

GENERAL DESIGN REQUIREMENTS FOR DAMS/RESERVOIRS NOT REGULATED BY THE MISSOURI DEPARTMENT OF NATURAL RESOURCES (MDNR) ¹

Design Standards	Type of Water Reservoir/Dam Location					
	Isolated Water Body (sheet drainage)		Dam on Watercourse Not Identified on U.S.G.S. Map		Dam on Watercourse Identified on U.S.G.S. Map (Blue Line)	
	No Downstream Structures	Downstream Structures	No Downstream Structures	Downstream Structures	No Downstream Structures	Downstream Structures
Approval & PE Seal Requirements						
Initial approval needed to construct/remove dam	None	None	Community Development Director	Community Development Director	County Council	County Council
Professional Engineer Seal Required	No	If dam height > 8 ft.	If dam height > 8 ft.	If dam height > 8 ft. or required by Development Review Director	Yes	Yes
Plan Requirements						
Plan & Profile drawings showing dam location	Yes	Yes	Yes	Yes	Yes	Yes
Dam Cross-Section & Core/Keyway design drawings	No	If dam height > 8 ft.	If dam height > 8 ft.	Yes	Yes	Yes
Grading Plan drawings for water reservoir & dam	No - show approximate reservoir area on plan drawing	If dam height > 8 ft. or disturbed area ≥ 1 acre	If dam height > 8 ft. or disturbed area ≥ 1 acre	Yes	Yes	Yes
Sediment & Erosion Control Plans/SWPPP	If disturbed area ≥ 1 acre	If disturbed area ≥ 1 acre	Yes	Yes	Yes	Yes
Spillway locations, profiles, cross-sections	Show spillway location(s) on plan drawing	Yes	Yes	Yes	Yes	Yes
Permanent erosion control measures & construction details	No	No - unless required by Development Review Director	Yes	Yes	Yes	Yes
Soils/Geotechnical Analysis & Testing						
Soils/Geotechnical analysis & report (to include calculations & recommendations for compaction & slope stability)	No - Recommended	If dam height > 8 ft. & required by Development Review Director	No - Recommended	If dam height > 8 ft.	Yes	Yes
Soils & Compaction testing reports for dam construction	No - Recommended	No - Recommended	No - Recommended	If dam height > 8 ft.	Yes	Yes
Hydrologic & Hydraulic Requirements						
H & H analysis required to determine Peak Water Elevation in reservoir & Outlet Velocity in spillways	No	No - unless required by Development Review Director	If tributary drainage area ≥ 20 acres or required by Development Review Director	Yes	Yes	Yes
Design Storm Frequency	None	15 - 100 year per Director	100 year	100 year	100 year	500 year
Design Storm Duration & Calculation Method	None	Modified Rational, 20 minute storm per Design Criteria 50.30	Tributary drainage area < 20 acre - Modified Rational, 20 minute storm per Design Criteria 50.30 Tributary drainage area ≥ 20 acre - TR 55, Type II, 24 hour storm ²	Tributary drainage area < 20 acre - Modified Rational, 20 minute storm per Design Criteria 50.30 Tributary drainage area ≥ 20 acre - TR 55, Type II, 24 hour storm ²	TR-55, Type II, 24 hour storm ²	TR-55, Type II, 24 hour storm ²
Reservoir Routing Analysis Required	No	No	No - unless required by Development Review Director	Yes	Yes	Yes
Required Freeboard from top of dam to peak water elevation in reservoir	None	None	1 foot	2 feet	2 feet	2 feet
Additional Permit Requirements						
Land-Use Permit	Issued by the Planning & Zoning Division as part of the application/permit approval. No fees are required for this permit.					
Natural Watercourse/Vegetated Buffer Permit	Issued by the Development Review Division if the project impacts a natural watercourse or its required vegetated buffers. No fees are required for this permit.					
Flood Plain Development Permit	If any construction is proposed within the regulated 100 year flood plain as depicted on the Flood Insurance Rate Maps. The current fee for this permit is \$60.					
No-Rise Certification	If any construction is proposed within the regulated 100 year floodway as depicted on the Flood Insurance Rate Maps, a "no-rise" certification must be provided, including a water surface analysis made by a professional engineer that supports the "no-rise" condition, as applicable.					
USACE/MDNR 404/401 Permits	If the reservoir or dam impact flood plain, water bodies, or watercourses determined to be jurisdictional water bodies by the US Army Corps of Engineers (USACE), then 404 and 401 permits must be obtained from the USACE and MDNR.					
MDNR Land Disturbance Permit	If the land disturbance area is one acre or greater, then a land disturbance permit must also be obtained from the Missouri Department of Natural Resources (MDNR).					
Recommended Design Features						
Forebays	Recommend incorporating a forebay(s) at the upstream end(s) of the pond to trap any eroded sediment and debris before it enters and settles on the bottom of the pond (if regularly cleaned/maintained the forebay(s) will help reduce or eliminate the need to dredge the pond as it fills in with sediment over time).					
Low-Flow/Drain Pipe	Recommend incorporating a low flow/drain pipe with valve into the design so the pond can be drained for maintenance/repair purposes or to maintain hydrology in the receiving stream during times of drought.					
Pre-Design Meeting	Recommend arranging a pre-design meeting with Development Review & Planning & Zoning staff to discuss site specific design requirements.					

¹ Additional design requirements/features may be imposed or requirements may be reduced by the Development Review Director if site, soil, geological, or hydrologic conditions warrant further or less engineering analysis/design.

² Other comparable methods for calculating the runoff hydrograph may be approved by the Development Review Director in lieu of the TR-55 method