



## 1 INTERIM REPORT – 11 DECEMBER 2008

Teams are required to submit a report to SHAC on the 11 December 2008. The submitted reports will be made available for download on the SHAC web site for the judges and the general public. Thank you for your participation in SHAC 09!

### 1.1 INTRODUCTION

Short description of project:

#### **“To mainstream sustainable building and living using our houses built on campus”**

Team Dunedin is designing and building a ‘mainstream’ sustainable re-locatable home. Each year our carpentry students, under supervision of our staff, build three re-locatable homes. By choosing materials, services and building methods that offer long term efficiency than what is currently being undertaken, the Otago Polytechnic (and our partners) will make one of these using maximum sustainable practices. As such, we hope to offer an accessible pathway to more sustainable living and building by acquiring knowledge and sharing this knowledge. We will also help educate our community, our stakeholders, our local suppliers (and ourselves!) by doing so, and ensure the design maximises social, as well as environmental sustainability.

Team motivation for project, and what does more sustainability mean?

#### **Motivation:**

As the Otago Polytechnic has committed to a more sustainable campus, SHaC 09 is prime opportunity to integrate sustainable practices into our ‘everyday activities’. With the Otago Polytechnic Carpentry students building three re-locatable houses each year, the Sustainable Habitat Challenge provides the right impetus to make sustainable practice a reality for both our lecturing staff and our graduating students. Moreover, there has been real motivation to communicate our ‘sustainable’ choices to our community, stakeholders and local businesses who normally support us and our activities.

#### **What does sustainability mean for the Otago Polytechnic?:**

In the context of the Otago Polytechnic, sustainability means sustainability means conscious efforts to balance economic, social and environmental dimensions. Important to the Otago Polytechnic is ‘doing’ sustainability and this means engaging in actions to address current imbalances.

Otago Polytechnic's Sustainable Futures programme is underway to move the organisation towards this goal and has five strands which have their own targets and key performance indicators.

1. Operations - Walking the talk with purchasing policy, energy and waste management, transport, carbon initiatives
2. Curriculum - Weaving education for sustainability into all programmes
3. Staff Development - Ensuring staff have the capability to deliver education for sustainability. Staff training is available.
4. Sustainable Otago - A forum for accelerating the uptake of sustainable development in the region.
5. Students - Supporting formal and informal student initiatives

#### **What does sustainability mean for Team Dunedin in this context?:**

Sustainability for Team Dunedin is defined through a number of facets, each integral to the success of the

SUSTAINABLE  
HABITAT  
CHALLENGE 09



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0800 SHAC 09

project.

On the outset sustainability is to provide an affordable comfortable sustainable house for a typical NZ family which will allow to sustaining our way of living in a more environmentally friendly way so that we can secure a future for generations to come.

It will also provide an example that things can change in our lives with out scarifying our standard of living. There is a more responsible and conscious way of managing our resource and it is essential to do so, we should therefore aim to take action as soon as possible. Hopefully this would have a positive impact on other sectors of society and together NZ can move towards a more sustainable place to live in showing that changes can start from home.

Presenting an example to mainstream kiwis of an affordable house recognizing their knowledge on standard building practices. Providing a house system that will allow a healthy environment to live in, in response to a typical kiwi family recognizing and emphasizing its culture without scarifying their lifestyle.

## 1.2 SHAC PROJECT OUTCOMES

Describe how the SHAC project has contributed in some part to the production of useful outcomes for you and your organisation:

Otago Polytechnic staff have a requirement to be 'learning things' within their specialism. With sustainable measures becoming more and more 'normal' it is essential that Polytechnic staff acquire working knowledge of what sustainable practice means to their industry area.

Also, as the Otago Polytechnic has made a commitment to sustainable outcomes for staff, students and our organisation, it is through projects such as SHaC (as well as our internal projects within the curriculum, operations and development) that we are physically able to 'action' our commitments.

What has been important to many of our staff who have up to this point been involved in SHaC is the opportunity to work towards something 'real'. Interestingly, it is the interface between the theoretical and the real where the challenges for sustainable practice occur – ie., what 'could' work and what does work in practice. This is true for all areas of sustainability and not just house building!

Other useful outcomes for both staff and students has been the opportunity of working together (and with community and partners) and coming up with new solutions to old problems. Practically speaking for the Otago Polytechnic, it would be easy to always design our portable houses the same year in and year out. But realistically, the house plans and build do need to change in order to keep up with the times, and involvement in SHaC is a fantastic way of doing this.

Matt Thompson, Lecturer in Carpentry says:

"So far I have learnt huge amounts about design of spaces, thermal design, new knowledge about thermal design and also learnt a lot about other people knowledge and how they perceive what carpenters do."

Research Outcomes include Research findings, Outputs, Linkages/collaborative activities, and Student involvement. Please list current and expected. Use either a formal (as below), or informal style as convenient.

### 1.2.1 RESEARCH OUTPUTS, TALKS, AND PRESENTATIONS, ETC

1. T. Bishop & D. Dalzell, "The Sustainable Habitat Challenge & Team Dunedin" Spotlight on Education, Otago University, Dec 2008.
2. Static exhibition in Excite 08 – Otago Polytechnic graduate exhibition (Appendix D)

### 1.3 PROMOTION AND COMMUNICATIONS

1. Alison Rudd, "Building for a Better future", Otago Daily Times, 29/12/2008 (Appendix E)

### 1.4 COLLABORATION AND INVOLVEMENT

What collaborations has SHAC contributed to? These may be directly involved in classes, or indirectly involved, for example writing an article about your project for a student magazine or web site. Approximations are expected. Department, class, and company names are fine. Please attach summary of class assignments.

#### 1.4.1 STUDENTS

Number of Students Involved: \_\_\_\_ ~ 30 \_\_\_\_ Hours: \_\_\_\_ ~ 200 \_\_\_\_

Who and What:

- Students from Architectural Draughting (Level 4) class project to develop drawings. Four students chosen to further develop plans in CAD. (Assignment attached, Appendix A)
- Communication Design student – Chris Holmes – design of logo and mock-up website (6 weeks) (Brief attached, Appendix B)
- Physics Students from University of Otago were involved in energy modelling of the first plan of the Team Dunedin house.
- University of Otago, 3 x Natural History Filmmaking and Communication students – attending meetings in order to prepare for film-making (Appendix C)

Plans for 2009:

- Bachelor of Design (Communication) students to develop website further
- Bachelor of Design (Communication) students to develop signage/display boards for Team Dunedin to help 'tell the story'.
- Marketing students (University of Otago) to undertake Marketing and PR. We are currently in discussions with David Holdsworth who supervises Honours students undertaking 'real world' marketing research.
- Carpentry (Level 4) students to build house
- Bachelor of Design (Interiors) student graduates to develop interior of house in collaboration with sponsors
- Bachelor of Design (Product) students to work on sustainable services/products for the house
- Natural Resource students to undertake gardening/landscaping development
- University of Otago, Natural History Filmmaking and Communication students – to produce 4 x 3-minute films

#### 1.4.2 STAFF

Number of Staff Involved:     ~7     Hours:     ~150    

Who:

Carpentry: Graeme Burgess - Programme Manager - Building

Graeme has been heavily involved in the development of the SHaC house plans, ensuring that the design gives Carpentry students the best opportunities to gain the experience required for their qualifications. Graeme has also worked closely with the architects indicating changes that need to be made for resources consent process.

Carpentry: Matt Thompson - Lecturer in Carpentry

Up until January 2009 Matt was to have been the lecturer to be in charge of the house build and he was therefore heavily interested and engaged in both the design and process of more sustainable practices. His enthusiasm has been an important part of Team Dunedin.

Architectural Draughting: Phil Ballard – Programme Manager for Architectural Draughting, Quantity Surveying and Construction Management

Phil developed an assignment for first year Architectural Draughting students (Appendix A) and has engaged in much of the research into sustainable building, both for his students and staff in the Architecture, Building and Engineering Department.

Administration: Tracey Paul

Tracey has been instrumental to Team Dunedin by taking notes and actions during our meetings and

supporting key members in their roles.

Marketing: Bevan Rickerby – Business to Business Manager, Otago Polytechnic

Bevan brings strong working relationships with our local businesses and industry to Team Dunedin. Bevan has developed and worked on the Otago Polytechnic's previous Charity House Auction's – and therefore has a good understanding of its requirements. He is working relentlessly with our 2007 and 2008 sponsors to generate the 'best' sustainable option for the 2009 house (these sponsors are listed below). This also includes working closely again with Metro (real estate agents), Dunedin, where there will be interesting communication opportunities through their magazine *Inhouse*.

Marketing & Group Manager ABE: Mike Waddell - General Manager - Marketing, Communications & Customer Relations

General: D'Arcy Dalzell – Executive Project Co-ordinator

D'Arcy has been involved in trying to 'round the troupes' at the Otago Polytechnic by speaking to staff and departments of the opportunities that exist for both staff and students with SHaC.

Plans for 2009:

Carpentry: Graeme Burgess

Graeme's plan for 2009, broadly speaking, will be to ensure the SHaC House is built and completed. He will oversee the build from a distance. The lecturers in charge of the build are Franc Humphries and Dave Feathers.

Carpentry: Matt Thompson

Matt will be assisting Graeme with the resource and materials list for sponsors – and as he is supervising the build next door will be available for consulting.

Carpentry: Franc Humphries and Dave Feathers

Franc and Dave will now be overseeing the build and teaching the Carpentry students.

Marketing: Bevan Rickerby – working with 2007 & 2008 Charity House Auction sponsors to generate the 'best' sustainable option for the 2009 house. To date, all sponsors (bar one) have pledged to offer more sustainable products and services for the SHaC House, which is great news. Bevan will also work closely again with Metro (real estate agents), Dunedin, where there will be interesting communication opportunities through their magazine *Inhouse*.

Bevan will be securing sponsorship and leveraging marketing and publicity opportunities with local media sponsors (More FM) and *Inhouse*.

Marketing & Group Manager ABE: Mike Waddell

Mike's plans for 2009 will be to tie together opportunities that exist with marketing sponsors and our communication plan.

General: D'Arcy Dalzell

D'Arcy has located 'gaps' in the teams expertise and is currently looking to fill these by contacting the University of Otago and internally in the Polytechnic. Her plans for this year will be to oversee the communication plan and work with staff and students to make public Team Dunedin's research, design and progress. This will involve writing, documenting and setting up public communications such as a website, press releases and general marketing.

#### 1.4.3 PROFESSIONALS AND PARTNERS

Number of Professionals and External Partners Involved: 8 Hours: 80

Who and What:

##### **Ian Currie, Arrow International – Project Coordinator**

Ian is Team Dunedin Project Co-ordinator who organises meetings, ensures commitments are met and liaises with team members.

##### **Maria Callau, PuCa Design – Energy Modelling & Architectural**

Maria is involved in Team Dunedin in a number of respects. As a tutor in energy modelling in the Physics Department of the University of Otago Maria and her students provided the initial energy model of the Team Dunedin house. Since the house plans have undergone some alteration, Maria herself has undertaken energy modelling for subsequent house plans.

Maria is also undertaking alterations to house plans in collaboration with various members of the team and under the guidance of architect Nick Baker. She is also working with the DCC to ensure the consent process is as smooth as possible and liaises regularly with the Carpentry staff at the Otago Polytechnic.

##### **Juan Puricelli – Waste Solutions.**

Juan is rating the Team Dunedin house with HERS star rating for efficiency through Waste Solutions. Gives the house a number of stars – indicative of how the house performs in terms of energy efficiency. In its current position, the house has a 6 ½ star rating.

##### **John Russell, representing the New Zealand Institute of Quantity Surveyors and Rawlinsons Quantity Surveyors.**

John's undertaking has been, attending design team meetings and giving cost advice.

##### **Pete Holmes, Steve Ting and Jane Adcroft – Natural History Filmmaking and Communication Students, University of Otago**

Pete, Steve and Jane are creating four three-minute 'webisodes' based around the SHAC Dunedin house. Each webisode will be shown on ecobob.com alongside other SHAC team films from around New Zealand. The filmmakers will commence filming in late January through to February, with production of each webisode staggered throughout the year.

Pete, Steve and Jane are currently in pre-production phase, working on story lines, structure and plot. They have a rough outline of each webisode, which they are currently developing. Once this is complete they will

send to and consult with Carthew Neal, the project director. (~15 hours)

Plans for 2009:

**Ian Currie**

Ian will be focusing more on the impact of sponsorship and also preparing for 'judgement day' . Ian will also keep a tally of costs and budget.

**Maria Callau, PuCa Design – Energy Modelling & Architectural**

With the plans completed and the consent given, Maria will contribute ongoing knowledge to the team. She will be contacting firms regarding solar panels and will complete energy modelling on the house.

**Juan Puricelli – Waste Solutions.**

Another analysis of the house for a star rating (this time with the house facing an ideal north position)

**John Russell, representing the New Zealand Institute of Quantity Surveyors and Rawlinsons Quantity Surveyors.**

**Pete Holmes, Steve Ting and Jane Adcroft – Natural History Filmmaking and Communication Students, University of Otago**

Production of 4 webisodes

## 1.5 FUNDING AND PARTNER MOTIVATION

Please describe how you are funding the project.

Otago Polytechnic traditionally funds the cost of building a house through its course budget. However in previous and successive years, our Charity House Auction has increased the 'spec' of each house, achieved through the generous support and sponsorship of local industry and businesses.

Otago Polytechnic will, in November 2009 auction off its SHaC House to the highest bidder. Once our costs have been recovered, the remaining sum will be donated to United Way charity ([www.unitedway.org.nz](http://www.unitedway.org.nz)) which supports various charities in our local community.

The Charity House Auction project is fast becoming an integral part of Otago Polytechnic's ethos – providing students with 'hands-on-learning' opportunities while benefiting Dunedin's wider community.

Businesses which are currently indicating support of the SHaC house in 2009 include: Active Furnishers, Aotea

Electric, Barry Dell Plumbers, Bedpost, Carpet Court, Dulux, Fisher and Paykel, Fulton Hogan, James Wren and Co, Kitchens for Less, LG, Makeovers, Mico Plumbing, Master Painters (Otago), Philips Lighting, Placemakers, Radio Works Otago, and Schneider Electric.

In cases where external partners or other tertiary classes or departments have contributed freely of their time, please explain what motivated their involvement:

**Arrow International**

Arrow International is keen to support the OP, be involved in an initiative raising awareness of Sustainable Design, and act as a link from tertiary education to industry.

**Quantity Surveying**

Motivation has been to promote the Quantity Surveying profession through involvement with kindred bodies.

**University of Otago film students**

“We decided to do the project as it gives us great experience for all-round filmmaking. We will learn about all aspects of the filmmaking process: pre-production organisation, script writing, production and post-production and allows us to make all the executive decisions!! It is also a great opportunity to work on web based filmmaking and a great networking opportunity working with well-known people in the industry like Carthew Neal.

All three of us were previously interested in the SHAC ideals of a more sustainable way of living and so this was a great opportunity to learn more about it and promote it in our own way.”

**Maria Callau – PuCa Design**

Maria is an architectural graduate from her native country and has been looking for both architectural draughting experience and experience in negotiating New Zealand’s resource consent process.

Her own company PuCa Energy modelling also specialises in energy use and output and is integral to the success of an energy efficient home. This project provides exposure and development of her own knowledge and experience.

## 1.6 DESIGN STORIES

A very interesting outcome of the SHAC project is the sharing of stories about what teams wanted to do, but could not for various reasons. For example, teams have had troubles getting materials approved, finding the funds to adapt overseas design guides to the New Zealand Environment, or sourcing system components at a price comparable to what is available overseas.

What design elements or strategies did your team wish to consider but could not include in the design? Why?

### **1. Working with existing sponsors**

Team Dunedin is working with sponsors in order to fund their build. This is both a positive and a challenge – we are strengthening existing relationships and putting a twist on our sponsorship relationship by asking for more sustainable products. Happily, our sponsors understand our motives and are happy to oblige. Without them, our build could not go ahead – but will aspects of ‘sustainability’ be compromised?

### **2. Ours is a transportable home**

This must be the largest parameter to our project and build. As such, we needed to cancel out ‘ideal’ sustainable solutions to services and design such as:

- Concrete floors
- Ground Source Heat Pump
- Remove the deck

### **3. Working an education environment**

Another of our challenges was working within the parameters of the education environment. With a team made up of members who each had their own personal objectives (architects, lecturers, sponsors, giving experience of the 3604 code etc) it has been difficult to match objectives, as well as timelines. A future attempt will seek to overcome these perhaps!

### **4. Working with staff and students**

How do you motivate people who do not necessarily have sustainability as a goal, or even an interest? The difficulty of motivating staff and students to become more ‘sustainable’ in their thoughts and practices cannot be underestimated.

## **1.7 SHAC 2011**

How would you like to see this project evolve into SHAC 2011? Several ideas have been suggested for a national project around more sustainable housing, for example,

- 1) regional design competitions at each participating tertiary in 2010, and each tertiary builds its winning design in 2011. Regional designers would work to a brief to fit capabilities of tertiary (SHAC preceded by regional design competitions)
- 2) Tertiary teams work on evaluating, and designing and retrofitting an existing house to give a more sustainable home. (SHAC retrofits only)
- 3) SHAC GreenBuild or SHAC PassivHouse. SHAC houses must use a particular design strategy, for example, PassivHouse methods, or SHAC Modular Houses.
- 4) SHAC International – New Zealand Tertiary’s combine resources to enter an international design competition, such as the US-based Solar Decathlon, [www.solardecathlon.org](http://www.solardecathlon.org)
- 5) SHAC Communities – wider focus looking at creating sustainable communities.
- 6) SHAC. Keep it the same so we get good at it.

What sort of project would you like to participate for 2011? How would it work?

Tim,

Getting this team together and building a house is certainly a challenge! It is agreed that the Team has learnt so much about relationships, expectations, communication and realistic delivery vs ideal scenario that it would be a shame not to give it another go in 2011.

Team Dunedin, therefore strongly advocates for a SHaC 2011/2012 – whatever the funding and timelines dictate.

After a team discussion there are a few things we would like you to consider for 'next time'.

Firstly, the team itself might need a bit more time. We feel like our design was rushed through in a way and we would have liked to have a bit more time – but I guess it is hard to make everyone happy!

We would also like to have had better opportunities to work with industry – if this could be coordinated somehow that would make our efforts a little easier, but again, not an easy task for you!

We feel as a team that Retrofitting is important, and would be an opportunity to expand the skills of our carpentry students.

There is also a challenge in working with students, so longer lead in times would be appreciated, but again the major challenge is bringing everyone 'on board' and sustainable leadership is maybe something that we are lacking from and that we would seek to find next time round.

Taking this idea of leadership further – how do we 'on the bottom rung' of the Polytechnic ladder impart our knowledge and expectations for sustainability projects in the future, and contribute to the bigger picture (e.g., by affecting unit standards etc). This is a real opportunity for many organisations and people to heed from.

All in all, SHaC is a real challenge on many different levels and we have appreciated the experience and look forward to finish line!

We really hope to have another opportunity with SHaC to try new and different things. Many thanks to you and the Steering Committee for doing such a great job and being inspiring sustainability landmarks!

#### 1.8 CONSENT DOCUMENTATION

Please include consenting documentation as a pdf when you send this file to [tim@shac.org.nz](mailto:tim@shac.org.nz)

If you have not yet completed the documentation, when do you expect to send it in? **\_\_\_mid-late January, 2009\_\_\_\_\_**

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**OTAGO POLYTECHNIC**

Architecture, Building and Engineering  
Diploma of Architectural Draughting

**Documentation One US 10164** version 7 (27 July 2004)

**FINAL ASSIGNMENT 2008**

**AUNTY PAT'S BACH**

You have a proud, quite well off, intelligent and slightly eccentric Aunt who is not far off retiring and wants to have a leisure bach retreat where she can spend the long summer days. She has no direct children or grand children of her own so wants a bach that is her own wee patch where she can chill out and read books, but will still accommodate her extended family (who she hopes will visit for the summer holidays).

As luck would have it you are her favourite relative and she sees it as a happy coincidence that you can help her by drawing up a bach for her. She understands that you have been looking at a site as part of your Construction Systems studies this year and she is intending to purchase that site to put her bach on.

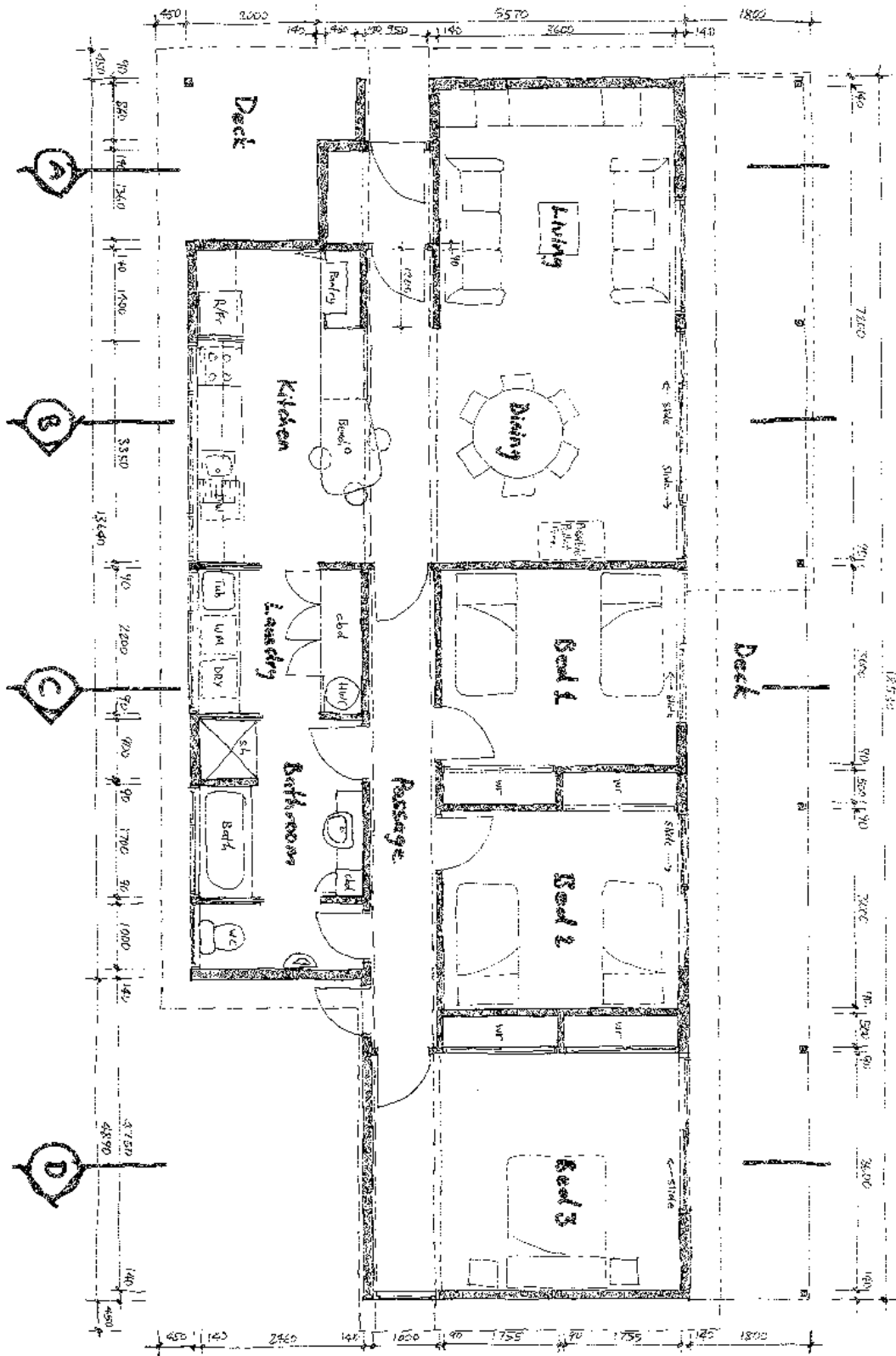
Aunty Pat has grasped the concept of sustainability and she has been looking at the Otago entry in the SHAC 09 Challenge. She understands that aspects of the preliminary design by the Otago group entry may be outside your knowledge, but she does like the floor plan being proposed by the group. She would like you to take the floor plan and put a butterfly roof on it to simplify the construction for you and keep it within the NZS3604 standard.

She would like you to build many aspects of sustainability and energy efficiency into the bach. This means that as you will be investigating sustainability of materials and energy efficiency in your other subjects you will be able to apply that knowledge to this project. This means that the house will be very well insulated and may have alternative heating sources to the norm so those aspects will also have to be taken into account in the design.

Many aspects of the design have not been resolved yet as there is still information being gathered from other people who are willing to help you with this project. These include energy efficiency engineers, quantity surveyors, builders and of course your lecturers. So far we have your site, a fairly firm Floor Plan, fairly firm Cross Sections and some good advice on insulation requirements / materials. Elevations, Details and Joinery have not been resolved yet so this project will have some realism to the process that would happen in a real design office.

Another design constraint is that the house is to be built off site then transported to the site by truck which means there will be a maximum height / width requirement for transportation.

The general arrangement is as indicated on the attached sheets. It will have to conform to NZ Building Code Acceptable Solutions, NZS 3604 : 1999 and AS 1100.



## PROJECT EXPECTATIONS

### Project outline

To create an identity and communication solution for Team Dunedin in the SHaC 09 project.

### Objectives

#### Objective 01: Identity

Create a cohesive identity for Team Dunedin's SHaC project. Team Dunedin require to communicate their philosophy behind the house and their methods. This will mean creating an identity for the team that can be used through web, print and other medias as needed.

#### Objective 02: Communication of Ideas, Values and Vision.

The communication solution needs to communicate Team Dunedin's Ideas, Values and vision. This will be fulfilled through the use of an interactive website (using the new identity) which promotes these properties through it towards team members as well as helping to heighten the knowledge of the SHaC project within the polytech's staff and students as well as with the general public.

### Resources required

Physical resources required will be supplied by Otago Polytech. Domain name and hosting will be supplied by Team Dunedin.

### Budget

Domain name - \$12 per year (note- still waiting for final confirmation of this pricing although it is not expected to exceed \$15)

Domain Hosting - \$84 per year

### Project Deliverables

Work will be done remotely from class and home with organised meetings with D'Arcy and the SHaC Dunedin Team.

Work will be in digital format for both the identity section of the project and the interactive information portal. A hard copy style guide will be supplied for use on the website as well as how best the identity work should be used across all media. All digital files including coding for the website and raw files from the creation of the identity and portal will be

The final website will be posted online for the client along with instructions on how best to update and service it.

### Timelines and Deadlines

Friday 19 <sup>th</sup> of September -	Research completed. Final choice for Identity chosen.
Friday 26 <sup>th</sup> of September -	Style Guide completed, minimum of three choices for website style completed.
Tuesday 2 <sup>nd</sup> of October -	Final decision made on website.
Friday 31 <sup>st</sup> of October -	Website goes live, all files handed over to client.

**SHAC 09 Dunedin**  
**Webisodes x 4 for Wasted/EcoBob websites**

**Science Communication Students:**

Peter Holmes, Steve Ling and Jane Adcroft

**Program Format:**

- A housing problem specific to Otago/Dunedin, eg. Bad heating
- A visual experiment demonstrating the problem using a badly built/designed house
- Talk to the expert from the team - the solution
- How the SHAC Dunedin team is using this solution/solving the problem in a standard regulation house, a second visual experiment
- Quick Tips on how to solve the problem at home, eg. closing certain doors, draughtproofing

The broad topics for each four episodes will be: Design/Materials, Insulation, Heating, Environment. These may change, along with the format, in consultation with the team. We need some feedback as to whether we have accurately represented who the team is and their aims for the project.

**Style:**

We hope to have a quirky style and have some fun thinking outside the box with the visual experiments, aiming for a youth audience. However, again, we will need to consult with the Dunedin Team and Carthew Neal as to how they wish to be represented and who they wish to target as an audience.



## Otago Daily Times

Published on Otago Daily Times Online (<http://www.odt.co.nz/>)

### Building for a better future

By Allison Rudd

Created 29/12/2008 - 05:32



SHAC national co-ordinator Tim Bishop (foreground), with, from left, Otago Polytechnic administrative assistant Tracey Paul, polytechnic carpentry tutor Matt Thompson, polytechnic executive projects co-ordinator D'Arcy Dalzell holding her daughter Zadie Tarbit (9 months), polytechnic graphic design student Simon Horner and University of Otago energy studies student Maria Callau and her daughter Maia Puricelli (4). Photo by Linda Robertson.

**Earlier this year, Otago Polytechnic won the tender to organise the Sustainable Habitat Challenge '09, a competition encouraging tertiary institutions to team up with architects, builders, product suppliers, community groups and local authorities to design and build sustainable and environmentally-friendly houses. When entries for the Ministry for the Environment-sponsored challenge closed in October, 10 teams from Auckland to Dunedin had submitted proposals. Staff writer Allison Rudd takes a look at their plans.**

#### • The SHAC '09 entrants [2]

Let's deal with the difficult bit first.

What is sustainability? Once the preserve of those perceived as "greenies", the term sustainability has become a buzz word particularly well-used by teachers and politicians.

It can mean different things in different contexts, but a useful layman's definition is this: sustainability is putting as much back into the environment as you take out - in other words, meeting the needs of the present without compromising the ability of future generations to meet their needs.

For Tim Bishop, the Sustainable Habitat Challenge - cutely known as SHAC - is all about coming up with innovative ways New Zealanders can live well while being free from reliance on expensive resources.