## Two 15.01m Slurry TBMs of CRCHI Break through on Two Projects

On Mar 12th, the largest slurry TBM in China’s Hunan Province broke through, which marks the completion of the right line tunneling of the Xiangya Road river-crossing tunnel in Changsha City and represents that the largest diameter shield machine tunnel in Hunan Province has achieved twin-tunnel through. The 15.01m slurry TBM ‘Xingsheng’ is manufactured by China Railway Construction Heavy Industry Corporation Limited (CRCHI) and launched on Mar 30,2021.

As the largest river-crossing tunnel in Hunan Province by far, the Xiangya Road river-crossing tunnel is considered as a key infrastructure project of Hunan Province, as well as a major livelihood project of Changsha City, which is the provincial capital. The total length of the tunnel is 4180m. The left line TBM tunnel is 1429 meters long, and the right line TBM tunnel is 1425 meters long. It is the first two-way six-lane river-crossing tunnel in Changsha and plans to open the main line to traffic by the end of 2023.

The project mainly crosses through moderately weathered rock and slightly weathered slate. The maximum strength extends to 86.6 MPa. There are multiple fracture zones in this section, of which maximum depth reaches to 46.3m. At the same time, the Changsha Metro Line 6 was under construction in parallel, bringing more challenges and risks to the constructions.

As per these geological conditions, CRCHI customized the 15.01m ‘Xingsheng’ TBM. The cutters were designed specifically to effectively reduce the impact upon the cutter head during the tunneling in the rock and composite strata under the river, greatly optimized the frequencies of cutters replacement and improved the excavation efficiency.

On March 9th, the 15.01m super-large diameter slurry TBM ‘Zhenxing’ broke through the left line of Hengqin Mangzhou Tunnel in Zhuhai City, which is 800km away from Changsha. The TBM is also manufactured by CRCHI and was launched on July 15th, 2022.

Hengqin Mangzhou Tunnel is located in Guangdong-Macao Deep Cooperation Zone. The tunnel is about 3 km long and planed to be open to traffic in 2024. The tunnel under cross the Maliuzhou Waterway,connecting Hengqin Island in the south and Zhuhai City in the north. The whole tunnel crossed through the ultra-soft soil layer, with the condition of more than 74.7% of the ultra-fine particles less than 20 microns, and the maximum depth is 50m. It is currently the super-large diameter shield machine subsea tunnel with the softest stratum and the highest content of fine particles in China.