



Farm dam construction

The storage of water is crucial to many farming operations. To build a dam then have it fail because of poor construction, can be disastrous to the economy of a farm.

Your dam will serve you well if you build it right the first time.

Construction of a dam should begin only after proper planning has been done.

Contractor

Building a farm dam is not simply a matter of pushing up an embankment. You should start by engaging a contractor who is experienced and uses proper techniques in farm dam construction.

Machinery

Using proper construction techniques requires the use of the right machinery. The basic machinery for dam building is:

- bulldozer with blade and ripper
- bulldozer with hydraulic scraper
- sheepsfoot roller
- water truck.

The contractor may use a self-loading scraper instead of a bulldozer with hydraulic scraper. Other specialised equipment includes excavators and rock breaking tools.

Materials and compaction

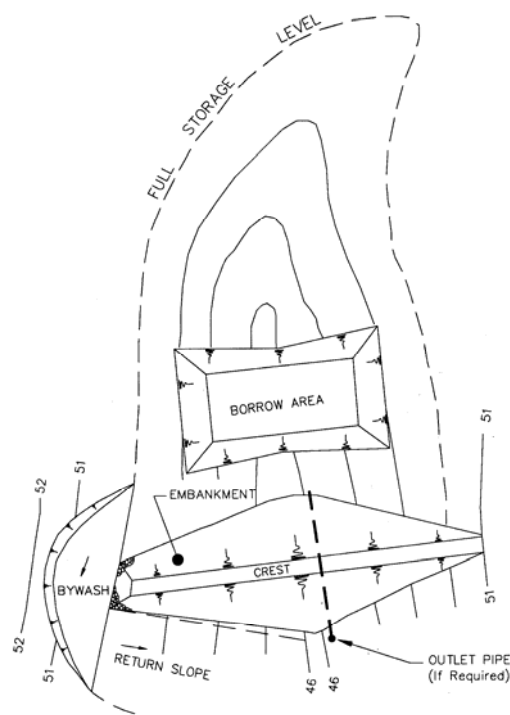
The embankment must be constructed using good clay materials and the correct compaction techniques. Fill material excavated from the borrow and bywash areas is built up in layers of not more than 200 mm thick. With each layer, close attention must be given to the moisture content and compaction of the material.

As a guide, the material has enough moisture if it is as wet as can be handled by a sheepsfoot roller. If you take a piece of the material in hand, it should roll out to the thickness of a pencil without it breaking up.

Construction

The sequence of construction work is:

- prepare the site
- excavate and backfill cutoff
- install pipework (if necessary)
- construct embankment
- excavate the bywash
- protect vulnerable areas from erosion.



Plan of dam site

Site preparation

Clear the embankment, borrow and bywash areas of trees and stumps. The area is then stripped of topsoil to a depth of 75 mm and the topsoil stockpiled near the site.

The bywash return slope must be left undisturbed. If trees need to be removed from the slope, it must be done carefully with minimal disturbance to the slope.

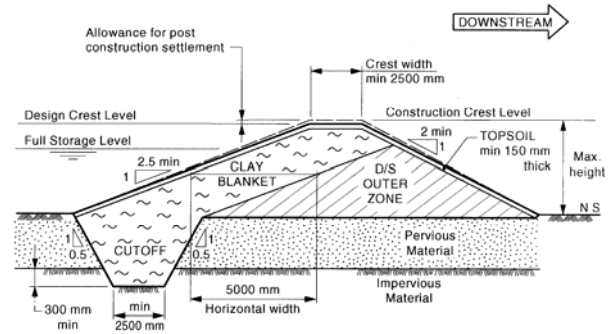


Cutoff works

The cutoff provides a water seal beneath the embankment and therefore must extend the full embankment length. The cutoff trench must be excavated at least 300 mm into impermeable material or on to fresh rock.

Excavated material may be placed in the downstream outer zone.

Backfill the trench with selected clay, compacted at the correct moisture content.



Cross section—clay blanket

Bywash evacuation

Bywashes must be cut level. This ensures a uniform flow of water across the bywash to the return slope. The bywash level should be at least 1 metre below the crest level of the dam.

Material excavated from the bywash may, if suitable be used in the embankment.

Erosion protection

Spread topsoil over the bank and bywash, and plant with a good holding grass. Make sure the bywash return slope is fully grassed. Promote growth of the grass with water and fertiliser.

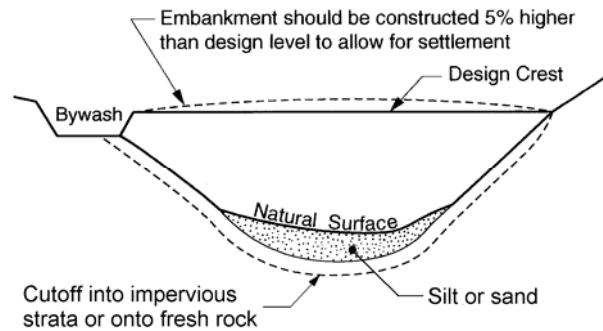
Protect the ends of the embankment where they meet with the bywash and the outfall from any pipework with rock pitching or concrete.

Further information

Fact sheets on water and other topics are available from Natural Resources and Water (NRW) service centres or the NRW website <www.nrw.qld.gov.au>.

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For further information phone 13 13 04



Typical section through gully

Installation of pipework

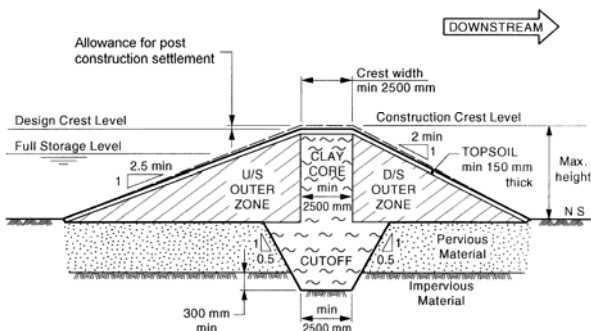
Install any outlet pipework where required and hand pack good moist clay around pipes. Anti-seepage baffles should be placed around the pipe where it passes through the core/blanket zone. The baffles can be concrete or steel construction.

Embankment construction

The embankment is built up in horizontal layers. The clay core or blanket zone must consist of impervious clays compacted at the correct moisture content.

The outer zones are usually compacted with a roller, however attention to moisture content of this material is not as critical as with the core/blanket zone.

Silt, sand or gravelly material can be placed in the downstream outer zone.



Cross section - clay core