Multifamily Energy Efficiency and Building Electrification Program Technical and Inspections Guide

For Market Rate and Affordable Housing

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Introduction

The **Multifamily Energy Efficiency Program** ("MFEEP") and the **Downstate Affordable Multifamily Energy Efficiency Program** ("AMEEP") (collectively, the "Program") offer incentives for installing energy-efficient upgrades and building electrification upgrades in existing multifamily buildings. Energy efficiency and electrification can help improve customers' bottom line by reducing energy use, maintenance costs, and greenhouse gas emissions while increasing operating efficiency. This Multifamily Energy Efficiency and Building Electrification Technical and Inspection Guide ("Technical and Inspection Guide") is a companion document to the Multifamily Energy Efficiency and Building Electrification Program Manual and intended to be used together. This Technical and Inspections Guide provides technical criteria and inspection checklists. **In the event of a conflict between this Technical and Inspections Guide and the Program Manual, the Program Manual controls unless expressly stated otherwise.** The following guidelines outline the technical and inspection requirements for energy efficiency measures under the Programs.

System and system components must be installed in accordance with manufacturer specifications and installation requirements, and in compliance with all applicable laws, regulations, codes, licensing and permit requirements including, but not limited to, the New York State Environmental Quality Review, the Statewide Uniform Fire Prevention and Building Code, the New York State Energy Conservation Construction Code (ECCCNYS), the National Electric Code, Fire Codes, and all applicable state, city, town ordinances. All references to ECCCNYS are for the most recent version of the Energy Conservation Construction Code of New York State. In all cases of conflict or difference between program requirements and applicable codes, applicable codes take precedence. The Participating Contractor overseeing eligible work under the Program remains responsible for complying with all relevant federal, state, and municipal laws, regulations, and codes in connection with all work performed on behalf of the customer. This guidance is not intended to override applicable building, fire, or energy code requirements, but to identify the technical and documentation standards that must be met to qualify for Program incentives.

This Technical and Inspection Guide is one of four main documents utilized to understand the Programs, incentives, and participation requirements.

- Multifamily Energy Efficiency and Building Electrification Program Manual ("Program Manual", "MFEEP & AMEEP Manual")
- Multifamily Energy Efficiency and Building Electrification Technical and Inspections Guide (this document)
- Con Edison Energy Efficiency Program Guidelines: Building Electrification
- MFEEP & AMEEP Incentive Fact Sheet

The Technical and Inspection Guide is broken out into sections (Weatherization, Energy Efficiency, Building Electrification, and AMEEP Comprehensive) and describes technical criteria for all eligible measure types. For each measure, the below technical criteria are provided.

Eligibility & Prerequisites	Items that must be addressed prior to project submission to ensure incentive eligibility. Prerequisites must be fully resolved before issuance of the Notice to Proceed (NTP) and cannot be reserved for installation unless expressly approved in writing by the applicable Utility. Disqualifying building or project conditions that would render a project ineligible for incentives regardless of remediation are also noted.
Technical Requirements	Installation and/or equipment requirements that must be clearly incorporated into the project's scope and installation plans, such as local and state building code requirements and equipment efficiency standards.

Documentation Requirements	Paperwork, images, and other documentation that must be provided before pre-inspection and/or post-inspection to demonstrate appropriate scope and installation practices on the project.
Inspection Requirements	The checklist inspectors will use to inform their pre-inspection and post-inspection reports and determine that all requirements have been met.

While most technical guidance is the same between utilities, any utility-specific information is noted with clear labels for **Con Edison** requirements and **National Grid** requirements.

1. Foundational Technical Requirements

All projects installed under the Program must meet all related programmatic requirements established in the MFEEP & AMEEP Program Manual, the Technical and Inspections Guide and the Con Edison Energy Efficiency Program Guidelines: Building Electrification to be eligible for incentives. All projects, inclusive of all measure types and program pathways, must meet these foundational technical requirements.

Foundational Technical Requirements for All Installations

Eligibility & Prerequisites

Project Eligibility

- The area of installation must be structurally sound and must not be damaged or leaking.

Technical Requirements

Equipment Requirements

- Installed equipment and materials must meet the applicable eligibility criteria set forth in the Program Manual, Incentive Fact Sheet, and (where applicable) Energy Star®, NEEP, AHRI, or other program-specific standards, and must meet or exceed applicable code requirements.
- Meet the minimum requirements established by ECCCNYS code or applicable local code requirements, whichever is higher.
  - For market rate buildings, the baseline efficiency must be equal to minimal code compliant.
  - For affordable buildings, existing below code conditions can be claimed as the baseline if acceptable proof is submitted, such as nameplate photo showing motor efficiency or a submittal/email from the manufacturer stating the equipment efficiency. If data is not available, then efficiency is determined based on minimal code compliance.

Installation Requirements

- All precautions must be taken by the installer to assess the risk of and mitigate moisture and fire risk; where applicable, proper ventilation techniques must be used alongside installation.
- Addressal of air leakage sealing, thermal bypasses, and thermal bridging if relevant, must be documented with photos, video, or other media to show it was installed before or during the installation in accordance with ECCCNYS or applicable local code.

Documentation Requirements

Pre-Installation

- A complete program application with all required documentation must be submitted prior to pre-inspection. Please see the MFEEP & AMEEP Program Manual for specific requirements.
- Datasheets and nameplate photos outlining heating inputs, SEER & EER values, date of manufacture, for all heating and cooling equipment on-site (e.g. HVAC units, boilers).
- Cutsheets for the proposed equipment being installed, including the manufacturer, material and/or equipment type, and all information relevant to the installation (e.g. R-value for insulation).
- Photos and videos of repaired elements to address any identified safety concerns (e.g. mold remediation).

- *Secondary Fuel Projects:* If the building operates on a Secondary Fuel type (e.g. Fuel Oil or District Steam), submit at least 12 months of fuel usage data.

Post-Installation

- All required photos, videos, and documentation proving sufficient installation, repairs of any identified areas, and service adequacy where applicable. See specific requirements for each measure.
    - If inspector was not able to observe full scope due to but not limited to access issues, contractor to provide timestamped photos and videos of requested supplemental information.

Inspection Requirements

Pre-Inspection Checklist

- The Utilities and/or the Implementation Contractor (IC) will complete an on-site or virtual pre-inspection. The type of inspection conducted will be determined based on the measure(s) installed, quality of photos and videos submitted, existing conditions and complexity.
- The inspector will document and confirm the building address, unit count, heating/cooling type, etc. matches application documents.
- The inspector will conduct a full survey of the building and installation area(s), including common areas, boiler rooms/basements, rooftops, and apartment units as applicable.
- The inspector will check for all pre-requisites outlined at the measure level and identify flags or fails based on established criteria.
    - Pre-inspection flags indicate discrepancies, missing or inaccurate documentation, or minor site concerns (e.g. roof cracks) that must be repaired prior to or during installation.
    - Pre-inspection fails indicate significant, potentially disqualifying conditions, including damage, safety hazards, or conditions that would render the project ineligible for the program.

Post-Inspection Checklist

- The Utilities and/or the Implementation Contractor (IC) will complete an on-site post-inspection. Virtual post-inspections may be allowed under special circumstances with written approval from the applicable Utility (which may be communicated through the Implementation Contractor (IC) acting on Utility's behalf).
- The inspector will review all site conditions against the pre-inspection to confirm that the installation occurred at the correct address, followed the approved scope of work, and repaired any identified damage.
- The inspector will confirm all installation components against the submitted cutsheets and project documentation to ensure installation sufficiency.
- The inspector will conduct a full survey of the building and installation area(s), visually inspecting all areas where installation occurred and documenting findings.
- The inspector will check all post-inspection criteria outlined at the measure level and identify flags or fails based on established criteria.
    - Post-inspection flags indicate discrepancies, missing or inaccurate documentation, or minor site concerns (e.g. improper sealing) that must be remediated before an incentive is issued.
    - Post-inspection fails indicate significant, potentially disqualifying conditions, including uninstalled or partially installed equipment, un-remediated safety hazards, or conditions that would render the project ineligible for the program.

2. Weatherization

This section of the Technical and Inspection Guide includes existing and proposed conditions, equipment requirements, and respective inspection checklist requirements for Weatherization measures. These measures are eligible for either Con Edison or National Grid incentives. Measures included in this section are:

- Attic Cavity Insulation – Opaque Shell
- Above Deck Roof Insulation – Opaque Shell

- Wall Cavity Insulation – Opaque Shell
- Window Replacement – Window Shell
- Air Leakage Sealing

2.1 Attic Cavity Insulation – Opaque Shell

Measure Description: Attic cavity insulation is the addition of insulation material to a building's attic cavity and is typically blown in cellulose or fiberglass batt insulation. The added insulation reduces the thermal conductance of the building envelope. Energy and demand savings are realized through reductions in the building's heating and cooling loads.

Strategic Framework Categorization: Strategic

Measure Type: Prescriptive

Program Applicability: MFEEP, AMEEP Non-Comprehensive and AMEEP Comprehensive

Attic Cavity Insulation – Opaque Shell Technical Requirements

Eligibility & Prerequisites

Project Eligibility

- Pre-requisite: Any conflicts with the pre-requisites listed below identified prior to or during the insulation installation must be addressed as part of the insulation project.
  - Roof membrane & parapet walls must be air & vapor sealed before attic cavity insulation is added or at time of insulation. The roof must be structurally sound and must not be damaged or leaking. No interior space should vent into the attic cavity.
  - Ventilation (exhaust and ducts) must be air sealed with fire-safe insulation and have no gaps or areas in which insulation can fill.
  - Any plumbing that travels through the attic cavity should be in good repair and free of leaks or visible damage.
  - Buildings with existing insulation within the attic cavity are ineligible.
- **Con Edison:** Projects where the ratio of the building's annual gas consumption (in therms) to insulated roof area (in square feet) is less than 2.0 may be subject to additional review and require Utility approval prior to pre-inspection.
- Concrete roofs and roofs with solar or non-standard configurations of roofs (e.g., multi-level) are eligible on a case-by-case basis, please reach out to the IC if you have interested projects.
- Project scope must not include installation of above deck insulation.

Technical Requirements

Equipment Requirements

- Installed insulation must be Energy Star certified and meet the minimum roof assembly R value of R-53 (high rise buildings) or R-49 (low rise buildings) required by ECCCNYS code C402.1.3 for high rise, R402.1.3 for low rise or applicable local code requirements, whichever is higher.
  - Roofs that cannot reach installed insulation with a total roof assembly to meet code must fill the cavity in its entirety, leaving a 2-inch gap between the insulation and roof deck for air flow and moisture mitigation.
- Cutsheets for the proposed roof insulation being installed, including the manufacturer and applicable R-value.

Installation Requirements

- Cavity insulation must be installed without compression or slumping and meet code at all points in roof.
- All precautions must be taken by the installer to assess the risk of and mitigate moisture; where applicable, proper ventilation techniques must be used alongside insulation installation.

- Addressal of air leakage sealing, thermal bypasses, and thermal bridging if relevant, must be documented with photos, video, or other media to show it was installed before or during the installation up to ECCCNYS C402.1.4 or applicable local code.
- Area surrounding roof and in-unit ventilation shafts must have no gaps or areas into which insulation can spill.
- Any exhaust or ventilation ducts should be appropriately air sealed with fire-safe insulation.
- Any electrical wiring, boxes, or fixtures that are not rated for insulation contact must be properly boxed and protected from insulation contact.
- Insulation installed must not cover/block existing ventilation that facilitates moisture, heat and or fire mitigation.

Documentation Requirements

Pre-Installation & Calculations

- HVAC equipment datasheets and nameplate photos outlining heating inputs, SEER & EER values.
- Cutsheets for the proposed roof insulation being installed, including the manufacturer, applicable R-value and fire rating.
- Cutsheets for installed vents and air leakage sealing materials.
- **Con Edison:** Submit cavity probes via photos and videos of the existing condition of the interior roof cavity and the material make-up of the roof membrane and roof structure.
  - Minimum probe guidelines depend on the rooftop geometry. See Appendix B: Probe Guidelines for minimum probe requirements.
- **Con Edison:** If the building operates on a Secondary Fuel type (*e.g.*, Fuel Oil or District Steam), must submit at least 12-months of fuel usage.
  - **National Grid:** 12 months of fuel usage for all dual fuel weatherization projects must be submitted.
- **Con Edison:** Roof measurements must be provided in square footage units. This should be supported by satellite images, floor plans, architectural elevation drawings, pre-inspection findings, etc. Roof areas to be incentivized must exclude parapet walls, vents and penetrations, stairwells, and other areas unable to be insulated.
  - **National Grid:** Roofs will be measured on site by internal inspectors.

Post-Installation

- Submit photo and video documentation collected at probing and during installation:
  - Presence and condition of internal electrical cables, conduits, and lighting fixtures for structural and safety compatibility with proposed insulation.
  - Condition of compromised portions of roof/top floor that will require air leakage sealing repairs.
  - Air leakage sealing required within cavity on conduits and vent shafts.
  - Locations and conditions of existing ventilation in attic cavity and documentation of repairs.
- Submit photo and video recordings of the following collected at project completion:
  - Submit photos and videos of the completed work that clearly show the depth of insulation installed at all roof openings.
  - Roof membrane & parapet walls locations that were vapor & air-sealed before attic cavity insulation was installed.
  - Photos showing that the attic floor/top floor ceiling was air sealed before roof/attic insulation was installed.
  - Passive vents are properly installed and fully sealed.
  - Installed final R-value & depth insulation installed matches or exceeds the scope of work.
  - Verification that final conditions of roof, parapet walls, vents, and drainage systems are not damaged from installation.
  - Electrical cables, lighting, ventilation, plumbing, drains or conduits/vent shafts in cavity have been appropriately boxed and protected.

Inspection Requirements

Pre-Inspection Checklist

- The inspector will check for pre-requisites in the Pre-Installation & Calculations section. If any of the Project Eligibility items are not met without an accompanying remediation plan, the inspection is an automatic Fail. The inspection will be completed.
- **Con Edison:** The inspector will check the roof cavity documentation provided by the installer to confirm if the roof is built with wood or metal framing members.
  - Thermal bridging must be addressed by contractor for metal framed roofs and applicable materials outlined in ECCCNYS C402.1.4 or applicable local code.
- **Con Edison:** The inspector will conduct a full survey of the top floor common areas to identify and document any potential air or vapor leakage or evidence of mold and will also inquire the same with the building management regarding leaks or mold contamination in the top floor apartments. The installer is to vapor and air seal the roof membrane to address these leaks.
- The inspector will document and confirm the building address matches application documents.
- The inspector will document the boiler and HVAC information.
  - The observed equipment must service the tenants for space heating or cooling.
  - The boiler fuel type will be confirmed by the inspector.
- For on-site inspections, the inspector will conduct a full survey of the roof, visually inspecting it as well as documenting the condition and performance with a thermal camera. They will identify and record potential leaks, irregularities, and damage to the roof membrane and parapet walls for the installer to fix. They will also note if solar panels are present.
  - Roof damage that penetrates the membrane vapor barrier and/or is located below the parapet counterflashing will be noted for repair.
- The inspector will check the roof measurement in the project submission and confirm all scope-relevant sections of the roof are included in the measurement.
  - Bulkheads, parapet walls, sky lights, and chimney/flues are to be excluded.
  - If any of the above are incorrect, inspector will perform a Google Maps measurement in satellite view (**Con Edison**) or document roof dimensions on site (**National Grid**).

Post-Inspection Checklist

- The inspector will check roof cavity documentation provided by the installer to ensure that the roof cavity is now insulated. Inspector will also verify the depth of the insulation via provided documentation.
- The inspector will confirm that the insulation material matches the provided specification sheets.
- The inspector will document that the building address matches application documents.
- The inspector will conduct a full survey of the roof, visually inspecting it, and recording a video using a thermal camera outlining areas with thermal discrepancies. The inspector will note thermal images for **Con Ed** or **National Grid** roofs showing a discrepancy of 10° Fahrenheit or greater.
- Inspector will assess condition of the roof by checking for any damage or compromised sections of the roof that were not fixed, identifying passive insulation vents and any other roof penetrations, as well as the overall integrity of the insulation work completed.
- The inspector will verify all building ventilation and roof cavity vents are confirmed to operate with unobstructed airflow pathways via photos of each opening and confirm proper installation of all passive rooftop vents.

2.2 Above Deck Roof Insulation – Opaque Shell

Measure Description: Above deck roof insulation is the application of insulation on top of the roof deck assembly. Typical insulation material is either spray polyurethane foam (SPF) or rigid foam board / vacuum insulation panels (VIP) applications. The added insulation reduces thermal conductance and convective losses of the building envelope. Energy and demand savings are realized through reductions in the building's heating and cooling loads.

Strategic Framework Categorization: Strategic

Measure Type: Prescriptive

Program Applicability: MFEEP, AMEEP Non-Comprehensive and AMEEP Comprehensive

Above Deck Roof Insulation – Opaque Shell Technical Requirements

Eligibility & Prerequisites

Project Eligibility

- Building must have concrete roof decking. Buildings with accessible attic cavities are not eligible for above deck roof insulation and must install attic cavity insulation to receive incentives.
- The roof must be structurally sound and must not be damaged or leaking. Any damage or leaks must be addressed as a part of the insulation project.
- Any plumbing that travels through the roof (e.g., to a water tower) should be in good repair and free of leaks or visible damage.
- Building must not have existing roof insulation.

Technical Requirements

Equipment Requirements

- Where the project is located in New York City, the NYC Building Code and NYC Plumbing Code requirements apply. Projects outside NYC must comply with applicable local code requirements.
- Installed insulation must be Energy Star certified and meet the minimum roof assembly R value of R33ci (high rise buildings) or R 30ci (low rise buildings) required by ECCCNYS code C402.1.3 for high rise, R402.1.3 for low rise or applicable local code requirements regarding insulation and vapor retardants.
- Insulation materials must be compliant with NYC Building code 2022 section 1508.2.
- All precautions must be taken by the installer to assess the risk of and mitigate moisture. Where applicable, a code compliant vapor and air barrier must be used alongside insulation installation.
- Roof storm drains and parapet gutters must comply with NYC Construction Plumbing code 2022 and sloped according to sections 1106.2 (storm drain) and 1106.6 (gutters) or applicable local construction code.
- Roof must be designed to comply with NYS Building code 2022 section 1507.10.1 or local relevant code for sloping.
- Any exhaust or ventilation ducts should be appropriately air sealed with fire-safe insulation.
- Any electrical wiring, boxes, or fixtures that are not rated for insulation contact must be properly boxed and protected from insulation contact.
- Installation must not negatively impact the code compliance of adjacent roofing elements – e.g.: per NYC Building code section 1510.8, parapet walls be at least 42 inches high. Adding new above deck roof insulation must not affect conformance with the building code.
- Newly installed parapet walls must meet NYC Building Fire code 705.11.
- Insulation materials must be compliant with NYC Building code 2022 section 2603.3.

Documentation Requirements

Pre-Installation & Calculations

- HVAC equipment datasheets and nameplate photos.
- Must submit building plans/layout detailing areas be retrofitted.
- Submit photo and video documentation during probing process showing a removed cross section of the upper roof membrane layer down to bare concrete decking to check for existing insulation. If infeasible, building drawings should be submitted as supporting documentation.
- Cutsheets for the proposed above deck roof insulation being installed, including the manufacturer and applicable R-value.
- If the building operates on a Secondary Fuel type (e.g., Fuel Oil or District Steam), must submit at least 12-months of fuel usage.
    - **National Grid:** Requires 12 months of fuel usage for weatherization projects.

- **Con Edison:** Roof measurements must be provided in square feet and supported by satellite images, floor plans, architectural elevation drawings, pre-inspection findings, etc. Roof areas to be incentivized must exclude parapet walls, vents and penetrations, stairwells, and other areas unable to be insulated.
  - **National Grid:** Roofs will be measured on site by internal inspectors.
- Document the parapet wall heights and clearance of the bulkhead entrance.
- Submit videos for pitching of roof for adequate sloping, using a laser level and assessing the whole roof and especially around edges. If pitching is inadequate and may cause ponding, this must be rectified in the final roof installation. Submit videos of laser level assessment on site.

Post-Installation

- Submit photo and video recordings of the following collected at project completion:
  - Submit photos and videos of the completed work that clearly show the depth of insulation installed at multiple locations on the roof.
  - Submit videos for pitching of roof for adequate sloping, using a laser level and assessing the whole roof and especially around edges. Submit videos of laser level completion assessment on site.
  - Submit photos of parapet wall height that clearly show the height of the wall.
  - Submit videos of the bulkheads, access hatches and roof top equipment showing functionality is not impacted by added insulation.

Inspection Requirements

Pre-Inspection Checklist

- The inspector will check for pre-requisites in the Pre-Installation & Calculations section. If any of the Project Eligibility items are not met without an accompanying remediation plan, the inspection is an automatic Fail. The inspection will be completed.
- **Con Edison:** The inspector will conduct a full survey of the top floor common areas to identify and document any potential air or vapor leakage or evidence of mold and will also inquire the same with the building management regarding leaks or mold contamination in the top floor apartments. The installer is to install a vapor and air barrier in the roof membrane to address these leaks.
- The inspector will document and confirm the building address matches the program's application.
- The inspector will document the boiler and HVAC information.
  - The observed equipment must service the tenants for space heating or cooling.
  - The boiler fuel type will be confirmed by the inspector.
- The inspector will document the parapet wall heights and clearance of the bulkhead entrance.
- The inspector will check the roof measurement in the project submission and confirm all scope-relevant sections of the roof are included in the measurement.
  - Bulkheads, parapet walls, sky lights, and chimney/flues are to be excluded.
  - If any of the above are incorrect, inspector will perform a Google Maps measurement in satellite view (**Con Edison**) or document roof dimensions on site (**National Grid**).

Post-Inspection Checklist

- The inspector will check roof insulation documentation provided by the contractor, to ensure that the roof is now insulated and verify the depth of the insulation via the provided documentation.
- The inspector will confirm that the insulation material matches the provided specification sheets.
- The inspector will document that the building address matches the application documents.
- The inspector will conduct a full survey of the roof, visually inspecting it as well as document with a thermal camera. They verify the condition of the roof by checking for any damage that was not fixed, height measurements of the parapet walls clearance of the bulkhead entrance, and the overall integrity of the insulation work completed.
- The inspector will check the level of the roof using a laser or digital leveler to meet the ¼ inch per foot required by NYS Building code.

2.3 Wall Cavity Insulation – Opaque Shell

Measure Description: Wall cavity insulation is the application of high density closed cell insulation material applied via pinhole injection application. The added insulation reduces the thermal conductance and convective losses of the building envelope. Energy and demand savings are realized through reductions in the building's heating and cooling loads.

Strategic Framework Categorization: Strategic

Measure Type: Prescriptive. Other types of insulation applications such as cladding are considered on a case-by-case basis via the Custom project pathway.

Program Applicability: MFEEP, AMEEP Non-Comprehensive and AMEEP Comprehensive

Wall Cavity Insulation – Opaque Shell Technical Requirements

Eligibility & Prerequisites

Project Eligibility

- Only applicable to walls that serve as a barrier between conditioned spaces and outside air. Party/shared walls, rim joists, and basement walls are not eligible for incentives and should be excluded from the scope.
- Existing insulation in exterior walls that are above grade is not eligible.
- Pre-requisites:
  - Existing condition of the wall has been verified structurally sound to handle additional insulation to wall cavity, avoiding any signs of potential buckling or blowout. Plans must be made to comply with all parts of local and state building codes. Any walls with observed bulging and drywall issues (e.g., cracks, bubbling) must be recorded and removed from the project scope.
  - Check for any visible air or vapor/moisture leakage points on walls. Any signs of moisture stains must be recorded and removed from project scope.
- Walls containing bare, hot flue boiler exhaust pipes are not eligible and must be excluded from the scope of work.
- Gut renovations must install a fire break prior to insulation in compliance with NYC Building Fire code 718.2.1.
- Building must have construction in compliance with NYC Building Fire code 718.2.6 or outlined in the exemptions.

Technical Requirements

Equipment Requirements

- Application of high density closed cell insulation material applied via pinhole injection application only.
- Must meet ECCCNYS code minimums and must comply with applicable local code requirements regarding insulation and vapor retardants.
- Installed insulation must be Energy Star certified and meet the minimum R required by ECCCNYS code C402.1.3 for high rise, R402.1.3 for low rise or applicable local code requirements regarding insulation, wall construction materials and vapor retardants.
  - Wall cavities that do not have enough depth to meet the code must fill the wall in its entirety and reflect final conditions in IC's Project Management System.
- Injection insulation materials must be compliant with NYC Building code 2022 section 2603.3.

Installation Requirements

- Photo and/or video documentation of any areas to be enclosed should be submitted supplemental to the post-inspection.
- All precautions must be taken by the installer to assess the risk of and mitigate moisture entrance and damage.

- Drills used to probe and open walls to inject insulation must use dust collection technology (built-in vacuum drill, dust shroud, saw dust bowl).
- Wall cavity insulation must be installed without compression, bulging, buckling, or slumping.
- Rim joists must be excluded from the scope of work.
- Gaps surrounding uninsulated chimneys directly contacting insulation must be packed with unfaced rock wool, unfaced fiberglass insulation, or fire-rated caulking.
- In-unit windows that are unable to fully close must be repaired, and cracked windowpanes are to be sealed with caulking.

Documentation Requirements

Pre-Installation & Calculations:

- HVAC equipment datasheets and nameplate photos
- Measurements related to the dimensions of the walls must be provided. This should be supported by floor plans, architectural elevation drawings, mapping software, pre-inspection etc. Wall areas to be incentivized must exclude doors, windows, fenestration, lobby & common area walls that are not to be insulated such as stairwells.
- Wall cavity probes must be taken to document the existing wall cavity size and conditions, including ruler measurements.
- Plans for and proof of addressing thermal bridging at the following points if insulation is not continuous: slab edges, rim joists, and roof-to-wall connections.
- R-value of the existing envelope determined using the wall insulation R-value from the latest NYSTRM Appendix-A based on the applicable building type.
- **Con Edison:** If the building operates on a Secondary Fuel type (*e.g.*, Fuel Oil or District Steam), must submit at least 12-months of fuel usage.
  - **National Grid** requires 12 months of fuel usage for weatherization projects.
- Cutsheets for the proposed wall insulation being installed must include manufacturer and applicable R-value.
- Submit photos and record damaged walls (e.g., inadequate repairs, holes, bulging, bubbling, cracks, prone to buckling) and exclude from insulation scope.

Post-Installation

- Submit photo and video recordings of the following collected at project completion:
  - Submit photos and videos of the completed work that clearly shows the walls completely insulated at all wall penetrations and sealed for each room insulated.
  - Submit photos and videos confirming installation was completed for all apartment units, e.g. a walkthrough video of each apartment from the front door's unit label through to the insulation entry points on each wall.
  - Photos and videos must clearly demonstrate that wall insulation has not damaged the integrity of the walls with no signs of bulging, buckling, or cracking.

Inspection Requirements

Pre-Inspection Checklist

- The inspector will check for pre-requisites in the Pre-Installation & Calculations section. If any of the Project Eligibility items are not met without an accompanying remediation plan, the inspection is an automatic Fail. The inspection will be completed.
- The inspector will need access to 15% of all apartments within scope.
- The inspector will note all locations not to be insulated including main entrance doors, exterior apartment windows, balconies, louvers, vents and all other relevant areas.
- The inspector will take thermal images of the inspected apartment exterior room walls from inside.
- The inspector will document the floor to ceiling height in the apartment and the height of the rim joists via the floor height.

- The inspector will document any window with a damaged casing or that does not shut completely and note if it is in-unit or common area.
- The inspector will document and measure dimensions of all vertical fenestration.
- The inspector will review the wall probes provided by the contractor to check for any insulation housed in the wall.
- The inspector will document the building address, boiler and HVAC information.

Post-Inspection Checklist

- The inspector will check wall insulation documentation provided by the contractor, to ensure that the walls are now insulated and verify the depth of the insulation via the provided documentation.
- The inspector will need access to 15% of all apartments within scope.
- The inspector will check walls insulation insertion hole distribution and for any insulation insertion holes not properly sealed and repaired.
- The inspector will take thermal videos of the top, bottom & pull back views of the walls, with special attention paid to areas above and below windows to check for the complete distribution of insulation within the wall.
- The inspector will review insulation documentation of each floor provided by the installer for confirmation of installation.
- The inspector will document any window with a damaged casing or that does not shut completely and note if it is in-unit or common area.
- The inspector will check for final insulation quality and ensure no insulation is visible outside the wall cavity post-curing.

2.4 Window Replacement – Window Shell

Measure Description: Window replacement refers to the installation of high-efficiency windows with reduced thermal conductance and optimal solar heat gain coefficient.

Strategic Framework Categorization: Strategic

Measure Type: Prescriptive

Program Applicability: MFEEP, AMEEP Non-Comprehensive and AMEEP Comprehensive

Window Replacement – Window Shell Technical Requirements
Eligibility and Prerequisites

Project Eligibility

- Only applicable to windows that serve as a barrier between conditioned spaces and outside air.
- Pre-requisite:
  - Window cavities must be air sealed before new windows are installed.
  - Check for any visible leaks or active water intrusion into, inside, or from the window cavity. Any area of water leakage that can permeate into the window cavity, wall cavity or building interior must be recorded and rectified prior to installation.

Technical Requirements

Equipment Requirements

- In all instances, new windows must perform better than existing windows and must comply with or exceed ECCCNYS code C402.5 or applicable local code.
- For NYC: New equipment must perform better than existing and must comply with or exceed ECCCNYS table C402.5 or applicable local code and be NFRC certified.
  - For Low-Rise (up to 3 floors) buildings, specified windows shall be Energy Star labeled. If Energy Star-labelled windows are not available, the specified windows must meet or exceed the Energy Star requirements for the building's location for U-value and Solar Heat Gain Coefficient (SHGC).

- For High-Rise buildings (over 3 floors), windows shall meet the code requirements of the applicable territory as described above.
- Proposed window must replace the full window including the frame, sash and glazing with code-compliant windows.

Installation Requirements

- Clean, repair, and square the rough opening. Remove debris, deteriorated materials, and ensure substrate is sound for anchoring.
- Apply proper window cavity air leakage sealing: low-expansion spray foam, backer rod and sealant or an air barrier system on all four sides. Show insulation continuity around the perimeter with no gaps or voids.

Documentation Requirements

Pre-Installation & Calculations

- HVAC equipment datasheets, fuel source and nameplate photos.
- Survey of quantities, dimensions, locations, cardinal and intercardinal orientations of the existing and proposed windows.
- Energy performance specifications (window type, frame type, U-value, gas fill, SHGC, low-e type, and location) for proposed windows.
- NFRC or other relevant rating agency's label(s).
- If the building operates on a Secondary Fuel type (e.g., Fuel Oil or District Steam), must submit at least 12-months of fuel usage. **National Grid** requires 12 months of fuel usage for weatherization projects.

Inspection Requirements

Pre-Inspection Checklist

- The inspector will check for prerequisites in the Pre-Installation & Calculations section. If any of the Project Eligibility items are not met without an accompanying remediation plan, the inspection is an automatic Fail. The inspection will be completed.
- The inspector will need in-unit access to 15% of apartments within scope.
- The inspector will confirm the quantities and locations of all existing windows against application, which includes conducting a window count survey that provides a breakdown of the quantity and square footage of each existing window type in scope of work and will confirm energy performance specifications (window type, frame type, U-value, gas fill, SHGC, low-e type, and location).
    - If U-value and infiltration rates (and other information needed for calculations) differ from code, contractor to submit testing results.
- The inspector will document the building address, boiler and HVAC information.
- Verify copies of NFRC or other relevant rating agency's label(s). For large jobs, provide certificates from NFRC or other relevant rating agency, which should be on file.

Post-Inspection Checklist

- The inspector will need in-unit access to 15% of all apartments within scope to collect photo/video documentation of windows included in the SOW.
- The inspector will conduct a window count survey that provides a breakdown of the quantity and square footage of each window type in scope of work.
- Confirm energy performance specifications (window type, frame type, U-value, gas fill, SHGC, low-e type, and location).
- Verify weatherstripping is in good condition and intact; test that windows open/close smoothly with proper latch engagement.

2.5 Air Leakage Sealing

Measure Description: Air leakage sealing reduces the rate and paths of natural air infiltration in a building through installation of products and repairs to the building envelope, including, but not limited to, caulking,

gasketing, and weather stripping. Air leakage sealing as a measure applies to all common areas – including areas listed in the existing equipment.

Strategic Framework Categorization: Strategic

Measure type: Prescriptive

Program Applicability: MFEEP, AMEEP Non-Comprehensive and AMEEP Comprehensive

Air Leakage Sealing Technical Requirements

Eligibility & Prerequisites

Project Eligibility

- Pre-requisite: Building envelope components must separate unconditioned and conditioned spaces to be eligible. An air leakage sealing survey is required to inspect the following common area building components:
  - Stairwells
  - Bulkheads
  - Exterior walls
  - Common area windows and skylights
  - Basement locations, including basement ceilings that lead into tenant spaces, exterior basement walls, and entrance doors.
  - Repeatable penetrations – including but not limited to, ventilation penetrations, intercoms, dryer exhaust penetrations, garbage chutes, and plumbing/electrical/general penetrations of exterior walls.
- Buildings with broken mechanical louvers or missing exterior doors and windows are ineligible. The eligible existing conditions are cracked and missing window/door frame caulk, missing/poor condition weatherstripping, holes in building exterior from electrical/plumbing penetrations, leakage at roof/wall intersections, damaged roof hatch, leakage through basement ceilings leading to tenant spaces, l doors leading from conditioned to unconditioned spaces & bulkheads.
- Building project scopes or audits in which only door issues are detected will not be considered an acceptable air leakage sealing project.

Technical Requirements

Equipment Requirements

- Larger openings should either be sealed with expandable low VOC spray foam or foam board.
- Installed air leakage sealing material used in mass envelope sections sealing must comply with ECCCNYS code section C402.6.3.1 or applicable local code.

Installation Requirements

- The exterior envelope, as well as interior walls/partitions between conditioned and unconditioned spaces, shall be inspected and all gaps sealed. At a minimum, the following items shall be inspected, and sealing measures may be implemented based upon inspection results:
  - Seal gaps in doors leading from conditioned to unconditioned space.
  - Seal air leaks between unconditioned (including unconditioned basement and attics) and conditioned spaces, to include, but not limited to, plumbing, ducting, electrical wiring, wall top plates, chimneys, flues, and dropped soffits.
  - Use foam sealant on larger gaps around windows, baseboards, and other places where air leakage, either infiltration or exfiltration may occur.
  - Confirm that all air leakage sealing materials used are appropriately adhered to the envelope surface, and no visible air gaps remain. Excess material should be trimmed and discarded.
  - Includes exterior door weatherstripping, sweep, and threshold, or full replacement if needed.
    - Entire floor sealing to be excluded from scope for building doors that cannot be replaced or repaired.

- Includes basement compartmentalization sealing as follows:
  - Install gaskets around trash chute doors and other interior shaft access panels.
  - Caulk around all pipe and electrical penetrations through the exterior wall and ceiling or penetrating from an unconditioned interior space into a conditioned space.
  - Rooftop venting, electrical, plumbing and mechanical equipment penetrations.

Documentation Requirements

Pre-Installation & Calculations

- The visual air leakage sealing survey must document all air leakage opportunities throughout all common areas paying close attention to drafty locations and areas with gaps and cracks.
- Submit a building survey video for exterior door and windows noting location, quantity, qualitative assessment of leak, and size/length of each proposed air leakage sealing opening must be provided.
- Submit photos showing current condition of non-compliance and compliance conditions for at least top of building, common areas and basement.
- Scope of work will detail areas in need of air leakage sealing, plan of action & photo documentation of location.
- Specification sheets for the proposed air leakage sealing materials must include manufacturer.

Post-Installation

- If additional air-leakage opportunities are identified after submission, document them with photos/videos and submit them as a proposed scope change for Utility review and approval before inclusion for incentive purposes.

Inspection Requirements

Pre-Inspection Checklist

- The inspector will check for pre-requisites in the Pre-Installation & Calculations section. If any of the Project Eligibility items are not met without an accompanying remediation plan, the inspection is an automatic Fail. The inspection will be completed.
- The inspector will take video documentation showing the inside of the building, displaying the measure location in the same order listed in the Audit's scope of work (e.g., line 1, line 2, line 3). Each video will document the requirements below:
  - Show and verify each location from the scope of work with all existing and installed equipment shown.
  - For door measures, both rooms adjacent to the door must be shown stating if either location is or is not conditioned to determine eligibility.
  - Show a close-up of each proposed air leakage sealing measure and location listed on the scope of work.
  - Read location descriptions and count measure quantities out loud, pointing the camera at each measure.
- The inspector will label each video with the index as is listed on the scope of work and location.

Post-Inspection Checklist

- The inspector will conduct a full survey of the building for any missed potential air leakage sealing measures as well as the listed measures on the IC project management system scope of work. All measures must be fully sealed.
  - Any measures found missing on-site must be fixed by the contractor, and video documentation of the fixed measure must be submitted to the Program.

3. Energy Efficiency

3.1 Energy Efficiency Gas Savings Measures

This section of the Technical and Inspections Guide includes existing and proposed conditions, equipment requirements, and respective inspection checklist requirements for gas Energy Efficiency measures that are eligible to be submitted under Con Edison or National Grid gas incentives. Measures included in this section are:

- Energy Management Systems (EMS) – Boiler Advanced Controls
- Linear Pipe Insulation – Hot Water & Steam Pipe Insulation
- Custom Equipment Insulation
- Smart Thermostatic Radiator Enclosure (Smart TRE)
- Boiler Replacements – Boiler. Furnace, Unit Heater – *AMEEP Only*
- Domestic Hot Water Heater Replacement – Storage Tank – *AMEEP Only*
- Central Domestic Hot Water Controls
- Burner Replacement – *AMEEP Only*
- Linkage-less Burner Control – *AMEEP Only*
- Steam Trap Replacement – Low Pressure Space Heating – *AMEEP Comprehensive Only*
- Master Air Venting – *AMEEP Comprehensive Only*
- Orifice Plates – *AMEEP Comprehensive Only*
- Thermostatic Radiator Valves (TRVs) – *AMEEP Comprehensive Only*
- In-Unit Low-Flow Aerators – *AMEEP Comprehensive Only*
- In-Unit Low-Flow Showerheads – *AMEEP Comprehensive Only*

Measures labeled 'AMEEP Only' or 'AMEEP Comprehensive Only' are eligible for incentives only under the specified AMEEP pathway, as determined by the applicable Utility.

3.1.1 Energy Management System (EMS) – Boiler Advanced Control

Measure Description: An advanced boiler control system is designed for the automated control of the boiler's cycling time based on both indoor and outdoor temperatures. These controls would utilize both indoor and outdoor temperature sensors along with remote monitoring to provide real-time operating and energy consumption data on the building and optimize the cycling operation of the boiler to better meet the demand for heat.

Strategic Framework Categorization: Strategic, when installed on a boiler with a Remaining Useful Life of at least 7 years

Measure Type: Prescriptive pathway, including performance-based incentive rates for certain unit counts (as described below)

Applicability: MFEEP, AMEEP Non-Comprehensive and AMEEP Comprehensive

Energy Management System (EMS) – Boiler Advanced Control Technical Requirements
Eligibility & Prerequisites
Project Eligibility
• Boilers with an existing or previously installed EMS of any condition (including non-operational or broken) are not eligible.
• Existing boiler controls must have no ability to connect to the Internet. For clarity, the restrictions in this section apply to existing (baseline) boiler controls; the proposed EMS must meet the connectivity and monitoring requirements listed under Technical Requirements.

- The existing boiler must have a Remaining Useful Life (RUL) of at least seven years.
  - The formula to calculate a boiler's RUL is: *Boiler Effective Useful Life (EUL) - (Current Year – Boiler Manufactured Year).* For purposes of this calculation, 'Current Year' means the calendar year in which the complete application package is submitted.
  - The boiler's Effective Useful Life (EUL) is based on its construction and heating distribution type. Boiler EULs are established in the New York State Technical Resource Manual (TRM).[1]
    - Hot Water, Steel Water Tube: 24
    - Hot Water, Steel Fire Tube: 25
    - Hot Water, Cast Iron: 35
    - Steam, Steel Water Tube: 30
    - Steam, Steel Fire Tube: 25
    - Steam, Cast Iron: 30
  - The boiler's Manufactured Year can be found on the boiler's nameplate. If the date isn't clearly visible on the nameplate, search for the boiler's serial number on the manufacturer's website or review permits, certificates, or purchase receipts.
  - *Example:* For an EMS application submitted in 2026, a Steam, Steel Water Tube boiler manufactured in 1992 would have a RUL of -3 and not be eligible for incentives.
- EMS applications for buildings with 5-9 or ≥ 250 apartment units are eligible under a performance-based incentive rate.
- Buildings with packaged terminal air conditioning units and/or in-unit thermostat controls are not eligible for EMS incentives under this measure.
- Projects with energy calculations that deviate from TRM methodology should be submitted under the Building Automation Systems/Building Management Systems (BAS/BMS) measure.

Technical Requirements

Equipment Requirements

- All existing boilers have a Remaining Useful Life (RUL) of at least 7 years and no existing EMS; any boiler controls do not have Internet connectivity.
- EMS installation on multiple boilers in a lead-lag configuration will be incentivized for an EMS system on the primary boiler only.
  - Boilers in a lead-lag configuration use secondary boilers that operate only to meet demand during peak heating season. Multiple boilers with cyclic operation or simultaneous operations at a low firing rate will be considered as a lead-lag operation.
  - If boilers are in a lead-lag configuration, the application must include an operating schedule.
- EMS installations on multiple boilers that provide primary heating to multiple buildings (e.g. a heating plant in a multi-building co-op) without a lead-lag configuration may be incentivized for each EMS installed.
- The EMS equipment installed must:
  - Use autonomous or rule-based decision making (i.e., not a user-entered program or schedule).
  - Collect multiple data inputs (i.e., does not make decisions off a single data point).
  - Collect and leverage real-time digital data.
  - Collect and leverage real-time monitoring and control through a software package or by providing data through a building protocol (e.g., IP, BACnet, Modbus, Zigbee).
  - Allow remote access or web-based monitoring (monitoring service agreement is not required).

Installation Requirements

- EMS equipment must be installed on all boilers providing space heating to the building(s) as required for eligibility; however, for lead-lag configurations, incentives will be calculated for one EMS system on the primary boiler only, as described above.
- Install sensors amounting to 25% of the building's total apartment unit count on a variety of floors, including one in the apartment at the end of each steam line (for steam systems).
- Must include temperature sensors for the stack, domestic hot water supply, outdoor weather, heating water supply or return, and condensate (for steam systems).

- Must allow multiple boiler systems to have staging capability.

Documentation Requirements

Pre-Installation & Calculations

- **Con Edison:** EMS projects must enter inputs for calculations on IC's Project Management System.
- **National Grid:** EMS projects must fill out the Common Area tool to be uploaded to IC's Project Management System.
- Documentation must be provided to confirm the total apartment count.
  - Buildings located in New York City may upload a screenshot from the Department of Planning's Zoning and Land Use (ZoLa) tool to IC's Project Management System.
- The installer must upload photos and/or videos to IC's Project Management System:
  - All existing boiler(s), including their nameplates and any existing boiler controls
    - The boiler nameplate photo(s) must clearly show the boiler's manufactured year, model, BTU/hr, and serial number. If any element is not visible, the installer must upload supplemental documentation that shows this information, such as permits or purchase receipts.
  - Confirmation of the site address and number of residential units (e.g. front door, mailroom).

Post-Installation

- The installer must upload photos and/or videos to IC's Project Management System:
  - All EMS equipment installed and operating on the same boiler(s) included in the submitted pre-installation images.
  - Proof of connected sensors for 25% of apartment units and the stack, domestic hot water supply, outdoor weather, heating water supply or return, and condensate (for steam systems) with temperature readings to demonstrate functionality (e.g. screenshot of sensor list from connected EMS monitoring system).

Inspection Requirements

Pre-Inspection Checklist

- The inspector will verify the total number of apartments served by the boiler(s). If multiple boilers are observed, the inspector will confirm whether a lead-lag configuration is used.
- The inspector will verify boiler nameplate information, such as boiler input, manufactured date, and model type.
- The inspector will calculate the boiler's RUL based on the EUL of the observed boiler and its manufactured year. If the RUL is less than seven, the pre-inspection will fail.
- The inspector will confirm that no existing EMS or Internet-capable boiler controls are installed, including any non-operational or broken systems. If either are observed, the pre-inspection will fail.
- The inspector will confirm that any existing boiler controls do not contain apartment sensors, network connectivity, or temperature sensors for stack, domestic hot water supply, heating water supply/return, or condensate (steam).

Post-Inspection Checklist

- The inspector will verify that the existing boiler and site address match the pre-inspection observations.
- The inspector will confirm that temperature sensors amounting to 25% of the building's total apartment unit count were installed on a variety of floors, including one in the apartment at the end of each steam line (for steam systems).
- The inspector will confirm that temperature sensors for the stack, domestic hot water supply, outdoor weather, heating water supply or return, and condensate (for steam systems) were installed.
- The inspector will confirm that the installed EMS includes Internet and network capability and that all sensors are connected and functional.

3.1.2 Linear Pipe Insulation – Hot Water & Steam Pipe Insulation

Measure Description: Linear pipe insulation is the installation of linear fiberglass or rigid foam/cellular glass pipe insulation in space heating hot water/steam and domestic hot water (DHW) distribution systems on uninsulated copper or steel piping between 0.50-inch and 8-inch diameters.

Strategic Framework Categorization: Strategic

Measure Type: Prescriptive

Applicability: MFEEP, AMEEP Non-Comprehensive and AMEEP Comprehensive

Linear Pipe Insulation – Hot Water & Steam Pipe Insulation Technical Requirements

Eligibility & Prerequisites

Project Eligibility

- Only existing, bare pipes are eligible - new piping would not qualify under pipe insulation incentives, regardless of new heating equipment being installed.
- Existing pipe must be copper or steel piping between 0.50 inches and 8.0 inches in diameter. Space heating piping located in conditioned spaces is not eligible for incentives under this measure.
- Existing piping must be located in common area spaces:
  - Space heating pipes are limited to unconditioned spaces only.
  - Domestic hot water and service hot water piping may be located in conditioned and unconditioned spaces.
- Intended use of piping for scope of work must be either space heating, domestic hot water, and service hot water.
- Risers and condensate/return piping in scope of work are not eligible for pipe insulation incentives.

Technical Requirements

Equipment Requirements

- Insulation should be either linear fiberglass or rigid foam/cellular glass.
- Must meet minimum thickness requirements specified in the most recent version of the ECCCNYS Table R403.4.2 (low rise), C404.4.1 (high rise) or applicable local code.

Documentation Requirements

Pre-Installation & Calculations

- **Con Edison:** Boiler projects must enter inputs for calculations on IC's Project Management System.
- **National Grid:** Boiler projects must fill out the Common Area tool to be uploaded to IC's Project Management System.
- Inputs for calculations will serve as the Pipe Insulation Survey, including pipe location, material type, intended use by the building, length, and diameter of pipe.
  - Pipe Insulation Survey must cover 100% of the heating distribution pipes (supply and return) in the common areas.
- If scope of work includes piping in inaccessible spaces, including crawl spaces, the installer must provide photos and videos verifying pipe diameter, length, and location.

Post-Installation

- If not able to confirm during post-inspection, the installer must provide pictures of the insulation thickness (ruler showing thickness in inches of insulation).

Inspection Requirements

Pre-Inspection Checklist

- The inspector will verify that the existing pipe is bare and is located in unconditioned spaces.
- The inspector will record information from the heating boiler including make, model, capacity, and efficiency.
- The inspector will verify the pipe application to be insulated (DHW, steam, hot water).
- The inspector will take photos and videos of the bare piping to be insulated along with location tags.
- The inspector is to use a laser distance meter to verify the length of each pipe line item to be insulated.
- The inspector will use a caliper to confirm each pipe line item diameter.
- The inspector will confirm that the entered scope of work matches the amount and length of pipes available to be insulated.

Post-Inspection Checklist

- The inspector will compare each pipe line item new insulation thickness to the minimum thickness specified in ECCCNYS Table C404.4.1 or applicable local code.
- The inspector will take photos and videos of the newly insulated piping with location tags.
- The inspector is to use a laser distance meter to verify the length of each pipe line item to be insulated.
- The inspector will use a caliper to confirm each pipe line item diameter.
- If installation was partially completed, the project may be subject to cancellation or incentive adjustment, as determined by the applicable Utility.

3.1.3 Custom Equipment Insulation

Measure Description: This measure entails insulation of any linear piping that is greater than 8 inches in diameter and/or any non-linear pipe segments, including but not limited to boiler jackets, tank insulation, and fittings.

Strategic Framework Categorization: Strategic

Measure Type: Custom

Applicability: MFEEP, AMEEP Non-Comprehensive and AMEEP Comprehensive

Custom Equipment Insulation Technical Requirements
Eligibility & Prerequisites
Project Eligibility
• Insulation that encompasses non-linear piping, including insulating jackets for boilers, tanks, fittings (elbows, tees, valves), or other equipment.   ○ Existing equipment must be bare and have no insulation. • Uninsulated copper or steel piping with a nominal diameter greater than 8.00” in hot water and steam space heating and domestic hot water (DHW) distribution systems in unconditioned spaces. • Boiler jacket as a standalone measure is not eligible.
Technical Requirements
Equipment Requirement
• Permitted insulation types are fiberglass, rigid foam, or cellular glass pipe insulation. • This measure applies to non-linear equipment insulation and linear piping greater than 8.0 inches in nominal diameter. All insulation materials under this measure must be certified and rated in accordance with applicable ASTM thermal insulation standards, as appropriate for the application. • Insulation must meet minimum thickness requirements specified in the most recent version of the ECCCNYS Table C404.4.1 or applicable local code.
Documentation Requirements

Pre-Installation & Calculations

- Custom equipment insulation projects must submit custom energy savings calculations.
- If scope of work includes equipment in inaccessible spaces, including crawl spaces, the contractor must provide photos and videos verifying bare equipment size (diameter, length) and location.

Inspection Requirements

Pre-Inspection Checklist

- The inspector will confirm information related to the heating boiler including make, model, input capacity, and boiler efficiency.
- The inspector will verify the pipe application to be insulated (DHW, steam, hot water)
- The inspector will take photos and videos of the bare piping/bare tanks or fittings to be insulated along with location tags.
- If observing > 8-inch pipe, the inspector is to use a laser distance meter to verify the length of each pipe line item to be insulated.
- If observing > 8-inch pipe, the inspector will use a caliper to confirm each pipe line item diameter.

Post-Inspection Checklist:

- The inspector will take photos and videos of the newly insulated piping or equipment with location tags.
- When applicable, the inspector will take photos showing insulation thickness (ruler showing thickness in inches of insulation).
- If observing > 8-in pipe, the inspector is to use a laser distance meter to verify the length of each pipe line item to be insulated.
- If observing > 8-in pipe, the inspector will use a caliper to confirm each pipe line item diameter
- The inspector will confirm insulation thickness meets the minimum thickness requirements specified in ECCCNYS Table C404.4.1 (or applicable local code).

3.1.4 Smart Thermostatic Radiator Enclosure (Smart TRE)

Measure Description: This measure is applicable for the installation of Smart Thermostatic Radiator Enclosures (TRE) which are insulated radiator covers with integrated temperature controls and sensors to control heat energy transfer from the radiator to a room, while enabling feedback to the heating plant to optimize building-wide energy consumption.

Strategic Framework Categorization: Strategic

Measure Type: Custom

Applicability: MFEEP, AMEEP Non-Comprehensive and AMEEP Comprehensive

Smart Thermostatic Radiator Enclosure (Smart TRE) Technical Requirements

Eligibility & Prerequisites

Project Eligibility

- Building must have exposed radiators in a one or two-pipe space heating steam system.

Technical Requirements

Equipment Requirements

- Radiators must be retrofitted with radiator covers with Smart TREs featuring integrated temperature controls and sensors.
- The Smart TREs must be connected to the central boiler to optimize gas consumption.

Installation Requirements

- All projects are subject to meeting a minimum installation threshold of 75% of all radiators in the building(s) included in the project scope must have Smart TREs installed.

Documentation Requirements

Pre-Installation & Calculations

- Boiler plant type, MBH input, and efficiency must be provided.
- Existing heating conditions such as documentation of overheating through surveys of tenants, and measuring in-unit temperatures during the heating season.
- Smart TRE surveys should collect information for all radiators in the whole building, including common areas.
- An initial radiator survey must be collected and provided to document all existing radiators in the building(s).
  - The initial radiator survey must include the building name (if applicable), site address, and a separate line item for each radiator in the building. For each line item, the survey must include the radiator's floor number, apartment unit number or common area type, space name (living room, bedroom, etc.), radiator type, and the presence of any existing radiator controls including type, make, and model.
  - A clear image of each radiator in the building survey must be provided, with corresponding details tying it to a specific line item and location.
  - A separate initial radiator survey must be provided for each building included in the scope.

Post-Installation

- A final radiator survey must be collected and provided to identify which radiators had Smart TREs installed to meet the 75% implementation threshold.
  - The final radiator survey must match the building name (if applicable), site address, and line items provided in the initial radiator survey.
  - For each line item, the survey must indicate whether a Smart TRE was installed and if so, a clear image of the radiator with the installed Smart TRE and proof of connectivity (e.g. nameplate, functioning thermostat) must be provided with corresponding details tying it to a specific line item and location.
  - A separate final radiator survey must be provided for each building included in the scope.

Inspection Requirements

Pre-Inspection Checklist

- The inspector will conduct a required on-site pre-inspection to confirm the accuracy of the initial radiator survey and verify existing radiators in the building, including all common areas and at least 15% of apartment units.
- The inspector will confirm that no existing radiator covers or Smart TREs exist on-site and that all radiators to be covered as part of the scope are included in the initial radiator survey.
- The inspector will verify that the building has a one or two-pipe steam space heating system.
- The inspector will take pictures of boilers and confirm that there are no other energy management systems on-site.
- The inspector will test common area and apartment radiators, relying on a 90% confidence/10% margin of error formula to derive a statistically significant sample size for testing based on the total radiator quantities by type for common areas and apartments.

Post-Inspection Checklist

- The inspector will conduct a required on-site post-inspection to confirm the accuracy of the final radiator survey and verify installation of Smart TREs, including all common areas and at least 15% of apartment units.
- The inspector will review all the radiator covers installed to confirm the types of TREs installed.
- Based on the inspection sample and accuracy of the final radiator survey, the inspector will confirm that at least 75% of radiators in the building had Smart TREs installed with visible system connectivity.
- The inspector will inspect the boilers to confirm that no other energy management systems were installed.

3.1.5 Boiler Replacement – Boiler, Furnace and Unit Heater

Measure Description: Boiler replacement is the removal of existing space heating boilers and the installation of higher-efficiency boilers. The upgraded equipment improves combustion efficiency and heat transfer performance, resulting in more effective conversion of fuel into usable heat for the building. Energy and demand savings are realized through decreased heating loads on the fuel supply. This measure is applicable to steam boiler applications only.

Strategic Framework Categorization: Non-Strategic, with conditional approval as Neutral for hard-to-electrify multifamily applications

Measure Type: Prescriptive

Applicability: AMEEP Non-Comprehensive and AMEEP Comprehensive

Boiler Replacement – Boiler, Furnace and Unit Heater Technical Requirements
Eligibility & Prerequisites

Project Eligibility

- Building must meet low-to-moderate income qualifications for the AMEEP program. Market rate buildings are not eligible.
- Existing boiler unit of lower efficiency than to proposed equipment must be installed and used for space heating on-site.
- Common area space furnace replacements are eligible.
- *Gas Combustion Equipment:* Building must qualify as Hard to Electrify by satisfying all three of the following conditions:
  - Building vintage before 1979;
  - Building must use steam for internal distribution of heating;
  - Building must have at least 25 residential units or 25,000 square feet of conditioned space.
- Existing boiler must be fueled by Firm Gas. Oil-to-Gas Conversions from Fuel Oil to Firm Gas are eligible and must meet the below criteria:
  - **Con Edison:** Any project applications for Oil-to-Gas conversions must be submitted with the electric utility
  - Utility confirmation of establishment of new gas service (e.g., new gas account number), MCID, and gas turn-on date must be provided before an incentive can be issued.
  - Conversions are only allowed from Fuel Oil No. 2 and 4.
- Hydronic and condensing boiler replacements are not eligible.

Technical Requirements

Equipment Requirements

- Projects with multiple boilers in a lead-lag configuration will be incentivized for one boiler replacement.
  - Boilers in a lead-lag configuration use secondary boilers that operate only to meet demand during peak heating season. Multiple boilers with cyclic operation or simultaneous operations at a low firing rate will be considered as a lead-lag operation.
- Projects with multiple boilers that provide primary heating to multiple buildings (e.g. a heating plant in a multi-building co-op) without a lead-lag configuration may be incentivized for each boiler replaced.
- Steam boiler Minimum Boiler Efficiency: Et or AFUE 82% Annual Fuel Utilization Efficiency (AFUE) and thermal efficiency (Et) ratings must be sourced from the AHRI directory; if data is not available, only then the manufacturer's rating may be used.

- Boiler installation must be accompanied with a comprehensive energy management system that meets ECCCNYS code C403.4 to C403.4.4 or applicable local code.
- Boilers must meet the safety code requirements in the NYS Mechanical Code Chapter 10 or applicable local code.

Documentation Requirements

Pre-Installation & Calculations

- **Con Edison:** Boiler projects must enter inputs for calculations on IC's Project Management System, including photos and videos of the existing boiler(s) and nameplate information (including clearly visible make, model, and input capacity).
- **National Grid:** Boiler projects must fill out the Common Area tool to be uploaded to IC's Project Management System.
- If legacy data is unavailable, the year of the make/model and/or installation can be used to determine the minimal code compliant value from that year to use as the baseline.

Post-Installation

- **Con Edison:** The installer must submit photos and videos of the new boiler(s) and nameplate information (including clearly visible make, model, and input capacity).
- If the new nameplate is below the minimum efficiency required, submit low and high fire combustion testing showing the boiler is operating at or above the minimum efficiency requirements.
- If thermal efficiency cannot be confirmed during post-inspection, the contractor will provide certificate from AHRI directory or efficiency curve from the manufacturer.

Inspection Requirements

Pre-Inspection Checklist

- The inspector will document nameplate information of the existing boiler equipment, including make, model, and input capacity (Btu/hr or MBH).
- The inspector will confirm if the equipment is new, the quantity of boilers to be replaced, the efficiency of the existing boiler(s), and the location of the equipment.
- The inspector will verify whether the boiler is used as the building's primary heating source.
- If multiple boilers are observed, the inspector will confirm whether they operate in a lead-lag configuration.

Post-Inspection Checklist

- The inspector will document new equipment nameplate information including make, model, and input capacity (Btu/hr or MBH).
- The inspector will verify the installed equipment and site conditions against the pre-inspection and submitted spec sheets to confirm pre- and post-installation efficiency level.
- The inspector will take photos and/or videos of installed equipment, tag name, serial numbers, and other information if available.
- The inspector will confirm that the equipment is new and operational at the time of post-inspection.
- The inspector will verify the quantity of boilers replaced, the location of the equipment, and whether the boilers operate in a lead-lag configuration.
- The inspector will confirm if the equipment is electrically and mechanically connected and if controls were installed.

3.1.6 Domestic Hot Water Heater Replacement – Storage Tank

Measure Description: Domestic hot water heater replacement is the removal of existing domestic hot water heaters and the installation of higher-efficiency water heating equipment. The upgraded equipment improves heat transfer performance and combustion efficiency, resulting in more effective heating of domestic hot water.

Energy and demand savings are realized through reduced fuel or electric consumption required to meet domestic hot water loads. This measure is applicable to proposed storage tank water heater (STWH).

Strategic Framework Categorization: Neutral

Measure Type: Prescriptive

Applicability: AMEEP Non-Comprehensive and AMEEP Comprehensive

Domestic Hot Water Heater Replacement – Storage Tank Technical Requirements

Eligibility & Prerequisites

Project Eligibility

- Building must meet low-to-moderate income qualifications for the AMEEP program. Market rate buildings are not eligible.
- *Gas Combustion Equipment:* Building must qualify as Hard to Electrify by satisfying all three of the following conditions:
  - Building vintage before 1979;
  - Building must use steam for internal distribution of heating;
  - Building must have at least 25 residential units or 25,000 square feet of conditioned space.
- Existing unit of lower efficiency than proposed equipment.
- Equipment must be used for domestic hot water usage.
- Existing water heater must be fueled by Firm Gas. Oil-to-Gas Conversions from Fuel Oil to Firm Gas are eligible and must meet the below criteria:
  - Utility confirmation of establishment of new gas service (e.g., new gas account number), MCID, and gas turn-on date must be provided before an incentive will be issued.
  - Conversions are only allowed from Fuel Oil No. 2 and 4.

Technical Requirements

Equipment Requirements

- Proposed equipment must comply with the following
  - Be more efficient than existing equipment.
  - Must comply with applicable Energy Star requirements.
  - Storage tank volume ≥40 gallons and Et >90%.
  - Must meet the Code of Federal Regulations Title 10 §431.102
  - Must meet or exceed standards set in ECCCNYS Table C404.2 or applicable local code.

Documentation Requirements

Pre-Installation & Calculations

- **Con Edison:** Projects must enter inputs for calculations on IC's Project Management System, including photos and videos of the existing water heater(s) and nameplate information (including clearly visible make, model, and input capacity).
  - Storage tank specifications such as Standby Heating Loss (SLee) and Overall Heat Loss Coefficient (UAee) must be submitted.
- **National Grid:** Projects must fill out the Common Area tool to be uploaded to IC's Project Management System.
- If legacy data is unavailable, the year of the make/model and/or installation can be used to determine the minimal code compliant value from that year to use as the baseline.
- For any existing water heater(s), the installer must provide storage tank volume.

Post-Installation

- If the new nameplate is below the minimum efficiency required, submit low and high fire combustion testing showing the water heater is operating at or above the minimum efficiency requirements.

- If thermal efficiency cannot be confirmed during post-inspection, the contractor will provide certificate from AHRI directory or efficiency curve from the manufacturer.

Inspection Requirements

Pre-Inspection Checklist

- The inspector will document the nameplate information of the existing water heater(s), including make, model, and input capacity in Btu/hr or MBH.
- The inspector will take photos and/or videos of the existing equipment, configuration of existing heat exchangers, and tag names.
- The inspector will confirm the quantity of water heater(s) to be replaced and verify alignment with the scope of work.
- The inspector will verify the location of the equipment and the building's site address.

Post-Inspection Checklist

- The inspector will document the nameplate information of the installed water heater(s), including make, model, and input capacity in Btu/hr or MBH.
- The inspector will verify the installed equipment against the cut sheets provided and confirm that the equipment is new and operational at the time of post-inspection.
- The inspector will take photos and/or videos of the installed equipment and tag names.
- The inspector will verify the quantity of water heater(s) replaced and the location of the equipment.
- The inspector will confirm if the equipment is electrically and mechanically connected.

3.1.7 Central Domestic Hot Water Control

Measure Description: Domestic hot water controls involve the upgrade of central domestic hot water systems that continuously recirculate at a constant temperature and flow rate to systems that modulate temperature and/or flow based on actual demand. The upgraded controls optimize system operation by reducing unnecessary circulation and standby losses while maintaining required hot water availability. Energy and demand savings are realized through decreased fuel or electric consumption associated with reduced pumping and water heating loads.

Strategic Framework Categorization: Strategic

Measure Type: Custom

Applicability: MFEEP, AMEEP Non-Comprehensive and AMEEP Comprehensive

Central Domestic Hot Water Control Technical Requirements

Eligibility & Prerequisites

Project Eligibility

- The building must have a central domestic hot water (DHW) recirculation system running continuously at constant temperature and flow rate.
- New construction or gut rehab central DHW control projects are not eligible.

Technical Requirements

Equipment Requirements

- Proposed central DHW controls must correctly regulate the DHW flow rate and/or temperature based on demand.

Documentation Requirements

Pre-Installation & Calculations

- DHW Controls projects must submit custom energy savings calculations unless otherwise stated.

- Facility operation hours, facility type, and description of existing load profile must be provided.
- Specification sheet provided must include a description of available control strategies.

Post-Installation
- A description of the installed DHW controls' sequence of operations must be provided.

Inspection Requirements

Pre-Inspection Checklist
- The inspector will take photos and/or videos of the existing DHW recirculation system and controls, recirculating pump, and nameplates.
- The inspector will verify that existing system is operational at constant temperature and flow rate.
- The inspector will confirm the location of the equipment and the building's site address.
  Post-Inspection Checklist

Post-Inspection Checklist
- The inspector will take photos and/or videos of the DHW controls installed, including the control interface, recirculating pump, and nameplate(s) to capture the make, model, and other information.
- The inspector will compare the installed equipment against the submitted scope and cut sheets to verify installation.

3.1.8 Burner Replacement

Measure Description: Replacement of an old and inefficient burner assembly to a more efficient burner. This is for Multifamily boiler system applications. Burner replacement is the removal of old and inefficient burner assembly and the retrofit of a higher-efficiency burner. The upgraded equipment improves combustion efficiency, resulting in more effective conversion of fuel into usable heat for the building. Energy and demand savings are realized through decreased heating loads on the fuel supply. This measure is applicable to multifamily boiler system applications.

Strategic Framework Categorization: Neutral

Measure Type: Custom

Applicability: AMEEP Non-Comprehensive and AMEEP Comprehensive

Burner Replacement Technical Requirements

Eligibility & Prerequisites

Project Eligibility
- *Gas Combustion Equipment:* Building must qualify as Hard to Electrify by satisfying all three of the following conditions:
  - Building vintage before 1979;
  - Building must use steam for internal distribution of heating;
  - Building must have at least 25 residential units or 25,000 square feet of conditioned space.
- Existing unit must have a lower efficiency than the proposed replacement equipment.

Technical Requirements

Installation Requirements
- New burners must be correctly tuned for optimum operational conditions and must exceed baseline efficiency.

Documentation Requirements

Pre-Installation & Calculations
- Burner replacement projects must submit a custom calculation unless stated otherwise.

- Facility operation hours, facility type, and description of existing load profile must be provided. Hours of operation must be allocated appropriately for each stage of modulating burners.

Post-Installation
- Contractor must provide pre- and post-combustion analysis test receipts in low-fire and high-fire.
- Contractor must provide annual operating hours of the existing and proposed equipment.
- If thermal efficiency cannot be confirmed, contractor to provide certificate from AHRI directory or efficiency curve from the manufacturer.

Inspection Requirements

Pre-Inspection Checklist
- The inspector will take photos of the burner nameplate to verify make, model and equipment capacity (Btu/hr or MBH).
- The inspector will take a photo of the existing burner.

Post-Inspection Checklist
- The inspector will take photos of the newly installed burner
- The inspector will take photos of the newly installed burner nameplate to confirm make, model, and capacity (Btu/hr or MBH).

3.1.9 Linkage-less Burner Control

Measure Description: Linkage-less burner control is the replacement of a traditional linkage-based burner control system with a linkage-less controller that more precisely regulates the fuel and combustion air mixture. The upgraded control system improves combustion efficiency by independently adjusting fuel and air delivery to maintain optimal combustion across the operating range. Energy and demand savings are realized through reduced fuel consumption, improved burner performance, and minimized excess air losses.

Strategic Framework Categorization: Neutral

Measure Type: Custom

Applicability: AMEEP Non-Comprehensive and AMEEP Comprehensive

Linkage-less Burner Control Technical Requirements

Eligibility & Prerequisites

Project Eligibility
- *Gas Combustion Equipment:* Building must qualify as Hard to Electrify by satisfying all three of the following conditions:
  - Building vintage before 1979;
  - Building must use steam for internal distribution of heating;
  - Building must have at least 25 residential units or 25,000 square feet of conditioned space.
- This measure is not eligible for incentives if submitted in combination with boiler replacement under the same project scope, unless otherwise approved by the applicable Utility.
- Existing burner must have linkage-based controls.

Technical Requirements

Installation Requirements
- All linkage-based controls must be replaced with automatically controlled servo motors.

Documentation Requirements

Pre-Installation & Calculations
- Linkage-less burner control projects must submit a custom calculation unless stated otherwise.

- The contractor must submit information related to facility operation hours and facility type.

Post-Installation
- Contractor must provide pre- and post-combustion analysis test receipts in low-fire and high-fire.
- Contractor must provide annual operating hours for the existing and proposed equipment.

Inspection Checklist

Pre-Inspection Checklist
- The inspector will take photos of the boiler make, model and capacity of unit(s).
- The inspector will take photos of the existing burner make, model, and efficiency.

Post-Inspection Checklist
- The inspector will take photos of the burner make and model.
- The inspector will take photos of the newly installed linkage-less controls equipment's make and model.

3.1.10 Steam Trap Replacement – Low Pressure Space Heating

Measure Description: Steam trap replacement is the repair or replacement of failed common area and in-unit steam traps within a steam distribution system. Properly functioning steam traps remove condensate and non-condensable gases while preventing the loss of live steam. Restoring steam trap performance improves system efficiency, maintains balanced heat distribution, and reduces unnecessary steam losses. Energy and demand savings are realized through decreased fuel consumption required to generate excess steam and improved overall system operation.

Strategic Framework Categorization: Neutral

Measure Type: Prescriptive

Applicability: AMEEP Comprehensive

Steam Trap Replacement – Low Pressure Space Heating Technical Requirements

Eligibility & Prerequisites

Project Eligibility
- Existing failed open steam traps in low pressure heating systems (<15 psig).
  - ≥70% of existing Common Area Steam Traps must be failed open.
  - ≥70% of existing In Unit Steam Traps must be failed open, if applicable.
- For projects eligible under this measure, the scope must include repair or replacement of steam traps sufficient to meet Program requirements and achieve the savings assumed in the AMEEP Comprehensive Downstate Savings Calculator. Unless otherwise approved by the applicable Utility in writing, this includes repair or replacement of all failed steam traps identified through the required survey and any additional traps required to meet Program minimum requirements.
- The Utilities and/or the IC may require testing of all traps, or may allow statistically valid sampling for testing, in accordance with the Program Administrator-provided survey tool and protocols.

Technical Requirements

Installation Requirements
- Comprehensive projects must replace all failed open, failed closed, and untested common area and in-unit steam traps.
- Repaired steam traps must replace all internal components required for the steam trap to operate correctly. This includes valve & seat assembly, thermostatic element, float, inverted bucket, and/or disk.
- Repaired traps must include a new cap to indicate work was done on the trap.

Documentation Requirements

Pre-Installation & Calculations

- Comprehensive projects with steam traps in scope of work must fill inputs into the AMEEP Comprehensive Downstate Savings Calculator.
- The contractor will complete a Steam Trap Survey by entering survey information in the AMEEP Comprehensive Downstate Savings Calculator. Survey involves the collection of basic information on the steam boiler plant and steam traps, in addition to using an ultrasonic meter to confirm whether each trap is working, failed open, or failed closed. This includes the following guidelines:
  - Perform a baseline survey of the steam traps that are intended to be repaired when the traps are in use for confirmation of proper function.
  - Survey must be performed when the heat is on.
  - Contractor surveyor must place a numbered tag on each common area trap they test and document this number in the Program Administrator provided steam trap survey tool. The tags must remain in place until the project close-out.
  - Common Area and Apartment steam trap testing will rely on a 90% confidence, 10% margin of error formula to derive a statistically significant sample size for testing based on the steam trap quantities for common areas and apartments. To calculate the sample size needed for testing, please use the AMEEP Comprehensive Downstate Savings Calculator.
  - For apartment radiators, provide apartment number, room description, and location in the AMEEP Comprehensive Downstate Savings Calculator. Trap location information will be used by the IC to perform apartment trap testing.

Post-Installation

- Upon completion of all trap repairs and/or replacements, the contractor must submit an updated copy of the AMEEP Comprehensive Downstate Savings Calculator with any pertinent scope changes and comments.

Inspection Requirements

Pre-Inspection Checklist

- The inspector will refer to the Steam Trap Survey in the AMEEP Comprehensive Downstate Calculator for information regarding steam trap inlet pipe diameter and steam trap type, manufacturer, & model information.
- The inspector will take photos of the boiler nameplate information to verify make, model, and capacity (BTU/hr or MBH).
- The inspector will document and take photos of the failed steam traps.
- The inspector will verify if the steam condensate goes to the condensate tank or is handled differently. The inspector will test the steam traps to determine functionality. Trap testing involves functionally determining the trap operating condition – working, failed open, or failed closed. This determination should be made using an ultrasonic meter and/or infrared temperature meter.
  - Trap testing must be performed during the heating season (Oct. 1 – May 31) and when the outdoor temperature is less than 55° Fahrenheit.
  - The inspector will consider the steam trap survey completed by the contractor as the whole scope of work to observe. Below are the sample sizes for inspection:
    - Common area traps – 100% of the traps covered under the project scope must be itemized and tested. A minimum of 25% of the sample tested common area traps must be inspected. Apartment traps – 100% of the traps covered under the project scope must be itemized but only 25% of the sample tested apartment traps must be inspected.

Post-Inspection Checklist

- The inspector will refer to the Steam Trap Survey in the AMEEP Comprehensive Downstate Calculator for information regarding steam trap inlet pipe diameter and steam trap type, manufacturer, model information.
- The inspector will document and take photos of the newly replaced steam traps.

- The inspector will test the steam traps using an ultrasonic meter and/or infrared temperature meter.
  - If the post-inspection is performed outside of the heating season (Oct. 1 – May 31) and when the outdoor temperature is more than 55° Fahrenheit, the inspector may conduct a visual inspection to confirm if the steam traps were replaced or repaired.

3.1.11 Master Air Venting

Measure Description: Master Air Venting is the installation or replacement of main vents and riser vents to improve steam distribution efficiency within a steam heating system. Proper venting allows air to be removed quickly from mains and risers, enabling steam to reach all areas of the building more evenly and efficiently. Improved venting reduces distribution imbalances, shortens boiler run times, and minimizes excess fuel consumption. Energy and demand savings are realized through improved steam distribution system performance and reduced heating losses.

Strategic Framework Categorization: Neutral

Measure Type: Custom

Applicability: AMEEP Comprehensive

Master Air Venting Technical Requirements
Eligibility & Prerequisites
Project Eligibility
• This measure applies to 1-pipe and 2-pipe steam distribution systems. • Co- or Pre-requisite measures: Pipe Insulation must be installed in addition to this measure in order to qualify for the program. • Any exposed pipe in unconditioned common areas must be insulated as common areas scope. If all pipe is already insulated prior to submission of the project, the co-requisite is satisfied.
Technical Requirements
Installation Requirements
• Installer must remove any existing air vents that are either broken, incorrectly sized, or in the wrong location and cap the hole. • For proper distribution balancing, air vents should be sized and installed at the ends of 100% of the steam supply mains and risers. • If riser tops are inaccessible, the appropriate air vent should either be installed on the riser within the second-to-top floor apartment or on the nearest radiator on its inlet side.
Documentation Requirements
Pre-installation & Calculations

• Comprehensive projects with Master Air Venting in scope of work must fill in inputs into the AMEEP Comprehensive Downstate Savings Calculator.
• Must perform a baseline survey of the steam heating distribution system.
  ○ Survey involves collecting basic information on the steam boiler plant and any existing main or riser air vents.
  ○ Survey includes nameplate photos of all boilers in boiler plant
  ○ Survey includes quantity per model of main vent.

- Survey includes quantity per model of riser vent.

Inspection Requirements

Pre-Inspection Checklist

- The inspector will use the master air venting calculations to compare site conditions regarding the pipe size and length of the steam supply main lines and risers, make, model, size, location and count of all the air vents.
- The inspector will compare site conditions to submitted building survey and note any air vents that are broken, incorrectly sized, in the wrong location, and/or have a plugged orifice.

Post-Inspection Checklist

- The inspector will use the most up to date Master Air Venting Calculation for the project to compare information regarding the newly installed air vents.
- The inspector will verify make, model size, location and counts of the air vents. The inspector will verify that air vents are installed in the vertical direction and at least 15" away from any pipe elbows.
- If installing multiple vents in the same location, the inspector will verify that the vents are installed on trees branching off main line.
- The inspector will confirm that the combined venting capacity of all air vents installed on the tree should not exceed the capacity of the tree's tapping hole in the main line.

3.1.12 Orifice Plates

Measure Description: Orifice plates involve the installation of calibrated flow-restricting devices at radiators to improve steam system balance and reduce overheating. The orifice plates regulate the amount of steam entering each radiator, preventing excessive steam flow and promoting even heat distribution throughout the building. By limiting unnecessary steam production and reducing overheating, boiler run time and fuel consumption are decreased. Energy and demand savings are realized through improved distribution efficiency and reduced boiler runtimes.

Strategic Framework Categorization: Neutral

Measure Type: Custom

Applicability: AMEEP Comprehensive

Orifice Plate Technical Requirements

Eligibility & Prerequisites

Project Eligibility

- Project must pursue the AMEEP Comprehensive pathway to be eligible for incentives. Non-comprehensive applications for the AMEEP and MFEEP programs are not eligible.
- This measure applies to all radiators within a 2-pipe steam distribution system.
- Co- or Pre-requisite measure: TRVs must be installed in addition to this measure, unless the building demonstrates (with documentation acceptable to the applicable Utility) that TRVs were installed or replaced within the prior 12 months and meet current Program requirements
  Annual combustion test receipts must be submitted.

Technical Requirements

Installation Requirements

- Orifice plates must be sized for each size of radiator; the reduced heat output of any radiator must not fall below 100% of the heat load of the room it serves.

- Orifice plates must be installed for at least 70% of all apartments and 100% common-area radiators, not including those on the top floor (top floor radiators cannot be restricted from venting air through the distribution system).

Documentation Requirements

Pre-Installation & Calculations

- Comprehensive projects with Orifice Plates in scope of work must fill in inputs into the AMEEP Comprehensive Downstate Savings Calculator.
- The Heat-Load vs. Radiator EDR analysis should cover all the rooms and radiators in the apartment being sampled.
- The contractor must perform a baseline survey of the steam heating distribution system.
    - Survey involves collecting basic information on the steam boiler plant and a detailed "heat-load vs. radiator EDR" analysis on a sample of apartments; the apartment sample must minimally include one (1) apartment per each building line.

Post-Installation

- Upon completion of installations, must submit for review a checklist showing all radiators in the building and the orifice plates installed.

Inspection Requirements

Pre-Inspection Checklist

- The inspector will take photos of radiator tags or identifiers.
- The inspector will take photos related to the boiler including nameplate make and model and boiler pressure.
- The inspector will confirm the quantity of radiators in the building.
- The inspector will confirm that radiator size and room size match information in survey for apartment lines.
- The inspector will confirm if the heating system is 1-pipe steam vs 2-pipe steam based on the existence of a condensate return system.
- The inspector will cover at least 10% of the apartments analyzed by the contractor on their scope of work/survey.
- The inspector will record apartment space temperatures (for building with an EMS – it is preferred to examine the space temperature trend log data for documenting existing overheating conditions).

Post-Inspection Checklist

- The inspector will take photos of radiator tags or identifiers.
- If the boiler was replaced and if different than the one recorded during the pre-inspection, the inspector will take photos related to the boiler including nameplate make and model and boiler pressure. The inspector will confirm the quantity of total radiators in the building and how many radiators had newly replaced orifice plates.
- The inspector will confirm that radiator size and room size matches the survey for apartment lines on what has newly replaced orifice plates. The inspector will cover at least 10% of the apartments analyzed by the contractor on their scope of work/survey.
- The inspector will record apartment space temperatures (for building with an EMS – it is preferred to examine the space temperature trend log data for documenting the improved balanced heating conditions).

3.1.13 Thermostatic Radiator Valve (TRV)

Measure Description: Thermostatic Radiator Valves (TRVs) involve the installation of temperature-modulating valves on in-unit and common area radiators to improve space temperature control and reduce overheating. TRVs automatically regulate the flow of steam or hot water to each radiator based on the desired setpoint, allowing for more precise and occupant-responsive heating. By reducing overheating and reducing

unnecessary boiler run time, overall system efficiency is improved. Energy and demand savings are realized through reduced fuel consumption and reduced heating load.

Strategic Framework Categorization: Neutral

Measure Type: Custom

Applicability: AMEEP Comprehensive

Thermostatic Radiator Valve (TRV) Technical Requirements

Eligibility & Prerequisites

Project Eligibility

- This measure applies to all radiators within a 2-pipe steam distribution system.
- Co- or Pre-requisite measure: Orifice Plates must be installed in addition to this measure in order to qualify for the program.
- Replacement of Orifice Plate must be completed within the last year with sufficient documentation to satisfy the co-requisite.

Technical Requirements

Installation Requirements

- TRVs must be installed for at least 70% of all apartment radiators and 100% of all common-area radiators.
- Use a remote temperature sensing TRV on any enclosed radiators.
- M&V may be required for projects with this measure depending on size.

Documentation Requirements

Pre-Installation & Calculations

- Comprehensive projects with TRVs in scope of work must fill in inputs into the AMEEP Comprehensive Downstate Savings Calculator.

Post-Installation

- Upon completion of installations, must submit a checklist showing all radiators in the building and the orifice plate and TRV that was installed.

Inspection Requirements

Pre-Inspection Checklist

- The inspector will record radiator tags or identifier.
- The inspector will take boiler nameplate pictures showing make and model.
- The inspector will record boiler pressure via photograph.
- The inspector will record the quantity of radiators in the building.
- The inspection must cover at least 10% of the apartments' radiators, confirming there are no TRVs.

Post-Inspection Checklist

- The inspector will record radiator tags or identifier.
- The inspector will take boiler nameplate pictures showing make and model.
- The inspector will record boiler pressure via photograph.
- The inspector will record the quantity of radiators in the building.
- The inspection must cover at least 10% of the apartments' radiators to confirm TRV installations. Bag & Tag review may be requested by the Utilities or the IC in connection with QA/QC activities.

3.1.14 In-Unit Low-Flow Aerators

Measure Description: Low-flow aerators involve the installation of high-efficiency faucet aerators that reduce domestic hot water flow rates while maintaining acceptable water pressure and performance. The aerators decrease the volume of hot water used at sinks and fixtures by limiting flow without compromising functionality. By reducing hot water consumption, the demand on the water heating system is lowered. Energy and demand savings are realized through decreased fuel consumption associated with domestic hot water heating.

Strategic Framework Categorization: Neutral

Measure Type: Prescriptive

Applicability: AMEEP Comprehensive

In-Unit Low-Flow Aerators Technical Requirements
Eligibility & Prerequisites
Project Eligibility
• Existing faucet aerators must be rated at a minimum flow rate of 2.2 GPM for kitchen aerators, 1.5 GPM for bathroom aerators.
Technical Requirements
Equipment Requirements
• New bathroom aerators must be certified as EPA WaterSense. • Proposed kitchen faucet must be rated at a maximum flow rate of 1.5 GPM. • Proposed bathroom faucet must be rated at a maximum flow rate of 1.0 GPM.
Installation Requirements
• Maximum of 4 aerators per dwelling unit.
Inspection Requirements
Pre-Inspection Checklist
• The inspector will survey a sample of aerators up to 25% of the population of aerators or 70 aerators, whichever is lower. • The inspector will record location, type, quantity, and GPM of inspected devices.
Post-Inspection Checklist
• The inspector will survey a sample of aerators up to 25% of the population of aerators or 70 aerators, whichever is lower. • The inspector will record location, type, quantity, and GPM of inspected devices.

3.1.15 In-Unit Low-Flow Showerheads

Measure Description: Low-flow showerheads involve the installation of high-efficiency showerheads designed to reduce domestic hot water flow rates while maintaining adequate spray performance and user comfort. The upgraded fixtures limit water consumption by controlling flow without significantly affecting functionality. By decreasing the volume of hot water used during showers, the demand on the water heating system is reduced. Energy and demand savings are realized through lower fuel consumption associated with domestic hot water heating.

Strategic Framework Categorization: Neutral

Measure Type: Prescriptive

Applicability: AMEEP Comprehensive

In-Unit Low-Flow Showerheads Technical Requirements
Eligibility & Prerequisites
Project Eligibility
• Existing showerhead must be rated at a minimum flow rate of 2.0 GPM • Existing showerheads eligible for this measure include swivel- or wand-type showerheads.
Technical Requirements
Equipment Requirements
• Proposed showerhead must be rated at a flow rate of less than 2.0 GPM. • New showerheads must be certified as EPA WaterSense.
Documentation Requirements
Pre-Installation & Calculations
• Specification Sheets with multiple GPM options must mark the selected model and GPM of the showerhead.
Inspection Requirements
Pre-Inspection Checklist
• The inspector will survey a sample of showerheads up to 25% of the population of showerheads or 70 showerheads, whichever is lower. • The inspector will record location, type, quantity, and GPM of inspected devices
Post-Inspection Checklist
• The inspector will survey a sample of showerheads up to 25% of the population of showerheads or 70 showerheads, whichever is lower. • The inspector will record location, type, quantity, and GPM of inspected devices.

3.2 Energy Efficiency Electric Savings Measures

This section of the Technical and Inspections Guide includes existing and proposed conditions, equipment requirements, and respective inspection checklist requirements for electric Energy Efficiency measures that are eligible to be submitted under Con Edison for electric savings incentives. National Grid does not provide electric incentives under this Program; National Grid references in this section, if any, relate to documentation workflows administered through the IC. Measures included in this section are:

- Variable Frequency Drive (VFD) - HVAC Fan and Pump
- Electronically Commutated (EC) Motor
- Motor Replacement
- Pump Replacement
- Elevator Drive System Upgrade
- Ventilation Overhaul
- Building Automation Systems/Building Management Systems (BAS/BMS)
- Advanced Thermostats
- Chiller Replacement – Air and Water Cooled
- Cooling Tower Replacement
- Refrigerator Replacement – *AMEEP Comprehensive Only*

3.2.1 Variable Frequency Drive (VFD) – HVAC Fan and Pump

Measure Description: VFDs allow for the speed of the fan or pump to be modulated based on control parameters such as, but not limited to, building pressure sensors, operational schedule, and seasons to

maintain a desired system flow rate and/or pressure based on varying system demand, which reduces motor energy consumption.

Strategic Framework Categorization: Strategic

Measure Type: Prescriptive and Custom pathways

Applicability: MFEEP, AMEEP Non-Comprehensive and AMEEP Comprehensive

Variable Frequency Drive (VFD) – HVAC Fan and Pump Technical Requirements

Eligibility & Prerequisites

Project Eligibility

- Existing motor must be running continuously without VFD controls.
- New VFD replacing existing VFD (including non-operational or broken VFD**)** are not eligible.
- VFDs installed in fixed speed applications are not eligible.
- Prescriptive applications are for new VFDs installed on existing supply fans, return fans, exhaust fans, chilled water pumps, condenser water pumps, and heating hot water pumps.
- Custom applications include, but are not limited to, new VFDs installed on existing booster pumps and cooling tower fans.

Technical Requirements

Installation Requirements

- Must be tied to the control system and operate at variable speeds as determined by the control system to maintain a desired setpoint or condition.

Documentation Requirements

Pre-Installation & Calculations

- Prescriptive VFD applications must enter inputs for calculations on IC's Project Management System.
- Custom VFD applications must submit savings documentation in a form acceptable to the applicable Utility (which may include approved tools or custom calculations) unless otherwise stated:
  - For Domestic Water Booster Pump applications with VFD measure, the PC should use and submit the Con Edison Domestic Water Booster Pump Tool to calculate savings and incentives.
    - Total Dynamic Head (TDH) duty point documentation is necessary requirement for savings calculation.
  - Program Caps for Booster Pump Projects (these caps apply to savings calculation methodology and do not override project-level incentive caps or cost coverage limits set forth in the Program Manual):
    - Baseline capped at 10% of total building energy use.
    - Total Savings capped at 80% of savings relative to baseline energy consumption.
- For Custom Other applications:
  - Provide a description of the existing equipment load profile including runtime and speed percentage.
  - When using motor efficiencies at operating point, part-load efficiency values should be chosen, which are generally lower than the nominal full-load efficiency rating in NEMA tables.
  - Provide a description of the proposed VFD application and the proposed operating sequence.
  - Provide information regarding the installation of any supporting equipment, sensors, or sequences of operation to help determine how VFDs are modulated (like coincidence factors)
  - If a Building Automated System/Building Management System is installed at the building, provide a photo of the control screen for the specific equipment included in the SOW.

Post-Installation

- For custom applications, provide documentation of the executed/programmed sequence of operations.
- Provide information regarding the setpoints utilized in the control of the VFDs.
- If there is a BAS/BMS is available, provide a photo of the control screen for the specific equipment included in the SOW.

- PC must provide hourly or daily consumption data to confirm proposed VFD load profile.

Inspection Requirements

Pre-Inspection Checklist

- The inspector will verify there are no existing VFD controls.
- The inspector will take photos of the motor nameplate to capture Motor Size (hp) and any tag names/IDs.
- The inspector will verify the type of VFD application for the specific fan/pump (cooling tower fan, chilled water pumps, condenser water pumps, etc.).
- The inspector will take photos of any BAS/BMS control screens (if available) associated with the equipment included in the SOW.

Post-Inspection Checklist

- The inspector will take photos to verify the newly installed VFD make and model, serial number, and Motor Size (HP). The inspector will verify the current operating mode of the VFD (from the front screen): Auto or Manual.
- The inspector will take photos of the VFD display to capture operating speed: Hz, speed percentage, or RPM.
- If speed varies rapidly and cannot be captured reliably in still photos, the inspector must take a short video capturing the operating speed display.
- The inspector will verify the quantity and location of VFDs against the approved scope of work.
- The inspector will take photos of any BAS/BMS control screens (if available) associated with the equipment included in the SOW.
- The inspector will verify the proposed sequence of operation with the building staff.

3.2.2 Electronically Commutated (EC) Motors

Measure Description: This measure covers the upgrade to electronically commutated (EC) motor. This measure encompasses EC motor applications that include but are not limited to HVAC Blower Fans, Hydronic Circulator Pumps, and Exhaust Fans.

Strategic Framework Categorization: Strategic

Measure Type: Both Prescriptive and Custom

Applicability: MFEEP, AMEEP Non-Comprehensive and AMEEP Comprehensive

Electronically Commutated (EC) Motors Technical Requirements

Eligibility & Prerequisites

Project Eligibility

- Existing equipment must be operational.
- For motors with no nameplate efficiency, baseline efficiency based off the NEMA premium efficiency table values – ECCCNYS C405.8(1) or applicable code.
- Existing motor must not be already an EC Motor.
- Equipment downsizing (i.e., reduction in motor size hp) is not eligible.
- Prescriptive applications are for new EC Motor replacement on HVAC Blower Fans and Hydronic Circulator Pumps.
  - For HVAC blower fan and circulator pumps, the existing motor has to be a direct-drive permanent split capacitor (PSC).
- Custom applications are for new EC Motor Replacement on Rooftop Exhaust Fans. Existing motors can include but not be limited to the following types: PSC motor, single-phase, or three-phase motors.

Technical Requirements

Equipment Requirements

- Baseline and final running conditions of the motors must be operational for 24 hours a day and 7 days a week.

Documentation Requirements

Pre-Installation & Calculations

- Prescriptive EC motor applications (HVAC blower fan and circulator pumps in HVAC hydronic and DHW systems) must enter inputs for calculations on IC's Project Management System.
- Custom applications (Exhaust Fan) should use the Con Edison EC Motor Tool to calculate savings and incentives.

Post-Installation

- The Participating Contractor must submit photos and/or videos to IC's Project Management System with all other required post-installation documentation (e.g. final invoice). Uploaded photos and/or videos must include:
  - Zoomed out photo showing the equipment.
  - Zoomed in photo of each motor nameplate to capture make, model, serial number, motor size (HP), and efficiency.
  - Zoomed in photo of VFD interface (if applicable) to capture speed. Video must be submitted if speed is not visible on photo due to unsynchronized framerate.
  - Video showing the equipment is operational.

Inspection Requirements

Pre-Inspection Checklist

- The inspector will verify the count of all motors (fan/pumps) included in the scope and their tag/name identifier.
- The inspector will confirm motor schedule/runtimes with building staff. Proposed motors >1 hp that run for 100+ hours/yr must meet NEMA premium efficiency
- The inspector will take photos to capture the motor make and model, motor size (HP), efficiency and poles.
- If the scope includes ≤motors/fans, the inspector will observe all fan motors. If the scope includes >20 motors/fans, the inspector will observe at least 25% of each motor type included.

Post-Inspection Checklist

- The inspector will verify the operating speed of each motor (especially where a speed reduction or VFDs are implemented).
- The inspector will take photos to capture the motor make and model, motor size (HP), efficiency and poles.
- If the scope includes ≤20 motors/fans, the inspector will observe all fan motors. If the scope includes >20 motors/fans, the inspector will observe at least 25% of each motor type included.

3.2.3 Motor Replacement

Measure Description: This measure covers the installation of high efficiency motors in multifamily applications. Full-load efficiency of installed equipment must exceed current code requirements and current baseline efficiency of equipment.

Strategic Framework Categorization: Strategic

Measure Type: Custom

Applicability: MFEEP, AMEEP Non-Comprehensive and AMEEP Comprehensive

Motor Replacement Technical Requirements

Eligibility & Prerequisites

Project Eligibility

- For motors with no nameplate efficiency, baseline efficiency based off the NEMA premium efficiency table values – ECCCNYS C405.8(1) or applicable local code.
- Existing equipment must be operational.
- Equipment downsizing (i.e., reduction in motor size hp) is not eligible.
- If replacing with EC motor technology, please reference the EC Motor measure.

Technical Requirements

Equipment Requirements

- Proposed motor must have NEMA premium efficiency.

Documentation Requirements

Pre-Installation & Calculations

- Motor replacement applications must submit a custom calculation unless otherwise stated:
  - For Domestic Water Booster pump motor replacement applications, the PC should use the Con Edison Domestic Water Booster Pump Tool to calculate savings and incentives.
  - Total Dynamic Head (TDH) duty point documentation is necessary requirement for savings calculation
- For rooftop exhaust fan motor replacements, applicable fan timer schedules for baselines and proposed conditions must be submitted.
- Description of motor application.
- Applicable motor schedules for the baseline conditions.

Post-Installation

- Applicable motor schedules for the proposed conditions.

Inspection Requirements

Pre-Inspection Checklist

- The inspector will verify the motor quantity included in the scope.
- The inspector will confirm motor schedule/runtimes with building staff. Proposed motors >1 hp that run for 100+ hours/yr must meet NEMA premium efficiency.
- If the scope is for pump replacements, the inspector will observe all motors included in the scope.
- If the scope is for fan motor replacements with fewer than 20 motors/fans, the inspector will observe all fan motors. If the scope includes more than 20 motors/fans, the inspector will observe at least 25% of each motor type included in the scope, unless otherwise directed by the applicable Utility.
- The inspector will take nameplate photos to capture the following:
  - Motor make, model and RPM.
  - Motor tag or identifier.
  - Motor size (HP) listed on the nameplate.
  - Motor efficiency listed on the nameplate.
  - Motor RPM listed on the nameplate.

Post-Inspection Checklist

- The inspector will confirm that the motors have been replaced and are operational.
- The inspector will confirm the operating speed of each motor if there is a speed reduction or if VFDs are implemented.
- If the scope is for pump replacement, the inspector will observe all motors included in the scope. If the scope is for a fan motor replacement with fewer than 20 motors/fans, the inspector will observe all fan motors. If the scope includes more than 20 motors/fans, the inspector will observe at least 25% of each motor type included.
- The inspector will take nameplate photos to capture the following:
  - Motor make, model and RPM.
  - Motor tag or identifier.
  - Motor size (HP) listed on the nameplate.

- Motor efficiency listed on the nameplate.
- Motor RPM listed on the nameplate.

3.2.4 Pump Replacement

Measure Description: This measure covers the upgrade to high efficiency pumps in multifamily applications in hydronic distribution or domestic water usage.

Strategic Framework Categorization: Strategic

Measure Type: Custom

Applicability: MFEEP, AMEEP Non-Comprehensive and AMEEP Comprehensive

Pump Replacement Technical Requirements
Eligibility & Prerequisites
Project Eligibility
• Existing equipment must be operational. • Pump end use can be categorized as Hydronic Distribution (For space heating and space cooling applications) and Domestic Water Usage (Including hot and cold-water applications). • If the SOW is upgrading a non-EC motor pump to an EC motor pump, then see the Electronically Commutating (EC) Motor Replacement measure. • If only the motor of the pump is replaced and the proposed motor is not an EC motor, please see the Motor Replacement measure. • Motors with no nameplate efficiency, baseline efficiency based off the NEMA premium efficiency table values – ECCCNYS C408.7(1).
Technical Requirements
Equipment Requirements
• Pump with PEI rating must meet or exceed requirements based on ECCCNYS C403.17 (or applicable local code).
Documentation Requirements
Pre-Installation & Calculations
• Facility operation hours, pump run hours, facility type, and description of existing load profile • Existing pump curve (if available) and proposed pump curve. • Projects including savings from a decrease in hours of operation (e.g., via new controls) must use a custom calculation. • Description of existing controls, including: ○ Pump replacement applications must submit a custom calculation unless otherwise stated. • For Domestic Water Booster pump replacement applications, the PC should use the Con Edison Domestic Water Booster Pump Tool to calculate savings and incentives.
Post-Installation
• Description of the proposed controls and load profile including runtime and speed percentage. • For Domestic Water Booster pump motor replacement applications, evidence of motors operating at variable speed is required. Justification on VFD load percentages is required for the savings calculations.
Inspection Requirements
Pre-Inspection Checklist
• The inspector will verify the quantity of pumps included in the scope. • The inspector will confirm the existing schedule/runtimes. • The inspector will take photos to capture the pump tag/identifier and make and model. • The inspector will take nameplate photos to capture the following:

    - Motor make, model and RPM.
    - Motor tag or identifier.
    - Motor size (HP) listed on the nameplate.
    - Motor efficiency listed on the nameplate.
    - Motor RPM listed on the nameplate.
- The inspector will verify if there are any existing pump controls, and if so, record type of controls.

Post-Inspection Checklist

- The inspector will verify the quantity of pumps installed against the scope.
- The inspector to confirm the proposed schedule/runtimes.
- The inspector will take photos to capture the proposed pump tag/identifier and make and model.
- The inspector will take photos of the motor nameplate (if separate from Pump to capture motor size (HP), efficiency and poles.
- The inspector will take nameplate photos to capture the following:
    - Motor make, model and RPM.
    - Motor tag or identifier.
    - Motor size (HP) listed on the nameplate.
    - Motor efficiency listed on the nameplate.
    - Motor RPM listed on the nameplate.
- The inspector will verify proposed pump controls, and if so, record type of controls.

3.2.5 Elevator Drive System Upgrade

Measure Description: This measure covers the replacement of existing traction elevator drive systems with more efficient technology, including Silicon-Controlled Rectifier (SCR) drives, Pulse Width Modulation (PWM) drives, and Variable Voltage Variable Frequency (VVVF) drives.

Strategic Framework Categorization: Strategic

Measure Type: Prescriptive

Applicability: MFEEP, AMEEP Non-Comprehensive and AMEEP Comprehensive

Elevator Drive System Upgrade Technical Requirements
Eligibility & Prerequisites
Project Eligibility
• Retrofit of existing elevators only. • Existing elevator drive must be of lower efficiency, including: Silicon Controlled Rectifier (SCR) -6 or -12 or Motor-Generator (M-G) Set. • Existing elevator drive system with Pulse Width Modulation (PWM) is not eligible.
Technical Requirements
Equipment Requirements

• Proposed systems can include, as applicable:
  ○ Pulse Width Modulation (PWM) Drives.
  ○ Variable Voltage Variable Frequency (VVVF) drives.
  ○ SCR-6 or SCR-12.
• The new drives may either be regenerative or non-regenerative, as applicable, if the baseline is a M-G Set.
• The new drives must have regenerative braking if the baseline drive is SCR-6 or SCR-12, unless otherwise approved by the applicable Utility.

Installation Requirements

- Standalone or small groups of elevator cab installations may be split into individual projects if needed to accommodate lengthy project timelines.

Documentation Requirements

Pre-Installation& Calculations

- Elevator projects must enter inputs for calculations on IC's Project Management System.
- Inputs for calculations include:
  - Motor Nameplate and ID number.
  - Generator nameplate (if part of M-G set).
  - Motor transmission system (geared or gearless).
  - Motor drive make and model.
  - Regenerative braking drive and/or braking resistors.
  - Elevator nameplate (make, model, serial number, car capacity, rated top velocity, and counterbalance weight - OCW documentation)
  - Elevator number/ID.
  - Elevator schedule (hours of operation).

Inspection Requirements

Pre-Inspection Checklist

- The inspector will confirm the elevator Manufacturer and Model.
- The inspector will confirm the total number of passengers and freight cars.
- The inspector will confirm the maximum allowable capacity (Lbs) and speed (Ft/min).
- The inspector will confirm the overweight Fraction (counterbalance/car capacity).
- The inspector will confirm the operating hours of each elevator.
- The inspector will confirm if it's a Geared or Gearless machine.
- The inspector will verify the number of floors served by each elevator.
- The inspector will verify the elevator drive type (Motor-Generator Set, SCR Drive) and if there are timer controls present.
- The inspector will take photos of the motor drive nameplate to confirm:
  - Motor Horsepower (HP).
  - Motor efficiency (%).
  - Motor # of poles.
  - Motor Enclosure (ODP, TEFC).

Post-Inspection Checklist

- The inspector will confirm the elevator drive type (SCR, VVVF, PWM).
- The inspector will document the rated efficiency of the installed drive, consistent with manufacturer documentation (e.g., SCR-6 ≈ 0.85, SCR-12 ≈ 0.90, PWM ≈ 0.94, VVVF ≈ 0.95), as applicable.
- The inspector will verify if the proposed drive is regenerative or non-regenerative.
- The inspector will take photos of the motor drive nameplate to confirm:
  - Manufacturer, model number, and serial number.
  - Motor Horsepower (HP).
  - Motor efficiency (%).
  - Motor # of poles.
  - Motor Enclosure (ODP, TEFC).

3.2.6 Ventilation Overhaul

Measure Description: Ventilation Overhaul involves upgrading a building's air exchange system to improve indoor air quality. This measure entails replacing the rooftop exhaust fans and installing constant airflow regulators (CARs).

Strategic Framework Categorization: Strategic

Measure Type: Custom

Applicability: MFEEP, AMEEP Non-Comprehensive and AMEEP Comprehensive

Ventilation Overhaul Technical Requirements

Eligibility & Prerequisites

Project Eligibility

- Co-or Prerequisite measures: Rooftop exhaust fans must be replaced, and no existing Constant Airflow Regulators (CARs) are installed within the registers.
- Existing motor efficiency for exhaust fans must be based off motor nameplate
  - For motors with no nameplate efficiency, baseline efficiency based off the NEMA premium efficiency table values – ECCCNYS C405.7(1) or applicable code.
- Existing ventilation conditions containing CARs installed at registers are not eligible.
- Scopes of only shaft cleaning or sealing are not eligible.

Technical Requirements

Equipment Requirements

- Kitchens and bathrooms shall be continuously ventilated to a minimum of 25 CFM and 20 CFM respectively or intermittently ventilated to a minimum of 100 CFM and 50 CFM respectively as stated in the latest version of the NYC Mechanical code (Table 403.3.1.1) or applicable code, as applicable.

Installation Requirements

- CARs must be installed in 70% of apartment exhaust grills and 100% of the common area supply and exhaust grills.

Documentation Requirements

Pre-Installation & Calculations

- Facility operation hours, facility type, and description of existing load profile must be provided.
- Proposed quantity of fans to be replaced Description of what each fan serves.
- Applicable fan timer schedules for baseline and proposed conditions.
- CFM measures and aerosol reports for the ductwork and shafts should include the existing and proposed conditions. Clarifications on existing and proposed leakage rates are essential to the savings calculations for duct sealing, and failure to provide them can cause delays
- A total count of the kitchen and bathroom registers.
- It's incorrect to assume 100% loss of conditioned air through ducts (for exhaust fans) in the sensible heat equation of the calculation. Justifications on the assumptions should be shared.
- For market rate buildings, the baseline efficiency must be equal to minimal code compliant.
- For affordable buildings, existing conditions can be claimed as the baseline if acceptable proof is submitted, such as nameplate photo showing motor efficiency or a submittal/email from the manufacturer stating the efficiency. If data is not available, then efficiency is determined based on minimal code compliant.

Inspection Requirements

Pre-Inspection Checklist

- The inspector will take photos to capture the exhaust fan make, model, and count.
- The inspector will confirm the area each fan serves.
- The inspector will take nameplate photos to confirm:
  - Motor make and model
  - Motor size (HP)
  - Motor efficiency (%)
  - Speed percentage
- The inspector will confirm the existing CFM and speed (to be determined on a case-by-case basis by the program team if this is rated speed or actual speed).

- The inspector will confirm existing controls and operating schedule.
- The inspector will observe the air registers in a sample of apartment and common spaces to measure the baseline CFM and verify no existing Constant Airflow Regulators.

Post-Inspection Checklist

- The inspector will take photos to capture the exhaust fan make, model, and count.
- The inspector will confirm the area each fan serves.
- The inspector will take nameplate photos to confirm:
  - Motor make and model
  - Motor size (HP)
  - Motor efficiency (%)
  - Speed percentage
- The inspector will confirm the proposed CFM and speed (to be determined on a case-by-case basis by the program team if this is rated speed or actual speed).
- The inspector will observe and record a sample of the air registers in the apartments and common spaces to confirm the installation of a CAR and measure the new CFM (must exceed minimum code requirement).

3.2.7 Building Automation Systems/Building Management Systems (BAS/BMS)

Measure Description: This measure is applicable for the installation of Building Automation Systems or Building Management System which use automatic controls to improve building performance and increase energy efficiency, such as HVAC optimization tools. BAS/BMS installations vary based on the equipment used but typically include a system of connected sensors that feed data to a software, which then automates and controls the building's heating and cooling equipment to ensure maximum efficiency.

Strategic Framework Categorization: Strategic

Measure Type: Custom

Applicability: MFEEP, AMEEP Non-Comprehensive and AMEEP Comprehensive

***NOTE:** BAS/BMS equipment may save gas, electricity, or both. BAS/BMS projects may also be installed in buildings with secondary fuel types.

Building Automation Systems/Building Management Systems (BAS/BMS) Requirements
Eligibility & Prerequisites

Project Eligibility

- Projects with existing BAS/BMS, including non-operational or broken, are not eligible.
- Equipment included in the BAS/BMS scope must be operation and must not already be controlled by an existing building automation or management system.
- The following list of measures, if combined with the BMS measure may fall under different measure category, incentive amount may not be the same as BMS measure. Confirm with the applicable Utility or the IC regarding project measure eligibility:
  - Variable Speed Drive on HVAC Chiller
  - Variable Speed Drive on Fan or Pump
  - Chiller Water Reset Controls
  - Demand Controlled Ventilation
  - Packaged RTU Advanced Controls
  - Air-Side Economizer
  - Wireless Pneumatic Thermostat
  - Advanced Thermostat

Technical Requirements

Equipment Requirements

- If the scope includes motor replacement, it must be rated NEMA premium efficiency.
- If utilizing the Con Edison BAS/BMS calculator, the BAS/BMS must include:
  - If incorporated with Demand Control Ventilation, real-time carbon dioxide monitoring at the operator interface is required.
  - Central time control
  - Real-time outside air damper positioning
  - Graphic operator interface
  - System ability to generate reports such as fault detection and diagnostics reports, energy use intensity (EUI), etc.
  - Web-based interface with PC-based controls
  - Must allow for a minimum space temperature setback of at least +/- 5°F in both heating and cooling modes, except in facilities that are occupied 24/7.

Installation Requirements

- Must be tied to the control system and operate at variable speeds as determined by the control system to maintain a desired setpoint or condition.

Documentation Requirements

Pre-Installation & Calculations

- If the BAS/BMS is not combined with any of the disqualifying scenarios and includes the specifications listed in the equipment requirements above, contractors should submit their BAS/BMS project using the Con Edison BAS/BMS calculator.
- Description of the existing equipment operating hours, facility type, and description of existing load profile.
- Indicate the extent of work to be done, for example, software/programming updates or installation of hardware such as VFDs.

Post-Installation

- Description of proposed controls and sequence of operation.
- The Participating Contractor must provide the BMS printout showing the setpoints for the equipment in the scope.

Inspection Requirements

Pre-Inspection Checklist

- The inspector will verify that there is no existing BAS/BMS.
- The inspector will confirm the sequence of operation with the building staff.
- The inspector will confirm that the equipment is operational.
- The inspector will take photos of the equipment nameplate to confirm:
  - Equipment tag/identifier
  - Make, model, serial number
  - Quantity of units in the scope
  - Motor capacity (HP)
  - Motor efficiency (%)

Post-Inspection Checklist

- The inspector will confirm the sequence of operations with the building staff.
- The inspector will confirm that the equipment is operational.
- The inspector will confirm that BAS/BMS has been installed and it is electronically and mechanically connected.
- The inspector will verify that the equipment has been successfully tied into the BMS. If there's no display panel or online access while on-site, the Participating contractor is responsible for providing BMS print outs showing setpoint.

- The inspector will take photos of the equipment nameplate to confirm:
  - Equipment tag/identifier
  - Make, model, serial number
  - Quantity of units in the scope
  - Motor capacity (HP)
  - Motor efficiency (%)

3.2.8 Advanced Thermostat

Measure Description: This measure involves the replacement of existing non-WiFi connected programmable or older, less granularly controllable thermostats with Energy Star-certified smart thermostats or WiFi-communicating and analytics-capable thermostats, referred to collectively as advanced thermostats. By optimizing heating and cooling system operation through advanced scheduling, remote access, and automated adjustments, overall system runtime is reduced. Energy and demand savings are realized through decreased fuel and/or electric consumption associated with space conditioning loads and improved peak demand management.

Strategic Framework Categorization: Strategic

Measure Type: Prescriptive, Custom

Applicability: MFEEP, AMEEP Non-Comprehensive and AMEEP Comprehensive

***NOTE:** Advanced Thermostat equipment may save gas, electricity, or both. Advanced thermostat projects may also be installed in buildings with secondary fuel types through the Custom pathway.

Advanced Thermostat Requirements
Eligibility & Prerequisites

Project Eligibility

- Existing thermostatic controls consisting of non-WiFi connected programmable or less sophisticated thermostats controlling heating and/or cooling HVAC system.
- This measure is only applicable for decentralized space conditioning applications.
- This measure is applicable for HVAC system(s) using natural gas and/or electricity to provide space heating and/or cooling.
  - If this measure is used with HVAC system(s) using Oil or Steam to provide space heating and/or cooling, then the project must be submitted as Custom.
- This measure is not applicable to multifamily central heating systems with additional capacity for domestic hot water.

Technical Requirements

Equipment Requirements

- Installed equipment must meet the requirements of one of the two Advance Thermostat categories below
  - Wi-Fi communicating and analytics capable thermostat requirements:
    - Programmable thermostatic schedule.
    - Wireless connectivity - allowing users to remotely monitor and adjust temperature settings via a smartphone, tablet, or computer.
    - Additional energy savings features such as usage coaching, HVAC system diagnostics, geofencing, and/or comparative information.
  - Energy Star certified smart thermostat requirements:
    - All features of a Wi-Fi communicating and analytics capable thermostat.
    - Meet the Energy Star criteria.

- Ability to perform automatic adjustments in response to occupancy behavior.

Installation Requirements

- Thermostat must connect to decentralized heating and/or cooling system.
- At least one tenant per dwelling unit must be trained to use the advance thermostat and have the related application installed on their device.
- ≥50% of dwelling units must have at least one (1) advanced thermostat installed.

Documentation Requirements

Pre-Installation & Calculations

- Specification sheets must include all required features described in Equipment Requirements above.
- Descriptions of existing thermostats and heating and cooling systems of the building.

Post-Installation

- A list of the number of Advanced Thermostats installed per apartment number.

Inspection Requirements

Pre-Inspection Checklist

- The inspector will survey a sample of thermostats up to 25% of the population of thermostats or 70 thermostats, whichever is lower.
- The inspector will record location, manufacturer, model, and related HVAC equipment(s) (manufacturer, model, capacity) of the inspected devices.
- The inspector will take photos of the thermostat and related HVAC equipment(s) nameplate.

Post-Inspection Checklist

- The inspector will survey a sample of thermostats up to 25% of the population of thermostats or 70 thermostats, whichever is lower.
- The inspector will record location, manufacturer, model, and related HVAC equipment(s) (manufacturer, model, capacity) of the inspected devices.
- The inspector will take photos of the thermostat and related HVAC equipment(s) nameplate.

3.2.9 Chiller Replacement – Air and Water Cooled

Measure Description: This measure covers the replacement of high efficiency constant and variable speed electric air-cooled and water-cooled chillers in Multifamily buildings.

Strategic Framework Categorization: Strategic

Measure Type: Custom

Applicability: MFEEP, AMEEP Non-Comprehensive and AMEEP Comprehensive

Chiller Replacement – Air and Water Cooled Technical Requirements

Eligibility & Prerequisites

Project Eligibility

- Only operational electric-to-electric chiller replacements are eligible.

Technical Requirements

Equipment Requirements

- Replacement equipment efficiency must meet or exceed ECCCNYS C403.3.2(3), or applicable code, to qualify for eligibility.

- Building cooling load must be determined in adherence to ECCCNYS using TMY or similar weather data. It is recommended to align the calculated load the BCL with the existing or proposed equipment capacity, subject to Utility review.

Installation Requirements
- Proposed chiller must be constant or variable speed electric air-cooled or water-cooled chiller with full load and IPLV efficiencies that exceed baseline.

Documentation Requirements

Pre-Installation & Calculations
- Facility operation hours, facility type, and description of existing load profile must be provided.
- Manufacturer cut sheets documenting full-load and IPLV efficiencies for the proposed chiller(s).

Post-Installation
- The Participating Contractor must provide proof of the chiller's make, model, and serial number if the information is not clearly visible on the equipment nameplate.

Inspection Requirements

Pre-Inspection Checklist
- The inspector will confirm the existing Chiller Make and Model, serial number, quantity of modules, and capacity (Tons or Btu/hr).
- If multiple chillers are observed, the inspector will confirm the sequence of operation.
- The inspector will verify the chiller setpoint and entering water temperature.
- The inspector will confirm the location of equipment and verify the building's site address.
- The inspector will confirm that the existing equipment is electrically and mechanically connected.
- The inspector will take photos of the existing equipment's nameplate.

Post-Inspection Checklist
- The inspector will confirm the new chiller's make, model, serial number, quantity of modules, and capacity (Tons or Btu/hr) against the provided cut sheets and scope of work.
- If multiple chillers are observed, the inspector will confirm the sequence of operation.
- The inspector will confirm that the replacement equipment is electrically and mechanically connected.
- The inspector will take photos of the replacement equipment's nameplate.

3.2.10 Cooling Tower Replacement

Measure Description: This measure covers the replacement of cooling towers that have passed its effective useful life with newer, more efficient cooling towers.

Strategic Framework Categorization: Strategic

Measure Type: Custom

Applicability: MFEEP, AMEEP Non-Comprehensive and AMEEP Comprehensive

Cooling Tower Replacement Technical Requirements

Eligibility & Prerequisites

Project Eligibility
- Existing unit must be past its effective useful life as per the latest version of the NYS TRM.
- Existing cooling tower must not have VFDs.
- Baseline cooling towers typically have an approach temperature of 10°F under standard rating conditions.
- Equipment right-sizing or downsizing is not eligible.

Technical Requirements

Equipment Requirements

- Where VFDs for cooling tower fans or pumps are required by code per ECCCNYS C403.1 or as applicable, such VFDs are not eligible for incentives under this measure.
- Proposed cooling towers must have an approach temperature of 6°F or better under standard rating conditions.

Documentation Requirements

Pre-Installation & Calculations

- Facility operation hours, facility type, and description of existing load profile must be provided.
- Custom energy savings calculations must be provided.

Post-Installation

- The installer must provide proof of the cooling tower's make, model, and serial number if it's not labeled on the equipment.

Inspection Requirements

Pre-Inspection Checklist

- The inspector will confirm the cooling tower tag, make, model, serial number, quantity of units, and capacity (tons or Btu/hr).
- The inspector will confirm the location of the equipment (rooftop, basement, etc.).
- The inspector will verify the equipment is electrically and mechanically connected.
- The inspector will verify the equipment is operational.
- The inspector will take photos of the cooling tower to capture nameplate data.

Post-Inspection Checklist

- The inspector will confirm the cooling tower tag, make, model, serial number, quantity of units, and capacity (Tons or Btu/hr).
- The inspector will verify that the equipment is electrically and mechanically connected.
- The inspector will verify that the equipment is operational.
- The inspector will take photos of the cooling tower to capture nameplate data.

3.2.11 Refrigerator Replacement

Measure Description: Refrigerator replacement is the removal of existing inefficient refrigerators and the installation of new high-efficiency units. The upgraded equipment incorporates improved compressor technology, enhanced insulation, and more efficient fans and controls, resulting in reduced electricity consumption while maintaining required cooling performance. By lowering the overall energy required for food storage, building electrical loads are reduced. Energy and demand savings are realized through decreased electric consumption and reduced peak demand associated with refrigeration operation.

Strategic Framework Categorization: Neutral

Measure Type: Custom

Applicability: AMEEP Comprehensive

Refrigerator Replacement Technical Requirements

Eligibility & Prerequisites

Project Eligibility

- This measure does not apply to refrigerator-freezers with a total refrigerated volume exceeding 39 cubic feet or to freezers with a total refrigerated volume exceeding 30 cubic feet.
- Appliances shall be one-for-one replacements with regards to capacity.

Technical Requirements

Equipment Requirements

- Appliances shall be Energy Star labeled.

Documentation Requirements

Pre-Installation & Calculations

- Photo of proposed refrigerator Energy Star label or cutsheet showing each product is Energy Star labeled.

Post-Installation

- Documentation showing quantity of each model refrigerator or freezer that was installed.

Inspection Requirements

Pre-Inspection Checklist

- The inspector will survey a sample of refrigerators up to 25% of the population of refrigerators in scope or 70 refrigerators, whichever is lower.
- The inspector will record the location (apartment number), make, model number, size/capacity, and count of all appliances.

Post-Inspection Checklist

- The inspector will survey a sample of refrigerators up to 25% of the population of refrigerators or 70 refrigerators, whichever is lower.
- The inspector will record the location (apartment number), make, model number, size/capacity, and count of all appliances.
- The inspector will verify Energy Star label.

4. Building Electrification

The following section focuses on several measures and their technical requirements related to building electrification. Building Electrification measures include heat pumps and complementary technology for space heating and cooling, or the heating of domestic hot water systems. In addition to heat pump technology, non-heat pump electrification of cooling will be allowed, under the Fuel-Switching measure.

Building Electrification measures are:

- Considered **Strategic**
- Can have both **Prescriptive** and **Custom** applications
- Are part of both MFEEP and AMEEP

Please note: this technical guide is complemented heavily by the:

- **Con Edison Energy Efficiency Program Guidelines: Building Electrification Guide**
- Multifamily Energy Efficiency and Building Electrification Program Manual, and
- The **Non-Residential Decommissioning Checklist**

This document will reference the most up-to-date information in those documents, to prevent duplication.

The following technical requirements can be found in the following other supporting documents:

Technical Requirement	Supporting Document

Required documentation for project application submission	Section 6 in Program Manual
Required documentation for IC to conduct Engineering Savings Analysis and Load Calculation review	Section 3.3 and 4 of the Con Edison Energy Efficiency Program Guidelines – Building Electrification Guide
Decommissioning of existing fossil fuel systems requirements	Section 3.4 of the Con Edison Energy Efficiency Program Guidelines – Building Electrification Guide and the Non-Residential Decommissioning Checklist
Installation Requirements per measure	Section 3.3 and 4 of the Con Edison Energy Efficiency Program Guidelines – Building Electrification Guide
How to complete the Energy Savings Calculators as part of the Savings Analysis package, for Space Heating	Space Heating Building Electrification Calculator User Guide
How to complete the Energy Savings Calculators as part of the Savings Analysis package, for DHW applications	Domestic Hot Water Calculator Guide
How to complete the Energy Savings Calculators as part of the Savings Analysis package, for Heat Recovery Chillers	HRC Calculator User Guide

4.1 Technical Eligibility for Building Electrification Projects

The following table outlines the eligible Building Electrification measures and identifies common electrification technologies in the MFEEP and AMEEP programs and is not exhaustive:

Pathway	Measure Name	Eligible Technologies
Prescriptive (5-100 dwelling units)	Prescriptive Space Heating: Full Building Load Electrification	• Cold Climate Air-to-Air Mini-Split Heat Pumps • Cold Climate Air-to-Air Single Packaged Heat Pumps • Air-to-Air Large Commercial Unitary Heat Pumps (single packaged or split system) • Air Source Variable Refrigerant Flow Heat Pumps • Packaged Terminal Heat Pumps (PTHP)
Custom	Custom Space Heating: Full Building Load Electrification	• Space Heating Air Source Heat Pumps Technologies above • Heat Recovery Chillers and Heat Pump Chillers • Heat Pump Dedicated Outdoor Air Systems (HP-DOAS) • Energy Recovery Ventilators (ERVs) • Heat Recovery Ventilators (HRVs)
Custom	Custom Domestic Hot Water Electrification (“DHW”)	• Heat Pump Water Heaters (HPWH) for domestic/service water heating • Air-to-Water HPWHs for domestic/service water heating
Prescriptive	Prescriptive Domestic Hot Water Electrification (“DHW”)	• Heat Pump Water Heaters (HPWH) for domestic/service water heating: • Full load Air-to-Water HPWHs for domestic/service water heating where hot water serves in-unit use only.

The following conditions render a project ineligible for Building Electrification incentives for space heating applications:

Please note that there are several ***disqualifying conditions*** for Building Electrification projects including:

- Any form of new construction or addition including: a heat pump installed to service newly constructed building, heat pump installed to service newly added floor (Vertical expansion) in an existing building, heat pump installed to service newly added space (Horizontal expansion).
- Heat Pump installed to serve as a cooling only unit.
- The building already has heat pumps serving the building.
- The building had already begun installation of heat pumps prior to on-site pre-inspection was conducted.
- Heat Pumps installed that are not included in the approved Scope of Work and do not meet equipment eligibility requirements

4.2 Technical Requirements for Building Electrification Inspections

The following inspection procedure outlines the requirements for Building Electrification. The integrity of the program will be maintained through a standardized field-inspection and oversight process. This process is aimed at providing assurance that Participating Contractors have demonstrated compliance with program rules and requirements and reducing the number of non-conformances found on-site.

There will be two types of on-site inspections: programmatic inspections (pre-inspection and post-inspection) and Quality Assurance/Quality Control ("QAQC") inspections. All Building Electrification Projects shall comply with these requirements, where applicable. Projects may be subject to additional review and additional implementation requirements.

Programmatic Pre-Inspection Requirements

The programmatic pre-inspection's goal is to **understand and verify the existing conditions** of the fossil fuel equipment on-site.

Prior to equipment level inspection checks, the inspector will:

- Document and confirm the building address matches application documents.
- Conduct a full survey of the areas where the proposed units will be installed (facade, roof or adjacent grounds) to identify and document any potential issues that may need to be addressed before installation – water damage, snow level, draining requirements. etc. and will also inquire the same with the super regarding issues in the apartments that can be detrimental to the installation of proposed equipment. Please refer to the Standards and Field Assessment Guides for more detail.

The inspector will then:

- Confirm that heat pump installation has not begun, and there are no pre-existing heat pumps on site.
- Confirm the current operating conditions of the space heating and cooling and DHW equipment.
- Check for any non-conformances that you see in the boiler room.
- Confirm if the boiler and the fuel tank will be decommissioned.
- Inspect 10% of the in-unit apartment units to check for existing heating and cooling elements, with information such as: quantity, make, model #, heating capacity (kBtu/hr), cooling capacity, heating efficiency and cooling equipment COP.

Pre-Inspection Data Point Collection

Space Heating Application	Domestic Hot Water Application
The inspector will capture photos and videos documenting existing boilers, oil tanks/steam lines, radiators, electric resistance baseboards, and key installation details. The following data points will be collected, as available on site:	The inspector will take photos and videos to document existing DHW equipment, including hot water boilers, combination boilers, storage tank water heaters, oil tanks/steam lines, heat exchangers, and key installation details. The following data points will be collected, as available on site:

Location of the boiler	Equipment Type
Quantity of boilers	Location
Boiler Fuel type	QTY
Boiler heating fluid type	Fuel Type
Area serviced by the boiler	Service Area(s)
Boiler Make	Storage Volume (Gallons)
Boiler Model #	Manu.
Boiler Serial #	Model #
Boiler Output (kBtu/hr)	Serial #
Boiler Input (kBtu/hr)	Natural or Forced Draft
Thermal Efficiency	Burner Manu.
Burner Manufacturer.	Boiler Model #
Burner Model #	Boiler Serial #
Burner Serial #	First Hour Rating
Max. Burner Output (kBtu/hr)	Input Btu/hr
Max. Burner Input (kBtu/hr)	Output Btu/hr
Min. Burner Output (kBtu/hr)	UEF/ COP
Max. Burner Input (kBtu/hr)	Voltage
Operating Condition?	# Phase
Will it be Decommissioned?	Max Input (W)
	Min Input (W)
	Standby Loss (Btu/hr)
	Operating Condition?
	Will it be Decommissioned?

The inspector will take photos and videos to document existing cooling equipment, including window units, PTACs, rooftop units, mini-splits, electric chillers, absorption chillers, and key installation details.

- Tag ID
- Location
- Quantity
- Fuel Type
- Cooling fluid type
- Service Area(s)
- Equipment Make
- Equipment Model #
- Equipment Serial #
- Equipment Output (kBtu/hr)
- Equipment Input (kW)
- Equipment cooling efficiency (CEER, COP, EER, IEER)
- Operating Condition?
- Will be Decommissioned?

Programmatic Post-Inspection Requirements

Post-installation Programmatic Inspections for projects installing ASHP, AWHP, or WSHP measures will be subject to a Con Edison checklist, detailed below, related to the installed measures. Inspections will verify:

- Compliance with all aspects of the relevant standards and quality assurance checklist

- Project compliance will all program requirements

Any non-conformances found during a Post-Installation Programmatic Inspection must be resolved by a Participating Contractor before the selected project receives incentive payments from the Program. Non-conformances are defined as, and equivalent to, a “fail” under the program inspection rules.

Review Criteria aligned with Non-Residential Inspection Checklist

The following criteria as assessed by the IC during programmatic post-inspections, as outlined by the Non-Residential Inspection Checklist:

For All Projects:

- **C1:** Verify installed equipment is as proposed on application, quantity, make and model.
- **C1A:** Typos on any project documentation for model or serial numbers that do not impact sizing or equipment eligibility.
- **C5:** Verify site conditions are consistent with Load Sizing Analysis, or a revised energy analysis has been completed. Review of ACCA (Manual D, J, N, or S) or other approved load calculation methodologies, with observed site conditions.
- **C15B:** Verify that units are above snow depth level according to ACCA Weather Station data as provided by the NYS Clean Heat program. Only applicable to ASHP applications
- **C17:** Observe functional testing of equipment in either cooling or heating mode as conducted by contractor or operator, if conditions allow.
- **C18:** Verify that electrical disconnect is installed in an accessible location for service.

For Decommissioning Only:

- **DE2:** Confirm the contractor-completed Decommissioning Checklist matches conditions on site.
- **DE2A:** Conditions on site have fully met requirements in Decommissioning Checklist, but the checklist itself was filled out incorrectly.

Decommissioning Verification:

- **DV1: (**NATURAL GAS ONLY) On the day of the inspection, visually verify that visible fuel line(s) to the decommissioned appliance have been disconnected, removed, and capped with a press fitting or a threaded fitting using thread sealant, fuel line cap is tight and secure, and that no odor or sound of leaking gas is detected.
- **DV2: (**OIL OR PROPANE ONLY) On the day of the inspection, visually verify oil fuel lines to decommissioned appliance(s) have been disconnected, removed and capped using a threaded fitting and that the cap is tight and secure. Additionally, visually verify that oil or propane is not leaking.
- **DV3:** Verify disconnection of power supply to decommissioned space heating appliance. (E.g. Visually verify that no exposed wires can be seen, etc.).
- **DV4: V**isually verify that a Carbon Monoxide detector is present and functioning.

Venting:

- **V1:** Visually verify that rigid metal caps with threaded fasteners have been used to seal flue vents previously used by the decommissioned appliance(s).
- **V2:** For commonly vented systems with an operational DHW or combustion appliance, confirm that the remaining vent is free of visible defects, pitched upward toward the chimney, and supported.

Please refer to Appendix A for the most common Building Electrification post-inspection failures.

4.3 Non-Heat Pump HVAC Replacement – Fuel Switching

Measure Description: Fuel switching includes measures that replace existing oil, steam, or natural gas HVAC equipment with electric systems. Conversions from electric systems to gas, steam, or oil are not eligible.

Strategic Framework Categorization: Strategic

Measure Type: Custom

Applicability: AMEEP & MFEEP

Non-Heat Pump HVAC System – Fuel Switching

Eligibility & Prerequisites

Eligible existing equipment includes:

- Gas-engine-drive chiller
- Gas-fired boiler
- Oil-fired boiler
- *Steam absorption chiller *(check below)*
- *Steam-driven boiler *(check below)*
- *Steam turbine chiller *(check below)*

Measures not eligible for fuel switching incentives include:

- Heat pumps, heat pump chillers, heat recovery chillers for space heating/cooling or hot water; please see the Electrification section for information on heat pump eligibility and incentives.
- Electrification of non-HVAC equipment, such as stoves, washers, and dryers.
- Conversion to electric resistance heating.
- Removal of Cogeneration or Combined Heat and Power (CHP) Plants.
- Addition of new Cogeneration or Combined Heat and Power (CHP) Plants.
- *Replacing Steam Chillers or Steam Boilers that use District Steam.

Technical Requirements

Equipment Requirements

- Equipment must be replaced with electric chiller or boiler.
- Replacement equipment efficiency must meet or exceed ECCCNYS C403.3.2(3).
- Proposed chiller must be constant or variable speed electric air-cooled or water-cooled chiller with full load and IPLV efficiencies that exceed baseline.
- Building cooling load in adherence to ECCCNYS code which uses weather data (TMYX or similar). It is recommended to match the BCL with the existing or proposed equipment capacity if it's unknown.

Documentation Requirements

Pre-Installation & Calculations

- The Participating Contractor must provide:
  - Proof of the chiller's make, model, and serial number if it's not labeled on the equipment.
  - Documentation clarifying fossil fuel type (district steam vs oil vs natural gas) used for chillers need to be provided.
  - Documentation verifying DOB permit applications were filed and permitted for boiler upgrades
- Facility operation hours, facility type, and description of existing load profile must be provided.
  - Justification for the percentage of existing electric load used by the chiller and time period need to be provided.

Post-Installation & Calculations

- If the old boiler is being removed, documentation of boiler removal filing (OP49) should be provided.
- Documentation of proof for electric boiler installation permit & inspections, like first Test Inspection for new equipment should be provide.

Inspection Requirements

Pre Inspection Checklist

Conditions	Chiller	Boiler
The inspector will confirm the existing Chiller/Boiler Make and Model, serial number, quantity of modules, and capacity (Tons or Btu/hr)	☒	☒
If multiple chillers/boilers are observed, the inspector will confirm the sequence of operation	☒	☒
The inspector will verify the setpoint and entering water temperature	☒	☐
The inspector will confirm that the existing equipment is electrically and mechanically connected	☒	☒
The inspector will take photos of the existing equipment's nameplate.	☒	☒
The inspector will verify whether the boiler is used as the building's primary heating source.	☐	☒

Post Inspection Checklist

Conditions	Chiller	Boiler
The inspector will confirm the new Chiller/Boiler Make and Model, serial number, quantity of modules, and capacity (Tons or Btu/hr)	☒	☒
The inspector will verify the installed equipment against submitted spec sheets to confirm post-installation efficiency level.	☒	☒
The inspector will take photos and/or videos of installed equipment, nameplate, serial numbers, and other information if available.	☒	☒
The inspector will confirm that the equipment is new and operational at the time of post-inspection.	☒	☒
If multiple chillers/boilers are observed, the inspector will confirm the sequence of operation	☒	☒
The inspector will verify the setpoint and entering water temperature	☒	☐
The inspector will confirm that the existing equipment is electrically and mechanically connected	☒	☒
The inspector will take photos of the existing equipment's nameplate.	☒	☒
The inspector will verify whether the boiler is used as the building's primary heating source.	☐	☒

5. AMEEP Comprehensive

This section of the Technical and Inspection Guide includes existing and proposed conditions, and respective inspection requirements for measures under the AMEEP Comprehensive pathway. These measures are eligible for either Con Edison or National Grid incentives. For details on Comprehensive Incentive Rates, please see the Multifamily Energy Efficiency and Building Electrification Program Manual.

5.1 Inspection Requirements

Eligible measures within the Comprehensive pathway are subject to the same inspection requirements outlined in the pre- and post-inspection sections for each measure within this document. Please refer to those sections for detailed guidance.

5.2 Comprehensive Projects – Minimum Installation Requirements

The intent of the Comprehensive pathway is to support projects where measures are installed throughout the building. All measures, including shell and in-unit measures, need to be installed throughout the entire building to a reasonable extent and must meet the installation minimum to receive the points for the measure. The Building Installation Minimum is how much of a measure upgrade should be present in a building after the AMEEP Comprehensive project completion. Measures already upgraded prior to AMEEP project submission count towards this minimum. The measures installed as part of an AMEEP Comprehensive project scope must result in the building reaching the Building Installation Minimum.

- Example: The building installation minimum requirement for window replacement is 60% of apartment windows. If 20% of the building's apartment windows have already been replaced, then the building will need to install the additional 40% of its apartment windows through AMEEP.

Measure Name	Points	AMEEP Comprehensive Minimum Installation Requirements
Air Sealing Package	10	A minimum of 40% of the building's floors must be included in the scope of work. The air sealing scope must extend beyond basic measures such as weather-stripping doors and installing door sweeps. A comprehensive approach to air sealing is required.
Boiler Controls/EMS	15	No existing EMS. Install minimum of 25% apartment sensors, on a variety of floors, and including one in the apartment at the end of each branch line.
Boiler or Furnace Replacement	30	Systems must be replaced in their entirety (100%), except in cases involving central systems serving multiple units, where at least 70% of the central system must be upgraded. For unitary systems, a minimum of 70% of in-unit boilers must be replaced.
Elevator Drive System Upgrade	20	Modernize 75% of elevators in building.
Energy/heat recovery ventilators	20	The ERV/HRV must serve 80% of the conditioned common space.
Master Air Venting	10	To ensure proper distribution and balancing, air vents must be appropriately sized and installed at the termination points of 100% of all steam supply mains and risers.
EC Motors	15	70% of three phase motors >1hp that run more than 100 hours/year must upgraded to NEMA premium.
Orifice Plates	10	Orifice plates must be installed on a minimum of 70% of all apartment radiators and 100% of common-area radiators, excluding those located on the top floor. Top-floor radiators must not be restricted from venting air through the steam distribution system.
Pipe Insulation	10	100% of pipe in mechanical room and 50% of accessible piping in unconditioned spaces must be insulated.
Pumps - DHW	15	70% of all motors/pumps of the specific building system being controlled per the Scope of Work (e.g., all booster pumps in the building).

Refrigerators	10	Replace 50% of in-unit and 100% of common area refrigerators.
Roof Insulation	30	100% of the roof must be insulated. Attic floor/top floor ceiling must be air sealed before insulation is added.
Advanced Thermostats	10	50% of apartments.
Smart TREs	15	At least 60% of all radiators in the building regardless of type must have TREs installed.
Steam Traps	10	All failed open and failed closed common area traps must be repaired or replaced.
TRVs	10	Install TRVs in 70% of radiator-equipped apartments. Orifice Plates must be installed in addition to this measure in order to qualify for the program.
Ventilation Overhaul	30	1. Kitchens and bathrooms shall be continuously ventilated to a minimum of 25 CFM and 20 CFM, respectively. 2. Adjustable constant airflow regulators (CARs) are required to maintain balanced operation. CARs must be installed in 70% of apartment exhaust grills and 100% of common area supply and exhaust grills. 3. Seal all central ventilation duct work (e.g. aerosolized sealant product) to meet duct leakage limit of 5 CFM50 per register + 5 CFM50/floor leakage OR a maximum leakage of 10% of total design air flow for system, whichever is lower.
VFD/VSDs	15	100% of all motors/pumps of the specific building system being controlled per the Scope of Work (e.g., all booster pumps in the building).
Wall Insulation	40	Retrofit 70%+ of exterior wall surface.
Water Heater Replacement	30	For central systems, 100% of the boiler or furnace that serves the apartments must be updated. For unitary systems, 70% of the apartment boilers/furnaces must be updated.
Window Replacement	40	Replace 60% of apartment windows.

Appendix

Appendix A: Building Electrification Post-Inspection Common Failures

C1 (Major) - Verify installed equipment is as proposed on application, quantity, make and model

1. The model number of the condensers found on-site does not match the scope of work.
2. The quantity of the condensers found on-site does not match the scope of work.

Before post inspection

1. Inform IC as soon as possible of a possible scope of work change.
2. Generate a new scope of work and cost proposal that includes a list of all equipment, indoor and outdoor, matching what was installed on site and provide it to the IC.

C 17 (Major) - Observe functional testing of equipment in either cooling or heating mode as conducted by contractor or operator, if conditions allow.

Before post inspection

Ensure that all equipment is operating in both cooling and heating modes. This can be confirmed with a digital temperature thermometer.



C15B (Major) - Verify that units are above snow depth level according to ACCA Weather Station data as provided by the NYS Clean Heat Program. The required snow depth for the condenser below is 6 inches. In this case, the PC did not ensure that the condenser was above the requirement, therefore, the result is a failure.



Item Number 5 programmatic inspection - Are there refrigerant lines left un-insulated/un-protected from UV at the outdoor unit connection?

Insulations are not allowed to be more than 1 inch from the junction box. The image below shows a project that failed the requirement.



C5 (QAQC inspection) - Verify site conditions are consistent with Load Sizing Analysis or a revised energy analysis has been completed. Review of ACCA (Manual J, S, and D) or other approved heating and cooling calculation methodologies, with observed site conditions.

Please note that per the current program manual, PCs are required to provide an explanation if they're oversizing their heat pump system. It can be in the form of an email or a signed letter from the project engineer.

Appendix B: Probe Requirements

For the Weatherization measure Attic Cavity Insulation – Opaque Shell, submission of quality probes is required to verify existing insulation conditions within the roof cavity prior to installation. These probes help confirm insulation presence, depth, and consistency, and help identify potential voids or obstructions. To ensure a representative assessment, probes must be taken from multiple locations and in different orientations based on the building's configuration.

The orientation and minimum number of probes required will vary depending on building type and roof design, as outlined below. All probes must be clearly documented with photographs and location notes to demonstrate that different areas of the roof cavity were evaluated.

