HOW TO BUILD A DAM

Construction of a Dam - Step 1

To build a Dam the engineers must first de-water the part of the river valley in which they wish to place the dam. This is usually achieved by diverting the river through a tunnel.
The tunnel is built through one side of the valley around the planned construction area. A series of holes is drilled in the rock. Explosives are placed in the drill holes, blasting takes place and broken rock is then removed. This procedure is repeated many times until the tunnel is completed. Diversion tunnels are often lined with concrete.

Construction of a Dam - Step 2

Work on diverting the river starts in summer when river levels are low. Earth-moving equipment is used to build a small dam (called a *cofferdam*) upstream of the main construction area. This acts as a barrier to the river and causes it to flow through the diversion tunnel.
Another cofferdam is built downstream of the main damsite to prevent water flowing back into the construction area.
Pumps are used to remove any water that seeps through the cofferdams.
Diversion tunnels are not always necessary when concrete dams are being built. The river can sometimes be channelled through a large pipe and the dam constructed around it.

Construction of a Dam - Step 3

The construction methods used in building a dam depend on the type of dam being built. The first stage normally involves the removal of loose rock and rubble from the valley walls and river bed.
Concrete-faced rockfill dams require a footing (or *plinth*) to be constructed around their upstream edge. The plinth is made from concrete and serves as a foundation or connection between the dam and the valley walls and floor. It has an important role in preventing water leakage around the edges of the dam. The area under the plinth is waterproofed by drilling holes and pumping cement grout into cracks in the rock. The thin concrete face on the upstream side of the dam is connected to the plinth via stainless steel and rubber seals called waterstops.

Construction of a Dam - Step 4

During dam construction the associated power station and intake works are also being built. When the dam is completed the diversion tunnel is closed and the lake begins to fill. The closure of the diversion tunnel has two phases. During low flow a large re-usable steel gate is lowered across the entrance. The diversion tunnel is then permanently blocked off by the construction of a concrete plug.
In some instances dewatering outlets are built into the plugs so water can be released during an emergency.


Hydro Tasmania