

## 技术类成果

# 高土石坝建设与安全保障技术

# CONSTRUCTION AND SAFETY GUARANTEE TECHNOLOGY OF HIGH EMBANKMENT DAMS

### 【创新性】

高土石坝建设和运行安全保障技术研究自 20 世纪 50 年代开始，持续近六十年。提出了根据土的工程特性进行土料选择和设计的原则，论证了红土、风化土、宽级配砾石土作为防渗土料等筑坝的可行性，提出了土石坝渗流安全控制的方法及高土石坝反滤层设计准则，解决了高土石坝变形控制、渗透稳定、坝坡稳定等关键问题。自西北口面板堆石坝开始，引入现代面板堆石坝筑坝技术，研究、推广和发展了面板坝设计、施工、试验技术，研发了完善的高土石坝坝料特性试验设备和大坝性态分析方法。研究成果为土石坝设计和施工规范的编制和修订提出了科学依据，支撑了高土石坝安全建设运行。

### 【影响力】

研究成果支撑了汾河水库水中倒土坝、毛家村土坝、碧口、鲁布革等 100m 级高心墙坝、小浪底、瀑布沟等深厚覆盖层上 200m 级高土石坝，以及长河坝、糯扎渡等 300m 级高心墙坝成功建设，为天生桥一级、洪家渡、水布垭等高面板堆石坝建设提供了直接科学支撑。有关成果获得国家科技进步一等奖 2 项、二等奖 3 项。

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**获奖单位：**岩土所

### 【Innovation】

The research on construction and safety guarantee technology of high embankment dams began in the 1950s and lasted for nearly 60 years so far. A principle for the selection and design of soil material in accordance with the engineering properties of soil was put forward. The feasibility of special soil on dam building was demonstrated, such as red soil, weathered soil and wide grading gravelly soil. A method for the seepage controlling of embankment dams as well as the criterial for design of the filter layer was proposed. The problems on deformation controlling, seepage stability and slope stability were solved. The modern building technology of concrete faced rockfill dam was introduced since the research

on Xibeikou dam. Design, construction and experimental methods of concrete faced rockfill dams were studied and developed. Large scale equipment for material testing and analysis methods for performance simulation were developed. The research achievements have provided scientific bassetes for the compilation and revision of the technical specification for design and construction of embankment dams. Moreover, the research supported the safe construction and operation of high embankment dams.

### 【Influence】

The research achievements have supported the successful construction of 100m-level high embankment dams, such as the Fenhe water dumping dam, Maojiacun earth dam, Bikou and Lubuge earth core dams, 200m-level high embankment dams on deep overburden such as Xiaolangdi and Pubugou, as well as 300m-level high earth core rockfill dams such as Changheba

and Nuozhadu. Furthermore, scientific support was provide to the construction of high concrete faced rockfill dams, such as the Tianshengqiao-I, Hongjiadu and Shuibuya dams. Relevant achievements have won two first prizes and three second prizes of the National Science and Technology Progress Award.

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Award-winning Unit : Department of Geotechnical Engineering

▶ 长河坝、水美  
——天然宽级配砾石土料



▶ 糯扎渡、两河口、双江口  
——人工掺配砾石土料

