

NATIONAL FLOOD
INSURANCE PROGRAM

SUBSTANTIAL DAMAGE DETERMINATIONS

A guide for local officials

Depth-Damage Edition





Substantial Damage Training at Village of Russells Point, Logan County, July 16, 2003

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A man standing in front of his flood-damaged home, asked an assorted group of local, state, and federal officials, *Who's responsible for telling me what I can do now?*

He wanted to get on with repairing his home, his possessions, his life. Though days after the flood waters had receded, the local floodplain administrator had not yet told him about the local flood hazard reduction regulations or the required floodplain development permit. It probably seemed easier not to, before the flood.

Days later that resident and many of his neighbors were demanding to know, *Why?* Why had their officials not warned them, not told them that their community had flood hazard reduction regulations that, if followed, could have reduced their flood risk to life and property?

Flood recovery is important, but reducing flood risk—before the next flood—is far more important. Unless our citizens have the tools they need to reduce their exposure to flood hazards then we are fighting a losing battle.

FEMA & ODNR offer a variety of training opportunities and materials such as this guide, but the best tools are worthless if not used.

Who's responsible for telling me what I can do now? First and foremost, the answer is, **you**, the local floodplain administrator.



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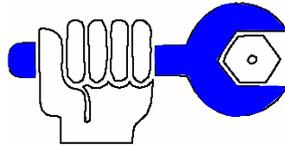


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I. INTRODUCTION TO SUBSTANTIAL DAMAGE DETERMINATIONS

Look for the  symbol to indicate that a useful form or example is attached.



This guide is intended to provide **you**—the local floodplain official—with readily accessible information and tools to conduct post-flood damage inspections, substantial damage determinations, and documentation of compliance as part of your National Flood Insurance Program (NFIP) responsibilities. This process is an important part of your community’s flood hazard reduction strategy and a requirement for all NFIP-participating communities. The forms necessary to complete this process are included. Related materials are included whenever practical.



Look for the  symbol to indicate additional information or materials that may be needed or helpful.



To avoid unnecessary duplication this guide assumes **you** have an understanding of your basic responsibilities as a local floodplain manager, the requirements for NFIP-participation, and the terminology of floodplain management.

Look for the  symbol to indicate a reference. Many publications can be located through ODNR, Division of Water, 2045 Morse Road, Columbus, Ohio 43229, (614) 265-6750.



For more information concerning these concepts, please refer to *The National Flood Insurance Program Handbook for Local Permit Officials* and *Answers to Questions About Substantially Damaged Buildings*. The *Handbook* contains a detailed description of the local floodplain administrator’s responsibilities while a further discussion of the substantial damage determination process is found in *Answers*. A complete description of the NFIP regulations is contained in *THE CODE OF FEDERAL REGULATIONS AT 44 CFR 59 ET. SEQ.*

Look for the  symbol to indicate that the information required must be acted upon quickly.

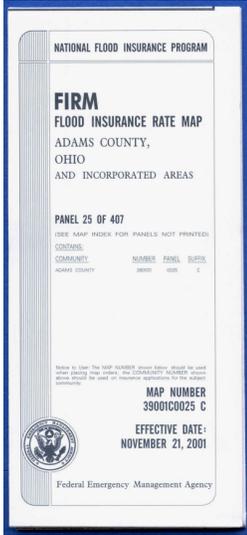


Following a flood, timely and accurate information from **you**—the local floodplain administrator—allows citizens to know what flood safety requirements apply to them and to consider what they can do beyond those minimum requirements to further reduce their flood risk. When a structure is *Substantially Damaged* and / or *Substantially Improved* the applicable requirements of your local flood hazard reduction regulations change. The following information describes how you determine when this change occurs and what you need to do about it. We at ODNR can help but only **you** can do your job.



II. WHEN TO CONDUCT SUBSTANTIAL DAMAGE DETERMINATIONS

Pre-FIRM vs. Post-FIRM



Substantial damage determinations apply to structures in federally identified floodplains, originally built before the initial date of your Flood Insurance Rate Map (FIRM) or where subsequent revisions to the FIRM initially identify a structure as in or as being below an increased Base Flood Elevation (BFE). All three examples are referred to in this guide as Pre-FIRM. *Post-FIRM* structures must be compliant with your regulations no matter the extent of damage. Pre-FIRM structures that are not substantially damaged (and/or improved) are not required to comply with the Post-FIRM standards of your local flood hazard reduction regulations. *When should you conduct substantial damage determinations?*

Anytime a Pre-FIRM structure is substantially damaged—from any source—(and/or improved), that structure must be brought into compliance with your Post-FIRM standards.

The 50% Rule

... any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the “start of construction” of the improvement. This term includes structures which have incurred “substantial damage”, regardless of the value of or actual cost of repair work performed.



CAUTION

All NFIP-participating communities **must** have copies of their Flood Insurance Study, & FIRM (& Floodway) panels.

Order from the online **FEMA Flood Map Store** at www.fema.gov or call (800) 358-9616 to obtain copies **before the flood**.

Anyone can also download portions of most FIRMs from the FEMA Flood Map Store site, free of charge.

The definition of **Substantial Damage** is contained in 44 Code of Federal Regulations 59.1 as part of the definition of **Substantial Improvement**

The 50% threshold can be reached by damage (from any source) or improvement or any combination of the two. FEMA refers to this threshold as *the 50% rule*. The repair costs include all costs *necessary* to return the structure to its pre-flood condition, *even if the property is not returned that condition*. Remember that structures built *after* the effective date of your community’s initial FIRM (*Post-FIRM*) must comply with your flood damage reduction standards even if less than 50% damaged. Therefore, **Substantial Damage Determinations** are *not* done for Post-FIRM structures (see definition of Pre-FIRM above).



III. HOW TO CONDUCT SUBSTANTIAL DAMAGE INSPECTIONS

What's going on in my Floodplain?



The bigger your community, the more you will need to depend upon others to notify you of possibly substantially damaged structures. Maintenance, construction, and other workers who are regularly in the field are invaluable eyes and ears for day-to-day information on floodplain activities. Let them know what to look for and provide a way for them to keep you informed about what they see.

Before a flood, you should become acquainted with your local emergency response agencies (e.g., Ohio Emergency Management Agency (OEMA), your county EMA, fire/rescue department(s), police department(s), health department(s), and Red Cross.

Learn about their roles and how they help your community recover when floods occur. Discuss with them your responsibilities for post-flood substantial damage determinations and the contribution of flood protection standards to reducing your community's future flood risk.



Where did the Damage Occur?



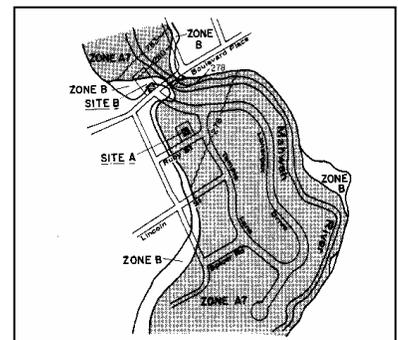
Following a flood, your local emergency response agencies should be used to help identify the extent of the flooded area. As soon as possible, you—with as much help as possible—should inspect the flooded areas.

During this inspection you should identify damaged structures, assess the extent of damage, and remind the owners of your community's flood hazard reduction regulations, along with the need to apply for a flood hazard development permit before reconstruction. Residents may be upset with these regulations but they will have far less cause to be upset if they only need to rebuild once. Don't keep your flood hazard reduction regulations a secret!



See samples 1-4

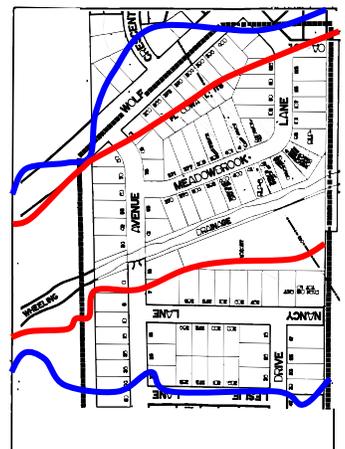
Before and after a flood, let your community know what flood safety information is available. After a flood, put a announcement in your local newspaper, notifying your residents of the need to obtain a flood hazard development permit. Contact affected homeowners and let them know what information they will need before they begin their repairs. Post your flood hazard area maps in accessible public locations.



What supplies do I need?



- Community flood map (i.e., FIRM),
- Parcel Map with addresses map showing individual lots (helpful to have FEMA-floodplain boundaries drawn on),
- Camera (digital preferred),
- DEPTH DAMAGE FIELD ESTIMATE form,
- Inspection Tags,
- Tape measure,
- Gloves,
- Flashlight,
- Insect Repellant,
- Boots,
- and Disinfectant Wipes recommended



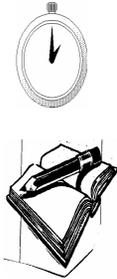
See sample 6 DEPTH DAMAGE FIELD ESTIMATE form



See samples 7 - 10 Inspection Tags



Triage



Just as in the aftermath of battle when military surgeons quickly group the wounded by the severity of their injuries; following a flood, the local floodplain official needs to focus attention and resources wisely. The floodplain official should quickly identify and begin assessment of structures thought to be damaged. Since flooding can result in extensive damage to many structures, you will find it helpful to group damaged structures in three broad groups.

FEMA #213 Answers to Questions About Substantially Damaged Buildings p. 9
Available at:
<http://www.fema.gov/hazards/floods/lib213.shtm>



No matter the group, all violations of your flood safety regulations must be corrected to the maximum extent practical.

FEMA must approve anything short of full compliance with your regulations.

Before accepting anything short of full compliance, contact the Division of Water at (614) 265-6750 for assistance with your compliance strategies.



See sample 4 SD notification letter

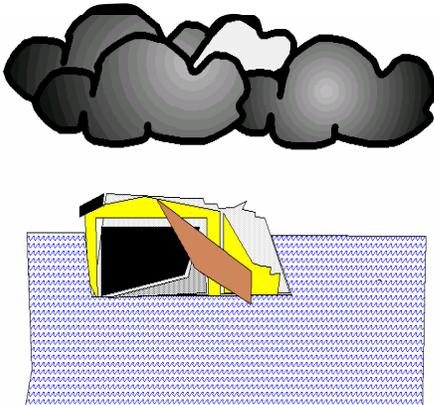
Group 1 All Post-FIRM structures (these must comply with Post-FIRM standards) and any Pre-FIRM structures that have received little to no damage (40% or less) can forego a more detailed assessment. Floodplain development permits are required.



Group 2 Pre-FIRM structures that possibly have received substantial damage (40% to 60%) should undergo a detailed assessment. Post-FIRM regulatory standards apply to all substantially damaged structures. Send a letter notifying property owners of the applicable flood safety standards. Pre-FIRM standards apply to all these structures that are not substantially damaged. Floodplain development permits are required.



Group 3 All Pre-FIRM structures that have obviously received substantial damage (60% or more) can forego a more detailed assessment. Post-FIRM regulatory standards apply. Send a letter notifying property owners of the applicable flood safety standards and maintain enough documentation of the damage to avoid misunderstandings. Floodplain development permits are required.





CAUTION

What to Note on the *DEPTH DAMAGE FIELD ESTIMATE* form

In addition to your *regular* floodplain development documentation, your substantial damage determination should include:

- **DATE & TIME OF INSPECTION** This may effect what damage is evident.
- **DATE OF CONSTRUCTION** to determine if it is Pre- or Post-FIRM
- **SOURCE OF DAMAGE** A Substantial Damage Determination is required whenever a Pre-FIRM structure suffers 50% or more damage—from whatever cause.
- **DEPTH** of flooding (if applicable)—with locations
- **ELEMENTS** Check the pre-damage construction quality (*Low to Excellent*)
- **PERCENT** damage from table on *DEPTH DAMAGE FIELD ESTIMATE* form

A model *Special Flood Hazard Development Permit Application* (with detailed instructions) is provided in the *Handbook For Local Permit Officials*. The *Handbook* can be downloaded at: www.dnr.state.oh.us/water/floodpln/refrencs.htm

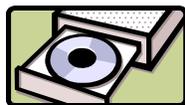


See sample 6 (*DEPTH DAMAGE FIELD ESTIMATE* form)

Additional clarifications are included on the back of the *DEPTH DAMAGE FIELD ESTIMATE* form. The flood map information may be added after the field data is obtained.

RSDE CD

To obtain a copy of FEMA's *Residential Substantial Damage Estimator* Software, please contact FEMA at 1-800-480-2520. The CD includes a *Users Guide* with sample-forms and instructions.



To obtain the *RSDE-CD* contact FEMA at: www.fema.gov/

CAUTION

This program requires additional materials (e.g., *Marshall & Swift Residential Cost Handbook* (May be purchased at: www.marshallswift.com/p-39-residential-cost-handbook.aspx) or similar industry-accepted reference).



IV. DETERMINING DAMAGE COST



EXCLUDED ITEMS LIST

Items considered real property **do not** include:

- the land itself,
- plans & specifications,
- survey costs,
- permit fees,
- non-structural debris removal (e.g., removal of debris from building or lot, dumpster rental, transport fees to landfill and landfill tipping fees),
- clean-up (e.g., dirt and mud removal, building dry out, etc.).

Items **not** considered real property, such as:

- throw rugs or carpeting over finished floors,
- furniture,
- refrigerators,
- stoves (not built-in), etc.

Outside improvements, including:

- landscaping,
- detached accessory structures (e.g., sheds, gazebos, garages, screened pool enclosures),
- sidewalks,
- fences,
- yard lights,
- swimming pools,
- landscape irrigation systems.

INCLUDED ITEMS LIST

To determine damage cost consider all **structural elements** including:

- spread or continuous foundation footings and pilings,
- monolithic or other types of concrete slabs,
- bearing walls, tie beams and trusses,
- wood or reinforced concrete decking or roofing,
- floors and ceilings, 
- attached decks and porches,
- interior partition walls,
- interior & exterior wall finishes
- windows and doors,
- re-shingling or re-tiling a roof,
- hardware,
- kitchen & bathroom fixtures & cabinets,
- built-in appliances,
- built-in bookcases, cabinets, & furniture,
- HVAC equipment,
- plumbing and electrical services,
- bathroom tiling & fixtures,
- light fixtures & ceiling fans,
- security systems,
- water filtration, conditioning or re-circulation systems,
- labor & other costs associated with demolishing, removing, or altering building components,
- overhead & profit.

FEMA #213
Answers to
Questions About
Substantially
Damaged
Buildings. p. 10





V. DETERMINING PRE-FLOOD MARKET VALUE



Sources of Market Value

Actual Cash Value may be used as a substitute for **Market Value**, but **Replacement Cost** may not be used.

Possible sources for value are:

- The tax assessment value of the structure, adjusted for appreciation or depreciation

or

- A state licensed appraisal of the structure



Substantial Damage and Improvement determinations apply to the value of the **STRUCTURE ONLY**.



For a more detailed discussion of *Actual Cash Value & Market Value* determinations see, FEMA #213 *Answers to Questions About Substantially Damaged Buildings*, p. 10



For additional information about using flood safety techniques when repairing flood damaged structures, visit fema.gov

Sources for Cost of Repair

- Estimate from a licensed general contractor

or

- Estimate from a licensed appraiser

or

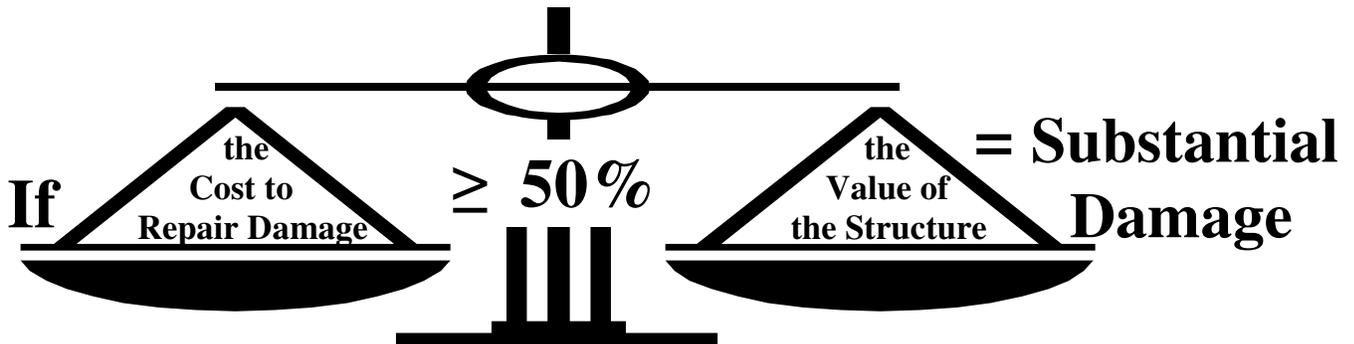
- Estimation process of the local floodplain official



See sample 6
DEPTH DAMAGE
FIELD ESTIMATE form



VI. MAKING THE SUBSTANTIAL DAMAGE DETERMINATION



As soon as you compile a list of the substantially damaged structures in your community, send that list to FEMA along with a description of what will be done to ensure that each structure is rebuilt in compliance with your flood safety standards.



Send your substantial damage information to FEMA's Natural and Technological Hazards Division, 536 South Clark Street, 6th Floor, Chicago, Illinois 60605, (312) 408-5500.

VII. RECORDS MANAGEMENT

Record keeping by local government is a vital post-flood task that is often given less attention than it requires. The tremendous responsibilities of providing emergency response and quickly posting damaged buildings can overshadow the importance of the paperwork that these tasks create.

The need to document observations, actions, decision and inspections; legal considerations; and financial issues make adequate record management an absolute necessity.

The records you keep may be requested by Federal or State staff to confirm compliance with the NFIP regulations and may be required for Hazard Mitigation Grant Program (HMGP) applications. Records will support that you have done your job correctly and that your community is meeting its NFIP responsibilities.



The more quickly you collect accurate substantial damage information, the more likely you will be able to work with your residents to incorporate your flood safety standards in their repairs & maintain your community's eligibility for disaster assistance.

VIII. FLOOD RECOVERY RESOURCES

You are part of your community's primary flood recovery resource. You as the local floodplain administrator should:

- Enforce your **FLOOD HAZARD REDUCTION REGULATIONS**. This not only can save lives and property in the future, it will help ensure that your community receives all the disaster assistance possible. The **SPECIFIC STANDARDS** section of your flood hazard reduction regulations apply to all *Substantially Damaged* structures regardless of actual repair proposed or done.

Conduct **SITE INSPECTIONS** to help ensure compliance with your flood safety standards and to offer corrections when necessary.



- Offer **HOW-TO ASSISTANCE** to your residents before they begin to repair the damage
- Publicize any **FINANCIAL ASSISTANCE** that your residents qualify for as an NFIP-compliant community

Substantial Damage Determinations vs. Building Inspection for Health/Safety/Occupancy

A substantial damage determination is **not** the same kind of inspection as a building inspection for health, safety, or occupancy. Nonetheless, it is required by a community's floodplain management regulations for every flood-impacted structure in the identified 100-year floodplain. It is usually conducted after a health/safety inspection.

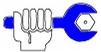
Outside Help Map Be Available



Following large disaster events, the number and scope of substantial damage determinations can overwhelm a local floodplain manager and bring compliant reconstruction to a standstill. A local floodplain manager is encouraged to use other inspectors to assist with this process. Contact your county EMA director (check: www.ema.ohio.gov/county.htm) to request assistance with damage inspections. The Ohio Building Officials Association (OBOA) has been training building inspectors in substantial damage determinations for the past several years and they can provide assistance for substantial damage determinations to any community affected by the flood.



To request this assistance please follow the steps below:



See sample 5
**REQUEST
FOR OBOA
INSPECTORS**

1. The community floodplain administrator should complete a written request to the county emergency management director. This request must be signed by the CEO of the community. The county emergency management director should forward the request to the Ohio Department of Natural Resources, Floodplain Management Program at (614) 265-6750 or FAX by (614) 265-6767.
2. The Ohio Building Officials Association (OBOA) needs: 1) initial estimate of how many structures; 2) the general location for inspections* (political subdivision, boundary streets, or subdivision names, etc.); and 3) contact person name, phone number and address for each political subdivision requesting assistance.



*Remember that substantial damage determinations are only required in federally identified floodplain areas.

OBOA will also need commitment by the requesting community for the following:**

1. Lodging arrangements made for the inspectors.
2. A place available to fuel the vehicles.
3. A commitment that the inspectors will be reimbursed for their meals.
4. Assurance that if the requesting community gets reimbursed for other expenses, such as vehicle expenses and labor and benefit expenses, the responding inspector's community will be reimbursed for those expenses.

**Please note that at this time the expenses for lodging, fuel and meals are not reimbursable through the FEMA Public Assistance Program should a disaster be declared.



- 3. The Ohio Department of Natural Resources, Floodplain Management Program will coordinate with the OBOA Coordinator as quickly as possible and your community will receive follow-up from the OBOA coordinator to finalize the support service. ODNR, Floodplain Management Program will monitor the OBOA effort and provide statewide situation reports. If you have any questions you may contact Cindy Crecelius, Program Manager at Ohio Department of Natural Resources, Floodplain Management Program at 614-265-6750 or email cindy.crecelius@dnr.state.oh.us.



Who Was That Masked Man?



You are not alone. This can be a blessing, or a curse, or both. During and after a flood, various government and private agencies will be in your community and contacting your citizens to assess damage and facilitate disaster relief. Familiarizing yourself with these organizations, their goals and their methods—before the flood—will enable you to best use their services and to answer the many questions of your citizens. Coordination can also help reduce unnecessary duplication of effort resulting in a quicker, smarter recovery.



Basic phone numbers for to remember:

To register for disaster assistance for *federally-declared* disasters, call **(800) 621-FEMA 3362**.
 For questions about the progress of *federally-declared* disaster assistance, call (800) 310-3169.
 For general flood insurance information, call (800) 427-4661
 For copies of Flood Maps and Flood Insurance Studies, call (800) 358-9616



Visit www.fema.gov for a wide range of *how-to* information about reconstruction of residential and non-residential structures, manufactured home installation and non-residential floodproofing. ODNR’s Floodplain Program website at: www.ohiodnr.com/water/Home/default/tabid/3252/Default.aspx can also help you obtain many of these publications & financial program information or call **(614) 265-6750**. Our *Handbook for Local Permit Officials* contains a list of technical and financial aid sources available for flood hazard mitigation. Our office also provides continuing assistance with a variety of your floodplain management duties. See APPENDIX B for some examples.

The **Ohio Emergency Management Agency (OEMA)** offers financial and planning assistance for flood hazard mitigation For information about the **Hazard Mitigation Grant Program (HMGP)** and **Flood Mitigation Assistance (FMA)**, contact OEMA at **(614) 889-3530**.



Important participants in your community’s flood recovery efforts include the:

Your _____ **County EMA** _____
(Record their number here)
 (visit: www.ema.ohio.gov/county.htm).

Police /Sheriff department(s): _____
(Record their number here)

Fire department(s): _____
(Record their number here)

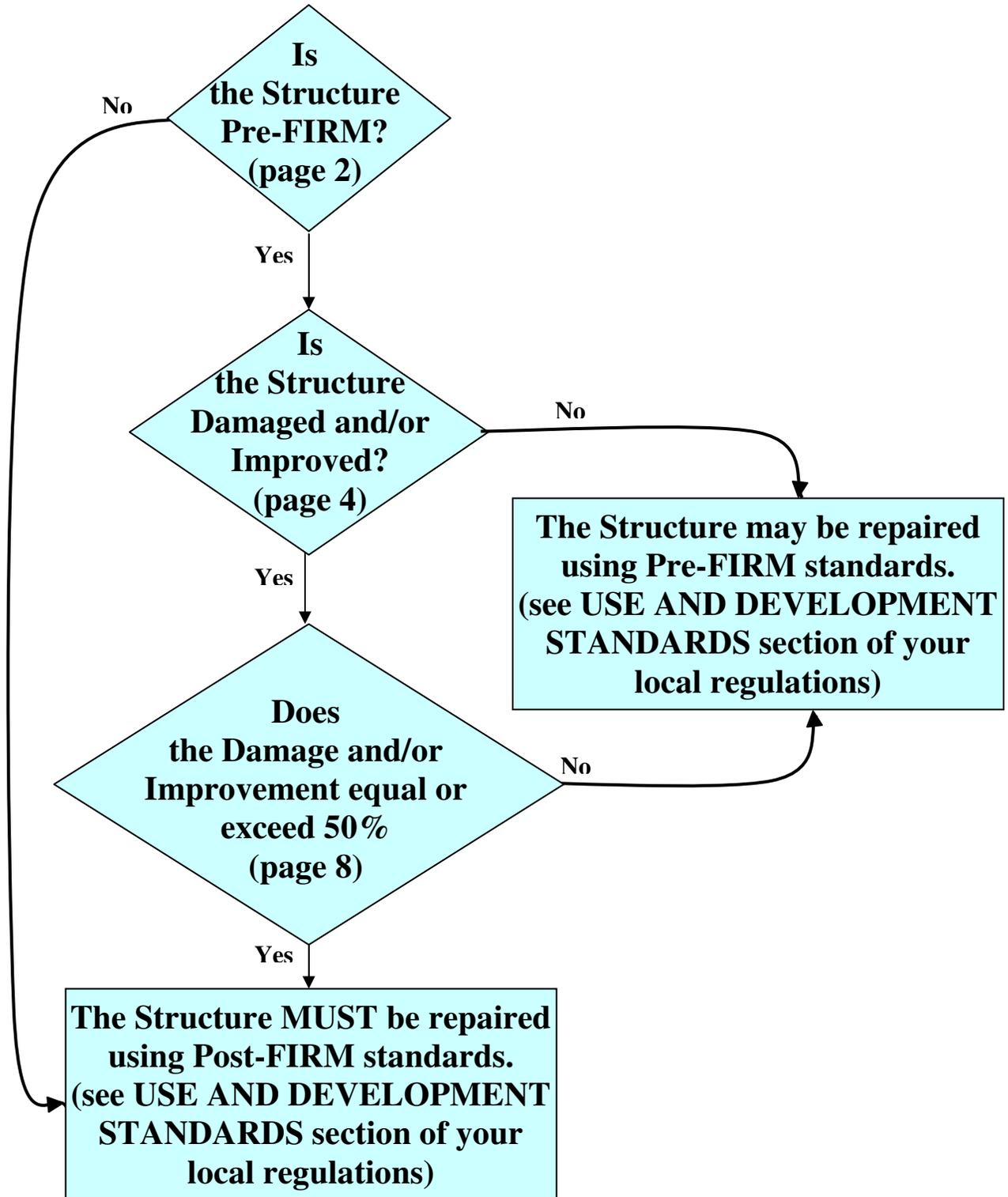
Health department(s): _____
(Record their number here)

and **Red Cross:** _____
(Record their number here)

Private agencies may be obtaining useful information for your community’s flood recovery. The American Red Cross, local religious or civic organizations should not be overlooked when coordinating your flood recovery efforts. These *first responders* to flood disaster will be able to assist you in the location, extent, and type of damage you need to deal with.



SUBSTANTIAL DAMAGE FLOW CHART CHECKLIST





X. APPENDIX A (Samples)



The following forms are provided for a quick use or photocopying:

- SAMPLE 1. NEWS RELEASE
- SAMPLE 2. DISASTER RECOVERY INFORMATION Notice
- SAMPLE 3. COST ESTIMATE LETTER
- SAMPLE 4. NOTIFICATION TO PROPERTY OWNER
- SAMPLE 5. REQUEST FOR OBOA INSPECTORS
- SAMPLE 6. DEPTH DAMAGE FIELD ESTIMATE form
- SAMPLE 7. SAFE Tag
- SAMPLE 8. HABITABLE Tag
- SAMPLE 9. LIMITED ACCESS Tag
- SAMPLE 10. UNSAFE Tag





NEWS RELEASE



FOR IMMEDIATE RELEASE

_____(DATE)_____

PERMIT REQUIREMENTS FOR REPAIR OF FLOOD-DAMAGED STRUCTURES

Unusually heavy rainfall in _____(community / region)_____ in/on _____(date)_____ resulted in serious damage to many homes and businesses. _____(local official/agency)_____ urges owners of structures damaged by flooding to be aware of the following information.

_____ (community) _____ participates in the National Flood Insurance Program (NFIP). All NFIP-participating communities have adopted locally enforced flood damage reduction regulations. These regulations contain standards for *new*, *substantially damaged*, and/or *substantially improved* structures in identified Special Flood Hazard Areas (100-year floodplains). The 100-year or regulatory flood has a one percent probability of occurring in any given year.

A substantially damaged structure is one that has damage equal to or exceeding 50 percent of the pre-damaged market value. Substantially improved structures include those with repairs, alterations or additions that are equal to or exceeding 50 percent of the market value of the structure before any improvements.

_____ (community) _____ regulations, which reflect minimum federal criteria for flood damage prevention, require that development permits be obtained before any activities occur in the Special Flood Hazard Area. If your residence or commercial structure has been affected by the recent flooding and you are going to make repairs, please contact your local floodplain manager, _____(name of local floodplain manager)_____, at _____(phone and/or address)_____ for a permit application and information on any standards that apply.

To determine if your structure is in a Special Flood Hazard Area review a copy of the community Flood Insurance Rate Map _____(map number)_____ located at _____(office address/location)_____ or download a free flood map for your area from www.fema.gov/.

If you have additional questions contact _____(name of official or agency)_____ at _____(phone and/or address)_____.

Sample 1



DISASTER RECOVERY INFORMATION



Subject: Repair and Replacement of Structures Damaged by Flooding

PERMIT REQUIREMENTS FOR REPAIR OF FLOOD-DAMAGED STRUCTURES

The President has declared a major disaster for _____(area)_____ as a result of unusually heavy rainfall occurring between _____(date to date)_____. The flooding has resulted in serious damage to many homes and businesses. _____(community)_____ _____(local floodplain manager)_____ urges owners of structures damaged by the flooding to be aware of the following information.

_____ (community) _____ participates in the National Flood Insurance Program (NFIP). All NFIP- participating communities adopted locally enforced flood protection regulations. These regulations contain standards for new and substantially damaged structures that are in identified Special Flood Hazard Areas (SFHA)s. Maps of the identified SFHAs are available from _____(local floodplain manager)_____ or online at www.fema.gov/, and may be in temporary Disaster Recovery Centers.

A substantially damaged structure is one that has damage equal to or exceeding 50 percent of the pre-damaged market value. _____(community)_____ regulations require protection of any new, or repair of substantially damaged structures to the minimum federal criteria of the 100-year flood elevation. Development permits for structures in the SFHAs must be obtained BEFORE any activities. If your residence or commercial structure has been affected by the recent flooding and you are going to make repairs, **please contact your local floodplain manager**, _____(name of local floodplain manager)_____, **at** _____(phone and / or address)_____.

Note: For the name, address and phone number of any Floodplain Manager for NFIP-participating Ohio communities, please call the Division of Water at (614) 265-6750 or go online at: <http://www.dnr.state.oh.us/water/floodpln/communitylist.pdf>.



COST ESTIMATE LETTER



_____ community _____.

To: _____ community **Residents**

Date: _____ date _____.

Due to the recent flood, the _____ community _____ must now begin the task of evaluating the damage of all structures that were affected by the flood waters. The _____ community _____'s Flood Hazard Reduction Regulations, (_____ date adopted _____) require that all structures that received damage in excess of 50% of the value of the structure must now conform with all applicable regulations.

In an effort to begin this assessment, the _____ community _____ is requesting each property owner to obtain an accurate value of your structure along with a certified cost estimate needed for the repairs from a qualified independent contractor. The value of your structure is generally determined by one of three methods: **1) A Certified Appraisal, 2) Insurance Policies or 3) County Tax Values** (available by calling _____ community office _____). The estimated cost of improvements should be based upon the needed repairs to ceilings, floors, or other structural parts of the building, whether or not the alteration affects the external dimensions of the structure.

Please submit this information to the _____ floodplain official _____ street _____ community state _____ zip _____ within thirty (30) days after the date of this letter. If you have any questions, please do not hesitate to call _____ floodplain official _____ at _____ telephone _____.

NAME: _____

ADDRESS: _____

ESTIMATED STRUCTURE VALUE: _____

Attach copy of the documentation used to determine this value

ESTIMATED COST OF IMPROVEMENTS: _____

Attach copy of a certified contractor's estimate

Sample 3



NOTIFICATION TO PROPERTY OWNER

Floodplain Administrator's Name, Title
Address
Community Name, Ohio Zip Code

Date

Property Owner
Address
Community Name, Ohio Zip Code

Dear Property Owner:

Insert Community Name participates in the National Flood Insurance Program (NFIP). All communities that participate in the NFIP have adopted locally enforced flood damage reduction regulations. These regulations contain standards for new, substantially damaged and/or substantially improved structures in identified Special Flood Hazard Areas (100-year floodplains). In accordance with these regulations, *Insert Community Name* conducted substantial damage determinations for all structures built in the Special Flood Hazard Area prior to *Insert Community Name* initial Flood Insurance Rate Map. **Based on this inspection, your property has been substantially damaged.**

A substantially damaged structure is one that has damage that equals or exceeds 50 percent of the market value of the structure. **To maintain our community's participation status in the NFIP, and ensure that your future flood risk is reduced, your structure must be brought into compliance with local flood damage reduction regulations.** Please contact *Insert Name of Local Floodplain Administrator* to discuss options for bringing the structure into compliance and to obtain a local flood hazard area permit for this work. If you choose to contest this determination, please provide a contractor's estimate of all repairs and improvements, and/or a recent appraisal of the market value of your structure.

There are several funding sources available to help pay for the cost of bringing your structure into compliance. If you have a flood insurance policy, your structure may be eligible for Increased Cost of Compliance (ICC) funds. ICC provides up to \$30,000 to relocate, elevate, demolish or dry-floodproof structures that must comply with local flood damage reduction regulations. If the event that damaged your structure results in a Presidential disaster declaration, Hazard Mitigation Grant Program (HMGP) funds become available to mitigate flood-prone structures. Please contact this office for additional details on possible funding sources including: Flood Mitigation Assistance (FMA), Pre-Disaster Mitigation (PDM), Repetitive Flood Claims (RFC) and the Severe Repetitive Loss Pilot Program.

Failure to bring this structure into compliance is a violation of local flood damage reduction regulations. Section *Insert Violation and Penalties Section # of local floodplain regulations* contains possible ramifications for failure to comply. Failure to comply will also result in much higher flood insurance premiums for you and/or future owners of the property.

Please contact *Insert Name of Local Floodplain Administrator* at *Insert Phone Number* to discuss this matter further. Thank you for your cooperation during this difficult recovery period.

Sincerely,

Name of Local Floodplain Administrator, Title

Sample 4



REQUEST FOR OBOA INSPECTORS

_____[insert date]_____

RE: ESF-14 Mission Request: Substantial Damage Determination Assistance

Dear County Emergency Management Director:

The _____[insert community name]_____ was impacted by severe weather and flooding that affected _____ Ohio beginning ____ [Date of Disaster]_____. As a participant in the National Flood Insurance Program our community has committed to determine if structures in the identified flood hazard areas are “substantially damaged” and to enforce specific flood protection standards in the repair and recovery process. As a result of this flood disaster our local ability to provide inspections and make the substantial damage determinations has been exceeded. Please consider this letter our formal request for assistance from the Ohio Building Officials Association (OBOA) in performing substantial damage determinations.

Our preliminary information indicates that [insert number] structures located in identified floodplains will need inspection. The structures are located in [complete general location information] . Our local floodplain administrator (or community designee) will serve as the point of contact for the Ohio Building Officials Association inspectors:

Name: _____
Address: _____
Phone (Office): _____ (Cell) _____
Email: _____

The OBOA inspectors are providing this service and support in the spirit of mutual aid. The expenses for lodging, fuel, and meals are not reimbursable through the FEMA Public Assistance Program should a Presidential Disaster Declaration be received. To support the inspectors, OBOA needs the following commitments from the requesting community.

1. Lodging arrangement for inspectors.
2. Available fuel for vehicles used to support the inspection determinations.
3. Reimbursement to inspectors for meals during the time they provide support.
4. Assurance that if the requesting community gets reimbursed for other expenses, such as vehicle expenses and labor and benefit expenses, the responding inspector’s community will be reimbursed for those expenses.

Upon commitment, the requesting community should forward this letter with the information required to your count emergency management agency.

Signed:

Community Chief Executive Officer



| DEPTH DAMAGE FIELD ESTIMATE | | | | (Jurisdiction) | | (County) | | | |
|---|----------------------|------------|--------------------|------------------------|----------------------|-------------|--------------------|-------------------|----|
| (owner/enter) | | | | Spoken to? Yes / No | | () | | | |
| (Street Address) | | | | (PO Community) | | OH (Zip) | | | |
| DATE OF INSPECTION | DATE OF CONSTRUCTION | FIRM PANEL | SOURCE OF DAMAGE * | | DURATION OF FLOODING | | TIME OF INSPECTION | | |
| / / | / / | | Flood | | | | M. | | |
| TYPE OF STRUCTURE : | | ONE STORY | | TWO OR MORE | | SPLIT LEVEL | | MANUFACTURED HOME | |
| Does Structure Have a Basement? | | Yes | No | Yes | No | Yes | No | Yes | No |
| Depth in feet to LAG | | | | | | | | | |
| Structures with damages of \geq 50% require use of Post-FIRM flood safety standards. | 16 | 81.1% | 80.7% | 76.4% | 69.2% | 69.3% | 84.4% | | |
| | 15 | 81.1% | 80.2% | 76.4% | 67.7% | 69.3% | 83.8% | | |
| | 14 | 81.1% | 79.5% | 75.4% | 65.9% | 69.3% | 81.7% | | |
| | 13 | 81.1% | 78.5% | 73.7% | 63.8% | 69.3% | 78.4% | | |
| | 12 | 81.1% | 77.2% | 71.4% | 61.4% | 68.8% | 73.9% | | |
| | 11 | 81.1% | 75.4% | 68.4% | 58.7% | 67.2% | 68.6% | | |
| | 10 | 80.1% | 73.2% | 64.8% | 55.7% | 64.8% | 62.6% | | |
| Structures with damage estimates between 40% & 50% require further information to determine which flood safety standards apply. | 9 | 77.7% | 70.5% | 60.8% | 52.4% | 61.6% | 56.1% | | |
| | 8 | 74.2% | 67.2% | 56.4% | 48.8% | 57.8% | 49.2% | | |
| | 7 | 69.8% | 63.2% | 51.8% | 44.9% | 53.5% | 42.3% | | |
| | 6 | 64.5% | 58.6% | 46.9% | 40.7% | 48.8% | 35.5% | | |
| | 5 | 58.6% | 53.2% | 41.9% | 36.2% | 43.8% | 28.9% | | |
| | 4 | 52.2% | 47.1% | 36.9% | 31.4% | 38.6% | 22.8% | SD | SD |
| | 3 | 45.5% | 40.1% | 31.9% | 26.3% | 33.4% | 17.4% | | |
| | 2 | 38.7% | 32.1% | 27.0% | 20.9% | 28.2% | 12.9% | | |
| Post-FIRM flood safety standards may be used to repair structures with damages of < 50% but are not required. | 1 | 32.0% | 23.3% | 22.3% | 15.2% | 23.2% | 9.4% | | |
| | 0 | 25.5% | 13.4% | 17.9% | 9.3% | 18.5% | 7.2% | | |
| | -1 | 19.4% | 2.5% | 13.9% | 3.0% | 14.2% | 6.4% | | |
| | -2 | 13.8% | 0% | 10.2% | 0% | 10.4% | 0% | | |
| | -3 | 9.0% | | 7.2% | | 7.2% | | | |
| | -4 | 5.2% | | 4.7% | | 4.7% | | | |
| | -5 | 2.4% | | 2.9% | | 3.1% | | | |
| | -6 | 0.8% | | 1.9% | | 2.5% | | | |
| -7 | 0.7% | | 1.7% | | | | | | |
| -8 | 0% | | 1.7% | | | | | | |

Notes:

For help with completing and using this form, see explanatory notes and diagrams on reverse.

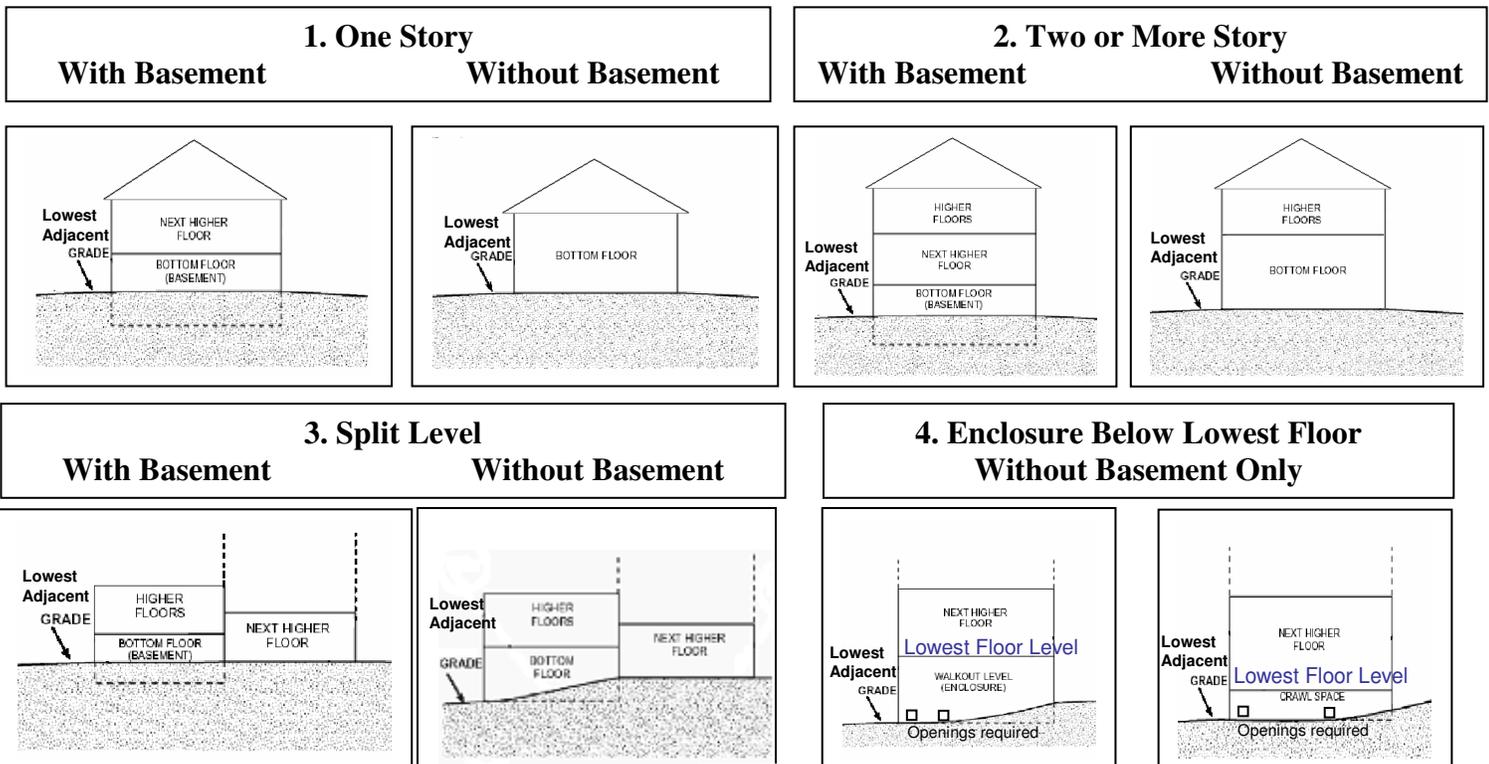
INSPECTED BY: _____ (name / title)

| | | | | | | | |
|--------------------------|---------------|-----------|------|-------------------|---|---------|--|
| Posted (Yes/ No) / / as: | | | | INITIAL FIRM DATE | | Rev | |
| UNSAFE | LIMITED ENTRY | HABITABLE | SAFE | / | / | 8/28/07 | |



The **DEPTH DAMAGE FIELD ESTIMATE** worksheet captures essential information to make Substantial Damage (SD) determinations for flood-related damages. It is intended that the worksheet should be mostly self-explanatory. The depth damage figures are based upon the USACE published *Generic Depth-Damage Relationships* (see <http://www.usace.army.mil/cw/cecw-cp/library/egms/egms.html>). The following are a few comments and clarifications that will assist you when filling out the worksheet.

1. **Jurisdiction:** Since a property's mailing address (*e.g.*, *Post Office Community*) is not always the same as jurisdiction, enter the correct information for each structure.
2. **SOURCE OF DAMAGE** indicates whether the damage was the result of flood, fire, wind, *etc.* or a combination of sources. Use the **DEPTH DAMAGE FIELD ESTIMATE** worksheet for flood-related damages. Use the **PERCENT DAMAGE FIELD ESTIMATE** for non-flood-related damages.
3. **DATE OF INITIAL FIRM** refers to the community's Flood Insurance Rate Map (FIRM). The initial date indicates when the flood area was first identified by FEMA. The SD determination process *does not apply* to structures built after this initial date. Check with the local floodplain administrator.
4. **FIRM PANEL:** Some communities have multiple panels. The panel number is found below the map title.
5. The **Depth in feet to Lowest Adjacent Grade (LAG)** refers to the level of the flood water (*i.e.*, The table uses -8 feet as a basement floor level, so a depth of -6 feet results from 2 feet of floodwater in a basement).
6. Round depths to the nearest whole foot.
7. Property owners with structures that have damages in the 40%'s (shaded on table) should be asked for documentation of damage and repairs to ensure that the structure is not substantially damaged.
8. For a structure with a compliant **Enclosure Below Lowest Floor** (see figure 4 below) use lowest floor instead of lowest adjacent grade to measure depth of flooding. Compliant enclosures must have openings.
9. Since currently, **Manufactured Homes** are not included in the USACE depth-damage tables, consider a floodwater depth of one foot above lowest floor to indicate substantial damage.
10. Local Floodplain Official must give property owners **written notice** that their structure has been determined to be substantially damaged along with instructions to comply with local permit requirements. A template SD-notification letter is included on our website at: <http://www.ohiodnr.com/water/floodpln/default/tabid/3511/Default.aspx>



OHIO BUILDING OFFICIALS DAMAGE ASSESSMENT SURVEY

**SAFE
SAFE FOR OCCUPANCY
WARNING:**

This structure has been inspected under emergency conditions and minimal damage has been found. Report any damage or unsafe conditions to the local authority.

Address: _____ Date: _____ Time: _____
Jurisdiction: _____ Inspector: _____
Contact Information: _____

Type Inspection: (circle applicable) **EXTERIOR** **INTERIOR**

Contact the Inspection Department and/or Jurisdiction Authorities for a copy of the damage report. All damage repairs must comply with local building codes and regulations.

OHIO BUILDING OFFICIALS DAMAGE ASSESSMENT SURVEY

**HABITABLE
REPAIRS ARE REQUIRED
WARNING:**

This structure has been inspected under emergency conditions and repairs are required. Report any damage or unsafe conditions to the local authority.

Address: _____ Date: _____ Time: _____
Jurisdiction: _____ Inspector: _____
Contact Information: _____

Type Inspection: (circle applicable) **EXTERIOR** **INTERIOR**

Contact the Inspection Department and/or Jurisdiction Authorities for a copy of the damage report. All damage repairs must comply with local building codes and regulations.

OHIO BUILDING OFFICIALS DAMAGE ASSESSMENT SURVEY

LIMITED ENTRY

**ENTER AT YOUR OWN RISK. DO NOT OCCUPY
WARNING:**

This structure has been inspected under emergency conditions and may not be safe to enter due to serious structural damage. Entering this structure may result in death or injury.

Address: _____ Date: _____ Time: _____

Jurisdiction: _____ Inspector: _____

Contact Information: _____

Type Inspection: (circle applicable) **EXTERIOR** **INTERIOR**

Contact the Inspection Department and/or Jurisdiction Authorities for a copy of the damage report. All damage repairs must comply with local building codes and regulations.

OHIO BUILDING OFFICIALS DAMAGE ASSESSMENT SURVEY

UNSAFE

**ENTER AT YOUR OWN RISK. DO NOT OCCUPY
WARNING:**

This structure has been inspected under emergency conditions and may not be safe to enter due to serious structural damage. Entering this structure may result in death or injury.

Address: _____ Date: _____ Time: _____
Jurisdiction: _____ Inspector: _____
Contact Information: _____

Type Inspection: (circle applicable) **EXTERIOR** **INTERIOR**

Contact the Inspection Department and/or Jurisdiction Authorities for a copy of the damage report. All damage repairs must comply with local building codes and regulations.



XI. APPENDIX B



The following additional information is provided for a quick reference:

To ensure you are using the most current edition, download FEMA's forms from their website at FEMA.gov

- FEMA Elevation Certificate form and instructions available at: www.fema.gov/business/nfip/elvinst.shtm
- FEMA Floodproofing Certificate form and instructions available at: http://www.fema.gov/plan/prevent/floodplain/nfipkeywords/floodproofing_certificate.shtm
- Post-Disaster Floodplain Management (ODNR Fact Sheet 96-40)
- NFIP Substantially Damaged Buildings In Special Flood Hazard Areas
- Protecting Your Property From Flooding Raise or Floodproof HVAC Equipment
- Protecting Your Property From Flooding Raise Electrical System Components



Man on top of Trolley at Gift Street Columbus, Ohio
1913 Flood



Ohio Department of Natural Resources Division of Water Fact Sheet

Fact Sheet 96-40

Post-Disaster Floodplain Management

Flooding is the largest natural disaster threat to Ohio. Local and state floodplain management programs reduce future flood damages and protect the natural benefits of the floodplain. If a community implements programs to reduce future flood risks, the federal government will make flood insurance available through the National Flood Insurance Program (NFIP). Land use regulations, containing the minimum federal standards of the NFIP, are adopted and enforced by local communities and state agencies to protect lives and property from the peril of flooding.



This fact sheet is intended to assist local and state agency floodplain managers in post-disaster situations to identify their NFIP-responsibilities. Administration and enforcement of floodplain management regulations are especially critical following a disaster event in order to stop the cycle of repetitive flood losses, and to comply with the NFIP-criteria of the Federal Emergency Management Agency (FEMA) which ensures flood insurance and flood disaster assistance eligibility.

After the Flood . . .

Immediately following a flood, many forces can devastate a community's floodplain management program. These include:

- Pressure to rebuild immediately with as little inconvenience as possible.
- Lack of coordination among agencies at different governmental levels.
- Misinformation about both flood insurance and allowable construction in the floodplain.

What is the solution? By understanding the community's floodplain regulations and implementing an effective permit procedure, the floodplain administrator can significantly reduce the impact of these forces.

Substantial Damage and the Permit Process

Before repair or alteration following a flood or other disaster, the local floodplain administrator is required to determine whether damaged structures must be flood protected to comply with the local floodplain regulations for "substantially damaged" structures. Under the NFIP, "substantial damage" means damage of any origin sustained by a structure whereby 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.

Preliminary damage assessments compiled soon after disasters by county emergency management staff can be a good starting point for identifying potentially substantially damaged structures. These assessments are used to determine county need for state and federal disaster assistance, and can be a screening tool to separate structures with minor damages from those with significant structural damage.

The next step is to require applications for floodplain development permits that will verify whether a structure is substantially damaged. The floodplain administrator must confirm if a potentially substantially-damaged structure exists by reviewing the property owner's estimate of repair cost and market value of the building prior to the damage event. The floodplain administrator is responsible for notifying the property owner of the flood protection elevation and construction standards contained in the local floodplain regulations. Structures sustaining "substantial damage" must be flood protected to at least the 100-year base flood elevation.

Example

| | |
|---|----------|
| Market value of residential structure: | \$90,000 |
| Cost to repair structure to its before damaged condition: | \$52,000 |
| Ratio of repair cost to market value: | 58% |

Structure is substantially damaged,
Structure must be flood protected!

Continued on back!



The Standards

The lowest floor of a new or substantially damaged/improved residential structure in the 100-year floodplain shall have its lowest floor elevated to or above the base flood (100-year) elevation. A new or substantially damaged/ improved nonresidential structure in the 100-year floodplain shall have its lowest floor elevated to or above the base flood elevation or shall be floodproofed watertight to that level.

These standards are found in nearly all Ohio communities' floodplain regulations. While there are other standards for development in a community's floodplain regulations, the above will be the most frequently applied in post-disaster situations.

Before the Flood . . .

Post-disaster chaos can be reduced if the floodplain administrator is prepared before the flood occurs. In fact, the NFIP is based on the concept that new floodplain development will conform to certain standards before a flood, so damage to that development will be reduced during and after the flood. Before a flood occurs in your community:

- Work closely with other officials involved in post-disaster recovery such as the County Emergency Management Director, Building Official, Health Department Official, and Community Engineer.
- Review flood maps and other information to pre-identify areas and structures at risk.
- Have adequate supplies of public information and permit materials such as fact sheets, press releases, permit forms, and design manuals ready for distribution immediately after a flood.

Mitigation in Post Flood Situations

Federal and state policies promote the concept of hazard "mitigation"- reducing the impact of a disaster, to end the repetitive loss cycle. Mitigation of losses during repair of substantially-damaged structures is required under community regulations in NFIP-participating communities.

The Hazard Mitigation Grant Program and Flood Mitigation Assistance Program are two ways communities can obtain federal funding for projects that reduce flood damage potential during future disasters. Flood hazard

mitigation strategies utilized by these programs include: acquisition and relocation of damaged structures; open space land use dedication; elevation or retrofitting of floodprone buildings; training for professionals and local administrators in mitigation techniques; development of hazard mitigation plans; and improvement of or construction of minor structural flood control facilities.



In addition to the above, a variety of programs provide opportunities to assist disaster victims and communities, while achieving NFIP-regulatory compliance and providing strategies to break the repetitive loss cycle.

For more information on flood hazard mitigation and the NFIP, please contact the Division of Water's Floodplain Management Program at (614) 265-6750.

References

The following materials are available --free of charge-- to assist community officials with their floodplain management programs:

| | |
|----------|---|
| FEMA | Technical Bulletin Series on floodplain construction techniques and certifications. |
| FEMA-54 | Elevated Residential Structures |
| FEMA-85 | Manufactured Home Installation in Flood Hazard Areas |
| FEMA-102 | Floodproofing Nonresidential Structures |
| FEMA-114 | Retrofitting Flood Prone Residential Structures |
| FEMA-213 | Answers to Questions about Substantially Damaged Buildings |
| FEMA-229 | Disaster Assistance: A Guide to Recovery Programs |
| ODNR | Handbook for Local Permit Officials |

Other materials available from the Division of Water include fact sheets and sample news releases. Please call 1-800-480-2520 for FEMA publications or contact the Division of Water for more information.

Ohio Department of Natural Resources
 Division of Water
 Floodplain Management Program
 2045 Morse Road, Bldg. B-2
 Columbus, Ohio 43229-6693
 Voice: (614) 265-6750 Fax: (614) 265-6767
 Website: <http://www.dnr.state.oh.us/water>

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National Flood Insurance Program SUBSTANTIAL DAMAGED BUILDINGS IN SPECIAL FLOOD HAZARD AREAS

One of the types of construction your elected officials promised to regulate when your community entered the National Flood Insurance Program (NFIP) was improvement and/or repairs to substantially damaged buildings. This FACT SHEET provides you with quick reference information on the topic. For an in-depth discussion, please refer to the FEMA document entitled *Answers to Questions About Substantially Damaged Buildings*.

WHO

It is the responsibility of the community's permit official to assure that all applicable cost and value information is accurate. However, you may require the permit applicant or owner to provide you with the necessary information to make the determination.

WHY

When a building has been substantially damaged, the owner will be reconstructing a significant portion of the structure and may be expending large sums of money. This is the time to modify the building to protect it from flood damage. Although the owner may complain about the extra costs to elevate the building, or in the case of non-residential structures to floodproof it, you are helping to protect them from future flood damages. In addition, a substantially improved Pre-FIRM structure is rated as a Post-FIRM structure. By requiring the building to be elevated or floodproofed, you reduce the cost of flood insurance for the property owner.

WHERE

Any damaged building located in a Special Flood Hazard Area (SFHA), as mapped on your community's Flood Hazard Boundary Map (FHBM) or Flood Insurance Rate Map (FIRM), must be evaluated to determine whether it is substantially damaged.

WHEN

Whenever a building is damaged, whatever the cause, you must determine whether the cost of restoring the structure to its pre-damage condition exceeds the substantial damage threshold. This is determined by comparing the cost of restoring the structure to its pre-damage condition to the market value of the building before the damage occurred. If the cost of restoration equals or exceeds 50% of the pre-disaster market value, then the structure is considered substantially damaged.

HOW

To complete the process, you must know how to determine whether a structure is substantially damaged, and how to treat the structure once you determine that it is substantially damaged.



Protecting Your Property from Flooding



FEDERAL EMERGENCY MANAGEMENT AGENCY

ARE YOU AT RISK?

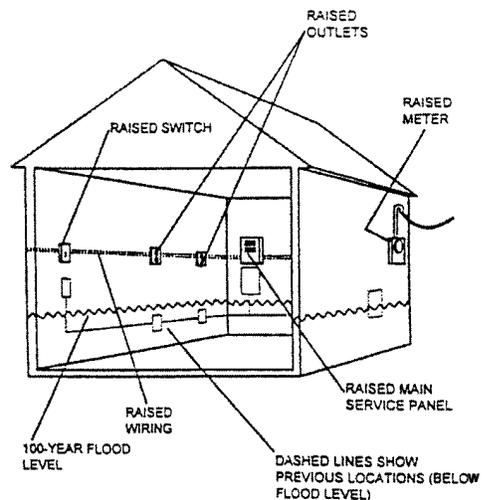
If you aren't sure whether your house is at risk from flooding, check with your local floodplain manager, building official, city engineer, or planning and zoning administrator. They can tell you whether you are in a flood hazard area. Also, they usually can tell you how to protect yourself and your house and property from flooding.

WHAT YOU CAN DO

Flood protection can involve a variety of changes to your house and property -changes that can vary in complexity and cost. You may be able to make some types of changes yourself. But complicated or large-scale changes and those that affect the structure of your house or its electrical wiring and plumbing should be carried out only by a professional contractor licensed to work in your state, county, or city. One example of flood protection is raising the heating, ventilating, and cooling equipment in your house so that it is above the flood level, or surrounding it with a floodwall. These are things that only a licensed contractor should do.

RAISE ELECTRICAL SYSTEM COMPONENTS

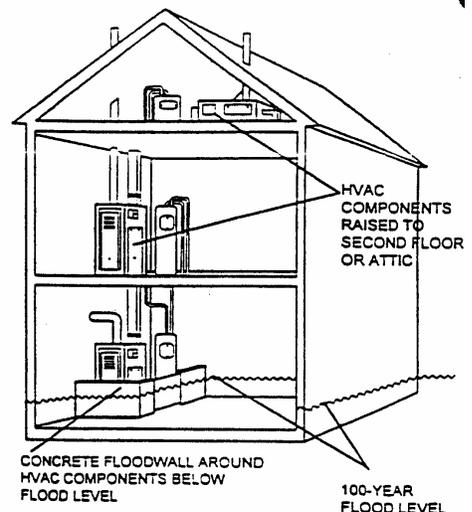
Electrical system components, including service panels (fuse and circuit breaker boxes), meters, switches, and outlets, are easily damaged by flood water. If they are inundated for even short periods, they will probably have to be replaced. Another serious problem is the potential for fires caused by short circuits in flooded systems. Raising electrical system components helps you avoid those problems. Also, having an undamaged, operating electrical system after a flood will help you clean up, make repairs, and return to your home with fewer delays. As shown in the figure, all components of the electrical system, including the wiring, should be raised at least 1 foot above the 100-year flood level. In an existing house, this work will require the removal of some interior wall sheathing (drywall, for example). If you are repairing a flood-damaged house or building a new house, elevating the electrical system will be easier.



RAISE OR FLOODPROOF HVAC EQUIPMENT

Heating, ventilating, and cooling (HVAC) equipment, such as a furnace or hot water heater, can be damaged extensively if it is inundated by flood waters. The amount of damage will depend partly on the depth of flooding and the amount of time the equipment remains underwater. Often, the damage is so great that the only solution is replacement.

In floodprone houses, a good way to protect HVAC equipment is to move it from the basement or lower level of the house to an upper floor or even to the attic. A less desirable method is to leave the equipment where it is and build a concrete or masonry block floodwall around it. Both of these methods require the skills of a professional contractor. Relocation can involve plumbing and electrical changes, and floodwalls must be adequately designed and constructed so that they are strong enough and high enough to provide the necessary level of protection.





Protecting Your Property from Flooding

FEDERAL EMERGENCY MANAGEMENT AGENCY



RAISE OR FLOODPROOF HVAC EQUIPMENT

TIPS

Keep these points in mind when you have your HVAC equipment raised or floodproofed:

- ✓ Changes to the plumbing, electrical system, and ventilating ductwork in your house must be done by a licensed contractor, who will ensure that the work is done correctly and according to all applicable codes.
- ✓ If you are having your existing furnace or hot water heater repaired or replaced, consider having it relocated at the same time. It will probably be cheaper to combine these projects than to carry them out at different times.
- ✓ Similarly, if you have decided to raise your HVAC equipment, consider upgrading to a more energy-efficient unit at the same time. Upgrading can not only save you money on your heating and cooling bills, it may be also make you eligible for a rebate from your utility companies.
- ✓ If you decide to protect your HVAC equipment with a floodwall, remember that you will need enough space in the enclosed area for system repairs and routine maintenance. Also, depending on its height, the wall may have to be equipped with an opening that provides access to the enclosed area. Any opening will have to be equipped with a gate that can be closed to prevent flood waters from entering.

ESTIMATED COST

Having your furnace and hot water moved to a higher floor or to the attic will cost about \$1,500. The cost of a floodwall will depend partly on its height and length. A 3-foot-high wall with a perimeter length of 35 feet would cost about \$1,000.

OTHER SOURCES OF INFORMATION

Protecting Your Home from Flooding, FEMA 1994

Repairing Your Flooded Home, FEMA-234, 1992

Refitting Flood-Prone Residential Structures, FEMA-114, 1986

To obtain copies of these and other FEMA documents, call FEMA Publications at: 1-800-480-2520. Information is also available on the World Wide Web at <http://www.fema.gov>.