
4 Making Substantial Improvement and Substantial Damage Determinations

4.1 Overview

Administering the SI/SD requirements requires local officials to perform four major actions: (1) determine costs, (2) determine market values, (3) make SI/SD determinations, and (4) require owners to obtain permits to bring substantially improved or substantially damaged buildings into compliance with the floodplain management requirements. This chapter describes how to determine whether work is a substantial improvement or a repair of substantial damage. The first step is to review estimates of the improvement or repair costs; this step involves deciding which costs to include and exclude. Next, the market value of the structure must be determined. There is more than one way to determine costs and market value, and the local official must examine both for reasonableness and accuracy.

The I-Codes include, in the administrative provisions, two requirements pertinent to the data necessary to make SI/SD determinations. Applicants must:

- State the valuation of proposed work, and
- Give other data and information as required by the building official.

Communities must be prepared to explain to permit applicants how they make SI/SD determinations. Local officials should develop written procedures that can help them make and document consistent determinations and improve efficiency, especially in the post-disaster period when large numbers of buildings may be damaged.

Chapter 5 outlines community responsibilities that are specifically related to administering these SI/SD requirements. Chapter 6 describes factors to consider when evaluating permit applications and all aspects of bringing substantially improved and substantially damaged buildings into compliance; it also includes illustrations of improvements and repairs.

Chapter 7 addresses handling substantial damage in the post-disaster period, with recommendations for planning ahead to be prepared for the added workload and demands on staff and resources. It describes some methods that can help communities focus their efforts when many damaged buildings may have to be evaluated. It also describes FEMA's *Substantial Damage Estimator* (SDE) software that communities can use to collect information about damaged buildings in order to make substantial damage determinations.

4.2 Accuracy and Verification

Costs of proposed repairs or improvements and market values are needed to determine whether proposed work is SI/SD. Methods for obtaining this information are described in Sections 4.4 and 4.5, respectively. Local officials are responsible for verifying that the data are complete and reasonable. The local official is responsible for reviewing the validity of all cost estimates provided by applicants, whether prepared by licensed contractors, engineers, architects, professional cost estimators, or by property owners. When work is repair of damage, an inspection visit should be made to verify that the proposed work is all of the work that is necessary to restore the building to its pre-damage condition.

Applicants may disagree with a community's SI/SD determination. In these cases, the burden is on the applicant to provide improved cost estimates or to obtain a professional appraisal of market value. The local official is responsible for reviewing the new information. In some cases, applicants may seek a formal appeal of the local official's decision (Section 5.6.6).

To be consistent, local officials should document their decisions and the documentation should be retained in the community's permit records. A sample worksheet that can be used to document SI/SD determinations is included in Appendix D. Maintaining good records and documentation is especially critical if a community has elected to administer a cumulative SI/SD requirement (Section 5.7.3).

4.3 Making SI/SD Determinations

Work on buildings ranges from routine maintenance and minor repairs (which may not require permits) to work that costs more than 50 percent of a structure's market value. Local officials who are responsible for administering their floodplain management regulations or codes are responsible for determining whether work is SI/SD. Other entities, such as insurance claims adjusters, may make estimates of damage for purposes of adjusting damage claims. However, an adjuster's estimate must not be used to make SI/SD determinations because the estimates of damage that determine the amount of a claim payment may not include all of the costs to repair the building to its pre-damage condition.

Consistency is important. Communities should decide in advance how they will handle significant flood events and develop written procedures for making decisions. It is easier to defend SI/SD determinations if all applicants are treated the same, especially when many buildings have been damaged (see Chapter 7).

Figure 4-1 illustrates an overview of the steps in the SI/SD determination that are described in detail in this Desk Reference. Once the cost of the work and the market value of the structure have been determined, the local official must make a final determination. The work is SI/SD if the ratio of the cost of work to the market value equals or exceeds 50 percent:

$$\frac{\text{Cost of Improvement or Cost to Repair to Pre-Damage Condition}}{\text{Market Value of Building}} \geq 50\%$$

Communities may use a combination of sources for the data needed to make SI/SD determinations. For example, a community may make SI/SD determinations based on applicant-supplied costs of repairs or improvements and community-obtained market values.

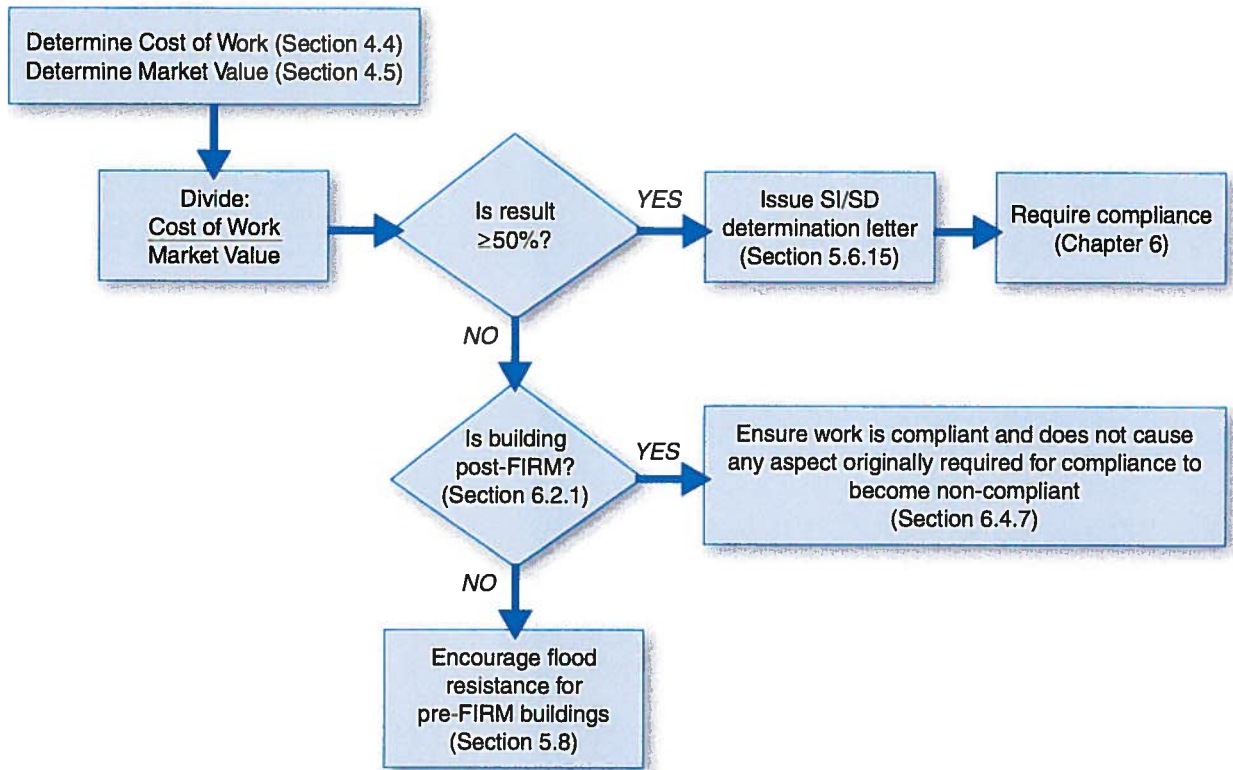


Figure 4-1. Make the SI/SD determination (overview)

4.3.1 SI/SD Provisions in the 2006 and 2009 I-Codes

The IBC and IRC apply to new construction and also to alteration, movement, enlargement, replacement, and repair of existing buildings. The IBC, the IRC, and the IEBC include SI/SD provisions that are consistent with the NFIP’s requirements. The specific code provisions are described below:

- **IBC.** The IBC relies on the definitions of “substantial improvement” and “substantial damage” in Section 1612. The code official must determine whether any alteration, repair, or addition to existing buildings, or work associated with a change of occupancy or moved buildings, meets those definitions. Section 1612.1 states that “all new construction of buildings, structures, and portions of buildings and structures, including substantial improvement and restoration of substantial damage to buildings and structures, shall be designed and constructed to resist the effects of flood hazards and flood loads.” In addition, the requirements for existing buildings, including historic buildings, are found in IBC Chapter 34.
- **IRC.** The IRC contains detailed administrative provisions in Chapter 1:
 - **R105.3.1.1 Substantially improved or substantially damaged buildings and structures in areas prone to flooding.** This section specifies that the building official shall examine

applications and prepare a finding with regard to the value of the proposed work. If the value equals or exceeds 50 percent of the market value of the building before the damage occurred or the improvement is started, the finding is provided to the board of appeals.

- **R112.2.1 Determination of substantial improvement in areas prone to flooding.** This section requires the board of appeals to determine if a proposal, referred to the board by the building official pursuant to Section R105.3.1.1, constitutes a substantial improvement (or repair of substantial damage). If the proposed work is found to be a substantial improvement or repair of substantial damage, the work must meet the requirements of Section R324 (Flood-Resistant Construction).
- **IEBC.** The IEBC is organized based on the nature of the work: repairs; repair of damaged buildings; alterations (Levels 1, 2, and 3); work associated with change of occupancy classification; additions (horizontal, vertical, new/raised foundations); and relocated or moved buildings. These characterizations of work are similar to those used in Chapter 6 (also see Table 3-1, which lists the definitions and terms used in the IEBC). The provisions of the IEBC that pertain to flood resistance are all triggered by a determination of whether the work constitutes a substantial improvement or a repair of substantial damage. When that occurs, the IEBC requires the building to be brought into compliance with the flood damage-resistant provisions of the IBC (located in IBC Section 1612). The IEBC also includes provisions for historic structures that are located in SFHAs.

4.4 Determining Costs of Improvements and Costs to Repair

The term “costs of improvements” includes the complete costs associated with all of the types of work that are described in Chapter 6. The term “costs to repair” includes the costs of all work necessary to restore a damaged building to its pre-damage condition. Both terms include the costs of all materials, labor, and other items necessary to perform the proposed work. Costs that must be included are described in Section 4.4.1 and certain costs that may be excluded are described in Section 4.4.2. Figure 4-2 illustrates the steps that local officials need to take in order to determine costs for making SI/SD determinations.

The term “substantial damage” refers to the repairs of all damage sustained and cannot reflect a level of repairs that is less than the amount of the damage sustained. If an owner does not intend to repair the damaged building right away or if the owner cannot afford to make all repairs immediately, the local official should inspect the property to determine whether, based on estimates, the work required to restore it to its pre-damage condition will constitute substantial damage. If this is the case, then the cost to repair is compared to the building’s market value and the local official should provide written notice to the owner of the substantial damage determination. The local official should include in the written notice information about obtaining permits and about the floodplain management requirements that must be met. Further, sometimes these buildings also are improved beyond their pre-damage condition. If proposed, then the cost of improvements must be included along with the cost to repair to make the SI/SD determination. Note that the substantial damage requirement applies regardless of the cause of damage, such as wind or fire.

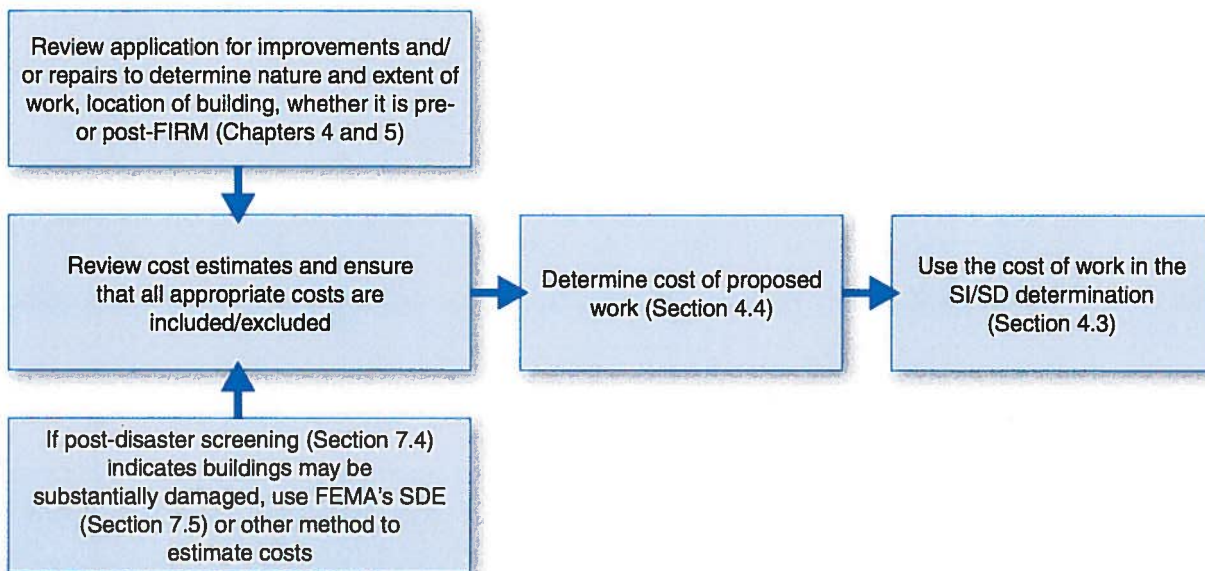


Figure 4-2. Determine the cost of work (overview)

The following topics related to determining costs will be covered in this section:

- Costs that must be included
- Costs that may be excluded
- Acceptable sources of cost information
- Estimates of donated or discounted materials
- Estimates of owner and volunteer labor
- Demolition, debris, and disposal
- Clean-up and trash removal
- Cost exclusions to correct existing health, safety, and sanitary code violations

Local officials will need to determine the necessary level of detail for the costs of improvements and costs of repairs from permit applicants or contractors in order to make a SI/SD determination.

4.4.1 Costs That Must be Included in SI/SD Determinations

Items that must be included in the costs of improvement and the costs to repair are those that are directly associated with the building. The following list of costs that must be included is not intended to be exhaustive, but characterizes the types of costs that must be included:

- Materials and labor, including the estimated value of donated or discounted materials (Section 4.4.4) and owner or volunteer labor (Section 4.4.5)
- Site preparation related to the improvement or repair (e.g., foundation excavation or filling in basements)
- Demolition and construction debris disposal (Section 4.4.6)

- Labor and other costs associated with demolishing, moving, or altering building components to accommodate improvements, additions, and making repairs
- Costs associated with complying with any other regulations or code requirement that is triggered by the work, including costs to comply with the requirements of the Americans with Disabilities Act (ADA)
- Costs associated with elevating a structure when the proposed elevation is lower than the BFE
- Construction management and supervision
- Contractor's overhead and profit
- Sales taxes on materials
- Structural elements and exterior finishes, including:
 - Foundations (e.g., spread or continuous foundation footings, perimeter walls, chain-walls, pilings, columns, posts, etc.)
 - Monolithic or other types of concrete slabs
 - Bearing walls, tie beams, trusses
 - Joists, beams, subflooring, framing, ceilings
 - Interior non-bearing walls
 - Exterior finishes (e.g., brick, stucco, siding, painting, and trim)
 - Windows and exterior doors
 - Roofing, gutters, and downspouts
 - Hardware
 - Attached decks and porches
- Interior finish elements, including:
 - Floor finishes (e.g., hardwood, ceramic, vinyl, linoleum, stone, and wall-to-wall carpet over subflooring)
 - Bathroom tiling and fixtures
 - Wall finishes (e.g., drywall, paint, stucco, plaster, paneling, and marble)
 - Built-in cabinets (e.g., kitchen, utility, entertainment, storage, and bathroom)
 - Interior doors
 - Interior finish carpentry
 - Built-in bookcases and furniture
 - Hardware
 - Insulation

- Utility and service equipment, including:
 - Heating, ventilation, and air conditioning (HVAC) equipment
 - Plumbing fixtures and piping
 - Electrical wiring, outlets, and switches
 - Light fixtures and ceiling fans
 - Security systems
 - Built-in appliances
 - Central vacuum systems
 - Water filtration, conditioning, and recirculation systems

4.4.2 Costs That May be Excluded from SI/SD Determinations

Items that can be excluded are those that are not directly associated with the building. The following list characterizes the types of costs that may be excluded:

- Clean-up and trash removal (Section 4.4.7)
- Costs to temporarily stabilize a building so that it is safe to enter to evaluate and identify required repairs
- Costs to obtain or prepare plans and specifications
- Land survey costs
- Permit fees and inspection fees
- Carpeting and recarpeting installed over finished flooring such as wood or tiling
- Outside improvements, including landscaping, irrigation, sidewalks, driveways, fences, yard lights, swimming pools, pool enclosures, and detached accessory structures (e.g., garages, sheds, and gazebos)
- Costs required for the minimum necessary work to correct existing violations of health, safety, and sanitary codes (Section 4.4.8)
- Plug-in appliances such as washing machines, dryers, and stoves

4.4.3 Acceptable Sources of Cost Information

The costs of improvements and the costs to repair are necessary to make the SI/SD determination. The following are acceptable methods to determine the costs:

- Itemized costs of materials and labor, or estimates of materials and labor that are prepared by licensed contractors or professional construction cost estimators.
- Building valuation tables published by building code organizations and cost-estimating manuals and tools available from professional building cost-estimating services. These sources can be used as long as some limitations are recognized, notably that there are local

variations in costs and the sources do not list all types and qualities of structures. These sources should not be used for structures that are architecturally unique, exceptionally large, or significantly different from the classes of structures that are listed.

- “Qualified Estimate” of costs that are prepared by the local official using professional judgment and knowledge of local and regional construction costs. This approach is most often used post-disaster when there are large numbers of damaged buildings and when permits must be quickly processed.
- Building owners may submit cost estimates that they prepare themselves. If the community is willing to consider such estimates, owners should be required to provide as much supporting documentation as possible (such as pricing information from lumber companies and hardware stores). In addition, the estimate must include the value of labor, including the value of the owner’s labor (Section 4.4.5).

FEMA developed the *Substantial Damage Estimator*, summarized in Section 7.5, to provide estimates of building values and costs to repair. In general, this method is most often used in the post-disaster period when local officials need to inspect large numbers of damaged structures and make many substantial damage determinations.

4.4.4 Estimates of Donated or Discounted Materials

To help make improvements or repairs to damaged homes, some organizations and individuals donate materials, and some companies donate or provide materials at a discount. The value placed on all donated or discounted materials should be equal to the actual or estimated cost of such materials and must be included in the total cost. Where materials or servicing equipment are donated or discounted below normal market values, the value should be adjusted to an amount that would be equivalent to that estimated through normal market transactions.

As part of the documentation required for a permit, the applicant should provide cost estimates of the value of donated or discounted materials based on actual or estimated costs. This estimate should be verified by the local official based on professional judgment and knowledge of local or regional material costs. Some communities help non-profit organizations and applicants make these estimates.

4.4.5 Estimates of Owner and Volunteer Labor

The situations described in Section 4.4.4 that involve donated or discounted materials may also involve volunteer labor. Also, property owners may undertake fairly significant improvement and repair projects on their own. In both cases, the normal “market” value or “going rate” for labor must be included in the estimates of the cost of improvements and the costs to repair. After significant events, labor rates may change and should be taken into account.

Labor rates vary geographically and by the nature of the work and trade required. As part of the documentation required for a permit, the applicant should provide an estimate of the value of owner or volunteer labor. The value placed on labor should be estimated based on applicable minimum-hour wage scales for the skill and type of construction work that is done. This

estimate should be verified by the local official based on professional judgment and knowledge of the local or regional construction industry wage scales. Some communities help non-profit organizations and permit applicants make these estimates.

4.4.6 Demolition and Construction Debris Disposal

Demolition and construction debris disposal is not the same as clean-up and trash removal (Section 4.4.7). Virtually any type of work on a building requires some demolition. It may be as little as removing the flooring or an interior wall, or as much as complete removal of a portion of the building and its foundation. Demolition may be part of an improvement project and usually is a necessary part of repairing damage. The costs of demolition, including the costs of disposal of the resulting debris, must be included in the cost of work for the purpose of making the SI/SD determination.

4.4.7 Clean-up and Trash Removal

Clean-up and trash removal are distinguished from demolition and construction debris disposal (Section 4.4.6). Clean-up and trash removal costs are not included in the costs used in the SI/SD determination because they are not related to the actual cost of improving or repairing a building.

Clean-up costs include such work as draining a basement; removing dirt and mud; and cleaning, disinfecting, and drying out buildings. Trash removal includes disposing of trash piled in the interior of the building or accumulated on the lot and related costs (e.g., dumpster, hauling, and tipping fees), as well as removal of abandoned contents and debris related to general clean-up of the structure before the improvement or repairs can be performed.

If clean-up and trash removal are done at the same time as demolition and construction debris disposal, a cost estimate should clearly distinguish between costs that must be included and costs that may be excluded. Local officials can:

- Require property owners to submit itemized costs from all contractors, clearly identifying the costs related to trash disposal and clean-up from those related to demolition necessary to perform the work on the building, or
- Based on judgment and knowledge of local costs, estimate the amounts to be excluded. The permit record should contain documentation of the basis for making this estimate.

4.4.8 Costs to Correct Existing Health, Safety, and Sanitary Code Violations

The definition of substantial improvement provides an exclusion for “[a]ny 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” (emphasis added).

When deciding whether to exclude the costs to correct existing cited health, safety, and sanitary code violations, local officials must consider the following:

- **Correct existing cited violations.** The work must be:
 - Limited to that necessary to correct an existing violation. This means that only work that is directly required for correction can be excluded from the costs of the proposed improvement or repair. All other work must be counted in the estimation of costs.
 - Required to correct an existing violation. This means the condition considered in violation pre-dates the application for a permit (or the date of a damage event) and, importantly, an official who has the authority to enforce the community's health, safety, and sanitary codes must have prior knowledge of the condition and must have verified that it constitutes a violation.
 - Required to correct an existing violation. Violations of a community's health, safety, and sanitary represent threats to public health and safety. Such conditions are considered violations only if they have been identified as violations. The mere presence of a condition that does not conform to current codes does not qualify as a violation.
- **Identified by the local code enforcement official.** To exclude certain costs from the SI/SD determination, an official who has the authority to enforce the community's health and sanitary codes must have knowledge of and have identified the condition, and must have verified or determined that the condition constitutes a violation (normally, this involves issuing a citation or other official notice). Communities might not make a routine practice of inspecting structures in order to document and issue citations for violations. If likely violations of health and sanitary codes are identified by the property owner or contractor during the course of deciding what work to perform and before any improvements or repairs are made, the costs to address those code violations may be excluded, but only if the local official has made the determination that they can be excluded.
- **Minimum necessary to ensure safe living conditions.** To qualify as excludable, the cost of correcting existing violations must be only those costs for the work that is the minimum necessary to address and resolve the violation. Costs of work in excess of the minimum necessary must be included in the SI/SD determination.

For proper treatment of this substantial improvement exclusionary provision, a clear distinction must be made between violations and elements that simply do not meet the present-day design or building code standards. The following examples describe situations where the work performed to meet code requirements must be included in SI/SD determinations and some situations where costs may be excluded:

- Work on a building, or work associated with a change in use or occupancy, may trigger requirements for compliance with the current code. When this occurs, the costs associated with compliance do not qualify for exclusion because the work is not a code violation, but is necessary to meet current code. For example, consider an applicant who applies for a permit to perform work necessary for a change of occupancy from retail space to a restaurant. This will trigger certain code requirements and those costs must be included in the SI/SD determination. Costs that are related to compliance with current code requirements, but are not related to correcting existing violations must be included.

- The owner of a poorly insulated building proposes to rehabilitate it for a new occupant. Although the building does not conform to the current code for energy efficiency, the costs of adding insulation and other energy efficiency work must be included because the lack of adequate insulation is not a health and safety violation.
- An owner proposes to improve a building and has applied for a permit. The owner presents the building official with evidence of termite damage. Termite damage is discovered in the floor joints and the joists are unable to safely support loads required by current code. The building official verifies that it constitutes a violation and cites it as a safety code violation. The minimum cost to correct this violation may be excluded if the violation was cited. If other building components have sustained termite damage that is not a safety code violation, such as damage to non-bearing wall studs and wall trim, the cost to address the damage must be included.
- A restaurant's plumbing system is failing and bathroom fixtures are inoperable. The condition is cited as a violation of the sanitary code. The owner proposes not only to correct the violation but make other improvements, including adding a second bathroom. The costs to correct the failing plumbing system and replace its fixtures may be excluded. The costs of the other improvements, including the second bathroom, must be included.
- In the course of inspecting an abandoned building, the code official cites several conditions as violations that must be corrected before the building can be reoccupied. The building is subsequently purchased and the new owner applies for a permit to not only address the violations, but also to rehabilitate the building. Only the costs to correct the cited violations that are explicitly related to health, sanitary, and safety code requirements may be excluded. All other costs associated with the rehabilitation must be included in the cost of improvements.
- The owner of a home has been notified that the home is not safe to occupy because of violations of the electrical code provisions. Rather than perform only the required repairs, the owner decides to completely renovate the home and submits an application that shows all renovation costs, while excluding the costs associated with all of the electrical work (including replacing all wiring and fixtures, installing more outlets, upgrading the panel board, etc.). The plan reviewer should catch this discrepancy. The only costs that may be excluded are those that are necessary to correct the violation – which means the costs associated with the code violation must be determined before they can be excluded from the SI/SD determination. All other costs associated with the upgrade of the electrical work must be included.

4.5 Determining Market Value

For purposes of making SI/SD determinations, local officials need to determine the “market value” of structures in question. When work is an improvement, the market value is the building’s market value “before the ‘start of construction’ of the improvement.” When work is repair of substantial damage, the market value is the building’s market value “before the damage occurred.” If buildings have not been maintained and have deteriorated over time, then the market value is determined as of the date of the application for the permit to improve or repair the building.

The NFIP regulations do not define “market value.” Generally, market value can be explained as the amount an owner would be willing but not obliged to accept, and that a buyer would be willing but not compelled to pay. The term may be defined by State statutes that pertain to zoning, property taxation, or real estate transactions.

Before reviewing options to determine the market value of a structure, it is important to note two basic NFIP requirements:

- Market value must always be based on the condition of the structure before the improvement is undertaken or before the damage occurred.
- Only the market value of the structure is pertinent. The value of the land and site improvements (landscaping, driveway, detached accessory structures, etc.) and the value of the use and occupancy (business income) are not included. Any value associated with the location of the property should be attributed to the land, not the building.

Many communities require the permit applicant to obtain an appraisal of market value from a qualified professional who is licensed to perform appraisals in the State or community where the property is located (Section 4.5.1). In addition, three other methods to estimate market value are covered in this section:

- Assessed value developed for property tax assessment purposes, adjusted to approximate market value (Section 4.5.2)
- Estimates of a structure’s actual cash value, including depreciation (Section 4.5.3)
- “Qualified estimates” based on the professional judgment of a local official (Section 4.5.4)

Figure 4-3 illustrates the steps local officials need to take in order to determine market values. Additional guidance on estimating market value following disasters is provided in Chapter 7.

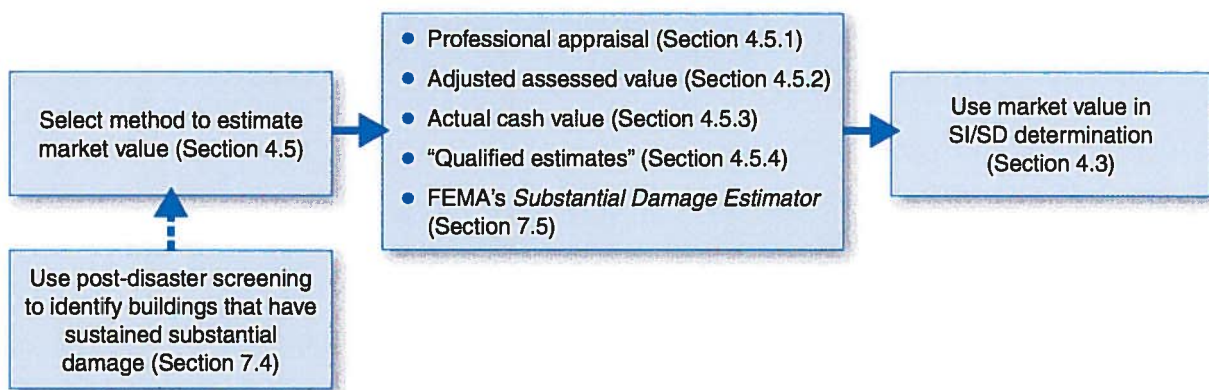


Figure 4-3. Determine the market value (overview)

4.5.1 Professional Property Appraisals

Property appraisals that are prepared by a professional appraiser according to standard practices of the profession are the most accurate and reliable method for determining market value. Professional appraisers should be qualified to appraise the type of property (e.g., residential, commercial, industrial) and should be licensed in the State or community in which the property is located. Most States require professional property appraisers to be licensed and to perform valuation work in accordance with the quality control standards found in the *Uniform Standards of Professional Appraisal Practice*, which are maintained and administered by The Appraisal Foundation (<http://www.appraisalfoundation.org>). In those States that require use of the standards, local officials should check that market value appraisals prepared to support SI/SD determinations have a statement regarding conformance with this standard.

Appraisal reports should identify intended users, including the property owner, who can then submit it as part of a permit application. In addition, the appraisal should be recent enough to reasonably reflect current market value as of the date of the permit application. When used to determine market value for damaged buildings, the appraisal must reflect the pre-damage condition. The “market approach” for determining market value works best if there are adequate market data and recent sales of comparable properties in the vicinity. Note that using the “income capitalization approach” is not acceptable because it is based on how the property is used, and not the value of structure alone. To separate the market value of a structure from the value of the land on which it is located, appraisers may need to do more research than is normally undertaken in order to reasonably allocate the total value between the structure and the land.

The following are situations where the local official may require the applicant to provide a professional appraisal to determine the market value of a structure:

- When it is written explicitly into the community’s floodplain management regulations or required by other local or State codes that independent appraisals shall be used for decisions related to non-conforming use permits.
- When the estimating methods that are used post-disaster (Section 7.4) yield a market value that indicates that the cost of proposed work closely approaches 50 percent of the structure’s estimated market value.
- When an applicant disagrees with the community’s SI/SD determination.

When a professional appraisal of market value is submitted, the local official is responsible for examining it to determine that it is reasonable for the specific characteristics of the building and to check that it does not include the value of land, land improvements (e.g., landscaping, paving), and accessory buildings. The market value of a non-residential building does not include the value of the use or occupancy. If there is cause to question the appraisal (for example, if it appears to overvalue the structure), the local official may request that another appraisal be provided.

4.5.2 Adjusted Assessed Value

Generally, assessed values or property assessments are determined by the State or local taxing or assessment authority. The assessor's job is to independently estimate the market value of real property. Assessments usually provide both land value and value of improvements, and are used as the basis for determining property taxes. Assessments are revised or adjusted periodically to account for changes in property values. The use of assessed value has some limitations that, if not considered and accounted for, can produce erroneous estimates of market value. These limitations are:

- **Appraisal cycle.** How often are the appraisals done and when was the date of the last appraisal? Market value estimates can be grossly outdated if the cycle is long and the property happens to be in the latter stage of its cycle and has not been appraised for many years.
- **Land values.** In most cases, land values and the value of improvements (structures) thereon will be assessed separately and listed as such in the tax records. In cases where they are not distinguished, a determination of the value of the land will have to be made and subtracted from the total assessed value.
- **Assessment level.** States and local taxing authorities vary in assessment levels (an established statutory ratio between the assessor's estimate of value and the true fair market value). For example, many States use an assessment level of 90 percent. In this case, the assessed values will underestimate market values by 10 percent. In cases where the assessment level is unacceptably low or where the projected ratio of cost of repair to market value is close to 50 percent, adjustments for assessment level must be made.

Local officials who elect to use assessed values for making SI/SD determinations should consult the authority that prepares the assessment values to understand the limitations on use of the data. Usually an adjustment factor is necessary because the assessed values cannot be used as a direct equivalent for current market value. The assessor's office should provide the adjustment factor that, when applied to assessed value, yields the "adjusted assessed value" that can then be used as an estimate of market value. A copy of the adjustment factor justification should be retained with the community's permanent records.

Adjusted assessed value may be used as a screening technique to separate out structures for which the ratio of repair or improvement costs to market value (adjusted assessed value) are obviously less than or greater than 50 percent. In post-disaster situations where no other market value estimates are available or where the number of permit applications is overwhelming, unadjusted assessed values may have to suffice as the definitive estimate of market value.

"Unadjusted assessed values" can be used to help local officials focus their efforts when large numbers of SD determinations must be made, such as after a disaster (Section 7.3.2).

An owner may appeal the use of assessed value, but the burden of proof can be placed on the applicant who can be required to submit an independent professional property appraisal that is prepared by a qualified appraiser.

4.5.3 Actual Cash Value

Actual cash value (ACV) is the cost to replace a building on the same parcel with a new building of like-kind and quality, minus depreciation due to age, use, and neglect. ACV does not consider loss in value simply due to outmoded design or location factors. The concept of ACV is used in both the insurance industry and the construction industry. In most situations, ACV is a reasonable approximation of market value.

A number of commercial sources of construction cost information are available to support estimating the replacement cost of a building, including industry-accepted guides available from companies such as RSMeans (<http://www.rsmeans.com>) and the Craftsman Book Company (<http://www.craftsman-book.com>), among others. These sources allow computation of construction costs based on occupancy, square footage, quality, and regional cost variations.

Depreciation accounts for the physical condition of a structure. Depreciation does not take into account functional obsolescence (e.g., outmoded design or construction that pre-dates current codes) or factors that are external to the structure (e.g., reputation of schools or distance to shopping and parks). Commercially available references provide tables and formulas to calculate physical depreciation. These tables and formulas are objective and are used by most professionals in the fields of property appraisal and building inspection. Local officials may consult with a qualified appraiser regarding depreciation, or additional guidance for applying depreciation rates over time is found in FEMA P-784 CD, *Substantial Damage Estimator* (Section 7.5).

4.5.4 Qualified Estimates

A “qualified estimate” of a structure’s market value is an estimate developed by a qualified local official who has sufficient experience and professional judgment on which to base such estimates. The local official may be in the building department or in the tax assessor’s office. The estimates should be made using the best available information, which may include recent permit records, recent home sales, regional cost data, estimates of depreciation based on knowledge of the pre-damage condition of buildings, and adjustments for unique or distinctive features of individual buildings. Another way that a local official may develop qualified estimates is if professional appraisals have been prepared for a few buildings; in that case, those results may be used to approximate the market values of similar buildings. This approach should be used only if the approaches described above cannot be used. Qualified estimates are most likely to be used in the post-disaster situation after large numbers of buildings have been damaged.