



# Federal Emergency Management Agency

Region VII

2323 Grand Boulevard, Suite 900  
Kansas City, Missouri 64108-2670

## NATIONAL FLOOD INSURANCE PROGRAM APPLICABLE FLOODPLAIN MANAGEMENT REQUIREMENTS FOR CERTAIN AGRICULTURAL STRUCTURES

### REGIONAL GUIDANCE

The Federal Emergency Management Agency (FEMA) has prepared the attached Regional Guidance for communities requesting assistance in dealing with the unique problem of agricultural structures in the 100-year floodplain. This guidance provides alternate methods that may be used by your community to allow certain types of agricultural structures in areas damaged by the Great Midwest Flood of 1993.

This guidance is a further clarification of what can be allowed via a variance and **should not** be taken as a blanket waiver from the minimum requirements of the National Flood Insurance Program (NFIP). Each site must be reviewed, and if appropriate, an individual variance hearing must be conducted for each contiguous parcel under one ownership. The hearing must be conducted by the governmental body or bodies that hear variance requests from the requirements of the "Ordinance Regulating Development Within Special Flood Hazard Areas" adopted by your community.

The decision must be based on the unique circumstances in each case. A variance may **only** be granted in circumstances when it is demonstrated that agricultural structures can be designed in such a manner that flooding will only result in minimal damage to the building and its contents, and will create no additional threats to public safety. In addition, the variance may **only** be approved for the types of buildings noted in this guidance [pole frame buildings, steel grain bins, steel frame corn cribs, general purpose barns for the feeding of livestock that are open on at least one side, livestock confinement buildings, poultry houses, dairy operations, and similar livestock operations substantially damaged by the Great Midwest Flood of 1993]. New construction must meet the minimum requirements of your ordinance and the NFIP requirements.

**PLEASE NOTE THAT AGRICULTURAL RESIDENCES MAY NOT BE CONSIDERED FOR THIS VARIANCE.**

**THE GRANTING OF A VARIANCE FROM THE MINIMUM NFIP REQUIREMENTS DOES NOT EXEMPT THE PROPERTY OWNER FROM PURCHASING FLOOD INSURANCE COVERAGE FOR THE STRUCTURE.**

For further information contact:  
Federal Emergency Management Agency  
REGION VII - MITIGATION DIVISION  
2323 Grand Boulevard, Suite 900  
Kansas City, Missouri 64108-2670  
(816) 283-7002

## AGRICULTURAL STRUCTURES GUIDANCE

### Background

The National Flood Insurance Program (NFIP) floodplain management regulations require new, substantially improved, and substantially damaged non-residential buildings to be elevated or floodproofed to the Base Flood Elevation (BFE or 100-year flood). To meet the NFIP floodproofing requirements, the structure must be designed so that the portion below the BFE it is made watertight with walls substantially impermeable to the passage of water. This type of flood protection technique is often referred to as "dry floodproofing." Agricultural structures are included under the general NFIP definition of a non-residential structure, and are consequently subject to all floodplain management regulations pertaining to new construction or substantially improved/substantially damaged structures.

However, the Federal Emergency Management Agency (FEMA) recognizes that alternate methods of flood protection may be appropriate for certain types of agricultural structures located in wide, expansive floodplains. These alternate methods of protection, commonly referred to as "wet floodproofing," allow for the inundation of the building by floodwaters, but minimize damage through use of flood-resistant materials and other construction techniques. Only when agricultural structures are designed to minimize damage to the building and its contents and creates no additional threats to public safety, may a variance be issued.

### Guidance for Applying Floodplain Management Variance Criteria to Certain Agricultural Structures:

A variance may be issued for the following types of agricultural structures only if the structure is used solely for agricultural purposes in connection with the production, harvesting, storage, drying, or raising of agricultural commodities, including the raising of livestock.

- < Pole frame buildings with open or closed sides used exclusively for the storage of farm machinery and equipment.
- < Steel grain bins and steel frame corn cribs.
- < General purpose barns for the temporary feeding of livestock that are open on at least one side. For livestock confinement buildings, poultry houses, dairy operations, and similar livestock operations, variances may only be issued for structures substantially damaged as a result of the Great Midwest Flood of 1993.

**New construction or substantial improvements of such structures** must meet the floodplain management requirements of 44 CFR 60.3 of the NFIP regulations for non-residential structures. These regulations require that new or substantially improved non-residential buildings must be elevated or floodproofed to the BFE (100-year flood).

- < Detached garages and storage sheds, used solely for parking and limited storage, that are no greater than 400 square feet in area.

## AGRICULTURAL STRUCTURES GUIDANCE

### INSURANCE IMPLICATIONS

**It must be emphasized that variances are granted with respect to floodplain management requirements and do not affect insurance rates.** The Federal Insurance Administration, by statute, must charge insurance rates commensurate with the risk to which a building is exposed. Insurance rates for buildings constructed under variances are generally higher than rates for a comparable structure that is fully compliant. In some instances the additional costs of insuring these buildings, if they are not elevated or floodproofed in accordance with the NFIP requirements, can approach or even exceed the costs of meeting NFIP requirements and the structure is still exposed to flood damages. **In accordance with the NFIP regulations, communities shall notify the applicant, in writing, that the issuance of a variance will result in increased premium rates for flood insurance and that such construction below the BFE increases risks to life and property [44 CFR 60.6(a) (5)].** The community should also note that dry floodproofing is required to one foot above the BFE. Structures floodproofed to the BFE only, will be rated as one foot below BFE.

In determining whether a variance from the local floodplain management regulations may be issued for the above stated agricultural structures, the community must apply the following NFIP variance criteria set forth in the NFIP floodplain management regulations [44 CFR 60.6(a)]. The responsibility for determining whether an applicant qualifies for a variance rests solely with the community. To properly administer the granting of a variance for these types of agricultural structures at the local level, communities must have variance review procedures in place. These variance review procedures must be within the bounds of the state enabling law.

Each variance must be decided individually by the community after a case by case analysis of the building's unique circumstances in accordance with the community's floodplain management ordinance. Issuing categories of variances to the NFIP requirements or granting a variance to a group of buildings is contrary to the purposes of the NFIP. FEMA uses these criteria to evaluate variances granted by a community and to determine if they are consistent with sound floodplain management.

---

### NFIP VARIANCE CRITERIA

- < The applicant has good and sufficient cause for requesting a variance.
- < The applicant will suffer exceptional hardship should the variance be denied.
- < The variance will not cause increased flood heights, additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization of the public, or conflict with existing local laws or ordinances.
- < The variance is the minimum necessary, considering the flood hazard, to afford relief.

## AGRICULTURAL STRUCTURES GUIDANCE

### CONDITIONS TO VARIANCES ISSUED

In order to minimize flood damages during the 100-year flood and the threat to public health and safety, the community shall attach, at a minimum, the following underlined conditions to a variance issued for any one of the above stated agricultural structures that are wet floodproofed.

These conditions can also be used as guidance to determine whether a building is a candidate for wet floodproofing:

1. Use of the structure must be limited to agricultural purposes only in zones A, A-30, AE, AO, or AH of the community's Flood Insurance Rate Map (FIRM).
2. The agricultural structure must be built or in the case of an existing building that is substantially damaged, with flood-resistant materials for the exterior and interior building components and elements (i.e., foundation, wall framing, exterior and interior finishes, flooring, etc.) below the BFE in accordance with 44 CFR 60.3(a) (3) of the NFIP regulations. The NFIP "Technical Bulletin 2 Flood-Resistant Material Requirements" provides guidance on materials resistant to flood damage and how and when these materials must be used to improve the building's ability to withstand flooding.
3. The agricultural structure must be adequately anchored to prevent flotation, collapse, or lateral movement of the structure in accordance with 44 CFR 60.3(a) (3) of the NFIP regulations. All of the building's structural components must be capable of resisting specific flood-related forces including hydrostatic, buoyancy, hydrodynamic and debris impact forces.  
Where flood velocities exceed five feet per second, fast-flowing flood waters can exert considerable pressure on the building's enclosure walls or foundation walls. "Technical Bulletin 1 Openings in Foundation Walls" and "Technical Bulletin 3 Non-Residential Floodproofing" provide guidance on design considerations to address these forces.
4. The agricultural structure must meet the NFIP openings requirement. NFIP requires that enclosure walls or foundation walls, subject to the 100-year flood, contain openings that will permit the automatic entry and exit of floodwaters in accordance with 44 CFR 60.3(c) (5) of the NFIP regulations. "Technical Bulletin 1 Openings in Foundation Walls" provides guidance for design openings in cases where a rate-of-rise is greater than five feet per hour.
5. Any mechanical, electrical, or other utility equipment must be located above the BFE or floodproofed so that they are contained within a watertight, floodproofed enclosure that is capable of resisting damage during flood conditions in accordance with 44 CFR 60.3(a) (3).
6. The agricultural structure must comply with the floodplain management floodway encroachment provisions of 44 CFR 60.3(d) (10) or (d) (3). No variances may be issued for agricultural structures within any designated floodway if any increase in flood levels would result during the 100-year flood.

## AGRICULTURAL STRUCTURES GUIDANCE

7. Major equipment, machinery, or other contents must be protected. The rate-of-rise of flood waters or the flood-warning time available through an existing, reliable (community-based or regionally-based) flood warning system must be adequate to provide sufficient lead time to remove and relocate contents to land above the BFE. A community must make a finding that rate-of-rise of flood waters and/or flood warning is adequate. Protection techniques must be specified.
- < Protection techniques for contents that cannot be relocated in the event of a flood include constructing protective watertight floodproofed areas within the building, the use of equipment hoists for readily elevating contents, or permanently elevating certain contents on pedestals or shelves above the BFE.
  - < For contents that can be relocated, a determination must be made that property owners can safely remove contents at any time, 365 days a year, without risk to lives and that the contents will be relocated to a site out of the floodplain. The site for storing relocated contents should be specified.
- 

### Important Issues Communities Need to Consider:

A community that varies individual standards for agricultural structures, but still provides a level of protection that minimizes flood damages and the threat to public health, safety and welfare, will not jeopardize its NFIP eligibility. The community's Floodplain Manager needs to thoroughly document the conditions of each variance. Because granting variances to wet floodproofed agricultural structures is a serious matter, the following are additional considerations a community should address as part of its variance review.

- < The applicant for a variance should demonstrate that such agricultural structures are located in wide, expansive floodplain areas, and that no other alternate location for the agricultural structure exists. Communities should require the applicant to demonstrate that the entire farm acreage underlying the structure is located in the Special Flood Hazard Area and **no other alternate locations** for the structure are available.
- < The community should consider stipulating a size limit for the structure to be wet floodproofed. Also, the community should consider any existing or future wet floodproofed structures on the site by establishing a minimum number of structures that may be potentially wet floodproofed at any one farmstead in order to minimize future flood damages.
- < The community should consider stipulating minimum distances to uncertified levees in order to protect structures that could be subject to high velocity waters as a result of a levee break or breach.
- < In order to grant the minimum type of variance from the NFIP standards necessary in order to afford relief, the community should consider a combination of elevation on fill and wet floodproofing.

## FURTHER INFORMATION REGARDING AGRICULTURAL STRUCTURES

The Regional Guidance for Certain Agricultural Structures includes an in-depth discussion of the requirements communities must follow in granting a variance for agricultural structures in areas affected by the Great Midwest Flood of 1993. However, due to the complexity of the matter, we are providing additional guidance regarding the issue. Should you have any questions after reading the guidance and the supporting documentation, please call the Federal Emergency Management Agency (FEMA) Regional Office at (816) 283-7002.

1. **Q. On page one, paragraph two of the Regional Guidance appears to indicate that applicants for a variance must provide a certification by a structural engineer that the agricultural structure can withstand the velocities and depths associated with a flood. Is this correct?**
  - A. *No. At this time, no additional certification is required. However, if floodproofing and construction techniques included in the technical bulletins are followed, then damage should be minimized.*
  
2. **Q. How do you wet floodproof grain bins?**
  - A. *Grain bins may be wet floodproofed by including openings in the design of the grain bin. While this will not meet the normal wet floodproofing requirements that require permanent openings, operators should have the option to prove they have sufficient time to open hatches or doors. This provision presupposes that all grain has been removed prior to the flooding for this technique to work. Counties should require that an evacuation plan be included for each grain bin variance request.*
  
3. **Q. The guidance states that mechanical, electrical, or other utility equipment must be located above the BFE or floodproofed. How can this be accomplished?**
  - A. *Various techniques for floodproofing mechanical, electrical and other utility equipment are included in a FEMA document entitled "Floodproofing Non-Residential Structures." Licensed engineers may also be able to provide options; however, it is important to remember that floodproofing or elevation may not be a viable option. In this case, the equipment should not be located in the structure or the variance for the structure should not be approved.*

## AGRICULTURAL STRUCTURES GUIDANCE

4. **Q.** The guidance also states in the event of a flood, major equipment, machinery, or other contents that cannot be protected by relocation must be elevated by means of hoists, pedestals, or floodproofed rooms. What if this is not practical because of the size of the equipment or the height of the BFE?

A. *If there is not adequate warning time prior to the flood and major equipment or machinery cannot be moved, elevated, or placed in a floodproofed room or structure, then these items should not be allowed to be stored in a floodplain.*

5. **Q.** The Regional Guidance indicates that this policy should only be used in wide, expansive floodplain areas. What is a wide, expansive floodplain?

A. *A wide, expansive floodplain is one that would cover the entire farm. Typically, a farm that is 40 acres or greater in size. Generally, the Mississippi and Missouri rivers are the only rivers that would have floodplains of sufficient size to meet this definition.*

6. **Q.** Several issues should be considered during the variance reviews. They include size limits for structures, maximum numbers of structures allowed at a site, and minimum distances from non-certified levees. Please expand on this?

A. *The size limit established by any community should be the minimum needed to meet the needs for the site. In making the determination of what that minimum is, variance boards should remember that the buildings should only house, store, or protect farm implements used on-site, animals raised on-site, or commodities grown on-site.*

*The criteria used to determine the number of structures should be the same as the criteria used to determine the size of the structures.*

*The minimum distance from the non-certified levees should be based on the anticipated velocity of the water coming through the levee breaks. The velocities may be determined by a licensed engineer. If you are a county where there was a levee failure, a good rule of thumb is that the structure should be no closer to the levee than the length of the debris path from the levee break.*

7. **Q.** Are agricultural structures covered by the National Flood Insurance Program (NFIP)? How are they rated? Will this policy exempt the structures from the flood insurance requirements?

A. *Agricultural structures are covered by the NFIP. For the purpose of rating the structures, they are considered non-residential. As long as the structures have four walls and a roof, they can be insured. In addition, silos and grain storage buildings can also be insured. Structures covered by this Regional Guidance are not exempt from the flood insurance requirements. Flood insurance for these structures will have to be rated at the actuarial rates. Flood insurance policies for any structure with the lowest floor (including basement) more than one foot below the base flood elevation must be forwarded to the Federal Insurance Administration for actuarial rating.*