



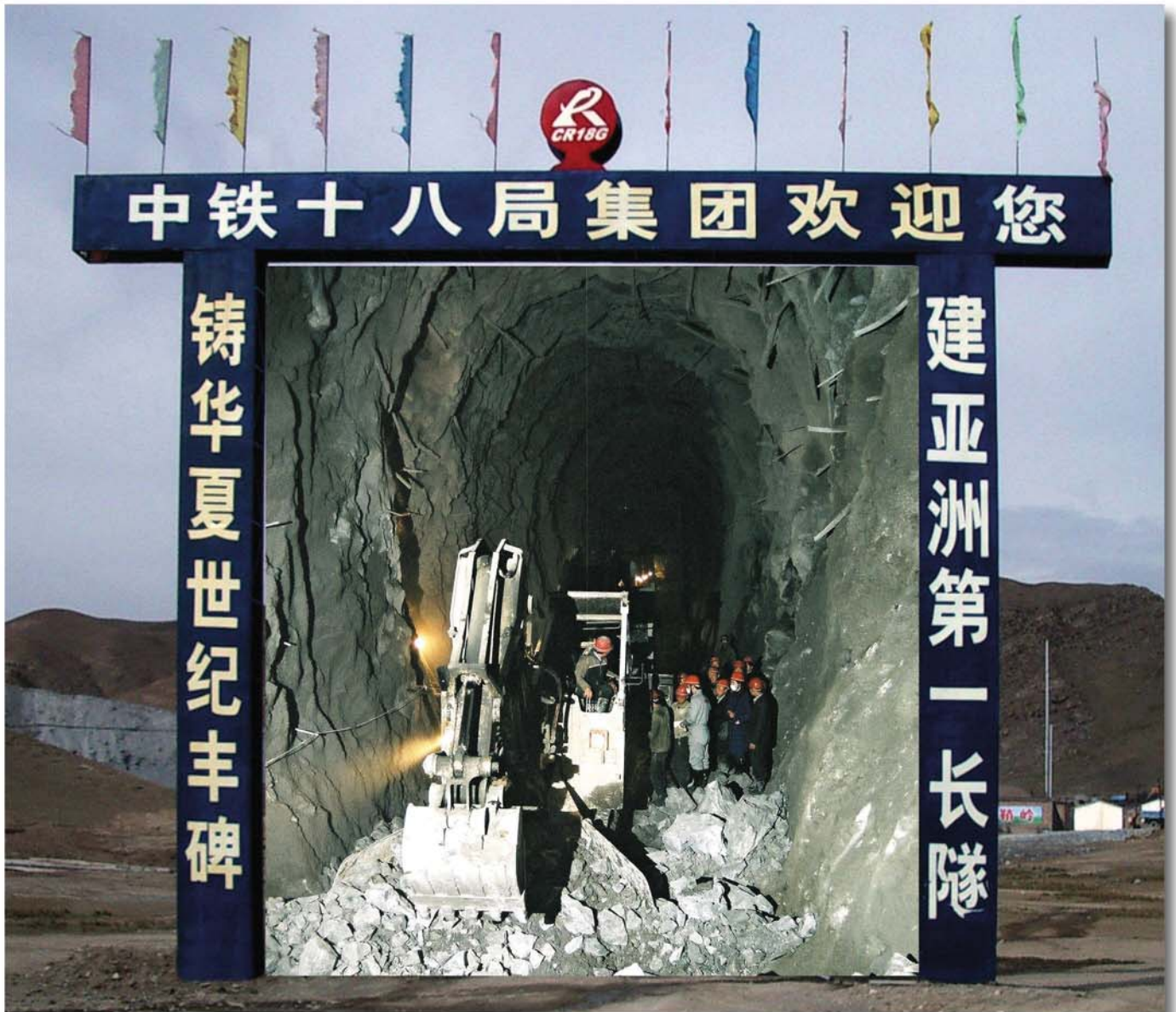
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ITC NEWS

- 16 - 2003

Wushaoling the longest railway Tunnel in China



Picture 1: «Chinese couplet» Building the longest tunnel in Asia; Establishing the monument in China; Welcome to Bureau 18 Group. Inside: Tunnel Loading Machine Schaeff model ITC 312 mucking in the mixed soil conditions

INTER TECHNO COMMERCE SA

Tunnelling Equipment

122, rue de la Fusion - CH-1920 Martigny

Tf: +41-277 222 191, Fx: +41-277 222 185

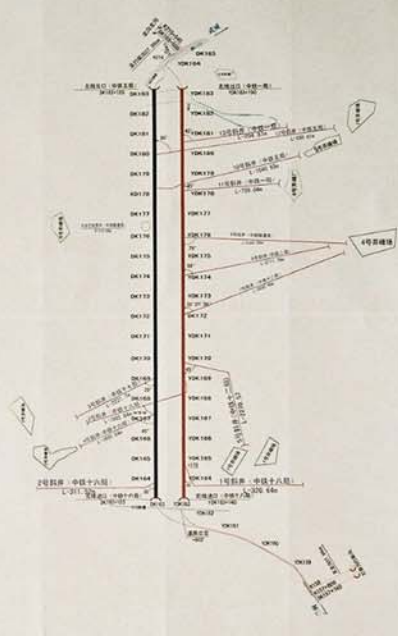
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工程概况

乌鞘岭隧道位于既有兰新线打柴沟车站和龙沟车站之间，设计为两座单线隧道，线间距40米，长度20050米，为11‰的单面坡。进口设计高程2663米，出口设计高程2447米。隧道穿越祁连山中高山区，洞身最大埋深1100米，全隧穿越四条区域性大断层，地质复杂。左线隧道先期作为平行导坑辅助右线施工，同时设13座斜井及1座竖井，长隧短打。右线隧道于2005年10月21日前建成。



Picture 2. General layout of the tunnel Project Brief Instruction

Wushaoling Tunnel is located between Dachaihou Station and Longgou Station and consists of two single tunnels with length of 20050 meter, the interval space of the two tunnel of 40 meter, 1.1% decline. The designing altitude of the tunnel entrance is 2663 m and the tunnel exit is 2447 m. The max. embedded depth of the tunnel is 1100 m. The tunnel is constructed through 4 fault zones. The left tunnel is constructed by the method of parallel heading to the right tunnel and there are 13 access tunnels and 1 shaft. The right tunnel will be completed before 21. 10. 2005.

Construction of new lines in Chinese Railways 2001-5 five-year plan will expand total network length from 68,000 to 75,000km. The plan involves investment totalling \$US 42.3 billion. Mike Knutton Senior Editorial Consultant IN absolute terms, China pumps more money into railway investment than any other country on earth. It is currently investing very nearly \$US 8.5 billion a year in its 2001-5 five-year plan, compared with its closest rival, German Rail, which is investing \$US 7.4 billion a year during the same period. In terms of spending per kilometre

to 2005, with turnover increasing by 2.4% and 1% respectively in the same period. Growth will be greater than average in the western region where domestic and international corridors are being expanded.

Development of new rail corridors is at the heart of China's rail expansion programme.

China's 10th five-year plan for railways is worth a total of Yuan 350 billion (\$US 42.3 billion) covering about 6000km of new main line and 1000km of new local line construction, 3000km of track doubling of existing lines, track upgrading, 6000 km of electrification, and the purchase and refurbishment of locomotives and rolling stock.

Lanzhou-Urumqi Railway

The continental landbridge (Lianyungang—Lanzhou—Urumqi—Alataw Shan-kou).

The line starts from Lanzhou in Gansu Province to Urumqi, capital of Xinjiang Autonomous Region, via Jiayuguan Pass. It passes through the Yellow River, crosses the Wushao Mountains, Tianshan Mountains and the Gobi Desert, with a total length of 1,903 km. This is the first railway trunk line in China's northwest region. In 1990, the line extended to Alataw Mountain Pass, linking with an arterial railway of the former Soviet Union, thus realizing the opening of the second Eurasian continental brigade.

The double tracking of the Lanzhou-Urumqi lines involve the Wushaoling tunnel, the longest in China, with complicated geological conditions.

Due to the drastic reduction in the working schedule, 12 access tunnels are / were constructed to get a lot of more faces in the main tunnel.

Totally 8 Bureaus of the Ministry of Railway are working on site with totally 20 units of ITC 312 machines.

The single lots are distributed as follows:

Access tunnel 1, length 326 m and 22 % decline was driven by #18 bureau of CRCC in slate and phyllite conditions with 1 machine ITC 312#0326. 7000 m of the main tunnel will be headed from this access.

Access tunnel 2, length 311 m and 10.2 % decline was driven by #16 bureau of CRCC in shale and argillite rock condition with 1 machine ITC 312#0327. 2300 m of the main tunnel will be headed from this access.

Access tunnel 3, length 2221 m and 11 % decline was driven by #18 bureau of CRCC in sand rock and argillite conditions with 2 machines ITC 312#0322 + 0342. 3000 + 5000 m of the main tunnel will be headed from this access.

Access tunnel 4, length 1685 m and 12 % decline was driven by #16 bureau

of CRCC in 3-4 degree surrounding rock condition with 1 machine ITC 312#0343. 2700 m of the main tunnel will be headed from this access.

Access tunnel 5, length 2270 m and 12 % decline was driven by #12 bureau of CRCC in sand rock condition with 1 machine ITC 312#0338.

Access Tunnel #6 is located at Jiji Gou of Dachaihou Town, Tianzhu County, 3,500 meter from right side of State Road #312. The total length of the access is 2221.5 meter, decline is 12% the merging point with the tunnel at the left line is in DK 169 + 600 and plane angle is 29°. The engineering purpose of this access is for the construction of the parallel heading from DK169 + 600 to DK171 + 300 at the left line. #17 bureau of CRCC will encounter hard construction conditions because of the variable geologic texture of F4 or F5 fault zone. The mud flow and mud surge may meet during the construction. Heading with 1 machine ITC 312#0314.

Access tunnel 7, length 3990 m and 12 % decline was driven by #12 bureau of CRCC in slate and phyllite slate conditions with 2 machine ITC 312#0319 + 0335.

Access tunnel 8, length 2771 m and 9.8 % decline was driven by #2 bureau of CRCC in slate and phyllite slate conditions with 2 machines ITC 312#0266 + 0337.

Access tunnel 9, length 2832 m and 14 % decline was driven by Tunnel Bureau of CRCC in severe rock condition with 1 machine ITC 312#0265. 1500 m of the main tunnel will be headed from this access.

Access tunnel 10, length 1640 m and 10 % decline was driven by #05 bureau of CRCC in lime-rock condition with 2 machines ITC 312#0263 + 0264. 2x5000 m of the main tunnel will be headed from this access.

Access tunnel 11, length 739 m and 22 % decline was driven by #01 bureau of CRCC in slate rock condition with 2 machines ITC 312#0261 + 0262. 400 m of the main tunnel will be headed from this access.

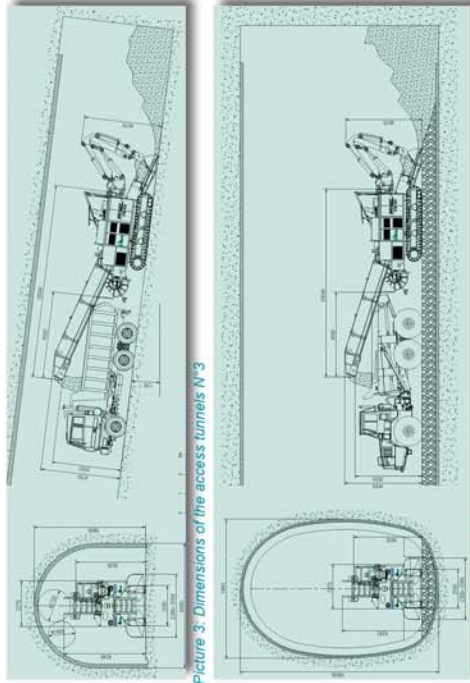
Access tunnel 12, length 342 m and 30 % decline was driven by #05 bureau in slate clay rock condition without ITC machine.

Access tunnel 13, length 233 m and 22 % decline was driven by #01 Bureau in silt stone and slate rock condition without ITC machine.

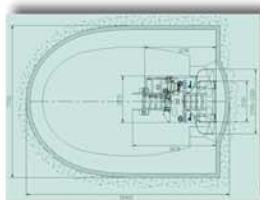
Main tunnel east portal left, length 7000 m and 1.1 % decline was driven by #18 Bureau in slate and phyllite condition with 1 machine ITC 312# 0326.

Main tunnel east portal right, length 2700 m and 1.1 % decline was driven by #16 Bureau in slate and phyllite condition with 1 machine ITC 312# 0327.

Main tunnel west portal left, length 6000 m and 1.1 % decline was driven by #01 Bureau in lime-rock condition with 1 machine ITC 312#0315.



Picture 3. Dimensions of the access tunnels N 3

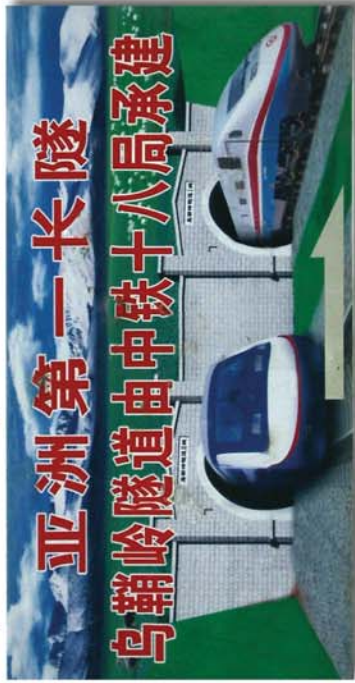


Picture 4. Dimensions of the main tunnels

Main tunnel west portal right, length 5000 m and 1.1% decline was driven by #05 Bureau in lime-rock condition with 2 machine ITC 312#0263+0264.

The maximal / average progress/month, for example: Bur. 18: 240 m / 200 m Bur. 02: 230 m / 190 m Bur. 05: 436 m / 200 m

The time schedule of the tunnel construction of 2.5 years is finally decided by the owner, Ministry of China Railway but at the beginning the tunnel construction schedule is 8 years according to the design. As the construction method is changed, now the tunnel is being constructed by 8 engineering bureaus of CRCC and CRCC.



Picture 6. Final result for 2005. The Longest Tunnel in Asia, Wushaoling Tunnel is constructed by Bureau 18

亚洲第一长隧
乌鞘岭隧道由中铁十八局承建



Picture 7: Mucking in the main tunnel



Picture 8: Loading onto Isuzu 20t dump trucks

工程简介

我公司担负施工的乌鞘岭隧道6号斜井，位于天祝县打柴沟镇茆茆沟内，距新312国道（右侧）3500米。斜井全长2221.5米，坡度为12%，与左线隧道的交点里程为DK169+600，平面夹角为29°。

该斜井主要担负左线DK169+600-DK171+300段左线平导施工任务。

该段地质构造复杂，主要穿越F4、F5断层破碎带，施工中突泥涌水和软岩流变等地质灾害随时可能遇到，施工难度大。

Picture 9: Access Tunnel #6 is located at Jiji Gou of Dachagou Town, Tianzhu County, 3,500 meter from right side of State Road #312. The total length is 2221.5 meter, decline is 12%the merging point with the tunnel at the left line is in DK 169 + 600 and plane angle is 29°. The engineering purpose of this access is for the construction of the parallel heading from DK169 + 600 to DK171 + 300 at the left line. #17 bureau of CRCC will encounter hard construction conditions because of the variable geologic texture of F4 or F5 fault zone. The mud flow and mud surge may meet during the construction.



Picture 10: Portal of the access tunnel ..

**20 units TUNNEL LOADING MACHINE
SCHAEFF Type ITC 312 H3
in the 20.05 km long Wushaoling
single track railway tunnel**



Picture 11: Mucking in the main tunnel



Picture 12: Shutter in the main tunnel



Picture 13: Access tunnel driven in soft rock