

EU

Durable And Reliable Tunnel Structures

A R&D programme known as DARTS is being partially financed by the EU. The €3.3 million project, which the EU is financing €1.66 million, is part of the Fifth Framework Programme. The EU countries will be investing €100-150 billion in the next ten years to build tunnels and underground structures to face congestion in rapidly growing urban areas. Disproportionate budget overruns and construction delays have characterised many tunnel projects, due to their complexity in technical, organisational and environmental aspects. Integrated design methods and supportive tools are lacking with respect to life cycle tunnel optimisation including durability, environmental aspect, sustainability and safety. DARTS will develop integrated compatible methods of durability, environmental and hazard design and improve decision basis for owners.

The prime contractor is Cowi of Denmark. Its partners are the Centre for Civil Engineering and Research Codes (Netherlands), Bouygues TP, Citytunnelkonsortiet i Malmö (Sweden), Ingenieurbüro Professor Schiessl (Germany), HBG, the Dutch ministry of transport, public works and water management, and the Netherlands Organization for Applied Scientific Research TNO. Visit www.cowi.dk and www.minvenw.nl

Taiwan

Longest High Speed Railway Tunnel Breaks Through

Premier Yu Shi-kun personally witnessed the holing through of the longest tunnel on Taiwan's high speed rail route on 29th August, 2002. The 7,276 m tunnel through Mount Pagua in Changhua County is part of contract C260 – which also includes six other short tunnels – and is the 20th tunnel that has been drilled through so far. It is also the longest one among the 41 tunnels on the high speed rail route between Taipei and Kaohsiung. The contractors – Bilfinger Berger (Germany) and Continental Construction Corp. of Taiwan – started drilling the tunnel on 8th April, 2000 using NATM. Holing through took place one and a half months ahead of schedule. Building will be completed by 28th June, 2004. Executives of Taiwan High Speed Rail Corp. (THSRC) reaffirmed the 345 km-long rail system will be completed in 2005 as scheduled. Visit www.thsrc.com.tw/emain/main.asp and www.hsr.gov.tw

World Digest Of Tunnels Under Planning

Canada. British Columbia transportation ministry planners envision a C\$756 million highway tunnel through the mountains north of Mount Seymour provincial park in a study that considers the pros and cons of alternative highway routes from Vancouver to Squamish. That route, which the ministry calls the "Hybrid Seymour-Indian Arm Route" would cost an estimated C\$3.9 billion to build, which is almost identical to the cost estimates for either the Indian or Seymour routes to Squamish. The study proposes two twin-lane tunnels through the insurmountable Fannin mountain range that divides the Seymour and Indian Arm drainages. They would be 8.4 kilometres long. Each kilometre of tunnel is estimated at more than C\$94 million. The granite in the area is fairly good for tunnelling. A new or revamped TBM is likely to be used. It might cost about C\$10 million to acquire and move a TBM to the site. The estimate breakdown is as follows: C\$13 million-C\$15 million per km for tunnelling and tunnel supports, C\$10 million per km for a concrete lining, C\$3 million per km for lighting and ventilation,

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C\$1 million per km for escape tunnels and C\$6 million for the tunnel portals.

China. The Qiantang river bridge in Hangzhou, a bridge operated for 65 years, will be adapted to the city light rail system of Hangzhou. This has been agreed by the ministry of railways and the Hangzhou municipal government recently. The ministry will rebuild a cross river railway tunnel in the lower reaches of the Qiantang river to replace the current Qiantang river bridge. There are only two railway bridges over the Qiantang river. With the fast development of railway transportation, capacity of these two bridges has come to saturation.

Italy. Agenzia olimpica Torino 2006, the authority in charge of organising the 2006 Winter Olympics in Turin, has approved six preliminary projects worth €150 million altogether. One of these – due to start at year-end or early 2003 – is the 1,856 m-long Corso Sebastopoli tunnel to connect Corso Unità d'Italia and Corso Unione Sovietica. It is estimated to cost €108.2 million. The tunnel will start at Piazza Polonia crossing Lingotto to surface near the Football Stadium. Another project is the refurbishment of the Sauze tunnel on road SS236. This will cost €1.5 million.

Switzerland. A majority of 57.53% of the Nidwald canton inhabitants has rejected the project to bore an exploration tunnel under the Wellenberg, prior to the construction of an underground nuclear dump for low and medium radioactive waste. Société coopérative nationale pour l'entreposage de déchets radioactifs (CEDRA) needs now to find an alternative. These nuclear waste in Switzerland are currently stored in storages within the plants and those of medical and research origins are stored in a storage in Würenlingen. Visit www.energie-schweiz.ch

United States. The Bush administration earmarked \$5 million for a feasibility study on the construction of a tunnel under Pennsylvania Avenue in front of the White House or under E Street behind the White House. President Bush set aside the money in the 2003 budget for the Federal Highway Administration to study whether a tunnel would help ease traffic congestion made worse by the closing of Pennsylvania Avenue in front of the White House itself during the Clinton administration. It has been estimated that construction costs range from \$55 million for a short tunnel under Pennsylvania Avenue to \$135 million for one under E Street. Read E-News Weekly # 2.

World Digest Of Bids

France. Open invitation to tender, deadline 16th October, 2002 for safety studies for 16 tunnels exceeding 300 m in Paris. Visit <http://ted.eur-op.eu.int/udl?request=Seek-Deliver&language=en&docid=138821-2002>, OJ S 174, or contact City of Paris, fax +33 140287205 and 140287305.

World Digest Of Contract Awards

France. Contract award to Scetauroute, value of €900,000, for environmental studies for the Lyon-Turin high speed link. Visit www.scetauroute.com and www.alpetunnel.com

Italy. Cir Costruzioni based in Argenta (Ferrara province) will build a 550 m-long tunnel under the Castello aragonese in Ortona at a cost of €9 million. The tunnel is part of the dualling of the last section of the Adriatic railway between Ortona and Guardiagrele.

Switzerland. BLS AlpTransit, the company responsible for planning and building the Lötschberg tunnel, has awarded Ascom a contract worth around CHF17 million to design, build and equip data and telephony networks for the tunnel. Work will begin once the service contracts have been signed and the Swiss government has released the credit. The time frame for this highly complex project is 2003 to mid-2007. Visit www.ascom.com

World Digest Of Ongoing Tunnelling

Spain. Breakthrough of the 1,118 m Santa María de la Cabeza tunnel in Madrid has been reported on 12th September, 2002 by Ferrovial and Dragados. Work will now focus on the final lining, ventilation, lighting and safety systems. The tunnel starts 100 m from Plaza de Atocha at the crossroads between Paseo de Santa María de la Cabeza, Calle Marqués de Valdivia and Calle Murcia, and ends near Calle Peñuelas. The €22.3 million tunnel is a north-south connection from downtown Madrid to the Toledo road (N-401) and the M-30 motorway. The tunnel runs under metro Line 3 and the suburban Cercanías rail line linking the Delicias and Pirámides stations. About 120,000 cubic metres of muck has been removed and 2,000 tonnes of steel plus 45,000 square metres of concrete has been used. Opening is scheduled for February 2003. Read E-News Weekly # 18.



Picture 1: The Varen tunnel on 15th July, 2002.

Switzerland. The dualling of the last single-track section of the Simplon railway, between Salquenen and Loèche, is under construction in the Valais canton since April 2000. It necessitates two tunnels. After two years of work, the Swiss federal railways have announced that the 2.8 km Varen tunnel has been holed through on 19th July, 2002. A pilot gallery was first bored using a TBM prior to being enlarged with drill-and-blast. The other tunnel, the 1,365 m-long Leuk tunnel, also required a pilot gallery which was holed through on 19th July, 2001. Entry in service is planned for the autumn of 2004. Visit www.sl-vs.ch

United States. Obayashi and Johnson Bros., the contractors digging light rail tunnels beneath Minneapolis-St. Paul International Airport have crossed a buried river valley for the second time, creating two sinkholes measuring 56 and 35 cubic metres that had to be filled with grout to solidify the area. In February, excavation of the first tunnel created a large sinkhole that closed a Northwest Airlines gate for a week and required 320 metres of fill. The sinkholes developed in the surrounding ground between the concrete rings and a surface area where planes taxi and park. The Herrenknecht TBM is continuing toward the south portal, where it is expected to emerge in late October. The first tunnel holed through in April (read E-News Weekly # 19). The two tunnels, costing about \$110 million, will allow trains to travel beneath the airport as part of the Hiawatha Line's eventual 18.7 km route between downtown Minneapolis and the Mall of America in Bloomington. Two stations will serve the airport – one underground near the main Lindbergh terminal and one on the surface near the Humphrey terminal. Excavation is well underway on the underground station near the main terminal. The hole being dug is about 160 metre long, enough to hold the 85 m platform plus rooms for electrical and communications equipment. Visit <http://www.dot.state.mn.us/metro/LRT> and www.metrocouncil.org/transportation/lrt/lrt.htm. Also visit www.tunnelbuilder.com, item us/54.

Venezuela. The Caracas-Tuy Medio rail project is now unlikely to start operating before the second half of 2005, compared to the original target of late 2004. The programme is running late due to a weak cash flow situation, and setbacks in the construction of stations, among other factors. As of the end of June, US\$1.14 billion had been spent on the project out of the total US\$1.7 billion budgeted. The construction contract for the 42 km line between the Venezuelan capital and the district of Tuy Medio was awarded to the Contuy-Medio consortium formed by Otaola (Venezuela), Ghella Sogone (Italy), Astaldi (Italy), Impregilo (Italy) and Marubeni (Japan). Marubeni will supply the trains. So far 22 tunnels have been excavated for the line, and just the last tunnel, through Las Mayas hill to El Poliedro station, remains to be bored. Read E-News Weekly # 4.

Venezuela. Work on a 9.5 km light railroad in Miranda province linking Los Teques city with capital Caracas is well underway and should be finished in 2005. Civil works, which started in February, are expected to take 34 months. Eighty percent of work scheduled for 2002 is done. Construction on the first of two stations, El Tambor, has started, and the entire project is 10% complete. Crews excavated

the Cristal river tunnel in August and have started work on two remaining tunnels. The rail line will link El Tambor in Los Teques, southwest of the capital, with Las Adjuntas station at the end of Line 2 of the Caracas metro. There will be no intermediate stations. Read E-News Weekly # 13. Visit www.tunnelbuilder.com, item ve/16.

World Digest Of Tunnel Renovation & Maintenance

Italy. Astaldi has started on 12th September, 2002 the upgrading of the 700 m-long Serra Spigola tunnel in south Cosenza on motorway A3 Salerno-Reggio Calabria. Modernisation of the second tube will start when the first bore is finished. Completion of the job is planned for July 2003. Visit www.enteanas.it

World Digest Of Inaugurations

Spain. The Spanish airports and air traffic authority (Aena) has opened the M-111 tunnels between Spain's principal airport Barajas in Madrid and Paracuellos del Jarama. The tunnels were opened by Plan Barajas, the organ associated to Aena in charge of the expansion of the Madrid airport. The 1,110 m-long tunnels, which will have a capacity of 6,000 vehicles per hour, are part of the diversion of a 2,034 m stretch of the M-111 road to avoid new airport installations, and will eventually pass under the future satellite building, airport services tunnel and one of the new runways. Visit www.aena.es

Spain. Barcelona has inaugurated on 15th September, 2002 its longest road tunnel – and allegedly the longest urban road tunnel in Europe. It is a 2.2 km cut-and-cover infrastructure between Cerdà and Diagonal. The north portal is near Calle Mejía Lejerica and the tunnel exits at Avenida Carrilet. Heading to Diagonal, there are entrances at the south portal, in Constitució and Sants, and exits in Doctors Dolsa, Masferrer and the north portal. To get to Cerdà, it is possible to enter the tunnel through the north portal, or in Sabino Arana and Avenida Madrid. Exits are in Avenida Madrid, Constitució and the south portal. The second longest tunnel in Barcelona is the La Rovira tunnel (1.3 km), followed by the Vila Olímpica tunnel (812 m), La Oreneta (783 m), Mitre (550 m), Poblenou (507 m), Almansa (490 m), Pla de Palau (455 m) and Colom (417 m).

World Digest Of Innovations – R & D

United Kingdom. Mayer International (UK) Ltd has developed a presettable light switching controller designed specifically to automatically adjust illumination in road tunnel entrance thresholds to accord with changes of daylight thus eliminating the hazardous 'black hole' effect associated with poorly lit tunnels. The unit operates from signals received from a light sensor which continuously measures changing lighting levels at tunnel entrances. The equipment is already installed at the A46/M1 motorway tunnel at Leicester and orders have been placed for numerous new road tunnels in Australia, China and Greece. Visit www.tunnel-lighting-control.com

Companies

Sweden. Skanska has appointed Stuart Graham as new president and chief executive officer of the Skanska Group. Mr Graham assumes his duties immediately, to succeed Claes Björk who is resigning from his present position. Visit www.skanska.com