Governor's Center for Local Government Services

Technical Information on Floodplain Management

Administrative Guidelines for Development

PLANNING SERIES #5

Commonwealth of Pennsylvania
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Department of Community and Economic Development
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DCED

Technical Information on Flood Plain Management

Administrative Guidelines for Development
Planning Series #5

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All comments, inquiries, or requests to receive additional copies of this publication or other publications should be directed to:

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#10 Reducing Land Use Barriers to Affordable Housing

NOTE: These publications are periodically revised or updated to reflect changes in Pennsylvania planning law.

Table of Contents

Permits for Construction and Development

Introduction

To participate in the National Flood Insurance Program (NFIP), a municipality must enact a code or ordinance, which at a minimum, meets the floodplain management requirements established by the Federal Emergency Management Agency (FEMA). This means that a participating municipality must regulate all construction and development within those areas of the community identified by FEMA as being flood-prone. To accomplish this, a municipality must issue a building permit before any construction or development takes place. This ensures that the municipality has the opportunity to review all proposed activities for compliance with any applicable floodplain management regulations.

While it may sound rather simple and straightforward, it is not always an easy matter to distinguish between those activities that require a permit and those that do not. The following information is provided to help municipalities become more confident in making this determination.

The Meaning of Construction and Development

Most municipalities are familiar with the term "construction." Municipal building codes and ordinances are designed to regulate the erection, alteration, repair, renovation, demolition or removal of any building or structure. However, the term "development" may be new to many communities. Rather broad in scope, it is defined in the NFIP regulations as:

> …Any manmade change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations.

Therefore, in addition to buildings and other structures, the term also applies to most land development activities, such as the grading and paving of roads and the installation of water and sewer service and related facilities; site preparation activities, such as the placement of fill and excavation work including the installation of on lot sewage systems; and, mining operations for the extraction of natural resources, such as sand and gravel, limestone, gas and oil, coal and other minerals. It also covers the clearing of water obstructions and the dredging of stream channels.

Permit Exemptions

Taken literally, permits would be required for just about anything imaginable from planting a tree to putting in a mailbox. However, the intent of the NFIP regulations and of local floodplain management ordinances, in general, is to reduce future flood damages. Therefore, activities, which have no direct bearing on increasing flood damage or aggravating flooding conditions, are excluded from the permit requirement.

Permits are not needed for temporary activities such as carnivals and other transient facilities or the placement of construction trailers. "Temporary" refers to activities, which will be completed or terminated within six months from the time they were started. If an activity is to continue well after six months, it should be treated as a permitted activity. For example, construction trailers are commonly associated with projects that last for more than six months. In these instances, a permit should be required in order to ensure that the vehicle is properly located and/or can be safely evacuated in the event of a flood.

Minor repairs to existing structures are also exempt. As an example, the International Building Code (IBC) required by Act 45 of 1999 would consider the following as an ordinary or minor repair:

The replacement of existing work with equivalent materials for the purpose of its routine maintenance and upkeep, but not including the cutting away of any wall, partition or portion thereof, the removal or cutting of any structural beam or bearing support, or the removal or change of any required means of egress, or, arrangement of parts of a structure affecting the exit way requirements; nor shall minor repairs include addition to, alteration of replacement or relocation of any standpipe, water supply, sewer, drainage, drain leader, gas, soil, waste, vent-or similar piping, electric wiring, or mechanical or other work affecting public health or general safety.

This includes putting on a new roof and replacing siding, windows or doors. However, enlarging a structure through an addition is considered new construction-not a minor repair. Any work that changes the exterior dimensions of a structure requires a permit.

Some land development and land treatment activities are also excluded from the building permit requirement. The greatest concern over the regulation of land development activities involves the modification of existing drainage patterns and the effect this has on increasing or aggravating flooding conditions. Permits are not required for normal farming operations, the removal of trees or the placement of small quantities of fill (except in the floodway). However, the installation of drainage or diversion channels and storm water management facilities are required to be permitted. While the cutting of trees is exempt, timbering operations that involve the development of skid or haul roads are not.

The outside storage of materials is another activity which may be exempt from the permit requirement simply because it is not covered under the definition of construction and development. When incidental to an existing use, the storage of materials can occur without a permit being issued. However, even though a permit may not be required, the provisions in a municipality's floodplain management ordinance, which pertain to storage activities, must still be complied with. If storage is associated with the construction or development of a new facility or the expansion of an existing one, the approval of the permit application should be based on a complete review of the activity including the proper location and protection of stored materials. Depending on the type of material, outside storage in flood-prone areas can be a serious hazard and municipalities concerned with this loophole in the permit system should consider making the necessary changes to extend the permit requirement to cover any storage activity.

Judgment and Discretion

While some distinctions can be made concerning different types of construction and development and the need for permits, it would be difficult to identify and classify every possible situation. Nor is it necessary.

There will be instances where the permit officer will have to use his or her discretion in deciding whether or not a permit is required. Basically, permits are required if an activity can affect flooding conditions or can be damaged by flooding. This will primarily be determined by three factors: type, location, and magnitude of the activity. The different types of construction and development have already been discussed. As for location, the chance of an activity affecting flood heights is much greater in the floodway than in the other areas of the floodplain. As such, it may be necessary to require permits for activities in the floodway which would not ordinarily require a permit if located within other portions of the floodplain. This would include any amount of fill, fencing, retaining walls, boat docks or any other development activities that may obstruct floodflows.

In situations where there is some question as to whether or not a permit is required, it will be the magnitude or size and extent of the proposed activity, which will most likely be the deciding factor. Needless to say, the larger the activity, the greater the potential for flood damage and for affecting flooding conditions. Small-scale

activities such as planting a tree or installing a mailbox are insignificant compared to a proposal to develop irrigation channels or to change existing ground contours through grading.

The other factor, which comes into play, is the ordinance itself. Some municipalities may require permits for all activities regardless of size. Others may exempt activities under a certain cost. The permit officer should be familiar with any ordinance provisions that limit or otherwise establish minimum criteria for requiring permits.

The purpose of the permit system is to give municipalities an opportunity to review construction and development proposals for compliance with local floodplain management regulations. If there remains a question, it is better to error on the side of caution and to require a permit.

Getting the Word Out

While municipalities may fully understand the need for permits, it is usually community residents who simply are not aware that they should check with the permit officer before proceeding with a project. Trying to resolve compliance problems after a structure or project is underway or completed can be troublesome and time consuming. Efforts to periodically inform the community of the need for permits can help cut down on the number of unauthorized activities.

A common means of informing the general public is the posting of "building permits required" signs along the roadways entering a municipality. This can be particularly effective in alerting new residents as well as out-of-town builders and developers. Some municipalities place articles or advertisements in local newspapers once or twice a year to inform the community of the existence of floodplain management regulations and the need for permits. Others include a notice with monthly water or sewage bills to get the information directly in the hands of property owners. Can you think of any others?

Municipalities interested in doing something to inform their residents should be aware that the Department of Community and Economic Development (DCED) reimburses municipalities for up-to-half of the eligible costs for administering and enforcing floodplain management regulations. Any effort to publicize local regulations is considered an administrative function eligible for reimbursement.

Determining the 100-Year Flood Elevation

Introduction

For a community to participate in the National Flood Insurance Program, it must first enact legislation to regulate future construction and development in areas subject to the 100-year flood. Buildings and other structures proposed within the floodplain must be either elevated or flood-proofed to or above the elevation of the 100-year flood. Other types of development such as water and sewer facilities and other utilities must be designed to minimize or prevent flood damage when located below the 100-year flood elevation.

Since the 100-year flood is the basis for regulating construction and development, it is necessary that the elevation of the 100 year-flood be established for each and every activity proposed within the floodplain. The ease and accuracy of determining the 100 year flood elevation will depend on the type of maps and flood information available to a given municipality.

Flood Insurance Studies

The Federal Emergency Management Agency (FEMA), for several hundred municipalities throughout the Commonwealth has prepared Flood Insurance Studies (FIS). Among other things, these studies include flood profiles of certain stream reaches. A flood profile is a graph, which shows the elevation of a particular flood or floods along a stretch of stream, which has been studied in detail. The profiles prepared by FEMA indicate that distance along the stream in feet and the elevation of the 10-year, 50-year, 100-year, and 500-year floods in feet above mean sea level.

To determine the 100-year flood elevation for a proposed activity using the flood profiles, first locate the site on the Flood Boundary and Floodway Map (FBFM). Select the nearest cross section on the map and measure from that line down the center of the stream to a point adjacent to the site using the approximate scale shown on the FBFM. With this distance converted into feet, find the corresponding cross section symbol along the bottom of the flood profile chart and measure out to this distance and mark. Locate this point on the profile of the 100-year flood and determine the elevation of the point from the vertical scale on the left hand column of the graph.

Once the 100-year flood elevation is determined using the map and profile, it is a matter of establishing a reference elevation at or near the site. Reference marks with elevations to the nearest 1/100 of a foot are provided on the FBFM. These can be used as starting points to establish nearby elevations through the use of a level or other comparable equipment.

Other FEMA Information

Less than half of Pennsylvania's municipalities identified by FEMA as being floodprone have Flood Insurance Studies. Because of the expense in preparing FIS's and recent reductions in the federal budget, it is unlikely that many more studies will be prepared, at least for the foreseeable future. This means that most municipalities in Pennsylvania must rely on Flood Hazard Boundary Maps (FHBM) or Flood Insurance Rate Maps (FIRM) to regulate floodplain development. Originally prepared by FEMA to serve as interim information until the preparation of Flood Insurance Studies (FIS), FHBMs provide approximate delineations of the 100-year floodplain. Unlike Flood Insurance Studies, flood profiles are not provided nor are floodways identified. Municipalities are to use FHBMs to determine whether or not proposed activities are within the floodplain and to establish 100-year flood elevations.

FEMA is replacing FHBMs with FIRMs for municipalities with minimal flood hazards. The maps are essentially the same. However, a municipality, which receives a FIRM in place of a FHBM, gains eligibility into the regular phase of the National Flood Insurance Program meaning that additional insurance coverage is available to residents of the community. In this case, the FIRM replaces the FHBM as the basis for administering floodplain management regulations.

It should also be noted that not all flood-prone streams in municipalities with Flood Insurance Studies are done in detail. Many Flood Boundary and Floodway Maps (FBFM) include approximate delineations of some floodplain areas. Like the floodplain delineations of FHBMs and FIRMS, neither flood profiles nor floodways delineations are provided for such areas. Determining flood elevations for development in these areas can be accomplished by the same methods used in determining flood elevations for development located within floodplain areas delineated on FHBMs and FIRMs.

Use of the Best Available Information

Municipalities, which have maps with approximate delineations of the 100-year floodplain, are required by FEMA to use better flood elevation data available from other sources. Agencies as the U.S. Army Corps of Engineers, the Soil Conservation Service, U.S. Geological Survey (USGS) and the Pa. Department of Environmental Protection (DEP) may have information on file, which may help a municipality establish a 100-year flood elevation for a particular site.

One source of information that is particularly helpful are the Floodprone Quadrangle Maps prepared by the USGS. These are standard topographic maps (1:24,000 scale), which show an approximate delineation of the 100-year floodplain. The topography of the area is shown through the use of 20-foot contour lines. The contour and elevation reference points which are frequently located on the topographic quads can be used to help estimate the 100-year flood elevation with surprising accuracy. While a 20-foot interval between contours seems to leave a lot of room for error, quite often this can be narrowed down significantly by sizing up the area with a field inspection.

In some instances, it may be possible to use historical flood information as a basis for determining flood elevations. The height of past floods may be obtained from newspaper articles, recorded high water marks or from residents who remember the extent of major flooding. The problem with using historical information is the difficulty in relating the frequency of occurrence of specific flood events. Unless the magnitude of a previous flood can be verified as being close to a 100-year flood, caution should be used in applying the data. This is particularly true if the historical information is for a flood that covered a smaller area than that which is shown as the 100-year floodplain on a FEMA map.

The County Soil Survey Reports prepared and published by the Soil Conservation Service (SCS) can be very helpful too. Each report provides a description of the various soil classifications found throughout the county and includes aerial photographs showing the location of each soil type. Alluvial soils, those derived from material deposited by running water, often include various types of soils prone to flooding. When found adjacent to rivers and streams, the boundary of alluvial soils in conjunction with a USGS Floodprone Quadrangle Map or FHBM can be used to obtain a reasonable estimate of the 100-year flood elevation. In addition, the SCS may have flood elevation information for watersheds with projects funded through the P.L. 566 program.

Floodplain Information Studies, Flood Control Reports and general file information prepared by U.S. Army Corps of Engineer District Offices are excellent sources of flood data. Where there is no existing information, some Districts offer technical assistance to municipalities and property owners in establishing on-site flood elevations.

The PA DEP has flood elevation data for those stream segments for which flood control feasibility studies were prepared. When constructing new bridges and culverts, the Pennsylvania Department of Transportation (PENNDOT) prepares hydraulic reports, which often include information concerning I00-year flood discharges.

Some municipalities require an applicant to obtain the services of a professional engineer to determine the 100-year flood elevation. This is entirely acceptable provided that the methods used to perform the hydrologic and hydraulic calculations are appropriate.

Contacts for Flood Elevation Information

Floodplain Management Services
U.S. Army Corps of Engineers

Delaware River Basin
Wanamaker Building
100 Penn Square East
Philadelphia, Pennsylvania 19107-3390
(215) 656-6500
www.hap.usace.army.mil

Ohio River Division
William S. Moorehead Federal Building
1000 Liberty Avenue
Pittsburgh, Pennsylvania 15222
(412) 392-7414
www.lrp.usace.army.mil

St. Lawrence Drainage
1776 Niagara Street
Buffalo, New York 14207-3199
(716) 879-4143
www.lrp.usace.army.mil

Susquehanna and Potomac River Basins
P.O. Box 1715
Baltimore, Maryland 21203-1715
(410) 962-4223
www.nab.usace.mil

Natural Resources Conservation Service (NRCS) formerly SCS
U.S. Department of Agriculture
For county soil survey information, contact the county Conservation District office listed in your local telephone directory. For Flood Control Data:

Suite 340, One Credit Union Place
Harrisburg, PA 17110-2993
(717) 237-2203
www.pa.nrcs.usda.gov
www.nrcs.usda.gov

Geologic Survey (USGS)
U.S. Department of Interior
For floodplain information reports and floodprone quadrangle maps:

25 Limekiln Road
New Cumberland, PA 17070
(717) 730-6900
www.usgs.gov

Bureau of Waterways Engineering
PA Department of Environmental Protection

P.O. Box 8460
Harrisburg, PA 17101-8460
(717) 787-3411
www.dep.state.pa.us

Engineering District
PA Department of Transportation
For bridge and culvert hydraulic information, contact the local Engineering District Office listed under Commonwealth of Pennsylvania in your local telephone directory or contact:

Highway Design Quality Assurance Division
P.O. Box 3161
Harrisburg, Pennsylvania 17120
(717) 787-5023
www.dot.state.pa.us

Using the Maps

If there is no better information available, a FHBM or FIRM, alone, can be used to estimate an elevation. This requires finding the boundary of the 100-year floodplain nearest the construction site. This can be done by examining the FHBM or FIRM to find a nearby reference point, such as a road intersection, railroad crossing, etc., through which the boundary passes and then locating the landmark in the field.

Another way is through scaling. Scaling involves measurements from a reference point on the map to the flood boundary nearest the construction site, the conversion of the map distance to ground distance and the actual measurement of this distance in the field.

When the site location has been determined, the ground elevation of the point on the floodplain boundary nearest the construction site is the 100-year flood elevation.

Regulating Development in the Floodway

Introduction

As part of its responsibilities under the National Flood Insurance Program (NFIP), the Federal Emergency Management Agency (FEMA) has prepared detailed Flood Insurance Studies and accompanying floodplain maps for more than 1,100 flood-prone municipalities in Pennsylvania. This information serves as the basis for enacting and administering local floodplain management regulations in compliance with the minimum requirements of the NFIP.

Municipalities with detailed Flood Insurance Studies (FIS) should be familiar with the term "floodway." The floodway is that portion of the 100-year floodplain, which serves as a flood channel to pass the deeper, faster moving waters. Buildings, structures and other development activities (such as fill) placed within the floodway can obstruct flood flows causing the waters to slow down and back up, resulting in higher flood levels.

To protect the free movement of floodwaters, participating municipalities must prohibit all encroachments, including fill, new structures, and other development within identified floodways that would cause any increase in flood heights. The following information is presented to help municipalities better understand and apply this NFIP regulation.

The FEMA Floodway

FEMA, the agency responsible for administering the NFIP, has established technical criteria for delineating floodways. The uniform identification of floodways and the consistent application of floodway regulations by participating municipalities throughout the nation will do much to curb future flood damages and reduce flood insurance claims.

In establishing a floodway, FEMA assumes that floodplain development will continue, but only to a point where current 100-year flood heights will be increased a maximum of one foot. To delineate specific floodway boundaries, a computer program is used to hypothetically fill both sides of the floodplain – starting from the edge of the floodplain and working toward the stream, until the floodplain is obstructed to an extent that flood levels will be raised one foot. The channel left open after squeezing in the conveyance area is the floodway.

The reason for allowing the one-foot increase is to leave ample room outside the floodway for development purposes, regardless of whether or not it will occur to that extent. In a sense, the floodway concept is a trade-off. A portion of the floodplain is allowed to be completely developed in exchange for reserving an open area for the discharge of floodwaters. This is why development, which would cause any increase in flood heights, is prohibited in the floodway.

Locating Floodway Boundaries

Floodways are calculated as part of detailed FIS prepared by FEMA and are shown for selected stream reaches on Flood Boundary and Floodway Maps (FBFM). Specific hydraulic information, including the width, sectional area and mean velocity of flow for each measured cross section is provided in the Floodway Data Table contained in the FIS booklet. This information can be useful in performing engineering computations for determining increases in flood heights.

It is important to remember that floodway boundaries are established by horizontal measurements, not by elevations. As a result, the only way to locate a floodway boundary is by scaling distances from the FBFM or by using features shown on the map which are transacted by the boundary line.

To determine when floodway regulations apply, it is important to accurately locate each and every development proposal on the FBFM. In most instances, it will be clear that a proposed project is either in or out of an identified floodway; but on occasion, an activity may fall close enough to the boundary to require further investigation. To locate the floodway boundary, measure the distance on the map from an identifiable feature, such as a road intersection, bridge or reference mark, to a point on the boundary line closest to the construction site in question. Convert this measurement to ground distance using the scale on the map. Locate the feature in the field and, proceeding in the same direction used when measuring on the map, locate the floodway boundary point. All measurements to or from roads should be taken from the centerline of the roadway.

Administering Floodway Regulations

If a proposed activity is to be located entirely or partially within an identified floodway, the applicant will have to comply with whatever floodway provisions the municipality has "on the books". Some municipalities prohibit all, or certain kinds of, development from locating in the floodway while others have adopted the minimum floodway performance standard required by the NFIP. In addition to floodplain management regulations, the municipality should ensure that all other local regulations which apply to the particular site or activity are followed.

NFIP requirements stipulate that an applicant must obtain all necessary federal and state permits as a condition for receiving a local permit. This is particularly important as it pertains to development activities in the floodway and can be extremely helpful in administering local floodway regulations.

Under state law, the PA DEP has jurisdiction over all obstructions located within a floodway area. This includes the floodway areas identified on the FBFM as well as those areas 50 feet landward from the top of the bank of any watercourse for which a floodway is not identified. This means an applicant must obtain a state encroachment permit as well as a local floodplain management permit prior to conducting any development activities in a floodway. Applicant should contact the DEP, Bureau of Waterways Engineering.

DEP reviews encroachment applications based on standards similar to local floodway regulations required through the NFIP. If DEP issues a permit to allow an activity in the floodway, a municipality may use this as a basis for issuing a local permit. On the other hand, a municipality should reject a permit application if DEP refuses to issue an encroachment permit.

When an activity involves a small structure or small amounts of fill, DEP may determine the development does not constitute an obstruction and, as a result, may not require the filing of an application. When this occurs, a municipality should ask the applicant for evidence that DEP was contacted and that the activity does not require a state permit.

If for some reason, a municipality decides not to accept the issuance of a state encroachment permit as basis for an applicant complying with local floodway regulations, the applicant can be required to provide the documentation necessary for the municipality to make its own determination. Unless the applicant can establish that no rise in the 100-year flood would result, a permit may not be issued.

Municipalities should require documentation prepared by a registered, professional engineer certifying the effect of the proposed development on flood heights.

In the event a proposed development will not cause a rise, a permit may be issued, provided all other applicable floodplain management regulations are followed, such as the elevation of residential structures or the floodproofing of non-residential structures. All engineering documentation concerning impacts on flood heights should be filed and made available upon request to FEMA.

No Rise Options

In order to develop a property located in the floodway, an applicant may be able to avoid an anticipated rise caused by a project by making compensating improvements. For example, a channelization project to improve flow through the floodway may offset the rise caused by a proposed building. A local permit could be issued, provided the applicant receives approval from DEP and, if the channel modification affects the floodway boundaries, approval from FEMA. Again, the applicant needs to submit the necessary engineering justification certifying compliance with the "no rise" criteria.

Another opportunity to develop in the floodway can occur when rebuilding or replacing an existing structure with one of equal or smaller dimensions. An applicant can rebuild or replace a structure of similar size without having to supply engineering information, since their placement will create no more of an obstruction to flood flows than the original one. However, engineering analysis must be provided in the event the replacement dimensions are greater. A municipality should maintain an inventory of structures which existed at the time the floodway was delineated and, if possible, include the size and location of each.

No encroachments, including fill, new construction, substantial improvements, and other developments are allowed within the floodway, which would cause any increase in flood heights.

Prohibited Structures

Regardless of the "no rise" regulation, mobile homes are strictly prohibited from being placed in the floodway. The only exception is that mobile homes may be placed within mobile home parks that existed prior to the enactment of a municipality's floodplain management regulations.

New structures as well as substantial improvements to existing structures of the kind cited in Section 38.7 of DCED's Floodplain Management Regulations are prohibited within the floodway. This includes buildings used for the production, storage or maintenance of a supply of 18 particular materials and substances considered too dangerous or hazardous to public health and environment to be located in such a high-risk area. Municipalities compliant with the Pennsylvania Flood Plain Management Act (Act 166 of 1978) have these regulations contained in their ordinances.

References and Further Assistance

Anyone interested in further information concerning this topic should obtain a copy of the booklet The Floodway: A Guide for Community Permit Officials, Community Assistance Series, No. 4, FEMA-FIA. This publication is available from FEMA or DCED.

DCED is responsible for coordinating the National Flood Insurance Program and for administering the Pennsylvania Flood Plain Management Act. DCED staff is available to help municipalities administer floodplain management regulations.

Elevation and Floodproofing

Introduction

Municipalities participating in the National Flood Insurance Program (NFIP) must enact and administer local floodplain management regulations, which, among other things, require the elevation or floodproofing of buildings and structures to or above the 100-year flood elevation. The elevation and floodproofing provisions are the **most important** of all NFIP requirements for several reasons. Very simply, a properly elevated or floodproofed structure is less prone to being flooded. This translates into reduced flood damages over the life of the structure and, to its occupants, a lessening of the financial and emotional burdens which are typically encountered when putting a home or business back in order after a flood.

These floodplain management requirements also have flood insurance implications. The issuance of policies, the determination of premium rates and the honoring of future claims greatly depend upon the extent to which a structure is elevated or floodproofed. A structure built in violation of NFIP floodplain management requirements could be declared ineligible for flood insurance. This would not only prevent the owner from obtaining insurance coverage, but it would also severely hinder the resale of the property since most banks and lending institutions require flood insurance coverage as a condition for obtaining a mortgage for a flood-prone property. At the very least, if *a* flood insurance policy could be issued for a structure in violation, the annual premium rate would be significantly higher than for a structure built in conformance with the regulations.

For these and other reasons, it is important for municipalities to properly administer the elevation and floodproofing requirements. The following information explains the minimum NFIP requirements and other related matters.

New Construction and Substantial Improvements

The NFIP elevation and floodproofing requirements apply to new construction and to substantial improvements to existing structures. New construction refers to freestanding structures built after the enactment of a municipality's floodplain management regulations. Substantial improvements are defined as any alteration, repair, reconstruction or expansion to a structure existing at the time of enactment, the costs of which equals or exceeds 50 percent of the market value of the existing structure. However, an alteration of a structure listed on the National Register of Historic Places or a State Inventory of Historic Places which is for the purpose of enhancing historic values is exempt from this definition as are projects specifically designed to bring existing structures into compliance with state or local health, sanitary or safety code specifications which are solely necessary to assure safe living conditions.

For the purposes of the NFIP, all structures are classified as either residential or non-residential. A residential structure is used for human habitation containing eating, living and sleeping quarters. The term includes single-family dwellings, apartments, tourist homes, rooming houses and the like. All other structures are considered non-residential and include such things as garages, shops, banks, churches, schools, warehouses and farm buildings.

Residential Structures

New residential structures and substantial improvements to existing residential structures must be built so that the lowest floor is to or above the 100-year flood elevation. The lowest floor is the finished floor of the lowest enclosed space including basements.

How a structure is to be elevated is up to the property owner. Elevation may be accomplished by raising the site with fill material or by using raised foundations, reinforced concrete or cinder block columns, wood posts, and other similar methods. The one exception to this is if the property is located within an identified floodway. Because of the concern for preventing increases in flood heights, the placement of fill for elevating a structure may be out of the question. Under these circumstances, the property owner will have to select an alternative method of elevation that poses the least obstruction to flood flows such as the use of columns, posts or piers.

In any event, it is important to remember that the lowest floors (including basements) of **residential structures must be elevated,** at a minimum, to the level of the 100-year flood.

Non-Residential Structures

For new non-residential structures and substantial improvements to existing non-residential structures, there is an option. Either the lowest floor (including basement) must be built to or above the 100-year flood level **or** any space built below the 100-year flood level must be floodproofed in a watertight condition, with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. Anyone intending to build a floodproofed building must obtain the services of a registered professional engineer or architect to develop or review the design, specifications and plans for the structure and to certify that the design and methods of construction are in accordance with accepted standards of practice for meeting the floodproofing requirements.

A technical publication that can be used by municipalities in administering this floodproofing regulation as well as by architects and engineers in designing such structures, is called **Flood-Proofing Regulations** prepared by the U.S. Army Corps of Engineers dated June 1972. Watertight floodproofing is categorized as either completely dry (W1) or essentially dry (W2). The only difference between the two classes is that some water vapor and seepage is allowed to occur in a W2 designed building. In either case, the purpose is to keep the enclosed space located below the 100-year flood elevation – **dry** and damage free. Copies of the manual may be obtained by contacting DCED or the U.S. Army Corps of Engineers.

It is important to remember that FEMA only recognizes one type of floodproofing. Only those new or substantially improved non-residential structures built in a completely or essentially "dry" floodproofed manner are eligible for flood insurance. However, FEMA also realizes that there are a variety of non-residential structures that because of their relatively small size, type of construction, and low damage potential, need not be elevated or "dry" floodproofed. These include such things as picnic pavilions; gazebos, boat docks and other open sided structures as well as small accessory storage sheds. For floodplain management purposes, such structures may be constructed in a "wet" floodproofed manner. As the term suggests, such structures must be designed and constructed to prevent or minimize damage when flooded. Specifications for wet floodproofing are listed under the W3 or W4 floodproofing classifications described in the publication Flood-Proofing Regulations.

Mobile Homes (Manufactured Homes)

Because of the special vulnerability of mobile homes to flood damage, specific NFIP requirements address the placement of mobile homes in floodplain areas. Regardless of their use as a **residential** or **non-residential** structure, **all** mobile homes must have the lowest floors elevated to or above the 100-year flood level. Floodproofing is **not** an option.

Mobile homes must also be placed on a permanent foundation and anchored to resist flotation, collapse, or lateral movement.

More Restrictive Regulations

Some municipalities may have regulations, which are more restrictive than the minimum federal requirements just described, or the minimum state requirements, which are explained, in the following section. Perhaps a municipality prohibits the placement of buildings and structures in the floodplain or requires that they be elevated to the 500-year flood level. If this is the case, then the more stringent regulations should be applied. Neither the NFIP nor Act 166 prevents a municipality from enacting and administering stronger local regulations.

Act 166

Besides the NFIP requirements, municipalities must also administer two additional sets of provisions required as a result of the Pennsylvania Flood Plain Management Act (Act 166 of 1978). A municipality must take special precautions when regulating the design and construction of jails, hospitals, nursing homes and mobile home parks. Of particular note is the requirement that these kinds of buildings be constructed so that the lowest floors be elevated one and one-half (1 ½) feet above the 100-year flood level. This extra measure of protection is termed a freeboard and is an added margin of safety against errors in the flood information and potentially higher flood levels caused by future watershed development.

It should be noted that any such proposed facility to be owned, operated or maintained by a municipality might fall under the jurisdiction of the PA DEP. Department of Environmental Protection necessitating the issuance of a state permit under Chapter 106 of DEP's Rules and Regulations.

In addition, structures used for the production, storage, or maintenance of a supply of 18 specific substances considered particularly dangerous when located in a floodplain must either be constructed with the lowest floor elevated 1½ feet above the 100 year flood elevation or be constructed to remain completely dry (W1) up to that height.

Protecting Existing Development

Federal and state floodplain management requirements only apply to new structures or to substantial improvements of existing structures. Owners of existing buildings vulnerable to flooding may desire to undertake their own actions to reduce future flood damage. The relocation of homes and businesses, elevation of structures, the construction of small dikes and levees are just a few examples. If anyone in your municipality is looking for information regarding flood damage reduction measures, they should contact DCED or the U.S. Army Corps of Engineers.

Further Information and Assistance

Besides those previously mentioned, there are other publications prepared by DCED and various federal agencies that provide general as well as technical information about flood damage reduction measures. Some are:

- Flood Damage Prevention Handbook – DCED
- Relocation – DCED
- Flood Resistant Construction Behind Dikes and Levees – DCED
- Elevated Residential Structures – FEMA
- Floodproofing Non-Residential Structures – FEMA
- Manufactured Home Installation in Flood Hazard Areas - FEMA

Permits

Introduction

A local building permit can be just one of many approvals needed by an applicant prior to building a structure or developing a piece of property. The variety of permits will depend on the type of construction or development, the location of the property and in some cases, the proposed use of the buildings, structures or land improvements. Municipalities with floodplain management regulations in compliance with the requirements of the National Flood Insurance Program (NFlP) must pay particular attention to other permit programs when issuing building permits for construction and development activities in those areas identified by the Federal Emergency Management Agency (FEMA) as being flood-prone.

Before issuing a local building permit, a municipality must determine that all necessary permits required by Federal or State law are obtained by the applicant. The purpose of this NFIP requirement is to help municipalities avoid issuing local permits for activities that may be in conflict with federal or state regulations. In turn, the proper administration of this provision by municipalities can help applicants avoid the time, trouble and expense arising from not securing all necessary permits.

The purpose of this publication is to identify and briefly describe several federal and state regulatory programs that commonly apply to activities in or adjacent to waterways. Ordinance administrators should become familiar with these and any other applicable permit programs so that applicants can be advised to contact the necessary agency or agencies to find out whether a permit is required. For more specific information such as copies of regulations or application forms, the individual agencies should be contacted directly.

Floodway Permits

Situation: *Mr. Kneidinger wants to build a garage behind his house located on Creekview Drive. When he arrives at the municipal building to apply for a building permit, you discover that the proposed site happens to be located within the floodway of Wetmore Creek, according to the map prepared for the municipality by FEMA. How would you advise Mr. Kneidinger?*

For municipalities with detailed Flood Insurance Studies prepared by FEMA, floodways are shown for selected streams on the accompanying Flood Boundary and Floodway Maps (FBFM) or Flood Insurance Rate Maps (FlRM), whichever are applicable. The floodway is that portion of the floodplain including the stream channel and adjacent land area where the deeper, faster moving floodwaters are typically found. In addition to complying with specific municipal floodplain management regulations an applicant wishing to undertake construction or development activities in a **floodway** must also comply with the state water obstructions and encroachment regulations of Title 25, Chapter 105 of the Pennsylvania Code.

The regulations stipulate that no person shall build any structure, place any fill material or conduct any other activity considered to be a water obstruction or encroachment within any **floodway** without first obtaining a permit from the PA DEP. For those streams which do not have floodways identified, DEP jurisdiction extends 50 feet landward from the top of the stream bank on both sides of the stream.

Answer: *Since the garage is to be located in the floodway identified by FEMA, Mr. Kneidinger must obtain a Water Obstruction and Encroachment Permit from DEP, in addition to complying with all applicable local floodplain management regulations.*

Permit applications may be obtained from the DEP Regional Office serving your area. For current addresses and telephone numbers or for further information contact:

Pennsylvania Department of Environmental Protection
Bureau of Water Quality Protection
P.O. Box 8775
Harrisburg, Pennsylvania 17105-8554
Telephone: (717) 787-6827

Floodplain Management Permits

Situation: *The Robinson Borough Water Authority is planning to build a maintenance garage next to their treatment facility. A portion of the garage will extend into the identified floodplain of Muddy Creek. Will a state permit be required?*

Besides requiring permits for obstructions within floodway areas, DEP also has jurisdiction over the development activities of **governmental** and **quasi-public entities** occurring within any portion of an identified floodplain area, not just the floodway. By virtue of the Pennsylvania Flood Plain Management Act of 1978, DEP was given the authority to regulate activities conducted by, or performed on property owned or maintained by other Commonwealth agencies, political subdivisions including local governments and, public utilities when located in a floodplain area. The rules and regulations are set forth in Title 25, Chapter 106 of the Pennsylvania Code.

Answer: *A water authority is a political subdivision and a portion of the proposed building lies within the identified floodplain area. So, yes, a permit from DEP is needed.*

For current addresses and telephone numbers of DEP Regional Offices or for further information, contact:

Pennsylvania Department of Environmental Protection
Bureau of Water Quality Protection
P.O. Box 8775
Harrisburg, Pennsylvania 17105-8775
Telephone: (717) 787-6827

Wetland Protection

Situation: *ABC Construction Company owns a three-acre swamp next to Hearn Run, that it wishes to develop into an equipment storage area. In order to raise the site above the 100-year flood level, the Company will use excavation material from ongoing construction projects to gradually fill the area. All site and building plans comply with the municipality floodplain management regulations. Should you issue the Company a permit?*

Wetlands including bogs, marshes, swamps and similar areas are environmentally important and, as such, are given special consideration at both the federal and state level. Section 404 of the Federal Clean Water Act authorizes the U.S. Army Corps of Engineers to regulate the discharge of dredged or fill material into the waters of the United States including all **adjacent wetlands**. Permit applications are reviewed by the Corps of Engineers in cooperation with the Environmental Protection Agency and the U.S. Fish and Wildlife Service and with other technical support agencies including state agencies. All proposals are assessed for impacts on water quality, flood control, fish and wildlife and ground water recharge, among others.

The Pennsylvania Dam Safety and Encroachment Act of 1978, as currently amended, gives the DEP jurisdiction over encroachments and obstructions into wetlands, as well. Permit applications are reviewed by the Pennsylvania Fish and Game Commissions, River Basin Commissions and other bureaus within DEP.

Efforts are currently underway to initiate a joint application procedure to make it easier for applicants to seek both federal and state approvals.

Answer: *The filling of the wetland will necessitate a permit from DEP and from the U.S. Army Corps of Engineers. As such, the local permit should be withheld until the necessary permits are secured.*

For further information on the state program, contact:

Pennsylvania Department of Environmental Protection
Bureau of Water Quality Protection
P.O. Box 8554
Harrisburg, Pennsylvania 17105-8775
Telephone: (717) 787-6827

There is a U.S. Corps of Engineers District Office serving each of the four major drainage basins of the state. For information concerning Section 404 permits, contact the office serving your area:

Address correspondence to:

The District Engineer
U.S. Army Corps of Engineers District

St. Lawrence Drainage Basin
1716 Niagara Street
Buffalo, New York 14207
Telephone: (716) 879-4143

Ohio River Basin
1000 Liberty Avenue
Pittsburgh, Pennsylvania 15222
Telephone: (412) 392-7414

Delaware River Basin
Wanamaker Building
100 Penn Square East
Philadelphia, Pennsylvania 19107
Telephone: (215) 656-6550

Susquehanna and Potomac River Basins
P.O. Box 1715
Baltimore, Maryland 21203-1715
Telephone: (410) 962-4223

Surface Mining Permits

Situation: *Farmer McCall wants to take some sand and gravel from the floodplain of Rocky Run to use as fill in repairing some of his dirt roadways. In applying for a local permit, Mr. McCall asks if any other state or federal permits are required. How would you respond?*

Surface mining activities are regulated by DEP. Surface mining is defined as the extraction of minerals from the earth, from waste or stockpiles, or from pits or from banks by removing the material overlying the mineral. Minerals include limestone, dolomite, sand, gravel, rock, stone, earth fill, slag, iron ore, coal, clay, and others. A person conducting a surface mining operation must obtain a **license** from DEP, which must be renewed annually. In addition, a **mining permit** is required to operate a surface mine. To obtain approval to mine a

particular property, an applicant must submit a site plan and a reclamation plan showing how the area will be restored when mining is completed.

However, there are exceptions to what is considered surface mining. Most notably, the extraction of minerals by a landowner for his own **noncommercial** use from land owned or leased by him is not considered surface mining and is, therefore, not regulated under the (Non-coal) Surface Mining Conservation and Reclamation Act.

It is important to note that surface mining is restricted within certain distances of highways, dwellings, schools, public buildings, and other structures. For floodplain management purposes, be aware that surface mining is prohibited within 100 feet from the bank of any stream.

Answer: *If Farmer McCall is mining the sand and gravel for his own use and does not intend to sell any of it, then a mining permit is not required.*

For license and permit applications or for further information, contact:

Pennsylvania Department of Environmental Protection
Bureau of Abandoned Mine Reclamation
P.O. Box 8476
Harrisburg, Pennsylvania 17105-8476
Telephone: (717) 783-2267

Water Quality Permits

Situation: *The McQuiston Casting Company wants to expand its plant along Wayward Run to house a new refining process complete with a waste treatment facility. The expansion is to be floodproofed in accordance with local floodplain management regulations. The plant manager wants to proceed as soon as possible. What's the holdup?*

No person, business or municipality may discharge sewage, industrial wastes or any other contaminants into the waters of the Commonwealth without obtaining a water quality permit from DEP. Applicants must limit the discharge of pollutants based on the water quality criteria established in Chapter 93 of Title 25 of DEP's Rules and Regulations.

Answer: *Chances are the treatment processes are going to require a discharge into Wayward Run. If so, a water quality permit is needed.*

For permit applications or for further information, contact the DEP Regional Office serving your area or:

Pennsylvania Department of Environmental Protection
Bureau of Water Supply and Waste Water Management
P.O. Box 8467
Harrisburg, Pennsylvania 17105-8467
Telephone: (717) 787-8184

Earth Disturbance

Situation: *The Wood Development Corporation submits a proposal to develop a 30-acre site for an industrial park. A portion of the area is located along the floodplain of Spangler Creek and will be kept in open space in compliance with local floodplain management regulations. Is there any reason not to issue a permit?*

The Erosion Control Regulations of Title 25, Chapter 102 of the Pennsylvania Code requires any person engaging in earthmoving activities, which will affect 25 acres or more to obtain an earth disturbance, permit through the County Conservation District. A permit application must be accompanied by an erosion and sediment pollution control plan which describes those measures which will be used to curb soil erosion and resulting sedimentation. Although earth disturbance permits are not required for activities of less than 25 acres or for the plowing and tilling for agricultural purposes, an applicant for a building permit, nevertheless, must have an erosion and sediment pollution plan prepared and take all the measures necessary to prevent erosion and sedimentation.

Answer: *If 25 acres or more are to be disturbed, then the Wood Development Corporation must secure an earth disturbance permit from the County Conservation District.*

To obtain permit applications or further information, contact your County Conservation District.

Sewage Permits

Situation: *The Keptners decide to build a second home on a five acre wooded tract along the fIoodplain of Babbling Brook, an area not served by the regional sewage system. The building permit application shows the lowest floor being well above the 100-year flood elevation and everything else appears to be in accordance with the floodplain ordinance. Should a permit be issued?*

According to Act 537, better known as the Pennsylvania Sewage Facilities Act, no one may alter, construct or install an individual sewage system or community sewage system without first obtaining a permit from a local agency authorized by DEP to issue such permits. A sewage enforcement officer (SEO) appointed by the local sewage enforcement agency and certified by DEP is responsible for issuing sewage permits in accordance with the rules and regulations adopted by DEP, which are contained in Title 25, Chapter 73 of the Pennsylvania Code.

An on-lot system cannot be floodproofed and, therefore, is particularly vulnerable to damage by flood waters. In addition, the potential for release of pollutants from the treatment tank is always present. Consequently, paragraph 73.12 of DEP's Regulations prohibits the issuance of sewage permits within identified floodways, on floodplains or in floodprone soils. In many instances, the sewage regulations, not local floodplain regulations, are the deciding factor in determining whether a floodprone property can be developed.

Answer: *A habitable dwelling requires some form of sewage disposal that, in turn, must be approved by the local Sewage Enforcement Officer. It may be that the applicants will have difficulty obtaining a sewage permit for the installation of an on-lot system if the entire tract is floodprone. In any event, a building permit should not be issued until the sewage permit is obtained.*

For further information, contact your local SEO or contact:

Pennsylvania Department of Environmental Protection
Bureau of Water Supply and Waste Water Management
P.O. Box 8467
Harrisburg, Pennsylvania 17105-8467
Telephone: (717) 787-8184

Labor and Industry – Flammables and Combustibles (F&C) Regulations

Situation: *An application is submitted for the installation of a 1,000-gallon underground gas tank at the Punch Village Nursery located next to Hazard Creek. Since the local floodplain management regulations do not address underground structures, there is no reason to not issue a permit, or is there?*

Within the Department of Labor and Industry, the Flammables and Combustibles Liquids (F&CL) Section is responsible for regulating the outside supply or storage of flammable and combustible liquids having a flash point below 200 F. These liquids include gasoline, naphtha, kerosene, fuel oil and other similar substances. Anyone maintaining a supply or storing 30 gallons or more, whether above or below ground, must file an application with the F&CLS of the Department of Labor and Industry and comply with all the location, design, construction, installation and maintenance standards and all other requirements of Chapters 11, 13 and 14 of Title 37 of the Pennsylvania Code.

The F&CL regulations do not apply to Philadelphia and Allegheny Counties or to liquids and facilities at **refineries**. The regulations include a section establishing standards for the installation of tanks in areas of high ground water tables and in areas subject to flooding. In addition, there are minimum setback distances for property lines and public ways (including watercourses), which must be maintained depending on the type of tank.

Answer: *Gasoline is a combustible and flammable liquid as defined by the Department of Labor and Industry Regulations. The installation of a 1,000-gallon tank, whether above or belowground, must be approved by the Flammable and Combustible Liquids Section.*

For applications or more information, contact:

PA Department of Labor and Industry
7th and Forster Streets
Room 1614
Harrisburg, Pennsylvania 17120
Telephone: (717) 787-7596

The DEP also regulates supply and storage tanks for Flammable and Combustible Liquids. For details on the DEP requirements, please contact DEP at 717-772-5599. For electronic access, please use .

Manufactured Homes

Introduction

Manufactured homes present a particular hazard when located in floodplain areas. First of all, they are extremely vulnerable to flood damage. On the average, one foot of floodwater above the floor of a manufactured home can cause damage of up to 45% of the value of the structure and it contents as compared to a 25% loss to a conventionally built home.

Secondly, because of their relatively light-weight construction and the fact that they are frequently placed on inadequate foundations and not properly anchored, manufactured homes often become buoyant in fast rising floodwater and are swept downstream colliding into other structures or blocking culverts or bridge openings.

Because of these special problems, municipalities participating in the National Flood Insurance Program (NFIP) and those compliant with the Pennsylvania Flood Plain Management Act (Act 166) must administer specific regulations to ensure the proper location and installation of manufactured homes in flood prone areas. This publication explains the current NFIP and Act 166 requirements and how municipalities should interpret and administer them.

Definitions

Due to the recent revisions to some of the requirements of the NFIP, the *term* "mobile home" has been replaced with the term "manufactured home". In addition, the *definition* was also changed to some extent.

The term "manufactured home" is just a newer way of referring to a mobile home. A manufactured home and a mobile home are the same thing

According to current NFIP requirements, a manufactured home is defined as:

> ... a structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when connected to the required utilities. The term includes park trailers, travel trailers and other similar vehicles placed on a site for greater than **180** consecutive days.

Don't let these changes confuse you. The term "manufactured home" is just the newer way of referring to a mobile home. A manufactured home and a mobile home are the same thing. They refer to units built on a chassis, usable with or without a foundation and are generally covered by the Department of Housing and Urban Development Manufactured Home Construction and Safety Standards.

On the other hand, manufactured or mobile homes should not be confused with modular or other industrialized housing, even though these forms of housing are also built in a factory and are transported to the site for placement and assembly. The critical difference is that modular and other industrialized housing are designed only for erection or installation on a permanent foundation, they are not designed to be moved once erected or installed, and they are designed and manufactured under the auspices of DCED. For floodplain management purposes, a modular or industrialized home should be treated as a conventionally built home.

The most significant change to the new definition of manufactured home is the inclusion of "park trailers, travel trailers and other similar vehicles placed on a site for more than 180 consecutive days." Recreational vehicles can be as much of a problem during flooding as standard mobile homes, if not more so. RV's parked

along the banks of rivers and streams are easily upended and carried downstream causing damage to other structures or aggravating flooding conditions by restricting the flow of floodwater through bridge openings and culverts.

Since RV's are vehicles, they can often-be moved to higher ground rather quickly, given proper warning time. But RV's or trailers are not always mobile. In many cases, RV's are placed on a site with no intention of ever removing them. Wheels are taken off or, if left on, the tires rot. Some are placed on supports or foundations. Under these and other circumstances, RV's become permanent structures. The 180 consecutive day provision in the Federal Emergency Management Agency (FEMA) definition is an attempt to make a distinction between R.V.'s which are temporarily placed as opposed to those where placement becomes more permanent.

Municipalities may continue using the term "mobile home" if desired. Regardless of which term is used, the definition of mobile home or manufactured home in local floodplain management regulations must conform with the definition previously cited. Most importantly, the definition must address the 180-day concern.

Minimum NFIP Requirements

All manufactured homes, whether residential or nonresidential, must be placed on a permanent foundation so that the lowest floor is elevated to or above the regulatory flood elevation. In this respect, manufactured homes are treated the same as conventionally built residential structures.

However, in addition to being elevated, manufactured homes must also be properly anchored to resist flotation, collapse, or lateral movement. There are many different ways of meeting this performance criterion. A common method is to attach the metal frame ties exposed underneath the perimeter of new manufactured homes to metal ground anchors, which are drilled or concreted into the ground. When a post or pile foundation is used, the chassis I-beam can be attached by using metal brackets and lag screws. In a September 1985 FEMA publication entitled *Manufactured Home installation in Flood Hazard Areas,* a variety of elevation and anchoring methods are fully explained. Copies of this report may be obtained by contacting DCED or FEMA.

As with any other local regulations, the burden of proof is always on the applicant. If there is any question as to the adequacy of a proposed anchoring system, the municipality should require the applicant to provide a certification from a registered professional engineer or architect stating that the design meets the anchoring requirements.

Manufactured Home Parks

Manufactured home *parks* are addressed through DCEDs Floodplain Management Regulations, which were adopted as a result of the Pennsylvania Flood Plain Management Act (Act 166). Municipalities in compliance with Act 166 have regulations calling for the issuance of special permits for the development of new, as well as substantially improved, manufactured home parks in floodprone areas.

As part of the special permit process, an applicant must submit rather detailed information about the site, its development, and any proposed structures. In addition, engineering documentation is required showing that flood damage and impacts on flooding will be minimized. Of particular note is the technical requirement for elevating the lowest floor of all manufactured homes to *one and one half (1 ½) feet* above the 100-year flood level.

The placement of manufactured homes in manufactured home parks is also regulated through NFIP. Manufactured homes placed in new parks or in expansions or substantial improvements to existing parks must be elevated and anchored. One issue currently under review by FEMA concerns the *replacement* of manufactured homes in existing parks. At present, a unit may be replaced with another one provided that the replacement

home is anchored. Future revisions to the NFIP requirements may require that replacement units be elevated, as well. Municipalities reviewing permit applications for the replacement of manufactured homes should contact the FEMA or the DCED the latest NFIP requirements.

Prohibition in Floodway

As a result of the October 1986 revisions to the NFIP requirements, manufactured homes are no longer prohibited from being placed in identified floodways. However, municipalities may want to retain the prohibition provision contained in their floodplain management regulations for several reasons. The following paragraphs address the two most important concerns.

First, even if a municipality decides to allow manufactured homes in the floodway, the "no rise" rule will effectively prevent something of the size of a manufactured home from being located in a floodway. The "no rise" rule prohibits any construction or development within the floodway that would cause any increase in flood heights.

Second, manufactured homes placed on a permanent foundation and adequately anchored to prevent movement or collapse due to the level and force of a 100-year flood, can be overwhelmed by a flood of a greater magnitude. Situating a manufactured home in the floodway, the area of the floodplain, which characteristically encompasses the deeper, faster moving floodwaters, is asking for trouble.

For Further Information and Assistance

DCED is responsible for coordinating the NFIP and related activities in Pennsylvania. DCED staff is available to help municipalities administer floodplain management regulations. Requests can be made to the nearest DCED Regional Office or to the Central Office in Harrisburg by calling 1-888-223-6837 toll free.

Department of Community & Economic Development Floodplain Management Regulations

Introduction

Most of the provisions contained in local floodplain management regulations are derived from the minimum requirements of the National Flood Insurance Program (NFIP). However, some of the provisions have also come about as a result of the Pennsylvania Flood Plain Management Act, commonly referred to as Act 166.

Although similar to the NFIP requirements, state floodplain management requirements differ by applying only to certain specified activities and by requiring additional precautionary measures against flooding. The publication explains these state requirements and what municipalities should do to properly administer them.

Act 166

The Pennsylvania Flood Plain Management Act, signed into law on October 4, 1978, requires all floodprone municipalities to participate in the NFIP, 1604 are enrolled. To participate a governing body must enact local floodplain management regulations that at a minimum comply with federal requirements. In addition to complying with federal requirements, Act 166 also directs municipalities to include provisions that comply with the minimum state floodplain management requirements. These additional state requirements are contained in the formal administrative regulations that were adopted by DCED as called for in Act 166. The complete text of these regulations is contained in Title 16, Chapter 38 of the Pennsylvania Code.

Special Permits

Section 38.6 of DCED's Floodplain Management Regulations identifies four development activities, which must be reviewed through a special permit process in order to obtain approval to locate in floodprone areas. The four activities are:

1. Jails and prisons
2. Hospitals
3. Nursing homes
4. Mobile home parks (manufactured home parks)

The state requirements must be applied to all proposed **new** facilities and, in the case of jails, hospitals, and nursing homes, to **expansions** to any such **existing** facilities. For existing manufactured home **parks,** the requirements must be applied to any **substantial improvements.**

Technical Requirements

No special permit may be issued to an applicant unless the proposed facility is designed to meet or exceed the technical requirements cited in Subsection 38.6 (h) of DCED's regulations. These requirements differ from the minimum NFIP requirements in that they provide for greater protection and safety against flooding.

First of all, the lowest floor elevation of a structure requiring a special permit must be constructed at least 1½ feet above the elevation of the 100-year flood. NFIP requirements only provide for the elevation of lowest

floors to the elevation of the 100-year flood. This extra level of protection is called a freeboard. It is a margin of safety against errors in flood data and increases in flood heights due to floodplain and general watershed development.

Secondly, the occupants of a building must be able to be safely evacuated at any time during a 100-year flood. This is particularly important when it comes to hospitals and nursing homes where the occupants may be bed-ridden or may find it difficult to walk on their own. Under these vulnerable circumstances plenty of warning time and good emergency preparedness is needed to minimize the threat to life.

Next, the applicant must ensure that any significant possibility of pollution, increased flood levels or flows, or debris endangering human life and property are prevented. These concerns must be addressed in the design of the facility to reduce the impact of the development on existing flooding conditions and to reduce flood related damages.

If there happens to be any conflict between federal and state regulations, the more *restrictive* must be applied.

Lastly, the development must also comply with minimum NFIP requirements in addition to the preceding state requirements. For example, manufactured homes placed in a new or substantially improved manufactured home park must be placed and anchored according to NFIP requirements besides being elevated 1 ½ feet above the 100-year flood elevation. If there happens to be any conflict between federal and state regulations, the more **restrictive** must be applied.

Application Information

An applicant must submit a very detailed package of information and documentation to a municipality in order to begin the official review process. The items that must be included in the application package are specifically listed in Subsection 38.6 (g) of DCED's regulations. These items include a detailed plan of the site showing existing and proposed buildings, roads, property lines, watercourses, ground contours and information on the 100-year flood including boundaries, water surface elevations and velocity and direction of flood flows. Building plans are also necessary for all proposed structures and other improvements. In addition to showing detailed architectural and engineering drawings, the plans must include complete information on the physical impact of the 100-year flood on all proposed structures and detailed information concerning any proposed floodproofing measures.

To complete the application package, the applicant must provide a series of certifications signed by a registered, professional engineer or architect ensuring that the facilities are designed to minimize flood damage.

Lastly, the applicant must prepare and submit an evacuation plan, which fully explains the manner in which the site can be safely evacuated before and during a 100-year flood. The evacuation plan should include a description of the flood warning system which will be used to activate the evacuation plan, a listing of personnel and equipment which will be needed and their respective responsibilities or purposes, the primary and alternate paths of evacuation through the facility as well as from the floodprone site, names and telephone numbers of emergency units which are to be notified in the event of an evacuation, and a step-by-step explanation of how the plan will be executed in the event of a flood. Any special or unique circumstances peculiar to the facility or its occupants which would affect an evacuation should be explained as well. It is important to underscore the need for a properly prepared evacuation plan. It could become the difference between saving or losing lives.

Review Process

Once all the application information is completed and submitted to the municipality, the review procedures outlined in Subsection 38.6 (1) must be followed.

To begin with, the municipality must send a copy of the application package to the county planning commission for their review and comment. It is up to the county to decide whether to review or to comment on the proposal. The only obligation the municipality has is to send the application package to the county within three working days following the receipt of the information from the applicant.

At this stage, the municipality must go through the process of reviewing the application package for compliance with the technical standards as well as for compliance with all other applicable local regulations. This should be done by the building permit or zoning officer in conjunction with the municipal engineer. It is suggested that municipalities involve local planning commissions to assist in the review of such proposals.

If there are unresolvable problems with the proposal and the municipality decides not to issue a special permit, then the process ends. However, if everything appears compliant and the municipality approves the application, then a copy of the entire application package must be sent to DCED within five working days after local approval.

DCED has 30 days from the time it receives the information to review and communicate back to the municipality regarding the issuance of the special permit. If the municipality does not hear from DCED within this time period, it may go ahead and issue the special permit. However, if DCED does respond **unfavorably** within the 30 days, the municipality must **not** issue the permit. In this event, DCED is required to notify the municipality and applicant of its reasons for disapproval. If the applicant makes the necessary changes, he or she may resubmit the application package to the municipality and the process begins anew.

Development Which May Endanger Human Life

Section 38.7 of DCED's Floodplain Management Regulations requires municipalities to regulate the building of new structures and the substantial improvements existing structures, which are considered potential hazards when located in floodplain areas. The type of structures considered hazardous are defined in Section 38.7 as being those used for the production, storage, or housing of an activity requiring the maintenance of a supply of the following 18 specific materials and substances:

1. Acetone
2. Ammonia
3. Benzene
4. Calcium carbide
5. Carbon disulfide
6. Celluloid
7. Chlorine
8. Hydrochloric acid
9. Hydrocyanic acid
10. Magnesium
11. Nitric acid and oxides of nitrogen
12. Petroleum products (gasoline, fuel oil, etc.)
13. Phosphorus
14. Potassium

15. Sodium
16. Sulphur and sulphur products
17. Pesticides (including insecticides, fungicides and rodenticides)
18. Radioactive substances, insofar as such substances are not otherwise regulated

It should be noted that, when it comes to the maintenance of a supply, the regulations do **not** apply when quantities are less than 550 gallons. This allows for the maintenance of a supply of home heating oil and other commonly used substances in small quantities without triggering the regulations. The only exception to this is radioactive substances. The maintenance of a supply of **any** amount of radioactive substances falls under the regulations.

Technical Requirements

The construction activities regulated by Section 38.7 are strictly **prohibited** from being built within any identified **floodway** area (FW). The reason for this is that floodways include the areas of the floodplain where the faster, deeper moving floodwaters are commonly found. Therefore, the danger of structural damage and the potential of chemical leaks or spills can be more of a threat in the floodway than in other areas of the floodplain.

In flood-fringe areas, or in floodplains with no identified floodways, often referred to as general or approximate floodplains, the regulated structures can be built provided they are constructed in conformance with the technical standards of Subsection 38.7 (b)(1). This means that **a new structure or a substantial improvement to an existing structure must be elevated or floodproofed to at least 1½ feet above the 100-year flood elevation**. In this instance, floodproofing is limited to completely dry floodproofing as defined under the W1 space classification standard contained in the publication "Flood-Proofing Regulations" prepared by the U.S. Army Corps of Engineers. This report can be obtained by contacting DCED or the nearest U.S. Army Corps of Engineers Office.

Application Information and Review

Unlike the special permit requirements, there is no extra information required other than what is normally required by federal floodplain management requirements. If a structure is elevated, the applicant must provide the elevation of the lowest floor. If on the other hand, the structure is floodproofed, the applicant must provide the elevation to which the structure is to be floodproofed and submit the necessary certification signed by a registered professional engineer stating that the structure is designed in conformance with the completely dry (WI) floodproofing standard.

There are no special review procedures, either. The permit application is to be reviewed and approved by the municipality. Staff from the Floodplain Management Division are available to assist in the review of such applications, if need be.

Variances

The opportunity to grant relief from the strict application of the state floodplain management requirements is very limited. **Variances can only be issued to provide relief from the** 1½ **feet freeboard requirement.** No other requirements can be eased.

If an applicant requests a variance from the 1½ feet freeboard requirement, he or she must satisfy the basic variance criteria as set forth through the NFIP. As with any other variance request, a key factor which must be

shown is the existence of an unnecessary hardship. If this can be demonstrated, then only the minimum relief should be provided. In this case, the maximum relief an applicant can receive is a level of protection down to the 100-year flood elevation and no further. However, a 1/2-foot or 1 foot above the 100-year flood elevation may be adequate enough to provide the minimum relief necessary. If that is the case, then that should be the extent of relief afforded.

Again, it is important to remember that variances to state floodplain management requirements are restricted to relief from the 1½ feet freeboard, only.

For further assistance and information, please call 1-888-223-6837 toll free.

Variances

Introduction

By their very nature, local regulations are to be applied equally and uniformly to all properties affected by these regulations. However, the impact of the regulations will affect properties and property owners differently depending on the physical characteristics of the properties and the financial capability of the owners to adjust property improvements to meet the regulations. For some owners, it may be a relatively simple and inexpensive matter; for others, it may prove more difficult and costly. Nevertheless, the standards represent a minimum level of public health, safety and welfare, which must be attained.

Still, the strict application of the regulations may be so oppressive and restrictive when applied to an individual property, that something will have to be done to remedy the situation. Such a remedy is called a variance and the criteria and procedures for reviewing such requests are contained in local ordinances.

In drafting the NFIP requirements, allowance was made for communities to consider requests for relief from local floodplain management regulations without losing their eligibility to participate in the Program. Recognizing the difference in state enabling legislation across the country, the NFIP variance requirements established in Section 60.6 of the Program regulations are presented as guidelines, as opposed to absolute criteria. The purpose was not to interfere with community variance provisions authorized or mandated through state legislation.

The Pennsylvania Municipalities Planning Code requires municipalities that have zoning ordinances to create zoning hearing boards. The purpose of these boards is to hear appeals, to hear challenges to the validity of zoning ordinances and to hear requests for variances among other things. The variance criteria which zoning hearing boards must use is specified in Section 910.2 of the Planning Code and are the ones usually enumerated in the variance sections of local zoning ordinances.

The variance criteria of the NFIP and the Pennsylvania Municipalities Planning Code are quite similar. Communities which have incorporated floodplain management requirements into their zoning ordinances usually make slight modifications to existing variance provisions to address those criteria uniquely floodplain related.

However, most municipalities in the Commonwealth have enacted single purpose floodplain management ordinances under the auspices of the Pennsylvania Flood Plain Management Act (Act 166 of 1978) and the various municipal codes. Unlike zoning ordinances, the criteria for providing administrative relief to the strict application of single-purpose ordinances is not addressed in state enabling legislation. Therefore, the variance sections contained in single-purpose floodplain management ordinances usually contain the variance criteria of the NFIP for lack of other required provisions.

Variance Criteria

Whether through a zoning or single-purpose ordinance, it is important for those involved in the review of variance requests to have a good, working knowledge of the variance criteria. The following outlines the NFIP criteria and offers an explanation of each.

Section 60.6 (a)(1) — Variances should not be issued within any designated floodway if any increase in flood levels during a 100-year flood would result. The purpose of this criterion is to preserve the integrity of the floodway and to minimize the effects of future floodplain development on flood heights. This provision bars

municipalities from issuing variances relative to floodway encroachments, which will cause obstructions to flood flows. Neither the general floodway regulations nor this variance restriction should be construed to prohibit all development in the floodway. Development is allowed provided it conforms to the performance standard of "no-rise."

Section 60.6 (a)(2) — Variances should not be issued for properties greater than 1½ acres. While the granting of variances should be limited to lots of smaller size, deviations from that limitation may occur. However, as the lot size increases, the technical justification required for issuing a variance increases. The point is that unique physical restraints are most often associated with small lots where set-back distances, rights-of-way and closeness to adjacent properties may pose severe limitations to the development of a tract.

Section 60.6 (a)(3)(ii) — Variances should only be issued upon a determination that failure to grant the variance would result in exceptional hardship to the applicant. The hardship that would result from failure to grant a variance must be unnecessary, unusual, and peculiar to the property involved. Mere economic or financial hardship alone is not acceptable cause. Inconvenience, aesthetic considerations, physical handicaps, personal preferences, or the disapproval of one's neighbors likewise do not qualify as exceptional hardships.

Of all the variance criteria, this is the most difficult for a property owner to prove or demonstrate. Only when the regulations impose a severe burden due to the particular physical circumstances of the property, which are not shared by other similarly situated properties, can there be sufficient grounds for a hardship. To apply a less rigorous interpretation could lead to the issuance of unwarranted variances.

Since NFIP requirements are principally building and design standards, the chance of a true hardship being created by the application of the regulations is very, very small. General zoning setbacks and use restrictions applied to a small, irregularly shaped lot are more apt to give rise to an exceptional hardship than the elevation and floodproofing standards of local floodplain management regulations. If a building can be located on a floodprone lot given other municipal restrictions, there should be no reason why the structure cannot be properly elevated or floodproofed.

One area of the NFIP requirements that may raise the hardship question is the regulation of floodway development. A vacant, residential lot located entirely within a floodway area may be difficult to develop without increasing flood heights. Still, there may be opportunities to offset potential increases by making compensating site or off-site improvements. To avoid these kinds of situations, communities should try to zone such areas for accessory or low density/open space uses, if practical.

Section 60.6 (a)(3)(iii) — Variances may only be issued upon a determination that the granting of a variance will not result in an increased flood heights; additional threats to public safety, extraordinary public expense; and will not create nuisances, cause fraud on or victimization of the public or conflict with existing local laws or ordinances.

Floodplain management regulations often reflect the minimum safety standards, which should be applied to floodplain development. To vary the regulations would certainly aggravate the threat to public safety. Easing off on the elevation requirement to facilitate handicapped access is such a case. To willfully expose the handicapped and emergency personnel to life threatening evacuation risks is another factor to consider in assessing public safety concerns.

Flood damaged structures are often viewed as public nuisances, at least temporarily. If damage is significant enough, the structures may become abandoned leaving the municipality to deal with the problem of demolishing the structure before someone is injured or before the value of adjacent properties is adversely affected. Allowing structures to be built in a more vulnerable fashion by easing off on the flood protection requirements increases the risk of creating future public nuisances.

Properly granted variances must not cause fraud on or victimize the public. In examining this requirement, local boards should consider the fact that every newly-constructed building adds to local government responsibilities and remains a part of the community for a long time. Buildings that are permitted to be constructed below the base flood elevation are subject to increased risk of damage from floods, while future owners of the property and the community as a whole are subject to all the costs, inconvenience, danger and suffering that increased flood damages bring. In addition, future owners may purchase the property, unaware that it is subject to flooding, and can be insured only at very high flood insurance rates.

Section 60.6 (a)(4) — Any variance granted should be for the minimum necessary to alleviate the hardship. In the case of variances to an elevation requirement, this means the board need not grant permission for the applicant to build at grade or even to whatever the applicant proposes, but only to that level that the board believes will both provide relief, minimize danger, and preserve the integrity of the local ordinance.

Section 60.6 (a)(5) — A community must notify the applicant, in writing, that the issuance of a variance to construct a building below the 100-year flood elevation will result in higher flood insurance premiums perhaps amounting to as high as $25 per $100 of insurance coverage.

While the building standards in a local ordinance may be altered by means of a variance, the flood insurance purchase requirement, which must be enforced by lending institutions, cannot be waived and thus may create severe financial consequences for the property owners, both present and future. Insurance rates for structures built below the 100-year flood elevation can be substantially higher than those for elevated structures. In many instances the rates will be so high as to make the structure essentially uninsurable because the owners cannot afford the premium. This may not matter to the original owner who applied for the variance in the first place, but it may matter a great deal to subsequent owners who cannot find buyers because of the high insurance rates, or to the community that finds itself with large numbers of unsaleable houses.

Section 60.6 (a)(6) — A community is required to maintain a record of all variance actions, including justification for their issuance and report such variances issued in its biennial report to FEMA.

Variances Under Act 166

Pennsylvania's Flood Plain Management Act and its accompanying regulations limit variances to one aspect of the regulations - the freeboard safety factor. Special Permit Activities and Development Which May Endanger Human Life have a minimum freeboard safety requirement of 1½ feet above the 100-year flood elevation. A municipality may vary the freeboard requirement provided that the applicant can meet other variance criteria. The criteria are closely related to those of the NFIP regulations and to those found in the Pennsylvania Municipalities Planning Code, Section 910.2, dealing with variances from zoning requirements.

The DCED Floodplain Management Regulations, section 38.6 and 38.7, should be carefully reviewed in the event of a variance request. DCED staff is available to provide technical assistance.

Summary

The variance is like a safety valve, which is used to provide the necessary relief when unusual circumstances arise. In general, variances are meant to be issued sparingly, if at all. Property owners may have many practical reasons for wanting relief from the regulations but upon thorough examination, few, if any, of the reasons are ever sufficient to satisfy the variance criteria as outlined here. Municipalities must avoid the pitfall of issuing unwarranted variances. This can have a "domino" effect by creating a demand for variances from adjacent property owners, and others who feel that they, too, are adversely affected by local floodplain management regulations. More importantly, the ordinance is, after all, designed to protect public health and safety.

Further Information and Assistance

Copies of DCED's Floodplain Management Regulations can be obtained from the nearest DCED – Governor's Center for Local Government Services Regional Office.

DCED is responsible for coordinating the NFIP and for administering Act 166. Staff is available to help municipalities prepare, enact and administer floodplain management regulations. For further information or assistance, call our toll free number 888-223-6837 or contact the DCED Regional Office serving your local area.

Appendix I

Planning Assistance from the Governor's Center for Local Government Services

The Governor's Center for Local Government Services is available to assist municipalities. Assistance is offered in an attempt to assess the impact of state agency decisions on local planning and zoning activities. Municipalities with an adopted comprehensive plan and zoning ordinance located within a county with an adopted comprehensive plan have the benefit by Commonwealth agencies considering the documents when reviewing applications for the funding or permitting of municipal infrastructure or other facilities. In addition, the Center offers grant assistance to prepare and/or update these important land use documents.

The Land Use Planning and Technical Assistance Program (LUPTAP) is an important component of the Growing Smarter Action Plan of the Governor's Center for Local Government Services. The LUPTAP provides matching grants for municipalities preparing to develop and strengthen community planning and land use management practices.

Guidelines for LUPTAP incorporate the principles of the Land Use Planning Executive Order and the recent changes to the MPC. The guidelines make clear that priority consideration for funding is given to municipalities that incorporate multimmunicipal approaches into their planning efforts. Similarly, those municipalities that strive for general consistency between their comprehensive plan, the county comprehensive plan and local zoning ordinances also receive priority consideration.

LUPTAP funding is one of the Center's most significant support programs. It allows municipalities to use funds to develop new or update existing comprehensive plans and land use implementation ordinances. It also allows municipalities to prepare strategies or special studies that will support the comprehensive planning process. LUPTAP funds can also be used to develop or update zoning or subdivision and land development ordinances, or to utilize advanced technology, such as GIS. Municipalities are permitted and encouraged to use up to $1,000 of the funding received toward educational programs on planning issues for local officials. The training and education program offered by the Center's training partners represent an excellent use of the funds.

The goal of the Center is to enhance the existing planning curriculum by offering new courses to local government officials through established partnerships with the Pennsylvania State Association of Boroughs (PSAB) and the Pennsylvania State Association of Township Supervisors (PSATS). The Center is proud to partner with PSAB and PSATS and draw on their understanding and experience in planning and growth issues to develop, promote and conduct new courses.

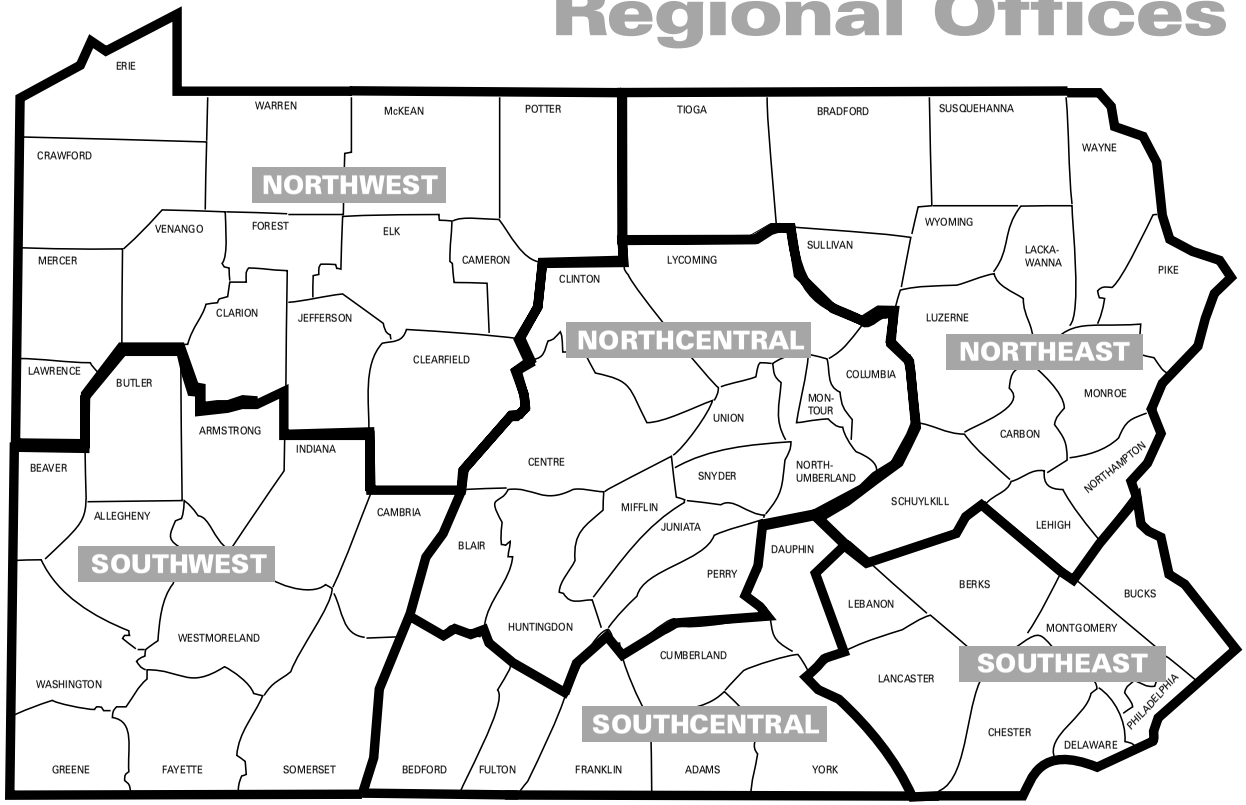
The courses offered by PSAB are directed primarily at economic development and downtown revitalization efforts as alternatives to sprawl. The courses PSATS offers focus on best practices and conservation. The primary audience for education and training programs is local government officials, however, other groups such as professional planners, municipal solicitors, elected officials citizens in general can benefit from these enhanced planning programs.

A community or individual desiring information on planning or planning assistance, either financial or technical, should contact the appropriate DCED Regional Office in their area. Some of the issues that the Department's staff can provide assistance are:

- Community planning and comprehensive plans
- Zoning
- Subdivision and land development
- National Flood Insurance and Floodplain Management
- Other planning related areas such as PRD, historic districts, mobile home parks, sign control, etc.
- Procedural questions involving the Municipalities Planning Code

Governor's Center for Local Government Services

Regional Offices



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