

Applications for building permits for repair or additions of any nature in flood zones:

For all permit applications – determine whether or not structure is in a flood plain or flood way using City GIS application. Flood Ways are blue with black diagonal hatching, Flood Plains are shaded blue.

Property not in a flood zone

1. Proceed with standard permitting pursuant to standard procedures for building permits.
2. Note on permit if repairs are resulting from a particular large scale event, e.g. flood, tornado, etc.

Property in a flood zone – New construction

1. All new construction must be completed in accordance with the City's flood plain ordinance and current building codes. See Table 3.

Property in a flood zone – additions or renovations of existing structures

1. Procedures for additions or renovations to existing structures in a flood zone are the same as for repairs to existing structures except the 50% compliance standard is measured based on cost of addition instead of cost to repair. See Appendix A for examples.

Property in a flood zone – Repairs to existing structures

All permit applications require must include a repair estimate for the total cost to repair damage. Estimate must be for the total **cost to repair**, not the **cost of repairs**. The cost to repair all building/structure damage to its pre damage condition must be included even if the property owner is self performing the work or elected to not perform certain elements of work (see page 8-18 of Appendix A). A listing of items to be included in the cost to repair is listed in Table 1

- a. Compare cost to repair for the **structure/building** with the market value of building. See Table 2 for acceptable methods of determining market value.
- b. If the Cost of the work is **less than 50%** of structure/building value:
 - i. Process permit pursuant to standard procedures for building permits.
 - ii. Note date and cause of damage on building permit.
- c. If the cost of work is **greater than 50%** of structure/building value:
 - i. Permit application must include sealed plans from an architect or engineer showing that the improvements conform to the City's Flood Damage Prevention Ordinance. See Table 3 for plan requirements.
 - ii. Before issuing building permit, plans must be reviewed by City Engineer for compliance with Flood Damage Prevention Ordinance.
 - iii. Following approval by City Engineer, process permit pursuant to standard procedures for building permits.

Table 1 - Items in Cost to Repair

Items to be included

- All structural elements, including:
 - Spread or continuous foundation footings and pilings
 - Monolithic or other types of concrete slabs
 - Bearing walls, tie beams and trusses
 - Floors and ceilings
 - Attached decks and porches
 - Interior partition walls
 - Exterior wall finishes (brick, stucco, siding) including painting and moldings
 - Windows and doors
 - Reshingling or retiling a roof
 - Hardware
- All interior finishing elements, including:
 - Tiling, linoleum, stone, or carpet over subflooring
 - Bathroom tiling and fixtures
 - Wall finishes (drywall, painting, stucco, plaster, paneling, marble, etc.)
 - Kitchen, utility and bathroom cabinets
 - Built-in bookcases, cabinets, and furniture
 - Hardware
- All utility and service equipment, including:
 - HVAC equipment
 - Plumbing and electrical services
 - Light fixtures and ceiling fans
 - Security systems
 - Built-in kitchen appliances
 - Central vacuum systems
 - Water filtration, conditioning, or recirculation systems
 - Cost to demolish storm-damaged building components
 - Labor and other costs associated with moving or altering undamaged building components to accommodate improvements or additions
 - Overhead and profits

Items to be excluded

- Plans and specifications
- Survey costs
- Permit fees
- Post-storm debris removal and clean up
- Outside improvements, including:
 - Landscaping
 - Sidewalks
 - Fences
 - Yard lights
 - Swimming pools
 - Screened pool enclosures
- Detached structures (including garages, sheds and gazebos)
- Landscape irrigation systems

Table 2 – Acceptable Estimates of Market Value

- An independent appraisal by a professional appraiser. The appraisal must exclude the value of the land and not use the “income capitalization approach” which bases value on the use of the property, not the structure.
- Detailed estimates of the structure’s actual cash value— the replacement cost for a building, minus a depreciation percentage based on age and condition. For most situations, the building’s actual cash value should approximate its market value. Your community may prefer to use actual cash value as a substitute for market value, especially where there is not sufficient data or enough comparable sales.
- Property values used for tax assessment purposes with an adjustment recommended by the tax appraiser to reflect current market conditions (adjusted assessed value). Found at: Shelbyal.com under Departments-Property Tax Commissioner - “PROPERTY TAX” tab.
- The value of buildings taken from NFIP claims data (usually actual cash value).
- Qualified estimates based on sound professional judgment made by the staff of the local building department or tax assessor’s office.

Table 3 – Standards for Development

DIVISION 4. - PROVISIONS FOR FLOOD HAZARD REDUCTION

Sec. 4-58. - General standards.

In all areas of special flood hazard the following provisions are required:

- (1) Require copies of all necessary permits from governmental agencies from which approval is required by Federal or State law, including section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1334. Maintain such permits be on file.
- (2) New construction and substantial improvements of existing structures shall be anchored to prevent flotation, collapse and lateral movement of the structure.
- (3) New construction and substantial improvements of existing structures shall be constructed with materials and utility equipment resistant to flood damage.
- (4) New construction and substantial improvements of existing structures shall be constructed by methods and practices that minimize flood damage:
 - a. All subdivision proposals shall be consistent with the need to minimize flood damage;
 - b. All subdivision proposals shall have public utilities and facilities such as sewer, gas, electrical and water systems located and constructed to minimize flood damage;
 - c. All subdivision proposals shall have adequate drainage provided to reduce exposure to flood hazards.
- (5) All heating and air conditioning equipment and components, all electrical, ventilation, plumbing, and other service facilities shall be designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding.
- (6) Manufactured homes shall be anchored to prevent flotation, collapse, and lateral movement. Methods of anchoring may include, but are not limited to, use of over-the-top or frame ties to ground anchors. This standard shall be in addition to and consistent with applicable State requirements for resisting wind forces.
- (7) New and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the system.
- (8) New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters into the systems and discharges from the systems into flood waters.
- (9) On-site waste disposal systems shall be located and constructed to avoid impairment to them or contamination from them during flooding.
- (10) Any alteration, repair, reconstruction or improvement to a structure which is not compliant with the provisions of this article, shall be undertaken only if the non- conformity is not furthered, extended or replaced.
- (11) Proposed new construction and substantial improvements that are partially located in an area of special flood hazard shall have the entire structure meet the standards for new construction.
- (12) Proposed new construction and substantial improvements that are located in multiple flood hazard risk zones or in a flood hazard risk zone with multiple base flood elevations shall have the entire structure meet the standards for the most hazardous flood hazard risk zone and the highest base flood elevation.

(Ord. No. 070-04, art. 4, § A, 2-17-20)

Table 3 – Standards for Development

Sec. 4-59. - Specific standards.

In all areas of special flood hazard designated as A1-30, AE, AH, A (with engineered or estimated base flood elevation), the following provisions are required:

- (1) Residential and non-residential structures - Where base flood elevation data is available, new construction and substantial improvement of any structure or manufactured home shall have the lowest floor, including basement, elevated no lower than one foot above the base flood elevation. Should solid foundation perimeter walls be used to elevate a structure, openings sufficient to facilitate the unimpeded movements of flood waters shall be provided in accordance with standards of subsection (3).
- (2) Non-residential structures - New construction and substantial improvement of any non-residential structure located in A1-30, AE, or AH zones, may be floodproofed in lieu of elevation. The structure, together with attendant utility and sanitary facilities, must be designed to be water tight to one (1) foot above the base flood elevation, with walls substantially impermeable to the passage of water, and structural components having the capability of resisting hydrostatic and hydrodynamic loads and the effect of buoyancy. A registered professional engineer or architect shall certify that the design and methods of construction are in accordance with accepted standards of practice for meeting the provisions above, and shall provide such certification to the official as set forth above and in section 4-57(6).
- (3) Enclosures for elevated buildings - All new construction and substantial improvements of existing structures that include any fully enclosed area below the base flood elevation, located below the lowest floor formed by the foundation and other exterior walls shall be designed so as to be an unfinished or flood resistant enclosure. The enclosure shall be designed to equalize hydrostatic flood forces on exterior walls by allowing for the automatic entry and exit of flood waters.
 - a. Designs for complying with this requirement must either be certified by a professional engineer or architect or meet the following minimum criteria:
 1. Provide 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 (if a structure has more than one enclosed area below the base flood elevation, each shall have openings on exterior walls);
 2. The bottom of all openings shall be no higher than one foot above grade; and
 3. Openings may be equipped with screens, louvers, valves and other coverings and devices provided they permit the automatic flow of floodwater in both directions.
 - a. So as not to violate the "Lowest Floor" criteria of this article, the unfinished or flood resistant enclosure shall only be used for parking of vehicles, limited storage of maintenance equipment used in connection with the premises, or entry to the elevated area.
 - b. The interior portion of such enclosed area shall not be partitioned or finished into separate rooms. All interior walls, ceilings and floors below the base flood elevation shall be unfinished and/or constructed of flood resistant materials.
 - c. Mechanical, electrical or plumbing devices shall not be installed below the base flood elevation. The interior portion of such enclosed area(s) shall be void of utilities except for essential lighting and power as required.
- (4) Standards for manufactured homes and recreational vehicles - Where base flood elevation data are available:
 - a. All manufactured homes placed and substantially improved on:
 1. Individual lots or parcels,
 2. In new or substantially improved manufactured home parks or subdivisions,
 3. In expansions to existing manufactured home parks or subdivisions, or

Table 3 – Standards for Development

4. On a site in an existing manufactured home park or subdivision where a manufactured home has incurred "substantial damage" as the result of a flood, must have the lowest floor including basement elevated no lower than one foot above the base flood elevation.
 - b. Manufactured homes placed and substantially improved in an existing manufactured home park or subdivision may be elevated so that either:
 1. The lowest floor of the manufactured home is elevated no lower than one foot above the level of the base flood elevation, or
 2. Where no base flood elevation exists, the manufactured home chassis and supporting equipment is supported by reinforced piers or other foundation elements of at least equivalent strength and a maximum of 60 inches (five feet) above grade and must meet the standards of section 4-61(5).
 - c. All manufactured homes must be securely anchored to an adequately anchored foundation system to resist flotation, collapse and lateral movement.
 - d. All recreational vehicles placed on sites must either:
 1. Be on the site for fewer than 180 consecutive days, fully licensed and ready for highway use if it is licensed, on its wheels or jacking system, attached to the site only by quick disconnect type utilities and security devices, and has no permanently attached structures or additions; or
 2. The recreational vehicle must meet all the requirements for "New Construction," including the anchoring and elevation requirements of section 4-59, provisions (3)a and (3)c.
- (5) Require, until a regulatory floodway is designated, that no new construction, substantial improvements, or other development (including fill) shall be permitted within Zones A1-30 and AE on the City of Pelham 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.
- (6) Accessory structures (also referred to as appurtenant structures) - This provision generally applies to new and substantially improved accessory structures. When an accessory structure complies with all other provisions of this article (including floodway encroachment), represents a minimal investment (less than \$5,000), and meets the requirements outlined below, these structures may be wet-floodproofed and do not have to be elevated or dry floodproofed.

Accessory structures include, but are not limited to, residential structures such as detached garages, storage sheds for garden tools or woodworking, gazebos, picnic pavilions, boathouses, small pole barns, and similar buildings. The following provisions apply to accessory structures built below the base flood elevation:

- a. A permit shall be required prior to construction or installation.
- b. Must be low value (less than \$5,000) and not be used for human habitation.
- c. Use must be restricted to parking of personal vehicles or limited storage (low-cost items that cannot be conveniently stored in the principal structure).
- d. Must be designed with an unfinished interior and constructed with flood damage-resistant materials below the BFE.
- e. Must be adequately anchored to prevent flotation, collapse, or lateral movement.
- f. Must have adequate flood openings as described in section 4-58(5) and be designed to otherwise have low flood damage potential.

Table 3 – Standards for Development

- g. Shall be constructed and placed on the building site so as to offer the minimum resistance to the flow of floodwaters.
- h. Any mechanical and other utility equipment in the structure must be elevated to or above the BFE or must be floodproofed.
- i. Under limited circumstances communities may issue variances to permit construction of wet-floodproofed accessory structures. Communities should not grant variances to entire subdivisions for accessory structures, especially detached garages. Variances should only be reviewed and issued on an individual or case-by-case basis and be based on the unique characteristics of the site.

(Ord. No. 070-04, art. 4, § B, 2-17-20)

Sec. 4-60. - Floodways.

Located within areas of special flood hazard established in section 4-46, are areas designated as floodway. A floodway may be an extremely hazardous area due to velocity floodwaters, debris or erosion potential. In addition, the area must remain free of encroachment in order to allow for the discharge of the base flood without increased flood heights. Therefore, the following provisions shall apply:

- (1) The community shall select and adopt a regulatory floodway based on the principle that the area chosen for the regulatory floodway must be designed to carry the waters of the base flood, without increasing the water surface elevation of that flood more than one foot at any point;
- (2) Encroachments are prohibited, including fill, new construction, substantial improvements or other development within the adopted regulatory floodway. Development may be permitted however, provided it is demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the encroachment shall not result in any increase in flood levels or floodway widths during a base flood discharge. A registered professional engineer must provide supporting technical data and certification thereof;
- (3) A community may permit encroachments within the adopted regulatory floodway that would result in an increase in base flood elevations, provided that the community first applies for a conditional letter of map revision (CLOMR) and floodway revision, fulfills the requirements for such revisions as established under the provisions of § 65.12, and receives the approval of FEMA;
- (4) Only if section 4-60, provisions (1) through (3) are satisfied, then any new construction or substantial improvement shall comply with all other applicable flood hazard reduction provisions of division 4.

(Ord. No. 070-04, art. 4, § C, 2-17-20)

Sec. 4-61. - Building standards for streams without established base flood elevations (approximate A-Zones).

Located within the areas of special flood hazard established in section 4-46, where streams exist but no base flood data have been provided (Approximate A-Zones), the following provisions apply:

- (1) Base flood elevation data shall be provided for subdivision proposals and all other proposed development, including manufactured home parks and subdivisions, greater than 50 lots or five acres, whichever is the lesser.
- (2) When base flood elevation data or floodway data have not been provided in accordance with section 4-46 then the floodplain administrator shall obtain, review, and reasonably utilize any scientific or historic base flood elevation and floodway data available from a Federal, State, or other source, in order to administer the provisions of division 4. Only if data are not available from these sources, then section 4-61, provisions (5) and (6) shall apply.

Table 3 – Standards for Development

- (3) No encroachments, including structures or fill material, shall be located within an area equal to the width of the stream or twenty-five feet, whichever is greater, measured from the top of the stream bank, unless certification by a registered professional engineer is provided demonstrating that such encroachment shall not result in any increase in flood levels during the occurrence of the base flood discharge.
- (4) All development in Zone A must meet the requirements of section 4-58 and section 4-59(1)—(4).
- (5) In special flood hazard areas without base flood elevation data, new construction and substantial improvements of existing structures shall have the lowest floor (for the lowest enclosed area; including basement) elevated no less than three feet above the highest adjacent grade. If the requirement as set forth in section 4-59(1) and (2) require the lowest floor to be elevated no less than one foot about the base flood elevation, then the structure for this condition shall be elevated no less than four feet about the highest adjacent grade.
- (6) In the absence of a base flood elevation, a manufactured home must also meet the elevation requirements of section 4-59(4)b.2. in that the structure must be elevated to a maximum of 60 inches (five feet).
- (7) Openings sufficient to facilitate automatic equalization of flood water hydrostatic forces on exterior walls shall be provided in accordance with standards of section 4-59(3)a. The floodplain administrator shall certify the lowest floor elevation level and the record shall become a permanent part of the permit file.

(Ord. No. 070-04, art. 4, § D, 2-17-20)

Sec. 4-62. - Standards for areas of shallow flooding (AO Zones).

Areas of special flood hazard established in section 4-46 may include designated "AO" shallow flooding areas. These areas have base flood depths of one to three feet above ground, with no clearly defined channel. The following provisions apply:

- (1) All new construction and substantial improvements of residential and nonresidential structures shall have the lowest floor, including basement, elevated above the highest adjacent grade at least as high as the depth number specified on the flood insurance rate map (FIRM) plus one foot of freeboard. If no depth number is specified, the lowest floor, including basement, shall be elevated at least three feet above the highest adjacent grade. Openings sufficient to facilitate the unimpeded movements of flood waters shall be provided in accordance with standards of section 4-59(3), "Enclosures for Elevated Buildings".

The floodplain administrator shall certify the lowest floor elevation level and the record shall become a permanent part of the permit file.

- (2) New construction and the substantial improvement of a non-residential structure may be floodproofed in lieu of elevation. The structure, together with attendant utility and sanitary facilities, must be designed to be water tight to the specified flood level in section 4-62(1) or three feet (if no depth number is specified), above highest adjacent grade, with walls substantially impermeable to the passage of water, and structural components having the capability of resisting hydrostatic and hydrodynamic loads and the effect of buoyancy. A registered professional engineer or architect shall certify that the design and methods of construction are in accordance with accepted standards of practice for meeting the provisions above, and shall provide such certification to the official as set forth above and as required in section 4-56(1)c. and (2).
- (3) Drainage paths shall be provided to guide floodwater around and away from any proposed structure.

UNIT 8

SUBSTANTIAL IMPROVEMENT AND

SUBSTANTIAL DAMAGE

In this unit

This unit covers:

- The substantial improvement rule – how to regulate major additions and other improvements to buildings in the floodplain.
- The substantial damage rule – how to regulate reconstruction and repairs to buildings that have been severely damaged.
- Exceptions to the basic rules for some special cases.

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INTRODUCTION

In previous units we focused on the rules and regulations that prevent or reduce damage from floods to new buildings. But what happens when the owner wishes to make an improvement, such as an addition, to an existing building? What if a building is damaged by a fire, flood or other cause?

Basic rule: *If the cost of improvements or the cost to repair the damage exceeds 50 percent of the market value of the building, it must be brought up to current floodplain management standards.*

That means an existing building must meet the requirements for new construction.

People who own existing buildings that are being substantially improved will be required to make a major investment in them in order to bring them into compliance with the law. They will not be happy. If the buildings have just been damaged, they will be financially strapped and your elected officials will want to help them, not make life harder for them.

For these reasons, it is easy to see that this basic rule can be difficult to administer. It is also the one time when your regulatory program can reduce flood damage to existing buildings. That's why this course devotes this unit to administering the substantial improvements and substantial damage regulations.

In this reference guide, the term "building" is the same as the term "structure" in the NFIP regulations. Your ordinance may use either term. The terms are reviewed in more detail in Unit 5, Section E.

A. SUBSTANTIAL IMPROVEMENT

44 CFR 59.1. Definitions: *“Substantial improvement” means any reconstruction, rehabilitation, addition or other improvement to a structure, the total cost of which equals or exceeds 50 percent of the market value of the structure before the start of construction of the improvement.*

This section provides information on determining whether a building has been substantially improved and on what NFIP requirements apply.

PROJECTS AFFECTED

All building improvement projects worthy of a permit must be considered. These include:

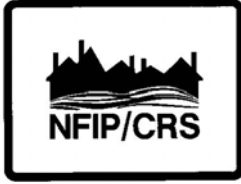
- Remodeling projects.
- Rehabilitation projects.
- Building additions.
- Repair and reconstruction projects (these are addressed in more detail in Section B on substantial damage)

If your community does not require permits for, say, reroofing, minor maintenance or projects under a certain dollar amount, then such projects are not subject to the substantial improvement requirements. However, if you have a larger project that includes reroofing, etc., then it must include the entire cost of the project.

One problem you may face is a builder trying to avoid the requirement by applying for a permit for only part of the job and then later applying for another permit to finish the work. If both applications are together worth more than 50% of the value of the building, the combined project should be considered a substantial improvement and subject to the rules.

FEMA requires that the entire improvement project be counted as one. In order to help you enforce this, you may want to count all applications submitted over, say, one year as one project. Check with your attorney on whether your ordinance clearly gives you the authority to do this and be sure to spell it out in the permit papers given to the applicant.

Some communities require that improvements be calculated cumulatively over several years. All improvement and repair projects undertaken over a period of five years, 10 years or the life of the structure are added up. When they total 50 percent, the building must be brought into compliance as if it were new construction.



The Community Rating System credits keeping track of improvements to enforce a cumulative substantial improvement requirement. It also credits using a lower threshold than 50 percent. These credits are found under Activity 430, Section 431.c and d in the *CRS Coordinator's Manual* and the *CRS Application*. See also *CRS Credit for Higher Regulatory Standards* for example regulatory language.

Post-FIRM buildings

The rules do not address only pre-FIRM buildings—they cover *all* buildings, post-FIRM ones included.

In most cases, a post-FIRM building will be properly elevated or otherwise compliant with regulations for new construction. However, sometimes a map change results in a higher BFE or change in FIRM zone. A substantial improvement to a post-FIRM building may require that the building be elevated to protect it from the new, higher, regulatory BFE.

It should be remembered that all additions to a post-FIRM building must be elevated at least as high as the BFE in effect when the building was built. (You can't allow a compliant building to become noncompliant by allowing additions at grade.) If a new, higher BFE has been adopted since the building was built, additions that are substantial improvements must be elevated to the new BFE.

THE FORMULA

A project is a substantial improvement if:

$$\frac{\text{Cost of improvement project}}{\text{Market value of the building}} \geq 50 \text{ percent}$$

For example, if a proposed improvement project will cost \$30,000 and the value of the building is \$50,000:

$$\frac{\$30,000}{\$50,000} = 0.6 \text{ (60 percent)}$$

The cost of the project exceeds 50 percent of the building's value, so it is a substantial improvement. The floodplain regulations for new construction apply and the building must meet

the post-FIRM construction requirements. If the project is an addition, only the addition has to be elevated (see the examples later in this section).

The formula is based on the cost of the project and the value of the building. These two numbers must be reviewed in detail.

Project cost

The cost of the project means all structural costs, including

- all materials
- labor
- built-in appliances
- overhead
- profit
- repairs made to damaged parts of the building worked on at the same time

A more detailed list is included in Figure 8-1.

To determine substantial improvement, you need a detailed cost estimate for the project, prepared by a licensed general contractor, professional construction estimator or your office.

Your office must review the estimate submitted by the permit applicant. To verify it, you can use your professional judgment and knowledge of local and regional construction costs, or you can use building code valuation tables published by the major building code groups. These tables can be used for determining estimates for particular replacement items if the type of structure in question is listed in the tables.

There are two possible exemptions you should be aware of: 1) improvements to correct code violations do not have to be included in the cost of an improvement or repair project and 2) historic buildings can be exempted from substantial improvement requirements. These are explained in more detail later on.

Market value

In common parlance, market value is the price a willing buyer and seller agree upon. The market value of a structure reflects its original quality, subsequent improvements, physical age of building components and current condition.

However, market value for property can be different than that of the building itself. Market value of developed property varies widely due to the desirability of its location. For example, two houses of similar size, quality and condition will have far different prices if one is on the coast, or in the best school district, or closer to town than the other—but the value of the building materials and labor that went into both houses will be nearly the same.

For the purposes of determining substantial improvement, market value pertains only to the structure in question. It does not pertain to the land, landscaping or detached accessory structures on the property. Any value resulting from the location of the property should be attributed to the value of the land, not the building.

Items to be included

- All structural elements, including:
 - Spread or continuous foundation footings and pilings
 - Monolithic or other types of concrete slabs
 - Bearing walls, tie beams and trusses
 - Floors and ceilings
 - Attached decks and porches
 - Interior partition walls
 - Exterior wall finishes (brick, stucco, siding) including painting and moldings
 - Windows and doors
 - Reshingling or retiling a roof
 - Hardware
- All interior finishing elements, including:
 - Tiling, linoleum, stone, or carpet over subflooring
 - Bathroom tiling and fixtures
 - Wall finishes (drywall, painting, stucco, plaster, paneling, marble, etc.)
 - Kitchen, utility and bathroom cabinets
 - Built-in bookcases, cabinets, and furniture
 - Hardware
- All utility and service equipment, including:
 - HVAC equipment
 - Plumbing and electrical services
 - Light fixtures and ceiling fans
 - Security systems
 - Built-in kitchen appliances
 - Central vacuum systems
 - Water filtration, conditioning, or recirculation systems
 - Cost to demolish storm-damaged building components
 - --- Labor and other costs associated with moving or altering undamaged building components to accommodate improvements or additions
 - --- Overhead and profits

Items to be excluded

- Plans and specifications
- Survey costs
- Permit fees
- Post-storm debris removal and clean up
- Outside improvements, including:
 - Landscaping
 - Sidewalks
 - Fences
 - Yard lights
 - Swimming pools
 - Screened pool enclosures
 - Detached structures (including garages, sheds and gazebos)
 - Landscape irrigation systems

Figure 8-1. Items included in calculating cost of the project

Acceptable estimates of market value can be obtained from these sources:

- An independent appraisal by a professional appraiser. The appraisal must exclude the value of the land and not use the “income capitalization approach” which bases value on the use of the property, not the structure.
- Detailed estimates of the structure’s actual cash value— the replacement cost for a building, minus a depreciation percentage based on age and condition. For most situations, the building’s actual cash value should approximate its market value. Your community may prefer to use actual cash value as a substitute for market value, especially where there is not sufficient data or enough comparable sales.
- Property values used for tax assessment purposes with an adjustment recommended by the tax appraiser to reflect current market conditions (adjusted assessed value).
- The value of buildings taken from NFIP claims data (usually actual cash value).
- Qualified estimates based on sound professional judgment made by the staff of the local building department or tax assessor’s office.

Some market value estimates are often used only as screening tools (i.e., NFIP claims data and property appraisals for tax assessment purposes) to identify those structures where the substantial improvement ratios are obviously less than or greater than 50 percent (i.e., less than 40 percent or greater than 60 percent). For structures that fall in the 40 percent to 60 percent range, more precise market value estimates are sometimes necessary.

SUBSTANTIAL IMPROVEMENT EXAMPLES

Example 1. Minor rehabilitation

A rehabilitation is defined as an improvement made to an existing structure which does not affect the external dimensions of the structure.

If the cost of the rehabilitation is less than 50 percent of the structure's market value, the building does not have to be elevated or otherwise protected. However, it is advisable to incorporate methods to reduce flood damage, such as use of flood-resistant materials and installation of electrical, heating and air conditioning units above the BFE.

Figure 8-2 shows a building that had a small rehabilitation project. Central air conditioning was installed and the electrical system was upgraded. The value of the building before the project was \$60,000. The value of the project was \$12,000:

$$\frac{\$12,000}{\$60,000} = 0.2 \text{ (20 percent)}$$

The project costs less than 50 percent of the building, so this is not a substantial improvement.

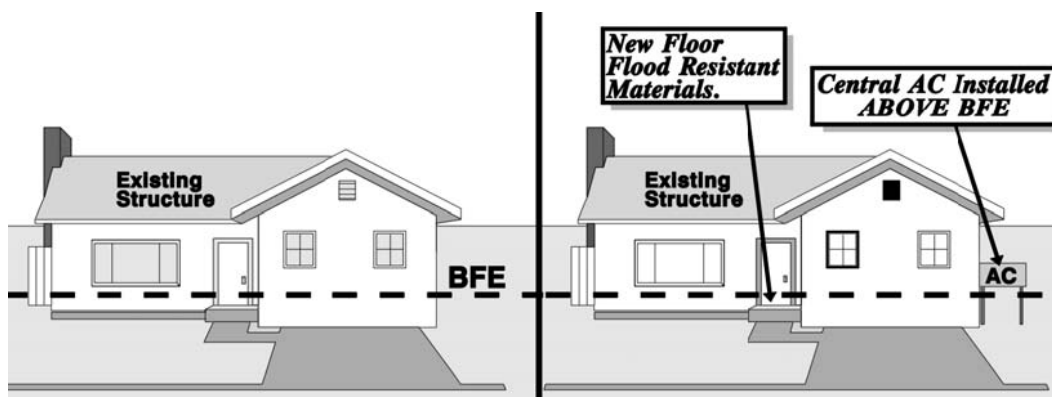


Figure 8-2. Minor rehabilitations use flood-resistant methods and materials

Neither structure would benefit from post-FIRM flood insurance rates because they are not elevated.

Note: To gauge what happens to flood insurance premiums if a substantially improved building is not brought up to post-FIRM standards, see Figures 7-7 through 7-12.

Example 2. Substantial rehabilitation

If the rehab costs more than 50 percent of the value of the building, your ordinance requires that an existing structure be elevated and/or the basement filled to meet the elevation standard.

Figure 8-3 shows a building that has been allowed to run down. It's market value is \$35,000. To rehab it will require gutting the interior and replacing all wallboard, built-in cabinets, bathroom fixtures and furnace. The interior doors and flooring will be repaired. The house will get new siding and a new roof. The cost of this rehab will be \$25,000:

$$\frac{\$25,000}{\$35,000} = 71.4 \text{ percent}$$

Because total cost of the project is greater than 50 % the rehab is a substantial improvement

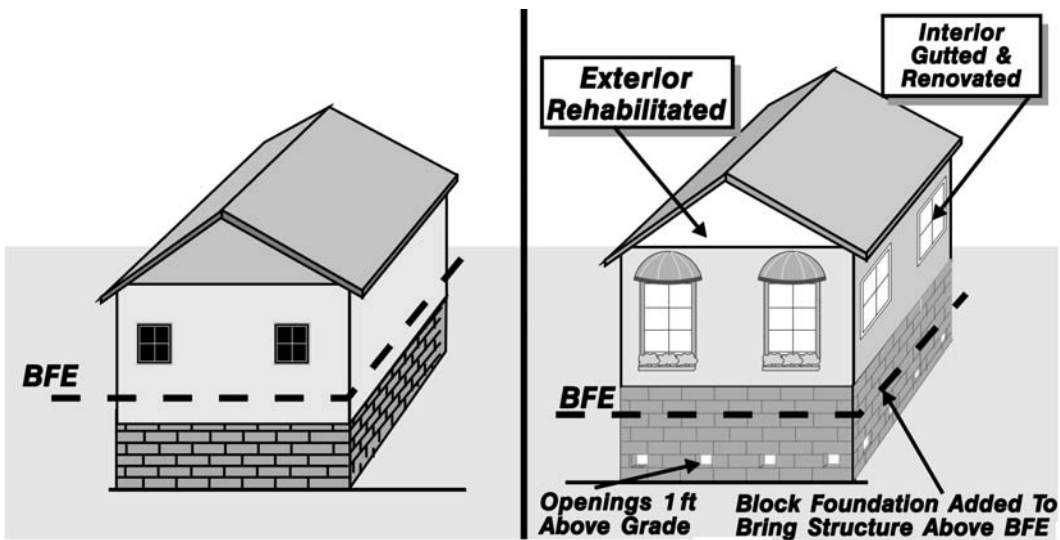


Figure 8-3. substantially rehabilitated building elevated above the BFE.

In A Zones, elevation may be on fill, crawlspace, columns, etc. In V Zones, only pilings, columns or other open foundations are allowed. The new structure would benefit from post-FIRM flood insurance rates.

Example 3. Lateral addition—residential

Additions are improvements that increase the square footage of a structure. Commonly, this includes the structural attachment of a bedroom, den, recreational room garage or other type of addition to an existing structure. Note that if one building is attached to another through a covered breezeway or similar connection, it is a separate building and not an addition.

When an addition is a substantial improvement, the addition must be elevated or floodproofed, providing that improvements to the *existing* structure are minimal. Figures 8-4 and 8-5 illustrate lateral additions that are compliant.

Depending on the flood zone and details of the project, the existing building may not have to be elevated. The determining factors are the common wall and what improvements are made to the existing structure. If the common wall is demolished as part of the project, then the entire structure must be elevated. If only a doorway is knocked through it and only minimal finishing is done, then only the addition has to be elevated.

In A Zones only, if significant improvements are made to the existing structure (such as a kitchen makeover), both it and the addition must be elevated and otherwise brought into compliance. Some states and many communities require that both the existing structure and lateral additions be elevated in all cases.

In V Zones, the existing structure always has to be elevated, placed on an engineered foundation system, etc., when an addition is proposed that constitutes a substantial improvement. This is due to the “free-of obstruction” standard whereby the lower existing structure would obstruct the storm surge, causing damage to the addition.

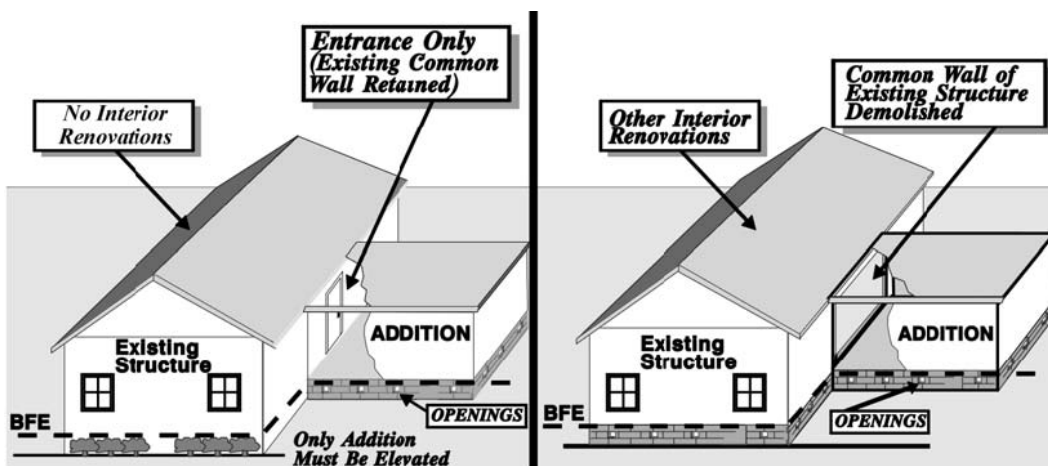


Figure 8-4. Lateral additions to a residential building in an A Zone.

In V Zones, the entire building must be elevated on pilings, columns or other open foundations. The Substantial Improvement/Damage

structure on the left would not benefit from post-FIRM flood insurance rates because it was not elevated.

Example 4. Lateral addition—nonresidential

A substantial improvement addition to a nonresidential building may be either elevated or floodproofed. Otherwise, all the criteria for residential buildings reviewed in Example 3 must be met.

If floodproofing is used, the builder must ensure that the wall between the addition and the original building is floodproofed. Floodproofing is not allowed as a construction measure in V Zones.

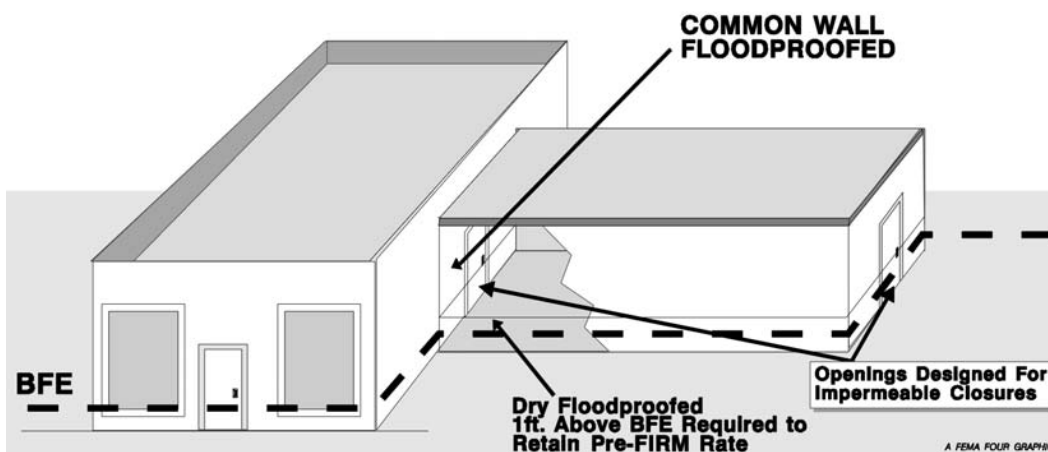


Figure 8-5. Lateral addition to a nonresidential building in an A Zone.

This approach is not allowed in V Zones. The structure would *not* benefit from post-FIRM flood insurance rates because the original building was not elevated or flood-proofed.

Example 5. Vertical addition—residential

When the proposed substantial improvement is a full or partial second floor, the entire structure must be elevated (Figure 8-6). In this instance, the existing building provides the foundation for the addition. Failure of the existing building would result in failure of the addition, too.

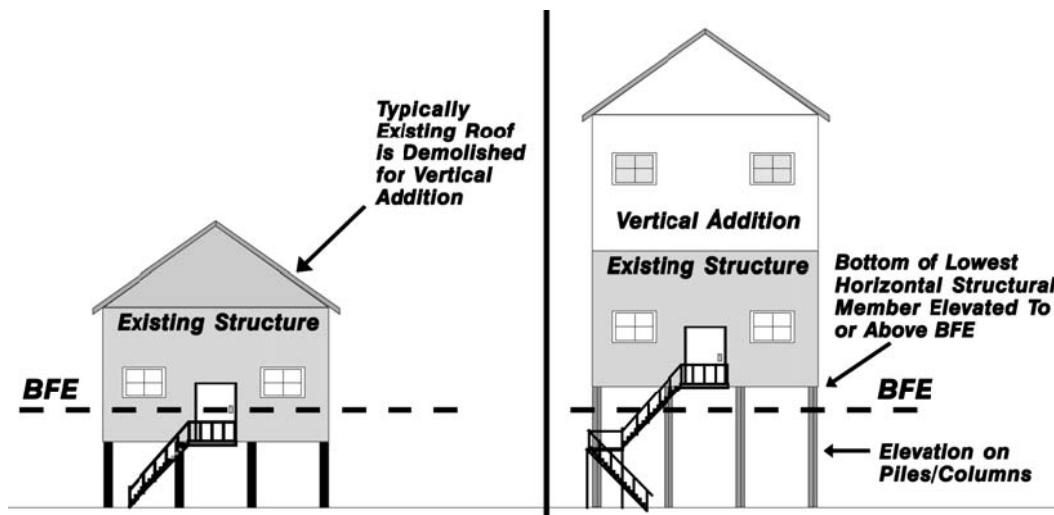


Figure 8-6. Vertical addition to a residential building in a V Zone.

The new structure would benefit from post-FIRM flood insurance rates.

Example 6. Vertical addition—nonresidential

When the proposed substantial improvement is a full or partial second floor, the entire structure must be elevated or floodproofed (Figure 8-7).

The owner could obtain post-FIRM rates on the building if it is floodproofed to one foot above the BFE and he has a floodproofing certificate signed by a registered engineer. An optional approach is to elevate the entire building and obtain an elevation certificate.

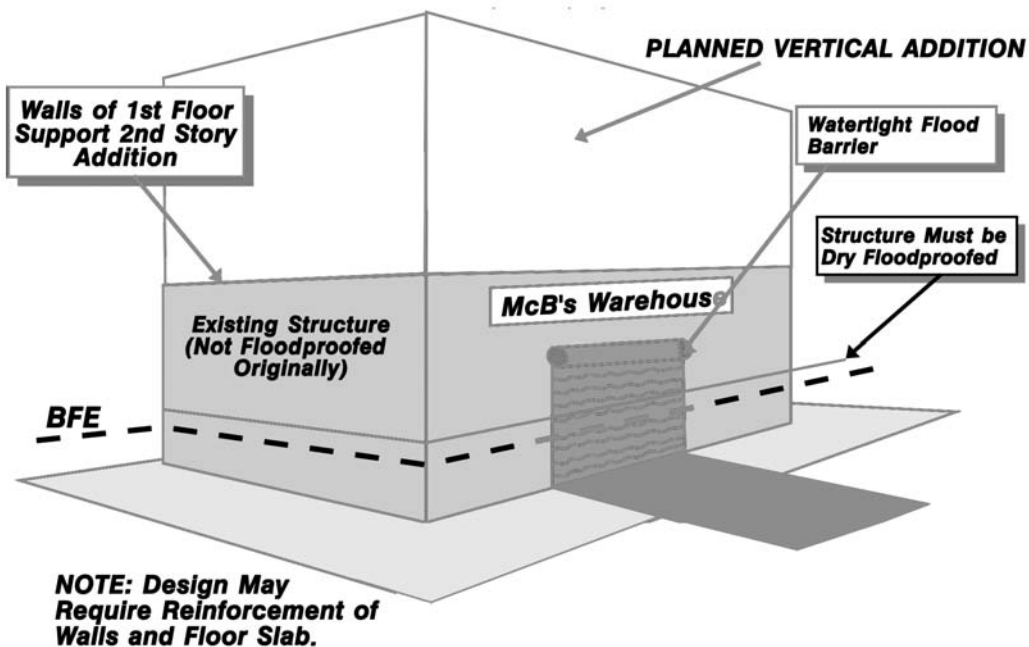


Figure 8-7. Vertical addition to a nonresidential building in an A Zone.

The new floodproofed structure would benefit from post-FIRM flood insurance rates.

Example 7. Post-FIRM building—minor addition

All additions to post-FIRM buildings are defined as new construction and must meet the requirements of your floodplain management ordinance regardless of the size or cost of the addition (Figure 8-8). A small addition to a residential structure that is not a substantial improvement must be elevated at least as high as the BFE in effect when the building was built. Minor additions to nonresidential structures can be floodproofed to the BFE.

If a map revision has taken place and the BFE has increased, only additions that are substantial improvements have to be elevated to the new BFE or flood-proofed (nonresidential buildings only).

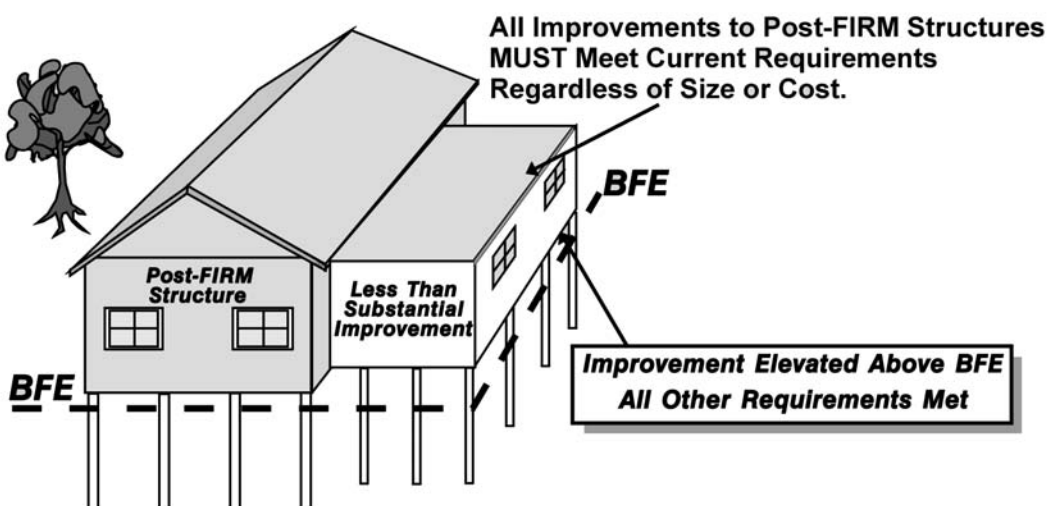


Figure 8-8. Small additions to post-FIRM buildings must be elevated.

Example 8. Post-FIRM building—substantial improvement

Substantial improvements made to a post-FIRM structure must meet the requirements of the current ordinance. Figure 8-9 shows a lateral addition made after a map revision took place and the BFE was increased.

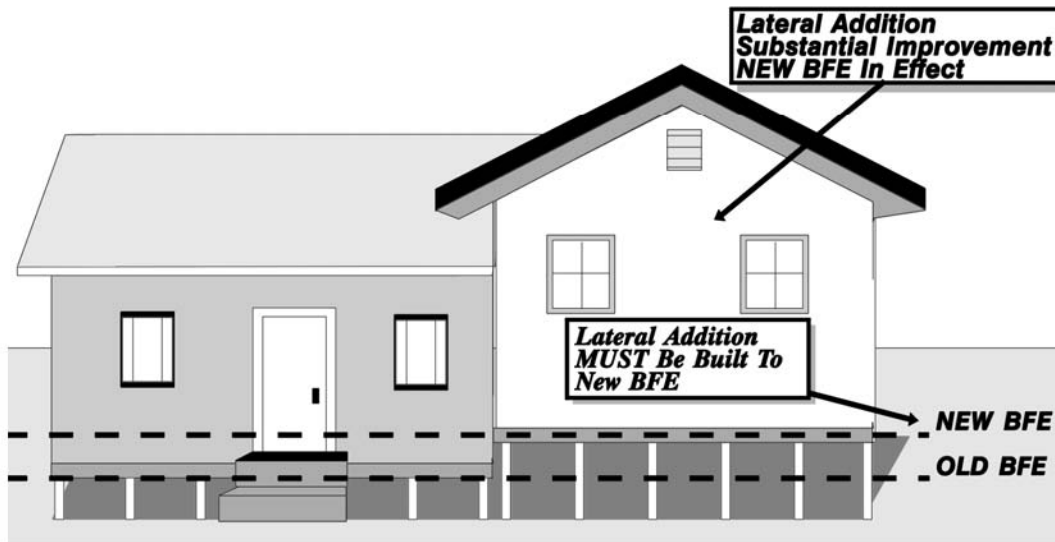


Figure 8-9. Substantial improvements to post-FIRM buildings must be elevated above the new BFE. Nonresidential buildings may be floodproofed

B. SUBSTANTIAL DAMAGE

44 CFR 59.1. Definitions: "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.

Two key points:

- The damage can be from any cause—flood, fire, earthquake, wind, rain, or other natural or human-induced hazard.
- The substantial damage rule applies to all buildings in a flood hazard area, regardless of whether the building was covered by flood insurance.

The formula is essentially the same as for substantial improvements:

$$\frac{\text{Cost to repair}}{\text{Market value of the building}} \geq 50 \text{ percent}$$

Market value is calculated in the same way as for substantial improvements. Use the pre-damage market value.

COST TO REPAIR

Notice that the formula uses “cost *to* repair,” not “cost *of* repairs.” The cost to repair the structure must be calculated for full repair to the building’s before-damage condition, even if the owner elects to do less. It must also include the cost of any improvements that the owner has opted to include during the repair project.

The total cost to repair includes the same items listed in Figure 8-1. As shown in Example 2 below, properly repairing a flooded building can be more expensive than people realize. The owner may opt not to pay for all of the items needed. The owner may:

- Do some of the work, such as removing and discarding wallboard.
- Obtain some of the materials free.
- Have a volunteer organization, such as the Mennonites, do some of the work.
- Decide not to do some repairs, such as choosing to nail down warped flooring rather than replace it.

Basic rule: *Substantial damage is determined regardless of the actual cost to the owner. You must figure the true cost of bringing the building back to its pre-damage condition using qualified labor and materials obtained at market prices.*

The permit office and the owner may have serious disagreements over the total list of needed repairs and their cost, as the owner has a great incentive to show less damage than actually occurred in order to avoid the cost of bringing the building into compliance. Here are four things that can help you:

- Get the cost to repair from an objective third-party or undebatable source, such as:
 - A licensed general contractor.
 - A professional construction estimator.
 - Insurance adjustment papers (exclude damage to contents).
 - Damage assessment field surveys conducted by building inspection, emergency management or tax assessment agencies after a disaster.
 - Your office.
- Even if your office does not prepare the cost estimate, it needs to review the estimate submitted by the permit applicant. You can use your professional judgment and knowledge of local and regional construction costs. Or, you can use building code valuation tables published by the major building code groups.
- Use an objective system that does not rely on varying estimates of market value or different opinions of what needs to be repaired. The Substantial Damage Estimator Program discussed later in this section will do this.
- Publicize the need for the regulations and the benefits of protecting buildings from future flooding. A well-educated public won't argue as much as one that sees no need for the requirement.
- Help the owner find financial assistance to meet the extra cost of complying with the code. If there was a disaster declaration, there may be sources of financial assistance as discussed in the next unit. If the owner had flood insurance and the building was substantially damaged by a flood, the new Increased Cost of Compliance coverage will help (see next section).

SUBSTANTIAL DAMAGE EXAMPLES

Example 1. Reconstruction of a destroyed building

Reconstructions are cases where an entire structure is destroyed, damaged, purposefully demolished or razed, and a new structure is built on the old foundation or slab. The term also applies when an existing structure is moved to a new site.

Reconstructions are, quite simply, “new construction.” They must be treated as new buildings.

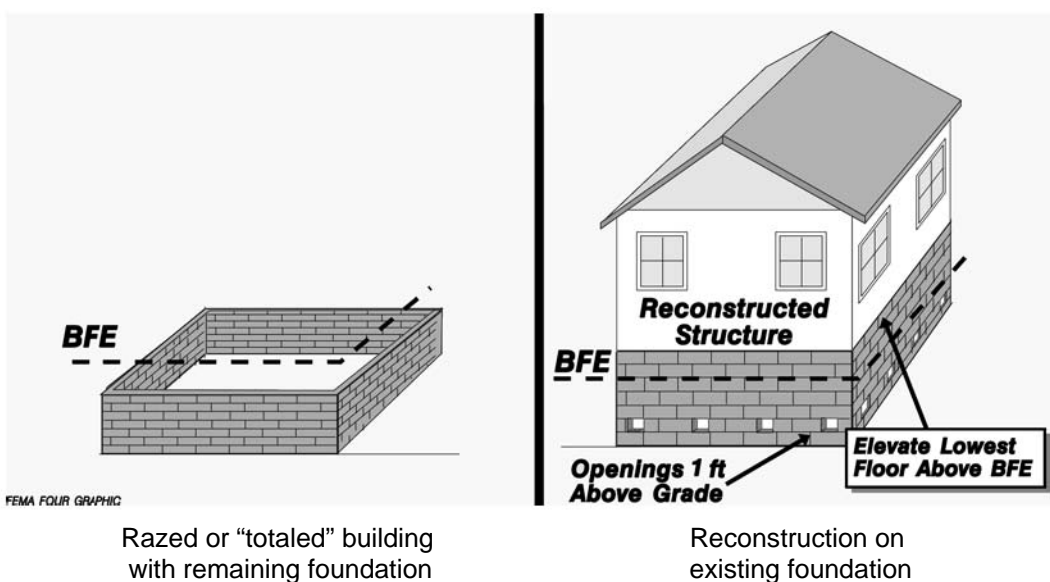


Figure 8-10. A reconstructed house is new construction.

This example is for A Zones only. A new building in the V Zone must be elevated on piles or columns.

Example 2. Substantially damaged structure

To determine if a damaged structure meets the threshold for substantial damage, the cost of repairing the structure to its before-damaged condition is compared to the market value of the structure prior to the damage. The estimated cost of the repairs must include all costs necessary to fully repair the structure to its before-damaged condition.

If equal to or greater than 50 percent of that structure's market value before damage, then the structure must be elevated (or floodproofed if it is nonresidential) to or above the level of the base flood, and meet other applicable local ordinance requirements. This is the basic requirement for substantial damage.

Figure 8-11 graphically illustrates the amount of damage that can occur to a building flooded only four feet deep. Even though the structure appears sound and there are no cracks or breaks in the foundation, the total cost of repair can be significant.

The cost of repair after a flood that simply soaked the building will typically include the following structural items:

- Remove all wallboard and insulation.
- Install new wallboard and insulation.
- Tape and paint.
- Remove carpeting and vinyl flooring.
- Dry floor, replace warped flooring.
- Replace cabinets in the kitchen and bathroom.
- Replace built-in appliances.
- Replace hollow-core interior doors.
- Replace furnace and water heater.
- Clean and disinfect duct work.
- Repair porch flooring and front steps.
- Clean and test plumbing (licensed plumber may be required).
- Replace outlets and switches, clean and test wiring (licensed electrician may be required).

Note: See also Figures 7-7 through 7-12 for what happens to flood insurance premiums if a substantially damaged building is granted a variance and is not brought up to post-FIRM standards.



Figure 8-11. Even slow moving floodwater can cause substantial damage.

SUBSTANTIAL DAMAGE SOFTWARE

FEMA has developed a software program to help local officials make substantial damage determinations. The software is based on Microsoft Access, but is self-contained and does not require any software in addition to a Windows operating system.

The software comes with a manual, *Guide on Estimating Substantial Damage Using the NFIP Residential Substantial Damage Estimator*, FEMA 311. This includes a user's manual and worksheets that allow the calculations to be done manually.

Contact your FEMA Regional Office for a copy of the software package and help in using it. Following a major disaster declaration, training sessions and technical assistance may be available.

INCREASED COST OF COMPLIANCE

On June 1, 1997, the NFIP began offering additional coverage to all holders of structural flood insurance policies. This coverage is called Increased Cost of Compliance or ICC.

The name refers to cases where the local floodplain management ordinance requires elevation or retrofitting of a substantially damaged building. Under ICC, the flood insurance policy will not only pay for repairs to the flooded building, it will pay up to \$30,000 to help cover the additional cost of complying with the ordinance. This is available for any flood Substantial Improvement/Damage

insurance claim and, therefore, is not dependent on the community receiving a disaster declaration.

There are some limitations to ICC:

- It's only available if there was a flood insurance policy on the building before the flood.
- It covers only damage caused by a flood.
- Claims are limited to \$30,000 per structure.
- Claims must be accompanied by a substantial damage determination by the floodplain ordinance administrator.

It should also be mentioned that a portion of the rest of the claim payment may help meet the cost of bringing the building up to code. For example, if there was foundation damage, the regular claim will pay for the cost of repairing or replacing the foundation. The ICC funds would only be needed for the extra costs of raising the foundation higher than it was before.

An ICC claim cannot be paid unless the community has determined the building to be substantially damaged and requires that the building comply with local ordinance requirements. For further information on how ICC coverage works and how you can help policyholders in your community qualify for the coverage, refer to *National Flood Insurance Program's Increased Cost of Compliance Coverage: Guidance for State and Local Officials, FEMA 301*.

In certain cases, an ICC claim can be filed if the building is repetitively flooded, and has had two or more claims averaging 25% or more of building value within a ten-year period, provided the community has language in the flood damage ordinance that implements the substantial damage rule in these cases.

Figure 8-12 has example ordinance language. This language exceeds the minimum NFIP requirements, but would be needed if you wanted to trigger the ICC provision for repetitively damaged buildings.



The Community Rating System credits keeping track of improvements to enforce a cumulative substantial improvement requirement. The 1999 *CRS Coordinator's Manual* credits the ordinance language in Figure 8-12. These credits are found under Activity 430, Section 431.c in the *CRS Coordinator's Manual* and the *CRS Application*.

Option 1

A. Adopt the Following Definition:

“Repetitive Loss” means flood-related damage sustained by a structure on two separate occasions during a 10-year period for which the cost of repairs at the time of each such flood event, on the average, equals or exceeds 25 percent of the market value of the structure before the damage occurred.

B. And modify the “substantial improvement” definition as follows:

“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 which have incurred “repetitive loss” or “substantial damage”, regardless of the actual repair work performed.

Option 2

Modify the substantial damage definition as follows:

“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 damage also means flood-related damage sustained by a structure on two separate occasions during a 10-year period for which the cost of repairs at the time of each such flood event, on the average, equals or exceeds 25 percent of the market value of the structure before the damage occurred.

NOTE 1: Communities need to make sure that these definitions are tied to the floodplain management requirements for new construction and substantial improvements and to any other requirements of the ordinance, such as the permit requirements, in order to enforce this provision.

NOTE 2: An ICC Claim Payment is ONLY made for flood-related damage. The substantial damage part of the definition must still include “damage of any origin” to be compliant with the minimum NFIP Floodplain Management Regulations.

Figure 8-12. Sample ordinance language for ICC repetitive loss definitions

Source: -- *Increased Cost of Compliance Coverage: Guidance for State and Local Officials*, FEMA-301, September 2003. This language is only needed to trigger an ICC payment for a repetitive loss. No ordinance changes are needed for the ICC coverage for substantial damage.

C. SPECIAL SITUATIONS

As explained in previous sections, the substantial improvement and substantial damage requirements affect all buildings regardless of the reason for the improvement or the cause of the damage. There are three special situations you should be aware of: exempt costs, historic buildings and corrections of code violations.

EXEMPT COSTS

Certain costs related to making improvements or repairing damaged buildings do not have to be counted toward the cost of the improvement or repairs. These include:

- Plans and specifications.
- Surveying costs.
- Permit fees.
- Demolition or emergency repairs made for health or safety reasons or to prevent further damage to the building.
- Improvements or repairs to items outside the building, such as the driveway, fencing, landscaping and detached structures.

HISTORIC STRUCTURES

Historic structures are exempted from the substantial improvement requirements subject to the criteria listed below. The exemption can be granted administratively if the current NFIP definitions of substantial improvement and historic structure are included in your ordinance, or they can be granted through a variance procedure.

In either case, they are usually granted subject to conditions.

If the improvements to a historic structure meet the following three criteria and are approved by the community, the building will not have to be elevated or floodproofed. It can also retain its pre-FIRM flood insurance rating status.

1. The building must be a bona fide “historic structure.” Figure 7-13 has the definition that must be followed.

2. The project must maintain the historic status of the structure. If the proposed improvements to the structure will result in it being removed from or ineligible for the National Register or federally-certified state or local inventory, then the proposal cannot be granted an exemption from the substantial improvement rule.

The best way to make such determinations is to seek written review and approval of proposed plans by the local historic preservation board, if it is federally-certified, or by the state historic preservation office. If the plans are approved, you can grant the exemption. If not, no exemption can be permitted.

3. Take all possible flood damage reduction measures. Even though the exemption to the substantial improvement rule means the building does not have to be elevated to or above BFE, or be renovated with flood-resistant materials that are not historically sensitive, many things can and should be done to reduce the flood damage potential. Examples include:

- Locating mechanical and electrical equipment above the BFE or flood-proofing it.
- Elevating the lowest floor of an addition to or above the BFE with the change in floor elevation disguised externally.

CORRECTIONS OF CODE VIOLATIONS

The NFIP definition of substantial improvement includes another exemption:

44 CFR 59.1 Definitions: "Substantial improvement" means The term does not, however, include ... 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

Note the key words in this exemption: *correct* existing violations, *identified* by the local official, and *minimum* necessary to assure safe conditions. This language was included in order to avoid penalizing property owners *who had no choice* but to make improvements to their buildings or face condemnation or revocation of a business license.

This exemption was intended for *involuntary* improvements or violations that existed before the improvement permit was applied for or before the damage occurred—for example, a restaurant owner who must upgrade the wiring in his kitchen in order to meet current local and state health and safety codes.

You can only exempt the items specifically required by code. For example, if a single stair tread was defective and had to be replaced, do not exempt the cost of rebuilding the entire stairway. Similarly, count only replacement in like kind and what is minimally necessary. If the

owner chooses to upgrade the quality of a code-required item, the extra cost is not exempt from the formula—it's added to the true cost of the improvement or repairs.

Unfortunately, many property owners and builders pressure local building official to exclude “code violation corrections” from their voluntary improvement proposals. There are “code violations” in all structures built before the current code was enacted. In many cases, those elements must be brought up to code as part of an improvement project.

This is very different from a code violation citation that forces a property owner to correct those violations and make improvements that were otherwise not planned. The building official must know about and document the violations before or at the time the permit is issued.

Example

A small business in a 40-year old building was damaged by a fire. The building's pre-fire market value was \$100,000. The insurance adjuster and the permit office concluded that the total cost to repair would be \$45,000.

However, the community's building code states that whenever an applicant applies for a permit to modify or improve a building, the building must be brought up to code. This building would need the following additional work:

- Replace unsafe electrical wiring.
- Install missing fire exit signs, smoke detectors and emergency lighting.
- Widen the front door and install a ramp to make the business accessible to handicapped and mobility-impaired people.

The total cost of these code requirements would be \$8,000. However, since these were required by the code before the fire occurred, they would not have to be counted toward the cost to repair. Based on the basic formula:

$$\frac{\$45,000}{\$100,000} = 0.45 \text{ or } 45\%$$

The building is not declared substantially damaged

In this example, the building can be repaired without elevating or floodproofing. However, the permit office should strongly recommend incorporating flood protection measures and flood resistant materials in the repair project (as in the example in Figure 8-2).