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Case histories for post-construction landslides – examples from the Mittelland Canal (Germany)

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The Mittelland Canal in Central Germany is the one of the important waterways within Germany connecting the Elbe River in the East with the Rhine River in the West. With a total length of 324.4 km it is the longest artificial waterway in Germany. The construction of the canal took 42 years and was divided into several sections with successive opening of the canal (Schmidt-Vöcks, 2000). Construction phases were locally accompanied by landslide events involving medium to large volumes (up to 150 000 m^3) which postponed the opening and increased construction costs. Nearly 90 landslide events spanning the last 120 years are extracted from the German landslide database (Damm & Klose, 2015). Most information within the database is gathered by means of scientific and (geo)technical literature as well as archive studies from inventories of emergency agencies, state, press and web archives, company and department records. The information includes material characteristics, repair and mitigation measures as well as resultant costs.
88% of landslide events occurred in the first half of the 20th century during and after construction phases (1906 to 1938). The vulnerability to slope failures is mainly determined by material characteristics of Mesozoic over-consolidated fine-grained sediments which destabilize due to bulging and shrinking respectively under influence of dynamic stress (v. Vittinghoff, 2002). Landslide triggers can be categorized into natural and man-related. The first ones include heavy rainfall and micro-seismicity due to diapirism and the latter ones construction and possibly bombing attacks during WWII.
Mitigation for slope stabilization along the canal was evolved contemporary (Goetzcke, 1927). Subsequently only few landslides occurred, which are concentrated at tributary canals. Slope movement is still noticeable at former landslide hotspots, but today as a creeping movement.

Damm, B. and Klose, M. (2015) The landslide database for Germany: Closing the gap at national level. Geomorphology, 249:82-93.

Goetzcke (1927) Neuere Erfahrungen bei Erdarbeiten. Zentralblatt der Bauverwaltung, 47(24): 291-297.

Schmidt-Vöcks, D. (2000) Die Geschichte des Mittellandkanals in: Stadtlandschaft und Brücken in Hannover: der Mittellandkanal als moderner Schifffahrtsweg. Wasser- und Schifffahrtsdirektion Mitte, Schlüteresche (Publisher), Hannover, 19-28.

Vittinghoff, v. T. (2002) Analyse des Langzeitverhaltens einer Spundwandkonstruktion in einem überkonsolidierten Ton. Inst. für Grundbau und Bodenmechanik, TU Braunschweig.