


Review

 **Simon Pitchers** enjoys this account of the creation of the London Olympic Stadium, both for its lessons on running successful projects and the fascinating facts that will enrich a dinner-party conversation.

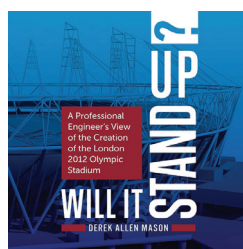
Will it stand up?

Author: Derek Allen Mason

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In the future, few of our profession will use much mathematics in their daily working lives. Already, there are machine-learning systems out there that can solve problems by developing autonomously their own coded algorithms, enabling themselves to solve problems more efficiently and comprehensively than any human.

Those who think that, while machines may be able to crunch numbers, the human engineer's territory of conceptual design is unassailable by computers, are in for a surprise. Pessimists predict the death of our profession and the dawn of the 'engitect' or 'architeer'. Consensus is that the profession needs to respond to the change that is rapidly approaching, by broadening the knowledge of its membership. We need to understand more about non-structural factors that come into play in building projects, whether it's law, politics, M&E systems, architecture, finance or the drafting of a lease. We must step outside of the island that is our comfort zone, learn more about the wider world of building and claim new territory, otherwise machines will erode and reduce the sphere of our expertise. We need to become top of everyone's list of interesting people to invite to their dinner party.

That is why all grades of membership of our institution should read this book.

The book doesn't talk much about the future. It doesn't go into much geeky detail about the Olympic Stadium design. It is written in a clear, simple hand that is understandable to both a lay reader and a professional engineer. At 161 pages it is a small but

worthwhile commitment of reading time.

We all felt pride in 2012 during the London Olympics, but this back-story of success should make us, as a profession, even prouder.

Derek Mason, the author, was the third-party checker of the stadium design. He is also an athlete and a chartered structural engineer. He describes the fascinating story that starts from the very conception of Britain's bid for the 2012 Olympics right up to the legacy left by the Olympic Village.

Derek structures his book around seven principles of running a successful project:

- have a common goal
- develop a good detailed plan before you start
- develop a good communication strategy
- develop the ethos of good teamwork
- decide on the legacy from the outset
- develop robust checking procedures before you start
- make sure your project is fit for purpose.

These are put forward as a blueprint for success in most projects. They are very good principles too, though if you put two engineers in a room they would have a good argument as to whether these were the KEY principles. However, the overriding message that emerges is the strength of vision, leadership, purpose and collaboration that prevailed in this most brilliant of exemplar projects.

There are many horizon-broadening snippets of information contained in this book:

- An 80 000-seater stadium was built for the Olympics, but 55 000 of those seats were temporary.

- The weight of steel in the stadium is less than half of that used in comparable stadiums and one quarter of the steel used in the (nonetheless incredibly impressive) Beijing Olympic Stadium.
- The roof design was adapted to use steel tubes left over from a North Sea gas pipeline project in Russia and 52t of scrap metal, including confiscated knives and guns, were also used in the construction.
- A partial roof covering was found by wind-tunnel design to be optimal to ensure that wind speeds inside the stadium did not exceed 2m/s – otherwise athletic records could be affected.
- The building isn't clad – it's 'wrapped' in a lightweight fabric – a brilliant way of not over-egging the finish of a predominantly temporary structure.
- Because the opening ceremony had not been commissioned at the start of the design, the designers didn't know what loads would be imposed and had to guess.
- The stadium is built on an island site of industrial wasteland surrounded by rivers, canals and railway lines, completely occupying it and forcing facilities such as food outlets and shops to be grouped in 'pods' outside the stadium. This brings spectators closer to the action.

It's a fine testament to the project and its style reminded me slightly of that life-saving work *Engineering Mathematics* by Stroud and those reality property TV programmes where there is a re-cap after each commercial break. The repetition might irritate slightly, but it definitely helps the clarity of the message. It also means that you'll remember more for that all-important dinner party.

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