
5 Administering Substantial Improvement and Substantial Damage Requirements

5.1 Overview

This chapter covers administrative topics, including community responsibilities and the responsibilities of property owners and permit applicants. It highlights options for informing the public about the SI/SD requirements and the need to get permits. Several matters that arise when reviewing permits are addressed in detail.

Chapter 4 focused on making SI/SD determinations and the data that are necessary to make those determinations, including the cost of improvements, the cost of repairs, and the market value of buildings. Chapter 6 includes illustrations of SI/SD, and explains certain NFIP flood insurance implications related to SI/SD. Chapter 7 recommends ways to handle substantial damage in the post-disaster period, especially when many buildings are damaged. Chapter 8 provides brief descriptions of common types of flood mitigation projects that may be eligible for funding by FEMA's five Hazard Mitigation Assistance grant programs.

5.2 Community Responsibilities

When a community decides to participate in the NFIP, it accepts the responsibility to adopt, administer, and enforce floodplain management provisions that either meet or exceed the minimum NFIP requirements. The following describes the responsibilities that specifically apply to administering the SI/SD requirements:

- Review permit applications to determine whether improvements or repairs of buildings in SFHAs constitute substantial improvement or repair of substantial damage.
- Review descriptions of proposed work submitted by applicants to ensure that all requirements are addressed.
- Review cost estimates of the proposed work submitted by applicants and determine if the costs are reasonable for the proposed work, or use other acceptable methods to estimate the costs.
- Decide the method to determine market value (including which method to use after an event that damages many buildings) and identify the buildings most likely to have sustained substantial damage.

Even if work on a building is determined to not constitute SI/SD, owners can do a lot to reduce future flood damage. Some recommendations that local officials may wish to encourage are listed in Section 5.8.

- Review market value appraisals, if submitted by applicants, to determine if the appraisals reasonably represent the characteristics of the building and the market value of the structures (excluding land value).
- Determine if proposed improvements are substantial improvements based on the costs of the proposed work compared to the market value of the building.
- Determine if damaged buildings are substantially damaged based on cost estimates for repairs compared to the market value of the building before the damage occurred.
- Issue a letter to the property owner to convey the SI/SD determination. If NFIP-insured buildings are substantially damaged by flooding, this letter is necessary for owners to file an Increased Cost of Compliance (ICC) claim to help pay to bring buildings into compliance (Section 7.6).
- Retain all versions of the Flood Insurance Rate Maps (FIRMs) and allow citizens to access the maps. The most recent map, called the “effective” map, is to be used to regulate development, including substantial improvements. Earlier versions of the maps are necessary to verify BFE data for post-FIRM buildings that pre-date the current effective maps.
- Maintain in the permit file specific information on all development that occurs within the SFHA and make this information available for public inspection. The documentation should include the lowest floor elevations, other pertinent elevations such as for machinery and equipment, and flood protection designs.
- Conduct periodic field inspections during construction to ensure that development complies with issued permits, work with builders and property owners to correct deficiencies and violations, and check for unpermitted development.
- Perform assessments after events that cause damage, inform property owners of the requirement to obtain permits for repairs, and determine whether the damage qualifies as substantial damage.
- Coordinate with property owners and insurance adjusters regarding NFIP flood insurance claims and ICC coverage.

Local building officials have the authority to condemn buildings that are judged to be unfit for occupancy. Judging whether to condemn a building and making a determination of substantial damage are separate decisions. A condemned building might not be substantially damaged and a substantially damaged building might not have conditions that warrant condemnation.

5.3 Property Owner/Applicant Responsibilities

Property owners and applicants for permits have certain responsibilities that are implicit when a community adopts regulations and building codes that apply to their properties. First and foremost, they have a responsibility to comply with the requirements that are enforced by communities, including floodplain management requirements. The following is a summary of those responsibilities pertinent to the SI/SD requirements:

- Find out if a permit is required. Most property owners – and all contractors – understand that permits are required for some types of work. It is common for owners to specify

that contractors obtain permits. However, sometimes owners assume that contractors automatically do so and, as a result, the work may be undertaken without permits. Legally, the responsibility lies with the owner.

- Submit complete information about all proposed improvements and all repairs to be undertaken, including the costs of all work (and valuations of work that the owner or volunteers will perform, including estimated costs of donated materials).
- Share information from insurance claims adjusters, if requested by the local official.
- Provide a professional appraisal of the market value of the building if requested by the local official (or accept the market value estimation made by the local official).
- Comply with the approved plans and limitations specified in the issued permit and the approved construction documents.
- Inform the local official if new work is to be added to the work already authorized by an issued permit. New work must be reviewed to determine whether the community's floodplain management regulations apply.
- Contact the community to schedule inspections at the appropriate times and submit surveyed elevation data when required by the local official.
- Provide "as-built" surveyed elevation data (e.g., FEMA's *Elevation Certificate*) to the local official to determine compliance (the *Elevation Certificate* also is necessary for insurance agents to determine the appropriate rate for NFIP flood insurance policies).
- Maintain enclosed areas below elevated buildings as compliant enclosures by not altering any aspect required by the permit, including limitations on use for parking of vehicles, building access, and storage.

5.4 Important Community Actions

Communities routinely process permit applications for work on existing buildings. For buildings located in SFHAs, work that constitutes substantial improvement triggers the requirement to bring buildings into compliance. Some property owners may view this as an undue burden that may cost them considerably more than the work originally proposed. Therefore, it is important that communities have a well-established process that treats all owners in a consistent manner. This is especially important in communities that have large numbers of buildings in their floodplains that could be damaged by a single event.

The remaining sections of this chapter will describe the following important community actions with respect to SI/SD:

- Informing the public (application forms, websites, handouts)
- Administering the SI/SD requirements
- Exceeding the NFIP minimum floodplain management requirements
- Recommendations to improve flood resistance

5.5 Informing the Public

Most property owners understand that building permits are required when they want to have work done on their buildings. However, they are rarely aware of the requirements that apply when buildings are located in SFHAs. Informing the public about the requirements may alleviate some of the difficulties that can occur when uninformed owners apply for permits. Successful outreach methods employed by communities include:

- Permit counter staff and inspectors are trained and familiar with the SI/SD requirements and other requirements for development in SFHAs and they all convey the same message when talking with property owners and contractors.
- Permit application forms or supplements to applications are designed specifically to capture information about work proposed for buildings in SFHAs.
- Handouts at the permit counter explain floodplain requirements, including the SI/SD requirements.
- Information is posted online about permit requirements, including SI/SD requirements in the SFHA.
- Newsletters and brochures are used for periodic mailings, such as those described in guidance materials developed for the NFIP's Community Rating System (Section 5.7.1).

5.5.1 Permit Application Forms

A permit is required for almost every type of development that is proposed in the mapped SFHA. Local permit application forms should be designed to collect the information needed to make SI/SD determinations. Permit forms should require applicants (or their contractors) to provide detailed descriptions of the proposed work and detailed breakdowns of the costs of work, as this information is essential for making SI/SD determinations. Some communities that have many buildings in their SFHAs have developed detailed permit application forms to help them review proposals for work in SFHAs, including work on existing buildings.

Forms and checklists help ensure that all applicants are treated consistently. They also make it easy for the local official to document SI/SD determinations and to retain that documentation in permanent records.

Appendix D includes a sample notice called “Sample Notice for Property Owners, Contractors, and Design Professionals” that includes a summary of the “50% rule,” information about property valuation, a list of items to be included and excluded in the cost of work, and a cost-breakdown sheet. The sample notice includes two affidavits to be signed by the owner and the contractor. The affidavits are used to confirm that the work described in an application is all of the work that will be done.

5.5.2 Websites and Handouts

Most communities have websites designed to provide information for their citizens. Websites often include sections to explain requirements for various permits and approvals. Some even

have online permit application capabilities. Increasingly, citizens, designers, and contractors are turning to websites to learn about regulations and requirements. Posting information online about development requirements in SFHAs is helpful for communities and their citizens.

Despite the increased use of the Internet, most communities still provide printed materials. Many communities distribute newsletters and brochures to their citizens, including materials related to flood hazards, flood insurance, and SFHA construction requirements.

5.6 Administering the SI/SD Requirements

The NFIP requires communities to review all applications for development in SFHAs and to apply their floodplain management regulations and building codes to work that is proposed on existing buildings. Chapter 4 described making SI/SD determinations, estimating costs, and estimating market values. This section addresses several topics that local officials encounter when administering floodplain management regulations and building codes pertaining to SI/SD:

- Combinations of types of work
- Phased improvements
- Incremental repair of damaged buildings
- Damaged buildings
- Special circumstances (involving damaged buildings)
- Appeals of decisions
- Variances to the requirements
- Floodways
- V zones
- Coastal Barrier Resource Areas
- Revisions of the FIRM
- Inspections
- Enforcement and violations
- Recordkeeping
- Issuing SI/SD determination letters
- Rescinding SI/SD determinations

5.6.1 Combinations of Types of Work

It is common for local officials to see applications for combinations of improvements and repairs. In these cases, the combined cost of all work must be used to make the SI/SD determination. For example, it is common for property owners who are making necessary repairs to damaged buildings to also include elective improvements. Communities must require applicants to

provide the estimated costs of all proposed improvements and repairs. The total cost is then used to make the SI/SD determination, comparing it to the pre-damage or pre-improvement market value of the building. Section 6.4 illustrates examples of types of work that local officials may see combined in permit applications.

5.6.2 Phased Improvements

The term “phased improvement” refers to a single improvement that is broken into parts. For a number of reasons, owners may wish to schedule anticipated improvements over a period of time, and they may request separate permits for each phase. Local officials should take care to ensure that phased improvements do not circumvent the substantial improvement requirements.

Concern about phased improvements is one reason why some communities adopt requirements that accumulate the value of improvements over time (Section 5.7.3).

Experienced plan reviewers can usually tell if the work described in a permit application adequately identifies all of the work needed to complete the improvement. One approach is to remind the applicant that the application is a legal document and that it is the applicant’s responsibility (or the responsibility of the applicant’s design professional or contractor) to accurately complete the application. It is also reasonable for the local official to request that the applicant state, in writing, that the work proposed is all of the anticipated work and that the work can be done for the stated cost estimate.

Some communities address deliberate phasing of improvements in the permit application or other document. Appendix D includes sample affidavits that the community may require be signed by owners and contractors to confirm that the work described in an application is all of the work that will be done.

Other scenarios of phased improvements include:

- **Incomplete work.** Permits should not be issued for work that clearly will not result in a building that can be occupied without additional work. For example, while a community may decide to issue one permit for the foundation, framing, and roof of an addition, and a second permit at a later time to complete the remaining work necessary for occupancy (electrical, plumbing, flooring, etc.), the SI/SD determination must be made prior to issuance of the first permit, and must consider the cost of all work regardless of the number of permits issued.
- **Multiple permits.** Some jurisdictions, especially larger cities and counties, issue separate mechanical, electrical, plumbing, and building permits. If handled by different offices, coordination is especially important so that the value of all work is combined for the SI/SD determination, regardless of the number of permits issued.
- **Consecutive permits.** If an application for a second permit is submitted within a short period of time after the first permit is issued, the local official should examine whether the work covered by the second request is related to improvements to the building. If so, then the work must be evaluated in conjunction with the first permit to determine whether the combination constitutes substantial improvement. The substantial improvement regulations

apply to all of the work that is proposed as the improvement, even if multiple permits are issued. Therefore, the determination of the cost of the improvement should consider all costs of all phases of the work before issuance of the first permit.

- **Modification of issued permits.** A request to modify an existing permit to add work could retroactively trigger substantial improvement. It is common that a permit is issued to repair a damaged structure, and the owner subsequently decides to have some additional improvements done. Whether the community handles this as a modification of the initial permit or issuance of a second permit, care must be taken to reevaluate the SI/SD determination. Local officials must verify that the proposed repair work includes all of the anticipated work, including improvements to the building.
- **Unauthorized work.** If unauthorized work on a building in the SFHA is discovered, the enforcement action taken by the community must include making an SI/SD determination. The costs must include all of the work that has been performed, plus all of the remaining work necessary to complete the project.

5.6.3 Incremental Repair of Damaged Buildings

“Incremental repairs” are similar to phased improvements and refer to a single repair project that is broken into parts. When buildings have sustained damage, regardless of the cause, it is fairly common for some owners to undertake restoration and repairs over a period of time. Sometimes the initial work is only the minimum necessary to make the building safe enough to reoccupy (provided reoccupancy is allowed by the community). Sometimes the owner’s financial situation does not allow all of the repairs to be done at the same time.

The definition of “substantial damage” makes it very clear that the substantial damage determination must consider all costs necessary to restore damaged structures to their before-damage condition. Even if an owner elects to perform less work or make repairs over time, the community must require the applicant to provide an estimate of the costs to fully restore the structure. Section 4.4 includes guidance on estimating the costs of work performed by the owner or volunteers and the costs of donated or discounted materials.

5.6.4 Damaged Buildings

Most damage occurs during a single and sudden event, such as a fire, high wind, lightning strike, falling tree, tornado, earthquake, flood, natural gas explosion, etc. However, buildings also may be damaged by causes that are not related to a specific event. These causes include soil settlement, exposure to the elements, termite infestation, vandalism, deterioration over time, and other causes. Regardless of the cause of damage, when owners apply for permits to repair, communities must determine whether the building is substantially damaged.

Property owners should check their insurance policies. Policies that include “law and regulations” coverage may cover costs associated with complying with requirements to bring buildings into compliance with flood provisions in local floodplain ordinances or building codes.

With respect to making substantial damage determinations, costs to repair must include all costs that are necessary to repair a building to its pre-damage condition, even if the owners elect to perform only some repairs or incremental repairs (Section 5.6.3).

If a community suffers damage to only a few buildings, then the permits for repairs generally can be handled under a community's standard permit processing procedures. Communities that have a large number of buildings in their floodplains should decide in advance how best to handle inspecting damaged buildings and making substantial damage determinations (Chapter 7). In those circumstances, FEMA's *Substantial Damage Estimator* (SDE) software provides an effective and efficient approach for developing reasonable estimates of the values of buildings and costs to repair or reconstruct buildings (Section 7.5).

Issuance of an SD determination does not necessarily indicate that a building is unsafe, unfit for occupancy, or condemned.

Local officials should become familiar with the ICC coverage that is part of NFIP flood insurance policies. ICC claims are only paid on buildings in the SFHA that the local official determines to be substantially damaged or that have sustained repetitive flood damage that qualifies under the policy. ICC can provide policyholders with up to \$30,000 towards costs necessary to bring a building into compliance with the community's floodplain management requirements. ICC is described in Section 7.6.

5.6.5 Special Circumstances (Damaged Buildings)

Communities should be aware of a number of special circumstances that may arise when dealing with damaged buildings:

- **Change of ownership.** Sometimes owners sell damaged buildings in SFHAs before repairs are undertaken. Change of ownership does not have any bearing on the substantial damage determination. Regardless of whether the determination is made before or after the sale, it is to be based on the value prior to the date of damage.
- **Multiple flood events.** Communities may have to address damage resulting from multiple flood events. All affected structures should be handled consistently:
 - If no repairs are made to a structure after a flood, and a second flood causes additional damage, local officials must include all costs to repair damage from both events. The market value of the building used in making an SI/SD determination is the value prior to the first flood. If that value cannot be determined, the market value prior to the second flood should be used.
 - If some or all repairs are made after a flood (and the cost to repair to the structure was determined to not be substantial damage), and a second flood causes damage that must be evaluated to determine whether the building was substantially damaged, then the market value is the value prior to the second flood.
- **Conditions discovered in the course of doing work.** Occasionally, additional damage is discovered during the course of work that has been authorized by a permit. For example, termite damage or other conditions may not have been identified before the permitted work is started, but it is discovered once work is underway. Such conditions may reduce the

capacity of the load-bearing members or otherwise result in damage to the building. After the condition is revealed, if the work that is required to address the discovered condition triggers a change in the permit, the community must reevaluate the SI/SD determination. The costs of the new work must be added to the cost of the improvement. The market value of the building that was used in the original determination is used in the revised determination.

5.6.6 Appeals of Decisions

An applicant for a permit may appeal a decision, order, or determination that was made by the local official. This occurs most often if there is ambiguous language in a code or regulations that leads to differing interpretations. Typically, appeals are heard by a board designated to hear such cases, which may go by a variety of names (board of appeals, board of adjustments, etc.). In some small communities, the function may be handled by the jurisdiction's governing body (town council, board of selectmen, etc.).

An owner may appeal the local official's finding or determination that the proposed work constitutes SI/SD. The owner may appeal an SI/SD determination on the basis of insufficient information, errors, repair/improvement costs that should be included/excluded, inappropriate valuations of costs for the proposed work, or an inappropriate method to determine the market value of the building.

It is not appropriate for an owner who wishes to build in a manner that is contrary to the regulations and codes to seek an appeal. In those cases, the owner would seek a variance.

5.6.7 Variances to the Requirements

A variance is a grant of relief from the terms of a land use, zoning, or building code regulation. If granted, it allows construction in a manner that is otherwise prohibited. The burden of determining whether to grant a variance rests on the community.

The primary goals of the NFIP and local floodplain management regulations and codes are the reduction of damage and protection of public health and safety. Because a variance from the requirements for construction in SFHAs can create an increased risk to life and property, local officials should carefully consider requests for variances from flood elevation or other floodplain management requirements.

The NFIP regulations do not set forth absolute criteria for granting variances [44 CFR § 60.6]. The regulations outline procedures that communities must follow (see FEMA 480, *Floodplain Management Requirements: A Study Guide and Desk Reference for Local Officials* for additional guidance on handling variances). Variances shall only be issued based on the following:

- A showing of good and sufficient cause;

NFIP flood insurance policies on post-FIRM buildings and substantially improved buildings that do not comply with the NFIP requirements, even if authorized by a properly issued variance, are rated according to risk. The cost will be high if a variance allows the lowest floor to be below the BFE (see Figure 6-14 in Section 6.6).

- A determination that failure to grant the variance would result in exceptional hardship (consistent with usage related to land use and zoning, in this context a “hardship” must be related to the land, not a financial or personal circumstance of the owner);
- A determination that granting the variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization of the public, or conflict with existing local laws or regulations; and
- Evidence that the variance is the minimum necessary to afford relief, considering the flood hazard.

As a guiding principle, a variance should pertain to the unique characteristics of the land itself. A properly issued variance may be granted for a parcel of land with physical characteristics so unusual that complying with the regulation or code would create an exceptional hardship for the applicant. However, a variance should not be granted based on the personal circumstances of an individual.

Sometimes variances are sought because the owner or the designer believes they will not be able to meet the community’s floodplain management regulations. Usually there are alternative ways to comply that would negate any purported justification for a variance, and local officials should require consideration of those alternatives before acting on variance requests. Typical characteristics of a parcel of land that might justify a variance include an irregularly shaped lot, a parcel with unsuitable soils, or a parcel with an unusual geologic condition below ground level. However, it is unusual that any physical characteristic would give rise to a hardship that would be sufficient to justify issuing a variance to the elevation requirement.

A community that grants a variance based on the above evidence and according to FEMA guidance does not jeopardize its standing in the NFIP. However, FEMA and the States periodically evaluate how effectively communities administer their floodplain management requirements. FEMA becomes concerned when there is a pattern of variances that suggest the practice is used to circumvent requirements.

Communities that administer the I-Codes may handle variances to the flood provisions through their boards of appeals. Unless the State or community has modified or replaced the administrative provisions, the IRC specifies that the building official will review information provided with permit applications for work on buildings in SFHAs. The official will make a finding based on the cost of the proposed work and the market value of the building and, if the results indicate the work is a substantial improvement, the finding is forwarded to the board of appeals for a final determination. Communities have a board of appeals (which might go by another name) to hear and decide appeals of orders, decisions, or determinations made by the building official. The IRC outlines specific responsibilities of the board when hearing matters related to

Insufficient justifications for variances to the SI/SD requirements include:

- Inconvenient access to an addition
- Difficult access for those with physical limitations
- Too costly to comply
- The owner does not plan to get flood insurance
- Building will look different
- Building will need a waiver of height limitations

structures in SFHAs, including:

- **Determination of substantial improvement in areas prone to flooding.** Requires the board of appeals to evaluate the building official's finding regarding the value of proposed improvements to determine if the work constitutes SI/SD.
- **Criteria for issuance of a variance for areas prone to flooding.** Sets forth specific criteria, consistent with the minimum NFIP requirements, to be applied in the review and consideration of variances to the minimum flood hazard area requirements.

5.6.8 Floodways

Local officials must examine proposals for work on buildings that are located in floodways to determine whether the work constitutes SI/SD. If a building is located in a floodway, bringing it into compliance may involve a floodway encroachment analysis. The NFIP regulations require that this analysis be performed for any work that encroaches into a floodway [44 CFR § 60.3(d)(3)]. If the analysis indicates any increase in the BFE, the local official must not allow the proposed work.

The NFIP defines the floodway as the channel or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height. Floodways are delineated along most waterways that are studied using detailed methods.

The analysis that is performed to delineate floodways takes into consideration existing encroachments and obstructions (including buildings) that were present at the time the data were collected for the analysis. This means that proposals for work on existing buildings that are located in a floodway are evaluated based on whether the exterior dimensions (footprint) of the original buildings will be increased, as follows:

- **No change to footprint.** Substantial improvement that does not expand the footprint might be an interior-only renovation or an added story. If the actions necessary to bring the building into compliance do not increase the exterior dimensions, a floodway encroachment analysis is not required. Note that enclosing a deck that is below the BFE to change it to livable space should be treated as an addition even though the work does not increase the footprint; the addition becomes an encroachment in the floodway and an analysis must be prepared.
- **Increase in footprint, substantial improvement.** If work that increases the footprint (including an increase in fill, if used for elevation) involves an addition (or a combination of interior work and an addition) is determined to be a substantial improvement, the building must be brought into compliance. In this case, a floodway encroachment analysis is required because the exterior dimensions will be increased. A permit for the increase in footprint cannot be issued if the analysis indicates any increase in the BFE. An option that may decrease the effects of encroachment is to elevate additions on open foundations (piers or columns).
- **Increase in footprint, non-substantial improvement.** Local officials must review all proposed development in SFHAs and authorize the development by issuing permits. Development includes additions that do not constitute substantial improvements. If located in a floodway, a proposal to expand the exterior dimensions of a building with an addition that is not

a substantial improvement must be supported with a floodway encroachment analysis. Although the NFIP regulations do not require that the addition be elevated and meet all other requirements of the NFIP, the addition may be a potential encroachment into the floodway that must be evaluated. If the floodway analysis indicates any increase in the BFE, a permit cannot be issued for the addition.

5.6.9 V Zones

Local officials must review proposals to improve structures that are located in V zones to determine compliance with the NFIP’s V zone provisions, as well as the requirements for substantial improvements found in 44 CFR § 60.3(e). In V zones, new and substantially improved buildings must:

- Be elevated on open foundations (pilings or columns) that allow floodwaters and waves to pass beneath the elevated buildings
- Be elevated so that the bottom of the lowest horizontal structural member of the lowest floor is at or above the BFE
- Have the foundation anchored to resist flotation, collapse, and lateral movement due to the effects of wind and water loads acting simultaneously on all building components
- Have the area beneath the elevated building free of obstructions that would prevent the free flow of floodwaters and waves during a base flood event
- Have utilities and building service equipment elevated above the BFE
- Have the walls of enclosures below the elevated building designed to break away under base flood conditions without transferring loads to the foundation

In V zones, a registered professional engineer or architect shall develop or review the structural design, specifications, and plans and shall certify that the design and methods of construction are in accordance with accepted standards of practice to meet the V-zone requirements.

Section 6.4 describes some of the more common examples of improvements and repairs and descriptions of how property owners and contractors can meet NFIP requirements (also see Tables 6-1a and 6-1b). It is important to note again that work on a post-FIRM building cannot be allowed if it would make the building non-compliant with the floodplain management requirements that had to be met when the building was constructed.

All substantially improved buildings in V zones must be elevated. Floodproofing is not allowed in V zones, even for non-residential buildings.

5.6.10 Coastal Barrier Resource Areas

The Coastal Barrier Resources Act of 1982, and later amendments, prohibits the NFIP from providing flood insurance for structures built or substantially improved after October 1, 1983, in any areas designated as undeveloped coastal barriers. These areas are mapped and designated by Congress as units of the Coastal Barrier Resource System (CBRS) and are shown

on FIRMs. The FIRMs also show areas designated as Otherwise Protected Areas (OPAs), which include portions of coastal barriers that are used primarily for natural resources protection and are owned by Federal, State, and local governments or by certain non-profit organizations.

Permits are required for new construction and for improvements of existing buildings in CBRs and OPAs. Communities are required to administer their floodplain management regulations even if Federal flood insurance is not available for new buildings and substantially improved buildings in these areas.

Local officials must process permit applications for repairs and improvements to buildings in CBRs and OPAs. If the work is SI/SD, then it must comply with the minimum requirements of the NFIP. It is important to realize that pre-FIRM buildings in CBRs and OPAs that qualified for NFIP flood insurance may lose that eligibility if they are substantially improved or sustain substantial damage. Federal flood insurance may be obtained for a structure in the OPA if written documentation certifies that the structure is used in a manner consistent with the purpose for which the area is protected.

5.6.11 Revisions of the FIRM

In many communities, flood hazard maps have been revised to reflect new floodplain studies, better flood data, improved topographic data, new encroachments and bridges, and for other reasons. When flood hazard maps are revised, either the SFHAs expand in area and the BFEs increase, or the SFHAs reduce in area and the BFEs decrease. Map revisions may reflect changes in community boundaries, zone designation, new floodway delineations, or changes in floodway boundaries. Also, A zones without BFEs may be studied and shown with BFEs, or waterways that were previously unmapped may be shown with SFHAs.

The NFIP expects communities to maintain copies of all flood hazard maps, even those that have been replaced with revised maps. This is especially important when work is proposed on post-FIRM buildings.

Communities must maintain all versions of their Flood Insurance Studies (FISs) and flood hazard maps. This is an important responsibility because it affects consideration of work on buildings constructed in compliance with a map that pre-dates a current effective map. Section 6.4.8 describes repairs and improvements on post-FIRM buildings where there have been revisions to the FIRM.

5.6.12 Inspections

Even when building permits and construction plans are complete, proper inspections during construction are important to determine whether any work has deviated from the approved permits and plans. Building inspectors need to understand the flood damage-resistant design and construction requirements that they are to check during inspections. If deviations from the conditions of a permit or plans are discovered early during construction, it will be easier to work with the owner and builder to achieve compliance through corrective actions.

Using a plan review and inspection checklist can make inspections easier because the inspector has a standardized summary of floodplain management requirements. A checklist also

documents the inspection, which can be important if questions arise regarding compliance.

The following inspections are recommended for buildings that are required to be brought into compliance with the floodplain management requirements for new construction and substantial improvements:

- **Footing or Foundation Inspection.** Buildings and additions that are elevated on solid perimeter foundation walls create enclosures below the elevated buildings (e.g., crawlspace or underfloor space). Inspectors should check for the specified number, size, and location of flood openings. The bottom of each flood opening must be no higher than 1 foot above finished exterior grade or interior floor; flood openings should not be confused with underfloor air ventilation openings, which are located just under the floor level. For slab-on-grade (and stemwall) foundations, the lowest floor inspection is also conducted at this time.
- **Lowest Floor Inspection.** The best time to verify compliance with the elevation requirement is after the lowest floor elevation is set, but before further vertical construction takes place. An error in elevation of a foot or two may seem minor, but corrective action can be expensive and complicated if that error is discovered after the walls and roof are in place.
- **HVAC Inspection.** Verify that utilities and mechanical equipment are elevated or designed to prevent water from entering or accumulating within the components during conditions of flooding [44 CFR § 60.3(a)(3)]. Frequently overlooked items include heating, ventilation, and cooling equipment; electrical outlets; plumbing fixtures; and ductwork that is installed under the floor, usually in a crawlspace.
- **Enclosure Inspection.** Inspect enclosures below elevated buildings to ensure that they comply with the limitations on use (parking, building access, or storage), protection of HVAC described above, the use of flood damage-resistant materials, and the specific requirements based on the flood zone (openings in A zones or breakaway walls in V zones).
- **Final Inspection.** A final inspection to document compliance can be performed at the same time as the final inspection to issue the occupancy certificate. During final inspections:
 - Collect the “as-built” documentation of elevations prior to the final sign-off and issuance of occupancy certificates.
 - If used, complete and sign the plan review and inspection checklist and place all inspection reports in the permit file.

The NFIP requires communities to obtain and retain documentation of the lowest floor elevations of new buildings and substantially improved buildings. FEMA’s *Elevation Certificate* is designed specifically for this purpose.

FEMA’s *Floodproofing Certificate* is designed to satisfy the documentation requirements when non-residential buildings are proposed to be dry floodproofed.

5.6.13 Enforcement and Violations

Proper enforcement of the floodplain management provisions is a critical part of fulfilling a community’s responsibility under the NFIP. During construction, violations of the provisions must be resolved as soon as they are discovered and before further construction takes place. What may first appear to be a minor violation could turn out to be a significant issue that not

only exposes property owners and occupants to future flood damage, but results in higher NFIP flood insurance policies.

If the community has exhausted legal means to remedy a violation and the owner refuses to resolve the matter and bring the building into compliance, the community may cite the structure as a violation in accordance with Sec. 1316 of the National Flood Insurance Act of 1968. This provision allows the NFIP to deny flood insurance on the building that remains in violation, and on all other insurable buildings on the property. Owners who refuse to resolve violations should be informed that denial of flood insurance can have significant consequences: the property may be difficult to sell; the owner may have problems with the mortgage lenders if flood insurance cannot be maintained; and future Federal disaster assistance may be denied.

The NFIP expects communities to attempt all reasonable actions to bring violations into compliance. When such attempts are unsuccessful, the community should contact the NFIP State Coordinator or the FEMA Regional Office for advice.

A community's standing in the NFIP depends on making a good faith effort to successfully resolve violations. By allowing a violation to go unresolved, the community may set a precedent, making it more difficult to take future enforcement actions and potentially jeopardize participation in the NFIP.

5.6.14 Recordkeeping

Obtaining certain documentation and maintaining complete permit records are key responsibilities for communities that participate in the NFIP. Certifications or documentation of the following must be maintained for all new buildings constructed in SFHAs and, if applicable, for buildings that are substantially improved:

- The permit application form and all attachments, including the site plan
- Documentation of the SI/SD determination
- Community letter documenting the SI/SD determination (Section 5.6.15)
- Floodway encroachment analyses (Section 5.6.8)
- Records of inspections of the project while under construction such as obtaining the lowest floor elevations, which is initially obtained after the foundation is in place but prior to further vertical construction, and other pertinent elevations
- Design of engineered openings that are used as alternatives to the prescriptive openings in the walls of enclosures below elevated buildings in A zones (see FEMA Technical Bulletin 1, *Openings in Foundation Walls and Walls of Enclosures Below Elevated Buildings in Special Flood Hazard Areas*)
- In coastal high hazard areas, engineering certifications of designs and construction methods of new and substantially improved buildings (5.6.9)
- Designs for breakaway walls around enclosures below elevated buildings in V zones if prescriptive solutions are not used (see FEMA Technical Bulletin 9, *Design and Construction Guidance for Breakaway Walls Below Elevated Buildings Located in Coastal High Hazard Areas*)

- Evidence that work proposed for listed historic structures will not preclude continued listing (Section 6.5.1)
- Variance proceedings, including justifications and notifications to recipients (Section 5.6.7)
- Record of final inspections of the construction project before the certificate of occupancy is issued, such as location and size of openings, location of utilities, and “as-built” lowest floor elevation
- Certification of the elevation to which any nonresidential building has been floodproofed before the certificate of occupancy is issued

Although the use of checklists is not required by the NFIP, it is a good way to document plan reviews, inspections, and compliance. Some communities use checklists during plan reviews to verify that appropriate flood damage-resistant provisions have been checked and found to satisfy the applicable requirements. Similarly, the use of inspection checklists improves the consistency of inspections and helps verify the flood damage-resistant requirements.

5.6.15 Issuing SI/SD Determination Letters

Local officials should convey SI/SD determinations to property owners in an official letter. Because this letter notifies the owners of a significant requirement, it is recommended that it be sent in a manner that documents receipt by the addressee. Appendix E includes three sample letters to send SI/SD determinations to property owners. One sample is used to notify owners when a local official determines that proposed improvements are substantial improvements. Another sample is used to notify owners when a local official determines that buildings have sustained substantial damage. The third sample is used to notify owners that it has been determined that damage does not constitute substantial damage. The local official should offer to meet with owners or representatives to explain the various aspects required for buildings to meet the community’s floodplain management regulations for new buildings, explained in Chapter 6.

If substantial damage is caused by flooding and the buildings are insured by the NFIP, then the SD determination letter is necessary for owners to file ICC claims under NFIP flood insurance policies to help pay to bring the buildings into compliance with the community’s floodplain management requirements (Sections 5.6.4 and 7.6).

5.6.16 Rescinding SI/SD Determinations

Local officials use data to make findings and determinations regarding whether work constitutes substantial improvement or repair of substantial damage. The data, described in detail in Chapter 4, consist of the cost estimates of the proposed improvements or the cost estimates of work that is required to repair damaged buildings to their pre-damage condition, regardless of the amount of work that will be done. The data also include the market values of buildings prior to the improvement or before the damage occurred.

Determinations usually are based on data provided by the owner, the owner's representative, or a contractor. Other sources of repair costs and improvement costs and market value are described in Chapter 4.

Following receipt of an SI/SD determination, property owners may appeal the determination (Section 5.6.6) or may submit new data and request that the initial determination be rescinded. When new data are provided, local officials should evaluate it carefully. Rescinding a determination means the owner's investment in a flood-prone area would take place in a manner that continues the exposure of the existing structure and the investment to flood damage. Communities should thoroughly document and retain evidence of any appeals and changes to SI/SD determinations in their permanent records.

5.7 Exceeding NFIP Minimum Requirements

Some States and communities have adopted requirements for SI/SD that exceed the NFIP minimum requirements to better protect their citizens and property. The NFIP encourages communities to evaluate their own situations, degree of flood risk, and vulnerability of their residential and commercial properties, and to consider adopting requirements that are more restrictive in order to achieve the long-term goal of being more resistant to flood disasters. The more restrictive provisions take precedence. Many communities adopt higher standards in order to qualify for credit under the NFIP's Community Rating System (CRS). Section 5.7.1 is an overview of the CRS, a voluntary program that provides discounts on Federal flood insurance rates.

In terms of higher standards that relate to SI/SD, the two approaches that exceed the NFIP minimums are:

- Lower threshold for SI/SD (Section 5.7.2)
- Cumulative SI/SD (Section 5.7.3)

5.7.1 Community Rating System

The NFIP established the Community Rating System to encourage activities that exceed the NFIP minimum requirements and are effective at reducing flood damage and claims under the NFIP. In communities that apply to the CRS and are verified as implementing certain activities, citizens who purchase Federal flood insurance benefit from discounts on premiums ranging from 5 percent to as much as 45 percent.

For more than 40 years, communities that participate in the NFIP have recognized flood hazards in their construction and development decisions. Until 1990, the NFIP had few incentives

In 2003, the Association of State Floodplain Managers, Inc. (ASFPM) reported that several States have requirements that exceed the NFIP minimum requirements for substantial improvement. In these cases, State requirements take precedence.

The CRS has three goals:

1. Reduce flood losses
2. Facilitate accurate insurance rating
3. Promote awareness of flood insurance

for communities to do more than administer the minimum NFIP regulatory provisions. During those early years, flood insurance rates were the same in every community, even though some elected to exceed the minimum provisions.

The CRS is a voluntary program. Any community that is in full compliance with the regulations of the NFIP is considered to be in “good standing” and may apply for a CRS classification. A community’s CRS classification is a ranking based on the credit points calculated for specific floodplain management activities undertaken to meet the goals of the NFIP and the CRS. There are 18 creditable activities organized under 4 categories. One category includes more restrictive requirements for work on existing buildings.

The discount on NFIP flood insurance premiums is only one incentive for communities to undertake activities credited by the CRS. The larger benefits are improved public safety, reduced damage to property and public infrastructure, avoidance of economic disruption and losses, reduction of human suffering, and protection of the environment.

Additional information about the CRS can be found through the appropriate NFIP State Coordinator, the appropriate FEMA Regional Office, by downloading the *Coordinator’s Manual* at the CRS Resource Center (<http://training.fema.gov/EMIWeb/CRS>), or by checking the NFIP CRS section of FEMA’s website at <http://www.fema.gov/business/nfip/crs.shtm>.

5.7.2 Lower Threshold for SI/SD

The NFIP’s threshold for determining whether proposed work constitutes substantial improvement, or repair of substantial damage, is 50 percent. Compliance is required when the costs of an improvement or the costs to repair damage equal or exceed 50 percent of a structure’s market value.

Adopting a lower threshold, such as 40 percent or 30 percent, is perhaps the easiest way to exceed the NFIP minimum requirement. The concept is simple – compliance is required when the ratio of costs compared to market value equals or exceeds the lower percentage specified in the community’s regulations. Communities should make certain that they uniformly apply the lower threshold to all buildings in SFHAs, even after events that cause damage to many buildings, regardless of the cause of the damage.

Additional guidance for regulatory language and implementation of a lower threshold for SI/SD is found in *CRS Credit for Higher Regulatory Standards*, which is accessible online (<http://www.fema.gov/library/viewRecord.do?id=2411>).

The CRS offers credits to communities that adopt more restrictive requirements for SI/SD.

CRS credits are available to communities that adopt more restrictive SI/SD requirements:

- 43 CRS communities get credit for a lower threshold for SI/SD
- 289 CRS communities get credit for cumulative SI/SD

(Data as of October 2009)

5.7.3 Cumulative SI/SD

Many pre-FIRM buildings are subject to repetitive flood damage. Because of the nature of many flood hazard areas where repetitive flooding occurs, many of the buildings in these areas are unlikely to sustain the level of damage that qualifies as substantial damage based on the NFIP minimum 50 percent trigger. One way that communities can achieve long-term reduction of flood losses is to adopt a requirement that all improvements and repairs are tracked over time and counted towards the SI/SD determination. Another reason some communities take this approach is to capture “phased improvements,” described in Section 5.6.2.

Adopting what is usually referred to as a “cumulative substantial improvement” requirement means that buildings will be brought into compliance with flood damage-resistant standards sooner than if the community administers the minimum NFIP requirement, which applies to each separate application for improvements and repairs.

The following change to the definition of “substantial improvement” is an example of how a cumulative substantial improvement requirement can be implemented (suggested new text is underlined). A more limited approach would be to count only repairs of damage (not improvements) in a cumulative manner. Communities should carefully consider the period of time to specify, whether the “life of the structure” or a specific period of time, such as 5-, 15-, or 30-years.

“Substantial improvement” means any combination of repairs, reconstruction, rehabilitation, addition, or other improvement of a structure taking place during [insert period of time selected by the community] the cost of which equals or exceeds fifty percent of the market value of the structure before the work is started. This term includes structures that have incurred ‘substantial damage,’ regardless of the actual repair work performed.

A good system for recording and accessing records is necessary to administer a cumulative SI/SD requirement. Each time an owner applies for a permit to make improvements or repairs, the records for that building must be checked. Obviously, this is feasible only if those records are retained over the period of time specified in the regulations.

Tracking the cost of repairs and improvements over time is straightforward but, for the purpose of making SI/SD determinations, the community must have a market value to compare to those costs. Because the market value of a building changes over time, communities need to decide how they will handle those changes. One approach is to obtain the market value each time a permit is obtained, use it in the computation each time, and add the resulting percentages. Communities may choose to accumulate percentages or repair/improvement costs over a set period of years. Table 5-1a illustrates this approach where market value increases steadily, and Table 5-1b illustrates this approach where the market value first decreases and then increases.

Table 5-1a. Tracking Cumulative Substantial Improvements, Determining Market Value for Each Permit Application (shows increases in market value).*

Elapsed time from initial permit application	Current market value (at the time of each permit application)	Cost of improvement	Cost as percentage of current market value	Cumulative percentage
0 year	\$100,000	\$10,000	10%	10%
3 years	\$110,000	\$42,000	38%	48%
6 years	\$120,000	\$10,000	8%	56%

* In this example, the 50 percent threshold is reached with the third permit application.

Table 5-1b. Tracking Cumulative Substantial Improvements, Determining Market Value for Each Permit Application (shows decrease, then increase in market value).*

Elapsed time from initial permit application	Current market value (at the time of each permit application)	Cost of improvement	Cost as percentage of current market value	Cumulative percentage
0 year	\$100,000	\$10,000	10%	10%
3 years	\$90,000	\$28,000	31%	41%
6 years	\$105,000	\$10,800	10%	51%

* In this example, the 50 percent threshold is reached with the third permit application.

Communities will only have records of work for which permits are required. Owners may undertake work that does not require a permit (e.g., patching a roof or replacing a window) and those costs would not count towards the cumulative substantial improvement. It is not the intent of a cumulative substantial improvement requirement to discourage general maintenance and upkeep. However, if any part of the work requires a permit, then all of the proposed work is counted in the SI/SD determination. For example, as part of a project to repair roof damage that involves replacing rafters and underlayment, the owner may decide to replace shingles on an undamaged portion of the roof. The cost of the re-shingling is included in the determination.

Additional guidance for regulatory language and implementation of a cumulative substantial improvement requirement is found in *CRS Credit for Higher Regulatory Standards*.

5.8 Recommendations to Improve Flood Resistance

Local officials can encourage owners to improve the flood resistance of older buildings during the course of repairs and improvements even if owners propose improvements or repairs that do not trigger the SI/SD requirements. Improving resistance can facilitate rapid clean-up and recovery, and reduce repair costs. Whether these actions are applicable to a specific situation depends, in part, on the characteristics of the flood hazard and the building:

- Replace gypsum board or wood paneling below the BFE (preferably below the BFE plus 1 foot or more) with vinyl panels that can be removed to facilitate clean-up and drying before being reinstalled.
- Replace insulation with closed-cell foam insulation that can be cleaned, dried, and replaced.
- Replace flooring and floor finishes with flood damage-resistant materials.
- Relocate mechanical equipment out of basements or other flood-prone spaces and elevate above the BFE.
- Abandon the use of below-grade areas (basements) and fill them in to prevent structural damage.
- Install flood openings in crawlspace foundation walls and garage walls (see FEMA Technical Bulletin 1, *Openings in Foundation Walls and Walls of Enclosures Below Elevated Buildings in Special Flood Hazard Areas*).
- Install backflow devices in sewer lines.
- If sufficient warning time is available from official sources, pre-plan actions to move contents from the lower floors to the higher floors when a warning is issued.

