

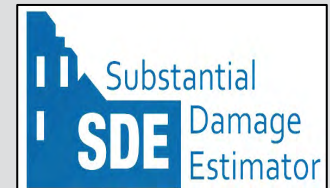
# Substantial Damage Estimation (SDE) Introduction



**Federal Emergency Management Agency (FEMA)**

**Harrisburg, PA**

**June 2023**





# Housekeeping/Health and Safety

- Emergency exits and evacuation procedures
- Facilities – restrooms and refreshments
- General class arrangement
- Course materials – paper vs. computer-based materials
- Wi-Fi access and password
- Lunch arrangements
- Field exercise and transportation
- Questions welcome anytime!

# Unit 1 – Substantial Damage Estimation Introduction



## Substantial Damage Estimation 3.0 Introduction



**Gregory Wilson**

**Emergency Management Specialist**

**FEMA Building Science Branch**

**SDE Lead, FEMA Headquarters (2010 - present)**

**Charlie Baker**

**Program Analyst**

**Floodplain Management Division**

**FEMA Headquarters**

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**Floodplain Management Section Supervisor**

**State Support – Mitigation Division**

**FEMA Region III**

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**Advancing Resilience in Communities (ARC)**

**Tetra Tech**

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**Floodplain Management Analyst**

**Advancing Resilience in Communities (ARC)**

**Tetra Tech**



# Icebreaker



# Icebreaker





# SDE Program Schedule

## Day 1:

- Intro and General Information
- SDE Overview
- Inspection Guidance
- SDE Tool Introduction and Installation
- SDE Tool Overview
- Percent Damage Estimates
- Manual/Paper Exercises
- SDE Tool Features

## Day 2:

- SDE Tool Features Continued
- SDE Tool Exercises
- SDE Best Practices
- SDE Resources and Final Comments
- Field Exercises



# SDE Program Handouts

- Manual/Paper SDE Worksheets
- Rainbow Charts
- Case Studies

**SIMPLIFIED QA/QC GUIDANCE FOR EVALUATION OF RESIDENTIAL CONCRETE BUI**

**1-STORY RESIDENTIAL BUILDINGS ON SLAB/PIERS/CRAWLSPAC**

Depth of Flooding Above Top of First Finished Floor (ft)	Doors and Windows	Cabinets and Countertops	Floor Finish	Plumbing <sup>2</sup>	Electrical <sup>2</sup>
0'	0%	0%	0%	0%	0%
0.5'	10%	25%	5%	0%	0%
1'	20%	50%	5%	5%	10%
1.5'	40%	50%	5%	10%	10%
2'	40%	50%	5%	10%	20%
2.5'	40%	50%	5%	10%	20%
3'	50%	50%	10%	20%	20%
3.5'	50%	50%	10%	20%	50%
4'	75%	75%	15%	20%	60%
5'	100%	100%	20%	30%	60%
6'	100%	100%	25%	40%	70%
7'+	100%	100%	30%	50%	80%

**NOTES:** 1) This simplified guidance should be used when the inspector cannot enter a structure. 2) Values may differ on some elements for structures on piers or crawlspace. Consider increasing plumbing, electrical, hvac damage if present beneath 1st floor structure. 3) Structures on piles will be assessed on a case-by-case basis due to variability in finished space below the structure, location of utilities, and potential foundation and superstructure damage if located in a high velocity area.

**Residential**  
SDE DAMAGE INSPECTION WORKSHEET

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

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

**SDE ADDRESS Tab**

**Subdivision / Community 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/Parish: \_\_\_\_\_ Zip: \_\_\_\_\_

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

**Mailing Address**      Check here if same as building address:

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

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

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

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

County/Parish: \_\_\_\_\_ Zip: \_\_\_\_\_

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

SDE Residential Damage Inspection Worksheet      1 of 7



# SDE Program Objectives

- What is SD?
- What is an SDE?
- Why are SD and SDE important?
- Percent Damage Determinations
- SDE Manual/Paper Exercises
- SDE Tool
- Field Exercises

# SDE Purpose

- Community-wide and large-scale damage assessment.
- Multiple structure damage assessment.
- Prompt, effective, efficient and economical damage assessment.
- Rapid damage assessment and simplified damage estimate in percentage terms.
- Expedite prompt community recovery and regulatory processes, including permit administration.
- Consistent and standardized.
- Reasonable and defensible.

## **SDE assessments and determinations include:**

- Primary structure only.

## **SDE assessments and determinations exclude:**

- Property/real estate value.
- Secondary or accessory structures.
- Property improvements.
- Structure contents and personal property.
- Vehicles.
- Lost wages and income, including rental income.

## **SDE determinations are applicable to:**

- Residential structures.
- Non-Residential/Commercial structures.
- Mixed-use structures and occupancies/uses.

## **SDE considerations and determinations are based on a structure's:**

- Area (in square feet) and height (in stories).
- Construction type, characteristics and attributes.
- Primary, initial, intended and approved occupancy/use.



# Questions?



**Flood/Wind Building Science Helpline:**  
**[FEMA-BuildingScienceHelp@fema.dhs.gov](mailto:FEMA-BuildingScienceHelp@fema.dhs.gov)**  
**866.927.2104**  
**<http://www.fema.gov/building-science>**

# Substantial Damage Estimation (SDE) Overview



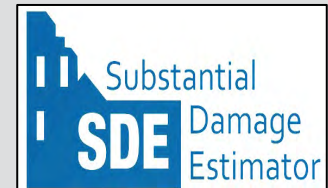
**Federal Emergency Management Agency (FEMA)**

**Harrisburg, PA**

**June 2023**



**FEMA**





# Unit 2 – Substantial Damage Estimation Overview

## Overview of Substantial Damage Estimation



# Statistics – More Than Numbers

**FEMA-4618-DR, Pennsylvania Disaster Declaration as of 10/20/2021**








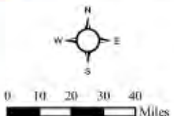
**Data Layer/Map Description:**  
 The types of assistance that have been designated for selected areas in the Commonwealth of Pennsylvania.

All areas in the Commonwealth of Pennsylvania are eligible for assistance under the Hazard Mitigation Grant Program.

Additional designations may be made at a later date if requested by the commonwealth and warranted by the results of further damage assessments.

**Designated Counties**

-  No Designation
-  Individual Assistance
-  Individual Assistance and Public Assistance (Categories A - G)
-  Public Assistance (Categories A - G)



**Data Sources:**  
 FEMA, ESRI,  
 Initial Declaration: 09/10/2021  
 Disaster Federal Registry Notice:  
 Amendment #4: 10/20/2021  
 Datum: North American 1983  
 Projection: Lambert Conformal Conic



# Substantial Damage (SD) Definition

## Substantial Damage as defined in the National Flood Insurance Program (NFIP) 44 CFR 59.1:

- Damage of any origin sustained by structures whereby restoration costs to return to its pre-damage condition equal or exceed 50% of the structure's market value prior to damage occurrence.
- “*Any origin*” refers to any natural or man-made hazards or other sources.

*“Damage is damage, no matter the origin”.*

# Why Conduct Substantial Damage Assessments & Determinations?

**NFIP regulations require NFIP-participating communities** to determine the extent of structure damage after all damage events.

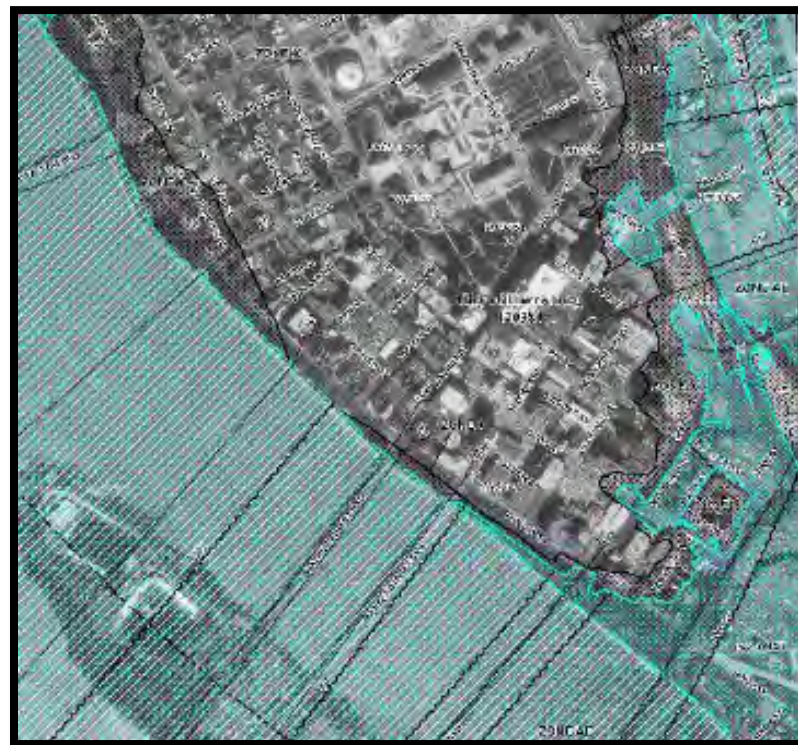
- Determine structures as substantially damaged or not.
- Does not pertain to structures beyond designated Special Flood Hazard Areas (SFHAs) boundaries unless addressed in local floodplain management ordinances.



# Why Conduct Substantial Damage Assessments & Determinations?

## Substantial damage requirements and determinations apply to:

- All structures or portions thereof located in SFHA designated boundaries by FEMA/Flood Insurance Rate Maps(FIRMs).
- All structures located in other SFHAs designated by local community floodplain management ordinances.
- SFHA = 100-year floodplain



# Purpose of SDE Assessments, Inspections and Determinations

## SDE assessments, inspections and determinations provide:

- Structure assessments and estimated damages in percentages.
- Structure total percent damage at/above or below 50% threshold.





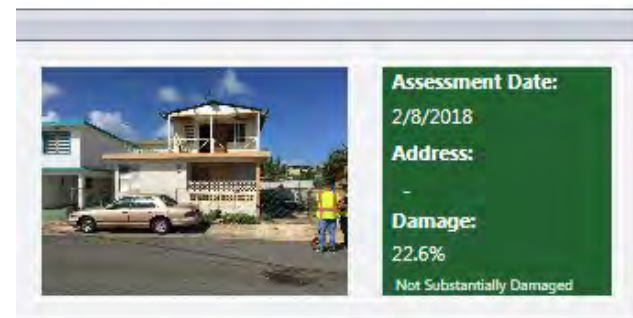
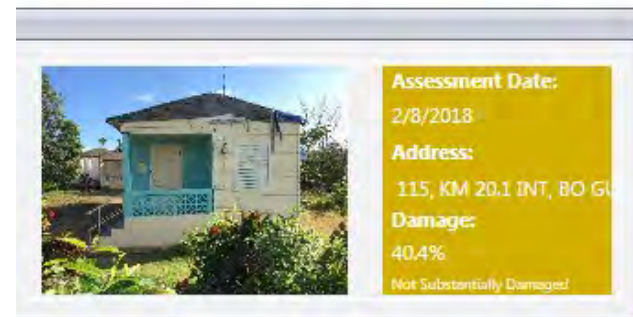
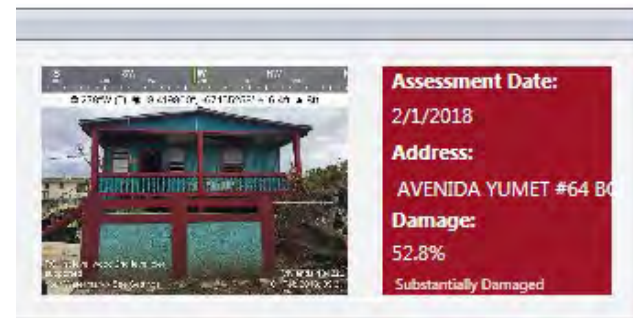
## Discussion Points:

- Target structures with 30 to 70 percent estimated damage to concentrate SDE efforts on those structure determinations at/above 50%.
- 50% ratio threshold as a compromise to zero versus total reconstruction.



# SDE Determinations

- SDE determinations must be reasonable and defensible.
- SDE tool provides effective, efficient and equitable process for local officials to estimate substantial damage determinations.
- Aids in calculating substantial damage estimates.
- Aids in rapid collection of SDE data based on SDE tool inspection criteria based on visual observations.
- Creates formal, standardized and organized reports of SDE inspection results.



# Damage of Any Origin

Although primary causes of damage may be flood or flood and high winds, SDE assessments must evaluate impacts of all damages caused by all sources, including:

Hurricane	Foundation Settlement
Storm Surge	Roof Damage from Trees
Tsunami	Lack of Maintenance
Tornado	Vandalism
Fire	Pre-Event Damage and Other Origins



# Substantial Damage Ratio

$$\frac{\text{Structure Repair Cost}}{\text{Structure Market Value}} \geq 50\%$$

**A ratio equal to or greater than 50% is considered substantially damaged.**

**Market Value = Pre-Damage Value**

# Structure Repair Costs

The NFIP regulations allow three options for determining structure repair cost:

- SDE tool-computed cost estimate.
- Contractor cost estimate.
- Community cost estimate.

# Structure Repair Costs

Contractor and community cost estimates must:

- Include all itemized structure repair costs required to return a structure to pre-damage condition.
- Estimate labor and materials at prevailing market values.
- Include volunteer labor and donated or discounted materials at prevailing market values.

# Structure Repair Costs

## General Structure Repair Cost Items Include:

- Materials and labor
- Site preparation
- Demolition and construction debris removal
- Costs required for compliance with other regulations
- Construction management
- Sales tax on materials

**Note: Project cost estimates should provide detailed and itemized information for these items.**

# Cost Estimate Method

- Communities must decide which cost estimate methods can be used for estimating structure fair market value and structure repair cost community-wide.
- Communities must apply one single, consistent cost estimate method for structure fair market value and structure repair cost community-wide.
- Property owners may appeal SDE determinations and may hire professional appraisals at their own expense, provided this option is available to all property owners.



# Structure Market Value

The NFIP requirements allow three options for determining structure value or structure pre-damage market value:

- Computed Actual Cash Value (ACV) – calculated from SDE tool, multiplies structure area (square feet) and base cost (or per unit cost).
- Adjusted Tax Assessed Value.
- Professional Appraisal Value.

# Substantial Damage Determinations and Appeals

- Property owners possess legal rights to appeal SDE determinations completed by communities.
- Property owners must demonstrate SDE determinations and damage percentages by approved methods that differ from the community's selected method of SDE determinations for structure repair cost and structure market value.
- Property owners may appeal community SDE determinations by any other approved methods at their expense, including contractor estimates and professional appraisals, provided all other property owners may exercise the same rights and processes.
- The community's best defenses against appeal challenges and losses are SDE determinations that are consistent, reasonable and defensible.

# General Guidance

Consider structure repairs required to return structures to pre-damage conditions while in compliance with local construction codes, floodplain management and other ordinance requirements.



## SDE Purpose:

- Verify total structure percent damage at/above or below 50%.
- Verify reasonableness of structure substantial damage determination.
- Verify substantial damage determination supported by the SDE data collected and accurate calculations.



# SD Determination Impact

Substantial damage determinations at/above 50% require that structures be brought into compliance with all local floodplain management ordinances and construction codes.



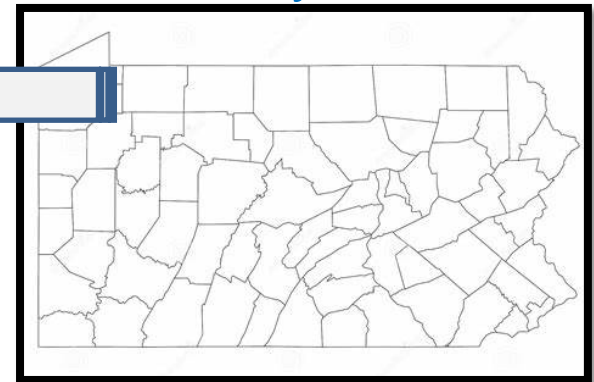
# Federal, State, Territorial and Local Roles and Responsibilities

Federal, state, territorial and local governments possess distinct roles and responsibilities related to substantial damage estimation.

FEMA



State/County



# Federal Roles and Responsibilities

## FEMA, through the NFIP:

- Supplements state and local communities with technical assistance, guidance and instruction following:
  - Presidential disaster declarations.
  - Post-disaster substantial damage requirements.
- Acts as a liaison with state and local communities, as requested.



## Substantial Improvement/ Substantial Damage Desk Reference

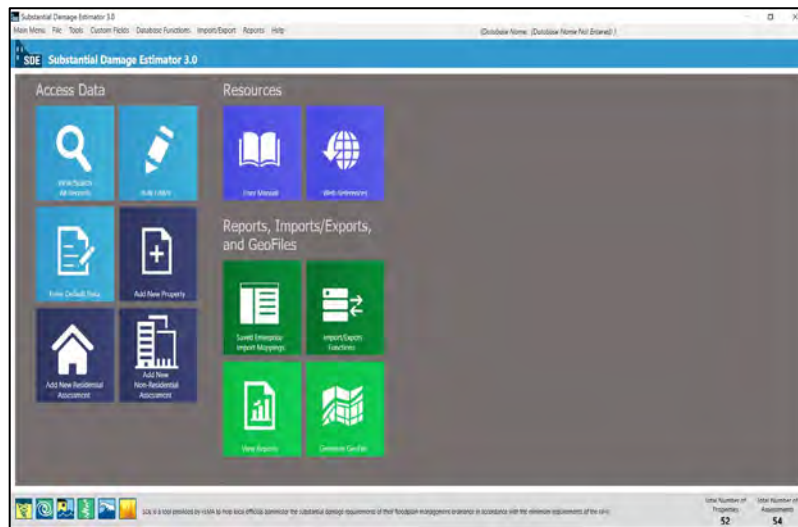

FEMA P-758 / May 2010



# Federal Roles and Responsibilities

## FEMA, through the NFIP:



- Administers the NFIP programs.
- Provides free educational resources regarding substantial damage assessments and estimations.

**Substantial Damage Estimator (SDE) User Manual and Field Workbook**

Using the SDE Tool to Perform Substantial Damage Determinations

FEMA P-784 / Tool Version 3.0 / August 2017

The SDE is used to help local officials address the Substantial Damage requirements of their Member management software in keeping with the minimum requirements of the NFIP.



# State and Territory Roles and Responsibilities

## **State and territorial authorities assist communities with:**

- Understanding substantial damage requirements.
- Identifying and prioritizing neighborhoods requiring substantial damage assessments and determinations.
- Organizing local and volunteer resources to attend to immediate issues.
- Assisting FEMA in prioritizing communities for assistance as required.
- Conducting substantial damage assessments and determinations on all state-owned facilities.

## **Local communities are responsible for:**

- Selecting methods to determine substantial damage determinations.
- Providing property data to conduct substantial damage assessments and determinations.
- Conducting timely substantial damage assessments and determinations for publicly and privately owned structures.

- Promptly informing property owners regarding:
  - SDE determination requirements.
  - Post-disaster regulatory demolition and construction permit requirements.
  - Appeal rights and process.
- Provide technical assistance.
  - Assist the community and residents in understanding flood hazards, floodplain maps and substantial damage.

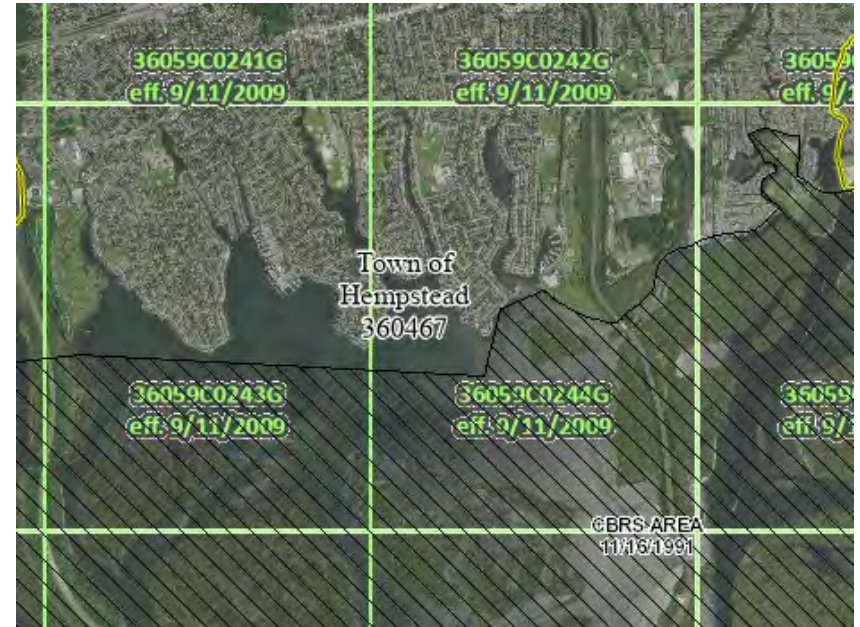


- Enforcing reconstruction requirements.
- NFIP regulations and requirements.
- Local floodplain management ordinances.
- Local construction codes.
- Substantial Improvement/Substantial Damage (SI/SD) requirements.



# Local Community Roles and Responsibilities

- Identify the local agency, department or official responsible for floodplain management.
- Determine SFHA boundaries and when structures or portions of structures are in SFHAs.
- Designated by FEMA FIRM maps.
- Designated by local community floodplain management ordinances and maps.



# Local Community Roles and Responsibilities

- Review development and construction proposals for regulatory compliance.
- Issue or deny SFHA demolition, development and construction permits.
- Assist with data collection for revising floodplain maps.



# Local Community Roles and Responsibilities

- Conduct substantial damage assessments and determinations.
- Review post-disaster SDE assessments and determinations for accuracy and reasonableness.
- Review cost estimates for post-disaster repairs to determine if they are complete, itemized and reasonable with fair market values.

**Substantial Damage Estimator**

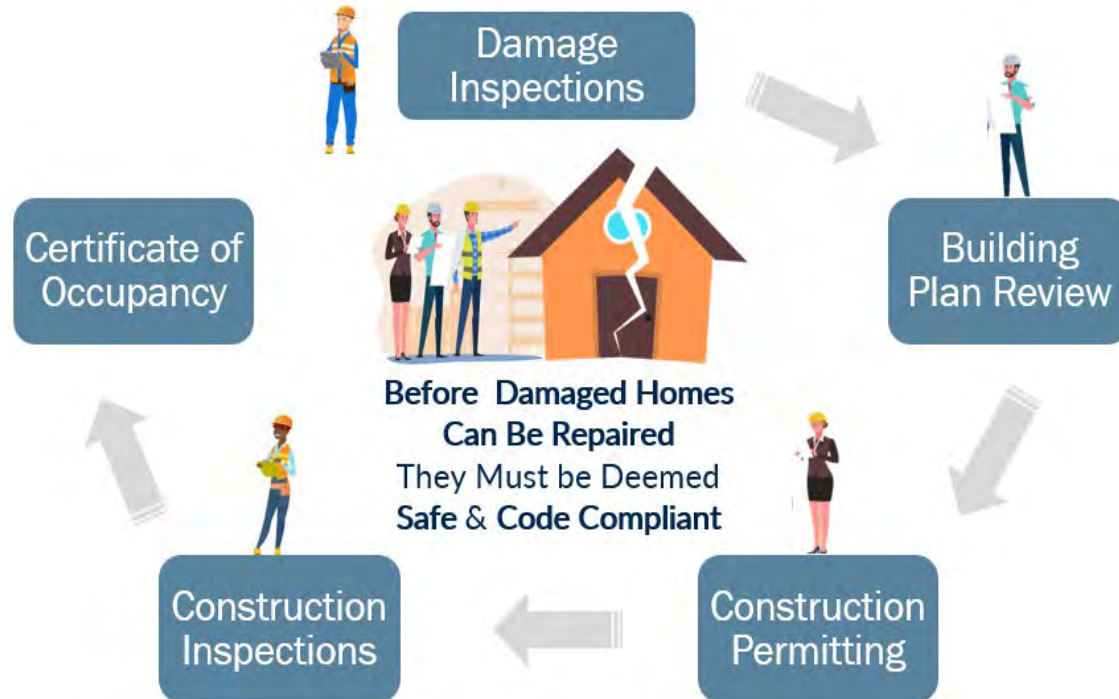
Subdivision Parcel# 60T2R7000017 Lot Number		Elev. of Lowest Floor 0.1 ft Datum TBD		Community NFIP Community Name VILLAGE OF TANGIFAHOA NFIP Community ID# 220213 Latitude 30.88126 Longitude -90.51376	
Building Address Owner's Name Street Address City County State Zip Phone Additional Owner(s) NA					
Building Information Year of Construction 1900 Type Manufactured House Quality Average					
Date of Inspection 10/10/2016 Inspected by Team_02 Inspector Phone		Date of Damage 8/12/2016 Cause of Damage Flood Duration of Flood 24 Hours Est. depth above lowest floor 1.0		Residence Information	
NFIP Information Firm Panel# 22105C0075 Suffix F Date of FIRM Panel 7/22/2010		Firm Zone AE BFE 177.0 Regulatory Floodway Possible			
Percent Damaged Value of Building \$43,388.72 Computed Actual Cash Value		Percent Damaged 80.1 % Substantially Damaged		Cost of Repairs/Improvements \$34,767.89 Computed Damages	
Damage Summary Replacement Cost \$70,899.00 Depreciation % 38.8 % Computed Actual Cash Value* \$43,388.72		Computed Damages \$34,767.89 Percent of Existing Improvements and Repairs Pre-Disaster 0 % Repair/Reconstruction % 80.13 <small>* Per FEMA Publication 213, Actual Cash Value may be used as Market Value.</small>			
Optional User Entered Data Professional Appraisal Tax Assessment \$0.00 Factor Adjustment 0 Adjusted Tax Assessed Value		Contractor's Estimate of Repairs/Improvements Community's Estimate of Repairs/Improvements			
Authorized Local Official: _____ Signature			Authorized Local Official: _____ Printed Name		

Thursday, October 05, 2017 Page 1 of 1

# Community Challenges

## Discussion Point:

What post-disaster challenges might communities face that may affect their abilities to conform to substantial damage requirements in disaster aftermaths?

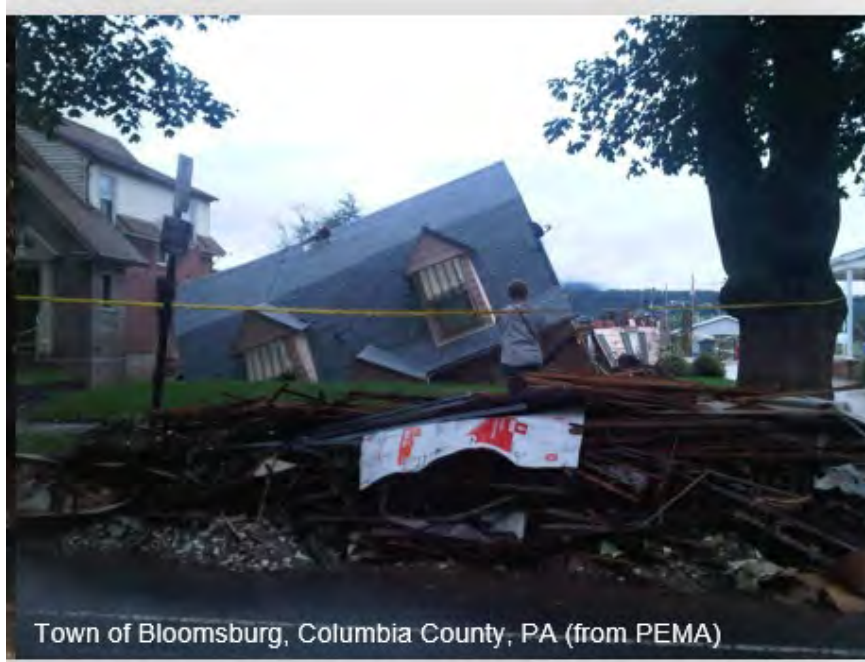




# Community Challenges

- Lack of knowledge of community responsibilities and obligations under NFIP regulations for post-disaster actions.
- Lack of experience with disasters.
- Disaster types and extents.
- Multiple competing interests and priorities.
- Damaged or limited city facilities.
- Damaged infrastructure and transportation.
- Loss of utilities – electric, gas, water, wastewater, phone and internet.
- Loss of critical services – police, fire, medical and Emergency Operation Centers.

# Questions?



**Flood/Wind Building Science Helpline:**  
**[FEMA-BuildingScienceHelp@fema.dhs.gov](mailto:FEMA-BuildingScienceHelp@fema.dhs.gov)**

**866.927.2104**

**<http://www.fema.gov/building-science>**

# Community Challenges

- Lack of access to damaged or restricted areas due to flooding, debris or downed power lines.
- Quickly identifying damage extent in floodplains.
- Lack of pre-disaster data needed for cost estimates:
  - Structure market or assessed values.
  - Structure repair costs.
- Neighboring communities also affected by disasters.
- Large number of affected structures.
- Large number of permit applicants.
- Limited staff and resource availability.

# Substantial Damage Estimation (SDE) Inspection Guidance



**Federal Emergency Management Agency (FEMA)**

**Harrisburg, PA**

**June 2023**





## Two-Person SDE Inspection Teams:

- Reduced personal safety and security issues
- Improved SDE inspection data accuracy, completeness and quality
- Reduced SDE inspection distraction and delay impacts
- Increased SDE inspection timeliness and speeds



# SDE Inspection Guidance

## Community Communications:

- Develop Letters of Introduction from community points of contact
- Issue SDE inspection notices on jurisdictional letterhead
- Conduct and/or issue public service announcements
- Provide photographic identification inspection badges

*Sample Letter of Introduction for SDE Inspections*  
**City of Floodville**

Department of Building Inspections  
1212 River Road  
Floodville, NY 14008

September 8, 2017

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, 2017, 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 exterior and interior damage. They will record the required information used by the Floodville Department of Building Inspections to make 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 that are undertaken without a proper permit are violations and may result in citations, fines, the removal of the non-compliant construction, or other legal action.

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 Building Department 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)

## Property and Structure Access and Entry:

Communities and SDE inspection teams must:

- Always request authorization prior to entering properties and structures
  - Possibly request written permission with initialed SDE assessment form
- Verify permission granted by legal property owners or tenants
- Never trespass or demonstrate forceful behaviors
- Never enter properties and structures having any potentially unsafe, unsanitary, dangerous or hazardous conditions



## "As-Is" Property and Structure Conditions

- SDE inspections to be completed in “*as-is*” condition
- SDE inspections not invasive or destructive
- SDE inspectors should never:
  - Remove exterior or interior finishes or other items
  - Access certain inaccessible spaces, especially with ladders

# SDE Inspection Guidance

Three components of SDE inspections that require **best professional judgement** by SDE inspectors:

- Initial/original structure construction quality
- Pre-damage structure depreciation value
- Structure percent damage for structure elements
  - Recorded in 5% increments

# SDE Inspection Guidance – Damage Undetermined

Select **damage undetermined** options in SDE tool when:

- **No physical damage** sustained by structures
- **Vacant property parcel/lot** without structures
- **No applicable property address** or property address does not exist
- **No property access** or structure entry otherwise not possible
- **Refused structure inspection** by occupant/resident
- **Other**

When selecting Damage Undetermined, other data fields become unavailable or grayed out.

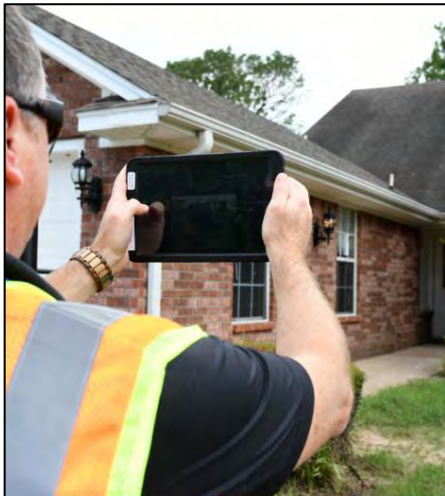
## Anticipated SDE Inspection Times:

- Residential inspections – 15 minutes each
- Non-Residential/Commercial inspections – 15 to 45 minutes each
  - Dependent upon structure area/size and complexity
- Daily average – 20 inspections per team
  - Daily average typically slower on initial first and second SDE inspection days

# SDE Tool Data & Photograph Entry Options

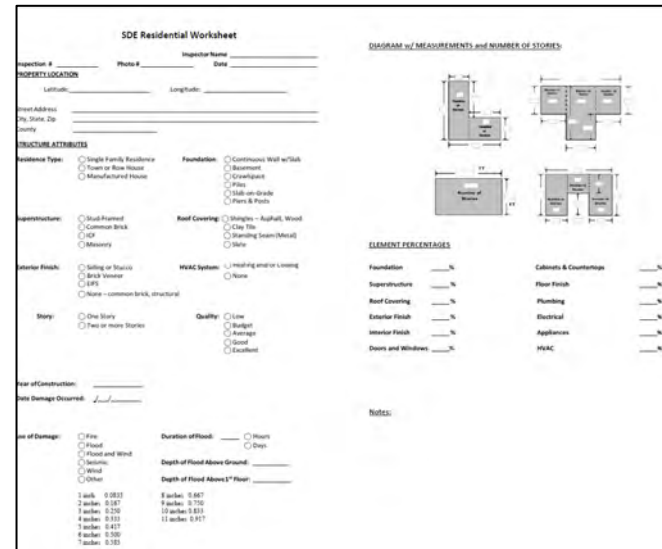
## Use of **computer/tablet** in field

- Input structure damage data into SDE tool
- Integrated camera with GEO coordinates locator



## Use of **manual/paper inspection form** in field

- Input data on paper, then later enter it into the SDE tool
- Separate camera equipment or cell phone



**SDE Residential Worksheet**

Inspection # \_\_\_\_\_ Photo # \_\_\_\_\_ Inspector Name \_\_\_\_\_ Date \_\_\_\_\_

**PROPERTY LOCATION**

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

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

Front Address \_\_\_\_\_

Street Name \_\_\_\_\_

**STRUCTURE ATTRIBUTES**

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

Foundation:  Continuous Wall w/Slab  Basement  Crawl Space  Pier  Slab on Grade  Piers & Posts

Superstructure:  Stud Framed  Concrete Block  ICF  Masonry

Roof Covering:  Shingles - Asphalt, Wood  Clay Tile  Standing Seam (Metal)  Slate

Interior Finish:  Siding or Shingles  Brick Veneer  EIFS  None - common brick, structural

HVAC System:  Heating and/or Cooling  None

Quality:  Low  Average  Good  Excellent

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

Date Damage Occurred: \_\_\_\_\_

Year of Damage:  Fire  Flood  Flood and Wind  Seismic  Other

Duration of Flood:  Hours  Days

Depth of Flood Above Ground: \_\_\_\_\_

Depth of Flood Above 1<sup>st</sup> Floor: \_\_\_\_\_

1 inch: 0.022 8 inches: 0.647  
2 inches: 0.047 9 inches: 0.762  
3 inches: 0.070 10 inches: 0.877  
4 inches: 0.093 11 inches: 0.992  
5 inches: 0.117 12 inches: 1.107  
6 inches: 0.140 13 inches: 1.222  
7 inches: 0.164 14 inches: 1.337

**DIAGRAM of MEASUREMENTS and NUMBER of STORES**

**ELEMENT PERCENTAGES**

Foundation \_\_\_\_\_ % Cabinets & Countertops \_\_\_\_\_ %  
Superstructure \_\_\_\_\_ % Floor Finish \_\_\_\_\_ %  
Roof Covering \_\_\_\_\_ % Plumbing \_\_\_\_\_ %  
Exterior Finish \_\_\_\_\_ % Electrical \_\_\_\_\_ %  
Interior Finish \_\_\_\_\_ % Appliances \_\_\_\_\_ %  
Doors and Windows \_\_\_\_\_ % HVAC \_\_\_\_\_ %

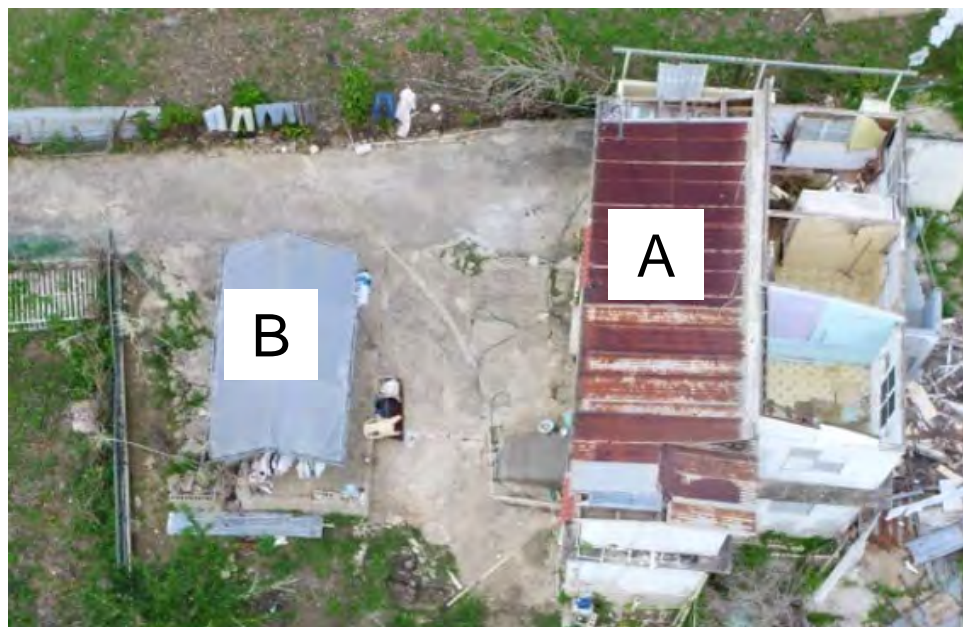
Notes:



## Property Address Protocols:

Properties containing multiple primary structures

- Create additional SDE assessments using the following identification system



**Primary structures** include addresses with an “**A**” in the address, such as “100 **A** Main Street”

**Secondary structures** include addresses, such as “100 **B** Main Street, 100 **C**, etc.”

Each structure address on property parcels must include:

- Address with a letter after the number
- Completed assessments

## Property Address Protocols – Townhomes, Rowhomes, Condominiums, Cooperatives, and Strip Malls

- Prepare one SDE assessment for each unique property address
- Provide each property owner or tenant of each space or unit within larger structures with individual SDE summary reports if requested



## Photograph General Guidance:

- Obtain property/structure photographs for each SDE assessment and inspection
- Obtain two property/structure photographs from different positions or viewpoints – front/street and side/corner views

**Front/Street View**



**Side/Corner View**





## Photograph General Guidance:

- Photographs with integrated GPS coordinates identify and verify structure locations associated with SDE inspection data
- Dry erase boards may identify property and structure locations and property addresses



## General Photograph Guidance:

- Distance and clarity to identify and verify structures
  - Avoid photograph rotation or angles
  - Avoid taking photographs into sun or with bad lighting
- What is visible in person may not be visible in photographs
- Additional photographs if objects obstruct structure view
- Not necessary to display and demonstrate all damage
- Other protocols when no or undetermined damage

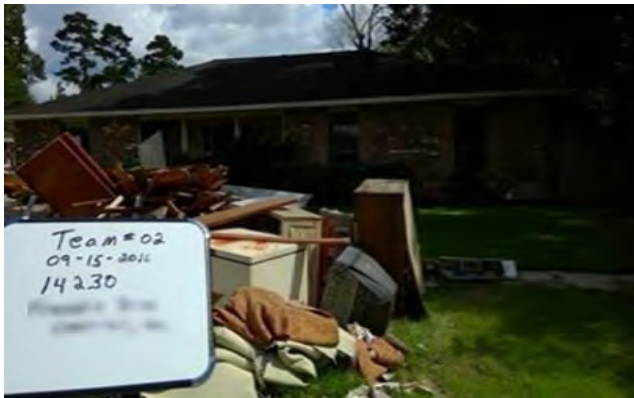
# SDE Inspection Photographs



1



2



3

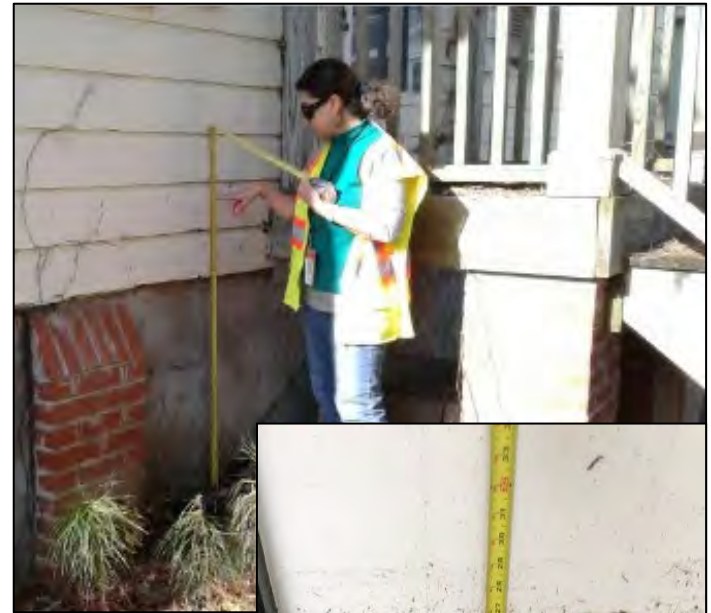


4

## Common Photograph Errors

## Floodwater Depth and High-Water Mark or Debris Line

- Demonstrate estimated floodwater depth above structure's lowest floor height/elevation based on high-water mark or debris line
- Include tape measure to indicate high-water mark and record:
  - Height above lowest adjacent grade level
  - Height above structure's lowest floor level height/elevation



## Floodwater Depth and High-Water Mark/Debris Line

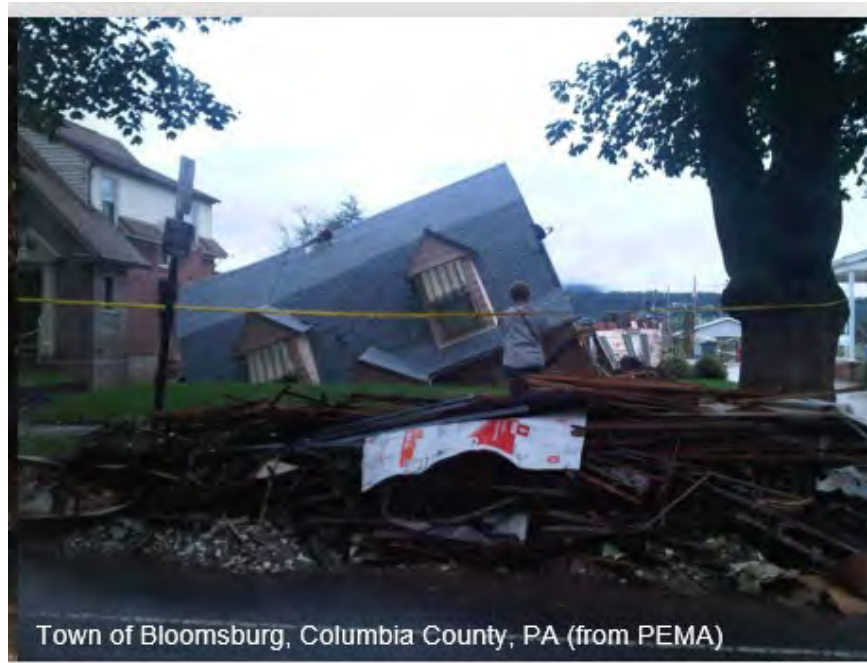


## Damage Undetermined Photographs

- Two photographs from different angles or viewpoints from public rights of way:
  - No Physical Damage
  - Vacant Parcel/Lot
  - Refused Inspection
  - Other
- When SDE inspectors are unable to access properties or structures
- Unless occupants/residents expressly forbid or refuse inspections and/or photographs



# Questions?



**Flood/Wind Building Science Helpline:**  
**[FEMA-BuildingScienceHelp@fema.dhs.gov](mailto:FEMA-BuildingScienceHelp@fema.dhs.gov)**

**866.927.2104**

**<http://www.fema.gov/building-science>**

# Substantial Damage Estimation (SDE) Introduction and Installation



**Federal Emergency Management Agency (FEMA)**

**Harrisburg, PA**

**June 2023**



**FEMA**



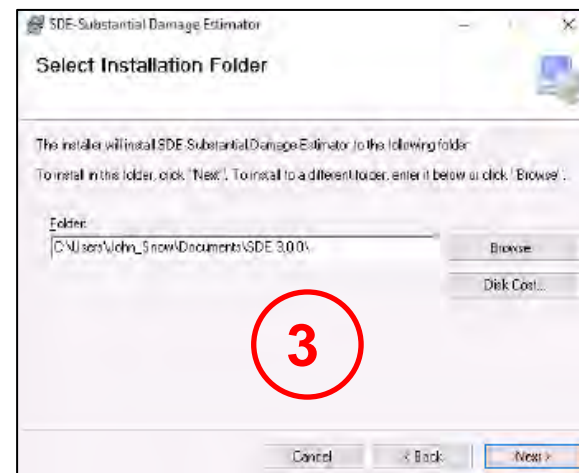
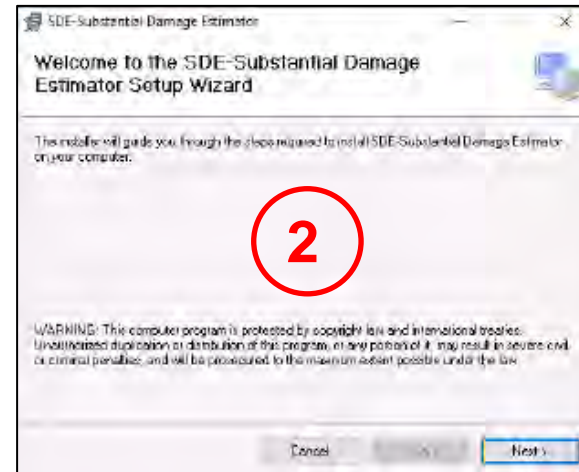
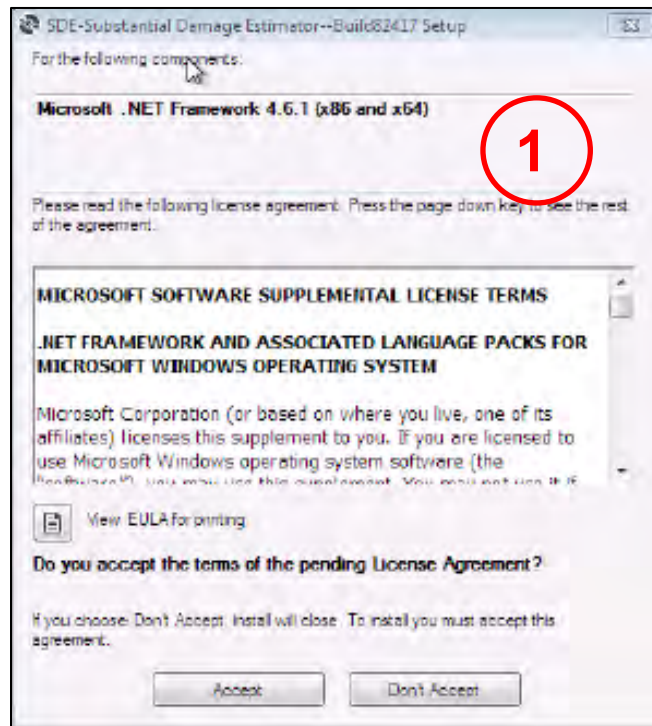


## SDE Tool Introduction, Installation and Basics:

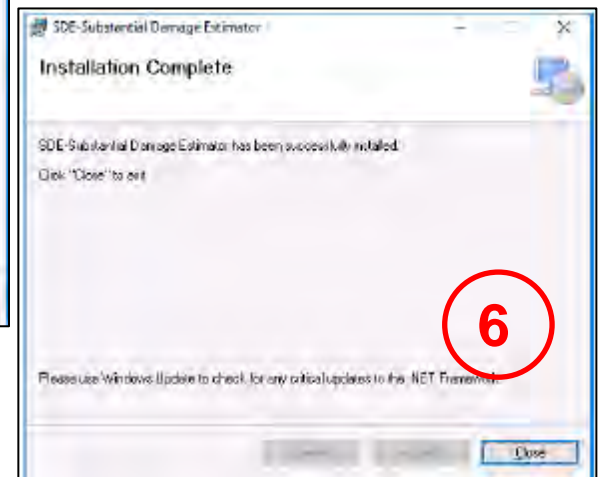
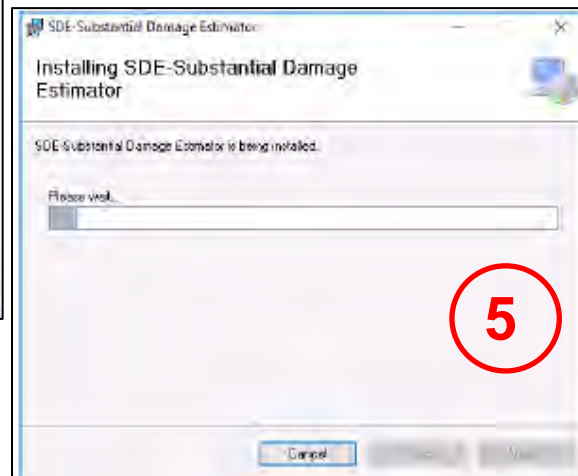
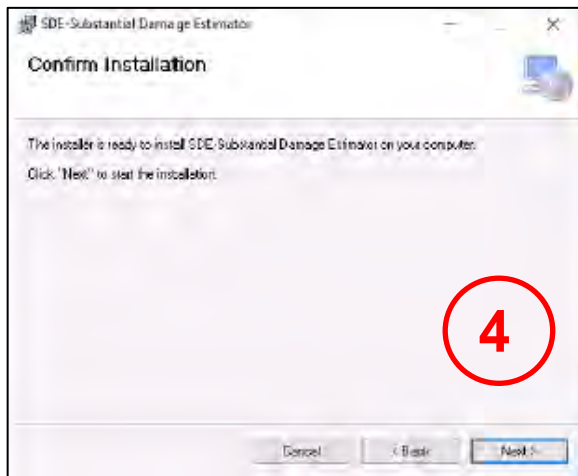
- Windows-based desktop, laptop or tablet tool.
- Windows tablets compatibility.
- Installed locally .
- Internet connectivity not required.
- Client server/network interface functionality.
- Integrated camera capability.



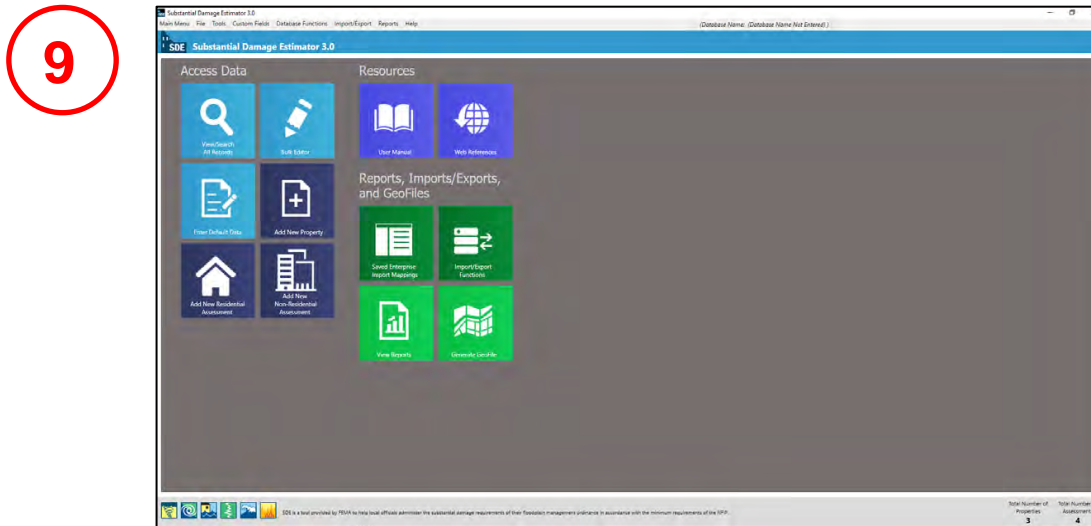
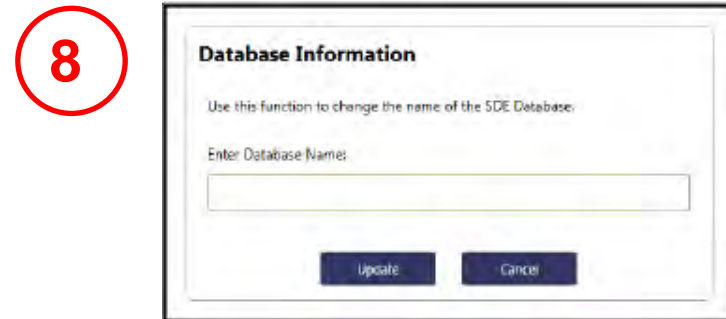
# SDE Tool Installation



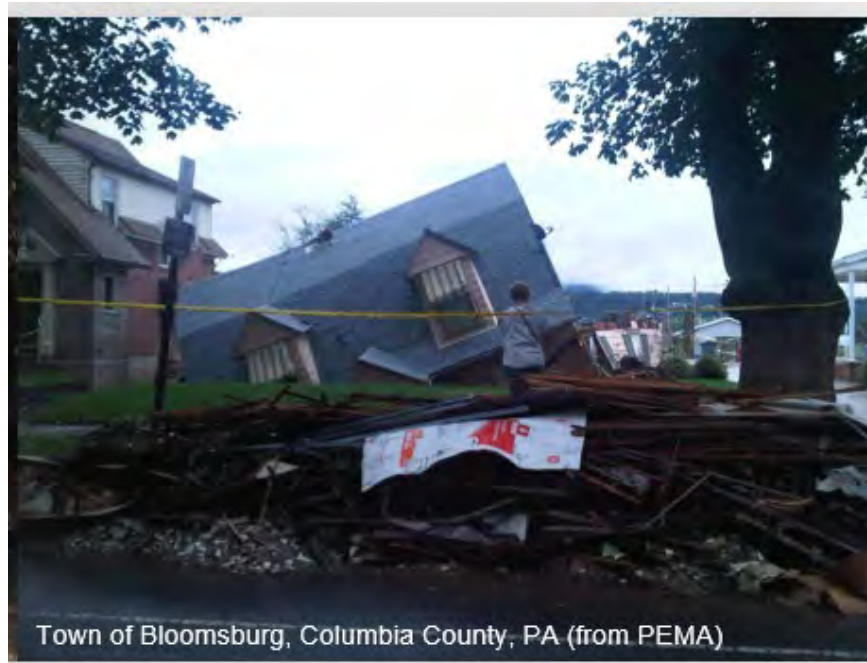
# SDE Tool Installation



# SDE Tool Installation



# Questions?



**Flood/Wind Building Science Helpline:**  
**[FEMA-BuildingScienceHelp@fema.dhs.gov](mailto:FEMA-BuildingScienceHelp@fema.dhs.gov)**

**866.927.2104**

**<http://www.fema.gov/building-science>**

# Substantial Damage Estimation (SDE) Tool Overview



**Federal Emergency Management Agency (FEMA)**

**Harrisburg, Pennsylvania**

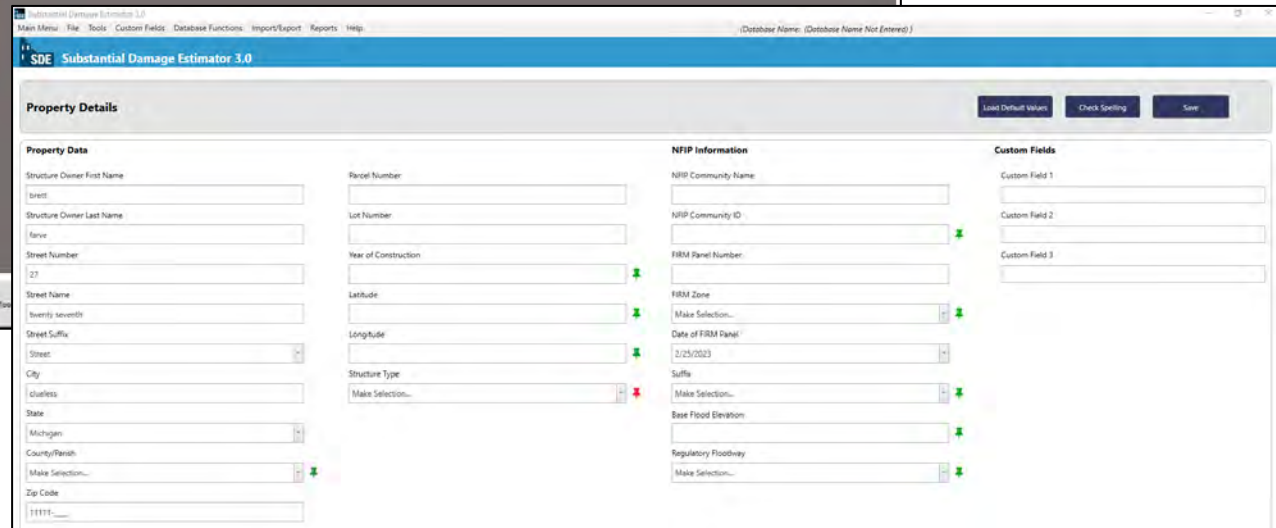
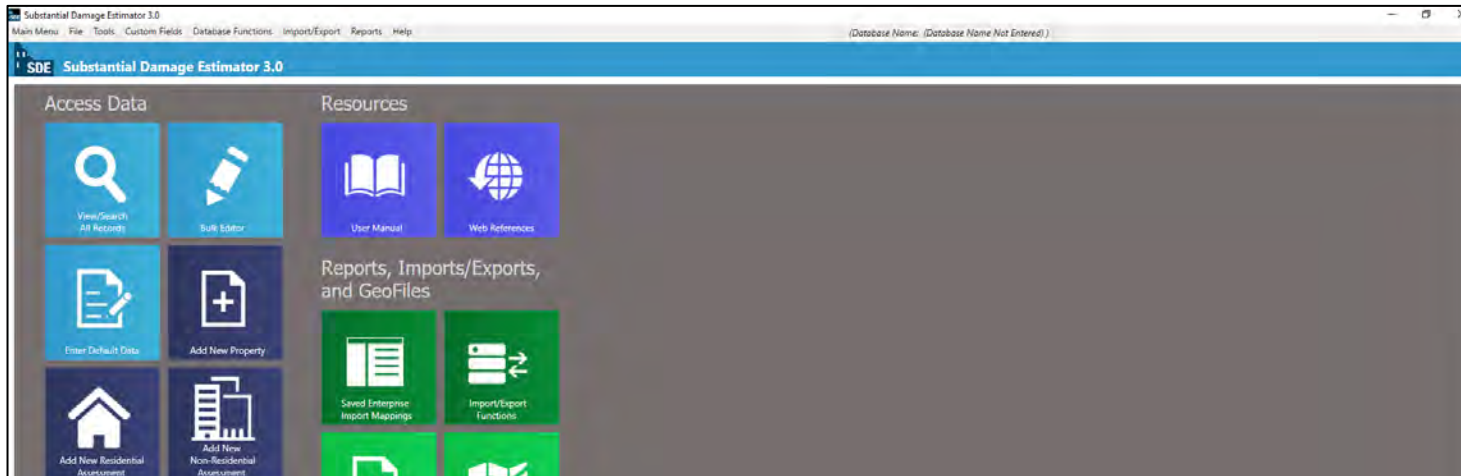
**June 2023**



**FEMA**



## SDE Tool Overview and Exploration



# SDE Tool Benefits

- Identifies SDE data fields required to be collected for substantial damage determinations.
- Records data in formal, standardized, structured and organized manners.
- Provides a central database of inventoried structures.
- Allows photograph and file attachments relevant to SDE inspections.
- Provides inquiries and reports that summarize SDE data collected during the substantial damage (SD) determination process.
- Demonstrates National Flood Insurance Program (NFIP) and local code compliance and FEMA acceptance.



# SDE Terminology

**SDE Record** – refers to property data entered into the SDE tool before entering SDE inspection data.

- May include pre-populated data.

**SDE Assessment** – refers to SDE record after SDE inspection data are entered into the record.

- Includes property data plus inspection data.
- Describes the complete entry including sufficient data to calculate SD determinations.

Two **SDE Assessment Form/Inspection Worksheet** types:

- **Residential:**

- Detached single family dwelling structures.
- Attached townhouse or rowhome structures.
- Manufactured home structures.

- **Non-Residential (Commercial):**

- Multi-family structures/apartment buildings.
- Commercial structures.
- Mixed-use structures.
- All other structures.

## SDE Assessment Form Selection and Structure Type Determination Requirements

- Select SDE assessment form and structure type are based on:
  - Initial structure design.
  - Initial structure construction type, materials and methods.
  - Initial structure intended and approved occupancy and use.
- Structure type is not based on:
  - Current structure occupancy and use.
  - Exterior appearance.
  - Interior contents.

# Residential Structures Types

Single- or Two-Family Dwellings



Townhouses or Rowhomes



Manufactured Homes



# Residential Structure Attributes

Address	Structure/Damage/NFIP	Cost	Element Percent
Structure Type:			
Residential			
Story:			
One Story (Standard)			
Residence Type:			
Single Family Residence			
Foundation:			
Slab - on - Grade			
Superstructure:			
Stud-framed (Standard)			
Roof Covering:			
Shingles - Asphalt, Wood (Standard)			
Exterior Finish:			
Brick Veneer			
HVAC System:			
Heating and/or Cooling			
Year of Construction:			
1950			
Quality:			

## Required Residential Attributes:

- **Story (2)**
- **Residence Type (3)**
- **Foundation (6)**
- **Superstructure (4)**
- **Roof Covering (4)**
- **Exterior Finish (4)**
- **HVAC system (2)**
- **Construction Year**
- **Quality of initial construction – (5)**



# Residential Structure Types – Manufactured Homes

## Manufactured or mobile homes (MHs)

- 1 inch of water in MH = 5 feet of flood damage in single family homes (SFR).
- Floor system damage or warping weakens structural integrity.
- Floor system is the strongest structural member.
- Utility systems and connections are located below the floor system.
- Recent MH model construction is similar to a single-family dwelling with a stick-frame construction.
  - May be less susceptible to flood damage than an older MH model.
  - May be confused with modular construction or industrialized buildings.

# Non-Residential Structure Types

Apartment buildings



Commercial structures



Warehouse



# Apartments vs Townhomes

- Apartments, flats, lofts, cooperatives and condominiums are evaluated as non-residential structures.
- Townhouses/rowhomes are evaluated as residential structures.





# Polling Question

## Residential or Non-Residential Structure?



# Polling Question

## Residential or Non-Residential?



# Structure Type Selection

## Select Structure Type in SDE Tool:

- Select using the drop-down menu feature in SDE tool.
- Residential or Non-Residential.

Address	Structure/Damage/NFIP	Cost	Element Percent
Structure Type: Residential			
Story: One Story (Standard)			
Residence Type: Single Family Residence			
Foundation: Slab - on - Grade			
Superstructure: Stud-framed (Standard)			
Roof Covering: Shingles - Asphalt, Wood (Standard)			
Exterior Finish: Brick Veneer			
HVAC System: Heating and/or Cooling			
Year of Construction: 1950			
Quality:			

## Structure Height/Stories:

- Floor levels only above grade level.
- Floor levels must include habitable/living space.
- Storage/carport space below elevated structures = 1 story.
- Habitable/Living space area/square footage differs on 1st and 2nd floor levels = 1.5 stories – Select 2 stories.



One Story



Two Story



1.5 Story

# Polling Question

**1 or 2 story structure?**



# Foundations

**Continuous Walls with Slab**



**Slab-on-Grade**



**Basement Walls**



**Crawlspace Walls**



**Piles**



**Piers and Posts**



# Superstructure

## Stud-Frame



## Common Brick



BRICK VENEER WALL



DOUBLE BRICK WALL



# Superstructure



Photo Courtesy of FEMA

**Insulated  
Concrete  
Form (ICF)**  
(Styrofoam wall  
system, infilled  
with concrete  
and rebar)



## Masonry/CMU

Includes unreinforced and  
reinforced concrete  
masonry





## Mixed construction types

- Select masonry when a structure is constructed of half masonry/half wood framed.



# Polling Question

Assign appropriate superstructure type to Structures A, B and C.



# Structure Attributes – Roof Covering

## Economy Roof Covering Materials

### Corrugated Metal Panels



Metal Sheets



### Bitumen



### Asphalt Shingles



### Liquid Applied Membrane



# Structure Attributes – Roof Covering

**Clay Tile**



**Slate**



**Metal Standing Seam**



**Concrete - Select Slate**



# Structure Attributes – Roof Covering

## Standing Seam Metal Panels versus Corrugated Metal Sheets



Standing Seam Metal Panels = \$\$

- High end material – good to excellent, not economy.
- Increased wind performance.
- Secured by interlocking seams/clips.
- No exposed rivets or fasteners.

Corrugated Metal Panels = \$

- Economy material – low to budget
- Poor wind performance.
- Vulnerable to weather and corrosion.
- Exposed rivets or fasteners.



# Structure Attributes – Roof Covering

## Metal Roof Covering Material Failure

Corroded  
Rivet/Fastener



# Structure Attributes – Roof Covering

## Missing Roof System or Covering

Blue Tarped Roof:

- Wood framed structures.
- Assume standard roof covering and low, budget or average quality.



- Masonry structures have no wood frame second story.
- Assume slate roof covering (for concrete roof).

Missing Roof Covering:

- Assume similar superstructure and roof system materials.
- Assume standard asphalt shingle roof covering and average quality.



**TIPS:**

- Seek information from property owner or resident if/when present.
- Compare with neighboring structures with similar design and construction.

# Polling Question

Assign the appropriate **roof construction type** to **Structures A, B and C**





# Polling Question

**Mixed roof construction type and materials – concrete and metal.**

- If mixed on separate stories, select covering that received damage.



# Structure Attributes – Exterior Finish

## Siding/Stucco - standard



## No Exterior Finish



# Structure Attributes – Exterior Finish

## Exterior Finish

**Brick Veneer –  
 Not Common Brick**

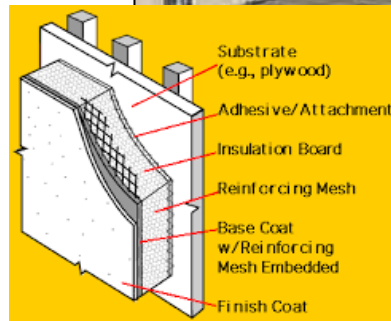
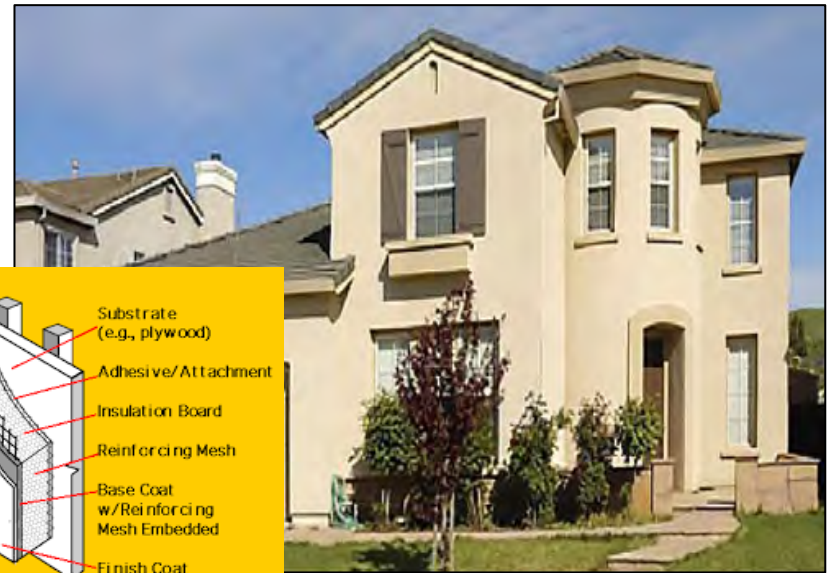


**BRICK VENEER WALL**      **DOUBLE BRICK WALL**



[www.houspect.com.au](http://www.houspect.com.au)

**Exterior Insulated Finish  
 System (EIFS) –  
 Not Stucco**



Both exterior finishes typically used with wood frame superstructure

# Structure Attributes – Mechanical/HVAC System

## Mechanical/HVAC System



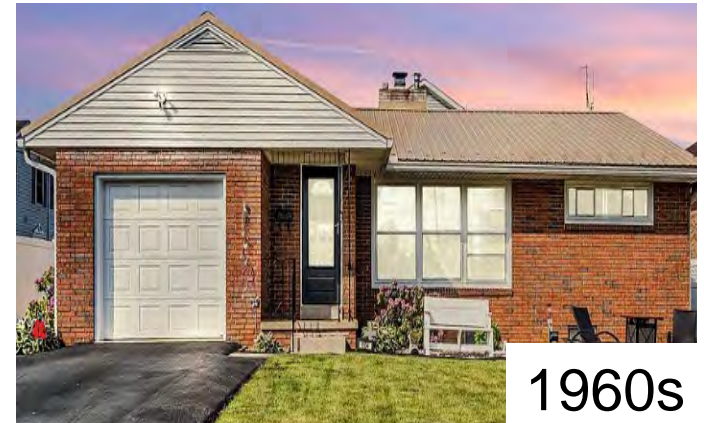
**Heating and/or Cooling**



**None**

# Structure Attributes – Construction Year

- Estimate construction decade according to design and construction trends.
- Confirm construction date with homeowner if possible.



Source: zillow.com



# Construction Quality



Low Budget

Informal/illegal structures not constructed to construction codes and standards.

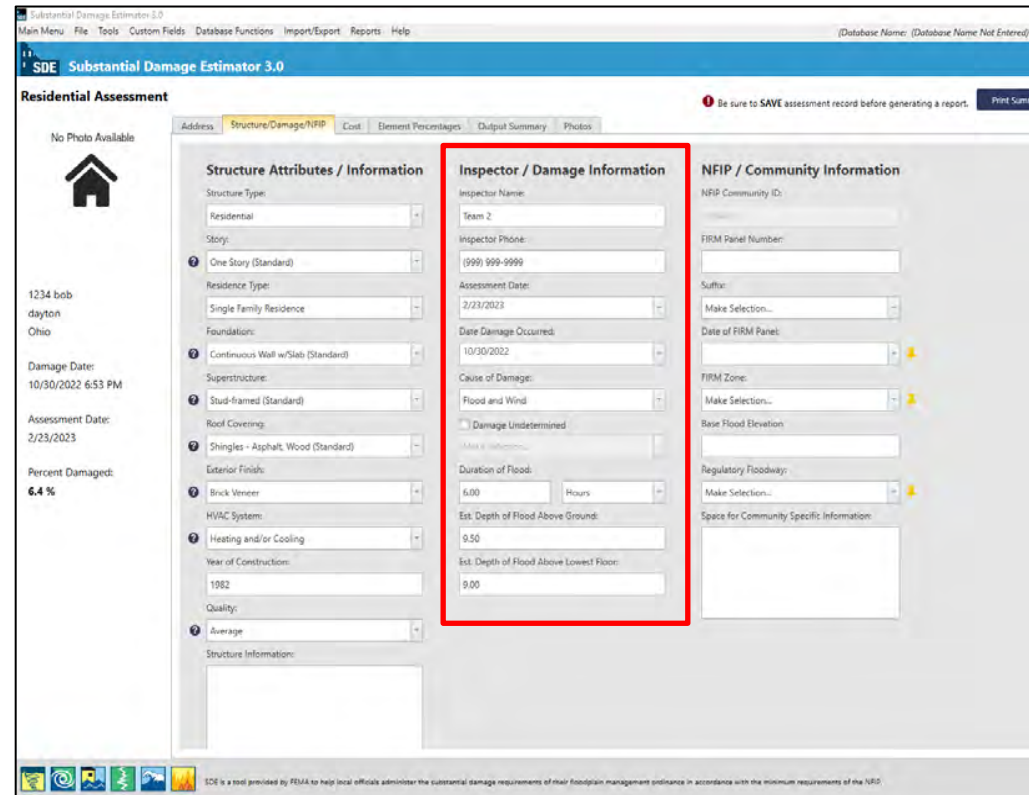
Average

Less recent structures constructed to some construction codes and standards when initially constructed – less hazard-resistant code provisions.

Good Excellent

More recent structures constructed to current construction codes and standards – greater hazard-resistant code provisions.

- Inspector "Team" Name
- Assessment Date
- NFIP Community ID
- Cause of Damage
- Duration of Flood (event)
- Estimated Depth of Flood Above Ground (grade level)
- Estimated Depth of Flood Above Lowest Floor



The screenshot shows the 'Residential Assessment' window of the Substantial Damage Estimator 3.0. The 'Inspector / Damage Information' section is highlighted with a red box. The data entered in this section is as follows:

Field	Value
Inspector Name	Team 2
Inspector Phone	(999) 999-9999
Assessment Date	2/23/2023
Date Damage Occurred	10/30/2022
Cause of Damage	Flood and Wind
Duration of Flood	6:00 Hours
Est. Depth of Flood Above Ground	9.50
Est. Depth of Flood Above Lowest Floor	9.00

Other visible fields in the interface include:

- Structure Attributes / Information:** Residential, One Story (Standard), Single Family Residence, Continuous Wall w/Slab (Standard), Stud-framed (Standard), Shingles - Asphalt, Wood (Standard), Brick Veneer, Heating and/or Cooling, Average.
- NFIP / Community Information:** NFIP Community ID, FIRM Panel Number, Suffix, Date of FIRM Panel, FIRM Zone, Base Flood Elevation, Regulatory Floodway.
- Left Panel:** No Photo Available, 1234 bob, dayton, Ohio, Damage Date: 10/30/2022 6:53 PM, Assessment Date: 2/23/2023, Percent Damaged: 6.4 %.

# Lowest Floor Elevations

Measure the height/elevation of the lowest floor (in feet) above the lowest adjacent grade level.

- Verify reasonableness of the SD determination.
- No impact on structure percent damage.



Address: Structure/Damage/NFIP Cost Element Percentages

Section Photos

**Subdivision / Community**

Subdivision:

Parcel Number:  
7605987405

Lot Number:

Elevation of Lowest Floor:  
2.50

Datum:

NFIP Community ID:  
370015

NFIP Community Name:  
BELHAVEN, TOWN OF

Latitude:  
35.535790

Longitude:  
-76.614260



# Flood Depth Measurements

Address | Structure/Damage/NFIP | Cost | Element Percentages | Output Summary | Photos

### Structure Attributes / Information

Structure Type: Residential

Story: Two or More Stories

Residence Type: Single Family Residence

Foundation: Crawlspace

Superstructure: Stud-framed (Standard)

Roof Covering: Shingles - Asphalt, Wood (Standard)

Exterior Finish: Siding or Stucco (Standard)

HVAC System: None

Year of Construction: 1900

### Inspector / Damage Information

Inspector Name: Team 1

Inspector Phone:

Assessment Date: 12/19/2018

Date Damage Occurred: 9/14/2018

Cause of Damage: Flood

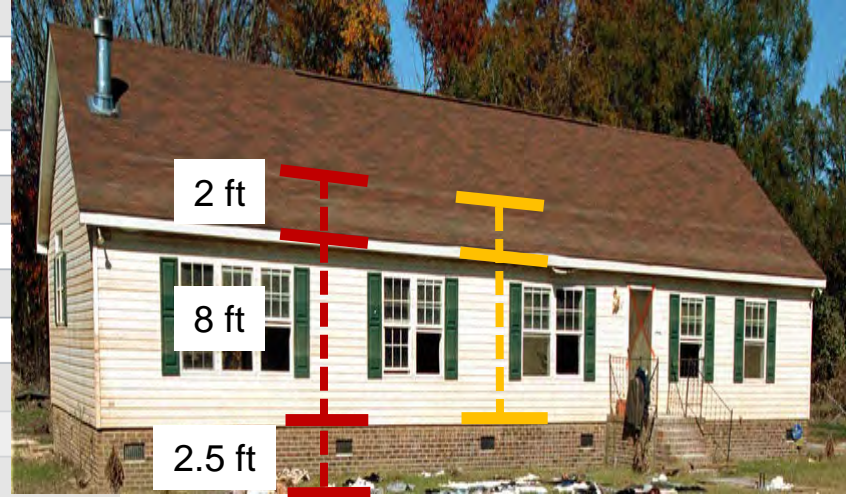
Damage Undetermined

Make Selection...

Duration of Flood: 1.00 Days

Est. Depth of Flood Above Ground: 12.5

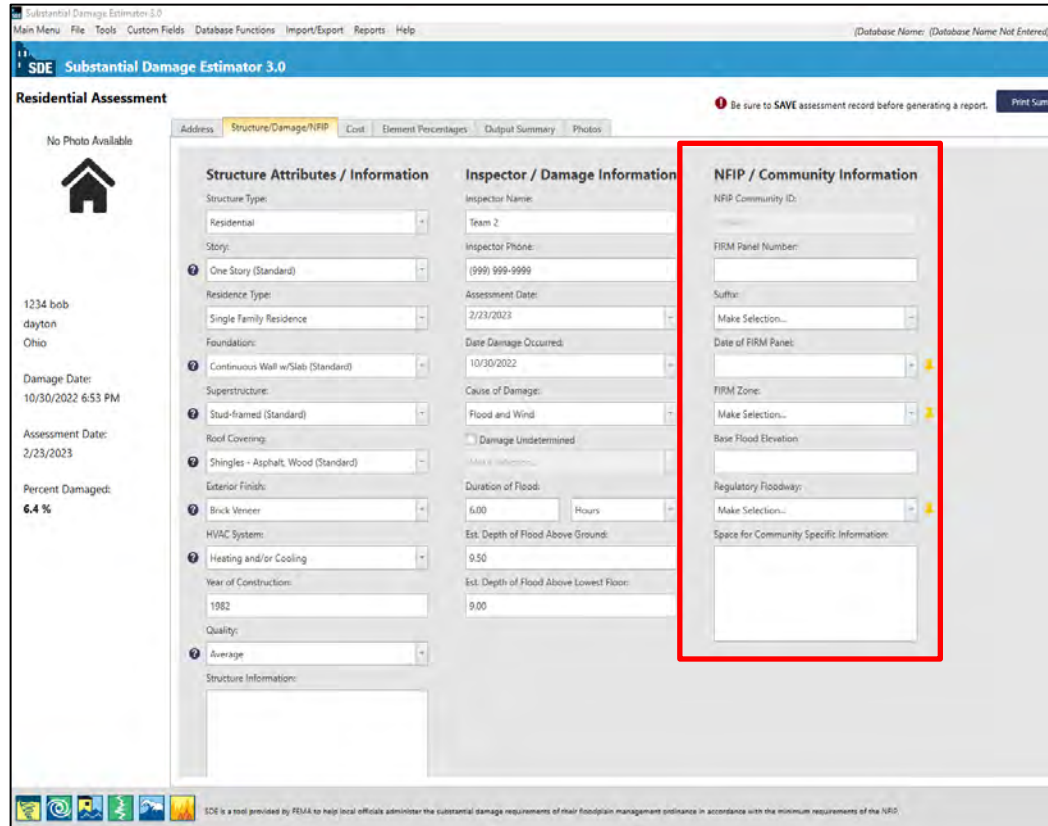
Est. Depth of Flood Above Lowest Floor: 10.0



Flood Depth Above Ground

Flood Depth Above Lowest Floor

Community Status Book	Map Service Center
NFIP Community ID	NFIP Community ID
Date of Flood Insurance Rate Map (FIRM) Panel	Date of FIRM Panel
	NFIP FIRM Panel Number
	FIRM Zone
	Base Flood Elevation*
	Regulatory Floodway



Substantial Damage Estimator 3.0  
Main Menu File Tools Custom Fields Database Functions Import/Export Reports Help (Database Name: (Database Name Not Entered))

SDE Substantial Damage Estimator 3.0

Residential Assessment

Be sure to SAVE assessment record before generating a report. Print Summary

No Photo Available

1234 bob  
dayton  
Ohio

Damage Date:  
10/30/2022 6:53 PM

Assessment Date:  
2/23/2023

Percent Damaged:  
6.4 %

Structure Attributes / Information

Structure Type: Residential

Story: One Story (Standard)

Residence Type: Single Family Residence

Foundations: Continuous Wall w/Slab (Standard)

Superstructure: Stud-framed (Standard)

Roof Covering: Shingles - Asphalt, Wood (Standard)

Exterior Finish: Brick Veneer

HVAC System: Heating and/or Cooling

Year of Construction: 1982

Quality: Average

Inspector / Damage Information

Inspector Name: Team 2

Inspector Phone: (999) 999-9999

Assessment Date: 2/23/2023

Date Damage Occurred: 10/30/2022

Cause of Damage: Flood and Wind

Duration of Flood: 6:00 Hours

Est. Depth of Flood Above Ground: 0.50

Est. Depth of Flood Above Lowest Floor: 9.00

NFIP / Community Information

NFIP Community ID:

FIRM Panel Number:

Suffix:

Make Selection...

Date of FIRM Panel:

FIRM Zone:

Make Selection...

Base Flood Elevation:

Regulatory Floodway:

Make Selection...

Space for Community Specific Information:

SDE is a tool provided by FEMA to help local officials administer the substantial damage requirements of their floodplain management ordinance in accordance with the minimum requirements of the NFD.

# Map Service Center

FEMA Flood Map Service Center: Welcome!

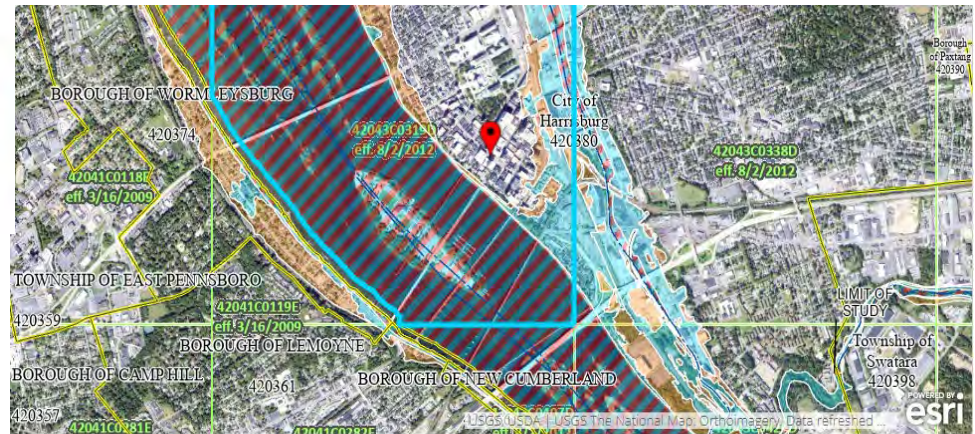
Looking for a Flood Map?

Enter an address, a place, or longitude/latitude coordinates:

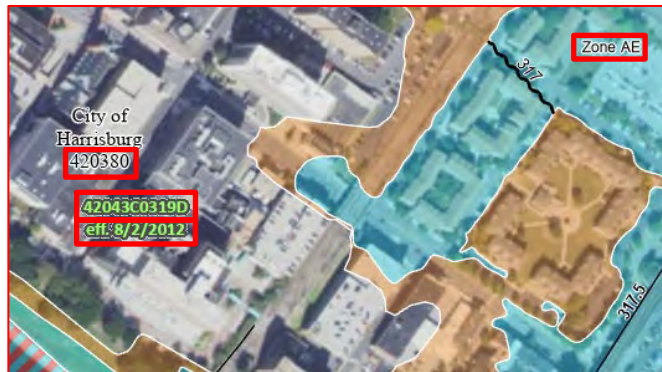
nassau county, ny

Looking for more than just a current flood map?

Visit [Search All Products](#) to access the full range of flood risk products for your community.



<https://msc.fema.gov/portal/home>



<p><b>PIN</b></p> <ul style="list-style-type: none"> <li> Approximate location based on user input and does not represent an authoritative property location.</li> </ul>	<p><b>SPECIAL FLOOD HAZARD AREAS</b></p> <ul style="list-style-type: none"> <li> Without Base Flood Elevation (BFE) Zone A, V, AH</li> <li> With BFE or Depth</li> <li> Regulatory Floodway Zone AE, AO, AH, VE, AR</li> <li> 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X</li> <li> Future Conditions 1% Annual Chance Flood Hazard Zone X</li> <li> Area with Reduced Flood Risk due to Levee. See Notes, Zone X</li> <li> Area with Flood Risk due to Levee Zone D</li> </ul>	<p><b>OTHER AREAS OF FLOOD HAZARD</b></p> <ul style="list-style-type: none"> <li> Area of Minimal Flood Hazard Zone X</li> <li> Effective LOMRs</li> <li> Area of Undetermined Flood Hazard Zone D</li> <li> otherwise Protected Area</li> <li> coastal Barrier Resource System Area</li> </ul>	<p><b>OTHER FEATURES</b></p> <ul style="list-style-type: none"> <li> Cross Sections with 1% Annual Chance</li> <li> Water Surface Elevation</li> <li> Coastal Tract Base Flood Elevation Line (BFE)</li> <li> Limit of Study</li> <li> Jurisdiction Boundary</li> <li> Coastal Tract Baseline</li> <li> Profile Baseline</li> <li> Hydrographic Feature</li> </ul>
<p><b>MAP PANELS</b></p> <ul style="list-style-type: none"> <li> Area of Minimal Flood Hazard Zone X</li> <li> Effective LOMRs</li> <li> Area of Undetermined Flood Hazard Zone D</li> <li> otherwise Protected Area</li> </ul>	<p><b>OTHER AREAS OF FLOOD HAZARD</b></p> <ul style="list-style-type: none"> <li> Area of Minimal Flood Hazard Zone X</li> <li> Effective LOMRs</li> <li> Area of Undetermined Flood Hazard Zone D</li> <li> otherwise Protected Area</li> <li> coastal Barrier Resource System Area</li> </ul>	<p><b>GENERAL STRUCTURES</b></p> <ul style="list-style-type: none"> <li> Channel, Culvert, or Storm Sewer</li> <li> Levee, Dike, or Floodwall</li> </ul>	

# Address

Be sure to save assessment records before generating a report.

Address   Structure/Damage/NFIP   Cost   Element Percentages   Output Summary   Photos

### Subdivision / Community

Subdivision:

Parcel Number:

Lot Number:

Elevation of Lowest Floor:

Datum:

NFIP Community ID:

NFIP Community Name:

Latitude:

Longitude:

### Structure Address

Structure Owner First Name:

Structure Owner Last Name:

Street Number:

Street Name:

Street Suffix:  
Make Selection...

City:

State:

County/Parish:  
Make Selection...

Zip Code:

Phone Number:

Cell Phone Number:

### Mailing Address

Check if same as Structure Address.

Mailing Owner First Name:

Mailing Owner Last Name:

Mailing Street Number:

Mailing Street Name:

Mailing Street Suffix:  
Make Selection...

Mailing City:

Mailing State:

Mailing County/Parish:  
Make Selection...

Mailing Zip Code:

Mailing Phone Number:

Mailing Care of:

### Custom Fields

Custom Field 1

Custom Field 2

Custom Field 3

# Percent Damage

The **Percent Damage** feature of SDE Tool estimates structure damage extent and structure repair costs required for the following structure elements:

## Residential Structures

- Foundation
- Superstructure
- Roof Covering
- Doors and Windows
- Cabinets and Countertops
- Floor Finish
- Plumbing
- Electrical
- Appliance
- Interior Finish
- Mechanical/HVAC

## Non-Residential Structures

- Foundation
- Superstructure
- Roof Covering
- Plumbing
- Electrical
- Interior Finish
- Mechanical/HVAC

**Percent Damage** should be entered in **5% increments**.


# Residential Percent Damage and Element Percentages

**Percent Damage** – Estimates and data entry required by SDE inspector.

**Element Percentages** – Values of structure elements as part of total structure value.

**Residential Assessment** ! Be sure to **SAVE** assessment record before generating a report.

Address | Structure/Damage/NFIP | Cost | **Element Percentages** | Output Summary | Photos



**Element Percentages**

Element:	Percent Damaged:	Element Percentage:	Element Cost:	Damage Values:
Foundation:	<input type="text" value="0.0%"/>	9.5 %	\$6,580.65	\$0.00
Superstructure:	<input type="text" value="0.0%"/>	17.4 %	\$12,052.98	\$0.00
Roof Covering:	<input type="text" value="0.0%"/>	4.5 %	\$3,117.15	\$0.00
Exterior Finish:	<input type="text" value="5.0%"/>	7.3 %	\$5,056.71	\$252.84
Doors and Windows:	<input type="text" value="0.0%"/>	16.4 %	\$11,360.28	\$0.00
Cabinets and Countertops:	<input type="text" value="0.0%"/>	4.6 %	\$3,186.42	\$0.00
Floor Finish:	<input type="text" value="10.0%"/>	8.2 %	\$5,680.14	\$568.01
Plumbing:	<input type="text" value="0.0%"/>	8.9 %	\$6,165.03	\$0.00
Electrical:	<input type="text" value="0.0%"/>	5.1 %	\$3,532.77	\$0.00
Appliances:	<input type="text" value="0.0%"/>	4.3 %	\$2,978.61	\$0.00
Interior Finish:	<input type="text" value="15.0%"/>	13.8 %	\$9,559.26	\$1,433.89
HVAC:	<input type="text" value="0.0%"/>	0.0 %	\$0.00	\$0.00
			Replacement Cost:	Computed Damages:
			\$69,270.00	\$2,254.74

Damage Date: 9/14/2018  
Assessment Date: 12/19/2018  
Percent Damaged: **4.3 %**

## Required Non-Residential Attributes

- **Story (3)**
- **Structure Use (22)**
- **Sprinkler System** – fire protection/fire sprinkler system (Y/N)
- **Conveyance** – elevators/escalators (Y/N)
- **Year of Construction**
- **Quality** of initial construction – (5)

**Structure Attributes / Information**

Structure Type:  
Non-Residential

Story:  
? Make Selection...

Structure Use:  
? Make Selection...

Sprinkler System:  
? Make Selection...

Conveyance:  
? Make Selection...

Year of Construction:  
1950

Quality:  
? Average

Structure Information:

# Residential and Non-Residential Assessment Form Differences

## Structure Attributes / Information

Structure Type: Residential	Structure Type: Non-Residential
Story: One Story (Standard)	Story: Make Selection...
Residence Type: Single Family Residence	Structure Use: Make Selection...
Foundation: Slab - on - Grade	Sprinkler System: Make Selection...
Superstructure: Stud-framed (Standard)	Conveyance: Make Selection...
Roof Covering: Shingles - Asphalt, Wood (Standard)	Year of Construction: 1950
Exterior Finish: Brick Veneer	Quality: Average
HVAC System: Heating and/or Cooling	Structure Information:  
Year of Construction: 1950	
Quality:	

**Residential**  
 construction  
 attributes

**Non-Residential**  
 construction  
 attributes



# Conveyance and Sprinkler Systems

## Vertical Conveyance Systems

- Elevators
- Escalators



## Fire Protection – Fire Suppression/Sprinkler Systems



## Field Inspection Comments Data Field:

- Structure access/entry unavailable or otherwise unable to access/enter.
- Structure owner/resident refused SDE inspection and/or photographs.
- Structure existed prior to storm but was demolished.
- Structure repair completed.
- Structure under repair currently.
- Structure was under construction prior to storm.
- Structure owner/resident provided damage information.

**Structure Attributes / Information**

Structure Type:

Story:

Residence Type:

Foundation:

Superstructure:

Roof Covering:

Exterior Finish:

HVAC System:

Year of Construction:

Quality:

Structure Information:


## Field Inspection Comments Data Field continued:

- Structure does not include four walls and a roof.
- Structure has a basement.
- Structure is built into a hill.
- Structure area/square footage updated based on field inspection.
- Structure area/square footage needs to be updated by office staff.
- Structure neighbor provided damage information.
- Structure damage cause established by adjacent property.

## Cost Adjustments Field:

Address Structure/Damage/NFIP Cost Element Percentages Output Summary Photos

### Square Footage

Click to calculate or enter square footage: 

Base Cost:

Geographic Adjustment:

Total Square Footage:

Cost:

### Computed Actual Cash Value

Total Adjustments:

Replacement Cost:

Replacement Cost Per Sq Ft:

Cost Data Reference:

Cost Data Date:

Depreciation Rating:

Depreciation Percentage:

Computed Actual Cash Value:

### Cost Adjustments

Adjustments:	Quantity:	Unit:	Unit Cost:	Adjustment Cost:
Windows/Skylights	<input type="text" value="0.00"/>	Ea	<input type="text" value="\$0.00"/>	\$0.00
Wall Covering	<input type="text" value="0.00"/>	Sq Ft	<input type="text" value="\$0.00"/>	\$0.00
Conveyance System	<input type="text" value="0.00"/>	Ea	<input type="text" value="\$0.00"/>	\$0.00
Built-In Security/Communications	<input type="text" value="0.00"/>	Ea	<input type="text" value="\$0.00"/>	\$0.00
Built-In Equipment	<input type="text" value="0.00"/>	Ea	<input type="text" value="\$0.00"/>	\$0.00
Roofing	<input type="text" value="0.00"/>	Sq Ft	<input type="text" value="\$0.00"/>	\$0.00


### Additional Adjustments

Adjustments:	Quantity:	Unit Cost:	Adjustment Cost:
<input type="text"/>	<input type="text" value="0.00"/>	<input type="text" value="\$0.00"/>	\$0.00
<input type="text"/>	<input type="text" value="0.00"/>	<input type="text" value="\$0.00"/>	\$0.00
<input type="text"/>	<input type="text" value="0.00"/>	<input type="text" value="\$0.00"/>	\$0.00
<input type="text"/>	<input type="text" value="0.00"/>	<input type="text" value="\$0.00"/>	\$0.00
<input type="text"/>	<input type="text" value="0.00"/>	<input type="text" value="\$0.00"/>	\$0.00

## Square footage calculator

Address | Structure/Damage/NFIP | **Cost** | Element Percentages | Output Summary | Photos

**Square Footage**

Click to calculate or enter square footage: 

Base Cost:

Geographic Adjustment:

Total Square Footage:

Cost:

**Cost Adjustments**

Adjustments:	Quantity:	Unit:	Unit Cost:	Adjustment Cost:
Windows/Skylights	<input type="text" value="0.00"/>	Ea	<input type="text" value="\$0.00"/>	\$0.00
Wall Covering	<input type="text" value="0.00"/>	Sq Ft	<input type="text" value="\$0.00"/>	\$0.00
Conveyance System	<input type="text" value="0.00"/>	Ea	<input type="text" value="\$0.00"/>	\$0.00
Built-In Security/Communications	<input type="text" value="0.00"/>	Ea	<input type="text" value="\$0.00"/>	\$0.00
Built-In Equipment	<input type="text" value="0.00"/>	Ea	<input type="text" value="\$0.00"/>	\$0.00
Roofing	<input type="text" value="0.00"/>	Sq Ft	<input type="text" value="\$0.00"/>	\$0.00

**Additional Adjustments**

Adjustments:	Quantity:	Unit Cost:	Adjustment Cost:
<input type="text"/>	<input type="text" value="0.00"/>	<input type="text" value="\$0.00"/>	\$0.00
<input type="text"/>	<input type="text" value="0.00"/>	<input type="text" value="\$0.00"/>	\$0.00
<input type="text"/>	<input type="text" value="0.00"/>	<input type="text" value="\$0.00"/>	\$0.00
<input type="text"/>	<input type="text" value="0.00"/>	<input type="text" value="\$0.00"/>	\$0.00
<input type="text"/>	<input type="text" value="0.00"/>	<input type="text" value="\$0.00"/>	\$0.00

**Computed Actual Cash Value**

Total Adjustments:

Replacement Cost:

Replacement Cost Per Sq Ft:

Cost Data Reference:

Cost Data Date:

Depreciation Rating:

Depreciation Percentage:


Computed Actual Cash Value:

# Cost Tab

- Base or Unit Cost
- Geographic Adjustment
- Structure Depreciation Rating

Address Structure/Damage/NFIP **Cost** Element Percentages Output Summary Photos

### Square Footage

Click to calculate or enter square footage: 

Base Cost:

Geographic Adjustment:

Total Square Footage:

Cost: **\$0.00**

### Computed Actual Cash Value

Total Adjustments: **\$0.00**

Replacement Cost: **\$0.00**

Replacement Cost Per Sq Ft:

Cost Data Reference:

Cost Data Date:

Depreciation Rating:

Depreciation Percentage:

Computed Actual Cash Value: **\$0.00**

### Cost Adjustments

Adjustments:	Quantity:	Unit:	Unit Cost:	Adjustment Cost:
Windows/Skylights	<input type="text" value="0.00"/>	Ea	<input type="text" value="\$0.00"/>	\$0.00
Wall Covering	<input type="text" value="0.00"/>	Sq Ft	<input type="text" value="\$0.00"/>	\$0.00
Conveyance System	<input type="text" value="0.00"/>	Ea	<input type="text" value="\$0.00"/>	\$0.00
Built-In Security/Communications	<input type="text" value="0.00"/>	Ea	<input type="text" value="\$0.00"/>	\$0.00
Built-In Equipment	<input type="text" value="0.00"/>	Ea	<input type="text" value="\$0.00"/>	\$0.00
Roofing	<input type="text" value="0.00"/>	Sq Ft	<input type="text" value="\$0.00"/>	\$0.00

### Additional Adjustments

Adjustments:	Quantity:	Unit Cost:	Adjustment Cost:
<input type="text"/>	<input type="text" value="0.00"/>	<input type="text" value="\$0.00"/>	\$0.00
<input type="text"/>	<input type="text" value="0.00"/>	<input type="text" value="\$0.00"/>	\$0.00
<input type="text"/>	<input type="text" value="0.00"/>	<input type="text" value="\$0.00"/>	\$0.00
<input type="text"/>	<input type="text" value="0.00"/>	<input type="text" value="\$0.00"/>	\$0.00
<input type="text"/>	<input type="text" value="0.00"/>	<input type="text" value="\$0.00"/>	\$0.00

# Structure Percent Damage

The Structure **Percent Damage** feature of the SDE Tool estimates level of structure damage and cost of structure repair required for these following structure elements:

## Residential Structures

- Foundation
- Superstructure
- Roof Covering
- Doors and Windows
- Cabinets and Countertops
- Floor Finish
- Plumbing
- Electrical
- Appliance
- Interior Finish
- HVAC

## Non-Residential Structures

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

**Enter Percent Damage estimates in 5% increments.**

# Non-Residential Structure Percent Damaged and Element Percentages

## Non-Residential Assessment

Be sure to **SAVE** assessment record before generating a report.



Damage Date:  
9/14/2018

Assessment Date:  
12/11/2018

Percent Damaged:  
**43.7 %**

- Address
- Structure/Damage/NFIP
- Cost
- Element Percentages**
- Output Summary
- Photos

### Element Percentages

Element:	Percent Damaged:	Element Percentage:	Element Cost:	Damage Values:
Foundation:	<input type="text" value="0.0%"/>	13.0 %	\$8,815.30	\$0.00
Superstructure:	<input type="text" value="20.0%"/>	29.0 %	\$19,664.90	\$3,932.98
Roof Covering:	<input type="text" value="10.0%"/>	8.0 %	\$5,424.80	\$542.48
Plumbing:	<input type="text" value="0.0%"/>	11.0 %	\$7,459.10	\$0.00
Electrical:	<input type="text" value="90.0%"/>	6.0 %	\$4,068.60	\$3,661.74
Interiors:	<input type="text" value="100.0%"/>	23.0 %	\$15,596.30	\$15,596.30
HVAC:	<input type="text" value="0.0%"/>	10.0 %	\$6,781.00	\$0.00
			Replacement Cost:	Computed Damages:
			\$67,810.00	<b>\$23,733.50</b>



# Structure Percent Damaged Guidance

"Rainbow Charts" or other aids may be developed by communities to assist with assigning structure percent damage.

**IMPORTANT:** Aids are generic and may not adequately account for special conditions, so structure percent damaged may need to be adjusted.

SIMPLIFIED QA/QC GUIDANCE FOR EVALUATION OF RESIDENTIAL CONCRETE BUILDING INTERIOR ELEMENTS <sup>1</sup>								
1-STORY RESIDENTIAL BUILDINGS ON SLAB/PIERS/CRAWLSPACE <sup>3</sup>								
Depth of Flooding Above Top of First Finished Floor (ft)	Doors and Windows	Cabinets and Countertops	Floor Finish	Plumbing <sup>2</sup>	Electrical <sup>2</sup>	Appliances	Interior Finish	HVAC <sup>2</sup>
0'	0%	0%	0%	0%	0%	0%	0%	0%
0.5'	10%	25%	5%	0%	0%	25%	5%	10%
1'	20%	50%	5%	5%	10%	100%	5%	25%
1.5'	40%	50%	5%	10%	10%	100%	5%	50%
2'	40%	50%	5%	10%	20%	100%	5%	60%
2.5'	40%	50%	5%	10%	20%	100%	5%	65%
3'	50%	50%	10%	20%	20%	100%	10%	70%
3.5'	50%	50%	10%	20%	50%	100%	10%	75%
4'	75%	75%	15%	20%	60%	100%	15%	80%
5'	100%	100%	20%	30%	60%	100%	20%	85%
6'	100%	100%	25%	40%	70%	100%	25%	100%
7'+	100%	100%	30%	50%	80%	100%	30%	100%

NOTES: 1) This simplified guidance should be used when the inspector cannot enter a structure. 2) Values may differ on some elements for structures on piers or crawlspace. Consider increasing plumbing, electrical, hvac damage if present beneath 1st floor structure. 3) Structures on piles will be assessed on a case-by-case basis due to variability in finished space below the structure, location of utilities, and potential foundation and superstructure damage if located in a high velocity area.

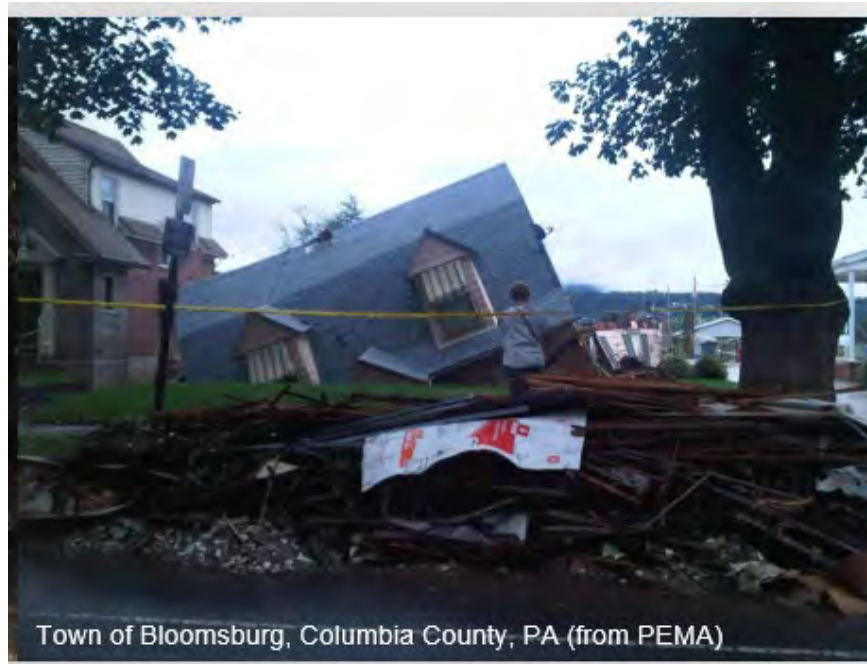
# Polling Question

Should the percent damaged be adjusted for this concrete floor?

Depth of Flooding Above Top of First Finished Floor (ft)	Doors and Windows	Cabinets and Countertops	Floor Finish
0'	0%	0%	0%
0.5'	10%	25%	5%
1'	20%	50%	5%
1.5'	40%	50%	5%
2'	40%	50%	5%
2.5'	40%	50%	5%
3'	50%	50%	10%
3.5'	50%	50%	10%
4'	75%	75%	15%
5'	100%	100%	20%
6'	100%	100%	25%
7'+	100%	100%	30%



# Questions?



**Flood/Wind Building Science Helpline:**  
**[FEMA-BuildingScienceHelp@fema.dhs.gov](mailto:FEMA-BuildingScienceHelp@fema.dhs.gov)**

**866.927.2104**

**<http://www.fema.gov/building-science>**

# Substantial Damage Estimation (SDE) Percent Damages by Structure Element for Residential Structures



**Federal Emergency Management Agency (FEMA)**

**Harrisburg, PA**

June 2023

**Flood/Wind Building Science Helpline:**

**[FEMA-BuildingScienceHelp@fema.dhs.gov](mailto:FEMA-BuildingScienceHelp@fema.dhs.gov)**

**866.927.2104**

**<http://www.fema.gov/building-science>**



**FEMA**



# Unit 6 – Percent Damage by Structure Elements

Reminder:

$$\frac{\text{Structure Repair Cost}}{\text{Structure Market Value}} \geq 50\%$$

Ratio equal to or greater than 50% considered substantially damaged

# Percent Damage by Structure Elements

## Percent Damage by Structure Elements

Address	Structure/Damage/NFIP	Cost	Element Percentages	Output Summary	Photos
<b>Element Percentages</b>					
<b>Element:</b>	<b>Percent Damaged:</b>	<b>Element Percentage:</b>	<b>Element Cost:</b>	<b>Damage Values:</b>	
Foundation:	<input type="text" value="5.0%"/>	10.5 %	\$21,000.00	\$1,050.00	
Superstructure:	<input type="text" value="5.0%"/>	11.8 %	\$23,600.00	\$1,180.00	
Roof Covering:	<input type="text" value="5.0%"/>	3.8 %	\$7,600.00	\$380.00	
Exterior Finish:	<input type="text" value="5.0%"/>	17.4 %	\$34,800.00	\$1,740.00	
Doors and Windows:	<input type="text" value="5.0%"/>	13.8 %	\$27,600.00	\$1,380.00	
Cabinets and Countertops:	<input type="text" value="5.0%"/>	3.9 %	\$7,800.00	\$390.00	
Floor Finish:	<input type="text" value="5.0%"/>	6.9 %	\$13,800.00	\$690.00	
Plumbing:	<input type="text" value="5.0%"/>	7.5 %	\$15,000.00	\$750.00	
Electrical:	<input type="text" value="5.0%"/>	4.3 %	\$8,600.00	\$430.00	
Appliances:	<input type="text" value="0.0%"/>	3.6 %	\$7,200.00	\$0.00	
Interior Finish:	<input type="text" value="5.0%"/>	11.6 %	\$23,200.00	\$1,160.00	
HVAC:	<input type="text" value="5.0%"/>	4.9 %	\$9,800.00	\$490.00	
			Replacement Cost:	Computed Damages:	
			\$200,000.00	<b>\$9,640.00</b>	

**Reminder: Estimate Structure Percent Damage in 5% Increments**

# Percent Damage – General: 0% - 100%

## Percent Damage for All Structure Elements:

- 0% - 24% – no to minimum damage or structure element not existing
- 25% - 49% – minimum to minor damage
- 50% - 74% – minor to major damage
- 75% - 100% – major to maximum/total damage

# Percent Damage – Foundation: 0% - 24%



## Common Damage:

- Footing/foundation: no to minimum footing/foundation damage, undermining or scour
- Footing/foundation piles or piers: no to minimum pile or pier damage, undermining or scour
- Foundation walls: no to minimum foundation wall damage, cracking, settlement or displacement



# Percent Damage – Foundation: 25% - 49%



## Common Damage:

- Footing/foundation: minimum to minor foundation damage, undermining or scour
- Footing/foundation and/or structural support systems: minimum to minor damage, cracking, but no displacement, heaving or discontinuity
- Cross bracing and/or breakaway walls on elevated pile or pier foundations: minimum to minor damage

# Percent Damage – Foundation: 50% - 74%



## Common Damage:

- Footing/foundation: minor to major foundation damage, settlement, undermining or scour
- Foundation walls: minor to major foundation wall damage, debris damage, cracking
- Concrete slab: minor to major slab damage, significant/severe undermining

# Percent Damage – Foundation: 75% - 100%



**Always use caution when approaching!**

## Common Damage:

- Footing/foundation: major to maximum/total foundation damage, settlement
- Foundation walls: major to maximum/total foundation wall damage, cracking, settlement, displacement or missing foundation wall portions
- Concrete slab: major to maximum/total slab damage, settlement, displacement or undermining

# Percent Damage – Superstructure: 0% - 24%



## Common Damage:

- Floor system: no to minimum floor damage, no missing floor portions
- Wall system: no to minimum exterior or load-bearing wall damage, no missing wall portions
- Roof system: no to minimum roof damage, no missing roof portions
- Structural system: no to minimum structural deformation or distortion

# Percent Damage – Superstructure: 25% - 49%

## Common Damage:

- Floor system: minimal to minor floor damage, limited missing floor portions
- Wall system: minimal to minor wall damage, limited missing wall portions
- Roof system: minimal to minor roof damage, limited missing roof portions
- Structural system: minimal to minor structural deformation or distortion, no to limited structural components missing



# Percent Damage – Superstructure: 50% - 74%

## Common Damages



- Floor system: minor to major floor damage, limited open portions
- Wall system: minor to major wall damage, damage by debris and pressure, open wall damage or missing wall portions
- Roof system: minor to major roof damage, limited missing portions
- Structural system: minor to major structural deformation or distortion

# Percent Damage – Superstructure: 75% - 100%



## Common Damage:

- Floor system: major to maximum/total floor damage, large open floor damage, or large missing portions
- Exterior wall system: major to maximum/total wall damage, large open wall damage or open damage to large portions or large missing portions
- Wall system: major to maximum/total damage by debris and pressure
- Roof system: major to maximum/total damage, large open roof damage to portions or missing portions
- Structural system: major to maximum/total structural deformation or distortion



# Percent Damage – Roof Covering: 0% - 100%





# Percent Damage – Rainbow Charts

## “Rainbow Charts” and Percent Roof Damage – Wind-Driven Rain

### SIMPLIFIED QA/QC GUIDANCE FOR EVALUATION OF RESIDENTIAL BUILDING INTERIOR ELEMENTS<sup>1</sup> DUE TO WIND DAMAGE

1-STORY CONCRETE RESIDENTIAL BUILDINGS ON SLAB/PIERS/CRAWLSPACE <sup>3</sup>								
	Doors and Windows	Cabinets and Countertops	Floor Finish	Plumbing <sup>2</sup>	Electrical <sup>2</sup>	Appliances	Interior Finish	HVAC <sup>2</sup>
50% Roof Damage or Less	25%	50%	5%	0%	35%	50%	5%	0%
More than 50% Roof Damage	50%	100%	5%	0%	75%	100%	5%	0%

NOTES: 1) This simplified guidance should be used when the inspector cannot enter a structure. 2) Values may differ on some elements for structures on piers or crawlspace. Consider increasing plumbing, electrical, hvac damage if present beneath 1st floor structure. 3) Structures on piles will be assessed on a case-by-case basis due to variability in finished space below the structure, location of utilities, and potential foundation and superstructure damage if located in a high velocity area.

1-STORY WOOD RESIDENTIAL BUILDINGS ON SLAB/PIERS/CRAWLSPACE <sup>3</sup>								
	Doors and Windows	Cabinets and Countertops	Floor Finish	Plumbing <sup>2</sup>	Electrical <sup>2</sup>	Appliances	Interior Finish	HVAC <sup>2</sup>
50% Roof Damage or Less	25%	50%	50%	0%	50%	50%	50%	0%
More than 50% Roof Damage	50%	100%	100%	0%	100%	100%	100%	0%

NOTES: 1) This simplified guidance should be used when the inspector cannot enter a structure. 2) Values may differ on some elements for structures on piers or crawlspace. Consider increasing plumbing, electrical, hvac damage if present beneath 1st floor structure. 3) Structures on piles will be assessed on a case-by-case basis due to variability in finished space below the structure, location of utilities, and potential foundation and superstructure damage if located in a high velocity area.

# Percent Damage – Exterior Finish: 0% - 100%



# Percent Damage – Exterior Doors & Windows

- Includes all doors and windows, as well as frames and hardware, including hinges, handles and locks
- Excludes paint and stain
- Assumptions:

Low Quality	Fair Quality	Average Quality	Good Quality	Excellent Quality
Hollow Core Doors	Hollow Core Doors	Hollow Core Doors	Raised-panel Hardwood Doors	Raised-panel Hardwood Doors
Low Quality Hardware	Low Quality Hardware	Low Quality Hardware	High Quality Hardware	High Quality Hardware

# Percent Damage – Exterior Doors & Windows



## Use “Rainbow Charts” and Flood Depth

Depth of Flooding Above Top of First Finished Floor (ft)	Doors and Windows
0'	0%
0.5'	10%
1'	20%
1.5'	40%
2'	40%
2.5'	40%
3'	50%
3.5'	50%
4'	75%
5'	100%
6'	100%
7'+	100%

# Percent Damages – Cabinets & Countertops



- 50% damage at 1 foot to 5 feet of water depth above floor level – lower cabinets only not upper cabinets – include bathrooms
- 100% damage at 5 feet or more of water depth



Depth of Flooding Above Top of First Finished Floor (ft)	Cabinets and Countertops
0'	0%
0.5'	25%
1'	50%
1.5'	50%
2'	50%
2.5'	50%
3'	50%
3.5'	50%
4'	75%
5'	100%
6'	100%
7'+	100%

# Percent Damage – Floor Finish: 0% - 5%



## Common Damage:

- Concrete floor finish in concrete structures – typically no damage
- No damage cost included for cleanup and sanitation/disinfection costs

# Percent Damage – Floor Finish: 50% - 100%



## Common Damage:

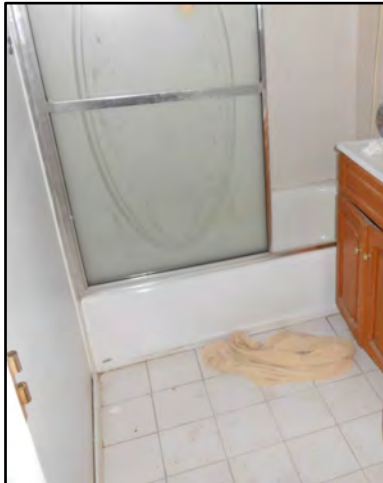
- Wood floor finish in wood structures:
  - 50% - 100% damage may require removal and replacement
- Typical values for floor finish damage in wood structures:
  - 50% for two-story structures
  - 100% for one-story structures

# Percent Damage – Plumbing Systems

- Plumbing systems include incoming water services; water distribution systems and piping; wastewater systems and piping; plumbing fixtures; and water heaters.
- Greywater systems included if/when existing prior to damage, whether required alternate systems or optional supplemental systems.
- Septic systems currently not included, although under consideration for future regulatory revision.
- If/When floodwaters rise above municipal sewer manhole cover levels and/or saturate soils, septic systems may be unable to discharge waste and sewage may back up into structures through sewer lines.



# Percent Damage – Plumbing Systems



Damage to fixtures



## Common Damage:

- Sewage backup

Depth of Flooding Above Top of First Finished Floor (ft)	Plumbing <sup>2</sup>
0'	0%
0.5'	0%
1'	5%
1.5'	10%
2'	10%
2.5'	10%
3'	20%
3.5'	20%
4'	20%
5'	30%
6'	40%
7'+	50%

# Percent Damage – Electrical Systems

- Circuit breaker panels and electrical distribution wiring
- Basic wiring systems for receptacles, switches and light fixtures
- Wiring systems and receptacles for equipment and appliances, including refrigerators, stoves/ovens, and washers and dryers
- Solar array systems when installed directly on structures
- Minimum number of electrical receptacles and light fixtures, sometimes quantified by the local construction code
- Greater damage in slab-on-grade, crawlspace or basement structures occurs more rapidly than in elevated structures

# Percent Damage – Electrical Systems



Depth of Flooding Above Top of First Finished Floor (ft)	Electrical <sup>2</sup>
0'	0%
0.5'	0%
1'	10%
1.5'	10%
2'	20%
2.5'	20%
3'	20%
3.5'	50%
4'	60%
5'	60%
6'	70%
7'+	80%

# Percent Damage – Equipment and Appliances

**Built-in appliances** – eligible cost in SDE cost estimates, since removal of broken equipment and appliances may damage other structure parts

**Think:** Built-in stove/oven and connected water heater

**Plug-in or cord-connected appliances** – no eligible cost in SDE cost estimates since easy removal without damage to other structure parts

**Think:** Washing machine, dryer, and stove/oven

Depth of Flooding Above Top of First Finished Floor (ft)	Appliances
0'	0%
0.5'	25%
1'	100%
1.5'	100%
2'	100%
2.5'	100%
3'	100%
3.5'	100%
4'	100%
5'	100%
6'	100%
7'+	100%

# Polling Question

## Built-in or Plug-in Cord-Connected Appliance?



Dishwasher



Electric Water  
Heater



# Percent Damages – Interior Finishes: 0 - 100%

## Use “Rainbow Charts” and Flood Depth of Flood

SIMPLIFIED QA/QC GUIDANCE FOR EVALUATION OF RESIDENTIAL CONCRETE BUILDING INTERIOR ELEMENTS<sup>1</sup>

1-STORY RESIDENTIAL BUILDINGS ON SLAB/PIERS/CRAWLSPACE <sup>3</sup>								
Depth of Flooding Above Top of First Finished Floor (ft)	Doors and Windows	Cabinets and Countertops	Floor Finish	Plumbing <sup>2</sup>	Electrical <sup>2</sup>	Appliances	Interior Finish	HVAC <sup>2</sup>
0'	0%	0%	0%	0%	0%	0%	0%	0%
0.5'	10%	25%	5%	0%	0%	25%	5%	10%
1'	20%	50%	5%	5%	10%	100%	5%	25%
1.5'	40%	50%	5%	10%	10%	100%	5%	50%
2'	40%	50%	5%	10%	20%	100%	5%	60%
2.5'	40%	50%	5%	10%	20%	100%	5%	65%
3'	50%	50%	10%	20%	20%	100%	10%	70%
3.5'	50%	50%	10%	20%	50%	100%	10%	75%
4'	75%	75%	15%	20%	60%	100%	15%	80%
5'	100%	100%	20%	30%	60%	100%	20%	85%
6'	100%	100%	25%	40%	70%	100%	25%	100%
7'+	100%	100%	30%	50%	80%	100%	30%	100%

2-STORY RESIDENTIAL BUILDINGS ON SLAB/PIERS/CRAWLSPACE <sup>4</sup>								
Depth of Flooding Above Top of First Finished Floor (ft)	Doors and Windows	Cabinets and Countertops	Floor Finish <sup>2</sup>	Plumbing <sup>3</sup>	Electrical <sup>3</sup>	Appliances	Interior Finish	HVAC <sup>3</sup>
0'	0%	0%	0%	0%	0%	0%	0%	0%
0.5'	5%	25%	5%	0%	0%	25%	5%	5%
1'	10%	40%	5%	5%	0%	50%	5%	15%
1.5'	20%	40%	5%	5%	10%	75%	5%	25%
2'	20%	40%	5%	5%	10%	100%	5%	35%
2.5'	20%	40%	5%	10%	10%	100%	5%	40%
3'	25%	40%	5%	10%	30%	100%	5%	50%
3.5'	25%	40%	5%	10%	35%	100%	5%	50%
4'	35%	70%	5%	10%	50%	100%	5%	55%
5'	50%	70%	10%	15%	50%	100%	10%	55%
6'	50%	70%	15%	20%	50%	100%	15%	55%
7'+	50%	70%	20%	25%	50%	100%	20%	60%

NOTES: 1) This simplified guidance should be used when the inspector cannot enter a structure. 2) This guidance assumes the 2nd floor living area is equivalent to the 1st floor living area. Consider increasing floor finish damage if the 2nd floor is significantly less square footage than first floor. 3) Values may differ on some elements for structures on piers or crawlspace. Consider increasing plumbing, electrical, hvac damage if present beneath 1st floor structure. 4) Structures on piles will be assessed on a case-by-case basis due to variability in finished space below the structure, location of utilities, and potential foundation and superstructure damage if located in a high velocity area.

# Percent Damages – Mechanical/HVAC Systems



## Window A/C Units and Plug-in Cord Heating Units:

- Select none



Depth of Flooding Above Top of First Finished Floor (ft)	HVAC <sup>2</sup>
0'	0%
0.5'	10%
1'	25%
1.5'	50%
2'	60%
2.5'	65%
3'	70%
3.5'	75%
4'	80%
5'	85%
6'	100%
7'+	100%



# Questions?



**Flood/Wind Building Science Helpline:**  
**[FEMA-BuildingScienceHelp@fema.dhs.gov](mailto:FEMA-BuildingScienceHelp@fema.dhs.gov)**

**866.927.2104**

**<http://www.fema.gov/building-science>**



# Substantial Damage Estimation (SDE) Manual/Paper Exercises



**Federal Emergency Management Agency (FEMA)**

**Harrisburg, PA**

**June 2023**



# Unit 7 – SDE Manual/Paper Assessment Form

**Residential**  
SDE DAMAGE INSPECTION WORKSHEET

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

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

**SDE ADDRESS Tab**

**Subdivision / Community 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/Parish: \_\_\_\_\_ Zip: \_\_\_\_\_

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

**Mailing Address**      **Check here if same as building address:** \_\_\_\_\_

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

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

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

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

County/Parish: \_\_\_\_\_ Zip: \_\_\_\_\_

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

SDE Residential Damage Inspection Worksheet 1 of 7

**Non-Residential**  
SDE DAMAGE INSPECTION WORKSHEET

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

**SDE ADDRESS Tab**

**Subdivision / Community 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/Parish: \_\_\_\_\_ Zip: \_\_\_\_\_

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

**Mailing Address**      **Check here if same as building address:** \_\_\_\_\_

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

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

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

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

County/Parish: \_\_\_\_\_ Zip: \_\_\_\_\_

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

SDE Non-Residential Damage Inspection Worksheet 1 of 4

SDE Manual/Paper Assessment Form or Inspection Worksheet

# Rainbow Charts

SIMPLIFIED QA/QC GUIDANCE FOR EVALUATION OF RESIDENTIAL CONCRETE BUILDING INTERIOR ELEMENTS <sup>1</sup>								
1-STORY RESIDENTIAL BUILDINGS ON SLAB/PIERS/CRAWLSPACE <sup>3</sup>								
Depth of Flooding Above Top of First Finished Floor (ft)	Doors and Windows	Cabinets and Countertops	Floor Finish	Plumbing <sup>2</sup>	Electrical <sup>2</sup>	Appliances	Interior Finish	HVAC <sup>2</sup>
0'	0%	0%	0%	0%	0%	0%	0%	0%
0.5'	10%	25%	5%	0%	0%	25%	5%	10%
1'	20%	50%	5%	5%	10%	100%	5%	25%
1.5'	40%	50%	5%	10%	10%	100%	5%	50%
2'	40%	50%	5%	10%	20%	100%	5%	60%
2.5'	40%	50%	5%	10%	20%	100%	5%	65%
3'	50%	50%	10%	20%	20%	100%	10%	70%
3.5'	50%	50%	10%	20%	50%	100%	10%	75%
4'	75%	75%	15%	20%	60%	100%	15%	80%
5'	100%	100%	20%	30%	60%	100%	20%	85%
6'	100%	100%	25%	40%	70%	100%	25%	100%
7'+	100%	100%	30%	50%	80%	100%	30%	100%

NOTES: 1) This simplified guidance should be used when the inspector cannot enter a structure. 2) Values may differ on some elements for structures on piers or crawlspace. Consider increasing plumbing, electrical, hvac damage if present beneath 1st floor structure. 3) Structures on piles will be assessed on a case-by-case basis due to variability in finished space

SIMPLIFIED QA/QC GUIDANCE FOR EVALUATION OF RESIDENTIAL WOOD BUILDING INTERIOR ELEMENTS <sup>1</sup>								
1-STORY RESIDENTIAL BUILDINGS ON SLAB/PIERS/CRAWLSPACE <sup>4</sup>								
Depth of Flooding Above Top of First Finished Floor (ft)	Doors and Windows	Cabinets and Countertops	Floor Finish	Plumbing <sup>2</sup>	Electrical <sup>2</sup>	Appliances	Interior Finish	HVAC <sup>2</sup>
0'	0%	0%	0%	0%	0%	0%	0%	0%
0.5'	10%	25%	100%	0%	5%	25%	20%	10%
1'	20%	50%	100%	5%	10%	100%	25%	25%
1.5'	40%	50%	100%	10%	10%	100%	40%	50%
2'	40%	50%	100%	10%	20%	100%	50%	60%
2.5'	40%	50%	100%	20%	20%	100%	65%	65%
3'	50%	50%	100%	20%	20%	100%	70%	70%
3.5'	50%	50%	100%	20%	50%	100%	75%	75%
4'	75%	75%	100%	20%	60%	100%	80%	80%
5'	100%	100%	100%	30%	60%	100%	85%	85%
6'	100%	100%	100%	40%	70%	100%	100%	100%
7'+	100%	100%	100%	50%	80%	100%	100%	100%

NOTES: 1) This simplified guidance should be used when the inspector cannot enter a structure. 2) Values may differ on some elements for structures on piers or crawlspace. Consider increasing plumbing, electrical, hvac damage if present beneath 1st floor structure. 3) Structures on piles will be assessed on a case-by-case basis due to variability in finished space below the structure, location of utilities, and potential foundation and superstructure damage if located in a high velocity area.

# SDE Residential Case Study



## Structure Attributes:

- Residence type
- Foundation type
- Superstructure
- Roof covering
- Exterior finish
- Mechanical/HVAC system
- Number of stories
- Quality of construction
- Depth of flood

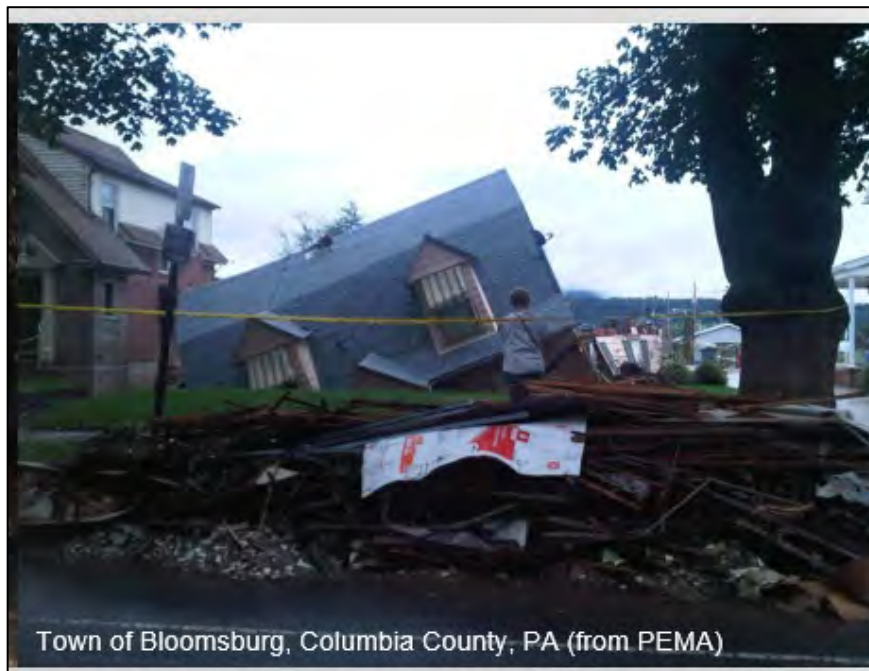
## Percent Damages by Structure Elements:

- Foundation
- Superstructure
- Roof covering
- Exterior finish
- Interior finish
- Doors and windows
- Cabinets and countertops
- Floor finish
- Plumbing system
- Electrical system
- Equipment and appliances
- Mechanical/HVAC system <sup>5</sup>

# Preparation for Field Exercises

- Remember paper copies of SDE Assessment Forms and Rainbow Charts.
- Remember electronics, laptops or tablets.
- Tomorrow's schedule:
  - Unit 8: Tool Features
  - Unit 9: Tool Exercises
  - Unit 10: Best Practices
  - Unit 11: Resources and Final Comments Out
  - Lunch: 12:30 – 1:30 p.m.
  - Field Exercise 1:30– 4:30 p.m.: **INSERT CORRECT LOCATION**
  - Transportation

# Questions?



**Flood/Wind Building Science Helpline:**  
**[FEMA-BuildingScienceHelp@fema.dhs.gov](mailto:FEMA-BuildingScienceHelp@fema.dhs.gov)**

**866.927.2104**

**<http://www.fema.gov/building-science>**

# Substantial Damage Estimation (SDE) Tool Features and Functions



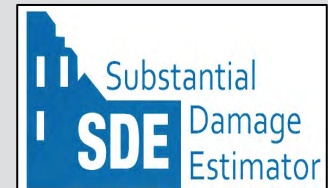
**Federal Emergency Management Agency (FEMA)**

**Harrisburg, PA**

**June 2023**



**FEMA**





# Unit 8 – SDE Tool Features and Functions

## SDE Tool Features and Functions

- Use help links and informational buttons.
- Enter all required information.
- **SAVE, SAVE, SAVE!!!**

Structure Attributes / Information	Inspector / Damage Information
Structure Type: Residential	Inspector Name: <input type="text"/>
Story: One Story (Standard)	Inspector Phone: <input type="text"/>
Residence Type: Single Family Residence	Assessment Date: <input type="text"/>
Foundation: Slab - on - Grade	Date Damage Occurred: 2/25/2023
Superstructure: Stud-framed (Standard)	Cause of Damage: Make Selection...
Roof Covering: Shingles - Asphalt, Wood (Standard)	<input type="checkbox"/> Damage Undetermined Make Selection...
Exterior Finish: Brick Veneer	Duration of Flood: <input type="text"/> Make Selection...
HVAC System: Heating and/or Cooling	Est. Depth of Flood Above Ground: 0.00
Year of Construction:	Est. Depth of Flood Above Lowest Floor:

# SDE Tool Order of Operations

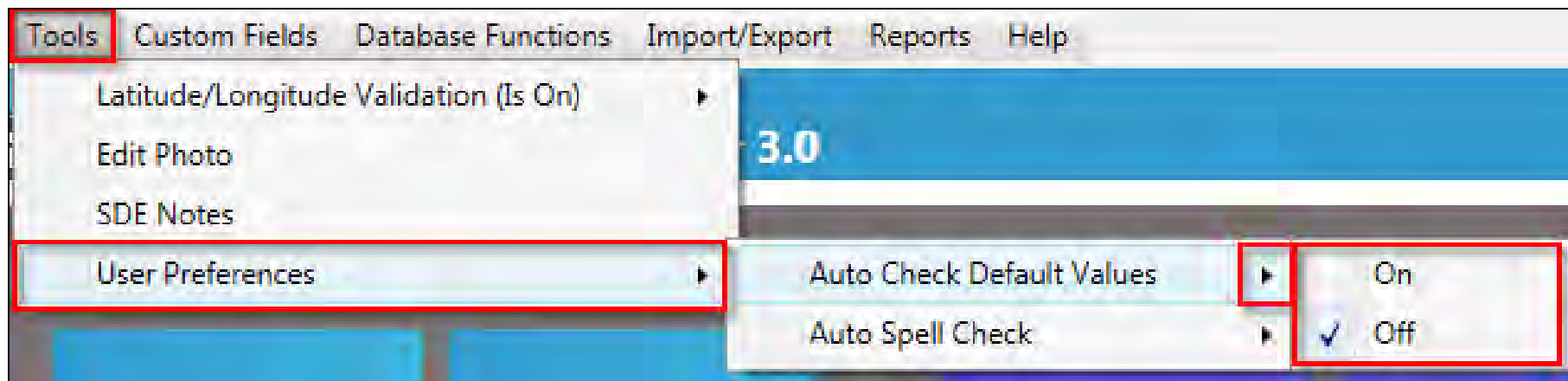
1. Identify the affected area to perform SDE inspections.
2. Import parcel and/or tax assessment data into the SDE tool.
3. Coordinate teams and a plan for performing SDE assessments.
4. Collect data and perform their assessments using the SDE tool.
5. Perform QA/QC on data prior to submitting them.
6. Export final assessments to the database.
7. Perform additional QA/QC on finalized assessments.

# SDE Main Menu

The screenshot shows the main menu of the Substantial Damage Estimator 3.0 application. The interface is organized into several sections:

- 1** **Substantial Damage Estimator 3.0** (Application Title Bar)
- 2** **Access Data** (Section Header)
  - 2** View/Search All Records (Magnifying glass icon)
  - 3** Bulk Editor (Pencil icon)
  - 4** Enter Default Data (Document with pencil icon)
  - 5** Add New Property (Document with plus icon)
  - 6** Add New Residential Assessment (House icon)
  - 7** Add New Non-Residential Assessment (Building icon)
- Resources** (Section Header)
  - 12** User Manual (Open book icon)
  - Web References (Globe with arrow icon)
- Reports, Imports/Exports, and GeoFiles** (Section Header)
  - 8** Saved Enterprise Import Mappings (Document with list icon)
  - 9** Import/Export Functions (Document with arrows icon)
  - 10** View Reports (Document with bar chart icon)
  - 11** Generate GeoFile (Map icon)

# SDE Tools Menu



# SDE Default Data


Substantial Damage Estimator 3.0

File Tools Custom Fields Database Functions Import/Export Reports Help (Database Name:)

**SDE Substantial Damage Estimator 3.0**

**Default Data** Check Spelling Clear All Values Delete Save

<p><b>Address / Structure Information</b></p> <p>City: <input type="text"/></p> <p>State: <input type="text" value="Make Selection..."/></p> <p>County/Parish: <input type="text" value="Select a State First"/></p> <p>Zip Code: <input type="text"/></p> <p>Year of Construction: <input type="text"/></p> <p>Datum: <input type="text"/></p> <p><b>Cost Information</b></p> <p>Base Cost: <input type="text"/></p>	<p><b>Inspector / Damage Information</b></p> <p>Date Damage Occurred: <input type="text"/></p> <p>Cause of Damage: <input type="text" value="Make Selection..."/></p> <p>Duration of Flood: <input type="text" value="Make Selection..."/></p> <p>Geographic Adjustment: <input type="text"/></p> <p>Cost Data Date: <input type="text"/></p> <p>Inspector Name: <input type="text"/></p> <p>Inspector Phone: <input type="text"/></p> <p>Assessment Date: <input type="text"/></p> <p>Cost Data Reference: <input type="text"/></p>	<p><b>NFIP / Community Information</b></p> <p>NFIP Community Name: <input type="text"/></p> <p>NFIP Community ID: <input type="text"/></p> <p>FIRM Panel Number: <input type="text"/></p> <p>FIRM Zone: <input type="text" value="Make Selection..."/></p> <p>Date of FIRM Panel: <input type="text"/></p> <p>Suffix: <input type="text" value="Make Selection..."/></p> <p>Base Flood Elevation: <input type="text"/></p> <p>Regulatory Floodway: <input type="text" value="Make Selection..."/></p>	<p>Space for Community Specific Information:</p> <div style="border: 1px solid gray; height: 150px; width: 100%;"></div>
---	--	---	--

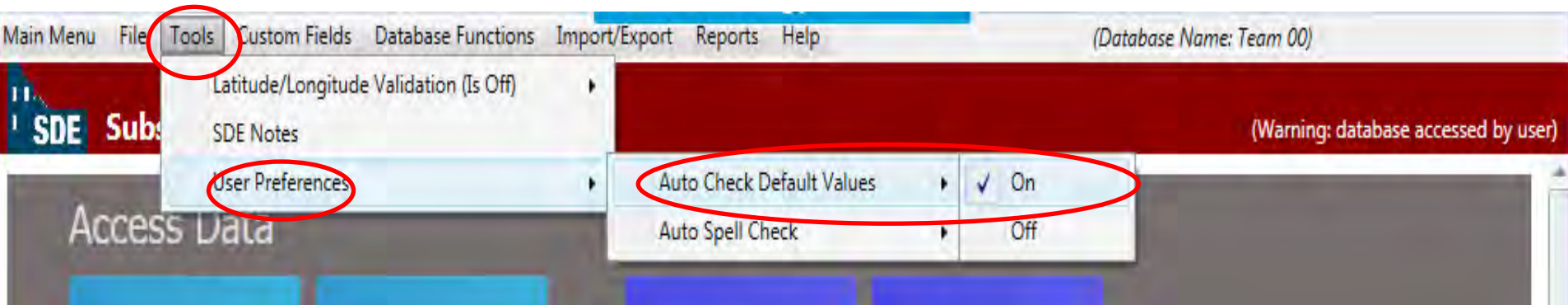

 SDE is a tool provided by FEMA to help local officials administer the substantial damage requirements of their floodplain management ordinance in accordance with the minimum requirements of the NFIP.

Total Number of Properties: **1131**      Total Number of Assessments: **1131**

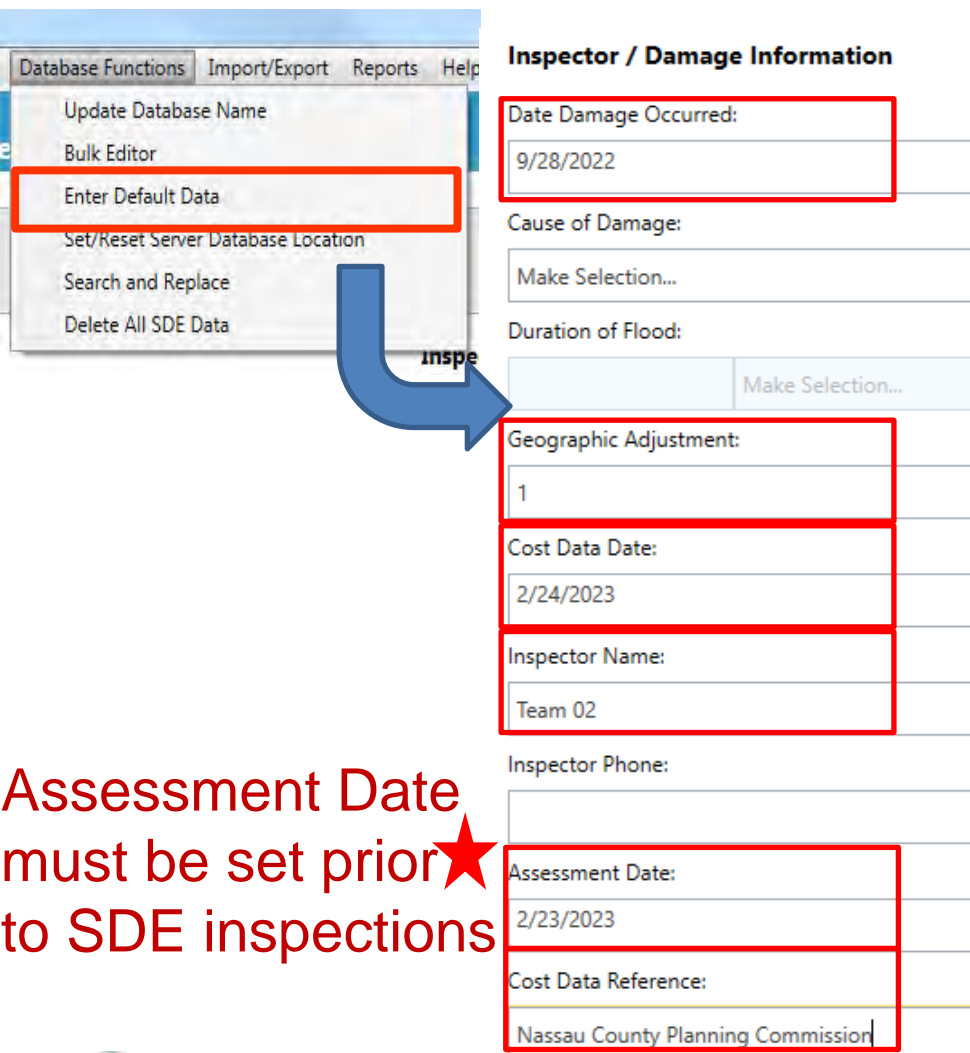
# SDE Tool Default Values

Set Auto Check Default Values to “ON.”

To use default values, select **Default Values** each time after exiting the SDE tool.



# SDE Tool Default Values



**Inspector / Damage Information**

Date Damage Occurred: 9/28/2022

Cause of Damage: Make Selection...

Duration of Flood: Make Selection...

Geographic Adjustment: 1

Cost Data Date: 2/24/2023

Inspector Name: Team 02

Inspector Phone:

Assessment Date: 2/23/2023

Cost Data Reference: Nassau County Planning Commission

- ## Enter Default Data
- **Date Damage Occurred:** XX/XX/20XX
  - **Geographic Adjustment:** 1
  - **Inspector Name:** Team XX
  - **Cost Data Date:** XX/XX/20XX
  - **Assessment Date:** Set to current date prior to SDE inspections
  - **Cost Data Reference:** Nassau County Planning Commission

Assessment Date must be set prior★ to SDE inspections

There are **two methods** for **importing data** into the SDE tool:

1. **SDE Format Data Import** plus photos (SDE Import):
  - SDE data from another SDE database
  - Data from other disasters
  - Data from the current disaster stored on a different computer
2. **Enterprise Import** of property data from a non-SDE source such as tax records or standalone lists in Microsoft Excel



## **Method 1: SDE Format Data Import** (SDE data from another SDE database)

- This involves previously saved assessments in SDE format, with structure attributes, value, and element percent damaged.
- It works with SDE databases from previous SDE versions.
- It allows for import of data and photos.

# SDE Format Data Import

The screenshot displays the main dashboard of the SDE software. The dashboard is divided into several sections. On the left, there are four large blue tiles: 'Enter Default Data' (document icon), 'Add New Property' (document with plus icon), a home icon, and another 'Add New' tile (building icon). On the right, there is a section titled 'Reports, Imports/Exports, and GeoFiles' containing two green tiles: 'Saved Enterprise Import Mappings' (table icon) and 'Import/Export Functions' (database icon with arrows), which is highlighted with a red border. A modal dialog box is open in the foreground, titled 'Select the option you would like to use:'. It contains five green tiles: 'Import SDE Data' (curved arrow pointing left), 'Export SDE Data' (curved arrow pointing right), 'Enterprise Import' (table icon with arrow), 'Export Files to Excel' (table icon with arrow and 'X'), and 'Import/Export User Settings' (gear icon). The 'Import SDE Data' tile is highlighted with a red border. A 'Close' button is located at the bottom of the dialog box.

# SDE Format Data Import

The screenshot displays the 'Import SDE Data' dialog box within the SDE Substantial Damage Estimator 3.0 application. The main dialog has a title bar with the application name and a menu bar with options: Main Menu, File, Tools, Custom Fields, Database Functions, Import/Export, Reports, and Help. The main area contains the text 'Map to the directory where the SDE records to be imported are saved.' and three buttons: 'Check All', 'Uncheck All', and 'Import'. Below this is a 'Select Directory' button, which is highlighted with a red box. To the right of this button is an 'Overwrite All' checkbox with the text '(Check to overwrite all existing records)'. Below the main dialog, a 'Browse For Folder' dialog box is open, showing a list of folders. The 'SDE' folder is selected and highlighted with a red box. At the bottom of the 'Browse For Folder' dialog, the 'OK' button is also highlighted with a red box. The background of the main application window shows a table with columns 'Select', 'Overwrite', and 'Property'.

# SDE Format Data Import

Substantial Damage Estimator 3.0

File Tools Custom Fields Database Functions Import/Export Reports Help

(Database Name:)

**SDE** Substantial Damage Estimator 3.0

### Import SDE Data

Map to the directory where the SDE records to be imported are saved.

Check All

Uncheck All

Import

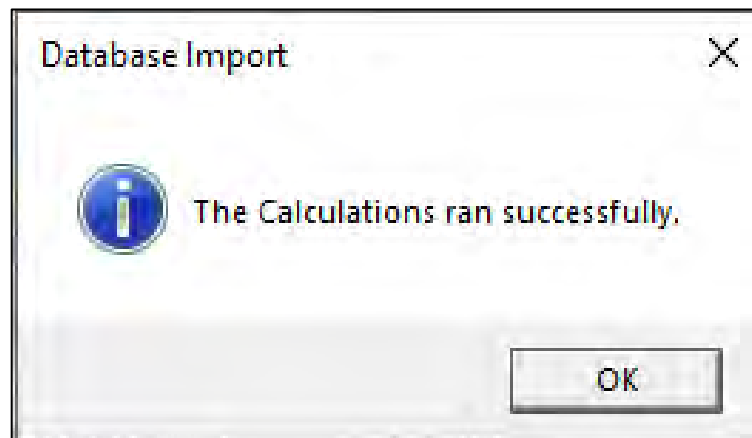
Select Directory

Overwrite All (Check to overwrite all existing records)

Select	Overwrite	Property Address	Date of Last Modification for New Record	Date of Last Modification for Existing Record				
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<b>42551 Center Street Franklinton</b>	<b>2/12/2013</b>					
		Inspector Name	Date Of Damage	Cause Of Damage	Assessment Date	Percent Damaged	Date of Last Modification	
<input type="checkbox"/>	<input type="checkbox"/>	Team 6	8/29/2012	Flood and Wind	11/2/2012	44.2	11/2/2012	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<b>22221 Main Road Franklinton</b>	<b>2/12/2013</b>					
		Inspector Name	Date Of Damage	Cause Of Damage	Assessment Date	Percent Damaged	Date of Last Modification	
<input type="checkbox"/>	<input type="checkbox"/>	Team 5	8/29/2012	Flood and Wind	11/2/2012	61.2	11/2/2012	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<b>11858 Queen Road Franklinton</b>	<b>2/12/2013</b>					
		Inspector Name	Date Of Damage	Cause Of Damage	Assessment Date	Percent Damaged	Date of Last Modification	
<input type="checkbox"/>	<input type="checkbox"/>	Team 1	8/29/2012	Flood	11/2/2012	34.5	11/2/2012	
<input type="checkbox"/>	<input type="checkbox"/>	<b>48439 Tulip Highway Franklinton</b>	<b>2/12/2013</b>					
		Inspector Name	Date Of Damage	Cause Of Damage	Assessment Date	Percent Damaged	Date of Last Modification	
<input type="checkbox"/>	<input type="checkbox"/>	Team 3	8/29/2012	Flood and Wind	11/2/2012	47.3	11/2/2012	
<input type="checkbox"/>	<input type="checkbox"/>	<b>42774 Rose Drive Franklinton</b>	<b>2/12/2013</b>					
		Inspector Name	Date Of Damage	Cause Of Damage	Assessment Date	Percent Damaged	Date of Last Modification	
<input type="checkbox"/>	<input type="checkbox"/>	Team 6	8/29/2012	Flood and Wind	11/2/2012	51.7	11/2/2012	
<input type="checkbox"/>	<input type="checkbox"/>	<b>16347 Rose Road Franklinton</b>	<b>2/12/2013</b>					
		Inspector Name	Date Of Damage	Cause Of Damage	Assessment Date	Percent Damaged	Date of Last Modification	

# SDE Format Data Import

When **SDE Data Import** is complete, confirmation windows will open.



**View Search Records** (Total Number of Records: 8)

To view property cards, enter search criteria and then click Filter button.

Structure Type:  
Both

Select Custom Field:  
Make Selection...

Sort By Value:  
Make Selection...

Assessment Date:  
From: To:

Select Field:  
View All Records

Sort By Order:  
 Asc.  Desc.









Search For:

Properties Only:   
(shows only properties without assessments)

Percent Damaged:  
Min: Max:

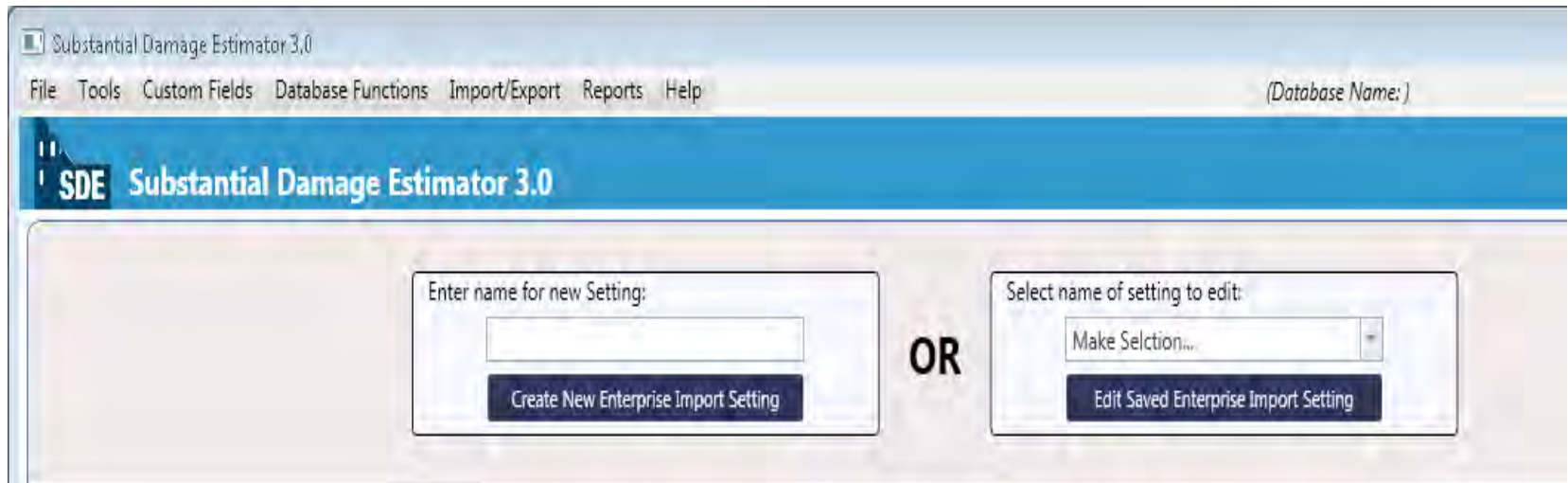
Filter

Clear

<p>No Photo Available</p>  <p><b>Assessment Date:</b> 2/23/2023 <b>Address:</b> 1234 bob <b>Damage:</b> Data Entry Incomplete</p>	 <p><b>Assessment Date:</b> 12/8/2020 <b>Address:</b> 2116 N Calcasieu <b>Damage:</b> 91.8% Substantially Damaged</p>	 <p><b>Assessment Date:</b> 11/14/2020 <b>Address:</b> 117 Ellender <b>Damage:</b> 100.0% Substantially Damaged</p>
 <p><b>Assessment Date:</b> 10/31/2020 <b>Address:</b> 107 Dean <b>Damage:</b> 95.2% Substantially Damaged</p>	 <p><b>Assessment Date:</b> 12/23/2020 <b>Address:</b> 7843 Hwy 27 S <b>Damage:</b> 99.5% Substantially Damaged</p>	 <p><b>Assessment Date:</b> 11/13/2020 <b>Address:</b> 131 Devall <b>Damage:</b> 100.0% Substantially Damaged</p>
 <p><b>Assessment Date:</b> 11/23/2020 <b>Address:</b> 305 A-C Woodruff <b>Damage:</b> 0.0% No Physical Damage Sustained</p>	 <p><b>Assessment Date:</b> 10/30/2020 <b>Address:</b> 539 Mermentau River <b>Damage:</b> 97.8% Substantially Damaged</p>	

**Method 2: Enterprise Import** of property data from a non-SDE source.

- Only property-level data in Excel can be imported using the *Enterprise Import* function.
- Assessment data can only be imported from SDE exports.



The screenshot shows the 'Substantial Damage Estimator 3.0' application window. The title bar reads 'Substantial Damage Estimator 3.0'. The menu bar includes 'File', 'Tools', 'Custom Fields', 'Database Functions', 'Import/Export', 'Reports', and 'Help'. A '(Database Name:)' field is visible in the top right corner. The main window features a blue header with the SDE logo and the text 'Substantial Damage Estimator 3.0'. Below the header, there are two options for managing settings, separated by the word 'OR'. The left option is 'Enter name for new Setting:', which includes a text input field and a 'Create New Enterprise Import Setting' button. The right option is 'Select name of setting to edit:', which includes a dropdown menu with 'Make Selection...' and an 'Edit Saved Enterprise Import Setting' button.

# SDE Fields for Enterprise Import

Owner's First and Last Names	Community NFIP ID
Lot Number	FIRM Panel
Parcel Number	FIRM Zone
Address Lines 1 and 2	BFE
Street Suffix	Suffix
Cardinal (N, E, S, W) or quadrant directions (NW, SW, NE, SE) either preceding or following (structure type)the street name	Residential or Non-Residential Structure Type
Apartment, Unit, etc.	Phone Number
City	Date of FIRM Panel
State	Regulatory Floodway (Yes, No or Possible)
County	Subdivision
Zip Code	First Floor Elevation
Year of Construction	Datum
Longitude	Total Square Footage
Latitude	Custom Fields (Max 3)
Community Name	



# SDE Enterprise Import

Reports, Imports/Exports, and GeoFiles

- Enter Default Data
- Add New Property
- Save Enterprise Import Mappings
- Import/Export Functions**
- Add New F Assess

Select the option you would like to use:

- Import SDE Data
- Export SDE Data
- Enterprise Import**
- Export Files to Excel
- Import/Export User Settings

Close

# SDE Enterprise Import – Step 1

The screenshot shows the SDE Enterprise Import dialog box in the background. A red box labeled '1' highlights the instruction: "To use 'Enterprise Import', please select a file." with a "Get File" button below it. Below this, there are input fields for "Sheet Name" (containing "Sheet1") and a "Get File" button. In the foreground, a Windows File Explorer window is open to the path "SDE Training > New York 2023 > Demo Files". A red box labeled '2' highlights the file "EnterpriseImportDemo" in the file list. At the bottom of the File Explorer, a red box labeled '3' highlights the "Open" button. The "File name" field is empty, and the file type is set to "Excel Files".

The screenshot shows a small dialog box titled "Enterprise Import" with a close button (X) in the top right corner. The text inside the dialog box reads: "Your excel file has been loaded." At the bottom of the dialog box, a red box labeled '4' highlights the "OK" button.

# SDE Enterprise Import – Step 2

Substantial Damage Estimator 3.0  
Main Menu | File | Tools | Custom Fields | Database Functions | Import/Export | Reports | Help  
(Database Name: (Database Name Not Entered))

**SDE Substantial Damage Estimator 3.0**

**Enterprise Import**

To use "Enterprise Import", please select a file.

Get File

Please set these options for MS Excel Import

Enter the existing name of the sheet from the selected file.

Sheet Name: Sheet1

[Click here to format your Excel sheet](#) **5**

**Enterprise Import**

Does this Excel sheet contain column headers?

**6**

Substantial Damage Estimator 3.0  
Main Menu | File | Tools | Custom Fields | Database Functions | Import/Export | Reports | Help  
(Database Name: (Database Name Not Entered))

**SDE Substantial Damage Estimator 3.0**

**Enterprise Import**

To use "Enterprise Import", please select a file.

Get File

Please set these options for MS Excel Import

Enter the existing name of the sheet from the selected file.

Sheet Name: Sheet1 [Click here to format your Excel sheet](#)

First Name	Last Name	Street Number	Street Name	Street Suffix	City	State	County	Zip	Year Con	Long	Lat	CID	FIRM Panel	Res or Non Res
Jeremy	Doe	12	Arizona	Ave	Amherst	NY	Suffolk	11701	2003	-75.11414	40.12329	360788	3610308428	Non-Residential
Jessy	Doe	20	Arizona	Ave	Olney	NV	Suffolk	11701	2010	-75.11298	40.12259	360788	3610308428	Residential
James	Doe	45	Connecticut	Ave	Rockville	NV	Suffolk	11701	1990	-75.11609	40.12172	360788	3610308428	Residential
Johanna	Doe	62	Connecticut	Ave	Vienna	NY	Suffolk	11701	1981	-75.11499	40.12297	360788	3610308428	Residential
Juliana	Doe	79	Kentucky	Ave	Fairfax	NV	Suffolk	11701	1993	-75.11081	40.12492	360788	3610308428	Residential
John	Doe	260	Ketchum	Ave	Columbia	NV	Suffolk	11701	1980	-75.11233	40.12418	360788	3610308428	Residential
Jerry	Doe	271	Ketchum	Ave	Colden	NV	Suffolk	11701	1987	-75.11169	40.12306	360788	3610308428	Non-Residential
Jacob	Doe	112	Minnesota	Ave	Holland	NV	Suffolk	11701	2001	-75.11451	40.12602	360788	3610308428	Non-Residential
Jakson	Doe	125	Minnesota						-75.11963	40.12667	360788	3610308428	Residential	
Joseph	Doe	220	Pennsylvania						-75.10984	40.12567	360788	3610308428	Non-Residential	
Jillian	Doe	234	Pennsylvania						-75.11076	40.12590	360788	3610308428	Non-Residential	

**Enterprise Import**

Your imported columns have been populated in the Select Fields.

**8**

[Click to use table above to map data](#) **7**

# SDE Enterprise Import – Step 3

Substantial Damage Estimator 3.0

Main Menu File Tools Custom Fields Database Functions Import/Export Reports Help (Database Name: (Database Name Not Entered))

**SDE Substantial Damage Estimator 3.0**

**Map Your Data**

(The columns from the table above have been extracted and loaded into the 'Select a Field' controls below. Use 'Select a Field' controls to map the data from the table above.)

Saved "Enterprise Import Column Mappings" are pre-defined settings that have been created by the user to help aid in pre-populating the column field mappings below. (Note: You will still need to select the parsing method where applicable.)

Make Selection...

Owner/Address Information

<b>Structure Owner First Name:</b> Mapped Column Name	<b>Structure Owner Last Name:</b> Mapped Column Name	<b>Phone Number:</b> Mapped Column Name	<b>Street Number:</b> Mapped Column Name	<b>Street Name:</b> Mapped Column Name
Select a Field	Select a Field	Select a Field	Select a Field	Select a Field
Parsing Make Selection...	Parsing Make Selection...		Parsing Make Selection...	Parsing Make Selection...

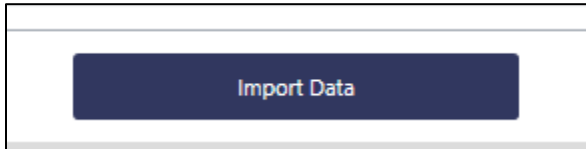
Community Information

<b>NFIP Community ID:</b> Mapped Column Name	<b>NFIP Community Name:</b> Mapped Column Name	<b>Latitude:</b> Mapped Column Name	<b>Longitude:</b> Mapped Column Name
Select a Field	Select a Field	Select a Field	Select a Field

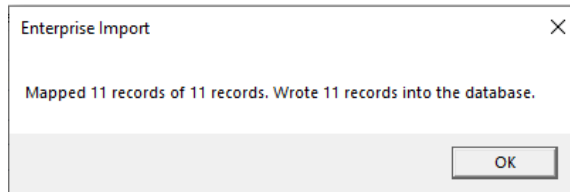
Subdivision Information

<b>Subdivision:</b> Mapped Column Name	<b>Parcel Number:</b> Mapped Column Name	<b>Lot Number:</b> Mapped Column Name	<b>Datum:</b> Mapped Column Name	<b>First Floor Elevation:</b> Mapped Column Name
Select a Field	Select a Field	Select a Field	Select a Field	Select a Field

# SDE Enterprise Import – Step 4

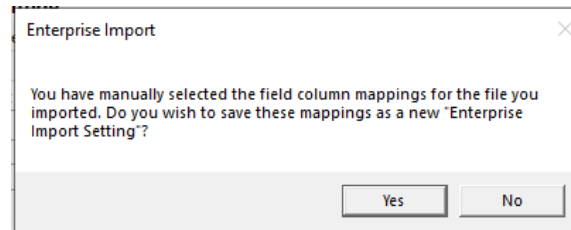


1

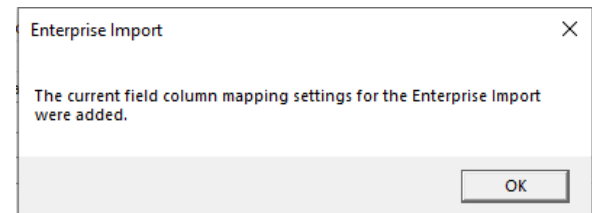


2

3



4



# SDE Enterprise Import – Step 5

Substantial Damage Estimator 3.0

Main Menu File Tools Custom Fields Database Functions Import/Export Reports Help (Database Name: (Database Name Not Entered))

**SDE Substantial Damage Estimator 3.0**

**View Search Records** (Total Number of Records: 11)  
To view property cards, enter search criteria and then click Filter button.

Structure Type: Both

Select Custom Field: Make Selection...

Sort By Value: Make Selection...

Assessment Date: From: To:

Select Field: View All Records

Sort By Order:  Asc.  Desc.

Search For: Properties Only: (shows only properties without assessments)

Percent Damaged: Min: Max: Filter Clear

Assessment Date: Address: 12 Arizona Damage: %	Assessment Date: Address: 62 Connecticut Damage: %	Assessment Date: Address: 271 Ketcham Damage: %	Assessment Date: Address: 220 Pennsylvania Damage: %
Assessment Date: Address: 20 Arizona Damage: %	Assessment Date: Address: 79 Kentucky Damage: %	Assessment Date: Address: 112 Minnesota Damage: %	Assessment Date: Address: 234 Pennsylvania Damage: %
Assessment Date: Address: 45 Connecticut Damage: %	Assessment Date: Address: 260 Ketcham Damage: %	Assessment Date: Address: 125 Minnesota Damage: %	

**Current Record Detail**

Structure Owner: Jeremy Doe

Address: 12 Arizona

NIFP Community ID: 360788 NIFP Community:

Assessment Date: Inspector:

Percent Damaged: %

View / Edit Property Info Delete Property

# Create SDE Assessment

## Please Select a Property

Structure Owner Name	Property Address	County/Parish	Parcel Number	Lot Number	Subdivision	Year of Construction
Not Provided Not Provi...	1008 We...	Duval	05037200...			1900
Not Provided Not Provi...	12933 He...	Duval	15787500...			1900
Not Provided Not Provi...	14054 Pi...	Duval	17928902...			1900
Not Provided Not Provi...	14074 Pi...	Duval	17928901...			1900
Not Provided Not Provi...	14221 Pl...	Duval	16089800...			1900
Not Provided Not Provi...	1824 Buc...	Duval	16097900...			1900
Not Provided Not Provi...	1834 Buc...	Duval	16098000...			1985
Not Provided Not Provi...	1844 Buc...	Duval	16098100...			1900
Not Provided Not Provi...	1944 Hov...	Duval	16528552...			1900
Not Provided Not Provi...	1976 W 2...	Duval	08730300...			1900
Not Provided Not Provi...	2018 Leo...	Duval	16499300...			1900
Not Provided Not Provi...	2040 Leo...	Duval	16499100...			1900
Not Provided Not Provi...	2075 Sun...	Duval	16494200...			1900
Not Provided Not Provi...	3526 San...	Duval	18036607...			1988
Not Provided Not Provi...	4369 Port...	Duval	18035510...			1900
Not Provided Not Provi...	4377 Port...	Duval	18035510...			1900
Not Provided Not Provi...	4389 Port...	Duval	18035510...			1900
Not Provided Not Provi...	4417 Port...	Duval	18035510...			1900
Not Provided Not Provi...	5118 Ho...	Duval	15007100...			1018

Preload using default values.

New Property

Use Selected Property


# SDE Photographs

**SDE Substantial Damage Estimator 3.0**

**Residential Assessment**

Address   Structure/Damage/NFIP   Cost   Element Percentages   Output Summary   Photos

No Photo Available



**Not Provided Not Provided**


Damage Date:  
10/7/2016

Assessment Date:  
12/2/2016

Percent Damaged:  
**48.9 %**

**Photo Upload**  
 Please do not attach more than a combined 3 MBs of photos to each assessment.

1 Use Integrated Camera   2 Select Photo to Upload   3 Edit Selected Photo




Enter Description:

4

Update/Save Description Name

Click on a photo for more details:



d2588f87-69b6-4880-97

6 Delete

5  Default Image



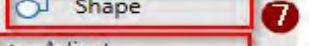
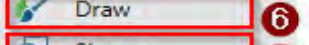
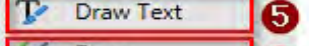
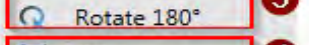
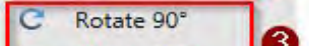
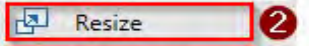
# SDE Edit Photographs

## Edit Photo

Use the folder icon below to navigate to the photo you would like to edit. For more information about the photo editing tools, click on the help icon.



### Transform



### Adjust

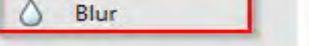
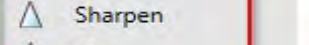
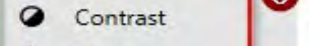
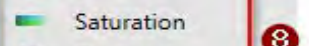
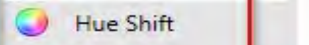


Image Preview



# SDE Data Validation

There are errors in your assessment. Please correct:

Field	Your Entry	Format
Depreciation Percentage	0	Please enter a depreciation percentage.
NFIP Community ID		Please enter a valid NFIP Community Na...
Residence Type		Please select a residence type.
Assessment Date	2/25/2023 12:00:00 AM	The Assessment Date must be after Date...
Base Cost Per Sq Ft	0.0000	Please enter a dollar value - do not use '\$...
Cause of Damage		Please enter the cause of damage for th...
Date of FIRM Panel	2/25/2023 9:01:55 PM	Date of FIRM Panel must be before today.
FIRM Zone		Please choose a FIRM Zone.
Latitude		Please provide a latitude in decimal form...
Longitude		Please provide a longitude in decimal for...
Quality		Please enter the quality of the structure.
Regulatory Floodway		Please choose a floodway type.
Year of Construction		Please enter a valid year.
Inspector's Name		Please enter the inspector's name.
Inspector's Phone		Please enter a valid phone number (with...
Mailing - City		Please enter the city for the mailing addr...
Mailing - County		Please enter the county for the mailing a...
Mailing - First Name		Please enter the first name for the mailin...
Mailing - Last Name		Please enter the last name for the mailin...
Mailing - Phone Number		Please enter a valid phone number (with...
Mailing - State		Please enter the state for the mailing ad...

Address Errors/Warnings

Close Assessment Without Saving

Save

## Data Validation

### Flags

**Red** – Required to save assessments

**Yellow** – Required to save valid assessments

**Green** – Recommended and not required

# SDE Data Validation

Assessments	
Required or Suggested	Fields
<b>Required to Save an Assessment</b>	<ol style="list-style-type: none"> <li>1. NFIP CID</li> <li>2. Date of Assessment (i.e., inspection date)</li> </ol> <p><b>Residential-specific:</b></p> <ol style="list-style-type: none"> <li>1. Residence Type</li> <li>2. Number of Stories (1, 2 or more)</li> </ol> <p><b>Non-Residential-specific:</b></p> <ol style="list-style-type: none"> <li>1. Number of Stories (1, 2-4, 5 or more)</li> <li>2. Structure Use</li> </ol>
<b>Required to Save a Valid Assessment</b> (same fields required for residential and non-residential assessments)	<ol style="list-style-type: none"> <li>1. Elevation of Lowest Floor</li> <li>2. Latitude and Longitude</li> <li>3. Year of Construction</li> <li>4. Quality (initial construction)</li> <li>5. Date Damage Occurred</li> <li>6. Cause of Damage</li> <li>7. FIRM Panel Number</li> <li>8. Date of FIRM Panel</li> <li>9. FIRM Flood Zone</li> <li>10. BFE</li> <li>11. Regulatory Floodway</li> <li>12. Base Cost Per Square Foot</li> <li>13. Depreciation Rating</li> <li>14. Depreciation Explanation (if manual depreciation value is entered)</li> </ol>
<b>Suggested</b> (same fields suggested for residential and non-residential assessments)	<ol style="list-style-type: none"> <li>1. Building Owner Name and Address Information</li> <li>2. Owner Mailing Address</li> <li>3. Inspector Name and Phone Number</li> </ol>

# SDE Tool Bulk Editor

Substantial Damage Estimator 3.0

File Tools Custom Fields Database Functions Import/Export Reports Help (Database Name,)

**SDE Substantial Damage Estimator 3.0**

**QA/QC - Bulk Editor** Total Records Displayed: 1134

Note: To fully edit all of the values for structures that have a status of 'No Physical Damage' you must first change the status within the assessment. By default, a structure with 'No Physical Damage' has a set of requirements that have been assigned to allow it to be a valid assessment.

**Export**

Structure Type	Structure Use	StoryTypeID	Subdivision	Parcel	Lot	First Floor Elevation	Datum	Assessment Date	NFIP Community Name	Community NFIP ID	Latitude
1	0	104		0503720000R		2.00		12/2/2016	Jacksonville, City of	120077	
1	0	104		1578750000R		0.50		12/3/2016	Jacksonville, City of	120077	
1	0	104		1792890230R		0.75		12/2/2016	Jacksonville, City of	120077	
1	0	104		1792890190R		1.00		12/2/2016	Jacksonville, City of	120077	
1	0	104		1608960000R		0.75		12/2/2016	Jacksonville, City of	120077	
1	0	104		1609790010R		0.25		12/2/2016	Jacksonville, City of	120077	
1	0	104		1609800000R		0.00		12/2/2016	Jacksonville, City of	120077	
1	0	104		1609810000R		0.25		12/2/2016	Jacksonville, City of	120077	
1	0	104		1652855200R		0.50		12/3/2016	Jacksonville, City of	120077	
1	0	104		0873030000R		0.00		12/2/2016	Jacksonville, City of	120077	
1	0	104		1649930000R		0.00		12/2/2016	Jacksonville, City of	120077	
1	0	104		1649910000R		1.00		12/2/2016	Jacksonville, City of	120077	
1	0	104		1649420000R		0.00		12/2/2016	Jacksonville, City of	120077	
1	0	104		1803660735R		1.50		12/2/2016	Jacksonville Beach,...	120078	
1	0	104		1803551075R		0.30		12/2/2016	Jacksonville, City of	120077	
1	0	104		1803551074R		1.00		12/2/2016	Jacksonville, City of	120077	
1	0	104		1803551072R		0.50		12/2/2016	Jacksonville, City of	120077	
1	0	104		1803551070R		1.00		12/2/2016	Jacksonville, City of	120077	
1	0	104		1599710000R		0.25		12/2/2016	Jacksonville, City of	120077	
1	0	104		1579380000R		2.00		12/3/2016	Jacksonville, City of	120077	
1	0	104		1600080000R		0.50		12/2/2016	Jacksonville, City of	120077	
1	0	104		1600140000R		0.00		12/2/2016	Jacksonville, City of	120077	
1	0	104		0833640000R		2.00		12/2/2016	Jacksonville, City of	120077	
1	0	104		1600370000R		0.75		12/2/2016	Jacksonville, City of	120077	
1	0	104		0559980000R		1.50		12/2/2016	Jacksonville, City of	120077	
1	0	104		0559980000R		1.50		12/2/2016	Jacksonville, City of	120077	
1	0	104		0211790000R		0.00		12/2/2016	Jacksonville, City of	120077	
1	0	104		1692020000R		99.00		12/5/2016	Jacksonville, City of	120077	

SDE is a tool provided by FEMA to help local officials administer the substantial damage requirements of their floodplain management ordinance in accordance with the minimum requirements of the NFIP

Total Number of Properties: **1131** Total Number of Assessments: **1131**

- 1. Export SDE Data** – for use only within the SDE tool.
  - It includes photographs.
- 2. Export Data to Excel** – one-way export.
  - Use SDE filters to export by:
    - Structure type.
    - Inspection date.
    - Percent damaged.
    - Eight other filter categories.

# SDE Tool Export

Reports, Imports/Exports, and GeoFiles

Enter Default Data    Add New Property

Home    Add New Report Assessment

Saved Enterprise Import Mappings    **Import/Export Functions**

Select the option you would like to use:

**Import SDE Data**    **Export SDE Data**    Enterprise Import    Export Files to Excel    Import/Export User Settings

Close

**Export SDE Data**

Structure Type:

Select Field:

Search For:

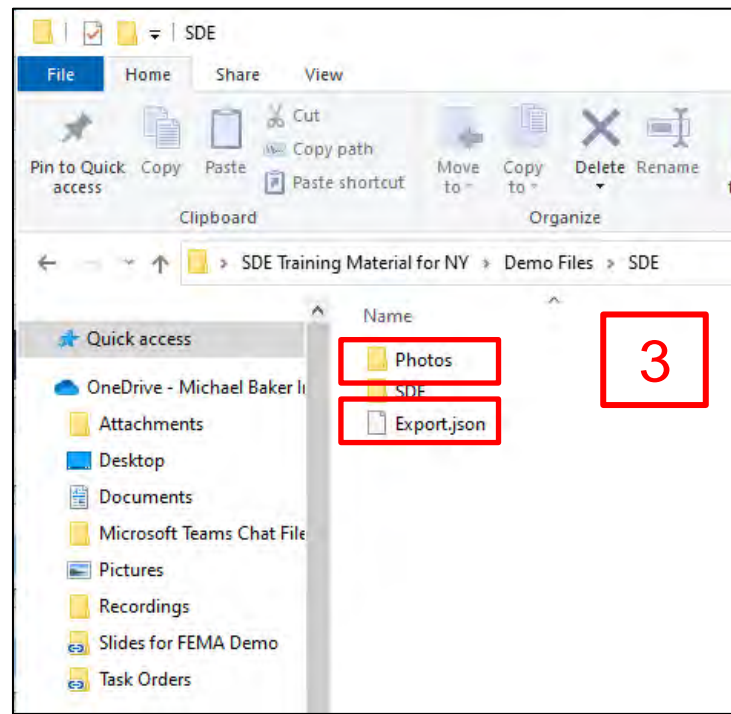
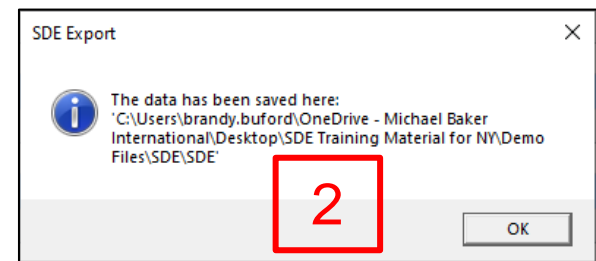
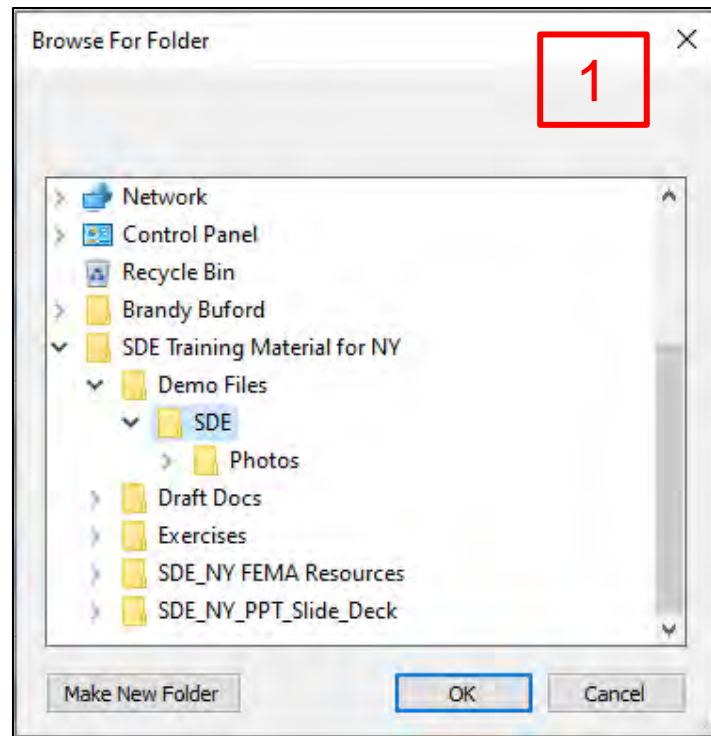
Use Assessment Date?

Assessment Date: From:  To:

Percent Damaged: Min:  Max:

Select	Structure Type	Structure Owner Name	Street Address	City	County/Parish
<input checked="" type="checkbox"/>	Non-Residential	Not Provided Not...	305 A-C Wood...	Lake Charles	Calcasieu
	Assessment Date	Percent Damaged	Inspector Name		
<input checked="" type="checkbox"/>	11/23/2020	0.0	TEAM7		
<input checked="" type="checkbox"/>	Non-Residential	Not Provided Not...	7843 Hwy 27 S	Sulphur	Calcasieu
	Assessment Date	Percent Damaged	Inspector Name		
<input checked="" type="checkbox"/>	12/23/2020	99.5	TEAM1		
<input checked="" type="checkbox"/>	Residential	Not Provided Not...	107 Dean	Grand Chenier	Cameron
	Assessment Date	Percent Damaged	Inspector Name		
<input checked="" type="checkbox"/>	10/31/2020	95.2	TEAM1		
<input checked="" type="checkbox"/>	Residential	Not Provided Not...	131 Devall	Hackberry	Cameron
	Assessment Date	Percent Damaged	Inspector Name		
<input checked="" type="checkbox"/>	11/13/2020	100.0	TEAM10		

# SDE Tool Export





# SDE Excel Export

Reports, Imports/Exports, and GeoFiles

The screenshot displays the main interface of the SDE software. On the left, there are four large blue buttons: 'Enter Default Data' (document icon), 'Add New Property' (document with plus icon), 'Add New Re Assessment' (house icon), and 'Add New Re Assessment' (building icon). On the right, under the heading 'Reports, Imports/Exports, and GeoFiles', there are two green buttons: 'Saved Enterprise Import Mappings' (document icon) and 'Import/Export Functions' (document with double arrows icon). The 'Import/Export Functions' button is highlighted with a red border. A white dialog box is overlaid on the bottom half of the screen, titled 'Select the option you would like to use:'. It contains five green buttons: 'Import SDE Data' (left arrow in square), 'Export SDE Data' (right arrow in square), 'Enterprise Import' (hand pointing down), 'Export Files to Excel' (X with right arrow), and 'Import/Export User Settings' (gear). The 'Export Files to Excel' button is highlighted with a red border. A 'Close' button is at the bottom of the dialog box.

Enter Default Data

Add New Property

Add New Re Assessment

Add New Re Assessment

Saved Enterprise Import Mappings

Import/Export Functions

Select the option you would like to use:

Import SDE Data

Export SDE Data

Enterprise Import

Export Files to Excel

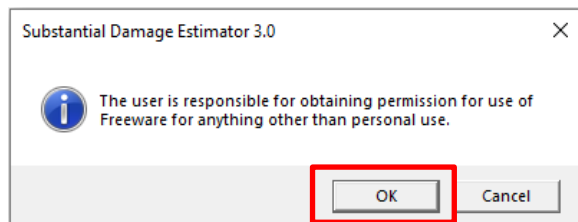
Import/Export User Settings

Close



Assessments being plotted on the GIS map:

- Select **Generate GeoFile** from the main menu.
- The function prepares the .KMZ file.



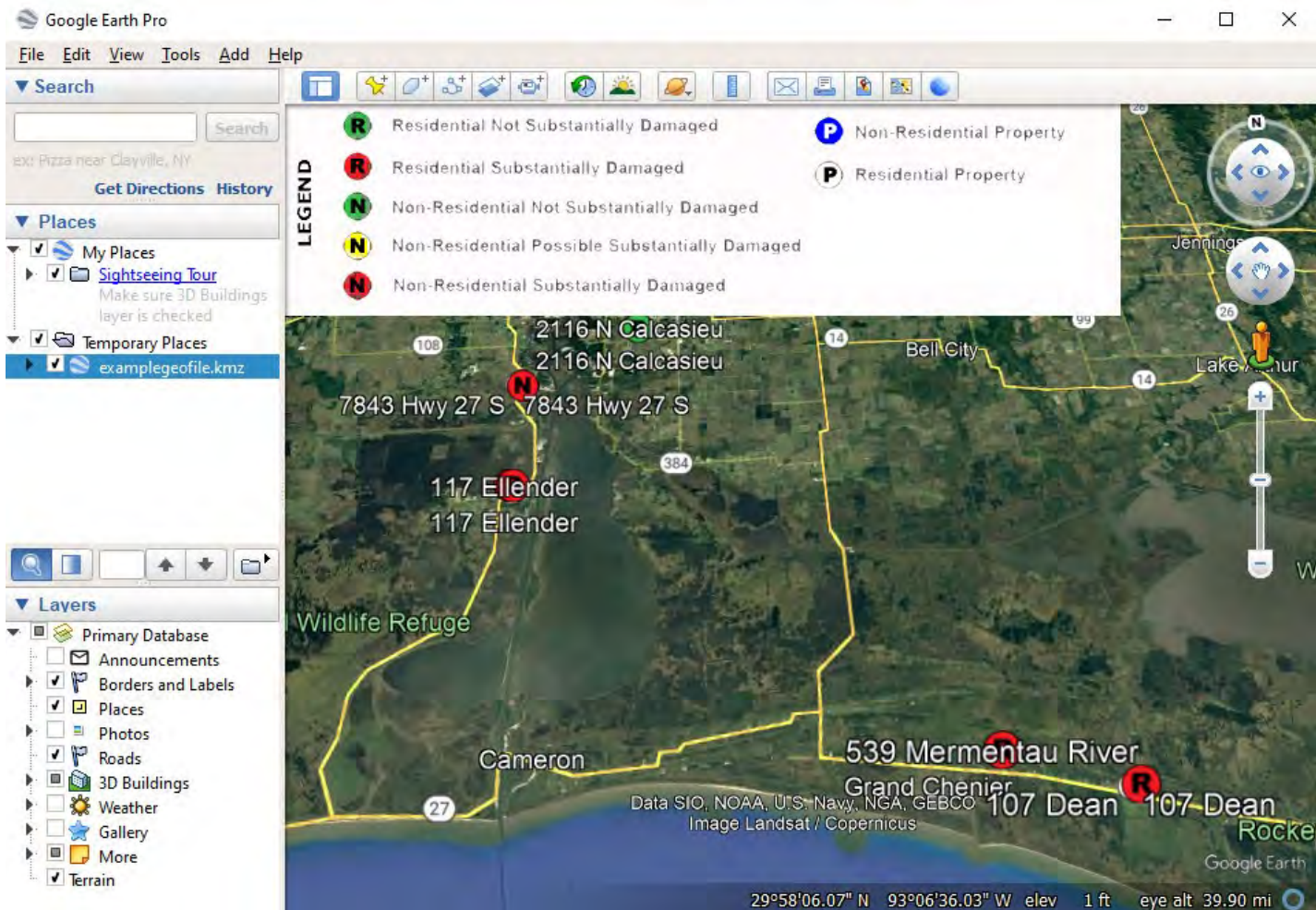
# SDE Generate GeoFile

**Generate Geo Reference File** 3 of 1132 total records selected. Generate Geo File

	Property Address	Assessment Date	Structure Owner Name	Percent Damaged	Inspector	Structure Type	City	NFIP Community ID
<input checked="" type="checkbox"/>			Not Provided	25.7	Team 3	NonResidential		
<input checked="" type="checkbox"/>			Not Provided	31.6	Team 3	NonResidential		
<input checked="" type="checkbox"/>			Not Provided	3.8	Team 1	NonResidential		
<input type="checkbox"/>			Not Provided	23.6	Team 1	NonResidential		
<input type="checkbox"/>			Not Provided	28.4	Team 1	NonResidential		
<input type="checkbox"/>			Not Provided	24.9	Team 4	NonResidential		
<input type="checkbox"/>			Not Provided	33.4	Team 4	NonResidential		
<input type="checkbox"/>			Not Provided	29.6	Team 4	NonResidential		
<input type="checkbox"/>			Not Provided	31.9	Team 4	NonResidential		
<input type="checkbox"/>			Not Provided	57.5	Team 2	NonResidential		
<input type="checkbox"/>			Not Provided	17.6	Team 1	NonResidential		
<input type="checkbox"/>			Not Provided	40.5	Team 2	NonResidential		
<input type="checkbox"/>			Not Provided	57.5	Team 2	NonResidential		
<input type="checkbox"/>			Not Provided	57.5	Team 2	NonResidential		
<input type="checkbox"/>			Not Provided	40.5	Team 2	NonResidential		
<input type="checkbox"/>			Not Provided	40.5	Team 2	NonResidential		
<input type="checkbox"/>			Not Provided	18.4	Team 1	NonResidential		
<input type="checkbox"/>			Not Provided	57.5	Team 2	NonResidential		

[Structure Owner Name] = 'Not Provided'

# SDE Generate GeoFile



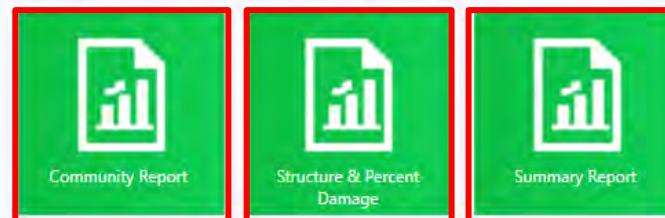
# SDE Tool Reports

The SDE tool generates four separate types of **reports**:

- **Community Report**
- **Structure and Percent Damage Report**
- **One-Page Structure Summary Report** for individual structures
- **Five-Page Detailed Structure Report** for individual structures



Select the report you would like to view:



Close

**Reports** Note: The reports are based on the filters below. If no structure type is selected, the tool will display all.

**Filter By:**

Structure Type: Residential  Use Inspection Date?  Display report(s) without photos?

Select Field: View All Records Search For:

Percent Damaged: Min:  Max:

**1**

---

1 of 6 100% Find Next **3**


**SDE Community Report**

**Community NFIP ID and Name:** 225194 CAMERON PARISH, UNINCORPORATED AREAS

**107 Dean Road, Grand Chenier, Louisiana 70643**

Assessment Date: 10/31/2020

Owner Name	Basis for Value of Structure	Basis for Cost of Repairs	Computed Actual Cash Value	Type of Structure
Not Provided, Not Provided	Computed Actual Cash Value	Computed Damages	\$117,884.16	Single Family Residence
<b>Percent Damaged</b>	\$117,884.16	\$112,254.34		
95.2 %				
<b>Other Depreciation Explanation</b>				




**2**

---

**539 Mermentau River Road, Grand Chenier, Louisiana 70643**

Assessment Date: 10/30/2020

Owner Name	Basis for Value of Structure	Basis for Cost of Repairs	Computed Actual Cash Value	Type of Structure
Not Provided, Not Provided	Computed Actual Cash Value	Computed Damages	\$349,286.40	Single Family Residence
<b>Percent Damaged</b>	\$349,286.40	\$341,660.16		
97.8 %				
<b>Other Depreciation Explanation</b>				



2/26/2023 5:52:51 AM Page 1 of 6

# SDE Tool Reports

### Substantial Damage Estimator

<b>Subdivision</b>		<b>Community</b>	
Subdivision	Elev. of Lowest Floor	NFIP Community Name	CAMERON PARISH, UNINCORPORATED AREAS
Parcel # 0200031952	10.00 ft.	NFIP Community ID #	225194
Lot #	Datum	Latitude	29.745630
		Longitude	-92.883770

<b>Structure Address</b>	
Owner's Name	Not Provided, Not Provided
Street Address	107 Dean Road
City	Grand Chenier
County/Parish	Cameron
State	Louisiana
Zip	70643
Phone	



<b>Structure Information</b>	
Year of Construction	9999
Residence Type	Single Family Residence
Quality	Average

<b>Damage Information</b>			<b>Residence Information</b>	
Date of Assessment	10/31/2020	Date of Damage	08/27/2020	Could not get close to structure due to ongoing construction work, currently repairing foundation and super structure. estimate 1st floor at 10 feet, based on surrounding area and known food elevation assume fluffing is 13 feet, can see ceiling has to be replaced so leads to believe leakage through roof, mold seen inside ad will.
Inspector Name	TEAM1	Cause of Damage	Flood and Wind	
Inspector Phone	337-775-2800	Duration of Flood	1 Days	
		Est. Depth of Flood Above Lowest Floor	3.00	

<b>NFIP Information</b>					
Firm Panel #	Suffix	Date of FIRM Panel	Firm Zone	BFE	Regulatory Floodway
22023C1075H	H	11/16/2012	AE	13.00	No

<b>Percent Damaged</b>		
Basis for Value of Structure	Percent Damaged	Basis for Cost of Repairs
\$117,884.16	95.2 %	\$112,254.34
Computed Actual Cash Value	Substantially Damaged	Computed Damages

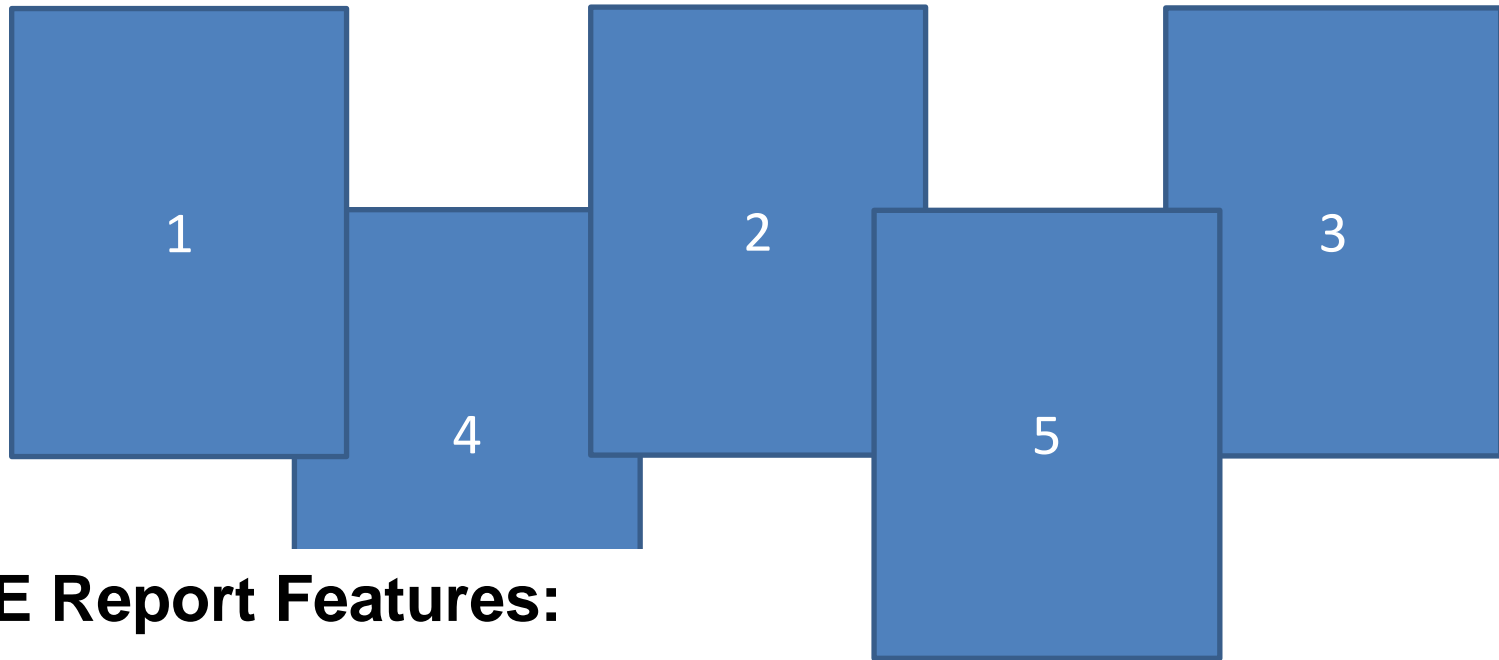
<b>Damage Summary</b>			
Replacement Cost	\$155,520.00	Computed Damages	\$112,254.34
Depreciation %	24.2 %	Percent of Existing Improvements and Repairs Pre-Disaster	
Computed Actual Cash Value*	\$117,884.16	Repair/Reconstruction %	95.2 %
		Other Depreciation Explanation	
* Per FEMA Publication 213, Actual Cash Value may be used as Market Value.			

<b>Optional User Entered Data</b>	
Professional Market Appraisal	Contractor Estimate
Tax Assessed Value	\$0.00
Factor Adjustment	Community Estimate
Adjusted Tax Assessed Value	\$0.00

Authorized Local Official : \_\_\_\_\_ Signature      Authorized Local Official : \_\_\_\_\_ Printed Name



# SDE Tool Reports



## SDE Report Features:

- It has a fixed format, but users can export data and customize in Excel.
- There is an option to select all structures or select certain structures.
- It provides a quick view of the property owner's name, address, percent damage, and default photo.

# SDE Functions and Features for Data Quality Reviews

- Data validation flags
- Check spelling feature
- Records search
- Bulk editor tool
- Column headings can be used to sort data A to Z, or Z to A, or numerical values low to high, or high to low
- Review for outliers, unreasonable values, and inconsistent or incorrect spelling
- Errors affect credibility

# SDE Features Review

**WHAT** did we just do?

**Step 1:** The municipality imports the SDE record.

**Step 2:** Teams collect data in the field and generate SDEs.

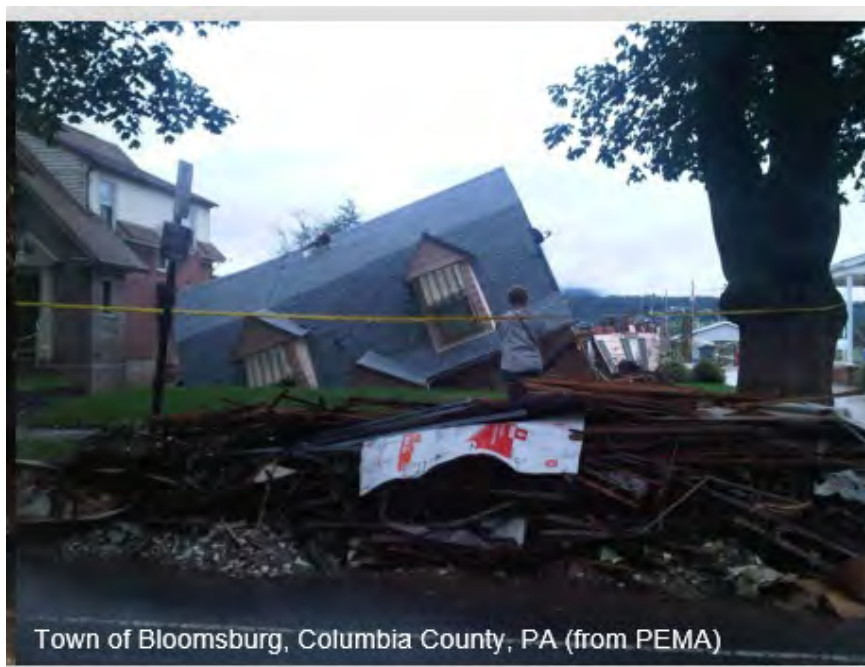
**Step 3:** Teams perform QA/QC of data.

**Step 4:** Teams export data back to the database to create an SDE assessment record.

**Step 5:** Additional QA/QC of assessments (optional).

- Default data and/or data imports useful to complete multiple assessments
- Enter all required information
- Save data before leaving each page
- Informational help buttons as needed
- Photos should be small; avoid high-definition photos
- Bulk editor to perform QA/QC
- Delete All function

# Questions?



**Flood/Wind Building Science Helpline:**  
**[FEMA-BuildingScienceHelp@fema.dhs.gov](mailto:FEMA-BuildingScienceHelp@fema.dhs.gov)**

**866.927.2104**

**<http://www.fema.gov/building-science>**

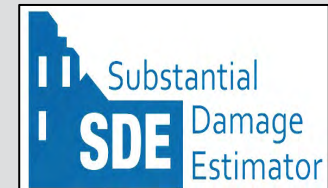
# Substantial Damage Estimation (SDE) Tool Exercises



**Federal Emergency Management Agency (FEMA)**

**Harrisburg, PA**

**June 2023**



# Unit 9 – SDE Tool Exercises

1. ALWAYS save on each page.
2. Fill in all required information.
3. Inspector name is the inspection team number.
4. Inspector phone is the community contact number, NOT the individual inspector's contact number.
5. Use informational buttons, help links and other resources.
6. Measurements must be in imperial measurements (inches must be converted to feet prior to entry into the SDE tool).
7. Percent damage estimates must be in 5% increments.
8. If an element is not included, enter zero for percent damage value.

# SDE Exercise 1 – 888 Main Road

## Select Exercise 1





# SDE Exercise 1

Review the detailed .pdf report and compare answers.

# SDE Exercise 2 – 305 Tulip Street

## Select Exercise 2



# SDE Exercise 2

Review the detailed .pdf report and compare answers.

# SDE Exercise 3 – Manufactured Home

## Select Exercise 3



# SDE Exercise 3

Review the detailed .pdf report and compare answers.

## Select Exercise 4



# SDE Exercise 4

Review the detailed .pdf report and compare answers.

# SDE Exercise 5 – 2116 Lilly Drive

## Select Exercise 5





# SDE Exercise 5

Review the detailed .pdf report and compare answers.

# SDE Exercises Reports

- Run and export the five-page detailed report for one property.
- Run and export the SDE Summary Report.
- Run and export the SDE Community Report.

# SDE Exercises Data

- Use Bulk Editor – update the Parcel Number and Owner Last Name.
- Generate the Geofile.
- Export data to Excel and view the output.
- Use SDE Export – export all data.
- Delete all data in the SDE tool.
- Import the SDE data created above.
- Delete function: Database functions, Delete All.

# Questions?



**Flood/Wind Building Science Helpline:**  
**[FEMA-BuildingScienceHelp@fema.dhs.gov](mailto:FEMA-BuildingScienceHelp@fema.dhs.gov)**  
**866.927.2104**  
**<http://www.fema.gov/building-science>**

# Substantial Damage Estimation (SDE) Best Practices



**Federal Emergency Management Agency (FEMA)**

**Harrisburg, PA**

**June 2023**



**FEMA**



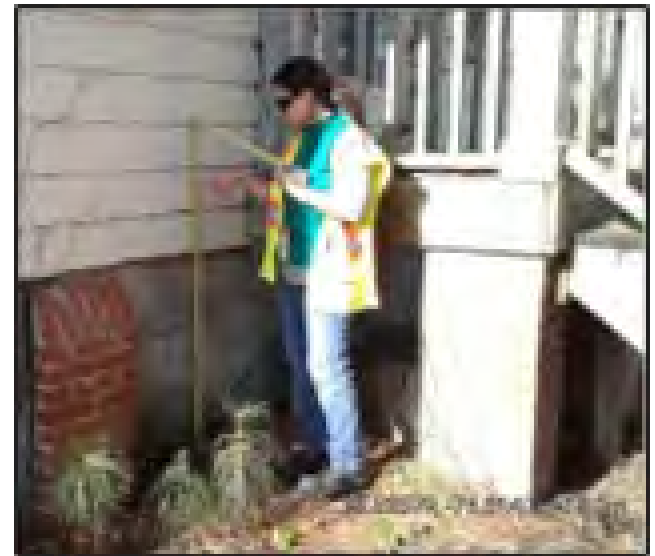
## Photographs

- Photos are not intended to show all damage.

### Recommendations:

- Take two photographs per structure – one photo of the **front or street view** and one of the **side or corner view** showing the roof.
- Take a photograph of **high-water mark** or **debris line** indicated with tape measure.

## SDE Best Practices



# SDE Tool – Photograph Requirements

- Photo size should be 640 pixels wide by 480 pixels high (640 x 480).
- Photos should be in a .JPG format.
- Photographs with a high resolution or large file sizes adversely affect the SDE tool operating speed.



# Photography Best Practice

- **Photograph quality:**  
Photo must be clear; structure to fill at least 75% of photograph.
- **Elevated structures:**  
One photograph with perspective and scale on the structure's height/elevation above grade level.



Structure too far away



Photo too dark



Photo taken too close & doesn't show full structure



Dry erase board not visible



# SDE Tool Data Quality Assurance/Control

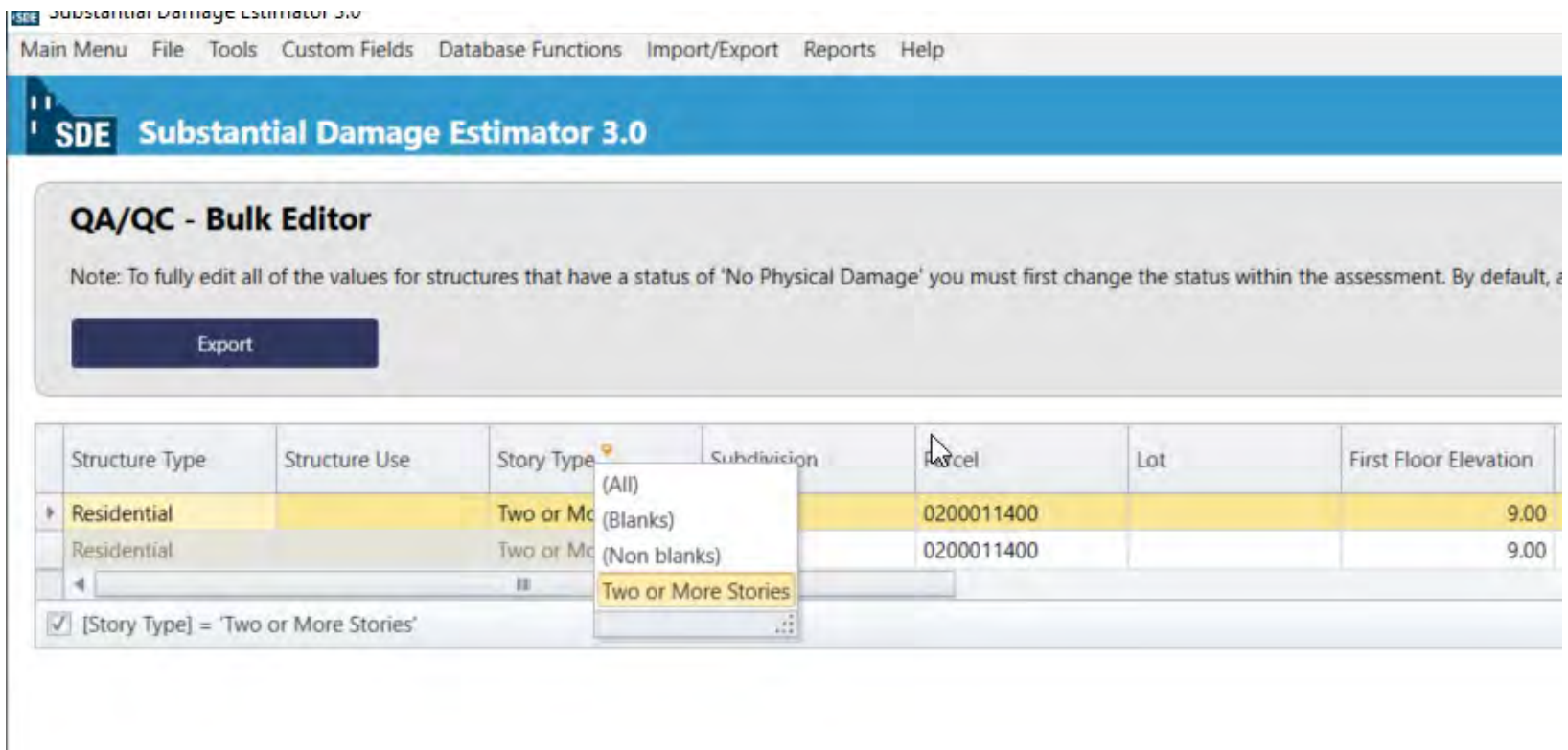
Inspection data for each team should be reviewed daily for the following:

- Completeness of SDE assessments and records.
- Consistency in SDE data entry.
- Structure area/square feet.
- Structure attributes.
- Structure element and percent damage.
- Floodwater depth.
- Comparison of data with recorded floodwater depth.
- Analysis of structure photographs.
- Digital photograph quality.

# SDE Tool Data Quality Assurance/Quality Control

- Data validation flags.
- Check spelling feature.
- Records search.
- Bulk editor tool.
- Column headings can be used to sort data:
  - Alphabetically A to Z or Z to A.
  - Numerically low to high or high to low.
- Review for outliers, unreasonable values and inconsistent or incorrect spelling.
- Errors affect credibility.

Use headings in the **Bulk Property Editor** to sort columns and find outliers, typos and misspellings.



The screenshot shows the 'QA/QC - Bulk Editor' window in the SDE Substantial Damage Estimator 3.0 application. The window title is 'Substantial Damage Estimator 3.0' and the menu bar includes 'Main Menu', 'File', 'Tools', 'Custom Fields', 'Database Functions', 'Import/Export', 'Reports', and 'Help'. Below the title bar, there is a blue header with the SDE logo and the text 'Substantial Damage Estimator 3.0'. The main content area is titled 'QA/QC - Bulk Editor' and contains a note: 'Note: To fully edit all of the values for structures that have a status of 'No Physical Damage' you must first change the status within the assessment. By default, ...'. Below the note is a dark blue 'Export' button. The main part of the interface is a data table with the following columns: 'Structure Type', 'Structure Use', 'Story Type', 'Subdivision', 'Parcel', 'Lot', and 'First Floor Elevation'. The table contains two rows of data, both highlighted in yellow. The first row has 'Residential' for Structure Type and Use, 'Two or More Stories' for Story Type, and '0200011400' for Parcel and Lot, with a First Floor Elevation of 9.00. The second row has 'Residential' for Structure Type and Use, 'Two or More Stories' for Story Type, and '0200011400' for Parcel and Lot, with a First Floor Elevation of 9.00. A dropdown menu is open over the 'Story Type' column, showing options: '(All)', '(Blanks)', '(Non blanks)', and 'Two or More Stories'. At the bottom of the table, there is a filter bar with a checked checkbox and the text '[Story Type] = 'Two or More Stories''. The application title bar at the top left reads 'SDE Substantial Damage Estimator 3.0'.

Structure Type	Structure Use	Story Type	Subdivision	Parcel	Lot	First Floor Elevation
Residential	Residential	Two or More Stories		0200011400		9.00
Residential	Residential	Two or More Stories		0200011400		9.00

Filter:  [Story Type] = 'Two or More Stories'

# SDE Tool Save Property Inspection Data and Review Errors

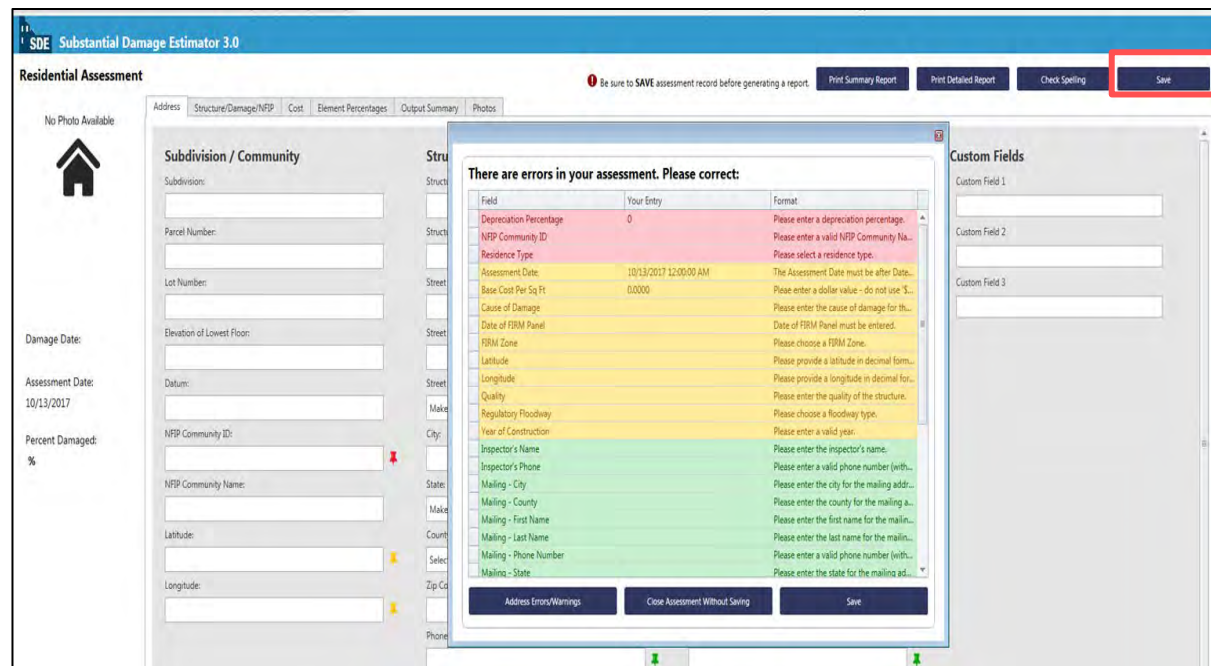
- You **MUST** hit **SAVE** for each record before navigating to the main menu or you will lose all changes without warning!
  - Double-check to make sure the assessment is **COMPLETE**.
  - Triple-check Square Footage – it will not provide an error warning if empty.

## Data Entry Fields in the SDE Tool

**Red** – Required to save the assessment

**Yellow** – Required to save a *valid* assessment

**Green** – Recommended, not required



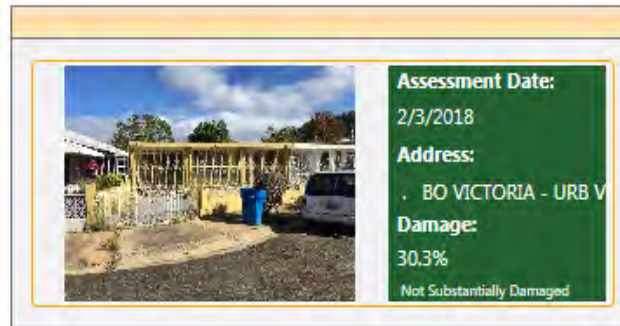
The screenshot shows the SDE Substantial Damage Estimator 3.0 interface. The main window is titled "Residential Assessment" and contains various input fields for property information. A dialog box titled "There are errors in your assessment. Please correct:" is open, listing several errors with their respective field names and suggested corrections. The errors are color-coded: red for required fields, yellow for valid assessment fields, and green for recommended fields. The dialog box also includes buttons for "Address Errors/Warnings", "Close Assessment Without Saving", and "Save".

Field	Your Entry	Format
Depreciation Percentage	0	Please enter a depreciation percentage.
NFP Community ID		Please enter a valid NFP Community No.
Residence Type		Please select a residence type.
Assessment Date	10/13/2017 12:00:00 AM	The Assessment Date must be after Date...
Base Cost Per Sq Ft	0.0000	Please enter a dollar value - do not use '\$...
Cause of Damage		Please enter the cause of damage for th...
Date of FRM Panel		Date of FRM Panel must be entered.
FRM Zone		Please choose a FRM Zone.
Latitude		Please provide a latitude in decimal form...
Longitude		Please provide a longitude in decimal for...
Quality		Please enter the quality of the structure.
Regulatory Floodway		Please choose a floodway type.
Year of Construction		Please enter a valid year.
Inspector's Name		Please enter the inspector's name.
Inspector's Phone		Please enter a valid phone number (with...
Mailing - City		Please enter the city for the mailing addr...
Mailing - County		Please enter the county for the mailing a...
Mailing - First Name		Please enter the first name for the mailin...
Mailing - Last Name		Please enter the last name for the mailin...
Mailing - Phone Number		Please enter a valid phone number (with...
Mailing - State		Please enter the state for the mailing ad...

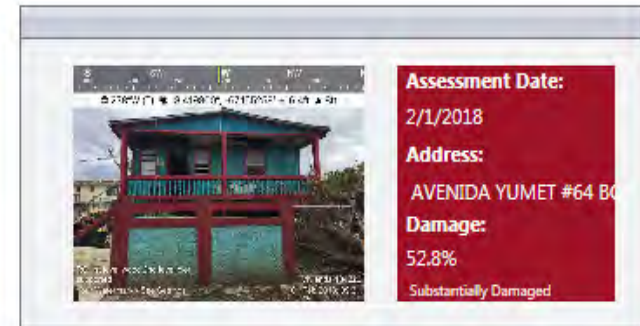
# Confirming Completeness of Property Records

After the property inspection record is **SAVED**:

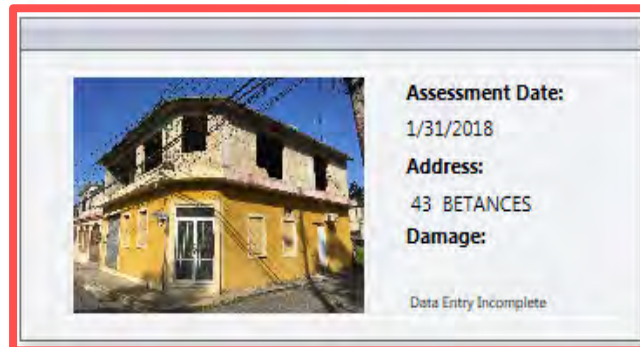
1. Go to **View Search**.
2. Enter the **search criteria**.
3. Confirm the assessment is **not “grey.”**



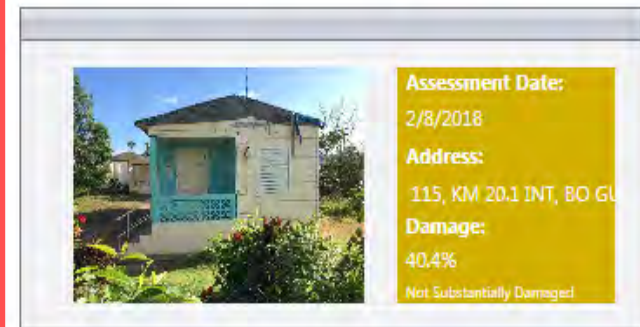
Assessment Date: 2/3/2018  
Address: BO VICTORIA - URB V  
Damage: 30.3%  
Not Substantially Damaged



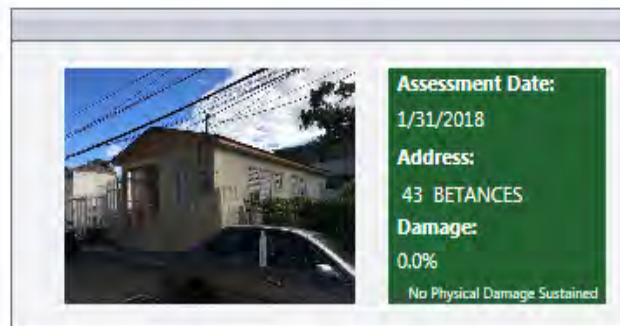
Assessment Date: 2/1/2018  
Address: AVENIDA YUMET #64 B  
Damage: 52.8%  
Substantially Damaged



Assessment Date: 1/31/2018  
Address: 43 BETANCES  
Damage:  
Data Entry Incomplete



Assessment Date: 2/8/2018  
Address: 115, KM 20.1 INT, BO GU  
Damage: 40.4%  
Not Substantially Damaged



Assessment Date: 1/31/2018  
Address: 43 BETANCES  
Damage: 0.0%  
No Physical Damage Sustained



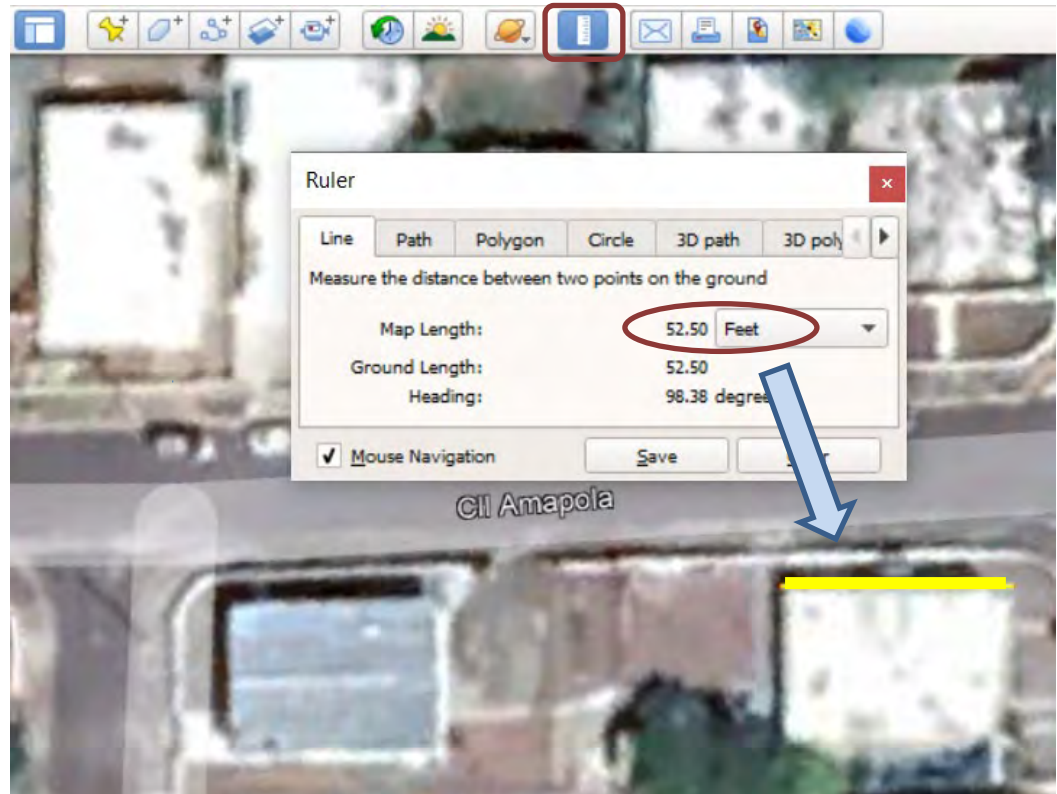
Assessment Date: 2/8/2018  
Address:  
Damage: 22.6%  
Not Substantially Damaged

# Using Visual Checks for Quality Control

Compare **number of stories** and **footprint area/size** to structure photos and aerial imagery.

Use **Google Earth** as supplemental aid:

- Ruler tool.
- Street view.

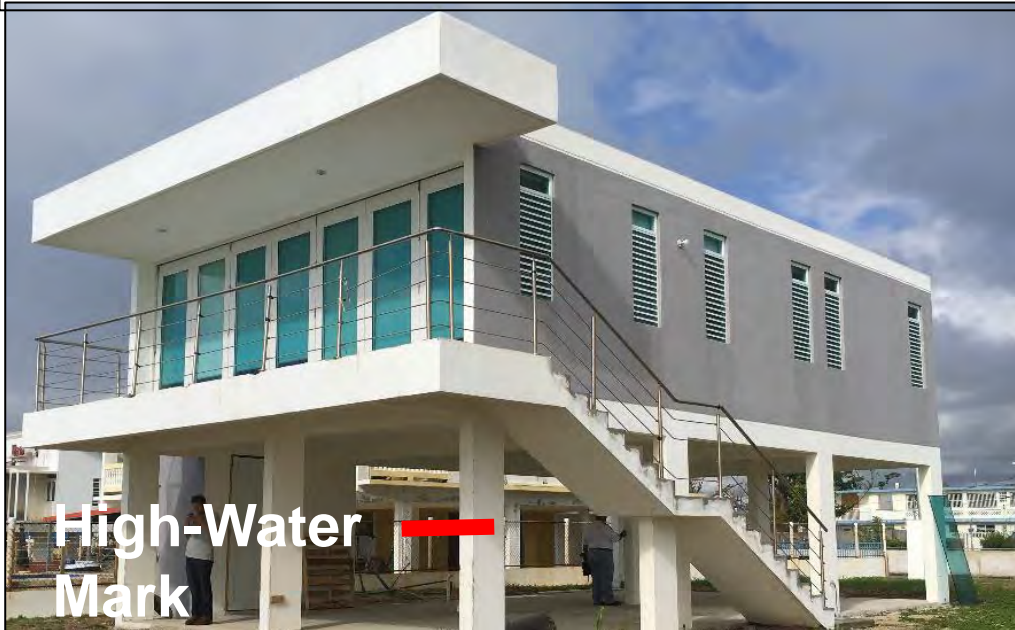


# Visual Checks for Quality Control

Compare percent damage to structure photographs.

**Example:** Do these percent damage estimates match your visual observations?

If not, this structure requires additional field observation.



## Element Percentages

Element:	Percent Damaged:
Foundation:	0.0%
Superstructure:	50.0%
Roof Covering:	50.0%
Exterior Finish:	50.0%
Doors and Windows:	50.0%
Cabinets and Countertops:	0.0%
Floor Finish:	0.0%
Plumbing:	50.0%
Electrical:	100.0%
Appliances:	100.0%
Interior Finish:	100.0%
HVAC:	0.0%

# SFHA Property Inventory

Maintain structure inventories in SDE databases to prepare for future SDE inspections.

- Pre-populate property-level data for structures in the Special Flood Hazard Area (SFHA).
- Maintain/update SDE databases and SFHA maps.
- Prepare in *“blue-sky days”* **BEFORE** disasters strike!



**SDE Assessments and Inspections in Areas Located Outside SFHA:**  
Either avoid entirely or defer these inspections until after the areas inside the regulated SFHA are completed.



# Questions?



**Flood/Wind Building Science Helpline:**  
**[FEMA-BuildingScienceHelp@fema.dhs.gov](mailto:FEMA-BuildingScienceHelp@fema.dhs.gov)**  
**866.927.2104**  
**<http://www.fema.gov/building-science>**

# Substantial Damage Estimation (SDE) Resources & Final Comments



**Federal Emergency Management Agency (FEMA)**

**Harrisburg, PA**

**June 2023**



**FEMA**



## FEMA SDE and Recovery Resources



Answers to Questions  
About Substantially Improved/  
Substantially Damaged  
Buildings

FEMA 213 / August 2018



Substantial Improvement/  
Substantial Damage  
Desk Reference

FEMA P-758 / May 2010

**Substantial Damage Estimator Tool**

English

To be considered "substantially damaged," a building in a flood hazard area must meet a set of criteria and comply with certain requirements.

FEMA uses the term "substantial damage" to trigger a review of compliance with building code requirements applied to damaged buildings in flood hazard areas.

Those requirements are:

1. The current community floodplain management regulations, and
2. The flood provisions of the [International Codes](#).

Substantial damage does not trigger all building code requirements for new construction.

Buildings must comply with flood provisions when the cost of restoring the structure to its before-damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

The SDE is a tool to help local officials administer the Substantial Damage requirements of their floodplain management ordinances in keeping with the minimum requirements of the NFP.

**FEMA**

**Job Aid**

**Public Assistance** April 2017

**Understanding Substantial Damage in the International Building Code, International Existing Building Code, or International Residential Code**

This document will help you understand the concept of Substantial Damage (SD) and how to determine if a building meets the criteria. FEMA's Public Assistance Forward Mission Standard Policy found in the Public Assistance Program and Policy Guide, Chapter 2 – Section VI.B.2.1 requires that projects receiving FEMA assistance for repair or replacement incorporate the national hazard-related provisions of the most recent editions of the International Code Council's (ICC) International Building Code (IBC), International Existing Building Code (IEBC), and/or International Residential Code (IRC), known collectively as the I-Codes. The Policy applies to buildings that have received designations of Substantial Structural Damage, Substantial Damage, or are eligible for replacement in accordance with 44 CFR Part 106.226(f).

**CONFORMING AND NON-CONFORMING BUILDINGS**

Conforming buildings meet a community's current floodplain management requirements and current flood provisions of the building code. Non-conforming buildings do not usually fit one of the following responses: 1) they were built before flood requirements were adopted, or 2) were built after the first flood requirements were adopted, but before those requirements were subsequently changed. A change in the Flood Insurance Rate Map or floodplain management requirements of building code flood provisions can lead to non-conformance.

**Background**

Substantial Damage (SD) is a trigger applied to damaged buildings in flood hazard areas<sup>1</sup> that requires those buildings to be brought into compliance or to maintain compliance with: 1) the current community floodplain management regulations, and 2) the flood provisions of the I-Codes. Substantial Damage does not trigger all building code requirements for new construction. The Substantial Damage trigger is activated when damage of any origin is sustained by the structure, whereby the cost of restoring the structure to its before-damage condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

Substantial Damage is related to Substantial Improvement (SI). Substantial Improvement is another trigger applied to non-conforming buildings in flood hazard areas and, like Substantial Damage, requires those buildings to maintain or be brought into compliance with the current floodplain management regulations and flood provisions of the I-Codes. The Substantial Improvement trigger is activated when the sum of the improvement costs and the costs of any repair performed at the same time, equals or exceeds 50 percent of the market value of the building before the improvement or damage occurred.

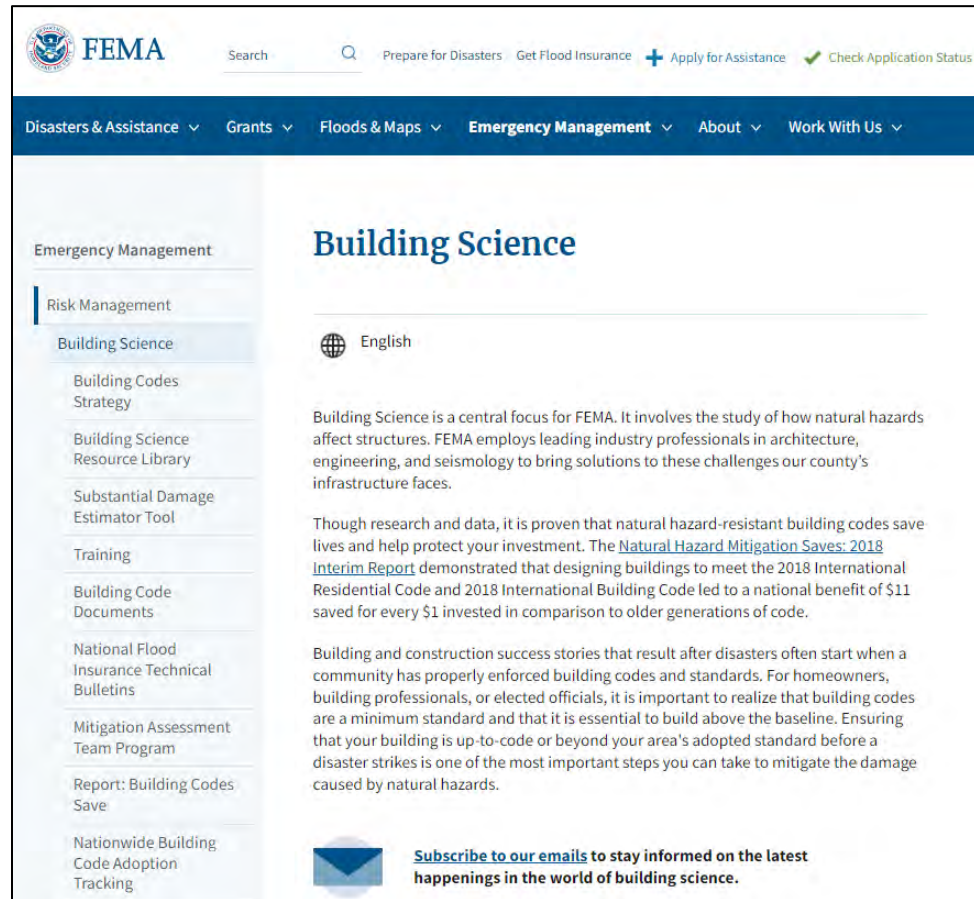
For building code and floodplain management purposes, Substantial Damage is considered a part of Substantial Improvement, and any costs of repair, reconstruction, or rehabilitation are combined with any improvement costs into

1 FEMA Public Assistance Program and Policy Guide 19104-008-2, April 2017.  
2 For the 2012 IRC, a flood hazard area is defined in the greater of the following two ways: The area within a flood plain subject to a 1% general or special flood hazard or any area of a flood hazard area in a community's flood hazard map, or within a high flood hazard area.

# FEMA Building Science SDE Resources

**FEMA Building Science Website:** Search “FEMA Building Science”

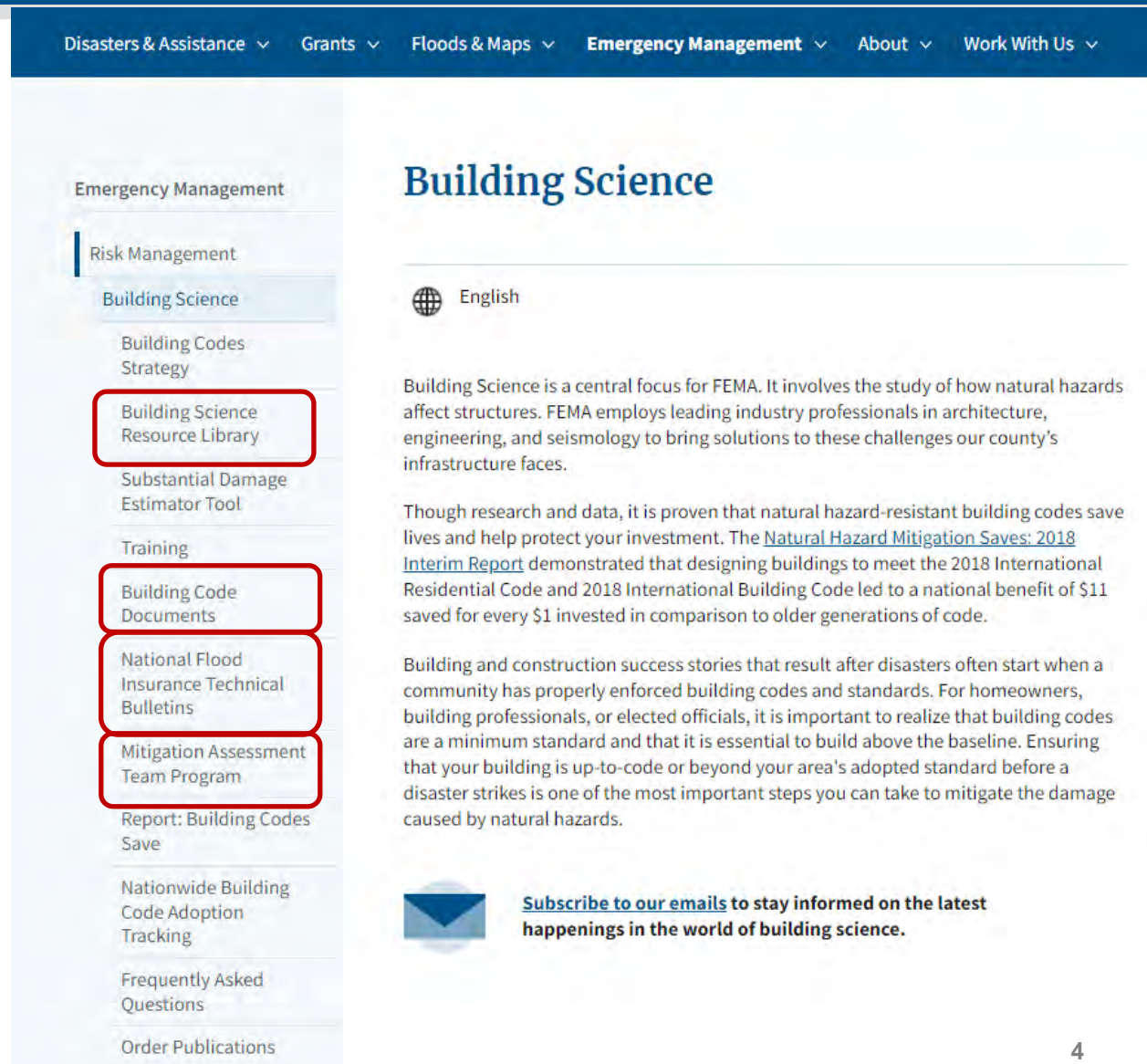
<https://www.fema.gov/emergency-managers/risk-management/building-science>



The screenshot shows the FEMA Building Science website. At the top, there is a search bar and navigation links for "Prepare for Disasters", "Get Flood Insurance", "Apply for Assistance", and "Check Application Status". Below this is a dark blue navigation bar with dropdown menus for "Disasters & Assistance", "Grants", "Floods & Maps", "Emergency Management", "About", and "Work With Us". The main content area features a left sidebar with "Emergency Management" and "Risk Management" sections. The "Building Science" link is highlighted in the sidebar. The main content area has a "Building Science" heading, a language selector set to "English", and two paragraphs of text. The first paragraph describes Building Science as a central focus for FEMA, involving the study of how natural hazards affect structures. The second paragraph states that research and data prove that natural hazard-resistant building codes save lives and help protect investment, citing a 2018 report. A third paragraph discusses building and construction success stories that result after disasters, emphasizing the importance of building codes and standards. At the bottom, there is a blue envelope icon and a call to action to "Subscribe to our emails to stay informed on the latest happenings in the world of building science."

## Other resources on the FEMA Building Science webpage:

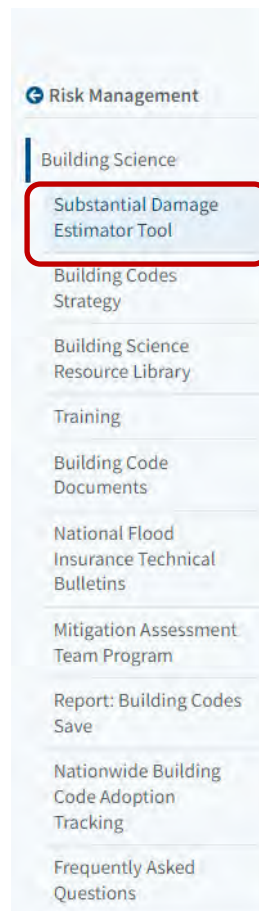
- Design/Mitigation technical guidance.
- Building code adoption.
- National Flood Insurance Program Technical Bulletins.
- Mitigation Assessment Team reports.
- Recovery Advisories and Fact Sheets.

The screenshot shows the FEMA Building Science webpage. The navigation menu at the top includes 'Disasters & Assistance', 'Grants', 'Floods & Maps', 'Emergency Management', 'About', and 'Work With Us'. The main content area is titled 'Building Science' and features a sidebar with the following categories: 'Emergency Management', 'Risk Management', 'Building Science', 'Building Codes Strategy', 'Building Science Resource Library', 'Substantial Damage Estimator Tool', 'Training', 'Building Code Documents', 'National Flood Insurance Technical Bulletins', 'Mitigation Assessment Team Program', 'Report: Building Codes Save', 'Nationwide Building Code Adoption Tracking', 'Frequently Asked Questions', and 'Order Publications'. The 'Building Science' section is highlighted in blue. Below the sidebar, there is a language selector set to 'English'. The main text describes Building Science as a central focus for FEMA, involving the study of how natural hazards affect structures. It mentions that FEMA employs leading industry professionals in architecture, engineering, and seismology to bring solutions to these challenges. A paragraph states that though research and data, it is proven that natural hazard-resistant building codes save lives and help protect your investment. It references the 'Natural Hazard Mitigation Saves: 2018 Interim Report' which demonstrated that designing buildings to meet the 2018 International Residential Code and 2018 International Building Code led to a national benefit of \$11 saved for every \$1 invested in comparison to older generations of code. Another paragraph discusses building and construction success stories that result after disasters often start when a community has properly enforced building codes and standards. For homeowners, building professionals, or elected officials, it is important to realize that building codes are a minimum standard and that it is essential to build above the baseline. Ensuring that your building is up-to-code or beyond your area's adopted standard before a disaster strikes is one of the most important steps you can take to mitigate the damage caused by natural hazards. At the bottom, there is a blue envelope icon and a call to action: 'Subscribe to our emails to stay informed on the latest happenings in the world of building science.'

## Substantial Damage Estimator (SDE) 3.0 Tool (2017):

- SDE 3.0 User Manual and Field Workbook.
- Built-in help menus and informational buttons.
- Residential and Nonresidential Inspection forms (for manual data collection).
- Substantial Damage Policy, Regulatory and Guidance Information.
- Substantial Damage Estimator Best Practices (2017).



## Substantial Damage Estimator Tool

English

To be considered "substantially damaged," a building in a flood hazard area must meet a set of criteria and comply with certain requirements.

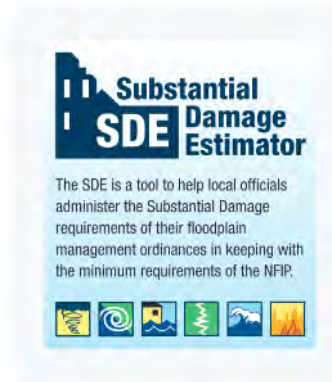
FEMA uses the term "substantial damage" to trigger a review of compliance with building code requirements applied to damaged buildings in flood hazard areas.

Those requirements are:

1. The current community floodplain management regulations, and
2. The flood provisions of the [International Codes](#).

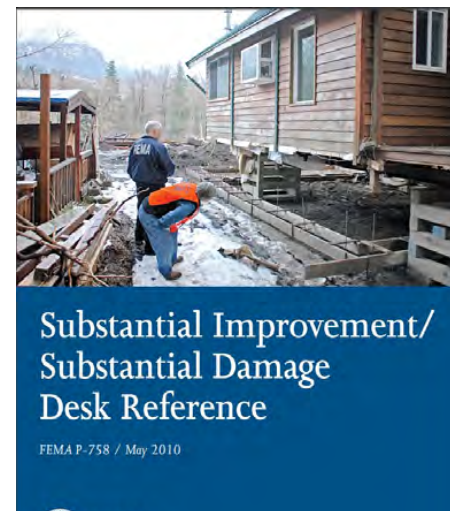
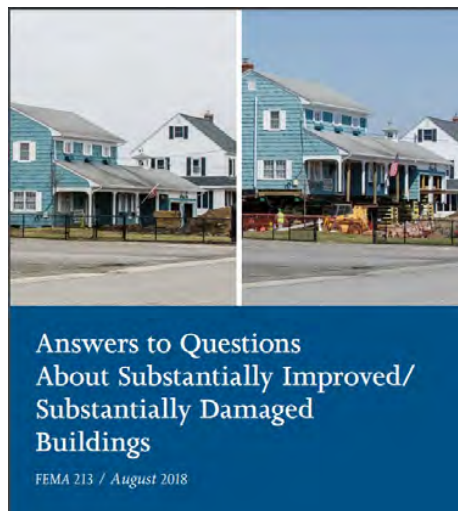
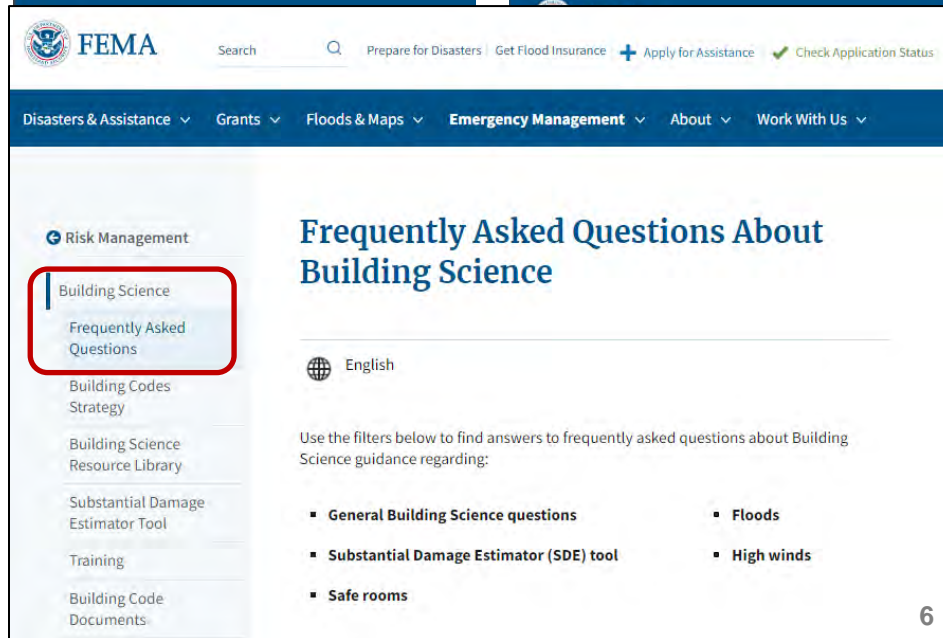
Substantial damage does not trigger all building code requirements for new construction.

Buildings must comply with flood provisions when the cost of restoring the structure to its before-damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.



# FEMA Building Science SDE Resources

- **FEMA 213**, *Answers to Questions About Substantially Damaged Buildings* (2018)
- **FEMA P-758**, *Substantial Improvement / Substantial Damage Desk Reference* (2018)
- **SDE Frequently Asked Questions (FAQs)**; on the FEMA Building Science FAQ webpage

FEMA

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Risk Management

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  - Building Codes Strategy
  - Building Science Resource Library
  - Substantial Damage Estimator Tool
  - Training
  - Building Code Documents

## Frequently Asked Questions About Building Science

English

Use the filters below to find answers to frequently asked questions about Building Science guidance regarding:

- General Building Science questions
- Substantial Damage Estimator (SDE) tool
- Safe rooms
- Floods
- High winds

# Additional Resources

- 44 CFR 60.3:

[eCFR :: 44 CFR 60.3 -- Flood plain management criteria for flood-prone areas.](#)

- FEMA SDE Training 10-module series:

[https://www.youtube.com/playlist?list=PL720Kw\\_OoJlKaUGLcplGiC2Gw9-lutGHt](https://www.youtube.com/playlist?list=PL720Kw_OoJlKaUGLcplGiC2Gw9-lutGHt)

- Map Service Center:

<https://msc.fema.gov/portal/home>

- Community Status Book:

<https://www.fema.gov/flood-insurance/work-with-nfip/community-status-book>



# Final Comments

- The correct application of SDE assessments and determinations and subsequent recovery and reconstruction enhances the community's resilience and sustainability during future hazard and disaster events.
- Damage is damage, no matter the origin.
- Consistency throughout the SDE process confirms validity and credibility throughout the community.



# Questions?



**Flood/Wind Building Science Helpline:**  
**[FEMA-BuildingScienceHelp@fema.dhs.gov](mailto:FEMA-BuildingScienceHelp@fema.dhs.gov)**  
**866.927.2104**  
**<http://www.fema.gov/building-science>**