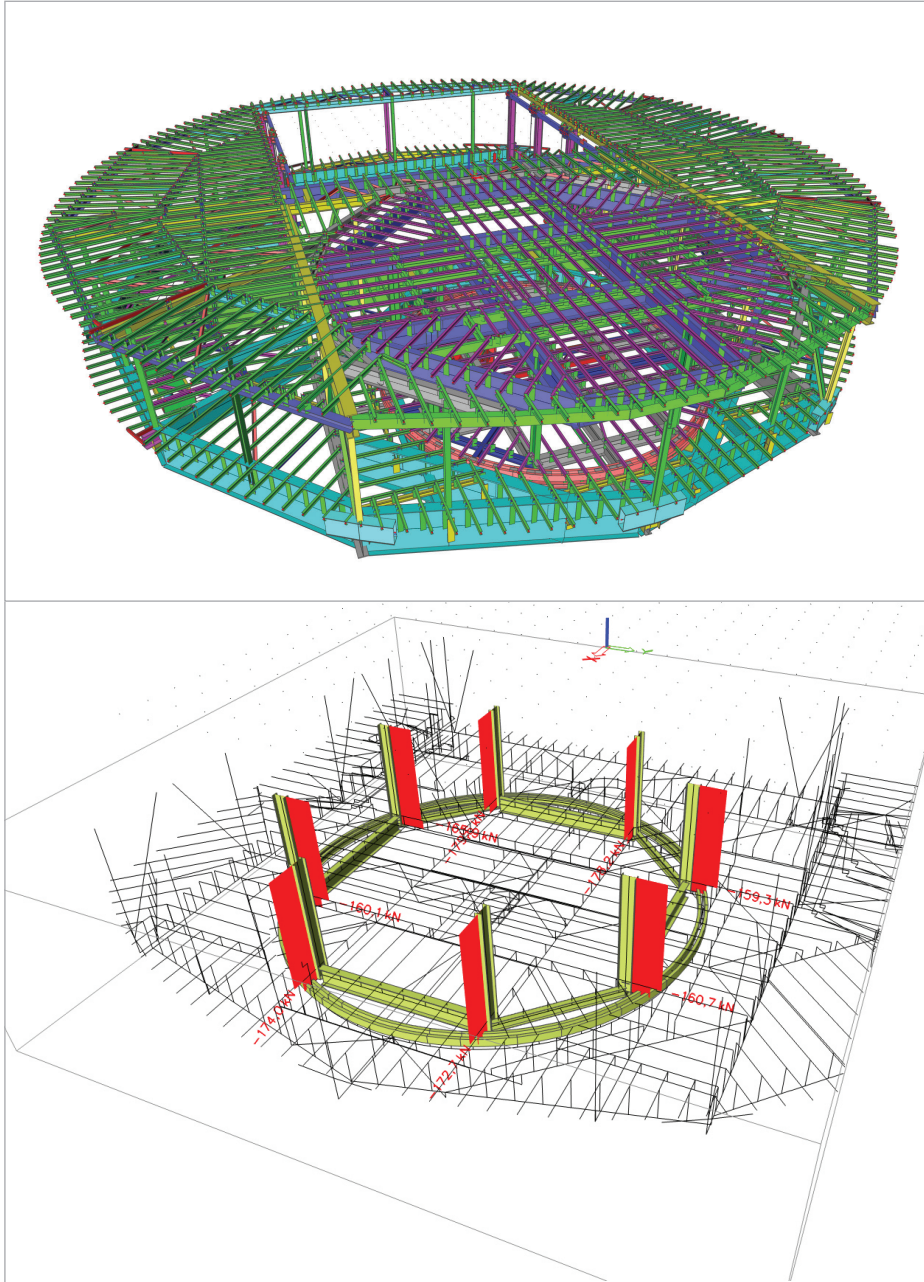


Revolving stage, New Music Theatre - Linz, Austria



The revolving stage in the new Music Theatre Linz is a two-storey steel construction with an outer diameter of 32 m. The height of the two storeys is 3.95 m and is adapted to the surrounding building. The space underneath the revolving stage is used as an underground parking garage.

The upper storey forms the floor of the main stage and is mounted onto the lower storey by lean columns. The lower storey provides the primary supporting structure for the revolving stage. 36 crane rail wheels are mounted to the outer diameter of the lower storey and run on a crane rail, 100 m in length. The centre of the revolving stage is formed by a ball bearing slewing ring with a diameter of 2.55 m, which ensures the exact rotary movement and provides additional vertical support.

In addition to supporting the steel structure of the revolving stage, the ball bearing slewing ring at its centre also provides rotary feedthroughs for electricity, data connections and the sprinkler system.

Stage wagons which are positioned with an accuracy of 1 mm can drive onto the upper storey of the revolving stage. The revolving stage itself thus requires a 1 mm accuracy of positioning under any predefined operating condition. Furthermore, this poses the requirement of minimal deformations of the steel structure. In combination with a limited overall height of only 5.9 m, this leads to a massive steel construction of the lower storey.

The large revolving stage has a built-in smaller revolving stage with an outer diameter of 15 m which can be used during performances. Furthermore, three lifting platforms that cover the total area of 15 m x 12 m are located on the large revolving stage.

The drive components for the rotation of both revolving stages as well as for the lifting movement of the platforms are positioned in between the main girders of the lower storey. The available space is thus used in an optimal way. However, the accessibility of the drives is rather complicated. Due to the limited space, the construction of the lower storey proved to be very complex.

The large revolving stage is rotated by eight friction wheel drives which run on the crane rail's concrete base. The maximum circumferential speed is 1.0 m/s. The small revolving stage is supported by 66 plastic reels which ensure a very smooth revolving movement. Eight reels are powered directly and provide a maximum circumferential speed of 1.0 m/s. In order to lift the three platforms, 12 rope winches are mounted to the large revolving stage.

The weight of the revolving stage - including the installed equipment - amounts to approximately 502 t. The dynamic payload for rotary movement is 158 t, while the static payload is 493 t.

Revolving stages provide a fast and easy way to transform the scenery in theatres. Alternatively, many theatres have installed lifting platforms for the same purpose. Both methods have their specific advantages which usually cannot be combined. However, the solution designed for the Musiktheater Linz enables it to alternately use the benefits of the small revolving stage or the lifting platforms simply by rotating the large revolving stage.

The design of the provisional draft started in 2010. In 2011, the structural design of the revolving stage was completed. The assembly and putting into operation was finished in 2012.

The structural analysis of the revolving stage was performed with Scia Engineer. The model consisted of almost 5,000 single beams and 42 load cases which were used in 29 load combinations to provide the necessary structural certification.

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Waagner-Biro Stage Systems is one of the leading stage machinery companies worldwide. The company offers the complete spectrum of stage equipment for full and medium sized theatres, as well as mobile building equipment for arenas, stadiums and multi-purpose halls.

As a supplier of complete solutions, Waagner-Biro Stage Systems designs and implements complex stage facilities in opera houses, theatres, concert halls, event centres, multi-purpose and exhibition halls, congress centres, stadiums and arenas.

Special stage equipment for cruise liners, computer-aided stage control systems, mobile building equipment (e.g. automated telescopic stands for the highest technical demands), telescopic soundproof walls, mobile air cushion seating systems, soundproof board systems as well as special lifting platforms and stage wagon systems round off the delivery spectrum of Waagner-Biro Stage Systems.

Project information

Owner	Musiktheater Linz GmbH (M.T.G.)
Architect	Terry Pawson Architects, London
Engineering Office	Waagner-Biro Stage Systems
Location	Linz, Austria
Construction Period	12/2009 to 04/2013

Short description | **Revolving stage, New Music Theatre**

The construction work for the new Musiktheater Linz began in 2009 after decades of discussions, planning and re-planning, and was finished with the gala opening in April 2013. The main hall of the Musiktheater provides a seating capacity for 1,000 people. The central element of the stage machinery is a large revolving stage for transport purposes with a diameter of 32 m. Located within this revolving stage is a smaller revolving stage for scenic transformations with a diameter of 15 m as well as three lifting platforms which cover the total area of 15 m x 12 m. Depending on the requirements of the performed show, either of the two parts of the large revolving stage can be rotated into the playing area of the main stage. Furthermore, the lifting platforms can pick up stage wagons which are driven onto the main stage from one of the side stages. This leads to extremely high requirements regarding the precision of the revolving stage's rotary movement.

