



SUMMARY: CIRCULAR DEQ-8 MONTANA STANDARDS FOR SUBDIVISION STORM WATER DRAINAGE (9/20/2024)

The purpose of this document is to provide a quick summary of the updates to *Circular DEQ-8 Montana Standards for Subdivision Storm Water Drainage* adopted on 9/20/2024.

In general, many things have been moved around to provide greater clarity and group similar subjects together. This is particularly true with the appendices.

Section 1.4 Definitions

Three definitions were added to the circular.

- **Building Location Area** – an area identified on a lot layout where construction of an impervious area may occur, including but not limited to structures, driveways, roads, parking areas, etc.
- **Stabilized** means preventing soil from eroding or erosion from occurring, typically through the use of one or more best management practices (e.g. erosion control blankets, re-establishing vegetation, riprap, etc).
- **Storm Water Facility** means those structures that temporarily hold or convey water as part of storm water management. Storm Water Facility includes retention and detention ponds, infiltration facilities, drainage ditches and storm sewer systems. For the purposes of evaluating setbacks and depiction on the lot layout, Storm Water Facility does not include building gutters, downspouts, or landscaping.

Section 2.2 Reports – The circular now clarifies what is needed specifically for a Simplified Plan application (report) and a Standard Plan application (report). Notice the “must” for what is required. This change mostly affects Simplified Plans. **DEQ now requires the consultant to provide the estimated depth to the limiting layer as part of the design for either plan type.**

Section 2.3 Drawings – Designs that require a PE must include drawings (general layout and design details), including the PE stamp and signature. DEQ now only requires one copy of the plans for review (instead of three) but will still need the additional drawings for final approval.

Section 2.4 Technical Specifications – When the specifications for the stormwater design can't fit on the drawings, separate specifications need to be submitted.

Section 2.5 Operation and Maintenance – Unless the O&M procedures can be legibly shown on the lot layout, it needs to be submitted separately.

Section 3.2 Simplified Plan – Clarified that the criteria need to be satisfied for every lot to use the plan for the application. New requirements:

- Can only be used on subdivisions of five or fewer lots.
- **The three percent slope requirement has been removed.**
- The increase in storm water runoff will be retained on the lot where it is generated;
- Roadway or driveway construction will not cross off-site drainages with a contributing basin area of more than 5 acres
- All areas of disturbed earth must be stabilized and protected from erosion until vegetation has been re-established
- **The retention volume shall be calculated as per the following:**
 1. The minimum retention pond volume must be 250 cubic feet per every 1,000 square feet of impervious area. The minimum retention pond size using this methodology is 750 cubic feet. (No spreadsheet is necessary if pond volume is calculated using this methodology)
 2. If a lesser volume of storage is proposed than in (1), the retention volume must be calculated using the spreadsheet provided in Appendix B for the 100-year storm event.
- Retention facilities have to be designed per Section 5.2
- Roadway and driveway construction for simplified plans must include a minimum 12-inch diameter culvert where roadside ditches or drainages are crossed. Culverts should be installed at a minimum 2% grade and must not be less than the local county road standards minimum grade. Sizing calculations for culvert crossings must be provided if requested by the reviewing agency.

Section 3.3 Standard Plan – The circular now has language where the consultant has to describe how buildings and drainfields cannot be inundated. DEQ may request calculations showing this, if needed.

Section 3.4 Initial Stormwater Facility – Landscaping (existing or proposed) or the initial abstraction in the SCS Method (TR-55) may not be used to satisfy the initial storm water facility volume requirements. What this means is the circular now requires this volume to be provided in either a retention, detention or infiltration facility.

For Standard Plans, the circular now allows the use of Best Management Practices (BMPs) from the Montana Post-Construction Storm Water BMP Design Manual (there is a copy in the training folder) for the initial stormwater facility designs (as opposed to just our standard facilities). If they use one of these BMPs, they have to be designed to remove 80% of Total Suspended Solids (TSS) from the stormwater. Pervious pavement and dispersion BMPs are not allowed for this (these two do not work well for sediment removal).

Section 3.5 Pre- and Post-Development Conditions – Predeveloped conditions may now include state and county highways and roads existing prior to the date of the application (even for areas without approval/COSA).

For areas with an existing COSA, the pre-development runoff must be based on the previously approved impervious area or land use if the impervious area is unknown.

NEW - When the extent and location of the post-development impervious area is not known, the applicant must identify a building location area, a stormwater facility construction area, and a numerical estimate of the proposed impervious area on the lot layout and storm water design drawings. The estimated post-development impervious area should be conservative and must be consistent with similar developments in the area of the project. The stormwater facility construction area must be located separate from the building location area and where runoff will naturally occur. The stormwater facility construction area must meet all applicable setbacks in ARM 17.36.323.

For lots with a COSA, relocating storm water facilities outside of an approved stormwater facility area or impervious area outside of a building location area may be done with a revised lot layout (if conditions of rule are met)

DEQ can require additional information if there are potential impacts to adjacent properties from stormwater facilities and their discharges.

Section 3.6 – Rainfall – The NOAA has published **Atlas 14 Volume 12 for Idaho, Montana and Wyoming, which is an update and replacement of Atlas 2**. You can find it here: [PF Map: Contiguous US \(noaa.gov\)](#) The circular also now allows consultants to use Chapter 9 of the MDT manual and their rainfall values (Appendix B). **Our rainfall table has been removed.** DEQ-8 now clarifies how rainfall intensity is to be calculated and used.

Section 3.7.3 – Urban Hydrology for Small Watersheds Technical Release 55 (TR-55) or SCS Curve Method – This section has been cleaned up for more clarity. The circular also now provides the SCS Curve Runoff Table.

Section 3.7.5 – Time of Concentration- Additional information and guidance is provided for how to use time of concentration and what the consultant should provide. It is not different than what it was, but it now is much easier to understand.

There are also now separate sections on sheet flow, shallow flow and concentrated flow, providing a better description of each. The section on shallow flow now includes the unpaved/paved velocity calculations from TR-55, which are based on the Mannings equation with certain assumed values.

Section 4.1 – Conveyance Structures – The circular now requires the following design information for conveyance structures (culverts, pipes, swales, channels, etc) at the 10-year storm event – **note the circular now allows minor overtopping of roadways under certain conditions:**

- A. Flow depth at culvert crossings must not over-top roadways;
- B. Flow depth at culvert crossings must not over-top driveways that provide access to a commercial unit or three or more single family living units;
- C. Flow depth at culvert crossings over driveways must not exceed a flow depth of 2-inches;
- D. Cross-pans or valley pans at roadway intersections must not exceed a flow depth of 2-inches;
- E. Flow depth and spread in roadside ditches or curb/gutter/inlets must maintain a 10-foot-wide lane for emergency access, 5-foot either side of the crown or median; and
- F. Parking lots must be designed such that a maximum flow depth of 2-inches is not exceeded.

Section 4.3 – Storm Sewers – The circular now provides a table of MINIMUM slopes for storm sewer pipe

Section 4.4 – Culverts – The circular now requires 12-inch minimum sized culverts. If smaller than 12 inches, they can only be used with limitations (only for driveways/pathways, must be less than 20 feet in length, and provision for increased maintenance in O&M plan). Culvert capacity, velocity and control (inlet/outlet) must be provided.

- Calculations including culvert inverts, roadway elevations, and headwater and tailwater elevations for both the 10-year and 100-year storm events are required for more complex designs when requested.
- Adequate protection from erosion must be provided at culvert outlet structures when the outlet velocity exceeds 10 cubic feet per second.
- The following design details for culverts must be shown on the lot layout or plans:
 - A. Diameter,
 - B. Slope, and
 - C. Length.
- Additional design details can be required for complex designs. Additional design details include, but are not limited to, invert and roadway elevations, profile views, inlet and outlet structures, and erosion protection.

Section 5.1 – Retention Facilities – Clarification has been added to distinguish between a retention vs an infiltration facility [If infiltration is used to reduce the required storage volume, the retention facility is considered an infiltration facility, and must be sized in accordance with the requirements of Chapter 7.]

Clarification has been added regarding the use of roadside swales as retention ponds. They must have check dams and be able to convey flows if needed.

Section 5.1 – Retention Facilities (continued)

The bottom of retention facilities now must be at least one foot above a limiting layer.

Retention facilities deeper than four feet now must have signage, and 4:1 slopes or fencing.

Groundwater monitoring may be required now for any facility where it is believed that groundwater may be within 2 feet of the bottom of the facility.

Retention facilities now must include considerations for routing 100-year peak flows without damaging adjacent or down-gradient buildings including the need for an emergency overflow. Emergency overflow structures must be designed with a stabilized transition from the retention facility to down-gradient swales.

On the lot layout (or plans), it is now required that the volume, depth, top and bottom dimensions and side slopes be included.

DEQ also now can ask for any additional information needed for more complex designs, including emergency overflow structure details.

Section 6.2 – Detention Facilities Design – Similar to retention ponds, they are limited to 3:1 slopes and a depth of four feet. Deeper ponds must have signage AND fencing.

Detention facility's bottoms within 1 foot of a limiting layer/high groundwater are required to be designed as follows:

- A. Have side slopes that are no steeper than 3 H to 1 V and are stabilized;
- B. Be designed in accordance with the wet detention basin procedure included in the Montana Post-Construction Storm Water BMP Design Guidance Manual; and
- C. Have a maximum depth of four feet; or
- D. If the depth is greater than four feet;
 - 1. Have signage warning of the potential hazards of the pond (e.g. drowning); and
 - 2. Have fencing designed to prevent public access to the facility.

Groundwater monitoring may be required now for any facility where it is believed that groundwater may be within 2 feet of the bottom of the facility.

Detention facilities are now required to address 100-year storm event routing, including emergency overflow construction and stabilization.

The following must be shown on the lot layout or the plans: volume, depth, top and bottom dimensions, side slopes and outlet structure dimensions with elevations.

Section 6.2 – Detention Facilities Design (continued)

The circular also now can ask for any additional information needed for more complex designs, including emergency overflow structure details.

Section 6.3 – Calculations – The following calculations are now required for detention ponds: stage-storage; outlet structure/weir/orifice equations, references, coefficients and assumptions; and emergency outlet sizing. Inflow/outflow hydrographs and reservoir routing calculations can be requested if needed.

Section 7.2 – Infiltration Facilities Designs – Infiltration rates must be based on test pit data, where the test pit is within 25 feet of facility and cannot be constructed where the bottom of the facility is in sandy clay or finer soils.

Infiltration facilities must be constructed **2 feet** above a limiting layer.

They must have a pre-treatment facility.

All infiltration facilities must include consideration for larger storm events. Excess runoff at the infiltration facilities must be directed in a way to prevent inundating buildings and drainfields during the 100-year storm event. This requirement may be narratively addressed. Calculations must be provided when requested.

The test pit requirements for an infiltration facility are based on how test pits are handled in DEQ-4, including the deviation request for a reduced number of test pits.

Appendix A – Infiltration Testing – The circular now allows double ring infiltrometer and the infiltration method modified by Missoula (based on DEQ-4) in addition to the soil texture design rate and encased falling head method. The soil texture design rates have been modified.

Appendices - The examples provided in the appendices have now been cleaned up and clarified if needed.