

High-Rise and Low-Rise Multifamily

Know Your Project – Key Terms

Multifamily (MF) buildings will have to comply with either residential requirements or a mix of nonresidential and residential requirements depending on the number of habitable stories in your building:

- ✦ **Multifamily Building:** contains multiple dwelling units that share common walls (townhomes) and may also share common floors or ceilings (apartments). Hotel or motel buildings are not considered multifamily.
- ✦ **High-Rise Residential:** all multifamily buildings with four or more habitable stories.
- ✦ **Low-Rise Residential:** all multifamily buildings with three or fewer habitable stories.

High-Rise vs Low-Rise Multifamily

While low-rise multifamily buildings need to comply with residential requirements, several project aspects for high-rise buildings fall under the scope of either nonresidential requirements or specific high-rise residential (HRR) requirements for some prescriptive measures

Mandatory Measures All MF Buildings §110	
Low-Rise §150.0, 150.1, 150.2	High-Rise §120-141
<ul style="list-style-type: none"> ✦ Envelope: Residential ✦ HVAC: Residential <ul style="list-style-type: none"> ○ including HERS measures ✦ Water Heating: Residential <ul style="list-style-type: none"> ○ including solar hot water and dual loop recirculation ✦ Indoor Lighting Dwelling Units: Residential <ul style="list-style-type: none"> ○ Common areas: different options dependent on % of total conditioned floor area ✦ Outdoor Lighting and Parking Garages: Residential <ul style="list-style-type: none"> ○ Different options dependent upon # of parking spots 	<ul style="list-style-type: none"> ✦ Envelope: Nonresidential* ✦ HVAC: Nonresidential <ul style="list-style-type: none"> ○ including ventilation ✦ Water Heating: Residential <ul style="list-style-type: none"> ○ including solar hot water and dual loop recirculation ✦ Indoor Lighting Dwelling Units: Residential <ul style="list-style-type: none"> ○ Common areas: Nonresidential ✦ Outdoor Lighting: Nonresidential <p>*Section 140.3 includes specific requirements for high-rise residential</p>

Mandatory, Prescriptive, Performance

Mandatory requirements that apply to both low and high-rise multifamily buildings can be found in [Section 110.0 through 110.10](#) of the Standards.

In addition to meeting these “mandatory measures,” projects can choose between a prescriptive or performance compliance path. Most multifamily projects pursue the performance compliance path, which allows flexibility to trade-off performance between building systems. In order to verify compliance using the performance path, compliance software must be used to show overall project compliance.

The compliance software compares the building design to a similar building that meets the prescriptive requirements of the Standards. Mandatory measures must be met, and cannot be traded off.

- ✦ More information can be found about the Performance and Prescriptive Compliance Approaches in the [Navigator Ace Tool](#).

Solar Ready Areas

Projects are required to either include an allocated solar ready area or show compliance with the appropriate exceptions found in [Section 110.10\(b\)1B](#). A solar ready area or “solar zone” is a section of the roof designated and reserved for the future installation of a solar electric or solar thermal system.

- ✦ **Sizing:** The solar area shall comprise *no less* than 15% of the total roof area of the building (less any skylight area) and may consist of multiple sub areas provided that each subarea is at least 80 square feet with no dimension less than 5 feet.
- ✦ **Location:** The solar area shall be located on the roof or overhang of the building or on the roof or overhang of another structure located within 250 feet of the building, or on covered parking installed with the building project.

[Section 110.10](#) also includes requirements for orientation, shading, structural design loads, and interconnection pathways for electrical service.

Envelope

Mandatory requirements for roofs, walls, floors and windows vary depending on construction type, and whether the project is high-rise or low-rise.

Mandatory Envelope Requirements for Multifamily

	Low-Rise	High-Rise
Roof		
Maximum U-factor	0.031 (wood R-30)	0.098 (metal R-19) 0.075 (wood R-13)
Wall		
Maximum U-factor	0.102 (2x4 R-13) 0.074 (2x6 R-19)	0.105 (metal R-13 w/ R-4) 0.110 (2x4 R-11)
Floor		
Maximum U-factor	0.037 (wood R-19)	0.269 (raised mass) 0.071 (other R-11)
Fenestration		
Maximum U-factor	0.58	NA

Detail on assemblies can be found in [Joint Appendix 4](#).

HVAC & Domestic Hot Water

There are two Energy Code Ace Trigger Sheets that go into more detail on HVAC requirements. They include requirements for new construction (new systems) as well as alterations. Low-rise projects should reference the residential sheet, and high-rise the nonresidential sheet.

- ✦ **Residential HVAC Change-outs:** This trigger sheet covers entirely new and complete replacement HVAC systems, alterations to equipment and alterations to ductwork.
- ✦ **Nonresidential Small Commercial HVAC Alterations:** This trigger sheet covers packaged units and split systems.

Domestic Hot Water requirements also differ based on whether the building is low-rise or high-rise:

- ✦ **New Low-Rise MF buildings** and additions which add water heating must meet the mandatory requirements of [Sections 150.0\(n\)](#) and [150.0\(j\)](#) regarding system design & insulation.

- ★ **Mandatory pipe insulation requirements for High-Rise MF** are found in [Section 120.3](#). Water heating systems shall have an insulation thickness corresponding to the system's fluid temperature as listed in [Table 120.3-A](#).
- ★ **Both Low-Rise and High-Rise MF complying prescriptively** must meet requirements in [Section 150.1\(c\)8](#):
 - ✦ Systems serving individual dwelling units shall be gas or propane and either a storage type water heater with an input of 75,000 Btu/hr or less or an instantaneous type water heater with an input of 200,000 Btu/hr or less. An electric resistance storage or instantaneous water heater may only be installed if natural gas is unavailable—additionally the water heater must be located within the building envelope and a solar water heating system with a solar savings fraction of 0.5 must be installed.
 - ✦ Systems serving multiple dwelling units must meet the minimum efficiency requirements of [Sections 110.1](#) and [110.3](#) and have a recirculation loop equipped with an automatic control system which controls pump operation based on hot water demand and return temperature.
 - ✦ A **solar water heating system** with a minimum solar savings fraction of 0.20 in climate zones 1-9 or 0.35 in climate zones 10-16 is prescriptively required for systems serving multiple dwelling units.

Dwelling Unit Lighting (§130.0, §150.0)

Lighting requirements inside dwelling units are mandatory (rather than prescriptive) and are the same for low-rise and high-rise multifamily buildings. For a list of which spaces in high-rise residential buildings are subject to the residential lighting requirements, refer to [Section 130.0\(b\)](#). For a complete description of the residential lighting requirements, see [Section 150.0\(k\)](#) and [Tables 150.0-A](#) and [150.0-B](#).

Application	Fixture and Control Requirements
Bathrooms	One High Efficacy (HE) fixture AND either manual-on vacancy sensor or HE for all other fixtures
Closets ≥ 70 ft ²	High Efficacy or manual-on vacancy sensor or dimmer
Kitchens	High Efficacy for at least 50% of total rated wattage
Garages, Laundry, and Utility Rooms	High Efficacy and vacancy sensor
All other interior rooms	High Efficacy or Manual-on vacancy sensor or Dimmer
For more complete information regarding lighting requirements for dwelling units, please see our Residential Fact Sheet on Indoor and Outdoor Lighting	

- ★ **High Efficacy Luminaires** are designed and built to operate only energy efficient light sources, such as fluorescent T8 lamps, compact fluorescent lamps (CFLs), LEDs and high intensity discharge (HID) lamps.
 - ✦ Note that high efficacy lamps installed in low efficacy luminaires (e.g. screw-based CFL and LED lamps) do NOT count as high efficacy lighting.
- ★ **Occupancy/Vacancy sensors and daylight sensors** are all devices that automatically control lights and/or light levels in response to conditions that they “sense” or “see.”
- ★ **Dimmers**, already common in residential applications, allow room occupants to lower lighting levels (and thus energy use) as desired.

Indoor Common Area Lighting (§130.0, §140.6, §150.0(k)12)

For high-rise multifamily buildings, common areas must comply with the applicable nonresidential lighting standards.

For low-rise multifamily residential buildings, the requirements for indoor lighting of common areas are based on the percentage of conditioned floor area made up by these common areas. Indoor common areas with a combined floor area of:

- ★ **20% or less of Conditioned Floor Area** require that permanently installed lighting for these areas consist of high efficacy luminaires or be controlled by an occupant sensor.
- ★ **Greater than 20% of Conditioned Floor Area** will need to comply with the applicable requirements of nonresidential indoor lighting. In addition, lighting installed in corridors and stairwells shall be controlled by occupant sensors that reduce the lighting power in each space by at least 50% when unoccupied.

Lighting for Parking Lots and Carports

Requirements for outdoor lighting of parking areas are based on the vehicle capacity. Parking lots, carports, or parking garages designed for:

- ★ **Fewer than eight vehicles** must adhere to the basic requirements for outdoor residential lighting:
 - ✦ High efficacy lighting OR
 - ✦ Low efficacy lighting with controls.
- ★ **Eight or more vehicles** are required to meet the nonresidential lighting requirements, including lighting power density limits. See [Sections 130.2](#) and [140.7](#) for an exhaustive list of requirements.

Additional Resources for Lighting

The following resources may be helpful in addition to the Standards language to understand the residential requirements:

- ★ [California Lighting Technology Center Lighting Guides](#): The CLTC has produced 2013 Title 24, Part 6 Lighting Guides for Residential Lighting and Outdoor Lighting.

Electrical Distribution (§130.5)

The 2013 Standards introduced requirements for electrical distribution in Part 6 that are relevant to nonresidential portions of a multifamily project. They can be found in [Section 130.5](#) and include requirements for:

- ★ Service Metering
- ★ Electrical Disaggregation
- ★ Voltage Drop
- ★ Receptacle Controls

Commissioning (§120.8)

Multifamily projects that have nonresidential portions have commissioning requirements in [Section 120.8](#), which apply to systems serving the nonresidential portions of the building.

