

# Residential

## SDE DAMAGE INSPECTION WORKSHEET

**Single-Family, Town or Row House (Site Built Residences), or Manufactured House**

Address: \_\_\_\_\_

### **SDE ADDRESS Tab**

#### **Subdivision Information**

Subdivision: \_\_\_\_\_ Parcel Number: \_\_\_\_\_

Lot Number: \_\_\_\_\_ Elevation of Lowest Floor: \_\_\_\_\_ Datum: \_\_\_\_\_

#### **Community Information**

NFIP Community ID: \_\_\_\_\_ NFIP Community Name: \_\_\_\_\_

Latitude: \_\_\_\_\_ Longitude: \_\_\_\_\_

#### **Building Address**

Owner First Name: \_\_\_\_\_ Owner Last Name: \_\_\_\_\_

Street Number: \_\_\_\_\_ Street Name: \_\_\_\_\_ Street Suffix: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_

County: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone: \_\_\_\_\_ Cell Phone: \_\_\_\_\_

#### **Mailing Address**                      **Check here if same as above: \_\_\_\_\_**

First Name: \_\_\_\_\_

Last Name: \_\_\_\_\_

Street Number: \_\_\_\_\_ Street Name: \_\_\_\_\_ Street Suffix: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_

County: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone: \_\_\_\_\_ Cell Phone: \_\_\_\_\_

Care of: \_\_\_\_\_

**SDE STRUCTURE / DAMAGE / NFIP INFO Tab**

**Structure Attributes**

Residence Type: \_\_\_ Single Family \_\_\_ Town or Row House \_\_\_ Manufactured House

Foundation: \_\_\_ Continuous Wall w/Slab (Standard) \_\_\_ Basement \_\_\_ Crawlspace  
\_\_\_ Piles \_\_\_ Slab-on-Grade \_\_\_ Piers and Posts

Superstructure: \_\_\_ Stud-Framed (Standard) \_\_\_ Common Brick \_\_\_ ICF \_\_\_ Masonry

Roof Covering: \_\_\_ Shingles – Asphalt, Wood (Standard) \_\_\_ Clay Tile \_\_\_ Standing Seam (Metal)  
\_\_\_ Slate

Exterior Finish: \_\_\_ Siding or Stucco (Standard) \_\_\_ Brick Veneer \_\_\_ EIFS  
\_\_\_ None – common brick, structural

HVAC System: \_\_\_ Heating and/or Cooling \_\_\_ None

Story: \_\_\_ One Story (Standard) \_\_\_ Two or More Stories

**Structure Information**

Year of Construction: \_\_\_\_\_

Quality of Construction: \_\_\_ Low \_\_\_ Budget \_\_\_ Average \_\_\_ Good \_\_\_ Excellent

Residence Information (if needed): \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Damage Information**

Date Damage Occurred (mm/dd/yyyy): \_\_\_\_\_

Cause of Damage: \_\_\_ Fire \_\_\_ Flood \_\_\_ Flood and Wind \_\_\_ Seismic \_\_\_ Wind \_\_\_ Other

Cause of Damage (if "Other" is selected): \_\_\_\_\_

No Physical Damage (check here if none): \_\_\_\_\_

Duration of Flood: \_\_\_\_\_ Hours \_\_\_\_\_ Days

**SDE STRUCTURE / DAMAGE / NFIP INFO Tab**

Depth of Flood Above Ground (estimated to nearest 0.5 foot): \_\_\_\_\_

Depth of Flood Above First Floor (estimated to nearest 0.5 foot): \_\_\_\_\_

***Inspector Information:***

Inspector's Name: \_\_\_\_\_

Inspector's Phone: \_\_\_\_\_ Date of Inspection (mm/dd/yyyy): \_\_\_\_\_

***NFIP Information***

FIRM Panel Number: \_\_\_\_\_ Suffix: \_\_\_\_\_ Date of FIRM Panel (mm/dd/yyyy): \_\_\_\_\_

FIRM Zone: \_\_\_\_\_ Base Flood Elevation: \_\_\_\_\_

Regulatory Floodway: \_\_\_ Yes \_\_\_ No \_\_\_ Possible

***Community Information (if needed):*** \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**COST Tab**

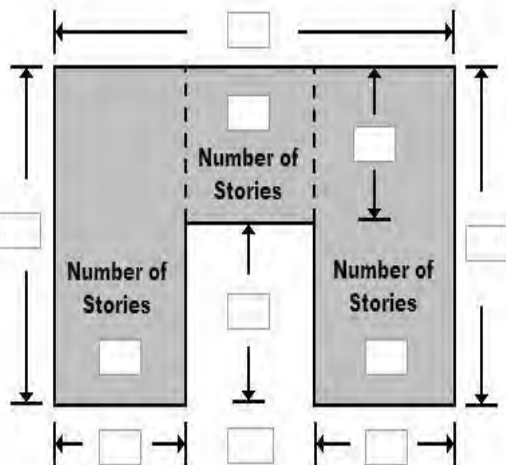
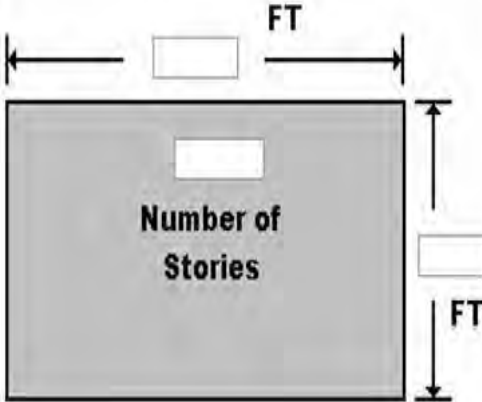
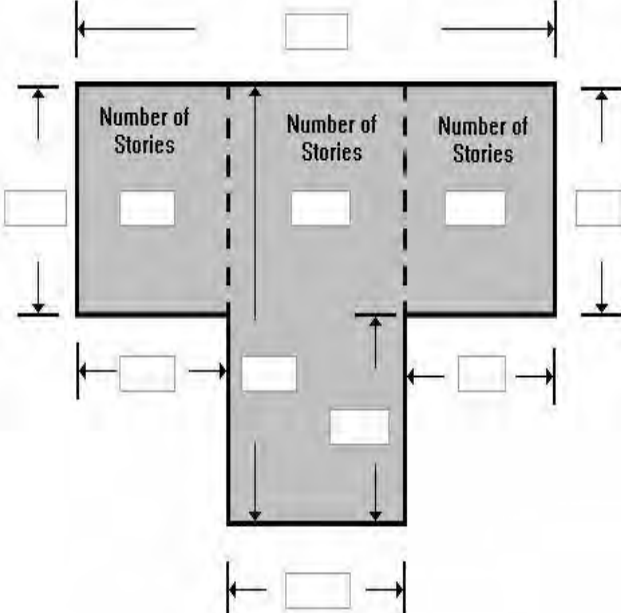
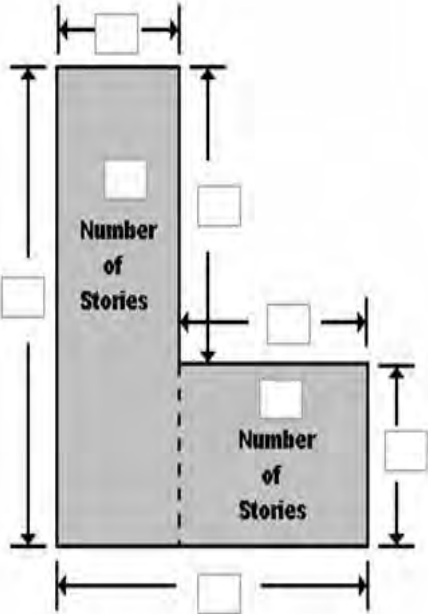
***Square Footage***

Calculate (on next page) or Enter Square Footage

Total Square Footage (if available): \_\_\_\_\_

**COST Tab**

Select appropriate diagram of structure footprint and enter structure dimensions and the number of stories:



**COST Tab**

**Base Cost per Sq Ft:** \_\_\_\_\_ **Geographic Adjustment:** \_\_\_\_\_

***Adjustments***

<b><u>Single-Family House</u></b>	<b><u>Quantity</u></b>	<b><u>Units</u></b>	<b><u>Unit Cost</u></b>	<b><u>Item Cost</u></b>
Roofing		Sq Ft		
Heating / Cooling		Each		
Appliances		Each		
Fireplaces		Each		
Porch / Breezeways		Sq Ft		
Garage		Sq Ft		
<b><u>Manufactured House</u></b>	<b><u>Quantity</u></b>	<b><u>Units</u></b>	<b><u>Unit Cost</u></b>	<b><u>Item Cost</u></b>
Expando		Sq Ft		
Carport		Sq Ft		
Open Porch		Sq Ft		
Enclosed Porch		Sq Ft		
Decks		Each		
Skirting		Sq Ft		
Fireplaces		Each		

**COST Tab**

***Additional Adjustments***

<u>Adjustments</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Item Cost</u>

**Cost Data Reference** (source or name): \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

**Cost Data Date:** \_\_\_\_\_

**Depreciation Rating:**

\_\_\_ 1. Very Poor Condition \_\_\_ 2. Requires Extensive Repairs \_\_\_ 3. Requires Some Repairs  
\_\_\_ 4. Average Condition \_\_\_ 5. Above Average Condition \_\_\_ 6. Excellent Condition \_\_\_ 7. Other

Depreciation Percentage (if 'Other' selected for Depreciation Rating): \_\_\_\_\_

Depreciation Explanation (if 'Other' selected for Depreciation Rating): \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**ELEMENT PERCENTAGES Tab**

***Element Percentages***

Residence Type: \_\_\_\_ Single-Family (SF) House \_\_\_\_ Manufactured House (MH)

<u>Item</u>	<u>% Damaged</u>	<u>Element %</u>	<u>Item Cost</u>	<u>Damage Values</u>
Foundation (SF only)				
Superstructure				
Roof Covering				
Exterior Finish				
Interior Finish				
Doors and Windows				
Cabinets and Countertops				
Flood Finish				
Plumbing				
Electrical				
Appliances				
HVAC				
Skirting / Forms Piers (MH only)				

**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:** \_\_\_\_\_

# Non-Residential

## SDE DAMAGE INSPECTION WORKSHEET

Address: \_\_\_\_\_

### SDE ADDRESS Tab

#### **Subdivision Information**

Subdivision: \_\_\_\_\_ Parcel Number: \_\_\_\_\_

Lot Number: \_\_\_\_\_ Elevation of Lowest Floor: \_\_\_\_\_ Datum: \_\_\_\_\_

#### **Community Information**

NFIP Community ID: \_\_\_\_\_ NFIP Community Name: \_\_\_\_\_

Latitude: \_\_\_\_\_ Longitude: \_\_\_\_\_

#### **Building Address**

Owner First Name: \_\_\_\_\_

Owner Last Name: \_\_\_\_\_

Street Number: \_\_\_\_\_ Street Name: \_\_\_\_\_ Street Suffix: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_

County: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone: \_\_\_\_\_ Cell Phone: \_\_\_\_\_

#### **Mailing Address**

**Check here if same as above:** \_\_\_\_\_

First Name: \_\_\_\_\_

Last Name: \_\_\_\_\_

Street Number: \_\_\_\_\_ Street Name: \_\_\_\_\_ Street Suffix: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_

County: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone: \_\_\_\_\_ Cell Phone: \_\_\_\_\_

Care of: \_\_\_\_\_



**SDE STRUCTURE / DAMAGE / NFIP INFO Tab**

**Structure Information**

Year of Construction: \_\_\_\_\_ Number of Stories: \_\_\_ 1 Story \_\_\_ 2 thru 4 \_\_\_ 5 or more

Structure Use: \_\_\_\_\_

Sprinkler System: \_\_\_ Yes \_\_\_ No      Conveyance: \_\_\_ Yes \_\_\_ No

Residence Type: \_\_\_ Single Family \_\_\_ Town or Row House \_\_\_ Manufactured House

Quality of Construction: \_\_\_ Low \_\_\_ Budget \_\_\_ Average \_\_\_ Good \_\_\_ Excellent

Structure Information (if needed): \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Damage Information**

Date Damage Occurred (mm/dd/yyyy): \_\_\_\_\_

Cause of Damage: \_\_\_ Fire \_\_\_ Flood \_\_\_ Flood and Wind \_\_\_ Seismic \_\_\_ Wind \_\_\_ Other

Cause of Damage (if 'Other' is selected): \_\_\_\_\_

\_\_\_\_\_

No Physical Damage (check here if none): \_\_\_\_\_

Duration of Flood: \_\_\_\_\_ Hours      \_\_\_\_\_ Days

Depth of Flood Above Ground (estimated to nearest 0.5 foot): \_\_\_\_\_

Depth of Flood Above First Floor (estimated to nearest 0.5 foot): \_\_\_\_\_

**Inspector Information:**

Inspector's Name: \_\_\_\_\_

Inspector's Phone: \_\_\_\_\_ Date of Inspection (mm/dd/yyyy): \_\_\_\_\_

**SDE STRUCTURE / DAMAGE / NFIP INFO Tab**

***NFIP Information:***

FIRM Panel Number: \_\_\_\_\_ Suffix: \_\_\_\_\_ Date of FIRM Panel (mm/dd/yyyy): \_\_\_\_\_

FIRM Zone: \_\_\_\_\_ Base Flood Elevation: \_\_\_\_\_

Regulatory Floodway: \_\_\_ Yes \_\_\_ No \_\_\_ Possible

***Community Information (if needed):*** \_\_\_\_\_

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**COST Tab**

***Square Footage***

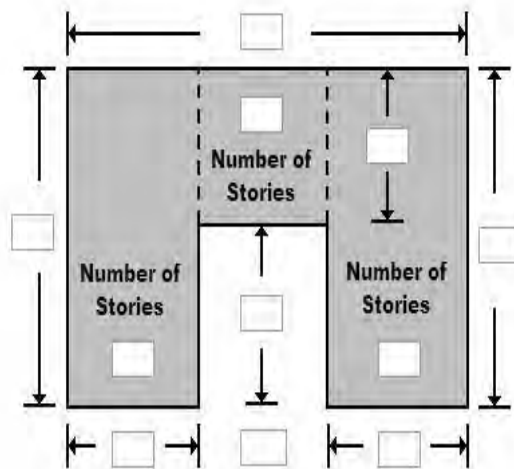
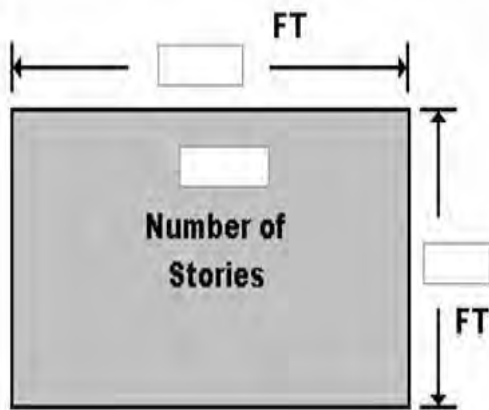
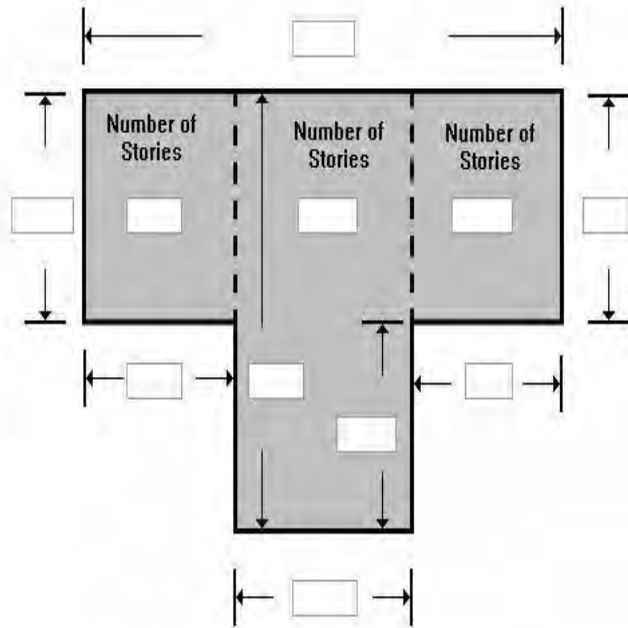
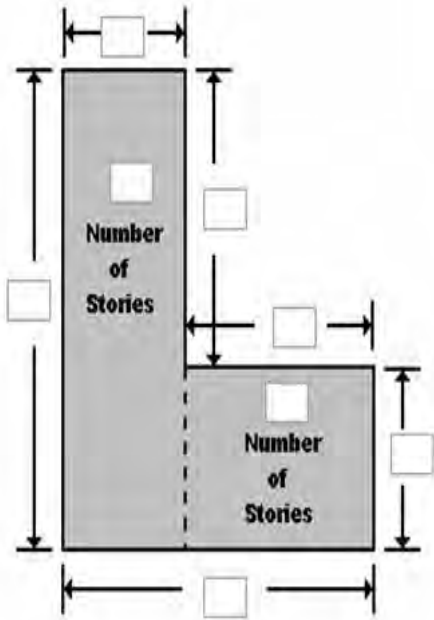
Calculate (on next page) or Enter Square Footage

Total Square Footage (if available): \_\_\_\_\_

Base Cost per Sq Ft: \_\_\_\_\_ Geographic Adjustment: \_\_\_\_\_

**COST Tab**

Select appropriate diagram of structure footprint and enter structure dimensions and the number of stories:



**COST Tab**

***Adjustments***

<u>Adjustments</u>	<u>Quantity</u>	<u>Units</u>	<u>Unit Cost</u>	<u>Item Cost</u>
Roofing		Sq Ft		
Built-in Equipment		Each		
Built-in Security / Communications		Each		
Conveyance System		Each		
Wall Covering		Sq Ft		
Windows / Skylights		Each		

***Additional Adjustments***

<u>Adjustments</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Item Cost</u>

**Cost Data Reference** (source or name): \_\_\_\_\_

\_\_\_\_\_

**Cost Data Date:** \_\_\_\_\_

**Depreciation Rating:**

\_\_\_ 1. Very Poor Condition \_\_\_ 2. Requires Extensive Repairs \_\_\_ 3. Requires Some Repairs  
\_\_\_ 4. Average Condition \_\_\_ 5. Above Average Condition \_\_\_ 6. Excellent Condition \_\_\_ 7. Other

Depreciation Percentage (if 'Other' selected for Depreciation Rating): \_\_\_\_\_

Depreciation Explanation (if 'Other' selected for Depreciation Rating): \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

**ELEMENT PERCENTAGES Tab**

***Element Percentages***

<u>Item</u>	<u>% Damaged</u>	<u>Element %</u>	<u>Item Cost</u>	<u>Damage Values</u>
Foundation				
Superstructure				
Roof Covering				
Plumbing				
Electrical				
Interiors				
HVAC				

# PHOTO LOG

Team ID Name/Number: \_\_\_\_\_

Date: \_\_\_ / \_\_\_ / \_\_\_

Memory Stick No.	Photo No.	Address / Description

## Checklist 1 - Post-Disaster Planning

Need	Completed	Item
1.	_____	<p><b>Brief all elected officials as soon as possible after the event.</b></p> <p>Source:</p> <ul style="list-style-type: none"> <li>• FEMA P-758, <i>Substantial Improvement/Substantial Damage Desk Reference</i>, Chapter 7 (May 2010)</li> </ul>
2.	_____	<p><b>Select an SDE Manager.</b></p> <p>Source:</p> <ul style="list-style-type: none"> <li>• FEMA P-784, <i>SDE Field Workbook</i>, Section 2.1 (April 2013)</li> </ul>
3.	_____	<p><b>Review NFIP requirements for Substantial Damage and Substantial Improvement.</b></p> <p>Sources:</p> <ul style="list-style-type: none"> <li>• NFIP Regulations</li> <li>• FEMA P-758, <i>Substantial Improvement/Substantial Damage Desk Reference</i> (May 2010)</li> <li>• FEMA 213, <i>Answers to Questions About Substantially Damaged Buildings</i> (May 1991)</li> </ul>
4.	_____	<p><b>Review SDE tool and User Manual to understand the SDE data requirements.</b></p> <p>Sources:</p> <ul style="list-style-type: none"> <li>• FEMA P-784, <i>SDE User Manual</i>, Section 3.0 (April 2013)</li> <li>• FEMA <i>SDE Best Practices</i> (May 2012)</li> <li>• FEMA Substantial Damage Estimator Tool Frequently Asked Questions</li> </ul>
5.	_____	<p><b>Identify floodplain maps to review the boundaries of the SFHA.</b></p> <p>Data may include FIRMs, FBFMs, FIS reports, community maps showing previously flooded areas, and flood studies by State or other Federal agencies.</p> <p>Sources:</p> <ul style="list-style-type: none"> <li>• FEMA P-784, <i>SDE Field Workbook</i>, Sections 2.0 and 3.1 (April 2013)</li> <li>• Community NFIP coordinator</li> </ul>

## Checklist 1 - Post-Disaster Planning

Need	Completed	Item
6.	_____	<p>Identify type, location, and community contacts for tax or GIS data for structures within the SDE inventory area that are potentially Substantially Damaged.</p> <p>Any or all of the following data will be useful: owner name, building address, type of house, non-residential building use, year of construction, square footage, number of stories, adjusted building values, number of years since last tax adjustment, and dates of additions or renovations.</p> <p>Sources:</p> <ul style="list-style-type: none"> <li>• FEMA P-784, <i>SDE User Manual</i>, Sections 3.2 and 3.3 (April 2013)</li> <li>• FEMA P-784, <i>SDE Field Workbook</i>, Section 3.1 (April 2013)</li> </ul>
7.	_____	<p>Identify community street, address, or tax maps for delineating the boundaries of the SFHA.</p> <p>This will help delineate the maximum limits of the SDE inventory area while also showing addresses or lot locations.</p> <p>Source:</p> <ul style="list-style-type: none"> <li>• FEMA P-784, <i>SDE Field Workbook</i>, Sections 2.2 and 2.5 (April 2013)</li> </ul>
8.	_____	<p>Transfer SFHA boundaries from floodplain map to street, address, or tax map.</p> <p>Using the effective FIRM for the community, transfer the SFHA boundaries to a base map with named streets and either addresses or lot boundary lines. This will delineate the maximum limits of the SDE inventory to narrow the focus of the inspections while avoiding areas outside the SFHA.</p> <p>Source:</p> <ul style="list-style-type: none"> <li>• FEMA P-784, <i>SDE Field Workbook</i>, Sections 3.1 (April 2013)</li> </ul>
9.	_____	<p>Perform a curbside review of structures within the SDE inventory area.</p> <p>This helps the SDE Manager understand the scope and extent of the inventory area as well as the initial construction quality, size, and type of structures that will require inspections.</p> <p>Source:</p> <ul style="list-style-type: none"> <li>• FEMA P-784, <i>SDE Field Workbook</i>, Section 2.3 (April 2013)</li> </ul>



## Checklist 1 - Post-Disaster Planning

Need	Completed	Item
		2013)
10.	_____	_____
		<p><b>Identify the property and structure access procedures for locked or occupied structures.</b></p> <p>These procedures should be written and well defined; the elected officials and community legal counsel should then review and approve them to ensure that the procedures are legal and defensible. As a minimum, these procedures should include guidance on owner/resident interaction, and requirements for entering open property and structures when owners/residents are not present or when occupants are present but refuse entry to the structure or property. In addition, inspectors with permission to enter a structure need to verify that the structure is structurally stable and safe to enter.</p> <p>Source:</p> <ul style="list-style-type: none"> <li>• FEMA P-784, <i>SDE Field Workbook</i>, Sections 4.6 and 4.7 (April 2013)</li> </ul>
11.	_____	_____
		<p><b>Pre-enter available SDE property data into the SDE tool.</b></p> <p>This data must be cross-referenced to a FIRM, address, or tax map so that the inspectors know which structure and property record are being inspected. Once the data are uploaded into SDE, it will create property records. After the inspection is complete and the field data are entered, the records become SDE assessments.</p> <p>Sources:</p> <ul style="list-style-type: none"> <li>• FEMA P-784, <i>SDE User Manual</i>, Sections 3.2 and 3.3 (April 2013)</li> <li>• FEMA P-784, <i>SDE Field Workbook</i>, Section 3.1 (April 2013)</li> </ul>
12.	_____	_____
		<p><b>Identify the number and names of inspectors required for the inventory and form the inspection teams.</b></p> <p>The number of inspectors and inspection teams will determine the potential daily rate of inspections and a target completion date.</p> <p>Source:</p> <ul style="list-style-type: none"> <li>• FEMA P-784, <i>SDE Field Workbook</i>, Section 3.3.2 (April 2013)</li> </ul>

## Checklist 1 - Post-Disaster Planning

Need	Completed	Item
13.	_____	<p><b>Identify inspection areas that may require permission or special access.</b></p> <p>Industrial parks, factories, private or gated subdivisions, islands, airports, school campuses, and other areas may require permission or other advance coordination to gain access to the property and structures.</p>
14.	_____	<p><b>Identify the proposed sequence of SDE inspections.</b></p> <p>Decide which subdivisions, neighborhoods, or areas will be inspected first, then next, and so on. The sequence will depend on the number of inspectors, their availability during the inspection process, the number of structures to inspect, and the proposed completion date of the inspections. The sequence may be revised as issues arise due to other post-disaster activities that may restrict or limit the inspection teams.</p> <p>Source:</p> <ul style="list-style-type: none"> <li>• FEMA P-784, <i>SDE Field Workbook</i>, Section 3.3 (April 2013)</li> </ul>
15.	_____	<p><b>Prepare a list of local contacts for all project personnel and local agencies.</b></p> <p>This list should include, as a minimum, the SDE Manager, a responsible community official, inspectors, office staff, and the police, fire, and emergency management contacts.</p> <p>Source:</p> <ul style="list-style-type: none"> <li>• FEMA P-784, <i>SDE Field Workbook</i>, Section 3.4 (April 2013)</li> </ul>
16.	_____	<p><b>Research, obtain, or develop unit costs for determining reasonable structure values for residential and non-residential structures in the community.</b> Resources include industry-accepted cost-estimating guides, building permit data, discussions with local contractors or realtors, adjusted tax data, guidance from adjacent communities, or personal experience with residential and non-residential cost estimating.</p> <p>Sources:</p> <ul style="list-style-type: none"> <li>• FEMA P-784, <i>SDE User Manual</i>, Section 3.4.2.3 (April 2013)</li> <li>• FEMA P-784, <i>SDE Field Workbook</i>, Section 3.5 (April 2013)</li> </ul>

## Checklist 1 - Post-Disaster Planning

Need	Completed	Item
17.	_____	<p><b>Prepare a Letter of Introduction on community letterhead.</b></p> <p>The letter will be handed to occupants by the inspectors as they prepare to enter a new property. This should include, as a minimum, a brief discussion on the intent and scope of the SDE inspections, the normal work hours and days, the option of the structure owner or resident to refuse entry to the property or the structure, and provides the name, telephone number, and e-mail address of the SDE Manager or local official in charge of the SDE inventory.</p> <p>Source:</p> <ul style="list-style-type: none"> <li>• FEMA P-784, <i>SDE Field Workbook</i>, Appendix E (April 2013)</li> </ul>
18.	_____	<p><b>Make Substantial Damage determinations for structures located in the SFHA.</b></p> <p>Sources:</p> <ul style="list-style-type: none"> <li>• FEMA P-784, <i>SDE User Manual</i>, Section 4.5 (April 2013)</li> <li>• FEMA P-784, <i>SDE Field Workbook</i>, Section 4 (April 2013)</li> </ul>
19.	_____	<p><b>After Substantial Damage determinations are complete, issue permits for repair and reconstruction</b></p> <p>Source:</p> <ul style="list-style-type: none"> <li>• FEMA P-758, <i>Substantial Improvement/Substantial Damage Desk Reference</i>, Chapter 7 (May 2010)</li> </ul>
20.	_____	
21.	_____	
22.	_____	
23.	_____	
24.	_____	
25.	_____	

## Checklist 2 – Field Preparations

	Need	Have	Item
1.	_____	_____	Flood maps such as FIRMs, FBFMs, FEMA Flood Recovery maps, or other floodplain or flood risk maps.
2.	_____	_____	Tax or address map with 100-year flood boundaries.
3.	_____	_____	Route map showing proposed areas and sequence for data collection.
4.	_____	_____	Tax data, including homeowner/building owner name, address, and zip code, mailing address and zip code, number of stories, and dimensions or habitable square footage (if available).
5.	_____	_____	Copies of blank SDE Damage Inspection Worksheets.
6.	_____	_____	Copies of blank photo logs (if needed).
7.	_____	_____	Photo ID badges for inspectors.
8.	_____	_____	Letter of Introduction with community point of contact (name and telephone number).
9.	_____	_____	Clip boards, pens/pencils, steno pad or writing tablet, highlighter.
10.	_____	_____	100 ft tape measure (to obtain or verify structure dimensions).
11.	_____	_____	Address board and dry erase markers.
12.	_____	_____	Hard hat, gloves, safety glasses, steel-toe and steel-shank shoes, and flashlight.
13.	_____	_____	Cell phones or walkie-talkies.
14.	_____	_____	Digital camera, primary and alternate memory cards, and extra batteries.
15.	_____	_____	Verification that police, fire, and emergency management agencies have been advised of SDE inspections.
16.	_____	_____	Laptop computers with SDE tool installed and power cords for use and re-charging in field vehicles.
17.	_____	_____	
18.	_____	_____	

	Need	Have	Item
19.	_____	_____	
20.	_____	_____	
21.	_____	_____	
22.	_____	_____	
23.	_____	_____	
24.	_____	_____	
25.	_____	_____	

Procedures to review with inspectors prior to the start of data collection

	Need	Completed	Item
1.	_____	_____	Field safety procedures for dealing with extreme temperatures, wild and domestic animals, driving, parking, and what to do in case of an accident.
2.	_____	_____	SDE data collection and recording requirements.
3.	_____	_____	Guidance on identifying initial construction quality for both residential and non-residential structures.
4.	_____	_____	SDE inspection procedures for residential structures.
5.	_____	_____	SDE inspection procedures for non-residential structures.
6.	_____	_____	Guidance on selecting the depreciation rating.
7.	_____	_____	Data collection routes and sequence.
8.	_____	_____	Guidelines for interaction with structure owners and occupants.
9.	_____	_____	Procedures for dealing with locked or occupied buildings.
10.	_____	_____	
11.	_____	_____	
12.	_____	_____	
13.	_____	_____	

**Required and Recommended Elements to be Included  
In a Contractor or Community Estimate of Repairs  
ALL STRUCTURES**

Address or Location: \_\_\_\_\_

Community: \_\_\_\_\_

**ITEMS THAT MUST BE INCLUDED** (check box on left if present):

*All structural elements, including:*

- 1. Foundations (e.g., spread or continuous foundation footings, perimeter walls)
- 2. Monolithic or other types of concrete slabs
- 3. Bearing walls, tie beams, trusses
- 4. Joists, beams, subflooring, framing, ceilings
- 5. Interior non-bearing walls
- 6. Exterior finishes (e.g., brick, stucco, siding)
- 7. Windows and exterior doors
- 8. Roofing, gutters, and downspouts
- 9. Hardware
- 10. Attached decks and porches
- 11. \_\_\_\_\_
- 12. \_\_\_\_\_
- 13. \_\_\_\_\_
- 14. \_\_\_\_\_
- 15. \_\_\_\_\_

**ITEMS THAT MUST BE INCLUDED** (check box on left if present):

*All interior finish elements, including:*

- 1. Floor finishes (e.g., hardwood, ceramic, vinyl, linoleum, stone, and wall-to-wall carpet over subflooring)
- 2. Bathroom tiling and fixtures
- 3. Wall finishes (drywall, paint, stucco, plaster, paneling, tile, and marble)
- 4. Built-in cabinets (kitchen, utility, entertainment, storage, and bathroom)
- 5. Interior doors
- 6. Interior finish carpentry
- 7. Built-in bookcases and furniture
- 8. Hardware
- 9. Insulation
- 10. \_\_\_\_\_
- 11. \_\_\_\_\_
- 12. \_\_\_\_\_
- 13. \_\_\_\_\_
- 14. \_\_\_\_\_
- 15. \_\_\_\_\_

**ITEMS THAT MUST BE INCLUDED** (check box on left if present):

*All utility and service equipment, including:*

- 1. HVAC equipment
- 2. Plumbing fixtures and piping
- 3. Electrical service panel, wiring, outlets, and switches
- 4. Light fixtures and ceiling fans
- 5. Security systems
- 6. Built-in appliances
- 7. Central vacuum systems
- 8. Water filtration, conditioning, or recirculation systems
- 9. \_\_\_\_\_
- 10. \_\_\_\_\_
- 11. \_\_\_\_\_
- 12. \_\_\_\_\_
- 13. \_\_\_\_\_
- 14. \_\_\_\_\_
- 15. \_\_\_\_\_



**ITEMS THAT MAY BE EXCLUDED:**

- 1. Trash removal and clean-up
- 2. Costs to temporarily stabilize a building so that it is safe to enter and evaluate
- 3. Costs to obtain or prepare plans and specifications
- 4. Land survey costs
- 5. Permit fees and inspection fees
- 6. Carpeting and re-carpeting installed on top of the sub-flooring or finished floor
- 7. Outside improvements, including landscape, irrigation, sidewalks, driveways, fences, yard lights, swimming pools, pool enclosures, and detached accessory structures costs required for minimum necessary work to correct existing violations of health, safety, sanitary or building codes
- 8. Plug-in appliances such as washing machines and stoves
- 9. \_\_\_\_\_
- 10. \_\_\_\_\_
- 11. \_\_\_\_\_
- 12. \_\_\_\_\_
- 13. \_\_\_\_\_
- 14. \_\_\_\_\_
- 15. \_\_\_\_\_

## **Recommended Guidelines for Interaction with Structure Owners by SDE Inspectors**

1. The objectives of the SDE inspections are to accurately collect the data required for the Substantial Damage determinations through rapid visual inspections and then move on to the next structure. The initial inspections may require more than 30 minutes for a residential structure. After the first five or so residential inspections, the inspection time should be 15 minutes or less, as the inspectors gain experience and feel more comfortable with the inspections.
2. Remember that you are entering someone's home, structure, or place of business on official City business. Therefore, conduct yourself in a professional manner and be respectful of personal property. Many of these owners and occupants have suffered significant financial losses.
3. The inspections should be conducted between the hours of \_\_\_\_ AM and \_\_\_\_ PM, Monday through Friday (Monday through Saturday), until all required structures have been inspected. This is in accordance with the inspection guidance provided in the community Letter of Introduction that you will be carrying during the inspection period.
4. Due to the extensive damage, many of the homes and buildings may be unoccupied. Our community legal counsel has determined that we can enter open, unoccupied structures. The structure must be unlocked and open, without any signs or other visible postings forbidding trespassing on the property or within the structure. Therefore, you may have little or no contact with many of the occupants as you complete the inspections.
5. When approached by a property owner or occupant, verify that the building being inspected is theirs and then hand them a community Letter of Introduction. In general, property owners and occupants will be curious and possibly suspicious of the inspections. Explain that you are only there to inspect for damage and record the required data. The Letter of Introduction should be handed out to anyone who requests information about the inspections, including the "why" and under "what authority."
6. If you feel threatened in any manner, return to your vehicle and call the police and then the SDE Manager with the address and type of threat.
7. Property owners and occupants with additional questions should call the point-of-contact identified in the Letter of Introduction. Try to avoid lengthy conversations as much as possible. Many of the conversations will become repetitive and will unnecessarily slow down the rate of inspections.
8. Unless specifically directed by the SDE Manager, do not try to explain the Substantial Damage determination process, what the results might mean for the property owner, or any State or Federal buyout or other post-disaster grant or funding program.
9. Under the SDE Manager's direction, explain that building permits may be required for any reconstruction, repairs, or new construction in the aftermath of the disaster. Also, any reconstruction, repairs, or new construction conducted without a proper permit may be considered non-compliant construction and could result in daily fines and/or removal of the non-compliant construction.

10. For locked properties or properties where the owner or occupant is present and refuses to allow you inside, simply record the address, a name and telephone number (if available), the reason for no entry, and then hand the owner or occupant a Letter of Introduction before moving on to the next structure.
11. Before entering a building, verify that the floor is safe to walk on, and then enter carefully. Refrain from pulling pieces of plaster, tearing out drywall or ceilings, or tearing back wallpaper or drywall unless absolutely necessary for the assessment of the damages on the percent breakdown section of the *Damage Inspection Worksheet*.

*Sample Letter of Introduction for SDE Inspections*

**City of Floodville**

Department of Building Inspections

1212 River Road

Floodville, NY 14008

September 8, 2013

Dear Structure Owner or Occupant:

The bearer of this letter is on official business for the City of Floodville during the hours between 8:00 AM and 6:00 PM, Monday through Saturday.

As a result of the flooding that occurred between September 3 and 4, 2013, City staff will be inspecting buildings throughout the community for evidence of Substantial Damage. This evaluation is required by our Floodplain Management Ordinance dated April 8, 2005. These inspections apply to all structures within the 100-year floodplain as shown on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM), Panels 0100 through 0350 for Floodville dated June 19, 2008.

The inspectors will require approximately 30 minutes for a residential inspection and from 30 to 90 minutes for non-residential buildings to inspect for interior and exterior damage. They will record the required information used by the Floodville Department of Building Inspections for making Substantial Damage determinations. After the City has completed the determination process, a written determination will be mailed to the owners of the inspected structures.

Please be advised that all repairs, reconstruction, and new construction are subject to the provisions of the Floodville Building Code and may require a permit. Construction activities conducted without a proper permit may be considered non-compliant and may result in daily fines and/or the removal of the non-compliant construction.

If you refuse admittance to the inspectors, your address will be provided to our City Attorney for processing of a formal legal request to inspect the structure during normal business hours.

Questions regarding the inspection process may be directed to me or Mr. William Jones of the Department of Building Inspections at 888-999-1212 between the hours of 7:30 AM and 5:00 PM, Monday through Friday or e-mailed to [william.jones@floodville.ny.gov](mailto:william.jones@floodville.ny.gov).

Sincerely,

Lisa Donaldson, Chief Inspector  
Department of Building Inspections  
888-999-0000  
[lisa.donaldson@floodville.ny.gov](mailto:lisa.donaldson@floodville.ny.gov)

## ***Substantial Damage***

### *Sample Letter to Notify Structure Owner of Determination*

#### **NOTICE OF SUBSTANTIAL DAMAGE DETERMINATION**

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 14056. These repairs are required due to flood damage from the storms of July 26-28, 2013.

It has been 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 regulations and/or building code, we have determined that the proposed repairs constitute 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 damages are considered Substantial Damage.

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 home into compliance. There are several aspects that 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 National Flood Insurance Program (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, or other legal action.

Sincerely,

Lisa Donaldson, Chief Inspector  
Department of Building Inspections  
888-999-0000  
lisa.donaldson@floodville.ny.gov

## ***Substantial Improvement***

### *Sample Letter to Notify Structure Owner of Determination*

#### **NOTICE OF SUBSTANTIAL IMPROVEMENT DETERMINATION**

Dear [name of structure owner]:

The City of Floodville has reviewed your recent application for a permit to [*describe proposed improvement/addition*] for the existing residential structure located at [insert structure address], Floodville, NY 14056.

It has been 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 regulations and/or building code, we have determined that the proposed work constitutes Substantial Improvement of the building. This determination is based on a comparison of the cost estimate of the proposed work to the market value of the building (excluding land value). When the cost of improvements equals or exceeds 50 percent of the market value of the building, the work is Substantial Improvement.

As a result of this determination, you are required to bring the building 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 home into compliance. There are several aspects that 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 National Flood Insurance Program (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, or other legal action.

Sincerely,

Lisa Donaldson, Chief Inspector  
Department of Building Inspections  
888-999-0000  
lisa.donaldson@floodville.ny.gov

**Work does NOT Constitute Repair of Substantial Damage**  
*Sample Letter to Notify Property Owner of Determination*

**NOTICE OF DETERMINATION**

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 14056. These repairs are required due to flood damage from the storms of July 26-28, 2013.

It has been 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 regulations and/or building code, we have determined that the proposed repair work does not constitute Substantial Damage for this 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 Substantial Damage.

Please be advised that we may need to make another determination if you elect to perform work other than that described and defined in your current permit application. This could include additional renovations or upgrades or building an addition. Construction activities that are undertaken without a proper permit are violations of the City building code and may result in citations, fines, or other legal action.

Let me know if you have any questions on this matter.

Sincerely,

Lisa Donaldson, Chief Inspector  
Department of Building Inspections  
888-999-0000  
lisa.donaldson@floodville.ny.gov

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 Work percentages of total costs.

Foundation		Damage Threshold			
		0-25%	25-50%	50-75%	Over 75%
Description	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.	<p>Water level does not rise to the level of the bottom of the first floor of the structure.</p> <p>No scouring at the footings.</p>	<p>Water level rises just above first floor level.</p> <p>Limited scouring at the footings.</p>	<p>Water level is 4-7 feet against the outside of the building.</p> <p>Limited scouring at the footings.</p> <p>Soils are saturated and unstable</p>	<p>Water level is 7 feet or higher against the outside of the building.</p> <p>Limited scouring at the footings.</p> <p>Foundation is notably cracked and/or displaced. Structure has been knocked off its foundation.</p>
		<p>Some undermining but no visible cracking at concrete slab.</p>	<p>Soils are saturated.</p> <p>Undermining of the concrete slab, especially at corners - hairline cracks only.</p>	<p>Cracks noted on or along the foundation walls.</p> <p>Significant undermining of the concrete slab – significant cracking is visible.</p>	<p>Portions of the foundation are damaged or missing</p> <p>Significant undermining of the concrete slab - major cracking and separation of the concrete slab.</p>
	Common Damages	<p>Short-term inundation to limited heights. Limited scouring and erosion - low flow and low velocity floodwaters. No noticeable cracking of the masonry or displacement of the foundation walls.</p>	<p>Short-term inundation - Foundation is inundated with flood waters but for a limited duration. Limited scouring or undermining of the foundation or footings is found. Minor cracking from some settlement but no displacement, heaving or discontinuities of the structural support systems.</p>	<p>Floodwaters extend over the top of the foundation system - significant inundation for over 12 hours. Some cracking of the masonry/concrete foundation walls. Some damages to the foundation wall from debris or settlement noted.</p>	<p>Settlement noted at the footings, due to erosion or unstable soils. Foundation wall damage – sections of the walls are cracking, displaced, and missing, causing an inherent instability to the support for the house. Use caution when approaching or entering the house.</p>
	Special Considerations for Coastal/High Velocity Floods	<p>Coastal floods may show more evidence of scouring at the supports - the foundation system may be better designed to resist this scouring action.</p> <p>High velocity floodwaters may create erosion/scouring that the building has not been designed to resist.</p>			



Superstructure (Wood Frame/Masonry)		0- 25%	25-50%	50-75%	Over 75%
Description	<p>The wall support systems that extend from the foundation wall to the roof structure. Superstructures include the exterior wall sheathing panels, shear panels, or braced wall panels. This section also includes structural members that support the roof (rafters and trusses), but does not include the roof sheathing.</p>	<p>Water level does not rise to the level of the bottom of the first floor of the structure.</p>	<p>Water level rises just above first floor level.</p>	<p>Water level is up to 3 feet high on the first floor level.</p>	<p>Water is over 3 feet high on the first floor level of the house.</p>
	<p>Wood frame construction: Lightweight lumber or metal studs Interior wall framing (without sheathing) Typical exterior structural panel wall sheathing is plywood or hardboard</p>	<p>No damage to the roof framing.</p>	<p>Damage to the roof framing is limited.</p>	<p>Some damages to exterior walls.</p>	<p>Significant damages to exterior walls.</p>
	<p>Masonry construction: Load bearing walls using unreinforced masonry (URM) and reinforced block or brick Typical exterior covers are stucco, siding (aluminum, vinyl, or wood), and masonry veneer (Reinforced concrete construction should be categorized under masonry.)</p>	<p>Minor damage to portions of the wall structure. Wall studs and sheathing suffered minor damage by contact with debris or from floodwater pressures against the structure. Minor missing or damaged sections of the roof structure. No deformation or distortion of the structural frame is evident.</p>	<p>Some missing sections or open damage to portions of the wall structure. Wall studs and sheathing suffered some damage by contact with debris or from floodwater pressures against the structure. Some missing or damaged sections of the roof structure. No deformation or distortion of the structural frame is evident.</p>	<p>Missing sections or open damage to significant portions of the wall structure. Wall studs and sheathing damaged by contact, collision, or piercing with debris or from floodwater pressures against the structure. Significant missing or damaged sections of the roof structure. Some deformation or distortion of the structural frame is evident.</p>	<p>Missing exterior wall(s) or open damage to large portions of the wall structure. Wall studs and sheathing damaged by contact, collision, or piercing with debris or from floodwater pressures against the structure. Large missing or damaged sections of the roof structure. Significant deformation or distortion of the structural frame is evident.</p>
<p>Special Considerations for Coastal/High Velocity Floods</p>	<p>Coastal areas have higher wind conditions requiring additional exterior wall structural panels, shear walls, and braced wall panels. Damages to these wall structural systems would indicate a higher percent of damages, because they are already designed to resist higher wind conditions.</p>				

Roof Covering		0- 25%	25-50%	50-75%	Over 75%
Description	Roofing includes a lightweight composition shingle, tile roofs, metal roofs, or a built-up roof with gravel or rock cover material. Roofing does not include structural framing members such as rafters or prefabricated trusses that support the roof deck. The roof sheathing and flashing is included in this section.	<p>Minor wind damage to the roof coverings.</p> <p>Main surface areas are unaffected.</p> <p>Flashings are intact.</p> <p>No damages to the roof sheathing.</p>	<p>Some damaged areas of the roof from high-winds or damages from debris.</p> <p>Some sections of the roof covering are missing or loose.</p> <p>Some damages to the flashings.</p> <p>Minimal damage to the roof sheathing.</p>	<p>Significant damaged areas of the roof from high winds or damages from debris.</p> <p>Significant sections of the roof covering are missing or loose.</p> <p>Damages to the flashings allow some water infiltration at joints and roof penetrations.</p> <p>Significant damage to the roof sheathing - some areas of the sheathing will need replacement.</p>	<p>Large damaged areas of the roof from high winds or damages from debris.</p> <p>Major sections of the roof covering are missing or loose.</p> <p>Damages to the flashings allow significant water infiltration at joints and roof penetrations.</p> <p>Major damage to the roof sheathing - most of the roof sheathing will need replacement.</p>
		Threshold Markers			
		Common Damages	<p>Roof shingles or tiles mostly intact. Some minor damage to roof shingles - some torn or loose shingles in limited areas.</p>	<p>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.</p>	<p>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. Some damage to the roof covering and sheathing due to debris falling or penetrating the roof assembly.</p>
	Special Considerations for Coastal/High Velocity Floods	<p>Coastal areas have higher wind conditions requiring additional roof covering requirements.</p> <p>Damages to these roof coverings would indicate a higher percent of damages, because they are designed to resist higher wind conditions.</p> <p>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.</p>			

Exterior Finish		0-25%	25-50%	50-75%	Over 75%
Description	<p>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.</p> <p>Insulation is installed at the flooring beneath the lowest floor level and throughout the walls and ceilings. Types of insulation include: fiberglass wall and ceiling insulation, blown wall and ceiling insulation, and rigid wall insulation.</p>	<p><b>Threshold Markers</b></p> <p>Water level is less than 6 inches above the lowest floor level.</p> <p>The duration of the floodwaters is limited - less than 12 hours.</p>	<p>Water level is between 6 and 18 inches above the lowest floor level.</p> <p>The duration of the floodwaters is limited - less than 12 hours.</p>	<p>Water level is between 18 inches and 3 feet above the lowest floor level.</p> <p>The duration of the floodwaters is more than 12 hours.</p>	<p>Water level is more than 3 feet above the lowest floor level.</p> <p>The duration of the floodwaters is more than 12 hours.</p>
	<b>Common Damages</b>	<p>Water staining, contamination, and damages on some of the exterior wall finishes. 'Clean and repair' process is likely. Brick and stone veneer walls, stucco walls, and 'cultured stone' walls may need some water removal techniques to allow drying of the interior materials and wall cavities. Verify adherence of the finish materials to the wall substrate. A limited amount of the siding materials may require replacement as needed. No damage or replacement of the insulation system is necessary, except where water and high moisture conditions have caused the insulation to fall loose within the crawlspace sub-flooring.</p>	<p>Damages/losses to some areas of the exterior wall surfaces, in addition to water staining and contamination. Some repairs are required at damaged locations prior or during 'clean and repair' process. Brick and stone veneer walls, stucco walls, and 'cultured stone' walls may need some water removal techniques to allow drying of the interior materials and wall cavities. Verify adherence of the finish materials to the wall substrate. Damaged house trim work will require replacement. Water damage to the insulation in the sub-flooring above the crawlspace or basement levels. Damage to insulation is evident and insulation often has fallen loose. This insulation should be removed and replaced.</p>	<p>Damages/losses to significant sections of the exterior wall surfaces, in addition to water staining and contamination. Significant repairs are required at damaged locations prior to 'clean and repair' process. Replacement of some sections of the exterior siding is required. Brick and stone veneer walls, stucco walls, and 'cultured stone' walls may need some water removal techniques to allow drying of the interior materials and wall cavities. Verify adherence of the finish materials to the wall substrate. Water damage to the insulation in the sub-flooring above the crawlspace or basement levels. This insulation should be removed and replaced. Water saturation of wall insulation may be found in the lowest section of the exterior walls. Contaminants in the flood waters are cause for removal and replacement of lower sections of the saturated insulation. Clean, sanitize, and dry the structural systems before re-installing materials. Damaged house trim work will require replacement, especially at door and window casings.</p>	<p>Damages/losses to major sections of the exterior wall surfaces, in addition to water staining and contamination. Major repairs are required at damaged locations prior to 'clean and repair' process. Replacement of large sections of the exterior siding is required. Brick and stone veneer walls, stucco walls, and 'cultured stone' walls may need some water removal techniques to allow drying of the interior materials and wall cavities. Verify adherence of the finish materials to the wall substrate. Damaged house trim will require replacement, especially at door and window casings. Water damage to the insulation in the sub-flooring above the crawlspace or basement levels. This insulation should be removed and replaced. Water saturation of wall insulation requires the removal of all of the insulation from the damaged sections of the exterior walls. Contaminants in the flood waters are cause for removal and replacement of lower sections of the saturated insulation. Clean, sanitize, and dry the structural systems before re-installing.</p>
	<b>Special Considerations for Coastal/High Velocity Floods</b>	<p>The salt, erosion, and winds in coastal areas will have a damaging effect on the quality of exterior wall finishes. Damages to exterior finishes are more likely during high-wind conditions due to the loss of protection from missing exterior finishes and water infiltration. Damages to the insulation 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. This will increase the percent of damages.</p>			

Interior Finish		0-25%	25-50%	50-75%	Over 75%
Description	<p>Interior finish includes the gypsum board, drywall, plaster, or paneling that makes up the wall surfaces. It also includes trim around door frames, baseboards, casings, chair rails, and ceiling moldings.</p> <p>Materials include low-grade wood/plastic composites, soft woods, and hard woods. Finishes include paint, stain, or varnish.</p> <p>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 have inherent coloring within the materials themselves (brick, stucco, EIFS).</p>	<p><b>Threshold Markers</b></p> <p>Water level does not rise to the level of the first floor structure.</p> <p>The duration of the floodwaters is limited - less than 12 hours.</p>	<p>Water level rises just above the first floor level.</p> <p>The duration of the floodwaters is limited - less than 12 hours.</p>	<p>Water level is up to 3 feet above the first floor level.</p> <p>The duration of the floodwaters is more than 12 hours.</p>	<p>Water is more than 3 feet above the first floor level of the house.</p> <p>The duration of the floodwaters is more than 12 hours.</p>
	<p><b>Common Damages</b></p>	<p>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. No damages anticipated on door, cabinet, and window hardware. The baseboards and the bottom of the door casings may need to be cleaned and painted.</p>	<p>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 the cabinet bases in the kitchen and bathrooms may require repainting.</p>	<p>Water staining and damages 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 surfaces 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.</p>	<p>Water staining and damages at the baseboards, and 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 surfaces 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, door and window casings, and window sashes will need to be primed and repainted along with the vanity cabinets in the bathrooms. Repaint both the upper and lower kitchen cabinets, where these are paint-grade cabinets.</p>
	<p><b>Special Considerations for Coastal/High Velocity Floods</b></p>	<p>Damage 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.</p>			

Doors and Windows		0-25%	25-50%	50-75%	Over 75%
<b>Description</b>	<p>This section includes all doors and windows of a structure, as well as locks, hinges, frames, and handles. Assumptions are hollow core doors with low-cost hardware for low, fair, and average quality construction, raised-panel hardwood veneer with good quality hardware for good or excellent quality construction.</p> <p>(This section does not include paint or stain.)</p>	<p><b>Threshold Markers</b></p> <p>Water level rises just to the floor structure of the first floor level.</p> <p>The duration of the floodwaters is limited - less than 12 hours.</p>	<p>Water level is just above the first floor.</p> <p>The duration of the floodwaters is limited - less than 12 hours.</p>	<p>Water rises to at least 12 inches above the first floor level.</p> <p>The duration of the floodwaters is more than 12 hours.</p>	<p>Water rises more than 12 inches above the first floor level.</p> <p>The duration of the floodwaters is more than 12 hours.</p>
		<p><b>Common Damages</b></p> <p>Bottoms of some interior doors may be deformed, delaminated, or have some swelling damages. Doors may need adjustment and/or repairs to close and latch properly. No impact on normal sill-height windows. Damages may be found at floor-level windows (hopper windows, awning windows, and floor-to-ceiling windows).</p>	<p>Bottoms of interior and exterior doors may be deformed, delaminated or have some swelling damages. Doors may need adjustment and/or repairs to close and latch properly. No impact on normal sill-height windows. Damages may be found at floor-level windows (hopper windows, awning windows and floor-to-ceiling windows).</p>	<p>Bottoms of interior and exterior doors will be deformed, delaminated, or have some swelling damages. Interior doors will likely need replacement. Exterior doors may need adjustment, repairs, or replacement. No impact on normal sill-height windows. Repairs or replacements may be needed at floor-level windows (hopper windows, awning windows, and floor-to-ceiling windows).</p>	<p>Bottoms of interior and exterior doors will be deformed, delaminated, or have some swelling damages. Interior and exterior doors will likely need replacement. Deformation or other damages will be found at normal sill-height windows. Replacement will be necessary at floor-level windows (hopper windows, awning windows, and floor-to-ceiling windows). Replacement may be necessary for other windows.</p>
	<p><b>Special Considerations for Coastal/High Velocity Floods</b></p>	<p>Wind-driven rain in coastal areas will have a damaging effect on the quality of exterior doors and windows.</p>			

Cabinets and Countertops		0-25%	25-50%	50-75%	Over 75%
Description	<p>The basic cabinets for bathroom vanities and kitchens include paint-grade cabinets made of a fiberboard or plywood material. The countertop is laminated plastic or a manmade 'cultured stone' surface.</p> <p>Paint-grade cabinets are the baseline because they can be painted to match upper wall cabinets, when they are repairable, to return the house to pre-disaster conditions.</p> <p>Damaged cabinets with hardwood face-frames, doors, and drawers will require replacement based on the depth of flooding above the floor. Therefore, if the flood depth only damages the base cabinet and countertops, the percent damage will be 60% or less.</p>	<p><b>Threshold Markers</b></p> <p>Water level is less than 4 inches above the finished floor level.</p>	<p>Water level is between 4 and 12 inches above the finish floor level.</p> <p>Flood duration is short - no prolonged exposure to water or contaminants.</p>	<p>Water level is between 1 foot and 3 feet above the finish floor level.</p> <p>Flood duration is longer than 12 hours - prolonged exposure to water and contaminants.</p>	<p>Water level is more than 3 feet above finish floor level.</p> <p>Flood duration is longer than 12 hours - prolonged exposure to water and contaminants.</p>
	<p><b>Common Damages</b></p> <p>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 limited repairs. Repainting will be required to match upper cabinets in kitchen.</p>	<p>Base cabinets of particleboard or medium-density fiberboard need to be replaced. Repaint to match upper cabinets in kitchen. Wood and plywood base cabinets may need cleaning, sanitizing, and some repairs at cabinet base. Repainting will be required to match upper cabinets in kitchen.</p>	<p>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.</p>	<p>Replace base cabinets and upper 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.</p>	

Floor Finish		0-25%	25-50%	50-75%	Over 75%
Description	<p>Materials for floor finish include: carpet, hardwood, vinyl composition tile, sheet vinyl, floor cover, ceramic tile, and marble. Sub-flooring is also included.</p> <p>Carpeting, hardwood flooring, vinyl flooring tiles, and sheet vinyl are typically replaced after water inundation. Brick, stone, and clay tile floor can be cleaned, sanitized, and reused. These types of floors may have areas where the mortar setting compound has broken loose. These tiles should be replaced. The floor sheathing is included in this Category of Work, as compared to the Superstructure Category.</p>	<p><b>Threshold Markers</b></p> <p>Water level does not rise to the level of the bottom of the first floor structure.</p> <p>No damages to the floor sheathing.</p>	<p>Water level rises just to the first floor level.</p> <p>Water level inundates the sub-flooring but does not rise to the finish floor materials.</p> <p>Minimal damage to the floor sheathing.</p>	<p>Water level is above the first floor.</p> <p>Water level inundates above the sub-flooring and finish floor materials.</p> <p>Significant damage to the floor sheathing - some areas of the sheathing will need replacement.</p>	<p>Water level is well above the first floor.</p> <p>Water level inundates above the sub-flooring and finish floor materials.</p> <p>Major damage to the floor sheathing - most of the floor sheathing will need replacement.</p>
	<p><b>Common Damages</b></p>	<p>No damage is anticipated in the floor finish system at this water level.</p>	<p>The sub-flooring may be damaged or delaminated by high-humidity conditions, and may need to be repaired or replaced.</p>	<p>The sub-flooring may be damaged or delaminated by water inundation. Floor covering will need removal, drying, sanitizing, and replacement, depending upon the type of floor covering. Carpets (with padding) should be removed and replaced. Wood floors will need to be replaced. Ceramic tiles and stone flooring may be re-used if they are still secured to the substrate. Sheet vinyl and vinyl tiles will need to be replaced to facilitate drying and repair of damages of the subfloor.</p>	<p>The sub-flooring may be damaged or delaminated by water inundation. Floor covering may need removal, drying, sanitizing, and replacement, depending upon the type of floor covering. Carpets (with padding) should be removed and replaced. Wood floors will need to be replaced. Ceramic tiles and stone flooring may be re-used if they are still secured to the substrate. Sheet vinyl and vinyl tiles will need to be replaced to facilitate drying and repair of damages of the sub-floor.</p>
	<p><b>Special Considerations for Coastal/High Velocity Floods</b></p>	<p>Damages to the floor finishes and floor sheathing 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. This will significantly increase the percent of damages.</p>			

Plumbing		0-25%	25-50%	50-75%	Over 75%
<b>Description</b>	<p>The plumbing system includes the incoming water service (municipal water supply or well service), the water heater, water distribution piping, 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.</p> <p>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 house through the sewer lines. Verify the condition of the potable water supply to determine if it can provide a safe water supply.</p>	<p><b>Threshold Markers</b></p> <p>Water level is less than 6 inches above the lowest floor level.</p>	<p>Water level is between 6 inches and 18 inches above the lowest floor level.</p> <p>Flood duration is short - no prolonged exposure to water or contaminants.</p>	<p>Water level is between 18 inches and 3 feet above the lowest floor level.</p> <p>Flood duration is longer than 12 hours - prolonged exposure to water and contaminants.</p>	<p>Water level is more than 3 feet above the lowest floor level.</p> <p>Flood duration is longer than 12 hours - prolonged exposure to water and contaminants.</p>
	<p><b>Common Damages</b></p>	<p>Floor drains can backflow into the house. Under floor (or under slab) plumbing systems should be purged, cleaned, and sanitized. Any materials that might contain remnants of waste materials or other contaminants in the floodwaters will require replacement.</p>	<p>Floor drains, shower drains, bathtubs, and toilets can back flow into the house. Septic contamination is likely. The water heater may need to be replaced.</p>	<p>Floor drains, shower drains, bathtubs, toilets, bathroom sinks, utility sinks, and toilets will backflow into the house. Septic contamination will occur. The water heater will need to be replaced.</p>	<p>All plumbing fixtures will backflow into the house. Septic contamination will occur. The water heater will need to be replaced.</p>
	<p><b>Special Considerations for Coastal/High Velocity Floods</b></p>	<p>Houses in coastal areas may have additional plumbing fixtures and piping on the exterior of the house.</p>			



Electrical		0-25%	25-50%	50-75%	Over 75%
Description	<p>100- to 200-amp electrical service providing circuit breaker panels and distribution wiring. Basic wiring (15/20 amp) for outlets, switches, receptacles, and lighting; 25- to 60-amp wiring systems for outlets for a washer, dryer, stove, and refrigerator.</p> <p>(A minimum number of outlets and lighting fixtures, sometimes quantified by local building code, begin to increase in number and application as the quality level of the residence increases.) The basic approach listed here is for slab-on-grade or elevated houses; crawlspace and basement houses will have higher damage levels more quickly due to the main panel and horizontal wiring runs located below the lowest floor level.</p>	<p>Water level is less than 12 inches above the finished floor level.</p> <p>Minor electrical components and limited wiring are inundated but remain below normal receptacle height.</p>	<p>Water level is between 12 inches and 18 inches above the finish floor level.</p> <p>A significant number of wiring components and limited wiring are inundated, floodwaters above the normal receptacle height.</p>	<p>Water level is between 18 inches and 3 feet above the lowest floor level.</p> <p>A significant number of wiring components and a significant amount of wiring is inundated - floodwaters above normal wall switch height.</p>	<p>Water level is more than 3 feet above the lowest floor level.</p> <p>Most of the wiring components and a significant amount of wiring are inundated - floodwaters above normal wall switch height.</p>
	Common Damage Details	<p>If the main electrical power source is located in the basement, the panel will need to be replaced. All outlets (receptacles, switches, and lights) located in the basement should be replaced. All receptacles, switches, and outlets located above the flood water high mark can be left in place and reused.</p>	<p>Modern Romex wiring that is inundated only for short durations (without wetting the ends/joints/terminations) can be dried and reused. Older nonmetallic cable (with impregnated braided sheathings) should be replaced when wetted. When chemical contaminants are suspected in the floodwaters, all inundated electrical wiring and components will require replacement.</p>	<p>Modern Romex wiring that is inundated only for short durations while wetting the ends/joints/terminations should be replaced. Older non-metallic cable (with impregnated braided sheathings) should be replaced when wetted. When chemical contaminants are suspected in the floodwaters, all inundated electrical wiring and components will require replacement.</p>	<p>Modern Romex wiring that is inundated only for long durations should be replaced. Older nonmetallic cable (with impregnated braided sheathings) should be replaced when wetted. When chemical contaminants are suspected in the floodwaters, all inundated electrical wiring and components will require replacement.</p>

Appliances		0- 25%	25-50%	50-75%	Over 75%
Description	Common, built-in appliances that would be included are the dishwasher, hot water tank, and some stoves.	<p>Water level is less than 6 inches above the finished floor level.</p> <p>Water level is in the floor area of the appliances but not into the equipment operating system.</p> <p>The appliances may be cleaned and reconditioned.</p>	<p>Water level is between 6 inches and 12 inches above the finished floor level.</p> <p>Water level is in the floor area of the appliances and into the equipment operating system.</p> <p>Some of the appliances will need to be replaced.</p>	<p>Water level is between 12 inches and 18 inches above the finish floor level.</p> <p>Water level is in the floor area of the appliances and into the equipment operating system.</p> <p>Most of the appliances will need to be replaced.</p>	<p>Water level is between 18 inches and 3 feet above the finish floor level.</p> <p>Water level is in the floor area of the appliances and into the equipment operating system.</p> <p>All of the appliances will need to be replaced.</p>
		<p>If appliances (water heater, clothes washer/dryer) are located in the basement or under the floor spaces, these should be replaced. Appliances at or above the first-floor level should be cleaned and reconditioned, as needed. Gas-fired appliances should be checked by a service technician to verify whether the gas burners and controls and electric wiring systems were compromised. Replacement may be required.</p>	<p>If appliances (water heater, clothes washer/dryer) are located in the basement or the under floor spaces, these should be replaced. Appliances at or above the first-floor level should be cleaned and reconditioned, as needed. Gas-fired appliances should be checked by a service technician to verify whether the gas burners and controls and electric wiring systems were compromised. Replacement may be required. The clothes dryer and dishwasher systems and controls will likely be inundated and may require replacement.</p>	<p>All appliances located at or above the first-floor level should be cleaned and reconditioned, as needed. Gas-fired appliances should be checked by a service technician to verify whether the gas burners and controls and electric wiring systems were compromised. Replacement may be required. The clothes dryer and dishwasher systems and controls will be inundated and need to be replaced.</p>	<p>All appliances at or above the first floor level should be cleaned and reconditioned, as needed. Gas-fired appliances should be checked by a service technician to verify whether the gas burners and controls and electric wiring systems were compromised. Replace as necessary. The clothes dryer, washing machine, and dishwasher systems and controls will be inundated and need to be replaced.</p>

HVAC		0- 25%	25-50%	50-75%	Over 75%
Description	<p>The base HVAC system is a forced-air heating system (furnace) with ductwork. The air handler system is located inside the thermal barrier of the house.</p> <p>The percent damaged will be less for a boiler. A boiler system has a sealed piping system to distribute the heat while the furnace uses a duct system. Ducts with water infiltration will need to be cleaned, repaired, and re-insulated. By contrast, a boiler piping system only needs to have the distribution piping clean and re-insulated. Note: Old duct and HVAC insulation may contain asbestos - use appropriate caution and adjust the costs for removal, if found.</p> <p>A gas-fired or oil-fired furnace located in a basement or crawlspace will require replacement of the furnace assembly as soon as 12 inches of floodwaters are present. This will require an adjustment of the percent damaged to 75%, as soon as the water reaches the firebox level of this heating equipment. A central air conditioner or heat pump will have a ducted air distribution system. The outside condenser unit(s) will require reconditioning after any flooding conditions.</p>	<p>Water level is less than 6 inches above the lowest floor level.</p> <p>Water level is in the lower ducts but not into the air handler or equipment operating system.</p> <p>The condenser unit may be reconditioned if the water level is less than 6 inches from the bottom of the appliance. If the condenser unit is located below the flood level, it will need to be replaced.</p>	<p>Water level is between 6 inches and 12 inches above the finish floor level.</p> <p>Water level is into the lower ducts and the air handler, but not into the equipment operating system.</p> <p>The condenser unit may be reconditioned if the water level is up to 12 inches from the bottom of the appliance. If the condenser unit is located below the flood level, it will need to be replaced.</p>	<p>Water level is between 12 inches and 3 feet above the finish floor level.</p> <p>Water level is into the lower ducts, air handler, and the equipment operating system.</p> <p>The fuel-fired equipment (burners/controls) is inundated.</p> <p>The condenser unit needs to be replaced.</p>	<p>Water level is more than 3 feet above the lowest floor level.</p> <p>Water level is into the duct distribution system, air handler, and the equipment operating system.</p> <p>The fuel-fired equipment (burners/controls) is inundated.</p> <p>The condenser unit needs to be replaced.</p>
	Common Damages	<p>If HVAC equipment (furnace, air handler, heat pump) are located in the basement or the under floor areas, the equipment should be reconditioned or replaced. Water-inundated duct insulation should be removed and replaced. If the duct insulation is integral to the ducts (duct board or secured interior duct liners), the ducts should be replaced. All ducts that are being reused will require cleaning.</p>	<p>If portions of the HVAC equipment (furnace, air handler, heat pump) are located in the basement or the under floor areas, the equipment should be reconditioned or replaced. Water-inundated duct insulation should be removed and replaced. If the duct insulation is integral to the ducts (duct board or secured interior duct liners), the ducts should be replaced. All ducts that are being reused will require cleaning.</p>	<p>Portions of the HVAC equipment (furnace, air handler, heat pump) should be replaced. Water-inundated duct insulation should be removed and replaced. If the duct insulation is integral to the ducts (duct board or secured interior duct liners), the ducts should be replaced. All ducts that are being reused will require cleaning.</p>	<p>All HVAC equipment (furnace, air handler, heat pump) should be replaced. Water-inundated duct insulation should be removed and replaced. If the duct insulation is integral to the ducts (duct board or secured interior duct liners), the ducts should be replaced. All ducts that are being reused will require cleaning.</p>

**Basic Flooding Model Assumptions:**

- 1) Medium height freshwater flooding - limited duration. Some high-velocity action; possible wave action.  
This guidance represents a starting point for inspectors to perform assessments on non-residential buildings. Because of the wide range of structure types, this guidance should be used as a rough estimation for a typical 1-story convenience store. Any variation from that should take into consideration the potential differences in each element.
- 2) The damage evaluation guidance in this should be taken as possible or likely indicators of the respective level of damage, but is not a definite representation of damage to a structure after a flood and wind event. Not all threshold markers may need to be met to achieve the level of damage indicated.

Foundation		Damage Threshold				
		0- 25%	25-50%	50-75%	Over 75%	
Description	Continuous perimeter foundations, footings, and piers for internal beams and floor loads. Materials include masonry or concrete masonry units (CMUs) or piles.	Threshold Markers	Water level rises just above first floor level.  No scouring around foundation.  Some undermining but no visible cracking at concrete slab.	Water level is 4-7 feet against the outside of the building.  Limited scouring around foundation.  Soils are saturated.    Undermining of the foundation, especially at corners - hairline cracks only.	Water level is 7-10 feet against the outside of the building.  Limited scouring around foundation.  Soils are saturated and unstable.    Cracks noted on or along the foundation walls.    Significant undermining of the foundation - significant cracking is visible.	Water level is more than 10 feet against the outside of the building.  Limited scouring around foundation.  Foundation is notably cracked and/or displaced. Structure has been knocked off its foundation.  Portions of the foundation are damaged or missing.    Significant undermining of the foundation - major cracking and separation of the foundation.
		Common Damages	Short-term inundation to limited heights. Limited scouring and erosion - low-flow and low velocity floodwaters. No noticeable cracking of the masonry or displacement of the foundation walls.	Short-term inundation - foundation is inundated with flood waters but for a limited duration. Limited scouring or undermining of the foundation or footings is found. Minor cracking from some settlement but no displacement, heaving, or discontinuities of the structural support systems.	Floodwaters extend over the top of the foundation system - significant inundation for over 12 hours. Some cracking of the masonry/concrete foundation walls. Some damages to the foundation wall from debris or settlement noted.	Settlement noted at the footings due to erosion or unstable soils. Foundation wall damage - sections of the walls cracking, displaced, and missing, causing an inherent instability to the support for the building. Use caution when approaching or entering the building.
	<b>Special Considerations for Coastal/High Velocity Floods</b>		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.			

Superstructure (Wood Frame/Masonry)		0-25%	25-50%	50-75%	Over 75%
Description	<p>The wall support systems that extend from the foundation wall to the roof structure. Superstructures include the exterior wall sheathing panels, shear panels, or braced wall panels. This section also includes structural members that support the roof, but does not include roof sheathing.</p> <p>Wood frame construction: Lightweight lumber or metal studs Interior wall framing (without sheathing) Typical exterior structural panel wall sheathing is plywood or hardboard</p> <p>Masonry construction: Typically concrete or CMUs, with steel reinforcement. Typical exterior covers are stucco, siding (aluminum, vinyl, or wood), and masonry veneer</p>	<p>Water level does not rise to the level of the bottom of the first floor of the structure.</p> <p>No damage to the roof framing.</p> <p>No wind damage to the superstructure.</p>	<p>Water level rises just above first floor level.</p> <p>Damage to the exterior walls is limited.</p> <p>Damage to the roof framing is limited.</p>	<p>Water level is up to 3 feet high on the first floor level.</p> <p>Some damage to exterior walls.</p> <p>Some damage to sections of the roof framing.</p>	<p>Water is over 3 feet high on the first floor level of the building.</p> <p>Significant damage to exterior walls.</p> <p>Significant damage to the main portion or multiple sections of the roof framing. Pressurization and failure of framing connections.</p>
		<p>Minor damage to portions of the wall structure. Wall studs and sheathing suffered minor damage by contact with debris or from floodwater pressures against the structure. Minor missing or damaged sections of the roof structure. No deformation or distortion of the structural frame is evident.</p>	<p>Some missing sections or open damage to portions of the wall structure. Wall studs and sheathing suffered some damage by contact with debris or from floodwater pressures against the structure. Some missing or damaged sections of the roof structure. No deformation or distortion of the structural frame is evident.</p>	<p>Missing sections or open damage to some portions of the wall structure. Wall studs and sheathing damaged by contact, collision, or piercing with debris or from floodwater pressures against the structure. Some missing or damaged sections of the roof structure. Some deformation or distortion of the structural frame is evident.</p>	<p>Missing exterior wall(s) or open damage to large portions of the wall structure. Wall studs and sheathing damaged by contact, collision, or piercing with debris or from floodwater pressures against the structure. Large missing or damaged sections of the roof structure. Significant deformation or distortion of the structural frame is evident.</p>
	<p>Special Considerations for Coastal/High Velocity Floods</p>	<p>Coastal areas have higher wind conditions requiring additional exterior wall structural panels, shear walls, and braced wall panels.</p> <p>Damages to these wall structural systems would indicate a higher percent of damages, because they are already designed to resist higher wind conditions.</p>			

Roof Covering		0-25%	25-50%	50-75%	Over 75%
<p>Roofing includes a lightweight composition shingle, tile roofs, metal roofs, or a built-up roof with gravel or rock cover material. Roofing does not include structural framing members such as rafters or prefabricated trusses that support the roof deck. The roof sheathing and flashing is included in this section.</p>	Threshold Markers	<p>Minor wind damage to the roof coverings.</p> <p>Main surface areas are unaffected.</p> <p>Flashings are intact.</p> <p>No damages to the roof sheathing.</p>	<p>Some damaged areas of the roof from high winds or damages from debris.</p> <p>Some sections of the roof covering are missing or loose.</p> <p>Some damages to the flashings.</p> <p>Minimal damage to the roof sheathing.</p>	<p>Significant damaged areas of the roof from high winds or damages from debris.</p> <p>Significant sections of the roof covering are missing or loose.</p> <p>Damages to the flashings allow some water infiltration at joints and roof penetrations.</p> <p>Significant damage to the roof sheathing - some areas of the sheathing will need replacement.</p>	<p>Large damaged areas of the roof from high winds or damages from debris.</p> <p>Major sections of the roof covering are missing or loose.</p> <p>Damages to the flashings allow significant water infiltration at joints and roof penetrations.</p> <p>Major damage to the roof sheathing - most of the roof sheathing will need replacement.</p>
	Common Damages	<p>Roof covering mostly intact. Some minor damage - some torn or loose parts of covering in limited areas.</p>	<p>Some areas where the roof was damaged by high winds. Several small areas of exposed roof sheathing as a result of missing/damaged covering.</p>	<p>Some areas where the roof was damaged by high winds. Several small areas of exposed roof sheathing as a result of damaged covering. Some damage to the roof covering and sheathing due to debris falling or penetrating the roof assembly.</p>	<p>Major areas of the roof where the shingles/tile are missing, allowing rainwater to freely enter the building below. Significant damage to roof covering and roof sheathing from strong winds or windborne debris penetrating the roof assembly.</p>
<p><b>Special Considerations for Coastal/High Velocity Floods</b></p>		<p><b>Coastal areas have higher wind conditions requiring additional roof covering requirements.</b></p> <p><b>Damages to these roof coverings would indicate a higher percent of damages, because they are designed to resist higher wind conditions.</b></p> <p><b>Damages to the roofing are more likely during high-wind conditions due to the loss of protection from missing roof coverings. This will increase the percent of damages.</b></p> <p><b>It is also possible that the local building code will require that the entire roof covering be removed and replaced.</b></p>			

Interiors		0-25%	25-50%	50-75%	Over 75%
Description	<p>Interiors 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.</p> <p>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 have inherent coloring within the materials themselves (brick, stucco, EIFS).</p> <p><b>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.</b></p>	<p><b>Water level does not rise to the level of the first floor structure.</b></p> <p>The duration of the floodwaters is limited - less than 12 hours.</p>	<p><b>Water level rises just above the first floor level.</b></p> <p>The duration of the floodwaters is limited - less than 12 hours.</p>	<p><b>Water level is up to 3 feet above the first floor level.</b></p> <p>The duration of the floodwaters is more than 12 hours.</p>	<p><b>Water is more than 3 feet above the first floor level of the building.</b></p> <p>The duration of the floodwaters is more than 12 hours.</p>
	Common Damages	<p>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. No damages anticipated on door, cabinet, and window hardware. The baseboards and the bottom of the door casings may need to be cleaned and painted.</p>	<p>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.</p>	<p>Water staining and damages 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 surfaces 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.</p>	<p>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 surfaces 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.</p>
	Threshold Markers	<p>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.</p>			
Special Considerations for Coastal/High Velocity Floods					

Plumbing		0-25%	25-50%	50-75%	Over 75%
Description	<p>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.</p> <p>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.</p>	<p>Water level is less than 6 inches above the lowest floor level.</p>	<p>Water level is between 6 inches and 18 inches above the lowest floor level.</p> <p>Flood duration is short - no prolonged exposure to water or contaminants.</p>	<p>Water level is between 18 inches and 3 feet above the lowest floor level.</p> <p>Flood duration is longer than 12 hours - prolonged exposure to water and contaminants.</p>	<p>Water level is more than 3 feet above the lowest floor level.</p> <p>Flood duration is longer than 12 hours - prolonged exposure to water and contaminants.</p>
		Common Damages	<p>Floor drains can backflow into the building. Under floor (or under slab) plumbing systems should be purged, cleaned, and sanitized. Any materials that might contain remnants of waste materials or other contaminants in the floodwaters will require replacement.</p>	<p>Floor drains, shower drains, bathtubs, and toilets can backflow into the building. Septic contamination is likely. Water heaters may need to be replaced.</p>	<p>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.</p>
	Special Considerations	<p>The plumbing systems in place in the buildings may vary significantly, and damage thresholds should account for the situation of the building being assessed.</p>			



Electrical		0-25%	25-50%	50-75%	Over 75%
Description	<p>Consists of all electrical components on the property site, such as electrical wiring, communications, conveyance, lighting, and security.</p> <p>A minimum number of outlets and lighting fixtures, sometimes quantified by local building code, begin to increase in number and application as the quality level of the structure increases. Structure type will also affect the amount of fixtures, wiring, and electrical equipment in the building, and therefore will significantly affect the percent damage to this element. For this example, equipment is assumed to be on the first floor. In multi-story buildings where equipment is on floors higher than where the flooding is occurring, these percent damage estimates would be significantly lower.</p>	<p>Water level is less than 12 inches above the finished floor level.</p> <p>Minor electrical components and limited wiring are inundated but remain below normal receptacle height.</p>	<p>Water level is between 12 inches and 18 inches above the finish floor level.</p> <p>A significant number of wiring components and limited wiring are inundated, and floodwaters are above the normal receptacle height.</p>	<p>Water level is between 18 inches and 3 feet above the lowest floor level.</p> <p>A significant number of wiring components and a significant amount of wiring is inundated - floodwaters are above normal wall switch height.</p>	<p>Water level is more than 3 feet above the lowest floor level.</p> <p>Most of the wiring components and a significant amount of wiring are inundated - floodwaters are above normal wall switch height.</p>
		Common Damage Details	<p>If the main electrical power source is located in the basement, the panel will need to be replaced. All outlets (receptacles, switches and lights) located below grade should be replaced. All receptacles, switches, and outlets located above the flood water high mark can be left in place and reused.</p>	<p>Modern Romex wiring that is inundated only for short durations (without wetting the ends/joints/terminations) can be dried and reused. Older nonmetallic cable (with impregnated braided sheathings) should be replaced when wetted. When chemical contaminants are suspected in the floodwaters, all inundated electrical wiring and components will require replacement.</p>	<p>Modern Romex wiring that is inundated only for short durations while wetting the ends/joints/terminations should be replaced. Older non-metallic cable (with impregnated braided sheathings) should be replaced when wetted. When chemical contaminants are suspected in the floodwaters, all inundated electrical wiring and components will require replacement.</p>
Special Considerations		<p>The electrical system in place and its location with respect to the building may vary significantly, and damage thresholds should account for the situation of the building being assessed.</p>			

HVAC		0-25%	25-50%	50-75%	Over 75%	
Description	Threshold Markers	<p>The base HVAC system is a forced-air heating system (furnace) with ductwork. The air handler system is located inside the thermal barrier of the building.</p> <p>The percent damaged will be less for a boiler. A boiler system has a sealed piping system to distribute the heat while the furnace uses a duct system. Ducts with water infiltration will need to be cleaned, repaired, and re-insulated. By contrast, a boiler piping system only needs to have the distribution piping clean and re-insulated. Note: Old duct and HVAC insulation may contain asbestos - use appropriate caution and adjust the costs for removal, if found.</p> <p>A gas-fired or oil-fired furnace located in a basement or crawlspace will require replacement of the furnace assembly as soon as 12 inches of floodwaters are present. This will require an adjustment of the percent damaged to 75%, as soon as the water reaches the firebox level of this heating equipment. A central air conditioner or heat pump will have a ducted air distribution system. The outside condenser unit(s) will require reconditioning after any flooding conditions.</p>	<p>Water level is less than 6 inches above the lowest floor level.</p> <p>Water level is in the lower ducts but not into the air handler or equipment operating system.</p> <p>The condenser unit may be reconditioned if the water level is less than 6 inches from the bottom of the appliance. If the condenser unit is located below the flood level, it needs to be replaced.</p> <p>Minor to no damage to exterior HVAC components.</p>	<p>Water level is between 6 inches and 12 inches above the finished floor level.</p> <p>Water level is into the lower ducts and the air handler, but not into the equipment operating system.</p> <p>The condenser unit may be reconditioned if the water level is up to 12 inches from the bottom of the appliance. If the condenser unit is located below the flood level, it needs to be replaced.</p> <p>Minor to some damage to exterior HVAC components.</p>	<p>Water level is between 12 inches and 3 feet above the finish floor level.</p> <p>Water level is into the lower ducts, air handler, and the equipment operating system.</p> <p>The fuel-fired equipment (burners/controls) is inundated.</p> <p>The condenser unit needs to be replaced.</p> <p>Some damage to some exterior HVAC components. Some components may have connection failures and some became windborne debris.</p>	<p>Water level is more than 3 feet above the lowest floor level.</p> <p>Water level is into the duct distribution system, air handler, and the equipment operating system.</p> <p>The fuel-fired equipment (burners/controls) is inundated.</p> <p>The condenser unit needs to be replaced.</p> <p>Significant damage to many exterior HVAC components. Components may have connection failures and components became windborne debris.</p>
		Common Damages	<p>If HVAC equipment (furnace, air handler, heat pump) are located in the basement or the under floor areas, the equipment should be reconditioned or replaced. Water-inundated duct insulation should be removed and replaced. If the duct insulation is integral to the ducts (duct board or secured interior duct liners), the ducts should be replaced. All ducts that are being reused will require cleaning.</p>	<p>If portions of the HVAC equipment (furnace, air handler, heat pump) are located in the basement or the under floor areas, the equipment should be reconditioned or replaced. Water-inundated duct insulation should be removed and replaced. If the duct insulation is integral to the ducts (duct board or secured interior duct liners), the ducts should be replaced. All ducts that are being reused will require cleaning.</p>	<p>Portions of the HVAC equipment (furnace, air handler, heat pump) should be replaced. Water-inundated duct insulation should be removed and replaced. If the duct insulation is integral to the ducts (duct board or secured interior duct liners), the ducts should be replaced. All ducts that are being reused will require cleaning.</p>	<p>All HVAC equipment (furnace, air handler, heat pump) should be replaced. Water-inundated duct insulation should be removed and replaced. If the duct insulation is integral to the ducts (duct board or secured interior duct liners), the ducts should be replaced. All ducts that are being reused will require cleaning.</p>