The international factory crane magazine

December/January 2008 Issue 67

HOIST

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Installing cranes

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Miracle workers

US firm North American Industries (NAI) often begins work on a Friday, working nights and weekends to complete a major portion of the installation when the plant would normally be closed

Installing lifting equipment in existing, and sometimes operational, factories is one of the biggest challenges for crane builders and manufacturers alike. Richard Howes finds out how they do it

We've all looked and wondered how the ship got into the bottle, but getting an overhead crane into an existing factory environment is equally challenging. Yet Mark Sidwell, sales director at the UK's Granada Materials Handling, says this kind of work dominates the diary around 90% of the time. The smaller percentage of time is taken up by external lifting equipment or fitting cranes as part of new builds.

For US firm North American Industries (NAI), the ratio is different (50/50) but still large enough to present regular problems, as it explains later. It says it often begins work on a Friday, working nights and weekends to complete a major portion of the installation when the plant would normally be closed.

By installations, we could be talking about installing runways and/or EOT girders. Here, we refer to both. Fitting runways is the more time consuming exercise where girders can often be positioned in a single mobile crane lift.

Of course, the people ordering the installation will rarely be crane-minded and the crane will often be an after-thought when the problem of lifting something too heavy to do so manually arises.

Put simply, existing buildings cannot handle the stresses enforced by modern day lifting gear, and the sometimes huge weights they can carry. There is the possibility of shock loading arising from accidental collision into the travel end stops at speed.

"Sometimes it's possible to get a structural engineer in to assess the strength of the building," says Sidwell, and it is possible to bolt new steel structures to existing framework, "but this is rare and tricky in itself," he adds.

Ingo Ruehl, materials handling boss at CERN (the European Organisation for Nuclear Research), agrees that the biggest obstacle to overcome is the building conformity, "the dimensions (mainly the height) for calculating clearances and the structure and foundations regarding the SWL," he explains. He says when there is a lack of clearance space "we make sure that all access to the crane rails and the crane itself are locked and set up a procedure that regulates the access."

Portal frame buildings are essentially erected as economical, multi-purpose warehouses, marketable, say, to storage and light fabrication firms. So when a firm requires the lifting of heavy marble sections, for example, a more robust framework must be installed within to support cranes, whether it be a jib crane in one corner, or an overhead crane spanning the whole factory floor.

If concrete footings are necessary, the manufacturer can inform the customer for what load capacity they need to be rated in order to support the crane.

Another example of the calamity installations can cause is when a customer ordered a 480 volt crane, but only had 240 volts in their building (perhaps due to a misunderstanding between the customer and their electrical contractor).

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NAI says it sends customers engineering clearance drawings which provide all important measurements and details. The customer either signs the drawing as it is or works with the crane engineers requesting adjustments until the drawing is approved. Only then does the manufacturing process begin.

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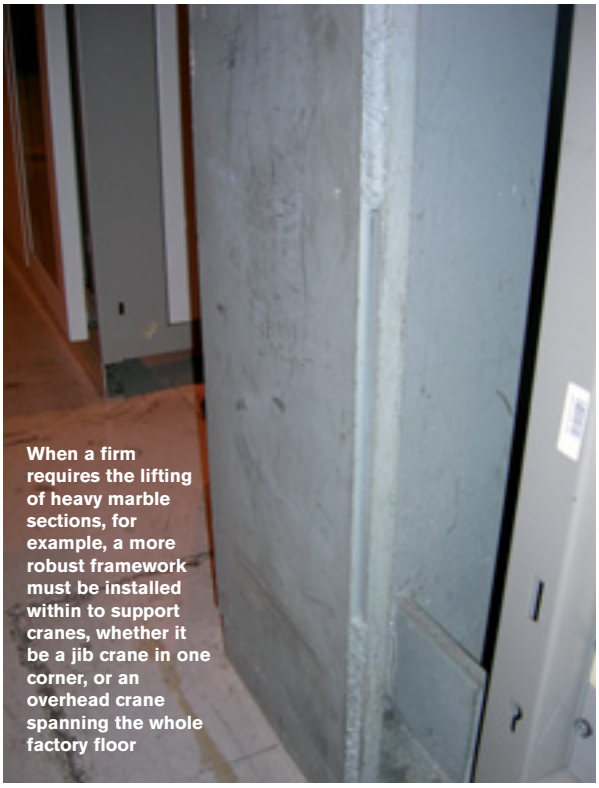

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Additionally, pre-installation letters are composed, clearly stating the expectations and responsibilities of both the customer and the manufacturer. For example, it may be agreed that the customer must have anchor bolts in place prior to the installation.

Planning helps protect the crane builder because it is the one which has to get the job done.

Job specifications can get pretty bizarre. Mark Sidwell recalls a job at a water treatment firm where they had to transport the crane parts across a beach. While they stopped short of taking their shoes off and rolling up their trousers, the shifting sand and incoming tide presented a logistical nightmare.

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NAI more recently installed a crane in Utah about 40 miles from the nearest town, climbing rough hilly terrain with a telehandler in order to transport the bridge beam from the road to the installation location.

NAI says it overcame several obstacles on one memorable job in which they complied with a customer's request during manufacturing to shorten the span of the bridge beam on a custom overhead crane. However, during the normal procedure of taking final measurements at the job site prior to installation, NAI discovered that the customer had never communicated to the building engineer the same requested change. As a result, the crane span was built to the customer's specifications, yet it would not have been long enough to reach the runway attached to the building. The measurements taken by NAI also turned up another problem, that the supports erected by the builders, on which the crane was to be installed, were uneven.

In this case, the bridge girder extension was welded on site, lengthening the beam once again so that it would fit the new dimensions.

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