



Kim Rochard

If your dream job involves castles and stately homes, it's unlikely you would turn your attention to structural engineering. But as Kim Rochard explains, it's possible to combine the two in the specialised field of conservation engineering. **Helena Russell** finds out more.

A typical day at work for Kim Rochard can range from flying a drone above a historic house to check the roof condition, to donning waders to inspect a bridge soffit or discussing how best to shore up a Tudor fort. As part of Historic England's structural engineering team, and with a solid background in conservation engineering, she is a strong advocate for getting the best out of existing buildings.

Despite having a father who worked in construction and a clear understanding of what civil engineers do, Rochard didn't intend to become an engineer. 'When I went to look round Bath University, I was thinking I would probably do physics. But I ended up in a 'taster' lecture with Tim Ibell; he was talking about bridges and I just thought to myself, 'this sounds much more interesting!' I was also attracted to the fact that it's a combined school of engineering and architecture. I like

drawing and art, and it was good to be able to do both.'

Her father's profession did have some influence on Rochard's career path – she believes that her fascination with historic buildings was kindled through exposure to his work, and further encouraged by mentors at university.

'When I was at Bath, my personal tutor was Dina D'Ayala, who specialised in conservation and earthquake engineering. My dissertation involved analysing the vaults of Bath Abbey to establish how much water they could hold without collapse. Insurance companies tend to want holes in the roof vaulting so that if, for example, a timber roof catches fire, any water can drain out before it brings down the roof,' she explains.

The rest is history

Her master's course included two industry placements, and Rochard

admits that the first of these made her question her decision to become a civil engineer. 'I was in a very traditional engineering practice and the work wasn't really for me.' But the experience instilled discipline, she admits. 'They were very rigorous; you didn't get anything wrong. Seventy per cent might get you a first, but it's not really good enough for real life, is it?'

Her second placement, at Integral Engineering Design in Bath, was a total contrast and the start of a long-term relationship. Within the first week, Rochard found herself sketching trusses with Integral director Margaret Cooke inside the roof of Toddington Manor, the stately home owned by artist Damien Hirst.

The Bath-based practice has a strong reputation in reuse of buildings and working with historic structures; over time, Rochard's portfolio grew, including Chedworth Roman Villa in Gloucestershire, her first job as project engineer (**Figure 1**). This scheduled monument owned by the National Trust is one of the UK's largest 4th century Roman villas. The project involved replacement of the Victorian shelters that covered the mosaics, to provide better environmental control and interpretation.

FIGURE 1: Chedworth Roman Villa, Rochard's first job as project engineer (**Figure 1**). This scheduled monument owned by the National Trust is one of the UK's largest 4th century Roman villas. The project involved replacement of the Victorian shelters that covered the mosaics, to provide better environmental control and interpretation.



JOHN DAWSON





YOU HAVE TO CONSIDER HOW BUILDINGS HAVE BEEN ADAPTED OVER TIME, ESPECIALLY WHEN IT CHANGES THE STRUCTURAL BEHAVIOUR

A new glulam shelter with suspended walkways allowed visitors to walk through the villa.

'We actually sat the new building on top of the Roman walls,' Rochard explains, 'which meant we had to develop a triangulated frame system where no tension was applied at the base.'

Other projects included the Clore Learning Centre and World Heritage Centre in Bath, which saw the creation of an award-winning visitor centre with education spaces in the Grade II listed former Bath City Laundry building.

In Trowbridge, she was involved with a major scheme to redevelop the County Hall, expanding the original 1930s civic building and its 1970s office extension into a larger facility where Wiltshire Council could consolidate its services (**Figure 2**). 'There was a campaign to list the building during the planning process, so we had to treat it as if it were already listed,' Rochard explains.

'We infilled the courtyard between the two structures using an ETFE roof to make a new public space – this was a massive new structure supported directly onto the existing buildings. With a lot of internal alterations to the building, we did plenty of detective work to establish the

material properties, make sure we could introduce the holes that were required for circulation, and make it act as one with the existing structure while bringing it up to date.'

'The thing I like about these projects is that while they are among the most technically challenging I've worked on, they also require a more holistic approach to understand the significance of the building, and the needs of the people that use it. You have to consider how buildings have been adapted over time, especially when it changes the structural behaviour, but you are much more in touch with the final use.'

CARE accreditation

Becoming an accredited conservation engineer was a natural step once she was chartered, and was encouraged by colleagues in the practice. But personal circumstances also played a part. 'I am a runner and had hurt my knee and couldn't run anywhere, so the conservation accreditation process gave me a bit of a focus. I went in every morning at 6am and worked on that for a couple of hours instead!'

The qualification process involves providing five project case studies and a CV demonstrating

professional development in the field of conservation. An interview with CARE panel members – recalled as 'a bit of a grilling' by Rochard – explores the applicant's experience and knowledge in more detail.

Accreditation is reviewed every five years, with the engineer required to submit evidence of training and an updated list of conservation-related projects. Having first qualified in 2015, Rochard is now approaching her second revalidation, but her involvement and responsibilities in the field are quite different in her current role.

Big decisions

Leaving Integral to move to Historic England was a big wrench, she admits – so much so that it took a spontaneous application, one false start and a pandemic before she finally made the change. 'I was walking home from work with my baby girl in the carrier on my back, and I saw a job come up at Historic England. I applied there and then and got an interview, and then was really surprised when I was offered the job!'

She turned the offer down, recalling that it just felt too difficult to make the jump. 'There were only five of us when I started at Integral, and we had got up to around 25 by that time. I couldn't do it – they were like my family!'

But the pandemic made her think again. 'Lockdown came along and we all got shut away at home. I realised I

↓FIGURE 2: Redevelopment of County Hall, Trowbridge required holistic approach considering significance of existing building and needs of contemporary users



STEVE TOWNSEND

CAREER MILESTONES

- 2006** Placement at FMH Consulting Engineers, Bath
- 2007** Placement at Integral Engineering Design, Bath
- 2009** Graduated from University of Bath with MEng Civil & Architectural Engineering, First Class
- 2009** Joined Integral Engineering Design as Graduate Engineer
- 2013** Achieved chartered membership with IStructE
- 2015** Became CARE accredited
- 2016** Promoted to Associate at Integral Engineering Design
- 2020** Joined Historic England as Senior Structural Engineer



hadn't seen everyone else for some time and the world hadn't fallen apart. Maybe I could do something different, maybe it would be a positive change for me and my family.

'So I got back in touch with Alex, who had offered me the job, and said if you have any vacancies come up, I might be interested in joining your team! She rang me back almost immediately.'

An 'intelligent client'

At Historic England, Rochard works in the technical conservation team as one of nine engineers, each working across a geographical region. Her remit extends south to the Isles of Scilly and up to the M4, and includes the challenge of maintaining the structure of Hurst Castle (Figure 3) in the New Forest, where a large section of the east wing fell into the sea in 2021. She is providing the 'intelligent client' role, assisting English Heritage, the charity that cares for the National Heritage Collection of more than 400 historic places and opens them to the public.

'My role is to provide the technical bridge between English Heritage's project management team and the engineers that they have employed to carry out the consultancy work,' she explains. Although it is a fascinating project to be involved with, she recalls the shock of the initial collapse.

'Overnight, 38m of the east wing collapsed and I was immediately called to go to the site and assess the

situation. We've been working with teams from COWI to put in a temporary revetment and make the site safe, and protect the east wing from further damage. We've carried out a massive geotechnical site investigation and have just finished looking at feasibility studies for the repair of the west wing, which was also quite severely damaged.

The big question is likely to focus on the long-term feasibility of the site, she says, and this is something that can only be resolved in discussion with the Environment Agency and other major stakeholders. The spit of land on which the castle sits is a Site of Special Scientific Interest, as well as providing local flood protection, so it is not as simple as just deciding whether to preserve a historic structure. The sea level rise that is predicted will add to the challenges.

'It's a question that many other heritage bodies are grappling with at the moment,' Rochard says.

But despite the difficult issues, Rochard finds the variety of both work and professional contact hugely rewarding. 'If you are not a straight numbers person, then conservation might well suit you,' she suggests. 'There are plenty of technical challenges, but if you enjoy social history and the people side of it, then it's more of a holistic thing.'

Other skills are also valuable in the role, perhaps to steer an engineering team in a particular direction if they aren't being as sensitive to the heritage

FIGURE 3: Long-term feasibility of coastal site will be key question for conservation of Hurst Castle

What is CARE?

The Conservation Accreditation Register of Engineers (CARE) identifies civil and structural engineers in the UK and Ireland who are skilled in the conservation of historic structures and sites.

To apply to join CARE, you must be able to demonstrate your conservation experience and skills, and that you have an understanding and empathy with the conservation philosophy and methods applied to heritage projects.

The register is run by the Institution of Civil Engineers and the Institution of Structural Engineers, and has a bilateral registration agreement with Engineers Ireland.



Find out more at
www.ice.org.uk/careers-learning/develop-your-career/advice-for-civil-engineers/specialist-professional-registers#Conservation

asset as they should. 'That's probably been the biggest change for me in this role, the need for diplomacy skills,' Rochard reflects.

She notes that the profile of conservation engineering has changed, evidenced to some degree by the increase in numbers on the CARE register. 'With the focus on sustainability increasing, conservation engineers have a skill set that will become more and more useful as we look to reuse what we already have.'

Postscript

In 2024, Rochard's interest in historic structures will also see her assume the role of Convenor of the IStructE's History of Structural Engineering Study Group. Find out more about the group's activities at www.istructe.org/get-involved/study-groups/history-of-structural-engineering.