



# Tom Howarth

Tom Howarth found himself fully immersed in a major steel reuse project just a couple of years after graduating – now he’s bringing his knowledge and experience to bear on developing a template for the ‘circular city’. **Helena Russell** reports.

Becoming one of the UK’s steel reuse pioneers wasn’t really in Tom Howarth’s game plan when he graduated from Sheffield University in 2020 – rather it was a classic case of being in the right place at the right time. In an alignment of stars, joining an engineering consultancy that was employed on a ground-breaking scheme with a forward-thinking client gave him the opportunity to dive right into an emerging sector.

He clearly found his niche – he admits that he could talk for hours on the subject of material reuse – and although the road has had a few bumps, he has come a long way in just a few years.

## Finding his feet

Structural engineering was not something Howarth was set on as a teenager, despite maths and physics being his strengths. ‘My uncle is an aerospace engineer, so I applied to study this at Sheffield University,’ he says. ‘But after the first two weeks of the course I realised that it wasn’t the right fit for me, so I quickly changed to civil engineering

at the same university.

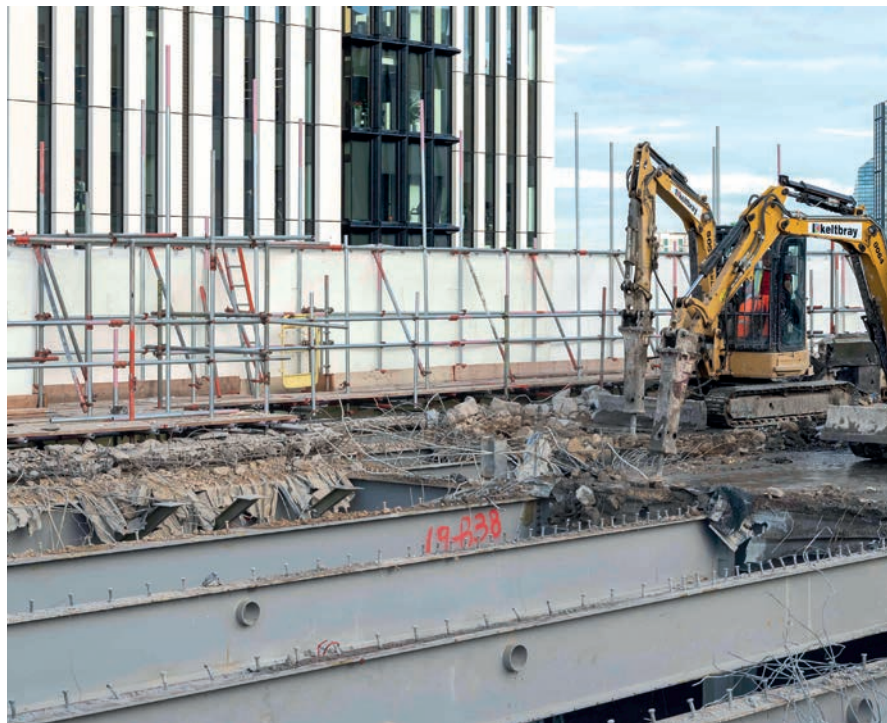
‘Aeronautical engineering is very detailed engineering with a lot of aerodynamics. You might work on one small piece of an aircraft that has a 10- or 15-year life cycle. In civil engineering, you can have a much larger role on a project and there’s more variety in what you might be working on,’ he says. ‘Even in my first year as a graduate engineer, I saw things being built. You do your calculations and submit them, and then you go on site and they’re actually building it!’

But in his second year of university he started doubting whether he had made the right choice, so decided to take a year out. ‘It was not quite clicking for me yet, but rather than going off and having the whole gap-year experience travelling around the world, I worked in pub kitchens and joined the Army Reserve.’

Howarth found the two roles had more in common than he expected, and stood him in good stead for his future career. ‘You learn a lot about discipline and self-motivation and what an actual

## CAREER MILESTONES

2020	Graduated from University of Sheffield with MEng Structural Engineering
2016–20	Joined Army Reserve: 4th Battalion, Duke of York’s
2020	Joined Elliott Wood as graduate/project engineer
2023	Joined EMR Reusable Steels as senior engineer
2025	Joined Maconda Solutions as structural reuse lead



stressful situation is like. Working in a high-pressure kitchen, training in the army and being on a demolition site have more in common than you might expect; the way people communicate is much more direct, wanting to get things done. It's very different to being in a consultant's office.'

After his break, Howarth came back and finished off the second year, then went down the structural engineering route in his third and fourth years. 'I was more interested in historical buildings than the traditional civils work such as roads and sewers. In my 14-week summer internship in the Lake District, I did quite a lot of work on heritage buildings, surveying masonry for old churches and barn conversions, and so on.'

His work experience and interest in masonry structures prompted a dissertation involving dry stone walls. 'They are inherently sustainable, and use local materials and skills,' Howarth says. 'It's a bit of a lost art and there's no design guidance, so if you want to use a dry stone wall for structural support on a major project, you probably wouldn't be able to do it. And yet there's still lots of infrastructure that incorporates such walls and major railway routes that are running on them, and these all need to be assessed and maintained. It's a tricky one, because they are structurally complex, there's no real rules. My plan was to build them, knock them down and analyse them – but my last year of study got derailed by Covid and I never got to fully complete it.'

### Passion for sustainability

The pandemic also impacted his first graduate job, at consulting engineer Elliott Wood. His joining was delayed, although he was brought in ahead of his graduate cohort and put to work on the development of the first IStructE Structural Carbon Tool ([www.istructe.org/the-structural-carbon-tool/](http://www.istructe.org/the-structural-carbon-tool/)).

This was when Howarth's passion for sustainability was first ignited. 'Director Penny Gowler was a great mentor for me and influenced me hugely. She introduced me to all these new ideas, and gave me an amazing opportunity to get involved with IStructE's sustainability initiative early in my career. I don't think I would be where I am now if it hadn't been for that.'

Through this initiative, Howarth got to know Will Arnold (then the IStructE's Head of Climate Action), whose 'use less stuff' philosophy really hit home. 'The way he talked about things resonated with me. The questions can get quite intricate, especially when you are trying to choose between one low-carbon product and another. There's always a bigger picture that you have to be aware of.'

But what really shifted his career towards steel reuse was getting involved with two ground-breaking projects that Elliott Wood was working on for client Great Portland Estates (GPE) in London.

### First steps in steel reuse

Plans by GPE to demolish City Place House, a structure in the City of London, offered the possibility to reuse the steel frame elsewhere – an idea that was

pioneered by Gary Elliott through Elliott Wood's 'Flip It' initiative. GPE's new office development on Piccadilly, known as 30 Duke Street, was identified as the recipient building.

Howarth was involved in the scheme from concept stage and, when demolition began, found himself directly overseeing the removal and assessment of the steel elements on site (**Figure 1**).

'It hadn't been done on this scale before – there had been pilot schemes where maybe 30t or 40t were reused, but this was 1,400t! The demolition contractor and project team were really committed to it, but it needed someone to manage it and that became me,' he says.

'Having someone there who knew what was going to happen with the steel once it came out of the site was important – to see if there was any damage and to report back. You need someone on site who can chat to the people taking the steel out and try to identify why it's damaged and look at ways of eliminating that on the next beam. Without this you would end up with endless email chains only to find out two months later that half the stock has been damaged and there's nothing that you can do about it. At the time, the on-site role wasn't really well defined, but now we might call it a circular economy coordinator.'

Howarth quickly gained direct experience of the practical challenges of steel reuse. He was working closely with European Metal Recycling (EMR) on the City Place House project, and when the firm decided to establish a new division to investigate how steel reuse could be scaled up, he was head hunted to be part of the team.

It was a tough decision, he admits, but he couldn't turn down the opportunity. 'I was learning a lot from people at Elliott Wood and it was a shame to leave, but I was offered a once-in-a-lifetime opportunity to do something that was completely new and to focus on a single concept.'

### Scaling up

'At EMR we were looking at the whole circle of steel reuse and how to scale it up,' he continues. 'This covered not just the business management, also finding the steel from demolition, guiding the design and the whole processing and manufacturing side,' Howarth says.

'Education and working with academia was a key part of growing the practice – the business ran like a start-up and we were able to apply some out-of-the-box ideas. We spent a week at Silverstone [racing circuit] checking out the 3D scanners they use on Formula 1 cars,



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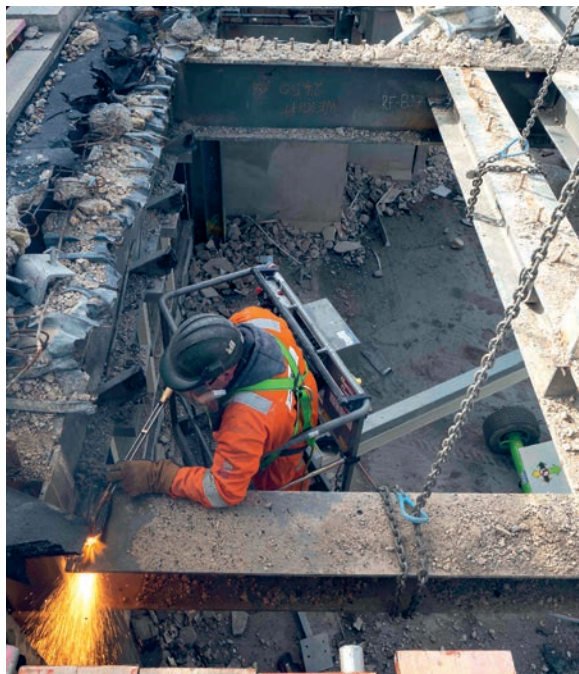
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**FIGURE 1:** At City Place House, Howarth had site role overseeing steel recovery, with large proportion subsequently reused at 30 Duke Street



with the idea of making 3D models of our steel beams with all the openings and fabrication captured. These were used on 30 Duke Street for some clever automated clash detection.'

Initially, the demand for reusable steel was actually very high, Howarth reveals, maybe even 100 times higher than the supply. However, a big challenge is to convince projects to recover it. There is a mismatch in which party can claim the carbon benefit of reused material – the donor loses out unless they have a project to reuse the material on.

Planning incentives help to increase supply, he suggests, when developers are given motivation to recover steel from old buildings. However, targets must be realistic, otherwise they set projects up for failure and risk undermining the concept as a whole.

A large part of his ongoing work is around the practical challenges of recovering steel, and identifying the best types of steel for reuse.

The 'cleaner' a piece of steel – the fewer items that are welded to it or coatings encasing it – the easier it is to process for reuse. Also longer, heavier pieces survive extraction with less damage, and are more cost-efficient to remove. 'It's better to use lifting equipment to lift out a few larger pieces rather than lots of small ones,' Howarth confirms.

'At EMR a lot was being done manually, such as grinding off plates and stiffeners. It was clear that if we were to scale up from 100t per month to 1,000t or 2,000t, we would need some kind of robotics, and to create a proper supply chain, and boost those efficiencies,' he adds.

After an 'intense' two years for Howarth, EMR took the decision to close the steel reuse business unit and he was out of a job. 'We were at a junction where we needed a large investment to move into the next phase; the proof of concept was there, but it wasn't the right time for EMR to put the money in.'

## People, community and collaboration

Howarth has since turned his attention to sharing his knowledge and applying it to the wider circular economy. 'I came out with a pragmatic belief that this could become the standard, it could happen on every site where it's practical. We have the know-how, but it needs the right industry players to pick it up.'

In April last year, he joined circular economy consultancy Maconda, after meeting founder James Adams at a workshop on material passports.

'He looks at asset digitisation, material passports and reuse frameworks –



MACONDA

applying the circular economy on projects as a bigger concept across all materials,' says Howarth. 'We aligned on how we believe the circular economy can work.'

'There are two main things I'm currently working on – the first is being a steel reuse expert in a consulting role, giving advice to projects where I can and keeping the network operational. The second is the Romulus Initiative (Figure 2), which was launched at the start of 2025 and seeks to promote the circular economy at a city-level scale,' he explains.

'This initiative pulls together a load of stakeholders – local government, industry (contractors, designers, consultants, etc.), developers and community organisations such as schools and charities. We compile a digital audit of what's in a building, both fit-out and structural elements, and through our network we make the information available to community organisations and construction companies that might be able to reuse these items.'

'People come for one thing and go away with so much more – we had a charity that was looking to set up a community kitchen, originally thinking we could help them out with reused furniture. Together, we found a fully working commercial kitchen that was destined for the scrap heap. This was exactly what they needed and saved them around £50,000, which is what it would have cost to buy it new,' Howarth says.

**↑ FIGURE 2:**  
Projects and reuse case studies are discussed at Romulus Initiative's monthly forum

'We sometimes get tunnel vision about how to set up a circular economy for the construction industry, but charities having been running their own organic reuse networks for years. There's a lot to learn from these groups, and a big part of Romulus is taking these lessons and exploring how we can apply them at scale.'

The pilot initiative is co-sponsored by the City of London Corporation and involves several London boroughs. Technology plays a key role, using digital product passports to compile material data and make it accessible and useful to participants, but Howarth underlines the crucial role of the human element. 'There's a lot of talk around AI [artificial intelligence] and algorithms being the key to unlocking reuse, but I believe that people, community and collaboration are what really makes change happen, with tech being a tool to assist this.'

## Time to deliver

Howarth is convinced that the industry is ready to deliver circular economy at scale. 'A lot of the lessons from Romulus and steel reuse can teach us how to build a circular economy. These are templates, e.g. the technical, design and deconstruction aspects of steel reuse are pretty much solved and we've proved we can do it at scale. There are thousands of tonnes of steel out there that are perfect for reuse, but are currently being recycled.'

'Right now I'm not exactly sure what will drive us from case studies to industry standard, whether that is planning incentives, investment or more adoption on large-scale projects. But I strongly believe that engineers have a big role to play in this. Even at graduate level, you are able to think outside the box and advocate for reuse on any project.'

Read more about the steel recovery at City Place House in the March 2023 issue of *The Structural Engineer*.  
<https://doi.org/10.56330/QDRO8604>

