

10. Development of Quality Assurance Systems for Tunnelling and Structure

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Construction management systems were developed to ensure construction quality during mountain tunneling and above ground construction. For mountain tunneling, a “mountain tunnel database” was developed that enables centralized organization of geological maps and data on completed work and quality management related to mountain tunnels relative to measurement points in the tunnel, and easy reference of relevant data at each measurement point. The database was applied at construction sites and its effectiveness as maintenance data was verified. For above ground work such as the construction of railway viaducts, a “three-dimensional reinforcement arrangement model” was applied at construction sites and the locations of reinforcement interference and the congestion of reinforcement were visually confirmed. Construction was simulated by checking whether spherical models with the same diameter as concrete aggregate or concrete vibrator could pass through the gaps between reinforcing bars. It was verified that the results were effective as data for justifying design modification.

Key words : mountain tunnel database, maintenance, three-dimensional reinforcement arrangement model, construction simulation