THE ORDERING FORCE
ENGINEERING | MANAGEMENT | GENERAL CONTRACTING

13 Prescriptive Measures
A closer look

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Introduction

The Prescriptive Pathway

Lawmakers in New York have recognized the difficulty of operating affordable housing under the new stringent LL97 guidelines. To ease the burden, they have allowed owners of certain rent-regulated properties to achieve LL97 compliance by implementing 13 energy-saving measures, also known as prescriptive measures.

To comply owners must:

1. Implement the applicable measures (not all 13 measures apply at all buildings) by December 31st, 2024
2. File a one time report by the May 2025 deadline

And that's it, once these requirements are met the property is done with Local Law 97 forever.

How do I know if my property qualifies for the Prescriptive Pathway?

If your property meets any of the following guidelines, your property can meet LL97 compliance by taking the prescriptive pathway:

1. Buildings in which more than 35% of dwelling units are subject to rent regulation based upon:

a. The Emergency Tenant Protection Act of 1974; or
b. The Rent Stabilization Law of 1969; or
c. The Local Emergency Housing Rent Control Act of 1962.

2. Housing Development Fund Company co-ops (HDFC co-ops, incorporated under the Business Corporation Law and Article 11 of the Private Housing Finance Law)

3. A building that participates in a project-based federal housing program, such as:

a. Section 8 Project-Based Rental Assistance ("PBRA"); or
b. NYCHA Permanent Affordability Commitment Together ("PACT"); or
c. Section 202 financing (supportive housing for the elderly); or
d. Section 811 financing (supportive housing for persons with disabilities); or
e. Continuum of Care ("CoC") leases serving formerly homeless individuals and families.

NOTE: Buildings with dwelling units rented using federal assistance that is not project-based but tenant-based, such as Section 8 Housing Choice Vouchers ("HCVs"), are not subject to Article 321 and may be a covered building under Article 320. This is because tenant-based assistance is attached to the occupant and not the building.

If you need help determining if your property qualifies for the implementation of the prescriptive pathway call us today at (347)-596-6073 or visit us at theOrderingForce.com

The 13 Prescriptive Measures

Note: Depending on the systems present in your building, not all 13 measures must be implemented at your property

Type of heating system	*Article 321 Prescriptive Energy Conservation Measures ("PECMs")*												
	1	2	3	4	5	6	7	8	9	10	11	12	13
	Temp. set points	*Repair leaks*	*Heating system function*	*Radiator temperature controls**	*Piping insulation*	*Water tank insulation*	*Indoor / outdoor temp. sensors**	*Steam traps**	*Master steam system venting**	*Lighting*	*Building envelope*	*Exhaust fan timers*	*Radiant barriers*
One-pipe steam	●	●	●		●	●	●		●	●	●	●	●
Two-pipe steam	●	●	●	●	●	○	●	●	○	●	●	●	●
Hydronic	●	●	●	●	●	●	●			●	●	●	●
Forced air	●		●				●			●	●	●	
Heat pump	●	●	●		●					●	●	●	
Electric resistance	●		●	●						●	●	●	●

○ = not applicable to vacuum pump systems

1 – Temperature Set Point

Why it's necessary: Adjusting temperature set points for heating and hot water to align with occupancy and facility needs is crucial. While a building must provide adequate heating and domestic hot water, excessively heated air and water can lead to discomfort and inefficient energy usage.

Requirements
Mandate the verification of set points for all central heating and hot water equipment. For buildings without central systems, verification is needed for:

- 100% of equipment serving common areas
- At least 20% for non-common owner areas
- and at least 10% for non-common tenant areas.

This scope excludes unitized systems with individual thermostats.

Minimum set points:

- Delivering hot water at 110-120 °F as per the 2022 NYC Plumbing Code.
- Interior temperature minimums range from 50 °F to 75 °F for various occupancies, with relaxation during off-hours.
- Multifamily residential buildings follow specific temperature minimums outlined in the NYC Housing Maintenance Code, including hot water delivery at 120 °F and minimum interior temperatures during the heating season.

Compliance can be achieved through a Local Law 87 of 2009 Energy Efficiency Report accepted by the Department, provided the audit and retro-commissioning work was completed within four years of the LL97 PECM report submission.

2 – Repair Leaks

Why it's necessary: Leak detection and repair are crucial elements of routine system maintenance. Leaks in water, steam, oil, or refrigerant can have cascading detrimental effects, including reduced operating efficiency of heating systems, damage to surrounding interior finishes, and increased stress on heating system components. Leaks from closed-loop steam or hydronic heating systems require adding feedwater, exacerbating scale buildup and metal corrosion due to higher dissolved solids and gases.

Requirements:

- Identification of readily accessible leaks through visual inspection and review of maintenance records/tenant complaints.
- Repair of all identified leaks by the end of 2024.
- Inspection coverage:
  - 100% of common areas
  - At least 20% of non-common owner areas
  - At least 10% of non-common tenant areas

System components not subject to this PECM:

- Ducts
- Distribution piping concealed within walls, ceilings, or floors
- Forced-air systems

Compliance can be achieved through a Local Law 87 of 2009 Energy Efficiency Report accepted by the Department, provided the audit and retro-commissioning work was completed within four years of the LL97 PECM report submission.

3 – Heating System Function

Why it's necessary: Dirty or clogged, as well as inaccurate or inoperable components, can diminish the operating efficiency of heating systems, leading to increased stress on the overall system. This, in turn, results in higher energy consumption and a shortened lifespan for the system. Maintenance tasks, beyond component cleaning or replacement, involve calibrating various processes such as damper, valve, and burner modulation, as well as boiler, heat exchanger, and fan coil sequence control, and prevention of short cycling.

Requirements:

- Verification of proper function through field observation and review of historical data.
- Investigation methods may include interviews with facility staff, managers, and tenants, trend analysis, dedicated data loggers, or review of operations, maintenance, and complaints records.
- Forced-air systems and electric resistance heating systems, exempt from PECM #2, are not exempt from this PECM.

Sample maintenance procedures (including, but not limited to):

- Check filters and vents, cleaning or replacing them as needed.
- Inspect and clean condensate drains.
- Remove sediment and limescale from tanks, skim oily residue, flush dirty boiler water, optimize waterlines, and replace anode rods in non-cast-iron boilers.
- Clean heat pump evaporator coils and condenser coils.
- Verify the accuracy of sensors and gauges.
- Ensure proper functioning of equipment sequences of operation.

Compliance can be achieved through a Local Law 87 of 2009 Energy Efficiency Report accepted by the Department, provided the audit and retro-commissioning work was completed within four years of the LL97 PECM report submission.

4 – Radiator Temperature Controls

Why it's necessary: Opening a window is often the least energy-efficient method to address an overheated radiator, although it might be the only option for many people. Proper controls offer a more effective solution. Steam and hydronic radiators typically have valves with knobs, but these knobs often function more as on/off switches than temperature controls, leading to potential overheating issues.

Requirements:

- Survey at least 80% of all radiators to confirm the presence and functionality of temperature controls.
- Specific reporting requirements based on the type of heating system are outlined in 1 RCNY §103-17(c)(4).
- For wireless ("smart") systems, real-time and historical data may be reviewed during the survey.

Retrofit options for existing radiators:

a) **Thermostatic radiator valves ("TRVs"):**

- Install TRVs for two-pipe steam systems, along with new steam traps or orifice plates properly sized to prevent steam from entering the return piping (refer to PECM #8).
- TRVs or insulated radiator enclosures are not mandatory for one-pipe systems with proper system-wide venting, provided wireless sensors are installed in at least 25% of the dwelling units (these sensors must provide operational feedback to the boiler)

b) **Thermostatic radiator enclosures ("TREs"):**

- TREs are heat storage boxes with electric fans that deliver hot air as needed. Install TREs for radiators instead of TRVs where records indicate overheating.
- Currently manufactured for steam systems only.

c) **Thermostats:**

- Confirm the installation of a functioning thermostat for electric radiators.

d) **Hydronic radiators:**

- Confirm the functionality of controls for hydronic radiators where present.

5 – Piping Insulation

Why it's necessary: While some steam/hot water pipes are intentionally left uninsulated for space heating, most distribution piping in heating and domestic hot water systems benefits from insulation. The primary advantage is the reduction of heat loss, leading to increased efficiency and lower energy consumption by boilers and water heaters. Additional benefits include a decreased risk of burns and fires, improved steam quality, shorter wait times for domestic hot water, and reduced risk of freezing in colder temperatures.

Requirements:

- Visual inspection of pipes, fittings, and valves in:
  - 100% of common areas
  - At least 20% of non-common owner areas
  - At least 10% of non-common tenant areas
- Installation, replacement, or repair of any missing or degraded piping insulation by the end of 2024.
- Compliance with this PECM does not mandate the removal of wall, floor, or ceiling assemblies, nor does it require disturbance of asbestos-containing materials that may have been used in piping insulation.

Selected best practices and guidance:

a. It may not be advisable to insulate condensate piping in pumped-return steam systems, as overly hot condensate can increase the risk of cavitation, potentially damaging pumps. Therefore, insulation for pumped-return steam piping is not mandatory.

b. Beyond LL97, low-temperature piping with surface temperatures lower than the surrounding environment should ideally be insulated, providing benefits similar to those of insulating high-temperature piping. Refrigerant piping in heat pump systems should also be insulated for optimal heat exchange.

c. In renovations where uninsulated piping is exposed due to the removal of wall, floor, or ceiling assemblies, the piping must be insulated according to Article 316 of Title 28 of the Administrative Code.

d. In new buildings and alterations subject to the NYC ECC, piping insulation is mandatory, with minimum thicknesses specified in Table C403.11.3. Detailed requirements and exceptions for heating/cooling and service hot water systems are outlined in C403.11.3 and C404.4, respectively.

e. Reference to the DOE guide for insulating hot water pipes.

6 – Water Tank Insulation

Why it's necessary: Newer tanks for boilers and hot water heaters often come with integrated rigid insulation, while older tanks may require field-applied insulation. Insulation plays a crucial role in reducing standby heat loss, thereby decreasing energy consumption by minimizing the need for continuous reheating. Careful application of field insulation is essential to avoid common pitfalls, as outlined in the DOE guide under "Selected best practices" below. Additionally, insulating condensate tanks can enhance system efficiency by capturing and reusing the high heat energy present in condensate. However, caution is advised for pumped-return systems, as overly hot condensate can damage pumps.

Requirements:

- Review of feedwater, condensate, and hot water tanks for the presence of insulation, considering specification sheets and assessing heat loss at the tank enclosure.
- Insulation should meet the requirements of the NYC ECC to the extent feasible, given existing clearances.

Note:

- Compliance with this PECM does not mandate the disturbance of asbestos-containing materials (ACMs), which were once commonly used for tank insulation and could be a reason for insulation removal over the years.

7 – Indoor/outdoor temperature sensors

Why it's necessary: Steam and hydronic boilers are designed for the coldest days of the year, and running them at full capacity during warmer days can lead to discomfort and excessive energy usage. Many systems lack advanced weather-responsive controls, resulting in short cycling. Upgrading heating system sensors to be more weather-responsive, both indoors and outdoors, is an effective way to modulate boiler output. Wireless sensors at radiators and outdoor reset control can precisely adjust heat output based on need and outside temperature. For forced-air systems, sensors measuring various parameters can help modulate heat output and control wireless duct dampers.

Requirements:

- Inspection of all boilers, with installation or repair of any missing or non-functioning indoor or outdoor reset temperature sensors identified during the inspection by the end of 2024.
- Refer to 1 RCNY §103-17(c)(7) for the percentage of dwelling units to be checked for indoor sensors and reporting requirements.

System components not subject to this PECM:

- Central heat pumps (as sensors are integral to the system)
- Unitized heating (e.g., mini-splits, PTACs, PTHPs)
- Radiant heating
- Electric resistance heating

8 – Steam Traps

Why it's necessary: Steam traps in two-pipe steam systems play a vital role in maintaining system efficiency. Routine maintenance is essential as even a single failed steam trap can lead to cascading system-wide failures. Specific impacts include increased steam production and energy use, potential damage to pumps, reduced heat output, accelerated corrosion, water hammer, and other adverse effects.

Impacts of steam trap failure: I. A steam trap failing in the open position can leak steam into the condensate return, resulting in excessive steam production, increased energy use, and likely damage to pumps. II. A steam trap failing in the closed position ("cold trap") allows air and condensate buildup, reducing heat output and accelerating corrosion. III. Both types of failure can lead to noisy and damaging effects on the entire system, including water hammer.

Testing requirements:

- Visual observation, temperature testing, and/or ultrasonic testing of all steam traps and orifice plates to identify traps for repair/replacement.
- Remedial work to be completed by the end of 2024.
- For two-pipe steam distribution systems:
    - Main supply and main return piping surface temperatures must have a differential of 30 °F or more.
    - If the temperature differential is less than 30 °F, testing requirements for common and non-common areas are specified, with potential full system testing based on the percentage of malfunctioning traps found.
    -

Documentation requirements:

- Creation of a detailed schedule recording each device's location, condition, date of initial inspection, installation, replacement, or repair, and date of re-inspection.
- Refer to 1 RCNY §103-17(c)(8) for additional inspection and reporting requirements.

9 – Master steam system venting

Why it's necessary: Steam distribution systems accumulate air when turned off, requiring efficient venting to ensure proper steam flow and heating once restarted. Individual radiators are vented by steam traps (in two-pipe systems) and air vents (in one-pipe systems), but for effective venting of the entire system, master venting is crucial. Master vents, installed at the ends of supply piping and in two-pipe systems, near the ends of return piping, facilitate quick air expulsion, ensuring uniform steam distribution to all radiators simultaneously.

Impacts of inadequate master venting:

- Radiators farthest from the steam source can take a long time to heat up, resulting in underheated spaces.

System conditions:

- Master vents may have been removed or poorly functioning, leading to inefficiencies in the system.

Note:

- Master venting is not recommended for use in two-pipe steam systems with vacuum pumps.

Requirements:

- Refer to 1 RCNY §103-17(c)(9) for inspection and reporting requirements.
- Partial sampling is insufficient; the entire system must be checked for proper master venting.

10 – Lighting

Why it's necessary: Upgrading a building's lighting to meet current energy conservation standards is often the most cost-effective method for reducing energy consumption. Certain upgrades, such as lamp replacements and lighting power calculations, can be integrated into routine maintenance tasks, making it a practical approach for energy efficiency improvement.

Requirements:

- The lighting system upgrade report, required for LL88 compliance by 5/1/2025 (Article 310 of Title 28 of the Administrative Code and corresponding 1 RCNY §103-18), will be used to document this PECM.
- The report must be prepared by a licensed electrician or a registered design professional (RDP), not by the qualified RCx agent.
- Compliance with a minimum of the 2009 NYC ECC is required, and if lighting was installed after 7/1/2010, compliance with a later NYC ECC is necessary, as indicated in the provided guide.
- Landmarked buildings are not exempt from these requirements, except where historic lighting is considered part of the landmark status.

11 – Building Envelope

Why it's necessary: Weatherizing a building enhances resistance to outdoor temperature and humidity changes, increasing the efficiency of heating and cooling systems. This results in lower energy consumption to maintain a comfortable indoor environment. Weatherizing involves plugging cracks and holes to slow convective heat transfer (movement of air and moisture) and insulating walls/floors/ceilings to slow conductive heat transfer (temperature changes passing through solid materials).

Requirements:

- Visual inspection for air leakage at envelope openings and penetrations between conditioned and unconditioned spaces. Missing or damaged gaskets, sealant, caulking, weatherstripping, etc., must be installed, repaired, or replaced by the end of 2024.
- Interior visual inspection must cover 100% of common areas, at least 20% of non-common owner areas, and at least 10% of non-common tenant areas.
- Exterior visual inspection can be limited to easily accessed areas; specialized façade access is not necessary.
- An LL87 Energy Efficiency Report (EER) accepted by the Department is acceptable for compliance, provided the audit and retro-commissioning work was completed within four years before the submission of the LL97 PECM report.

Selected best practices and guidance:

a. Owners are not required to disturb potential asbestos-containing materials (ACMs) or replace broken fenestration.
b. Refer to the DOE general guide to air sealing for topics like detecting leaks, caulking, weatherstripping, and insulation.
c. Explore the DOE's Building America Solution Center for topics related to "Air Seal" and "Building Science Introduction."
d. Consult the NYC Mayor's Office's Carbon Challenge Handbook for Multifamily Buildings for an illustrated overview of "Air Sealing and Insulation" topics.
e. Check the NY State Department of Homes and Community Renewal's Weatherization Assistance Program (WAP) for no- and low-cost weatherization for income-eligible homeowners and owners of multifamily rental buildings with income-eligible tenants.
f. Consider NYSERDA's Multifamily Buildings Low-Carbon Pathways Program, offering financial incentives for comprehensive envelope upgrades.
g. In new buildings and alterations subject to the NYC ECC, allowable air leakage rates are listed in section C404.5.
h. ASHRAE Standard 100 Annexes D and E provide guidance on energy-efficient building envelope upgrades and maintenance.

12 – Exhaust Fan Timer

Why it's necessary: Exhaust fans play a crucial role in eliminating moisture, pollutants, and stale/overheated air from areas such as bathrooms, kitchens, and laundry rooms. Proper operation of these fans is essential to maintain indoor air quality. Some fans are designed for continuous and quiet operation at low speeds, while others run intermittently at higher speeds. Inefficient use of energy occurs when fans designed for intermittent use are left on unnecessarily, leading to excessive energy consumption for both the fan motor and the replacement of conditioned air.

Requirements:

- Refer to 1 RCNY §103-17(c)(12) for inspection requirements.
- Interior visual inspection must cover 100% of common areas, at least 20% of non-common owner areas, and at least 10% of non-common tenant areas.

Selected best practices and guidance:

a. Consult the DOE guide to intermittent fan installation for guidance.

b. In new buildings and alterations subject to the NYC Mechanical Code (“MC”), Table 403.3.1.1 lists Minimum Ventilation Rates for various occupancies and space types.

c. For fans with two speeds, the timer or sensor can be used to switch back to the lower speed, promoting energy efficiency.

13 – Radiant Barriers

Why it's necessary: Reflective, insulated surfaces positioned on the wall behind a radiator (steam, hydronic, or electric) can effectively prevent heat loss through the wall. This enhances the radiator's efficiency and reduces energy consumption. Radiators primarily transfer heat through convection (heating surrounding air that rises to displace cooler air), radiant heat (sending out infrared radiation to heat objects in the line of sight), and conduction (transfer of heat into the wall when heated air touches it). A radiant barrier's reflective surface bounces radiant heat away from the wall and back into the room, while its insulation slows conductive heat transfer, preserving the heat energy of the inside air.

Requirements:

- Refer to 1 RCNY §103-17(c)(13) for inspection requirements.
- It is recommended that the installation of radiant barriers occurs in conjunction with Radiator temperature controls (#4).

Selected best practices and guidance:

a. Radiant barriers work most effectively when maintaining an air gap between themselves and the radiator surface, preventing heat transfer via conduction and allowing for more efficient convection.

b. Refer to the DOE description of radiant barriers for additional information.