

PART **3**

Commercial Energy Provisions: Existing Buildings

Chapter 5

■ Chapter 5 Existing Buildings

Chapter 5 of the *International Energy Conservation Code (IECC)* focuses on existing buildings and structures, addressing alterations, repairs, additions and changes of occupancy. This chapter requires the application of provisions from Chapter 4 to maintain the energy efficiency of existing buildings during the renovation or alteration process. Chapter 5 also addresses the maintenance of buildings and structures and the preservation of historic buildings. ■

C 502.3.7, C 503.6

Additional Energy Efficiency Credit Requirements

C 502.3.8

Renewable Energy Systems

C 505.2

Energy Use Intensities



C502.3.7, C503.6

Additional Energy Efficiency Credit Requirements

CHANGE TYPE: Addition

CHANGE SUMMARY: Additions and alterations must earn additional energy efficiency credits.

2024 CODE TEXT: C502.3.7 Additional energy efficiency credit requirements. Additions shall comply with sufficient measures from Sections C406.2 and C406.3 to achieve not less than 50 percent of the number of required efficiency credits from Table C406.1.1(1) based on building occupancy group and climate zone. Where a project contains multiple occupancies, credits from Table C406.1.1(1) for each building occupancy shall be weighted by the gross floor area to determine the project weighted average energy credits required. Accessory occupancies shall be included with the primary occupancy group for purposes of this section. Alterations to the existing building that are not part of the addition, but are permitted with an addition, shall be permitted to be used to achieve the required credits.

Exceptions:

1. Buildings in Group U (Utility and Miscellaneous), Group S (Storage), Group F (Factory), Group H (High-Hazard).
2. Additions less than 1,000 square feet (93 m²) and less than 50 percent of existing floor area.
3. Additions that do not include the addition or replacement of equipment covered by Tables C403.3.2(1) through C403.3.2(16) or Section C404.2.
4. Additions that do not increase conditioned space.
5. Where the addition alone or the existing building and addition together comply with Section C407.

C503.6 Additional energy efficiency credit requirements for alterations. Alterations that are substantial improvements shall comply with measures from Sections C406.2, C406.3 or both to earn the number of required



Alterations that are substantial improvements must achieve the same number of energy credits as new construction.

credits specified in Table C406.1.1(1) based on building occupancy group and climate zone. Where a project contains multiple occupancies, credits specified in Table C406.1.1(1) for each building occupancy shall be weighted by the gross conditioned floor area to determine the weighted average credits required. Accessory occupancies, other than Group F or H, shall be included with the primary occupancy group for the purposes of this section.

Exceptions:

1. Alterations that do not contain conditioned space.
2. Portions of buildings devoted to manufacturing or industrial use.
3. Alterations to buildings where the building after the alteration complies with Section C407.
4. Alterations that are permitted with an addition complying with Section C502.3.7.

CHANGE SIGNIFICANCE: According to the most recent Commercial Building Energy Survey, there were over 5.9 million commercial buildings in the US in 2018, with a total of over 96.4 billion square feet of floorspace. Together, these buildings consume over 6.8 quadrillion Btus of energy annually. To ensure existing buildings also achieve energy savings, the 2024 IECC now includes requirements for additions and alterations to earn energy credits. Additional energy efficiency credits (Section C406) allow designers and building owners to meet the energy savings requirements of the IECC in a flexible way. Energy credit options have undergone a significant transformation in the 2024 IECC (see Significant Change for Section C406.1 for full summary), expanding to include more base energy credit options than all previous versions as well as new renewable and load management credits.

Additions are required to earn at least half as many base energy credits as are required for new construction. Designers can achieve these credits by selecting from the 32 base energy credit options or from the eight renewable and load management credits. However, renewable and load management credits are not required for additions, even those over 5,000 square feet.

Alterations that are substantial improvements, as defined in the IECC, must achieve the same number of energy credits as new construction. As with additions, alterations are only required to earn base energy credits—not renewable and load management credits—although selecting from these options counts towards the total number of energy credits required.

There are a number of exceptions for additions and alterations that exempt the improvements from earning energy credits. Notably, projects complying with the Simulated Building Performance compliance option, Section C407, are exempt. This is because energy credits are included in the calculation for Simulated Building Performance compliance. Additionally, this exception makes it clear that existing buildings may comply with the code using the performance compliance path and are not required to comply prescriptively.

C502.3.8

Renewable Energy Systems

CHANGE TYPE: Addition

CHANGE SUMMARY: Additions are required to install a renewable energy system on-site or procure off-site renewable energy.

2024 CODE TEXT: **C502.3.8 Renewable energy systems.** Additions shall comply with Section C405.15 for the addition alone.

CHANGE SIGNIFICANCE: The requirement for renewable energy systems is new to the 2024 IECC, both for new construction and additions to existing building (see Significant Change for Section C405.15). For additions, the amount of required on-site renewable energy is calculated based on the square footage of the addition only. In some cases, the addition will qualify for one or more of the exceptions to Section C405.15.1, in which case off-site renewable energy must be procured from one of the six options outlined in Section C405.15.2.1.



Additions must meet the new construction requirement for renewable energy systems based on the square footage of the addition alone. This PV system, installed at ASHRAE's headquarters in Georgia, was a key strategy for achieving net zero energy in an existing building.

CHANGE TYPE: Modification

CHANGE SUMMARY: Provisions for occupancy changes are updated to apply energy use intensity rankings to determine when systems must comply with new construction requirements.

C505.2

Energy Use Intensities

2024 CODE TEXT: **C505.2 Energy use intensities.** Building thermal envelope, space heating, cooling, ventilation, lighting and service water heating shall comply with Sections C505.2.1 through C505.2.4.

Exceptions:

1. Where it is demonstrated by analysis approved by the code official that the change will not increase energy use intensity.
2. Where the occupancy or use change is less than 5,000 square feet (465 m²) in area.

C505.2.1 Building thermal envelope. Where a change of occupancy or use is made to a whole building that results in a fenestration area greater than the maximum fenestration area allowed by Section C402.5.1, the building shall comply with Section C402.1.4, with a proposed UA that shall be not greater than 110 percent of the target UA.

Exception: Where the change of occupancy or use is made to a portion of the building, the new occupancy is exempt from Section C402.5.1, provided that there is not an increase in fenestration area.

C505.2.2 Building mechanical systems. Where a change of occupancy or use results in the same or increased energy use intensity rank as specified in Table C505.2.2, the systems serving the building or space undergoing the change shall comply with Section C403.



Where the energy use intensity rank is the same or higher for a change of occupancy, the systems must be updated to the requirements for new construction.

TABLE C505.2.2 Building Mechanical Systems

Energy Use Intensity Rank	International Building Code Occupancy Classification and Use
High	A-2, B (laboratories), I-2
Medium	A-1, A-3, ^a A-4, A-5, B, ^b E, I-1, I-3, I-4, M, R-4
Low	A-3 (places of religious worship), R-1, R-2, R-3, ^c S-1, S-2

a. Excluding places of religious worship.

b. Excluding laboratories.

c. Buildings three stories or less in height above grade plane shall comply with Section R505.

C505.2.3 Service water heating. Where a change of occupancy or use results in the same or increased energy use intensity rank as specified in Table C505.2.3, the service water heating systems serving the building or space undergoing the change shall comply with Section C404.

TABLE C505.2.3 Service Water Heating

Energy Use Intensity Rank	International Building Code Occupancy Classification and Use
High	A-2, I-1, I-2, R-1
Low	All other occupancies and uses

C505.2.4 Lighting. Where a change of occupancy or use results in the same or increased energy use intensity rank as specified in Table C505.2.4, the lighting systems serving the building or space undergoing the change shall comply with Section C405 except for Sections C405.2.6 and C405.4.

TABLE C505.2.4—LIGHTING

Energy Use Intensity Rank	International Building Code Occupancy Classification and Use
High	B (laboratories), B (outpatient healthcare), I-2, M
Medium	A-2, A-3 (courtrooms), B, ^a I-1, I-3, I-4, R-1, R-2, R-3, ^b R-4, S-1, S-2
Low	A-1, A-3, ^c A-4, E

a. Excluding laboratories and outpatient healthcare.

b. Buildings three stories or less in height above grade plane shall comply with Section R505.

c. Excluding courtrooms.

CHANGE SIGNIFICANCE: The newly revised charging language for Section C505 details a number of scenarios where changes of occupancies or use will instead follow the requirements for alterations. These include changes of occupancy from Group F, H, S or U as well as any buildings undergoing alterations and a change of occupancy simultaneously. The requirements for all other changes of