

THE PROBLEM

Cosseys Dam is an earth fill embankment of 1950s vintage, and the core is not protected by filter materials. The dam has experienced a number of seepage incidents associated with the core and underdrain, indicative of core piping.

THE PEER REVIEW PROCESS

Damwatch carried out an independent peer review of the upgrade. This involved attendance at workshops and progress meetings during the investigation and design, and a detailed independent peer review of the final upgrade design.

The review process involved:

- Review of investigation information
- Risk assessment workshop
- Evaluation of remedial options

CLIENT

Watercare Services Limited.

SERVICE PROVIDED

Peer Review of the Cosseys Dam upgrade design.

LOCATION

Cosseys Dam is a water supply dam located in the Hunua Range south of Auckland, NZ. It is a 41m high, zoned earthfill dam commissioned in 1952.

PROJECT COMPONENTS

The components of the project included:

- Dam upgrade Stage 1
- Dam upgrade Stage 2
- Valve tower strengthening
- Wairoa River bridge
- Access road embankments.

TECHNICAL COMPONENTS

The technical components of the project which were reviewed included:

- Problem definition
- Option selection
- Dam geotechnical data
- Dam slope stability
- Dam seismic stability

- Independent advice to WaterCare at key stages
- Review of the technical components of the project.

THE SOLUTION

Damwatch' contribution covered peer review of the following analyses and design.

Analysis of monitoring data and observations from drill holes confirmed that core material had piped into the underdrain. The solution adopted was the excavation and rebuilding of the downstream shoulder and part of the core incorporating filter and drainage zones. Strengthening of the valve tower for seismic loads was also included in the project.

OUTCOMES

- Design reports' peer reviews'
- Participation in meetings/workshops
- Construction review, inspections and reports
- Dam upgrade design
- Instrumentation
- Valve Tower seismic stability
- Valve Tower strengthening design
- Flood management during construction
- Dam safety during construction
- Construction sequencing
- Cost estimates
- Construction drawing check
- Wairoa River bridge replacement design
- Reinforced earth walls along access road design check
- Dam construction
- Intake tower strengthening construction

