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Modification of listed cranes

Georg Friedrich Barracks, Fritzlar

Type of crane Double girder overhead travelling cranes _ **Year of construction** 1937 _ **Modification** 2007 _ **S.W.L.** 10,000 kg _ **Scope of supply** Updating two crane systems under conditions imposed by the Heritage Agency, Replacement of hoists, modification of travel drives, modernisation of safety equipment, replacement of electrics and power supply

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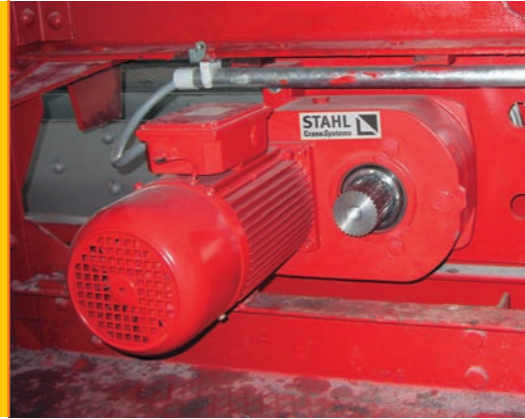
Lifting technology | Drive technology | Control technology



New hoists from the SH6 series updated the cranes to the state of the art and the latest safety regulations. The customised design fits perfectly into the existing structure of the cranes.



The crabs were updated swiftly and cost-effectively with the modular wheel blocks with original drives from STAHL CraneSystems.



Colour-perfect integration into the historical latticework was made possible by an off-standard red paint for the hoists and crabs.



Modern radio signal technology ensures reliable transmission of signals. The prewar festoon cables were a visual distraction and were removed completely so that the filigree latticework is shown off to advantage.



Fritzlar is the Federal German Army's helicopter hub in the centre of Germany. The Georg Friedrich Barracks situated there was built in the 1930's. Even in those days, the site included an airfield. Tenders were invited for modernising the buildings as part of a reconstruction project. Building 3 was to be brought up to state of the art complying with conditions laid down by the Heritage Agency. Part of the scope of the project on the army site was converting two identical crane systems built by the traditional Kassel company of Buck & Henkel AG.

Requirements The 1937 cranes needed to be updated as the old systems had an unprotected open power supply and various parts of the system no longer guaranteed safe operation. Also spare parts were difficult to find and had become extremely costly over the years.

For this reason the hoists, the electrical installation and the crane drives were to be replaced to match the users' requirements and ensure cost-effectiveness. At the same time the appearance of the cranes, which are listed, had to be maintained. The Heritage Agency focussed particular attention on the latticework con-

struction of the crane bridge girders, rarely seen nowadays, and the colour. As in restoring historical buildings, the modification needed to maintain the character of the building structure – an unusual challenge which STAHL CraneSystems was pleased to accept.

Realisation Together with the customer, the experienced engineers from STAHL CraneSystems' Hannover Branch Office drew up a concept for updating the cranes to the state of the art. The planned modification made a test as stipulated by §25 Clause 1 of the Accident Prevention Regulations for Cranes (VBGD6) necessary and the Machinery Directive, the Law on Equipment Safety and national regulations had to be applied. As no crane test logbook or technical documentation with the documents necessary to establish the identity and type of operation of the cranes was available, in advance the University of Kassel carried out material tests and calculated welding and bolt connections. The static calculation as per DIN 18800 and DIN 4132 resulted in the old rails being replaced. Rails of a total length of 66 metres were mounted in the existing bridge construction. Electric wire rope hoists of the SH6 series with an S.W.L. of 10 tonnes were used. The double-grooved rope drum permits true vertical lift with a lifting height of 12.5 metres. The crabs were

designed with cost-effective original components from STAHL CraneSystems and adapted to the existing track gauge. Rope sensors provide reliable protection against overloads. In conjunction with the SMC Multicontroller, this technique provides the basis for safe working, long life and documentation of the actual use of the hoist.

The trickiest job was modernising the crane drives. The drive technology usual seventy years ago, a central drive with drive shafts, had become uneconomic. The ravages of time had caused a great deal of wear so that the crane drives as a whole were replaced. After dismantling the old wheels, modular wheel blocks from STAHL CraneSystems' series programme were fitted. Experienced fitters carried out this work directly on site at a height of 13 m. The heavy crane bridges did not have to be removed from the crane runway for this, a huge saving on time and costs.

All new components were treated with a high-quality paint that matches the historical construction perfectly. The new concept for the electrics also met the particular industrial heritage requirements. The control signals to the hoist are transmitted without a festoon cable being installed. In its place a modern radio signal transmission was used. Compact conductor lines carry the power along the crane bridges. They are mounted inside the crane bridges so that no visually distracting festoon cables

detract from the overall appearance of the historical latticework construction. Similarly, new compact conductor lines supply power to the cranes along the 50 m long crane runways.

Result The entire modernisation of the cranes, from planning to design right up to assembly and commissioning, was completed on schedule. Documentation comprising crane test logbook, certificate of conformity and CE marking was put together for the acceptance test complying with the accident prevention regulations VBG9 §25. After testing and commissioning were successfully completed, the updated crane systems are once more fit for lifting heavy loads safely. Thus innovative technology in conjunction with cost-effective series production contributes to preserving a listed mechanical engineering tradition for posterity.