Huntsbury Reservoir
Post Earthquake Reconstruction

Dennis Hunt (Beca) - Design
Robert Clifton (Fulton Hogan) – Construction
Mark Christison (Christchurch City Council) – Operations
Huntsbury Reservoir Pre-Earthquake
Huntsbury Hill, Christchurch

- Capacity - 35,000m³ (largest in Christchurch)
- Dimensions - 77.4m x 63.0m x 7.9m
- Partially buried
- Reinforced concrete
CHRISTCHURCH  
CITY RESERVOIR  
1954.  
R.M. MACFARLANE C.M.G. M.P.  
MAYOR  
J.E. JONES J.P.  
CHAIRMAN OF WORKS COMMITTEE  
E. SOMERS  
CITY ENGINEER  

JUL 13 2011
Water loss paths

Time to empty: Not known accurately but a few hours
Inferred location of shear zone
Displacements

Predicted relative movements between A & B
Horizontal and Vertical
100 to 150mm in 20 to 50mm increments
Damage
Adjacent road at shear zone
Huntsbury Avenue at shear zone
Adjacent road at shear zone
KEY

Observed Cracking

Crack width / vertical displacement (mm).

Compression of sealant observed.

Spalling of concrete floor.

Direction of rotation of floor slab observed.

Inspection undertaken on the 3rd and 4th of March 2011

Huntsbury Reservoir No. 1 - Plan of reservoir floor cracking

Figure 1
Inclined borehole drilling through shear zone
Floor slab damage
Roof damage at column head
Roof damage at construction joint
Construction
Initial access into the reservoir confined space
Construction Access
Slot for wall construction
roof strengthened for mobile crane
Stage 1
floor slab
overlay, column
bases and wall
construction
Pump Station in nearby park
Stage 2 reservoir – under construction
Temporary propping Stage 2
Wall construction
Stage 2
Wall joint
Operations
Stage 1 reservoir operational December 2011
Landscaped area across shear zone
Stage 2 reservoir – landscaping in progress
1 May 2013
Management

- CCC consultation with local community
- Established working relationship CCC, Beca, Fulton Hogan
- Temporary facilities
  - CCC in suburban library
  - Beca in converted motel
- Environment of on-going earthquakes and damage
- Design and construct approach
- Individuals clear on responsibilities
- Flexibility required by all involved
People

Dennis Hunt
Rob Clifton
Mark Christison
Ian Billings
Nicholas Charman
Ash Pointon
Juvenal Verano
Doug Stirrat
Marcus Gibson
Ann Williams
Graeme Aitken
Conclusion

- Teamwork and prompt decision making essential
- Resilience required in design and detailing
- Importance of having stored water available after a major earthquake