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The Bruck Passivhaus hotel in China.

Q&A David Ritter, M.AIRAH

Atelier Ten's Melbourne leader aims to design buildings that work beautifully.

Ecolibrium: When did you first decide you wanted to be an engineer, and how did you get to where you are today?

David Ritter: I trained as an architect, and was fortunate enough to study a brilliant post-grad course that used innovative teaching techniques for understanding how buildings interacted with the physical environment. We used lux meters, temperature data loggers, thermal cameras, sound-level meters, anemometers, and carried out air-movement tests using helium balloons and smoke to gather data about a site for which we were challenged to make a design intervention. It was great to play around with these tools as a student, and I was really hooked by the idea that there is so much more to buildings than the spatial environment that is primarily taught at architecture school.

I also began to appreciate how good engineering principles are fundamental to good architecture. The course was led by an architect and engineer both passionate about inter-disciplinary working, and this has been a huge influence on my career path.

‘ My goal is to design buildings that work beautifully ’

I began my career working with some of the UK's most innovative building services/environmental engineering practices at a time when the field of sustainability consulting was starting out, and continued to work in this area, very much as a creative design engineer – working in the space between the traditionally divided roles of architect and services engineer.

Since my early career I was convinced that I wanted to become a professional engineer. So I completed a Masters in Building Services Engineering and followed the professional qualification path through CIBSE. It has been a long road, but it has been worth it!

Eco: How would you characterise your approach to work? What are the fundamentals to your philosophy and process?

DR: My goal is to design buildings that “work beautifully”. By that I mean that the architectural fabric of the building should be working hard to create both delight and comfort. This is achieved through application of passive design principles in the key early design stages such that they are seamlessly embedded in the architectural concept. In this way there is less work for the building services to do, which means less energy use, carbon emissions and operating costs.

For successful integration of innovative environmental engineering solutions I believe that the ability to communicate design ideas clearly and evocatively is an essential part of the process. When working with clients and architects, the ability to visually communicate engineering design proposals through sketching and illustrative graphics is an essential process for getting buy-in of ideas. Effective communication and engaging in a collaborative, iterative

The M&E refurbishment at Westminster is one of David Ritter's favourite projects.



design process at the front end of projects is an area where engineers on the whole could do a lot better.

Eco: Do you have a checklist you always follow?

DR: It varies according to the nature of the consultancy project; whether it is a piece of strategic ESD consultancy advice, a masterplan or a building design, etc. A good client briefing session is an essential part of the early project process. Generally for most projects we have a best-practice schedule of services in place, and can draw on previous precedents to make sure we are generating all the right questions to pro-actively get a project moving.

Eco: Are you open to new ideas, or are the old ways the best ways? Do you like to collaborate?

DR: We should always be open to new ideas and new technologies, but with one caveat – the laws of physics do not change – and we must be pragmatic when looking at new technologies with relation to their application and potential performance. Also as a caution against new technologies, they can often become “green bling”, which can be a distraction from the key target areas for improvement and innovation in our buildings.

This should mean getting the basic things right, such as form, orientation, building fabric performance, fenestration design and solar control.

Passivhaus is a great example of where a new way of thinking about building design and construction techniques is founded upon a pragmatic approach to delivering optimum human comfort and ultra-low energy operation.

“ Good engineering principles are fundamental to good architecture ”

I am a great believer in the benefits of collaborating with like-minded individuals and organisations to achieve a common goal. It makes sense to be flexible in business and work with others such that you can deliver the optimum

end product for the client. It is also one of the best ways to cross-fertilise the industry and sharpen our skills as design practitioners by inspiring and feeding off one another.

Eco: What are your favourite projects you've worked on and why?

DR: I greatly enjoyed working on the M&E refurbishment of the Palaces of Westminster during my time in London with multi-disciplinary practice, BDP. It is rare that you can have the chance to work on such a significant building. Architecturally it was fascinating, with the original Sir Charles Barry gothic design incorporating many



David Ritter, M.AIRAH



Ritter admires the work of Antoni Gaudi, such as the Sagrada Familia.

good passive design features such as passive stack ventilation in the main chambers.

Over time these shafts and ducts had become filled with services, and the original environmental design strategy had been lost. We examined the potential for reinstating some of these original systems but many obstacles prevented this – the modern-day need for high security being one of them. The basement plant rooms and services trenches really were a tangle of legacy pipes and wires that were more like a museum of building services installations.

As part of the refurbishment we examined a number of options for reducing the carbon footprint of the parliamentary estate, considering the application of technologies such as co-generation, tri-generation, solar thermal, solar PV and some more left-field technologies such as bio-digester gas production, micro hydro power and micro-wind generation.

I also greatly enjoyed the opportunity to work on two Passivhaus projects during a three-year spell in China. It was a fantastic experience to see first-hand the technology transfer from Europe to China of one of the world's most advanced building standards to some built projects in a highly dynamic, but low-skill-based construction industry.

The Bruck Passivhaus hotel became the first such building in a sub-tropical climate, and it was brilliant to see how this standard can be applied successfully, even to hot, humid climate conditions. The project has inspired me to pursue opportunities for the application of this standard here in Australia.

Eco: Whom do you admire and why? Do you have a mentor? Do you gain any satisfaction from mentoring others?

DR: I admire many designers, but I particularly like the work of Antoni Gaudi. His projects are a work of genius, underpinned by



Atelier Ten built the world's largest thermal mass labyrinth at Federation Square.



a brilliant integration of engineering principles that make his structures highly efficient and rational, based upon the natural laws of physics. He was an architect with a fantastic understanding of the properties of materials and their use to sculpt space in the most astonishing ways.

I have a great respect for Patrick Bellew, founder of Atelier Ten – I have to mention the boss, don't I – he's an exceptionally talented engineer, and I learnt a great deal from working with him. I greatly enjoy his pro-active design process and ability to sketch and draw design solutions to elegantly solve problems at meetings. He also has a deep understanding of responses to climate in the natural world and how these can influence our designs.

Many here will know him from work carried out on Federation Square to

develop the world's largest thermal mass labyrinth for pre-conditioning the air supply to the atria, influenced by the way termites build their nests.

Having a good mentor has been a great help through the final stages of my engineering chartership process and has kept me on track to achieve this goal.

“ Mentoring or teaching . . . also helps to keep your own skills and knowledge fresh ”

It is a wonderful thing to mentor others, and I am currently enjoying teaching “Environmental Building Systems at the University of Melbourne to Bachelors of Built Environments students. Through mentoring or teaching, not only do you give valuable encouragement and knowledge to the next generation of designers but it also helps to keep your own skills and knowledge fresh.

“ Don't be afraid to follow the things you are passionate about ”

Eco: Are there interesting, funny or quirky facts you could share with us about your work and what you do?

DR: I am preparing for the Atelier Ten Global Bake-Off. It's a bit of fun to promote interaction between the offices – you have to bake something and present the output on social media. The award categories are strictly based upon the “engineering performance” of the baked goods.

I am hoping to create a high R-value bread, or perhaps as a new-comer to Australia I should be learning the “perfect pav”.



Does pavlova have engineering performance?

Eco: What advice do you have for emerging engineers who wish to follow in your path?

DR: Don't be afraid to follow the things you are passionate about, these are your strengths and will make you a more valuable engineer. I strongly recommend following a professional career path even if it seems like a long road – if you continue to work away at it you will get there.

Being actively involved in a professional organisation such as AIRAH is essential as you are able to contribute to and gain from the wealth of knowledge and support within the organisation and it will challenge and motivate you

in your career. Being part of a wider network also helps you to make valuable connections and brings a “big picture” understanding of the industry and the part you can play.

Eco: What's the most important lesson you've learned working at Atelier Ten?

DR: Atelier Ten have been established for 25 years now, and have designed some of the most innovative and architecturally distinctive environmental engineering projects around the world.

What has impressed me most about the Atelier Ten approach is that design innovation is always based upon a comprehensive understanding of the local climate and sound engineering analysis. The approach means rolling up our sleeves to be involved early in the design process, working in a collaborative, iterative way to crystallise the design concepts with other team members such that they often become a powerful form generator, embedded into the architectural design.

Atelier Ten have also taught me to value the art of communication; working within a design field it is highly important that engineers become better communicators through sketching, drawing and graphical presentation of technical analyses. Working in this way allows clients and other team members to clearly understand technical concepts, and creates a wider ownership and excitement about the environmental engineering principles.

“ Being actively involved in a professional organisation such as AIRAH is essential ”

Eco: What's next for you, and what are your goals for the future?

DR: My immediate goals are to grow Atelier Ten's presence in Melbourne; I am looking forward to developing good collaborations with partner

organisations. The long-term plan is to establish a thriving office here.

Eco: Describe yourself. What are your defining characteristics?

DR: Creative problem solver. Deep thinker – perhaps too much!

Eco: If I wasn't an engineer, I'd be a . . .

DR: Baker. I absolutely love the art of baking a good sourdough – there's something strangely satisfying about shaping the loaf well and seeing it rise in the oven.



Strangely satisfying sourdough.

Eco: Do you have hobbies or diversions?

DR: I enjoy playing badminton and learning Mandarin.

Eco: My most valued possession is . . .

DR: I try not to have too many – I am trying to “live lightly” – but possibly a 1950s sofa bed that's travelled around the world with us.

Eco: Tell us something about yourself others might not know.

DR: I'm left-footed and right-handed.

Eco: In five years I'd like to be . . .

DR: Able to understand Aussie rules footy! ■



Aussie rules is an acquired taste.