

Development in Areas of Shallow Flooding

For floodplain mapping purposes, *shallow flooding is defined as flooding with an average depth of one to three feet in areas where a clearly defined channel does not exist.* This can occur for a variety of natural or human-caused reasons. Some areas of shallow flooding are identified on flood hazard maps – many are not.

Special Flood Hazard Areas (100-year Floodplains)

Flood hazard maps may show areas labeled as “Zone AO” or “Zone AH” that are expected to experience shallow flooding during a 100-year flood event. These are “Special Flood Hazard Areas” and are subject to floodplain development regulations. If the anticipated depth of the 100-year flood has been determined, it may be indicated as the depth in feet above the ground (in Zone AO) or as the Base Flood Elevation above sea level (in Zone AH). When this is specified, development should be protected to or higher than the specified flood depth or elevation. If no flood depth is indicated on the map (or available from another source) then development should be protected to a level 2 feet above the highest adjacent grade.

Other Flood-Prone Areas

Many areas prone to flooding are not identified on flood hazard maps. Shallow flooding can be a problem in developed areas where drainage systems (swales, ditches, storm sewers, stormwater ponds, etc.) are overloaded by large storms. It can also occur naturally on alluvial fans, in areas with sheet flow, in depressions where water ponds, and in shallow drainageways that are normally dry. In addition, debris accumulation, ice jams, and extreme events can contribute to flooding beyond the mapped floodplain boundaries. When flood-prone areas are not identified on flood hazard maps and designated as Special Flood Hazard Areas, development requirements may not be sufficient to protect against flood damage. The following information can be used as guidance for protecting development in these areas.

What Is the Flood Hazard?

Just because a site is not in a mapped floodplain doesn't mean that it is safe from flooding. It only means that the site was not recognized as a “high flood hazard area” (with water depths greater than one foot) when the map was developed. Moderate to low flood hazard areas can and do flood. And it only takes a few inches of water inside a house to cause thousands of dollars in damage. Resources that are helpful for indentifying and investigating flood hazards include:

Anywhere it rains, it can flood!
About one-third of all flood insurance claims are for properties outside of the mapped Special Flood Hazard Areas.

- **Flood Hazard Maps.** Flood hazards should be taken into account for any development in or near a 100-year or 500-year floodplain. The mapped floodplain boundaries are based on model results and may change with time due to changing conditions and/or improved mapping techniques. The flood potential may change due to development or other land use changes in the watershed. It is wise to prepare for mapped flood hazards, the possibility of increased hazards, and the potential for larger flood events.
- **Soil Surveys.** Soil survey maps can be used to evaluate the potential for flooding or shallow groundwater conditions. Soil descriptions and tables published with these maps indicate the limitations associated with different soil types.
- **History.** Neighbors, municipal officials, County Soil and Water Conservation Districts, and others may be able to tell you if an area has experienced water problems in the past. But keep in mind that no flooding in the last 20 years doesn't mean that there will be none in the next 20 years.
- **Rainy Day.** Look at the site in the rain and pay attention to where the water goes; think about where it would go if there was a lot more water. Look for low areas and intermittent drainageways. Is there a dam, dike, earthen berm or other structure that could impact the area if it overtopped or failed? Is there a bridge, culvert, or storm drain that could plug with debris? How close is the nearest stream? Remember that “little creeks” can cause “big floods.”

If maps, soils, historic drainage patterns, or other clues indicate a potential for flooding, then protect your investment by incorporating the flood risk into the site layout, project design, and materials used.

Location

Locate development on high ground in an area that will not be subject to drainage or erosion problems.

- Resist the temptation to fill in a boggy area or shallow swale to construct a house. Water often retains its historic flow pattern, which can damage the foundation or basement. An additional concern is the impact that diverted flow may have on surrounding areas, which may develop unanticipated drainage problems.
- Leave a vegetated buffer between developed areas and streams or wetlands. Woody vegetation helps to maintain the stability of stream systems and also reduces the risk of flooding, erosion, or sediment damage. Some streams can move fifty feet or more during a single flood event.



Build High (to Stay Dry)

Since water flows downhill, it's a good idea to elevate buildings and other vulnerable items in any flood-prone location. Within Special Flood Hazard Areas (regulated floodplains), basements are prohibited and buildings must be elevated or floodproofed to (or above) the designated flood protection level. The same strategy can be used in other areas. If there is a risk of shallow flooding, avoid wet basement problems and elevate the first floor at least three feet above grade. If the depth of historic flooding is known, try to elevate or protect your project to a level two feet above the historic high water mark.

Drain Water Away from Buildings

Within Flood Zones AH and AO, adequate drainage paths are required to guide flood waters around and away from proposed structures on slopes.

Flood Resistant Design and Materials

The foundation and lower portions of a building should be designed to withstand the effects of any anticipated flooding by utilizing flood damage-resistant materials, adequate anchoring, and elevation of sensitive components. In addition, it is important that any basement or other enclosed area be designed to either withstand the hydrostatic pressure of water or to equalize pressure by allowing water to enter and exit the enclosure.

(See also *Floodplain Facts #8: Enclosed Areas Below the Flood Protection Level* and *Floodplain Facts #9: Flood Resistant Design*.)



Flood Insurance

Since homeowners' insurance policies generally do not cover flooding, it is advisable to purchase flood insurance coverage for both buildings and contents in flood-prone areas. In mapped floodplains, most mortgage lenders require flood insurance coverage for the building. In other areas, insurance costs are lower and may provide valuable protection against financial losses from flooding.