

MHP: Energy Performance Improvement Program (EPIP)

Requirements for Green Physical Needs Assessments and Contractor Qualifications

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Background

The Massachusetts Housing Partnership (MHP) has developed an Energy Performance Improvement Program that will offer financing for energy and water conservation improvements to properties currently in the MHP portfolio. MHP seeks to reduce the utility costs and improve the condition and durability of properties to increase stability and reduce risk. In order to ensure that a cost-effective set of measures are proposed, that key health and indoor environmental quality concerns are addressed, and that the financed improvements are part of a well-developed multi-year capital plan for the property, MHP has developed a protocol for energy audits and Green Physical Needs Assessments (PNAs) that will be required for program participation. It is expected that the audits and PNAs will be used to develop the Green Retrofit Project Plan that will be submitted in the application for funding.

MHP's intent for the protocol is to obtain high-quality, "investment grade" energy and physical needs analysis that will support underwriting for loan financing for a portion of the Green Retrofit Project Scope of Work. MHP seeks PNAs that fully incorporate findings from the energy audits, and offer practical green options, based on current industry understanding of best green practices, for other identified capital needs. Ideally, reports would offer a comprehensive assessment without undue extraneous information.

Overview

For properties that are participating in MHP's Energy Performance Improvement Program (EPIP), the proposed Project Plan and Scope of Work must be based upon a Green Physical Needs Assessment (GPNA) that meets the requirements described below. Generally, the GPNA will include three parts:

1. An Energy Audit—a site visit/visual inspection, analysis of at least one year of utility consumption and cost for tenants and common areas, and analysis of energy efficiency opportunities and costs using simple payback analysis and savings to investment ratio analysis.
2. An Integrated Pest Management Inspection and Plan—a site visit/visual inspection including evaluation of current levels of infestation, and recommendations for repair measures to include in the scope of work and for implementation of an IPM program in property operations.

3. A Green Physical Needs Assessment—a multi-year plan indicating immediate repairs and future replacement cycles with green alternatives. The plan should reflect recommendations from the energy audit regarding the sequencing of work, early replacements, and changes in equipment type, sizes and efficiency. The plan should incorporate recommendations from the IPM inspection, including recommendations for immediate repair measures.

The three parts may be completed by a single Contractor, provided the contractor qualifications for each part are met, or may be completed by a Contractor and subcontractors with the required qualifications. The findings from the three parts must be presented in one report that incorporates all observations and recommendations in a single document.

Exceptions and Alternates

PNAs

Properties with a PNA that is less than 5 years old may be exempted from conducting a new PNA, provided that the Energy Audit includes comprehensive analysis of building envelope, HVAC systems and equipment and considers impact of replacements, including early replacements, upgrades and alternatives that would improve the energy performance, safety, health and comfort of the property.

IPM Inspections

Properties that have previously implemented an IPM Program and have an active IPM program in place may submit a copy of the IPM Plan and recent IPM pest control contractor's inspection/treatment reports in lieu of a new IPM Inspection.



Part One: Energy Audit

Requirements

Generally, energy audits shall conform to the standards of an ASHRAE Level 2—Energy Survey and Analysis Audit, as described in *Procedures for Commercial Building Energy Audits, Second Edition*, ASHRAE, Atlanta, GA, 2011.

Site Visit

Auditor is required to conduct a site visit that includes a thorough visual inspection and interview with on-site management and maintenance staff

Building Envelope Component Assessment

Provide an inventory of building envelope components comparing existing condition and performance relative to current energy code and to current green building best practices

Air Sealing Evaluation

- Inspect and identify areas where air is moving between the outside and inside the building as well as air movement through the building, between units, and between units and common areas. Provide recommendations on strategies and methods to reduce airflow.
- Note that blower door testing or infrared analysis is not required, but if additional testing would provide better information, the report may include a recommendation for suggested additional testing.

Equipment Documentation

- Provide an inventory of building HVAC and hot water equipment including age, condition, and performance relative to current energy code as well as greener alternatives.
- For ventilation equipment, evaluate the condition and effectiveness of existing systems and equipment, including noise levels. Measure flow rates in a sample of at least 10% of the units (5 units minimum), and determine whether bath and kitchen fans exhaust to the outdoors. Evaluate the current systems relative to requirements of ASHRAE 62.2 and 62.1, as applicable.

Comfort and Health Assessment

- For common areas and a sample of at least 10% of the apartments (minimum of 5 units, plus more if needed to capture the full range of variation in unit types and locations within the building) measure temperature, relative humidity and carbon dioxide (CO₂). During interviews and visual inspections, identify sources of drafts, areas where condensation is occurring, and frequent resident work order requests/complaints relative to temperature, humidity, odors and noise.
- Inspect for presence of CO detectors when combustion appliances are present
- Indicate in the report whether measurements, observations or interviews indicate that longer-term monitoring of temperature, relative humidity and carbon dioxide is recommended.



Renewable/on-site Energy Assessment

Provide an assessment of the suitability and opportunity for solar thermal, solar photovoltaic or other renewable and on-site energy alternatives that may be appropriate to consider.

Utility consumption and cost analysis

- Analyze at least one full year of energy and water utility data for common areas.
- Identify which utilities, if any, are metered to and paid directly by tenants. If tenant utility consumption data are available through WEGOWise or another energy monitoring system and can be accessed without violating tenant privacy, analyze at least one full year of tenant-paid utility data. If the property has established Utility Allowances, include them in the tenant utility data and analysis.
- Conduct basic rate analysis and identify whether any electricity meters are subject to demand rates. If meters are on demand rates, conduct demand analysis.

Opportunities Analysis

- Provide cost estimates of potential opportunities identified through inspection and analysis for energy conservation and energy efficiency and evaluate the simple payback and savings to investment ratios for each.
- For heating and domestic hot water equipment, assess equipment sizing relative to current heating loads or demand as determined by the utility consumption analysis. In the report, provide guidance on sizing equipment replacements, taking recommended envelope measures and higher-efficiency equipment into account.
- Evaluate the energy savings potential of early replacement of building envelope components, equipment and appliances.
- Identify the sequence of work and/or bundles of recommended measures that would provide the most cost-effective approach to maximizing the savings opportunities.

Required and Recommended Energy Conservation and Efficiency Measures

Required Measures

MHP has determined that the following measures are core to the Energy Performance Improvement Program. Not all elements will apply to every property, but if the existing conditions do not meet the standards noted below, the minimum requirement must be included as a recommended measure in the report.

- Air sealing: Recommendations for improving air sealing between interior and exterior, between units and between units and common areas
- Insulation: Where physically feasible, increase insulation levels at least to current code. Consider benefits of additional insulation beyond code requirements
- Windows and Doors: Weatherstrip/airseal if not replacing
- Combustion Equipment: If replacement is recommended, replace with sealed combustion/direct vent models where feasible
- Bath ventilation: All baths must vent to the outdoors and ventilation systems must be in good working order. Central systems must be checked and balanced for design flow rates—



duct cleaning, distribution air sealing, fan replacement, and flow controls should be considered. Individual unit bath exhaust systems should include an Energy Star-rated exhaust fan with controls such as a booster on a timer or humidistat. Constant background exhaust models should be recommended if warranted by conditions

- Kitchen ventilation: Range hoods that exhaust to the outdoors are preferable. If not present, the feasibility of installing ducted exhaust should be considered
- Appliances: Any appliance replacements will be with ENERGY STAR®-qualified models
- Gas ranges with pilot lights: Replace with electronic ignition models
- Lighting: All replacement lighting should be ENERGY STAR-qualified
- Water conservation: Tamper-proof WaterSense® fixtures when replacement is recommended with maximum flow rates of 1.75 gallon per minute (gpm) for showerheads and kitchen faucets, and 1.0 gpm for bath faucets

Other measures to be evaluated for inclusion in recommendations

- Windows and Doors: Early replacement with ENERGY STAR-qualified models if less than 15% useful life remaining
- Heating, Cooling and Hot Water Equipment: Early replacement with ENERGY STAR-qualified models if less than 15% useful life remaining. Consider higher-efficiency alternatives than ENERGY STAR if appropriate
- Heating, Cooling and Hot Water Equipment: Improved controls
- Premium efficiency motors for pumps, fans, other equipment
- ENERGY STAR and/or programmable thermostats
- Solar thermal for hot water
- Appliances: Replace if less than 15% useful life remaining.
- Water Conservation: ultra-low flow fixtures and/or WaterSense toilets (1.28 gallon per flush or better)

Report Requirements

Compile the audit findings, analysis and recommendations in a thorough but succinct manner. The Energy Audit Report should follow the model recommended by ASHRAE for a Level 2 Audit and include:

Executive Summary

- Intent of audit, brief background
- Summary of baseline energy use analysis and benchmarking
- Summary of recommended measures

Background Information

- Contact Information
- Audit Scope and Methods
- Description of the property (site and building)
- Historical energy and water use and cost
- Benchmarking comparison



- End-use analysis results
- Client motivations/purpose of the audit

Description of Existing Building Systems

- Occupancy and Use
- Building Envelope
- Lighting
- Mechanical
- Security, other operational requirements impacting energy use

Energy Conservation and Efficiency Measures (ECMs, EEMs)

- No-cost/low-cost measures
- Capital investment measures
- Demand response measures
- Renewable energy measures
- O & M Measures
- Recommendations on sequencing, bundling, priorities
- Potential incentives available

Supporting Information

- Plans and sketches
- Photographs
- Measured data
- Analysis
- Manufacturers' information
- Additional information as appropriate

Contractor Qualifications

Energy Auditors must:

1. Be certified to complete building energy audits by RESNET or the Building Performance Institute (BPI), or be a RESNET-certified Home Energy Rater or a BPI-certified Multifamily Building Analyst, or be a Certified Energy Manager (CEM) or be a State equivalent certified energy auditor with experience in auditing multifamily housing, or be a Professional Engineer with experience in multifamily housing audits.
2. The individual auditor, and not just the company, should have previous experience with at least three comprehensive audits of multifamily housing, and produce reports that are well regarded in the marketplace in terms of content, timeliness and responsiveness.
3. Not be under suspension or debarment by HUD or Fannie Mae, or involved as a defendant in criminal or civil action with HUD or Fannie Mae.
4. Have the capacity to complete the project inspection, analysis and report in a timeframe acceptable to MHP.



Part Two: Integrated Pest Management Inspection

Requirements

The Integrated Pest Management Inspector will make two visits to the property one week apart in order to place and then collect traps to assess the type and degree of pest infestations. The Inspector will inspect for conditions such as holes and pathways, trash management, and moisture that may contribute to pest concerns, interview on-site staff to evaluate current pest management practices, and produce a report with a compilation of the trap results, observation from the inspection and interviews, and recommendations for corrective action and implementation of an IPM Program at the property.

Expectations for the First Onsite Visit:

1. Conduct an inspection and meet with on-site property management and maintenance staff
2. Obtain an understanding of the configuration of buildings and related site features such as dumpster/trash areas.
3. Obtain an understanding of current pest management practices
4. Review the plan for placing glue traps to assess current levels of pest infestations with the property manager. Provide the “Using Glue Traps” handout (available at www.oahp.net) to the property manager and tenants
5. Place traps in all units and appropriate common areas
6. Determine the date for the follow-up visit to collect the traps and conduct detailed inspections.

Expectations for the Second Onsite Visit (to be scheduled one week after First Visit):

1. Collect the traps that were placed on the first visit, observe conditions in units and common areas, and compile the trap results and observations in a unit-by-unit and common areas report. Categorize infestation levels, for example, as High, Moderate or Low.
2. Use the trap findings to determine which units to select for detailed inspections. In total, at least 10% of units and all relevant common areas should be inspected. The units inspected should be representative of the full range of unit types and configurations, with prioritization of units where traps indicate a high level of infestation.
3. Conduct an inspection of building exteriors, basements or crawlspaces, common areas, trash rooms, dumpster enclosures, etc. for evidence of pests or conditions that could attract or harbor pests, including holes and penetrations of the building envelope. Compile inspection notes in a report and identify measures for corrective action if problems were noted.

Narrative Report Requirements

Provide a summary report of the results of the trap placement, interviews and inspections. Include charts, tables, photographs, and diagrams to fully describe current conditions, pest management practices, findings and recommended action. The report should identify any immediate corrective measures, such as critical repairs or further pest treatments. Clusters or areas of High or Moderate infestation should be identified. The report should also include recommendations for implementing IPM in property operations and maintenance.

Contractor Qualifications

The contractor conducting the IPM inspection must:

1. Be certified by QualityPro Green, GreenShield, or EcoWise
2. Be trained to evaluate and treat the exterior and interior of multifamily structures for pest infestations, in accordance with IPM standards
3. Have the work performed by an employee who is licensed or certified by the state for residential pest control or be QualityPro Green certified and who has previously produced reports of this nature that are well regarded in the marketplace in terms of content, timeliness and responsiveness
4. Not be under suspension or debarment by HUD or Fannie Mae, or involved as a defendant in criminal or civil action with HUD or Fannie Mae
5. Have the capacity to complete the project inspection, analysis and report in a timeframe acceptable to MHP



Part Three: Green Physical Needs Assessment

Requirements

General

The Green Physical Needs Assessment (GPNA) will include a comprehensive review of the property's site, building envelope, systems, health and safety conditions and incorporate findings from the energy audit and IPM inspection in the recommended capital plan. The objective of the GPNA is to identify all opportunities to improve the energy performance of the property while addressing indoor environmental quality concerns such as ventilation, moisture and pests. The GPNA should also identify ways to reduce the environmental impact of the property through choice of replacement materials, site improvements, and changes in operations. The GPNA should present and consider materials and improvements considered to be current green building and operations best practices, and offer analysis of green alternatives as appropriate for the property being assessed. The GPNA will meet the scope set forth in Part III A Section 316 of the Fannie Mae Multifamily Selling and Servicing Guide, with additional requirements as noted below.

The GPNA will identify opportunities for improving original or existing conditions using green best practices.

The GPNA will incorporate recommendations from the Energy Audit and IPM Inspection in developing plans and recommendations for immediate action and future capital planning.

Inspection and Analysis Requirements

1. The Contractor shall perform a Physical Condition Assessment (PNA) and prepare a report to explain the findings.
2. The Contractor shall conduct and document a site inspection of at least 25% of all units (minimum of five units, maximum of 50 units) and all office, community spaces and common areas. Selected units should be a random sample, with oversampling as needed to include all unit types and special circumstances, including occupied and unoccupied units, accessible units, etc. Additional units should be inspected if necessary to fully investigate green alternatives.
3. Environmental Concerns should be evaluated using the HUD/OAHP Environmental Restrictions Checklist and the report should include the completed checklist and indicate any directly observed potential on-site hazards.
4. If available, Contractor will review previous inspection reports, including previous PNAs, HUD Real Estate Assessment Center (REAC) or mortgagee files, as appropriate.
5. The Contractor will identify Critical Repair items, and immediately report any items that present an immediate threat to health and safety.

6. The Contractor shall identify and estimate the cost of short-term physical needs that should be addressed within the next twelve months, including recommended ECMs from the energy audit and required elements from the list in the following section. Contractor should take into account beneficial early replacements or work sequences that would provide greater net benefit to the project than addressing individual components on a strictly useful life basis. The Contractor should identify and evaluate green alternatives that would offer better energy performance, durability, health and comfort and reduce the environmental impact of the property.
7. The Contractor shall identify and estimate the cost and scheduling of immediate and medium-term physical needs that are required to maintain the property in good physical condition. The schedules may consider the next twenty (20) years, but shall identify and prioritize Critical Repairs, near-term (next 2 – 7 years) replacement needs, EEMs and ECMs from the Energy Audit, and immediate actions from the IPM Inspection and opportunities to improve property operations, health and comfort and to reduce the environmental impact of the property using green building and operations best practices.
8. The Contractor shall use its own templates to incorporate its site visit observations, the recommendations from the energy audit and IPM inspection, recommendations for green alternatives, and analysis of the required elements.
9. The Contractor may consider and recommend market-comparable improvements, with special consideration for cooling in properties where cooling is currently provided by tenant-provided window air conditioning units.

Required Elements

MHP has determined that the following measures are core to the Energy Performance Improvement Program. Not all elements will apply to every property, but if the existing conditions do not meet the standards noted below, the minimum requirement must be included as a recommended measure in the report. MHP has determined that the following elements must be evaluated during the PNA, and included in the recommended measures if not already addressed at the property:

- Concerns identified on the HUD Environmental Restrictions Checklist
- Recommended ECMs and EEMs from Energy Audit
- Ventilation Recommendations from Energy Audit
- Immediate Actions noted in the IPM Inspection
- Minimum standard of bringing systems requiring repair to code at the time of repair (note that energy efficiency and green requirements may be greater than code)
- ENERGY STAR-qualified building construction materials and elements, equipment, and appliances for any recommended near-term and future replacements
- Tamper-proof WaterSense-qualified plumbing fixtures for any recommended replacements
- Low-VOC paints, finishes
- Urea-formaldehyde-free cabinets and counter underlayments

- Scientific Certification System’s Floor Score certified flooring, or if carpet, Green Label Plus carpet, pad and adhesive

Report Requirements

The provider should strive to achieve a balance between brevity and thoroughness when assembling the report and presenting the analysis and recommendations.

1. The report shall include a detailed narrative summary of observations and recommendations and include color photographs to illustrate key conditions and recommendations
2. The report shall incorporate key findings of the energy audit and IPM inspection and include both reports as attachments
3. The report shall identify any deficiencies noted during the inspection, review of other documents and on-site staff interviews
4. The report shall explain whether the property meets accessibility requirements, and if not, what approaches might be feasible to improve accessibility and/or meet requirements
5. The report shall include acknowledgements that the Contractor and Energy and IPM inspectors (whether staff or subcontractors) meet the stated qualifications
6. The report shall include cost/benefit analysis of recommended upgrades, early replacements, or alternate sequencing of work for items that have cost estimates of more than \$10,000 per work element
7. The report shall include schedules of short-term and long-term replacement recommendations
8. The report shall include recommendations for items that can be accomplished through operations and maintenance, and changes in O & M practices that would help to achieve green building objectives.
9. The report shall note any obstacles or impediments encountered by the provider that prevented or limited completion of required inspection or analysis elements of the report

Contractor Qualifications

The Contractor conducting the GPNA must:

1. Be trained to evaluate building systems, health and safety conditions, physical and structural conditions, and to provide cost estimates for maintaining, rehabilitating or improving deficiencies
2. Have obtained at least one of the following green professional accreditations: From USGBC, the LEED-AP, LEED-NC, LEED-EB, LEED AP BD+C, LEED Homes, or LEED Green Associate. From NAHB: The Certified Green Professional designation
3. Have acceptably completed evaluations and written reports for multifamily buildings similar to the subject property, preferably with at least two previous assignments for affordable or HUD-assisted rental housing.



4. Produce reports that are well regarded in the marketplace in terms of content, timeliness and responsiveness.
5. Not be under suspension or debarment by HUD or Fannie Mae, or involved as a defendant in criminal or civil action with HUD or Fannie Mae.
6. Have the capacity to complete the project inspection, analysis and report in a timeframe acceptable to MHP

PROGRAM AND CONTACT INFORMATION

Program information, including documents referenced in this protocol, can be found at www.mhp.net/epip.

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