

## CHAPTER V: SPECIFIC STANDARDS

### 5.01 Application

The following applicable minimum development standards listed in this chapter are to be demonstrated to be met by the applicant for the following specific areas of the floodway, flood fringe and floodplain of the 100-year floodplain as delineated on the Official Floodplain Maps and correspond to the A, AE, AH, AO and Shaded-X zones depicted.

### 5.02 Floodway

- A. Uses Requiring Permits** - The following artificial obstructions including alterations and substantial improvements to existing artificial obstructions may be allowed in the floodway subject to the issuance of a permit by the Floodplain Administrator provided it is demonstrated in an encroachment analysis that any encroachment by the development does not increase the base flood elevation more than 0.00 feet as certified by an engineer unless a Conditional Letter of Map Revision (CLOMR) accompanies the application, the Official Floodplain Maps herein are amended before the permit can be issued and a subsequent Letter of Map Revision (LOMR) is issued by FEMA upon project completion.
1. Mining of materials, excavation of pits and pools provided that:
    - a. a buffer strip of undisturbed land of sufficient width to prevent flood flows from channeling or laterally migrating into the excavation is left between the edge of the channel and the edge of the excavation;
    - b. the excavation meets all applicable laws and regulations of other local and state agencies; and
    - c. excavated material is stockpiled outside the floodway.
  2. Railroad, highway and street stream crossings under the following conditions:
    - a. The crossings are designed to offer minimal obstruction to flood flow; and,
    - b. The crossings do not increase the base flood elevation nor cause a change in normal or flood-stage stream velocities that would likely cause a problematic change in erosion or deposition patterns; and,
    - c. Overflow channels are preserved to allow passage of the base flood; and,
    - d. Except for spans on which a mid-stream support is essential, all obstructions are outside the natural stream banks. Anticipated lateral migration of the stream will be considered in the location of the abutments; and,
    - e. Mid-stream supports must have footings buried below the maximum potential scour depth during the base flood; and,
    - f. The applicant demonstrates to the Floodplain Administrator and County Public Works Director that there is adequate freeboard to convey ice jams, the 100-year flood, and any debris associated with such a flood. This freeboard shall be at least two feet above the base flood elevation; and,
    - g. Reasonable alternatives to the stream crossing do not exist.
  3. Limited filling for highway, street and railroad embankments not associated with stream crossings provided that:
    - a. reasonable alternative transportation routes outside the designated floodway are not available; and,

- b. such floodway encroachment is located as far from the stream channel as possible and shall not increase the base flood elevation.
4. Buried or suspended utility transmission lines, with the following conditions:
  - a. Suspended utility transmission lines are designed such that the lowest point of the suspended line is at least fifteen (15) feet higher than the elevation of the flood of 100-year frequency on the Bitterroot, Blackfoot, Clark Fork and Swan Rivers, and at least ten (10) feet on other streams; and,
  - b. Towers and other appurtenant structures are designed and placed to withstand and offer minimal obstruction to flood flows; and,
  - c. Underground utility transmission lines carrying toxic or flammable materials are buried to a depth of at least twice the calculated maximum potential scour depth during the base flood. The maximum depth of scour shall be determined from any of the accepted hydraulic engineering methods, but final calculated figures shall be subject to approval by the Floodplain Administrator. The length of maximum burial shall take into account likely channel migration; and,
  - d. Whenever technically feasible and in consideration of the costs in relation to the scope of the project, crossings will not disturb the bed or banks of the stream. Alternatives such as alternative routes, directional drilling, and aerial crossings will be considered in light of all relevant issues.
5. Storage of materials and equipment provided that:
  - a. the material or equipment is not subject to major damage by flooding and is properly anchored to prevent flotation or downstream movement; or
  - b. the material or equipment is readily removable within the limited time available after flood warning. Storage of flammable, toxic, hazardous or explosive materials shall not be permitted.
6. Water supply wells provided that:
  - a. they are driven or drilled wells located on ground higher than the surrounding ground to assure positive drainage from the well; and
  - b. they require no other structures such as a well house; and
  - c. well casings are water tight to a distance of at least twenty-five (25) feet below the ground surface and wellheads are located a minimum of 18 inches above the ground and 2 feet above the base flood elevation; and
  - d. water supply and electrical lines have a watertight seal where the lines enter the casing; and
  - e. all pumps, electrical lines and equipment are either of the submersible type or are adequately flood proofed; and,
  - f. check valves are installed on main water lines at wells and all building entry locations.
7. Buried and sealed vaults for sewage disposal in recreational areas provided that they meet applicable laws and standards administered by the Department of Environmental Quality and Missoula County Environmental Health.
8. Public or private campgrounds provided that:
  - a. Access roads do not increase the base flood elevation and do not obstruct or divert flood waters; and

- b. No dwellings or permanent mobile homes are allowed; and,
  - c. Recreational vehicles and travel trailers are licensed and ready for highway use. They are ready for highway use if it is on its wheels or jacking system with wheels intact, are attached to the site with only by quick disconnect type utilities and securing devices, and have no permanently attached additions.
9. Structures accessory to the uses permitted in this section such as boat docks, marinas, sheds, picnic shelters, tables and toilets provided that:
    - a. the structures are not intended for human habitation;
    - b. the structures will have a low flood damage potential;
    - c. the structures will, insofar as possible, be located on ground higher than the surrounding ground and as far from the channel as possible;
    - d. the flood-proofing standards of Chapter VI are met; and
    - e. the structures will be constructed without fill and placed so there is a minimal obstruction to flood flows and anchored to prevent flotation.
  10. Replacement, alteration or substantial improvement of an existing mobile home on a developed site with servicing utilities provided that
    - a. The replacement home must be elevated on a permanent foundation so the lowest floor is 2 feet above the base flood elevation.
    - b. The foundation must be reinforced concrete, reinforced mortared block or poured piers, or other foundation elements of equal strength.
    - c. The chassis must be securely anchored to the foundation system with anchoring components capable of carrying a force of 4,800 pounds so that it will resist flotation, collapse or lateral movement. Methods of anchoring may include, but are not limited to, use of over-the-top frame ties to ground anchors.
    - d. Mobile homes proposed for use as commercial or industrial structures must be elevated 2 feet above the base flood elevation and cannot be dry floodproofed.
    - e. Adequate surface drainage and access for a hauler are provided.
  11. Substantial improvement or alteration of any legal artificial obstruction which existed prior to the delineation of the regulatory floodway provided all the provisions of Section 5.03.B.3 through 5.03.B.6 of these Regulations are met. In the floodway, a substantial improvement of an existing building must be elevated on a permanent stemwall foundation rather than on fill. Flood-proofing shall be accomplished in accordance with Chapter VI of these Regulations.
  12. Other than any prohibited uses, all other artificial obstructions, substantial improvements, alterations or non-conforming uses not specifically listed in these Regulations.
- B. Permits for Flood Damage Control Projects-** Flood damage control projects shall be allowed within floodways provided the applicant demonstrates by engineering certification that the project is able to substantially withstand the forces associated with the hydrodynamic and hydrostatic pressures associated including flood depths, velocities, impact, ice, buoyancy and uplift associated with the base flood and it is demonstrated in an encroachment analysis that any encroachment by the development does not increase the base flood elevation more than 0.00 feet as certified by an engineer unless a Conditional Letter of Map Revision (CLOMR) accompanies the application, the Official Floodplain Maps herein are amended before the permit can be issued and a subsequent Letter of Map Revision (LOMR) is issued by FEMA upon project completion provided:

1. For maintenance, substantial improvement or alteration of existing private levees or floodwalls, the applicant demonstrates the following criteria to the satisfaction of the Floodplain Administrator:
  - a. The length of the levee is the minimum required to protect the existing structures it is meant to serve. The analysis should detail the flood heights and velocities that would be experienced during a base flood if the levee were not present or were to fail; and
  - b. The cost of the project would not exceed 75% of the cost of elevating, floodproofing, and/or relocating the structures protected by the levee. The costs of these repairs are cumulative over 20 years from the date of the first repairs; and
  - c. A hydrologist or other qualified professional evaluates the effects of the levee both upstream and downstream and demonstrates that it would not cause foreseeable impacts to nearby property owners; and
  - d. The levee or floodwall is designed and constructed to safely convey the base flood; and
  - e. The levee or floodwall is constructed at least three (3) feet higher than the base flood elevation; and
  - f. The cumulative effect of the levee or floodwall does not increase the base flood elevation or significantly change velocities at any point in the vicinity of the project.
  - g. The Floodplain Administrator may waive 5.02 (B-1 a-c) if an existing stream bank levee is to be moved back from the stream bank to provide the maximum amount of flood storage.
  
2. Bank stabilization utilizing new, reconstructed or repaired riprap and other predominantly rock structures provided:
  - a. The project is to protect an existing residence, commercial building, industrial use, or necessary private or public infrastructure that is in imminent danger. A structure is considered to be in imminent danger when the ground beneath it is likely to be eroded or collapsed by a flood of a 10-year frequency or smaller, as estimated by a qualified hydrologist or engineer. Rip rap may be permitted as preventive maintenance for bridge abutments, roads, industrial uses, and public infrastructure; and
  - b. The cost of the project would not exceed 75% of the cost of relocating the structures to be protected. The costs of the project are cumulative over 20 years from the date of the first construction and/or repairs; and
  - c. The structure to be protected was constructed before February 23, 2000; and
  - d. A hydrologist or other qualified professional evaluates the stream/river upstream and downstream to determine the likely cause of bank erosion, and demonstrates that the cause of the problem cannot be feasibly fixed using other reliable stabilization techniques; and
  - e. The project is certified by an engineer to withstand the base flood; and
  - f. The project does not increase the base flood elevation; and
  - g. The project will not substantially affect vertical bed stability or substantially increase erosion upstream, downstream, or adjacent to the site; and
  - h. When practical and in situations where the integrity of the project will not be compromised, the project incorporates anchored woody debris or other design features to slow water velocities, and also incorporates revegetation on the upper bank and upstream

and downstream of the project. The applicant shall submit an annual performance and maintenance report on bank stabilization or other projects utilizing maturing vegetative components to the Floodplain Administrator for a period of 5 years or a time specified in the permit.

3. Other bank stabilization techniques, such as root wads, brush mattresses, willow wattling, and tree revetments provided:
  - a. The project is certified by an engineer that anticipated erosion, sedimentation, and transport of the materials are no more than the amount and rate of existing natural stream banks during the base flood; and,
  - b. The project does not increase the base flood elevation; and
  - c. The project results in long-term revegetation of the stream bank and adjacent areas with native vegetation; and
  - d. The floodplain is reserved or created to hold stream discharges greater than bankfull flows; and
  - e. The owner maintains the project to achieve long-term goals. The applicant shall submit an annual performance and maintenance report on bank stabilization or other projects utilizing maturing vegetative components to the Floodplain Administrator for a period of 5 years or a time specified in the permit.

**C. Permits for Water Diversions:** Water diversions are allowed within floodways provided:

1. An engineering certification demonstrates that the project is able to substantially withstand the forces associated with the hydrodynamic and hydrostatic pressures associated including flood depths, velocities, impact, ice, buoyancy and uplift associated with the base flood; and
2. The development does not increase the base flood elevation more than 0.00 feet as certified by an engineer unless a Conditional Letter of Map Revision (CLOMR) accompanies the application, the Official Floodplain Maps herein are amended before the permit can be issued and a subsequent Letter of Map Revision (LOMR) is issued by FEMA upon project completion; and
3. The structure is designed to pass bedload and large debris.

**D. Prohibited Uses Within The Floodway** - The following artificial obstructions and non-conforming uses are prohibited within the floodway:

1. New construction of any residential, commercial or industrial buildings; and
2. Encroachments including fill, new construction, substantial improvements, alterations and other development that would result in erosion of embankment, obstruction of the natural flow of waters or increase the base flood elevation except as what may be authorized through an alteration of the Floodway per Section 3.05; and
3. The construction or permanent storage of an object subject to flotation or movement during flood level periods; and
4. Mobile homes; and
5. Solid and hazardous waste disposal, water distribution systems, and sewage treatment and/or disposal systems except as allowed or approved under the laws and standards administered by the Montana Department of Environmental Quality and the Missoula City/County Health Department; and
6. Storage of toxic, flammable or explosive materials; and
7. Cemeteries, mausoleums, or any other burial grounds; and
8. Alterations of structures unless it can be shown the alteration will not raise flood heights; and

9. Channelization projects; and
  10. Clearing of native vegetation within 50 feet from the ordinary high watermark of a stream; and
  11. Permanent fences crossing streams; and
  12. The operation or use of any tractor, backhoe, bulldozer, or other blade or bucket equipped vehicle within a stream or along the stream bank.
- F. **Uses Allowed in the Floodway Without a Floodplain Permit.** Existing artificial obstructions or nonconforming uses established prior to March 28, 1975 pursuant to Section 76-5-301, MCA are allowed without a permit. However, alteration or substantial improvement of an existing artificial obstruction or nonconforming use requires a floodplain permit. Additionally, the following open space uses shall be allowed without a permit anywhere within the floodway, provided that such uses conform to the provisions of Chapter VI of the regulations, do not require a structure, are not prohibited by any other regulation or statute, and no part of the activity requires a permit as listed above such as fill, grading, excavation or storage of materials or equipment:
1. Maintenance of publicly owned flood control projects; and
  2. Agricultural uses not including related structures, such as tilling, farming, irrigation, ranching, harvesting and grazing; and
  3. Accessory uses, not including structures, such as loading or parking areas, or emergency landing strips associated with industrial or commercial facilities; and
  4. Private and public recreational uses such as at-grade golf courses, driving ranges, archery ranges, picnic grounds, parks, wildlife management and natural areas, game farms, shooting preserves, target ranges, trap and skeet ranges, hunting and fishing areas, and hiking or horseback riding trails; and
  5. Forestry, including processing of forest products with portable equipment; and
  6. Residential uses such as lawns, gardens, parking areas and play areas; and
  7. Fences that have a low impact to the flow of water such as barbed wire fences and wood rail fences; and
  8. Maintenance of artificial obstructions other than private levees and riprap within one (1) year after its obvious deterioration or destruction provided:
    - a. If an artificial obstruction is left in a state of disrepair or deterioration for a period of one (1) year or more, it shall be considered to be abandoned and its reconstruction or repair shall require a Floodplain Permit;
    - b. If an artificial obstruction is over fifty (50) percent destroyed, the obstruction is substantially damaged and a Floodplain Permit shall be required;
    - c. Maintenance does not require the operation or use of any tractor, backhoe, bulldozer, or other blade or bucket equipped vehicle within a stream channel or along the bank of any stream unless authorized by a maintenance plan approved through a floodplain permit.
  9. Recreational vehicles provided that they be on the site for fewer than 180 consecutive days or be fully licensed and ready for highway use. A recreational vehicle is ready for highway use if it is on its wheels or jacking system with wheels intact, is attached to the site only by quick disconnect type utilities and security devices, and has no permanently attached additions.
  10. Highway guard rail, signing and utility poles that have a low impact to the flow of water.

### 5.03 Flood Fringe

- A. **Uses Allowed in the Flood Fringe Without Permits** - All uses allowed in the floodway without a permit, according to the provisions of these Regulations, shall also be allowed without a permit in the flood fringe. In addition, individual or multiple family subsurface sewage disposal systems are allowed only when they are reviewed and approved under laws and regulations administered by the Department of Health.
- B. **Uses in the Flood Fringe Requiring Permits** - All uses allowed in the floodway subject to the issuance of a permit, according to the provisions of these Regulations, shall also be allowed by permit within the flood fringe. The encroachment limit does not apply and an encroachment analysis is not required for any development in the Flood Fringe where an accompanying Floodway has been designated within the Regulated Flood Hazard Area. In addition, new construction, substantial improvements and alterations to structures including, but not limited to, residential, commercial and industrial buildings and suitable fill shall be allowed by permit from the Floodplain Administrator provided:
1. Artificial obstructions must not be prohibited by any other statute, regulation, ordinance or resolution;
  2. Such artificial obstructions must be compatible with the Growth Policy in unzoned areas;
  3. The new construction, alterations and substantial improvements of residential buildings must be constructed on stemwall foundations such that the lowest floor including attached garage slabs is two (2) feet or more above the base flood elevation. Flood-proofing of electrical, heating, and plumbing systems shall be accomplished in accordance with Chapter VI of these regulations. With equivalent compensatory flood storage provided onsite, suitable fill may be placed for the garage approach and against the exterior stemwall foundation to the base flood elevation for a 15' minimum perimeter fill provided it has been compacted to 95 percent of the maximum density obtainable with the standard proctor test method per ASTM Standard D698 or AASHTO T99.
  4. The new construction, alteration and substantial improvement of detached garages shall be constructed with concrete perimeter walls and materials resistant to flooding extending two (2) feet above the base flood elevation and;
    - a. At grade with walls designed to automatically equalize hydrostatic forces by allowing for entry and exit of floodwaters by having two (2) or more openings with a total net free area of not less than one (1) square inch for every one (1) square foot of enclosed area below the lowest floor. The bottom of openings shall be no higher than one (1) foot above the higher of the exterior or interior adjacent grade or floor immediately below the openings. Openings may be equipped with screens or devices which permit the automatic entry and exit of floodwaters; or
    - b. Elevated to a minimum of the base flood elevation on fill that has been compacted to 95 percent of the maximum density obtainable with the standard proctor test method per ASTM Standard D698 or AASHTO T99. Equal compensatory storage provided for the garage approach shall be provided onsite and where necessary, the approach shall be culverted to minimize the obstruction to flood flow.

5. The new construction, alteration and substantial improvement of commercial and industrial buildings must be constructed on stemwall foundations or be adequately flood-proofed as follows:
  - a. **Wet Floodproofing** - If the structure is designed to allow internal flooding of areas below the lowest floor, use of this space shall be limited to parking, loading areas, building access, and storage of equipment or materials not appreciably affected by flood waters. The floors and walls shall be designed and constructed of materials resistant to flooding to an elevation no lower than 2 feet above the base flood elevation. Walls shall be designed to automatically equalize hydrostatic forces by allowing for entry and exit of floodwaters by having two (2) or more openings with a total net free area of not less than one (1) square inch for every one (1) square foot of enclosed area below the lowest floor. The bottom of openings shall be no higher than one (1) foot above the higher of the exterior or interior adjacent grade or floor immediately below the openings. Openings may be equipped with screens or devices which permit the automatic entry and exit of floodwaters. Flood-proofing of electrical, heating, and plumbing systems shall be accomplished in accordance with Chapter VI of these regulations; or
  - b. **Dry Floodproofing** - Structures whose lowest floors are used for a purpose other than parking, loading, or storage of materials resistant to flooding shall be flood-proofed to an elevation no lower than 2 feet above the base flood elevation. Flood-proofing shall include impermeable membranes or materials for floors and walls and watertight enclosures for all windows, doors, and other openings. These structures shall also be certified by an engineer to withstand the hydrostatic, hydrodynamic, and buoyancy effects of the base flood.
  - c. With equivalent compensatory flood storage provided onsite, suitable fill may be placed against the exterior stemwall foundation to the base flood elevation for a 15' minimum perimeter fill provided it has been compacted to 95 percent of the maximum density obtainable with the standard proctor test method per ASTM Standard D698 or AASHTO T99.
6. All mobile homes including replacement, alteration or substantial improvement of existing mobile homes placed in the flood fringe must have the chassis securely anchored to a foundation system that will resist floatation, collapse, or lateral movement. Anchoring must meet the requirements of Section 5.02 A.11 of these regulations. Flood-proofing shall be accomplished in accordance with Chapter VI of these Regulations provided:
  - a. The lowest floor must be elevated 2 feet above the base flood elevation on a permanent stemwall foundation, reinforced mortared block or poured piers or other open foundation elements of at least equivalent strength.
  - b. Mobile homes proposed for use as commercial or industrial structures must be elevated 2 feet above the base flood elevation and cannot be dry floodproofed.
  - c. Adequate surface drainage and access for a hauler shall be provided.
7. Roads, streets, highways and rail lines shall be designed to minimize increases in flood heights. Where failure or interruption of transportation facilities would result in danger to the public health or safety, the facility shall be located two (2) feet above the elevation of the flood of 100-year frequency.
8. Agricultural structures that have a low flood damage potential, such as sheds, barns, shelters, and hay or grain storage structures must be adequately anchored to prevent flotation or collapse. Flood-proofing shall be accomplished in accordance with Chapter VI of these Regulations.

9. Fill material placed in the flood fringe must be stable, compacted, well graded, pervious, generally unaffected by water and frost, devoid of trash or similar foreign matter, devoid of tree stumps or other organic material, and appropriate for the purpose of supporting the authorized use and/or permanent structure.
  10. Recreational vehicles, if they are on the site for more than 180 consecutive days or are not ready for highway use, must meet the elevating requirements of Section 5.03-B.5.
- C. **Prohibited Uses** - The following artificial obstructions and non-conforming uses are prohibited within the flood fringe:
1. Solid and hazardous waste disposal, water distribution systems, and sewage treatment and/or disposal systems except as allowed or approved under the laws and standards administered by the Montana Department of Environmental Quality and as allowed or approved under regulations administered by the Missoula City-County Board of Health.
  2. Storage of toxic, flammable, hazardous or explosive materials. Storage of petroleum products may be allowed by permit if stored on compacted fill at least two (2) feet above the elevation of the base flood elevation.
  3. Cemeteries, mausoleums or any other burial grounds;
  4. Critical facilities, including buildings and associated structures that provide essential community care and emergency operation functions such as schools, hospitals, nursing home facilities, fire stations and police stations.
  5. Construction or placement of a new residence with vehicular access having a flood depth and velocity outside of the Low Danger Zone identified in Figure 1.

#### **5.04 Floodplain Areas with Base Flood Elevations without a Floodway**

A development proposed for a 100-year floodplain within Zone AE, where base flood elevations are available but no floodway is delineated may not significantly increase flood velocities, raise the base flood elevation more than one-half foot as shown by an encroachment analysis or generally alter patterns of flood flow. The provisions of Sections 5.02 A-C & E and 5.03 shall apply to these areas. The Floodplain Administrator shall require the applicant to furnish additional hydraulic data before acting on a permit application for such a floodplain. The data may include, but is not limited to, any of the following:

1. A hydraulic study documenting probable effects on upstream, downstream, or adjacent property owners caused by the proposed development;
2. The calculated increase in the 100-year flood water surface profile caused by the proposed development.

#### **5.05 Zone AH & AO Floodplains**

The provisions of Sections 5.02 A-C & E and 5.03 of these Regulations apply to Zone AH and AO floodplains. The base flood elevation is either identified or the depth number designated on the Flood Insurance Rate Maps and shall be referenced to the highest adjacent grade in determining flood-proofing heights in applying Section 5.03.B of these Regulations. The encroachment limit does not apply and an encroachment analysis is not required for any development in the AH and AO floodplain. Adequate surface drainage must be provided around structures.

## 5.06 Zone A Floodplains With No Base Flood Elevations

The minimum floodplain development standards listed in this chapter apply to the designated floodplains with no base flood elevations and identified as Zone A floodplains on the Missoula County Flood Insurance Rate Maps including parcels divided off another parcel containing Zone A floodplain after August 15, 1983 as follows:

- A. **Uses Allowed Without Permits** - All uses allowed in the floodway and flood fringe without a permit shall also be allowed without a permit in Zone A floodplains.
- B. **Uses Requiring Permits** - All uses allowed in the floodway and flood fringe subject to the issuance of a permit shall require permits from the Floodplain Administrator for Zone A floodplains.
- C. **Base Flood Elevation** - Where necessary to meet the appropriate elevation requirements in these regulations, the Base Flood Elevation(s) must be determined by an engineer and utilized in the design and layout of the project demonstrating the design and construction criteria herein are met. The provisions of Section 5.04 also apply to the Zone A floodplains with no floodway delineated or water surface profile computed.
- D. **Divisions Of Land** - The base flood elevation shall be determined by an engineer for subdivision proposals and subdivision exemptions as per Missoula County Subdivision Regulations. The elevation data shall be utilized to ensure compliance with these Regulations. Subdivision proposals shall also provide for adequate drainage to minimize potential flood hazards.
- E. **Prohibited Uses** - Those uses prohibited in the Flood Fringe, in accordance with Section 5.03 C of these Regulations shall also be prohibited within the Zone A floodplain boundaries.