

论文类成果

胶结坝——环境友好的新坝型

【创新性】

提出了胶结坝新坝型（包括胶凝砂砾石坝、胶结堆石坝和胶结土坝）和“宜材适构”、“宜构适材”的新型筑坝理念，提出了新坝型结构设计和坝料配制方法，研发了安全优质高效的新坝型施工成套技术和专用装备，研发了新坝型数字质量监控系统并提出了控制指标体系，基于研究和实践总结提炼了胶结坝的筑坝原则，形成了新坝型筑坝技术体系，实现了利用当地材料胶结筑坝漫顶不溃的目标，经济且环境友好。成果已在 16 座工程应用，建设了碾压式、浇筑式胶凝砂砾石坝、胶结人工砂石坝，并在非岩基上成功建设了新坝型。已建工程实践表明，新坝型充分利用当地材料，与碾压混凝土坝相比可以节约投资 10%~20%，多座工程经历了超标过洪考验，对于面广量大的中小型水库大坝工程具有广阔的应用前景。

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【影响力】

论文发表在中国工程院主办的《Engineering》期刊（Q1 区 SCI 期刊）上，影响因子 2.667。相关研究成果近年在高质量期刊上发表 SCI 论文 4 篇，EI 论文 7 篇，被认定为水利部先进实用技术，西班牙科学院院士、国际大坝委员会前主席 Luis Berga 评价认为：“是 RCC 发展过程中中国的重要贡献之一”，国际大坝委员会荣誉主席 Adama Nombre 认为“是大坝技术领域的重要新发展，具有广泛的适用性”。国际大坝委员会、中国大坝工程学会均成立了胶结坝专委会，编写导则和技术公报，推动新坝型的研究和推广应用。



THE CEMENTED MATERIAL DAM: A NEW, ENVIRONMENTALLY FRIENDLY TYPE OF DAM

【Innovation】

The article presents a new type of dams—cemented material dams, including cemented sand and gravel, cemented soil and cemented rock dams, with the new construction concepts of "Proper materials selected to realize better function of structures" and "Dam structure optimized to make better use of local materials". The structure design method and material preparation method have been proposed and high efficient construction technology and special equipment have been developed. What's more, a digital quality monitoring system and a control indicator system have been built. Based on these researches and their application in dam projects, the main principles are summarized in the article. Cemented material dams can be built with local materials and will not collapse even in case of overtopping, which is more economical and environmentally friendly. The study results and equipments and systems developed have been successfully applied to 16 projects on rock or non-rock foundation, including some cemented artificial sand and gravel dams. Practice indicates the new-type dams that making full use of local materials can save 10%~20% investment compared to RCC dams, and many projects have gone through exceeding floods. It has a wide application prospect in extensive dams for the small and medium-sized reservoirs.

【Influence】

The thesis is published on CAE's Engineering (Q1, SCI), with an impact factor of 2.667. Relevant research findings, regarded as advanced applied technologies of MWR, have registered 4 SCI papers and 7 EI papers on high-quality journals. Luis Bergam, Academician of the Spanish Royal Academy of Sciences and former president of the International Commission on Large Dams (ICOLD), deems it as "one of the most important contributions China makes to RCC development". Adama Nombre, Honorary President of ICOLD, regards it as "important progress in large dam technology, with extensive applicability". ICOLD and the Chinese National Committee on Large Dams (CHINCOLD) have both established a committee on cemented material dams and compiled guidelines and technical bulletins, with the aim to promote the research and application of the new-type dams.

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