

# Finishing touch

The Finnish National Opera in Helsinki completes its renovation with a new flying ballet wagon

**The facility reopened in January this year with the premier of a new production of Sleeping Beauty**

The Finnish Opera in Helsinki was founded in 1911, and opened its first opera house in Töölönlahti bay in 1993. In 2005 a project was started to update the upper and lower stage machinery. The concept was designed by Arkkitehtitoimisto HPK, managed by GCA Ag, and completed in 2007.

The main stage has an area of 500m<sup>2</sup>, with a 28m fly tower. The stage can be rotated, raised or lowered, and is divided into four sections that can be raised or lowered separately, and used as lifts to transport sets from basement storage up to stage level.

At first the concept for the stage did not include a new ballet wagon. But the existing 16x16m ballet wagon took a lot of time and effort to put into position on the main stage – over an hour for 25-30 stage crew to move the ballet wagon from the side stage on to the main stage by hand. This procedure was carried out for over 100 performances each year.

It was clear that it would be extremely useful to have a ballet floor that could be set up on stage in a short time period, saving manpower, time and cost. The problem was discussed with the planners, GCA, and a solution was conceived – a new ballet floor wagon could be stored in the back of the fly loft of the main stage, and lowered down and rolled into position on the front stage.

The next question was how this ballet floor could be positioned on stage. The performing artists, preferring the Harlequin Sprung floor system, also wanted the new system to provide excellent conditions on stage. The engineering

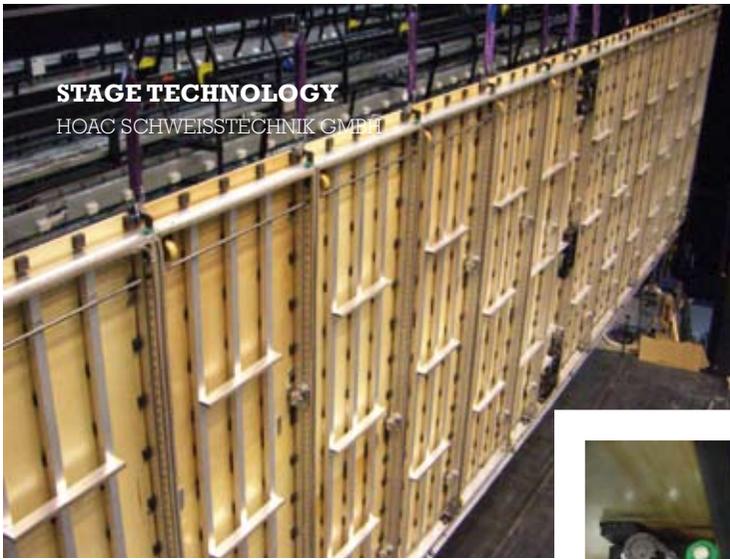
involved had already been successfully installed by Hoac Schweißtechnik at the Het Muziek Theater in Amsterdam, the Netherlands. That ballet floor wagon is based on a sandwich construction of Hoac aluminium frames. The Harlequin Sprung floor system is stored in the back of the fly loft, held by 3-ton winches.

Luckily, since a new, complete system of upper machinery was being installed at The Finnish National Opera House, a heavy storage area behind the fly loft could be considered. However, at discussions in December 2006, it became apparent that the project would be a big challenge, as the construction needed to be completely re-designed. The thickness of the ballet wagon was to be limited to 15cm, whereas the one at the Het Muziek Theater was 18cm. Another requirement was to be able to lower the wheeled ballet floor wagon to ground level after rolling it into position. The opera house wanted set-up times of under 15 minutes, using only a handful of stage crew members.

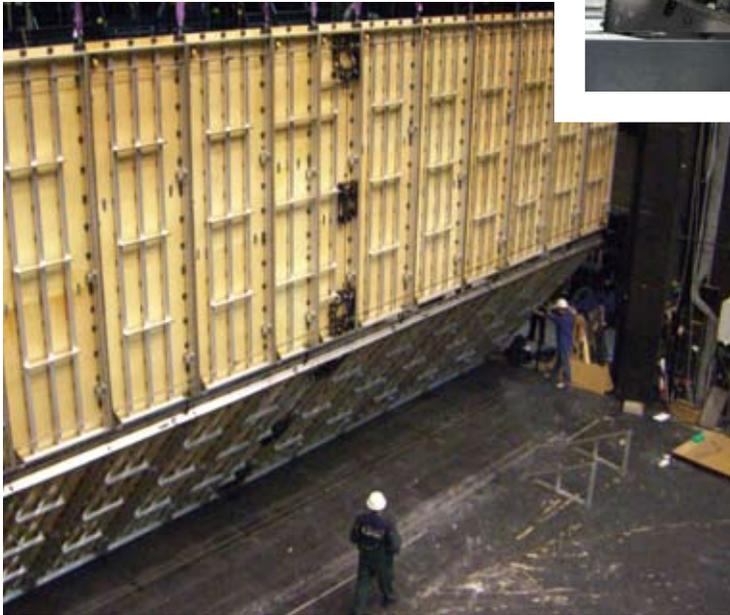
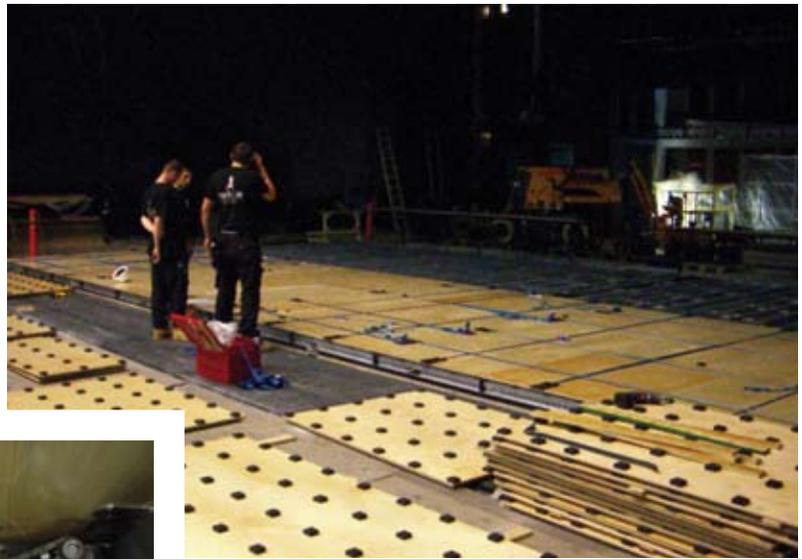
## **Back to the drawing board**

Hoac developed a completely new construction plan. The stage wagon used is 10.5cm thick, to allow enough space for the adapted Harlequin liberty sprung floor system, which has a shock-damped structure. New mechanical central drives were placed in the middle of each section (the wagon consists of four quarters) to bring the ballet floor to the ground, using hidden wheels. The power to lift and lower these wheels is transmitted by using central shafts, and gears for direction changes.





**STAGE TECHNOLOGY**  
HOAC SCHWEISSTECHNIK GMBH



**The wagon is stored in two parts, each of which consists of two connecting sections**

The new ballet floor wagon was installed on the main stage at Helsinki in September 2007. The 16x16m wagon is stored in two parts at the end of the fly loft, each hanging by two 3.5ton winches. Each half consists of two 4x16m sections, connected by articulated hinges. Elevating stages are positioned a few centimetres below the main stage, and act as guides as each part of the ballet floor is lowered onto them. Each section is lowered to the stage, disconnected and then positioned into place by hand. The sections are then closed mechanically with tenterhooks, while guiding anchors guarantee the stage is locked together.

The connection between the aluminium frame and the Harlequin liberty sprung floor system is based on a linear-driven bearing device mounted onto the frame. This allows the shock-dampening floor panels to move without obstructions.

The floor was premiered at a new production of the classic ballet *Sleeping Beauty*, in January

2008. While the opera house gained a large time- and effort-saving advantage, it was clear there was no loss in the quality of dance.

**Reduced set-up times**

“The performing artists feel no differences in usage compared to the old ballet floor wagon,” says Timo Tuovilen, technical director of the Finnish National Opera House. “In the beginning it seemed to us that the old version was much easier to use, even though it took so much time and manpower, since the new ballet floor wagon is something completely new on stage,” he adds. “But now, after getting used to this system, we actually end up with an easier use than before. Right now the set-up time is around 18 minutes and set-down time is 8 minutes, all done with four people. In a few months we will surely end up with less than 15 minutes set up time.” ■

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