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This paper presents common issues to avoid when developing and interpreting finite element seepage models. It includes typical examples of the issues, and provides methods for identifying and correcting some common mistakes in seepage modeling.

Dam and levee safety engineers commonly develop and interpret two-dimensional (2D) finite element seepage models as a critical step in dam or levee evaluation and design. Seepage models support engineering decisions such as the need for embankment rehabilitation, selection of mitigation measures, and the design of related features (i.e., cutoff walls, seepage berms, relief wells, internal drains, etc.) Risk evaluations are also performed based on these seepage models. While recent advancements in finite element software seemingly improve the ease and convenience of seepage modeling, fundamental input parameters such as model geometry, boundary conditions, mesh size, and material properties continue to govern the value of the model with respect to representing and predicting seepage behavior. Based on experience with performing and reviewing numerous seepage models, we have identified a set of common mistakes in both the development and interpretation of these models. Issues with developing models are often related to model geometry, mesh size, model limits, boundary conditions, and material properties. When interpreting or relying upon results of seepage models, limitations of a 2D model that represent 3D seepage condition are often ignored and a false sense of accuracy is developed (especially considering quality and consistency of input data), or little to no consideration is given to the combination of exit gradient and soil type at the exit. These issues can potentially lead to erroneous results and a flawed understanding of the seepage conditions.