The NFIP’s Substantial Improvement/Damage requirements

Pre/Post flood compliance

September 13, 2017

KEMA Conference – Topeka, KS
Topics

- NFIP- SI/SD Overview
- DATA Collection
- NFIP Info/Training resources
- Implementing SI/SD
- Final observations
The National Flood Insurance Program is:

A voluntary program based on a mutual agreement between the federal government and the local community.
Overview

National Flood Insurance Program (NFIP)

- FEMA’s FM&I manages the National Flood Insurance Program (NFIP) to reduce loss from natural disasters.
- Effective Mitigation can break the cycle of disaster damage, reconstruction, and repeated damage.
Where are determinations required?

Applies to **Pre-FIRM** development . . . within the Special Flood Hazard Area:

- All Zone A boundaries
  - 100-Year Floodplain
  - 1% Annual Chance Flood
  - Base Flood
BASIC FLOODPLAIN MANAGEMENT

- Adopt/enforce floodplain management ordinances
- Require new construction/substantial improvements to be elevated/flood resistant
- Prohibit new development in designated floodways that would increase flood heights
“For a Few Dollars More”

**The Parkers** realized that weather is unpredictable and that flood risk can change. Another big flood could happen at any time. But could they really afford to build higher? It was time to break out the calculator and do the math.

### Option 1: Building to the current requirements
- Estimated construction costs: $250,000
- Estimated monthly mortgage payment: $1,122
- Flood insurance premium: $143 per month or $1,716 per year
- Total monthly costs: $1,265

### Option 2: Building 3 feet above the current requirements
- Estimated construction costs: $252,125
- Estimated monthly mortgage payment: $1,132
- Flood insurance premium: $46 per month or $552 per year
- Total monthly costs: $1,178

*Note: This comparison is based on a 1-story home in an AE Flood Zone built at BFE and 3 feet above BFE on a concrete or CMU perimeter with vents. It has the NFIP maximum coverage of $250,000 building coverage and $100,000 contents coverage with a $1,000 deductible. Elevation costs are estimated at roughly 0.85 percent of total construction costs per additional foot of elevation. Cost savings could vary for different construction methods. Insurance premiums are based on rates published in the Jan. 2013 NFIP Manual. Mortgage payments are based on a 30-year fixed-rate mortgage at 3.5 percent APR for the full construction amount and exclude all insurance costs. Flood insurance must be paid in full at the beginning of the coverage year.*

**Good news!**

The Parkers will save about $90 every month by building 3 feet higher. Spending a little extra on construction reduced the Parkers’ flood risk, cut their...
Substantial Damage Defined

- Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damage condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.
Substantial Improvement Defined

- 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 does not include:**
  - (1) Any project for repair code violations of state or local health, sanitary, or building safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions
  - (2) Any alteration of a “historic structure”, provided that the alteration will not preclude the structures continued designation as a “historic structure”.
Calculating SI / SD

- The 50% Rule is determined by this ratio:
  - The cost of repairing the structure to its before damaged condition to
  - The market value (assessment/appraisal) of the structure prior to the damage
    - Note: the cost of the repairs must include all costs necessary to fully repair the structure to its before damage condition
  - If over 50%, enforcement is required.
Table 6-1a. Compliance Matrix (A Zones)

<table>
<thead>
<tr>
<th>Types of Work</th>
<th>Building is Pre-FIRM</th>
<th>Building is Post-FIRM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rehabilitation (renovate or remodel), not SI</td>
<td>Compliance not required</td>
<td>Work shall comply and shall not be allowed to make the building non-compliant with any aspect of the building that was required for compliance</td>
</tr>
<tr>
<td>Rehabilitation (renovate or remodel), SI</td>
<td>Building required to comply</td>
<td>Work shall comply and shall not be allowed to make the building non-compliant with any aspect of the building that was required for compliance (see Note below table)</td>
</tr>
<tr>
<td>Lateral addition and Rehabilitation, SI</td>
<td>Addition required to comply; building required to comply</td>
<td>Addition required to comply; building required to comply (see Note below table)</td>
</tr>
<tr>
<td>Lateral addition, not SI</td>
<td>Addition not required to comply</td>
<td>Addition required to be elevated to at least the elevation of the existing lowest floor</td>
</tr>
<tr>
<td>Lateral addition, SI, not structurally connected</td>
<td>Addition required to comply; building not required to comply</td>
<td>Addition required to comply</td>
</tr>
<tr>
<td>Lateral addition, SI, structurally connected</td>
<td>Addition required to comply; building required to comply</td>
<td>Addition required to comply; building required to comply (see Note below table)</td>
</tr>
<tr>
<td>Vertical addition above building, not SI</td>
<td>Compliance not required</td>
<td>Work shall comply and shall not be allowed to make the building non-compliant with any aspect of the building that was required for compliance (see Note below table)</td>
</tr>
<tr>
<td>Vertical addition above building, SI</td>
<td>Building required to comply</td>
<td>Work shall comply and shall not be allowed to make the building non-compliant with any aspect of the building that was required for compliance (see Note below table)</td>
</tr>
<tr>
<td>Repair foundation, not SI</td>
<td>Compliance not required</td>
<td>Repairs shall comply and shall not be allowed to make the building non-compliant with any aspect of the building that was required for compliance</td>
</tr>
<tr>
<td>Repair foundation, SI</td>
<td>Building required to comply</td>
<td>Building required to comply (see Note below table)</td>
</tr>
<tr>
<td>Replace/extend foundation, SI (including &quot;elevate-in-place&quot;)</td>
<td>Building required to comply</td>
<td>Building required to comply (see Note below table)</td>
</tr>
<tr>
<td>Repair damage, SD</td>
<td>Building required to comply</td>
<td>Work shall comply and shall not be allowed to make the building non-compliant with any aspect of the building that was required for compliance (see Note below table)</td>
</tr>
<tr>
<td>Reconstruct new building on existing or new foundation, SI</td>
<td>Reconstructed building required to comply</td>
<td>Reconstructed building required to comply (see Note below table)</td>
</tr>
</tbody>
</table>

Note: If a map revision has resulted in a higher BFE, a post-FIRM building must comply based on the new BFE.
Pre-FIRM Residential Compliance

Figure 6-1. Rehabilitation or remodel (no increase in footprint) of residential building in an A zone – the proposed work was determined to be a substantial improvement. The building is brought into compliance by elevating it on an extended perimeter foundation wall, installing flood openings, and raising the HVAC equipment onto a platform.

Notes: Open foundations (pilings/columns) are required under buildings in V zones. Foundation types other than perimeter walls are allowed in A zones.
SI - SD

A zones

- Lateral additions for Pre-FIRM structures in Zone A only.
  - SI that do not involve structural changes (may elevate addition only).

- Lateral additions for Pre-FIRM structures in Zone A only.
  - SI that involve structural changes (must elevate entire structure).
Pre-FIRM Manufactured Homes

**Figure 6-6.** Lateral addition to a pre-FIRM manufactured home in an A zone – the proposed work includes improvements to the existing home. The work constitutes substantial improvement. The addition and the home are elevated to or above the BFE.
Pre-FIRM Non-residential Compliance

Floodproofing Design Certificate Required

Retrofit Dry Floodproofing Required (Special Doors and Window Panels). Floodproof to 1-foot Above BFE to Qualify for Post-FIRM Insurance Rating.

Note: Floodproofing not allowed in V zones.

Figure 6-2. Rehabilitation or remodel (no increase in footprint) of non-residential building in an A zone – the proposed work was determined to be a substantial improvement. The building is brought into compliance by retrofit dry floodproofing measures (certification of design by registered design professional is required).
Retro-fitting non-residential structures for Dry-Flood proofing

FEMA 102, Floodproofing for Non-Residential Structures (1986)

1. Waterproof coating to reduce seepage
2. Permanent closure of opening with masonry
3. Underpinning of structure to resist hydrostatic pressure
4. Valve on sewer line to prevent backflow
5. Instrument panel raised above expected flood level
6. Major equipment installed with quick-disconnects and elevated above flood level with overhead hoist
7. Floor has been reinforced to withstand uplift pressure
8. Underground storage tank properly anchored
9. Cracks sealed with hydraulic cement
10. Steel bulkheads for doorways
11. Sump pump and drain to eject seepage
12. Rescheduling has emptied the loading dock
13. Audible alarm installed as part of area-wide flood warning system
Retro-fitting non-residential structures for Dry-Flood proofing

Connections between buildings presented a considerable design challenge because there were limited options for floodproofing. In some areas, the tight spaces between buildings were filled with expansion joint material, which was then waterproofed to prevent floodwater infiltration.

Figure 3-15. Types of flood shields

Figure 3-25. Three sets of stairs that provide building egress during the design flood event, but still allow normal use of the building (source: Walter P. Moore)

FEMA P-936, Floodproofing Non-Residential Buildings (2013)
Recovery and Development

Branson, Mo.: Substantially damaged Pre-FIRM structure – Date of Damage. April 2011 w/1 foot of flood water. Elevated in 2012 to 1 foot above BFE, using ICC.

Branson, Mo.: Structures demonstrating how the BFE has changed over time and implementation of the Substantial Damage requirement.
Topics

- NFIP- SI/SD Overview
- DATA Collection
- NFIP Info/Training resources
- Implementing SI/SD
- Final observations
DATA Collection

1. Identify / load Pre-FIRM structures (located within SFHA)
2. Determine - Pre-disaster market value of the Structure
3. Determine - Repair Costs – Cost per Square foot
4. Understand how elements relate to the outcome - Percent Damage of the Structure
Data collection

1. **Recommended to collect the 22 most commonly used data fields for future Import to SDE (*.xls file available upon request).**

2. **Reduces data errors and omissions**
   - In SDE User is prompted to use default data for every new assessment
   - Default data can be overwritten
     - Default data remains active until the user deletes it or enters new default data
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.

- Professional appraisal (Section 4.5.1)
- Adjusted assessed value (Section 4.5.2)
- Actual cash value (Section 4.5.3)
- “Qualified estimates” (Section 4.5.4)
- FEMA’s Substantial Damage Estimator (Section 7.5)

Steps to determine Market Value

Use post-disaster screening to identify buildings that have sustained substantial damage (Section 7.4)

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

P 758: Substantial Improvement / Damage Desk Reference
Calculate Repair Cost

Repair estimate (labor-material) is based on the fair market cost of construction per square foot

- Marshall & Swift
- R.S. Means
- Locality based labor & material estimate
- Contractor estimates

$100.00 / SF to $400.00 / SF?

Communities construction values vary across the country and within the State. Some communities estimate their construction cost just below $100.00/S.F., while others indicate its over $400.00. Where does your community fall?

Dilemma: why wouldn’t you want to use the permit construction value for value?
The 50% Rule is determined by this ratio:

- The cost of repairing the structure to its before damaged condition to
- The market value (assessment/appraisal) of the structure prior to the damage

Note: the cost of the repairs must include all costs necessary to fully repair the structure to its before damage condition

- If over 50%, enforcement is required.
Costs **included** in SI/SD determinations

- Material and labor (even when donated)
- Site Preparation
- Demolition of construction debris (excluding trash removal / clean up cost)
- Cost of complying with other regulations and codes (i.e. Health Dept., ADA, etc.)
- Cost of elevating the structure when the proposed elevation is below BFE.
- Construction management and supervision
- Contractor’s overhead
- Sales tax on materials
- Structural elements and exterior finishes
- Interior finish
- Utility and service equipment

Costs **excluded** from SI/SD determinations

- Damage Clean-up and trash removal
- Temporary stabilization of the structure.
- Construction plans and specifications
- Land Survey
- Permit Fees
- Carpeting or re-carpeting installed over a finished floor (wood/tiling).
- Outside improvements (landscaping, pool enclosures, sidewalks, fences, yards lights, and detached accessory structures).
- Cost associated with the minimum work necessary to correct existing violations of health, safety, and sanitary codes.
- Plug-in appliances such as washing machines, dryers and stoves.
12 Elements of Residential SDE Inspection

**ELEMENT PERCENTAGES Table**

<table>
<thead>
<tr>
<th>Item</th>
<th>% Damaged</th>
<th>Element %</th>
<th>Item Cost</th>
<th>Damage Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foundation (SF only)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Superstructure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roof Covering</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Exterior Finish</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interior Finish</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doors and Windows</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cabinets and Countertops</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flood Finish</td>
<td></td>
<td></td>
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<tr>
<td>Plumbing</td>
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</tr>
<tr>
<td>Electrical</td>
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<tr>
<td>Appliances</td>
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<tr>
<td>HVAC</td>
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<td></td>
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<td></td>
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<tr>
<td>Skirting / Formax (MH only)</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**SDE OUTPUT SUMMARY Tab - Optional User Entered Data**

- Professional Market Appraisal: ___________
- Tax Assessed Value: ___________ Factor Adjustment: ___________ Adjusted Tax Assessed Value: ___________
- Contractor's Estimate of Damage: ___________
- Community's Estimate of Damage: ___________

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FEMA A Risk Reduction Seminar: Floodplain Management Series
## A Risk Reduction Seminar: Floodplain Management Series

### Roof Covering

<table>
<thead>
<tr>
<th>Description</th>
<th>0-25%</th>
<th>25-50%</th>
<th>50-75%</th>
<th>Over 75%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roofing includes a lightweight composition shingle, tile roofs, metal roofs,</td>
<td>Minor wind damage to the roof coverings.</td>
<td>Some damaged areas of the roof from high-winds or damages from debris.</td>
<td>Significant damaged areas of the roof from high winds or damages from debris.</td>
<td>Large damaged areas of the roof from high winds or damages from debris.</td>
</tr>
<tr>
<td>or a built-up roof with gravel or rock cover material. Roofing does not</td>
<td>Main surface areas are unaffected.</td>
<td>Some sections of the roof covering are missing or loose.</td>
<td>Significant sections of the roof covering are missing or loose.</td>
<td>Major sections of the roof covering are missing or loose.</td>
</tr>
<tr>
<td>include structural framing members such as rafters or prefabricated trusses</td>
<td>Flashings are intact.</td>
<td>Damages to the flashings allow some water infiltration at joints and roof penetrations.</td>
<td>Damages to the flashings allow some water infiltration at joints and roof penetrations.</td>
<td>Damages to the flashings allow significant water infiltration at joints and roof penetrations.</td>
</tr>
<tr>
<td>that support the roof deck. The roof sheathing and flashing is included in</td>
<td>No damages to the roof sheathing.</td>
<td>Minimal damage to the roof sheathing.</td>
<td>Significant damage to the roof sheathing - some areas of the sheathing will need replacement.</td>
<td>Major damage to the roof sheathing - most of the roof sheathing will need replacement.</td>
</tr>
<tr>
<td>this section.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Threshold Markers

<table>
<thead>
<tr>
<th>Description</th>
<th>0-25%</th>
<th>25-50%</th>
<th>50-75%</th>
<th>Over 75%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roof shingles or tiles mostly intact. Some minor damage to roof shingles -</td>
<td>Some areas where the roof shingles were damaged by high winds. Several small areas of exposed roof sheathing as a result of missing/damaged shingles.</td>
<td>Some areas where the roof shingles were damaged by high winds. Several small areas of exposed roof sheathing as a result of missing/damaged shingles.</td>
<td>Some areas where the roof shingles were damaged by high winds. Several small areas of exposed roof sheathing as a result of missing/damaged shingles.</td>
<td>Major areas of the roof where the shingles/tile are missing, allowing rainwater to freely enter the house below. Significant damage to roof covering and roof sheathing from strong winds or windborne debris penetrating the roof assembly.</td>
</tr>
<tr>
<td>some torn or loose shingles in limited areas.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Special Considerations for Coastal/High Velocity Floods

- Coastal areas have higher wind conditions requiring additional roof covering requirements.
- Damages to these roof coverings would indicate a higher percent of damages, because they are designed to resist higher wind conditions.
- Damages to the roofing are more likely during high-wind conditions due to the loss of protection from missing roof coverings and water infiltration. This will increase the percent of damages.
7 Elements Commercial SDE Inspection

- Foundation
- Superstructure
- Roof Covering
- Plumbing
- Electrical
- Interiors
- HVAC

<table>
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<tr>
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<td>HVAC</td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>
### Floodplain Management Series

A Risk Reduction Webinar: Floodplain Management Series  
A Risk Reduction Seminar: Floodplain Management Series

#### Introductions
- **Introductions include the partitions, interior doors, and**  
  **surface finishes (for walls, floors, and ceilings).**  
  **Materials include low-grade wood/plastic**  
  **composites, soft woods, and hard woods.**  
  **Finishes include paint, stain, or varnish.**  
  **This item also covers any exterior and interior**  
  **painted surfaces. This includes all interior painted**  
  **surfaces, but not the building or repairs of the**  
  **underlying surfaces. This also includes those**  
  **exterior siding materials (and trim work) that need**  
  **to be painted, but not those that inherently**  
  **coloring within the materials themselves (brick,**  
  **stucco, EIFS).**

**NOTE:** Non-residential structures with multiple stories will receive less damage to this element than single-story structures, as the majority of interior finish for multi-story structures will likely not be on the ground floor.

#### Water Levels

<table>
<thead>
<tr>
<th>Water Level</th>
<th>Duration of Floodwaters</th>
<th>Common Damages</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-25%</td>
<td>Water level does not rise to the level of the first floor structure.</td>
<td>Wicking of the water and high moisture conditions into the finished materials at the subflooring and at the bottom of the walls. Water staining and damages possible at baseboard and the casings at the bottoms of door openings. Some adjustment/repair/replacement may be necessary. Water damage at the lowest levels of the wall assembly - lower wall and trim may need to be removed and replaced. Minor damages anticipated on door, cabinet, and window hardware. After repairs to surfaces, the lower wall finishes, baseboards, and door casings will need to be primed and repainted. The bottoms of cabinet bases in bathrooms may require repainting.</td>
</tr>
<tr>
<td>25-50%</td>
<td>Water level rises just above the first floor level.</td>
<td>Water staining and damages likely at the baseboard and the casings at the bottoms of door openings. Some adjustment/repair/replacement may be necessary. Water damage at the lowest levels of the wall assembly - lower wall and trim may need to be removed and replaced. Minor damages anticipated on door, cabinet, and window hardware. After repairs to surfaces, the lower wall finishes, baseboards, and door casings will need to be primed and repainted. The bottoms of cabinet bases in bathrooms may require repainting.</td>
</tr>
<tr>
<td>50-75%</td>
<td>Water level is up to 3 feet above the first floor level.</td>
<td>Water staining and damages likely at the baseboards and the casings at door openings need to be replaced. Water damage at the lowest levels of the wall assembly - wall and trim, window sills and window aprons, wall paneling, wainscoting, and chair rails require removal and replacement. Wall finishes should be removed to a height of 4 feet. Some damages anticipated on door, cabinet, and window hardware. Some replacement needed. After repairs to surfaces, the entire wall finishes, baseboards, and door and window casings will need to be primed and repainted, along with the vanity cabinets in the bathrooms. Both upper and lower paint-grade cabinets should be repainted where lower cabinets were repaired or replaced.</td>
</tr>
<tr>
<td>Over 75%</td>
<td>Water is more than 3 feet above the first floor level of the building.</td>
<td>Water staining and damages at the baseboards, running trim, and casings at door and window openings need to be replaced. Water damage at all the levels of the wall assembly - wall and trim, window sills and window aprons, wall paneling, wainscoting, and chair rails require removal and replacement. Wall finishes should be removed to a height of 8 feet. Significant damages anticipated on door, cabinet, and window hardware. Some replacement needed. After repairs to surfaces, the entire wall finishes, baseboards, and door and window casings and window sashes will need to be primed and repainted along with the vanity cabinets in the bathrooms. Repaint both upper and lower cabinets, where these are paint-grade cabinets.</td>
</tr>
</tbody>
</table>

#### Special Considerations for Coastal/High Velocity Floods

- Damages to the interior finishes are more likely during high-wind conditions due to the loss of protection from missing roof coverings and exterior finishes, and from subsequent water infiltration. The salt, erosion, and winds in coastal areas will have a damaging effect on the quality of exterior hardware. This will significantly increase the percent of damages.
FEMA P-784, Substantial Damage Estimator (SDE) Tool (2017)

FEMA developed the SDE tool to assist State and local officials in estimating Substantial Damage for residential and non-residential structures in accordance with the requirements of the National Flood Insurance Program (NFIP) as adopted by the communities. The tool can be used to assess flood, wind, wildfire, seismic, and other forms of damage. It helps communities provide timely Substantial Damage determinations so that reconstruction can begin quickly following a disaster.

Although the SDE data collection and reporting process remains relatively unchanged from previous versions of the tool, the SDE 3.0 release focuses on enhancing the three key areas of performance, data accessibility, and usability. Updates to the tool’s algorithms and some new embedded functionality create significant performance enhancements over previous versions. Users can now access the underlying database to run queries, perform bulk updates of data, or generate custom reports using their own databases and reporting tools. SDE 3.0 improves the user experience with dozens of enhancements that address user feedback.

FEMA P-784, Substantial Damage Estimator (SDE) User Manual and Field Workbook Using the SDE Tool to Perform Substantial Damage Determinations (August 2017), and the FEMA Substantial Damage Estimator Best Practices (August 2017) document have been updated to reflect the enhanced tool.

https://www.fema.gov/media-library/assets/documents/18692
General Guidance for Installation and Use of SDE 3.0

- Before installing the new version, export any existing SDE data that you want saved from previous SDE versions.

- Although it is not required, FEMA recommends that users uninstall previous versions of SDE from the host computer to avoid confusion between past and current inventories.

- Refer to the SDE Read Me – SDE 3.0 Tool Installation Guide (2017) in the list of downloads below.

The FEMA Substantial Damage Estimator Best Practices (2017) document suggests approaches for dealing with some of the challenging situations users may encounter while using the SDE tool. After a disaster, the complexity of field conditions and the need to prepare for and perform SDE inspections to assess damage can present numerous challenges. This document contains suggested solutions to some common challenges that SDE users may encounter. The information and methods can be used by Federal, State, and local officials when developing SDE-based inventories of potentially substantially damaged residential and non-residential structures. The guidance is organized into three phases of SDE management: 1. Planning for Data Collection, 2. Field Work, and 3. SDE Quality Assurance Reviews.

| SDE 3.0 Installation Package Zip File | 0.06G | September 1, 2017 |
| SDE 3.0 User Manual and Field Workbook | 7.86M | September 1, 2017 |
| SDE Read Me – SDE 3.0 Tool Installation Guide | 0.16M | September 1, 2017 |
The main menu:

1. Main Toolbar
2. View/Search
3. Bulk Property Editor
4. Enter Data
5. Add Property
6. Add Residential Assessment
7. Add Non-Residential
8. Saved Enterprise Import Map
9. Import/Export Functions
10. View Reports
11. Geo File
12. Resources
Enterprise Import

The Enterprise Import function is used to import multiple properties at one time. This can be a very useful function for large numbers of assessments, and any number of the available fields may be selected for importing.

Begin the process by clicking on the Enterprise Import button on the main menu.

After selecting the Get File button, you will be prompted to browse and select the file to be imported.

On-screen prompts will then ask questions specific to the type of file selected for import.

In this example, records are being imported from an Excel spreadsheet.

Click the Format Excel button.

When asked if this Excel sheet contains column headers, answer yes if appropriate. This will depend upon the format of the source data.

Once the data has loaded, click on the Import Using This Format button.

You will see a data-entry field for each type of data used in the SDE 2.0 tool.

In the Select a Field section, simply select the Excel spreadsheet column heading that contains the data needed for the SDE field.

For example, in the Owner’s First Name field, select the field Structure Owner’s First Name.

In the Owner’s Last Name field, select the column heading Structure Owner’s Last Name.
Excel Spreadsheet Template

1. Recommended to pre-load data for 22 of the most commonly used data fields using Enterprise Import (*.xls file available upon request).
2. Reduces data errors and omissions
3. User is prompted to use default data for every new assessment
4. Default data can be overwritten
   • Default data remains active until the user deletes it or enters new default data
Inputting Data into SDE 3.0

Substantial Damage Estimator - (Non-Residential Assessment)

<table>
<thead>
<tr>
<th>Subdivision / Community</th>
<th>Building Address</th>
<th>Mailing Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subdivision:</td>
<td>First Name:</td>
<td>First Name:</td>
</tr>
<tr>
<td>Parcel Number:</td>
<td>Last Name:</td>
<td>Last Name:</td>
</tr>
<tr>
<td>Lot Number:</td>
<td>Street Number:</td>
<td>Street:</td>
</tr>
<tr>
<td>Elev. of Lowest Floor:</td>
<td>Street Name:</td>
<td>Street Name:</td>
</tr>
<tr>
<td>Datum:</td>
<td>W 104th St.</td>
<td>W 104th St.</td>
</tr>
</tbody>
</table>

**FEMA**

A Risk Reduction Seminar: Floodplain Management Series
Pre-FIRM vs. Post-FIRM

**PRE-FIRM**

- Pre-existing
- “Built in the SFHA before the FIRM”

**Post-FIRM**

- Compliant
- “Built in the SFHA after the FIRM”

**PRE-FIRM**

- Homes built below BFE could be hit hard by an increase in full-risk rates

**Post-FIRM**

- Elevating 3 feet above the BFE could lower premiums significantly!
Example 1: Calculate Substantial Damage

- Market value = $40,000.
- Square footage = 1,000 sq. ft.
- SDE inspection percent of damage = 30%

- Construction cost per square foot = $80.
  - 1,000 sq. ft. x 30% = 300 sq. ft. to be repaired.
  - 300 sq. ft. x $80 = $24,000 cost of flood repair.
  - $24,000 divided by $40,000 = 60% damage.

- The cost of flood repair is over 50%.
- The structure is substantially damaged.
Example 2: Calculate Substantial Damage

- Market value = $80,000.
- Square footage = 1,000 sq. ft.
- SDE inspection percent of damage = 30%

- Construction cost per square foot = $80.
  - 1,000 sq. ft. \times 30\% = 300 sq. ft. to be repaired.
  - 300 sq. ft. \times $80 = $24,000 cost of flood repair.
  - $24,000 \text{ divided by } $80,000 = 30\% \text{ damage.}

- The cost of flood repair is below 50%.
- The structure is not substantially damaged.
Topics

- NFIP- SI/SD Overview
- DATA Collection
- NFIP Info/Training resources
- Implementing SI/SD
- Final observations
IS-284: Using the Substantial Damage Estimator 2.0 Tool


Good, accurate, basic info but not yet updated to 2023.
SDE 2.0 – Installation / Resources

- **SDE 3.0:**
  - users manual:  
    [https://www.fema.gov/media-library/assets/documents/18692](https://www.fema.gov/media-library/assets/documents/18692)

- **Substantial Damage Estimator Best Practices:**
  - [http://www.fema.gov/library/viewRecord.do?id=5929](http://www.fema.gov/library/viewRecord.do?id=5929)

- **P 758: Substantial Improvement / Damage Desk Reference:**
  - [http://www.fema.gov/library/viewRecord.do?id=4160](http://www.fema.gov/library/viewRecord.do?id=4160)

- **FEMA – 213: Answers to Questions About Substantially Damaged Buildings:**
Topics

- NFIP- SI/SD Overview
- DATA Collection
- NFIP Info/Training resources
- Implementing SI/SD
- Final observations
Substantial Improvement/Damage Estimation:

**Post-Flood Event**
- Identify Impacted Pre-Firm Structures.
- Assess the damage to Pre-FIRM / cumulative damage structures in the SFHA.
- Explain / enforce substantial damage / improvement and compliance requirements.
- Address overlapping compliance issues / challenges.
Where are determinations required?

Applies to **Pre-FIRM** development . . . within the Special Flood Hazard Area:

- All Zone A boundaries
  - 100-Year Floodplain
  - 1% Annual Chance Flood
  - Base Flood
SDE prioritization and field application

- **Up to 40% damage relative to market value:**
  - Use approximate damage determination methods. *Reconstruct as before flood.*

- **40-60% damage relative to market value:**
  - Use detailed, itemized repair cost estimates and definitive estimates of market value. *Reconstruct in full compliance if over 50%.*

- **60-100% damage relative to market value:**
  - Use approximate damage determination methods. *Reconstruct in full compliance.*
SDE prioritization and field application

- Up to 40% damage relative to market value:
  - Use approximate damage determination methods. *Reconstruct as before flood.*
### SDE prioritization and field application

- **Up to 40% damage relative to market value:**
  - Use approximate damage determination methods. *Reconstruct as before flood.*

#### GUIDANCE FOR ESTIMATING PERCENT DAMAGE CATEGORIES USING THE SUBSTANTIAL DAMAGE ESTIMATOR (SDE) FOR RESIDENTIAL PROPERTIES

**Basic Flooding Model Assumptions:**

1. Medium height freshwater flooding - limited duration. No high velocity action; no wave action.
2. A 1-story house (without a basement) is used for this example house to establish the Categories of most percentages of total costs.

<table>
<thead>
<tr>
<th>Foundation</th>
<th>0 to 25%</th>
<th>25-50%</th>
<th>50-75%</th>
<th>Over 75%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Descriptions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuous perimeter foundations, footings, and piers for internal beams and floor loads. Footing depth averages between 30 inches and 42 inches below ground level. Materials include unreinforced cast-in-place concrete, unreinforced masonry or concrete masonry units (CMUs), concrete slab on grade, or raised slab construction.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water level does not rise to the level of the bottom of the first floor of the structure.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water level is just above the first floor level.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water level is 4-7 feet against the outside of the building.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water level is 7 feet or higher against the outside of the building.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No scoursing at the footings. Some undermining but no visible cracking at concrete slab.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Limited scoursing at the footings. Some undermining and cracking at concrete slab.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Limited scoursing at the footings. Sods are saturated.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Limited scoursing at the footings. Sods are saturated and unstable.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foundation is reportedly cracked and displaced. Structure has been knocked off its foundation.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undermining of the concrete slab, especially at corners - hairline cracks only.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crack noted on or along the foundation walls.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Portions of the foundation are damaged or missing.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Significant undermining of the concrete slab - significant cracking is visible.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Significant undermining of the concrete slab - major cracking and separation of the concrete slab.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small foundation settlements.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Significant foundation settlements.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Settled foundation walls - sections of the walls are cracking, displaced, and leaning, causing an inherent instability to the support for the house. Use caution when approaching or entering the house.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increased settlement noted at the footings.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foundation wall damage - sections of the walls are cracking, displaced, and leaning, causing an inherent instability to the support for the house. Use caution when approaching or entering the house.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increased settlement noted at the footings.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increased settlement noted at the footings.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Special Considerations for Coastal/High Velocity Floods</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coastal floods may have more evidence of scoursing at the supports - the foundation system may be better designed to resist this scoursing action.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High velocity floodwaters may cause erosion/scouring that the building has not been designed to resist.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SDE prioritization and field application

- 40-60% damage relative to market value:
  - Use detailed, itemized repair cost estimates and definitive estimates of market value. *Reconstruct in full compliance if over 50%.*

Branson, Mo.
Substantially damaged April 2011 w/ 1 foot of flood water.
Being elevated to 1 foot above BFE (±8 feet).
**SDE prioritization and field application**

- **40-60% damage relative to market value:**
  - Use detailed, itemized repair cost estimates and definitive estimates of market value. *Reconstruct in full compliance if over 50%.*

---

**Guidance for Estimating Percent Damage Categories Using the Substantial Damage Estimator (SDE) for Residential Properties**

<table>
<thead>
<tr>
<th>Damage Threshold</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 25%</td>
<td>Water level is just above first floor level. Water level is 4-7 feet against the outside of the building. Water level is 7 feet or higher against the outside of the building.</td>
</tr>
<tr>
<td>25-50%</td>
<td>Undermining of the concrete slab, especially at corners - halftile cracks only. Significant undermining of the concrete slab - significant cracking to visible. Portions of the foundation are damaged or missing.</td>
</tr>
<tr>
<td>50-75%</td>
<td>Cracks noted on or along the foundation walls. Significant undermining of the concrete slab - major cracking and separation of the concrete slab.</td>
</tr>
<tr>
<td>Over 75%</td>
<td>Significant undermining of the concrete slab - major cracking and separation of the concrete slab.</td>
</tr>
</tbody>
</table>

---

**Coastal Damages**

- Short-term inundation to limited heights. Limited scouring and erosion - low flow and low velocity floodwaters. Floodwaters extend over the top of the foundation system - significant inundation for over 12 hours. Siltation noted at the footings, due to erosion or unstable soils. Foundation wall damage - sections of the walls are cracking, displaced, and missing, causing an instable support for the house. Use caution when approaching or entering the house.

---

**Common Damages**

- Continuous perimeter foundations, footings, and piers for internal beams and floor slabs. Footing depth average between 30 inches and 42 inches below ground level. Materials include unreinforced cast-in-place concrete, unreinforced masonry, or concrete masonry units (CMUs). Concrete slab on grade, or raised slab construction.

---

**Special Considerations for Coastal/High Velocity Flooding**

- Coastal floods may have more evidence of scouring at the supports - the foundation system may be better designed to resist this scouring action. High velocity floodwaters may create erosion/scouring that the building has not been designed to resist.
SDE prioritization and field application

- 60-100% damage relative to market value:
  - Use approximate damage determination methods. **Reconstruct In full compliance.**
### Damage Assessment Guidance

#### Guidelines for Estimating Percent Damage Categories Using the Substantial Damage Estimator (SDE) for Residential Properties

<table>
<thead>
<tr>
<th>Cabinets and Countertops</th>
<th>0 to 25%</th>
<th>25-50%</th>
<th>50-75%</th>
<th>Over 75%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water level is less than 4 inches above the finished floor level.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water level is between 4 and 12 inches above the finished floor level.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water level is between 1 foot and 3 feet above the finished floor level.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flooding duration is short - no prolonged exposure to water or contaminants.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flooding duration is longer than 12 hours - prolonged exposure to water and contaminants.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Threshold Markers</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Base cabinets have minimal water damage. Swelling and deterioration of manufactured case goods, especially cabinet bases, sides, and drawers using engineered wood products. Bathroom vanity cabinets and kitchen base cabinets may need cleaning, sanitizing, and some repairs at cabinet base. Repainting will be required to match upper cabinets in kitchen.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Replace base cabinets. Water damage and exposure is prolonged - deformation, delamination, and warping of cabinet base drawers and doors. Water contains debris and contaminants. The countertops may need to be replaced.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Replace base cabinets and wall cabinets. Water damage and exposure is prolonged - deformation, delamination, and warping of cabinet base drawers and doors. Water contains debris and contaminants. The countertops will need to be replaced.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Additional Resources:

- [9. SDE Sample Notice of Determination - Substantial Damage](http://www.fema.gov/media-library/assets/documents/18692)
- [10. SDE Sample Notice of Determination - Substantial Improvement](http://www.fema.gov/media-library/assets/documents/18692)
- [11. SDE Sample Notice of Determination - No Substantial Damage](http://www.fema.gov/media-library/assets/documents/18692)
### Completed example

**Non-Residential Assessment**

<table>
<thead>
<tr>
<th>Address</th>
<th>Structure/Damage/NFIP Info</th>
<th>Cost</th>
<th>Element Percentages</th>
<th>Output Summary</th>
<th>Item Cost</th>
<th>Damage Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daffy Duck</td>
<td>009 W 104th Street</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>eawood</td>
<td>009 W 104th Street</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kansas</td>
<td>009 W 104th Street</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Replacement Cost</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>381,500</td>
<td></td>
</tr>
<tr>
<td><strong>Total Estimated Damage</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>225,085</td>
<td></td>
</tr>
</tbody>
</table>
### Non-Residential Assessment

<table>
<thead>
<tr>
<th>Element</th>
<th>Percent</th>
<th>Cost</th>
<th>Total Replacement Cost</th>
<th>Total Estimated Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foundation</td>
<td>25%</td>
<td>$45,780.00</td>
<td>$11,445.00</td>
<td></td>
</tr>
<tr>
<td>Superstructure</td>
<td>50%</td>
<td>$91,560.00</td>
<td>$45,780.00</td>
<td></td>
</tr>
<tr>
<td>Roof Covering</td>
<td>0%</td>
<td>$22,890.00</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>Plumbing</td>
<td>20%</td>
<td>$38,150.00</td>
<td>$7,630.00</td>
<td></td>
</tr>
<tr>
<td>Electrical</td>
<td>14%</td>
<td>$53,410.00</td>
<td>$40,057.50</td>
<td></td>
</tr>
<tr>
<td>Interiors</td>
<td>18%</td>
<td>$68,670.00</td>
<td>$17,167.50</td>
<td></td>
</tr>
<tr>
<td>HVAC</td>
<td>16%</td>
<td>$61,040.00</td>
<td>$15,260.00</td>
<td></td>
</tr>
</tbody>
</table>

Total Estimated Damages: **$137,340.00**
Current Record Detail

Owner: 
Address: 
Community ID:  
Community:  

Inspection Date: 7/7/2014
Inspector: Shandi Teltschik

Percent Damaged: 38.4%

67.9 % (Substantially Damaged)
23.6 % (Not Substantially Damaged)
Dear [name of structure owner],

The City of Floodville has reviewed your recent application for a permit to repair [describe proposed improvement/addition] for the existing residential structure located at [insert structure address], Floodville, NY 14058. These repairs are required as a result of flood damage from the storms of August 26–28, 2017.

The Department of Building Inspections has determined that this structure is located within a mapped Special Flood Hazard Area on the Flood Insurance Rate Map (FIRM), Panel 0150, with an effective date of June 19, 2008. As required by our floodplain management ordinance or building code, we have evaluated the proposed repairs and determined that the damage constitutes Substantial Damage for the structure. This determination is based on a comparison of the cost estimate of the proposed cost of repairs to the pre-damage market value of the structure (excluding land value). When the cost of repairs equals or exceeds 50 percent of the pre-damage market value of the structure, the damage is considered to be Substantial Damage under the requirements of the National Flood Insurance Program (NFIP) and the city’s Floodplain Management Ordinance dated April 8, 2005.

As a result of this determination, you are required to bring the structure into compliance with the flood damage-resistant provisions of the City regulations and/or code [cite pertinent sections].

We would be pleased to meet with you and your designated representative (architect/builder) to discuss the requirements and potential options for bringing the structure into compliance. Several issues must be addressed to achieve compliance. The most significant requirement is that the lowest floor, as defined in the regulations/code, must be elevated to or above the base flood elevation (BFE) [or the elevation specified in the regulations/code] on the FIRM. You may wish to contact your insurance agent to understand how raising the lowest floor higher than the minimum required elevation can reduce NFIP flood insurance premiums.

Please resubmit your permit application along with plans and specifications that incorporate compliance measures. Construction activities that are undertaken without a proper permit are violations and may result in citations, fines, the removal of the non-compliant construction, or other legal action.
Non-Residential Assessment
A Risk Reduction Webinar: Floodplain Management Series

The plumbing system includes the incoming water service (municipal water supply or well service), the water heater, water distribution piping, fire protection system, and the wastewater system. Wastewater will be conveyed away from the structure by either a connection to the municipal sewer system or a septic system. When floodwaters saturate the soils, septic systems may be unable to discharge their waste, causing a back-up of the septic systems. If floodwaters rise above the level of the municipal sewer manhole covers, the sewage can back-up into the building through the sewer lines. Verify the condition of the potable water supply to determine if it can provide a safe water supply.

<table>
<thead>
<tr>
<th>Description</th>
<th>0-25%</th>
<th>25-50%</th>
<th>50-75%</th>
<th>Over 75%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flooding</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Floor drains can backflow into the building. Underfloor (or under slab) plumbing systems should be purged, cleaned, and sanitized. Any materials that might contain remnants of waste materials should be removed. Any damage to the building from the flood will need to be repaired.

Floor drains, shower drains, bathtubs, and toilets can backflow into the building. Septic contamination is likely. Water heaters may need to be replaced.

Floor drains, shower drains, bathtubs, toilets, bathroom sinks, utility sinks, and toilets will backflow into the building. Septic contamination will occur. Water heaters will need to be replaced.

Element Percentages Tab

<table>
<thead>
<tr>
<th>Item</th>
<th>% Damaged</th>
<th>Element%</th>
<th>Item Cost</th>
<th>Damage Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foundation</td>
<td>25</td>
<td>120</td>
<td>$45,780.00</td>
<td>$11,445.00</td>
</tr>
<tr>
<td>Superstructure</td>
<td>58</td>
<td>240</td>
<td>$91,560.00</td>
<td>$45,780.00</td>
</tr>
<tr>
<td>Roof Covering</td>
<td>60</td>
<td>6.0</td>
<td>$22,890.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>Plumbing</td>
<td>100</td>
<td>100</td>
<td>$38,150.00</td>
<td>$7,650.00</td>
</tr>
<tr>
<td>Electrical</td>
<td>140</td>
<td>140</td>
<td>$33,100.00</td>
<td>$46,050.00</td>
</tr>
<tr>
<td>Interiors</td>
<td>180</td>
<td>180</td>
<td>$68,670.00</td>
<td>$17,167.50</td>
</tr>
<tr>
<td>HVAC</td>
<td>160</td>
<td>160</td>
<td>$61,040.00</td>
<td>$15,260.00</td>
</tr>
</tbody>
</table>

Non-Residential Assessment

Daffy Duck
009 W 104th Street

Total Replacement Cost: $381,500.00
Total Estimated Damages: $137,340.00
Non-entry assessments
The wall covering system that covers the wall sheathing, as well as insulation and weather stripping. This includes the water resistant materials and the finish materials: Stucco, Siding (aluminum, vinyl, or wood), Masonry, Stone veneer.

Insulation is installed at the flooring beneath the lowest floor level and throughout the walls and ceilings. Type of insulation includes: fiberglass wall and ceiling insulation, blown wall and ceiling insulation, and rigid wall insulation.

### Residential Assessment

<table>
<thead>
<tr>
<th>Item</th>
<th>Percent Damaged</th>
<th>Element %</th>
<th>Item Cost</th>
<th>Damage Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foundation</td>
<td>0</td>
<td>8.8</td>
<td>$14,167.12</td>
<td>$0.00</td>
</tr>
<tr>
<td>Superstructure</td>
<td>25</td>
<td>19.9</td>
<td>$32,037.01</td>
<td>$8,009.25</td>
</tr>
<tr>
<td>Roof Covering</td>
<td>50</td>
<td>2</td>
<td>$3,219.80</td>
<td>$1,609.90</td>
</tr>
<tr>
<td>Exterior Finish</td>
<td>100</td>
<td>7.5</td>
<td>$120,725.0</td>
<td>$12,074.25</td>
</tr>
<tr>
<td>Interior Finish</td>
<td>20</td>
<td>11.6</td>
<td>$18,674.84</td>
<td>$3,734.97</td>
</tr>
<tr>
<td>Doors and Windows</td>
<td>80</td>
<td>13</td>
<td>$20,928.70</td>
<td>$16,742.96</td>
</tr>
<tr>
<td>Cabinets and Countertops</td>
<td>50</td>
<td>3.8</td>
<td>$6,117.62</td>
<td>$3,058.81</td>
</tr>
<tr>
<td>Floor Finish</td>
<td>50</td>
<td>11.9</td>
<td>$19,157.81</td>
<td>$9,578.91</td>
</tr>
</tbody>
</table>

The wall covering system that covers the wall sheathing, as well as insulation and weather stripping. This includes the water resistant materials and the finish materials: Stucco, Siding (aluminum, vinyl, or wood), Masonry, Stone veneer.

Insulation is installed at the flooring beneath the lowest floor level and throughout the walls and ceilings. Type of insulation includes: fiberglass wall and ceiling insulation, blown wall and ceiling insulation, and rigid wall insulation.
ICC and SD Estimation