

China

Shanghai Still Sinking

Shanghai is one of three cities in the country that have sunk more than two metres since 1921, a situation that could cause problems for underground facilities, such as metro tunnels, according to a recent government survey. The survey, conducted by the Ministry of Land and Resources, also shows that Tianjin and Taiyuan, capital of Shanxi Province, have sunk by that much since 1949. From September 2002 to September this year, Shanghai sank by around 13 mm, 3 mm more than the average subsidence in recent years. Although the current subsidence rate will keep the city above sea level for more than 400 years, it will probably cause the city's metro lines to deform because of the unevenness of land subsidence. Geologists blame the problem on the over-pumping of underground water and the rapid construction of skyscrapers in the city.

Experts plan to control the annual land subsidence within 5 mm by 2020, but this is proving to be very difficult. The city recently passed an urban planning law that limits the height and density of new buildings constructed downtown. The city has also taken to pumping water back into underground reservoirs to make up for the overuse of underground water sources. But attempts to limit the amount of water pumped out of these reservoirs has proven unsuccessful. The city set an annual pumping limit of around 50 million cubic metres, but more than twice that much is drawn from underground sources each year by factories and farmers.

World Digest of Tunnels under Planning

Germany. The Hesse Land stands just like the city of Rüdeshheim in favour of the 2.1 km Rüdeshheim tunnel despite heavy extra costs adding to the financing agreement signed in 1998 for the building of this rail tunnel. The project is on hold since it was known one year ago that the tunnel should be 480 m longer because of difficult geological conditions, water-bearing grounds, increased safety rules and the necessity to build a second tube. The total investment is believed to reach now €210 million as against €115 million in the agreement.

Laos. Thailand's state utility, Electricity Generating Authority of Thailand (EGAT), has signed an agreement to buy electricity generated at the US\$1.2 billion Nam Theun II hydroelectric power project, for a period of 25 years. The signing of the agreement completed in the Lao capital Vientiane by EGAT enables Nam Theun 2 Power Company (NTPC), the developer of the project, to proceed with the construction of the hydro plant on the Nakai Plateau, some 250 km east of Vientiane. The plant will provide 995 MW of electricity to EGAT and 75 MW to Electricité du Laos. Three kilometres of headrace tunnel, pressure shaft and pressure tunnel will transport water from the intake structure to the power station. Read E-News Weekly 35/2003. Visit www.namtheun2.com

Mexico. An immersed tunnel is planned in the state of Vera Cruz under the Coatzacoalcos river. The 1.6 km tunnel will link the Coatzacoalcos harbour with Allende, 700 m of which would be immersed. The project will require an investment of Ps1.2 billion, to be financed by the government, bank Banobras and possibly Petróleos Mexicanos. It is planned to develop the project under a 10-year concession deal.

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Spain. Tenders are to be invited shortly, further to approval by the Spanish government, for the design of the Boqueixón-Santiago and Ourense-Amoeiro sections of the high speed railway in Galicia. The 5.8 km Boqueixón-Santiago section includes the Marrozos and Santiago tunnels, 1,260 m and 620 m in length respectively. The estimated cost amounts to €72 million and the time frame is 30 months. The 6.4 km Ourense-Amoeiro section has two tunnels, (679 m and 4,062 m). Budget is €113.2 million and time frame for construction is 36 months.

Spain. The T2 tramline will connect the northern zone of the city, the historical centre of Valencia, Renfe's central railway station, the City of Arts and Sciences, the City of Justice and the Nazaret neighbourhood. This new line has been divided into two sections, one being the northern section which goes from Orriols/Torrefiel to Xàtiva station, passing through the historical centre of Valencia, and the other being the southern section which goes from the same station to Nazaret. The Orriols/Torrefiel-Xàtiva section will be built in phase one, providing a new artery to facilitate connections between the north and centre of Valencia.

This first section will have 12 stations and almost six km of track. The line will run on the surface from the Monastery of San Miguel de los Reyes to a point close to Pont de Fusta, where it will disappear underground until Estación del Norte, where it connects with Xàtiva station, consolidating the latter's status as an intermodal station between Line 3, the T-2 line and the Renfe services.

The new line will have three stations in order to respond to demand in the historical centre: one in the Plaza del Mercado to be known as Mercado, one next to the Mossén Sorell market to be known as Carmen and a third opposite the Serranos Towers. The access to this latter station will be positioned on the historical centre side to give more convenient pedestrian access to the IVAM and the Plaza de la Virgen.

Being developed concurrently with this first section of the T-2 line is a second fundamental project on the Xàtiva-Nazaret section which will serve the highly populated neighbourhood of Ruzafa and the City of Arts and Sciences area. Visit www.tunnelbuilder.com, es/105.

Switzerland. The city of Frauenfeld plans to end with traffic jams in the city centre by building a 600 m cut-and-cover tunnel. The cost is estimated at CHF50 million, financed one third each by the city, the canton and the Confederation. Building will start in February 2007 for opening at the earliest in 2009.

World Digest of Bids

Austria. Open invitation to tender, deadline 9th February, 2004 for construction of a 980 m-long 12 m² sewage collector in Graz. Visit <http://ted.publications.eu.int/udl?request=Seek-Deliver&language=en&docid=203662-2003>, OJ S 228, or contact Eisenbahn-Hochleistungsstrecken, Vienna, fax +43 18172186407. E-mail plk-st@hl-ag.com or helmut.steiner@hl-ag.com

France. Open invitation to tender, deadline 18th December, 2003 for feasibility study for a tunnel on road RD 2566 to bypass the Monti hamlet in Menton. Visit <http://ted.publications.eu.int/udl?request=Seek-Deliver&language=en&docid=204917-2003>, OJ S 229, or contact DDE des Alpes-Maritimes, Nice, fax +33 497186008.

France. Open invitation to tender, deadline 18th December, 2003 for feasibility study for a tunnel on road RD 17 to bypass the Gilette village. Visit <http://ted.publications.eu.int/udl?request=Seek-Deliver&language=en&docid=204918-2003>, OJ S 229, or contact DDE des Alpes-Maritimes, Nice, fax +33 497186008.

Germany. Open invitation to tender, deadline 23rd December, 2003 for equipment of a 440 m tunnel. Visit <http://ted.publications.eu.int/udl?request=Seek-Deliver&language=en&docid=201167-2003>, OJ S 225, or contact City of Augsburg, fax +49 8213243084. E-mail vergabe.baureferat@augzburg.de

Ireland. Negotiated procedure, deadline 7th January, 2004 for operations consultancy contract

consisting in the recruitment of an engineering consultancy service provider to advise in relation to the appointment of an operator (or operators) to manage and staff the Dublin port tunnel and the associated toll plaza. Visit <http://ted.publications.eu.int/udl?request=Seek-Deliver&language=en&docid=204025-2003>, OJ S 228, or contact National Roads Authority, Dublin, fax +353 1668009. E-mail hcreegan@nra.ie

United Kingdom. Preinformation notice for technical and specialist advice to assist in negotiations and discussions for a number of rail related projects in Westminster, among which Crossrail, with an estimated value of circa £90,000 per year. Visit <http://ted.publications.eu.int/udl?request=Seek-Deliver&language=en&docid=204815-2003>, OJ S 229, or contact Westminster City Council, London, fax +44 2076418535. E-mail khaynes@westminster.gov.uk

World Digest of Contract Awards

France. Geotec has secured a €35,605 contract for geotechnical investigation prior to the construction of two technical tunnels between La Puya and Les Espagnoux. The project is for a 300 m tunnel for a drinking water pipeline, to be built using a microtunnelling machine through limestone, diameter 2.5 to 3 m. Gradient 20%. Also a short section (20 to 30 m in smaller diameter). Visit www.geotec-sa.com

France. Fimatec won a €51,200 contract for ventilation and safety equipment in the La Condamine tunnel on road RD 2204B.

World Digest of Ongoing Tunnelling



Picture 1: Artist's impression of the Taio bypass tunnel.

Italy. Excavation of a 420.5 m-long 9.5 m-wide tunnel under Taio is to begin in south Tyrol as part of a 4,242 m bypass on trunk road SS 43 in Valle di Non, section Mollaro-Taio. The single-tube tunnel features a 5.35 m radius and will be mined. There will also be two cut-and-cover tunnels, 159 m in length each. The builders are Genova-based firm Carena SpA and Irces 95 Ingg. Pisa based in Brescia. The €32.7 million contract stipulates the job must be completed in 1,500 days. If the contractors finish the job ahead of schedule, they will get a special premium. Visit www.irces95.it

Italy. Valentina, the Lovat TBM broke through on 9th November in Piazza Massaua, completing 2 km of tunnel. The TBM started its job about one year ago, starting from Fermi, boring through the Paradiso and Marche stations. The TBM is now on its way to Pozzo Strada station, where it will meet with Madama Cristina, another Lovat TBM driving in the opposite direction from Monte Grappa. This second TBM broke through into this station on 17th October. The third TBM, a NFM refurbished machine, is due to start in December the boring of section Porta Susa-Porta Nuova. Visit www.metrotorino.it, www.lovat.com and www.tunnelbuilder.com, it/26.

Switzerland. A new 4,043 m railway tunnel is being built since 2001 between Grafenort and Engelberg on the Luzern-Stans-Engelberg railway. The tunnel will cost CHF105 million instead of CHF68 million and opening is delayed to end-2006 instead of fall 2005. The CHF37 million cost overruns, a 54% increase on the initial budget, will be financed by the Confederation (85%), and the Obwald and Nidwald cantons (7.5% each). CHF21 million is due to the difficult geological conditions. In 2002, the tunnel was flooded and this year, the tunnel was affected by two collapses. The geological risks were known during the design stage but core drills have not been done due to the cost to drill boreholes in difficult ground and to detect the very bad areas.

The tunnel is 5 m-wide and 6 m-high, for a cross section of 32 m². To date, progress has reached 2,300 m on the north drive and 576 m on the south drive. There is still 1,170 m still to go prior to

breakthrough. Drill/blast is used on the north drive. There are three shifts of 7-8 workers, working six days a week. The drill pattern consists of 90 holes. Advance reaches 3 m per blast. Sequential excavation is used on the south drive with driveage of the top heading using a roadheader. Daily advance does not exceed one metre. The contractors are Achermann and AST. Visit www.lse-bahn.ch/inhalt/aktuell/tunnelbau/ak_spaten.html and www.ast.co.at

United States. A total of 113 Harvey residents have filed complaints seeking millions of dollars in damages from the Metropolitan Water Reclamation District's contractor JV Jay Dee/Affholder who is blasting through the last section of the Deep Tunnel flood control project winding under Chicago and the suburbs, a project also known as the Little Calumet Leg of the Tunnel and Reservoir Plan (TARP). Residents say bad vibrations are leaving cracks in the floors and walls of their homes, maybe loosening foundations. This 12.9 km phase of the project has been under way in the south suburbs since February 2002 between Blue Island and Lansing. Most of the tunnel, however, will be built using a Robbins TBM.

The contractor insists science will prove the blasting couldn't have caused damages he ascribes to normal settling of the ground. Blasting experts say that any number of variables, including the force of the blast, the frequency of the blast waves and the distance from the site affect the impact on a structure. Blasts are measured by how many centimetres a particle of dirt would travel per second, and the threshold range for damage to a structure is 1.27 cm per second. Below that, a well-built house would not sustain any damages. Jay Dee/Affholder is setting off blasts at a high range of 1.78 cm per second. Whether a measurement above 1.27 at the blast site remains strong enough to cause damage by the time it reaches a given house takes a good deal of science to determine. Some residents say their preblasting videotapes don't show the damage they see now. In such cases, it might be left to all sorts of calculations and measurements to prove the contractor did or did not cause the trouble. Visit www.mwrddc.dst.il.us and www.tunnelbuilder.com, us/14.

World Digest of Tunnel Renovation & Maintenance

France. Negotiated procedure, deadline 26th December, 2003 for clearance increasing of the Pas du Roc 1 and 2, La Praz, La Brèche and La Madeleine tunnels on the Culoz-Modane line. Visit <http://ted.publications.eu.int/udl?request=Seek-Deliver&language=en&docid=201624-2003>, OJ S 225, or contact SNCF, Chambéry, fax +33 479609401. E-mail sra.chambery@sncf.fr

United Kingdom. Restricted procedure, deadline 31st December, 2003 for repair and maintenance of the mechanical services for the Butetown Link tunnel and associated cable networks, comprising of the following equipment: ventilation fans, lighting, switchboards and switchgear, pump control panels, fire valves, hydrants and pipework, lane control signs, motorway signalling equipment, emergency telephones, emergency distribution panels, air conditioning, earthing systems, battery tripping and closing units. Visit <http://ted.publications.eu.int/udl?request=Seek-Deliver&language=en&docid=204944-2003>, OJ S 229, or contact Cardiff City Council, Cardiff, fax +44 2920377605. E-mail nhyde@cardiff.gov.uk

Companies

Japan. Midsize contractors Kumagai Gumi and Tobishima will merge in April 2005 to make up the sixth construction group in Japan with an estimated turnover of ¥600 billion (€4.65 billion). Visit www.kumagaiqumi.co.jp and www.tobishima.co.jp