

**COMPARISON OF CONVENTIONAL CONCRETE WITH
ROLLER COMPACTED CONCRETE IN DAM CONSTRUCTION**

By

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DECLARATION BY THE CANDIDATE

I, Hubert Maphel anak Jonathan Tait, 2002611705 confirm that the work is my own and that appropriate credit has been given where reference has been made to the work of others.


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ABSTRACT

This literature research is conducted to compare conventional concrete (CVC) with roller compacted concrete (RCC) in dam construction. CVC does not have the ability to support a roller while being compacted. On the other hand, RCC is a concrete in its unhardened state that will support a roller while it is being compacted. At early stage, RCC is only applied in pavement construction. However, recently RCC is widely used for dam construction.

There are several differences between CVC and RCC. Contrary to a CVC dam, upstream facing systems are very essential in a RCC dam. In terms of downstream section, the ratio of the face is in the range of 0.7 (Horizontal) to 1 (Vertical) to 0.8 (Horizontal) to 1 (Vertical). On the other hand, the face should not steeper than 0.8 (Horizontal) to 1 (Vertical) for a RCC dam. CVC dam normally has thickness greater than RCC. Regarding construction materials, RCC dams have used mineral admixtures to reduce the amount of cement in the mixtures. Furthermore, the NMSA of CVC dams are bigger than RCC dams. For the construction equipment part, heavy machineries do the construction of RCC dams. Besides, CVC dams are internally consolidated while RCC dams are externally consolidated. For fresh concrete properties, CVC mixtures are generally have higher workability than RCC mixtures. RCC has no-slump consistency. In terms of hardened concrete properties, the hardened properties of the RCC mixtures are almost similar CVC.

Overall, RCC is better than CVC. The advantages of RCC include low construction material cost, reduction of size of stilling basin and rapid construction. All these features have enabled reduction of the total cost of a RCC dam construction.

Other than for pavement and dam construction, RCC is also suitable for other hydraulic structures such as embankment overtopping protection, wave breakers, levees and bank protection. In addition, RCC may be used for slope protection, foundation stabilisation, massive open foundations, large work pads and base slabs.

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