

# Appendix J: Existing Buildings and Structures

*(The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.)*

## General Comments

Appendix J contains the provisions for the repair, renovation, alteration and reconstruction of existing buildings and structures that are within the scope of the International Residential Code® (IRC®). The appendix, when adopted, includes or refers to all code requirements for existing buildings. The format of the appendix readily identifies the alternative methods of code compliance, developed to provide consistency with the purpose of the code.

Section AJ101 sets forth the intent and purpose of the appendix. Section AJ102 contains methods to obtain compliance with the appendix. Section AJ103 establishes the use of a preliminary meeting to discuss the proposed work. Section AJ104 sets forth the potential means for investigating and evaluating an existing building. Section AJ105 requires the identification of a work area on the permit. Section AJ201 establishes definitions for specific terms used in the appendix. Section AJ301 regulates repairs of existing buildings and structures. Section AJ401 addresses renovations of existing buildings and structures. Section AJ501 regulates alterations to existing buildings and structures, and Section

AJ601 establishes requirements for reconstruction work in existing buildings and structures.

## Purpose

Many existing residential buildings do not meet the code requirements that currently apply to new construction. Although these buildings are potentially salvageable, rehabilitation is often cost prohibitive because the building may not comply with all aspects of new construction requirements. At the same time, it is necessary to regulate construction activity in existing buildings that undergo repair, renovation, alteration, or reconstruction. Such activity represents an opportunity for the jurisdiction to determine both that new work conforms to the code (or the intent of the code) and that existing conditions either remain at their current level of compliance or are improved. To accomplish this objective and to make the rehabilitation process more available, this chapter allows for a controlled departure from full code compliance without compromising minimum life safety, fire safety, structural and environmental features of the rehabilitated building.

## SECTION AJ101 PURPOSE AND INTENT

**AJ101.1 General.** The purpose of these provisions is to encourage the continued use or reuse of legally existing buildings and structures. These provisions are intended to permit work in existing buildings that is consistent with the purpose of this code. Compliance with these provisions shall be deemed to meet the requirements of this code.

❖ This section allows for residential structures to continue their existing use while permitting repair, renovation, alteration or reconstruction work that may not be in full compliance with the general provisions of the code. Although strict compliance with the general requirements in the code may be modified by the provisions of this chapter, the resultant work will be consistent with the intent and purpose criteria set forth in Chapter 1. As a rule, the general requirements of the code are applicable unless modified by the provisions of this appendix. Upon compliance with the provisions of this appendix, the work meets the requirements of the code.

**AJ101.2 Classification of work.** For purposes of this appendix, work in existing buildings shall be classified into the categories of repair, renovation, *alteration* and reconstruction. Specific requirements are established for each category of work in these provisions.

❖ This appendix addresses four unique and specific types of work that may occur on an existing residential structure. Each type is regulated independently based on the provisions of the chapter. Repairs, where work is performed to restore a building element or system back to working order, are regulated by Section AJ301. Renovation, the act of restoring a building element to its original condition, is addressed in Section AJ401. Section AJ501 deals with alterations, where elements, components or systems of the building are modified using new materials and methods, and Section AJ601 addresses reconstruction of existing building elements. Although these areas seem to overlap in their scope, each has unique characteristics that are identified and regulated by this appendix.

**AJ101.3 Multiple categories of work.** Work of more than one category shall be part of a single work project. Related work permitted within a 12-month period shall be considered to be a single work project. Where a project includes one category of work in one building area and another category of work in a separate and unrelated area of the building, each project area shall comply with the requirements of the respective category of work. Where a project with more than one category of work is performed in the same area or in related areas of the building, the project shall comply with the requirements of the more stringent category of work.

- ❖ It is not uncommon for two or more types of construction activity to be taking place at the same time, as part of a single work project. Under such conditions, there are two situations that may occur: 1. Where the categories of work are isolated in different areas of the building and unrelated to each other, each project area is regulated by the specific requirements of the work being performed; or 2. Where the multiple categories of work occur in the same project area, the more restrictive provisions of the categories apply.

## SECTION AJ102 COMPLIANCE

**AJ102.1 General.** Regardless of the category of work being performed, the work shall not cause the structure to become unsafe or adversely affect the performance of the building; shall not cause an existing mechanical or plumbing system to become unsafe, hazardous, insanitary or overloaded; and unless expressly permitted by these provisions, shall not make the building any less compliant with this code or to any previously *approved* alternative arrangements than it was before the work was undertaken.

- ❖ The general limitation on any work done under the provisions of this chapter is that the level of safety, health and public welfare of the existing building must not be reduced by any work being performed. In the case of structural stability, the existing degree of structural strength must be maintained or increased. In general terms, the structure is not to be made unsafe. This requirement can be broadly interpreted because its application can vary case by case. To the extent that existing mechanical and plumbing systems are involved, the level of protection or sanitation must not be reduced.

Where this appendix chapter does not specifically modify the general provisions of the code, such provisions are applicable and conformance is required. Only in those areas where this chapter addresses specific materials or methods for specific elements, components or systems do the general code requirements not apply.

**AJ102.2 Requirements by category of work.** Repairs shall conform to the requirements of Section AJ301. Renovations shall conform to the requirements of Section AJ401. *Alterations* shall conform to the requirements of Section AJ501

and the requirements for renovations. Reconstructions shall conform to the requirements of Section AJ601 and the requirements for *alterations* and renovations.

- ❖ Depending on the category of work being performed, conformance to one or more groups of requirements is necessary. If the work is simply a repair job or a renovation, only the provisions of Section AJ301 or AJ401, respectively, are applicable. If the building is to undergo an alteration, the requirements of both Sections AJ401 and AJ501 must be applied. Section AJ601 must be used for reconstruction work.

**AJ102.3 Smoke detectors.** Regardless of the category of work, smoke detectors shall be provided where required by Section R314.3.1.

- ❖ The benefit of smoke detectors in residential buildings is unquestioned. Occupants of such buildings spend about one-third of the day asleep. The potential for a fire getting out of control before the occupants are awakened is quite probable, as reflected in statistics that indicate residential fire deaths far exceed those of any other building classification. As a result, the general provisions of Section R313.2.1 for smoke alarms are applicable in all cases and for all categories of work. This includes specific requirements where a dwelling unit undergoes interior alterations or repairs.

**AJ102.4 Replacement windows.** Regardless of the category of work, where an existing window, including the sash and glazed portion, or safety glazing is replaced, the replacement window or safety glazing shall comply with the requirements of Sections AJ102.4.1 through AJ102.4.3, as applicable.

- ❖ Replacement windows must comply with the applicable provisions for energy efficiency, safety glazing and emergency escape and rescue openings contained in Sections AJ102.4.1, AJ102.4.2 and AJ102.4.3.

**AJ102.4.1 Energy efficiency.** Replacement windows shall comply with the requirements of Chapter 11.

- ❖ Under all circumstances, a replacement window must comply with the energy efficiency provisions of Chapter 11. The provision is applicable only where the entire window is changed out, including the sash and glazing. Where such conditions exist, the new window is to have a maximum fenestration *U*-factor in compliance with Chapter 11. If the replacement window is in a hazardous location, safety glazing complying with Section R308 must be installed.

**AJ102.4.2 Safety glazing.** Replacement glazing in hazardous locations shall comply with the safety glazing requirements of Section R308.

- ❖ Just as for windows used in new construction, the glazing in replacement windows must comply with the safety glazing requirements of Section R308.

**AJ102.4.3 Emergency escape and rescue openings.** Where windows are required to provide emergency escape and rescue openings, replacement windows shall be exempt from the maximum sill height requirements of Section R310.1 and the

requirements of Sections R310.1.1, R310.1.2, R310.1.3 and R310.2 provided that the replacement window meets the following conditions:

1. The replacement window is the manufacturer's largest standard size window that will fit within the existing frame or existing rough opening. The replacement window shall be permitted to be of the same operating style as the existing window or a style that provides for an equal or greater window opening area than the existing window.
  2. The replacement window is not part of a change of occupancy.
  3. Window opening control devices complying with ASTM F2090 shall be permitted for use on windows required to provide emergency escape and rescue openings.
- ❖ The emergency escape and rescue opening requirements for replacement windows are not as stringent as those for windows that are used in new construction. Most of these differences are due to the fact that it is often difficult and cost prohibitive to change the opening size of windows in order to comply with current opening requirements that may differ significantly from the code under which a dwelling was originally built. Replacement windows are not required to comply with the sill height requirements of Section R310.1 and the requirements of Sections R310.1.2, R310.1.3 and R310.2 if all of the provisions of Items 1 through 3 to Section AJ102.4.3 are satisfied.

**AJ102.4.4 Window control devices.** Where window fall prevention devices complying with ASTM F2090 are not provided, window opening control devices complying with ASTM F2090 shall be installed where an existing window is replaced and where all of the following apply to the replacement window:

1. The window is operable.
2. The window replacement includes replacement of the sash and the frame.
3. The top of the sill of the window opening is at a height less than 24 inches (610 mm) above the finished floor.
4. The window will permit openings that will allow passage of a 4-inch-diameter (102 mm) sphere where the window is in its largest opened position.
5. The vertical distance from the top of the sill of the window opening to the finished grade or other surface below, on the exterior of the building, is greater than 72 inches (1829 mm).

The window opening control device, after operation to release the control device allowing the window to fully open, shall not reduce the minimum net clear opening area of the window unit.

- ❖ Similar to the provisions for replacement windows related to emergency escape and rescue opening requirements, the provisions for replacement windows as related to window control devices are not as stringent as those for windows that are used in new con-

struction. This is due to the fact that it is often difficult and cost prohibitive to change the opening size of windows in order to comply with current opening requirements that may differ significantly from the code under which a dwelling was originally built. Replacement window installations are required to comply with this section only if all of the items listed in Section AJ102.4.4 are applicable. Put another way, if the one or more of the items listed are not applicable for a particular replacement window installation, a window control device is not required to be installed.

**AJ102.5 Flood hazard areas.** Work performed in existing buildings located in a flood hazard area as established by Table R301.2(1) shall be subject to the provisions of Section R105.3.1.1.

- ❖ Long-term reduction in exposure to flood hazards is one of the reasons floodplain development is regulated. If additions, alterations or repairs of an existing building, including repair of damage from any cause, constitute substantial improvement or repair of substantial damage, the existing building is to be brought into compliance as required in Section R105.3.1.1 (see commentary, Section R105.3.1.1). Improvements are deemed to be "substantial" if the cost, including the value of labor as well as donated labor and materials, equals or exceeds 50 percent of the market value of the building before the improvements are made. Damage is considered to be "substantial" where the cost of restoring a damaged building to its predamage condition equals or exceeds 50 percent of the market value of the building before the damage occurred (for additional guidance, refer to FEMA P-259 and FEMA P-758).

**AJ102.6 Equivalent alternatives.** Work performed in accordance with the *International Existing Building Code* shall be deemed to comply with the provisions of this appendix. These provisions are not intended to prevent the use of any alternative material, alternative design or alternative method of construction not specifically prescribed herein, provided that any alternative has been deemed to be equivalent and its use authorized by the *building official*.

- ❖ Work that complies with the *International Existing Building Code*® (IEBC®) is deemed to comply with this appendix.

A comprehensive regulatory document such as a construction code cannot envision and then address all future innovations in the industry. As a result, the code must be applicable to, and provide a basis for, the approval of a number of newly developed, innovative materials, systems and methods for which no code text or referenced standards yet exist. The building official is expected to exercise sound technical judgment in accepting materials, systems or methods that, while not anticipated by the code text, can be demonstrated to offer equivalent performance. By virtue of this section, the code regulates new and innovative construction practices while contributing to the safety of building occupants.

**AJ102.7 Other alternatives.** Where compliance with these provisions or with this code as required by these provisions is technically infeasible or would impose disproportionate costs because of construction or dimensional difficulties, the building official shall have the authority to accept alternatives. These alternatives include materials, design features and operational features.

❖ The building official may accept alternative solutions involving materials, design features or operational features where compliance with the code provisions creates practical difficulties. A practical difficulty, in this context, means it is technically infeasible to meet the code requirements, or the costs involved in providing code compliance are highly disproportionate to the overall cost of the work. It is up to the building official to evaluate the legitimacy of these two exemptions from the general requirements. This section identifies construction or dimensional difficulties as a basis for using these modifications.

**AJ102.8 More restrictive requirements.** Buildings or systems in compliance with the requirements of this code for new construction shall not be required to comply with any more restrictive requirement of these provisions.

❖ Where the existing building is in compliance with the requirements of the code for new construction, it is not necessary to comply with any higher level requirements as set forth in this appendix. If the work to be performed is in compliance with the general provisions of the code, as would be required of a newly constructed building, there is no reason to require a higher level of performance for existing structures.

**AJ102.9 Features exceeding code requirements.** Elements, components and systems of existing buildings with features that exceed the requirements of this code for new construction, and are not otherwise required as part of *approved* alternative arrangements or deemed by the *building official* to be required to balance other building elements not complying with this code for new construction, shall not be prevented by these provisions from being modified as long as they remain in compliance with the applicable requirements for new construction.

❖ Unless used as a portion of an alternative solution as an equivalency, modifications to existing elements, components, or systems need only meet the requirements of the code for new construction. Even though the modification may actually reduce the previous level of compliance, the modification is acceptable if it does not reduce compliance to a level below that accepted for new work.

### SECTION AJ103 PRELIMINARY MEETING

**AJ103.1 General.** If a building *permit* is required at the request of the prospective *permit* applicant, the *building official* or his or her designee shall meet with the prospective applicant to discuss plans for any proposed work under these

provisions prior to the application for the *permit*. The purpose of this preliminary meeting is for the *building official* to gain an understanding of the prospective applicant's intentions for the proposed work, and to determine, together with the prospective applicant, the specific applicability of these provisions.

❖ Where the provisions of the code are performance provisions, such as those set forth in this appendix for existing buildings, the party or parties involved with the anticipated work must meet with the building official at the onset of the project to discuss any concerns or questions. Those issues that may be interpreted or applied in various ways must be addressed so that the position of the jurisdiction is understood.

This section indicates that the issues must be discussed prior to application for a building permit, with an emphasis on the scope of the work and the applicability of the code provisions for existing buildings. The effort should be cooperative, with input and discussion by both the building official and the potential permit applicant.

### SECTION AJ104 EVALUATION OF AN EXISTING BUILDING

**AJ104.1 General.** The *building official* shall have the authority to require an existing building to be investigated and evaluated by a registered *design professional* in the case of proposed reconstruction of any portion of a building. The evaluation shall determine the existence of any potential non-conformities to these provisions, and shall provide a basis for determining the impact of the proposed changes on the performance of the building. The evaluation shall use the following sources of information, as applicable:

1. Available documentation of the existing building.
  - 1.1. Field surveys.
  - 1.2. Tests (nondestructive and destructive).
  - 1.3. Laboratory analysis.

**Exception:** Detached one- or two-family dwellings that are not irregular buildings under Section R301.2.2.2.5 and are not undergoing an extensive reconstruction shall not be required to be evaluated.

❖ It is possible that the nature of the reconstruction work requires an evaluation of the existing building by a registered design professional. Based on the investigation and evaluation of the existing conditions in the building or a portion thereof, the building official is able to analyze the work that must take place to comply with the provisions of the code. The need for an evaluation is determined by the building official based on each situation. In addition, the code recognizes that such an evaluation is unnecessary for single- or two-family dwelling units of conventional construction unless the building is undergoing a major reconstruction.

The evaluation should focus on those existing conditions that are not in conformance with the code and its intended purpose, as well as determining how the

proposed modifications will address building performance. All resources that may assist in the investigation and evaluation of the existing conditions must be considered along with the three general sources identified in the code.

### SECTION AJ105 PERMIT

**AJ105.1 Identification of work area.** The work area shall be clearly identified on the *permits* issued under these provisions.

- ❖ Once the limits of one or more work areas have been established based on the scope of the work involved, the work areas must be properly identified and clearly described. The provisions of this appendix are typically limited to those portions of the building characterized as the work areas. The work areas must be described in satisfactory detail on any permits so that all parties have a consistent understanding of the area limits.

### SECTION AJ201 DEFINITIONS

**AJ201.1 General.** For purposes of this appendix, the terms used are defined as follows.

- ❖ This section clarifies the terminology used in this appendix. The terms take on very specific meanings that are often different from the way they are typically used.

**ALTERATION.** The reconfiguration of any space; the *addition* or elimination of any door or window; the reconfiguration or extension of any system; or the installation of any additional *equipment*.

- ❖ Where the work is extensive enough to cause a change in the layout of a building or a portion thereof, the work is an alteration. This activity could include taking an existing space and changing the configuration of the floor plan by adding or removing walls or partitions. Additional rooms may be created or multiple rooms could be transformed into a single room or area. As a result of such an alteration, the exiting system may be modified or the occupant load revised.

Where an additional door or window is installed, or where an existing door or window is removed, the work is an alteration. An alteration is also an increase to any system of the building, including the expansion of any electrical wiring, plumbing piping or mechanical ducts. If additional equipment, such as another electrical panel or HVAC unit, is installed in an existing building, the installation must be regulated as an alteration.

**CATEGORIES OF WORK.** The nature and extent of construction work undertaken in an existing building. The categories of work covered in this appendix, listed in increasing

order of stringency of requirements, are repair, renovation, *alteration* and reconstruction.

- ❖ This term describes the four types of construction activity that are regulated by this appendix chapter. The code sets forth specific criteria for each of the defined types of work, with each category placed in a hierarchical position based on the mandated level of requirements. The least restrictive category of work is defined as repair, with an increased degree of regulation for renovations and an even higher level for alterations. The most stringent requirements are applicable for work categorized as reconstruction.

**DANGEROUS.** Where the stresses in any member; the condition of the building, or any of its components or elements or attachments; or other condition that results in an overload exceeding 150 percent of the stress allowed for the member or material in this code.

- ❖ Although this term is recognized in general terms as a situation that is unsafe, perilous or likely to cause injury or death, for the purposes of this appendix it is much more narrow in scope. It is limited to a structural condition where the structural member or material is subjected to a load significantly higher than that which it is designed to support.

**EQUIPMENT OR FIXTURE.** Any plumbing, heating, electrical, ventilating, air-conditioning, refrigerating and fire protection *equipment*; and elevators, dumb waiters, boilers, pressure vessels, and other mechanical facilities or installations that are related to building services.

- ❖ A multitude of building service components are included in the definition of equipment or fixtures. These include elements of the plumbing, mechanical and electrical systems, as well as fire protective features that are installed in the building.

**LOAD-BEARING ELEMENT.** Any column, girder, beam, joist, truss, rafter, wall, floor or roof sheathing that supports any vertical load in addition to its own weight, or any lateral load.

- ❖ The structural components of a building that carry loads other than their own are load-bearing elements. These include members that carry gravity loads, lateral loads or both. The definition lists the various elements that are load-bearing where they support more than their own weight.

**MATERIALS AND METHODS REQUIREMENTS.** Those requirements in this code that specify material standards; details of installation and connection; joints; penetrations; and continuity of any element, component or system in the building. The required quantity, fire resistance, flame spread, acoustic or thermal performance, or other performance attribute is specifically excluded from materials and methods requirements.

- ❖ Materials standards, installation details and similar specific requirements make up the materials and

methods requirements. On the other hand, performance-related requirements tend to be excluded by definition.

**RECONSTRUCTION.** The reconfiguration of a space that affects an exit, a renovation or *alteration* where the work area is not permitted to be occupied because existing means-of-egress and fire protection systems, or their equivalent, are not in place or continuously maintained; or there are extensive *alterations* as defined in Section AJ501.3.

- ❖ The most stringent requirements for the four categories of work are assigned to reconstruction activities. Reconstruction causes a high level of concern because of its impact on fire and life safety. Where an existing exit is affected, the existing level of egress or fire protection is not acceptable or extensive *alterations* are to be undertaken, the work is considered as reconstruction.

**REHABILITATION.** Any repair, renovation, *alteration* or reconstruction work undertaken in an existing building.

- ❖ This is the general term for describing any or all of the four categories of work involved on an existing building.

**RENOVATION.** The change, strengthening or *addition* of load-bearing elements; or the refinishing, replacement, bracing, strengthening, upgrading or extensive repair of existing materials, elements, components, *equipment* or fixtures. Renovation does not involve reconfiguration of spaces. Interior and exterior painting are not considered refinishing for purposes of this definition, and are not renovation.

- ❖ A renovation can occur for either structural or non-structural work. The definition includes structural members that are replaced, modified or added to a building, as well as nonstructural materials that are changed in some form. The act of renovation focuses on specific elements rather than the reconfiguration of floor area.

**REPAIR.** The patching, restoration or minor replacement of materials, elements, components, *equipment* or fixtures for the purposes of maintaining those materials, elements, components, *equipment* or fixtures in good or sound condition.

- ❖ The least-stringent requirements for the four categories of work on existing building regulate repairs. Repair work maintains elements and systems of buildings in sound condition. Repair activities do not change the configuration of the space, nor do they address new construction or equipment.

**WORK AREA.** That portion of a building affected by any renovation, *alteration* or reconstruction work as initially intended by the owner and indicated as such in the *permit*. Work area excludes other portions of the building where incidental work entailed by the intended work must be performed, and portions of the building where work not initially intended by the owner is specifically required by these provisions for a renovation, *alteration* or reconstruction.

- ❖ The work area must be correctly identified to define the extent of the rehabilitation activities. Most of the requirements in this appendix are applicable only to the work area under consideration and do not apply to

other portions of the building. The work area, determined at the time of permitting, is limited to that part of the building affected by the rehabilitation work.

## SECTION AJ301 REPAIRS

**AJ301.1 Materials.** Except as otherwise required herein, work shall be done using like materials or materials permitted by this code for new construction.

- ❖ There are two possible options for materials used in repair work on an existing building. Unless prohibited by other provisions of the section, it is acceptable to use materials consistent with those that are already present. This allowance follows the general concept that the repair work is making the building no more unsafe or hazardous than it was prior to the work being done. Instead of using the same type of materials, the code permits the use of any materials currently allowed by the code.

**AJ301.1.1 Hazardous materials.** Hazardous materials no longer permitted, such as asbestos and lead-based paint, shall not be used.

- ❖ It is generally possible to repair a structure, its components and its systems with materials consistent with those materials that were used previously. However, where materials that are now considered hazardous are involved in the repair work, they may no longer be used. For example, the code identifies asbestos and lead-based paint as two hazardous materials that cannot be used in the repair process. Certain materials previously considered acceptable for building construction are a threat to the health of the occupants.

**AJ301.1.2 Plumbing materials and supplies.** The following plumbing materials and supplies shall not be used:

1. All-purpose solvent cement, unless *listed* for the specific application.
  2. Flexible traps and tailpieces, unless *listed* for the specific application.
  3. Solder having more than 0.2 percent lead in the repair of potable water systems.
- ❖ Specific methods and materials of plumbing installations are identified as no longer acceptable because of their negative impact on public health and safety. Where such existing materials and supplies are a part of the repair of a plumbing element or system, alternate materials must be used. The use of all-purpose solvent cement is permitted for plumbing repair work only if *listed* for the specific application. The same is true for flexible traps and flexible tailpieces.

**AJ301.2 Water closets.** Where any water closet is replaced with a newly manufactured water closet, the replacement water closet shall comply with the requirements of Section P2903.2.

- ❖ Where a new water closet replaces an existing water closet, the new fixture must be designed for a maximum water consumption of 1.6 gallons (6 L) for each

flushing cycle. Addressing environmental concerns, this limitation assists in reducing the amount of water consumed during the ongoing use of the building.

**AJ301.3 Electrical.** Repair or replacement of existing electrical wiring and *equipment* undergoing repair with like material shall be permitted.

**Exceptions:**

1. Replacement of electrical receptacles shall comply with the requirements of Chapters 34 through 43.
  2. Plug fuses of the Edison-base type shall be used for replacements only where there is not evidence of overfusing or tampering in accordance with the applicable requirements of Chapters 34 through 43.
  3. 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, as allowed and described in Chapters 34 through 43.
- ❖ Under most conditions, it is acceptable to repair existing electrical installations with the same types of wiring materials and electrical equipment as were used previously. However, this section identifies three conditions where additional criteria must be considered. Electrical receptacles must comply as for new construction as described in Chapters 34 through 43. Edison-base-type plug fuses can be replaced with like fuses only if it can be shown that no tampering or overfusing has occurred. Alternate methods of grounding are also set forth when nongrounding-type receptacles are replaced.

### SECTION AJ401 RENOVATIONS

**AJ401.1 Materials and methods.** The work shall comply with the materials and methods requirements of this code.

- ❖ The general provisions of the code are to be used for renovation work. There are several modifications to these provisions for door and window dimensions, interior finish materials, and the parapets of unreinforced masonry buildings assigned to a high seismic design category.

**AJ401.2 Door and window dimensions.** Minor reductions in the clear opening dimensions of replacement doors and windows that result from the use of different materials shall be allowed, whether or not they are permitted by this code.

- ❖ During many renovation projects, it is common for existing doors and windows to be removed and replaced. Quite often the new doors and windows are of different materials and do not provide the same clear opening dimensions as the originals. Reductions in opening dimensions beyond those allowed by the code are permitted if they are minor. Even though not spe-

cifically defined, a minor reduction would remain consistent with the intent and purpose of the provisions.

**AJ401.3 Interior finish.** Wood paneling and textile wall coverings used as an interior finish shall comply with the flame spread requirements of Section R302.9.

- ❖ Where wood paneling or textile wall covering materials are being replaced in a renovation project, the new materials must be in compliance with the provisions of Section R302.9 R315. The new interior finishes are to be regulated for flame spread and smoke development as they are for new construction.

**AJ401.4 Structural.** Unreinforced masonry buildings located in Seismic Design Category D<sub>2</sub> or E shall have parapet bracing and wall anchors installed at the roofline whenever a reroofing *permit* is issued. Such parapet bracing and wall anchors shall be of an *approved* design.

- ❖ When reroofing work requiring a building permit takes place on an unreinforced masonry building located in Seismic Design Category D<sub>2</sub> or E, it may be necessary to strengthen the parapet by providing bracing in an approved manner. In addition, wall anchors must be provided at the roof line. The existing parapet and wall anchors should be evaluated to determine the extent of the structural strengthening needed. The scope of the structural work and the methods of compliance are to be approved by the building official.

### SECTION AJ501 ALTERATIONS

**AJ501.1 Newly constructed elements.** Newly constructed elements, components and systems shall comply with the requirements of this code.

**Exceptions:**

1. Openable windows may be added without requiring compliance with the light and *ventilation* requirements of Section R303.
  2. Newly installed electrical *equipment* shall comply with the requirements of Section AJ501.5.
- ❖ Where the alteration of any portion of a building includes new construction, the work must be accomplished in accordance with the requirements of the code. An exception permits the installation of openable windows as additional features without requiring adherence to the light and ventilation provisions of Section R303. In addition, new electrical components and equipment need comply only with the requirements of Section AJ501.5.
- AJ501.2 Nonconformities.** The work shall not increase the extent of noncompliance with the requirements of Section AJ601, or create nonconformity to those requirements that did not previously exist.
- ❖ The extent of noncompliance is limited in regard to stairways, handrails, guards, interior finish materials and dwelling separation walls as addressed in Section AJ601. In addition, nonconformity must not be created

regarding any requirements that did not previously exist.

**AJ501.3 Extensive alterations.** Where the total area of all of the work areas included in an *alteration* exceeds 50 percent of the area of the *dwelling unit*, the work shall be considered to be a reconstruction and shall comply with the requirements of these provisions for reconstruction work.

**Exception:** Work areas in which the *alteration* work is exclusively plumbing, mechanical or electrical shall not be included in the computation of the total area of all work areas.

- ❖ If the amount of construction activity in a dwelling unit involves more than 50 percent of the unit's floor area, the stringency of the requirements is increased. The category of work is reconstruction, with the requirements for both alterations and reconstruction to be followed. This increase to a higher-level category is not required where the alteration consists only of plumbing, mechanical or electrical work.

**AJ501.4 Structural.** The minimum design loads for the structure shall be the loads applicable at the time the building was constructed, provided that a dangerous condition is not created. Structural elements that are uncovered during the course of the *alteration* and that are found to be unsound or dangerous shall be made to comply with the applicable requirements of this code.

- ❖ As building codes have progressed over the years, structural design values have been reviewed and modified. Unless a dangerous condition will be created, it is permissible to use the minimum structural design loads in place at the time the building was constructed.

As the alteration of the building is progressing, there may be occasions where structural elements are exposed and found to be damaged, unsound or otherwise dangerous. In such situations, it is mandatory that structural integrity of the building components be achieved. All necessary steps must be taken to ensure that the applicable structural requirements of the code are met.

#### **AJ501.5 Electrical equipment and wiring.**

**AJ501.5.1 Materials and methods.** Newly installed electrical *equipment* and wiring relating to work done in any work area shall comply with the materials and methods requirements of Chapters 34 through 43.

**Exception:** Electrical *equipment* and wiring in newly installed partitions and ceilings shall comply with the applicable requirements of Chapters 34 through 43.

- ❖ In any work area, electrical equipment and wiring installed must comply with the requirements of Chapters 33 through 42. Such requirements are also applicable in the construction of new walls, partitions and ceiling systems.

**AJ501.5.2 Electrical service.** Service to the *dwelling unit* shall be not less than 100 ampere, three-wire capacity and service *equipment* shall be dead front having no live parts

exposed that could allow accidental contact. Type "S" fuses shall be installed where fused *equipment* is used.

**Exception:** Existing service of 60 ampere, three-wire capacity, and feeders of 30 ampere or larger two- or three-wire capacity shall be accepted if adequate for the electrical load being served.

- ❖ It is typical that minimum 100-ampere service be provided to each dwelling unit that is undergoing alteration of electrical service. However, where it can be determined that the service loading does not exceed 60 amperes, an existing 60-ampere service is acceptable.

**AJ501.5.3 Additional electrical requirements.** Where the work area includes any of the following areas within a *dwelling unit*, the requirements of Sections AJ501.5.3.1 through AJ501.5.3.5 shall apply.

- ❖ This section sets forth additional requirements for specified enclosed spaces, kitchens, laundry rooms, ground-fault circuit interruption and lighting outlets in conjunction with work areas of dwelling units.

**AJ501.5.3.1 Enclosed areas.** Enclosed areas other than closets, kitchens, *basements*, garages, hallways, laundry areas and bathrooms shall have not less than two duplex receptacle outlets, or one duplex receptacle outlet and one ceiling- or wall-type lighting outlet.

- ❖ Those areas and rooms typically viewed as habitable spaces must be provided with at least two duplex receptacle outlets or one duplex receptacle outlet and a ceiling- or wall-type lighting outlet. A minimum number of receptacles must be available to reduce the potential for dangerous electrical conditions.

**AJ501.5.3.2 Kitchen and laundry areas.** Kitchen areas shall have not less than two duplex receptacle outlets. Laundry areas shall have not less than one duplex receptacle outlet located near the laundry *equipment* and installed on an independent circuit.

- ❖ To reduce the possibility that dangerous conditions are created in kitchen and laundry areas, a minimum number of receptacle outlets is mandated. In the kitchen, at least two duplex receptacle outlets are required. Near laundry equipment, a minimum of one duplex receptacle outlet is mandated. The receptacle outlet in the laundry area must be located on an independent circuit.

**AJ501.5.3.3 Ground-fault circuit-interruption.** Ground-fault circuit-interruption shall be provided on newly installed receptacle outlets if required by Chapters 34 through 43.

- ❖ The installation of ground-fault circuit interruption for all new receptacle outlets is covered by the provisions of Chapters 34 through 43. Those locations in new construction identified by the code to be protected by ground-fault circuit interruption are the same in alterations to existing buildings, but interruption is required only in those locations where new receptacle outlets are installed.

**AJ501.5.3.4 Lighting outlets.** Not less than one lighting outlet shall be provided in every bathroom, hallway, stairway,

attached garage and detached garage with electric power to illuminate outdoor entrances and exits, and in utility rooms and *basements* where these spaces are used for storage or contain *equipment* requiring service.

❖ Lighting outlets are to be installed in a variety of specific locations identified by this section. Areas where at least one lighting outlet is required include bathrooms, hallways, stairways and attached garages. Detached garages provided with electrical power must have facilities for illuminating exterior entrances and exits. *Basements* and utility rooms used as storage areas or to house equipment that must be serviced must also be provided with at least one lighting outlet.

**AJ501.5.3.5 Clearance.** Clearance for electrical service *equipment* shall be provided in accordance with Chapters 34 through 43.

❖ All electrical equipment is to be provided with the necessary working space and other clearances as set forth in Chapters 34 through 43.

**AJ501.6 Ventilation.** Reconfigured spaces intended for occupancy and spaces converted to habitable or occupiable space in any work area shall be provided with *ventilation* in accordance with Section R303.

❖ Adequate ventilation, by either natural or mechanical means, must be provided in occupiable spaces located within a work area. The requirement is applicable to spaces that are altered in shape or size, as well as those areas that are converted to habitable space. The ventilation requirements of Section R303 provide the minimum ventilation criteria that are to be used.

**AJ501.7 Ceiling height.** *Habitable spaces* created in existing *basements* shall have ceiling heights of not less than 6 feet, 8 inches (2032 mm), except that the ceiling height at obstructions shall be not less than 6 feet 4 inches (1930 mm) from the *basement* floor. Existing finished ceiling heights in non-habitable spaces in *basements* shall not be reduced.

❖ This section permits owners of older homes to create habitable space in *basements*. In existing *basements*, many times it is technically and structurally infeasible to modify an existing ceiling height to comply with the code for new construction. This section recognizes that the minimum ceiling heights easily achievable in new construction are often impossible to provide in *basements* of older homes and will allow homeowners to finish off their *basements*.

#### AJ501.8 Stairs.

❖ Sections AJ501.8.1 through AJ501.8.3 permit maintaining current width, headroom and landing size on existing *basement* stairways when alterations are made to the stairway or to other portions of the *basement*. In existing *basements*, many times it is technically and structurally infeasible to modify an existing stairway to comply with the code for new construction. The provisions of this section do not require a homeowner to replace or modify their existing *basement* stairs simply because the space at the bottom of the

stairs is being renovated. Because Section R102.7.1 specifically states that alterations shall not result in an unsafe building, this section does not preclude the building official from requiring the replacement of stairs considered substandard or hazardous.

**AJ501.8.1 Stair width.** Existing *basement* stairs and handrails not otherwise being altered or modified shall be permitted to maintain their current clear width at, above and below existing handrails.

❖ See the commentary to Section AJ501.8.

**AJ501.8.2 Stair headroom.** Headroom height on existing *basement* stairs being altered or modified shall not be reduced below the existing stairway finished headroom. Existing *basement* stairs not otherwise being altered shall be permitted to maintain the current finished headroom.

❖ See the commentary to Section AJ501.8.

**AJ501.8.3 Stair landing.** Landings serving existing *basement* stairs being altered or modified shall not be reduced below the existing stairway landing depth and width. Existing *basement* stairs not otherwise being altered shall be permitted to maintain the current landing depth and width.

❖ See the commentary to Section AJ501.8.

## SECTION AJ601 RECONSTRUCTION

### AJ601.1 Stairways, handrails and guards.

**AJ601.1.1 Stairways.** Stairways within the work area shall be provided with illumination in accordance with Section R303.6.

❖ Stairways located in the work area of a building undergoing reconstruction activities must be illuminated in accordance with Section R303.7. The provisions set forth two options for locating the light sources. In addition, the required locations of lighting control switches are specified.

**AJ601.1.2 Handrails.** Every required exit stairway that has four or more risers, is part of the means of egress for any work area, and is not provided with at least one handrail, or in which the existing handrails are judged to be in danger of collapsing, shall be provided with handrails designed and installed in accordance with Section R311 for the full length of the run of steps on not less than one side.

❖ The handrail requirements of Section R311 apply to reconstruction work only in certain circumstances. The stairway under consideration must be a required exit element for a work area of the building and consist of at least four risers. Either there are no handrails provided for the stairway, or the existing rail or rails are unsafe because of the possibility of collapse. If all of these conditions exist, a complying handrail is to be installed on at least one side of the stairway.

Handrail height, continuity, termination, clearance, and gripping surface must all be reviewed for conformance with the provisions of Section R311.

**AJ601.1.3 Guards.** Every open portion of a stair, landing or balcony that is more than 30 inches (762 mm) above the floor or *grade* below, is part of the egress path for any work area, and does not have *guards*, or in which the existing *guards* are judged to be in danger of collapsing, shall be provided with *guards* designed and installed in accordance with Section R312.

- ❖ The guard requirements of Section R312 apply to reconstruction work only in certain circumstances. The guard under consideration must be serving a walking surface at least 30 inches (762 mm) above the floor below and located along an exit path for a work area of the building. Either there is no guard provided or the existing guard creates an unsafe condition because of the potential for collapse. If all of these conditions exist, a complying guard is to be installed as protection at the elevation change.

Guard height and opening limitations must be reviewed for compliance with the provisions of Section R312.

**AJ601.2 Wall and ceiling finish.** The interior finish of walls and ceilings in any work area shall comply with the requirements of Section R302.9. Existing interior finish materials that do not comply with those requirements shall be removed or shall be treated with an *approved* fire-retardant coating in accordance with the manufacturer's instructions to secure compliance with the requirements of this section.

- ❖ In a reconstruction work area, all wall and ceiling finish materials must be in compliance with the flame spread and smoke-development limitations of Section R302.9 R315. The flame spread classification is limited to 200, with a maximum smoke-developed index of 450. Where the existing interior finish materials do not comply with these requirements, the materials are to be removed or treated with an approved fire retardant coating. Where the treatment method is used to obtain compliance, the manufacturer's instructions must be followed.

**AJ601.3 Separation walls.** Where the work area is in an attached *dwelling unit*, walls separating *dwelling units* that are not continuous from the foundation to the underside of the roof sheathing shall be constructed to provide a continuous fire separation using construction materials consistent with the existing wall or complying with the requirements for new structures. Performance of work shall be required only on the side of the wall of the *dwelling unit* that is part of the work area.

- ❖ Where reconstruction work takes place in a dwelling unit that is attached to one or more additional dwelling units, the wall or walls separating the units are to be continuous from the foundation to the underside of the roof deck. If such conditions do not exist, the wall must be extended to the roof sheathing to maintain the necessary separation of the units. The materials used in the wall construction must be at least equivalent to those of the existing wall, or alternatively, as required for new construction. There is no requirement for work to be done outside the work area; therefore, the wall

construction need be provided only on the side of the dwelling where the actual work area occurs.

**AJ601.4 Ceiling height.** *Habitable spaces* created in existing *basements* shall have ceiling heights of not less than 6 feet, 8 inches (2032 mm), except that the ceiling height at obstructions shall be not less than 6 feet 4 inches (1930 mm) from the *basement* floor. Existing finished ceiling heights in non-habitable spaces in *basements* shall not be reduced.

- ❖ This section permits owners of older homes to create habitable space in basements. In existing basements, many times it is technically and structurally infeasible to modify an existing basement ceiling height to comply with the code for new construction. This section recognizes that the minimum ceiling heights easily achievable in new construction are often impossible to provide in basements of older homes and will allow homeowners to finish off their basements.

### Bibliography

The following resource materials were used in the preparation of the commentary for this appendix of the code:

- FEMA P-758, *Substantial Improvement/Substantial Damage Desk Reference*. Frederick, MD: Federal Emergency Management Agency, 2010.
- FEMA P-259, *Engineering Principles and Practices for Retrofitting Flood Prone Residential Structures*. Frederick, MD: Federal Emergency Management Agency, 2012.