

Laser Scanning Eases Refurbishment of Glasgow's Famous King's Theater



As the famous King's Theatre in Glasgow has to undergo extensive refurbishment of the interior, a survey had to be carried out to gather information of damage caused by a flood some years earlier.

FARO®

Problem

The King's Theater, located in Glasgow Scotland, was commissioned by the Edinburgh-based theater company Howard & Wyndham at a cost of over \$79,000 when it opened on September 12th in 1904. In 1990, after the City of Glasgow became the European City of Culture, the theater was the venue for the ceremonial announcement. Over the years many actors have graced the stage of The King's. These included Sir Lawrence Olivier, Sarah Bernhardt, John Gielgud, Katharine Hepburn and Tyrone Power.

Ambassador Theater Group, the company that currently runs King's Theater, took control of the theater's day-to-day management in 2002. In early 2008 management announced that a full interior refurbishment would commence in the summer of 2009 to restore the theater to its former glory in time for the Commonwealth Games to be held in 2014. Simpson & Brown was chosen as the main architects for the project. Before the restoration could begin, Simpson & Brown required detailed elevation and plan drawings of the entire auditorium, section drawings at particular locations, and information about floor heights to give an indication as to the level of damage caused by a flood some years earlier.



Solution

Simpson & Brown knew the capabilities of 3D laser scanning technology, having used scanning services on both the Penicuik House and Craigievar Castle projects in the past. Geospatial Survey Solutions and Deri Jones & Associates (GSS/DJA) was asked to carry out the as-built documentation of the auditorium of King's Theater. GSS/DJA supplies laser scanning, dimensional control, 3D CAD engineering and visualization services.

Working with a variety of software packages, they provide the skills and experience to enable projects to go from 2D sketches to 3D imagery as

well as the ability to capture existing structures for reverse engineering. As early investors in FARO's large scale scanning equipment, GSS/DJA has a wide range of experience from reverse engineering ship hulls to recording Roman sarcophagi. For this particular project, only three days were needed on site to capture data using both the FARO Laser Scanner 880 and the MENSII GS200. The customer required highly accurate detailed information on elevation, height and section drawings at various positions in the auditorium. Some of the scanning was carried out over night to avoid disruption to the working theater and the scanning schedule was adapted to work around cast rehearsals and stage building. The FARO Laser Scanner's portability proved to be very important, working in the many different levels and stairways of a working theater. Over the three day period, some 60 full color scans were completed, capturing myriad details throughout the theater.

Return on Investment

The data was compiled using FARO Scene, and then exported into Pointools and Rhino. Detailed elevations and sections of each of the auditorium faces were drawn up in CAD and a record drawing of the complex ceiling. The auditorium details were incorporated into the overall building survey, with the DJA/GSS data being aligned to the survey by Loy of Glasgow to one millimeter accuracy. Spot heights for floors, balconies and seating levels were supplied, with the final deliverables package consisting of over 7.5 GB of data, a complete record of the auditorium prior to renovation.

