

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.

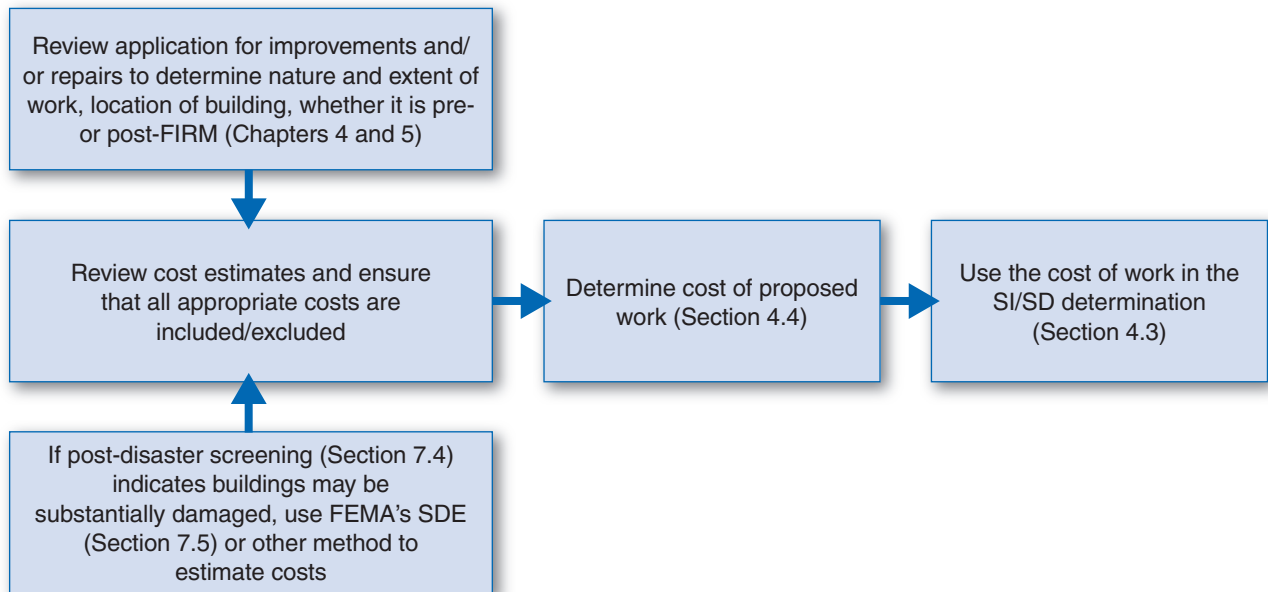


Figure 4-2. Determine the cost of work (overview)

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.