



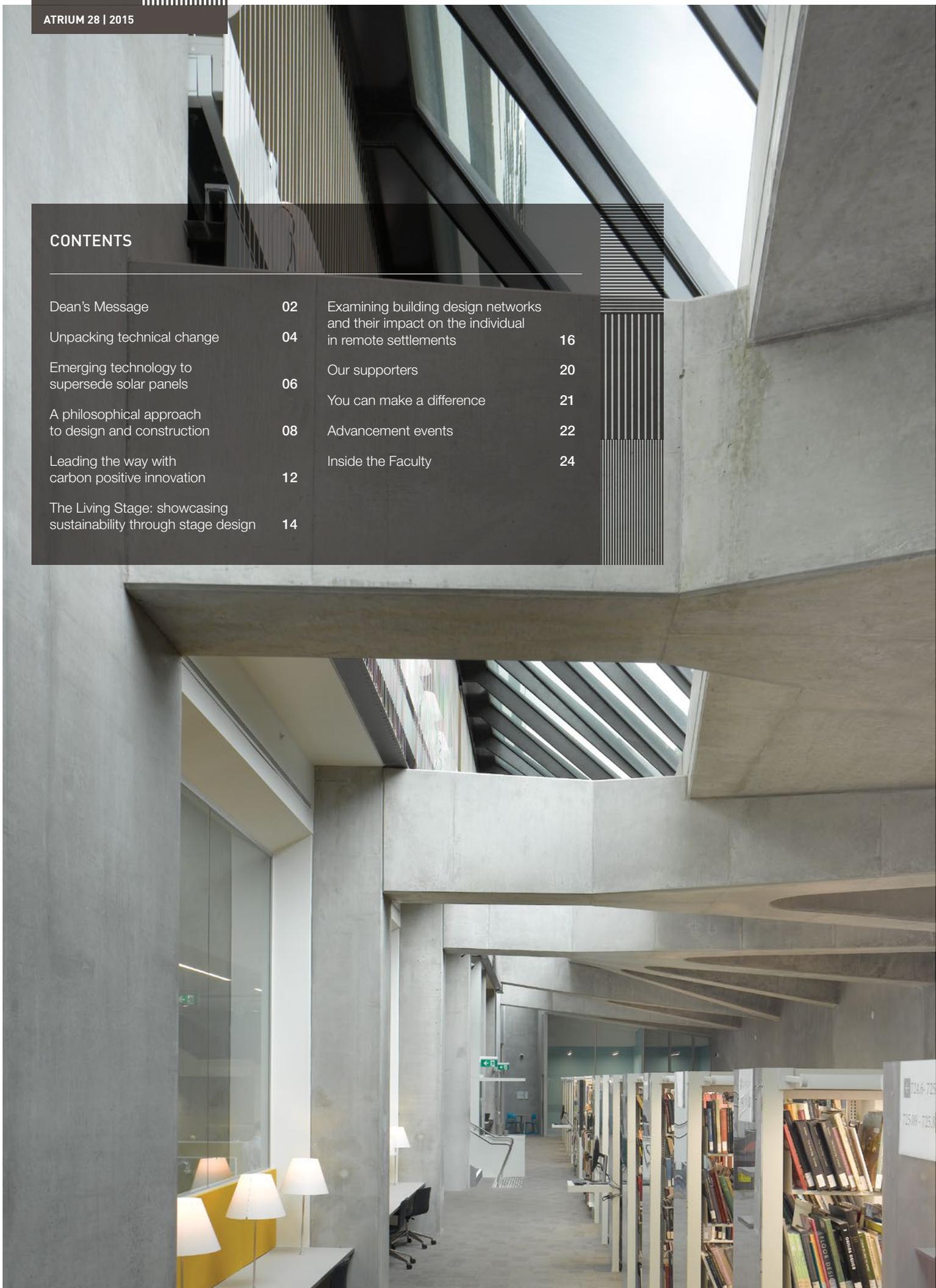
Atrium

THE UNIVERSITY
OF MELBOURNE
FACULTY OF ARCHITECTURE,
BUILDING & PLANNING



CONTENTS

Dean's Message	02	Examining building design networks and their impact on the individual in remote settlements	16
Unpacking technical change	04	Our supporters	20
Emerging technology to supersede solar panels	06	You can make a difference	21
A philosophical approach to design and construction	08	Advancement events	22
Leading the way with carbon positive innovation	12	Inside the Faculty	24
The Living Stage: showcasing sustainability through stage design	14		



DEAN'S MESSAGE



Our professions have evolved considerably, changes driven by evolving societal needs and expectations as well as by technological and economic drivers. This issue of *Atrium*, our first for 2015, has a particular focus on practice and construction innovation and how that translates into the various aspects of our professional work.

The theme of innovation is apposite with the first student cohort welcomed into the recently opened Melbourne School of Design building. The design and construction of the building has been recognised with the award of 6 Stars in the Green Star Education Design scheme. It is the only building to be awarded all 10 innovation points under this scheme and the largest building in Australia to be awarded such a high rating.

The collaborative processes manifest in the new building required extensive planning and careful consideration of the needs of students, staff as well as direction future research within our disciplines is likely to take. We have striven to create a living, learning space, a building that demonstrates what we teach. It is a building dedicated to expanding design frontiers and encouraging our staff and students to approach challenges with innovative solutions.

Why is an innovative approach to our practice so important? How do we ensure we remain open to new ideas and emerging methodologies in all aspects of our work? How do we incorporate that innovation into norms of practice and production in industries that are fragmented and often noted as slow to change?

These are some of the questions examined in this edition of *Atrium*.

It explores the achievements of alumni and students working the forefront of the construction innovation field. A number of current Faculty members also share pertinent contributions on the topic.

Chair of Construction Professor Paolo Tombesi, who has a particular interest in the relationship between the proposition for a building and the socio-technical aspects of its physical construction, discusses the necessity of technical change and the economic constraints to such innovation in construction. Paolo stresses the importance that institutional buildings, such as the new Melbourne School of Design, act as 'laboratories of change' to percolate particular innovations into the industry.

Dr André Stephan explores an emerging renewable energy technology that is set to supersede solar panels, and outlines some of the research currently underway to facilitate widespread adoption of this technology. An architectural engineer with academic expertise in the field of environmental assessment of buildings who has won a large number of awards in Australia, Belgium and France, André recently joined the Faculty as a Postdoctoral Research Fellow.

We can observe innovation emerging in practice by considering the work of young firms as they establish themselves and gain recognition. To illustrate this, we feature the residential and commercial work of emerging Melbourne firm Architects EAT. Led by ABP alumni Albert Mo, Eid Goh and James Coombe, their distinctive philosophical and exploratory approach to design is attracting international attention. The article traces their growth from an initial three person office in South Yarra to multi awarding winning architecture and interior design practice.

Alumnus Bill McCorkell, whose father, the late Howard McCorkell, was also

closely involved with the Faculty, is profiled in this issue to illustrate another dimension of innovation. His Melbourne architecture firm has demonstrated what is said to be the first ever carbon positive prefabricated house and was recently featured in the London-published *Financial Times*. Co-director of ArchiBlox, Bill discusses how expanding the scope of his practice to include other industries, and their associated products, has been a key innovation tool.

Of course, our students in the Melbourne School of Design frequently present highly creative ideas around sustainability and construction innovation in their respective fields of interest. One of our doctoral students, Tanja Beer, is breaking new ground in the field of sustainable theatre design and construction. Supervised by Dr Dominique Hes, Tanja's PhD project, *The Living Stage*, is said to be the world's first edible, recyclable, biodegradable performance space. Her work has garnered the attention of the Prague Quadrennial, the most prestigious stage design exhibition in the world, and she has been invited to exhibit.

Another of our PhD candidates, Hannah Robertson, was awarded the Henry and Rachael Ackman Travelling Scholarship. Her research project entails travelling to remote settlements in northeast and west Arnhem Land to Switzerland and India to examine how human needs can be more satisfactorily met through efficient utilisation of resources.

I hope you find this edition of *Atrium* both engaging and thought provoking in the range of innovation it explores.

**Professor Tom Kvan
Dean, Faculty of Architecture,
Building and Planning**

Image: Melbourne School of
Design Library, Roland Halbe

UNPACKING TECHNICAL CHANGE

Paolo
Tombesi

The term innovation enjoys plenty of rhetorical punch in academic jargon, particularly when used in conjunction with design, building and technology. Everyone seems to strive to be innovative, as if the association with the adjective automatically bestows disciplinary merits.

Literally, however, innovation only describes a process of 'marginal substitution', whereby a specific task with defined objectives is carried out in a way that uses either a differently structured or a new combination of components, or alters tested procedures.

In itself, the idea of technical change underpinned by these operations is not revolutionary, particularly in construction, where every project is different from the others preceding or following it. Of significance may rather be the breadth of its scope, what triggers the process of change (and to what ends), and what facilitates or prevents it from happening – in other words, innovation's agenda, motives and viability.

Neo-Schumpeterian economics have no qualms about placing marginal capital return at the centre of innovation and the logics determining its unfolding: by-and-large, we introduce technical change in order to obtain advantages from new configurations of production. Such advantages can be embedded in the quality of the resulting output or in the markets created for or by it.

With building activity, the location of such advantages is as widespread as it can be, given the capillary distribution of its supply chain into the structure of the economy. For the Australian Bureau of Statistics, over 8% of the gross domestic product and 9% of the active workforce have a stake in how buildings are built and, by extension, in the solutions employed to build them. If we add building users, the percentage reaches 100%.

For sake of simplicity, though, innovation theorists tend to distinguish between the interests of the manufacturing sector in making new components available, and the interests of the construction industry in either adopting them or eliciting their development through the search for new solutions. In the first case, we speak of technology 'push' (into construction); in the latter of technology 'pull' (from within construction).

A third interest group is represented by government, which is supposed to instigate the terms of this push-and-pull relationship by applying strategic pressure to, or releasing pressure from, particular points along product development and distribution chains.

Depending on the sections of the construction industry and the powers held by the actors involved in them, the relationship between pushes and pulls works better along privileged 'axes', where the interests of product introducers and adopters can align.

With residential volume building (Figure 1), for example, the natural axis of innovation connects components (i.e. manufacturers) with processes (i.e. housing developers and contractors). This is because in a sector defined and controlled by housing product 'supply' rather than 'demand', innovation advantages are most likely to accrue to the entrepreneur if technical change is to slot undistruptively into optimised construction routines and established product classes.

With for-a-client institutional building (Figure 2), by contrast, the axis translates significantly along the line notionally connecting established solutions and systemic changes to the building product. More than the introduction of discrete components, in fact, what seems to matter in these buildings is the extent to which more complex assemblies can determine novel spatial configurations or specific performances.

DEPENDING ON THE SECTIONS OF THE CONSTRUCTION INDUSTRY AND THE POWERS HELD BY THE ACTORS INVOLVED IN THEM, THE RELATIONSHIP BETWEEN PUSHES AND PULLS WORKS BETTER ALONG PRIVILEGED 'AXES', WHERE THE INTERESTS OF PRODUCT INTRODUCERS AND ADOPTERS CAN ALIGN.

IN EMBODYING SYMBOLIC AMBITIONS THAT REQUIRE A DIFFERENT, BROADER FRAMING OF 'RETURN', THESE BUILDINGS CAN ACT AS LABORATORIES OF CHANGE THAT, ONCE TESTED AND PROVEN, CAN PERCOLATE THROUGH THE INDUSTRY.

In this case, clients and professional consultants are the ones with the power to exert relative control over the pulling of 'architectural' innovation into the procurement context of their one-off, special features projects, bringing contractors and manufacturers along.

There are, of course, myriads of project-specific exceptions or variations to these generalisations; and this, in a sense, is what makes the whole idea of technical change in construction as a result of push-and-pull dynamics determined by marginal benefits useful as a disciplinary tool.

Firstly, push-and-pull analysis helps making sense of the social determinants of building development and the positioning strategies of the players involved. If we can understand how the specific interests of different actors are leveraged over the building process in given industrial circumstances, we can also decipher and possibly design, both as an intelligent community and a legislative society, the operative conditions that are likely to determine preferred outcomes. Rather than hoping for things of a quality that will never eventuate by itself, we can take

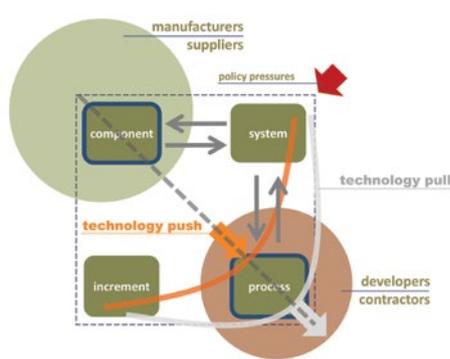


Figure 1 – Production substitution axis and roles in residential volume building

responsibility for the social engineering and investment required to make it happen.

Secondly, push-and-pull readings of evolving building output can help define spaces for policy. As a matter of fact, the building industry does not provide the same level of *means, motives and opportunities* for beneficial technical change evenly across its sectors. Some building types and markets could do well with product or process modifications that, although socially constructive, are financially cumbersome or uncalled for within the decision-making outlook of the economic subjects involved – i.e., they are potentially useful for the community but commercially unwarranted when their opportunity costs are considered.

Thus, instead of limiting our aspirations for technological progress to those building instances where value is likely to accrue efficiently to those who invest directly in its creation, we could exploit our ability to understand what makes a context conducive to particular strands of innovation, and assign products in that context explicit 'industrial development' responsibilities. Building products developed in suitable sectors could be targeted to act indirectly as Trojan horses for horizontal product innovation in other sectors, so as to reduce their built-in development marginal costs or adoption risk.

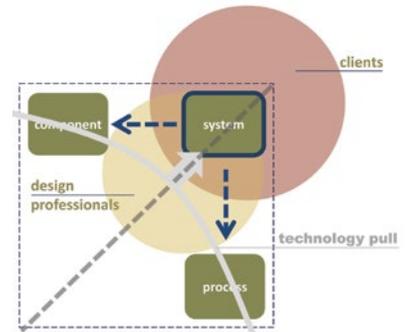


Figure 2 – Production substitution axis and roles in for-a-client institutional building

This is where institutional buildings – university infrastructure on top of all – have an instrumental role to play besides their individual existence. In embodying symbolic ambitions that require a different, broader framing of 'return', these buildings can act as laboratories of change that, once tested and proven, can percolate through the industry. For this very reason, not only the scope of the 'experiments' conducted within such laboratories needs to be meaningful and applicable beyond the specific project: their outcome also needs to be assessed and validated against clear parameters.

This is possibly the next, important step in the life of the ABP Faculty and the Construction Program. As indicated on several occasions in recent past, rigorous analysis of the results and dissemination of the lessons learnt with the procurement of the new MSD building have been identified as necessary and rewarding exercises. Several post-occupancy research and teaching projects are already underway; they suggest that the completion of our new house is supplying us with plenty of opportunities to build reflective knowledge, track record and leadership on technology transfer and applied push-and-pull dynamics in construction. With fresh quarters, the time to boost the mission of a professional school – critically dwell on practice and develop public scholarship upon it – has arrived.

EMERGING TECHNOLOGY TO SUPERSEDE SOLAR PANELS

André
Stephan

The rise of BiPV, or building-integrated photovoltaics, technology will see walls and windows join rooftops in generating electricity from the sun. It's a technology with the potential to supersede solar panels in the construction of the average home. André Stephan explains some of the factors currently hindering this emerging technology from entering mainstream use, and why innovation is tantamount to its widespread adoption.

Instead of simply being added on top of our buildings, BiPVs are integrated into construction assemblies. They can be divided into four main categories: tiles, modules, glazing and foil products¹. While BiPVs have been in the labs for at least 30 years, until recently they were too expensive to be installed on a large scale.

BiPV solar roof tiles have the same shape as an ordinary clay roof tile but possess the ability to generate electricity from the sun and can be seamlessly incorporated into the building. Likewise, BiPV modules provide the same weather protection as conventional assemblies but possess the added benefit of being able to generate electricity while reducing the amount of different materials required in the construction process. Sunshades are among the best candidates for using BiPV modules and a number of demonstration examples already exist in different countries.

More innovative BiPV products include glazing panes that generate electricity. These are produced by spraying glazed surfaces with nanoparticles of silicon which act as solar cells². The coatings come in different colours and opacities, providing building designers with a wide range of options to suit their needs. It is almost

impossible to tell the difference between conventional and transparent solar glazing. In addition, the opacity of some cells can be controlled, providing the added functionality of acting as a sunshade and generating more electricity while preventing the sun from penetrating the house excessively.

The final category of BiPVs utilise a very thin transparent film that converts the light of the sun to electricity for the household. These thin-film photovoltaics can be applied on virtually everything, transforming any surface into a mini generator. By simply adding the film on the interior side of the surface existing windows can be converted into solar windows. Significant research is being conducted to bring BiPVs out of the lab, however a number of barriers still need to be overcome to make BiPV a long-lasting construction solution.

The efficiency of BiPVs needs to increase in order to be a viable source of electricity. Currently modules achieve an efficiency value of around the 5-15% mark depending on the solar cell type¹, meaning the area needed to generate enough electricity can be prohibitive. This is especially true in urban areas, where the majority of the population resides. A larger surface area results in increased material usage and a higher cost, which means they require a higher initial investment than conventional PV panels.

The cost barrier preventing the large scale deployment of BiPVs is likely to shift in the coming years. With increases in industry volume and support of local governance for renewable energy, it is expected that the cost of BiPVs will continue to decrease in the near future, as has been the case for conventional PV panels.

Durability is a major and often overlooked aspect preventing widespread deployment of BiPVs, but a significant amount of research is currently underway to investigate expanding the service life of the photovoltaic component in BiPV systems in order to match the current average service life of the conventional assembly.

Another impediment to the widespread adoption of BiPV in mainstream construction practice lies in potential overheating issues caused by PV cells. This requires additional resource allocation to ensure the heat is extracted to improve efficiency as well as extra consideration of how this heat affects the performance of the building itself.

FOR THIS EXCITING RENEWABLE ENERGY SOLUTION TO WORK, IT'S ALSO ESSENTIAL THAT A LIFE-CYCLE APPROACH IS ADOPTED. THE ENTIRE SUPPLY CHAIN SUPPORTING THE MANUFACTURING, INSTALLATION AND OPERATION OF BIPVs SHOULD BE TAKEN INTO ACCOUNT TO ENSURE THAT NET ENERGY SAVINGS AND REDUCED ENVIRONMENTAL IMPACTS ACTUALLY OCCUR.

An overheating roof or west-oriented façade does not achieve thermal comfort for building users if no additional means are used to prevent that. In order to achieve widespread adoption, BiPV components must be capable of performing at similar levels to conventional assemblies while also generating electricity. Currently this is not easily achieved but technological advancements and reducing costs will see increased adoption of BiPVs.

In addition, the culture of construction practitioners and clients needs to change if mainstream adoption of BiPV technology. The rate of change in construction materials is fairly low compared to other industries, so greater promotion and marketing of demonstration projects, certificates of durability and advanced simulations are required to convince the construction industry of the viability of BiPVs and their benefits³.

For this exciting renewable energy solution to work, it's also essential that a life-cycle approach is adopted. The entire supply chain supporting the manufacturing, installation and operation of BiPVs should be taken into account to ensure that net energy savings and reduced environmental impacts actually occur. The electricity source being replaced by BiPV is a critical consideration. While this is not a significant issue in Australia, and especially Victoria, which relies on brown coal to generate more than 90% of its electricity⁴, in regions where hydraulic or geothermal electricity is the primary energy source, the embodied environmental impacts of BiPVs could be larger than benefits provided by their use.

A last concern associated with a dramatic expansion of the BiPV industry is the limited amount of raw materials needed to sustain a high volume global production. A significant number of crucial materials are either sourced from a limited number of places (e.g. Tellurium or Indium) or are

already scarce (e.g. Silver). As material scarcity has the potential to significantly impede the large scale deployment of BiPVs⁵, innovation in material substitution and recycling is required to ensure BiPVs become a generalised solution for renewable energy production.

Despite these challenges, BiPV technology looms as a major component in future construction projects. With a significant number of researchers around the world working to devise innovative solutions to overcome the associated barriers, we expect to see a dramatic increase in the integration of solar generation capability into the roofs, walls and windows of houses, apartments and commercial developments.

1. P.B. Jelle, C. Breivik, H. Drolsum Røkenes, Building integrated photovoltaic products: A state-of-the-art review and future research opportunities, *Solar Energy Materials and Solar Cells*, 100 (0) (2012) 69-96.

2. B.P. Jelle, A. Hynd, A. Gustavsen, D. Arasteh, H. Goudey, R. Hart, Fenestration of today and tomorrow: A state-of-the-art review and future research opportunities, *Solar Energy Materials and Solar Cells*, 96 (0) (2012) 1-28.

3. R.J. Yang, Overcoming technical barriers and risks in the application of building integrated photovoltaics (BiPV): hardware and software strategies, *Automation in Construction*, 51 (0) (2015) 92-102.

4. Clean Energy Council, *Renewable Energy in Victoria*, Clean Energy Council, Melbourne, 2013.

5. A. Feltrin, A. Freundlich, Material considerations for terawatt level deployment of photovoltaics, *Renew Energy*, 33 (2) (2008) 180-185.

Image: Building-integrated photovoltaic transparent roof of the San Francisco City College, California, USA.

A PHILOSOPHICAL APPROACH TO DESIGN AND CONSTRUCTION

Rees
Quilford

FROM AWARD-WINNING INNER-CITY COLLABORATIONS TO HIGH-RISE RESIDENTIAL DEVELOPMENTS, ARCHITECTS EAT APPROACH EACH PROJECT WITH AN OPEN MIND AND A FIRM EMPHASIS ON CONTEXT.

EAT Directors Albert Mo and Eid Goh first met while studying Architecture at the University of Melbourne. Shortly after graduation they established a small office off Toorak Road in South Yarra in 2000. Not yet registered, they initially operated as a design firm with Eid specialising in the hospitality sector and Albert pursuing residential work. Fellow University of Melbourne graduate James Coombe, joined the practice in 2005, became an Associate in 2010, and is now an Associate Director.

Architects EAT has grown substantially since those humble beginnings. A renowned design-driven practice, their work is informed by a consistent philosophical approach to producing unique commercial and residential designs which intimately connect with both their function and individual context.

The early days were tough. Like many small practices starting out, much of their work came from family, friends and colleagues.

"Starting from scratch with no contacts at all is quite difficult in Melbourne. You kind of have to rely on your peers and mentors to give you a kick start," says Eid. Over time, their reputation grew and their work began to attract industry and media exposure. The first big break came for EAT through the publication of Eid's work on a hospitality fit-out in the Collins Place food court. Inspired by Scandinavian design, his work on Toasted Café was done in collaboration with renowned graphic designer Fabio Ongarato Design. A large graphic mural provided the centrepiece and cast a surreal backdrop for patrons sitting on the undulating hooped pine joinery while they waited for their baguettes to toast. The design featured as the front cover of *Artichoke* magazine and heralded their arrival on the design scene. "We were all jumping up and down celebrating when it came out. We still retain that project on the website as it was such a keystone in our whole history," says Albert.



“IT’S ABOUT THE FEELING OF SPACE AND HOW LIGHTS AND SHARED EFFECTS INFLUENCE ARCHITECTURE. BEING MY OWN HOUSE, I WAS ABLE TO EXPLORE THAT,” – ALBERT MO

They’ve continued to attract the interest of architecture and design publications, but Eid emphasises that media exposure is never the first intention. “When we do a job, not that we don’t aspire or expect to be in magazines, the key thing is that the client really embraces the product. Whether it’s a hospital, a house or a retail space, it has to work for the user.”

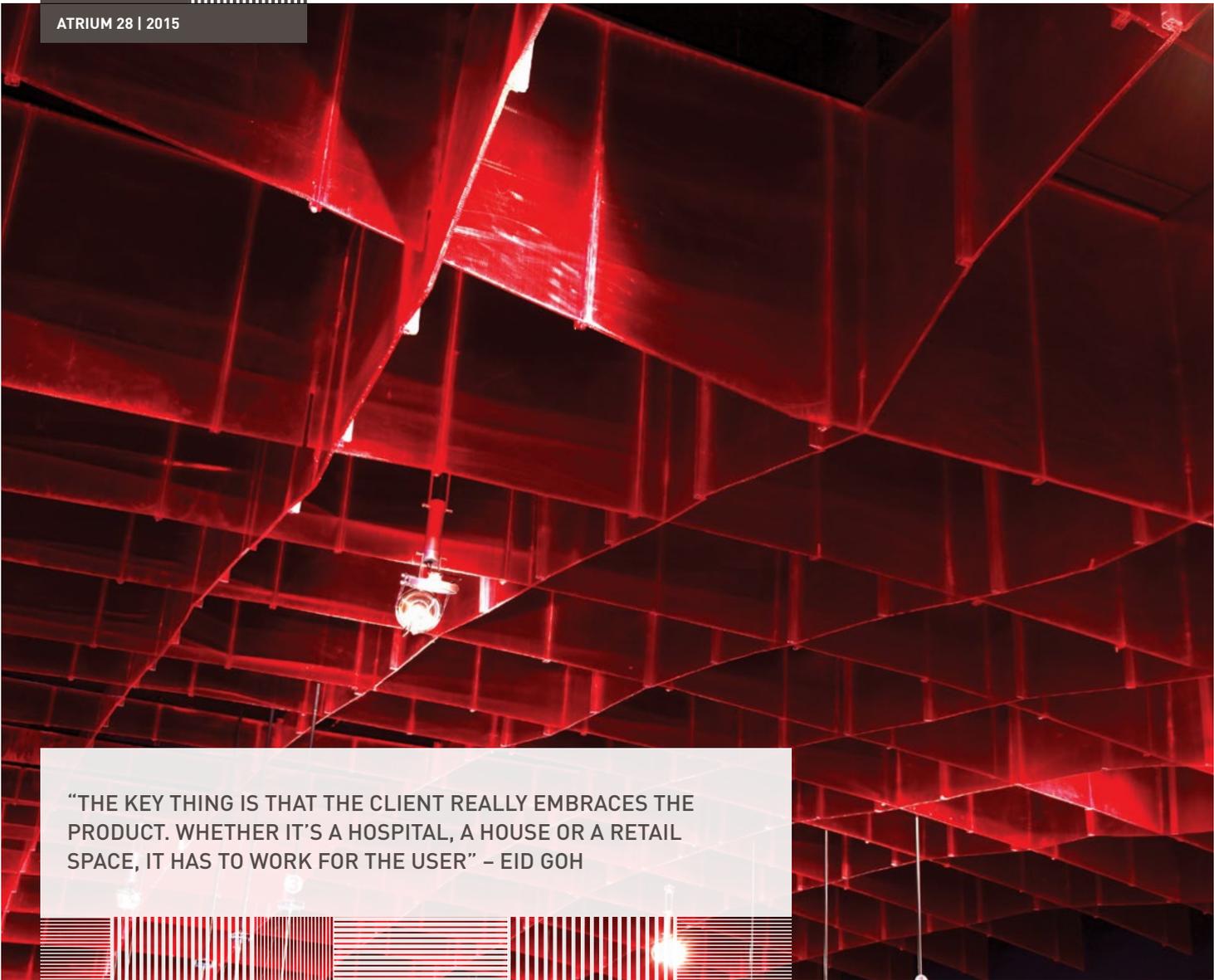
The next commercial milestone project was Eid’s work on the Mall of Asia Bowling Centre. The project saw them design a 32 lane 3000m² bowling centre with a billiard hall and pro shop, for a mall in the Philippines. Completed in 2007, the design allowed them to explore different materials and features a red sinuous curve ceiling made of laser cut red twin-wall polycarbonate sheeting. The fluid form of the inner structure and graphics by Büro North are intended to evoke the ‘swing’ of the bowler’s arm and the vibrations of the balls smashing the pins. The project was shortlisted for the 2008 Interior Design Awards ‘Colour in Commercial Award’ and published throughout the world. “This job made us realise that simple things and simple materials, treated properly, can give you a maximum outcome,” says Eid. The success of the bowling centre saw them engaged in large-scale design work both locally and internationally.

It was the design of Albert’s own residence, Kelso House, which put the firm on the map in the residential design field. The 170m² single family house in the densely urbanised suburb of Richmond was completed with a small budget and limited resources. Three long-strip skylights and an unmistakable black and white colour scheme provide the main focal points. The project also allowed Albert an opportunity to explore his interest in the philosophy of *phenomenology*, an approach that had interested him since his time at University, “It’s about the feeling of space and how lights and shared effects influence architecture. Being my own house, I was able to explore that,” he says.

Albert has applied similar notions and design theories to subsequent EAT projects. Their residential work emphasises a concern for scale and tactility as well as a sensibility for space. In terms of how this plays out in practice, the theory itself isn’t necessarily the focus of client discussions. The conversation instead revolves around architectural and building elements, certain styles, and the client’s response to the materials.

The EAT approach to residential design embraces Gaston Bachelard’s concept

Image: Kelso House.
A 170² single family house
in Richmond. Shortlisted
in three residential awards
in 2005.



“THE KEY THING IS THAT THE CLIENT REALLY EMBRACES THE PRODUCT. WHETHER IT’S A HOSPITAL, A HOUSE OR A RETAIL SPACE, IT HAS TO WORK FOR THE USER” – EID GOH

of the house as a uniquely personal space. In his 1958 book, *Poetics of Space*, Bachelard suggested “the house furnishes us with dispersed images and a body of images at the same time... For our house is our corner of the world. As has often been said, it’s our first universe, a real cosmos in every sense of the word.” Their work on the design of Elm and Willow House is an example of a highly successful collaboration in this vein. The project entailed a residential extension on a 280m² single family house in Canterbury, Melbourne. Completed in 2009, it utilised concrete, steel and glass as the primary building envelope. “The client was really happy to run with us on that phenomenological bent, so to speak. This project became about what the spaces would imbue and ignoring the typical things to do, so there’s no television, for example. The environment welcomes you into the house,” says James.

Upon completion, it attracted a great deal of attention, was profiled by international press, has featured in over one hundred blogs and websites and won the acclaimed ‘AIA Victorian Chapter Residential Award’.

The EAT team maintain that the design process for both their residential and

commercial projects is driven by a consistent philosophical approach rather than a predetermined style. “None of our projects are really the same, we always try to experiment a little bit and that leads us to doing different things every time and maybe even working something that came prior but in a different fashion,” says James.

Creating uniquely detailed projects and avoiding replicating previous designs is a source of pride. The EAT team believe in the importance of context, both in the physical and human sense. “Certain details can be transferred, however the overall aesthetic cannot,” says Albert.

Capitalising on the success of projects such as Elm and Willow House, EAT continued to deliver private residential projects and small-scale apartments before landing their first high-rise residential development, an engagement to design Pulse apartments. A 9,000m² medium density residential development in the beachside suburb of Saint Kilda, it comprises more than one hundred five-star rated units spread across two five-level buildings with five additional ground floor retail and hospitality tenancies. The transition to larger scale development

was a steep learning curve; the EAT office had to develop different ways of operating. “The number of people involved in the project obviously increased. We started to learn that architects aren’t necessarily at the top of the hierarchy. We learnt how to fight and when not to fight,” says Albert.

They also quickly learnt the benefits of streamlining options. While the Pulse development consisted of a little more than one hundred apartments, they developed more than 30 different unit types, “I look back and laugh”, says Albert. “Normal developers would have had less than ten.”

After fifteen years in the industry, EAT has come a long way. Eid suggests the ability to manage personal ego has been a crucial element to success, “You can win clients and you can lose them just as easily. You have to have an open mind. At the end of the day it’s about balancing design and business.”

Images (clockwise from above)
01. Mall of Asia Bowling Centre, Manila
02. Kelso House, Richmond
03. Pulse Apartments, St Kilda
04. Elm & Willow House, Canterbury



“WE ALWAYS TRY TO EXPERIMENT
A LITTLE BIT AND THAT LEADS US TO
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FASHION” – JAMES COOMBE



LEADING THE WAY WITH CARBON POSITIVE INNOVATION

Louisa
Deasey

Melbourne architecture firm ArchiBlox, the brainchild of Alumnus Bill McCorkell, pictured (BPD, 1993 and BArch (Hons), 1996) and builder David Martin, have taken sustainability innovation to the next level by creating what's said to be the first ever carbon positive prefabricated house.

The Archi+ Carbon Positive House, which went on display at City Square in Melbourne in February as part of The New Joneses and the Sustainable Living Festival, has now been moved to David's property in Cape Patterson, where its energy usage and expenditure can be formally assessed over a period of twenty four months. The prototype is so unique, it is the first new-build standing home in Australia to receive a platinum rating by the life-cycle assessment company eTool, and it was

recently featured in The Financial Times. The house itself is a lesson in creatively responding to the problem of carbon emissions in the construction of a standard home. And it teaches its lesson beautifully.

Designed to open to the north with floor-to-ceiling windows, the home contains edible garden walls, a sunroom which spans the length of the building, an insulating grass roof, as well as in-ground cool tubes which create cross-flow ventilation by pulling air in from the floor on the south side and emitting it through the north-facing windows.

The living spaces have been organised to be as compact as possible yet with full height openings, allowing a free-flowing space. Roof-mounted photovoltaic (PV) panels maximise solar power, and rainwater recycling completes the beautifully-sustainable package.



The project has put ArchiBlox on the map for well-designed sustainable houses, exactly the niche they aimed to fill when the two founded the company.

“David and I met eight to ten years ago on a project in Inverloch,” says Bill, “we got along really well, we had similar aspirations and ideals, we both saw a void in the marketplace for well-designed architecturally-sustainable homes – and that’s where the business kicked off from there.”

Bill is passionate about the possibilities in the intersection of architecture with other industries. Prior to founding ArchiBlox, he was Director of Melbourne architecture and interior design firm Techne, and also ran a side business importing eco-friendly LED lighting.

“I love looking at innovation within our industry but also the opportunities outside our industry which touch us. So that can include industries like

“From a personal perspective, when you do walk into a house that’s sustainable and its giving off very low VOCs (volatile organic compounds), so there’s no formaldehyde or chemical releases, you feel good. You feel physically a lot cleaner and better. With our houses, after they’ve been dormant for a few days or weeks, if it’s a hot day they still feel warm, and if it’s cool they feel cool.”

It’s no surprise that Bill is a lateral-thinker in the construction and design field – it’s in the McCorkell blood. His grandfather created the first steel-roll window system in Australia and founded McCorkell constructions (which his brother now runs), his uncle was president of Master Builders Australia, and his father, the late Howard McCorkell (BArch 1964), also a University of Melbourne Alumnus, was involved in some of the first cluster housing projects in Australia, through Merchant Builders Pty Ltd.

Merchant Builders, founded in the early 1960s, broke new ground by putting landscape considerations on equal footing

on, now features on the Heritage Victoria list for being of “architectural, social, historic and aesthetic significance to Victoria”.

Built in Doncaster in 1971, Winter Park comprised 20 low-profile, architect-designed houses constructed mostly from recycled brick, and oriented for maximum light and solar gain. Offering a private, visually-enticing shift from the banal urban landscape of suburbia, it was a project which shifted the focus from ease for the builder to enjoyment for the inhabitant.

Four decades later, it still sets the benchmark for town planners.

Archi+ Carbon Positive House aims to set a similar precedent, and become the prototype for low-footprint construction innovation.

“I believe dad found a niche in the marketplace with Merchant Builders – architecturally-designed houses that you

ONE OF THE BIGGEST TAKEAWAYS I HAD FROM MY TIME AT UNIVERSITY WAS SPATIAL ARRANGEMENT AND HOW DIFFERENT ARCHITECTURAL ELEMENTS CAN TRIGGER CERTAIN EMOTIONS. I STILL REMEMBER ONE OF MY LECTURERS TALKING ABOUT HOW YOU FEEL WHEN YOU GO FOR AN INTERVIEW AT A BIG OFFICE BUILDING AND IT’S A MARBLE-CLAD MASSIVE VOID, WHICH MAKES YOU FEEL BELITTLED BEFORE YOU’VE EVEN SHAKEN SOMEONE’S HAND.

lighting, or prefabrication, or many other areas. They all present an opportunity for innovation in our architectural work.”

But for Bill, innovation on a functional level shouldn’t come at the cost of form.

“One of the biggest takeaways I had from my time at University was spatial arrangement and how different architectural elements can trigger certain emotions. I still remember one of my lecturers talking about how you feel when you go for an interview at a big office building and it’s a marble-clad massive void, which makes you feel belittled before you’ve even shaken someone’s hand. So for me it’s also about that whole psychology of how a space can make you feel.”

with architectural design and the quality of the materials used.

“Dad won a Melbourne University scholarship at the end of his architectural degree to study cluster housing in the United States, and that led to his being involved with Merchant Builders back in Melbourne through David Yencken – who was then Dean of the Faculty and Merchant Builders co-founder.”

It’s hard to believe now, but the basic tenet of cluster housing – building groups of houses to maximise green space, and privacy for residents – was considered revolutionary in its time.

Winter Park, one of the first cluster-housing projects in Victoria, which Harold worked

could buy off the plan. And there’s quite a synergy with ArchiBlox. Our addition is that our homes are prefabricated, but the principles are the same.”

Bill places innovation up there as one of the founding principles of his business.

“One of our core values is ‘innovation is inspiration’. So we constantly strive to find a better way to inspire both our lives and the lives of others. So innovation in my business is fundamental in not only giving us direction, but also everyone that works with us – a drive and a mission to create.”

Image: Avalon House, an Archiblox prefabricated house with a green roof which minimises rainwater run off and solar penetration.

THE LIVING STAGE: SHOWCASING SUSTAINABILITY THROUGH STAGE DESIGN

Louisa
Deasey

PHD STUDENT TANJA BEER IS USING THE STAGE TO DEMONSTRATE SUSTAINABLE DESIGN PRACTICES.

Melbourne School of Design student Tanja Beer has garnered worldwide attention with her PhD projects, *The Living Stage*, which will exhibit at the prestigious Prague Quadrennial and the V & A Museum in London later this year.

The Living Stage is part of her PhD project that examines the latest ideas on positive impact, and explores how they can be applied to theatre. Sustainability in the stage design field is relatively uncharted territory, and Tanja's work is drawing global attention.

Tanja credits the success of the project to the innovative ideas in sustainability presented by her supervisor, Dominique Hes.



“A lot of my PhD is taking in her ideas around contributive practice and positive legacy which is all about shifting the field into something that is more about resilience and thrive-ability. Basically, I’m taking these very contemporary ideas and implementing them in theatre.”

Prior to commencing her PhD at MSD in 2011, Tanja had spent fifteen years as a freelance set and costume designer. A field, she says, “roughly thirty years behind architecture in terms of sustainability innovation. It wasn’t until I dabbled in the world outside of theatre that I got exposed to sustainability ideas in design.”

“Sustainability in theatre is quite a niche field and it’s in its very early stages. It’s only in the last five to ten years that we’ve actually started to have discussions coming out of the theatre community that address sustainable issues.”

The decision to move from a Masters in Set and Costume Design (which she completed in Austria) to a PhD focusing on sustainability, was ignited, in part, by a contract job at the Melbourne Museum.

“In 2009 the museum had just brought in a sustainability framework, and one of my jobs was to investigate how sustainable practice could be applied to exhibition design. So I started to think about my own practice as a set and costume designer and why we didn’t have something similar. I Googled ‘sustainable costume design’ and ‘sustainable theatre’ and there was almost nothing out there – I couldn’t believe that there was this massive gap, worldwide. If you Google it now, there’s a lot happening – so in the period of the last five to six years there’s been this massive transition.”

Like most highly innovative projects, *The Living Stage* was formed after Tanja began asking some pertinent questions about environmental impacts: Can a stage be grown? Is an edible stage possible and practical? If so, could the community be involved in its growth? And, more generally, could she design a stage that simultaneously enriches the audience, the community and the environment?

The Living Stage was an experimental project to answer these questions, and has become the world’s first recyclable, biodegradable and edible performance space.

First exhibited at the Castlemaine State Festival in 2013, the stage itself was an amphitheatre made of large apple crates, set up in a public park.

“The fantastic thing about apple crates is that you can use them as a structural element because they stack really well, and they’re fantastic growing spaces—they’re quite deep so you can put soil in there.”

Nonetheless, working with a living entity did pose some unforeseen issues.

“Growing plants is always tricky because you’re working with a living element, and we had one of the hottest summers in Melbourne in 2013. We thought we were doing a really fantastic job because we’d set up this separate space to do the permaculture, all hooked up to full water tanks and an irrigation system which meant we wouldn’t need to get water from the town. But it didn’t rain for six weeks so the water tanks ran dry and we had to then attach to the town’s mains.”

After Castlemaine, the same concept was then implemented with a new community group in Cardiff, Wales, for the World Stage Design Congress, which is how it came into the radar of the likes of The Society of British Designers who selected the work for the UK contingent of The Prague Quadrennial.

The Prague Quadrennial, showcased every four years, is the biggest stage design congress in the world, showcasing the most innovative ideas in set design to a global audience. Handpicked from some 140 or so applicants, images and the film of *The Living Stage* will comprise Tanja’s exhibit along with 22 of Britain’s top stage designers. After that, it will move to the V&A Museum in London.

For Tanja, the global attention means that she’s achieved her initial goal.

“It was really important for me to branch out of the little world of theatre and embrace these bigger ideas. Being here (at Melbourne School of Design) has really inspired me to think outside the theatre box. The idea of architecture is so expansive these days, and it’s been really inspiring to see how social, environmental, indigenous community planning, all these different elements can be brought into a practice like stage design.”

For Tanja, *The Living Stage* is just one possibility of many, in sustainable stage design.

“I’d love to create a set design that can purify water or one that can be printed in 3D with biodegradable materials.”

Images:
Opposite: The Living Stage|
Below: Tanja Beer, photo by Philippa Knack



BEING HERE (AT MELBOURNE SCHOOL OF DESIGN) HAS REALLY INSPIRED ME TO THINK OUTSIDE THE THEATRE BOX. THE IDEA OF ARCHITECTURE IS SO EXPANSIVE THESE DAYS, AND IT’S BEEN REALLY INSPIRING TO SEE HOW SOCIAL, ENVIRONMENTAL, INDIGENOUS COMMUNITY PLANNING, ALL THESE DIFFERENT ELEMENTS CAN BE BROUGHT INTO A PRACTICE LIKE STAGE DESIGN.

EXAMINING BUILDING DESIGN NETWORKS AND THEIR IMPACT ON THE INDIVIDUAL IN REMOTE SETTLEMENTS

Rees
Quilford

An extensive inquiry by a Melbourne School of Design student aims to result in more efficient approaches to building design in Australia's most remote regions.

In many of Australia's most remote settlements, there is a gap between basic human needs and the buildings and networks that support them. Melbourne School of Design PhD candidate Hannah Robertson is aiming to identify the nature and extent of this gap in order to understand why it has occurred. Her thesis, 'Resilient Remote Settlements: analysing the role and potential of buildings and networks to satisfy human needs in very remote settlements' is an economic study, from an architectural perspective, that investigates whether it is possible for human needs to be more satisfactorily met through efficient utilisation of resources in buildings and networks.

Supervised by Professor Paolo Tombesi and Professor Philip Goad, Hannah's project sees her working in the remote regional network of northeast Arnhem Land, Northern Territory where she has just returned from conducting fieldwork. "I am incredibly fortunate to be able to conduct fieldwork here as I have

established relationships with traditional owners through previous involvement developing the infrastructure masterplan with the Yolngu owned social enterprise Lirrwi Tourism whom are also providing me with in-kind accommodation and some transport assistance," says Hannah. Remote work is expensive and without Lirrwi's support her fieldwork would not have been possible.

Hannah's fieldwork activities included interviews with local community members to ascertain perspectives on daily interactions with the built environment and establish understandings of needs and aspirations. She also spoke with service providers and business owners to map existing built infrastructure opportunities, challenges and regional network dependencies and relationships. In May, Hannah travelled to the West Arnhem site of Kabulwamamyo to look at structures built by local Bininj people. Hannah's findings from Australia will then be compared to similar studies on remote settlements in different regions of the globe – Gujarat and Himachal Pradesh in India and the Lumnezia Valley in Switzerland – to understand how human needs have been satisfied through initiatives that reallocate limited resources for buildings and networks.

Australia, like India and Switzerland, has a predominantly urban population, but the remote population remains significant. In particular, the remote regions of Australia have a significant Aboriginal population with socio-cultural ways of life distinct from mainstream western counterparts. "Recent years have seen heavy scrutiny on support for the smallest very remote Aboriginal settlements and both sides of government have largely retracted funding for new buildings in these places," says Hannah.

Within this context, Hannah's study aims to analyse the existing built fabric of very remote settlements in relation to how fundamental human needs are addressed.

Other key research questions include examining the role of networks and mobility, as well as the extent to which the building work funded and carried out can be more effective in satisfying human needs. Approaches for building design and development in very remote settlements will be developed on the study's findings.

"The completion of the study will yield important results in the design and development of buildings in very remote settlements in three areas: firstly, understanding their potential to satisfy



THE COMPLETION OF THE STUDY WILL YIELD IMPORTANT RESULTS IN THREE AREAS: FIRSTLY, UNDERSTANDING THE ROLE OF BUILDINGS TO SATISFY HUMAN NEEDS AND SUBSEQUENTLY SUPPORT VIABILITY. SECONDLY, EFFECTIVE NAVIGATION AND UTILISATION OF INTERNAL AND EXTERNAL CONDITIONS AND, FINALLY, NETWORK PLANNING IN EFFECTIVE DESIGN AND DELIVERY.

human needs and subsequently support viability. Secondly, effective navigation and utilisation of internal and external conditions and, finally, network planning in effective design and delivery,” she says.

Later this year Hannah will travel to Switzerland and India to study alongside some of the most renowned international scholars in the area of ‘affordable habitat’ and ‘territorial development’ in rural settings. Much of this travel will be funded through the ‘The Henry and Rachael Ackman Travelling Scholarship’, of which she was a recent recipient.

Emanuel Percy Ackman bequeathed funds to the University of Melbourne in 1965 to establish Travelling Scholarships in Medicine and Architecture, and the Henry and Rachael Ackman Travelling Scholarship is the result of that donation. The scholarship, open to graduate research candidates in the Melbourne School of Design, funds travel and costs associated with a period of international study.

In Switzerland, Hannah will spend five months examining the development of the Lumnezia Valley as envisioned

by architect Gion Caminada. Whilst there, she will engage with the local community through the activities of the Laboratory of Construction and Conservation, the Laboratory of Urbanism and the Laboratory of Theory and History of Architecture at the Ecole Polytechnique Federale de Lausanne in Lausanne. During that time she will work with Professor Roberto Gargiani, Professor Paola Vigano, and Professor Luca Ortelli.

Hannah will then travel to the School of Planning and Architecture (SPA) in Delhi, and the Centre for Environmental Planning and Technology (CEPT) in Ahmedabad, for the final leg of her international journey. She will work under the supervision of Professor Arunava Dasgupta, who is the Director of the Department of Urban Design at SPA and also leads the Himachal Pradesh Action Research Group.

Hannah expects her research will support the assumption that the strategic use of building fabric can help maximise the satisfaction of human needs when reinforced by networks that allow the utilisation of internal assets and the navigation

of external constraints. “Parallels exist with the remote Australian situation and that of India and Switzerland. Despite the advanced nature of the Swiss economy and the contrasting developing nature of the Indian economy, like Australia, remote regions in both countries often struggle to survive on their traditional small scale agrarian practices.”

Hannah cites the remote alpine village of Vrin in Switzerland. With a population of 255, it has revitalised the traditional vernacular ‘Strickbau’ construction technology in adaptive community building structures such as communal barns and a community hall to stem the causes of falling populations. “This initiative has created local employment, economically sustainable approaches to small scale farming, while also honouring the local socio-cultural identity of the village,” she says.

Hannah is likely to submit her PhD in early 2017 and a public exhibition of the research and the work of the SPA, CEPT and EPFL will be organised at the University of Melbourne. She hopes her efforts will produce practical outcomes and a valuable reference for policy makers, architects, construction professionals and local community members.

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YOU CAN MAKE A DIFFERENCE

The Faculty of Architecture Building and Planning greatly values the generous support from alumni, friends and industry partners. It helps us create opportunities for our talented students.

As a Faculty, we are committed to ensuring that our students – the next generation of built environment professionals – understand the need for sustainable solutions in the creation of urban centres. Now, more than ever we have an opportunity to make a significant impact on our environmental and social futures by managing urban change.

How do we do this? One key approach is to ensure that our students develop interdisciplinary knowledge, where sustainability principles are embedded as a way of thinking and collaboration is the preferred mode of practice. To achieve this it is clear we must create a new, flexible academic space and an inspirational, world-class curriculum.

The new Melbourne School of Design building is unique in Australia. It is a centre of transformational education and research into sustainable cities and an exemplar of sustainable infrastructure. In particular, it allows students and researchers to explore sustainability issues across multiple disciplines in a *living and pedagogical* building that can be adapted to changing needs, and is designed to provide feedback to students and researchers for real-time learning. The facility itself is a platform for training our future leaders engaged in planning, designing and constructing cities and communities here and abroad.

We invite you to support our endeavours.
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INSIDE THE FACULTY

NEWS

Congratulations to PhD graduate and Honorary Senior Fellow **Dr Milinda Pathiraja** who was awarded the US\$100,000 Silver Award at the **2015 Global Holcim Awards for Sustainable Construction**. Announced on 20 April in Zurich, Switzerland, the 2015 awards recognised three projects that demonstrated architectural interventions with tangible benefits for their respective local communities. Dr Pathiraja is part of Sri Lankan studio Robust Architecture Workshop with Ganga Ratnayake. The studio's project, Post-War Collective, located in the rural town of Ambepussa, outside of the Sri Lankan capital of Colombo, incorporates a community library building that aims to reintegrate ex-soldiers into postwar Sri Lankan community. Made from rammed-earth walls and recycled materials, the building was constructed with the support of the army, teaching young soldiers building techniques and skills through its construction process.

Karen Burns and **Justine Clark**, an Honorary Senior Research Fellow at the Faculty, are part of a team that has been shortlisted as Creative Director for the Australian Pavilion at the 2016 Venice Biennale. Called **Parlour LIVE!** their proposal is based on the Parlour research project.

University of Melbourne **Professor Emeritus Allan Rodger** (Professor of Architecture in the faculty from 1974 – 1996 and Dean for 1979) was awarded the Leadership in Sustainability Prize by the Architects Institute of Australia at their annual Australian Achievement in Architecture Awards. Professor Rodger was a pioneer in the propagation of sustainability principles for the built environment, and he has continued to advocate and educate through conference presentations, teaching and practice.

The new Melbourne School of Design building has continued to receive international recognition for the quality of its design and construction. The New York Chapter of the **American Institute of Architects** has acknowledged the MSD design with one of their annual 'honor awards' and the building is one of nine projects in the typology category shortlisted for the Architizer awards. The MSD also continues to receive excellent media coverage, with feature articles in *Domain*, *Broadsheet*, *Architectural Review*, *The MARK*, *The Plan*, and coverage on the *Sacred Spaces* c31 television show.

VALE

Professor Evan Walker

The Chancellor and members of the University Council, the Vice-Chancellor, and the Dean of the Faculty of Architecture Building & Planning, together with members of the academic and administrative staff of the University of Melbourne, honour and celebrate the life and service of The Honourable Professor Evan Herbert Walker AO.

Evan Walker graduated from the University of Melbourne in 1959. Following many years success in private practice and public service, he returned to the University in 1991 to serve for three years as the Dean of the Faculty of Architecture, Building & Planning at a critical juncture in the

development of these disciplines. He continued thereafter in an active honorary capacity and remained its loyal friend until the time of his death.

Evan Walker's wisdom, courage, commitment and leadership will long inspire us. We extend our deepest sympathy to his wife Judith and members of the Walker family. A substantial piece on his contribution will feature in the next edition of *Atrium*.

PEOPLE

Welcome to **Mark Stevenson**, who has been appointed Professor of Urban Transport and Public Health in the Faculty. Professor Stevenson was most recently Professor and Director at the Monash University Accident Research Centre and brings a wealth of expertise in injury prevention research, with significant impact on the discourse of national public policy on road safety and injury prevention. He has worked on numerous national and international projects that have directly influenced road injury policy and has worked with both Federal and State Governments in Australia. He is internationally recognized in the field of road injury research.

Andrew Dingjan has been appointed Director at the Australian Urban Research Infrastructure Network (AURIN). Andrew was recently Executive Manager at the CSIRO and prior to that he held a number of Senior Executive and Chief Marketing Officer positions within the banking, financial and business services sectors in which he took projects through translation from research to operations. This extensive experience which will be key in assisting AURIN to move to the planned second phase.

RECENT EVENTS

Dean's Lecture Series

The first two events of the 2015 Melbourne School of Design Dean's Lecture Series have been hugely successful. The first lecture of the year was presented by **Neil Brenner**, Professor of Urban Theory and Director of the Urban Theory Lab in the Graduate School of Design, Harvard University.

Professor Brenner deconstructed assumptions of the patterns and impacts of urbanisation and argued for a more nuanced approach than typical approaches to the urban/rural divide.



Alan Pert and **Professor Emeritus Graham Brawn** were chairs on juries in the 2015 Design Awards program of the Victorian Chapter of the Australian Institute of Architects, Alan in the Urban Design category and Graham for the Melbourne Prize.

Congratulations to Digital Fabrication Coordinator **Linus Tan**, Masters of Architecture student **Siavash Malek** and Masters of Architecture Graduate **Daniel Hazmy** compiled a story and images which will be published in an upcoming book: *Fairy Tales – When Architecture Tells a Story*. Their work was handpicked from some 1200 submissions to be published alongside 19 others.

Dominique Hes has recently returned from a tour of the US where she delivered workshops and talks to launch her book, *Designing for Hope: Pathways to Regenerative Sustainability*, published by Routledge. Dr Hes had sold-out events in New York, Denver, Colorado State University and Seattle. Later this year she will be keynoting on regenerative sustainability for a conference in Belgium followed by a conference in Spain.

The Faculty farewelled our Director of Advancement, **Judy Turner**, who has moved on to a role with a patron focus, at the Melbourne Symphony Orchestra. Judy has been a vital part of our work over the past three years and she will be sorely missed.

Congratulations to ABP Alum **Craig Tan** who came first in the Commercial Exterior category for his Brompton Pavilion project, and Master of Architecture student **Amelyn Ng** winning the student category for her project Concealing the Crisis at the annual Dulux Colour Awards in March.

Masa Noguchi recently travelled to Brazil to give a lecture entitled *Zero Energy Mass Custom Global Movement* at the Federal University of Parana in Curitiba. In the week following, Masa took seven postgraduate students to Sao Paulo to collaborate with students from the University of São Paulo and the State University of Campinas on the delivery of zero energy mass custom homes (ZEMCH) in local contexts. Following the workshop, Masa travelled to New Zealand to present a keynote at PrefabNZ CoLab 2015 where the student work will also be exhibited.

Donald Bates travelled to Bali in March as a member of the jury for the FuturArc Prize 2015 and the FuturArc Green Leadership Award for 2015. Professor Bates also travelled to Chile in April, as a guest and speaker for the XIX Bienal Arquitectura + Educacion, which was held in Valparaiso, where he gave a lecture on the work of LAB Architecture Studio and participated in the forum on “Formative Processes – Curriculum for Architecture in the 21st Century”.

Donald Bates was one of the Creative Directors, along with **Hamish Lyon** (Director of NH Architecture and Studio Leader in the MSD Master of Architecture program) and **Andrew MacKenzie** for the 2015 Australian Institute of Architects National Architecture Conference held in May. The Melbourne School of Design hosted the launch reception as part of the conference, as well as tours of the new building for visiting delegates, a Q&A panel discussion, and a reception, in the Atrium.

The second lecture featured Manfred Grohmann, Professor for Structural Design at Kassel University and Director of Bollinger + Grohmann Ingenieure, discussing the contemporary conditions of building design and the role played by structural design engineers in the development of innovative and sustainable building design.

Japanese Room Opening Ceremony

A formal Japanese Tea ceremony was held in March to mark the opening of the Japanese Room. The architect of the original room, **Shigeru Yura**, travelled from Japan to participate in the ceremony. Professor Yura donated a sketch book by Douglas Annand, former University staff

member and artist of the mural in Wilson Hall, whom Shigeru met in 1960 at a trade fair in Sydney and then toured Japan with. The sketchbook documents that tour and will provide a valuable addition to the University's cultural collection. It is now housed in the University of Melbourne Archives.

MOTEL

Held in the Dulux Gallery in March, the MOTEL exhibition, curated and mounted by students, celebrated the pioneering work of entrepreneur **David Yencken**, who oversaw the first designs and importation of the modern American motel design in Australia. The exhibition proved very popular, with over two hundred people attending the launch.

Architecture for Collective Impact

Founding partner of NORD Architects in Copenhagen, Denmark, **Johannes Molander Pedersen**, in Australia as part of the AIA Architecture in Residency program, delivered a lecture to a full house on how the process of developing architecture and urban areas can commit participants from different sectors along a common agenda, creating a *Collective Impact* and social change.

Image:
Peter Bennetts

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