

SANDY BENNET

Principal



CAREER OVERVIEW

Sandy has over 50 years experience in geotechnical engineering, tunnelling and underground works. Prior to joining Flagstaff, Sandy was the Senior Geomechanics Engineer at Connell Wagner (now Aurecon). He was responsible for all of the company's geomechanics activities for over 20 years.

He was responsible for all geotechnical investigation and subsequent monitoring of ground behaviour on the Melbourne Underground Rail Loop (MURL) project covering rail tunnels, chambers, shafts and heavy foundations in a variety of ground conditions. His experience includes contract documentation and supervision for the manufacture and installation of acoustic control materials in the MURL tunnels, and assessment of most of the building development foundations, and excavations adjacent to alignment of the MURL tunnels, including establishing engineering criteria for future large scale development in proximity.

Other significant underground projects include the Brisbane Inner City Rail Tunnels including the criteria for the easement creation and future building caveats for the second tunnels, Blue Mountains Sewage Transfer and Northside Storage Tunnels.

He provided technical advice to the Contract Works Insurers for claims assessment in relation to the rectification of the Burnley Tunnel of Melbourne City Link, as well as coordinating engineering assessment of Dartmouth hydro power station failure including estimates for restoration and cost of alternate supply to grid.

Since joining Flagstaff, he has provided geotechnical and tunnelling advice on the review of tenders for the Brisbane North-South (Clem 7) Tunnel, and co-ordinated a peer review of the Brisbane Airport Link tunnel at Concept Design stage. He also has performed an independent review of the collapse of the Lane Cove Tunnel for insurance underwriters, and advised on the redevelopment of the Melbourne Main sewer tunnel for Melbourne Water.

More recently, he has advised the insurers' investigations of the major North Highwall failure at the Yallourn lignite mine, the Bakun Hydro tunnel in the Philippines, and a stope failure at Lightning Nickel Long Victor mine, Kambalda, WA.

Other assignments include leading technical peer reviews of the Melbourne Metro project on three occasions, expert advice to an interested party in the North Highwall stability of the Hazelwood open cut mine, assisting the project team with constructability advice in the selection and bidding for the Regional Rail Link Alliance process in Victoria and facilitating a risk analysis by the project team for the proposed Oz Minerals 7 km Carrapateena Decline development in SA.

He was Expert Advisor on tunnelling, hydrogeology and geomechanics to the Assessment Committee for the East-West (Eastern Section) Tunnel project in Melbourne in 2014.

Currently he is a member of the Peer Review Group for the \$11B Metro Tunnel Project and other projects under the mantle of Rail Projects Victoria (Melbourne Airport Rail, Geelong Faster Rail, and Regional Rail Revival).

MELBOURNE BASED

PROFESSIONAL QUALIFICATIONS

- Doctor of Philosophy – Univ. of Melbourne
- Master of Engineering Science (Hons) – Univ. of Melbourne
- Bachelor of Engineering (1st Hons) – Mining Engineering – Univ. of Melbourne

ACCREDITATIONS/ CERTIFICATION

- Fellow - Institution of Engineers Australia
- CP Eng NER APEC Engineer Int PE (Aus)
- Member - American Institute of Mining, Metallurgical & Petroleum Engineers (SME) (Legion status)
- Member - Australian Tunnelling Society

CAREER HISTORY

- 1971 – 1972 BHP Collieries
- 1973 – 2004 Connell Group (now Aurecon)
- 2005 – Flagstaff Consulting Group

BENEFITS SANDY PROVIDES TO CLIENTS

- A long career in understanding the interaction of ground conditions and excavation impacts from civil and mining activity. This evolved from extended post-graduate studies and on-site evaluation for verification.
- Experience of major Private and Public sector projects Australia wide and internationally in Singapore, Malaysia, Hong Kong, New Zealand and Pacific Islands.

OVERVIEW OF RELEVANT EXPERIENCE

- Peer Reviews.
- Independent review of major incidents (surface and underground) from a technical perspective.

EXPERTISE AREAS

- Geotechnical evaluation.
- Expert Advisor for Tunnelling Environmental Assessments.
- Advice on excavation methodologies for underground works.
- Independent advice for major works insurance claims.
- Peer Reviews relating to major Road, Rail, Water and Wastewater tunnels.

SELECTED KEY EXPERIENCE

Infrastructure Projects

Planning and direction of geotechnical investigation programmes for:

- MCG Northern Redevelopment
- Federation Square Substructure, Melbourne
- Melbourne Central Project
- 120 Collins Street, Melbourne
- Casselden Place tunnel protection works and foundation inspection
- Age Print Facility, Tullamarine
- T.M.C.A. Plant, Altona
- Goliath Cement Silos at Devonport and Railton, Tasmania
- Naval communication bases including antennae farms and microwave towers at four locations in Malaysia
- Investigation for Webb Dock rail bridge over Yarra River including over-water drilling
- Load testing of 10 deep socketed piles (up to 16 MN) for Westgate Freeway, for VicRoads, Melbourne
- National Rail Corporation - Newport to North Shore Gauge Standardisation, and

- Broadmeadows to Craigieburn suburban track electrification, Victoria.

Constructability advice for:

- Regional Rail Link Alliance team selection and bid evaluation, Victoria.

Geotechnical responsibilities for major tunnelling projects including:

- Cross City Tunnel, Sydney, Design Verification
- Eastern Freeway Tunnel, Melbourne, D&C Tender
- Blue Mountains Sewage Transfer - Geotechnical Overview
- Brisbane City Council - Studies for North Quay to Eagle Farm Sewer and D&C Tender
- Melbourne City Link, Melbourne - Tender Design
- Northside Storage Tunnel, Sydney
- Sydney Harbour Tunnel; and
- Eastern Distributor Tunnel Study, Sydney.

Expert Advisor:

- East-West (Eastern Section) Tunnel, Melbourne, Assessment Committee

Major rock slope stability assessments, including:

- Hong Kong Housing Society estates:
 - Healthy Village III
 - Lai Tak Tseun
 - Loh Man Sun
 - Cho Yu Chuen.

Mining and Resources

Geotechnical responsibilities for tunnelling projects including:

- Port Hedland Harbour Tunnel, Western Australia, D&C Tender
- Elouera Colliery mine access, NSW
- Mobile Miner MM130 - Assessment of Ground Support for Pasmaico, Broken Hill
- Ulan Coal - Alternate Mine Access, NSW
- Pasmaico Mine, No. 5 Airshaft Stability, Broken Hill
- Assessment of mobile miner for AM & S, Broken Hill
- Loy Yang Fire Services Tunnel (SECV) - Remedial works on failed segmentally lined tunnel, VIC
- Myuna Colliery drift construction, NSW; and
- King Island Scheelite development, TAS.

Risk analysis:

- Oz Minerals Carrapateena Mine, Decline development (7km), SA.

Cost and Time Analysis

- Airport Rail Link, Sydney - Review of Estimates for City Rail.

Contractual Advice, Insurance Claim Review and Expert Services

- Melbourne City Link – Burnley Tunnel claim
- Dartmouth Power Station failure assessment
- Lane Cove Tunnel collapse
- Yallourn Lignite Mine – North Highwall failure
- Bakun Hydro headrace tunnel, Philippines
- Lightning Nickel Mine – stope failure, Kambalda WA, and
- Hazelwood Mine, Morwell – Stability issues of north highwall / Princes Freeway.

Peer Reviews

- North- Western Sewer, Melbourne - Review Panel Convenor
- Airport Link Brisbane – Panel member
- Melbourne Metro – Panel leader (Technical) 2010 - 2012
- Melbourne Metro – Peer Review Group panel member 2015 – 2021
- Rail Projects Victoria – Peer Reviews of Melbourne Airport Rail, Geelong Faster Rail, Murray Basin Rail, Regional Rail Revival panel member 2018 - 2021; and
- Suburban Rail Loop – Peer Review Group panel member 2019 – 2021.