Stuttgart 21 Railway Station

Lindapter Hollo-Bolts provided a fully bolted, optimised connection solution for splicing structural hollow sections to form lift shaft frames within the Stuttgart 21 underground railway station.

Project Background

Location: Stuttgart, Germany
Product: Hollo-Bolt® by Lindapter®
Quantity: 12,475
Client: Deutsche Bahn (German Rail)
Engineer / Specifier: Werner & Balci Engineering, Esslingen
Contractor / Steel Fabricator: Max Bögl

Stuttgart 21 is one of Germany's largest and most complex rail infrastructure projects, involving the construction of a new underground railway station strategically located between Stuttgart Airport and the Stuttgart Fair halls. Designed to significantly improve passenger connectivity and transport capacity, the project required extensive new structural steel frameworks to support vertical circulation elements, including lift shafts, within a constrained underground environment. Given the scale of the works and the critical nature of the infrastructure, proven and reliable connection solutions were essential.

Client Requirement

The client required a bolted connection system for splicing structural hollow sections (SHS) to form new lift shaft frames within the underground station. Welding was undesirable due to programme constraints, underground site conditions and quality control considerations. The solution needed to deliver reliable structural performance, enable efficient installation, and align with the engineer's preference for a mechanically bolted system that could be installed accurately and repeatedly across many connections.

Hollo-Bolts formed a robust bolted splice connection for SHS members, eliminating the need for welding in a confined underground environment

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Design Solution

Hollo-Bolt hexagonal head fixings in hot dip galvanised finish were specified to meet the project's structural and durability requirements. A range of sizes, including M12 and M16 variants were selected to suit the different load demands and connection geometries across the lift frame structures. Initially, an alternative Hollo-Bolt configuration was specified; however, Lindapter worked closely with the project team to optimise the solution, refining the specification to ensure the most efficient and appropriate product selection for the application.

The resulting design provided a robust bolted splice connection for SHS members, eliminating the need for welding while maintaining high structural integrity.

Installation

Hollo-Bolts were used to create splice connections between SHS members, forming the primary steel frames for lift shaft structures throughout the underground station. These connections were critical in transferring loads safely and accurately within the lift shafts while allowing construction to proceed efficiently within the confined underground environment.

Installation took place within the new underground station, positioned approximately two minutes' walk from both the airport terminal and the exhibition halls. The use of Hollo-Bolts allowed the steelwork to be assembled quickly and precisely on site, without the need for welding equipment or extended hot-work procedures. This contributed to a smoother installation process and supported progress within the tight logistical and spatial constraints of a major underground transport hub.

Result

The optimised Hollo-Bolt solution delivered a reliable, fully bolted connection system that met the client's requirements and supported the efficient construction of lift shaft frames within the Stuttgart 21 station. By avoiding welding and simplifying installation, the solution enhanced build efficiency while ensuring long-term structural performance in a demanding rail infrastructure environment.

Key Benefits

- ✔ Efficient splicing of SHS members without welding
- ✔ Optimised specification through Lindapter's technical support
- ✔ Hot dip galvanised finish for durability and long-term performance
- ✔ Suitable for large-scale, complex underground rail infrastructure projects

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