



ADMINISTRATIVE RULES OF MONTANA

17.24.927 DISPOSAL OF UNDERGROUND DEVELOPMENT WASTE: DURABLE ROCK FILLS

- (1) The department may approve disposal of underground development waste in a durable rock fill on a site-specific basis, provided the method of construction is certified by a licensed professional engineer experienced in the design of earth and rockfill embankments and provided the requirements of ARM 17.24.924 and this rule are met. Underground development waste is eligible for disposal in durable rock fills if it is rock material consisting of at least 80% by volume of sandstone, limestone, or other rocks that do not slake in water and that are non-acid, non-toxic, non-acid-forming and non-toxic-forming. Resistance of the waste to slaking must be determined by using the slake index and slake durability tests in accordance with guidelines and criteria established by the department. Underground development waste must be transported and placed in a specified and controlled manner that will ensure stability of the fill.
 - (a) The method of waste placement must be designed to ensure mass stability and prevent mass movement.
 - (b) Loads of noncemented clay shale and/or clay underground development waste in the fill must be mixed with hard rock underground development waste in a controlled manner to limit on a unit basis concentrations of noncemented clay shale and clay in the fill. These noncemented materials must comprise no more than 20% of the fill volume as determined by tests performed by a registered professional engineer and approved by the department.
- (2) A qualified licensed professional engineer shall conduct stability analyses in accordance with ARM 17.24.920 and shall certify that the design of the durable rock fill will ensure the stability of the fill and meet all other applicable requirements.
 - (a) Parameters used in the stability analyses must be based on adequate field reconnaissance, subsurface investigations, including borings, and laboratory tests.
 - (b) The durable rock fill must be designed with the following factors of safety:

<u>Case</u>	<u>Design Condition</u>	<u>Minimum Factor of Safety</u>
I	Long-term	1.5
II	Earthquake	1.1

- (3) The design of the durable rock fill must include an internal drainage system, in accordance with ARM 17.24.924(14), that will ensure continued free drainage of anticipated seepage from precipitation and from springs or wet-weather seeps.

- (a) Anticipated discharge from springs and seeps must be based on records and/or field investigations to determine seasonal variation. The design of the internal drainage system must be based on the maximum anticipated discharge.
- (b) All granular material used for the drainage system must be free of clay and consist of durable particles such as natural sands and gravels, sandstone, limestone, or other durable rock that do not slake in water.
- (c) The internal drain system must be protected by a properly designed filter system.
- (4) Surface water runoff from the areas adjacent to and above the fill must not be allowed to flow into the fill and must be diverted into stabilized channels that are designed to pass safely the runoff from a 100-year, six-hour precipitation event. Diversion design must comply with the requirements of ARM 17.24.637.
- (5) The top surface of the completed fill must be graded such that the final slope after settlement will be no steeper than 1v:5h, unless otherwise approved in writing by the department, toward properly designed drainage channels constructed in undisturbed ground along the periphery of the fill. Surface runoff from the top of the fill must not be allowed to flow over the outslope of the fill.
- (6) Surface runoff from the outslope of the fill must be diverted off the fill to properly designed channels that will pass safely a 100-year, six-hour precipitation event. Diversion design must comply with the requirements of ARM 17.24.637.
- (7) Terraces must be constructed on the outslope if necessary for control of erosion. Terraces must meet the following requirements:
 - (a) The slope of the outslope between terrace benches must not exceed 1v:3h, unless otherwise approved in writing by the department.
 - (b) To control surface runoff, each terrace bench must be graded to a slope of 1v:20h toward the fill.
 - (c) A ditch must be constructed on the inside of each terrace to intercept runoff and divert it toward the channels specified in (6).

Authorizing statute(s): 82-4-205, 82-4-231, MCA

Implementing statute(s): 82-4-227, 82-4-231, 82-4-232, 82-4-233, MCA

History: NEW, 1990 MAR p. 936, Eff. 5/18/90; AMD, 1994 MAR p. 2957, Eff. 11/11/94; TRANS, from DSL, 1996 MAR p. 3042; AMD, 1999 MAR p. 811, Eff. 4/23/99; AMD, 2004 MAR p. 2548, Eff. 10/22/04; AMD, 2012 MAR p. 737, Eff. 4/13/12; AMD, 2024 MAR p. 258, Eff. 2/10/24.