



Q&A with... Miriam Graham

Miriam Graham, structural engineer at Arup, reflects on her work in the humanitarian and international development sector and being part of the IStructE's HID Panel.

What originally drew you to study civil/structural engineering? How have you found the profession so far?

My motivation for my career has always been to practically use my skills to make a difference for our people and planet. When choosing my career, I loved the idea that civil and structural engineers could build infrastructure like roads, shelter, and water supplies, greatly improving people's quality of life.

Now, as an engineer, I see the impacts of what we build on our planet and the people who live on it. I'm both daunted by the scale of change needed, and excited by the huge potential for seeing positive transformation.

You've been interested in the humanitarian and international development (HID) sector since university? What initially sparked that?

You just have to look at the United Nation's Sustainable Development Goals to see the challenges we face in overcoming global inequality. Coupled with the disproportionate effects that climate change will have on the Global South, the scale of development needed is huge and there is a complex challenge ahead to achieve this within our planetary boundaries. These challenges, alongside my love for understanding people and cultures, provide inspiration and motivation to me.

What kind of projects have you worked on at Arup? And how did you come to be involved in the company's sustainability hub?

From local Sheffield development projects to international development, I love working on projects that deliver socially useful outcomes, creating a tangible positive impact. My work has included a wide variety of uses such as a community hub, a centre for music education, and bridges in

rural communities.

I take my responsibility for the environmental impacts associated with our profession seriously, advocating for decreasing embodied carbon as far as possible. This led me to Arup's structural engineering sustainability hub where my leadership role now involves generating and sharing knowledge in a way which means all structural engineers can upskill rapidly and practically apply their learnings to projects. In the next year I'm looking forward to developing embodied carbon and circular economy policy with the University of Sheffield.

You've worked on projects with Engineers Without Borders and Bridges to Prosperity (B2P). Tell us a little about your experiences. What have you learned?

I've worked on several HID projects both during my career and while I was still studying. During one of my university summers, I supported one of Engineers Without Borders UK's long-term partnerships with Wellspring of Science and Technology (SIBAT) who are developing micro-hydro power in the Philippines. Our focus was on social and technical surveys of existing sites, and it was incredibly eye-opening to see first-hand how necessary it is for development to be socially centred to create long-term value for communities.

Through Arup's long-term partnership with B2P, I was the corporate construction manager for B2P's Cyabami bridge in Rwanda. I then continued working with B2P, leading the technical development of embodied carbon assessment for their repeatable bridge designs, transferring knowledge and providing B2P with a toolset to assess their carbon factors and embodied carbon for their projects.

These projects have all taught me more about the importance of engaging

well with communities and those you work with, using development to empower each other which in turn generates lasting outcomes.

How do you find working in HID and do you have any recommendations for students and graduates looking to get involved?

I find it an incredibly rewarding sector to work in, where the social transformation brought through infrastructure is very tangible. However, social development is complex and careful thought is important to consider both the value and potential damage you are bringing to a situation, focusing on building the capacity of others as opposed to delivering purely physical outcomes.

To begin in the sector, I would recommend building your network, looking out for opportunities, and applying to them! Finding knowledgeable people to talk to was really helpful for me, e.g. a family friend who works in the sector helped me to understand development projects more. I'm also grateful for the funding available, which has prevented financial barriers and enabled me to pursue opportunities involving travel.

Opportunities can be found in a range of contexts, e.g. I self-proposed my Master's dissertation in the field: *Investigating Success Factors for Infrastructure Projects Developing Low Income Communities*. This allowed me to develop my understanding and knowledge of the sector by connecting with a wide range of organisations and their projects.

You've been a member of the IStructE HID Panel since 2023. What would you say to young members thinking about getting more involved in the IStructE in this way?

Being a part of the panel has been a great way to get more involved in what's happening in the sector and practically work on initiatives to develop it. I've learned and grown by meeting others who work for a variety of organisations and have directly contributed to the field through work such as the HID resource map.

Access the resource map

Explore the map at: www.istructe.org/resources/guidance/hid-resource-map

