

(Effective until July 1, 2023)

**WAC 51-11C-50300 Section C503—Alterations.**

**C503.1 General.** Alterations to any building or structure shall comply with the requirements of Section C503 and the code for new construction. Alterations to an existing building, building system or portion thereof shall conform to the provisions of this code as they relate to new construction without requiring the unaltered portions of the existing building or building system to comply with this code. Alterations shall be such that the existing building or structure is no less conforming with the provisions of this code than the existing building or structure was prior to the alteration.

EXCEPTION: The following alterations need not comply with the requirements for new construction provided the energy use of the building is not increased:

1. Storm windows installed over existing fenestration.
2. Surface applied window film installed on existing single pane fenestration assemblies to reduce solar heat gain provided the code does not require the glazing fenestration to be replaced.
3. Existing ceiling, wall or floor cavities exposed during construction provided that these cavities are insulated to full depth with insulation having a minimum nominal value of R-3.0 per inch installed per Section C402.
4. Construction where the existing roof, wall or floor cavity is not exposed.
5. *Roof recover*.
6. *Air barriers* shall not be required for *roof recover* and roof replacement where the *alterations* or renovations to the building do not include *alterations*, renovations or *repairs* to the remainder of the building envelope.
7. Replacement of existing doors that separate conditioned space from the exterior shall not require the installation of a vestibule or revolving door, provided however that an existing vestibule that separates a conditioned space from the exterior shall not be removed.

**C503.2 Change in space conditioning.** Any low energy space in accordance with Section C402.1.1.1 that is altered to become *conditioned space* or *semi-heated space* shall be brought into full compliance with this code. Any semi-heated space in accordance with Section C402.1.1.2 that is altered to become conditioned space shall be brought into full compliance with this code.

For buildings with more than one space conditioning category, the interior partition walls, ceilings, floors and fenestration that separate space conditioning areas shall comply with the thermal envelope requirements per the area with the highest level of space conditioning.

A change in space conditioning project shall be deemed to comply with this code if the project area alone complies or if the existing building and the project area combined comply with this code as a whole building.

EXCEPTION: Buildings or spaces that were permitted prior to the 2009 Washington state energy code, or were originally permitted as unconditioned, may comply with this section as follows:

1. Where the component performance alternative in Section C402.1.5 is used to demonstrate compliance with this Section, the Proposed Total UA is allowed to be up to 110 percent of the Allowable Total UA. This exception may be applied to the project area alone, or to the existing building and project area combined as a whole building.
2. Where total building performance in accordance with Section C407 is used to demonstrate compliance with this Section, the total annual carbon emissions from energy consumption of the proposed design is allowed to be up to 110 percent of the annual carbon emissions from energy consumption allowed by Section C407.3. This exception may be applied to the project area alone, or to the existing building and project area combined as a whole building.

**C503.3 Building envelope.** New building envelope assemblies that are part of the alteration shall comply with Sections C402.1 through C402.5 as applicable.

EXCEPTION: Air leakage testing is not required for alterations and repairs, unless the project includes a change in space conditioning according to Section C503.2 or a change of occupancy or use according to Section C505.1.

**C503.3.1 Roof replacement.** *Roof replacements* shall comply with Table C402.1.3 or C402.1.4 where the existing roof assembly is part of the *building thermal envelope* and contains insulation entirely above the roof deck.

**C503.3.2 Vertical fenestration.** The addition of *vertical fenestration* that results in a total building vertical fenestration area less than or equal to that specified in Section C402.4.1 shall comply with Sec-

tion C402.4. The addition of *vertical fenestration* that result in a total building vertical fenestration area greater than specified in Section C402.4.1 shall comply with one of the following:

1. Vertical fenestration alternate in accordance with Section C402.1.3 for the new vertical fenestration added.

2. Vertical fenestration alternate in accordance with Section C402.4.1.1 for the area adjacent to the new vertical fenestration added.

3. Existing building and alteration area are combined to demonstrate compliance with the component performance alternate in accordance with Section C402.1.5 for the whole building. The Proposed Total UA is allowed to be up to 110 percent of the Allowed Total UA.

4. Total building performance in accordance with Section C407 for the whole building. The total annual carbon emissions from energy consumption of the proposed design is allowed to be up to 110 percent of the annual carbon emissions from energy consumption allowed in accordance with Section C407.3.

EXCEPTION: Additional envelope upgrades are included in the project so the addition of vertical fenestration does not cause a reduction in overall building energy efficiency, as approved by the *code official*.

**C503.3.2.1 Application to replacement fenestration products.** Where some or all of an existing *fenestration* unit is replaced with a new *fenestration* product, including sash and glazing, the replacement *fenestration* unit shall meet the applicable requirements for *U-factor* and *SHGC* in Table C402.4.

EXCEPTION: An area-weighted average of the *U-factor* of replacement fenestration products being installed in the building for each fenestration product category listed in Table C402.4 shall be permitted to satisfy the *U-factor* requirements for each fenestration product category listed in Table C402.4. Individual fenestration products from different product categories listed in Table C402.4 shall not be combined in calculating the area-weighted average *U-factor*.

**C503.3.3 Skylight area.** The addition of *skylights* that results in a total building skylight area less than or equal to that specified in Section C402.4.1 shall comply with Section C402.4. The addition of *skylights* that results in a total building skylight area greater than that specified in Section C402.4.1 shall comply with one of the following:

1. Existing building and alteration area are combined to demonstrate compliance with the component performance alternative with target area adjustment in accordance with Section C402.1.5 for the whole building. The Proposed Total UA is allowed to be up to 110 percent of the Allowed Total UA.

2. Total building performance in accordance with Section C407 for the whole building. The annual carbon emissions from energy consumption of the proposed design is allowed to be up to 110 percent of the annual carbon emissions from energy consumption allowed in accordance with Section C407.3.

EXCEPTION: Additional envelope upgrades are included in the project so the addition of skylights does not cause a reduction in overall building energy efficiency, as approved by the *code official*.

**C503.4 Mechanical systems.** Those parts of systems which are altered or replaced shall comply with Section C403. Additions or alterations shall not be made to an existing mechanical system that will cause the existing mechanical system to become out of compliance.

EXCEPTIONS: 1. Existing mechanical systems which are altered or where parts of the systems are replaced are not required to be modified to comply with Section C403.3.5 as long as mechanical cooling capacity is not added to a system that did not have cooling capacity prior to the alteration.  
2. Alternate mechanical system designs that are not in full compliance with this code may be approved when the code official determines that existing building constraints including, but not limited to, available mechanical space, limitations of the existing structure, or proximity to adjacent air intakes or exhausts makes full compliance impractical. Alternate designs shall include additional energy saving strategies not prescriptively required by this code for the scope of the project including, but not limited to, demand control ventilation, energy recovery, or increased mechanical cooling or heating equipment efficiency above that required by Tables C403.3.2(1) through C403.3.2(12).

3. Only those components of existing HVAC systems that are altered or replaced shall be required to meet the requirements of Section C403.8.1, Allowable fan motor horsepower. Components replaced or altered shall not exceed the fan power limitation pressure drop adjustment values in Table C403.8.1(2) at design conditions. Section C403.8.1 does not require the removal and replacement of existing system ductwork.

**C503.4.1 New mechanical systems.** All new mechanical systems in existing buildings, including packaged unitary equipment and packaged split systems, shall comply with Section C403.

**C503.4.2 Addition of cooling capacity.** Where mechanical cooling is added to a space that was not previously cooled, the mechanical system shall comply with either Section C403.3.5 or C403.5.

**EXCEPTIONS:**

1. Qualifying small equipment: Economizers are not required for cooling units and split systems serving one zone with a total cooling capacity rated in accordance with Section C403.3.2 of less than 33,000 Btu/h (hereafter referred to as qualifying small systems) provided that these are high-efficiency cooling equipment with SEER and EER values more than 15 percent higher than minimum efficiencies listed in Tables C403.3.2 (1) through (3), in the appropriate size category, using the same test procedures. Equipment shall be listed in the appropriate certification program to qualify for this exception. The total capacity of all qualifying small equipment without economizers shall not exceed 72,000 Btu/h per building, or 5 percent of the building total air economizer capacity, whichever is greater.

Notes and exclusions for Exception 1:

1.1. The portion of the equipment serving Group R occupancies is not included in determining the total capacity of all units without economizers in a building.

1.2. Redundant units are not counted in the capacity limitations.

1.3. This exception shall not be used for the initial tenant improvement of a shell-and-core building or space, or for Total Building Performance in accordance with Section C407.

1.4. This exception shall not be used for unitary cooling equipment installed outdoors or in a mechanical room adjacent to the outdoors.

2. Chilled water terminal units connected to systems with chilled water generation equipment with IPLV values more than 25 percent higher than minimum part load equipment efficiencies listed in Table C403.3.2(7), in the appropriate size category, using the same test procedures. Equipment shall be listed in the appropriate certification program to qualify for this exception. The total capacity of all systems without economizers shall not exceed 480,000 Btu/h per building, or 20 percent of the building total air economizer capacity, whichever is greater.

Notes and exclusions for Exception 2:

2.1. The portion of the equipment serving Group R occupancy is not included in determining the total capacity of all units without economizers in a building.

2.2. This exception shall not be used for the initial tenant improvement of a shell-and-core building or space, or for total building performance in accordance with Section C407.

**C503.4.3 Alterations or replacement of existing cooling systems.** Alterations to, or replacement of, existing mechanical cooling systems shall not decrease the building total economizer capacity unless the system complies with either Section C403.3.5 or C403.5. System alterations or replacement shall comply with Table C503.4 when the individual cooling unit capacity and the building total capacity of all cooling equipment without economizer do not comply with Section C403.3.5 or C403.5.

**C503.4.4 Controls for cooling equipment replacement.** When space cooling equipment is replaced, controls shall comply with all requirements under Section C403.3.5 and related subsections, and Section C403.5.1 for integrated economizer control.

**C503.4.5 Cooling equipment relocation.** Existing equipment currently in use may be relocated within the same floor or same tenant space if removed and reinstalled within the same permit.

**Table C503.4  
Economizer Compliance Options for Mechanical Alterations**

	<b>Option A</b>	<b>Option B (alternate to A)</b>	<b>Option C (alternate to A)</b>	<b>Option D (alternate to A)</b>
<b>Unit Type</b>	<b>Any alteration with new or replacement equipment</b>	<b>Replacement unit of the same type with the same or smaller output capacity</b>	<b>Replacement unit of the same type with a larger output capacity</b>	<b>New equipment added to existing system or replacement unit of a different type</b>
1. Packaged Units	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>

	<b>Option A</b>	<b>Option B (alternate to A)</b>	<b>Option C (alternate to A)</b>	<b>Option D (alternate to A)</b>
<b>Unit Type</b>	<b>Any alteration with new or replacement equipment</b>	<b>Replacement unit of the same type with the same or smaller output capacity</b>	<b>Replacement unit of the same type with a larger output capacity</b>	<b>New equipment added to existing system or replacement unit of a different type</b>
2. Split Systems	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	For units ≤ 60,000 Btuh, comply with two of two measures: 1. Efficiency: + 10% <sup>c</sup> 2. Economizer: shall not decrease existing economizer capability  For all other capacities: Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	For units ≤ 60,000 Btuh replacing unit installed prior to 1991 comply with at least one of two measures: 1. Efficiency: + 10% <sup>c</sup> 2. Economizer: 50% <sup>f</sup>  For all other capacities: Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>
3. Water Source Heat Pump	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	For units ≤ 72,000 Btuh, comply with at least two of three measures: 1. Efficiency: +10% <sup>c</sup> 2. Flow control valve <sup>g</sup> 3. Economizer: 50% <sup>f</sup>  For all other capacities: Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	For units ≤ 72,000 Btuh, comply with at least three of three measures: 1. Efficiency: +10% <sup>c</sup> 2. Flow control valve <sup>g</sup> 3. Economizer: 50% <sup>f</sup> (except for certain pre-1991 systems <sup>q</sup> )  For all other capacities: Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup> (except for certain pre-1991 systems <sup>q</sup> )
4. Water Economizer using Air-Cooled Heat Rejection Equipment (Dry Cooler)	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	Efficiency: + 5% <sup>d</sup> Economizer: shall not decrease existing economizer capacity	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>
5. Air-Handling Unit (including fan coil units) where the system has an air-cooled chiller	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	Economizer: shall not decrease existing economizer capacity	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup> (except for certain pre-1991 systems <sup>q</sup> )	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup> (except for certain pre-1991 systems <sup>q</sup> )
6. Air-Handling Unit (including fan coil units) and Water-cooled Process Equipment, where the system has a water-cooled chiller <sup>10</sup>	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	Economizer: shall not decrease existing economizer capacity	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup> (except for certain pre-1991 systems <sup>q</sup> and certain 1991-2016 systems <sup>1</sup> )	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup> (except for certain pre-1991 systems <sup>q</sup> and certain 1991-2016 systems <sup>1</sup> )
7. Cooling Tower	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	No requirements	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>
8. Air-Cooled Chiller	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	Efficiency: + 10% <sup>k</sup> Economizer: shall not decrease existing economizer capacity	Efficiency: Comply with two of two measures: 1. + 10% <sup>k,l</sup> and 2. Multistage compressor(s) Economizer: shall not decrease existing economizer capacity	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>
9. Water-Cooled Chiller	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	Efficiency: Comply with at least one of two measures: 1. Part load IPLV + 15% <sup>n</sup> or 2. Plate frame heat exchanger <sup>o</sup> Economizer: shall not decrease existing economizer capacity	Efficiency: Comply with two of two measures: 1. Part load IPLV + 15% <sup>n</sup> 2. Plate-frame heat exchanger <sup>o</sup> Economizer: shall not decrease existing economizer capacity	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>

<sup>a</sup> Minimum equipment efficiency shall comply with Section C403.3.2 and Tables C403.3.2(1) through C403.3.2(12).

<sup>b</sup> All separate new equipment and replacement equipment shall have air economizer complying with Section C403.5 including both the individual unit size limits and the total building capacity limits on units without economizer. It is acceptable to comply using one of the exceptions to Section C403.5.

<sup>c</sup> Reserved.

<sup>d</sup> Equipment shall have a capacity-weighted average cooling system efficiency that is 5% better than the requirements in Tables C403.3.2(1) and C403.3.2(2) (1.05 x values in Tables C403.3.2(1) and C403.3.2(2)).

<sup>e</sup> Equipment shall have a capacity-weighted average cooling system efficiency that is 10% better than the requirements in Tables C403.3.2(1)A and C403.3.2(2) (1.10 x values in Tables C403.3.2(1)A and C403.3.2(2)).

- f Minimum of 50% air economizer that is ducted in a fully enclosed path directly to every heat pump unit in each zone, except that ducts may terminate within 12 inches of the intake to an HVAC unit provided that they are physically fastened so that the outside air duct is directed into the unit intake. If this is an increase in the amount of outside air supplied to this unit, the outside air supply system shall be configured to provide this additional outside air and be equipped with economizer control.
- g Water-source heat pump systems shall have a flow control valve to eliminate flow through the heat pumps that are not in operation and variable speed pumping control complying with Section C403.4.3 for that heat pump.
  - When the total capacity of all units with flow control valves exceeds 15% of the total system capacity, a variable frequency drive shall be installed on the main loop pump.
  - As an alternate to this requirement, the capacity-weighted average cooling system efficiency shall be 5% better than the requirements in footnote <sup>c</sup> for water-source heat pumps (i.e., a minimum of 15% greater than the requirements in Table C403.3.2(2)).
- h Water economizer equipment shall have a capacity-weighted average cooling system efficiency that is 10% better than the requirements in Tables C403.3.2(8) and C403.3.2(9) (1.10 x values in Tables C403.3.2(8) and C403.3.2(9)).
- i Air economizer is not required for systems installed with water economizer plate and frame heat exchanger complying with previous codes between 1991 and June 2016, provided that the total fan coil load does not exceed the existing or added capacity of the heat exchangers.
- j For water-cooled process equipment where the manufacturers specifications require colder temperatures than available with waterside economizer, that portion of the load is exempt from the economizer requirements.
- k The air-cooled chiller shall have an IPLV efficiency that is a minimum of 10% greater than the IPLV requirements in EER in Table C403.3.2(7) (1.10 x IPLV values in EER in Table C403.3.2(7)).
- l The air-cooled chiller shall be multistage with a minimum of two compressors.
- m The water-cooled chiller shall have full load and part load IPLV efficiency that is a minimum of 5% greater than the IPLV requirements in Table C403.2.3(7).
- n The water-cooled chiller shall have an IPLV value that is a minimum of 15% lower than the IPLV requirements in Table C403.2.3(7) (1.15 x IPLV values in Table C403.3.2(7)). Water-cooled centrifugal chillers designed for nonstandard conditions shall have an NPLV value that is at least 15% lower than the adjusted maximum NPLV rating in kW per ton defined in Section C403.3.2.1 (1.15 x NPLV).
- o Economizer cooling shall be provided by adding a plate-frame heat exchanger on the waterside with a capacity that is a minimum of 20% of the chiller capacity at standard AHRI rating conditions.
- p Reserved.
- q Systems installed prior to 1991 without fully utilized capacity are allowed to comply with Option B, provided that the individual unit cooling capacity does not exceed 90,000 Btuh.

**C503.5 Service hot water systems.** New service hot water systems that are part of the alteration shall comply with Section C404.

**C503.6 Lighting, controlled receptacles and motors.** Alterations or the addition of lighting, electric receptacles and motors shall comply with Sections C503.6.1 through C503.6.6.

**C503.6.1 Luminaire additions and alterations.** Alterations that add or replace 50 percent or more of the luminaires in a space enclosed by walls or ceiling-height partitions, replace 50 percent or more of parking garage luminaires, or replace 50 percent or more of the total installed wattage of exterior luminaires shall comply with Sections C405.4 and C405.5. Where less than 50 percent of the fixtures in an interior space enclosed by walls or ceiling-height partitions or in a parking garage are added or replaced, or less than 50 percent of the installed exterior wattage is replaced, the installed lighting wattage shall be maintained or reduced.

**C503.6.2 Rewiring and recircuiting.** Where new wiring is being installed to serve added fixtures and/or fixtures are being relocated to a new circuit, controls shall comply with Sections C405.2.1, C405.2.3, C405.2.4, C405.2.5, C405.2.6, and as applicable C408.3. New lighting control devices shall comply with the requirements of Section C405.2.

**C503.6.3 New or moved lighting panel.** Where a new lighting panel (or a moved lighting panel) with all new raceway and conductor wiring from the panel to the fixtures is being installed, controls shall also comply with, in addition to the requirements of Section C503.6.2, all remaining requirements in Sections C405.2 and C408.3.

**C503.6.4 Newly-created rooms.** Where new walls or ceiling-height partitions are added to an existing space and create a new enclosed space, but the lighting fixtures are not being changed, other than being re-

located, the new enclosed space shall have controls that comply with Sections C405.2.1, C405.2.2, C405.2.3, C405.2.4, C405.2.5 and C408.3.

**C503.6.5 Motors.** Those motors which are altered or replaced shall comply with Section C405.8.

**C503.6.6 Controlled receptacles.** Where electric receptacles are added or replaced, controlled receptacles shall be provided in accordance with Section C405.10.

EXCEPTIONS:

1. Where an alteration project impacts an area smaller than 5,000 square feet, controlled receptacles are not required.
2. Where existing systems furniture or partial-height relocatable office cubical partitions are reconfigured or relocated within the same area, controlled receptacles are not required in the existing systems furniture or office cubicle partitions.
3. Where new or altered receptacles meet the exception to Section C405.10, they are not required to be controlled receptacles or be located within 12 inches of noncontrolled receptacles.

**C503.7 Refrigeration systems.** Those parts of systems which are altered or replaced shall comply with Section C410. Additions or alterations shall not be made to an existing refrigerated space or system that will cause the existing mechanical system to become out of compliance. All new refrigerated spaces or systems in existing buildings, including refrigerated display cases, shall comply with Section C410.

[Statutory Authority: RCW 19.27A.025, 19.27A.045 and chapter 19.27 RCW. WSR 20-21-080, § 51-11C-50300, filed 10/19/20, effective 2/1/21. Statutory Authority: RCW 19.27A.020, 19.27A.025, 19.27A.160 and chapter 19.27 RCW. WSR 19-24-040, § 51-11C-50300, filed 11/26/19, effective 7/1/20. Statutory Authority: RCW 19.27A.020, 19.27A.025 and chapters 19.27A and 19.27 RCW. WSR 19-02-089, § 51-11C-50300, filed 1/2/19, effective 7/1/19. Statutory Authority: RCW 19.27A.025, 19.27A.045, 19.27A.160, and 19.27.074. WSR 16-24-070, § 51-11C-50300, filed 12/6/16, effective 5/1/17; WSR 16-13-089, § 51-11C-50300, filed 6/15/16, effective 7/16/16. Statutory Authority: RCW 19.27A.025, 19.27A.160, and 19.27.074. WSR 16-03-072, § 51-11C-50300, filed 1/19/16, effective 7/1/16.]

**(Effective July 1, 2023)**

#### **WAC 51-11C-50300 Section C503—Alterations.**

**C503.1 General.** Alterations to any building or structure shall comply with the requirements of Section C503 and the code for new construction. Alterations to an existing building, building system or portion thereof shall conform to the provisions of this code as they relate to new construction without requiring the unaltered portions of the existing building or building system to comply with this code. Alterations shall be such that the existing building or structure is no less conforming with the provisions of this code than the existing building or structure was prior to the alteration. The additional energy efficiency credit requirements in Section C406.1 and the renewable energy requirements in Section C411 do not apply to alterations.

EXCEPTION:

- The following alterations need not comply with the requirements for new construction provided the energy use of the building is not increased:
1. Storm windows installed over existing fenestration.
  2. Surface applied window film installed on existing single pane fenestration assemblies to reduce solar heat gain provided the code does not require the glazing fenestration to be replaced.
  3. Existing ceiling, wall or floor cavities exposed during construction provided that these cavities are insulated to full depth with insulation having a minimum nominal value of R-3.0 per inch installed per Section C402.
  4. Construction where the existing roof, wall or floor cavity is not exposed.
  5. *Roof recover.*
  6. *Air barriers* shall not be required for *roof recover* and roof replacement where the *alterations* or renovations to the building do not include *alterations*, renovations or *repairs* to the remainder of the building envelope.

7. Replacement of existing doors that separate conditioned space from the exterior shall not require the installation of a vestibule or revolving door, provided however that an existing vestibule that separates a conditioned space from the exterior shall not be removed.

### **C503.2 Reserved.**

**C503.3 Building envelope.** New building envelope assemblies that are part of the alteration shall comply with Sections C402.1 through C402.5 and Sections C503.3.1 through C503.3.3.

EXCEPTION: Air leakage testing is not required for alterations and repairs, unless the project includes a change in space conditioning according to Section C503.2 or a change of occupancy or use according to Section C505.1.

**C503.3.1 Roof replacement.** *Roof replacements* shall comply with Table C402.1.3 or C402.1.4 where the existing roof assembly is part of the *building thermal envelope* and contains no insulation or the insulation is located entirely above the roof deck. In no case shall the *R*-value of the roof insulation be reduced or the *U*-factor of the roof assembly be increased as part of the *roof replacement*.

**C503.3.2 Vertical fenestration.** Alterations that include the addition of new vertical fenestration area shall comply with the following:

1. Where the addition of new *vertical fenestration* area results in a total building vertical fenestration area less than or equal to the maximum allowed by Section C402.4.1, the alteration shall comply with Section C402.4.

2. Where the addition of new *vertical fenestration* area result in a total building *vertical fenestration* area greater than the maximum allowed by Section C402.4.1 (regardless of the ratio prior to the addition), the alteration shall comply with one of the following:

2.1. Vertical fenestration alternate in accordance with Section C402.1.3 for the new vertical fenestration added.

2.2. Vertical fenestration alternate in accordance with Section C402.4.1.1 for the area adjacent to the new vertical fenestration added.

2.3. Existing building and alteration areas are combined to demonstrate compliance with the component performance alternate in accordance with Section C402.1.5 for the whole building. *U*-factors applied to existing envelope assemblies in the UA calculation shall comply with Section C501.2.1. The Proposed Total UA is allowed to be up to 110 percent of the Allowed Total UA.

2.4. Total building performance in accordance with Section C407 for the whole building. The total annual carbon emissions from energy consumption of the proposed design is allowed to be up to 110 percent of the annual carbon emissions from energy consumption allowed in accordance with Section C407.3.

EXCEPTION: Where *approved* by the *code official*, additional *fenestration* is permitted where sufficient envelope upgrades beyond those required by other sections of this code are included in the project so that the addition of new *vertical fenestration* does not cause an increase in the overall energy use of the building.

**C503.3.2.1 Replacement fenestration products.** Where some or all of an existing *fenestration* unit is replaced with a new *fenestration* product, including sash and glazing, the replacement *fenestration* unit shall meet the applicable requirements for *U*-factor and *SHGC* in Table C402.4.

EXCEPTION: An area-weighted average of the *U*-factor of replacement fenestration products being installed in the building for each fenestration product category listed in Table C402.4 shall be permitted to satisfy the *U*-factor requirements for each fenestration product category listed in Table C402.4. Individual fenestration products from different product categories listed in Table C402.4 shall not be combined in calculating the area-weighted average *U*-factor.

**C503.3.3 Skylights.** Alterations that include the addition of new skylight area shall comply with the following:

1. Where the addition of new *skylight* area results in a total building skylight area less than or equal to the maximum allowed by Section C402.4.1, the alteration shall comply with Section C402.4.

2. Where the addition of new *skylight* area results in a total building skylight area greater than the maximum allowed by Section C402.4.1 (regardless of the ratio prior to the addition), the alteration shall comply with one of the following:

2.1. Existing building and alteration area are combined to demonstrate compliance with the component performance alternative with target area adjustment in accordance with Section C402.1.5 for the whole building. *U*-factors applied to existing envelope assemblies in the UA calculation shall comply with Section C501.2.1. The Proposed Total UA is allowed to be up to 110 percent of the Allowed Total UA.

2.2. Total building performance in accordance with Section C407 for the whole building. The annual carbon emissions from energy consumption of the proposed design is allowed to be up to 110 percent of the annual carbon emissions from energy consumption allowed in accordance with Section C407.3.

EXCEPTION: Additional envelope upgrades are included in the project so the addition of new skylights does not cause a reduction in overall building energy efficiency, as approved by the code official.

**C503.4 Building mechanical systems.** Components of existing mechanical systems that are altered or replaced shall comply with Section C403, unless specifically exempted in this section, and Sections C408.2, C409.5, C501.2.2, C501.6, and C503.4.2 through C503.4.5. Additions or alterations shall not be made to an existing mechanical system that will cause the existing system to become out of compliance.

EXCEPTIONS:

1. Existing mechanical systems are not required to be modified to comply with Section C403.3.5 where mechanical cooling capacity is not added to a system that did not have cooling capacity prior to the alteration.
2. Compliance with Section C403.1.4 is not required where the alteration does not include replacement of a heating appliance.
3. Alternate mechanical system designs that are not in full compliance with this code may be approved when the code official determines that existing building constraints including, but not limited to, available mechanical space, limitations of the existing structure, or proximity to adjacent air intakes or exhausts makes full compliance impractical. Alternate designs shall include additional energy saving strategies not prescriptively required by this code for the scope of the project including, but not limited to, demand control ventilation, energy recovery, or increased mechanical cooling or heating equipment efficiency above that required by Tables C403.3.2(1) through C403.3.2(16).
4. Only those components of existing HVAC systems that are altered or replaced shall be required to comply with Section C403.8.1. Section C403.8.1 does not require the removal and replacement of existing system ductwork. Additional fan power allowances are available when determining the fan power budget (Fan kW<sub>budget</sub>) as specified in Table C503.4. These values can be added to the fan power allowance values in Tables C403.8.1.1(1) and C403.8.1.1(2) when calculating a new Fan kW<sub>budget</sub> for the fan system being altered. The additional fan power allowance is not applicable to alterations that add or change passive components which do not increase the fan system static pressure.

**Table C503.4  
Additional Fan Power Allowances (W/CFM)**

Airflow	Multi-Zone VAV Systems <sup>a</sup> ≤5,000 cfm	Multi-Zone VAV Systems <sup>a</sup> >5,000 and ≤10,000 cfm	Multi-Zone VAV Systems <sup>a</sup> >10,000 cfm	All Other Fan Systems ≤5,000 cfm	All Other Fan Systems >5,000 and ≤10,000 cfm	All Other Fan Systems >10,000 cfm
Supply Fan System additional allowance	0.135	0.114	0.105	0.139	0.120	0.107
Supply Fan System additional allowance in unit with adapter curb	0.033	0.033	0.043	0.000	0.000	0.000
Exhaust/ Relief/ Return/ Transfer Fan System additional allowance	0.070	0.061	0.054	0.070	0.062	0.055
Exhaust/ Relief/ Return/ Transfer Fan System additional allowance with adapter curb	0.016	0.017	0.220	0.000	0.000	0.000

<sup>a</sup> See definition of FAN SYSTEM, MULTI-ZONE VARIABLE AIR VOLUME (VAV).



**C503.4.1 New building mechanical systems.** All new mechanical systems and equipment in existing buildings shall comply with Sections C403, C408.2, C409.5, and C501.6.

**C503.4.2 Addition of cooling capacity.** Where mechanical cooling is added to a space that was not previously cooled, the mechanical system shall comply with either Section C403.3.5 or C403.5.

- EXCEPTIONS:**
1. Qualifying small equipment: Economizers are not required for cooling units and split systems serving one zone with a total cooling capacity rated in accordance with Section C403.3.2 of less than 33,000 Btu/h (hereafter referred to as qualifying small systems) provided that these are high-efficiency cooling equipment with SEER and EER values more than 15 percent higher than minimum efficiencies listed in Tables C403.3.2 (1), (2), (4), (8), (9), and (14), in the appropriate size category, using the same test procedures. Equipment shall be listed in the appropriate certification program to qualify for this exception. The total capacity of all qualifying small equipment without economizers shall not exceed 72,000 Btu/h per building, or 5 percent of the building total air economizer capacity, whichever is greater.
 

Notes and exclusions for Exception 1:

    - 1.1. The portion of the equipment serving Group R occupancies is not included in determining the total capacity of all units without economizers in a building.
    - 1.2. Redundant units are not counted in the capacity limitations.
    - 1.3. This exception shall not be used for the initial tenant improvement of a shell-and-core building or space, or for Total Building Performance in accordance with Section C407.
    - 1.4. This exception shall not be used for unitary cooling equipment installed outdoors or in a mechanical room adjacent to the outdoors.
  2. Chilled water terminal units connected to systems with chilled water generation equipment with IPLV values more than 25 percent higher than minimum part load equipment efficiencies listed in Table C403.3.2 (3), in the appropriate size category, using the same test procedures. Equipment shall be listed in the appropriate certification program to qualify for this exception. The total capacity of all systems without economizers shall not exceed 480,000 Btu/h per building, or 20 percent of the building total air economizer capacity, whichever is greater.
 

Notes and exclusions for Exception 2:

    - 2.1. The portion of the equipment serving Group R occupancy is not included in determining the total capacity of all units without economizers in a building.
    - 2.2. This exception shall not be used for the initial tenant improvement of a shell-and-core building or space, or for total building performance in accordance with Section C407.

**C503.4.3 Alterations or replacement of existing cooling systems.** Alterations to, or replacement of, existing mechanical cooling systems shall not decrease the building total economizer capacity unless the system complies with either Section C403.3.5 or C403.5. System alterations or replacement shall comply with Table C503.4.3 when either the individual cooling unit capacity or the building total capacity of all cooling equipment without economizer does not comply with the exceptions in Section C403.5. Equipment replacements that include space heating shall also comply with Section C503.4.3.

**Table C503.4.3  
Economizer Compliance Options for Mechanical Alterations**

	<b>Option A</b>	<b>Option B (alternate to A)</b>	<b>Option C (alternate to A)</b>	<b>Option D (alternate to A)</b>
<b>Unit Type</b>	<b>Any alteration with new or replacement equipment</b>	<b>Replacement unit of the same type with the same or smaller output capacity</b>	<b>Replacement unit of the same type with a larger output capacity</b>	<b>New equipment added to existing system or replacement unit of a different type</b>
1. Packaged Units	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>
2. Split Systems	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	For units ≤ 60,000 Btuh, comply with two of two measures: 1. Efficiency: + 10% <sup>c</sup> 2. Economizer: shall not decrease existing economizer capability	For units ≤ 60,000 Btuh replacing unit installed prior to 1991 comply with at least one of two measures: 1. Efficiency: + 10% <sup>c</sup> 2. Economizer: 50% <sup>f</sup>	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>
		For all other capacities: Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	For all other capacities: Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	
3. Water Source Heat Pump	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	For units ≤ 72,000 Btuh, comply with at least two of three measures: 1. Efficiency: +10% <sup>c</sup> 2. Flow control valve <sup>g</sup> 3. Economizer: 50% <sup>f</sup>	For units ≤ 72,000 Btuh, comply with at least three of three measures: 1. Efficiency: +10% <sup>c</sup> 2. Flow control valve <sup>g</sup> 3. Economizer: 50% <sup>f</sup> (except for certain pre-1991 systems <sup>h</sup> )	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup> (except for certain pre-1991 systems <sup>h</sup> )

	Option A	Option B (alternate to A)	Option C (alternate to A)	Option D (alternate to A)
<b>Unit Type</b>	<b>Any alteration with new or replacement equipment</b>	<b>Replacement unit of the same type with the same or smaller output capacity</b>	<b>Replacement unit of the same type with a larger output capacity</b>	<b>New equipment added to existing system or replacement unit of a different type</b>
		For all other capacities: Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	For all other capacities: Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	
4. Water Economizer using Air-Cooled Heat Rejection Equipment (Dry Cooler)	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	Efficiency: + 5% <sup>d</sup> Economizer: shall not decrease existing economizer capacity	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>
5. Air-Handling Unit (including fan coil units) where the system has an air-cooled chiller	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	Economizer: shall not decrease existing economizer capacity	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup> (except for certain pre-1991 systems <sup>q</sup> )	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup> (except for certain pre-1991 systems <sup>q</sup> )
6. Air-Handling Unit (including fan coil units) and Water-cooled Process Equipment, where the system has a water-cooled chiller <sup>10</sup>	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	Economizer: shall not decrease existing economizer capacity	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup> (except for certain pre-1991 systems <sup>q</sup> and certain 1991-2016 systems <sup>1</sup> )	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup> (except for certain pre-1991 systems <sup>q</sup> and certain 1991-2016 systems <sup>1</sup> )
7. Cooling Tower	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	No requirements	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>
8. Air-Cooled Chiller	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	Efficiency: + 10% <sup>k</sup> Economizer: shall not decrease existing economizer capacity	Efficiency: Comply with two of two measures: 1. + 10% <sup>k,l</sup> and 2. Multistage compressor(s) Economizer: shall not decrease existing economizer capacity	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>
9. Water-Cooled Chiller	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	Efficiency: Comply with at least one of two measures: 1. Part load IPLV + 15% <sup>n</sup> or 2. Plate frame heat exchanger <sup>o</sup> Economizer: shall not decrease existing economizer capacity	Efficiency: Comply with two of two measures: 1. Part load IPLV + 15% <sup>n</sup> 2. Plate-frame heat exchanger <sup>o</sup> Economizer: shall not decrease existing economizer capacity	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>
10. Package Terminal Air Conditioner	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	Efficiency: + 5% <sup>a</sup> Economizer: shall not decrease existing economizer capacity	Efficiency: + 5% <sup>a</sup> Economizer: shall not decrease existing economizer capacity	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>
11. Package Terminal Heat Pump	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	Cooling efficiency: + 5% <sup>d</sup> Heating efficiency: + 10% <sup>e</sup> Shall not decrease existing economizer capacity	Cooling efficiency: + 5% <sup>d</sup> Heating efficiency: + 10% <sup>e</sup> Shall not decrease existing economizer capacity	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>

- <sup>a</sup> Minimum equipment efficiency shall comply with Section C403.3.2 and the tables in Section C403.3.2.
- <sup>b</sup> All separate new equipment and replacement equipment shall have air economizer complying with Section C403.5 including both the individual unit size limits and the total building capacity limits on units without economizer. It is acceptable to comply using one of the exceptions to Section C403.5.
- <sup>c</sup> Reserved.
- <sup>d</sup> Equipment shall have a capacity-weighted average cooling system efficiency that is 5% better than the requirements in the tables in Section C403.3.2 (1.05 × values in the tables).
- <sup>e</sup> Equipment shall have a capacity-weighted average cooling system efficiency that is 10% better than the requirements in the tables in Section C403.3.2 (1.10 × values in the tables).
- <sup>f</sup> Minimum of 50% air economizer that is ducted in a fully enclosed path directly to every heat pump unit in each zone, except that ducts may terminate within 12 inches of the intake to an HVAC unit provided that they are physically fastened so that the outside air duct is directed into the unit intake. If this is an increase in the amount of outside air supplied to this unit, the outside air supply system shall be configured to provide this additional outside air and be equipped with economizer control.
- <sup>g</sup> Water-source heat pump systems shall have a flow control valve to eliminate flow through the heat pumps that are not in operation and variable speed pumping control complying with Section C403.4.3 for that heat pump.
  - When the total capacity of all units with flow control valves exceeds 15% of the total system capacity, a variable frequency drive shall be installed on the main loop pump.
  - As an alternate to this requirement, the capacity-weighted average cooling system efficiency shall be 5% better than the requirements in footnote <sup>e</sup> for water-source heat pumps (i.e., a minimum of 15% greater than the requirements in Table C403.3.2(14)).

- h Water economizer equipment shall have a capacity-weighted average cooling system efficiency that is 10% better than the requirements in Tables C403.3.2(7), C403.3.2(10), and C403.3.2(16) (1.10 × values in Tables C403.3.2(7), C403.3.2(10), and C403.3.2(16)).
- i Air economizer is not required for systems installed with water economizer plate and frame heat exchanger complying with previous codes between 1991 and June 2016, provided that the total fan coil load does not exceed the existing or added capacity of the heat exchangers.
- j For water-cooled process equipment where the manufacturers specifications require colder temperatures than available with waterside economizer, that portion of the load is exempt from the economizer requirements.
- k The air-cooled chiller shall have an IPLV efficiency that is a minimum of 10% greater than the IPLV requirements in EER in Table C403.3.2(3) (1.10 × IPLV values in EER in Table C403.3.2(3)).
- l The air-cooled chiller shall be multistage with a minimum of two compressors.
- m The water-cooled chiller shall have full load and part load IPLV efficiency that is a minimum of 5% greater than the IPLV requirements in Table C403.3.2(3).
- n The water-cooled chiller shall have an IPLV value that is a minimum of 15% lower than the IPLV requirements in Table C403.3.2(3) (1.15 × IPLV values in Table C403.3.2 (3)). Water-cooled centrifugal chillers designed for nonstandard conditions shall have an NPLV value that is at least 15% lower than the adjusted maximum NPLV rating in kW per ton defined in Section C403.3.2.3 (1.15 × NPLV).
- o Economizer cooling shall be provided by adding a plate-frame heat exchanger on the waterside with a capacity that is a minimum of 20% of the chiller capacity at standard AHRI rating conditions.
- p Reserved.
- q Systems installed prior to 1991 without fully utilized capacity are allowed to comply with Option B, provided that the individual unit cooling capacity does not exceed 90,000 Btuh.

**C503.4.4 Controls for cooling equipment replacement.** When space cooling equipment is replaced, controls shall comply with all requirements under Section C403.3.5 and related subsections, and Section C403.5.1 for integrated economizer control.

**C503.4.5 Mechanical equipment relocation.** Existing equipment currently in use may be relocated within the same floor or same tenant space if removed and reinstalled within the same permit.

**C503.4.6 Addition or replacement of heating appliances.** Where a mechanical heating appliance is added or replaced, the added or replaced appliance shall comply with Section C403.1.4 or with an alternate compliance option in Table C503.4.6.

- EXCEPTIONS:
1. Terminal unit equipment including, but not limited to, hydronic VAV boxes, electric resistance VAV boxes, electric duct heaters, water source heat pumps, fan coils, or VRF indoor units that are served by an unaltered central system.
  2. Air handling equipment with hydronic coils.
  3. Air handling equipment designed for 100 percent outdoor air that is not subject to the requirements in Section C403.3.5 or that qualifies for an exception to Section C403.3.5.
  4. Replacement of existing oil-fired boilers.
  5. Replacement of existing steam boilers with steam distribution to terminal units and the associated boiler feed equipment.
  6. Where compliance with Section C403.1.4 would trigger an unplanned utility electrical service upgrade based on the NEC 220.87 method for determining existing loads.
  7. Like-for-like replacement of a single heating appliance is permitted where that appliance is failing, requires immediate replacement, and where no other HVAC work is planned.

**Table C503.4.6  
Compliance Options for Mechanical Heating Equipment Alterations**

	<b>Proposed Heating Equipment Type<sup>a</sup></b>	<b>Heating Efficiency Table Reference</b>	<b>Alternate Compliance Options to Section C403.1.4</b>
1	Air-Cooled Unitary Heat Pumps	Table C403.3.2(2)	1. Compliance with C403.1.4, except heat pump rated capacity in accordance with Section C403.1.4 exception 5d is permitted to be sized equal to the supplemental internal resistance heating capacity in Climate Zone 4 or 5 <sup>c</sup> 2. Compliance with C403.1.4, except electric resistance mixed air preheat is permissible <sup>c</sup>
2	Packaged terminal, single-package vertical, and room air-conditioner heat pumps	Table C403.3.2(4)	1. Compliance with C403.1.4, except heat pump rated capacity in accordance with Section C403.1.4 Exception 5d is permitted to be sized equal to the supplemental internal resistance heating capacity in Climate Zone 4 or 5
3	Furnaces, duct furnaces, and unit heaters	Table C403.3.2(5)	1. Efficiency: +10% <sup>b</sup>
4	Gas-fired hot water boilers with fewer than 80% of served coils replaced	Table C403.3.2(6)	1. Efficiency: +10% <sup>b</sup>

	<b>Proposed Heating Equipment Type<sup>a</sup></b>	<b>Heating Efficiency Table Reference</b>	<b>Alternate Compliance Options to Section C403.1.4</b>
5	Variable refrigerant flow air-to-air and applied heat pumps	Table C403.3.2(9)	No alternate compliance option
6	DX-DOAS equipment	Table C403.3.2(12) and Table C403.3.2(13)	1. DX-DOAS is provided with heat recovery if not required by C403.3.5.1.
7	Water-source heat pumps	Table C403.3.2(14)	No alternate compliance option

<sup>a</sup> Includes replacement of equipment with a unit that is the same type or higher efficiency and the same or lower capacity, or a replacement of one equipment type with a different equipment type.

<sup>b</sup> Equipment shall have a capacity-weighted average heating system efficiency that is 10 percent better than that shown in the reference table (1.10 x values in reference table).

<sup>c</sup> Option 1 and Option 2 can be combined.

**C503.4.6.1 Hydronic system alteration supply water temperature.** Hydronic heating coils and appliances subject to Section C503.4.5 or Section C503.4.6 shall comply with Section C403.3.7.2.

**C503.5 Service water heating equipment.** All new service water heating systems, equipment, and components of existing systems that are altered or replaced shall comply with Section C404, C408.3, C409.5, and C501.6. Additions or alterations shall not be made to an existing service water heating system that will cause the existing system to become out of compliance.

EXCEPTION:

The following equipment is not required to comply with Section C404.2.1:

1. Replacement of a single electric resistance or fuel-fired service water heating appliance with a unit that is the same type and has the same or higher efficiency and the same or lower capacity, provided there are no other alterations made to the existing service water heating system size or configuration.

2. Replacement of any of the following water heater appliances:

2.1. Electric water heaters with an input of 12 kW or less.

2.2. Gas storage water heaters with an input of 75,000 Btu/h or less.

2.3. Gas instantaneous water heaters with an input of 200,000 Btu/h or less and 2 gallons or less of storage.

3. Where it has been determined by the code official that existing building constraints including, but not limited to, available floor space or ceiling height, limitations of the existing structure, or electrical service capacity, make compliance technically infeasible.

**C503.6 Pools and permanent spas.** All new systems and equipment serving pools and permanent spas and components of existing systems that are altered or replaced, shall comply with Sections C404.11, C408.3, C409.5, and C501.6. Additions or alterations shall not be made to an existing system serving a pool or spa that will cause the existing system to become out of compliance.

**C503.7 Electrical power and lighting systems and motors.** Alterations or the addition of lighting, receptacles and motors shall comply with Sections C503.7.1 through C503.7.7. Additions or alterations shall not be made to an existing lighting or electrical system that will cause the existing system to become out of compliance.

**C503.7.1 New lighting systems and controls.** All new interior and exterior lighting systems within an existing building site shall be provided with lighting controls in accordance with Section C405.2 and shall comply with C408.4, C409.5, and C501.6.

**C503.7.2 Luminaire additions and alterations.** Alterations that add or replace 20 percent or more of the luminaires in a space enclosed by walls or ceiling-height partitions, replace 20 percent or more of parking garage luminaires, or replace 20 percent or more of the total installed wattage of exterior luminaires shall comply with Sections C405.4 and C405.5. Exterior power allowance shall be determined using the specific area allowances for the areas altered and shall not include the base site allowance. Where less than 20 percent of the fixtures in an interior space enclosed by walls or ceiling-height parti-

tions or in a parking garage are added or replaced, or less than 20 percent of the installed exterior wattage is replaced, the installed lighting wattage shall be maintained or reduced.

**C503.7.3 Rewiring and recircuiting.** Where new wiring is being installed to serve added fixtures and/or fixtures are being relocated to a new circuit, lighting controls shall comply with all applicable requirements in accordance with Sections C405.2.1, C405.2.3, C405.2.4, C405.2.5, C405.2.6, C405.2.7, C405.2.8, C408.4, and C501.6.

**C503.7.4 New or moved lighting panel.** Where a new lighting panel (or a moved lighting panel) with all new raceway and conductor wiring from the panel to the fixtures is being installed, lighting controls shall also comply with, in addition to the requirements of Section C503.7.3, all remaining requirements in Sections C405.2, C408.4, and C501.6.

**C503.7.5 Newly-created rooms.** Where new walls or ceiling-height partitions are added to an existing space and create a new enclosed space, but the lighting fixtures are not being changed, other than being relocated, the new enclosed space shall have lighting controls that comply with all applicable requirements in accordance with Sections C405.2.1, C405.2.2, C405.2.3, C405.2.4, C405.2.5, C405.2.6, C408.4 and C501.6.

**C503.7.6 Motors.** Motors that are altered or replaced shall comply with Section C405.8.

**C503.7.7 Controlled receptacles.** Where electric receptacles are added or replaced, controlled receptacles shall be provided in accordance with Section C405.10 and shall comply with Sections C408.4 and C501.6.

**EXCEPTIONS:**

1. Where an alteration project impacts an area smaller than 5,000 square feet, controlled receptacles are not required.
2. Where existing systems furniture or partial-height relocatable office cubical partitions are reconfigured or relocated within the same area, controlled receptacles are not required in the existing systems furniture or office cubicle partitions.
3. Where new or altered receptacles meet the exception to Section C405.10, they are not required to be controlled receptacles or be located within 12 inches of noncontrolled receptacles.

**C503.8 Refrigeration systems.** Components of existing refrigeration systems that are altered or replaced shall comply with Sections C408.7, C410 and C501.6. Additions or alterations shall not be made to an existing refrigeration system that will cause the existing system to become out of compliance. All new refrigerated spaces and refrigeration systems and equipment in existing buildings, including new refrigerated display cases, shall comply with Sections C408.7, C409.5, C410 and C501.6.

[Statutory Authority: RCW 19.27A.020, 19.27A.025, 19.27A.160 and chapters 19.27A and 19.27 RCW. WSR 22-14-091, § 51-11C-50300, filed 7/1/22, effective 7/1/23. Statutory Authority: RCW 19.27A.025, 19.27A.045 and chapter 19.27 RCW. WSR 20-21-080, § 51-11C-50300, filed 10/19/20, effective 2/1/21. Statutory Authority: RCW 19.27A.020, 19.27A.025, 19.27A.160 and chapter 19.27 RCW. WSR 19-24-040, § 51-11C-50300, filed 11/26/19, effective 7/1/20. Statutory Authority: RCW 19.27A.020, 19.27A.025 and chapters 19.27A and 19.27 RCW. WSR 19-02-089, § 51-11C-50300, filed 1/2/19, effective 7/1/19. Statutory Authority: RCW 19.27A.025, 19.27A.045, 19.27A.160, and 19.27.074. WSR 16-24-070, § 51-11C-50300, filed 12/6/16, effective 5/1/17; WSR 16-13-089, § 51-11C-50300, filed 6/15/16, effective 7/16/16. Statutory Authority: RCW 19.27A.025, 19.27A.160, and 19.27.074. WSR 16-03-072, § 51-11C-50300, filed 1/19/16, effective 7/1/16.]