

Shear force transmission for load-bearing exposed precast concrete façade



The new August-Kühne-Haus in Bremen.

The new August-Kühne-Haus is currently under construction at the historic headquarters of the logistics company Kühne + Nagel in Bremen. Thermally insulating Egco-box cantilever connectors were supplied for the precast sections of the load-bearing exposed concrete façade.

Lydia Gritsch, Max Frank, Leiblfing, Germany



Design of the precast façade sections with in-situ Egco-box units.

Kühne + Nagel was founded almost 130 years ago in Bremen by August Kühne and Friedrich Nagel. Today the company has more than 1300 branches and around 82,000 employees worldwide and is one of the world's leading logistics service providers.



[Photos: Max Frank.]

Shear force transmission on the façade section using Egco-box thermally insulating connectors.

Reinforcement and Accessories



(Photo: Max Frank.)

Column-free rooms thanks to load-bearing façade elements.

The previous administration building in Bremen from the 1960s, the August-Kühne-Haus, had become too small for the growing company. Kühne + Nagel decided to demolish the old building and build a new head office at the current site on the corner of Wilhelm-Kaisen-Brücke/Martinistrasse in Bremen. With an investment sum of €26 million (US\$29.4m), the new building is intended to offer sufficient room for the employees with 13,500m² of floor space. The building is currently under construction and is expected to be finished in mid-2019.

The façade of the office building on the River Weser reflects the colour of the Weser sandstone, which has a grey-beige hue. The dynamic appearance of the building creates a visual illusion in relation to the height; "it steps down to the river," says the architect Jan-Oliver Meding from MPP MEDING PLAN + PROJEKT Hamburg.

Load-bearing façade

The special feature of the administration building is its load-bearing façade. Precast concrete sections, measuring 2.7m wide by 7m high, were used for this application – each being connected over two storey levels. The construction of the façade elements was manufactured in one piece. The floor span, from the building core to the load-bearing façade, is almost 7m; this produces column-free room space with a visually appealing spacious look.

High requirements

For the new August-Kühne-Haus, Egccobox was used for the thermal separation of the cold façade from the warm floor. A reduction in thermal bridging was successfully achieved through the use of high-quality materials in the Egccobox. The A1-classified mineral wool insulating material thus provides for maximum safety in case of fire as well as a low thermal conductivity.

High requirements were placed on the horizontal and vertical shear force capacity, especially in the area of the 'connecting bridge' between the higher and lower parts of the building. The transmission of these forces to the storey

floor was secured with the help of a highly reinforced edge beam. In the case of this project, shear forces of up to 500kN over the 0.5m can be transmitted with the Egccobox. Wind loads, acting in parallel and perpendicular directions against the façade, are also absorbed via the Egccobox units and dissipated to the building core. In addition, the Stremaform storage element facilitates the production of the necessary construction joints in this area on the one hand and optimally fulfils the required tothing effect on the other.

Product combination

In order to reduce the transport volume of the façade elements from the precast plant to the building site in Bremen, the shear force bars of the Egccobox were manufactured at shorter lengths with the aid of Coupler screw connections. The corresponding counterpart of the Coupler screw connection was mounted on-site. The product combination of the Egccobox thermal isolating elements and the Coupler screw connection from Max Frank is beneficial due to its low transport volume and individuality. ■



(Photo: Max Frank.)

Frame of the precast façade sections with Egccobox.