

Chapter 5. Property Protection

Property protection mitigation measures are used to modify a building or property subject to damage. Property protection measures fall under the following approaches:

- Modify the site to keep the hazard from reaching the building
- Modify the building (retrofit the building) so it can withstand the impacts of the hazard
- Insure the property to provide financial relief after the damage occurs

The word “building” can refer to residential, commercial or industrial structures, or it can mean infrastructure facilities (roads, bridges, culverts, water plants) or other public structures. These property protection measures are usually implemented by the property owner, although in many cases technical and financial assistance can be provided by a government agency.

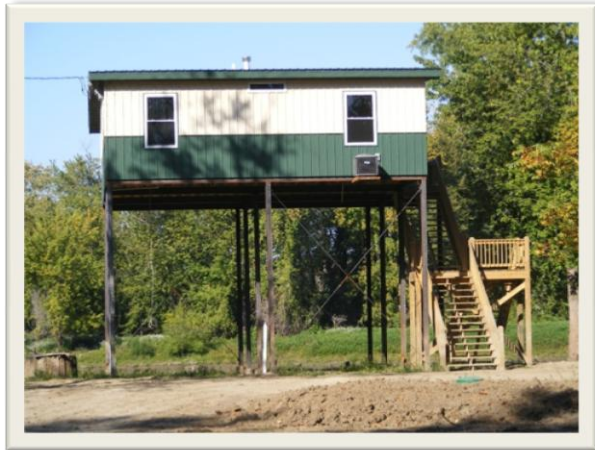
5.1 Keeping the Hazard Away

For the hazards considered in the Plan, flooding is the one hazard that can be kept away from a building. Acquisition ensures that buildings in a flood prone area will cease to be subject to damage. Acquisitions are based on grants from a government agency and the cost is not paid by the property owner. Once the land is acquired it will become open space and used for public recreational activities. The major impact of hazards is to people and improved property. Properties, in some cases can be modified so the hazard does not reach the damage-prone improvements. A fire break is one example of this approach, keeping brush and other debris that can fuel a fire away from the structure so fire may not reach it.

Hazards Addressed
• Flood
Tornado
Winter Storms
• Thunderstorms
• Wild/Field Fires
Drought

Barriers: Flood protection barriers can be built of dirt or soil (“berms”) or concrete or steel (“floodwall”). The design of a barrier must be carefully planned so as not to create water runoff on a neighboring property. Factors to be included in the design should be how porous the soil or ground is and how long the floodwater will stay. If the water stays up for an hour or two the design needs to account for leaks, seepage of water underneath, and the amount of rainfall inside the perimeter.

Barriers can only be built so high. They can be overtopped by higher water than expected and if made of soil they will erode and settle over time if not properly sloped, covered with grass and maintained. Floodwalls are susceptible to cracking and weakening over time and may lose its watertight seal. Barriers need careful design and maintenance and owners would be wise to insure the building in case of failure.



Relocation: Obviously, moving a building to higher ground and out of the floodplain is the surest and safest way to protect it from flooding. The cost may vary depending on the design of the building, for example a small stick built building would be less costly and easier to move than a building made of brick or stone and irregularly shaped.

Elevation: Raising a building above the flood level can be the almost effective as relocation. Water flows under the building, causing no

damage to the structure or contents. It is more economical than moving a building to a new neighborhood. Elevation is compliant with floodplain regulations that require new substantially improved, or substantially damaged buildings or 50% of its actual cash value.

The disadvantage to elevation is that the structure is not as aesthetically pleasing when raised 4 to 15 feet in height. Basements below ground are not allowed in the floodplain and if an existing building has one it must be filled in to protect the walls from water pressure which may deter the owner from the elevation method. All utilities and electrical must be elevated above the highest floor as well.



If not braced and anchored properly the elevated structure is exposed to other hazards that may cause greater impact than flooding. The possibility of high winds and earthquakes must be factored into the design of the elevation and should be planned by a certified engineer.

Demolition: If a building has been heavily damaged and susceptible to future damage, it is safest for homeowners to relocate. Acquisition, followed by demolition, is another approach for buildings that are not worth protecting due to major damage. Demolition should also be considered for houses that are heavy and larger making it difficult and more costly to relocate. The cost of the demolitions are usually paid for by the government and the land is turned into open space for recreational purpose for the community.

Local implementation: Following the 1993 flood several parcels with structures were purchased by government funds. In Grafton 103 homes were bought, in the rest of Jersey County 116 structures were purchased. After the 2008 flood another 8 structures in Grafton were bought

out using IEMA funds. The County oversaw 58 elevations of US Army Corps of Engineer leased site cabins and over 15 demolished. The 2013 flood resulted in demolition and elevation of cabins and in 2015 there have been requests to demolish 2 private homes and 3 more cabins. All of the elevations were completed according to requirements of the NFIP and the Ordinance for Development in the Floodplain. The county has a flood protection elevation for the first floor of all buildings of two feet above the established base flood elevation. Grafton and Elsie have a one foot flood protection elevation above the established base flood elevation



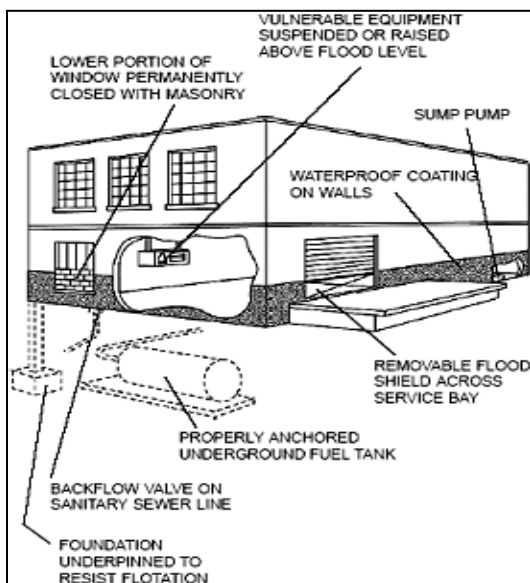
CRS Credit: The Community Rating System provides the most credit points for acquisition and relocation because this measure permanently removes the buildings from the floodplain. The score is based on the number of buildings removed compared to the number remaining (Activity 520-Acquisition and Relocation).

5.2 Retrofitting

Another alternative to keeping hazards away from buildings is to modify or “retrofit” the site or building to minimize or even prevent damage. There are a variety of ways to achieve this. These are measures that can be implemented to protect existing buildings from damage by floods, sewer backup, earthquakes, tornadoes and high winds and severe summer and winter storms.

Hazards Addressed
• Flood
• Tornado
• Winter Storms
• Thunderstorms
• Earthquake
Drought

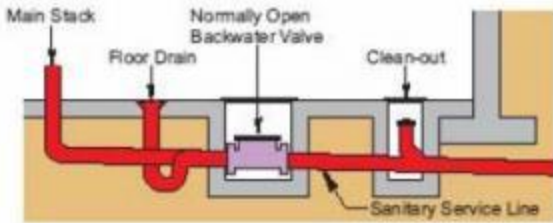
Flood retrofitting: Flood retrofitting measures include **dry floodproofing** where all areas below the flood protection level are made water tight. Walls are coated with waterproofing compounds or plastic sheathing. Openings such as doors, windows or vents are closed permanently or have removable shields, or with sandbags.



Dry floodproofing of new and existing non-residential buildings in the floodplain is permitted under State, FEMA and County regulations. Buildings of a residential nature may also be dry floodproofed as long as there is no substantial damage or improvements on the structure.

Wet floodproofing: The alternative to dry floodproofing is wet floodproofing. Anything that can be damaged by a flood is removed or elevated above the flood level. The walls are replaced with materials that are flood resistant. For example,

BACKWATER VALVE INSTALLATION



concrete block walls installed instead of wooden studs and gypsum wallboard. All appliances are permanently relocated to a higher floor or may be raised on concrete platform such as blocks or bricks. Thousands of dollars can be saved by simply moving furniture and electrical appliances out of the basement.

Sewer backup: Another flood protection modification addresses flooding caused by overloaded sanitary or combined sewers. There are four approaches that can be used to avoid sewer backup. Floor drains plugs, floor drain stand-pipes, overhead sewers, and backflow protection valves. The first two devices keep water from flowing out of the lowest opening in the building, the floor drain. They are relatively low in cost, however, if water becomes deep enough in the sewer system, it can flow out of the next lowest opening, such as a toilet or tub, or it can overwhelm a drain plug by hydrostatic pressure and flow into the building through the floor drain. The other two measures, overhead sewers, and backflow protection valves keep water in the sewer line during a backup. These are more secure but more costly.

For dry and wet floodproofing, and sewer backup prevention it is important to consider what type of contents are suitable for keeping in basements or crawl spaces. Valuables or keepsakes (photographs) should be kept elsewhere.

Local implementation: The City of Jerseyville has retrofitted most of the sewer lines with backflow protection valves; the City of Grafton has dry floodproofed commercial buildings along the Mississippi River. These buildings are constructed of concrete block with garage overhead doors that can be raised and the inside of the building can be power washed. Appliances are easily removed if there are reports of rising water. The County does not have a sewer system in the floodplain. After 2008 flood all septic systems located in the floodplain had to replace with an engineered design sealed system and a Floodproof Certificate. Any new development requires the same.

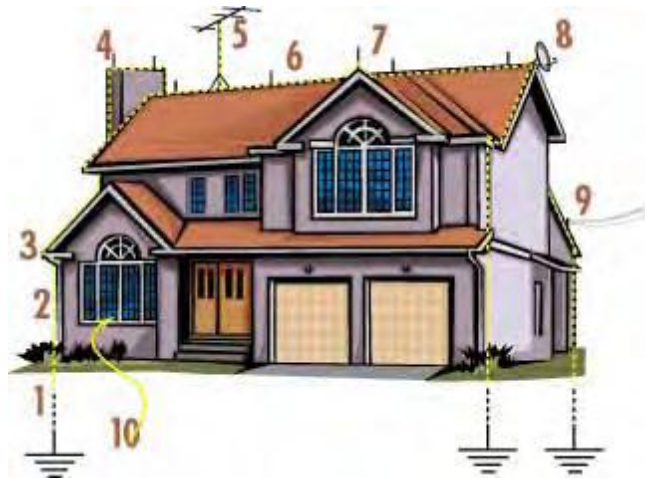


CRS credit: Credit for dry and wet floodproofing and sewer backup protection is provided in Activity 530 (Flood Protection). These measures are considered less secure than barriers, elevation, relocation or acquisition, therefore not as many points are given.

5.3 Building Retrofitting

Tornado retrofitting: One of the measures of retrofitting is to include construction of a “safe room” to protect lives of the occupants. Safe rooms can be built in a basement at the time of new construction or added to an existing home by connecting all parts of the shelter together (walls, roof and foundation) using adequate fasteners or tie downs. These will hold the safe room together when the combination of high wind and pressure differences work to pull the walls and ceiling apart. The walls are made out of plywood and metal sheeting to protect individuals from flying debris.

Another approach to retrofitting for tornadoes and high winds are to secure the roof, walls and foundation with adequate fasteners or tie downs. This measure is also used to manufactured homes. A third measure is to strengthen garage doors, windows and other large openings. If the wind breaks the buildings envelope, the pressures on the structure greatly increase. Impact-resistant glass is also recommended. Burying of utility lines is also a retrofitting measure that addresses high winds from tornadoes and summer storms and thus the less likely of loss of power.



Summer thunderstorm retrofitting: The approaches to protect public or private buildings from damaging storms include:

- storm shutters
- lightning rods
- strengthening connections and tie-downs
- impact-resistant glass in windows or Low-E Storm windows
- surge protectors at electrical outlets
- roofs made of materials less susceptible to damage by hail (asphalt or formed steel shingles)

Winter storm retrofitting: replacing or improving insulation values in older buildings and insulation of water lines, duct work and low-e thermal windows to reduce the use of energy and increase the comfort of the building. Roofs can be retrofitted to shed heavy loads of snow and prevent ice dams that form when snow melts.

Earthquake retrofitting of buildings: there are two types of hazards for buildings and people, the hazard of damage to the structure itself and damage to its contents. The following is an example of retrofitting for a structure, but could be quite costly:

- remove masonry overhangs that will fall onto a street or sidewalk during shaking
- bracing the walls of the building to provide more stability
- bolting sill plates to the foundation
- replacing windows with more shatter resistant glass

The following are examples of retrofitting of non-structural measures that are less costly:

- securing appliances, water heaters, book cases, and any fragile décor such as mirrors, pictures, any upright furniture that will not fall
- installing latches on cabinet doors and drawers
- anchoring any flammable tanks or cylinders
- flexible utility connections for water or gas

These approaches can be cost effective and the structure will still be pleasing to the eye and most importantly they will save lives during an earthquake event.

These same measures may not be as effective for **critical facilities**. Retrofitting for critical facilities should be done on a case by case basis according to the facilities purpose. For example, a hospital must be strong enough to handle aftershocks from an earthquake.

Earthquake retrofitting for infrastructure and lifelines: the definition of “lifelines” per FEMA is *the public works and utility systems that support human activities; individual, family, economic, political, and cultural. The various lifelines can be classified under the following five systems: electric power, gas and liquid fuels, telecommunications, transportation, and water supply and sewers.*

These five critical facility systems should be prioritized. Consideration should also be given to outside agencies including state, federal and private owners of utility systems or communications. The Illinois Emergency Management Agency (IEMA) offers a multitude of information of before a disaster and after and FEMA’s Ready.Gov web site also provides information for preparing for a disaster and how to prepare an emergency supply list.

Local implementation: Jersey County and its municipalities rarely endure earth movement due to earthquakes however; the Jersey County Code Administrator office does provide pamphlets on being prepared for a possible earthquake. The ESDA coordinator also has “family preparedness” meetings. Most new single family residences with basements do provide a safe room. Mobile homes that are placed in the county must be permitted and placement is inspected to meet the States tie down act. Any new critical facilities are required to be designed to account for possible multi hazards. All of the municipalities Subdivision Ordinances disclose where natural water ways are located and if there is any part in the floodplain. Flood insurance has been available in the communities since 1978.



CRS credit: retrofitting for protection of a structure from hazards other than flooding is not credited under the CRS.

5.4 Insurance

The National Flood Insurance Program (NFIP): is a Federal program created by Congress in 1968 to mitigate future flood losses nationwide through sound, community-enforced building and zoning ordinances. It has been broadened and modified over the years into the Flood Insurance Reform Act of 2004. Its purpose was designed to provide an insurance alternative to disaster assistance to meet the escalating costs of repairing damage to buildings and its contents. The NFIP does not mitigate the damage caused by a natural hazard, but it does help the owner to repair, rebuild and possibly afford to incorporate other mitigation measures. A homeowner's standard insurance policy will cover damage from tornados, wind, hail, and winter storms and separate endorsements are available for earthquake coverage.

Besides Jersey County there are three participating communities in the NFIP, the City of Grafton, Village of Elsay, and the City of Jerseyville. Flood insurance is required as a condition of certain types of federally backed aid and bank loans or mortgages for buildings located in the 100-year floodplain. These policies usually cover the building and not the contents. Renters can buy contents insurance even if the owner does not have building coverage. There is limited coverage for basements or below grade additions. Flood insurance is available to anyone in a participating NFIP community. If the building is located outside of the floodplain the premiums are usually lower.

Illinois Residential Real Property Disclosure Act: This act went into effect on October 1, 1994, requiring a seller to tell a potential buyer if the property is located in a floodplain or if he is aware of any flooding or basement leakage, or if the seller has flood insurance.¹ The drawback to this is the seller may not be aware a problem and is willing to state this on the disclosure form.

There are ramifications of not having flood insurance on an eligible insurable public facility damaged by flooding and is located in a mapped floodplain zone. FEMA is required to reduce Federal disaster assistance by the *maximum* amount of insurance proceeds that would have been received had the building and contents been fully covered under the NFIP. The maximum amount of coverage is \$500,000 thousand for non-residential. If property owners were required to have flood insurance after receiving disaster assistance from a previous flood and had dropped their coverage, they would lose their right to any future disaster assistance.

Community Rating Service: The Community Rating Service (CRS) was established by FEMA in 1990. Its purpose is to recognize floodplain management strategies that go beyond the NFIP minimum requirements. A NFIP community may volunteer to join the CRS. After the

¹ www.ilga.gov/legislation/

application process the community is given a class rating. Ratings are class ten to a class one, with class one being excellent. As a reward for going beyond the minimum requirements the communities residents and property owners will qualify for a flood insurance premium reduction that ranges from 5% to 45% savings. CRS credit is determined under four activities:

- Public information
- Mapping and regulations
- Flood damage reduction
- Flood preparedness

Local implementation: Unincorporated Jersey County joined the CRS in 2008 beginning with a Class 7 after application. The County has been a Class 5 for four years. Currently there are 62 communities in Illinois that are participating in the CRS. Jersey County is ranked third in the state in points (2,746) with a \$24,837 savings to NFIP policy holder’s premiums.² Grafton, Elsah and Jerseyville are non-participants.



CRS credit: Credit is given under the Public Information Activity 310 to 260.

5.5 Repetitive Loss Properties

In Chapter 2 explains the criteria for designation of the County’s repetitive loss properties – two federal flood insurance claims of at least \$1,000 in any ten year period. These properties deserve special attention because they are more prone to flooding than other areas in the county. Protection of these properties is a priority with FEMA and IEMA mitigation funding programs.

Hazards Addressed
• Flood
Tornado
Winter Storms
• Thunderstorms
Earthquake
Drought

In 2007 Jersey County identified 18 severe repetitive properties (SRL). FEMA has defined the SRL group as NFIP-insured residential property that has met at least 1 of the following paid flood loss criteria since 1978, regardless of ownership:

- 4 or more separate claim payments of more than \$5,000 each (including building and contents payments); or
- 2 or more separate claim payments (building payments only) where the total of the payments exceed the current value of the property

In either case, 2 of the claim payments must have occurred within 10 years of each other. Multiple losses at the same location within 10 days of each other are counted as 1 loss, with the payment amounts added together.³

² ISO/CRS Specialist, Lou Ann Patellaro, CFM 10/9/15 e-mail

³ *Guidance for Severe Repetitive Loss Properties*; www.fema.gov

In 2004, through the Flood Insurance Reform Act of 2004,* Congress directed FEMA to develop a program to reduce future flood losses. Under the SRL Grant Program funds were provided to state and local governments from FEMA as the source. Offers were to be made to the NFIP-insured owners for mitigation projects that would reduce future flood losses through:

- Acquisition or relocation of at-risk structures and conversion of the property to open space;
- Elevation of existing structures; or
- Dry floodproofing of historic properties.

In 2007 a cost/benefit study was conducted on the 18 SRL properties and application for a grant was submitted. Unfortunately the application was denied as the properties were all structures located on USACE leased ground and were not eligible for Federal funding. Ironically all 18 SRL structures were mitigated after the 2008 flood with Increased Cost of Compliance endorsement of their NFIP policies.

Local implementation: FEMA's NFIP data base reports Unincorporated Jersey County with 29 repetitive loss structures, Grafton has 33, and Elsay currently has 3 repetitive properties that have yet to be mitigated. All of Jersey County's RL properties are identified and electronic files are attached to the mapped area. An outreach mailing is sent annually to all repetitive loss properties in the County.

5.6 Recommendations

- Each municipality should have educational public information brochures/mailings designed specifically for their municipality.
- Elsay should consider retrofitting its historical houses.
- Other NFIP communities should consider joining the CRS program.
- Septic issues need to be addressed in the Village of Elsay by trying to find funding for the project.
- Grafton should be more stringent on development within the floodplain and seek individuals that may want to voluntarily sell their structures through grant funding and in turn the property becomes open space.
- Each public entity should protect its own publicly-owned facilities with the appropriate mitigation measures.
- The county and municipalities should encourage property protection by property owners by allowing incentives.
- Repetitive loss properties should be monitored and be mitigated.
- Each public entity should evaluate its own properties exposure to damage from hazards and a priority should be placed on determining the critical facilities vulnerability and whether these properties are adequately insured.

- Jersey County and municipalities should seek funding in support of safe rooms for mobile home parks.

* 7/2013 – Biggert Waters Flood Insurance Reform Act of 2012 eliminated the SRL program. Information is available at www.fema.gov/media-library/assets/documents/33634

5.7 References

www.fema.gov/media-library/assest/documents/33634

www.ilga.gov (765 ILCS 77/Art. 1) *Residential Real Property Disclosure Act*

FEMA NFIP Database

ISO/CRS Specialist, Lou Ann Patellaro, CFM 10/9/15 e-mail

Guidance for Severe Repetitive Loss Properties; www.fema.gov

www.ilga.gov/legislation/