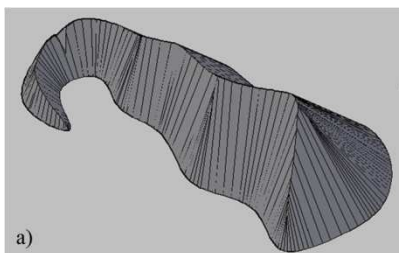


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## **GEOMETRIC METHOD FOR DESIGNING AN EMBANKMENT WITH A NATURAL SLOPE**

**Keywords:** *skeleton of roof, straight skeleton, parabola, hyperbola, Dandelin's theorem, Voronoi diagram for polygon, internal angle of friction, embankment*

Among the geometric methods used in science, technology and many other areas an important role is performed by the theory of straight skeletons. In terms of three-dimensional, but also plane geometry, this theory is known as the geometry of the skeletons of roofs or briefly as a roof geometry. This theory is in close kinship with Voronoi diagrams for polygon. Both the straight skeletons and Voronoi diagrams for polygons are many interesting practical applications: the (semi) automatic reconstruction of urban models based on satellite images, in cartography and photogrammetry, morphology analysis of the grain structure of the material, in medicine for representation, reconstruction and visualization of human organs, in the design of earthwork organization, to name just a few. In the present work we use the geometry of the roof to the geometric modeling of embankments on predetermined base line and a natural slope.



Model of the embankment with a natural slope: a) in AutoCAD, b) a real pile of granular material