

BOOK REVIEW

Paul Perry, associate director at *Hewson Consulting* reviews Roma Agrawal's new book for *Tunnels and Tunnelling*

Once in-a-while a book is published that will be found, read, remembered, referred to and even celebrated. This is not "Technical Press", in fact it is so much better than that, so please do not miss it.

Built is an exposé, an illumination, an extraordinary story, on the world that we, engineers, both exist in and undertake our work within. It explains the rationale behind structure, hidden behind the very fabric of society, from the basis of the author's life and career.

Told eloquently from the standpoint of a practicing structural engineer who has had a varied career to date, the book begins to describe what is taken for granted and will intrigue all to look again. Roma Agrawal writes well, tells a story clearly and will be, I am sure, an example to future engineers. She will be a growing inspiration.

The chapters are laid out with intriguing titles; Force, Rock, Hollow, Pure, Clean, to name but a few. These gradually lead the reader through a career and the story behind certain hidden aspects of structures related to examples including buildings, bridges and tunnels.

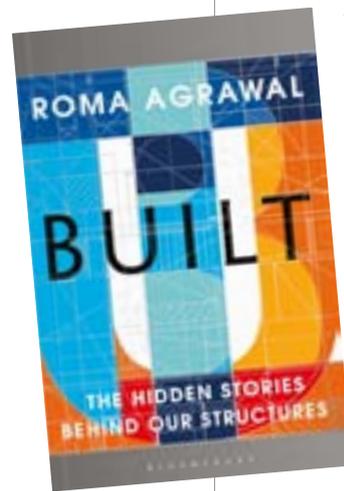
Starting with a childhood visit to New York, leading into her work as a structural engineer on The Shard, the simple explanation of the liking of physics and the way many disciplines in a design team work together to create "a solid structure" for all to admire, work in, shop in, use across generations. But it is here, in the first chapter that she lays out her content for the rest of the book; the streets, the tunnels and the bridges as well as the enviable work she has undertaken on building structures.

Even her "first physical contribution to the world", the cable stayed footbridge in Newcastle in the next chapter, is used in her explanation of force. We are constantly expected, whilst progressing a tunnelling scheme, to see through the obvious exterior, to the hidden structure behind, in our endless plot to ensure that tunnelling below, buildings above, is successful. Those who have to undertake protracted building damage assessment for those that own and use the building being considered, have now a reference to turn to and offer up to non-engineers a rational for our required "X-ray vision".

From Force and the understanding of how a column will fail, even the carrot and display of tension, she progresses through anecdotes and insights on her quest to explain how structures work, the materials such as brick and metal, the conditions such as rock and sky, gradually reveal this captivating story.

Earth starts with the fact that Mexico City is constructed on a lake and is sinking leading to Roma giving a fascinating recount of the works to save the Metropolitan Cathedral, the assessment and subsequent treatment of the ground is simply put, with hand dug concrete shafts, inclined drill holes and soil removal.

Hollow has a great of the underground city that is Derinkuyu, in Turkey and leads to a section on transport tunnels and Brunel's Tunnel with a simple but effective section of his tunnelling methods, "Brunel's slipworm" stemming from his observations of the work of a naval ship worm on a piece of timber. This is a story worth telling and with her sketches, assist an understand on the adventure that his project was and relating it to the modern day tunnelling methods, tunnel boring

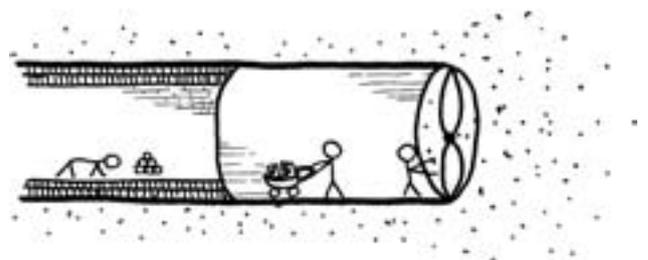


machines and Crossrail.

Roma introduces the reader to water / sewerage tunnels in Pure and then Clean, and through various descriptions highlights the importance of water and drainage across time including a timely visit to the current huge undertaking that is the Thames Tideway Tunnelling project. Here she sets it in context with Balzagette and the origins of his efforts to clean up London with his network of sewers, to the need and

improvement that will be offered once the Thames Tideway scheme is complete.

There is so much more to this book than just descriptions of structures, for example the chapter, Idol, describes the Brooklyn Bridge and Emily Warren Roebling, clearly a hero of the author. It is fascinating and along with the anecdotes, the sketches and her wonder and passion for her career, this is a book to inspire, to explain the complex simply and to be as much as an inspiration to those considering a career in engineering to those non-engineers who want to know about structures and what lies beneath. It may even be an education tool for us engineers, to assist in getting our messages across. On that basis I recommend this. 



Availability

To purchase the book, readers are encouraged to visit Roma Agrawal's own website:
<http://www.romatheengineer.com/showpage.php?pagename=book>