits. This is a Building Permit when properly filled out, signed and validated, and is not transferable. Construction Hour: Construction is limited to the hours of 7:00am to 7:00pm each day. No work shall be performed on certain holidays (MMC V-213-3(b)).

LICENSED CONTRACTORS DECLARATION

I hereby affirm under penalty of perjury that I am licensed under provisions of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code, and my license is in full force and effect.
License No: Expiration Date: Contractor:

OWNER-BUILDER DECLARATION

I hereby affirm under penalty of perjury that I am exempt from the contractors license Law for the following reason (Sec. 7031.5, Business and Professions Code: Any city or county which requires a permit to construct, alter, improve, demolish, or repair any structure, prior to its issuance, also requires the applicant for such permit to file a signed statement that he or she is licensed pursuant to the provisions of the Contractors License Law (Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Pofessions Code) or that he or she is exempt therefrom and the basis for the alleged exemption. Any violation of Section 7031.5 by an applicant for a permit subjects the applicant to a civil penalty of not more than five hundred dollars ($500).):

_____ I, as owner of the property, or my employees with wages as their sole compensation, will do the work, and the structure is not intended or offered for sale (Sec. 7044, Business and Professions Code: The Contractors License Law does not apply to an owner or property who builds or improves thereon, and who does such work himself or herself or through his or her own employees, provided
that such improvements are not intended or offered for sale. If, however, the building or improvement is sold within one year of completion, the owner-builder will have the burdon of proving that he or she did not build or improve for the purpose of sale.)

_____ I, as owner of the property, am exclusively contracting with licensed contractors to construct the project (Sec. 7044, Business and Professions Code: The Contractors License Law does not apply to an owner or Property who builds or improves thereon, and who contracts for such projects with a contractor(s) licensed pursuant to the Contractors License Law.)
I am exempt under Sec. _____ B.P.C. for this reason _____
DATE _____ OWNER _____

WORKERS COMPENSATION DECLARATION

I hereby affirm under penalty of perjury one of the following declarations:
_____ I have and will maintain a certificate of consent to self-insure for workers' compensation, as provided for by Section 3700 of the Labor Code, for the performance of the permit is issued.

_____ I have and will maintain workers' compensation insurance, as required by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued. My workers' compensation insurance carrier and policy number are:
Carrier/Policy No: _____
(This section need not be completed if the permit is for one hundred dollars ($100) or less).
_____ I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any number so as to become subject to the workers' compensation laws or California, and agree that if I should become subject to the workers' compensation provisions of Section 3700 of the Labor Code, I shall forthwith comply with those provisions.
DATE _____ APPLICANT: _____
WARNING: FAILURE TO SECURE WORKERS' COMPENSATION COVERAGE IS UNLAWFUL, AND SHALL SUBJECT AN EMPLOYER TO CRIMINAL PENALTIES AND CIVIL FINES UP TO ONE HUNDRED THOUSAND DOLLARS ($100,000), IN ADDITION TO THE COST OF COMPENSATION, DAMAGES AS PROVIDED FOR IN SECTION 3706 OF THE LABOR CODE, INTEREST, AND ATTORNEY'S FEES.

CONSTRUCTION LENDING AGENCY

I hereby affirm under penalty of perjury that there is a construction lending agency for the performance of the work for which this permit is issued (Sec. 3097, Civ. C.).
DATE _____ APPLICANT: _____

INSPECTION SUMMARY

_____ **MECH FINAL

* I certify that I have read this application and state that the above information is correct. I agree to comply with all city ordinances and state laws relating to building construction, and hereby authorize representatives of this city to enter upon the above-mentioned property for inspection purposes.

SIGNATURE OF APPLICANT OR AGENT :_____ **DATE** _____

Permit Finaled Date: _____ **Inspector Name:** _____ **Signature:** _____

02/13/2015
4:09 PM

Permit No.	MECH10-2594	**Permit Type**	MECHANICAL	**Site Address**	749 N MAPLE RD Ann Arbor, MI 48103
Applied	12/15/2010		**Applicant**	Fuller Heating Co	
Approved	12/15/2010		**Owner**	CITY OF ANN ARBOR	
Issued	12/15/2010		**Contractor**	Fuller Heating Co	
Parent Permit No.			**Description**	Replace Furnace	
			Notes		

Date of Inspection	Inspection Type	Inspector	Result	Remarks	Notes
01/21/2011	**MECH FINAL	PAPPAS VERN	PASS	eTRAKiT Inspection Request	Contact Name: Kevin Site Address: 749 N MAPLE RD Phone: (586) 876-4947 e-Mail: mikef@fullerheating.com

PERMIT NO: PLUM10-0173 ON-LINE PERMIT

ANN ARBOR
301 E. Huron St., MI 48104

INSPECTION REQUEST LINE
734.794.6263
OR
SCHEDULE INSPECTION ON-LINE
eTRAKiT

PERMIT TYPE
PLUMBING

PERMIT SUB-TYPE
PLUMBING

JOB VALUE **0**

APN **09-08-24-400-011**

DESCRIPTION
Replace Hot H2O Heater

APPLIED DATE
2/19/2010

APPROVED DATE
2/19/2010

ISSUED DATE
2/19/2010

PERMIT INFORMATION

SITE	749 N MAPLE RD Ann Arbor, MI 48103
APPLICANT	Hutzel Plumbing & Heating 2311 S. Industrial Hwy. Ann Arbor MI 48104
OWNER	CITY OF ANN ARBOR * PO BOX 8647 Ann Arbor MI 48107
CONTRACTOR	Hutzel Plumbing & Heating 2311 S. Industrial Hwy. Ann Arbor MI 48104

FEE SUMMARY

PLUMBING PERMIT FEES	$39.00
Total Fees Collected:	$39.00

NOTE: This job copy of this permit shall be kept on the job site to make the required entries thereon. The permit will expire if work is not started in 180 days, is abandoned, or does not receive an inspection for more than 180 days. Additional fees will be collected to renew expired permits. This is a Building Permit when properly filled out, signed and validated, and is not transferable. Construction Hour: Construction is limited to the hours of 7:00am to 7:00pm each day. No work shall be performed on certain holidays (MMC V-213-3(b)).

LICENSED CONTRACTORS DECLARATION

I hereby affirm under penalty of perjury that I am licensed under provisions of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code, and my license is in full force and effect.
License No: Expiration Date: Contractor:

OWNER-BUILDER DECLARATION

I hereby affirm under penalty of perjury that I am exempt from the contractors license Law for the following reason (Sec. 7031.5, Business and Professions Code: Any city or county which requires a permit to construct, alter, improve, demolish, or repair any structure, prior to its issuance, also requires the applicant for such permit to file a signed statement that he or she is licensed pursuant to the provisions of the Contractors License Law (Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Pofessions Code) or that he or she is exempt therefrom and the basis for the alleged exemption. Any violation of Section 7031.5 by an applicant for a permit subjects the applicant to a civil penalty of not more than five hundred dollars ($500).):

_____ I, as owner of the property, or my employees with wages as their sole compensation, will do the work, and the structure is not intended or offered for sale (Sec. 7044, Business and Professions Code: The Contractors License Law does not apply to an owner or property who builds or improves thereon, and who does such work himself or herself or through his or her own employees, provided
that such improvements are not intended or offered for sale. If, however, the building or improvement is sold within one year of completion, the owner-builder will have the burdon of proving that he or she did not build or improve for the purpose of sale.)

_____ I, as owner of the property, am exclusively contracting with licensed contractors to construct the project (Sec. 7044, Business and Professions Code: The Contractors License Law does not apply to an owner or Property who builds or improves thereon, and who contracts for such projects with a contractor(s) licensed pursuant to the Contractors License Law.)
I am exempt under Sec. _____ B.P.C. for this reason _____
DATE _____ OWNER _____

WORKERS COMPENSATION DECLARATION

I hereby affirm under penalty of perjury one of the following declarations:
_____ I have and will maintain a certificate of consent to self-insure for workers' compensation, as provided for by Section 3700 of the Labor Code, for the performance of the permit is issued.

_____ I have and will maintain workers' compensation insurance, as required by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued. My workers' compensation insurance carrier and policy number are:
Carrier/Policy No: _____
(This section need not be completed if the permit is for one hundred dollars ($100) or less).
_____ I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any number so as to become subject to the workers' compensation laws or California, and agree that if I should become subject to the workers' compensation provisions of Section 3700 of the Labor Code, I shall forthwith comply with those provisions.
DATE _____ APPLICANT: _____
WARNING: FAILURE TO SECURE WORKERS' COMPENSATION COVERAGE IS UNLAWFUL, AND SHALL SUBJECT AN EMPLOYER TO CRIMINAL PENALTIES AND CIVIL FINES UP TO ONE HUNDRED THOUSAND DOLLARS ($100,000), IN ADDITION TO THE COST OF COMPENSATION, DAMAGES AS PROVIDED FOR IN SECTION 3706 OF THE LABOR CODE, INTEREST, AND ATTORNEY'S FEES.

CONSTRUCTION LENDING AGENCY

I hereby affirm under penalty of perjury that there is a construction lending agency for the performance of the work for which this permit is issued (Sec. 3097, Civ. C.).
DATE _____ APPLICANT: _____

INSPECTION SUMMARY

* I certify that I have read this application and state that the above information is correct. I agree to comply with all city ordinances and state laws relating to building construction, and hereby authorize representatives of this city to enter upon the above-mentioned property for inspection purposes.

SIGNATURE OF APPLICANT OR AGENT :_____ **DATE** _____

Permit Finaled Date: _____ **Inspector Name:** _____ **Signature:** _____

02/13/2015
4:11 PM

Permit No.	PLUM10-0173	**Permit Type**	PLUMBING	**Site Address**	749 N MAPLE RD Ann Arbor, MI 48103

Applied	02/19/2010	**Applicant**	Hutzel Plumbing & Heating
Approved	02/19/2010	**Owner**	CITY OF ANN ARBOR
Issued	02/19/2010	**Contractor**	Hutzel Plumbing & Heating
Parent Permit No.		**Description**	Replace Hot H2O Heater
		Notes	

Date of Inspection	Inspection Type	Inspector	Result	Remarks	Notes

Appendix D

FEMA Floodplain Map

MAP SCALE 1 " = 500 '

250 0 500 1000 FEET

0 150 300 METER

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0241E

FIRM

FLOOD INSURANCE RATE MAP

WASHTENAW COUNTY, MICHIGAN

(ALL JURISDICTIONS)

PANEL 241 OF 585

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ANN ARBOR, CHARTER TOWNSHIP OF	260535	0241	E
ANN ARBOR, CITY OF	260213	0241	E
SCIO, TOWNSHIP OF	260537	0241	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
26161C0241E
EFFECTIVE DATE
APRIL 3, 2012

Federal Emergency Management Agency

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Appendix E

Form 4.4 Environmental Restrictions Checklist

Rental Assistance Demonstration Program
Environmental Restrictions Checklist

Project Name and Location (Street, City, County, ST, Zip Code):	**Owner Name, Address (Street, City, ST, Zip Code), and Phone:**
North Maple Duplexes 743-749 North Maple Road Ann Arbor, Washtenaw County, MI 48104	Ann Arbor Housing Commission 727 Miller Avenue, Ann Arbor MI 48103 (734) 794-6720

Project Description:
Completion of a Rental Assistance Demonstration (RAD) Property Condition Assessment (PCA) to determine repairs, replacements, maintenance items and items for improvement at the property.

ENVIRONMENTAL REVIEW FINDINGS	**YES**	**NO**
FLOOD PLAIN		
Is the project located in a FEMA Special Flood Hazard Area? (Current flood plain maps should be found in each HUD field office or call FEMA at 1-877-FEMA-MAP, FEMA's web site URL is www.fema.gov/FHM/)		X
Identify Map Panel and Date Panel 241 of 585, Community Panel 26161C0241E, dated April 3, 2012		
Does the project currently carry Flood Insurance?		X
Do any structures appear to be within or close to the floodplain? (If yes and if the project does not currently carry flood insurance, flood insurance is required.)		X
HISTORIC PRESERVATION (If yes, identify relevant restrictions below.)		
Is the property listed on the National Register of Historic Places?		X
Is the property located in a historic district listed on the National Register of Historic Places?		X
Is the property located in a historic district determined to be eligible for the National Register?		X
AIRPORT HAZARDS		
Is the project located in the clear zone of an airport? (24 CFR Part 51 D. If yes, Notice is required.)		X
HAZARDOUS OPERATIONS		
Is there any evidence or indication of manufacturing operations utilizing or producing hazardous substances (paints, solvents, acids, bases, flammable materials, compressed gases, poisons, or other chemical materials) at or in close proximity to the site?		X
Is there any evidence or indication that past operations located on or in close proximity to the property used hazardous substances or radiological materials that may have been released into the environment?		X
EXPLOSIVE/FLAMMABLE OPERATIONS/STORAGE (24 CFR Part 51C)		
Is there visual evidence or indicators of unobstructed or unshielded above ground storage tanks (fuel oil, gasoline, propane etc.) or operations utilizing explosive/flammable material at or in close proximity to the property?		X
FOR YES RESPONSES, SUMMARIZE RESTRICTIONS BELOW:		

RENTAL ASSISTANCE DEMONSTRATION PROGRAM ENVIRONMENTAL RESTRICTIONS CHECKLIST

ENVIRONMENTAL REVIEW FINDINGS	YES	NO
TOXIC CHEMICALS AND RADIOACTIVE MATERIALS		
Petroleum Storage		
Is there any evidence or indication of the presence of commercial or residential heating activities that suggest that underground storage tanks may be located on the property?		X
If yes, are any such tanks being used? If yes, indicate below whether the tank is registered, when it was last tested for leaks, the results of that test, and whether there are any applicable state or local laws that impose additional requirements beyond those required under federal law.		
Are there any out-of-service underground fuel storage tanks? If yes, indicate whether the tank was closed out in accordance with applicable state, local and federal laws.		X
Is there any evidence or indication that any above ground storage tanks on the property are leaking?		X
Polychorinated Biphenyls (PCB)		
Is there any evidence or indication that electrical equipment, such as transformers, capacitors, or hydraulic equipment (found in machinery and elevators, installed prior to July 1, 1884) are present on the site?		X
If yes, is any such equipment (a) owned by anyone other than a public utility company; and (b) not marked with a "PCB Free" sticker?		X
If yes, indicate below whether such equipment has been tested for PCBs, the results of those tests, and (if no testing has been performed) the proposed testing approach. (Electrical equipment need not be tested but will be assumed to have PCBs)		
If PCBs are found in non-electrical equipment over 50ppm it must be replaced or retrofitted, otherwise any equipment with PCBs or assumed to have PCBs require an O&M Plan.		
Asbestos Containing Materials (ACM)		
Is there any evidence or indication of ACM insulation or fire retardant materials such as boiler or pipe wrap, ceiling spray, etc. within the buildings on the property? If yes, the property is required to have an Operations and Maintenance Plan for asbestos containing materials.		X
Lead Based Paint		
Are there residential structures on the property that were built prior to 1978?		X
If yes, has the property been certified as lead-free?		
If property has not been certified as lead-free, has a Risk Assessment been completed?		
If yes, has the owner developed a plan including Interim Controls to address the findings of the Risk Assessment including Tenant notifications and an Operations and Maintenance plan?		
If yes, has a qualified Risk Assessor reviewed the Owner's plan and O&M plan for compliance with 24 CFR 35?		
EASEMENT AND USE RESTRICTIONS		
Are there easements, deed restrictions or other use restrictions on this property? (e.g. oil and gas well pumping, transformer boxes/units, navigation, microwave, rights of way (ROW), for hi-voltage power transmission lines, interstate/intrastate gas and liquid petroleum pipelines, etc.)	X	
FOR YES RESPONSES, SUMMARIZE RESTRICTIONS BELOW:		
A Detroit Edison Company ROW is present on the property. A Land Resource Use Restriction (LRUR) for the installation of potable water wells is enforced on the subject property due to ongoing offsite contamination and remediation of Dioxane. The contaminant is not highly volatile and contamination does not appear to be a vapor encroachment concern to human occupants of the subject property.		
If you have questions, please call or E-mail the HUD Housing Environmental Clearance Officer, Eric Axelrod at Eric.Axelrod@HUD.GOV or 202-708-1104 x 2275.		

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Appendix F

Tier II: Abbreviated Accessibility Checklist

Property Name: North Maple Duplexes

Date: 2/10/15

Project Number: 9698u

Limited Accessibility Checklist					
	Building History	**Yes**	**No**	**N/A**	**Comments**
1.	Has the management previously completed an ADA review?		✓		
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?		✓		
	Guest Rooms	**Yes**	**No**	**N/A**	**Comments**
1.	Does the total number of accessible guest rooms meet or exceed requirements?		✓		4 units → 3 rooms/unit.
2.	Are the guest room and bathroom doors a minimum of 32" clear width?		✓		Interior Doorways 31" width
3.	Are there roll-in showers that are a minimum of 30" x 60"?		✓		
4.	Is a text telephone provided or available?		✓		
5.	Are audible and visual emergency warning devices provided or available?		✓		
	Parking	**Yes**	**No**	**N/A**	**Comments**
1.	Are there an sufficient parking spaces with respect to the total number of reported spaces?		✓		Parking spaces are not indicated
2.	Are there sufficient van-accessible parking spaces available (96" wide/ 96" aisle for van)?		✓		Space for parking is first come, first serve

Limited Accessibility Checklist					
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?		✓		
	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 a 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?	✓			35½" – not wheelchair accessible
2.	If the main entrance is inaccessible, are there alternate accessible entrances?			✓	side entrance not wheelchair accessible
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?			✓	

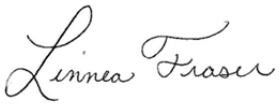
Limited Accessibility Checklist					
	Paths of Travel	**Yes**	**No**	**N/A**	**Comments**
1.	Is the main path of travel free of obstruction and wide enough for a wheelchair (at least 36 inches wide)?		✓		
2.	Does a visual scan of the main path reveal any obstacles (phones, fountains, etc.) that protrude more than 4 inches into walkways or corridors?	✓			furniture
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?	✓			1st floor apartments
7.	If audible fire alarms are present, are visual alarms (strobe light alarms) also installed in all common areas?		✓	✓	No common
	Elevators	**Yes**	**No**	**N/A**	**Comments**
1.	Do the call buttons have visual signals to indicate when a call is registered and answered?			✓	
2.	Is the "UP" button above the "DOWN" button?			✓	
3.	Are there visual and audible signals inside cars indicating floor change?			✓	
4.	Are there standard raised and Braille marking on both jambs of each host way entrance?			✓	
5.	Do elevator doors have a reopening device that will stop and reopen a car door if an object or a person obstructs the door?			✓	
6.	Do elevator lobbies have visual and audible indicators of car arrival?			✓	
7.	Does the elevator interior provide sufficient wheelchair turning area (51" x 68")?			✓	
8.	Are elevator controls low enough to be reached from a wheelchair (48 inches front approach/54 inches side approach)?			✓	

Limited Accessibility Checklist					
9.	Are elevator control buttons designated by Braille and by raised standard alphabet characters (mounted to the left of the button)?			✓	
10.	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?			✓	
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?			✓	

3.0 Part 2: Energy Audit

3.1 Acknowledgements of Part 2: Energy Audit

The Energy Audit Report and Excel RPCA Model was completed by Linnea Fraser of AKT Peerless. AKT Peerless certifies that the report preparers meet the qualifications identified in the RAD Physical Condition Assessment Statement of Work and Contractor Qualifications Part 2.1 (Version 2, December 2013).



Linnea Fraser, EIT
Senior Energy Analyst
AKT Peerless Environmental Services
Illinois Region
Phone: 773.993.3998
Fax: 248.615.1334

Date: March 17, 2015

Part 2 Energy Audit Report and Excel RPCA Model were Received and Reviewed by Owner:

Lori Harris
Norstar Development USA, LP
733 Broadway
Albany, NY 12207
Phone: 518-431-1051
Fax: 518-431-1053

Date:_____

AKTPEERLESS

Rental Assistance Demonstration (RAD):
PART 2: ENERGY AUDIT

743-749 North Maple Road, Ann Arbor, Michigan 48103
NORTH MAPLE DUPLEXES

PREPARED FOR	Norstar Development USA, LP 733 Broadway Albany, NY 12207	**ON BEHALF OF**	The Ann Arbor Housing Commission 727 Miller Ave Ann Arbor, MI 48103
PROJECT #	9698U-2-96	**PIC #**	MI064
DATE	March 17, 2015		

AKTPEERLESS

TABLE OF CONTENTS

AKTPEERLESS

Energy and Water Survey and Engineering Analysis

North Maple Duplexes

743-749 North Maple Road
Ann Arbor, Michigan 48103

for

Ann Arbor Housing Commission

727 Miller Avenue
Ann Arbor, Michigan 48103

AKT Peerless Project No. #7946e-16

1.0 Executive Summary

This report presents the findings and recommendations from a building energy and water audit conducted at North Maple Duplexes located at 743-749 North Maple Duplexes in Ann Arbor, Michigan. The energy and water audit follows industry standards and acceptable practice for assessing energy and water performance of commercial and multi-family buildings. The audit has been conducted by AKT Peerless and has involved a coordinated effort between AKT Peerless, the Client and building operating staff.

Documents were provided for review, interviews and field investigations were conducted, and building systems were analyzed. In the year analyzed (February, 2014 to January, 2015) the Ann Arbor Housing Commission spent an estimated $2,998 on utilities at the subject property. Tenants spent an estimated $5,806 on utilities.

AKT Peerless identified six (6) separate Energy Conservation Measures (ECMs) and one (1) Water Conservation Measure (WCMs). The annualized savings of all recommendations totals $2,732 (at current energy and water prices), with the potential to reduce total energy consumption and GHG emissions by 35%. If fully implemented, the payback period from annual energy savings for these ECMs is estimated to be 2.9. Measures associated with common areas (PHA expenses) and measures specific to tenant units have been separated for planning purposes.

Measures best suited for implementation at the End of Useful Life (EUL), advanced ECMs, and measures recommended for further evaluation have been identified and are included in Sections 9-10 of this report.

A preliminary energy use assessment was conducted prior to the cost reduction measure analysis. The figure below describes the historical annual energy consumption and cost for the subject property.

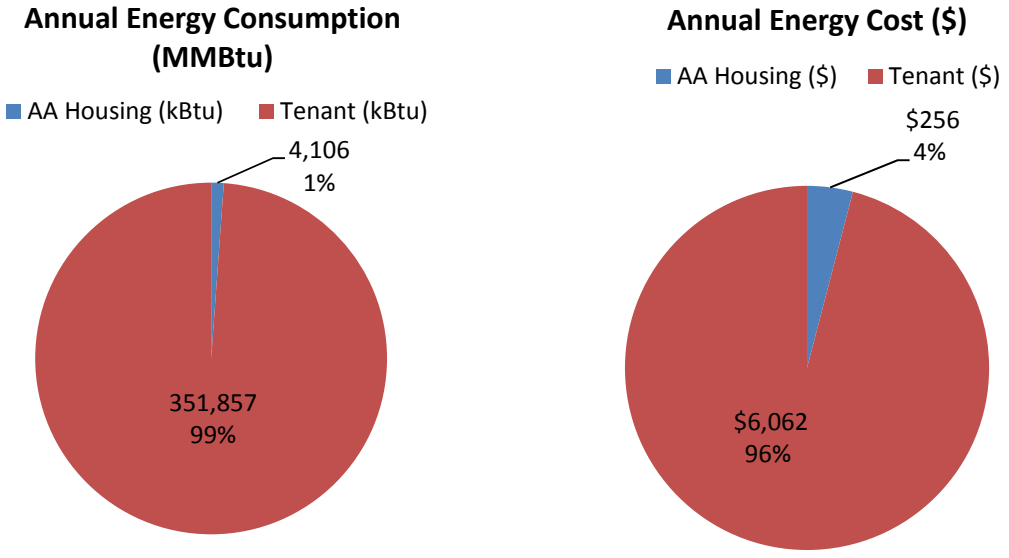


Figure 1. Historical Annual Energy Consumption and Cost

*Estimate. Please refer to Section 3.3 Energy Calculations Methodology.

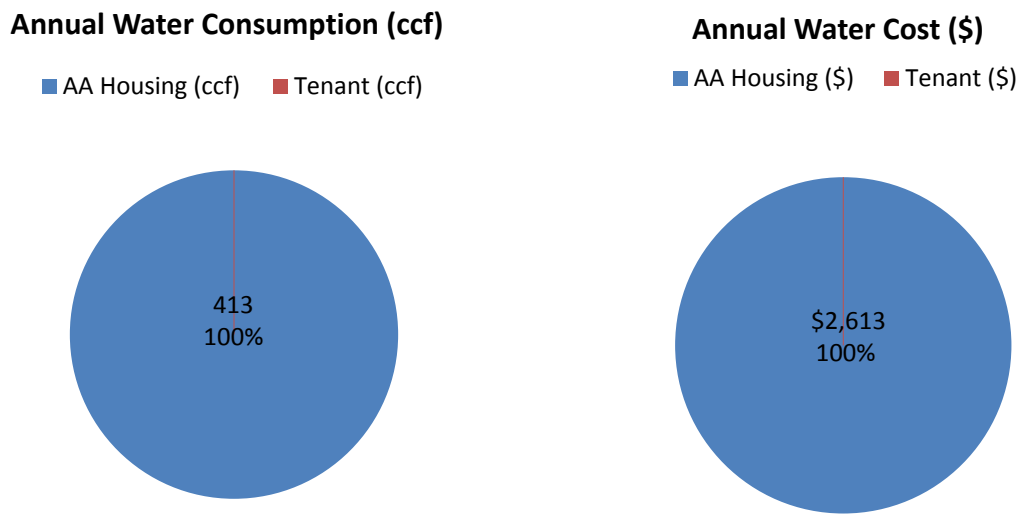


Figure 2. Historical Annual Water Consumption and Cost

The implementation costs and annual savings estimates for each proposed Energy and Water Conservation Measure are presented in Table 1 and Table 2. Table 1 outlines ECMs and WCMs that will directly impact the Owner's annual costs.

Table 1. Financial Summary of All Energy Conservation Measures (Owner)

Energy or Water Conservation Measure	ID	Additional First Cost	Annual Savings	Simple Payback (yrs)
Install Low-Flow Showerheads and Faucet Aerators (entire campus)	WCM1	$100	$571	0.2
Exterior Lighting Retrofit (entire campus)	ECM1	$1,511	$637	2.4
	Totals	**$1,611**	**$1,208**	**1.3**

The following ECMs are recommended specifically for tenant spaces. Due to separate billing for tenants, energy and cost savings will primarily benefit the tenants; however, the reduction in energy bills can impact the tenant's decision to continue residing in the building. Furthermore, at times of turnover, and vacancy, the housing authority is responsible for individual unit costs and would capture the benefit associated with these improvements at those times.

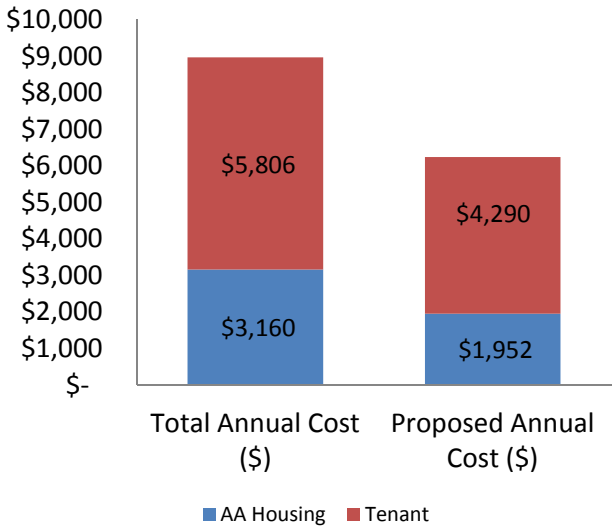
Table 2. Financial Summary of All Energy Conservation Measures (Tenant)

Energy Cost Reduction Measure (ECM)	ID	Additional First Cost	Annual Savings	Simple Payback (yrs)
Interior Lighting Retrofit	ECM2	$140	$377	0.4

Energy Cost Reduction Measure (ECM)	ID	Additional First Cost	Annual Savings	Simple Payback (yrs)
Install Programmable Thermostats	ECM3	$200	$161	1.2
Control Air Leakage	ECM4	$1,200	$413	2.9
Increase Attic Insulation to R-49	ECM5	$2,358	$121	19.5
Install High Efficiency AC Units	ECM6	$2,400	$444	5.4
	Totals	**$6,298**	**$1,516**	**4.2**

Table 3. Impact Summary

% Energy Savings	33%
% Water Savings	16%
% Cost Savings	31%
Annual Cost Savings ($)	$2,732
% Reduction in GHG Emissions (CO_2 Equivalent Metric Tonnes)	35%



2.0 Purpose and Scope

Norstar Development USA, LP, on behalf of the Ann Arbor Housing Commission (the Client), retained AKT Peerless Environmental & Energy Services (AKT Peerless) to conduct an ASHRAE Level II Energy Survey and Analysis of North Maple Duplexes located at 743-749 North Maple Road in Ann Arbor, Michigan.

AKT Peerless' scope of work and report is based on its proposal PE-16420, dated September 11, 2014 and authorized by Norstar Development USA, LP on behalf of the Ann Arbor Housing Commission (the Client), and the terms and conditions of that agreement.

The purpose of this report is to assist the Client in evaluating the current energy and water use and energy and water cost of the subject property relative to other, similar properties; and also to identify and develop modifications that will reduce the energy and water use and /or cost of operating the property. This report will identify and provide the savings and cost analysis of all practical measures that meet the client's constraints and economic criteria, along with a discussion of any changes to operation and maintenance procedures. It may also provide a listing of potential capital-intensive improvements that require more thorough data collection and engineering analysis, and a judgment of potential costs and savings.

Relevant documentation has been requested from the client that could aid in the understanding of the subject property's historical energy use. The review of submitted documents does not include comment on the accuracy of such documents or their preparation, methodology, or protocol. The following documents were available for review while performing the analysis:

- Energy Utility Bills
- 2009 United States Greenhouse Gas Inventory, Annex 2
- USEPA Climate Leaders Calculator for Low Emitters
- HUD Residential Energy Benchmark Tool
- HUD Residential Water Use Benchmarking Tool
- National Oceanic Atmospheric Administration "Normal Monthly Heating Degree Days (Base 65)" and "Normal Monthly Cooling Degree Days (Base 65)"

3.0 Additional Scope Considerations

In addition to fully satisfying the American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE) Procedures for Commercial Building Energy Audits, Second Edition 2011, Level II guidelines, this report includes all the necessary requirements of an Energy Audit as defined in the Rental Assistance Demonstration (RAD): Physical Condition Assessment (RPCA) statement of Work and Contractor Qualifications released by the Department of Housing and Urban Development (HUD) in October 2012, updated December 2013. These items are identified as follows:

- Heating and cooling systems sized according to the methodology proposed in the Air Conditioning Contractors of America (ACCA) Manual J guide. (See Section 11.4)
- Hot water heater analysis of existing size of individual hot water heater and the appropriate efficiency replacement sizing using First Hour Rating or another professionally recognized sizing tool. (See Section 11.2)
- An initial assessment of the potential feasibility of installing alternative technologies for electricity, heating and cooling systems, and hot water heating at the property. (See Section 13.0)
- An expected end of useful life study for all recommended energy and water efficiency measures.
- Recommendations of any additional professional reports needed (including, for example alternative energy system feasibility studies, air infiltration tests for energy loss and ventilation needs, blower door tests, infrared imaging, duct blasting, etc.)

4.0 General Information

4.1 Audit Team

This audit is the result of a collaborative process between the following AKT Peerless and client personnel:

Table 4. Audit Team

Name	Organization	Title
Jason Bing	AKT Peerless	Senior Energy Analyst
Lance Mitchell	Ann Arbor Housing Commission	Facilities & Maintenance Property Manager
Jennifer Hall	Ann Arbor Housing Commission	Executive Director

4.2 Audit Process

AKT Peerless collected historical energy data and floor plans for the building, when available. The square footage of all spaces was determined and the size and location of pertinent mechanical equipment was documented. AKT Peerless conducted a walk-through survey of the building on January 3rd, 2013 collecting specific information on the mechanical, electrical, and plumbing systems as well as occupancy, scheduling, and use patterns.

AKT Peerless utilized industry accepted measuring devices, including but not limited to: a blower door to quantify air infiltration, an infrared camera to visually identify areas of potential energy loss, an infrared thermometer to measure temperature(s) at the subject property, and a ballast discriminator to identify existing T12 lighting when applicable. Light levels were measured using a light meter in various areas to compare to Illuminating Engineering Society of North America (IESNA) recommended levels.

A visual inspection of the mechanical equipment, lighting systems, controls, building envelope and plug loads was performed. Mechanical equipment nameplate data was recorded and the specifications and performance data were reviewed and used in this analysis. Additionally, a blower door test was performed on one of the units to determine the air tightness of the apartment units, as well as identify areas of infiltration.

4.3 Energy Calculations Methodology

The primary methods of energy calculation for this analysis were simplified manual and spreadsheet tabulations based on professional standards. Actual calculation methods are discussed in each applicable section.

The end use consumption breakdown, found later in this report, is based on 2003 Commercial Buildings Energy Consumption Survey (CBECS) data for lodgings of relatively similar scale and age.

Because historic utility bill information was limited for the facility, the audit team did not have an accurate accounting of all energy consumption in the facility. The benchmark information provided in the 2009 Residential Energy Consumption Survey (RECS) and CBECS survey allowed our audit team to approximate the total energy end use consumption for the facility.

5.0 Property Description

This section summarizes physical characteristics and general use of the subject property.

5.1 Location

The subject property is located in ASHRAE Climate Zone 5A. According to National Oceanic and Atmospheric Administration recording of heating and cooling degree days, on an annual basis Ann Arbor, MI is expected to experience an average of 7,484 heating degree days (HDD) and 732 cooling degree days (CDD) with a basepoint temperature of 65 degrees Fahrenheit.

5.2 Property Characteristics

General information pertaining to the subject building is summarized in the following table:

Table 5. Property Characteristics

Primary Building Type / Occupancy	Multi-Family (General)
Region	ASHRAE 5A
Date of Construction	1995
Approximate Total Square Footage	4,188 sq ft

The subject property Primary Building Type is designated as Multi-Family (General). For all energy performance comparisons presented in this report the subject building will be compared to similar buildings of the same Primary Building Type.

5.3 Property Spaces

This complex is divided into two (2) approximately identical buildings. Spaces refer to the building as a whole and the rooms that comprise the building. Typically, the various space types will serve specific functions within the facility. The following table identifies the space types for the subject building.

Table 6. Summary of Property Spaces

Space	Use	Sq Footage (sf)	% of Total Area
Four (4) 3-bdr units	Residential Apartments	1,047 sf/unit	100%

5.4 Building Occupancy

Occupancy schedule has a significant impact on a facilities energy usage. In fact, the relationship between occupancy and system operating schedules and setpoints are typically more important than equipment efficiencies. The occupancy schedules for the subject building as follows:

Table 7. Building Occupancy Schedule

Day	Time	Use	Average Population
Sunday-Saturday	24/7	Primary Residence	2-4/unit

5.5 Building Envelope

This section summarizes physical characteristics of the subject building envelope.

5.5.1 Walls and Wall Insulation

The typical above grade wall construction appears to be a slab-on-grade, two-story standard wood framed structure built on a concrete foundation with light beige vinyl siding to the outside mechanically fastened to an exterior grade board over 2x4 wood studs. One quarter inch (1/4") face brick is utilized to create a decorative finish at the lower level, with most of the entire street-facing façade (at both levels) covered in the finish. The assembly is finished with painted drywall on the interior. The facility director noted that an entire portion of this face brick on the northernmost building had been removed and replaced with vinyl siding. Rigid insulation was added at this time. Fiberglass insulation was observed in at least one exterior wall location and is assumed to be located throughout the perimeter at each building. Depth of insulation could not be determined but is assumed at 3-5/8" and rated at R-13. This is generally considered standard efficiency.

These properties do not appear to have a basement.

5.5.2 Roof and Roof Insulation

The typical roof design on the four apartment buildings is a gabled, passively vented roof. Approximately 10" overhangs with non-continuous soffits run parallel to the ridge and balance a continuous ridge vent. The roof assembly is asphalt shingled roof (dark brown) over felted wood substrate mechanically fastened to prefabricated or site built 2x wood trusses. The typical attic appears to have 10-12" of blown fiberglass insulation on the ceiling. The insulation observed onsite appeared to be often unevenly distributed.

The estimated R-value of the attic is R-22 to R-27. This is generally considered standard efficiency for age of construction.

5.5.3 Windows and Other Fenestrations

The apartment windows are all dual glazed units with white aluminum frames and a thermal pane gap. These windows do not appear to be thermally broken. The windows were visibly "sweating" with condensation in several locations at the unit observed (749). The unit at the lower level had ice dams forming around the exterior sill from excessive moisture around the windows. This can cause rapid material degradation and exaggerate poor thermal performance around the assembly.

These windows are generally considered substandard efficiency and several are in poor condition and are need of replacement.

5.5.4 Doors

The exterior entrance doors appear to be solid core doors set in wood and aluminum frames.

5.5.5 Air Leakage

A blower door test was conducted on the building during the site visit. The blower door test was used to quantify air leakage by determining the 50-Pascal airflow rate. This blower door reading, expressed in cubic feet per minute (CFM_{50}), is the actual flow rate measured at 50 Pascals of house pressure. CFM_{50} is the most direct measurement of the airtightness of a building. For the subject property, North Maple Duplexes, the blower door airflow rate was 1,800 CFM_{50}.

Using standard industry practice (accounting for wind speed, shielding of the building by external elements, and the buildings height and size), the estimated natural air change rate was calculated to be 0.85 air changes per hour (ACH_n).

The leakage may have been exaggerated by an opening at the return air duct to the attic. This should be address as soon as possible and is mentioned later in this report.

5.5.6 Minimum Ventilation Requirement (MVR)

Either air leakage or a whole-house ventilation system must provide acceptable indoor air quality. The American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) set minimum ventilation requirements (MVRs) to ensure acceptable indoor air quality in homes. The older ASHRAE Standard 62-1989 recognizes air leakage as a legitimate ventilation strategy. The newer ASHRAE Standard 62.2-2007 requires a whole-house mechanical ventilation system.

ASHRAE Standard 62-1989 requires that air leakage must provide at least 15 CFM per person or 0.35 air changes per hour, whichever is greater. For the subject property, North Maple Duplexes, the MVR was calculated to be 60 CFM (=0.35 ACH) per average unit. This equates to a building tightness limit (BTL) of 888 CFM50 per average unit.

The blower door test (0.85 ACH) determined that air leakage provides excessive ventilation.

5.6 Heating, Ventilation, and Air Conditioning (HVAC)

Each of the units is heated by one (1) Lennox gas-fired, forced-air furnace (model number G6IMP.36B-071-09) rated at 71 kBtu/h input and 64 kBtu/h output with a 90% AFUE. This unit was installed in 2010. Heated supply air is generated from the furnace, located in the laundry room, and both return air is distributed through ductwork. In the unit inspected, there were flexible, insulated ducts throughout the attic, utilizing vinyl strapping at connections. It was observed that there may be some connection problems in the attic space with the return air duct. Furthermore, the opening in the ceiling to accommodate the return air duct is too large, and a large volume of air movement was identified here during the blower door test. The heating for each unit is controlled by a single Honeywell non-programmable digital thermostat.

The property does not have central cooling. There does not appear to be any window units in use at this property.

Ventilation for the units is supplied by both natural ventilation in window openings and a ceiling exhaust fan in each bathroom. The bathroom exhaust fan requires maintenance to better remove contaminated air.

The domestic hot water for each unit is supplied by a dedicated tank-style, gas-fired, water heater located in the laundry room. The unit inspected during the site visit contained an AO Smith, 40 gallon tank with a 40 kBtu/h rating that was installed in 2011.

These are generally considered standard efficiency units.

5.7 Lighting

This section describes this property's interior and exterior lighting.

5.7.1 Interior Lighting

Interior Lighting in each of the typical residential units consists of the following:

Kitchen/Living/Bedroom/Bath/Laundry/Hall

- Standard socket (A lamp) 2 Lamp Overhead 60-75W Incandescent (7)
- Standard socket (A lamp) 2 Lamp Wall Mount 60-75W Incandescent (1)
- Standard socket (A lamp) 4 Lamp Ceiling Fan 60-75W Incandescent (1)
- Circline T9 fixture (2)

5.7.2 Exterior Lighting

Exterior lighting for the N. Maple Duplexes Apartments consists of the following for each of the typical two (2) buildings:

- 50W High Intensity Discharge (HID) wall-mounted porch light (7 total)
- 14W MaxLite LED wall-mounted porch light (1 total)
- 150W HID wallpacks security lighting (1 each, 2 total)

5.8 Other Equipment (Energy)

Typical apartment unit kitchens include a refrigerator, microwave and an electric stove. Equipment is generally considered standard efficiency equipment.

Each apartment unit also supplies an electric hook up (vent, water, and electricity) for a washer and dryer in the laundry room. Typical washers and dryers observed during field investigations were standard or substandard efficiency units.

5.9 Water Consuming Devices

Each typical apartment unit has devices in the kitchen and bath that consume water. Typical apartment unit kitchens appear to have a standard double sink with standard efficiency aerators. The typical three bedroom apartments have one bathroom which has a lavatory, toilet and shower/bath. It appears most units have standard efficiency flow devices installed in each of the bathrooms, including showerheads and faucet aerators (2.5 gpm showerhead, 2.2 gpm faucet aerator). Toilets are 1.6 gpf units. There are higher efficiency alternatives available for these devices.

Each typical basement is equipped with a slop sink and laundry hook-up. Washers and slop sink aerators appear to be standard efficiency/flow units in most apartments.

5.10 Improvements since Previous Audits (2009)

The audit team believes the following equipment replacements/upgrades have taken place since the previous energy/water audits were conducted in 2009:

- New (high efficiency) furnace installed in 2010
- New (standard efficiency) hot water tank installed at each tenant apartment in 2011
- One LED Exterior Light has been installed in 2014

6.0 Energy Use Analysis

This section provides information on energy delivery to the subject property.

Energy use and cost indices for each fuel or demand type, and their combined total, have been developed using generally accepted industry methods and benchmarking tools provided by the Department of Housing and Urban Development (HUD) . The Energy Utilization Index (EUI) and cost index of the subject building are compared (benchmarked) with the EUI and cost index of similar buildings evaluated in the HUD Residential Energy Benchmark Tool.

AKT Peerless was not provided with all of the utility bills for this analysis, and this portion has been estimated. The following figures summarize the most recent annual energy consumption and costs for this property. These graphs reflect North Maple Duplexes' estimated annual utility consumption and cost**.**

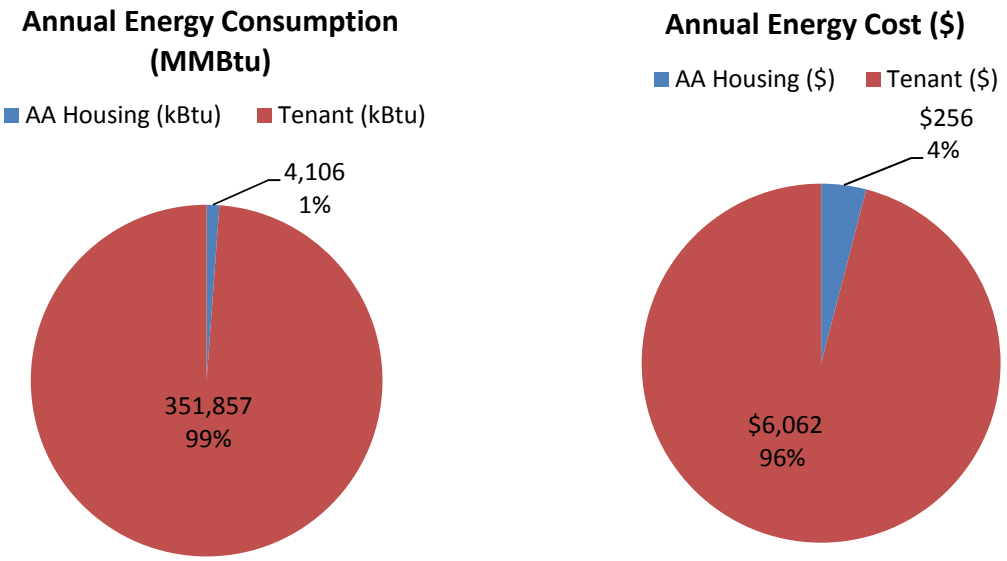


Figure 3. Historical Annual Energy Consumption and Cost

Please refer to Section 3.3 Energy Calculations Methodology.

6.1 Electricity

Electricity is supplied and delivered to the subject property by DTE Energy. Historic common area electrical use and estimated tenant use is compared to cooling degree days is summarized in the following figure:

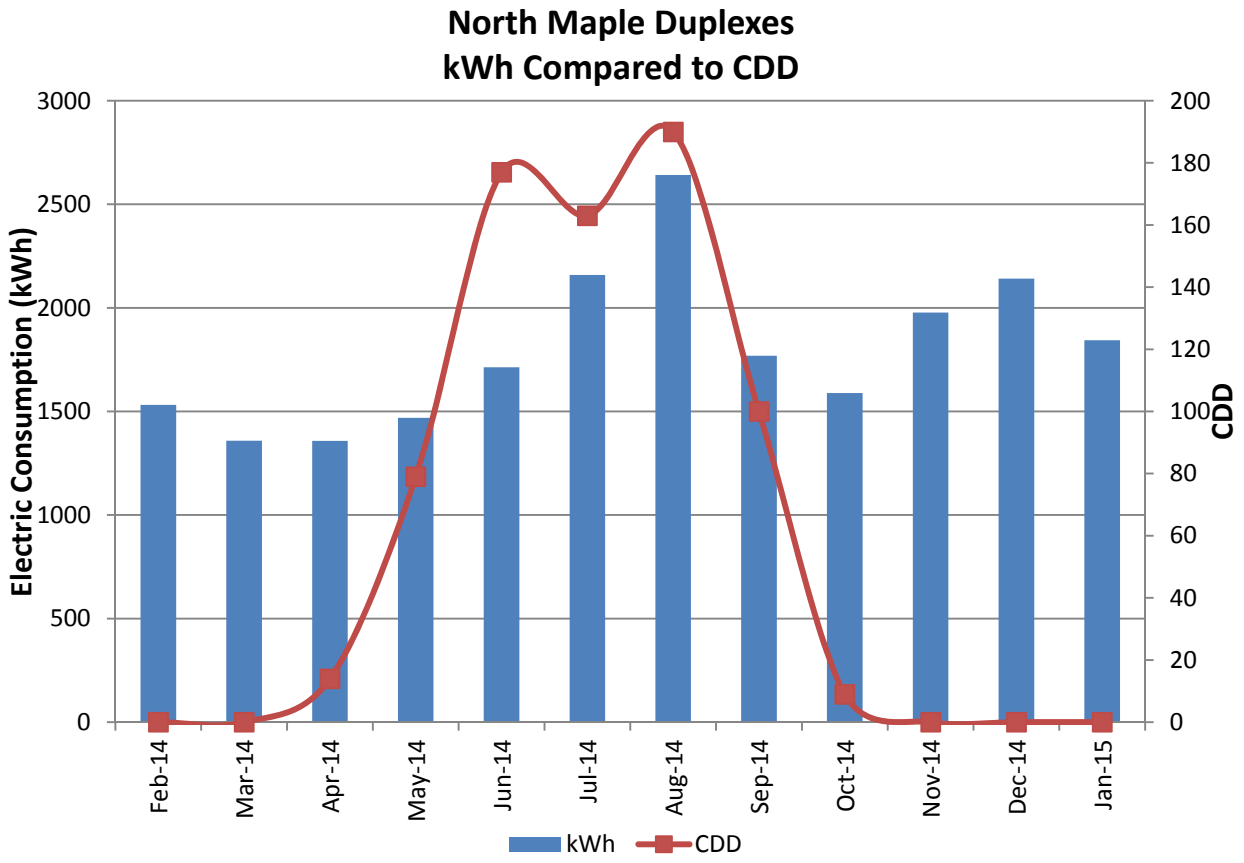


Figure 4. Electricity Consumption Graph

Table 8. Annual Electricity Metrics

	Owner	Tenant
Consumption	1,607 kWh	21,552 kWh
Energy Use Intensity	0.29 kWh / sf	5.15 kWh / sf
MMBtu	4 MMBtu	74 MMBtu

	Owner	Tenant
Cost per kWh	$0.213 / kWh	$0.147 / kWh
Cost per ft^2	$0.06 / sf	$0.76 / sf
Electricity Cost	$256	$3,172

Based on the method described in Section 3.3, Energy Calculations Methodology, the following figure shows the electricity consumption per end use.

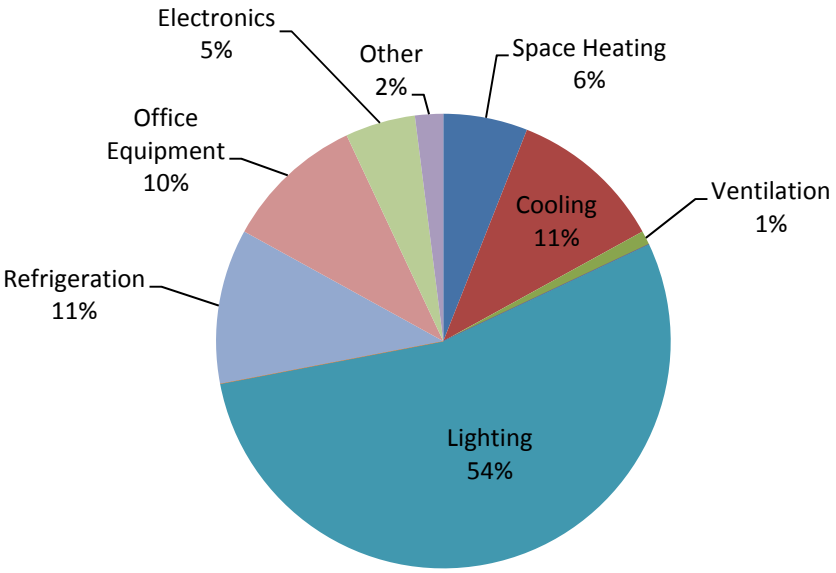


Figure 5. Estimated Electricity Consumption Per End Use

6.2 Natural Gas

Natural gas is supplied and delivered to the subject property by DTE Energy. Historic natural gas use is summarized in the following figures:

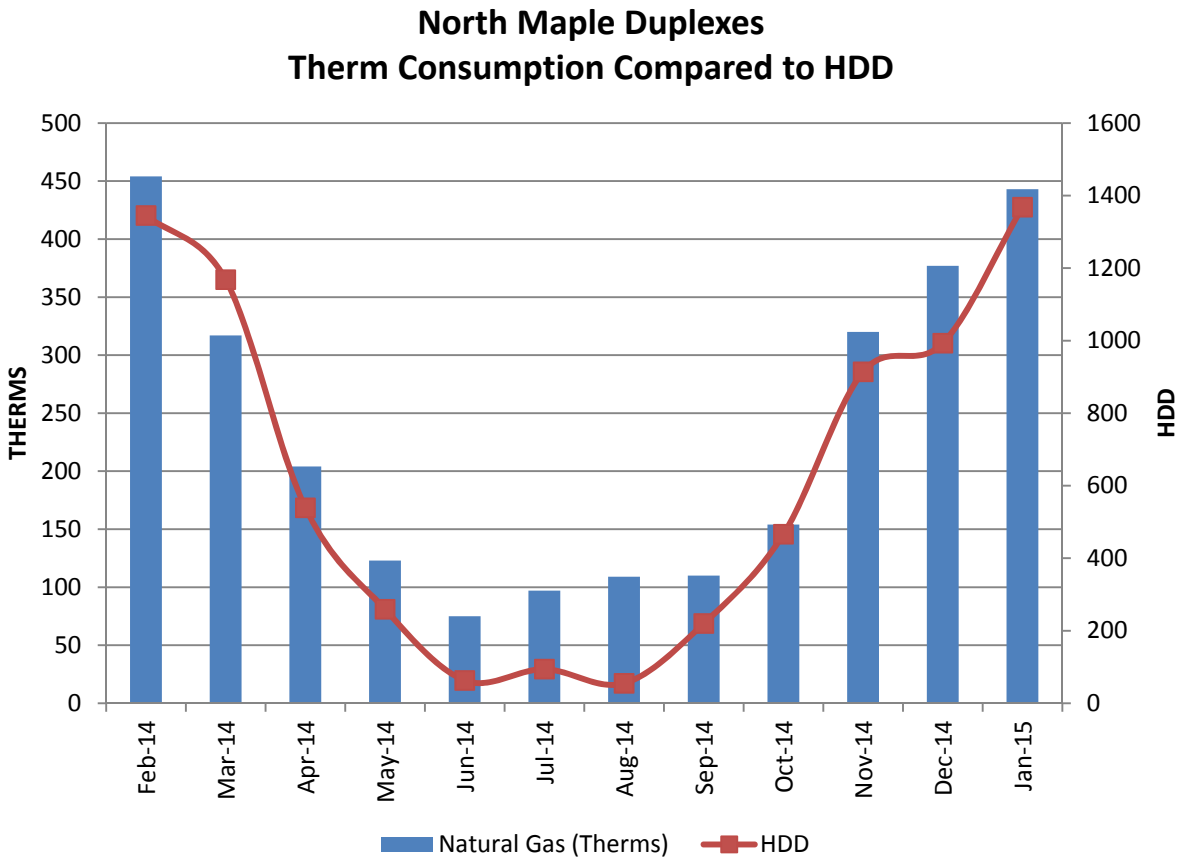


Figure 6. Natural Gas Consumption Graph

Table 9. Annual Natural Gas Metrics

	Tenant
Consumption	2,783 therms
Energy Use Intensity	0.66 therms / ft^2
MMBtu	278 MMBtu

	Tenant
Cost per therm	$0.95 / therm
Cost per ft^2	$0.63 / ft^2
Natural Gas Cost	$2,634

Based on the method described in Section 3.3, Energy Calculations Methodology, the following figure shows the estimated Natural Gas consumption breakdown by end use.

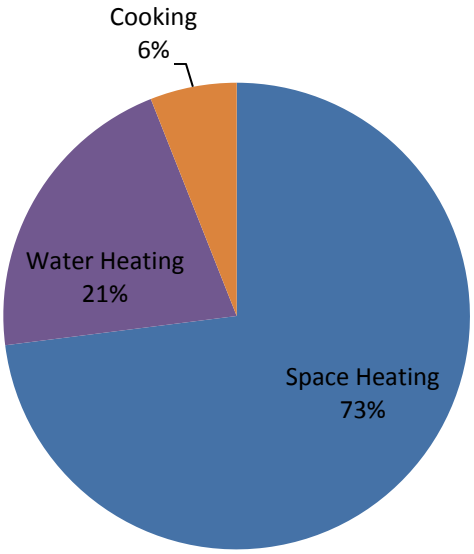


Figure 7. Estimated Natural Gas Consumption Per End Use

6.3 Domestic Water Use

For the time period covered by client provided records, historic domestic water use is summarized in the following figures.

Providers	Number of Meters Provided	Unit of Consumption
City of Ann Arbor	2	CCF

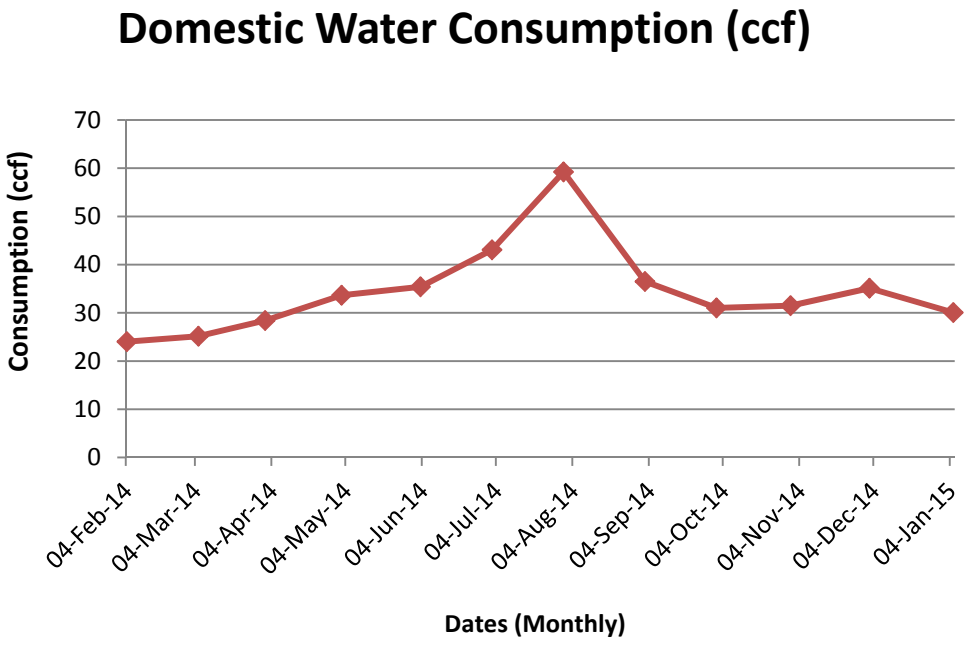


Figure 8. Domestic Water Consumption Graph (Owner)

Table 10. Annual Domestic Water Metrics

Consumption	413 CCF	**Cost per ccf**	$6.33 / CCF
Water Cost	$2,613	**Cost per ft^2**	$0.62 / ft^2

The supplied utility bill information for water consumption was limited. The provided annual water consumption was 413 CCF. Average cost per CCF for domestic water and sewer on an annual basis is $6.33. Total annual domestic water and sewer cost is $2,613. Actual cost and usage is expected be higher than the presented information.

According to the EPA, residential water use accounts for more than half of the publicly supplied water in the United States. For this reason, the EPA has introduced the WaterSense program to identify possible water efficiency methods and technologies for consumers throughout the country. Considering the

responsibility that typically lies with the tenants, multi-family homes are no stranger to excessive water usage. Fortunately, implementation of improved technologies throughout these facilities can impact the water supply as well as the rising overhead costs associated with distribution and collection.

The HUD Energy Benchmarking Tool was used to compare water consumption data for the subject property to typical water consumption data for similar HUD properties. The tool utilizes normalized data from its database of more than 9,100 buildings to provide comparative metrics on domestic water consumption based on a facility's historic water data and design characteristics. Finally, a score is generated for the analyzed building to identify its ranking among similar buildings.

The Residential End Uses of Water study (REUWS) published in 1999 by the AWWA Research Foundation and the American Water Works Association is a research study that examined where water is used in single-family homes in North America. Conducted by Aquacraft, PMCL, and John Olaf Nelson, the REUWS was the largest study of its kind to be completed in North America and efforts are underway to repeat the effort and obtain updated results. The "end uses" of water include all the places where water is used in a single-family home such as toilets, showers, clothes washers, faucets, lawn watering, etc. The full REUWS final report is available to the public at no charge from the Water Research Foundation (WRF).

Figure 8 below shows the REUWS typical domestic water consumption breakdown by end use.

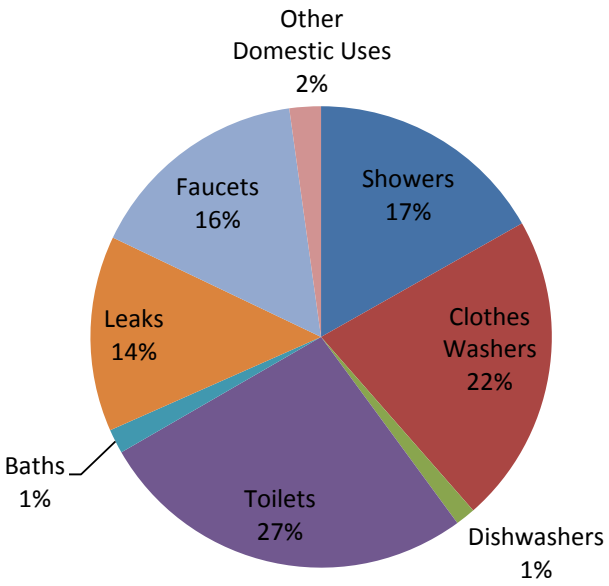


Figure 9. Domestic Water Typical End Use

6.4 Utility Cost Breakdown

The disparate energy types (electricity and natural gas for this facility) and water costs have been aggregated to provide a breakdown of total utility cost into end use components. The breakdown of

energy and water cost is based on the energy use breakdown, as described in Section 3.3, Energy Calculations Methodology.

The following table and charts detail the breakdown of energy and water costs. It should be noted that the consumption percentage identified in Section 5.1 Electricity, Section 5.2 Natural Gas, and Section 5.3 Domestic Water Use and the overall cost percentage for each end use are different. This is due to the cost difference for purchasing each energy type.

Currently, Ann Arbor Housing Commission pays $62.36 per MMBtu of electricity. The tenants pay $43.12 per MMBtu of electricity and $9.47 per MMBtu of natural gas.

Table 11. Annual Utility Use Breakdown

Categories	Electricity (MMBtu)	NG (MMBtu)	Total Consumption (MMBtu)	Consumption (%)
Space Heating	5	203	208	58%
Cooling	9	0	9	2%
Ventilation	1	0	1	0.2%
Water Heating	0	58	58	16%
Lighting	42	0	42	12%
Cooking	0	17	17	5%
Refrigeration	9	0	9	2%
Electronics and Appliances	8	0	8	2%
Computers	4	0	4	1%
Other	2	0	2	0.4%
TOTAL	**78**	**278**	**356**	

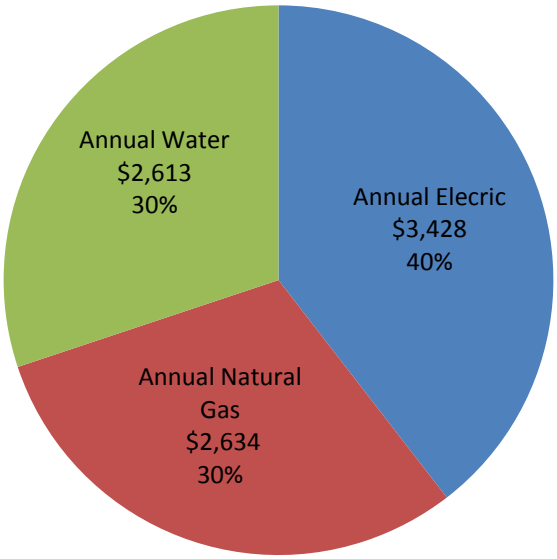


Figure 10. Annual Utility Cost by Type (Owner + Tenant)

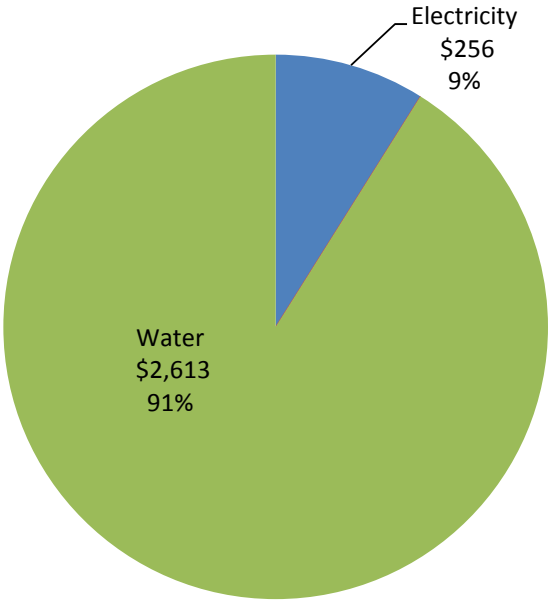


Figure 11. Annual Utility Cost by Type (Owner)

7.0 Energy Performance Benchmark

A benchmark is a standard by which something can be measured. Energy Benchmarking is the comparison of one building's energy consumption to the use of energy in a similar building. HUD's Office of Public and Indian Housing (PIH) has developed the Energy Benchmarking Tool to establish if a building's energy consumption is higher or lower than expected energy usage for similar buildings. AKT Peerless utilized the HUD Energy Benchmarking Tool to quantify the performance of the subject building relative to the family of HUD residential buildings.

This statistical analysis of the HUD tool is based on filters for the building's location, gross square footage, total number of units and year of construction (refer to the appendix for more information regarding dataset filters). This filtered data set is used to calculate the benchmarks for an overall benchmark Energy Use Intensity (EUI) as well as the Energy Cost Intensity (ECI). The benchmarks shown in the portfolio summary are derived from the statistical analysis described in this section.

The following table compares the building energy performance of the subject property and the established benchmark.

Table 12. HUD Residential Energy Use Benchmarking Tool

	Actual	Benchmark
Score Against Peers	43	50
EUI (Energy Use Index)	85.0 kBtu/ft^2	79.0 kBtu/ft^2
$ ECI (Energy Cost Index)	1.45 $ / ft^2	1.35 $ / ft^2

7.1 Estimated Energy Star Score

ENERGY STAR is a joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy dedicated to helping all building owners save money and protect the environment through energy efficient products and practices.

Results are already adding up. Americans, with the help of ENERGY STAR, saved enough energy in 2010 alone to avoid greenhouse gas emissions equivalent to those from 33 million cars — all while saving nearly $18 billion on their utility bills.

Because a strategic approach to energy management can produce twice the savings — for the bottom line and the environment — as typical approaches, EPA's ENERGY STAR partnership offers a proven energy management strategy that helps in measuring current energy performance, setting goals, tracking savings, and rewarding improvements.

EPA provides an innovative energy performance rating system which businesses have already used for more than 200,000 buildings across the country. EPA also recognizes top performing buildings with the ENERGY STAR.

Energy Star certification is based on your building's performance against typical energy performance of similar buildings. A target efficiency rating of 75 is required to qualify for the Energy Star. Because the audit team does not have all the utility bills for the entire facility, and the energy performance utilized in this investigation is based on estimates generated through best practice software results, the facility at the subject property is not currently eligible for the Energy Star.

If the building owner would like to pursue Energy Star certification in the future, our audit team can work with ownership and tenants/lessees to establish an accurate benchmark and determine the necessary steps towards efficiency improvements required for the certification.

8.0 Water Performance Benchmark

Water Benchmarking is the comparison of one building's water utilization to the use of water in a similar building. HUD's Office of Public and Indian Housing (PIH) has developed the preliminary benchmarking tool to establish if a building's water utilization is higher or lower than normal usage for similar buildings.

In order to develop the water consumption benchmarking tool, water consumption data was collected through voluntary release of information from thousands of buildings in nearly 350 PHAs nationwide. Regression analyses were performed on these datasets to see which of over 30 characteristics were most closely linked to water conservation.

Your building will score from 0 - 100, where 0 means water consumption is probably excessive and 100 means that the building probably uses water very efficiently. Important: this is a whole-building tool. Water use inputs include resident-paid consumption, when applicable/available.

The table below quantifies the performance of a use-defined building relative to the family of HUD residential buildings.

Table 13. HUD Residential Water Use Benchmarking Tool

	Actual	Benchmark
Score Against Peers	56	50
WUI (Water Use Intensity)	73.8 gal/ft^2	79.7 gal/ft^2
WCI(Water Cost Intensity)	0.62 $ / ft^2	0.67 $ / ft^2

9.0 Operations and Maintenance (O&M) Opportunities

Operation and maintenance make up the largest portion of the economic and environmental life cycle of a building and have become primary considerations of building owners and operators. Effective O&M is one of the most cost-effective methods for ensuring reliability, safety, and energy efficiency. Inadequate maintenance of energy-using systems is a major cause of energy waste in both the Federal government and the private sector. Improvements to facility maintenance programs can often be accomplished immediately and at a relatively low cost.

The following recommendations are believed to have the opportunity to reduce energy and water consumption for the facility.

9.1 Develop a Preventative Maintenance Plan for Equipment

Planned or preventative maintenance is proactive (in contrast to reactive) and allows the maintenance manager control over when and how maintenance activities are completed. When a maintenance manager has control over facility maintenance, budgets can be established accurately, staff time can be used effectively, and the spare parts and supplies inventory can be managed more efficiently.

Regardless of which strategy is used, maintenance should be seen as a way to maximize profit and/or reduce operating costs. From this perspective, the main functions of a maintenance department/staff are as follows:

- Control availability of equipment at minimum cost
- Extend the useful life of equipment
- Keep equipment in a condition to operate as economically and energy efficiently as is practical

The maintenance department/staff would be responsible for the following tasks:

- Maintenance planning
- Organizing resources, including staffing, parts, tools, and equipment
- Developing and executing the maintenance plan
- Controlling maintenance activities
- Budgeting

9.2 Institute an Energy Star Purchasing Policy

Energy costs associated with electrical plug loads should be minimized where possible. Plug loads are electrical devices plugged into the building's electrical system and generally include things like appliances and fixtures. When purchasing appliances and fixtures, the U.S. EPA ENERGY STAR standards should be specified. Manufacturers are required to meet certain energy efficiency criteria before they can label a product with the ENERGY STAR emblem, so these products represent your best energy saving value.

9.3 Water Heater Tank and Pipe Insulation

A water heater keeps water continually heated to a specific, set temperature. As the water loses heat through the tank walls during periods of non-use, the burner or heating element has to reheat the water. An insulation jacket will reduce the heat loss and, as a result, the energy required to maintain the hot water temperature and the water heater will not need to cycle as often. The insulation jacket enables the heater to bring the water up to temperature quicker, too, saving additional energy. Certain manufacturers may prohibit this on newer models. Please consult the tank manufacturer for newer models.

During periods of non-use, the heated water will rise to the top of the tank. The pipes can actually draw heat out of the tank, like a *wick*, and should be insulated. The first ten feet of hot and cold piping, if accessible, should be wrapped. If the water heating system is located in an unconditioned (cold) area, all accessible piping should be insulated.

9.4 Adequately Seal Doors and Windows

Infiltration is the flow of air through openings in a building. In order to reduce infiltration, the cracks and holes in a building must be adequately sealed. Maintaining caulking and weather stripping in good condition saves both money and energy. It also preserves the building and improves the comfort of its occupants. Verify that all doors and windows are adequately sealed. Verify that doors in existing entrance hallways are being closed to prevent unnecessary infiltration. Also, inspect the exterior of the buildings for cracks or other damage.

Older windows can be a major source of heat loss and air leakage, and can greatly impact the heating load on a building. A detailed engineering study is generally required to determine the best way to upgrade windows. However, be sure to consider low-e high performance glazing when window replacement becomes necessary. The additional cost will usually be paid for in energy savings in less than ten years.

A solution to infiltration from the bathroom exhaust fan involves installing a backdraft damper in the vent to restrict the flow of unwanted air into the building while still allowing the fan to properly exhaust unwanted air.

9.5 Regularly Clean Heating Equipment and Ductwork

A typical problem with multifamily properties is the presence of uneven heating within each unit. This is often attributed to the distribution system as well as the maintenance of the heating equipment. Heating systems that are not maintained can begin to collect debris in places like filters or the interior of the ductwork where it interferes with the flow of conditioned air from the furnace. This misdirected flow can cause a temperature differential between the rooms in the apartment and influence the occupants to adjust the appropriate thermostat set point.

Scheduled cleaning maintenance of the heating equipment and distribution system will not only ensure the occupant's continued comfort, but will also reduce the unnecessary energy consumption from increased temperature settings. Additionally, the proper maintenance will increase the lifetime of the equipment.

9.6 Change Furnace Filters on a Regular Basis

The furnace filter in the inspected home had far surpassed its intended life. The filter was built up with dust and other contaminants, restricting airflow through the furnace unit. This filter was changed during the site visit, but the filters at the remaining homes should be inspected.

As furnace filters get dirty, they become more efficient at catching dust up to a certain point. Then, if the furnace filter is not changed, it will begin to restrict airflow. This causes your furnace to work much harder to heat and cool your home because it must run longer, thus using more electricity.

A furnace filter pulls a majority of unwanted particles from the indoor air. Examples are mold spores, pet dander, household dust, smoke, pollen, dust mites and smog. Regular filter change is an easy way to reduce energy consumption. A dirty filter will force your system to work harder to push air through the filter, while a clean one will allow the air travel more freely. The filter also keeps the coils and the heat exchanges in your system clean, minimizing maintenance issues and extending the life of the equipment. It will also help maintain peak performance of the furnace or air conditioner.

A clean furnace filter helps the occupants breathe the cleanest air possible by pulling all those unwanted particles from the air. Changing your furnace filters at the recommended time frames will help keep occupants healthy and prevent airborne sickness and diseases. A clean furnace filter is a great way to help people with allergies and asthma live a healthier life by pulling aggravating allergens from the air.

A basic fiberglass furnace filter should be changed about every 30 days, while a pleated furnace filter lasts longer and should be changed about every 90 days.

10.0 Proposed Energy Conservations Measures (ECMs) and Water Conservation Measures (WCMs)

This analysis identified and included three primary types of ECM/WCMs:

- ECM/WCMs impacting the Owner (the Client) costs; and
- ECM/WCMs impacting the Tenant(s) costs; and
- ECM/WCMs to be implemented at the End of Useful Life (EUL) of equipment (includes both Owner and Tenant impacts)

The energy and water audit of the facility identified one (1) water conservation measure and six (6) energy conservation measures (ECMs). These ECMs are estimated to provide approximately $2,732 in annual savings. The investment required to implement all of the measures before the inclusion of applicable utility incentives is estimated to be $7,959. These savings measures are summarized within this section. Incentives are not included in the calculation of payback times and savings calculations. Utilizing available incentives is expected to reduce project costs and decrease simple payback.

Table 14. Financial Summary of ECMs and WCMs

Energy Cost Reduction Measure (ECM)	ID	Additional First Cost	Annual Savings	Simple Payback (yrs)
Install Low-Flow Showerheads and Faucet Aerator (entire campus)	WCM1	$100	$571	0.2
Exterior Lighting Retrofit (entire campus)	ECM1	$1,511	$637	2.4
Interior Lighting Retrofit at Tenant Apartments	ECM2	$140	$377	0.4
Install Programmable Thermostats at Tenant Apartments	ECM3	$200	$161	1.2
Control Air Leakage	ECM4	$1,200	$413	2.9
Increase Attic Insulation to R-49	ECM5	$2,358	$121	19.5
Install High Efficiency AC Units	ECM6	$2,400	$444	5.4
Total		**$7,959**	**$2,732**	**3.5**

Table 15. Summary of Energy Savings for ECMs and WCMs

ECM Description	kWh Annual Savings (kWh)	Therm Annual Savings (Therms)	Water Annual Savings (ccf)	GHG Reduction (Metric Tonnes)
Install Low-Flow Showerheads and Faucet Aerator (entire campus)	0	149	68	0.79
Exterior Lighting Retrofit (entire campus)	2,994	0	0	2.22
Interior Lighting Retrofit at Tenant Apartments	2,563	0	0	1.90
Install Programmable Thermostats at Tenant Apartments	0	170	0	0.90
Control Air Leakage	0	436	0	2.32
Increase Attic Insulation to R-49	0	128	0	0.68
Install High Efficiency AC Units	3,016	0	0	2.23
Totals	**8,624**	**883**	**68**	**11.07**

Table 16. Measures for Consideration at the End of Useful Life (EUL) of Equipment

Energy Cost Reduction Measure (ECM)	ID	Additional First Cost	Annual Savings	Simple Payback (yrs)
Replace Older Refrigerators with Energy Star Models	EUL1	$50	$8	6.6
Replace Old Hot Water Heaters with Energy Star Models	EUL2	$225	$31	7.2
Install Energy Star Windows	EUL3	$2,485	$678	3.7
Install High Efficiency Furnace	EUL4	$3,600	$184	19.6

10.1 WCM1 - Install Low-Flow Showerheads and Faucet Aerators

Summary						
Cost to Implement	**Estimated Annual Cost Savings**	**Simple Payback (years)**	**Electricity Savings (kWh)**	**Natural Gas Savings (therms)**	**Water Savings (ccf)**	**GHG Reduction (Metric Tonnes)**
$100	$571	0.2	0	149	68	0.79

Recommendation Description

In some areas, water and sewer rates have increased dramatically over the past few years and are rivaling the cost of energy. Reducing water use through conservation strategies can generate significant cost savings. These strategies include implementing low flow shower heads and faucet aerators.

WaterSense, a program sponsored by the U.S. Environmental Protection Agency (EPA), is helping consumers identify high performance water-efficient toilets that can reduce water use in the home and help preserve the nation's water resources.

It is recommended to install a low-flow faucet aerator (0.5 GPM) in each bathroom on the entire campus. Additionally, it is recommended to replace every showerhead with a low-flow showerhead (1.5 GPM).

Assumptions

Calculation of savings is based on replacing four (4) showerheads currently using 2.5 GPM with a new showerhead using 1.5 GPM. A value of 8 min of shower use per occupant per day (from the REUWS survey referenced in Section 5.3) was used, assuming two occupants or greater in each house.

Lavatory water savings calculation were based on replacing one (1) faucet aerator using 2.2 GPM with a low-flow faucet aerator (>0.5 or equal to 1 GPM) in each of the residential unit bathrooms. In total, the analysis of replacing showerheads and faucet aerators produced a water savings of greater than or equal to 12,740 gallons per household (4 total households).

Incentives

DTE Energy's Multifamily Program is offering direct install incentives for low-flow showerheads and faucet aerators. The application for this program is included in the appendix.

Expected Useful Life Study

Faucet aerators and showerheads have an expected useful life of ten years and toilets have an expected useful life of 20 years. It is believed that faucets and showerheads were installed approximately 10 years and are need of replacement.

10.2 ECM1 - Exterior Lighting Retrofit

Summary						
Cost to Implement	**Estimated Annual Cost Savings**	**Simple Payback (years)**	**Electricity Savings (kWh)**	**Natural Gas Savings (therms)**	**Water Savings (ccf)**	**GHG Reduction (Metric Tonnes)**
$1,511	$637	2.4	2,994	0	0	2.22

Recommendation Description

Exterior lighting on the building façade and around the building is outdated. Significantly more efficient lighting options exist. Therefore, it is recommended that exterior lighting be retrofitted with more efficient lighting. Specifically, light emitting diode (LED) lighting.

The existing HID exterior lighting is outdated, and significantly more efficient lighting options are readily available. For this application, it is recommended that exterior lighting be retrofitted with more efficient light emitting diode (LED) lighting.

Along with significant electrical savings at equivalent lumen output, maintenance will be greatly reduced as the LED lights proposed have an L70 lifespan of 100,000 hours. L70 is an industry standard to express the useful lifespan of an LED. It indicates the number of hours before light output drops to 70% of initial output. Maintenance reduction is not factored into the savings calculated for this report. LED lighting is considered a green technology due to the high fixture efficacy and the absence of mercury, arsenic, and ultraviolet (UV) light.

The initial cost of this project is the material cost for two (2) of the subject exterior wall packs and seven (7) of the exterior wall packs at entries and stairs. Again, the additional savings associated with reduced maintenance costs are not included in the calculated savings.

Assumptions

It is assumed that all the lighting is used at night and is property owned.

Installation of new LED wall packs would be performed by in-house maintenance staff at no additional labor cost.

It is assumed that the proposed fixtures will provide adequate light level for safety and security purposes. The lighting calculator spreadsheet result is included in the appendix.

Calculations

This ECM analysis was based on replacing the existing wall pack fixtures with model #MLFL14LED50 **or equivalent**, 14 watt high performance LED wall packs and replacing security lighting with model # MLSWP30LED50 watt high performance LED.

$$Energy\ Cost\ Savings = Energy\ Consumption\ Savings\ \times Energy\ Cost\ per\ kWh$$

Where:

$$Energy\ Consumption\ Savings = Existing\ Usage - Proposed\ Usage$$

$$Usage = \sum (\#\ of\ fixtures\ \times watts\ per\ fixture\ \times burn\ hours)$$

Incentives

DTE Energy's Multifamily Program is offering incentives for replacing existing HID exterior lighting with LED lighting. Existing lighting must operate more than 3,833 hours per year and replacement must result in at least a 40% power reduction.

Expected Useful Life Study

Lamps in the exterior light fixtures were installed in 2008 and have an expected useful life of six years. It is believed that the remaining lamps will need to be replaced next year. The expected useful life of an LED replacement fixture is typically around 15 years.

10.3 ECM2 - Interior Lighting Retrofit in Tenant Apartments

Summary						
Cost to Implement	**Estimated Annual Cost Savings**	**Simple Payback (years)**	**Electricity Savings (kWh)**	**Natural Gas Savings (therms)**	**Water Savings (ccf)**	**GHG Reduction (Metric Tonnes)**
$140	$377	0.4	2,563	0	0	1.90

Recommendation Description

Approximately twenty (20) incandescent lamps, in various fixtures, were observed in the tenant units during the site visit. The majority of the incandescent lamps were 60 watt, with some 75 watt lamps observed. It is recommended that **all** incandescent lamps be upgraded to compact fluorescent lamps (CFLs). The existing incandescent lamps are inefficient and require unnecessary amounts of energy. The incandescent lamps are a mix of 60 watt and 75 watt, which have 16 watt and 19 watt CFL replacements respectively.

Compact fluorescent lamps are a great alternative to incandescent bulbs. On average, CFLs use seventy-five percent less electricity than incandescent bulbs and have a lifetime that is 10 times longer. Advances in technology over the past few years have brought great improvements to CFLs in terms of light quality and appearance, and they are available in a variety of shapes and sizes.

Assumptions

A lighting survey of the property was conducted by AKT Peerless during the walk-through. A table of existing and proposed lighting can be found in the appendix.

Calculations

$$Energy\ Cost\ Savings = Energy\ Consumption\ Savings\ \times Energy\ Cost\ per\ kWh$$

Where:

$$Energy\ Consumption\ Savings = Existing\ Usage - Proposed\ Usage$$

$$Usage = \sum (\#\ of\ fixtures\ \times watts\ per\ fixture\ \times burn\ hours)$$

Incentives

DTE Energy's Multi-family Program is offering direct install incentives to replace incandescent lamps with CFLs. The application for this incentive is included in the appendix.

Expected Useful Life Study

Lamps in the exterior light fixtures were installed in 2008 and have an expected useful life of six years. It is believed that the remaining lamps will need to be replaced next year. The expected useful life of an LED replacement fixture is typically around 15 years.

10.4 ECM3 - Install Programmable Thermostats

Summary						
Cost to Implement	**Estimated Annual Cost Savings**	**Simple Payback (years)**	**Electricity Savings (kWh)**	**Natural Gas Savings (therms)**	**Water Savings (ccf)**	**GHG Reduction (Metric Tonnes)**
$200	$161	1.2	0	170	0	0.90

Recommendation Description

Currently, control of the furnace heat in each home is by a manual thermostat located in the hallway. Please note that although the thermostat observed during the site visit (and possibly others) is electronic with a digital display, it is not programmable.

It is recommended that a programmable thermostat is installed to control the heat. The programmable thermostats would allow a nighttime setback to be employed, thereby saving energy on heating during overnight hours.

Because the thermostat is controlled by the resident, a "tamper-proof" type design should be considered. Tenant or resident energy education is crucial when replacing manual thermostats with temperature limiting programmable thermostats. At the time of installation, tenants and residents should be informed about why the thermostats were selected and how they operate. Recommended temperature settings are included below.

	Heating Daytime Setting	Heating Nightime Setback
Current Setpoints (estimated)	73 °F	73 °F
Proposed Setpoints	72 °F	68 °F

Calculations

Calculations were performed using an energy savings calculator that was developed by the U.S. EPA and U.S. DOE for estimating purposes. The calculator was modified to more closely represent the actual building heating load. Weekday and weekend typical usage pattern used an 8 hour nighttime setback of 68 degrees and a regular set-point of 72 degrees.

Assumptions

The subject energy savings calculator assumes the following:
Savings per Degree of Setback (Heating Season) = 3% based on Industry Data 2004

The baseline energy consumption for heating dedicated to the building was estimated using a combination of the consumption profiles in Section 5.2 and the auditor's judgment. Resultant consumption was 17 MMBtu for heating.

A reduction of 4 degrees (nighttime setback of 68 degrees) for an 8 hour setback every night was assumed.

Incentives

DTE Energy's Multifamily Program is offering a direct install incentive for installing programmable thermostats in the individual units.

Expected Useful Life Study

The existing manual thermostats have an expected useful life of 15 years. These thermostats were installed in 1999 and will reach the end of their useful life in 2014. At this time, replacement of the manual thermostats with programmable thermostats, with the same expected useful life, is recommended.

10.5 ECM4 - Control Air Leakage

Summary						
Cost to Implement	**Estimated Annual Cost Savings**	**Simple Payback (years)**	**Electricity Savings (kWh)**	**Natural Gas Savings (therms)**	**Water Savings (ccf)**	**GHG Reduction (Metric Tonnes)**
$1,200	$413	2.9	0	436	0	2.32

Recommendation Description

Air leakage through holes, gaps, cracks, penetrations, and electrical receptacles is a major source of heat loss from a dwelling unit. Controlling this air leakage through a combination of weather stripping and strategic sealing can significantly reduce the amount of heat lost to the outside, thus reducing the amount of energy needed to heat the dwelling unit. Insulation also can help reduce air leakage.

In addition to saving energy, controlling air leakage can reduce moisture problems and reduce the influx of odors and contaminated air from the basement and other units, while increasing the overall comfort of the residents.

But reducing air leakage through air-sealing techniques is more complicated than simply weather-stripping and caulking. Two important principles must be understood. First, even if a building is full of holes, air will not move through those holes unless there is a difference in pressure between indoors and outdoors. This pressure differential depends on the difference between indoor and outdoor temperatures, wind speed and direction, and mechanical ventilation. If there is no pressure differential, the air stands still and does not leak in or out. This is important because sealing a hole where there is no pressure differential will not save energy. Pressure tends to be highest on upper and lower floors and in basements. In the heating season, hot air rises and pushes on the ceiling, creating high positive pressure and eventually leaking out. When it does leak out, it is replaced by cold air coming into the lower part of a building, where the pressure is negative from all the warm air moving upward. This force is called the "stack effect."

The second important principle is that air sealing can affect air quality. Air leakage is the primary source of ventilation in many buildings. Tightening a building by reducing air leakage can endanger the health of the occupants in buildings with no mechanical ventilation. This risk is highest in buildings with significant sources of indoor air pollution, such as back drafting from gas appliances or high occupancy levels. If a building does not have mechanical ventilation, it is recommended that a ventilation system be installed before air leakage is significantly reduced.

<u>For the subject property, North Maple Duplexes:</u> (see Section 5.5.5 and 5.5.6 for details)

The blower door test determined that air leakage is adequate for ventilation, but excessive. **It is highly recommended that air sealing is performed at this property.**
The blower door airflow rate was 1,800 CFM50.
The building tightness limit (BTL) is 888 CFM50.
Therefore, an air leakage reduction limit of 51% should not be exceeded.

Air Sealing Strategy:

Air seal the home to the minimum ventilation rate (MVR) for air leakage, but **not** below. During the blower test of one representative sample unit, the air leakage was identified to be in the following areas:

1) Penetrations for the return air and supply air ducts through the ceiling are providing a direct air path between the conditioned space and attic in unit 749. This may be a common condition throughout. A significant reduction in air leakage will be realized by blocking the air path into the attic at this duct penetration. A combination of rigid foam and expandable polyurethane foam (such as GreatStuff) can be utilized to fill the gaps on either side of the penetration. Caulk should be used for finish sealing.

2) Window areas are cause of drafts. All interior window casing should be sealed with caulk (outside of the casing to the wall, inside of the casing to the jamb extensions, and the jamb extensions to the window frame). Products such as Dap's Seal & Peal (removable weather-strip caulk provides a watertight and weatherproof seal to temporarily seal out drafts and save energy / peels away when removal is desired / won't damage painted surfaces) can be used to air seal the leaks between the slider units and window frame. The tested unit had weather stripping at the entry doors (complete jambs and new threshold sweep), but all units should be checked for the same.

3) Floor to wall joints have air leakage. Base molding and shoe molding should be caulked complete at floor and wall.

4) Wall penetrations have air leakage. Plumbing pipes under sinks, electrical outlets, and other wall and ceiling penetrations should be sealed.

5) Air seal the attic as necessary. This would include all additional ceiling and top plate penetrations (electrical and plumbing vent stack); also, the perimeter furring cavity is likely to have significant air leakage.

Assumptions

Air sealing would cost an estimated $800 per unit ($3,200 total for the facility if performed by AA Housing staff) to achieve 51% reduction in air leakage. This is difficult to predict, and it is highly recommended to air seal a sample unit while conducting periodic "post" blower door tests to track air sealing progress and verify scope of work. This method should result in a scope of work that will provide a predictable reduction in air leakage.

Calculations

See Section 5.5.5 and 5.5.6 for details.
The sensible heat loss due to excess air leakage was estimated based on a 51% reduction of existing air leakage (61 CFM). This preserves the MVR detailed in the recommended description above. Equation

used for estimation was: Q = 1.08 * (61 cfm) * (6,818 HDD) * 24 hr/day = 10,889,931 Btu (approx. 109 therms) per unit.

Incentives

DTE Energy's Multifamily Program is not offering incentives for air sealing at the present time.

Expected Useful Life Study

Depending on the applied location, the life expectancy of caulks and sealants can be in the range of five to ten years. It is believed that the areas identified with air leakage have either never been sealed in the past or need to be resealed.

10.6 ECM5 - Increase Attic Insulation to R-49

Summary						
Cost to Implement	**Estimated Annual Cost Savings**	**Simple Payback (years)**	**Electricity Savings (kWh)**	**Natural Gas Savings (therms)**	**Water Savings (ccf)**	**GHG Reduction (Metric Tonnes)**
$2,358	$121	19.5	0	128	0	0.68

Recommendation Description

Attic insulation reduces the amount of heat that flows from a dwelling unit through the attic to the cold outside air. By reducing this heat loss, attic insulation reduces the amount of energy needed to heat the dwelling unit in the winter. In the summer, attic insulation saves on cooling costs and keeps buildings more comfortable by reducing the conduction of heat from the hot attic through the ceiling and into the unit.

A material's resistance to heat flow is measured in units of "R-value". The higher the R-value, the better the insulating property. The R-value of insulation depends on the type of insulation and its thickness. Optimal R-value for attic insulation depends on the existing insulation, fuel costs, and climate.

The typical attic appears to have 10" (nominal) of blown fiberglass insulation. The estimated R-value of this insulation type and level is R-24 (loose fill fiberglass, 0.6 lb/ft^3, horizontal application, open blow, R-value 2.2-2.7 per inch. The insulation observed onsite appeared to be poorly placed with the blown insulation often unevenly distributed. It was also noted that areas around the stairwell were missing insulation. This uneven distribution of insulation results in a lower effective insulation value in the attic. Overall, this insulation would be considered standard efficiency at best, or in some cases substandard efficiency (<R-21).

This ECM explored adding an additional insulation level of approximately R-30, bringing the total to R-49, which is the target Energy Star recommended insulation level for retrofitting wood-framed buildings in this climate zone.

If the attic insulation is increased at some point in the future, be sure to do any required air sealing first. Also, rafter vents (insulation baffles) will likely be required to achieve the desired insulation depth near the eaves. The following is from the Energy Star website regarding rafter vents:

To completely cover your attic floor with insulation out to the eaves you need to install rafter vents (also called insulation baffles). Complete coverage of the attic floor along with sealing air leaks will ensure you get the best performance from your insulation. Rafter vents ensure the soffit vents are clear and there is a channel for outside air to move into the attic at the soffits and out through the gable or ridge vent. To

install the rafter vents, staple them directly to the roof decking. Rafter vents come in 4-foot lengths and 14-1/2 and 22-1/2 inch widths for different rafter spacings. Rafter vents should be placed in your attic ceiling in between the rafters at the point where your attic ceiling meets your attic floor.

Once they are in place, you can then place the batts or blankets, or blow insulation, right out to the very edge of the attic floor. Note: Blown insulation may require an additional block to prevent insulation from being blown into the soffit. A piece of rigid foam board placed on the outer edge of the top plate works very well for this.

Assumptions

Using the cost of $1.10 per square foot (from RS Means) of approximately 10" of blown loose -fill cellulose insulation.

Calculations

The conductive heat loss due through the ceiling was estimated based comparing an effective insulation value of R-24 in the ceiling area with an R-49 ceiling area. Equation used for estimation was the standard heat loss: $Q = U * A * (6{,}818\ HDD) * 24\ hr/day$

Incentives

DTE Energy's Multifamily Program is not offering incentives for installing additional insulation in the attic space at the present time.

Expected Useful Life Study

Aside from potential exposure to environmental elements, insulation, for the most part, has an expected useful life of over fifty years. Adding insulation to the existing layer should be considered when the existing insulation is still in good condition and is sufficient to fulfill code requirements.

10.7 ECM6 - Install High Efficiency AC Units

Summary						
Cost to Implement	**Estimated Annual Cost Savings**	**Simple Payback (years)**	**Electricity Savings (kWh)**	**Natural Gas Savings (therms)**	**Water Savings (ccf)**	**GHG Reduction (Metric Tonnes)**
$2,400	$444	5.4	3,016	0	0	2.23

Recommendation Description

According to the Great Lakes Adaption Assessment for Cities, the estimated number of days reaching temperatures at or above 90 degrees in Southeast Michigan will increase to 30-50 days per year due to global climate changes. With many of the Ann Arbor Housing residents being disabled or elderly, health issues often are exacerbated by the hot and humid weather. Consequently, AAHC plans on including air conditioning to all the tenant spaces.

At the present time, only a few of the tenant units at North Maple Duplexes have window air conditioners for space cooling. In cases where window air conditioners are present, the resident is responsible for those purchases and installation. Often, improper installation can cause damage to the windows and walls. Additionally, the appropriate size is not always selected; thus reducing the efficiency of the unit and increasing energy costs.

Several options, including geothermal systems and through-the-wall units, were considered for North Maple Duplexes. A geothermal system appears infeasible due the overall costs associated with installation. Alternatively, through-the-wall units are feasible for this property; however, installation would involve framing, interior finish, and exterior finish work.

The most efficient and cost effective option for this property is a high efficiency split system. This system consists of both an indoor and outdoor unit. The indoor unit (evaporator coil) is installed in the current forced air furnace. The unit is connected to the outdoor unit with just a few lines running through a small opening in the exterior wall. The outdoor condensing unit has a small footprint and can easily be hidden behind the surrounding landscape.

The efficiency of an air-conditioning unit is identified by the Seasonal Energy Efficiency Ratio (SEER) rating. The SEER rating of a unit is the cooling output during a typical cooling-season divided by the total electric energy input during the same period. The higher the unit's SEER rating the more energy efficient it is. Standard efficiency through-the-wall air conditioners typically have SEER ratings at or below 10. Technological developments have produced great advances in air conditioning efficiency, with current split system SEER ratings of 18 or better.

It is recommended that AAHC install a high efficiency split system (condensing unit and evaporator coil) in all tenant spaces.

Calculations

This ECM analyzes the cost savings associated with installing a split system over through-the-wall air

conditioners in all of the units at North Maple Duplexes. *The premium cost is the difference between the cost of the high efficiency item and the standard replacement item (through-the-wall room air conditioners).

Equipment and installation cost of $2,500 for a through-the-wall air conditioner (10 SEER).
Base cost of $2,710 for high efficiency split system
Additional labor cost of $800 per unit for high efficiency installation. This is for the cost of installing necessary refrigerant and electrical lines.

An online Air-Conditioning Cost Calculator was used to generate all estimates used in this ECM. The result output is included in the appendix. For the purposes of this report, it was assumed that four of the tenant spaces were being considered for air-conditioning upgrades. On average, the typical number of annual cooling hours was estimated to be about 600 hours and the typical rating per unit to be approximately 1.5 tons.

Incentives

DTE Energy's Multifamily Program is not offering incentives to install high efficiency air conditioners at the present time.

Expected Useful Life Study

Room air-conditioners typically have an expected useful life of 15 years. The recommended ductless split system also has an expected useful life of 15 years.

Manual J Calculation Results

To confirm appropriate sizing of the recommended cooling equipment, AKT Peerless performed calculations in accordance with Air Conditioning Contractors of America (ACCA) Manual J guidelines. An industry accepted software program, HVAC-Calc Residential 4.0.58c, was used to calculate the heat loss and heat gain in a unit. A detailed report of the Manual J calculations is included in the appendix of this report.

It was assumed that most of the units at North Maple Duplexes were all constructed in a similar manner; therefore, the sizing of cooling systems would be the same for all four units. According to the calculations, the total heat gain for a typical unit would be between 13 and 15 kBtu/h. It should be noted that these calculations have assumed previously recommended ECMs have already been implemented. Recommended size for the air-conditioning system should be around 1 to 1.5 ton units per tenant space.

11.0 ECMs for End of Useful Life (EUL)

The following are ECMs for which the calculated payback period exceeds the useful life of the product, when considered for immediate replacement. However, these ECMs have a viable payback period when the replacement occurs at the end of the product's useful life (EUL), since the item would be replaced at this time in any case. In order to demonstrate the benefit of upgrading to an energy efficient product, only the premium cost for upgrading to the energy efficient product is considered in the initial investment. The premium cost is the difference between the cost of the energy efficient item and the standard replacement item.

11.1 EUL1 - Replace Older Refrigerators with Energy Star Models

Summary (per refrigerator)

Premium Cost	Estimated Annual Cost Savings	Simple Payback (years)	Electricity Savings (kWh)	Natural Gas Savings (therms)	GHG Emissions (Metric Tonnes)
$50	$8	6.6	51	0	0.04

Recommendation Description

After lighting, refrigerators are the second largest users of electricity in most households (not including households with electric heat or hot water). Older refrigerators can use up to four times more electricity than the most efficient new models available in the same size.

Replacing these inefficient units with new, more efficient refrigerators can realize substantial energy and cost savings. In many cases, it is cost-effective to replace older refrigerators before scheduled replacement because of the electricity cost savings.

It was believed that these 1 bedroom homes have refrigerators approximately 15 cu ft. and the units were manufactured between 1997-2000. The replacement model used in the ECM calculation is 15 cu ft. model that is estimated to use 343 kWh per year and has an estimated cost of $500 each. This automatic-defrost model is ENERGY STAR® qualified because it is 15 percent more efficient than federal standards require. By contrast, the average refrigerator in that size purchased before 1990 uses around 1,100 kWh, with older units using more than 1,500 kWh per year.

Calculations

The Stanford University Appliance Calculator was used to generate all estimates used in this ECM. The calculator result output is included in the appendix.

The Appliance Calculator Project is part of the Stanford Large-Scale Energy Reductions through Sensors, Feedback & Information Technology Initiative, an Advanced Research Projects Agency for Energy research program (ARPA-e), funded by the Department of Energy http://arpa-e.energy.gov/

Incentives

DTE Energy's Multifamily Program is not offering incentives to install Energy Star products at the present time.

Expected Useful Life Study

The expected useful life of refrigerators is approximately fifteen years. The existing refrigerators are at or near the end of their useful life and are recommended for replacement.

11.2 EUL2 - Replace Hot Water Heaters with Energy Star Models

Summary (per water heater)

Premium Cost	Estimated Annual Cost Savings	Simple Payback (years)	Electricity Savings (kWh)	Natural Gas Savings (therms)	GHG Reduction (Metric Tonnes)
$225	$31	7.2	0	33	0.18

Recommendation Description

Usually, a water heater is replaced only when it fails. But if the existing water heater is at least ten years old, it is near the end of its useful life, and it may make sense to replace it before it fails. By replacing the water heater before it stops working, the HA may enjoy significant energy savings, in addition to avoiding a situation in which residents are without hot water while a new system is being selected. Replacements of old water heaters that are oversized will generally yield higher savings than if the old system is appropriately sized. In any case, if the old water heater is leaking or shows signs of heavy rust or water streaking in the combustion chamber, it should be replaced (Weingarten and Weingarten 1996).

The energy factor (EF) indicates a water heater's overall energy efficiency based on the amount of hot water produced per unit of fuel consumed over a typical day. This includes the following:

- Recovery efficiency – how efficiently the heat from the energy source is transferred to the water
- Standby losses – the percentage of heat loss per hour from the stored water compared to the heat content of the water (water heaters with storage tanks)
- Cycling losses – the loss of heat as the water circulates through a water heater tank, and/or inlet and outlet pipes.

A new standard efficiency 40-gallon gas water heater has a current minimum Energy Factor of 0.59, due to inefficiencies of combustion, a central flue carrying heat away with combustion exhaust, and a continuous gas pilot light, as well as standby losses through insulation and thermo-siphoning.

This ECM recommends Energy Star qualified gas water heaters (Energy Factor of 0.67 or greater). This represents a 14% percent savings compared to a standard efficiency gas water heater. In addition to

reducing standby losses with added insulation and anti-thermo-siphon device (heat traps), these improved efficiencies can be achieved for very little added cost by using electronic ignition instead of a pilot light, having automatic draft dampers, and reducing losses out the flue by recovering more of the heat first.

This ECM describes replacement on a per unit basis.

Energy Star Qualifying Models: Residential High-Efficiency Gas Storage Water Heaters
http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=WGS

- Minimum Energy Factor (EF) of 0.67 as of September 1st, 2010.
- Minimum First Hour Rating (FHR) of 67 gallons
- Annual energy savings of 14% (Based on the National Gas Average Energy Cost and a comparison to a conventional gas water heater with an EF rating of 0.59)

Calculations

Data used in this ECM are from a cost comparison study conducted by the American Council for an Energy-Efficient Economy (ACEEE). http://aceee.org/about

Incentives

DTE Energy's Multifamily Program is not offering incentives for replacing older hot water heaters with Energy Star models at this time.

Expected Useful Life Study

Hot water heaters have an expected useful life of ten years. The existing hot water heaters were installed at different times. The following lists the hot water heaters per tenant unit and their installed date:

Tenant Unit #	Tank Size	Installed Date
Unit 743	40 gallon	2006
Unit 745	40 gallon	2009
Unit 747	40 gallon	1995
Unit 749	40 gallon	2010

Unit 747 have hot water heaters that are at their expected useful life and are in need of replacement immediately.

First Hour Rating Calculation

Use	Avg. Gal. of Hot Water Use		Times used during 1 hour		Gallons used in 1 hour
Shower (8 minutes avg.)	10	x	# of tenants	=	10/20
Shaving (.05 gpm)	2	x	1	=	2
Hand Dishwashing or Food prep (2 gpm)	4	x	1	=	4
Clothes Washer (one load)	7	x	1	=	7
			Total Peak Hour Demand	=	23/33

Depending on the anticipated number of tenants in a unit, the recommended size for replacement hot water heaters is 30 gallon tanks. Some of the existing tank sizes in units are adequate for standard replacements; however, it is recommended that any existing 40 gallon tanks be replaced with 30 gallon tanks at the end of their useful life.

11.3 EUL3 - Install Energy Star Windows

Summary

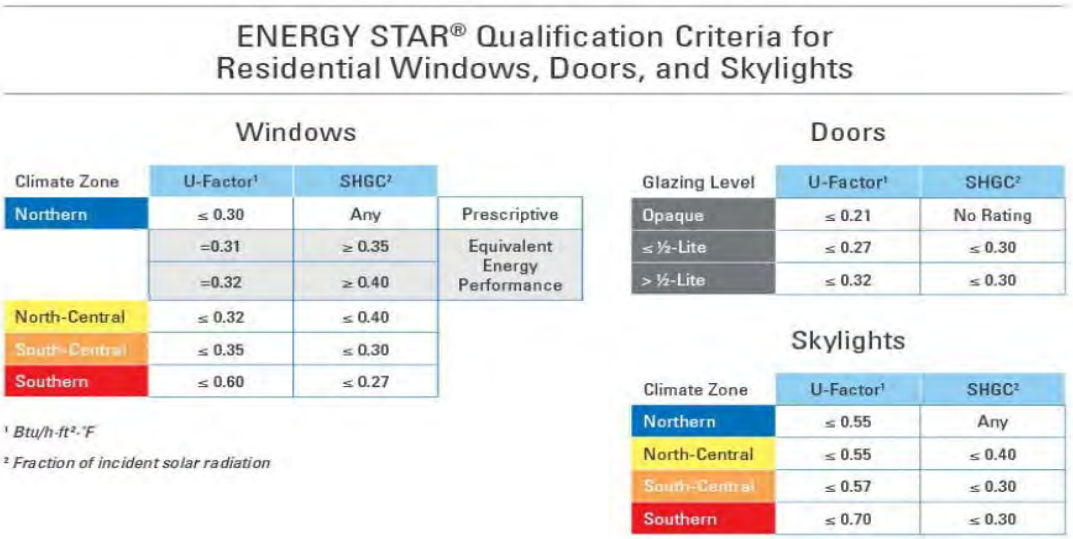
Premium Cost	Estimated Annual Cost Savings	Simple Payback (years)	Electricity Savings (kWh)	Natural Gas Savings (therms)	GHG Reduction (Metric Tonnes)
$2,485	$678	3.7	0	716	3.8

Recommendation Description

Windows play a major role in the energy use and comfort of a dwelling unit. In the winter, heat in a room is lost when cold outside air infiltrates into the dwelling unit around the edges of the window. Heat can also be lost by conduction directly through the pane, even if the window fits tightly. The cold drafts and the chilly window pane make the room uncomfortable. But windows can also help to heat a room, by letting the sun's rays enter. Solar radiation is beneficial in the winter but can be a major source of discomfort in hot summer climates.

It is recommended that the existing tenant windows be replaced with Energy Star rated windows to reduce the energy consumption caused by overheating. Replacing poor-quality windows can save 10% to 20% on energy consumption for heating.

It is important to choose a window that is right for the particular climate. In most climates, the best energy buy for residential windows is a medium-performance window, such as a gas-filled, double-pane window with low-emissivity glazing and a wood or vinyl frame. This type of window is typically about 5% to 15% more expensive than plain double-pane windows (E Source 1995). Higher-performance windows may be cost-effective in areas with severe winter climates and expensive heating fuel. In climates with mild winters and hot summers, a window with a reflective or selective coating should be specified.



ENERGY STAR® Qualification Criteria for Residential Windows, Doors, and Skylights

Windows

Climate Zone	U-Factor[1]	SHGC[2]	
Northern	≤ 0.30	Any	Prescriptive
	=0.31	≥ 0.35	Equivalent Energy Performance
	=0.32	≥ 0.40	
North-Central	≤ 0.32	≤ 0.40	
South-Central	≤ 0.35	≤ 0.30	
Southern	≤ 0.60	≤ 0.27	

[1] Btu/h-ft²-°F

[2] Fraction of incident solar radiation

Doors

Glazing Level	U-Factor[1]	SHGC[2]
Opaque	≤ 0.21	No Rating
≤ ½-Lite	≤ 0.27	≤ 0.30
> ½-Lite	≤ 0.32	≤ 0.30

Skylights

Climate Zone	U-Factor[1]	SHGC[2]
Northern	≤ 0.55	Any
North-Central	≤ 0.55	≤ 0.40
South-Central	≤ 0.57	≤ 0.30
Southern	≤ 0.70	≤ 0.30

Source:

http://www.energystar.gov/ia/partners/prod_development/archives/downloads/windows_doors/Windows_Doors_and_Skylights_Program_Requirements.pdf?8c9b-add8

Incentives

DTE Energy's Multifamily Program is not offering incentives for installing Energy Star rate windows at this time.

Expected Useful Life Study

Windows have an expected useful life of 30 years. A portion of the windows have recently been upgraded. The remaining windows are believed to be at or near their expected useful life and are in need of replacement.

11.4 EUL4 - Install High Efficiency Furnaces

Summary

Premium Cost	Estimated Annual Cost Savings	Simple Payback (years)	Electricity Savings (kWh)	Natural Gas Savings (therms)	GHG Reduction (Metric Tonnes)
$3,600	$184	19.6	0	194	1.03

Recommendation Description

Replacing the old heating plant in a building can generate considerable savings if the existing equipment is inefficient and/or the fuel source is expensive compared to other options. A furnace near the end of its useful life is a particularly good candidate for replacement with high-efficiency equipment. Unfortunately, this opportunity was missed by the AAHC when three (3) of the furnaces were recently replaced with standard efficiency (80%) units in 2011.

Because of technology advances, new furnaces are much more efficient than they used to be, presenting opportunities for significant savings on heating costs. Existing furnaces have a designed efficiency of 80-81%. Replacement units are available with efficiencies of up to 95%. Significant energy savings can be realized with the installation of more efficient units. This ECM is calculated for replacing all eight (8) furnaces (80% AFUE) with high efficiency furnaces, (92% AFUE) at the end of useful life.

Calculations

Natural gas consumption of existing furnaces is approximately equal to 58% of total consumption (1,614 therms for furnace heating). Efficiency gain from 80% to 92% with high efficiency units.

Base cost of $1,900 for standard efficiency furnaces (80% AFUE).
Base cost of $2,600 for high efficiency furnaces (92% AFUE).
Additional labor cost of $200 per furnace for high efficiency installation. This is for the cost of installing necessary PVC venting runs through the exterior wall.

Incentives

The Detroit HVAC Incentives offers up to $300 in incentives for a replacement of natural gas furnaces. An implementation of this incentive with the ECM would aggregate savings with labor and the new furnace to $300 for a natural gas furnace of 94% or higher efficiency. Refer to table in appendix for further details. A retrofit of 8 new furnaces on the property amounts to a potential of $2,400 in incentives.

Additional Federal Tax Credits are available for replacing furnaces where up to 30% of the installed cost or $1,500 for all systems in each unit retrofit, whichever is less, can be reimbursed at the end of the year.

Expected Useful Life Study

Furnaces have an expected useful life of 20 years. The existing units were installed at different dates. The following lists the furnaces per tenant unit and their installed date:

Tenant Unit #	Installed Date
Unit 749	2010
Unit 743, 745, 747	2011

Manual J Calculation Results

To confirm appropriate sizing of the recommended heating equipment, AKT Peerless performed calculations in accordance with Air Conditioning Contractors of America (ACCA) Manual J guidelines. An industry accepted software program, HVAC-Calc Residential 4.0.58c, was used to calculate the heat loss and heat gain in a unit. A detailed report of the Manual J calculations is included in the appendix of this report.

It was assumed that most of the units at North Maple Duplexes were all constructed in a similar manner;

therefore, the sizing of heating systems would be identical for all four units. Overall values for the heat loss within the software are often increased by a factor of 15% to 25% to account for averages used in the winter design temperatures. According to the calculations, the total heat loss for a typical unit would be approximately 28 kBtu/h. It should be noted that these calculations have assumed previously recommended ECMs have already been implemented. Because high-efficiency furnaces are not typically manufactured with a rating below 45kBtu/h, it is believed that the existing furnace size is appropriate for all of the units.

12.0 Advanced ECMs and/or ECMs Recommended for Further Evaluation

The following capital intensive measures may be feasible but would require an additional, detailed engineering analysis of the entire facility.

12.1 FE1 - Add Wall Insulation incl. Continuous @ Perimeter

Recommendation Description

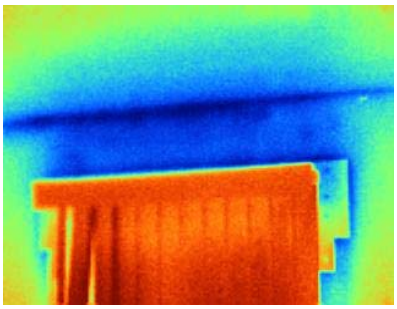
The purpose of wall insulation is to reduce the amount of heat that flows from a dwelling unit through the walls to the cold outside air. By reducing this heat loss, wall insulation reduces the amount of energy needed to heat the dwelling unit. Wall insulation also can save on cooling costs and reduce overheating in the summer.

A material's resistance to heat flow is measured in units of "R-value." Higher R-values have better insulating properties. The R-value of insulation depends on the type of insulation and its thickness.

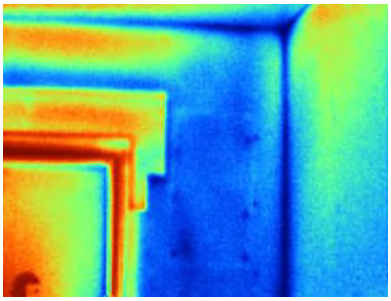
Based on the age of the property and the unknown condition of any existing wall insulation, an in-depth study would be required to establish the costs and potential savings of implementing this recommendation.

An infrared (IR) thermal imaging camera was used during the site visit to evaluate the thermal properties of a similar construction home at North Maple Estates. The findings are detailed below:

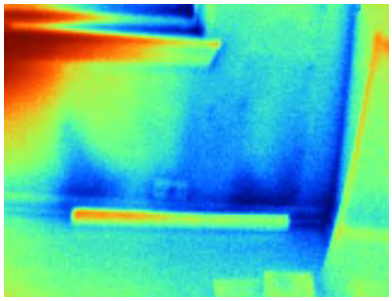
Wall insulation appears to have settled in wall cavities or was never insulated to top of stud bays.



Displays thermal bridging at headers above windows.



Displays missing insulation above door header.



Displays poorly placed insulation above baseboard.

One solution would be to use the IR camera on a colder day, and mark areas that need insulation. Those voided areas could then be then filled with dense pack cellulose.

Furthermore, the Owner should investigate the use of exterior foam insulation panels whenever these buildings undergo exterior renovation (ie, replacement of siding). Foam insulation sheathing reduces thermal bridging through structural elements like wood studs, where it serves as a thermal break. Adding insulation, either in the cavities or continuous insulation on the exterior, requires further study.

Incentives

DTE Energy's Multifamily Program is not offering incentives for insulation at this time.

Expected Useful Life Study

Aside from potential exposure to environmental elements, insulation, for the most part, has an expected useful life of over fifty years. Adding insulation to the existing layer should be considered when the existing insulation is still in good condition and is sufficient to fulfill code requirements.

12.2 FE2 - Replace/Invest in Energy Star Clothes Washers

Recommendation Description

Because the Owner of the property is responsible for paying the water utility, the audit team believes an investigation into high efficiency clothes washers may be a sound investment for the Ann Arbor Housing Commission.

Typically, residents are responsible for providing their own washers and dryers. This reduces a first cost for the housing commission – however, residents appear to be installing/utilizing the cheapest functioning units available. These units are often very old, and extremely inefficient. This results in high electrical energy consumption, but even greater water consumption.

In the past few years, the change in design and operation of the clothes washer units has allowed the consumer to reduce water usage and drying time. Typical high-efficiency washers use 27 gallons of water per load. In contrast, conventional models that were built from 1980 to the late nineties consumed between 43 and 51 gallons of water per load.

In addition to a reduction in water usage, many of the energy efficient washers will minimize the amount of hot water use by utilizing cold water as much as possible. The faster cycle on the efficient washers also minimizes the time needed to dry clothes, which overall minimizes the electrical consumption for laundry.

The existing washers at the subject property were identified to be approximately 10 year old, Admiral heavy duty units. It is assumed that all tenant units are occupied; however, the typical usage of the laundry units is unknown and would require additional analysis to properly determine the savings from installing Energy Star rated washing machine units. Additionally, converting the existing washing machines to only using a cold rinse can also provide substantial savings based on tenant usage.

Because the Owner is responsible for water consumption, and water costs continue to rise, the team recommends a further life cycle investigation into funding and installing Owner-supplied (cold rinse) Energy Star units.

Incentives

Presently, DTE Energy's Multifamily Program is not offering incentives for installing Energy Star products at this time.

Expected Useful Life Study

Furnaces have an expected useful life of 20 years. The existing units were installed at different dates. The following lists the furnaces per tenant unit and their installed date:

Tenant Unit #	Installed Date
Unit 749	2010
Unit 743, 745, 747	2011

Manual J Calculation Results

To confirm appropriate sizing of the recommended heating equipment, AKT Peerless performed calculations in accordance with Air Conditioning Contractors of America (ACCA) Manual J guidelines. An industry accepted software program, HVAC-Calc Residential 4.0.58c, was used to calculate the heat loss and heat gain in a unit. A detailed report of the Manual J calculations is included in the appendix of this report.

It was assumed that most of the units at North Maple Duplexes were all constructed in a similar manner; therefore, the sizing of heating systems would be identical for all four units. Overall values for the heat loss within the software are often increased by a factor of 15% to 25% to account for averages used in the winter design temperatures. According to the calculations, the total heat loss for a typical unit would be approximately 28 kBtu/h. It should be noted that these calculations have assumed previously recommended ECMs have already been implemented. Because high-efficiency furnaces are not typically manufactured with a rating below 45kBtu/h, it is believed that the existing furnace size is appropriate for all of the units.

13.0 Feasibility Assessment of Green Energy Technologies

13.1 Photovoltaic for Electricity

Implementing photovoltaic panels for electricity at the subject property is not recommended due to high installation costs. Further study is not recommended.

13.2 Solar Thermal for Hot Water Heating

Hot water usage at the subject property is not high enough to justify initial costs of solar heating therefore the property is not a viable candidate of solar thermal for hot water heating. Further study is not recommended.

13.3 Wind Turbine

The property is not a viable candidate of installing wind turbines due to insufficient wind power in this geographic area. Further study is not recommended.

13.4 Combined Heat and Power

The property has less than 80 units (a rule of thumb for minimum number of units for feasibility) and does not have a central power source. The property is not a viable candidate of implementing combined heat and power and further study is not recommended.

13.5 Geothermal Heat Pumps

Geothermal heat pumps were originally considered by the Ann Arbor Housing Commission for this property. While the property has sufficient acreage to drill wells, the cost associated with geothermal heat pumps is not effective at this time. Further study is not recommended.

13.6 Fuel Cells

Due to the high initial costs associated with fuel cells, implementation is not recommended at the subject property. Further study is not recommended.

14.0 Recommendations & Impact

Based on the analysis described in this report, AKT Peerless believes substantial energy conservation opportunities are available, and recommends implementation of all proposed ECMs.

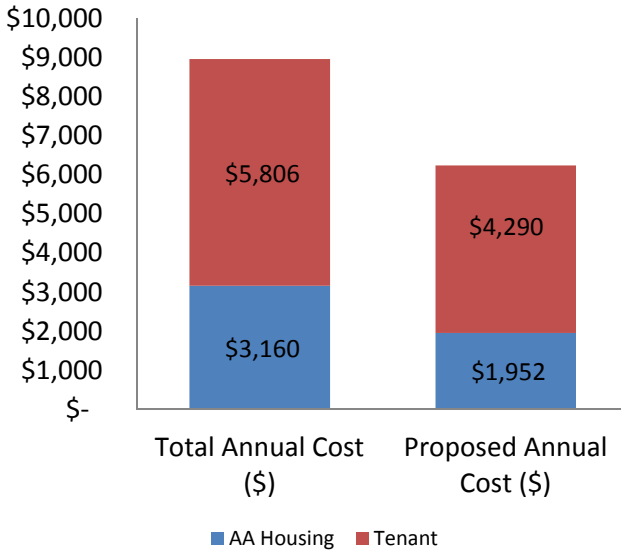
The combined annual EUI for the subject building is estimated at 85 kBtu per square foot per year. The annual energy cost index is an estimated $1.45 per square foot per year. Reduction of fuel (non-electrical) and electrical energy consumption through the implementation of recommended ECMs will potentially result in a reduced EUI of 56.89 kBtu per square foot per year, a potentially reduced annual cost index of $0.80 per square foot per year, and potential total annual energy cost savings of $2,732 per year.

An additional result of implementing the recommended ECMs would be the reduction of greenhouse gas (GHG) emissions by 11.07 metric tonnes. Measurements of greenhouse gas emissions are based on data gathered from the United States Environmental Protection Agency (USEPA) eGRID database.

The subject building is located in eGRID electric utility sub-region RFCW. Greenhouse gas emissions from electrical consumption are based on emissions data measured at the electrical generating facilities serving consumers located in the specified eGRID utility sub-region, and therefore greenhouse gas emissions and the estimated reduction in greenhouse gas emissions reflect the mix of fuel sources used by the regional electrical utilities serving the subject property. Emissions factors for natural gas consumption are based on data gathered from the 2009 United States Greenhouse Gas Inventory, Annex 2.

Table 17. Impact Summary

% Energy Savings	33%
% Water Savings	16%
% Cost Savings	31%
Annual Cost Savings ($)	$2,732
% Reduction in GHG Emissions (CO_2 Equivalent Metric Tonnes)	35%



15.0 Limitations

AKT Peerless accepts responsibility for the competent performance of its duties in executing this assignment and preparing this report in accordance with the normal standards of the profession, but disclaims any responsibility for consequential damages. Although AKT Peerless believes the results contained in herein are reliable, AKT Peerless cannot warrant or guarantee that the information provided is exhaustive, or that the information provided by the client, third parties, or the secondary information sources cited in this report is complete or accurate.

Nothing in this report constitutes a legal opinion or legal advice. For information regarding individual or organizational liability, AKT Peerless recommends consultation with independent legal counsel.

ASHRAE *Procedures for Commercial Building Energy Audits* recommends that the Energy Analyst apply a consistent definition of building square footage to both the subject building and to similar buildings used for energy performance comparisons. AKT Peerless cannot evaluate the accuracy or consistency of building square footage measurements of similar buildings included in the comparison database. However, in order to improve the consistency and accuracy of building measurements and comparisons within the Client's own building portfolio, a procedure for measuring the subject building square footage has been incorporated into the Basic Buildings Characteristics form provided to the Client and located in the appendix.

The Energy Analyst has not verified the accuracy of building floor area as reported by the building owner/operator and has not verified that the building owner/operator's definition of building usage is consistent with the definitions used in the CBECS.

The Energy Analyst has not evaluated the potential financial savings from changing to a different utility price structure.

Also, the Energy Analyst has not verified that the property owner/operator has reported all sources and records of energy consumed at the subject property. Potentially unreported information may include, but is not limited to, bills, meters, and types of energy consumed. Inaccurate information provided to the energy analyst and information not reported to the energy analyst may influence the findings of report. Information provided by the owner/operator of the subject building or other client representatives is summarized in the Basic Building Characteristics form located in the appendix and the utility bills and other energy invoices included in the appendix.

16.0 Signatures

Report originally submitted by:

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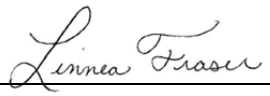

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SEDAC Design Assistance Expert
(Updated – 03/17/2015)

Appendix

NATURAL GAS UBA

AAHC Site: **North Maple Duplexes**

Month	Start	End	Days	HDD	Consumption Therms	Actual (0) Estm. (1)	Delivery $	Gas $	Total $
Feb-14	4-Feb-14		29	1345	454	0	$ -	$402	$402
Mar-14	5-Mar-14		27	1168	317	0	$ -	$268	$268
Apr-14	1-Apr-14		31	539	204	0	$ -	$179	$179
May-14	2-May-14		32	259	123	0	$ -	$116	$116
Jun-14	3-Jun-14		29	63	75	0	$ -	$77	$77
Jul-14	2-Jul-14		30	94	97	0	$ -	$112	$112
Aug-14	1-Aug-14		32	55	109	0	$ -	$123	$123
Sep-14	2-Sep-14		29	220	110	0	$ -	$128	$128
Oct-14	1-Oct-14		31	466	154	0	$ -	$162	$162
Nov-14	1-Nov-14		31	914	320	0	$ -	$308	$308
Dec-14	2-Dec-14		34	993	377	0	$ -	$360	$360
Jan-15	5-Jan-15		30	1368	443	0	$ -	$401	$401
				7,484	**2,783**				**$2,634.33**
									$0.947 $/Therm

ELECTRICAL UBA

AAHC Site: **North Maple Duplexes**

Month	Start	End	Days	HDD	CDD	Actual (0) Estm. (1)	Consumption kWh	Total Charges ($)
Feb-14	4-Feb-14		29	1345	0	0	1637	$255
Mar-14	5-Mar-14		27	1168	0	0	1448	$223
Apr-14	1-Apr-14		31	539	14	0	1450	$222
May-14	2-May-14		32	259	79	0	1554	$239
Jun-14	3-Jun-14		29	63	177	0	1785	$274
Jul-14	2-Jul-14		30	94	163	0	2236	$339
Aug-14	1-Aug-14		32	55	190	0	2733	$413
Sep-14	2-Sep-14		29	220	100	0	1864	$283
Oct-14	1-Oct-14		31	466	9	0	1698	$257
Nov-14	1-Nov-14		31	914	0	0	2106	$314
Dec-14	2-Dec-14		34	993	0	0	2282	$326
Jan-15	5-Jan-15		30	1368	0	0	1962	$283
				7484	**732**		**22,755.00**	**$3,427.98**
								$0.15065

HUD Residential Energy Use Benchmarking Tool

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

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

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

Building Description

Preliminary: 9/17/07

Building Name: North Maple Duplexes (optional entry)

5-digit Zip Code: 48103 *Not Sure?*

Heating Degree Days: 7484

Mapping Location: *Ann Arbor, MI*

Cooling Degree Days: 732

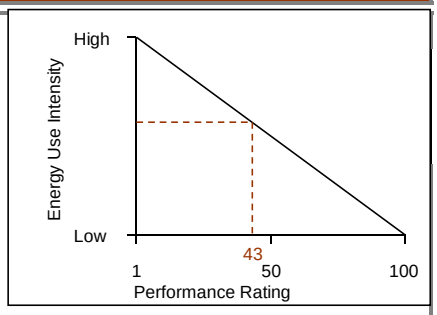
	Gross Floor Area (ft2)	Total Number of Units	Is This a Multifamily Building with Central Laundry? (Y/N)	Is this a Multi-Family Walkup Building? (Y/N)	Heated Floor Area (ft2)	Year Built
Building Description:	4,188	4	N	N	4,188	1995

Annual Consumption

	Electricity	Gas	#2 Fuel Oil	#4 Fuel Oil	District Steam	District Hot Water	Propane
Select Units:	kWh	Therms	Gal	Gal	kLbs	MMBtu	Gal
Energy	22,755	2,783					
Cost ($)	3,428	2,634					
Calculated unit cost:	$0.151 $/kWh	$0.95 $/therm	$/gallon	$/gallon	$/klbs	$/kBtu	$/gallon

Results

	Your Building	HUD Typical
Score Against Peers	**43**	**50**
Building Site Energy Use (kBtu/year)	**355,940**	**331,033**
Site Energy Use Intensity (kBtu/ft2-year)	**85.0**	**79.0**
Energy Cost Intensity ($/ft2-year)	**1.45**	**1.35**
Total Annual Energy Cost ($/year)	**6,062**	**5,638**



HUD Residential Water Use Benchmarking Tool

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

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

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

Building Description

ORNL 8/22/2007

Building Name: North Maple Duplexes (optional entry)

5-digit Zip Code: 48103 *Not Sure?*

Mapping Location: *Ann Arbor, MI*

	Gross Floor Area of Building(s) (ft2)	Building(s) is Single-Family Detached or Semi-Detached? (Y/N)	Is Residents Water Use Paid Directly by the PHA? (Y/N)	Number of Units in Building(s)	Number of Units in Building(s) with In-Unit Laundry Hookups or Central Laundry Access?	How Many Buildings share this Water Meter?
Building Description:	4,188	N	Y	4	4	2

Annual Consumption

Building Annual Water Use: 308,983 (gallons/year)

Building Annual Water Use Cost: 2,613 ($/year)

Average Annual Water Cost: $0.8 ($/100 gallons)

Results

	Your Building	HUD Typical
Score Against Peers	56	50
Annual Water Use (gal/year)	308,983	333,885
Annual Water Use Intensity (gal/ft2-year)	73.8	79.7
Annual Water Cost Intensity ($/ft2-year)	0.62	0.67
Total Annual Water Cost ($/year)	2,613	2,823

Photo 1: Front exterior of the complex

Photo 2: Side Entrance to Complex

Photo 3: Wall-Mounted Exterior Lighting

Photo 4: Typical Window Frame

Photo 5: Digital Honeywell Thermostat

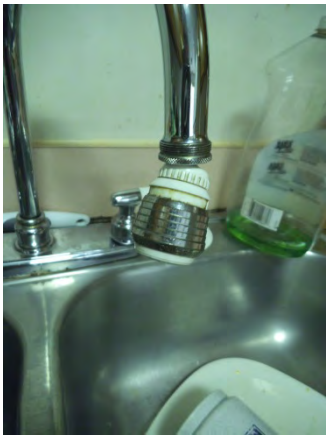


Photo 6: Typical Kitchen Faucet with Aerator

Photo 7: Typical Showerhead

Photo 8: Typical Bathroom Sink Faucet

Photo 9: Typical bathroom toilet

Photo 10: Condensation on the interior of windows

Photo 11: Attic framing and insulation

Photo 12: Insulation on piping

Photo 11: Exterior view of typical window

Photo 12: Domestic Hot Water Heater per Unit

Photo 13: Filter from furnace in need of replacement

Photo 14: Interior of gas-fired furnace

Interior Lighting Calculator

Zone / Space	Qty	Burn Hours	Existing Fixture Type	Existing Fixture	Input Watts per Fixture	Annual Consumption (kWh)	Proposed Fixture Type	Proposed Fixture	Input Watts per Fixture2	Annual Consumption (kWh)3	Demand Reduction (kW)	Retrofit Cost ($)	Annual Energy Savings (kWh)	Annual Cost Savings ($)	SP (yrs)
All Zones in Tenant Apartment	20	1456	Incandescent	Incandescent - 60W	60	1747	CFL	16 watt CFL	16	466	0.88	$ 70.00	1281	$188.57	0.4
										TOTALS	$0.88	$ 70.00	1,281	$188.57	0.4

Exterior Lighting Calculator

Zone / Space	Qty	Burn Hours	Existing Fixture Type	Existing Fixture	Input Watts per Fixture	Annual Consumption (kWh)	Proposed Fixture Type	Proposed Fixture	Input Watts per Fixture2	Annual Consumption (kWh)3	Retrofit Cost ($)	Annual Energy Savings (kWh)	Annual Cost Savings ($)	SP (yrs)
Exterior Wallpacks	7	4380	HID	50 watt HPS	65	1993	MaxLite WP	MaxLITE 14w LED Wall Pack	14	357	$1,091.23	1636	$348.26	3.13
Exterior Wallpacks	2	4380	HID	150 watt HID	188	1647	MLSWP30LED50	30W LED Wall Pack	33	289	$420.00	1358	$289.01	1.45
										TOTALS	$1,511.23	2,993.98	$637.27	2.37

MLSEC14LED50

14 WATT SECURITY LIGHT WITH PHOTOCELL

PROJECT NAME
CATALOG NUMBER
NOTES
FIXTURE SCHEDULE

FEATURES:

- 120V VAC operation
- 50,000 hour life and maintenance free for up to 13 years
- CRI: 82
- Mercury free and operates without emitting UV radiation
- Heavy-duty, die-cast aluminum base and vandal resistant injection molded polycarbonate housing maintain a sleek appearance and enable long life
- High quality shatter resistant polycarbonate lens
- Fixture is sealed to be dirt and insect free
- Back and bottom is plugged with conduit holes for mounting and wiring flexibility
- PhotoCell standard
- 5 Year limited warranty
- Does not attract insects
- Power factor is greater than .99
- IES BUG rating - B0 U3 G2

CONSTRUCTION:

Fixture: The heavy duty die-cast, powder-coat aluminum base, with a one-piece injection molded polycarbonate prismatic lens/housing masked and painted for a seamless cover. The fixture is gasketed and assembled with two screws to produce a sealed fixture that is free of water, dirt and insects.

Lens: Polycarbonate lens with UV stabilizers

LED Module: Aluminum components in the LED module act as a heat sink to reduce heat and ensure long life. The module uses directional settings to control the fall of light and the light levels. This fixture is an efficient replacement for metal halide and incandescent fixtures that reduces wattage and extends life.

LED Driver: Self contained driver meets UL 1310 UL 48 Class2

Finish: The bronze base is powder-coat painted, and the housing is masked and painted bronze to match the base.

Installation: Can mount to recessed J-box or directly to the wall

Luminaire Ordering Information:

WATTS	ORDER CODE	MODEL NUMBER	DELIVERED LUMENS	LAMP LIFE (Hrs.)	DIMENSIONS (L"xW"xH")	CCT
14	71416	MLSEC14LED50	887	50,000	11.8 x 6.8 x 5.3	5500

MAX12008

Lighting layouts and spacing criteria available upon request

MaxLite®: 1-800-555-5629 | **Fax:** 973-244-7333 | **Web:** www.maxlite.com | **E-mail:** info@maxlite.com

Revised: 06-18-13

MLSEC14LED50

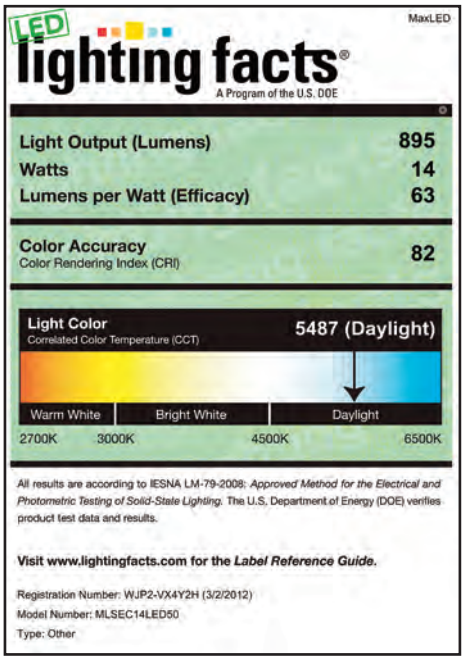
14 WATT SECURITY LIGHT WITH PHOTOCELL

SPECIFICATIONS:

Item	Specification	Details
General Performance	Spacing Criteria	Available upon request
	Color Temperature (CCT)	5500K
	CRI	82
	Lumens Delivered	887
	Efficacy	62.3 lumen/watt
	Color Consistency	Proprietary binning for uniform color
	Lumen Maintenance (L70)	50,000 hours
	IES Classification	Type IV
	Cutoff Class	Non- Cutoff
	IES B.U.G. Rating	B0 U3 G2
Electrical	Power Factor	Over 98%
	Input Voltage	120V 50/60 Hz
	Power Consumption	14 Watts nominal
Physical	Dimensions	11.8" x 6.8" x 5.3"
	Weight	3 lbs
	Housing	Aluminum & Polycarbonate
	Lens	Polycarbonate w/ UV Stabilizers
	Mounting	Can mount to recessed J-box or direct to walls
	Operating Temperature	-30˚F to 130˚F
	Humidity	20% - 85% RH, non condensing
Certification	Certification	cETLus
	Material Usage	RoHS compliant; no mercury
	Environment	Outdoor
	LED Class	N/A

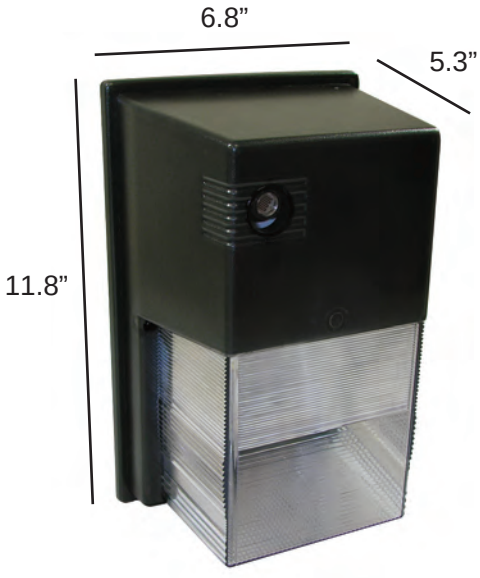
PhotoCell:

PhotoCell is "potted solid state" sensor and has a 2-minute reset at power disruption.



Lighting layouts and spacing criteria available upon request

DIMENSIONS:



MaxLite®: 1-800-555-5629 | **Fax:** 973-244-7333 | **Web:** www.maxlite.com | **E-mail:** info@maxlite.com

Revised: 06-18-13

MLSWP30LED50

LED WALLMAX - 30 SERIES SMALL WALL PACK

PROJECT NAME
CATALOG NUMBER
NOTES
FIXTURE TYPE

FEATURES:

- Replaces up to 150 Watt Metal Halide
- Universal 120-277V
- Maintenance free for up to 13 Years
- Mercury free; no UV
- Heavy-duty cast aluminum housing; rust and corrosion proof; polyester powdercoat
- High quality shatterproof glass.
- Sealed fixture is dirt and bug free
- Multiple knockouts for mounting convenience
- Occupancy/Dusk to Dawn sensor compatible
- LM-79/80 data available
- 5 Year Limited Warranty
- Does not attract insects

CONSTRUCTION:

Fixture: Heavy-duty cast aluminum one-piece housing; polyester powdercoat; rust and corrosion proof. Fixture is sealed to be dirt and bug proof.

Lens: High quality shatterproof glass.

Reflector: Internal aluminum reflector for increased efficacy and optimal light distribution.

LED Module: Aluminum components in the LED module act as heat sinks to reduce heat and add to life. The module uses directional settings to control the fall of light and the light levels. This makes the fixture an efficient replacement for metal halide and high pressure sodium fixtures, while reducing wattage and extending life.

LED Driver: Self contained driver meets UL 1310 UL 48 Class2.

Finish: Dark Bronze or white finish available; polyester powdercoated.

Installation: Can mount to recessed outlet box or direct to surface.

Luminaire Ordering Information:

Watts	Order Number	Model Number	Lumens	Luminaire Life (Hrs.)	Fixture Dimensions W"x H" x L"	CCT
33	70724	MLSWP30LED50	2080	50,000	14.25 x 9.0 x 7.5	5000
33	71127	MLSWP30LED50W	2080	50,000	14.25 x 9.0 x 7.5	5000

Lighting layouts and spacing criteria available upon request

MAX11362

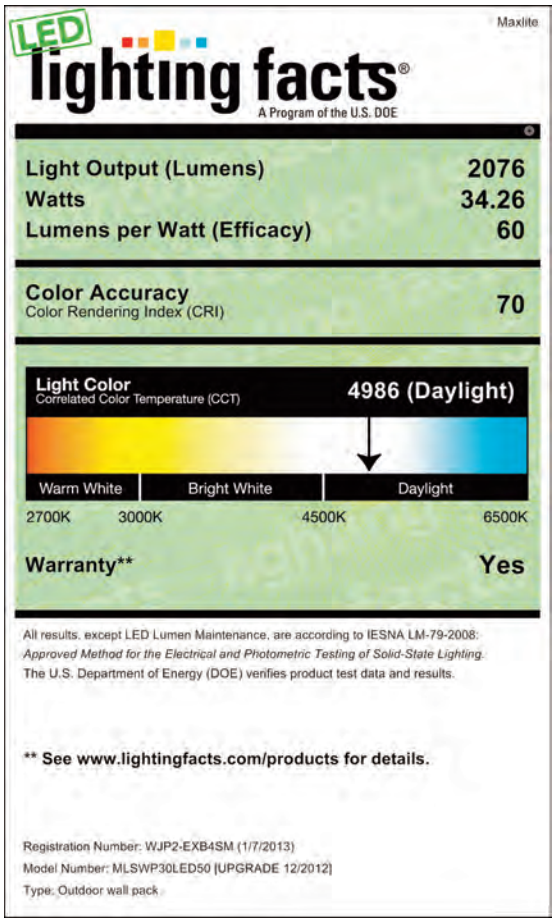
MLSWP30LED50

LED WALLMAX - 30 SERIES SMALL WALL PACK

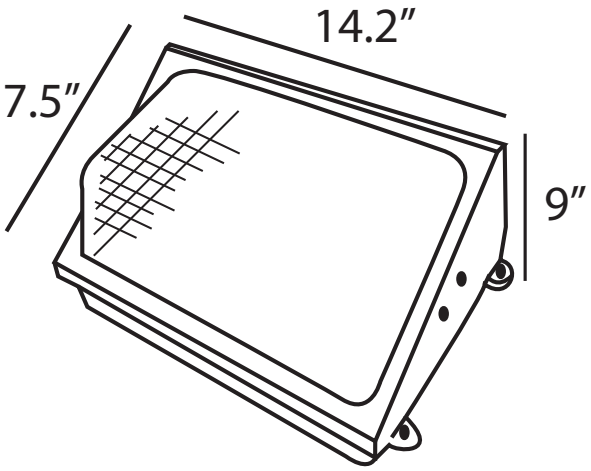
SPECIFICATIONS:

Item	Specification	Details
General Performance	Spacing Criteria	Available upon request
	Color Temperature	5000K
	Lumens Delivered	2080
	Efficacy	50 lumen/watt
	Color Consistency	Proprietary binning for uniform color
	Lumen Maintenance (L70)	50,000 hours
Electrical	Power Factor	Over 98%
	Input Voltage	120V-277V 50/60 Hz
	Power Consumption	33 Watts
Physical	Dimensions	14.25" x 9.0" x 7.5"
	Weight	6.15 lbs
	Housing	Aluminum
	Lens	High quality shatterproof glass
	Mounting	Can mount to recessed outlet box or direct to surface.
	Operating Temperature	-30˚F to 130˚F
	Humidity	20% - 85% RH, non condensing
Certification	Certification	CETL, FCC, LM79, LM80
	Material Usage	RoHS compliant; no mercury
	Environment	Indoor / Outdoor
	LED Class	L70 rated to 50,000 hours

Lighting layouts and spacing criteria available upon request



DIMENSIONS:



MaxLite®: 1-800-555-5629 | **Fax:** 973-244-7333 | **Web:** www.maxlite.com | **E-mail:** info@maxlite.com

Revised: 2-1-13

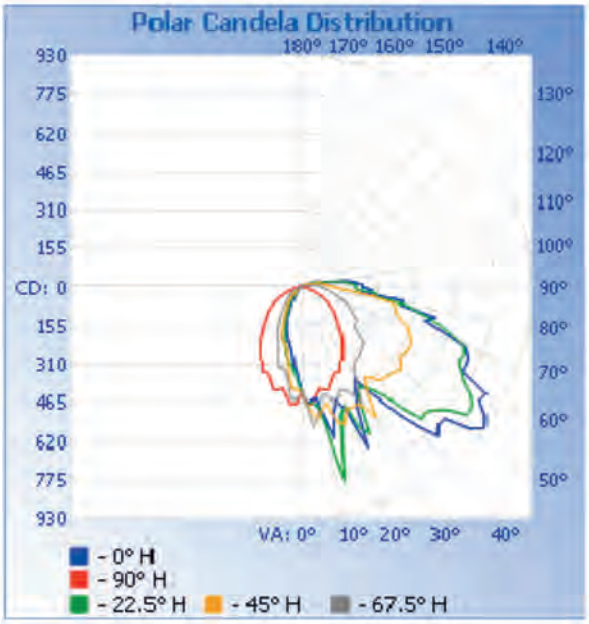
MLSWP30LED50

LED WALLMAX - 30 SERIES SMALL WALL PACK

PHOTOMETRICS:

Intensity (Candlepower) Summary at 25℃ - Candelas

Angle	0	22.5	45	67.5	90
	MLSWP30LED50				
0	423	423	423	423	423
5	456	463	505	560	471
10	523	554	493	456	414
15	514	631	558	466	429
20	532	507	520	448	379
25	526	651	517	478	372
30	426	462	601	448	330
35	549	510	440	368	289
40	726	637	488	360	252
45	780	708	498	345	214
50	884	766	516	306	183
55	903	839	479	260	158
60	858	754	498	252	125
65	733	699	481	223	90
70	700	696	450	188	61
75	516	569	390	160	38
80	403	431	373	126	22
85	244	302	211	101	12
90	246	215	134	80	8
95	212	194	103	55	9
100	110	133	89	35	10
105	80	74	66	25	10
110	65	59	41	20	9
115	24	30	32	15	9
120	18	20	22	12	8
125	16	17	17	10	6
130	14	16	15	8	5
135	14	14	12	6	3
140	13	12	10	5	2
145	11	10	8	3	1
150	8	8	5	2	1
155	6	5	1	0	0
160	2	0	0	0	0



Lighting layouts and spacing criteria available upon request

MaxLite®: 1-800-555-5629 | **Fax:** 973-244-7333 | **Web:** www.maxlite.com | **E-mail:** info@maxlite.com

Revised: 2-1-13

Tenant Unit Programmable Thermostats (20)

This energy savings calculator was developed by the U.S. EPA and U.S. DOE and is provided for estimating purposes only. Actual energy savings may vary based on use and other factors. The calculator was modified by the auditor as detailed in subject report.

Enter your own values in the gray boxes or use our default values.

Number of Units	4
Initial Cost for one programmable thermostat	$51
Initial Cost for one manual thermostat	$1
Unit Fuel Cost (Cooling) ($/kWh)	$0.136
Unit Fuel Cost (Heating) ($/Therm)	$0.91

24 Hour Typical Usage Patterns*

	Weekday	Weekend
Nighttime Set-Back/Set-Up Hours	8	8
Daytime Set-Back/Set-Up Hours	16	16
Hours without Set-Back/Set-Up	0	0

Choose your city from the drop-down menu

City: MI-Detroit

Heating Season*

Typical Indoor Temperature w/o Set-Back	74
Nighttime Set-Back Temperature (Average)	67
Daytime Set-Back Temperature (Average)	72
Heating System Type	Gas Furnace

Cooling Season*

Typical Indoor Temperature w/o Set-Up	75
Nighttime Set-Up Temperature (Average)	82
Daytime Set-Up Temperature (Average)	82
Cooling System Type	None

**All temperatures are in degrees Fahrenheit. Setpoint is defined as the temperature setting for any given time period. Set-back temperature is defined as the lower setpoint temperature for the energy-savings periods during the heating season, generally nighttime and daytime. Set-up temperature is defined as the higher setpoint temperature for the energy-savings periods during the cooling season, generally nighttime and daytime.*

	4 Programmable Thermostat(s)	4 Manual Thermostat(s)	Savings
Annual Energy Costs			
Heating Energy Cost	$1,408	$1,561	$153
Heating Energy Consumption (MBTU)	*156*	*172*	*17*
Cooling Energy Cost	$0	$0	$0
Cooling Energy Consumption (MBTU)	*0.0*	*0.0*	*0*
Total	**$1,408**	**$1,561**	**$153**

STANFORD UNIVERSITY

About Contact

A Department of Energy ARPA-E Project

Appliance Calculator

The Appliance Calculator helps you:

- Find out how much your current refrigerator is costing in electricity use.
- Determine when it makes sense to upgrade.
- Shop for a new refrigerator based on electricity consumption and other features.

Follow the instructions below—note that your Results will get updated anytime you change a dropdown selection.

Electricity Saving Refrigerator Calculator

Step 1: Describe Your Current Refrigerator

State: Michigan

Refrigerator Type: Top Freezer

Approx Model Year: 1980-1989

Size: 16.5-18.9 cu. ft.

Icemaker: without icemaker

EnergyStar: No

Your Current Refrigerator Energy Usage Results

Electricity Consumption of Your Refrigerator: **1082 kWh/yr**

Average Electricity Price in Your State: **$0.125/kWh**

Step 2: Describe Your Desired New Refrigerator

EnergyStar: Yes

Electricity Consumption: Any

Price Range: Any

Brand: Any

Refrigerator Type: Any

Color: Any

Size: 7.5-16.4 cu.ft.

Icemaker: Any

Show All Models

Your New Refrigerator Search Results

Save/Compare	New Refrigerators	Price	Annual Electricity Use	Lifetime Electricity Cost	EnergyStar
☐	 Whirlpool 14.6 cu. ft. Top Freezer Black — See at SEARS/Kmart	$700	354 kWh	$515	Yes
☐	 Whirlpool 14.6 cu. ft. Top Freezer White — See at SEARS/Kmart	$700	354 kWh	$515	Yes
☐	 Frigidaire 14.8 cu. ft. Top Freezer — See at SEARS/Kmart	$590	355 kWh	$517	Yes
☐	 Frigidaire 14.8 cu. ft. Top Freezer — See at SEARS/Kmart	$590	355 kWh	$517	Yes
☐	 Frigidaire 14.8 cu. ft. Top Freezer — See at SEARS/Kmart	$620	355 kWh	$517	Yes

☐		GE 15.5 cu. ft. Top Freezer GTH16BBXR See at SEARS/Kmart	$500	363 kWh	$528	Yes
☐		GE 15.5 cu. ft. Top Freezer GTH16BBXR See at SEARS/Kmart	$500	363 kWh	$528	Yes

Page 1 of 1 View 1 - 7 of 7

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About Contact

A Department of Energy ARPA-E Project

Appliance Calculator

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- Find out how much your current refrigerator is costing in electricity use.
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Follow the instructions below—note that your Results will get updated anytime you change a dropdown selection.

Electricity Saving Refrigerator Calculator

Step 1: Describe Your Current Refrigerator

State: Michigan

Refrigerator Type: Top Freezer

Approx Model Year: 1980-1989

Size: 16.5-18.9 cu. ft.

Icemaker: without icemaker

EnergyStar: No

Your Current Refrigerator Energy Usage Results

Electricity Consumption of Your Refrigerator: **1082 kWh/yr**

Average Electricity Price in Your State: **$0.125/kWh**

Step 2: Describe Your Desired New Refrigerator

EnergyStar: Any

Electricity Consumption: Any

Price Range: Any

Brand: Any

Refrigerator Type: Any

Color: Any

Size: Any

Icemaker: Any

Show All Models

Your New Refrigerator Search Results

Save/Compare	New Refrigerators	Price	Annual Electricity Use	Lifetime Electricity Cost	EnergyStar
☐	 Frigidaire 20.6 cu. ft. Top Freezer **See at SEARS/Kmart**	$950	356 kWh	$518	Yes
☐	 Frigidaire 19.0 cu. ft. Freezerless , Stainless Steel **See at SEARS/Kmart**	$1,550	39 kWh	$57	Yes
☐	 SMEG 9.2 cu. ft. Top Freezer FAB28U **See at SEARS/Kmart**	$1,980	305 kWh	$444	No
☐	 SMEG 9.2 cu. ft. Top Freezer FAB28U **See at SEARS/Kmart**	$1,980	305 kWh	$444	No
☐	 Frigidaire 18.2 cu. ft. Top Freezer **See at SEARS/Kmart**	$900	335 kWh	$488	Yes

☐		Frigidaire 18.2 cu. ft. Top Freezer See at SEARS/Kmart	$1,000	335 kWh	$488	Yes
☐		Frigidaire 18.2 cu. ft. Top Freezer See at SEARS/Kmart	$1,000	335 kWh	$488	Yes
☐		Frigidaire 18.3 cu. ft. Top Freezer See at SEARS/Kmart	$1,050	335 kWh	$488	Yes
☐		Frigidaire 18.3 cu. ft. Top Freezer See at SEARS/Kmart	$1,050	335 kWh	$488	Yes
☑		Whirlpool 18.9 cu. ft. Top Freezer White See at SEARS/Kmart	$750	343 kWh	$499	Yes
☐		Whirlpool 18.9 cu. ft. Top Freezer Black See at SEARS/Kmart	$750	343 kWh	$499	Yes
☐		Whirlpool 18.9 cu. ft. Top Freezer Stainless Steel See at SEARS/Kmart	$950	343 kWh	$499	Yes
☐		Whirlpool 18.5 cu. ft. Top Freezer w/ Humidity Controlled Crispers Black See at SEARS/Kmart	$750	345 kWh	$502	Yes
☐		Whirlpool 18.9 cu. ft. Top Freezer with CEE Tier 3 Rating White See at SEARS/Kmart	$800	345 kWh	$502	Yes
☐		Whirlpool 18.9 cu. ft. Top Freezer with CEE Tier 3 Rating Black See at SEARS/Kmart	$800	345 kWh	$502	Yes
☐		Maytag 18.9 cu. ft. Top Freezer w/ Strongbox™ Door Bins White See at SEARS/Kmart	$850	345 kWh	$502	Yes

In accordance with ACCA Manual J

Report Prepared By:

AKT Peerless

For: Bottom Floor North Maple Duplexes
743 North Maple Duplex
Ann Arbor, Michigan 48103

Design Conditions: Yipsilanti

Indoor:		Outdoor:	
Summer temperature:	75	Summer temperature:	89
Winter temperature:	70	Winter temperature:	5
Relative humidity:	50	Summer grains of moisture:	22
		Daily temperature range:	Medium

Building Component		Sensible Gain (BTUH)	Latent Gain (BTUH)	Total Heat Gain (BTUH)	Total Heat Loss (BTUH)
Whole House	1,153 sq.ft.	12,531	920	13,451 (1 tons)	28,981
First Floor		12,539	920	13,459	29,057
All Rooms	1,153 sq.ft.	12,539	920	13,459	29,057
Infiltration		1,266	0	1,266	11,937
- Tightness: Avg.; Winter ACH: 1.02 ; Summer ACH: .5					
Duct		597	0	597	3,790
- Supply above 120; Enclosed in unheated space; R-4					
People	4	1,200	920	2,120	0
Miscellaneous		1,200	0	1,200	0
Floor	1,153 sq.ft.	0	0	0	1,949
- Over enclosed crawl space; Hardwood or tile; R-19 (4 - 6.5 inch)					
S Wall	380.5 sq.ft.	603	0	603	2,226
- Wood frame, with sheathing, siding or brick; R-113 1/2 in.; none					
Window	38.8 sq.ft.	1,381	0	1,381	1,251
- Double pane; Vinyl frame; Clear glass					
- No inside shading; Coating: None (clear glass); No outside shading.					
N Wall	384.8 sq.ft.	610	0	610	2,251
- Wood frame, with sheathing, siding or brick; R-113 1/2 in.; none					
Window	16.5 sq.ft.	340	0	340	532
- Double pane; Vinyl frame; Clear glass					

Building Component		Sensible Gain (BTUH)	Latent Gain (BTUH)	Total Heat Gain (BTUH)	Total Heat Loss (BTUH)
- No inside shading; Coating: None (clear glass); No outside shading.					
Door - Metal; Fiberglass; Storm	18 sq.ft.	116	0	116	429
W Wall - Wood frame, with sheathing, siding or brick; R-113 1/2 in.; none	177.7 sq.ft.	281	0	281	1,040
Window - Double pane; Vinyl frame; Clear glass - No inside shading; Coating: None (clear glass); No outside shading.	49 sq.ft.	3,410	0	3,410	1,580
E Wall - Wood frame, with sheathing, siding or brick; R-113 1/2 in.; none	192.7 sq.ft.	305	0	305	1,127
Window - Double pane; Vinyl frame; Clear glass - No inside shading; Coating: None (clear glass); No outside shading.	16 sq.ft.	1,114	0	1,114	516
Door - Metal; Fiberglass; Storm	18 sq.ft.	116	0	116	429
Whole House	1,153 sq.ft.	12,531	920	13,451 (1 tons)	28,981

In accordance with ACCA Manual J

Report Prepared By:

AKT Peerless

For: Top Floor North Maple Duplexes
745 North Maple Road
Ann Arbor, Michigan 48103

Design Conditions: Yipsilanti

Indoor:		Outdoor:	
Summer temperature:	75	Summer temperature:	89
Winter temperature:	70	Winter temperature:	5
Relative humidity:	50	Summer grains of moisture:	22
		Daily temperature range:	Medium

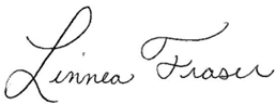
Building Component		Sensible Gain (BTUH)	Latent Gain (BTUH)	Total Heat Gain (BTUH)	Total Heat Loss (BTUH)
Whole House	1,260 sq.ft.	14,531	920	15,451 (1.5 tons)	27,793
First Floor		14,531	920	15,451	27,793
All Rooms	1,260 sq.ft.	14,531	920	15,451	27,793
Infiltration		1,357	0	1,357	12,600
- Tightness: Avg.; Winter ACH: .98 ; Summer ACH: .49					
People	4	1,200	920	2,120	0
Miscellaneous		1,200	0	1,200	0
Floor	1,260 sq.ft.	0	0	0	0
- Over conditioned space					
S Wall	393 sq.ft.	519	0	519	1,915
- Wood frame, with sheathing, siding or brick; R-113 1/2 in.; R-2.51/2 in. Extruded poly board					
Window	38.8 sq.ft.	1,381	0	1,381	1,251
- Double pane; Vinyl frame; Clear glass					
- No inside shading; Coating: None (clear glass); No outside shading.					
N Wall	365.3 sq.ft.	579	0	579	2,137
- Wood frame, with sheathing, siding or brick; R-113 1/2 in.; none					
Window	36 sq.ft.	742	0	742	1,161
- Double pane; Vinyl frame; Clear glass					
- No inside shading; Coating: None (clear glass); No outside shading.					
Door	18 sq.ft.	116	0	116	429

Building Component		Sensible Gain (BTUH)	Latent Gain (BTUH)	Total Heat Gain (BTUH)	Total Heat Loss (BTUH)
- Metal; Fiberglass; Storm					
W Wall	177.7 sq.ft.	281	0	281	1,040
- Wood frame, with sheathing, siding or brick; R-113 1/2 in.; none					
Window	49 sq.ft.	3,410	0	3,410	1,580
- Double pane; Vinyl frame; Clear glass					
- No inside shading; Coating: None (clear glass); No outside shading.					
E Wall	210.7 sq.ft.	334	0	334	1,233
- Wood frame, with sheathing, siding or brick; R-113 1/2 in.; none					
Window	16 sq.ft.	1,114	0	1,114	516
- Double pane; Vinyl frame; Clear glass					
- No inside shading; Coating: None (clear glass); No outside shading.					
Ceiling	1,260 sq.ft.	2,298	0	2,298	3,931
- Under ventilated attic; R-22 (7 inch); Dark					
Whole House	1,260 sq.ft.	14,531	920	15,451 (1.5 tons)	27,793

4.0 Part 3: Utility Consumption Baseline

4.1 Acknowledgements of Part 3: Utility Consumption Baseline

The Consumption Narrative Report and Utility Consumption – Summary and Utility Consumption – Monthly worksheets in the RPCA Model were completed by Linnea Fraser of AKT Peerless. AKT Peerless certifies that the report preparers meet the qualifications identified in the RAD Physical Condition Assessment Statement of Work and Contractor Qualifications Part 3.2 (Version 2, December 2013).



Linnea Fraser, EIT
Senior Energy Analyst
AKT Peerless Environmental Services
Illinois Region
Phone: 773.993.3998
Fax: 248.615.1334

Date: March 17, 2015

Part 3 Consumption Narrative Report and Excel RPCA Model were Received and Reviewed by Owner:

Lori Harris
Norstar Development USA, LP
733 Broadway
Albany, NY 12207
Phone: 518-431-1051
Fax: 518-431-1053

Date: _____

AKTPEERLESS

Rental Assistance Demonstration (RAD):
PART 3: UTILITY CONSUMPTION BASELINE

743-749 North Maple Road, Ann Arbor, Michigan 48103
NORTH MAPLE DUPLEXES

PREPARED FOR	Norstar Development USA, LP 733 Broadway Albany, NY 12207	**ON BEHALF OF**	The Ann Arbor Housing Commission 727 Miller Ave Ann Arbor, MI 48103
PROJECT #	9698U-3-96	**PIC #**	MI064
DATE	March 17, 2015		

AKTPEERLESS

Rental Assistance Demonstration (RAD): CONSUMPTION NARRATIVE REPORT

743-749 North Maple Road, Ann Arbor, Michigan 48103
NORTH MAPLE DUPLEXES

PREPARED FOR Norstar Development USA, LP
733 Broadway
Albany, NY 12207

ON BEHALF OF The Ann Arbor
Housing Commission
727 Miller Ave
Ann Arbor, MI 48103

PROJECT # 9698U-3-96

PIC # MI064

DATE March 13, 2015

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AKTPEERLESS

1.0 EXECUTIVE SUMMARY

1.1 Purpose and Scope of Work

The purpose of the Part 3: Utility Consumption Baseline is to establish a twelve-month consumption baseline for normalized heating, cooling, lighting, and other electric, gas and water usage (not cost) for the subject property as defined in the Rental Assistance Demonstration (RAD): Physical Condition Assessment (RPCA) statement of Work and Contractor Qualifications released by the Department of Housing and Urban Development (HUD) in October 2012 (Version 1).

This report contains data on all utility usage at the subject property, both tenant-paid and owner-paid (if applicable), and including all common areas for a full 12-month period. It establishes a baseline to allow for benchmarking, and for future measurement of consumption and costs. As such, the utility baseline creates a whole building consumption profile, addressing missing utility data, vacancies, and weather patterns, in achieving its aim of establishing that standard on which future consumption can be compared.

1.2 Subject Site Description

1.2.1 General Site Description

The subject property contains two (2) 2,094 square foot multi-family buildings. The subject buildings were constructed in 1995 and contain two (2) stories with a crawlspace. There are a total of four (4) three bedroom, one bathroom units at the site. The subject building is generally referred to as North Maple Duplexes.

1.2.2 Site Utilities and Usage

Each unit at the subject property has an electric meter and a natural gas meter. Each building has one water meter. One common electric meter exists at the site. Therefore, there are a total of five (5) electric meters, four (4) natural gas meters, and two (2) water meters at the site.

1.3 Baseline Site Energy Consumption

The Actual Site Energy Use, Energy Use Intensity (EUI), Weather Normalized Site Energy Use and Weather Normalized EUI displayed below are consistent with the ASHRAE Procedures for Commercial Building Energy Audits. This methodology establishes the property's baseline use and cost conditions that are representative of the building's energy performance.

This statistical analysis removes the bias of independent variables such as historic weather, occupancy and operating hours. These calculations have been normalized to the mean values of the independent variables impacting the building's energy performance and represent the most probable performance under actual conditions accounting for weather, occupancy and operating hour variability.

As the subject site has been 100% occupied for the duration of the analysis period, no pro-forma adjustment factors to the consumption have been made.

1.3.1 Actual Site Energy Use and EUI

Actual Site Energy Use	Actual Site Energy Use Intensity (EUI)
355,963 kBtu/yr	85.00 kBtu/ ft^2/yr

1.3.2 Weather Normalized Site Energy Use and EUI

Weather Normalized Site Energy Use	Weather Normalized Site Energy Use Intensity (EUI)
338,577 kBtu/yr	80.84 kBtu/ft^2/yr

2.0 INTRODUCTION

2.1 Purpose

The purpose of the Part 3: Utility Consumption Baseline is to establish a twelve-month consumption baseline for normalized heating, cooling, lighting, and other electric, gas and water usage (not cost) for the subject property as defined in the Rental Assistance Demonstration (RAD): Physical Condition Assessment (RPCA) statement of Work and Contractor Qualifications released by the Department of Housing and Urban Development (HUD) in October 2012 (Version 1).

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2.2 Scope of Work

AKT Peerless' scope-of-services is based on its proposal PE-16420, dated September 11, 2014 and authorized by Norstar Development USA, LP (the Client), and the terms and conditions of that agreement.

The purpose of the Part 3: Utility Consumption Baseline is to establish a twelve-month consumption baseline for normalized heating, cooling, lighting, and other electric, gas and water usage (not cost) for the subject property as defined in the Rental Assistance Demonstration (RAD): Physical Condition Assessment (RPCA) statement of Work and Contractor Qualifications released by the Department of Housing and Urban Development (HUD) in October 2012 (Version 1).

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creates a whole building consumption profile, addressing missing utility data, vacancies, and weather patterns, in achieving its aim of establishing that standard on which future consumption can be compared.

3.0 SUBJECT SITE DESCRIPTION

3.1 General Site Description

The subject property contains two (2) 2,094 square foot multi-family buildings. The subject buildings were constructed in 1996 and contain two (2) stories with a crawlspace. There are a total of four (4) three bedroom, one bathroom units at the site. The subject building is generally referred to as North Maple Duplexes.

3.2 Current/Planned Use of the Property

The subject property has been used as a multi-family structure and operated by the AAHC since its initial construction in 1996. AAHC is participating in HUD's Rental Assistance Demonstration pilot program and intends to continue operating the building as a multi-family residential facility.

4.0 ENERGY CONSUMPTION ANALYSIS

This section provides information on energy utilities associated with the subject property.

4.1 Electricity

The following figure (Figure 4.1) identifies monthly electrical consumption (kWh) in comparison to cooling degree days (CDD). Cooling Degree Days (CDD) are roughly proportional to the energy used for cooling a building, while Heating Degree Days, (HDD) are roughly proportional to the energy used for heating a building. In general, daily degree days are the difference between a base point temperature (65 degrees) and the average outside temperature.

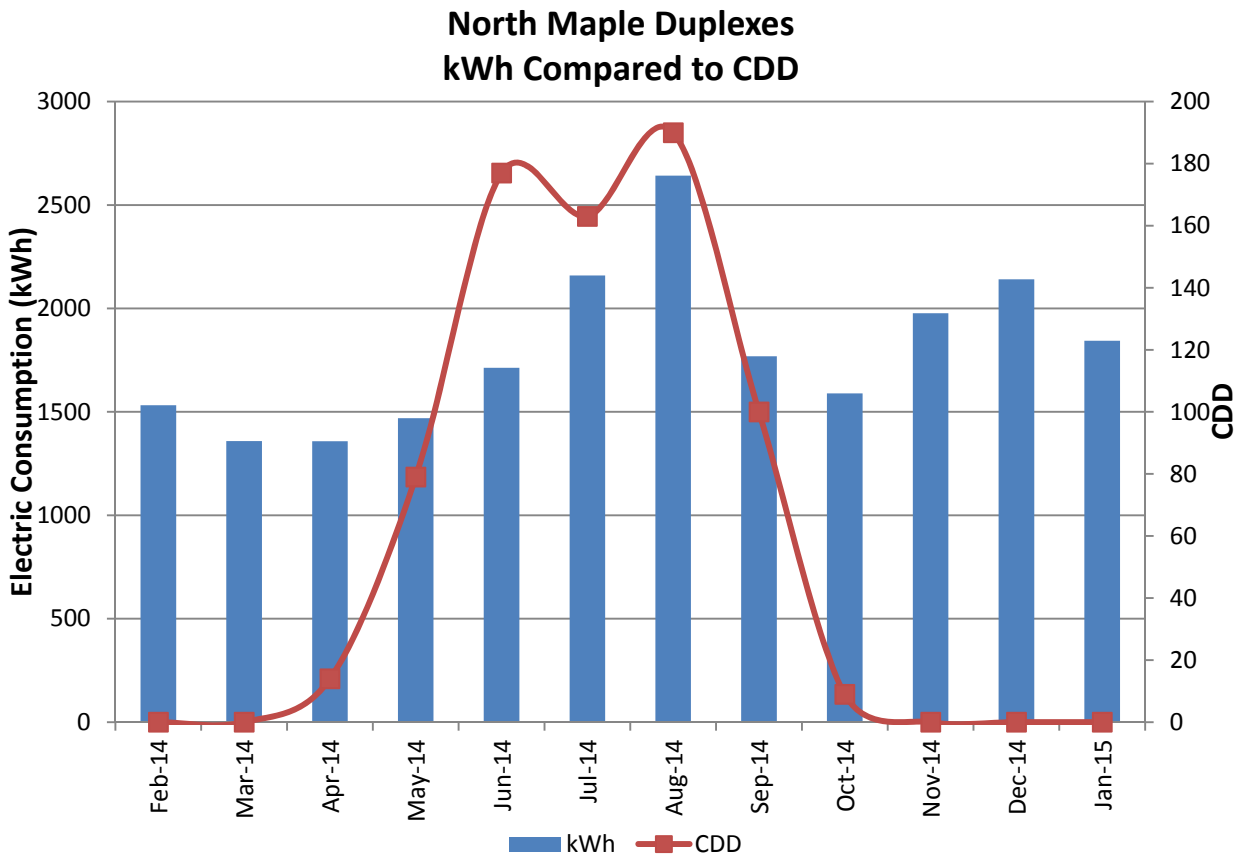


Figure 4.1 Electricity Consumption Graph

The following table (Table 4.1) identifies key information regarding the electric utility associated with the property.

Table 4.1 Annual Electricity Metrics

Vendor	DTE Energy
Meters on Site	Residential - Four (4) Non-Residential (Common) – One (1)
Use for Residential	Lighting, electric appliances, tenant plug loads, tenant ac window units (if present), washing machines, furnace blower and control.
Use for Non-Residential	Exterior lighting
Responsible for Payment	Residential – Tenant Non-Residential - Owner

Rate	Residential - $0.147 / kWh Non-Residential - $0.213 / kWh
Site Consumption	22,755 kWh / year (77,663 kBtu / year)
Energy Use Intensity (EUI)	5.43 kWh / ft^2 (18.54 kBtu / ft^2)
Weather Normalized Site Consumption	22,986 kWh / year (78,451 kBtu / year)
Weather Normalized EUI	5.49 kWh / ft^2 (18.73 kBtu / ft^2)

AKT Peerless received tenant electric bill information in an electronic spreadsheet from the owner (AAHC) for the subject property. This spreadsheet included the following information for each individual unit at the subject property: meter read date, invoice amount ($), usage days per billing period, and net usage (kWh). For the subject property, North Maple Duplexes, monthly electrical data was included from August 2014 to January 2015. The most current twelve (12) months of electrical data provided (February 2014 through January 2015) were used for this analysis and input into the RPCA model.

The actual electric consumption was adjusted to produce a weather-normalized summary of electric consumption. This process involved the following steps:

- CDD for the base year billing periods were calculated. Source for CDD is www.degreedays.net (using temperature data from www.wunderground.com) at weather station ANN ARBOR MUNICIPAL AIRPORT, MI, US (83.74W,42.22N), Station ID: KARB.
- Base year billing consumption (kWh) and CDD were normalized by number of days in each billing period.
- Relationship between usage (kWh/day) and weather (CDD/day) was established by using spreadsheet software (Excel) to determine the “best fit” linear regression trend line and R^2 value. The R^2 value is a statistical indicator that represents goodness of fit of the tread line, with $R^2 > 0.75$ considered an acceptable fit.
- Weather Normalized Site Consumption was calculated using the linear regression equation and the 10 year average CDD per month.

4.2 Natural Gas

The following figure (Figure 4.2) identifies monthly natural gas consumption (therms) in comparison to heating degree days (HDD). HDD are roughly proportional to the energy used for heating a building. In general, daily degree days are the difference between a base point temperature (65 degrees) and the average outside temperature.

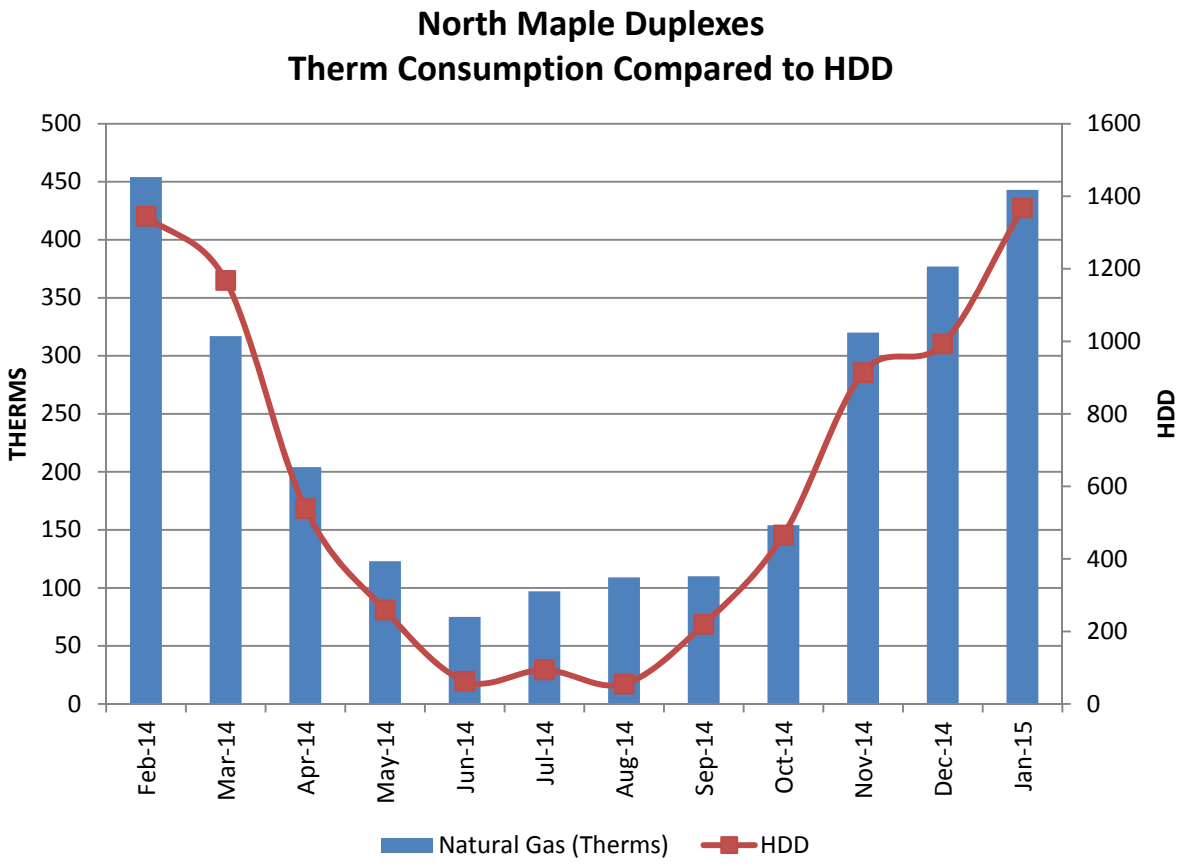


Figure 4.2 Natural Gas Consumption Graph

The following table (Table 4.2) identifies key information regarding the natural gas utility associated with the property.

Table 4.2 Annual Natural Gas Metrics

Vendor	DTE Energy
Meters on Site	Residential – Four (4) Non-Residential (Common) – None (0)
Use for Residential	Gas-fired furnaces for space heating, ranges for cooking, dryers for laundry.
Use for Non-Residential	None
Responsible for Payment	Tenant
Rate	$0.947 / therm
Site Consumption	2,783 therms / year (278,300 kBtu / year)

Energy Use Intensity (EUI)	66.45 kBtu / ft^2
Weather Normalized Site Consumption	2,601 therms / year (260,126 kBtu / year)
Weather Normalized EUI	62.11 kBtu / ft^2

AKT Peerless received tenant natural gas bill information in an electronic spreadsheet from the owner (AAHC) for the subject property. This spreadsheet included the following information for each individual unit at the subject property: meter read date, invoice amount ($), usage days per billing period, and net usage (therms). For the subject property, North Maple Duplexes, monthly natural gas data was included from August 2013 to January 2015. The most current twelve (12) months of natural gas data provided (February 2014 through January 2015) were used for this analysis and input into the RPCA model.

The actual natural gas consumption was adjusted to produce a weather-normalized summary of natural gas consumption. This process involved the following steps:

- HDD for the base year billing periods were calculated. Source for HDD is www.degreedays.net (using temperature data from www.wunderground.com) at weather station ANN ARBOR MUNICIPAL AIRPORT, MI, US (83.74W,42.22N), Station ID: KARB.
- Base year billing consumption (therms) and HDD were normalized by number of days in each billing period.
- Relationship between usage (therms/day) and weather (HDD/day) was established by using spreadsheet software (Excel) to determine the "best fit" linear regression trend line and R^2 value. The R^2 value is a statistical indicator that represents goodness of fit of the tread line, with $R^2 > 0.75$ considered an acceptable fit.
- Weather Normalized Site Consumption was calculated using the linear regression equation and the 10 year average HDD per month.

5.0 LIMITATIONS

5.1 Assumptions

The Ann Arbor Housing Commission (AAHC), the property owner, released utility information to AKT Peerless delivered directly from the utility provider(s), DTE Energy. It is assumed that this monthly usage and cost data is accurate and contains no data gaps or errors.

Information on how the utilities are utilized was generated from conversations with AAHC staff and results of the RPCA through the Energy Audit.

5.2 Limitations and Exceptions

AKT Peerless accepts responsibility for the competent performance of its duties in executing this assignment and preparing this report in accordance with the normal standards of the profession, but disclaims any responsibility for consequential damages. Although AKT Peerless believes the results contained herein are reliable, AKT Peerless cannot warrant or guarantee that the information provided is exhaustive, or that the information provided by the client, owner, third parties, or the secondary information sources cited in this report is complete or accurate.

AKT Peerless has not verified that the property owner/operator has reported all sources and records of energy consumed at the subject property. Potentially unreported information may include, but is not limited to, bills, meters, and types of energy consumed. Inaccurate information provided to AKT Peerless and information not reported to AKT Peerless may influence the findings of report.

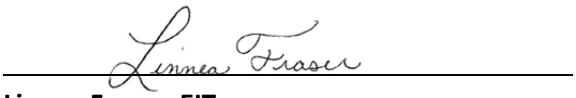
AKT Peerless has not verified the accuracy of building floor area as reported by the owner.

Should additional information become available to the Client or Owner that differs significantly from our understanding of conditions presented in this report, AKT Peerless requests that such information be forwarded immediately to our attention so that we may reassess the conclusions provided herein and amend this project's scope of services as necessary and appropriate.

Nothing in this report constitutes a legal opinion or legal advice. For information regarding individual or organizational liability, AKT Peerless recommends consultation with independent legal counsel.

6.0 SIGNATURES

Report submitted by:



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