DAM SAFETY

POLICY MEMORANDUM #22

TO: Dam Owners, Operators, and Engineers

FROM: Stormwater, Dam Safety, and Flood Management Program
Water and Science Administration

DATE: January 29, 2025

SUBJECT: Determining Embankment Height

Background

Dam or embankment height has traditionally been defined by terms such as the "upstream toe", “lowest point of excavation”, or the "original streambed", which may not be suitable for modern stormwater management facilities constructed outside of a stream channel or with filter media placed in excavations below the original ground surface.

Further, Maryland and federal definitions for dam height have multiple variations as highlighted below:

Maryland Environment Article §5-503:

- Height is measured “vertically from the lowest point on the top of the dam to the lowest point on the upstream toe of the dam”.

USDA, Natural Resource Conservation Service (NRCS), Maryland Conservation Practice, Standard Pond Code 378, January 2000 (MD-378):

- The effective height of the dam is the difference in elevation, in feet, between the emergency spillway crest and the lowest point on a profile taken along the centerline of the dam, excluding the cutoff trench.

- The height of the embankment shall be measured from the top of the dam to the lowest point of excavation, excluding the cutoff trench, along the centerline of the dam.

National Inventory of Dams:

- Dam Height: Height of the dam, in feet to the nearest foot, which is defined as the vertical distance between the lowest point on the crest of the dam and the lowest point in the original

streambed.

- Hydraulic Height: Hydraulic height of the dam is defined as the vertical difference between the maximum design water level and the lowest point in the original streambed.

- Structural Height: Structural height of the dam is defined as the vertical distance from the lowest point of the excavated foundation to the top of the dam.

This policy seeks to remove confusion created by multiple definitions by creating a unified definition of "Embankment Height" for use in Maryland dam and small pond design and regulation that is consistent with Maryland law.

Defining Embankment Height

Dam Safety regulations and best practices are generally founded on the recognition of the risk that the storage of water poses. Accordingly, a meaningful criterion to assign height to the dam embankment would be based on the maximum breach height, which is typically determined when performing a breach analysis and hazard classification.

The embankment height is the vertical distance between the lowest point of fill on the upstream face of the dam to the lowest point on the crest of the dam (excluding the auxiliary spillway). Oftentimes this is found at the principal spillway location but can be at other locations along the embankment. For the purposes of this definition, the lowest point of fill includes human-placed materials such as spillway conduits and cradles.

In some cases, given the specific construction of the dam and spillway, the embankment height determined from the lowest point of fill on the upstream face may be less than the breach height, in which case the larger of the two shall be considered as the embankment height.

Additional Information

Questions about this policy or other items relating to ponds and dams can be directed to the Chief of the Dam Safety Permits Division at 410-537-3552.

Examples

The following pages include diagrams which are provided as guidance for determining the embankment height.

Figure 1:

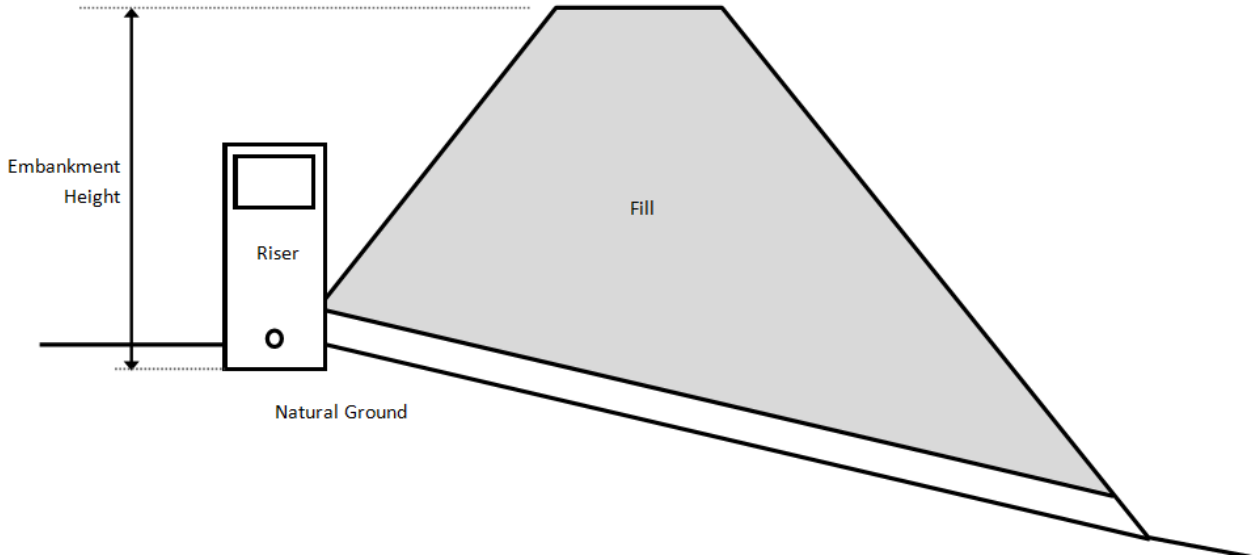

Figure 2:

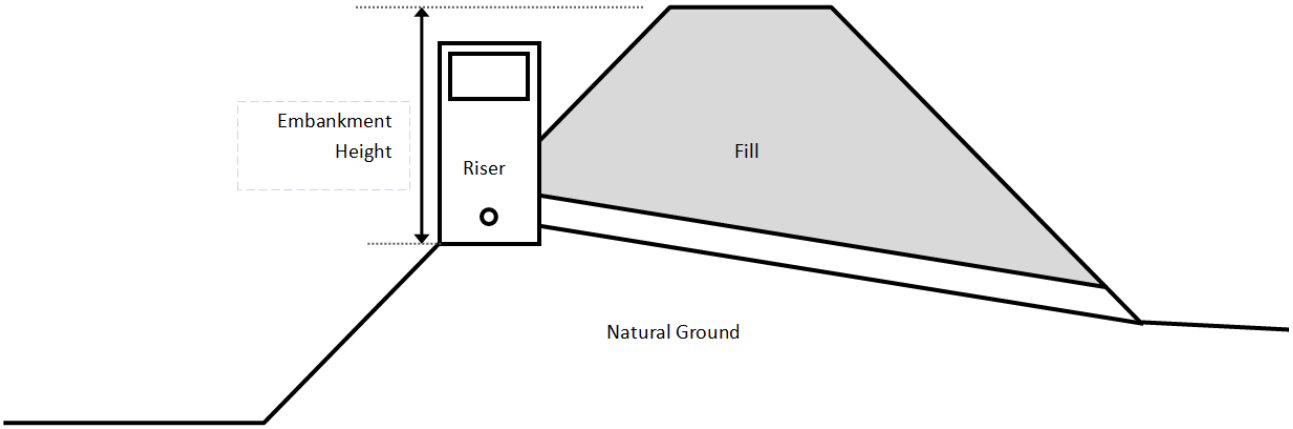

Figure 3:

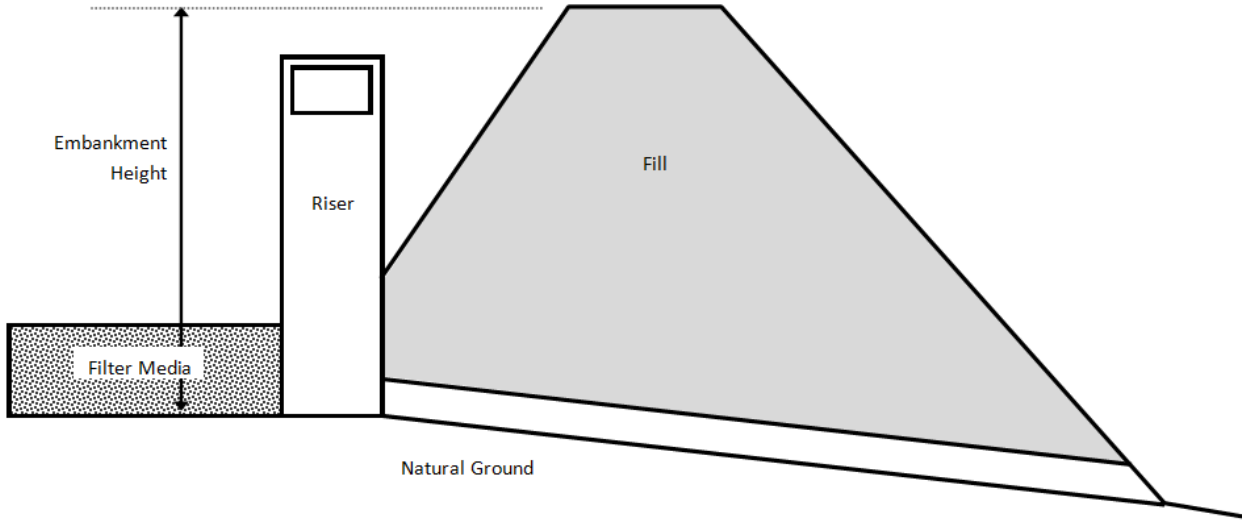

Figure 4:

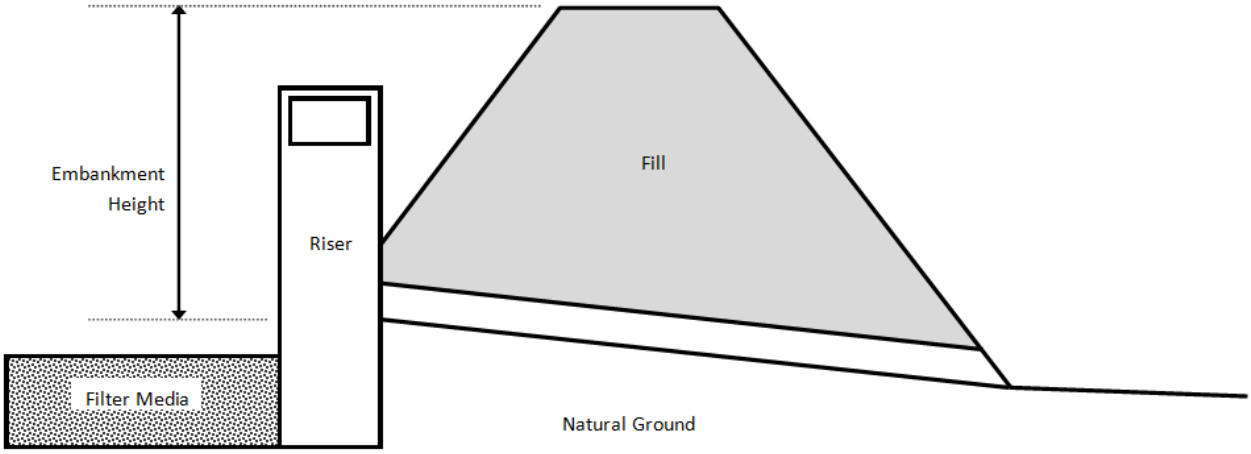

Figure 5:

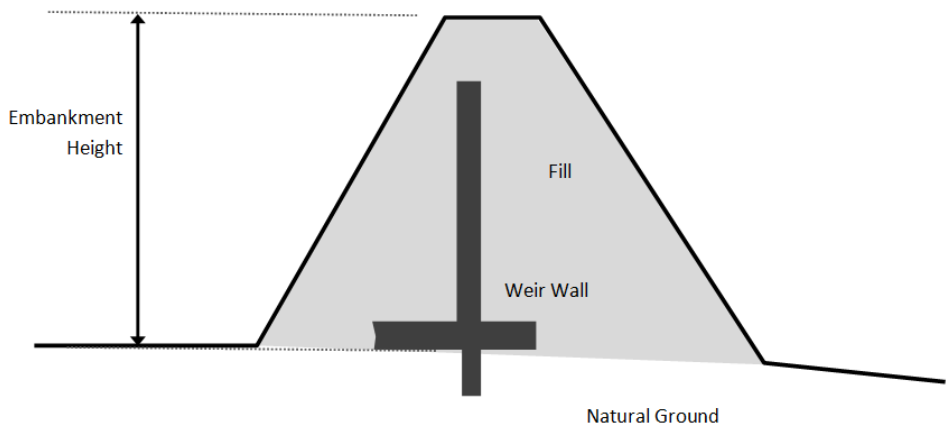

Figure 6: