3 NFIP Substantial Improvement/ Substantial Damage: Requirements and Definitions

3.1 Overview

This chapter provides NFIP regulations for substantial improvement and substantial damage, and includes key definitions for implementing the SI/SD requirements (also see the glossary and acronyms in Appendix C). This chapter also compares the NFIP's terminology with terms and definitions used in the I-Codes.

3.2 Introduction to the SI/SD Requirements

The NFIP includes a requirement that new buildings and substantially improved buildings be constructed in ways that minimize or prevent damage during a flood. This requirement grew out of the recognition that there were large numbers of buildings already located in flood-prone areas that would continue to be subject to damage.

The purpose of the SI/SD requirements is to protect the property owner's investment and safety, and, over time, to reduce the total number of buildings that are exposed to flood damage, thus reducing the burden on taxpayers through the payment of disaster assistance. The SI/SD requirements are triggered when the local official determines that the cost of repairing or improving a building in an SFHA equals or exceeds 50 percent of the building's market value (excluding land value).

Types of work that may trigger SI/SD requirements are described in detail in Chapter 6 and generally include:

- Rehabilitation or remodeling of a building with or without modifying its external dimensions
- Lateral additions that may or may not involve structural modifications of a building
- Vertical additions
- Repair of foundations, including replacing or extending foundations

The SI/SD requirement is similar to common zoning and code requirements that address nonconforming uses and structures. The non-conformance is allowed to continue until a triggering event occurs, such as a change in use or a proposal to undertake significant physical alterations.

Understandably, owners are concerned about the costs of bringing buildings into compliance. NFIP flood insurance policies on buildings located in SFHAs include coverage that is available for buildings that are substantially damaged by flood. Called Increased Cost of Compliance (ICC), this coverage is described in Sections 5.6.4 and 7.6.

- Restoration or repair of damage of any origin that is necessary to restore a building to its predamaged condition
- Reconstruction of demolished or destroyed buildings on the same site or on the same foundation
- Work on post-Flood Insurance Rate Map (FIRM) buildings
- Work on existing buildings where flood zones or floodways are revised

The intent of the SI/SD requirements is not to discourage routine maintenance. If work requires a permit, then the local official must review all of the work proposed and the cost of all work must be included in the project costs, including work that might otherwise be considered routine maintenance.

Chapter 6 describes how building characteristics and details of proposed work relate to the SI/SD requirements of local floodplain management regulations.

3.3 NFIP Regulations for SI/SD

The NFIP regulations are online at http://www.fema.gov/business/nfip/laws1.shtm. The following excerpts of the regulations pertain to new construction and substantial improvement. The requirements state that communities shall:

§ 60.3(a)(3) Review all permit applications to determine whether proposed building sites will be reasonably safe from flooding. If a proposed building site is in a flood-prone area, all new construction and <u>substantial improvements</u> shall (i) be designed (or modified) and adequately anchored to prevent flotation, collapse, or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy, (ii) be constructed with materials resistant to flood damage, (iii) be constructed by methods and practices that minimize flood damage, and (iv) be constructed with electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities that are designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding;

§ 60.3(b)(4) Obtain, review and reasonably utilize any base flood elevation and floodway data available from a Federal, State, or other source, including data developed pursuant to paragraph (b)(3) of this section, as criteria for requiring that new construction, <u>substantial improvements</u>, or other development in Zone A on the community's FHBM or FIRM meet the standards in paragraphs (c)(2), (c)(3), (c)(5), (c)(6), (c)(12), (c)(14), (d)(2) and (d)(3) of this section;

§ 60.3(c)(2) Require that all new construction and <u>substantial improvements</u> of residential structures within Zones A1-30, AE and AH zones on the community's FIRM have the lowest floor (including basement) elevated to or above the base flood level, unless the community is granted an exception by the Administrator for the allowance of basements in accordance with § 60.6 (b) or (c);

§ 60.3(c)(3) Require that all new construction and <u>substantial improvements</u> of non-residential structures within Zones A1-30, AE and AH zones on the community's FIRM (i) have the lowest

floor (including basement) elevated to or above the base flood level or, (ii) together with attendant utility and sanitary facilities, be designed so that below the base flood level the structure is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy;

§ 60.3(c)(5) Require, for all new construction and substantial improvements, that fully enclosed areas below the lowest floor that are usable solely for parking of vehicles, building access or storage in an area other than a basement and which are subject to flooding shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must either be certified by a registered professional engineer or architect or meet or exceed the following minimum criteria: A minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall be provided. The bottom of all openings shall be no higher than one foot above grade. Openings may be equipped with screens, louvers, valves, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters;

§ 60.3(c)(6) Require that manufactured homes that are placed or <u>substantially improved</u> within Zones A1-30, AH, and AE on the community's FIRM on sites

- (i) Outside of a manufactured home park or subdivision,
- (ii) In a new manufactured home park or subdivision,
- (iii) In an expansion to an existing manufactured home park or subdivision, or
- (iv) In an existing manufactured home park or subdivision on which a manufactured home has incurred "substantial damage" as the result of a flood, be elevated on a permanent foundation such that the lowest floor of the manufactured home is elevated to or above the base flood elevation and be securely anchored to an adequately anchored foundation system to resist floatation collapse and lateral movement.
- § 60.3(c)(7) Require within any AO zone on the community's FIRM that all new construction and <u>substantial improvements</u> of residential structures have the lowest floor (including basement) elevated above the highest adjacent grade at least as high as the depth number specified in feet on the community's FIRM (at least two feet if no depth number is specified);
- § 60.3(c)(8) Require within any AO zone on the community's FIRM that all new construction and substantial improvements of non-residential structures (i) have the lowest floor (including basement) elevated above the highest adjacent grade at least as high as the depth number specified in feet on the community's FIRM (at least two feet if no depth number is specified), or (ii) together with attendant utility and sanitary facilities be completely floodproofed to that level to meet the floodproofing standard specified in § 60.3(c)(3)(ii);
- § 60.3(c)(10) Require until a regulatory floodway is designated, that no new construction, <u>substantial improvements</u>, or other development (including fill) shall be permitted within Zones A1-30 and AE on the community's FIRM, unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the community.

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§ 60.3(c)(12) Require that manufactured homes to be placed or <u>substantially improved</u> on sites in an existing manufactured home park or subdivision within Zones A-1-30, AH, and AE on the community's FIRM that are not subject to the provisions of paragraph (c)(6) of this section be elevated so that either:

- (i) The lowest floor of the manufactured home is at or above the base flood elevation, or
- (ii) The manufactured home chassis is supported by reinforced piers or other foundation elements of at least equivalent strength that are no less than 36 inches in height above grade and be securely anchored to an adequately anchored foundation system to resist floatation, collapse, and lateral movement.

§ 60.3(d) [When floodways have been designated] (3) Prohibit encroachments, including fill, new construction, <u>substantial improvements</u>, and other development within the adopted regulatory floodway unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the base flood discharge;

§ 60.3(e)(4) [When V zones have been designated] Provide that all new construction and substantial improvements in Zones V1-30 and VE, and also Zone V if base flood elevation data is available, on the community's FIRM, are elevated on pilings and columns so that (i) the bottom of the lowest horizontal structural member of the lowest floor (excluding the pilings or columns) is elevated to or above the base flood level; and (ii) the pile or column foundation and structure attached thereto is anchored to resist flotation, collapse and lateral movement due to the effects of wind and water loads acting simultaneously on all building components. Water loading values used shall be those associated with the base flood. Wind loading values used shall be those required by applicable State or local building standards. A registered professional engineer or architect shall develop or review the structural design, specifications and plans for the construction, and shall certify that the design and methods of construction to be used are in accordance with accepted standards of practice for meeting the provisions of paragraphs (e)(4) (i) and (ii) of this section.

§ 60.3(e)(5) Provide that all new construction and <u>substantial improvements</u> within Zones V1-30, VE, and V on the community's FIRM have the space below the lowest floor either free of obstruction or constructed with non-supporting breakaway walls, open wood lattice-work, or insect screening intended to collapse under wind and water loads without causing collapse, displacement, or other structural damage to the elevated portion of the building or supporting foundation system. [Note: specifications for breakaway walls not shown.]

3.4 Selected Definitions and Terms

Some of the terms used in this Desk Reference are defined in the NFIP regulations and some have meanings that are based on common usage. This section compares the NFIP terms with those defined and used in the administrative and flood damage-resistant provisions of the family of building codes known as the I-Codes. The I-Codes include the *International Building Code* (IBC) *International Residential Code* (IRC), *International Existing Building Code* (IEBC),

International Mechanical Code®, International Plumbing Code®, the International Fuel Gas Code®, and a number of other specialty codes.

3.4.1 Definitions: NFIP Regulations

The following are the NFIP definitions of several terms used in this Desk Reference (also see Appendix C for a glossary of related terms and definitions):

- Floodproofing means any combination of structural and non-structural additions, changes, or adjustments to structures that reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures, and their contents.
- **Historic structure** means any structure that is:
 - (a) Listed individually in the National Register of Historic Places (a listing maintained by the Department of Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register;
 - (b) Certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the Secretary to qualify as a registered historic district;
 - (c) Individually listed on a state inventory of historic places in states with historic preservation programs which have been approved by the Secretary of the Interior; or
 - (d) Individually listed on a local inventory of historic places in communities with historic preservation programs that have been certified either:
 - (1) By an approved state program as determined by the Secretary of the Interior or
 - (2) Directly by the Secretary of the Interior in states without approved programs.
- Lowest floor means the lowest floor of the lowest enclosed area (including basement). An unfinished or flood damage-resistant enclosure, usable solely for parking of vehicles, building access, or storage in an area other than a basement area is not considered a building's lowest floor; Provided, that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of § 60.3.
- New construction means, for floodplain management purposes, structures for which the "start of construction" commenced on or after the effective date of a floodplain management regulation adopted by a community and includes any subsequent improvements to such structures.
- Substantial damage means damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.
- Substantial improvement means any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the "start of construction" of the improvement. This term includes structures that have incurred "substantial damage," regardless of the actual repair work performed. The term does not, however, include either:

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- (1) Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions or
- (2) Any alteration of a "historic structure," provided that the alteration will not preclude the structure's continued designation as a "historic structure."

The definition of substantial improvement includes structures that have incurred substantial damage. Work necessary to restore a substantially damaged building to its pre-damage condition constitutes a substantial improvement; therefore, the NFIP regulations that refer to substantial improvement also include substantial damage.

3.4.2 Comparison of Definitions and Terms: NFIP and I-Codes

FEMA has determined that the provisions in the I-Codes for the design and construction of flood damage-resistant buildings are consistent with the NFIP requirements. Adoption of a code based on one or more of the I-Codes does not, by itself, meet all of the NFIP requirements, largely because the model codes deal primarily with buildings and structures. To learn more about coordinating local floodplain management regulations with the I-Codes, contact the NFIP State Coordinating Agency or FEMA Regional Office listed in Appendix A. The International Code Council, in coordination with FEMA published *Reducing Flood Losses Through the International Codes*®: *Meeting the Requirements of the National Flood Insurance Program* for additional guidance.

Many States and communities administer building codes that are based on the model I-Codes. Because the model codes include provisions for SI/SD and local regulations also include SI/SD provisions, it is important to compare terms. In communities that use both codes and regulations to regulate SFHA development, officials need to be familiar with terms used in each, and recognize that some terms are used in one but not the other. Some terms are defined while others are simply used in context with their common meaning. Table 3-1 compares terms that are defined or used by the NFIP with terms used in the I-Codes. Some terms (noted "used in guidance documents") are not defined by the NFIP, but are used in this Desk Reference and various guidance documents listed in Appendix B.

Table 3-1. Comparison of Definitions and Terms in the NFIP and I-Codes

	NFIP	IBC	IRC	IEBC
Addition	Used in the NFIP definition of "substantial improvement." Common NFIP usage: an expansion of a building that increases the total square footage.	An extension or increase in floor area or height of a building or structure.	An extension or increase in floor area or height of a building or structure.	An extension or increase in floor area, number of stories, or height of a building or structure.
Addition, minor	Not defined in NFIP regulations; used in guidance documents. Common NFIP usage: an addition that, based on a determination, is not a "substantial improvement."	Not used in the IBC; included in definition of "Addition."	Not used in the IRC; included in definition of "Addition."	Not used in the IEBC; included in definition of "Addition."
Addition, lateral or horizontal	Not defined in NFIP regulations; used in guidance documents. Common NFIP usage: an addition that extends beyond the existing footprint. May be a minor addition or may be determined to be a "substantial improvement."	Not used in the IBC; included in definition of "Addition."	Not used in the IRC; included in definition of "Addition."	Not used in the IEBC; included in definition of "Addition."
Addition, vertical	Not defined in NFIP regulations; used in guidance documents. Common NFIP usage: an addition that extends a building upward, either by adding an upper story or by elevating the building inplace and constructing a new story underneath. May be determined to be a "substantial improvement;" less likely to be a minor addition.	Not used in the IBC; included in definition of "Addition."	Not used in the IRC; included in definition of "Addition."	Not used in the IEBC; included in definition of "Addition."

NFIP National Flood Insurance Program **IBC** International Building Code **IRC** International Residential Code **IEBC** International Existing Building Code

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Table 3-1. Comparison of Definitions and Terms in the NFIP and I-Codes (continued)

	NFIP	IBC	IRC	IEBC
Alteration	Not defined in NFIP regulations; used in the NFIP definitions "start of construction" and "historic structure." Used in NFIP guidance documents.	Any construction or renovation to an existing structure other than repair or addition.	Any construction or renovation to an existing structure other than repair or addition that requires a permit. Also, a change in a mechanical system that involves an extension, addition, or change to the arrangement, type, or purpose of the original installation that requires a permit.	Any construction or renovation to an existing structure other than a repair or addition. Alterations are classified as Level 1, Level 2, and Level 3.
Alteration, Level 1	Not used by the NFIP.	Not used in the IBC.	Not used in the IRC.	403.1 Scope. Level 1 alterations include the removal and replacement or the covering of existing materials, elements, equipment, or fixtures using new materials, elements, equipment, or fixtures that serve the same purpose. [Note: 601.3 requires alterations that constitute SI to comply with flood requirements of the IBC.]
Alteration, Level 2	Not used by the NFIP.	Not used in the IBC.	Not used in the IRC.	404.1 Scope. Level 2 alterations include the reconfiguration of space, the addition or elimination of any door or window, the reconfiguration or extension of a system, or the installation of any additional equipment. (Level 2 alternations must comply with the requirements for Level 1 and Level 2.)
Alteration, Level 3	Not used by the NFIP.	Not used in the IBC.	Not used in the IRC.	405.1 Scope. Level 3 alterations apply where the work area exceeds 50 percent of the aggregate area of the building. (Level 3 alternations must comply with the requirements for Level 1, Level 2, and Level 3.)

Table 3-1. Comparison of Definitions and Terms in the NFIP and I-Codes (continued)

	NFIP	IBC	IRC	IEBC
Building, Elevated-in- Place	Not defined in NFIP regulations; used in guidance documents.	Not used in the IBC (see Addition).	Not used in the IRC (see Addition).	Not used in the IEBC (see Addition).
	Common NFIP usage: a building that is detached from its original foundation and reattached to a new elevated foundation at the same location.			
Building, Existing	Not defined in NFIP regulations; used in guidance documents. NFIP usage: a building that pre-dates the community's first floodplain management regulation (see Pre-FIRM).	[Existing structure means] A structure erected prior to the date of adoption of the appropriate code, or one for which a legal building permit has been issued. See also Section 1612.2.	[Existing building means] Existing building is a building erected prior to the adoption of this code, or one for which a legal building permit has been issued.	[Existing building means] A building erected prior to the date of adoption of the appropriate code, or one for which a legal building permit has been issued.
Building, Relocated	Not defined in NFIP regulations; used in guidance documents. Common NFIP usage: a building that is detached from its original foundation and moved to another location with a new foundation.	Not used in the IBC; scope of IBC includes the movement of buildings.	Not used in the IRC; scope of IRC includes movement of buildings.	409.1 Scope. Relocated buildings provisions shall apply to relocated or moved buildings. [1202.6 requires relocated buildings to comply with the flood requirements of the IBC.]
Habitable (Habitable Space)	Not defined in NFIP regulations; used in guidance documents. Uses allowed for enclosures below the base flood elevation include parking of vehicles, building access, and storage.	A space in a building for living, sleeping, eating, or cooking. Bathrooms, toilet rooms, closets, halls, storage or utility spaces and similar areas are not considered habitable spaces. [Note: habitable spaces are not all equivalent to the uses allowed below the elevated buildings in SFHAs.]	A space in a building for living, sleeping, eating or cooking. Bathrooms, toilet rooms, closets, halls, storage or utility spaces and similar areas are not considered habitable spaces. [Note: habitable spaces are not all equivalent to the uses allowed below the elevated buildings in SFHAs.]	Terms not defined in the IEBC; default to definitions in the IBC.

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Table 3-1. Comparison of Definitions and Terms in the NFIP and I-Codes (continued)

	NFIP	IBC	IRC	IEBC
Non-residential	Not defined in NFIP regulations. Used in NFIP regulations and guidance documents; see "Residential."	All occupancies other than "Institutional Group I," "Residential Group R," and dwellings within the scope of the IRC (see "Residential"). [Note: From ASCE 24-05, Non-residential – any building or structure or portion thereof that is not classified residential.]	The scope of the IRC includes only "detached one- and two-family dwellings and townhouses not more than three stories above-grade in height with a separate means of egress and their accessory structures."	Terms not defined in the IEBC default to definitions in the IBC.
Pre-FIRM	A building for which construction or substantial improvement occurred on or before December 31, 1974, or before the effective date of an initial FIRM.	Not used in the IBC.	Not used in the IRC.	Not used in the IEBC.
Post-FIRM	A building for which construction or substantial improvement occurred after December 31, 1974, or on or after the effective date of the initial FIRM, whichever is later.	Not used in the IBC.	Not used in the IRC.	Not used in the IEBC.
Reconstruction	Not defined in NFIP regulations; used in the NFIP definition of "Substantial Improvement." Common NFIP usage: rebuilding on same foundation. Another common usage refers to ground-up reconstruction, including a new foundation. In both, the new building is treated as new construction.	Used in the IBC definition of "Repair."	Used in the IRC definition of "Repair."	Used in the IEBC definition of "Repair."
Rehabilitation	Not defined in NFIP regulations; used in the NFIP definition of "Substantial Improvement." Common NFIP usage (including "remodel") to describe work that does not increase square footage.	Used only in the IBC flood damage-resistant provisions	[Appendix J, Existing Buildings and Structures] Any repair, renovation, alteration or reconstruction work undertaken in an existing building. Used in the IRC flood damage-resistant provisions.	Any work, as described by the categories of work defined herein, undertaken in an existing building.

Table 3-1. Comparison of Definitions and Terms in the NFIP and I-Codes (continued)

	NFIP	IBC	IRC	IEBC
Renovation	Not defined in NFIP regulations; used in guidance documents.	Used in the IBC definition of "Alteration."	Used in the IRC definition of "Alteration."	Used in the IEBC definition of "Alteration."
	Dictionary definition is "to restore to a former better state (as by cleaning, repairing, or rebuilding)."			
Repair	Not defined in NFIP regulations; used in the NFIP definition of "Substantial Improvement."	The reconstruction or renewal of any part of an existing building for the purpose of its maintenance.	The reconstruction or renewal of any part of an existing building for the purpose of its maintenance.	The restoration to good or sound condition of any part of an existing building for the purpose of its maintenance.
	Dictionary definition includes (a) act or process of repairing; (b) to restore by replacing a part or putting together what is torn or broken.			402.1 Scope. Repairs, as defined in Chapter 2, include the patching or restoration or replacement of damaged materials, elements, equipment or fixtures for the purpose of maintaining such components in good or sound condition with respect to existing loads or performance requirements.

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Table 3-1. Comparison of Definitions and Terms in the NFIP and I-Codes (continued)

	NFIP	IBC	IRC	IEBC
Residential	Used (but not defined) in the NFIP regulations and guidance documents.	308 Institutional Group I. Institutional Group I includes, among others, the use of a building or structure, or a portion thereof, in which people are cared for or live in a supervised environment, having physical limitations because of health or age are harbored for medical treatment or other care or treatment, or in which people are detained for penal or correctional purposes or in which the liberty of the occupants is restricted. 310.1 Residential Group R. Residential Group R includes, among others, the use of a building or structure, or a portion thereof, for sleeping purposes when not classified as an Institutional Group I or when not regulated by the International Residential Code in accordance with Section 101.2. Residential occupancies shall include the following: [NOTE: list that follows is not shown.]	R101.2 Scope. The provisions of the International Residential Code for One- and Two-family Dwellings shall apply to the construction, alteration, movement, enlargement, replacement, repair, equipment, use and occupancy, location, removal and demolition of detached one- and two-family dwellings and townhouses not more than three stories above-grade in height with a separate means of egress and their accessory structures.	Terms not defined in the IEBC; default to definitions in the IBC.

Table 3-1. Comparison of Definitions and Terms in the NFIP and I-Codes (continued)

Residential (continued) INOTE: The term Tresidential is defined in ASCE 24-05, Residential – (1)
reformatories, detention centers, correctional centers, and prerelease

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Table 3-1. Comparison of Definitions and Terms in the NFIP and I-Codes (continued)

	NFIP	IBC	IRC	IEBC
Restoration	Used in the NFIP definition of "Substantial Damage." Dictionary definition includes (a) an act of restoring or the condition of being restored; (b) bringing back to a former position or condition.	Used in the definition of "Historic structures" and requirements for historic buildings.	Not used in the IRC.	Used in the IEBC definition of "Repair."
Story	Not used in the NFIP regulations. "Lowest Floor" means the lowest floor of the lowest enclosed area (including basement). An unfinished or flood damage-resistant enclosure, usable solely for parking of vehicles, building access, or storage in an area other than a basement area is not considered a building's lowest floor; Provided, that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of Section 60.3.	That portion of a building included between the upper surface of a floor and the upper surface of the floor or roof next above (also see "Mezzanine" and Section 502.1). It is measured as the vertical distance from top to top of two successive tiers of beams or finished floor surfaces and, for the topmost story, from the top of the floor finish to the top of the ceiling joists or, where there is not a ceiling, to the top of the roof rafters.	That portion of a building included between the upper surface of a floor and the upper surface of the floor or roof next above.	Terms not defined in the IEBC; default to definitions in the IBC.