Embankment dam stability

Many regulated rivers and canals among the federal waterways in Germany are confined by embankment dams. In these cases, the water level of the rivers and canals is often significantly higher than the surrounding ground surface. Due to the large water volume which would be set free in case of dam failure, embankment dams always pose a threat to the surrounding terrain. Therefore, it must be ensured that these embankment dams, which are permanently subject to water loads, will not fail. For this purpose, dam stability has to be verified considering the specific conditions of each case. Frequent controls as well as repair and maintenance work ensure permanent embankment dam stability.

Lateral embankment in the area of a water impoundment at the Upper Rhine

Regulations

For federal waterways, two fundamental regulations on embankment dam stability exist.

For embankment dam control:
This administrative regulation (embankment inspection) regulates the execution of embankment control with the objective to recognize damages early and perform necessary measures in time.

Verification of the safety against piping according to MSD

For the assessment of the piping risk at structures integrated in waterway embankments, the MSD suggests a special procedure which particularly considers the geometrical and geohydraulic conditions of the area around the structure.

The procedure is based on the numerical calculation of the flow through the embankment and through the soil in the area around the structure under unfavourable geohydraulic conditions.

For embankment dam stability:
This code of practice (embankment dam stability of German inland waterways) regulates the performance of embankment dam stability verification particularly considering percolation through the embankment. It is a supplement to the relevant DIN standards and other general technical codes.

Training

The BAW Federal Waterways Engineering and Research Institute) regularly offers training on embankment inspection and embankment stability for the WSV (Federal Waterways and Shipping Administration).