



# TURANDOT

## Facts and figures about the stage technology

<b>Construction time</b>	About twelve months were required, from the planning stage to final assembly.
<b>Participation</b>	About forty technology firms from Austria, Germany, Switzerland and Romania were involved in building the stage. On top of that, ten of the festival's technicians, including crane operators, took part in the construction process too.
<b>Wooden piles</b>	The stage is erected on about 119 piles made of spruce wood and steel and driven up to six metres deep into the bed of the lake.
<b>Wall</b>	The wall is 72 metres long and about 27 metres high at its highest point. Built into it are 59 loudspeakers, concealed in some of the stone slabs. In all, the wall weighs approx. 335 tonnes. About 160 tonnes of this can be attributed to the steel construction and about sixty tonnes to the wooden framework which the masonry units are fitted to. The remaining 115 or so tonnes come from concrete and steel blocks on the rear side of the wall, which are necessary for stability. The wall has been assembled from about 29,000 individual pieces – approx. 23,000 steel parts and 6,000 wooden parts. The total number of building blocks used in the wall is 650.
<b>Cylinder</b>	In the middle of the stage set is a rotating cylinder built of steel and wood. Operated by a winch, it can revolve around its vertical axis. It takes 40 seconds to complete a 180° revolution. At its highest point the cylinder is 5.4 metres above the mean water level.
<b>Warriors</b>	The "terracotta warriors" are about two metres high and are modelled on figures from China's ancient Terracotta Army. Around 205 of them are deployed on the stage. Of these, 144 are "air warriors" mounted on the concrete core of the lake stage, and 61 are "water warriors" in the water in front of the stage.
<b>Carousel</b>	At a depth of 2.5 metres a semicircular carousel track runs round the circumference of the stage. It's 191 metres long with a diameter of 61 metres.

\* All height specifications refer to the mean water level, known as "water level 2", which corresponds to the Bregenz level of 416 centimetres.



## Companies involved in construction of the stage

Mader & Flatz ZT GmbH	concrete core statics	Bregenz (A)
Rudhardt & Gasser	civil engineering/contractor/ planning	Bregenz (A)
Salzmann Hafengebäude mbH	piloting, subcontractor Starmann	Fußsach (A)
Screenpix	3D planning	Klaus (A)
Dr. Brugger & Partner ZT GmbH	construction engineering	Bludenz (A)
Markowski Straka ZT GmbH	survey work	Feldkirch Altstadt (A)
Andres Geotechnik AG	soil mechanics	St. Gallen (CH)
Andreas Ascherl	security	Hohenweiler (A)
Kiechel und Hagleitner GmbH	electrotechnology	Bregenz (A)
BauTrans GmbH	mobile cranes	Lauterach (A)
Liebherr GmbH	mobile cranes	Biberach/Riss
Feels-so-good!	diver wall	Ravensburg (D)
Ing. Büro Gerhard Lener	cylinder/statics	Feldkirch (A)
Martinek Peter	cylinder/construction inspection/ approval	Nenzing (A)
Vonbank & Witwer Stahlbau GmbH	cylinder/contractor, steel construction	Nüziders (A)
Reisch Maschinenbau GmbH	cylinder/mechanical engineering	Frastanz (A)
STB Steuerungstechnik Beck GmbH	cylinder/control technology	Egg (A)
Anaya Industrietechnik GmbH	cylinder/hydraulics	Röthis (A)
Felder Zimmerei	cylinder/timber construction	Stallehr (A)
Assfalg Qualitätshydraulik GmbH & Co. KG	cylinder/hydraulic aggregate	Unterwachingen (D)
Gundermann Mikroelektronik GmbH	cylinder/LED wall – lid	St. Leon Rot (D)
Starmann Metallbau GmbH	wall/contractor	Klagenfurt (A)
Ing. Büro Exent	wall/statics wall and boat	Hüttwilen (CH)
formTL Ingenieure für Tragwerk und Leichtbau GmbH	wall	Radolfzell (D)
Rudigier Stahl-Metall-Bau	wall/subcontractor Starmann	Bludenz (A)
Laguna Lindau Tauchsport e.K.	wall/diver, subcontractor Starmann	Lindau (D)
Zimmermann, Kuss & Partner ZT GmbH	wall/subcontractor Starmann	Nötsch (A)
Safe Side Consulting GmbH	wall/building site evaluation,	Ludesch (A)



	subcontractor Starmann	
Vermessungsbüro Dobler GmbH	wall/subcontractor Starmann, survey work	Lorüns (A)
HATec Engineering GmbH	wall/ subcontractor Starmann, engineering firm	St. Stefan (A)
Hagspiel Arno	wall/scene construction	Alberschwende (A)
Edelbunt Malerei	wall/scene painting	Telfs (A)
SC Art Deco Exim SRL	warriors/water warriors (concrete)	Bucharest (RO)
Ing. Theodor Mader GmbH & Co. KG	warriors/water warriors substructure	Bregenz (A)
La Mimesi	warriors/air warriors (synthetic)	Berlin (D)
i+R Holzbau GmbH	warriors/air warriors substructure	Lauterach (A)
Ing. Andreas Gaisberger ZT GmbH	warriors/air and water warrior statics, Puccini room statics	Dornbirn (A)
Ing. Theodor Mader GmbH & Co. KG	Puccini room/contractor	Bregenz (A)
Steurer Ludwig Maschinen- und Seilbahnbau GmbH & Co. KG	boat/contractor	Doren (A)
watershow.de GmbH	water fountains	Würzburg (D)

The 2015 Bregenz Festival runs from 22 July to 23 August 2015. For tickets and information, please call +43 (0)5574 407-6 or visit [www.bregenzfestspiele.com](http://www.bregenzfestspiele.com).