

## CAREERS IN ENGINEERING HISTORIC STRUCTURES

# Building engineering brilliance

**Professor David Nethercot** chooses his favourites from The Structural Awards, celebrating their 50th anniversary this year

**A**s The Institution of Structural Engineers' Structural Awards reaches its half-century, Prof David Nethercot, the former Institution president and chair of the Awards judges, selects his top five winners since the inaugural event in 1968.

Each of the structures represents a value Prof Nethercot believes makes good engineering: great design, taking responsibility for the work, understanding its role to the community, innovation and sustainability.



**Built to last**  
Prof Nethercot is chair of the judges

### GLASS LANTERN/ APPLE ZORLU CENTRE



**Istanbul, Turkey**  
**Award: Supreme (2014)**

"Apple Inc uses glass a lot in its stores but the Glass Lantern in Istanbul is the ultimate design in simplicity and purity of expression.

"Through innovative engineering it creates an impossibly perfect glass box, made up of five pieces stuck together.

"It is an outstanding example of collaboration between engineer and fabricator to achieve a stunning, architecturally minimalist structure. As a visitor you think: 'How on Earth did they manage to build this?'

"It was born out of years of developing and understanding, working with the manufacturer of the glass to craft bigger sheets and better solutions for the joints, and so on.

"The Glass Lantern was the culmination of many years of evolution, and I'm sure the people at Apple were delighted because it is a breathtaking structure."



### SEVERN BRIDGE

**Between South Gloucestershire and Monmouthshire**  
**Award: Supreme (1968)**

"The Severn Bridge won the top prize in the first year of the awards, in 1968, and set a very high

standard that has seldom been surpassed, in my opinion.

"Its construction had a big impact on me – partly because I was a student at Cardiff University and lived in London at the time. The experience of

driving across a bridge over a big expanse of water was totally unique. It was, and still is, a spectacular design. As a steel box girder bridge it helped establish new approaches to construction.

"Shortly after it was

built there were a number of bridge collapses across the world, and I became involved in investigating them.

"Through that, the robust and truly pioneering Severn Bridge gained even more of my respect, as

I came to understand the complexity involved in this stunning project.

"Even now, in 2017, many engineers aspire to create something equal in innovation and standing, yet few achieve the level of the Severn Bridge."

### LONDON MILLENNIUM FOOTBRIDGE

**Between Bankside and St Paul's Cathedral, London**  
**Award: Structural Research and Development (2003)**

"The remedial work done by the engineers won the London Millennium Footbridge our Structural Research and Development Award three years after it was opened, to much fanfare, by the Queen.

"It started to sway on the first day and became known as the 'Wobbly Bridge', with good reason. It was closed for almost two years as the designers sought to take responsibility for it being unsafe.

"Through some in-house testing and



outsourced research they produced a solution which showed exactly why it had happened and how it could be prevented on future structures. They made their findings public and submitted the remedial work to the Structural Awards.

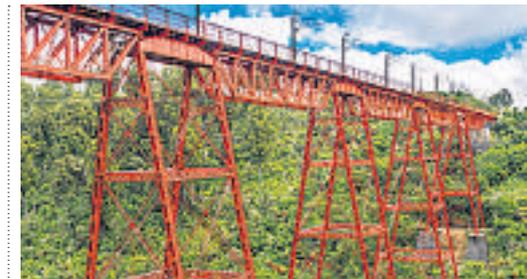
"We agonised for a long time but ultimately the committee decided that it ought to be recognised. After all, this was engineers acting responsibly. And the failure was not catastrophic; it was a case of hay fever rather than pneumonia."

**North Island, New Zealand**  
**Award: Structural Heritage (2017)**

"This 262m-long railway bridge was originally constructed between 1905 and 1908. In 2017 the trains' loads are heavier and because of the ravages of time it was declared no longer adequate.

"It was thought a new construction would be required. However, an investigation was able to ascertain which parts of the structure needed replacement, and where it was possible to strengthen and modify. It was possible to produce a Mark II version of the original structure by using the same material,

### MAKATOTE VIADUCT



and so it now appears more or less the same as it did. It is a wonderful example where

imaginative thought and engineering knowhow have led to a brilliant, cost-effective solution."

► The winners of The Structural Awards were announced on 17 November. The Awards are held annually by The Institution of Structural Engineers

to celebrate structural engineers' role as innovative design professionals and the guardians of public safety. Visit [structuralawards.org](http://structuralawards.org) to learn more

### IRON MARKET



**Port-au-Prince, Haiti**  
**Award: Sustainability (2012)**

"An earthquake badly damaged the market – made up of two iron-framed halls first built in 1891. Initially it was thought the site would have to be demolished. A British engineer determined that there was plenty that could be salvaged.

"By recreating one of the two buildings in more or less the original style, it had a big impact upon the community because of its symbolic importance as an essential trading venue and social hub. It demonstrates how, with a bit of thought and good-quality structural engineering, it is possible to produce a solution that is much better than the obvious alternative."