

# CHAPTER 5

## REPAIRS

### SECTION 501 GENERAL

**501.1 Scope.** Repairs as described in Section 402 shall comply with the requirements of this chapter. Repairs to historic buildings shall comply with this chapter, except as modified in Chapter 11.

**501.2 Conformance.** The work shall not make the building less conforming than it was before the *repair* was undertaken.

**501.3 Flood hazard areas.** In flood hazard areas, repairs that constitute *substantial improvement* shall require that the building comply with Section 1612 of the *International Building Code*.

### SECTION 502 BUILDING ELEMENTS AND MATERIALS

**502.1 Existing building materials.** Materials already in use in a building in conformance with requirements or approvals in effect at the time of their erection or installation shall be permitted to remain in use unless determined by the *code official* to render the building or structure unsafe or *dangerous* as defined in Chapter 2.

**502.2 New and replacement materials.** Except as otherwise required or permitted by this code, materials permitted by the applicable code for new construction shall be used. Like materials shall be permitted for repairs and alterations, provided no *dangerous* or *unsafe* condition, as defined in Chapter 2, is created. Hazardous materials, such as asbestos and lead-based paint, shall not be used where the code for new construction would not permit their use in buildings of similar occupancy, purpose and location.

**502.3 Glazing in hazardous locations.** Replacement glazing in hazardous locations shall comply with the safety glazing requirements of the *International Building Code* or *International Residential Code* as applicable.

**Exception:** Glass block walls, louvered windows, and jalousies repaired with like materials.

### SECTION 503 FIRE PROTECTION

**503.1 General.** Repairs shall be done in a manner that maintains the level of fire protection provided.

### SECTION 504 MEANS OF EGRESS

**504.1 General.** Repairs shall be done in a manner that maintains the level of protection provided for the means of egress.

### SECTION 505 ACCESSIBILITY

**505.1 General.** Repairs shall be done in a manner that maintains the level of accessibility provided.

### SECTION 506 STRUCTURAL

**506.1 General.** Structural repairs shall be in compliance with this section and Section 501.2. Regardless of the extent of structural or nonstructural damage, *dangerous* conditions shall be eliminated. Regardless of the scope of *repair*, new structural members and connections used for *repair* or rehabilitation shall comply with the detailing provisions of the *International Building Code* for new buildings of similar structure, purpose and location.

**506.2 Repairs to damaged buildings.** Repairs to damaged buildings shall comply with this section.

**506.2.1 Repairs for less than substantial structural damage.** For damage less than *substantial structural damage*, the damaged elements shall be permitted to be restored to their predamage condition.

**506.2.2 Repairs for substantial structural damage to vertical elements of the lateral-force-resisting system.** A building that has sustained *substantial structural damage* to the vertical elements of its lateral-force-resisting system shall be evaluated in accordance with Section 506.2.2.1, and either repaired in accordance with Section 506.2.2.2 or repaired and rehabilitated in accordance with Section 506.2.2.3 depending on the results of the evaluation.

**506.2.2.1 Evaluation.** The building shall be evaluated by a registered design professional, and the evaluation findings shall be submitted to the *code official*. The evaluation shall establish whether the damaged building, if repaired to its predamaged state, would comply with the provisions of the *International Building Code*, except that the seismic design criteria shall be the reduced IBC level seismic forces specified in Section 101.5.4.2.

**506.2.2.2 Extent of repair for compliant buildings.** If the evaluation establishes that the building in its predamage condition complies with the provisions of Section 506.2.2.1, then the damaged elements shall be permitted to be restored to their predamage condition.

**506.2.2.3 Extent of repair for noncompliant buildings.** If the evaluation does not establish that the building in its predamage condition complies with the provisions of Section 506.2.2.1, then the building shall be rehabilitated to comply with the provisions of this section. The wind load for the *repair* and rehabilitation shall be those required by the building code in effect at the time of original construction, unless the damage was caused by wind, in which case the wind loads shall be in accordance

with the *International Building Code*. The seismic loads for this rehabilitation design shall be those required by the building code in effect at the time of original construction, but not less than the reduced-level seismic forces specified in Section 101.5.4.2.

**506.2.3 Substantial structural damage to gravity load-carrying components.** Gravity load-carrying components that have sustained *substantial structural damage* shall be rehabilitated to comply with the applicable provisions for dead and live loads in the *International Building Code*. Snow loads shall be considered if the *substantial structural damage* was caused by or related to snow load effects. Undamaged gravity load-carrying components that receive dead, live or snow loads from rehabilitated components shall also be rehabilitated if required to comply with the design loads of the rehabilitation design.

**506.2.3.1 Lateral-force-resisting elements.** Regardless of the level of damage to gravity elements of the lateral-force-resisting system, if substantial structural damage gravity load-carrying components was caused primarily by wind or seismic effects, then the building shall be evaluated in accordance with Section 506.2.2.1 and, if noncompliant, rehabilitated in accordance with Section 506.2.2.3.

**506.2.4 Flood hazard areas.** In flood hazard areas, buildings that have sustained *substantial damage* shall be brought into compliance with Section 1612 of the *International Building Code*.

## SECTION 507 ELECTRICAL

**507.1 Material.** Existing electrical wiring and equipment undergoing *repair* shall be allowed to be repaired or replaced with like material.

**507.1.1 Receptacles.** Replacement of electrical receptacles shall comply with the applicable requirements of Section 406.3(D) of NFPA 70.

**507.1.2 Plug fuses.** Plug fuses of the Edison-base type shall be used for replacements only where there is no evidence of over fusing or tampering per applicable requirements of Section 240.51(B) of NFPA 70.

**507.1.3 Nongrounding-type receptacles.** For replacement of nongrounding-type receptacles with grounding-type receptacles and for branch circuits that do not have an equipment grounding conductor in the branch circuitry, the grounding conductor of a grounding-type receptacle outlet shall be permitted to be grounded to any accessible point on the grounding electrode system or to any accessible point on the grounding electrode conductor in accordance with Section 250.130(C) of NFPA 70.

**507.1.4 Group I-2 receptacles.** Non-“hospital grade” receptacles in patient bed locations of Group I-2 shall be replaced with “hospital grade” receptacles, as required by NFPA 99 and Article 517 of NFPA 70.

**507.1.5 Grounding of appliances.** Frames of electric ranges, wall-mounted ovens, counter-mounted cooking

units, clothes dryers and outlet or junction boxes that are part of the existing branch circuit for these appliances shall be permitted to be grounded to the grounded circuit conductor in accordance with Section 250.140 of NFPA 70.

## SECTION 508 MECHANICAL

**508.1 General.** Existing mechanical systems undergoing *repair* shall not make the building less conforming than it was before the *repair* was undertaken.

**508.2 Mechanical draft systems for manually fired appliances and fireplaces.** A mechanical draft system shall be permitted to be used with manually fired appliances and fireplaces where such a system complies with all of the following requirements:

1. The mechanical draft device shall be listed and installed in accordance with the manufacturer’s installation instructions.
2. A device shall be installed that produces visible and audible warning upon failure of the mechanical draft device or loss of electrical power at any time that the mechanical draft device is turned on. This device shall be equipped with a battery backup if it receives power from the building wiring.
3. A smoke detector shall be installed in the room with the appliance or fireplace. This device shall be equipped with a battery backup if it receives power from the building wiring.

## SECTION 509 PLUMBING

**509.1 Materials.** Plumbing materials and supplies shall not be used for repairs that are prohibited in the *International Plumbing Code*.

**509.2 Water closet replacement.** The maximum water consumption flow rates and quantities for all replaced water closets shall be 1.6 gallons (6 L) per flushing cycle.

**Exception:** Blowout-design water closets [3.5 gallons (13 L) per flushing cycle].