

Chapter RD 16

WISCONSIN'S FLOOD PLAIN MANAGEMENT
PROGRAM

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RD 16.01 Preamble. (1) From lessons gained in flood problem areas across the nation, the Wisconsin Legislature in enacting chapter 614, laws of 1965, recognized that zoning is a necessary tool to protect human life, health, and to minimize property damages and economic losses. Consequently, local units of government (villages, cities, and counties) have been given the responsibility under section 87.30, Wis. Stats., to adopt reasonable and effective flood plain zoning ordinances within their respective jurisdictions where appreciable damage may occur.

(2) The basic purpose of flood plain regulations is *not to prohibit* but to guide development in the flood plain areas consistent with nature's demands for the conveyance of flood flows and the community's land use needs. Regulations that reflect the flood hazard can provide a reasonable degree of flood protection as part of the original construction. Consequently flood damages, expenses, and inconveniences to the taxpaying residents of Wisconsin's communities can be minimized.

(3) This flood plain management program consists basically of 3 parts:

(a) Evaluation of the flooding potential and identification of the flood plains by using criteria established herein by the Division of Resource Development,

(b) Formulation, administration, and enforcement of reasonable regulations and other flood plain management practices which are based on sound technical data and consistent with state criteria and comprehensive community land use needs, and

(c) Continuous review and upgrading of flood plain management criteria and regulations based on new hydrologic, hydraulic, and other technical information and methods.

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RD 16.02 Statements of policy. (1) Villages, counties, and cities have primary responsibility for planning, adoption, and enforcement of zoning ordinances and other flood plain regulations, and public education in the field of flood hazards and their reduction. A continuing responsibility will remain at the local levels beyond insuring adequate enforcement of the enacted ordinances and other flood plain regulations. It will be the responsibility of local units of government to monitor the need for extending or otherwise modifying existing zoning ordinances and other flood plain regulations with regard both to content and area of application. The success or failure of any flood plain management program will depend on support and enforcement at the local level. In some communities affected by the uncontrolled

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spread of urbanization, the consequences of local action (or lack of action) taken today may be realized in the near future.

(2) Villages, cities, and counties shall adopt reasonable and effective flood plain zoning ordinances for any or all flood plains within their respective jurisdictions where appreciable damage may occur. The flood hazard associated with small streams having existing or potentially urbanized watersheds shall be considered as well as the larger rivers and streams. The "flashy" nature of flooding on some of these streams amplifies the need for flood plain management practices, since the peaking time for large floods on small streams does not allow sufficient time for evacuation or the implementation of temporary protective measures. Accordingly, in urban areas, appreciable damage may be expected to occur on many streams having drainage area over two square miles where such drainage area is generally not significantly controlled by lakes, swamps, or similar flood storage areas or where the division of resource development determines that such stream is potentially dangerous. In rural areas potential flood damage areas shall be construed to include all navigable streams. Although streams having drainage areas smaller than 2 square miles in urban areas and streams that are not navigable in rural areas may be hazardous, these streams may be considered a local drainage matter for flood plain zoning administration purposes.

(3) All flood plain zoning ordinances or any other flood plain regulations adopted by any village, county, or city shall ultimately comply with flood plain management criteria established by the division of resource development. These criteria are considered to provide only a minimum degree of flood protection for flood plain developments. Therefore, local units of government, if they so desire, may exceed these criteria in local flood plain regulations.

(4) The division of resource development with assistance from all interested federal and state agencies will, upon request, assist local units of government or regional planning commissions in evaluating the flood hazard, in making flood plain identification, and relating these factors to flood plain management and enforcement practices. The primary contribution of the state and federal agencies toward this program will be technical manpower and computer facilities for the necessary hydrologic, hydraulic, and engineering studies and report phase of the studies. Local contributions to this program shall include, among other things, necessary topographic and other base maps and assistance in field surveys.

(5) The division of resource development shall prepare a comprehensive statewide priority list for flood plain regulations by communities with rivers and streams having a flood damage potential. The rivers and streams having the greatest flood damage potential will have the highest priority. This priority list shall consider the existing flood damage potential and the flood damage potential associated with future flood plain developments and encroachments. Existing development patterns, existing or proposed public utilities and streets, projected community growth and expansion plans, and other factors will be considered in determining flood damage potential. Flood plain information studies that have been completed or are underway will in no way affect the priority given a village, county, or city.

(6) Local units of government are requested to assist in formulation and upgrading of the statewide priority list. In addition, the

division of resource development will also rely on assistance and guidance from interested regional planning commissions, and federal and state agencies.

The statewide priority list for flood plain regulations will be used by the division of resource development as guidelines in the determination and evaluation of the following:

(a) the need for local units of government to take action in implementing flood plain regulations and management practices;

(b) assistance from all interested state and federal agencies;

(c) allocation of state, federal, and other funds for programs and assistance affecting flood plain management;

(d) division of resource development enforcement actions against any local unit of government not acting in accordance with its statutory responsibility.

(7) Where watersheds and flood problems extend beyond state boundaries, the division of resource development shall work cooperatively with the adjoining state and the federal government to establish programs to develop water resources and to alleviate flood problems.

(8) To assure that flood plain zoning ordinances are effective in minimizing future flood damages, the local units of government shall supplement zoning by one or more of the following 3 flood plain management practices where applicable: (a) subdivision regulations, (b) building codes, (c) sanitary regulations.

(d) In addition, local units of government are encouraged to implement other flood plain management practices, including the following:

1. development policies;

2. open space, land easement and acquisition programs for flood plains;

3. flood proofing of existing structures on the portions of the flood plain not essential for the conveyance of flood flows;

4. public education program and dissemination of flood hazard information and need for flood plain management practices;

5. flood warning signs;

6. urban redevelopment;

7. permanent or temporary evacuation;

8. building financing.

(e) The division of resource development and other interested state and federal agencies will be available to assist any local unit of government in this endeavor.

(9) Any complaints received by the division of resource development regarding unauthorized filling, construction or any other type of flood plain encroachment shall be referred to the zoning administrator of the responsible local unit of government for necessary action. Subsequently, the local unit of government shall give notice within 30 days to the division of resource development regarding any local action taken pursuant to such complaint.

The division of resource development will be available to assist local units of government in enforcement actions.

(10) The division of resource development, in cooperation with the affected local units of government, shall, when possible, conduct periodic inspections. These inspections shall serve the following purposes:

(a) To ascertain the effectiveness of local administration and enforcement;

(b) To ascertain if completed construction, such as building floor elevations, is, in fact, in compliance with local regulations; and

(c) To evaluate for the local units of government the nature of any flood plain or floodway conditions, such as the need for adequate channel maintenance measures or the removal of debris at bridge openings, that could contribute to the flood damage potential.

The division of resource development will conduct such inspections through its regional offices consistent with the statewide priority for flood plain regulations.

(11) Since flood flows ignore corporate limits of communities, the division of resource development shall insure that flood plain zoning regulations of adjoining communities are compatible and consistent with the flood hazard.

(12) The division of resource development will encourage, assist, and cooperate in all efforts to implement soil and water conservation and watershed practices on the watershed of any water course.

(13) The division of resource development recognizes that there may be a need in some areas to supplement flood plain management practices with flood control projects. All flood control projects for Wisconsin's streams, including the preliminary planning, shall be coordinated through the division of resource development and shall be consistent with the state comprehensive plan for water resources. The economic justification of any flood control works shall reflect adequate flood plain regulations in areas to be affected by such works. No flood plain regulations shall reflect the effects of any flood control or protective works until such time as the flood control project is constructed and operative.

(14) Coordination of state and local comprehensive flood plain management goals and objectives with other state, federal, or institutional programs that could affect the quality of flood plain management programs is considered of paramount importance. Therefore, the division of resource development shall endeavor to coordinate the flood plain management program with programs of the other agencies, including:

- (a) Federal, State and local open space programs
- (b) Department of Housing and Urban Development "701" Urban Planning Assistance Program
- (c) Federal grant, loan or mortgage insurance programs such as the VA, FHA, HFFA.
- (d) Division of Highways, State Department of Transportation
- (e) Division of Engineering, State Department of Administration
- (f) State Industrial Commission
- (g) U. S. Weather Bureau
- (h) U. S. Soil Conservation Service
- (i) U. S. Corps of Engineers
- (j) Wisconsin Regional Planning Commissions
- (k) The University of Wisconsin
- (l) State Conservation Division
- (m) State Division of Health
- (n) Private lending and financing programs
- (o) State Soil Conservation Board

(15) The division of resource development, in addition to its continuing review function, has the responsibility to update the hydraulic

and hydrologic data and other technical information. These data, plus information on improvements in flood plain management techniques, will be transmitted to local units of government on a continuing basis for local implementation.

(16) The division of resource development will establish a technical advisory committee for shoreland and flood plain zoning composed of representatives of appropriate state and federal agencies to achieve optimum cooperation and assistance and to be continuously advised on latest technological advances from other state and federal agencies.

(17) Villages, counties, and cities shall in accordance with chapter 614, laws of 1965, enact zoning regulations by January 1, 1968. To be as reasonable as possible, and in view of the absence of technical data to comply with state flood plain management criteria, the following procedures will be followed by the division of resource development concerning its responsibility to assure compliance with the January 1, 1968, requirement:

(a) Local units of government shall submit proposed, preliminary, final, or enacted ordinances and associated maps for those areas where adequate flood information is available (such as experience flood maps or detailed soil maps) to the division of resource development by January 1, 1968, for review and comment.

(b) Local units of government shall express in writing that local ordinances reflecting division of resource development comments and suggestions will be adopted within three months of the date of the official DRD comments, and a copy of the adopted ordinance shall be furnished to the DRD.

(c) Local units of government shall submit to the DRD a list of streams under their jurisdiction for which technical information is not available to meet state flood plain management criteria. The streams shall be listed in order of the degree of flood damage potential associated with each stream and shall include a description of the type of information that is available for each, such as high water marks and topographic maps. This list will be considered in the state-wide priority for flood plain regulations.

(d) Local units of government shall express in writing that within six months from the date of release of technical information to meet state requirements, the same information will be adequately reflected in local flood plain regulations and that a copy thereof will be furnished to the DRD.

(e) The division of resource development's review of proposed, preliminary, final, or enacted ordinances will include the following:

1. Determination if the most accurate maps were utilized in delineating the flood plains;
2. Determination of the adequacy of the text of any ordinance;
3. Determination of the compatibility of ordinances from adjoining communities on the same streams or rivers;
4. Determination of the compatibility of flood plain ordinances with shoreland regulations.

(f) In some areas, the division of resource development may request local units of government to transmit a valley cross section and/or other survey data to the division of resource development as the basis for an estimation of the amount of freeboard needed above available

flood height data. This determination of freeboard shall then be reflected in the provisions of the local ordinance to guide future flood plain developments accordingly. The purpose of this determination, in addition to providing a greater degree of flood protection, is to provide initial regulations that will be reasonably compatible with ultimate regulations that will meet state requirements.

(g) Where local units of government fail to demonstrate any compliance with these requirements by January 1, 1968, initial enforcement actions by the division of resource development shall be directed against those governments.

History: Cr. Register, November, 1968, No. 155, eff. 12-1-68.

RD 16.03 Procedures. (1) Section 87.30, Wis. Stats., requires the effective administration and enforcement of local flood plain zoning ordinances. Therefore, to continually evaluate the effectiveness of the administration and enforcement of county, city, or village flood plain zoning ordinances, these local units of government shall give mailed notice to the regional and main office of the division of resource development of any public hearing on an application for a variance or special exception (conditional use). Such notice shall specify the time, place, and subject matter of the public hearing.

(2) The local units of government shall require the applicant to submit a map, or plan and/or legal description which accurately locates or describes the proposal with respect to the flood plain districts and provides all pertinent information such as the nature of the proposal, fill limits and elevations, and building floor elevations, etc. The local unit of government shall transmit this information to the division of resource development for the determination of reasonable flood protection levels and/or the evaluation of the effects upon flood heights, velocities and flood plain storage areas. The division of resource development may request additional information such as valley cross sections or other survey information to make its determination.

(3) The determination of these effects shall be based on the assumption that the flood plain or floodway encroachment resulting from any proposed fill, obstruction, or structures will extend for a significant reach of the stream, together with an encroachment equal in degree on the opposite side of the stream.

(4) The division of resource development shall advise the local unit of government of its findings within 30 days of receiving notice of an application for a variance or special exception (conditional use) or thirty days of receiving all requested engineering information. Inaction by the division of resource development within thirty days may be construed to mean it has no comment.

(5) A copy of all decisions granting a variance or special exception (conditional use) relating to the flood plain or floodway areas, shall be mailed within ten days of such action to the regional and the main office of the division of resource development.

(6) Requests from local units of government, regional planning commissions, or other organizations for flood plain information studies or any other assistance relating to flood plain management from any state or federal agencies shall be directed to and coordinated by the division of resource development. The division of resource development will establish a priority for flood plain studies and assistance

consistent with its statewide priority for flood plain regulations, and determine the appropriate state or federal agency to perform such work. The priority for studies will also consider the availability of topographic maps and other basic information.

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GENERAL CRITERIA FOR FLOOD PLAIN REGULATIONS

RD 16.04 Purposes and objectives. (1) **PURPOSES.** The purpose of these criteria is to provide a uniform basis for the preparation and implementation of sound flood plain regulations for Wisconsin rivers and streams in order to:

- (a) Protect human life and health;
- (b) Minimize expenditures of public monies for costly flood control projects;
- (c) Minimize rescue and relief efforts, generally undertaken at the expense of the general public;
- (d) Minimize business interruptions. Closing of factories and businesses, disruption of transportation routes, and interference with utility services result in loss of wages, sales and production;
- (e) Minimize damage to public facilities on the flood plains such as water mains, sewer lines, streets and bridges. These facilities are repaired at the expense of the general public;
- (f) Help maintain a stable tax base by the preservation or enhancement of property values for future flood plain developments. In addition, development of future flood blight areas on flood plains will be minimized and property values and the tax base adjacent to the flood plains will be preserved;
- (g) To discourage the victimization of unwary land and home buyers.

(2) **OBJECTIVES.** To accomplish the foregoing objectives, provisions in flood plain zoning and other flood plain management practices and the administration and enforcement thereof shall, among other things:

- (a) Reduce the hazard of floods to life and property through:
 1. Prohibiting certain uses which are dangerous to life or property in time of flood.
 2. Restricting uses which would be hazardous to the public health in time of flood.
 3. Restricting uses which are particularly susceptible to flood damage, so as to alleviate hardship and reduce demands for public funds for relief and protection.
 4. Requiring permitted flood plain uses, including public facilities which serve these uses to be protected against floods, thereby providing flood protection at the time of initial construction.
- (b) Protect the storage capacity of flood plains, and assure retention of sufficient floodway area to convey flood flows which reasonably can be expected to occur, through:
 1. Regulating filling, dumping, dredging and alteration of channels by deepening, widening or relocating.
 2. Prohibiting unnecessary encroachments in floodways.
 3. Encouraging open space uses such as agricultural and recreational.

(3) REGIONAL FLOOD. (a) The regional flood is a flood determined by the division of resource development which is representative of large floods known to have occurred generally in Wisconsin and reasonably characteristic of what can be expected to occur on a particular stream. The regional flood generally will have an average frequency in the order of the 100 year recurrence interval flood determined from an analysis of floods on a particular stream and other streams in the same general region.

(b) The division of resource development methods and techniques to ascertain the magnitude of the regional flood and application thereof shall be uniform throughout the state.

(c) Local units of government can and in some cases will be encouraged to anticipate floods in excess of the regional flood in local regulations.

(4) FLOOD PLAIN DELINEATION. (a) The regional flood generally shall serve as a basis for delineation of the minimum limits of the flood plains for regulatory purposes.

(b) Where technical information is available to ascertain the magnitude of floods larger than the regional flood that could be expected to occur (such as the standard project flood or the maximum probable flood), the flood plain limits of these large floods shall be reflected on the official zoning district maps for public informational purposes.

(c) The best possible engineering and other techniques should be utilized in locating the flood plain limits on an official zoning district map. Where there may be a conflict between the flood plain limits illustrated on the map and actual field conditions, the elevations from the flood profile shall be the governing factor in locating the regulatory flood plain limits on the ground.

(5) FLOODWAY DELINEATION. (a) The delineation of the floodway shall be based on the channel of the river or stream and those portions of the adjoining flood plains which are reasonably required to carry and discharge the regional flood.

(b) The determination of the floodway limits shall be based on hydraulic and engineering studies.

(6) REGULATORY FLOOD PROTECTION ELEVATIONS. (a) The regulatory flood protection elevation shall correspond to a point not less than two feet above the water surface profile associated with the regional flood.

(b) Where floodway encroachments are permitted, the increase in water surface elevations attributable to permitted floodway encroachments shall be reflected in the regulatory flood protection elevations.

(c) The regulatory flood protection elevations shall be clearly lettered at identifiable positions on the official zoning district map consistent with the water surface profile of the regional flood, or the profile shall be attached to and made part of the official zoning district map.

(7) FLOODWAY ENCROACHMENTS. (a) Any increase in flood stages attributable to encroachments on the floodway of any river or stream shall not exceed 0.50 foot in urban areas and 1.00 foot in rural areas in any one reach or for the cumulative effect of several reaches of a river or stream for the regional flood.

(b) Floodway encroachments shall be:

1. based on a uniform degree of encroachment for a significant reach on both sides of a river or stream;
2. based on hydraulic and engineering studies;
3. be consistent with local comprehensive planning.

(8) AREAS BETWEEN FLOODWAY OR ENCROACHMENT LIMITS AND/OR LEVEES. (a) *Permitted uses.* 1. Open space uses having a relatively low flood damage potential such as those associated with agriculture, recreation, parking, storage yards, certain sand and gravel operations;

2. Certain structures accessory to permitted open space uses if the structures are designed, constructed and placed on the lot so as to offer the minimum obstruction to flood flows;

3. Channel uses permitted by the public service commission pursuant to sections 30.11, 30.12, and 30.15, Wis. Stats.

(b) *Prohibited uses.* 1. Any fill, deposit, obstruction, excavation, storage of materials, or structure which acting alone or in combination with existing or future similar works could adversely affect the efficiency or the capacity of the floodway or adversely affect existing drainage courses or facilities. The determination of these effects shall be based on the assumption that the flood plain or floodway encroachment resulting from any proposed fill, obstruction, or structures will extend for a significant reach of the stream together with an encroachment equal in degree on the opposite side of the stream;

2. Structures that are a. designed for human habitation, b. associated with high flood damage potential, c. not connected with permitted open space uses, and d. structures consistent with open space uses that could obstruct flood flows in accordance with above part (a) of this subsection;

3. Storage of materials that are buoyant, flammable, explosive, or injurious to human, animal or plant life; and

4. Open space uses that are not in harmony with and may be detrimental to the uses permitted in the adjoining district.

(9) AREAS LANDWARD OF FLOODWAY OR ENCROACHMENT LIMITS. (a) *General.* 1. All flood plain developments should be consistent with a local comprehensive plan. In the absence of a formal plan, developments shall be in harmony with and not detrimental to the uses permitted in the adjoining district.

2. Flood plain developments shall not adversely affect the efficiency of or unduly restrict the capacity of the channels or floodways of any tributaries to the main stream, drainage ditches, or any other drainage facilities or systems.

3. Flood plain developments shall not materially affect the storage capacity of the flood plains, particularly in flood plain areas up-stream from urban areas. The determination of these effects shall be based on the assumption that the flood plain or floodway encroachment resulting from any proposed fill, obstruction, or structures, etc. will extend for a significant reach of the stream together with an encroachment equal in degree on the opposite side of the stream.

(b) *Urban residential areas.* 1. The first floor or basement floor of any building or structure to be erected, constructed, reconstructed, altered, or moved on the flood plain shall be placed on fill at or above the regulatory flood protection elevation.

2. Fill elevation shall be not less than one foot above the regional flood elevation plus any increase in elevation permitted in "(7) Floodway Encroachments" of these criteria and the fill shall extend at such elevation at least 15 feet beyond the limits of any structure of building erected thereon.

(c) *Rural seasonal or permanent residences.* 1. The first floor and any floor of a basement of a building or structure used for human habitation or associated with a high flood damage potential to be erected, constructed, reconstructed, altered, or moved on the flood plain shall be at or above the regulatory flood elevation.

2. If rural seasonal or permanent residences are served by public facilities such as water or sewer lines, criteria for urban residential areas shall apply.

(d) *Commercial areas.* Commercial areas generally are to be constructed on fill with no first floor or basement floor below the regulatory flood elevation. Certain yards, parking lots, and other auxiliary land uses may be at lower elevations. However, no such area in general use by the public shall be inundated to a depth greater than two feet or subjected to flow velocities greater than four feet per second upon the occurrence of the regional flood.

(e) *Manufacturing and industrial areas.* Protection methods utilizing fill, levees, floodwalls, and flood proofing measures for buildings, structures, and appurtenant works are to be provided to the regulatory flood protection elevation. Interference with normal plant operations is to be minimized, especially for streams having protracted flood durations. A lesser degree of protection may be permissible for storage yards, parking lots, and other auxiliary uses compatible with these criteria.

(f) *Public utilities, streets and bridges.* 1. When failure or interruption of public facilities would result in danger to the public health or safety, or where such facilities are essential to the orderly functioning of the area, protection to the level of the regulatory flood protection is to be provided.

2. Where failure or interruption of service would not endanger life or health, a lesser degree of protection may be provided for minor or auxiliary roads or utilities.

3. Public utilities, roads, and bridges on the flood plain should be designed to minimize increases in flood elevations and should be compatible with the local comprehensive flood plain development plan.

(g) *Storage of materials.* Any storage of materials that are buoyant, flammable, explosive, or in times of flooding, could be injurious to human, animal, or plant life, should be at or above the regulatory flood protection elevations.

(10) FLOOD PROOFING MEASURES. When these criteria permit flood proofing measures such as those listed below, these measures shall be designed consistent with flood velocities, depths, forces, and other factors associated with the regional or regulated flood. A plan or document certified by a registered professional engineer that the flood proofing measures are adequately designed shall be submitted to the local unit of government prior to any authorization therefor.

(a) Anchorage of structures to foundations.

(b) Installation of watertight doors, bulkheads and shutters.

(c) Reinforcement of walls to resist water pressures.

(d) Use of paints, membranes or mortars to reduce seepage of water through walls.

(e) Addition of mass or weight to structures to resist flotation.

(f) Installation of pumps to lower water levels in structures.

(g) Construction of water supply and waste treatment systems to prevent the entrance of flood waters.

(h) Pumping facilities for subsurface drainage systems for buildings to relieve external foundation wall and basement floor pressures.

(i) Cutoff valves on sewer lines or the elimination of gravity flow basement drains.

(11) FLOOD PROTECTIVE OR CONTROL WORKS FOR URBAN AREAS. (a) *Levees or floodwalls.* 1. The criteria for "Floodway Encroachments" generally shall be applicable to levees or floodwalls.

2. The minimum height and design of any levee or floodwall shall be based on the flood profile of the regional flood confined between the levees or floodwalls, plus three feet of freeboard or the standard project flood confined between the levees or floodwalls, whichever provides the greater protection from floods.

3. Increases in flood stages resulting from any levee or floodwall in excess of the allowable increases in "Floodway Encroachments" or these criteria shall be contained within the upstream extent of any levee or floodwall.

4. Flood plain developments landward of any levee or floodwall shall be compatible with provisions for interior drainage and designated ponding areas associated with any levee or floodwall.

5. The general criteria for "Areas Landward of Floodway or Encroachment Limits" shall apply for flood plain developments until such time as the levees and floodwalls are constructed and operative.

(b) *Reservoirs and channel improvements.* Any regulatory flood protection elevations or floodway or encroachment limits based on any proposed reservoir or channel improvements shall not be effective until the reservoir or channel improvements are constructed and operative.

(12) MODIFICATIONS OR ADDITIONS TO EXISTING STRUCTURES. (a) *Areas between floodway or encroachment limits and levees.* No modifications or additions to any structure that are not in compliance with permitted floodway uses are permitted unless such modifications will decrease the flood damage potential of the structure or cause the structure to decrease the degree of obstruction to flood flows.

(b) *Areas landward from floodway or encroachment limits.* 1. Any modifications or additions to any structure generally shall be in compliance with the general criteria for flood plain regulation.

2. Where compliance with applicable criteria results in undue hardship, the following shall apply:

a. Any modifications or additions to any structure for human habitation or with a high flood damage potential shall be protected to the regulatory flood protection elevation by acceptable flood proofing measures. In accordance with section "(10) Flood Proofing Measures" of these criteria.

b. Modifications or additions for other structures may be permitted at elevations lower than the regulatory flood protection elevation if

such modification or addition will not be subjected to high flood depths of flood velocities and will not require the installation of public facilities.

c. Any modification involving the internal use of an existing building not in compliance with these criteria may be permitted if such use will not endanger human lives, increase the flood damage potential by the occurrence of the regional flood, or require the installation of public facilities.

(c) Any modifications or additions to existing structures also shall comply with the statutory provisions for non-conforming uses.

(13) **THE REMOVAL OF DESIGNATED FLOOD PLAIN LIMITS.** The flood plain designation on zoning district maps shall not be removed from any area unless it can be shown that the area is filled to an elevation two feet above the flood profile for the standard project flood.

(14) **CERTIFICATION OF COMPLIANCE.** In urban areas and where practicable in rural areas, no vacant land shall be occupied or used and no building hereafter erected, altered or moved shall be occupied until the applicant submits to the local zoning administrator or building inspector a certification by a registered professional engineer or land surveyor that the finished fill and building floor elevations and other flood plain regulatory factors were accomplished in compliance with appropriate flood plain zoning provisions and other flood plain regulations.

(15) **PUBLIC INFORMATION.** (a) Where possible, flood limits should be marked on the ground. Markers should be set to show both the depth of inundation and the area affected.

(b) All available information in the form of maps, engineering data, and regulations should be freely and widely distributed.

(c) All legal descriptions of property transferred in the flood plain area should include information relative to the zoning classification.

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RD 16.05 Definitions. (1) **BUILDING CODE.** A collection of regulations adopted by a local governing body setting forth standards for the construction of buildings and other structures for the purpose of protecting the health, safety, and general welfare of the public.

(2) **CHANNEL.** A natural or artificial watercourse of perceptible extent, with definite bed and banks to confine and conduct continuously and periodically flowing water. Channel flow thus is that water which is flowing within the limits of the defined channel.

(3) **CHANNEL BOTTOM.** The elevation of the deepest part of a stream channel at a particular section. Such elevations, when determined for many sections along the length of a stream provide a profile of the bottom from mouth to source.

(4) **DESIGNATED FLOODWAY.** The channel of a stream and those portions of the adjoining flood plains designated by a regulatory agency (department of natural resources) to provide for reasonable passage of flood flows.

(5) **ENCROACHMENT LINES.** The lateral limit or line along each side and generally parallel to the stream or other bodies of water, within which no structure or fill may be added. Their purposes are

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to preserve the flood carrying capacity of the stream or other body of water and its flood plain, and to assure attainment of the basic objective of improvement plans that may be considered or proposed. Their location, if along a stream, should be such that the floodway between them will effectively carry and discharge a flood not less than the regional flood.

(6) **FLOOD.** A temporary rise in stream flow or stage that results in inundation of the areas adjacent to the channel.

(7) **FLOOD FREQUENCY.** A means of expressing the probability of flood occurrences as determined from a statistical analysis of representative stream flow records. It is customary to estimate the frequency with which specific flood stages or discharges may be equalled or exceeded, rather than the frequency of an exact stage or discharge. Such estimates by strict definition are designated "exceedence frequency", but in practice the term "frequency" is used. The frequency of a particular stage of discharge is usually expressed as occurring once in a specified number of years. Also see: Recurrence interval.

(8) **FLOOD PEAK.** The highest value of stage or discharge attained during a flood event; thus peak stage or peak discharge.

(9) **FLOOD PLAIN.** The areas adjoining a watercourse or other body of water which has been or may be hereafter covered by flood water.

(10) **FLOOD PLAIN MANAGEMENT.** A term applied to the full range of public policy and action for insuring wise use of the plains. It includes everything from collection and dissemination of flood control information to actual acquisition of flood plain lands, including the enactment and administration of codes, ordinances, and statutes regarding flood plain land use.

(11) **FLOOD PLAIN REGULATIONS.** A general term applied to the full range of codes, ordinances, and other regulations relating to the use of land and construction within flood plain limits. The term encompasses zoning ordinances, subdivision regulations, building and housing codes, encroachment laws and open area regulations.

(12) **FLOOD PROFILE.** A graph or a longitudinal profile showing the relationship of the water surface elevation of a flood event to location along a stream or river.

(13) **FLOOD PROOFING.** A combination of structural provisions, changes, or adjustments to properties and structures subject to flooding primarily for the reduction or elimination of flood damages to properties, water and sanitary facilities, structures, and contents of buildings in a flood hazard area.

(14) **FLOOD RECORD.** Records of flood events for which there is reasonably reliable data useful in technical analysis. The highest recorded stage or discharge is often referred to as "maximum flood of record" as differentiated from "historic highwater marks" which may not be well defined.

(15) **FLOOD STAGE.** A term commonly used by the U. S. Weather Bureau and others to designate that stage, on a particular river gage, at which overflow of the natural banks of the stream results in significant damage in any portion of the reach for which the gage is a representative index.

(16) **FLOODWAY.** The channel of the stream or body of water and those portions of the flood plains which are reasonably required to carry and discharge the flood water or flood flow of any river or stream.

(17) **FREEBOARD.** A factor of safety usually expressed in feet above a design flood level for flood protective or control works. Freeboard tends to compensate for the many unknown factors that could contribute to flood heights greater than the height calculated for a selected size flood and floodway conditions such as wave action, bridge opening and floodway obstructions, and the hydrological effects of urbanization of the watershed.

(18) **HISTORICAL FLOOD.** A known flood which occurred before systematic record keeping was begun for the stream or area under consideration.

(19) **MAXIMUM PROBABLE FLOOD.** The most severe flood with respect to flood peak that may be expected from a combination of the most critical meteorological and hydrological conditions that are reasonably to be expected on the drainage basin.

(20) **REACH.** A hydraulic engineering term to describe longitudinal segments of a stream or river. A reach will generally include the segment of the flood plain where flood heights are primarily controlled man-made or natural flood plain obstructions or restrictions. In an urban area, the segment of a stream or river between two consecutive bridge crossings would most likely be a reach.

(21) **RECURRENCE INTERVAL.** The *average* interval of time, based on a statistical analysis of actual or representative stream flow records, which can be expected to elapse between floods equal to or greater than a specified stage or discharge. Recurrence interval is generally expressed in years. Also see: Flood frequency.

(22) **RURAL AREAS.** Rural area means all area not included under urban area, such as agricultural, wilderness, and undeveloped areas.

(23) **SOIL SCIENTIST.** A person with academic training and education in pedology, agronomy, and other areas dealing with soils.

(24) **STANDARD PROJECT FLOOD.** A hypothetical flood, estimated by the Corps of Engineers, representing the critical flood runoff volume and peak discharge that may be expected from the most severe combination of meteorological and hydrologic conditions that are considered *reasonably characteristic* of the geographical region involved, excluding extremely rare combinations.

(25) **SUBDIVISION REGULATIONS.** Regulations and standards established by a local unit of government with authority from a state enabling law, for the subdivision of land in order to secure coordinated land development, including adequate building sites and land for vital community services and facilities such as streets, utilities, schools and parks.

(26) **URBAN AREAS.** For the purpose of these flood plain criteria, urban area shall be construed to include the following:

(a) The area within the present corporate limits plus the adjoining area that is or could be under the statutory extraterritorial zoning jurisdiction of any city, village, or town;

(b) Any group of seasonal or permanent residential buildings or any other group of buildings that are served by public utilities, such as public water and sanitary facilities;

(c) Any other area where the developments are urban in nature.

(27) URBAN REDEVELOPMENT. The overall program of public and private action, growing out of the National Housing Act of 1954, as amended, designed to prevent the spread of blight, to rehabilitate and conserve urban areas that can be economically restored, and to clear and redevelop areas that cannot be saved.

(28) ZONING ORDINANCE. An ordinance adopted by a local governing body, with authority from a state zoning enabling law, which under the police power divides an entire local governmental area into districts and, within each district, regulates the use of land, the height, bulk, and use of buildings or other structures, and the density of population.

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