



Maintenance hall of superlatives

Ductile drainage pipes for the A380 hangar

The Airbus A380, currently the largest passenger aircraft in the world, surpasses all previous records, not only in terms of passenger capacity, but also when it comes to dimensions and weight. The Airbus A380 is the largest passenger aircraft in series production in the world, and the first wide-bodied aircraft with two full-length passenger decks. The new flagship of the Airbus Group heralds a new class of wide-bodied jets. It has a maximum approved seating capacity of 853 passengers and, depending on the equipment variant, a maximum takeoff weight of 592 tonnes. The physical dimensions are equally impressive, with a length of 72.30 metres, a wingspan of 79.80 metres and a height of 24.10 metres.

And this is precisely where the problem lies. The A380 is simply too large and sometimes too heavy for existing facilities. Extensive modifications therefore have to be made to the existing airport infrastructure, or new facilities have to be constructed.

As is the case at the largest airport in Germany, the Rhein-Main Airport in Frankfurt/Main, where the A380 hangar and apron is

currently under construction. When the first Lufthansa A380 Airbus comes into service in the summer of 2009, things will also become serious for technology, engineering and maintenance. Since the previous maintenance hangars at Frankfurt Airport are too low to accommodate the new aircraft, a new aircraft hangar is being erected on the southwest side of the airport: 350 m long, 140 m wide and 45 m high. These dimensions will make the new A380 hangar the largest single industrial building in Germany. The 42,000 m² area of the building offers enough room to accommodate four Airbus A380s or six Boeing 747s.

Lufthansa is investing approx. €150 million in the new hangar, including the apron and parking areas and the connection to the existing rail system. The construction of the maintenance hangar is in full swing. The cornerstone was laid on 21st September 2006.

The rainwater drainage pipes being used for the surface drainage of the hangar and apron, consisting of ductile drainage pipes as per DIN EN 598 in the DN 500, DN 700, DN 800 and DN 900





nominal sizes were manufactured by Buderus Giesserei Wetzlar GmbH, and the DN 1000 pipes by the Bunte/Bratengeier consortium.

Due to the enormous weight of the A380 and the very low pipe coverage of only 96 cm in some places, the structural stability of the pipes had to be proven. For this project, it was also essential to make special calculations with preliminary considerations. Because of the complexity of the calculations to be produced, the task was entrusted to the Civil Engineering Faculty at the Münster University of Applied Sciences, under the direction of Professor Dr.-Ing. Bernhard Falter. The calculations ultimately showed that ductile cast iron pipes with a K7 wall thickness class would suffice even for this extreme application case. Additional measures such as concrete bedding or load distribution panels were not necessary. Furthermore, the excavation and in-fill quantities could be greatly reduced due to the very low wall thickness, enabling the surface drainage to be implemented with a relatively low technical and financial input.

