

現在、施工を進めている中央新幹線第一中京圏トンネル(西尾工区)では、土かぶり約90mの地下に保守基地線トンネルと本線トンネルを包含する分岐大断面(延長150m、最大 330m^2)を上下線2か所、NATMで施工する計画である。分岐大断面は、事前の地質調査で確認された花崗岩区間に配置した。地表面は工業団地として開発されていることから、慎重な施工が求められた。そのため、先進導坑(100m^2)にて地質を把握し、事前設計の妥当性を確認した。掘削は大断面を分割し切り抜ける方法とし、各加背で計測管理をしながら、掘削を進めた。2023年2月時点で、上下線の分岐大断面の施工基面まで(最大 210m^2)の掘削が完了したため、その結果について施工経過を報告する。

Planning and Construction of a Large Cross-section Branching Tunnel with an Excavated Cross-sectional Area of 330m^2 (Part 1)

—The Chuo Shinkansen, Dai-ichi Chukyoken Tunnel, Saio Lot—
By Yoshinori Tatsumi, Central Japan Railway Company

Construction of a large cross-section branching tunnel (150 m in length, 330m^2 maximum) is planned in the Chuo Shinkansen Dai-ichi Chukyoken tunnel (Saio Lot), which is currently under construction. The two branching sections, including the maintenance yard line tunnel and the main line tunnel with an earth cover of approximately 90 m, will be constructed using the NATM. The large cross-section branch will be located in a granite section identified during the preliminary geological survey. Since the ground surface is being developed as an industrial park, careful construction is required. Therefore, the geological condition was investigated using a pilot tunnel (100m^2) to confirm the validity of the preliminary design. The excavation was carried out by dividing the large cross-section into sections and expanding the excavation area, with each section being measured and controlled. As of February 2023, excavation up to the base of the large cross-section of the inbound and outbound lines (maximum 210m^2) had been completed. In this paper, the authors report the progress of the construction.

東京都水道局では、安全でおいしい高品質な水の安定供給の取組みの一つとして、災害や事故時などにおけるバックアップ機能を確保するため、導水施設の二重化を進めており、現在、東大和市の多摩湖(村山貯水池)から武蔵野市の境浄水場に至る全長約11kmの区間において、導水施設である東村山境線の二重化事業を実施している。本工事は路線を4つの工区に分割したうちの第四工区にあたり、土かぶり約25mの位置に外径3.08mのシールドで延長1.34kmの導水トンネルを築造するものである。工事路線は、発進立坑築造時にシールド路線深さにおいて確認された最大長径550mmの巨礫を含む砂礫層の区間と硬質粘性土の区間にまたがっており、相反した特徴を持つ地盤への対応が求められた。本稿では、地盤条件や各種課題への施工上の対策とその実績について報告する。

Construction of a Muddy Soil Pressure Balanced Shield TBM for Sand Gravel Ground Mixed with Boulders and Hard Cohesive Soil

—Higashimurayama-Sakai Line, Bureau of Waterworks, Tokyo Metropolitan Government—

By Tomio Sakai, Tokyo Metropolitan Government

As part of efforts to ensure a stable supply of safe, delicious, high-quality water, the Bureau of Waterworks, Tokyo Metropolitan Government, is promoting the redundancy of water supply facilities to ensure a backup function in the event of a disaster or accident. Currently, the bureau carries out a project to duplicate the water conveyance facility from the Higashimurayama-Sakai line, an approximately 11-km section from Lake Tama (Murayama Reservoir) in Higashiyamato City to the Sakai Water Treatment Plant in Musashino City. The line is divided into four construction lots, and this project is the fourth lot. The project is a 1.34-km long water conduit tunnel constructed with a shield TBM with an outer diameter of 3.08 m at a location with an earth cover of approximately 25 m. The construction is required to deal with the ground with conflicting characteristics because the construction route passes through a section of sand gravel ground with mixed boulders with a maximum size of 550 mm, which was confirmed at the depth of the shield tunnel when the starting shaft was constructed, and a section of hard cohesive soil. In this paper, the authors report on the ground conditions and construction measures against various issues, as well as the results of these measures.

JR東日本では、東京圏鉄道ネットワークを最大限活用するとともに、多方面から羽田空港へのダイレクトアクセスを実現するため「羽田空港アクセス線」の建設プロジェクトに取り組んでいる。羽田空港アクセス線は、「羽田空港と首都圏の広範なエリアとのアクセス利便性向上」「時間短縮や乗換解消などシームレスな移動の実現」「異常時などにおける輸送代替性の向上」といった効果が期待される。羽田空港アクセス線では、東山手ルート、西山手ルート、りんかい線ルートの3ルートを計画しているが、JR東日本では「東山手ルート」および羽田空港駅に乗り入れるための「アクセス新線」に2023年6月より本格的な工事に着手する。本稿では、羽田空港アクセス新線の計画概要およびシールドトンネルなどの設計、施工上の課題について述べる。

Plan for Haneda Airport Access Line for Direct Access from Central Tokyo By Sayako Nakano, East Japan Railway Company

JR East is working on a project to construct a “Haneda Airport Access Line” to make maximum use of the Tokyo area railroad network and to provide direct access to Haneda Airport from many directions. The Haneda Airport Access Line is expected to “improve access convenience between Haneda Airport and a wide area of the Tokyo metropolitan area”, “realize seamless travel by reducing time and eliminating transfers”, and “improve transportation alternatives in times of emergency”. Three routes are planned for the Haneda Airport Access Line: the Higashiyamate Route, the Nishiyamate Route, and the Rinkai Line Route. JR East will begin full-scale construction on the Higashiyamate Route and the “New Access Line” to reach Haneda Airport Station in June 2023. In this paper, the authors describe the outline of the new Haneda Airport Access Line project and the issues involved in the design and construction of shield tunnels and other facilities.