Publication

To 3D or not to 3D?

In their article "To 3D or Not to 3D?," published in *Geostrata*, Haley & Aldrich engineers Katherine Coco, P.E., M.ASCE, Maria Alejandra Larrea Brown, M.ASCE, and Matthew Ksanznak, E.I.T., M.ASCE, discuss the practicality of using 3D limit equilibrium modeling (LEM) programs to analyze excavations.

The article appeared in the June/July 2025 issue of *Geostrata*, a magazine issued by the American Society of Civil Engineers. Katherine, Alejandra, and Matthew probe the pros and cons of 3D LEM compared with traditional 2D modeling options, walking through a real-life example drawn from the closing of an ash pond. In this example, engineers used 3D LEM to understand the stability of excavation areas, finding that the approach "gave stakeholders confidence in the engineering behind the [safety] thresholds because the models better simulated the excavation configurations observed in the field," the authors report.

Katherine, Alejandra, and Matthew also point out some challenges with 3D LEM, including the expense of the software and the computing time required — "on the order of 10 to 100 times longer than the time needed to solve a problem using 2D LEM software," they report. They offer tips for when 3D LEM may be appropriate and how to implement a successful analysis program.

Learn more in the full article.