

## Edward (Ted) J Nye

	<b>Nationality</b>	Australian
	<b>Year of Birth</b>	1952
	<b>Profession</b>	Chartered Engineer
	<b>Specialisation</b>	Underground Engineering – Transport
	<b>Position</b>	Director, E J Nye & Associates Pty Ltd
	<b>Key Qualifications</b>	Dip. Eng(Civil), B. Eng(Civil), NER, FIEAust

### KEY EXPERTISE

Over 40 years investigative, design and construction experience over a wide range of major transport and related projects (across Australia and in the UK, New Zealand, Malaysia, China, Hong Kong, Singapore, Chile, and the Pacific Islands). Delivery manager, design management, design team leader, tunnel design engineer and associated construction methodologies development. Project concept development for road and rail. Specialist expertise in assessing the interaction between underground and surface structures. Provide leadership and innovative solutions across disciplines. Client side, D & C and Alliance contract experience.

### EDUCATION AND PROFESSIONAL STATUS

Verified Certificates - Python for Data Science – UC-San Diego & MITx– Dec 19, Mar 20.

Verified Certificates in C programming – Dartmouth IMTx – 2020

Verified Certificate in Forensic Engineering – Learning from Failures – DelftX-May 2020

Bachelor of Engineering (Civil), Swinburne College of Technology, 1977

Diploma of Engineering (Civil), Caulfield Institute of Technology, 1974

Member of the Australian Tunnelling Society (ATS)

Member of the Australasian Geomechanics Society (AGS)

Fellow of the Institution of Engineers, Australia

Initiated/Chaired ATS/AGS “Buildings around Existing Tunnels” one day seminar, Sydney, April 2023.

Chairman of the 15<sup>th</sup> Australasian Tunnelling Conference, September 2014.

ATS Committee member and past Chairman, 1995 – 2015

Warren Centre – Underground Space Study 1996 – Steering Committee Member, Working Group Chair

Austrorads Tunnelling Committee, advisor, 2008 to 2013.

In 2015 presenter at four overseas conferences (Singapore\* – annual guest lecture, Tunnelling Society of Singapore, Shanghai\*, New Orleans, Switzerland\*), Shanghai\* 2016 and Wuhan 2017. (Invited speaker \*). Other overseas visits to TBM factories, Herrenknecht, Germany and CREG, Zhengzhou, China (most recent in 2015, but also 1996 and 2005 to Germany).

### EXPERIENCE RECORD SUMMARY

#### **Dec 2016 – present E J Nye & Associates Pty Ltd, Tunnel Specialist**

**Sub-station -Sydney Airport:** Providing advice to contractor for new sub-station over APL tunnel for Sydney Trains approval. Client: PerformanceElectrics

**Villawood Development:** Liaison and report with Sydney Trains for development approval adjacent to ST car park. All design by others. Client: ABA Pty Ltd

**Green Square Station:** Verification analysis for independent review including review of other consultant's analyses for building over the south platform tunnel. Client Toga

**Sandstone Precinct Project.** Design reviews and risk assessments. Proximity to Sydney Metro tunnels. Pedestrian tunnel to link buildings. Tower crane cable anchors verification. Client: Built

**Brisbane Metro (Bus tunnel):** Review of design and construction methodology for the wide shallow cover driven tunnel under Adelaide St. Report reviewing monitoring data. FE analysis. Client: Acciona

**Sydney Airport- Domestic Terminal Station** – demolition of the PI carpark. Dilapidation survey of station and pedestrian tunnel. Risk assessment report. Advisor. Client: SACL.

**133 Liverpool Street, Sydney.** Assessment of impact of proposed extended deep basement on Sydney Trains and Sydney Metro tunnels. FE analysis. Client: Deicorp

**Twin Towers- Kogarah.** FE analysis/geotechnical/structural assessment and reporting on potential impacts from adjacent 3-level basement excavations on the NGRS tunnel (unreinforced concrete lined sewer tunnel constructed in 1942). Client: Landmark Group

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**Derailment Risk Assessment** – risk assessment for potential derailment of train and then impact into a new building development in Ashfield adjacent to the rail corridor. Client: Buildview/EIAustralia

**Waterloo Road Development** – FE analysis and reporting to assess potential impact from a building basement excavation (Sydney Metro cross-over tunnel). Clients: John Holland Properties

**Westconnex – Rozelle Interchange** – Peer reviewer for design, construction, geotechnical, settlement, noise, and vibration, monitoring etc. Client: RMS/TSA.

**Developments Adjacent to Rail Tunnels** – Technical advisor on more than 8 significant projects (Sydney Metro/Airport Line/City Circle/M8 and Eastern Distributor Road tunnel), bus transport interchange and car park, MLC Centre, Holiday Inn Hotel - Mascot, Green Square Station (both ends of station). Clients: including SACL, Walkers, Savills, GPT, Roberts Pizzarotti, Toga.

**Burrawang to Avon Dam Water Supply Tunnel with potential HEPS** - Technical advisor for this potential 20km tunnel, 200m drop shaft and underground hydro-electric power station (240MW), plus connecting 9km long spur pipeline. Client: WaterNSW.

**Forrestfield Airport Link – Perth** – technical review for jet grouting contractor. Identified TBM construction issues related to annulus grouting. Reviewed grouting data and prepared comprehensive report. Also reviewed another cross-passage with an alternative soft ground construction method combining piling with jet grouting. Client: Trevi Aust. Pty Ltd.

**Wynyard Place Project** - dilapidation surveys related to works adjacent to Wynyard Station. Station column removal/pavement/existing buildings/light rail in George Street, Client: Multiplex.

**Access Improvement Study**– Concept development of 12km long combined diesel freight and electric passenger train tunnel with a significant river crossing (bored and immersed tube). Client: TfNSW/Kinhill

**Faster Rail Project** – PM for strategy report to improve existing main line rail access to allow further land development. Client: Walker Corporation.

**Northconnex Road Tunnel** – Technical reviews on this 10km long road tunnel. Shotcrete and waterproofing issues, specifications, and contractor's submissions. Client: Transurban.

**Connector Motorway, Melbourne** – Technical assessment and report to resolve a dispute between the operator/owner and the contractors. Joint Clients, Connector Motorway, JHG and CPB.

**Northshore Transport Options** – Development and promotion of a rail tunnel under Sydney Heads and later an alternative to the Western Harbour Crossing and Beaches Link tunnel alignments focusing on Chatswood. Client: none

**Mott MacDonald in 2016/17** - Continued involvement in the major projects listed below.

### **2011 – 2016      Mott MacDonald Australia Pty Ltd, Tunnel Practice Leader**

Led a group of geotechnical, tunnel, ventilation and as required structural engineers.

**St James Station** - inspection and assessment of disused platforms and tunnels. Client: confidential

**Wynyard Place Project** – Led a five-person team, dilapidation survey of rail and disused trams tunnels, Wynyard Station, high rise buildings, gardens, and road pavements. Client: Multiplex.

**Toll Plaza Removal, Sydney Harbour Bridge** – temporary crane load checking and dilapidation survey of the rail and disused trams tunnels approaches on the south end of the bridge. Client: RMS.

**Barangaroo Central** - advising developers bid team on the interface issues between the development and the proposed Barangaroo Station in Hickson Road. Client: Lend Lease.

**Barangaroo South** - developed the criteria to design the building foundations to preserve the Sydney Metro rail corridor down to Darling Harbour. Risk assessment for tunnelling. Client: Lend Lease.

**Sydney Metro Stage 1 (OTS contract)**- team lead, shafts (provided fully tanked solution with tension piles), shallow cover pedestrian tunnels connecting to stations, y-junction interface connection with the ECRL. Inspections of ECRL tunnels associated with upgrades for the driverless trains.

**Airport Rail Link** – assessment of in-situ concrete lining including testing and strain gauge monitoring. Engaged materials and survey monitoring specialist. Hard rock section. Client: Broadspectrum

**Project 2C** - Sydney Airport – approvals from Sydney Trains for deep piling, design and construction reviews retaining walls, ground treatment, waterproofing, soft ground design reviews. Client: Contractor

**Westminster Road Widening** - Developing the concept and supervision of detailed design of a traffic impact barrier along the top of a railway embankment. Client: RMS.

**North Strathfield Rail Underpass** – Design lead for a very shallow cover tunnel under live railway tracks. Construction supervision. First use of shotcrete only lining and spray-on membrane in in

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Australia. Shaved three years off construction program with driven tunnel solution. Construction supervision through the site PTT process. Client: SKM/PB JV.

**Melbourne Metro** – client side - verification tunnels and review of station cavern reference designs. Alignments, inspection of SI core, review of standard to be used. Client: Vic. Dep. Transport.

**Sydney Opera House VAPS Project** - Technical advisor for initial design and designer selection. Bulk excavation under the monumental stairs and tunnelling under the opera house. Client: SOHT

**M2 Tunnel Widening, Sydney** – Design verification for widening by 3.6m of a twin bored hard rock tunnels under high operating road traffic conditions. Site inspections. Developed the original widening concept for Transurban. Client: SKM.

### **2002 – 2010 Sinclair Knight Merz, Tunnel Engineering Manager**

**Northern Link, Brisbane** – Technical assessment of the EOI for this 4km long road tunnel.

**Boggo Road Busway Tunnel, Brisbane** – Led the driven tunnel design team. Detailed design of a 15m wide by 430m long busway tunnel with very shallow ground cover. Construction supervision. Client: Alliance - Thiess Contractors, Main Roads and SKM.

**Epping Chatswood Rail Link** – Project Manager for RailCorp asset assessment report prior to their acceptance of the asset transfer from and delivered by another government department.

**Eastlink Freeway Project, Melbourne** – Design and site visit construction reviews of the 1.5km long twin three lane road tunnel. Client: Southeast Integrated Transport Authority.

**North South Bypass and TransApex Road Tunnels, Brisbane** – Review of construction methods and design, co-ordination, and review of tunnel. Client: Brisbane City Council and State Government.

**M2 – F3 Connection (now Northconnex).** Design planning, supervision of tunnel ventilation, geotechnical engineering, cost estimator for up to 10km of tunnel. Client: Federal Dep. Transport

**Lane Cove Road Tunnel** – High level advice to the Lane Cove Tunnel Company throughout project.

**Expert Witness - 1** - Claim processed through arbitration following a fatal rock roof fall on the Cross City Tunnel. Specialist advice given on the construction methodology adopted by the contractor.

**Expert Witness – 2** – Supreme Court of NSW. Assessed the potential impact of new building development on an existing 1970s cut and cover twin track rail tunnel.

**Endeavour Drift Project** – Project manager and designer. Concept design for coal surge bins at 500m depth, review of material handling issues related to bin geometry, construction methodologies and analysis of rock with high in-situ stresses and complex geometry. Client: BHP Billiton.

**Overseas Assignments.** Led team of specialist, geotechnical, cost estimator, construction and TBM. Feasibility of twin 10m diameter tunnels for mine access in the Andes, Chile. Client: Codelco

### **1989 – 2001 E J Nye and Associates Pty Ltd, Director (Self Employed)**

**M5 Motorway Road Tunnel** – Consultant at tender, design and construction phases. Client: RTA.

**Airport Rail Link (Sydney)** – EIS construction methodology, interfacing with the FAC, project management, technical reviews, site inspections including deep diaphragm walls. Soft ground tunnel by 11m diameter slurry TBM (6km in length) and the Cooks River Crossing (using circular coffer dams). Client: Rail Access Corporation/Kinhill.

**Tunnel Protection.** Developed guidelines then reviewed numerous developments along the 11km length of the Airport Rail Link, either for developers, RailCorp or Sydney Airport. Client: RAC

**Epping Chatswood/Parramatta Rail Link** – EIS construction methodology, client for tender issued design of the station caverns. Tunnelling methods leading into Parramatta. Client: DoT and PRL.

**Northwest Rail Link** - Initial planning for the alignment and station locations. Client: Arups

**Techbase Software:** Marketing and developing applications for this relational database with a 3D graphical interface.

**High Speed Train Study.** Tunnel technical adviser for a potential HST north of Sydney to Gosford. Long tunnels (> 10km) to be used for both passenger and freight trains.. Client: Arup.

**Overseas Assignments:** Hong Kong, verification, Tai Lam Road Tunnel. Feasibility study, 150km freeway, China (with 54 tunnels and 120 bridges) for the Asian Development Bank including 2 months in China, Three Gorges Dam ship lock site visit, advise the YRRI and cross-country study tour in Europe and to London for the ARL project.

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**1974 – 1989 John Connell, Mott, Hay and Anderson - Senior Tunnel Engineer**  
**Shangri la Hotel (ANA Hotel), Sydney.** Design team leader all site civil works including over the railway tunnel. Client: CRI

**Sydney Harbour Tunnel.** Design team leader for the land tunnels. Project design engineer for the feasibility study including the south immersed tube connection. Concept design under the Opera House Forecourt. Client: Transfield/Kumagai.

**Melbourne Underground Rail Loop (MURL).** Geotechnical monitoring tunnels and all stations then structural design of station booking halls and pedestrian tunnels. Assembly of large diameter plate bearing testing equipment and assessing results. Installation of a very wide range of monitoring sensors including strain gauges, loads cells and extensometers. Ground vibration and noise monitoring due to blasting. Finite Element analyses to compare field data with FE analysis. Viaduct repairs, bonding various materials (including rubber to aluminium and concrete), specifications, and testing. Client: MURLA

**Buildings adjacent to Tunnels.** Detailed FE analysis to assess potential impacts of three new major buildings, including their basement excavations on the new MURLA tunnels.

**Foundation design.** Numerous projects including bored piers to rock to liquefaction potential of saturated sand under large structures.

**Overseas Assignments.** Hong Kong (12 months) slope, retaining wall and tunnel stability and later (4 months) feasibility study for a 5km long road tunnel. London, major bridge and building foundations, study for immersed tube crossing of the English Channel. Large hydro tunnels in Malaysia, contractors claim, rock bursts. Three aid assignments in the Pacific, all site investigations over water with barges, Kiribati (2 no.) and Tonga (3 months each, 3km long causeway, a fishery jetty and a container wharf).

### **Publications - over 30 published papers - selection only here/ & 1 YouTube video.**

"Excavations Adjacent to Tunnels in Rock". A. J. Bennett and E. J. Nye. Conference on Finite Element Methods in Engineering, Melbourne, August 1987.

"The Soft Ground Bored Tunnel Under Sydney Airport". Nye, E.J. 10<sup>th</sup> Australian Tunnelling Conference, Melbourne, March 1999.

"North Strathfield Rail Underpass Shallow Cover Driven Tunnel", Ted Nye, RETC Washington DC, June 2013.

"Sydney Metro Northwest – Design and Construction of the services Facility Shafts", E. Nye et al. 16<sup>th</sup> Australasian Tunnelling Conference, Sydney, October 2017.

"Sydney Heads Rail Tunnel – a Treasure Trove of Planning Opportunities". E. Nye, P. Prince, and Dr S. Lackey. ITA-AITES World Tunnel Congress, WTC2020, Malaysia, September 2020.

"Basement Excavation Analysis – Potential impact on the North Georges River Sewer tunnel", Joint ATS/AGS Seminar, Building Around Existing Tunnels, Sydney April 2023.

"Barangaroo South – International Tower 3 – Protecting a Future Rail Corridor", Joint ATS/AGS Seminar, Building Around Existing Tunnels, Sydney, April 2023.

"Reinforcement Learning Tunnel Design/Construction – is it possible?" 18<sup>th</sup> Australasian Tunnelling Conference, Auckland, New Zealand, Nov 2023.

"Reflection on the flawed planning process for the Western Harbour Tunnel, Sydney", to be published Nov. 2024. 5<sup>th</sup> International Conference Transport and Geomechanics, Sydney.

Link to YouTube video – Sydney Heads Rail Tunnel, March 2019. Joint meeting AGS/ATS, Sydney.

<https://www.youtube.com/watch?v=t70kd6eUMfl>

The final project for the edX data science courses from UC-San Diego was titled "Australian Fatal Road Accidents (1989 to 2019)".