

# 22

## ***Drainage, Flood Control and Erosion Control***

Follow **Chapter 22** in the **DPM** when performing hydrologic and hydraulic calculations and designing storm drainage infrastructure in **Bernalillo County**. You may access the **DPM** for free online at:

[http://amlegal.com/albuquerque\\_nm/](http://amlegal.com/albuquerque_nm/)

or you may purchase a copy by calling American Legal Publishing at 1-800-445-5588.

Before reading **Chapter 22** in the **DPM**, be sure to read **Bernalillo County Drainage Instructions** (at the end of this Chapter). For more detailed information, consult **Chapter 38 Floods** of the **Bernalillo County Code of Ordinances** available at the following internet link:

[www.municode.com/library](http://www.municode.com/library)

If you are developing a tract of land that is encumbered in whole or in part by a **FEMA Special Flood Hazard Zone**, you must submit a **Floodplain Development Permit Form** (found in the back of this Chapter).

If a **Stormwater Pollution Prevention Plan (SWPPP)** is required for your project, you must submit your **SWPPP** plan to **Bernalillo County** and obtain an **SWPPP Permit** (See Chapter 8). **Bernalillo County** will verify that you filed your **NOI** and your **NOT** on the **EPA** website. **BCPWD** will inspect the project to ensure that the **BMPs** are installed.

The Design Engineer should realize that there are some general differences between designing in **Bernalillo County** and designing in the **City of Albuquerque**. Because of the diversity of terrain and population density in **Bernalillo County**, the design approach and specifications may vary according to region: **valley**, **mountains** or **mesa**, and whether that area is **urban** or **rural**.

- Storm drainage design in **urban** areas of **Bernalillo County** is very similar to that in the **City of Albuquerque**. In many cases, however, **Bernalillo County** has its own design standards that differ from those outlined in the **DPM**. For example, **Bernalillo County** may allow the use of **storm drain materials** that are not accepted in the **City of Albuquerque**. When discharging to storm drain networks in **urban** areas, **free discharge** may be allowed if there is unreserved downstream capacity.

- In many **rural** areas, roadside swales may be used in lieu of curb and gutter. Driveway and roadway culverts are commonplace. Storm drain pipe networks are rare. By necessity, hydrological methods in the **mountains** are different from those used in the **valley** and on the **mesa**. Where there is no storm drain network, as is the case in most **Bernalillo County rural** areas, stormwater runoff from a site is restricted to existing flow rates and/or volumes and downstream capacity.
- Flows from off-site must be calculated assuming that upstream basins are fully developed. (Use **Table A-5** from **Chapter 22** of the **DPM** to estimate the amount of impervious area for each zoning category.) If there are no flows entering the site from off-site, stormwater runoff from a site is restricted to existing flow rates and/or volumes and downstream capacity.
- In general, developments in the **Rio Grande Valley** in **Bernalillo County** are allowed a maximum of **30% impervious area** to minimize flooding. Check with the **DR** to determine the allowable impervious area for your project.
- The requirement for a Conceptual Grading and Drainage Plan may be waived if the following conditions are met:
  - a. The subdivision does not contain a Zone A FEMA Floodplain
  - b. The subdivision is not more than 50 lots
  - c. The subdivision is not more than 5 acres
- Typically, in the East Mountains (**East of the West 104° Longitude meridian**) a drainage plan or report is not required for subdivisions that meet **ALL** of the following conditions:
  - a. The original parcel is 40 acres or less
  - b. The parcel is to be subdivided into lots of 5 acres or more
  - c. The parcel is zoned for single family dwellings
  - d. The impervious area is less than 15 percent of the lot size
- When preparing a drainage plan or report anywhere in **Bernalillo County**, check with the **DR** to determine if a drainage plan or report has been prepared for the property or adjacent properties. If so, the new report or plan must comply with the existing reports and plans.
- When preparing a drainage plan or report in those portions of **Bernalillo County** that fall between the west escarpment of the Rio Grande Valley and the **West 104° Longitude meridian** that runs roughly along the crest of the Sandia Mountains, Design Engineers should be sure to check if the site location is inside the boundaries of any **Drainage Management Plans**. If your site falls within the boundaries of a **Drainage Management Plan**, you must comply with any requirements listed on the plan. A complete list of **Drainage Management**

**Plans** may be obtained by **DR** at **2400 Broadway SE**. The following is a partial list of approved **Drainage Management Plans**.

- The North Albuquerque Acres Drainage Management Plan
  - The Southwest Valley Flood Damage Reduction Study
  - The 2001 Southeast Valley Drainage & Stormwater Quality Management Plan
  - The Calabacillas West Branch Arroyo Drainage Management Plan
  - Amole/Hubble Drainage Master Plan Update
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- In some cases, underground storage may be allowed for detention/retention ponds.
  - An **agreement** or **covenant** between the landowner and **Bernalillo County** is required for all drainage facilities and systems.
  - There are instances where the **Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA)** acts as the agency in review of proposals involving major arroyos or platting. There are also instances where the **Middle Rio Grande Conservancy District (MRGCD)**, the **New Mexico Department of Transportation (NMDOT)**, the **City of Albuquerque**, the **Albuquerque Bernalillo County Water Utility Authority (ABCWUA)** and other agencies may be involved in plan review.
  - Regarding drainage, **Bernalillo County** has jurisdiction over the unincorporated area within **Bernalillo County** boundaries that is outside the limits of a **municipality** (**City of Albuquerque**, **City of Rio Rancho**, **Village of Tijeras**, or **Village of Los Ranchos**), outside the boundaries of tribal lands (**Pueblo of Isleta**, **Pueblo of Laguna**, **Pueblo of Sandia** or **Tohajiilee Navajo Chapter**) and that is not on state or federal land.

**Bernalillo County** also has jurisdiction over property or infrastructure that is owned or maintained by **Bernalillo County** anywhere within its boundaries, including infrastructure and property **within municipal limits** or on tribal, state or federal land.

- **Bernalillo County** shares jurisdiction over drainage regulation with the following agencies:
  - **AMAFCA**
  - **MRGCD**
  - **State of New Mexico (various agencies)**
- Generally, **Bernalillo County's Drainage Ordinances** follow the **City of Albuquerque's** closely and therefore criteria will be very similar. There are exceptions noted, plus several checklists that **Bernalillo County** has developed to help the Design Engineer.

- There are three drainage checklists that may pertain to your development:
  - **Bernalillo County Grading & Drainage Plan Checklist**
  - **SWPPP Review Checklist**
  - **Bernalillo County NPDES Inspection Form**

The above checklists are in the back of this Chapter.

If there is a FEMA Special Flood Hazard Zone on your site, you will need to submit a **Floodplain Development Permit Form**, also found in the back of this Chapter.

- When following *DPM Chapter 22*, do the following:
  - Replace *City Engineer* with **County Engineer**.
  - Replace *DRB* with **CDRA**
  - Replace *City* with **County**
  - Replace *City Limits* with **County Boundary**
  - The *Simplified Procedure for 40 Acres and Smaller Watersheds* may not be used in the **East Mountains**. The **East Mountains** is defined as any area in **Bernalillo County** east of **104° West Longitude**.

#### **Part A – Procedure for 40 Acre and Smaller Basins:**

As mentioned in the previous section, the *Simplified Procedure for 40 Acres and Smaller Watersheds* may not be used east of **104° West Longitude**.

The designer may use any of the following methods to calculate runoff in **Bernalillo County**:

- U.S. Natural Resources Conservation Service Curve Number Method
- U.S. Army Corps of Engineers TR-55 Program
- U.S. Geological Survey Rainfall Runoff Regression Equation
- **AHYMO** (**A**rid lands **HY**drological **MO**del) by Anderson-Hydro ([ahymo@ahymo.com](mailto:ahymo@ahymo.com))

Always consult the **DR** to determine which requirements apply to your project. Read the **Bernalillo County Drainage Instructions** in the back of this Section for more information.

A **BCPWD** Submittal Form must accompany all drainage submittals. The Submittal Form and all other **BCPWD** forms may be found at the following internet link:

[www.bernco.gov/DRforms](http://www.bernco.gov/DRforms)

# BERNALILLO COUNTY DRAINAGE INSTRUCTIONS

## Drainage Reports:

Drainage Report requirements are based on the procedures outlined in the *City of Albuquerque's Development Process Manual, Chapter 22.2*. The **East Mountain** area is an exception where, due to the differences in soils, slopes and rainfall, a more detailed method is required.

## Platting Actions:

Grading and Drainage Plans are required with all platting actions as deemed necessary by the **Bernalillo County Drainage Engineer** as defined below.

1. **Grading and Drainage Plans** are required when one of the following is true:
  - a. The area to be graded exceeds one acre.
  - b. The volume of dirt to be moved exceeds 500 cubic yards.
  - c. Runoff from the proposed development exceeds the allowable runoff for the parcel. Check with **DR** (Development Review Section) to determine the allowable runoff for the subject parcel.
  - d. The **Bernalillo County Drainage Engineer** determines that a Grading and Drainage Plan is warranted by reasons other than those listed above.
2. **Drainage Reports** are required for major subdivisions containing more than five lots or constituting five acres or more, platting or construction within a designated flood hazard area, and for any platting or development adjacent to a major arroyo.
3. For subdivisions encumbered by a **Zone A** flood zone designation, if larger than five acres or greater than 50 lots, a detailed flood zone analysis is required to be prepared and submitted to **FEMA** for a **Letter of Map Revision (LOMR)**.
4. **Drainage Easements** are required for public water crossing private land with a flow rate of 30 cfs or greater. Easement widths will be determined by a hydraulic and hydrologic investigation by a **Professional Engineer** licensed to practice in the **State of New Mexico**.
5. **Irrigation Easements** are required for viable irrigation swales.
6. **Special Provisions for East Mountain Area:**
  - a. **Drainage Reports** and/or **Plans** will not be required where the tract, lot or parcel is 40 acres or less and is subdivided into lots, tracts or parcels of five acres or more and is zoned strictly for single-family dwelling (R-1).
  - b. **Drainage Reports** and/or **Plans** will not be required where the tract, lot or parcel is five acres or less, and the total impervious area is 15 percent or less of the area of the tract, lot or parcel. The impervious area shall include all existing improvements, proposed improvements and future improvements if applicable. Impervious areas are defined as those areas not covered by grass or natural

vegetation. Dirt, gravel and paved roads, streets, drives, walks, trails, play areas and areas of human activity shall be considered impervious. Roofs shall be considered impervious. Landscaping that is underlain by an impervious membrane (plastic) shall be considered impervious. If less than 15 percent of the lot is impervious, the owner must submit a **15 Percent Form** to waive the requirement for a **Drainage Report** and/or **Plan**. The **15 Percent Form** may be obtained at the following internet link:

[www.bernco.gov/DRforms](http://www.bernco.gov/DRforms)

- c. Drainage Easements** and/or dedicated rights-of-way shall be required for any arroyo, watercourse or storm drainage facility flowing through or adjacent to any lot, tract or parcel.
  - i.** For an upstream drainage basin of ten acres or more, the minimum width of drainage easement or right-of-way for natural arroyos or watercourses shall include the top of each definable bank of the arroyo or watercourse and be set back from the top of each bank a horizontal distance equal to 1.2 times the difference in elevation between the top of each definable bank and the adjacent flowline of the greater. The minimum width shall be 50 feet. For an upstream drainage basin of ten acres or less, the minimum width of drainage easement or right-of-way for natural arroyos or watercourse shall include the top of each definable bank of horizontal distance equal to 1.2 times the difference in elevation between the top of each definable bank and the adjacent flowline of the arroyo or watercourse, or the 100-year floodplain, whichever is greater. The minimum width shall be 25 feet for natural channels, arroyos or watercourses. It shall be ten feet for line channels where adequate maintenance and vehicular access is available.
  - ii.** The minimum width drainage easement or right-of-way for an improved drainage facility shall be defined as the width necessary to contain a trapezoidal concrete lined channel, having a bottom width of ten feet and two to one side slopes, designed to convey the full 100-year design storm, including necessary freeboard and also the outer limits of a maintenance road 12 feet wide on one side of the channel.
  - iii.** The centerline of any arroyo, watercourse or storm drainage facility requiring a drainage easement or right-of-way shall be located by field survey prior to platting or development.
  - iv.** The minimum width of a drainage easement for an underground storm drain or structure shall be 20 feet, or  $2 \times \text{depth} + \text{width of pipe or structure} + 4$  feet, whichever is greater.

### **Special Use Permits:**

- 1. Drainage information** is required for all Special Use Applications. The degree of required information is dependent on the use and site conditions. **Drainage Reports** are required for uses where significant disturbance of the natural ground is associated with the use or off-site flows impact the property.
- 2. Conceptual Grading and Drainage Plans** may be required prior to permit approval if there are space limitations that could impact the use. Proposed storm drainage facilities are required to be shown on the site plan.

### **Building Permits:**

**Grading and Drainage Plans** are required with all **Building Permits** as deemed necessary by the **Bernalillo County Drainage Engineer**, as defined below.

- 1. Grading and Drainage Plans** are required when proposed development exceeds allowable limits for the area as specified in **Drainage Master Plans, Subdivision Master Plans** or other guidance documents.
- Development in **FEMA**-designated flood hazard areas may require detailed hydrologic and hydraulic analysis to revise flood zones based on the development.
- Residential development in **FEMA**-designated flood hazard areas requires elevation of the finished floor to one (1) foot or more above the base flood elevation. Pre- and post-construction **Elevation Certificates** are also required. The specific requirements for development in flood hazard areas are documented with a **Floodplain Development Permit**. Any development within or adjacent to a designated floodplain shall be discussed and closely coordinated with the **Bernalillo County Floodplain Administrator**. A pre-design meeting is strongly recommended.
- Commercial development in **FEMA** designated flood hazard areas requires elevation of the finished floor to or above the base flood elevation. Wet or dry flood-proofing certified by an Engineer is allowed in lieu of elevation. Pre- and post-construction **Elevation Certificates** are required. A **Floodplain Development Permit** is required.