

Tranzinfo HotTopic

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Tunnels

A selection of recent publications and resources on tunnels – including design, construction, safety and ventilation

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1. A perspective of Australian tunnel ventilation

Humphrey, G et al

PIARC World Road Congress, 22nd, 2003, Durban, South Africa

9 pages

World Road Association (PIARC)

This paper deals with one of the most difficult issues in recent Australian tunnel design - ventilation and air quality impact. Filtration equipment installation, regulatory responses and cost pressures are all discussed with in this review of Australian tunnel ventilation design, which also offers commentary areas for future design changes.

2. Closed face tunnelling and ground stability

Grose, B

Tunnels and Tunnelling International 2005 Vol. 37 No. 3 Pages 27-28

The findings of the British Tunnelling Society's Closed Face Working Group's report on closed face tunnelling are presented in this article, a review which gave particular focus to urban area tunnelling. Machinery options are discussed and closed faced tunnelling incidents that have occurred across the world are examined, highlighting hazards and the need for risk -based assessment, site investigations and the employment of geophysics. Article also presents a review of operating parameters for tunnel boring machines (TBMs).

3. Design and delivery of the Lane Cove Tunnel project

Rozek, J

International Road Federation World Meeting, 15th, 2005, Bangkok, Thailand
5 pages

International Road Federation

The 8.5 kilometre Lane Cove Tunnel Project will provide a controlled access link from the M2 Motorway to the Gore Hill Freeway, just north of Sydney, Australia. It incorporates twin 3.6 kilometre tunnels and additional freeway lanes. This paper outlines the project and the intended benefits which include improvements to traffic flows on arterials and local roads, bus services, pedestrian and cycling facilities, and air quality.

4. European research on tunnel fire safety

Rhodes, N

Tunnels and Tunnelling International 2005 Vol. 37 No. 7 Pages 25-27

The occurrence of several serious fires in European road tunnels in recent years prompted the European Commission to address the issue of tunnel safety. This article outlines the major objectives and progress of three of the programmes - Fire in Tunnels (FIT), UPTUN and SafeT.

5. Geoenvironmental considerations in optimum use of underground space

Sterling, RL, Godard, J-P

ITA Position Paper

18 pages

The history and rationales for using underground space and the importance of geology and geoenvironmental design in the underground works process are reviewed in this paper. A discussion of the trends in underground technology development and urban underground space usage is also included.

[Click here](#)

6. An intelligent approach to making tunnels safe

Dumsky, G

Traffic Engineering and Control 2003 Vol. 44 No. 3 Pages 98-99

This article describes a product produced by ArtiBrain, a company based in Austria. They have developed a video detection system that aims to emulate human decision making processes and offer totally automated tunnel monitoring.

7. Numerical tunnel design – how far have we come?

Grose, B, Macklin, S, Yeow, HC

Tunnels and Tunnelling International. 2005, Vol. 37 No. 5 Pages 40-43

A review of recent developments in computer modelling and 3D analysis of tunnelling projects, this article examines their impact on tunnel design and analysis. Includes discussion of the benefits to approval processes, health and safety issues, and instrumentation and monitoring system design decisions.

8. Optimizing vertical alignments: a quantitative approach to cost-effective road design for tunnels

Broeren, P

International Symposium on Highway Geometric Design, 3rd, 2005, Chicago, Illinois

18 pages

Transportation Research Board

This paper details a custom-developed decision support system (DSS) for vertical alignment design and discusses it in connection with the case of the second Coentunnel in Amsterdam, The Netherlands. This system consisted of three modules: quantitative risk, cost-benefit, and sensitivity modules. The cost-benefit analysis, for example, demonstrated that extra costs for traffic accidents and congestion because of the steeper grade, greatly exceeded any saving in construction costs.

9. Tunnels under construction: Code of Practice

WorkCover NSW 1990

16 pages

The WorkCover Authority of New South Wales has developed this Code of Practice with the aim of providing practical guidance for safe tunnel construction. The code sets out minimum requirements for tunnel construction work. [Click here](#)

10. The ‘worst-case’ conditions for the tunnel ventilation system in case of a major fire

Miclea, P, Harder, J

Rail Transit Conference Proceedings, 2005, Pittsburgh, Pennsylvania

12 pages

A fire in a tunnel exposes the strength of the standards that govern the design of tunnels and underground facilities, especially tunnel ventilation systems. Evacuation routes must remain free of smoke and heat for the duration of the evacuation, regardless of the specific fire conditions. This paper discusses some of the main factors that contribute to the worst-case design of tunnel ventilation systems, and the likelihood of such extreme conditions occurring simultaneously, offering recommendations regarding their inclusion into the design and sizing of the emergency equipment.

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