<<现代堆石坝技术进展>>

图书基本信息

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内容概要

The development of modern rockfill dams started from late 1960s and early1970s. Since then, rapid progress has been achieved in the construction ofrockfill dams throughout the world. This is mainly due to its distinct advantages ineconomy and efficiency. At present, several super high CFRD and ECRD projectshave been successfully constructed in the world, such as Shuibuya CFRD （233m） in China and Nurek ECRD （300 m ） in Tajikistan. Zipingpu CFRD with height of156m has demonstrated good performance in safety during the strong Wenchuanearthquake in 2008. Based on the previous progress achieved and the successfulpractices of the international milestone projects, great achievements will be madeby further research works and engineering practices in the future.This volume presents the state-of-the-art of rockfill dam technologies by 2009throughout the world. It could be a useful reference for engineers, professionalsand students.

书籍目录

章节摘录

The material for the first 10 layers of the em-bankment is processed with conventional earth-work construction machinery. The excavated ma-terial brought from the borrow areas is transpor-ted to the processing yard, then spread with abulldozer in layers generally 150 mm thick andsprinkled with water. Most of the larger lumpsbreak down to small size in this processing ofspreading. Finally tamping - foot roller or bull-dozer is employed to roll over the fill material byseveral passes till the percentage of lumps is re-duced to 12% to 13%. Material coarser than 10mm in size is catergorised as lumps. The numberof passes for various layers varies hetween 15 and 22. Water is sprayed over the processed layer and the material is then pushed by dozer blade into a stockpile. While pushing, the dozer blade inevi-tably excavate some material from ground which is drier. Water is added to the piled - up materialand the material worked with the loader buck- et. The water content of the material is broughtto within zero to +3% of the optimum watercontent. 3. 2. 2 Processing by agricuLtural rotavatorThe material for the last 12 layers of the em-bankment is processed with agricultural rotava- tor. The object of using the rotavator is to reducethe material processing effort.The excavated material is spread in 150 mm thick layers by the bulldozer blade. The material is then loosened by the dozer rippers and water is sprinkled over the surface. The processing is then performed by therotavator, with more water being sprinkled if required.ln every pass, the rotavator penetrates 20 to 30 mm into the layer while cutting and pul- verizing the lumps. Generally 6 passes of the ro- tavator i.s required to achieve full penetration of 150 mm into the layer. When full penetraiion is achieved, the proportion of lumps in the materi- al is 15% to 25% and the maximum size of the lumps is about 100 mm.The processing of the material is continued with further passes of the ratavator. The proportion of lumps is reduced to about 12% after 8 to 18 passes. The maximum size of the lumps is a7oout 50 mm. The processed materials is stockpiled by aloader, water is added to the stockpile as re-quired to increase the water content of the pro-cessed material. Mixing of water is achieved byworking the material with the front - end loader.3. 3 Construction o f trial embankmentThe processed fill material stockpile in the pro-cessing area is transported to the trail embank-ment by dumps.Since the grader has brokendown at the early stage, bulldozer is deployedfor spreading and leveling.ln this case, thespreading thickness is not uniform and the com-paction thickness varied from 100 to 190 mm. A self - propelled single - drum tamping - footvibratory roller with a static weight of 10. 2 tonswas used for compaction. As the fill material issilt, vibration is not used for compaction.The tamping - foot roller operates at a speed of 4 km/hour to achieve a compacted dry density of 97%of the maximum standard Proctor dry density. Generally the compacted surface is hard andhomogeneous after 6 passes of the roller, ex-pects for a few wet spots during Stage 1 wherethe moisture is much above the optimum due to lack of suitable water - mixing equipment. Thi.sproblem does not occur during Stage 2 because ofthe uniform mixing of water by the rotava-tor. Sometimes the compacted surface is undulat- ing due to the uneven spreading and poor levelingof material by the bulldozer. The proportion of lumps in the compacted fillis found to be about 8% to 9% compared withthe range of 12% to 13% before pacement and compaction. This reduction in the lumps contentoccurs during haulage of the material from theproce.ssing area to the embankment , spreadingof the material by the bulldozer and compaction by the tamping - foot roller. ……

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