# 1. BUILT PEDAGOGY

A Systems Thinking Approach to Architectural Design and Delivery

Knowledge boundaries are shifting and reforming to create new frontiers and challenges for the faculty and school. Education is evolving to become more dynamic and this will continue to gain velocity into the future. The university is no longer simply about teaching – instead it works as a facilitator, incubator and catalyst for new knowledge and transfer.

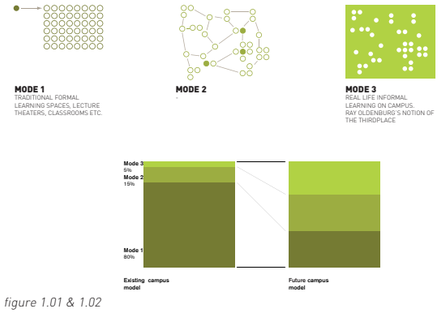



*figure 1.01 & 1.02*

## POSITIVE LOOPS

The correctly formulated system strategy, developed through iteration and process will allow different functions of the faculty to work together – so that disparate elements can co exist and reinforce each other adding value and creative potential. Such positive loops will enable the entire system or school to perform to higher levels.

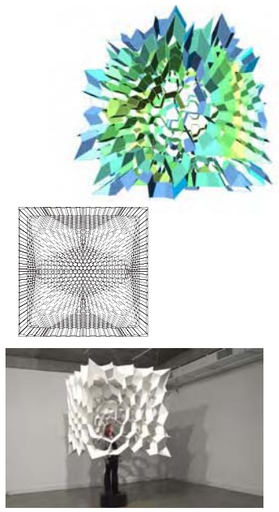
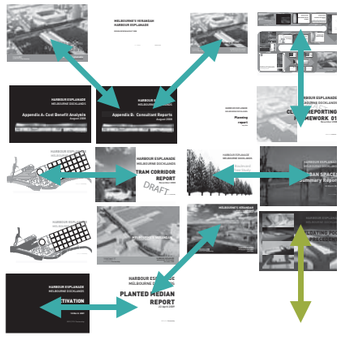


*figure 1.09*

# OPEN ENDED

The design approach proposed by the design team can be likened to the prevalent shifts in education seen both within architecture schools and faculties beyond. The boundaries and divisions between teacher, student and learning environment is blurring – a continual smoothness is forming. The approach the design team practice is bottom up, an open ended question rather than a predetermined solution. At this stage we do not even know what the new school will be like, only which questions we would like to ask, in a process of conceiving it. The design exercise will be formed as an open set of systems and processes. The approach will be integrated and non linear to achieve the best solution.



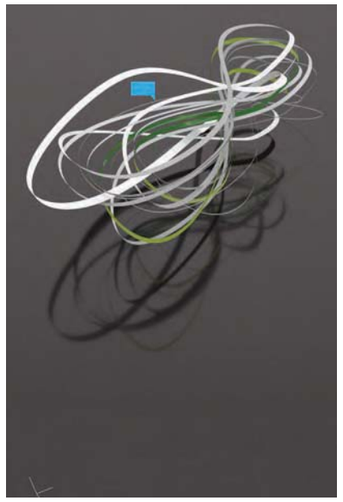



*figure 1.03 & 1.04*

## in SYNC

As more is asked from our educators and teachers within education, the same questions are being asked of architects and architecture in the community. The 'architect' no longer holds all the solutions via singular visions. In order to deliver flexible functionality and develop lasting solutions to architectural problems, architects must work in collaboration with stakeholders and other specialists.

## PROTOTYPE

As a process driven exercise, the new school of architecture will act as an evolving prototype. The new school building will encapsulate complete functionality. The result will provide for a new learning environment for practice and research in the fields of architecture, landscape architecture, urban design, building and property.

## ADAPTABLE PROCESS

There is no longer a 'finished design' - the architect now must deploy strategies to develop frameworks that work within pre existing and future systems. The new school through its own processes will become a non static organic system design that can adapt and change in its usage, pedagogy and tendencies.

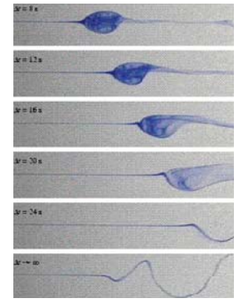


*figure 1.05, 1.06 & 1.07*

# SYSTEMS THINKING

*figure 1.08*

Our design team suggests that it is in Systems Thinking where answers to the many questions lie. A system is a group of interacting, interrelated, and interdependent components that form a complex and unified whole. The value of Systems Thinking lies in the way that it enables one to design intelligent and enduring solutions to vast problems. In its simplest sense, Systems Thinking allows for a continuous representation of reality, so that all a system's natural forces can be considered in order to achieve more efficient results. It allows problems to be analysed with an eye towards the long view.

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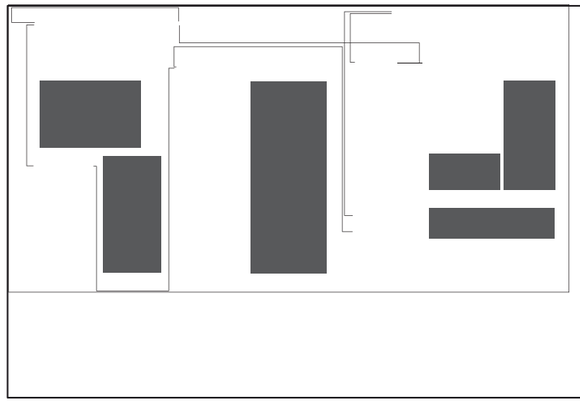
***Diagrams:***

*Figure 1.01 & 1.02 A shift from traditional classroom learning model to informal flexible spaces*
*Figure 1.03 The design process will require the iterative reformulation of brief and concept*
*Figure 1.04 Circles of collaboration*
*Figure 1.05, 1.06 & 1.07 Adaptive evolutionary models*
*Figure 1.08 interacting, interrelated, and interdependent components form a complex and unified whole*
*Figure 1.09 BKK's Pavillions for New Architecture exhibit, Monash University Museum of Modern Art*



# 2. THE ACADEMIC ENVIRONMENT

The ideal learning and research environment is NON linear. This non linear environment can only be facilitated through new learning facilities and typologies - both physical and virtual. As the campus model is evolving, we envisage an open solution to learning models which will spatially follow this learning evolution.

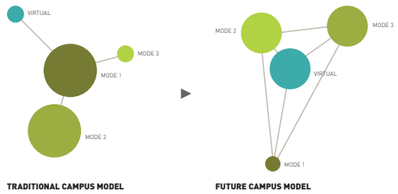



*figure 2.01*

## MAIN STREAM

Future knowledge transfer will be accessible to more – beyond the faculty and even further into the broader community. Architectural discourse within the Faculty has an opportunity to become main stream. Relevant issues concerning the urban, social and built fabric can be better communicated, broadcast, podcast and downloaded with broader reach and clarity into the wider community. The role of typical presentations can be transformed to become relevant and useful discussion.


*figure 2.06*

# COLLABORATIVE INTERACTION

The design team envisage interactive learning environments. New spatial models will enable the faculty to enrich their present functions. Similar to open source software development, efficient solutions are resolved and improved through on going collaborations both formal and dynamic.

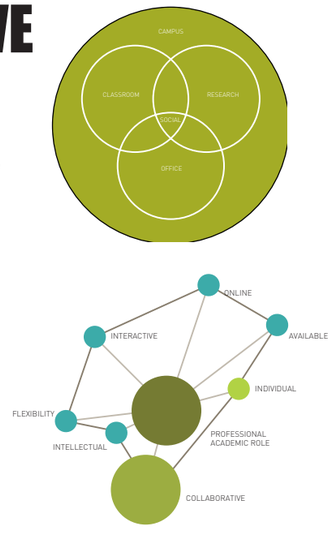



*figure 2.02 & 2.03*

*figure 2.04*

## SMOOTH ACCESSABILITY

The future facility working environment will enable present forms of data management to evolve into the sharing of rich content from processes and collaboration. Information will flow smoothly between the imagined, the physical and digital formats. Alongside the new spatial models will be new data access and transfer models. User generated information, rich-content, tagging, user rankings and ratings will drive and develop such emergent technologies. The future school will provide, beyond the physical, as a digital research and resource node, accessible to all and from anywhere.

# OPEN ACCESS

Drawing from this - students, researchers, industry professionals and academics will actually be able to exist at the centre of their own agendas. The pre-existing knowledge barriers found in traditional design schools become obsolete – academics vs craftsman vs social scientist vs computer engineer – all become a unified vessel. The school becomes an evolving source for information and knowledge. Users will have open access to knowledge publications like never before, ultimately with connections to other international faculties and experts.

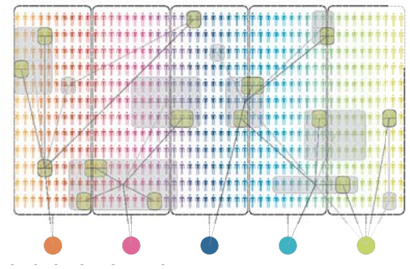


*figure 2.05*

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***Diagrams:***

*Figure 2.01 Future campus learning model*

*Figure 2.02 & 2.03 A collaborative approach to learning*

*Figure 2.04 Greater accessibility to key data & research materials*

*Figure 2.05 Teachers, Students, & Practitioners will all benefit from the flexible model*

# 3. THE DESIGN STUDIO

From classical Beaux Arts traditions, to the industrial thinking Bauhaus and current socio and economic focused trends in architectural and spatial research, future studios will inevitably become more non linear and specific.

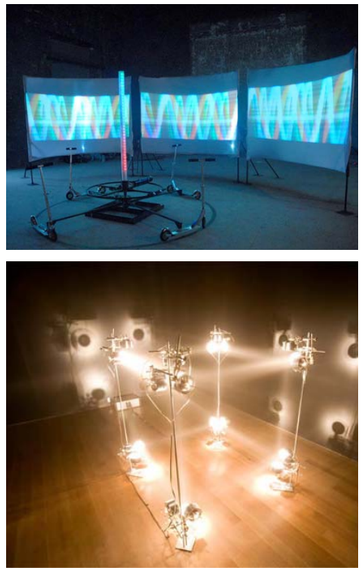


*figure 3.01 & 3.02*

## NETWORKS V.2

The classic distinction between student and teacher has been slowly eroding - it is less relevant now than it has been in the past. Learning occurs from both informal and structured networks - the new school will adopt this paradigm shift and facilitate networks to grow and develop.


*figure 3.05*

## AGILITY

Today there are possibilities for models that were not possible five years ago. Communications technologies have dramatically and progressively improved, where the ubiquity of wireless networking has changed the nature of how people interact. Future design studios will break down current paradigms to create agility and flexibility. Architecture itself will not necessarily be the 'end goal' of the studio but rather it will be how to create knowledge, allow its transfer and address new challenges. Future studios will be armed with the ability and tools to address new and emerging opportunities.

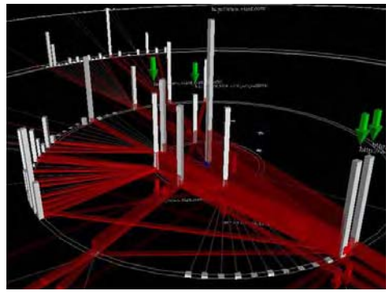



*figure 3.03 & 3.04*

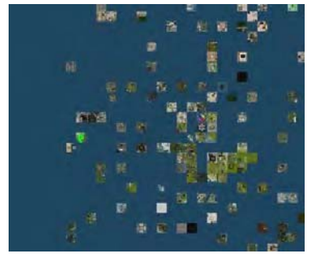
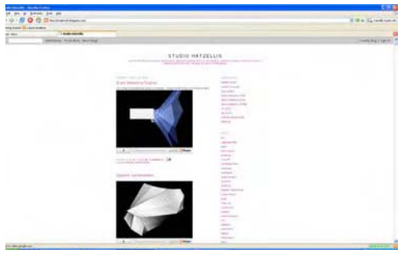


*figure 3.06 & 3.07*

## REACH

Studio design criticism will no longer culminate via the present jury on presentation day, but beyond, flexible for the user, it will come from plugged in peers within the faculty and from experts beyond, including a wider international architecture community. The built fabric will accommodate a stronger foundation for collaboration and user interaction.




## SECOND LIFE

Virtual world designs developed by students like Ted 'The Tracer' Mikulski in Second Life may give some indication of a more open learning and design debate. This is a situation where critics and peers are available from both real world and virtual world networks. Solutions are also able to be accessed by a wider community and are tested by growing and dynamic situations. The knowledge is retained and available to other users both currently in real-time and beyond in the future.

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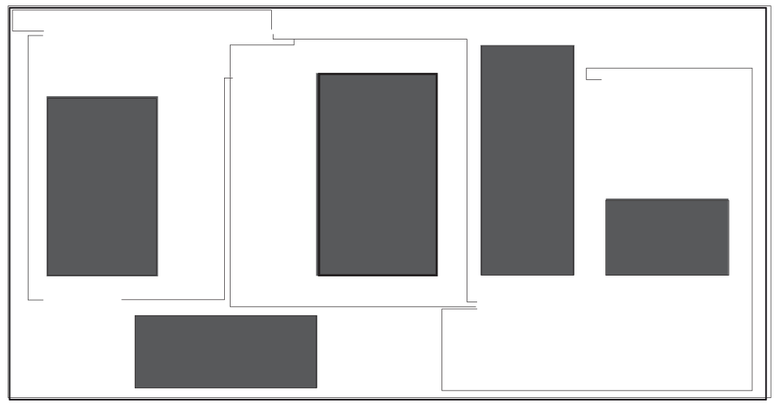
***Diagrams:***

*Figure 3.01 & 3.02 A More flexible studio model will enable greater flexibility*
*Figure 3.03 & 3.04 The ubiquity of wireless networking has changed the nature of how people interact.*
*Figure 3.05 Learning occurs from both informal and structured networks*
*Figure 3.06 & 3.07 Virtual worlds*



# 4. THE LIVING BUILDING

The design team envisage a Systems Thinking approach to not only the spatial organisation of the school but also inherently integrated with its physical performance. The spatial solution will strive to achieve environmentally sustainable qualities such as carbon neutrality and the conservation of water and natural resources but also work at enhancing occupant health and wellbeing. The spatial form will be modelled and tested against its contribution to such social and environmental aspects.

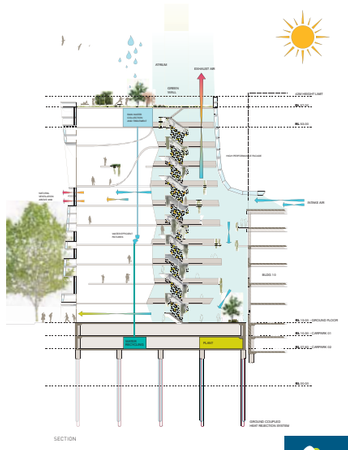


figure 4.01

green star Education v1

6 Star Green Star Certified Rating Building demonstrates World Leadership'

## ADAPTABILITY

Flexibility of spaces will be regarded not only as a core operational objective of the University but also for the resultant economic and environmental lifecycle reduction.

The design is an evolving process derived from passive design principles utilising the façade and structure as the primary climate modifier. A highly efficient modular system moderates the ambient condition which reduces the need for energy inputs to the outdoor air. The modularity of the façade provides a framework for full scale system testing for innovative facades research and future refurbishment.

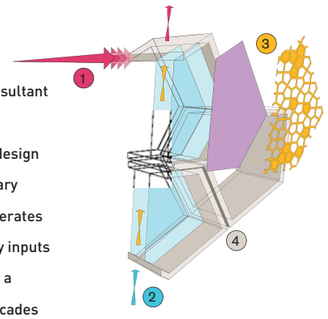



figure 4.02

## 4D TEXT BOOK

Through metering feedback, interactive control and system monitoring graphics, the building environmental systems will allow continual building tuning by staff and students as well as demonstration of resource conservation. There will be great potential to conceive beyond a 3D textbook into a richer form – online interfaces will allow the building project to become an ongoing 4D case study for academics, students, professionals and the community.

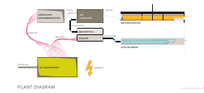
figure 4.05

## SYSTEMS

The design will harness the natural environment and renewable energy sources. Natural ventilation and daylight will be optimised through intelligent façade systems combined with strategically positioned Atrium spaces. The Heliostat daylight guiding system projects daylight deep into the lower levels. Solar ventilation chimneys with wind cowls assist natural ventilation.

## COMFORT

Mechanical systems are designed to maximise the efficient delivery of comfort conditions to the space. The proposed underfloor air distribution (UFAD) system with increased levels of outdoor supply air and mixed mode facility promotes a healthy indoor environment and encourages flexibility allowing 'plug and play' internal spaces. Cooling efficiency will be enhanced by activating the structural slab with chilled water pipework.



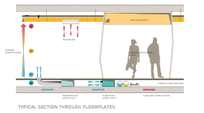




figure 4.03 & 4.04

## VIRTUOUS CYCLES

The Tri-generation system reduces the demand on the inner city power infrastructure, reduces carbon intensity and improves the overall efficiency by utilising the by-product waste heat to generate heating and cooling.

Heat rejection is minimised by incorporating ground source heat rejection integrated with the foundation piles.

Rainwater will be harvested and re-used for cooling towers and toilet flushing. The waste water will be collected and treated for landscape irrigation.

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***Diagrams:***

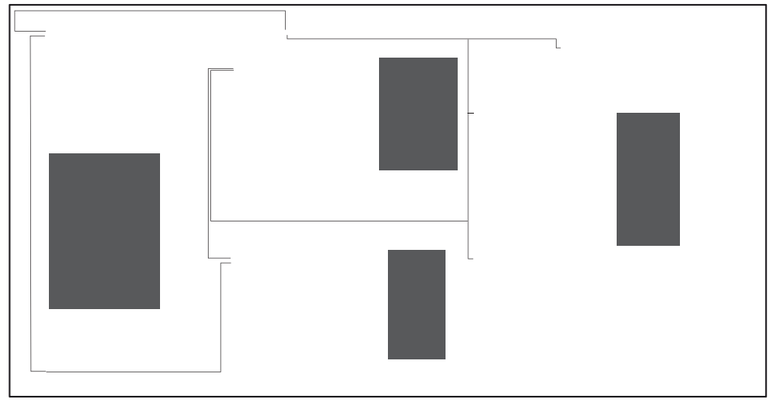
*Figure 4.01 The spatial form will be modelled and tested against its contribution to such social and environmental aspects.*

*Figure 4.02 Flexible Modular system for testing future full scale innovative facades.*

*Figure 4.03 The design will harness the natural environment and renewable energy sources.*

*Figure 4.04 Underfloor air distribution (UFAD) system*

*Figure 4.05 Interface*



# 5. CAPABILITY AND PROCESS

Following from the design approach, we envisage a value-adding and holistic working collaboration throughout the entire life of the project – between the architects, environmental strategists, key consultants, the Faculty and building users. The working relationship we create will develop a networked information rich team. The non linear approach is intended to uncover client aspirations that would not be evident otherwise. This team will consist of BKK Architects as principle consultant working in collaboration, Detail 3, Aurecon, Third Skin and The University of Melbourne (as research partner).

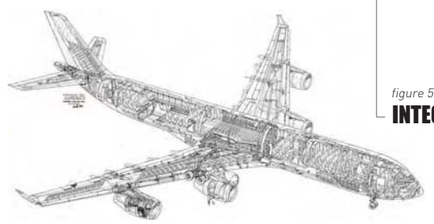


*figure 5.01*

## INTEGRATED

We are proposing a Systems Thinking approach based on a consideration of what role building elements play. We will be looking to drive resource efficiency and value by analysing how singular elements can be made to work harder in performing multiple functions, in multiple systems. Approaching design from a systems thinking basis has the ability to transform a cycle of ever increasing resource use, into a virtuous cycle of building elements working together to form self-reinforcing systems.

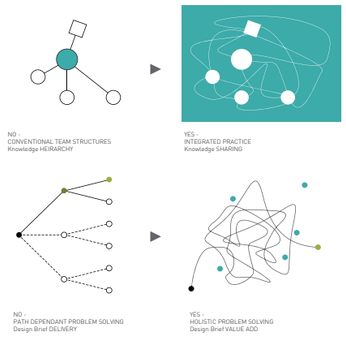



*figure 5.02 & 5.03*

## IN PARALLEL

Through parallel working streams, the proposed project process will undergo concurrent research support and design input from the end users themselves, the students of the faculty. It is envisaged that student research, conducted through design studios, subjects, seminars will feedback continuously throughout the projects stages. The work and research conducted will provide a real-time information source for students at the school.
This proposed project provides opportunity for a two way case study for the entire faculty.

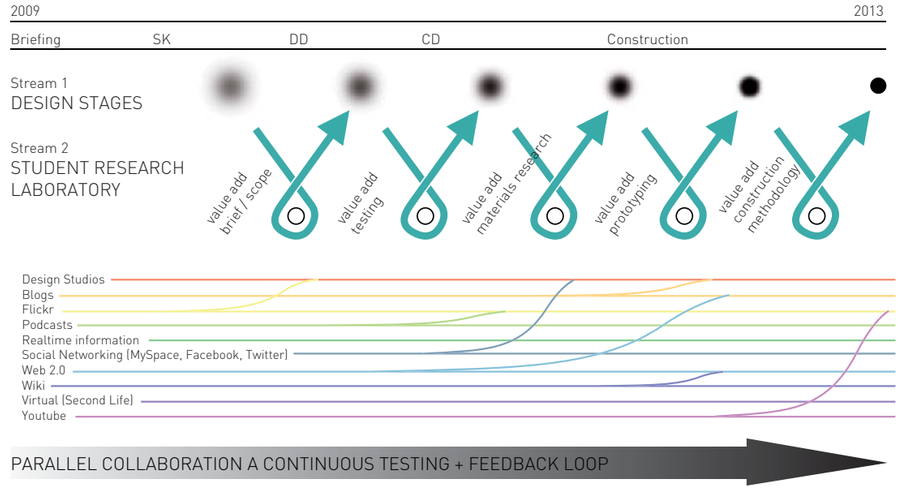
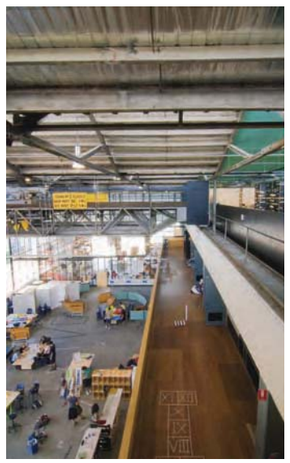



*figure 5.04*

## PAST PROJECT DELIVERY



**Advanced Technologies Building - Swinburne University**
Chris Barnett (Third Skin)
Project Value $60M, Melbourne, 2008 (under construction)
ESD review and Green Star Education tool advice to Swinburne University and H2O Architects on the design development of a new 20,000sqm teaching and research facility at the Swinburne University Hawthorn Campus.

**School of Architecture & Design – University of Tasmania**
Chris Barnett (for SBE in collaboration with Six Degrees Architects)
Project Value $6.5M, Launceston, 2007
New School of Architecture facilities consisting of teaching, studio and workshop spaces for 420 students. Adaptive re-use of former Diesel Workshop building in the Inveresk Cultural Precinct at Inveresk Launceston. Winner of the 2007 National RAIA Award for Sustainable Architecture, 2007 RAIA Lachlan Macquarie Award for Heritage, 2007 RAIA Tasmania-Sustainability Award, 2007 RAIA Tasmania- Heritage Award, 2007 RAIA Tasmania- Public Building Award., Australian Timber Design Award

**Neurosciences Stage 1 – University of Melbourne**
Greg Blanch (Detail 3 for University of Melbourne as client.
Feasibility and schematic design phases)
Project Value $35M, Melbourne, 2006
Basement multi-deck carpark and podium level site interface.

**Burwood Campus ICBB – Deakin University**
Greg Blanch (Detail 3 for H2o Architects as client.
Documentation and documentation team manager)
Project Value $50M, Burwood, 2004-2005
New Information Centre and Business Building

**Performing Arts Centre and Information Services Building – Monash University**
Greg Blanch as project architect and Michael Innes as project director (for Pels Innes Neilson & Kosloff Architects in collaboration with Allan Powell architects)
Project Value $15M, Clayton Campus, 1996
New performing arts centre including music and drama theatres, and information services building addition to existing library.

**Geelong Waterfront Campus Dennys Lascelles Refurbishment – Deakin University**
Greg Blanch (Detail 3 in conjunction with McGlashan Everist Architects for Deakin University as client. Design development and construction documentation phases documentation)
Project Value $35M, Geelong waterfront, 2005-2006
Existing building refurbishment and new multi-deck carpark.
**Sidney Myer Asia Centre – University of Melbourne**
Greg Blanch as technical director (for Nation Fender Katsalidis Architects), Jeff Robinson
Project Value $17M, Melbourne, 2001
This multi-purpose education building (classrooms, administration office, trading areas and exhibition space) is a landmark in Swanston Street, Melbourne. It has a state-of-the-art 500-seat teaching theatre that includes a heat recovery system to reduce energy consumption.
**Ian Potter Centre – University of Melbourne**
Greg Blanch as technical director (for Nation Fender Katsalidis Architects)
Project Value $7M, Melbourne, 2000
New campus gallery. Various stages.

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*Diagrams:*

*Figure 5.01*
*An holistic working collaboration throughout the entire life of the project*
*Figure 5.02 $ 5.03*
*Conventional team structure versus integrated practice Figure*
*Figure 5.04*
*Parallel collaboration*

**Other Selected Projects:**
**CH Building Laboratory Refurbishment – Swinburne University of Technology**
Greg Blanch (Detail 3 for SUT as client)
Project Value $8.7M, Hawthorn Campus, 2007-2008
Refurbishment of existing laboratory and research facility.
**Lecture Theatre – RMIT**
Greg Blanch & Michael Innes (Detail 3 in collaboration with Allan Powell Architects for RMIT as client)
Project Value $7M, Bundoora Campus, current
New iconic, state of the art lecture theatre.
**Technology Building and Lecture Theatre– Monash University**
Greg Blanch as project architect and Michael Innes as project director (for Pels Innes Neilson & Kosloff Architects)
Project Value $10M, Peninsula Campus, 1991
New technology building and separate lecture theatre.
**Building West – Deakin University**
Greg Blanch as project architect and Michael Innes as project director (for Pels Innes Neilson & Kosloff Architects in collaboration with Wood Marsh architects)
Project Value $7.5M, Burwood Campus, 1996
New building housing academic spaces, tutorials/seminar rooms, vice chancellors office.
**TAFE School of Design – RMIT**
Michael Innes as project director (for Pels Innes Neilson & Kosloff Architects in collaboration with Allan Powell architects)
Project Value $15M, Cardigan Street Campus, 1996
**Swinburne University, Hawthorn Campus**
Jeff Robinson
Project Value $18.0M, Melbourne
A new multi- project commission for the new Library, Chancellory Office, student apartments and Graduate School of Management at the Hawthorn Campus.
**Monash University, Caulfield Campus**
Jeff Robinson
Project Value $67.0M, Melbourne
This project comprises a 20,000sqm, 11 level academic building with lecture theatres, seminar rooms and conference facilities.
**Monash University International Centre, Clayton, Vic**
Jeff Robinson
Project Value $12.0M, Australia
The complex includes an impressive public forecourt with water features and a glazed multi-level atrium entry linking Monash International to the west and Monash College and Language Centre to the east.

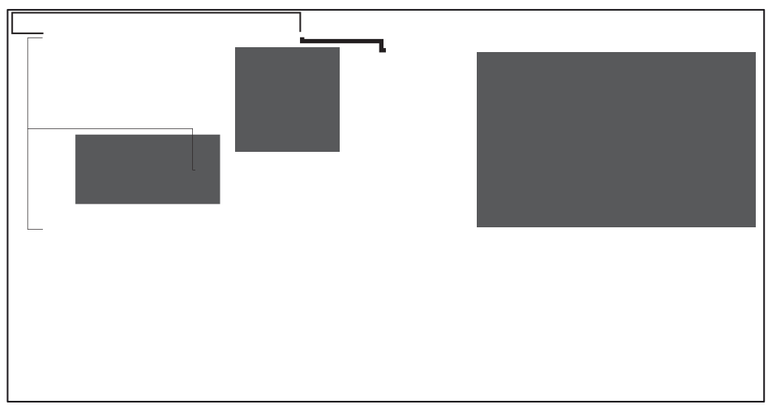
***Client Referees:***

*Ms Pru Sanderson*
***Vic Urban***
*Level 12, 700 Collins Street*
*Docklands, 3008*
*Telephone 8317 3400*
*Docklands Harbour Esplanade - BKK*

*Mr Paul Farley*
***Deakin University***
*Telephone 0419 555 734*
*Various projects carried out by Detail 3*

*Ms Dimity Reed*
***Acadmeic / Journalist / Design Consultant***
*6/77 Caroline Street,*
*South Yarra, 3141*
*Telephone 9821 5995*
*Central Dandenong Masterplan – BKK*

*Mr John Trembarth*
***Monash University Properties Director (Retired)***
*Performing Arts Centre and Information Services Building – Greg Blanch for Pels Innes Neilson & Kosloff*



# 6. MERIT

BKK architects have, over several years, built a reputation for close collaboration with the academy and a capacity for in-house design research. As an inaugural participant in RMIT's Embedded Practice Research program, BKK hosted a doctoral candidate over 3 years from 2004-2007 undertaking research into custom parametric tooling. The initial involvement with RMIT via the University's Spatial Information Architecture Laboratory has since lead to research efforts encompassing design technique, product development, & cross-disciplinary design. BKK are presently working with RMIT's Innovative Structures Group employing advanced Bi-directional Evolutionary Structural Optimisation software to explore highly efficient yet strikingly beautiful structural forms.

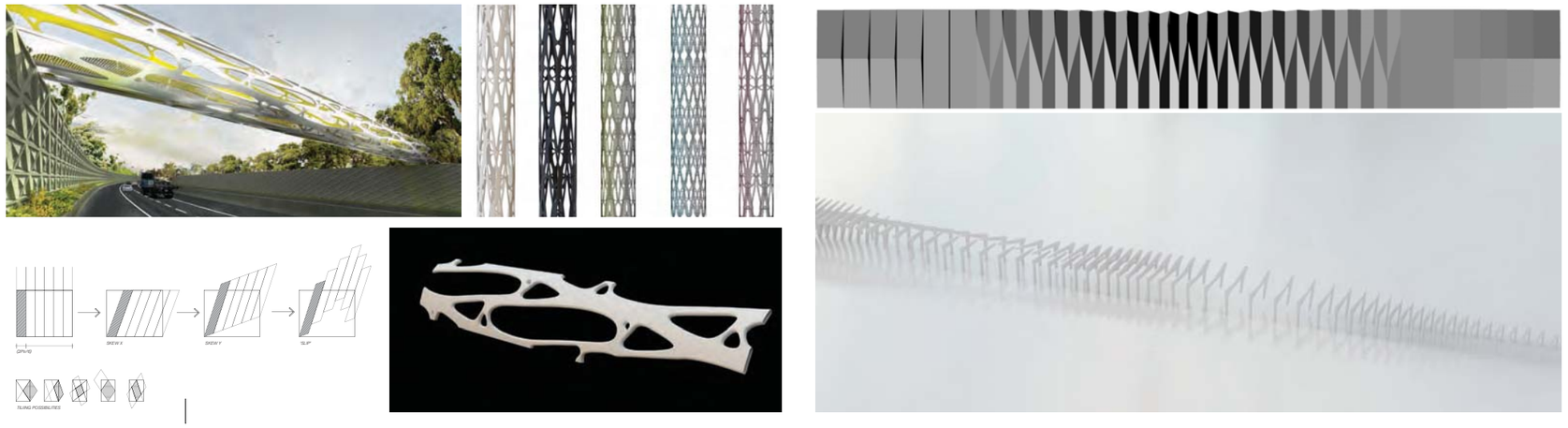


figure 6.01

## SELECTED AWARDS, PUBLICATIONS, LECTURES AND EXHIBITIONS




figure 6.02



**Diagrams:**

*Figure 6.01 Research and Development undertaken in collaboration with RMIT's Structural Innovations Group*

*Figure 6.02 Selected publications*