

SHAC 09: COMPETING LOGICS OF SUSTAINABLE ARCHITECTURE IN A NEW ZEALAND COMPETITION

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ABSTRACT

In late 2007, the Ministry for the Environment provided funding for a national competition for tertiary-led teams to design, develop and build sustainable housing in their local communities. The Sustainable Habitat Challenge (SHaC 09) aimed to 'make ideas and methods for low-energy, low-resource housing a reality for New Zealand. By building better homes, we hope to show that a more sustainable life is practical, achievable and desirable.' Nine teams from around the country were involved in designing and building a variety of different responses to the Sustainable Habitat Challenge.

Drawing on publically available documents from the ShaC website this paper examines the way ideas about sustainable architecture are embedded in the designs and materials produced by the nine teams. The paper will look at the various ways each team has used a range of images of space, building form, environmental knowledge, technology and idealised concepts of place, to construct an overarching 'logic of sustainable architecture' (Guy and Farmer 2001). These logics are an amalgam of the social, cultural and technological and give alternative visions for the future of sustainable building in Aotearoa New Zealand. Analysing these different logics, provides some insights into the various ways that sustainable housing is currently conceptualised.

While there are often attempts to provide a set of definitive, objective and standardised guidelines and technical criteria for judging the 'greenness' of buildings, I argue that sustainable architecture is necessarily pluralist in inspiration and realisation. Successful green buildings rely as much on the social location and framing of sustainability as they do on technical considerations. There is clearly a range of alternative ways in which communities, designers and householders can respond appropriately to the challenges of resource depletion, environmental degradation and climate change.

KEYWORDS:

Logics of sustainable architecture; eco-technologies; sustainable architecture competitions; building images.

INTRODUCTION

Sustainable architecture and building practice takes many forms because there are a range of possible responses to the complex problems of climate change, resource depletion and environmental degradation that we face. This paper uses a sustainable building competition (the Sustainable Habitat Challenge, hereafter SHaC) as a site to examine some of the different ways in which sustainable architecture can be imagined and produced. The purpose of the paper is to discuss how different 'logics of sustainable architecture' (Guy and Farmer, 2001) inform the different building designs and typologies produced by teams involved in the SHaC challenge.

Drawing on the work of Simon Guy and Graham Farmer in their paper 'Reinterpreting Sustainable Architecture: The Place of Technology' (2001) I am interested in examining the ways in which different 'individuals, groups, and institutions embody widely differing perceptions of what environmental innovation is about' (Guy and Farmer, 2001: 140). While different social actors (architects, builders, designers, sustainability experts, etc) may all have a commitment to sustainable building, it is likely they will produce variety in their solutions to the problems we face.

I begin by briefly describing SHaC and the nine teams that have been involved in the competition. I will then discuss how I am using the notion of a 'logic of sustainable architecture' in my analysis of the SHaC teams' designs. Finally, I outline what I believe are four distinct typologies of sustainable architecture that developed in response to the SHaC brief.

This paper focuses only on the goals and aspirations of the teams as they outlined them in written materials. Their success, in terms of achieving these goals and those of SHaC, is explored elsewhere (Ryan, 2010 forthcoming).

SHAC 09

The Sustainable Habitat Challenge is an initiative of Otago Polytechnic and is partially funded by the Ministry for the Environment's Sustainable Management Fund. The goal of the challenge was to ask: collaborative, tertiary-led teams to design and build or retrofit a sustainable home, develop a campaign to inform the public about how their design supports sustainable living and pass on information and techniques about their design to the building community (SHaC Judging Criteria).

Judging criteria were established which clearly set out the parameters that should define the sustainable designs and buildings of the teams. Eight categories were identified as being central to the successful design of homes in the challenge including:

- *Energy*: No net non-renewable energy consumption is required by the house and site.
- *Water*: Mains water requirements and water leaving the site as waste are minimised.
- *Materials*: All the materials are re-used, recycled or made from renewable resources. Building materials are durable, typically they will last as long as or longer than it will take to grow or produce those resources again. All materials are made entirely from materials grown or manufactured in New Zealand.
- *Waste*: Development does not adversely affect the environment or increase the environmental loadings and pressures of waste, wastewater or stormwater
- *Indoor Environmental Quality*: The design of your home allows you to maintain a healthy indoor temperature all year round, with no additional energy for heating or cooling.
- *Affordable and Suitable for Purpose*: The house will be affordable. The occupants will be delighted by the house, its size, cost, and features
- *Supporting a Sustainable Community*: Supports well-being, good quality of life, and healthy local environment today and into the future. Development does not adversely affect the environment or increase pressures.
- *Communications Campaign*: People in your region know how your team house design contributes to sustainable living and understand what features can be reproduced in their current or next house. Designers, Builders, and the Local Council are familiar with your team designs and how to apply them successfully. (SHaC Judging Criteria)

Nine teams, made up of lecturers, students and others interested in sustainable architecture, were part of the challenge. The teams are described briefly in the table below.

Table 1: Overview of Nine teams in SHaC 09

Team Name	New build or retrofit & site	Team members	Key features of design & technologies
Te Hira Whanau 'Bach 101'	Retrofit Rangitoto Island	Te Hira whanau Te Hononga o Whaihanga ki Wairaka (Kaupapa Maori unit of Unitech) Design Tribe	Retrofitted classic Kiwi bach – replaced rotted southern wall and roofing, pv lighting system, improved insulation, new water tanks, composting toilet
Unitech Ecocrib	New build Unitech campus	Unitech Product design and School of Applied technology staff and carpentry students	Efficient, healthy, bach-style home – Hebel panel systems, low water use bath & tapware, multipurpose kitchen island, outdoor planters
Team Housewise	Retrofit Manakau, Auckland	University of Auckland – School of Population Health Housing New Zealand Corporation Landcare Research NZ Housing Foundation Tenant family	Low-cost retrofits for State houses – house remodelled, insulation improved, hot water heat pump, heat recovery ventilation system
Whareuku	New build Lake Rotoiti	University of Auckland	Rural Maori house, constructed from earthen material incorporating flax fibres
Team Waikato	New build Relocatable	Wintech	Transportable – highly insulated, trombe wall
The Plant Room	Retrofit Apartment, Wellington	Victoria University Massey University Weltech	Bolt-on system to improve apartment living – solar hot water, worm farm, rainwater tank, garden planters
Team Canterbury	New build Relocatable	CPIT Canterbury University mechanical team Lincoln University	Transportable, conventional, low cost – high insulation, sun screens
Team Dunedin	New build Relocatable	Otago Polytechnic University of Otago Certificate in Carpentry students	Transportable - highly insulated, mechanical ventilation
Team Central Otago	New build Clyde	Otago Polytechnic	Straw Bale House, earthen floor, thermal mass wall, no treated timbers, sauna, masonry stove, pv panels

It is useful to examine the commonalities and differences across the teams in terms of the larger claims they make about the environment, eco-technologies and buildings in place.

LOGICS OF SUSTAINABLE ARCHITECTURE

Guy and Farmer (2001) argue that it is possible to identify a number of different ‘logics’ at work in sustainable buildings as well as in the writing about sustainable architecture. They draw on the work of Hajer (1995) who argues that logics can be understood as an assembly of ideas, concepts and categorisations that give meaning to our notions of social and physical realities and are themselves produced, reproduced and transformed through practices such as designing, building or using eco-technologies in particular ways. Logics ‘hang together’ in various ways by virtue of what is perceived as the main environmental problem and the best sustainable solution to that problem. Logics should be understood as being the products of human action, institutional location and social and political context. Moreover, ‘through the design process of any particular development, logics may collide, merge, or co-inhabit debate about form, design, and specification’ (Guy and Farmer, 2001: 141).

Guy and Farmer construct six competing logics that they identified from analysis of completed buildings and a literature review of writings on sustainable building. Each of these logics includes the following:

- *An image of space* ‘through which environmental benefits and detriments flow and are represented’ (Guy and Farmer, 2001: 141);
- *A source of environmental knowledge* ‘through which we come to experience and understand the environment’ (ibid);
- *An idealised concept of sustainable place* or ‘*environmental place making*’ that provides the overall design strategy, and shapes which technologies will be chosen;
- *Technologies* – that are dependent on an idealised concept of place, and varying from high-tech intelligent, through autonomous, local low-tech, non-toxic, participatory and so on; as well as
- *A dominant building image* ‘in relation to the environments they inhabit’ (ibid).

The following table provides a succinct summary of the six logics of eco-technic, eco-centric, eco-aesthetic, eco-cultural, eco-medical and eco-social. Guy and Farmer treat these as ‘metalogics’ that frame their thinking about sustainable architecture.

Table 2: Competing logics of sustainable architecture (extracted from Guy and Farmer, 2001: 141).

Table 1 The six competing logics of sustainable architecture

Logic	Image of Space	Source of Environmental Knowledge	Building Image	Technologies	Idealized Concept of Place
Eco-technic	global context macrophysical	technorational scientific	commercial modern future oriented	integrated energy efficient high-tech intelligent	Integration of global environmental concerns into conventional building design strategies. Urban vision of the compact and dense city.
Eco-centric	fragile microbiotic	systemic ecology metaphysical holism	polluter parasitic consumer	autonomous renewable recycled intermediate	Harmony with nature through decentralized, autonomous buildings with limited ecological footprints. Ensuring the stability, integrity, and “flourishing” of local and global biodiversity.
Eco-aesthetic	alienating anthropocentric	sensual postmodern science	iconic architectural New Age	pragmatic new nonlinear organic	Universally reconstructed in the light of new ecological knowledge and transforming our consciousness of nature.
Eco-cultural	cultural context regional	phenomenology cultural ecology	authentic harmonious typological	local low-tech commonplace vernacular	Learning to “dwell” through buildings adapted to local and bioregional physical and cultural characteristics.
Eco-medical	polluted hazardous	medical clinical ecology	healthy living caring	passive nontoxic natural tactile	A natural and tactile environment which ensures the health, well-being, and quality of life for individuals.
Eco-social	social context hierarchical	sociology social ecology	democratic home individual	flexible participatory appropriate locally managed	Reconciliation of individual and community in socially cohesive manner through decentralized “organic,” nonhierarchical, and participatory communities.

In this paper I use the logics, and their component parts, as a springboard for thinking about the SHaC teams. I have drawn selectively on aspects of the framework to make sense of the way that architectural and building lecturers and students in Aotearoa New Zealand responded to the SHaC challenge.

BUILDING IMAGES IN PLACE: TYPOLOGIES OF SUSTAINABLE ARCHITECTURE IN SHaC 09

In the following discussion I have drawn on a variety of publically available documents produced by each of the SHaC teams to document their design and building over the course of the challenge (i.e. website material, two interim reports produced in 2008, and the final report, October 2009). There is some unevenness across the teams in terms of the materials produced. Nevertheless there was enough material produced by each team to give a clear sense of what they perceive to be the main environmental problem their design addresses, the idealised concept of place they wish to inhabit and the building image constructed out of these¹.

Five of the six logics that Guy and Farmer identify are present to some extent in the designs produced by the SHaC teams. Some of these logics are drawn on much more heavily (e.g. eco-technic) while others are very minor players (e.g. eco-centric). There was no instance that I could find of the eco-aesthetic logic. In the following discussion I have identified what I think are four distinctive typologies at work in SHaC. These typologies draw in various ways on the metalogics that Guy and Farmer have identified, but they also take a particular form in response to the social, environmental and cultural context of Aotearoa New Zealand, as well as the institutional locations from which they are drawn. One of the typologies – ‘conventional, affordable, anywhere’ - is a relatively straightforward instance of the eco-technic logic identified by Guy and Farmer. However the other three typologies (‘eco-socio/cultural in Aotearoa’, ‘healthy, social housing’, and ‘regenerative aspirations’) are amalgams of different logics, and represent something distinctive about sustainable building in Aotearoa New Zealand as developed in relation to the SHaC challenge.

Typology I: ‘Conventional, affordable, anywhere’



Team Waikato



Team Canterbury



Team Dunedin



Unitech Ecocrib

to build sustainably is not about the fancy bits. It is about how you build, the materials used, cutting back on waste and using the material efficiently (Team Waikato, 2009:9).

this stylish home is “normal” as possible while containing a wide variety of accessible and sustainable products and services. Proof that sustainable building is within everyone’s reach today. (Team Dunedin, website www.shac.org.nz/group/teamdunedin accessed 4/11/09).

If there is a dominant logic at work among the SHaC teams, and perhaps in the field of sustainable architecture more widely, it is that of the ‘eco-technic’, where the focus is on global issues of climate change and an emphasis on efficient use of resources (whether of energy, water or building materials). The eco-technic logic draws primarily on techno-rational and scientific knowledges for posing the

¹ I was involved in a minor way from June 2008 to January 2009 in The Plant Room team on the communications team, and therefore know more about the development of the concepts and designs of this team than of others. However I played no part in the development of the design initially, nor as it progressed throughout 2009.

main environmental problems and identifying solutions. Four of the SHaC teams drew heavily on this logic in their designs, building and discourse (teams Dunedin, Canterbury, Waikato and Unitech Ecocrib). These teams also shared a base in the polytechnic education of carpentry students. Three of the teams designed their buildings as re-locatable, which they acknowledged limited their ability to incorporate some of the usual good features found in sustainable buildings (e.g. they were not able to include high thermal mass or things like a veranda or a ground source heat pump). Unitech Ecocrib was planned as a modification of an existing design used for teaching Certificate in Applied Technology carpentry students. However due to financial constraints the build did not go ahead and the team submitted designs for improving the indoor environmental quality of the house and designed features such as a multi-purpose kitchen-island and low-water use bath and tapware.

As the quotes above suggest, these teams favoured passive solar designs that were conventional and that would be readily understood by the ‘average’ New Zealander. There was no desire to go very far outside of the standard building conventions used in timber-framed houses, which is understandable given the fact that these designs and builds were part of the standards-based training of carpentry students at the four polytechnics. Sustainability in housing is here meant to appeal to ‘everyone’. As Team Dunedin, stated they wanted to provide a ‘mainstream home layout that most New Zealanders would be comfortable with’ (website www.shac.org.nz/group/teamdunedin accessed 4/11/09).

Readily available and cost-effective technologies were chosen e.g. heat pumps, heat ventilation systems, high levels of insulation and so on. There was relatively little emphasis given to issues of life cycle analysis of the materials and technologies used – as an example, glass wool insulation was generally chosen because of affordability, and treated timbers used even though there was some recognition of the toxicity of the chemicals. Issues of affordability often trumped what were considered more sustainable decisions – e.g. Team Canterbury decided against using thermally broken aluminium windows because of cost, and did not use PV panels because they were judged not to measure up in terms of ‘cost recovery’.

These buildings were small in size – partly a response to being transportable buildings and also the need for them to be manageable for carpentry students to build. However, the small footprint of the buildings was also seen as a benefit, because small houses require fewer resources to build and are energy efficient to live in. In addition their small size means they are well-suited to urban in-fill environments that are themselves desirable, because they do not encourage urban spread and facilitate the use of public transport.

The transportability of these buildings means that they are designed with the view that they can work equally well anywhere. Place, in the sense of cultural, social and bioregional location is therefore seen as being of little importance.

Typology II: Eco-socio/cultural in Aotearoa - authentic and community-based



Whareuku



Te Hira Whanau Bach 101



Team Central Otago

Whereas the eco-technic logic emphasises global, perhaps ‘universal’ concerns around climate change and the need to reduce GHG emissions, the eco-cultural logic starts from a more local and culturally

contextualised sense of the environmental space we inhabit. Homes are located in *particular* spaces, with their own particular environmental challenges (physical and social). From this perspective our buildings should be places where we learn to “dwell” through buildings adapted to local and bioregional physical and cultural characteristics’ (Guy and Farmer, 2001:141). Three SHaC teams conform to this logic - each in slightly different ways. Nevertheless all three drew on building images that were in their own ways ‘authentic’, ‘harmonious’ or ‘typological’. For Whareuku, Te Hira Whanau Bach 101 and Team Central Otago there were clearly identified building images that located these buildings firmly in a *particular* place. In addition to features of the eco-cultural logic, all three teams also valued and incorporated a participatory element in their designs and/or builds. They felt it was important to involve the future residents, but they also sought connections with the broader community.

Whareuku: rural Maori housing made of earth and flax

Conventional housing methods have been demonstrated not to work so well in a rural Maori context. Research that aims to benefit a community works best if the researchers have experienced and are a part of the community. *A technical solution won't suffice*. This is especially true in the complex housing situation on rural Maori land (Whareuku, 2009:15 - my emphasis)

The materials are appropriate to use for construction because they represent the generative foundation of life. All things are born from her and nurtured by her, including mankind (Kepa Morgan, Whareuku, 2009:7)

Whereas in the eco-technic logic the technological features of sustainable building are paramount, for the Whareuku team technical solutions are seen as being insufficient in themselves to solve the problems of poor housing for Maori in rural areas. Alongside the passive solar design and construction of an earth house (using an innovative method combining rammed earth with locally sourced flax fibres) two other key features of Whareuku make it a clearly distinct typology that differs in significant ways from the eco-technic logic.

Firstly, notions of kaitiakitanga (guardianship of the land) are important, and are in some respects similar to the eco-centric logic, with its emphasis on the importance of being in harmony with nature and seeking to ensure that the local biodiversity of the place flourishes. Kaitiakitanga was manifested through such things as the way that waste was managed, as well as how flax harvesting was performed ‘according to traditional Maori methods which leave the flax plant in a better state to grow, and the flax leaves (and soil) are readily available’ (Whareuku, 2009: 7).

Secondly, Whareuku used a participatory process in the design, build and choice of location for the house on Maori land. In order to make the process accessible to a wide range of people, five key attributes were seen as being desirable in the housing method: a minimum of input by professional engineers; a design-life of six generations; and construction technology that is readily able to be adopted by a non-technical workforce, is not overly dependent on large complex machinery and is low-cost and easily transferable (Whareuku, 2009: 3). In addition a sweat equity component of the house build made the home more affordable.

In addition to contributing to environmental sustainability, the Whareuku method is seen as supporting social sustainability more generally, by renewing and strengthening relationships, opening up communication channels and strengthening the community. ‘There is a collective pride and identity that arises out of the project’ (Whareuku, 2009:10).

Te Hira Whanau Bach 101: Classic Kiwi bach on Rangitoto Island

Sustainability has always been inherent in the typology of the classic Kiwi bach. You design and build it yourself, you reuse found and local materials, and you and your family

progressively build a real connection to the place. You also become a kaitiaki or guardian for a piece of our precious coastline (Te Hira Whanau Bach 101, 2009: 1).

The Te Hira Whanau Bach 101 represents a beacon of resistance to both the ubiquitous gentrification of kiwi bachs [...] and the loss of those built on crown land [...] Adoption of appropriate technology solutions [...] has helped preserve the essence of Kiwi bach life while enhancing cultural and environmental sustainability (Te Hira Whanau Bach 101, 2009: 2)

The name of this team indicates the bach's ownership by a whanau (Te Hira). 'Bach 101' refers both to the number of the bach on Rangitoto Island (which was built in 1919 and is one of only 34 baches remaining on the island) and also to the idea of a university 'foundation course' in a building typology that New Zealanders love. Place and culture both provided a context that required a participatory method as well as minimal change to the bach, because of the classification of the three settlements on Rangitoto island as historic settlements.

The retrofitting of the building takes the particular form it does because of its location on Rangitoto, with its lack of power and unique history of bach settlement. The project also involved the te Hira whanau with their specific cultural requirements that the retrofitting had to accommodate. For example, water collected off the roof of the toilet will only be used for showering and washing, and not for cooking. Moreover, it was decided to retain the cooking facilities in an already existing basalt cave/kauta as this allows easy feeding of the sometimes large numbers of whanau who visit in the summer.

Environmental sustainability in this project was therefore intimately connected with cultural sustainability - 'the sustainability of the unique Rangitoto bach typology and whanau connection to the bach and its wider environs. (Te Hira Whanau Bach 101, 2009: 11). This meant there were rather modest goals for the bach. The low HERS rating of 2 was not viewed as much of a problem because of the occupation of the bach mostly in the summer, as well as a broader reference to the 'Rangitoto bach typology', where the bach 'encourages connecting with the outdoor environment (as opposed to a modern cocoon)'. (Te Hira Whanau Bach 101, 2009: 10)

Team Central Otago: Straw bale home for treeless arid central Otago

Straw is a great building material option for Central Otago – it's cheap, natural and provides great insulation for the dry Central Otago climate. Essentially we're taking a waste product and turning it into a solid, durable, well insulated and easy to maintain home (Team Central Otago, 2009:3)

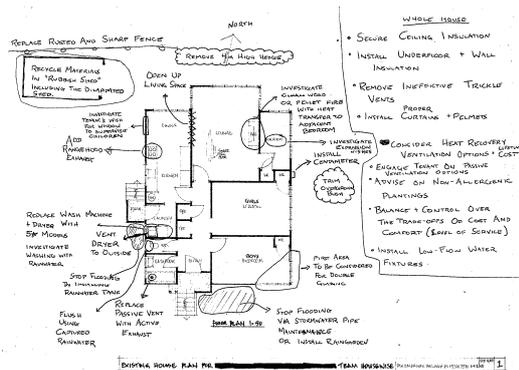
The ideal sustainable housing in Central Otago is co-created by the individuals and their wider communities. The ideal house has a low environmental footprint, high social focus through community involvement and is affordable. Its creation is through a construction sector that is open minded, and continually striving to improve its practices. (Team Central Otago, 2009: 4)

Team Central Otago designed a house for a specific client, originally from Finland. They based their design on the brief from their client, who had knowledge of straw bale houses in Europe. Straw is a building material that is ideally suited to Clyde's climate, which is dry and hot in the summer, and cold in the winter. The building image was built around the future eco-homeowner's desire for 'a home that was warm, beautiful, non-toxic and had a minimal impact on its surroundings' (SHaC Team update Sept 2009: 10). There are no treated timbers or mdf in the building and low VOC finishes are used. The house was also intended to be a 'sanctuary from exterior noise and temperatures'. Typical Finnish aspects of house design such as a sauna (as the main means of washing) and a loft, were also incorporated into the design. In addition, solar water heating and 'a super-efficient masonry stove will

keep the interior warm and provide for hot water needs while keeping environmental emissions to a minimum.’ (Team Central Otago, 2009: 3)

Here a recognition of the bioregional characteristics of Central Otago are combined with what is culturally familiar for a Finnish client, to create a home that will be thermally comfortable in all seasons and that uses materials that are readily at hand. In addition Team Central Otago have sought to draw on the community within which their house is being built – both to use already existing knowledge, as well as to disseminate the sustainable building knowledge that will be increased with this build.

Typology III: Healthy, social housing



Team Housewise is interested in how Housing New Zealand can develop a renovation package for a 1950s state house with useable technologies that facilitate more environmentally and socially sustainable performance in-use (‘hardware’) as well as facilitate a learning process with residents (‘software’) to support more sustainable living. (website accessed 4/11/09 <http://www.shac.org.nz/group/teamhousewise>)

While teams located within the previous typology made some reference to issues of health, Team Housewise had as its primary concern a desire to improve the indoor environmental quality for the tenants of a State house in South Auckland. The design and renovation was a response to an actual Housing New Zealand home and family. The team started from the position that much of the older State housing is in a poor state and the house they were working with: ‘presented most of the chronic symptoms associated with underperforming New Zealand Housing stock from its era; damp and mouldy, yet still draughty; too cold in winter; too hot in summer and a building in need of extensive maintenance and design modification. One of the tenant’s children has asthma and her symptoms are likely aggravated by the poor conditions inside the house’.

In addition to wanting to improve the living conditions for the family in the house, there was a goal to ‘inspire HNZC to run similar processes on other state properties’ (Team Housewise, 2008: p3). This project was to be a repeatable, cost effective method for retrofitting Housing New Zealand’s older State housing stock. Housing New Zealand Corporation, a partner in the project, approved a budget of \$105,000 as the definition of ‘repeatable’ project.

Alongside the eco-medical logic present in the Team Housewise design, was a desire to engage the resident family ‘to ensure that the solutions adopted are practical and prioritized for longer term sustainability’. (website accessed 4/11/09 <http://www.shac.org.nz/group/teamhousewise>) The project was therefore also participatory in its ethos and involved the tenant in the design process. For example, a new window for the kitchen was suggested by the tenant, so that she could watch her children playing outside, and a pellet burner was rejected because the tenant was concerned it would be too hot for her children.

Tenant participation in terms of how well the house performed around water and energy use was also seen as being important which meant that there should be ‘useable technologies’ that enabled ‘a learning process for the tenants’. This involved the use of a Centimeter display ‘which allows the family to understand the implications of using certain appliances in particular ways’.

Typology IV: Regenerative aspirations: imagining a new type of urban place



We are interested in exploring a particular logic of “green architecture” that goes beyond some current ideas of sustainable design. Our aim is to create a “regenerative” habitat where people will be delighted, community will be developed and sustainable living will literally “grow”. (The Plant Room, 2008: 18)

While sharing some of the features of the eco-socio/cultural housing typology and the eco-health logic, The Plant Room stands out as being much more ambitious in its sustainable aspirations than any of the other teams, joining together concerns about post-oil crash society, cradle-to-cradle thinking, social housing, and participatory models of design. These aspirations were clearly generative of ideas for the project, but were perhaps less well realised in the final designed solution - ‘the Plant Room’ - a bolt-on prefabricated room, focused on improving the indoor environmental quality of a Wellington apartment.

This room is designed to provide:

hot water for one, a healthy growing space for herbs, fruit and vegetables all year around, a worm farm, a rainwater tank, an outdoor space and an enclosed room. It shades the apartment to avoid summer overheating and collects hot air to circulate warmth in the winter. It is designed to improve the quality of apartment living while reducing the energy and weather use of its occupants (The Plant Room, 2009: 8).

The room also includes a fold-out day bed and somewhere to dry clothes. While the team focused on the design of one Plant Room, the broader intention was to see a series of such bolt-ons attached to the whole facade of an apartment building, thereby having a more profound impact on the environmental and social sustainability of the building. In addition to the bolt-on system there were also plans for a collective recycling system, rooftop energy generation and green roof on the apartment building.

The Plant Room team located their solution to the problem of the large number of existing, poorly performing buildings in relation to broader notions of social sustainability. Sustainability therefore encompassed improvements to the whole apartment building, which were seen as enabling ‘social interactions and a sense of community [which] are vital for the well-being of all... the Plant Room brings delight, joy, comfort and well-being to all occupants – not just of the apartment but of the building also. Part of this was to include future inhabitants in the design process – these people influence the design in terms of scale, consultation and a sense of ownership’ (The Plant Room, 2009: 30).

These aspirations are linked to a recognition of the problems and opportunities associated with ‘higher density, social housing’ found in Wellington. Inspiration comes from the idea that architecture can be ‘regenerative’ – leaving space and place in a better condition than it was found.

CONCLUSION

The Sustainable Habitat Challenge provides a site where we can see the different ways that sustainable building can be conceptualised in response to a set of sustainability criteria. Each of the teams began with their own particular constraints of time, personnel and budget, and came up with unique responses to the challenge. The purpose of this paper is not to pass judgement on how successful or otherwise these responses were to the judging criteria, or to any other external and seemingly objective set of standards. Rather I was interested in exploring the different typologies of sustainable building that developed in response to the SHaC challenge. Three of the typologies shared the belief that sustainable building practice must recognise the importance of 'place' (with each specific place being located in particular histories, cultures, bio-physical sites and social networks of people). On the other hand, the largely eco-technic logic driving the projects under the auspices of teaching carpentry or applied technology students worked with the notion that their homes could be built 'anywhere' and that they should appeal to an 'average' family. While aspects of the eco-technic logic and the other logics can be combined in different ways, I do think that 'anywhere' and 'here' cannot both be accommodated in a sustainable building project. Moreover, I would make the stronger claim that 'anywhere' almost always means 'nowhere', and therefore fails to take account of the fact that sustainable building must respond to particular problems of particular sites involving particular sets of people with their histories, cultures and social networks. More than anything, successful sustainable architecture is a response to the demands of culture and place.

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