

MPP-NC Technical Requirements

Version 6 – ASHRAE 2010

SUPPLEMENTAL REQUIREMENTS FOR NYSERDA’S MULTIFAMILY PERFORMANCE PROGRAM – NEW CONSTRUCTION COMPONENT

Introduction

All NYSERDA Multifamily Performance Program – New Construction (MPP-NC) projects shall meet the requirements set forth in the EPA’s [ENERGY STAR Certified Multifamily High Rise program](#), for either the Performance Path or the Prescriptive Path. All MPP-NC projects also must meet the additional NYSERDA requirements detailed in this document and the requirements listed in NYSERDA’s MPP-NC Program Guidelines.

ASHRAE Code References

As New York State code now references ASHRAE 90.1-2010, all requirements and guidance in the EPA documents that refer to ASHRAE 90.1-2007 must instead follow ASHRAE 90.1-2010. Additionally, requirements and guidance that refer to ASHRAE 62.1-2007 and 62.2-2007 in the EPA documents must instead follow ASHRAE 62.1-2010 and 62.2-2010, respectively.

Additional Building Component Requirements

In addition to all requirements listed in the EPA’s ENERGY STAR MFHR Prescriptive Path Requirements and the EPA’s ENERGY STAR MFHR Performance Path Requirements, NYSERDA requires the following to be met. Unless otherwise noted, the following requirements apply to both Performance and Prescriptive Path projects.

METERING

- Provisions shall be made to determine the electrical energy consumed by each tenant by separately metering individual dwelling units, either by direct metering or submetering each unit. The only exception to this requirement is for supportive housing* projects and certain gut rehab projects. Gut rehab projects that include metering systems in the scope of work will still be required to separately meter individual dwelling units.

HEATING AND COOLING EQUIPMENT

- Heating and cooling equipment shall be ENERGY STAR qualified, where applicable. Specifically, heating and cooling equipment of any product category that is eligible for ENERGY STAR qualification must be ENERGY STAR qualified. For example, a residential boiler with a rating of 100,000 Btu per hour would need to be ENERGY STAR qualified; but a boiler intended for commercial applications with a rating of 300,000 Btu per hour

* For the program definition of “supportive housing”, consult the Program Guidelines.

energy (which is not eligible for ENERGY STAR qualification) would not[†]. Please refer to the ENERGY STAR website (www.energystar.gov) for more details on which product categories are eligible for ENERGY STAR qualification.

HEATING AND COOLING DISTRIBUTION

- Heating and cooling supply and return ductwork shall be insulated to a minimum R-4 in conditioned space.

ENVELOPE

- Window frames shall be separated from conductive framing (metal & masonry studs, lintels & sills) with insulation designed to serve as a thermal break.
- Residential spaces must be thermally isolated from all commercial/retail spaces.

VENTILATION AND INFILTRATION

- Outdoor air shall be provided to each unit directly from the outdoors. Projects using exhaust ventilation systems must specify how outside air is delivered at the flow rate required by ASHRAE 62.2-2010. Systems that rely on transfer air from pressurized hallways or corridors, adjacent to dwelling units, attics, etc., are prohibited.
- Exhaust fans that provide the local exhaust for kitchens and bathrooms can simultaneously facilitate the outdoor air ventilation system for the apartment, with sufficient make-up air provided mechanically or by a dedicated make-up outdoor air source (e.g., trickle ventilators).

DOMESTIC HOT WATER

- Domestic water heating equipment shall be ENERGY STAR qualified, where applicable. Specifically, domestic water heating equipment of any product category that is eligible for ENERGY STAR qualification must be ENERGY STAR qualified. For example, a gas storage water heater with a nominal input of 75,000 BTU/hour or less and a rated storage volume from 20 to 100 gallons would need to be ENERGY STAR qualified; but a gas storage water heater with a rated storage volume larger than 100 gallons (which is not eligible for ENERGY STAR qualification) would not[†]. Please refer to the ENERGY STAR website (www.energystar.gov) for more details on which product categories are eligible for ENERGY STAR qualification.

COMMON SPACE LIGHTING

- All light fixtures in non-apartments spaces, including hallways, stairwells, lobbies, elevators and decorative fixtures, shall have combined lamp and ballast efficacies

[†] The examples provided are intended for illustrative purposes only. Actual ENERGY STAR specifications are subject to change and can be found at www.energystar.gov.

meeting or exceeding ENERGY STAR specifications[‡]. Alternatively, T-5 or T-8 lamps with electronic ballasts or ENERGY STAR qualified screw-in lamps may be used.

OUTDOOR LIGHTING

- All outdoor lighting fixtures shall have combined lamp and ballast efficacies meeting or exceeding ENERGY STAR specifications[‡].

IN-UNIT LIGHTING

- All hard-wired lighting fixtures installed within apartments shall meet or exceed ENERGY STAR specifications[‡]. ENERGY STAR qualified screw-in lamps may be used in the following applications only: Closets, storage spaces, and other locations that are not within habitable living space.
- Overall in-unit lighting power density may not exceed 0.6 W/ft². When calculating overall lighting power density, use 0.6 W/ft² for spaces where lighting is not installed. (PRESCRIPTIVE PATH ONLY)[§]

ENERGY STAR MFHR BENCHMARKING

- The Participant agrees to provide NYSERDA copies of all utility bills showing consumption and cost for electricity, fuel, and water, or an executed Data Release Authorization Form providing access to such information, for no less than three (3) years following the date of receipt of the Certificate of Occupancy. Such bills shall cover all common areas of the building and a representative sample of apartments. The apartment sample shall consist of at least 10% of the apartments with no fewer than five (5) apartments. Of the 10% sample, at least one of each apartment type (e.g. studio, large 1 bedroom) must be represented. Along with the Data Release Authorization Forms, a list of all apartment numbers and their corresponding apartment type (e.g. studio, large 1 bedroom) must be provided. Note, that an alternative option is available to projects in Con Edison territory, as described in the Program Guidelines, using Addendum #4.

Revisions to Simulation Guidelines

All NYSERDA Multifamily Performance Program – New Construction projects shall follow the EPA’s ENERGY STAR Multifamily High Rise Simulation Guidelines, with the following revisions.

LIGHTING (Section 3.6)

3.6.2 In-unit Lighting

[‡] Information on ENERGY STAR lighting efficacy requirements can be found in the current version of the document titled “Luminaires Program Requirements” at the “Light Fixtures for Partners” page of the ENERGY STAR website, www.energystar.gov.

[§] For Performance Path projects, the proposed design may exceed 0.6 W/ft², but will incur an energy penalty for doing so. See “Revisions to Simulation Guidelines” on this page for more information.

Replace the 1.1 W/ft² baseline and unspecified proposed lighting power density with 0.6 W/ft², as shown below:

3.6.2.2 In the Baseline Building Design, in-unit lighting power density of **0.6 W/ft²** ~~1.1 W/ft²~~ shall be incorporated into the model.

3.6.2.3 In the Proposed Design, in-unit lighting power density of **0.6 W/ft²** ~~1.1 W/ft²~~ shall be modeled for rooms or portions of the rooms with no specified hardwired lighting.

VENTILATION AND INFILTRATION (Section 3.12)

3.12.2 Baseline Building Design-Ventilation

Replace 3.12.2.1 and 3.12.2.2 with the following:

3.12.2.1 Local Mechanical Exhaust. The Baseline Building Design local mechanical exhaust in all dwelling unit bathrooms and kitchens shall be modeled using the recommended continuous/intermittent rates as listed in ASHRAE 62.2-2010 (5 ACH/100 CFM in kitchens and 20 CFM/50 CFM in bathrooms). If not specified otherwise, intermittent exhaust shall be modeled with a 2 hr/day runtime, or converted to an equivalent 24 hr/day runtime if combined with whole-unit ventilation in the model.

3.12.2.2 Whole-Unit Ventilation. The Baseline Building Design whole-unit ventilation rates in all dwelling units shall be modeled using the recommended rates as listed in ASHRAE 62.2-2010.

FAN MOTOR ENERGY (Section 3.14)

3.14.5 Demand Control Ventilation

Replace 3.14.5 with the following:

3.14.5.1 Enclosed Parking Garages

Exhaust fans serving enclosed parking garages may be required to have demand control ventilation as per *mandatory* section 6.4.3.4.5. Fan energy savings in the enclosed parking garages must be calculated as follows:

Baseline

$E_{base} = CFM_{ex,base} \times P_{fan} [W/CFM] \times 365 [days/yr] \times (8.4 [hrs/day] + FFLP_{base} \times 15.6 [hrs/day])$
where,

E_{base} [kWh] = annual energy consumption of the baseline garage exhaust fan

$CFM_{ex,base}$ = the lesser of specified exhaust CFM and $A [ft^2] \times 1.5 [CFM/ft^2]$, where A is the floor area of garage

P_{fan} [kW/CFM] = design exhaust fan power; $P_{fan} = 0.0003$

FFLP_{base} = Fraction of Full Load Power at reduced air flow rate (FFLP=0.5 for installations where demand control ventilation is required by Section 6.4.3.4.5; FFLP=1 for installations subject to exceptions to 6.4.3.4.5)
 8.4 [hrs/day] = hours per day when exhaust fan runs at full CFM_{ex}
 15.6 [hrs/day] = hours per day when contaminant level allows lower CFM

Proposed

$E_{prop} = BHP \times 0.746[kW/bhp] / Eff \times 365[days/yr] \times (8.4 [hrs/day] + FFLP_{prop} \times 15.6 [hrs/day])$
 where,

$E_{prop}[kWh]$ = annual energy consumption of the proposed garage exhaust fan

BHP = break horse power of specified exhaust fan

Eff = electrical efficiency of fan motor

CFM_{ex,prop} = specified design exhaust CFM

FFLP_{prop} = fraction of Full Load Power determined from Figure 6-V of 90.1 2007

User's Manual copied below, based on the specified flow control method and the minimum Percent Design CFM, equal to the ration of design exhaust CFM and the minimum CFM allowed by the specified controls. The minimum CFM cannot be below 0.05 CFM/ft² in enclosed parking garages, per Section 404.2 of Mechanical Code of New York State.

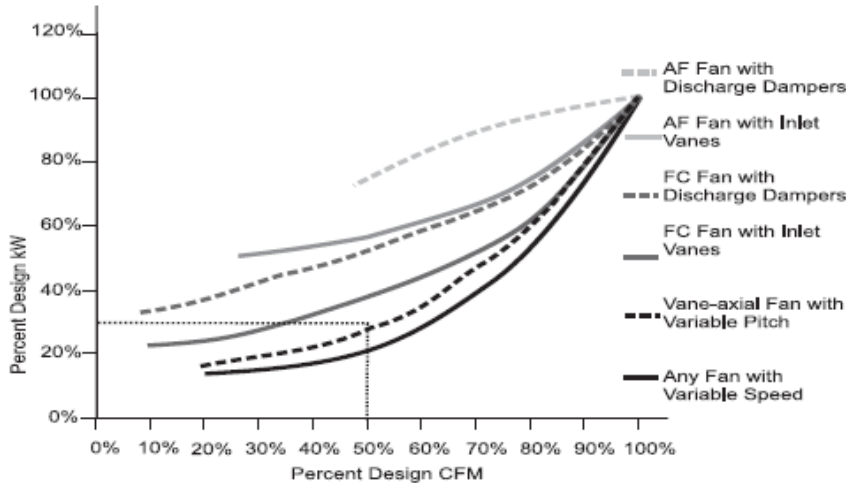


Figure 6-V—Generic Part-Load Curves for a Variety of Fans

3.14.5.2 Other Demand Control Ventilation Applications

Fan motor energy savings from other demand control ventilation applications may be modeled by reducing fan runtime in the *Proposed Design* compared to the Baseline. If Demand Control Ventilation is modeled in the *Proposed Design*, the baseline ventilation CFM must be based on the lesser of the design ventilation flow rates required by the

applicable code and the actual specified flow rate. The modeled reduction in runtime hours must be documented and is subject to approval by the rating authority.

ENERGY RATE (Section 3.16)

Replace 3.16.1 with the following:

3.16.1 The following average annual prices must be used for performance rating calculations of all projects in the Program:

Electricity:	0.1936 \$/kWh (1)
Natural Gas:	14.86 \$/Mcf (2)
Oil:	4.00 \$/gallon (3)

(1) One year state-wide average, U.S. DOE Energy Information Administration residential data.

"Electric Power Monthly", summarized at <https://www.nyserda.ny.gov/Energy-Data-and-Prices-Planning-and-Policy/Energy-Prices-Data-and-Reports/Energy-Prices/Electricity/Monthly-Avg-Electricity-Residential.aspx>

(2) One year state-wide average, U.S. DOE Energy Information Administration residential data. "Natural Gas Navigator", summarized at <https://www.nyserda.ny.gov/Energy-Data-and-Prices-Planning-and-Policy/Energy-Prices-Data-and-Reports/Energy-Prices/Natural-Gas/Monthly-Average-Price-of-Natural-Gas-Residential.aspx>

(3) NYSEDA, "New York Home Heating Oil Price Monitoring Program" (Posted #2 Fuel Oil Credit Price), <https://www.nyserda.ny.gov/Energy-Data-and-Prices-Planning-and-Policy/Energy-Prices-Data-and-Reports/Energy-Prices/Home-Heating-Oil/Monthly-Average-Home-Heating-Oil-Prices.aspx>

Additional documentation

In addition to all documentation and tools provided as part of the EPA's ENERGY STAR Qualified Multifamily High Rise program, NYSEDA's Multifamily Performance Program – New Construction requires the following administrative and guidance documents. Additional information on these documents and how they apply to projects can be found within the Program Guidelines document.

- Program Guidelines
- Project Information Form
- Terms and Conditions
- ERP Tables
- Incremental Cost Guidelines
- Baseline Cost Estimator
- Prescriptive Path Calculator

Projects Pursuing LEED

Both the ENERGY STAR Qualified Multifamily High Rise program and the USGBC's LEED Rating System's energy section are heavily dependent on ASHRAE 90.1 for modeling guidance and minimum requirements. As such, the energy models required for each program are very similar. This section is meant to delineate the few differences that do exist, and to provide allowances for projects applying for LEED to deviate from the EPA/NYSERDA requirements, when possible and as stated below.

EPA Simulation Guidelines, Section 3.5

MODELING DEVIATION

This section states that the baseline fenestration properties shall be determined as follows:

- When the Proposed Design is a wood-frame building, properties of fenestration in the baseline shall be based on prescriptive requirements of ASHRAE 90.1-2007 for vertical glazing with nonmetal framing. For all other building types, properties of fenestration shall be based on prescriptive requirements for the applicable metal framing.

ASHRAE 90.1 Appendix G, and therefore LEED, requires you to use the U-values in the baseline that correspond to the type of fenestration (metal or non-metal framing) actually used in the proposed.

ALLOWANCE

For all building types other than wood-framed buildings, the modeler may choose to follow either the EPA guidance in section 3.5 of the Simulation Guidelines, or to follow ASHRAE 90.1-2010 Appendix G Table 3.1 Section 5, and model the baseline fenestration properties based on the type of fenestration (metal or nonmetal) used in the proposed design.