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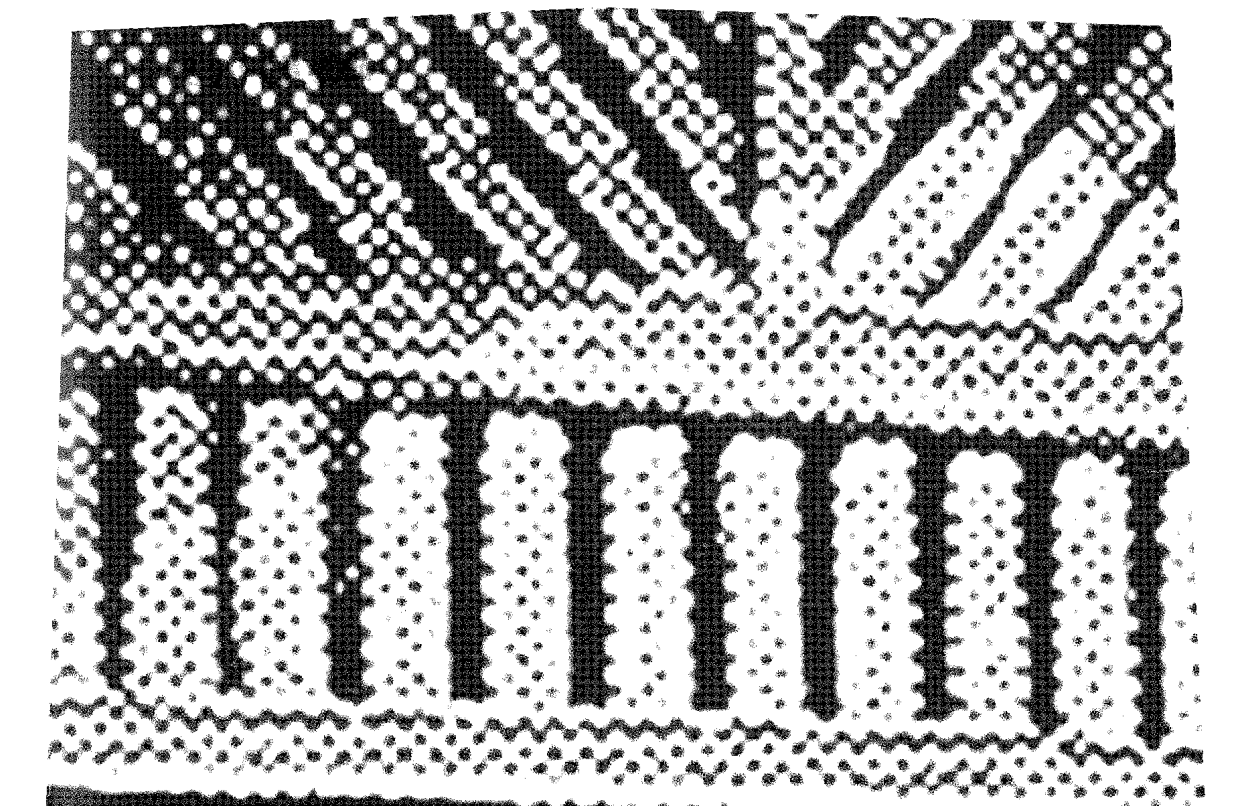
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TAKE2
HOUSING DESIGN IN INDIGENOUS AUSTRALIA
EDITED BY PAUL MEMMOTT
EDITORIAL ASSISTANCE CATHERINE CHAMBERS

TAKE 2 : Housing Design in Indigenous Australia

Edited by Paul Memmott

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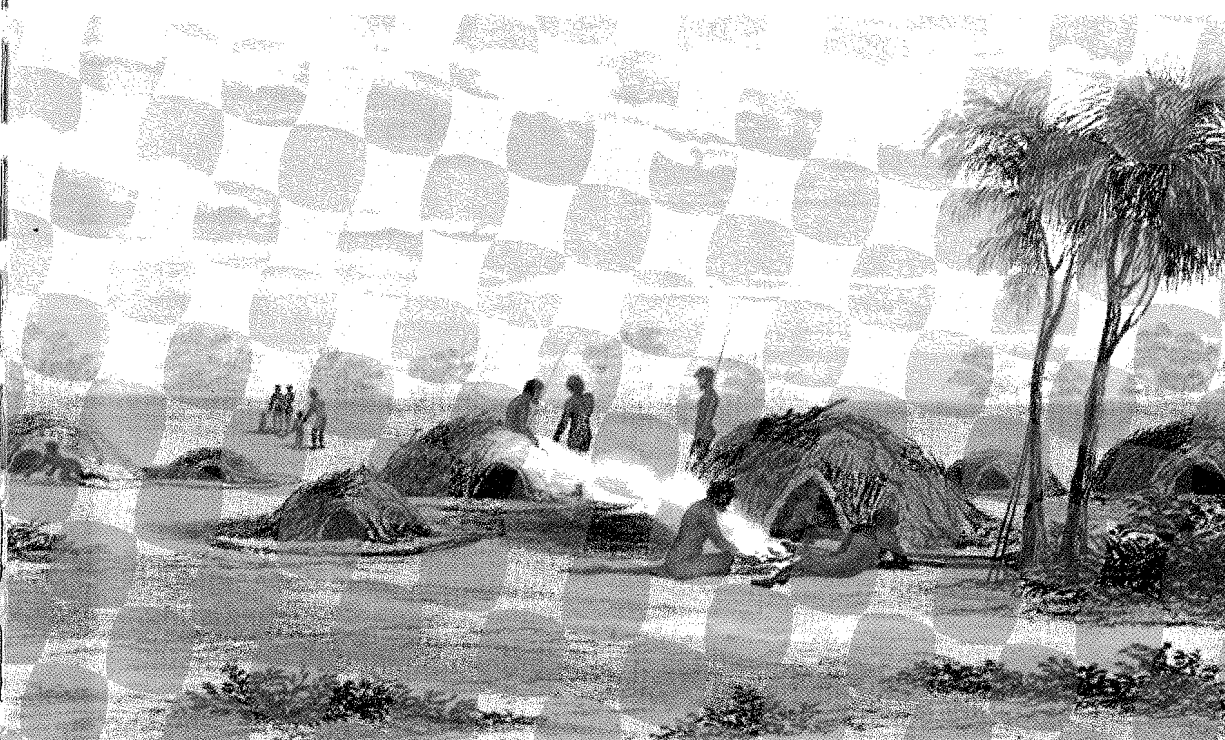
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THE UNIVERSITY OF
NEW SOUTH WALES



Title page, detail, A house in an Alice Springs town camp designed by Mark Savage and Jane Dillon in the mid 1980s. [Photographer: James Ricketson, 1987, AERC Collection, University of Queensland.]



Watercolour sketch of an Aboriginal village near Mt Shannon in north-west New South Wales. The function of the small domes (adjacent to the larger ones) is not known, but there are two plausible suggestions as to their use. One is that they were used to store grass seeds and other staple seeds and grains. The other is that they were dog kennels. [Source: Sturt, Capt. C. 1849 Narrative of an Expedition into Central Australia. London: T. and W. Boone, 1849, Vol. 1 facing p.264. Artist: J. H. Le Keux.]

RAIA SISALATION PRIZE

This issue is the second in the recently established RAIA journal series, TAKE, which celebrates a new direction for the longstanding RAIA Sisalation Prize. Managed by the Royal Australian Institute of Architects and sponsored by Insulation Solutions, this prize has been awarded annually since 1956. Over the years it has taken different formats – as a travel scholarship, as a commission to an author to write a book and since 2001 as two separate prizes to an editor and associate contributors of the RAIA architectural journal series, TAKE.

While retaining its objective to develop and apply architectural knowledge in Australia, a review of the RAIA Sisalation Prize in 2001 resulted in its restructure into two stages to make it more attractive to a wider range of potential applicants and to deliver an annual event. The first stage selects an editor, who as primary prize winner, proposes a theme and draws together in stage 2 a team of associate contributors to produce a journal volume featuring an edited collection of papers. The theme of each issue bridges academic and practice issues in architecture. The RAIA Sisalation Prize is awarded annually and seeks to further the development of architecture through both the annual publication of the guest edited journal TAKE and an annual symposium event addressing key issues of the journal publication.

The RAIA Sisalation Prize is guided by a Steering Committee including practitioners, academics and a representative of the sponsor, Insulation Solutions. The Steering Committee is responsible for the overall management of the prize including selection of the major prizewinner, selection of the journal theme, guidance to the Editor, copy editing, management of editorial and publication issues and promotion of the prize. The Steering Committee reports to the RAIA National Education Committee. The RAIA Education Unit provides management support for the prize, including the journal publication, and the RAIA Chapter Manager in the state/territory in which the event is held manages the annual symposium. The symposium launching this second issue was held in Brisbane, Queensland in August 2003.

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A photograph of Meriam people building a house in 1958 on the island of Mer (or Murray Island), the most easterly of the Torres Strait Islands. It was built of bamboo and bush timber, with woven coconut leaf walls. The grass-thatched roof was about 2.4 metres high at the ridge of the gable. Elevated, split bamboo floors were also utilised, being raised about a metre from the ground. Under the influence of Pacific Islander missionaries around the turn of the 19th century, this gable roof design superseded traditional dome forms. [Photographer: J. Beckett, University of Sydney.]

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Part of a discrete urban settlement on the outskirts of a rural town in the Murdi Paaki region of western New South Wales in 1999. The humpy survives from a town camp established on a Town Common Reserve in the 1950s. As part of an ATSIC program, most humpies have been replaced by modern houses on elevated platforms to reduce flooding risks presented by the nearby river. However the residents had retained a few humpies, partly for storage and visitor use, but also as symbols of a past lifestyle era. [Photographer: P. Memmott, AERC, University of Queensland.]

Paul Memmott

Associate Professor Paul Memmott is an architect and anthropologist with 30 years experience in the field of Indigenous people-environment relations. He is currently Director of the Aboriginal Environments Research Centre (AERC) located in the School of Geography, Planning and Architecture at the University of Queensland, which maintains a national focus on Indigenous housing and settlement research. Memmott is also Principal of the consulting firm Paul Memmott and Associates (PMA), which is based in Brisbane and operates in close association with the AERC. The firm specialises in consulting on Aboriginal projects and since 1972 has had a long track record of involvement in Aboriginal housing practice and research.

Memmott has undertaken numerous projects throughout Australia, ranging from anthropological and cultural heritage investigations for Indigenous groups, to architectural projects, settlement planning and housing policy development for government clients. Memmott's general research interest is the cross-cultural study of the ethno-environmental relations of Indigenous peoples. He is the author of five books, 90 published papers and some 200 technical reports for clients ranging from Indigenous organisations, to state and federal governments. (see www.aboriginalenvironments.com)

Carroll Go-Sam

Carroll Go-Sam is a descendant of the yabulambara and gambilbara Dyrirbal people from the Wild, Herbert and upper Tully River basins, and maintains connections and interests in townships and locations where Dyrirbal people are located. Go-Sam's Bachelor of Architecture degree was completed in 1997 at the University of Queensland, and was complemented with studies in anthropology. Go-Sam's study focused on the issues of Aboriginal environmental design and culminated in the completion of her final year thesis entitled *The Mutitjulu experiment: a study of decentralised houses by Paul Pholeros*, which was awarded the Department's thesis prize.

Go-Sam has worked for Aboriginal community organisations such as Kambu Progress Association, Tangentyere Council and Musgrave Park Cultural Centre. She has been employed by various Brisbane architectural firms and worked on the Bidungu Housing Project, Gregory Crossing, North Queensland. Her professional services range from project management, architectural design, negotiation with authorities on town planning issues and design assessment. She also participates in traditional owner organisations such as Budjubulla, Gumbilbara and Goolwana Bana, which focus on service delivery for Dyrirbal descendants.

Julian and Barbara Wigley

Julian and Barbara Wigley are practising architects who have specialised in community planning, housing management and building design for Aboriginal and Torres Strait Islander client groups for the past 31 years. Their architectural practice specialises in Aboriginal town planning, housing, land negotiation and facilitating community participation in development projects. They assisted in the establishment of Tangentyere Council in Alice Springs during their stay in Alice Springs between 1975 and 1979 while working for the Aboriginal and Torres Strait Islander Housing Panel. The Wigleys continued an independent national architectural practice from Melbourne, assisting community clients in northern Australia after the closure of the panel in 1979. They have co-authored a number of books on housing and housing management.

Jane Dillon and Mark Savage *

During the 1980s Jane Dillon and Mark Savage spent eight years in Alice Springs working for Tangentyere Council, an Aboriginal community council and resource agency that provides architectural and planning services to Aboriginal communities and organisations within a 600 kilometre radius of Alice Springs. The range of work conducted by Dillon and Savage was considerable and included housing, schools, clinics, stores, sporting facilities, art and craft centres, community and childcare centres, offices and media facilities. The nature of their work in Central Australia provided an understanding of the broader issues surrounding the provision of housing, infrastructure and other community facilities for Aboriginal groups.

Dillon and Savage currently run a small architectural practice in Sydney, which has focused on providing architectural services that require a high degree of community involvement. They have continued to work on a variety of planning and design projects with a wide range of Aboriginal communities and organisations in many parts of Australia.

Su Groome

Su Groome is a Cairns based architect and a founding partner of Studio Mango, with over 10 years experience working in Tropical North Queensland. She has worked with Indigenous communities for more than seven years. Groome's work with Indigenous communities includes: settlement planning with developing communities; design of housing, outstation facilities and community buildings; and housing maintenance projects based on the Housing for Health methodology devised by Healthabitat (see Pholeros below). Her work in Cairns includes a demonstration sustainable house, designed around passive design principles and incorporating substantial renewable power and water conservation components. The Master Builders and Housing Industry Association gave this house an award.

Groome's published work includes numerous contributions to the Centre for Appropriate Technology's Our House magazine, discussion papers on participatory planning and kitchen design for the Centre for Appropriate Technology, planning reports for the Port Stewart and Mona Mona communities, a report on the Housing for Health project in Pomppuraaw and the Your House book for Queensland Aboriginal and Torres Strait Islander Housing. Groome is also a contributor to the National Indigenous Housing Guide.

Paul Pholeros

Paul Pholeros is an architect and has a small practice working on urban, rural and remote area architectural projects throughout Australia. He is also a co-director of Healthabitat Pty Ltd, in partnership with a specialist medical doctor and an environmental health professional. For over 17 years, Healthabitat has been involved in improving the health of Indigenous people by improving their living environments by means of community projects around Australia.

Cathy Keys

Cathy Keys graduated from the Department of Architecture, University of Queensland in 1993 after completing a final year thesis concerned with Indigenous birth practices and their implications for architectural design. She then commenced a doctoral thesis on Warlpiri single women's camps or jilimi. Over the four years of this research based in the Warlpiri community of Yuendumu she completed a number of user-needs consultations for the community. She has tutored and lectured in Aboriginal environments to architecture students and written and published on aspects of Warlpiri women's living environments. Keys currently works in the Queensland Department of Aboriginal and Torres Strait Islander Housing.

Shaneen Fantin

Shaneen Fantin has eight years experience working with Aboriginal people on community and housing projects in the Northern Territory, Queensland and Canada. Between 1997 and 2002 she was consultation and design architect (with Troppo Architects and Richard Layton and Associates) on seven National Aboriginal Health Strategy housing and infrastructure projects in the Northern Territory and Queensland. Fantin's particular expertise is in cross-cultural consultation and design. Most recently she has worked on the consultation and design process of the Bwgcorman Youth Space on Palm Island for the Queensland Community Renewal Team.

Fantin has recently submitted her PhD thesis entitled 'Housing Aboriginal culture in northeast Arnhem Land' which focuses on the Yolngu people in Arnhem Land and the translation of their cultural beliefs and practices into architectural design outcomes. She has won numerous grants and awards for her research into Aboriginal

housing design and culture at the Aboriginal Environments Research Centre, University of Queensland, and has co-authored papers and reports on Yolngu traditional architecture, Indigenous homelessness and post-occupancy evaluations of Aboriginal Housing in the Northern Territory. Fantin is currently a lecturer in Design Studio, Remote Area Construction, Architecture and Technology, and History and Theory in the Louis Laybourne Smith School of Architecture and Design at the University of South Australia.

Philip Kirke

Philip Kirke is the Principal Architect of the Western Australian office of GHJ Architects. He graduated with an Honours degree in Architecture from the University of Western Australia in 1988. From 1990 to 1991 he worked in Manchester in the United Kingdom and was involved in community architecture projects for its inner city West Indian community. Kirke gained corporate membership of the Royal Institute of British Architects before returning to Australia. From 1992 to the present time he has been the architect for the major staged development of the unique multi-cultural Christmas Island District High School. From 1996 to the present time he has been continuously involved in remote Aboriginal community projects, chiefly in the Western Desert, but also in the Kimberley, the Great Victoria Desert with the Spinifex people and with Western Australia's wheatbelt Nyoongar communities.

Kirke has developed an interest in the idea that our own society has become too large and anonymous. A true culture, that is a culture born of the spirit of man and functioning as a living instrument of that spirit, is nowhere to be found, except in pockets as micro-cultures. He is currently designing a series of unique houses for local artists in Perth. These houses have been influenced by his cross-cultural work and with a fresh sense of what is unique and important in our own micro-cultures.

Simon Scally

Simon Scally graduated from the University of Melbourne in 1987. In 1992, he moved to Darwin and established Build Up Design Architects. The firm's focus is the delivery of high quality, culturally appropriate housing, schools, clinics, community buildings and infrastructure for Aboriginal clients. Build Up Design has received a number of awards from the Royal Australian Institute of Architects' NT Chapter, including the 1994 Institutional Award for the Bawinanga Womens Centres, the 2000 Institutional Award for the Belyuen School and the 2001 Public Building Award for The Batchelor Institute of Indigenous Tertiary Education study centre at Maningrida.

Paul Haar

Architect, Paul Haar, is a sole practitioner with offices in Melbourne and country Victoria. Much of his work as a young graduate was focused on researching climate-appropriate design, and the revitalisation of a community based housing culture amongst Aboriginal and Torres Strait Islander communities in remote parts of northern Australia. Experience in these fields has led him to develop, in his practice, design processes and building solutions that are guided less by architectural ego and more by the essence of client and community in the context of a sustainable future. Underlying this thrust is a 28-year grounding in construction management and trade work, gathered from a broad range of small and medium scale projects.

Haar was born to a migrant family of farmers, engineers and wood craftsmen. Thus his well-known appreciation of timber in architecture, his attention to detail in construction practice, and his love for community and the land are easily explained.

Geoff Barker

Geoff Barker has worked with Indigenous communities over a period of approximately 20 years. This period included eight years with Northern Building Consultants (NBC), an Indigenous owned and directed organisation operating in the Northern Territory and the Kimberley region of Western Australia. Five of those years were spent

as the organisation's General Manager. Practical Management and Development (PM+D), which he founded, has been the focus of his activity for the last 10 years. The firm has been involved in housing and community facility design, asset management, and community planning and development projects, as well as major infrastructure development work and provision of assistance to self-build schemes.

Barker's prime interest is in working with community groups to enable them to integrate their ideas and needs into an overall project methodology, and then to develop these into a community-based project delivery process. The intention is to achieve specific project objectives concurrently with a range of community benefits, which can lead to improved conditions and wellbeing. PM+D's staff are involved in a range of voluntary activities including technical advice to Yirra Yaarkin Noongar Theatre in Perth, and membership on the Graham (Polly) Farmer Foundation Board that funds Indigenous education projects in Western Australia.

Col James

Col James, AM, is a local resident architect/planner in Redfern, Sydney who has worked with the Redfern Aboriginal Housing Company since its inception in 1972. James is a graduate of the Universities of NSW, Sydney and Harvard, and director of the I.B. Fell Housing Research Centre, located in the Faculty of Architecture, at the University of Sydney. He is committed to the active involvement of university staff and students to support the local Aborigines.

Angela Pitts

Angela Pitts has over 10 years experience in urban and regional development working in Africa, the United Kingdom and the United States of America. She is currently a PhD candidate at the University of Sydney and holds Masters degrees in Urban Planning and African Area Studies from the University of California, Los Angeles (UCLA). Since arriving in Australia, Pitts has worked as a volunteer for the Aboriginal Housing Company as a social/urban planner on the Pemulwuy Redevelopment Project.

Dillon Kombumerri

Dillon Kombumerri, a Yugumbir man from the Gold Coast, Queensland, is a registered architect with 13 years experience. He is the leader of the Merrima Aboriginal Design Unit established in 1995 within the NSW Government Architect's Office as a discrete business unit run by Indigenous design professionals. Kombumerri previously sat on the Redfern Aboriginal Housing Company Board and is currently a director of AISEAN (Australian Indigenous Scientists, Engineers and Architects Network Ltd). Incorporated in 2001, AISEAN is a national network of Indigenous professionals working in the fields of science, engineering, architecture and the built environment.

Catherine Chambers (editorial assistant)

As a Senior Research Assistant with the Aboriginal Environments Research Centre, University of Queensland, Chambers has been engaged in a number of cultural heritage, native title claim and site recording projects. She has co-authored a major published report on violence in Australian Indigenous communities, and a series of papers on how Indigenous homelessness can be categorised and responded to. Since early 2001, she has been involved in a Mentoring and Evaluation Program initiated by the Commonwealth Office of the Status of Women to assist its National Indigenous Family Violence Grants Program recipients. Chambers graduated from the University of Queensland in 1995, receiving a Bachelor of Architecture with honours. Her tertiary studies also included an anthropology component. She has worked professionally on architectural projects within Australia and overseas, including heritage conservation schemes, urban renewal, convention and conference centre projects, single and multi residences and educational facilities. She was a part-time design tutor at the Queensland University of Technology's School of Architecture for three years. During 2003, Catherine has been employed as a Research Officer with the Cultural Heritage Branch of Queensland's Environment Protection Agency, assisting with maintenance of the state's Heritage Register.



Synthesising Indigenous Housing Paradigms:
An Introduction to *TAKE 2*
Paul Memmott & Carroll Go-Sam

The collection of specialist knowledge and skills related to the design of housing for Aboriginal Australians has emerged as an architectural sub-discipline¹. One of its chief components centres on how an understanding of the cultural differences inherent in Aboriginal domiciliary behaviour can inform the design process. This can be described as the cultural design paradigm. Two other architectural paradigms have impacted on Aboriginal housing design in recent years; these are the environmental health paradigm and the housing-as-process philosophy, both of which contribute to its distinctiveness as a field of study and practice. Reconciling all these approaches within the design process has become a key challenge for contemporary practitioners.

The cultural design paradigm involves the use of models of culturally distinct behaviour to inform definitions of Aboriginal housing needs. Its premise is that to competently design appropriate residential accommodation for Aboriginal people who have traditionally oriented lifestyles, architects must understand the nature of those lifestyles, particularly in the domiciliary context. This knowledge also increases understanding of the needs of groups who have undergone cultural changes, including those in rural, urban and metropolitan settings, by helping to identify those aspects of their customary domiciliary behaviour that have been retained. The approach was adopted by a variety of practitioners in the 1970s and is analysed here in TAKE 2. For example, the first essay by Julian and Barbara Wigley, who have 30 years of experience in the field, starts with a thumbnail sketch of Aboriginal history², and goes on to outline a series of design conundrums in Aboriginal housing. It addresses some contradictory cultural needs, a number of which are considered by later contributors.

Julian Wigley's work in Alice Springs during the mid-1970s included assisting with the establishment of Tangentyere Council, an umbrella Aboriginal organisation that now services some 18 or 19 Alice Springs' town camps. Tangentyere is considered something of a benchmark in Aboriginal housing design and practice. In the mid-1980s, its architectural department was managed by the TAKE 2 contributors Jane Dillon and Mark Savage. At this time Paul Memmott was contracted by the council to carry out an evaluation of its housing stock. He attempted to apply the 'cultural design paradigm' to his analysis of the approximately 120 designs in the Tangentyere portfolio³. It was this early work, and the experience he gained by exposure to other Central Australian projects throughout the 1990s⁴, which forms the basis of his essay in TAKE 2. Jane Dillon and Mark Savage's contribution deals with the design approach that developed within Tangentyere during the 1980s in response to the town campers' culture. The perspective of the first three papers in the monograph is, therefore, strongly focused on Central Australia.

Meanwhile the cultural design paradigm has been taught, researched and applied from within the Aboriginal Environments Research Centre (AERC) at the University of Queensland, of which Memmott is Director⁵. Two of the AERC's doctoral graduates, who are architectural practitioners in their own right, have also contributed to TAKE 2 and their work demonstrates elements of this approach at its strongest. Shaneen Fantin's paper on Arnhem Land Yolngu people deals with the relationship between housing design, and avoidance behaviour and sorcery, whilst Catherine Keys' discussion of women's domiciliary camps built and occupied by Warlpiri people of the Northern Territory's central west extrapolates design strategies related to their culturally distinct household needs. Their work is complemented by that of Philip Kirke whose essay considers further issues related to designing for spatial behaviour, as exemplified in his work with the Martu tribespeople of the Western Desert of Western Australia.

Whereas Dillon and Savage's paper draws readers into the specifics of tropical, arid-area climatic design, material choice and detailing, Sue Groome's contribution provides an overview of these technical design aspects, which is illustrated by using a number of examples from Australia's tropical north. These contexts are characterised by the monsoonal influence and reflect her professional experience with the Centre for Appropriate Technology⁶ before she established her own practice in Cairns.

The attention given to technology and detailing by Dillon and Savage, and Groome leads readers into the

second paradigm: environmental health design. This approach emerged from within Nganampa Health Council in Alice Springs, which services the Anangu Pitjantjatjara homelands in the north-west of South Australia. Between 1986 and 1987, Nganampa, in conjunction with the South Australian Government, sponsored a review of environmental and public health in these homelands. The resulting document has become known as the 'UPK report'⁷. In it architect Paul Pholeros combined his architectural skills with those of Paul Torzillo, a doctor, and Steph Rainow, an anthropologist, to develop an understanding of the critical relationships between poor Aboriginal health and housing technology performance. A seminal project of a similarly multi-disciplinary type, involving an architect and a doctor, had been carried out prior to the Nganampa et al study⁸. However, the former was the first that systematically isolated and causally linked complexes of health problems with sets of design features and ranked them in a set of priorities based on the likelihood of improving health standards. Pholeros, Torzillo and Rainow have produced further books about their work, most recently under the logo of Healthabitat, as well as a series of important papers⁹. Their work culminated in a commission from the Commonwealth, State and Territory Housing Ministers' Working Group on Indigenous Housing to prepare The National Indigenous Housing Guide¹⁰, and their methodology has been practically applied through a large-scale ATSI project entitled, Fixing Houses for Better Health Project.

Despite some contradictions existing between the design practice guidelines or methods advocated by the proponents of the cultural design paradigm and the environmental health paradigm¹¹, these two approaches can and should be complementary. They lead into a third architectural paradigm: the housing-as-process philosophy, which aims to firmly situate housing design and provision within the broader framework of an Aboriginal community's planning goals and cultural practices, as well as its socio-economic structure and development. One fundamental aspect of this approach involves design attention being given to the community's housing management capacities to ensure that all technology is locally sustainable. This subject is introduced in Simon Scally's essay on outstation architecture in the Top End. A second grass-roots proponent of this philosophy is the architect and builder Paul Haar, who has extensive experience in self-help housing projects involving Indigenous Australians and whose essay draws on his experiences at Mt Catt, another Top End outstation, and St Pauls in the Torres Strait. Thus, four contributions in TAKE 2–Groome, Fantin, Scally and Haar—focus on northern Australia. The housing-as-process philosophy is considered more systematically as a design methodology in the essay by Geoff Barker¹². Finally, the integration of social planning and architectural design in the context of a metropolitan setting that has been rife with drug abuse, violence and police conflict is examined in the paper on Redfern by Col James, Angela Pitts and Dillon Kombumerri.

Why has this monograph been prepared? Despite the specialist nature of Aboriginal housing design, there has not been a book produced that deals with this subject from a broadly architectural perspective, that encompasses general principles and contrasting paradigms and that offers examples from around the continent. However, there have been other important books on Aboriginal housing published. The first, *A Black Reality*¹³, collected a series of essays written mainly by anthropologists, which were headed by an overview of housing policy completed by the editor. It contributed to the cultural design paradigm that was emerging in the 1970s through its anthropological documentation of domiciliary behaviour in traditionally oriented camps but, as architects did not write it, it failed to translate its findings into design strategies. Three successive books, written by architecturally trained authors, did engage in design issues but were largely case studies of single settlements. These were: *Black Out in Alice*¹⁴ that considered the Mount Nancy town camp in Alice Springs; *Humpy House and Tin Shed*¹⁵ that dealt with Wilcannia in western New South Wales; and *Housing for Health*¹⁶ that examined the Pipalytjara people living in the north-west corner of South Australia. Helen Ross's 1987 book *Just for Living*¹⁷ is a further example of the case study type, centring on the Aboriginal community at Halls Creek in Western Australia. It was written by a social scientist whose perspective was essentially one drawn from environmental psychology, and like Heppell's first book, while it offered important insights into cultural values and behaviour in relation to housing, it did not translate these into design strategies that could be readily implemented by architects. A fifth book, *Housing Design*

Assessment for Bush Communities¹⁸, again provides case study material on seven Central Australian communities, but also contains useful housing design guidelines for that region. Another relevant housing book, recently published, is *Settlement: A History of Australian Indigenous Housing* edited by the historian Peter Read. Its themes are strongly focused on history and government policy but not design, even though some contributors were architects¹⁹.

In selecting contributors for TAKE 2, we have assembled some general papers that provide an overview of housing design principles and strategies being used across the Australian continent. Our apologies to those colleagues whose housing designs and case studies we have had to unfortunately refrain from including due to a lack of space. It is within their important work that one will discover a further range of design solutions that emphasise in different ways, the three contemporary paradigms sketched out within the pages of this monograph.

Endnotes

¹ In making this statement, we are not suggesting the approaches to Aboriginal housing design that we discuss are somehow fundamentally different to those adopted in mainstream practice. Indeed, all of the normal principles, methods and precepts apply. But in addition there is a gradually accruing body of knowledge and techniques focused on a range of problems encountered in this field of work, which in combination, if not in their inherent nature, are rather unique.

² The reader interested in Aboriginal housing history would benefit from perusal of Read, P. (ed.), *Settlement: A History of Australia Indigenous Housing*, Canberra: Aboriginal Studies Press, 2000; Memmott, P., 'Aboriginal Housing, State of the Art (or non-State of the Art)', *Architecture Australia*, (June 1988): pp.34–47; Memmott, P. (ed.), 'Aboriginal and Islander Architecture in Queensland', Special Edition, *Queensland Architect: Chapter News and Views*, Brisbane: Royal Australian Institute of Architects, September 1993; and Wigley, B. & Wigley, J., *Black Iron: A History of Aboriginal Housing in Northern Australia*, Darwin: Northern Territory National Trust, 1993.

³ Memmott, P., 'The Development of Aboriginal Housing Standards in Central Australia: The Case Study of Tangentyere Council' in Judd, B. & Bycroft, P. (eds), *Evaluating Housing Standards and Performance (Housing Issues 4)*, Canberra: Royal Australian Institute of Architects, National Education Division, 1989, pp.115–143.

⁴ For example see Memmott, P., Long, S., Fantin, S. & Eckerman, E., *Post-Occupancy Evaluation of Aboriginal Housing in the N.T. for IHANT: Social Response Component*, Brisbane: Aboriginal Environments Research Centre, University of Qld, 2000.

⁵ Formerly in the Department of Architecture, now the School of Geography, Planning and Architecture. The AERC grew out of the Aboriginal Data Archive, which was founded in 1976 by Peter Bycroft and Paul Memmott.

⁶ Mention of technical design issues and the Centre for Appropriate Technology (CAT) raises the subject of alternate technology, as explored and publicised by CAT. The concept originally stems from the design philosophy of its Director, Bruce Walker (1986, 1990–91, 1994). It might be argued that alternate technology as it applies to Aboriginal housing and settlement design is another design paradigm; however, in our view, it can be readily examined and analysed within the other paradigms.

⁷ Nganampa Health Council Inc, South Australian Health Commission, & Aboriginal Health Organization of South Australia, *1987 Report of Uwankara Palyanyku Kanyintjaku: An Environmental and Public Health Review Within the Anangu Pitjantjatjara Lands*, Alice Springs, December 1987.

⁸ In Wilcannia in 1974–75, see Memmott, P., *Humpy, House and Tin Shed: Aboriginal Settlement History on the Darling River*, Sydney: Ian Buchan Fell Research Centre, Department of Architecture, University of Sydney, 1991, pp.151–154.

⁹ For example, see Pholeros, P., 'The Provision of Housing—An Improbably Dream?' in *1987 Report on Uwankara Palyanku Kanyintjaku: An Environmental and Public Health Review within the Anangu Pitjantjatjara Lands*, Alice Springs, December 1987; Pholeros, P., *AP Design Guide, Building for Health on the Anangu Pitjantjatjara Lands*, Alice Springs: Nganampa Health Council, 1990, (Reprinted 1994); Pholeros, P., Rainow, S. & Torzillo, P., *Housing for Health: Towards a Healthy Living Environment for Aboriginal Australia*, Newport Beach, New South Wales: Healthabitat, 1993; and Pholeros, P., Torzillo, P. & Rainow, S., 'Housing for Health: Principles and Projects, South Australia, Northern Territory and Queensland, 1985–97' in Read, P. (ed.), *Settlement: A History of Australian Indigenous Housing*, Canberra: Aboriginal Studies Press, 2000.

¹⁰ Healthabitat, *The National Indigenous Housing Guide: Improving the Living Environment for Safety, Health and Sustainability*,

Canberra: Commonwealth, State and Territory Housing Ministers' Working Group on Indigenous Housing (Australian Department of Family & Community Services and Aboriginal and Torres Strait Islander Commission), 1999.

11 For example, see Shaneen Fantin's essay in TAKE 2.

12 One of Geoff Barker's major contributions to Aboriginal housing has been to facilitate the second sustained integration of an Indigenous organisation and an architectural service, after Tangentyere. This organisation is known as Northern Building Consultants (NBC). NBC evolved in the 1980s under different structures, with the duration of Barker's involvement being from 1984 to 1991. NBC now has two successful independent companies, one operating in the Northern Territory and one in Western Australia.

13 Heppell, M. (ed.), *A Black Reality: Aboriginal Camps and Housing in Remote Australia*, Canberra: Australian Institute of Aboriginal Studies, 1979.

14 Heppell, M. & Wigley, J., *Black out in Alice: A History of the Establishment and Development of Town Camps in Alice Springs*, Monograph 26, Canberra: Development Studies Centre, Australian National University, 1981.

15 Memmott, *Humpy, House and Tin Shed*, 1991.

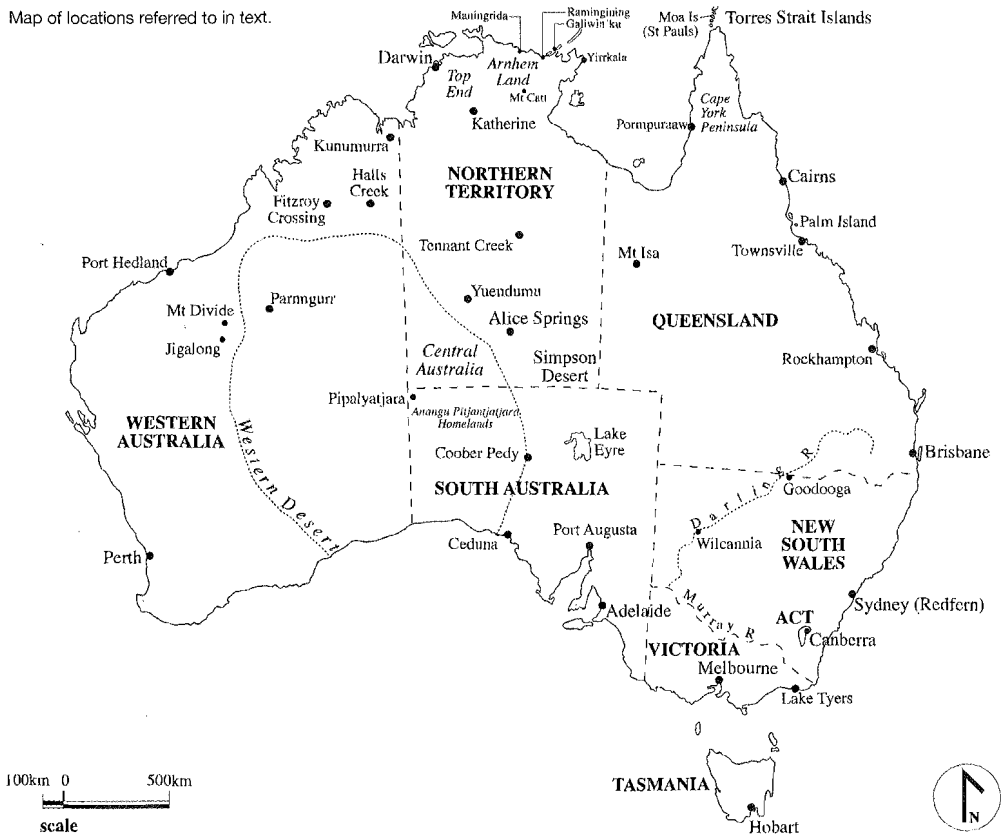
16 Pholeros et al Rainow & Torzillo, *Housing for Health*, 1993.

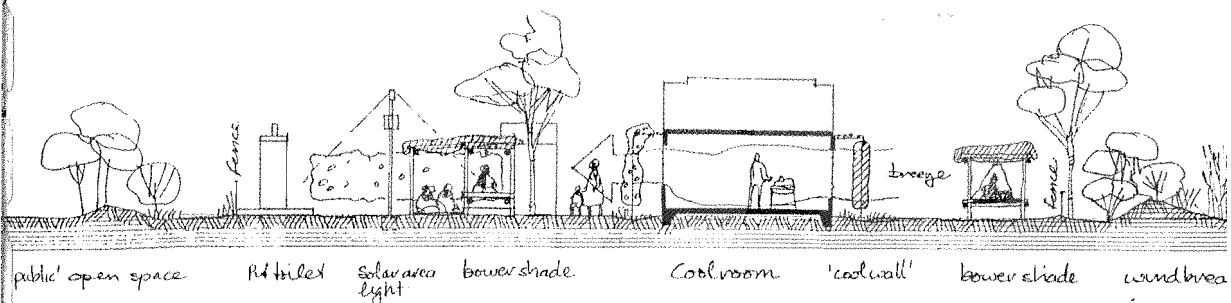
17 Ross, A., *Just for Living: Aboriginal Perceptions of Housing in North-west Australia*, Canberra: Aboriginal Studies Press, 1987.

18 Morel, P. & Ross, H., *Housing Design Assessment for Bush Communities*, Alice Springs: Tangentyere Council, NT Department of Lands, Housing and Local Government, 1993.

19 See Memmott, Keys, Smith, Pholeros et al, and Haar in Read, (ed.), *Settlement*, 2000. All except Smith are contributors to this journal.

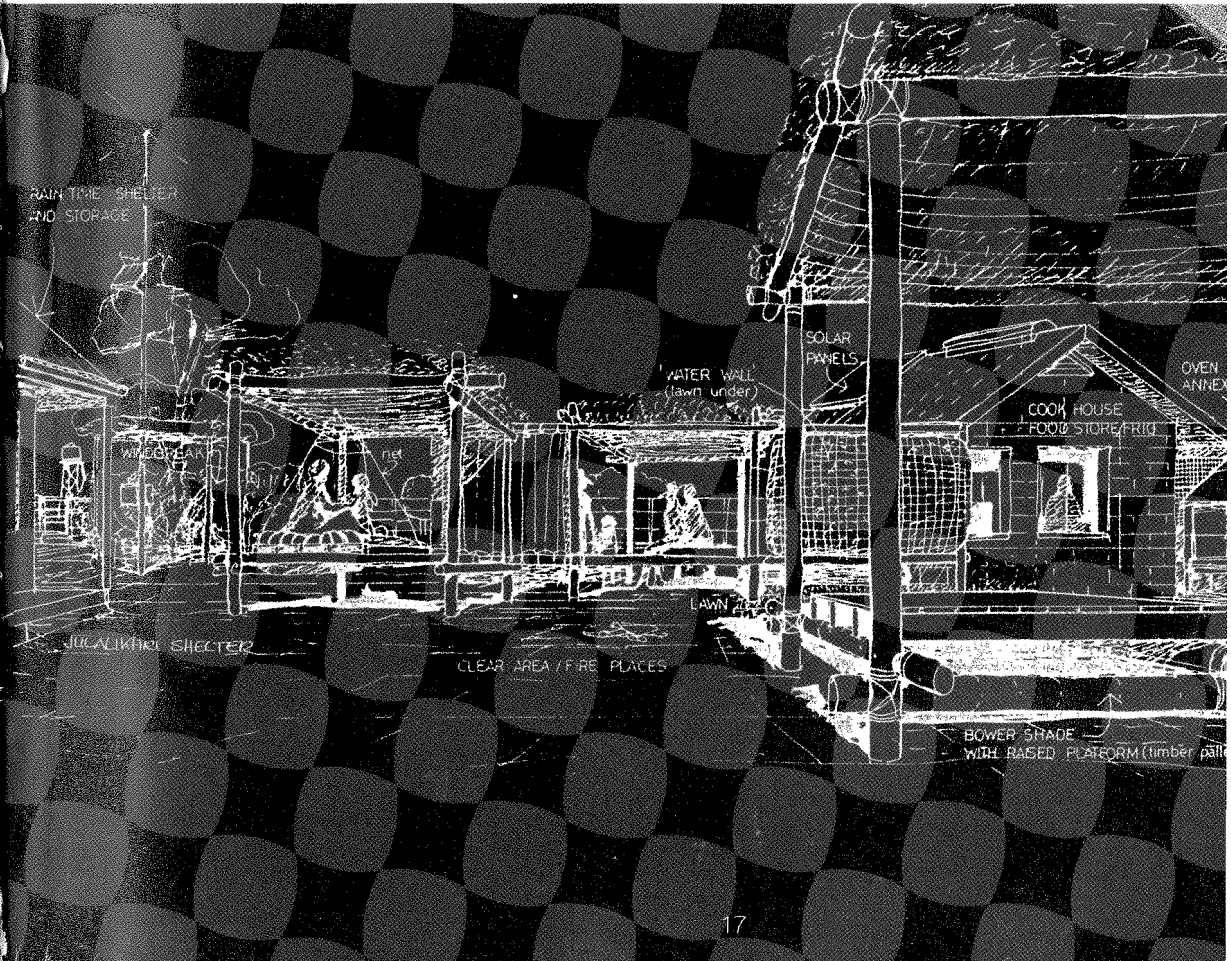
Map of locations referred to in text.





Above
 A typical cross section through a domestic space illustrating the climatic and functional relationships between a house and related bower shades, windbreaks and other outdoor facilities. [Source: Wigley, B. & J., 'Community Planning Report: Barkly Region', 1990, p.62.]

Below
 An architectural impression of a cook house unit and bower shades with a timber floor platform located in a yard space or near a house used during rainy periods. [Source: Wigley, B. & J., 'Community Planning Report: Barkly Region', Prepared for ATSIC on behalf of the Jurnkurakurr Aboriginal Resource Centre, 1990, p.58.]





Remote Conundrums:
The Changing Role of Housing in Aboriginal Communities
Julian & Barbara Wigley

An Outline History of Aboriginal Housing

There are numerous records of highly specialised shelter building and patterns of settlement existing prior to European contact with Aboriginal Australia. Domestic, religious and special purpose spaces were built all over the continent; this was not an empty landscape.

Robin Boyd in his book *Australia's Home* refers briefly to Aboriginal shelter building and notes, '[i]nsulation from the excesses of the elements, which is the basis for human home-building, was not among the achievements of Australian Aborigines'¹. Boyd was not alone in failing to appreciate the highly specialised nature of Indigenous people's response to the environment, from stone dwellings in Victoria to lightweight elevated platforms in the tropical north. Boyd also failed to note the uses of materials and technologies adapted by Aboriginal shelter builders after contact with Europeans; tin, galvanised iron, wire and nails were quickly incorporated into their repertoire.

When Europeans moved onto the land, Aboriginal settlement patterns across the country were irrevocably changed. Permanent and seasonal camps, places of ritual and meeting and pathways were disrupted by roads, fences, telegraph lines and new settlements. In areas where there was little disruption to Indigenous life, vernacular building flourished until the 1950s or even later.²

One of the first European responses to the presence of Aborigines was the establishment of institutions intended to protect them from what was considered to be the degradation of contact, limit the spread of disease, halt the mixing of races, control movement and finally, control and manage Aboriginal employees. Under this protectionist policy (later assimilationist), residential compounds, prisons, leprosariums, dormitory buildings, schools and training institutions were constructed throughout Australia. During the late 1950s, the establishment of government settlements in remote areas and outside rural towns embodied the desire to contain people's movement within geographic areas. In many cases Aboriginal people were forcibly removed from towns where they were not wanted³. Community settlements were set up in isolated regions and, with government support, old missions were revitalised. Frequently the government settlements placed people outside their traditional lands.

During the 1950s and 1960s housing was seen as an important part of the government's policy of assimilation. Housing programs, communal dining rooms and ablution blocks were built with the aim of providing for a staged process of cultural and behavioural change. It was believed that in these settings Aboriginal families, with guidance and training, would adopt European ways of living. This was the period of 'transitional or staged housing'⁴, and the policy was adopted on missions and reserves across Australia. At the same time conventional housing was built for the European administrative staff and for selected 'half-castes'⁵. In certain towns, selected families were offered rental housing by the state housing authorities on the basis that they were strictly monitored. The aim was to have these people absorbed by the pool of non-Aboriginal tenants, and the practice was commonly referred to as 'salt and peppering'.



In the mid-1970s, land rights and policies of 'self-management' and 'self-determination' enabled the development of community-based organisations, planning instruments and resource agencies, and state, territory and Commonwealth housing instrumentalities, all of which resulted in a wide range of housing designs of varying quality and livability. The new Department of Aboriginal Affairs (DAA) embarked on a dramatically expanded program of capital works. It demanded that community councils and resource agencies engage architectural, building and engineering consultants to assist them in their physical development

Figure 1 Manufacturing stabilised soil bricks for transitional housing in Warrabri (now Ali Curung), Central Australia, during the mid-1960s. Warrabri was one of many settlements established in the post WWII period in which to assimilate Aboriginal people. [Source: AERC Archive, University of Queensland. Photographer: B. Saini.]



Figure 2 Renovation of a Kingstrand Hut (left) at Yuendumu in Central Australia. These transitional houses were built during the 1960s and are shown here being upgraded and extended during September 1987 to better suit community needs. [Source: AERC, University of Queensland. Photographer: P. Memmott.]

programs, in order to ensure efficient delivery of housing and infrastructure services. The aim of these programs was social change. Equality would be achieved through education for the young and old, and this required that properly serviced housing with community support infrastructure be established throughout Australia's

Indigenous settlements and towns.⁶ A growing political awareness and the expansion of Commonwealth Aboriginal program funding led to increasing recognition of the economic role of Aboriginal development in remote rural areas.

For the first time conventional housing came within the reach of many Indigenous families⁷. As the preferred type of dwelling, it became a symbol of citizenship and equality with non-Aboriginal Australians. This preference for conventional housing and its reliance on specialist rather than universal skills and knowledge has contributed to a decline in the range of vernacular building skills being practised and, generally, the

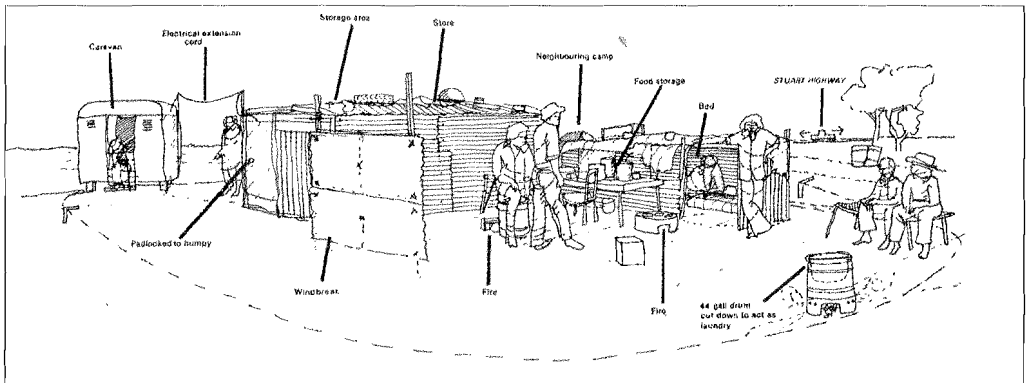


Figure 3 In the 1970s architects began to examine self-constructed Aboriginal residences to understand domiciliary behaviour patterns, use of space and artefacts, and scale of surroundings. Study by Julian Wigley in the Mt Nancy town camp, Alice Springs, c.1976. [Source: Heppel and Wigley 1981:136.]

demise of a non-specialist building culture among Aboriginal Australians. Remnants of Indigenous vernacular construction can be seen in some remote towns and settlements, particularly where immediate shelter solutions are required to meet cultural demands, for example, in 'sorry camps' or 'business camps' or 'women's wiltja'⁸. The programmers of housing delivery have viewed the Indigenous population as homogenous for clear institutional reasons, which have been either political, economic or social in nature.⁹

Over recent years pro-forma design guidelines have been based on the outcomes of post-occupancy evaluation reports and housing studies¹⁰. They offer a blend of cultural, climatic and technological requirements, and aim to provide durable and maintainable housing stock that has cultural and climatic relevance¹¹. Housing delivery coupled with housing management practices that are responsive to changing cultural demands and supported by adequate funding, may offer communities a better opportunity to manage, maintain and develop healthy living environments.

There are no economic incentives to drive the renewal of housing built in Indigenous communities, because the stock cannot be sold or exchanged for profit. Occupants, even if they decide to ignore cultural responsibilities, cannot capitalise on the house asset; they cannot borrow against it to undertake other endeavours as most 'home owning' Australians can. Welfare housing¹² can be a Clayton's gift. The renewal and maintenance of remote community housing is dependent on both the largesse of political parties and

their policies, and the strength of public opinion in supporting ongoing funding. Governments have an interest in maintaining populations and infrastructure in remote areas, and current housing delivery reflects this situation.

As each generation of Australians gains insight into the cultural climate of the time, lessons of past housing delivery can be too easily forgotten. A recent collaboration between the Aboriginal and Torres Strait Islander Commission (ATSIC) and Indigenous Housing Authority of the Northern Territory (IHANT), which sought to establish a set of designs suitable for Top End and Central Region communities of the Northern Territory does have a precursor¹³.

In March 1953, the Department of Works and Housing (Darwin) prepared a report entitled, Basic Plan for Native Housing in the Northern Territory along with a memorandum stating that:

1. There is a need for two types of houses to suit the arid and sub tropical conditions. The plan may be similar, but the ventilation must be increased for the latter type.
2. Kitchens, ablutions and latrines should be communal.
3. When siting houses, consideration should be given to tribal taboos.
4. Adequate permanent ventilation must be provided since natives tend to close all doors and windows.
5. The structural form must be simple and must be related to the mode of construction and availability of types and sizes of materials.
6. The cost must be kept to a minimum. This cost is seriously effected by those materials, which must be imported into the area or prefabricated by white labour. (C'wealth Dept of Works and Housing 1953).

Over the next 15 years a variety of prefabricated huts such as the Econo-huts, and Riley-Newsum and NACO units were constructed on settlements throughout the territory¹⁴. There is no evidence that at the time any Aboriginal people were consulted on the matter of suitable housing. If one were only to change the expensive items contained in the memorandum's second point, the list would contain little that differs from the aims of current government welfare housing—whether for Aboriginal Australians or other welfare recipients.

Processes do change. In 2001, ATSIC commissioners in Central Australia proposed to offer communities set designs for climatic regions in the Northern Territory. This was done under continuing political pressure to provide housing that meets the cultural, social and economic demands of a supposedly homogeneous design population differentiated only by family size and climatic location. These commissioners also continue to face pressure from their constituency to provide housing quickly.

Aboriginal peoples cannot be viewed as a homogeneous group, although most share the experiences of colonisation, such as the violence and later the protracted contact with the state. Government agencies tend to believe that Aboriginal housing is merely public housing and that human behaviour with education and training can be modified to meet the demands of the built form. The focus of housing providers has been on the technological aspects of building, essential services, durability of materials, functional detailing of building components and attempts to improve construction standards in remote areas¹⁵.

Aboriginal Housing Design

Since the 1970s there has been a lot of public attention focused on the appropriateness of Aboriginal housing designs. Many people believed that there existed a single design solution to 'the problem' of Aboriginal housing.¹⁶ This served as a clarion call to architects and designers around Australia; the results of many unsuccessful solutions are still remembered in communities.

Certain non-Aboriginal people held that all housing would be inappropriate, because there had been no previous tradition of building in Aboriginal culture and, therefore, housing would be destructive to the

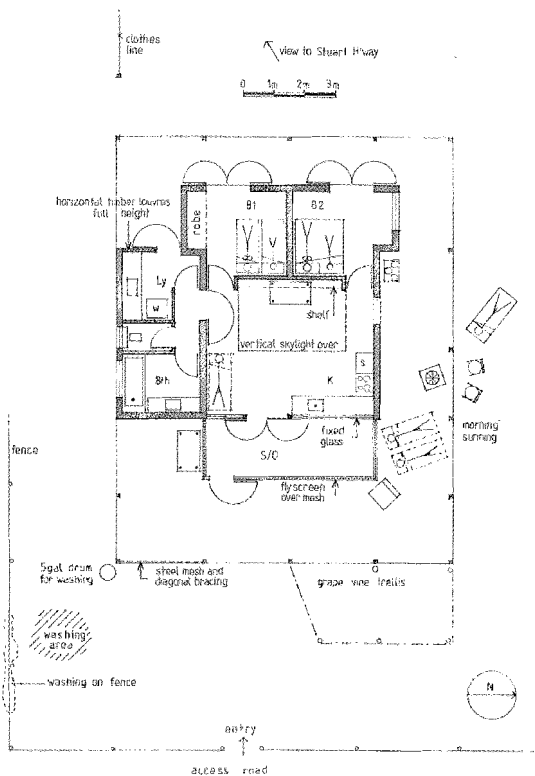


Figure 4 An example of a house design for Alice Springs town camps in 1976-77 by Julian Wigley. The design is one permutation of a generative design approach on a rectilinear planning grid with a 'core' of service rooms. Generative designs in the 1970s and 80s were a response to mass housing briefs for needy communities with modest budgets. The Aboriginal adaptation of use patterns on the above house is as recorded in September 1987. [Source: Memmott 1989, p.123; also see Heppell and Wigley 1981.]

responsibilities. Understanding some of the aspects of regional social histories is an important part of the design process, as these can help identify the adaptations and modifications to ways of living preferred by a particular client group.

The term 'camp' is used throughout Indigenous Australia in a polysemous manner to describe a number of potential elements: the fire or hearth; an individual domestic living area; the shelter or dwelling of a family group; or even the total geographic and social space used by a group of individuals and their families. The undifferentiated use of the term reflects the different notions of public and private space within the living environment, which still exist to a large degree today. There is no evidence that shelter building itself followed any ritual blueprint. Rather it is the location of the camp or shelter, and more particularly the location of the fire or hearth and its relationship to the mythological and physical landscape, that carries the symbolic meaning to a community's settlement pattern.

Anthropologists have drawn attention to the continuing importance of clan and kinship loyalties, which determine among other things the spatial location of families and individuals within a camp or community. They shed light on the strong spiritual attachment to land and the stresses endured when families are displaced or forced to live amongst strangers. Joseph Reser noted the critical role housing plays in a transition situation, and the way in which it can be negatively determined with respect to adaptation potential and cultural viability²⁰.

Indigenous housing recipients are now able to remind housing providers that culture is not a static recall of

maintenance of culture. This view tended to focus on housing as a primary agent of change rather than recognising the more important agents such as transportation, land rights, citizenship and communications.

The challenge for architects, and others, has been to provide for those functions that can best be catered for within conventional building forms while also enabling culturally specific uses of space to continue¹⁷. In an open camp situation featuring smaller scale structures, all movement in the social space can be observed and personal space maintained¹⁸. Footprints in the sand reveal the movement of people and animals around private and public spaces. Early knowledge of certain people's whereabouts means they can be avoided¹⁹. The conventional house offers no such convenience. The doors and walls can cause surprises, doors require locks for privacy and security, and no telltale footprint can be left in vinyl or concrete surfaces.

Within this cultural context, designers have to pick their way through the process of developing housing and settlement plans for client groups or individuals. Cultural responsibilities will vary between individuals and their affiliated groups where acculturation has caused change to people's expectations and

the past and that rather than modifying function, the changing activities of Indigenous communities will determine the form of dwellings and the spatial relationships in and around them. Above all, householders are concerned that their housing remains useful, supports the way they wish to live and, finally, that it attracts little attention from within or outside their community.

Remote Conundrums: Livability

There is clear evidence that pre-contact Aboriginal Australians built a variety of temporary and semi-permanent dwellings at specific campsites across Australia. These ranged from very large and complex dwellings to very simple but efficient shade structures²¹. They were immediate responses to personal need and were not required to be elaborate, just functional. The materials and the technology used were the primary determinants of the shelter's form.

A European codification of domestic space is what defines the conventional Anglo-Australian house. In most Indigenous households some, but by no means all, household activities have now been incorporated within this conventional house form. The transition this change represents has not always been an easy one; often there remains a lack of fit between some of the functional demands of domestic activities and the conventional house form. Present day use of conventional houses by extended families can exemplify some of these demands; for example, a bedroom may contain a refrigerator and food supply for a family unit living within the larger extended household. In some cases, especially in large complex households, the kitchen is a non-area where none of the occupants take ultimate responsibility for it remaining functional.

Many householders cannot even afford to equip their kitchens. Few families in remote Australia can afford to pay the ongoing costs of maintaining a conventional house. They remain devoid of any furniture other than mattresses on the floor. The actual use of internal and external spaces may not be that envisaged by designers: bedrooms may be used as storage rooms and living spaces for sleeping areas. Since the living room is the largest room in a conventional house, it can accommodate a large group of Indigenous householders who prefer to sleep together. Bedrooms provide lockable storage, when padlocks are fitted. Vehicles are not parked in defined driveways either because the location is inconvenient or the owner wants the car close to where they sleep.

The primary function of a bush shelter was to serve as an environmental mediator: to provide shade in the hot sun; protection from cold winds and rain; warmth in cold weather; coolness in hot weather; elevation from groundwater; and protection from mosquitoes, snakes and centipedes. It was to protect against the influences of magic. Many houses fail these primary functional requirements either because of the state of structural disrepair they have fallen into, or because the designer concentrated on only one aspect of a design and thereby produced a completely new set of design problems. For example, recent tropical designs incorporated a skirting detail that was meant to allow water to drain from a room when it was mopped. The housing recipients were concerned about what they perceived as poor workmanship—there was a gap between the floor and the wall, and water occasionally dripped through to the room underneath.

Kitchen design has vexed housing designers over the years, particularly in remote housing settings²². A designated outdoor cooking area, as defined by a fixed hearth (BBQ), shade structure (pergola) and ground finish (concrete paving or sand), cannot compete with the flexibility of a mobile bush shade that can be relocated to meet the demands of privacy, changing seasons and the sun's daily movement. Designers have attempted to link conventional kitchens with outdoor areas by using strutted and roller shutters without fly screens. The solution is neat if people use the feature as designed. The acceptance and maintenance of such design features will depend on their usefulness²³. If they are useful they will be adapted and maintained, but if they are not useful they will not be used and will fall into disrepair.

The house design based on conventional models, which meets all these functional requirements, has not as yet been achieved. The fixed nature and scale of conventional construction can make it extremely difficult

to adapt living spaces to meet the many seasonal changes experienced in northern Australia, whilst keeping out magic, maintaining avoidance relationships and providing safety and security. Householders will add on windbreaks, blue-sheets or tarpaulin roofs, bush structures and air conditioners. Achieving more ethereal ends, such as maintaining avoidance relationships within a walled house with corners and closed doors, requires new strategies²⁴.

Issues of privacy, security and safety are also problematic for designers in some communities—the use of security screens can make cleaning windows difficult, they become blackened with dirt and cut off interior space from the outside environment. All this works against the maintenance of a healthy internal environment that is well lit and well ventilated.

There are many other influential factors at work; for example, the anarchistic nature of Indigenous society, the social problems arising out of poverty and overcrowding²⁵, and the cultural demands of kinship conflicting with individual control of personal space. Consider the case of a community representative who explained his frustration about the care and upkeep of a new house. Warlpiri mourning practices require that he, on the death of a relative, give up his house and all other possessions, and move to another house. In some instances people must move from the community altogether. The community representative said, 'I don't feel like planting a garden or making any improvements to the house as my family may have to move out any time and start all over again.'²⁶ The design response to this issue that was enacted by the community's housing committee, involved making all house designs the same and scattering these new houses throughout the community. This example does not negate the provision of a wide variety of design solutions for Indigenous housing. It highlights one of the issues faced by some Aboriginal people attempting to make sense of their changing cultural climate, be they housing recipients or representatives of a regional Indigenous housing authority.

Endnotes

¹ Boyd, R., *Australia's Home: Its Origins, Builders and Occupiers*, Melbourne: Melbourne University Press, 1952, p.123.

² See Wigley, B. & Wigley, J., *Black Iron: A History of Aboriginal Housing in Northern Australia*, Darwin: Northern Territory National Trust, 1993.

³ For example, Lake Tyers Mission was a holding place for Aborigines from all over the state of Victoria.

⁴ An example of this kind of housing is the Kingstrand shelters still in use in Papunya and Yuendumu. They are one-room metal shelters with access to common ablution facilities. Cooking facilities were rudimentary. Under later government programs these shelters were to be extended with individual ablution facilities.

⁵ A term used at the time, now considered discriminatory and inappropriate.

⁶ It was believed that the tools for self-determination were education and good health, both of which required decent living conditions, including electricity and proper ablutions. Housing was to lead the way in this change as well as providing employment for local building teams. Refer to Heppell, M. (ed.), *A Black Reality: Aboriginal Camps and Housing in Remote Australia*, Canberra: Australian Institute of Aboriginal Studies, 1979.

⁷ A conventional house is defined as a serviced building that uses manufactured materials and components, and requires specialised trade skills to build and maintain.

⁸ Sorry camps are temporary residential settings where culturally prescribed mourning occurs over a prolonged period. Business camps are usually gender specific and established during ceremonies. And *wilja* is a central Australian term for a shade or shelter built from tree branches and covered with brush and/or spinifex.

⁹ An interesting research task would be to compare, with specific reference to Indigenous populations, institutional housing for recipients without ownership and estate housing with Indigenous ownership. Also see Moran, M., Memmott, P., Long, S., Stacy,

R. & Holt, J., 'Indigenous Home Ownership and Community Title Land: A Preliminary Household Survey', *Urban Policy and Research*, 20, 4 (2002), pp.357–370 on home ownership issues.

¹⁰ See Ross, A., *Just for Living: Aboriginal Perceptions of Housing in North-west Australia*, Canberra: Aboriginal Studies Press, 1987; Memmott, P., 'The Development of Aboriginal Housing Standards in Central Australia: The Case Study of Tangentyere Council' in Judd, B. & Bycroft, P. (eds), *Evaluating Housing Standards and Performance (Housing Issues 4)*, Canberra: Royal Australian Institute of Architects, National Education Division, 1989, pp.115–143; Memmott, P., *Humpy, House and Tin Shed: Aboriginal Settlement History on the Darling River*, Sydney: Ian Buchan Fell Research Centre, Department of Architecture, University of Sydney, 1991; Pholeros, P., Rainow, S. & Torzillo, P., *Housing for Health: Towards a Healthy Living Environment for Aboriginal Australia*, Newport Beach, New South Wales: Healthabitat, 1993; Morel, P. & Ross, H., *Housing Design Assessment for Bush Communities*, Alice Springs: Tangentyere Council, NT Department of Lands, Housing and Local Government, 1993; and Memmott, P., Long, S., Fantin, S. & Eckerman, E., *Post-Occupancy Evaluation of Aboriginal Housing in the N.T. for IHANT: Social Response Component*, Brisbane: Aboriginal Environments Research Centre, University of Qld, 2000.

¹¹ The National Trachoma and Eye Health Program (1976–1978), initiated by Dr Fred Hollows, was the first national program to identify environmental and social conditions relevant to Indigenous health. Hollows demanded that to support healthy environments, architects must 'elevate, separate and ventilate' their community house designs (personal communication in Papunya 1976). These precepts may conflict with certain cultural practices.

¹² Welfare housing is defined as rental housing. Recipients make a controlled rent payment that is related to household income.

¹³ Refer to Memmott, P., 'Remote prototypes', *Architecture Australia*, 9, 3 (May/June 2001), pp.60–65 and Memmott, P., & Chambers, C., 'Essay: Spatial behaviour and spatial planning at Galwin'ku, New insights into Aboriginal housing', *Architectural Review (Australia)*, Residential Issue (2002), pp.88–97 for an overview of the Northern Territory ATSI proposal.

¹⁴ Refer to Wigley & Wigley, *Black Iron*, 1993.

¹⁵ During the late 1980s and 1990s housing providers focused on the findings of the 'UPK study' (Nganampa Health Council Inc, South Australian Health Commission, & Aboriginal Health Organization of South Australia, *1987 Report of Uwankara Palyanyku Kanyintjaku: An Environmental and Public Health Review Within the Anangu Pitjantjatjara Lands*, Alice Springs, December 1987). The outcomes of this study were later applied indiscriminately without particular reference to the economic or social circumstances of housing recipients. It has contributed to the design guidelines developed for ATSI and state housing authorities.

¹⁶ The problem, as it was perceived, was the persistent refusal of Aboriginal occupants to modify their behaviour to meet the demands of the housing provided.

¹⁷ There is difficulty when outsiders attempt to define cultural precepts in other groups. Cultural precepts are flexible and change through life experience, so any identification of what defines a culture is always on probation and subject to individual will. Up until the 1970s town camps were not considered by anthropologists to be worthwhile areas of study. These groups were not seen as true Aborigines because of the fringe lifestyle they led. The exceptions were Collmann in Alice Springs and Sansom in Darwin who were interested in social and economic exchange. There was also Michael Heppell, who supported the activities of ATSI Housing Panel architects in urban locations, as well as Memmott's work in north-west Queensland from 1972–74.

¹⁸ Refer to the TAKE 2 paper by Keys.

¹⁹ Refer to the TAKE 2 paper by Fantin.

²⁰ Reser, J., 'A matter of control: Aboriginal housing circumstances in remote communities and settlements' in Heppell, M. (ed.), *A Black Reality*, 1979, pp.62–95.

²¹ Refer to Wigley & Wigley, *Black Iron*, 1993.

²² Refer to Wigley, J. & Wigley, B., *Housing Management Training in Rural Aboriginal Communities*, Canberra: Commonwealth Department of Human Services and Health, Australian Housing Research Council & Australian Government Publishing Service, 1994.

²³ Refer to the video series *Bush Mechanics* for examples of inventiveness and the adoption of the motor car as a useful feature incorporated into Aboriginal culture (Batty, D. & Kelly, F. J. (Directors), *Bush Mechanics: The Series*, A Film Australia National Interest Program in association with Warpiri Media Association Inc., 2001).

²⁴ Refer to Fantin's contribution later.

²⁵ For an interesting comparison refer to the descriptions of social problems pervading the lives of residents of an inner Melbourne suburb from the 1920s to the 1950s contained in McCalman, J., *Struggletown: public and private life in Richmond, 1900–1965*, Melbourne: Hyland House, 1998.

²⁶ From personal field notes compiled by Julian Wigley, Northern Territory, 1997.



Customary Aboriginal Behaviour Patterns and Housing Design
Paul Memmott

Since the 1970s a small group of researchers have been studying the domiciliary behaviour of Aboriginal self-constructed shelters and settlements, in either traditional, sedentary or fringe camps. These self-constructed camps are the laboratories in which customary lifestyles are practised and learnt. Since they are organised and constructed by their residents, a clear cultural fit can be observed between the settlement's type, the distribution of structures and the activity patterns contained within them.¹

This paper's key premise is that to competently design appropriate residential accommodation for Aboriginal people who have traditionally oriented lifestyles, architects must understand the nature of those lifestyles, particularly in the domiciliary context. This knowledge also assists them in understanding the needs of groups who have undergone cultural changes by helping to identify those aspects of their customary domiciliary behaviour which have been retained. The aim is not to identify an architectural solution for each item of customary behaviour, but to highlight the range of behaviours and the accompanying design issues which require some degree of consideration by a designer.

I will focus on domiciliary behaviour patterns and related design concepts relevant to Central Australia². This region I define quite broadly as encompassing all of the semi-arid and arid areas of the Western Desert, Central Australia proper, the Simpson Desert, the Lake Eyre basin and the north-west of NSW, and south-western Queensland. However, when describing traits of domiciliary behaviour, I shall attempt to write about customary behaviours commonplace across much, or all, of the continent. This paper is largely in the present tense, since these behaviours are still widely practised by many groups.

Domiciliary or household groups and their classification

In many anthropological reports concerning both northern and Central Australia, domiciliary groups, or the households associated with domiciliary spaces, are consistently classified as follows:

- (a) the nuclear family,
- (b) the single men's group,
- (c) the single women's group.

Customary nuclear families consisted of a man, his several wives, and the couple's unmarried daughters under 10 or 12 years and their uncircumcised sons³. Once children reached adolescence, the girls were married, usually by arrangement, and the boys were sent to an initiates' camp.

The regular operation of the levirate and the allocation of young wives to old men ... generally ensure that old people have young spouses to care for them until they die; and the Walbiri recognise the element of social insurance in these usages. As a result, it is rare for the household to include more than the parent and child generation-levels.⁴

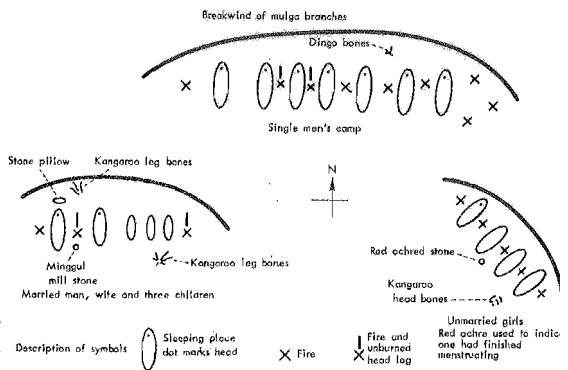


Figure 1 Diagram illustrating the customary layout of a small Western Desert group of three households recorded in April 1957. This is the camp of a group of Aboriginal people who were, at the time trespassing in the territory of the Pitjantjatjara people near Mt Agnes in the Blyth Range on the WA/SA border. The domiciliary groups comprised a nuclear family (left), a single men's group (top) and a single women's group (right). [Source: Tindale, N., 'Journal', South Australian Museum, April 1957.]

Thus in the 1970s, Denham⁵ observed in Alyawarr camps on the Sandover River that 55 per cent of women between the ages of 15 and 24 had spouses, but all of the males in this range were still single. As noted above by Meggitt, amongst the Warlpiri this was due to the custom of older men obtaining younger wives as well as polygyny. He found many men had two wives and a few had three. Arranged marriages are no longer a common feature in many communities but there are still reports of polygynous households

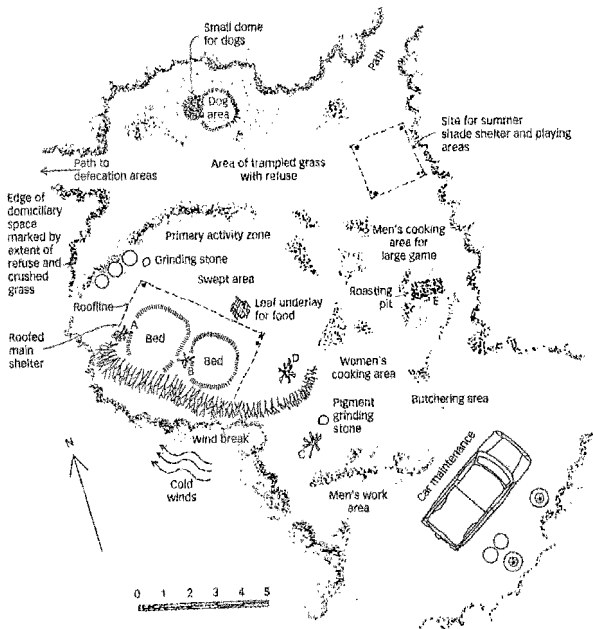


Figure 2 A semi-sedentary domiciliary space belonging to an Alyawarr man, his two wives and their young children. A—hearth for internal warming (winter nights) and cooking (wet weather); B—sleeping hearth; C—men's hearth for manufacturing artefacts; D—women's external cooking hearth (especially for sunny cold winter weather); and E—men's roasting pit for kangaroos, wallabies, emus and turkeys. [Source: Memmott, P., AERC Archive, University of Queensland, adapted from Binford 1987: 468, O'Connell 1987 and author's data.]

comprising of a male spouse, two wives and children. Residential surveys of Alyawarr and Warlpiri camps in the 1960s, 1970s and 1990s indicated that men's and women's households were prevalent, each representing up to 25 per cent of total households in the camp, as well as polygynous families.

Whereas there is persuasive evidence for the traditional three-fold division of household types in Aboriginal camps, as set out above, a range of ethnographic reports also mention the occurrence of some structurally different household forms⁶. A nuclear family group may have occasionally included other relatives who had strong ties of affection and obligation, such as those among the Warlpiri as described by Meggitt⁷; either the male spouse's old widowed mother, his father, his father's father or his wife's father. Writing about the Jigalong camps in the Western Desert, Tonkinson⁸ uses the term 'composite' to describe such an extended family, and gives examples of the type of relatives attached to the nuclear family:

(a) a married daughter and her children whose husband is away working; (b) an elderly 'wife'⁹ whom the male spouse looks after, and (c) the male's aged mother, if she has chosen not to camp with other widows.

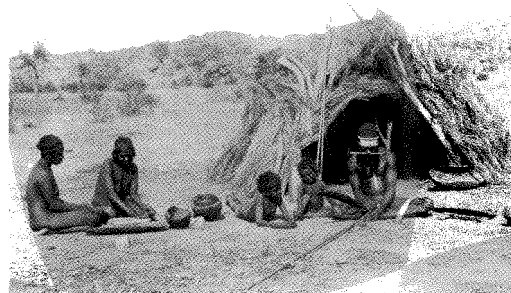
Eckerman has established a more detailed household classification¹⁰ in which she defines the category of extended family as consisting of at least three generations of kin. She distinguishes this from the nuclear family, the single parent family, and the compound family. She would describe a nuclear family, to which are attached diverse kin who do not extend across three generations, as a compound family. This seems to be the most precise method of classification available.

Designing for household types

Contemporary Aboriginal households in Central Australia are variable, and frequently complex, in their structure. Therefore the designer must profile them before embarking on design work.

The question of whether co-wives and their children prefer separate sleeping areas is pertinent to the design of contemporary bedroom layouts. Upon reaching adolescence the children of these wives may combine to form separate sleeping units divided by gender. This needs to be checked by the architect. Another obvious consequence of the age differential between the marriage partners described here is that there will be a high proportion of widows who may wish to occupy single women's residences. On the whole, published material dealing with the design of single women's houses has been produced by Keys¹¹.

Figure 3 An Arrernte family camp photographed in 1896 near the site of present-day Alice Springs. They are seated in front of this domed shelter constructed of heavy limbs and clad in grass. The family is probably polygynous comprising a man, his two wives and their respective children. The man is scraping back a spear shaft with a stone adze, the women are grinding seeds to make cakes, and the boy is making a toy spear. [Source: South Australian Museum, Photographer: F. Gillen or possibly B. Spencer.]



Kinship and camp behaviour

Camp residents are subject to many rules and obligations based upon kinship. There are rules for sharing and access to food, as well as for other material items and resources. For example, a woman has to provide food and water for her mother's brother, and a man may ask his brother's wife for food¹². On the relationship between the kinship system and everyday behaviour in camps, Professor Elkin had the following to say about the tribes living in the vicinity of Lake Eyre:

The kinship system here as elsewhere in Australia is not only the principal factor to be considered in arranging marriages, but also provides patterns of behaviour for all of life's situations, the patterns being represented or codified by the various types of relationship, such as father-son, mother's brother-sister's son and so on. The behaviour is both positive and negative; that is, a certain relationship demands that the two persons concerned perform certain duties, or make certain gifts, often mutual; and it may also prescribe that certain things be not done. The kinship obligations operate right through life and lay down what a person must do or not do with regard to his various classes of relations from their birth, through initiation to illness and death, and any complete description of the social and ceremonial life of the tribe would show the important part played by kinship¹³.

Amongst these rules and obligations based on kinship are some that affect socio-spatial behaviour, or the actions of people in spatial relationships to one another—either their relative spatial positions, their orientations, or the extent of their body contact—seen as an expression of their particular social relations. A new arrival in a domiciliary group can precipitate a shift in spatial behaviour depending upon the particular kinship relationships between the newcomer and the existing members of the group. A special category comprises the rules of avoidance¹⁴ between, for example, men and their mothers-in-law, or women and their brothers. Moving across the continent, one observes that there is a certain amount of consistency and some variation in these practices.

Another category of spatial behaviour is that required of an outsider approaching a domiciliary space. This is connected with the notion of personal space and with various kin avoidance rules. An approaching person may signal with noise cues (singing, coughing and talking) and require a positive response from an occupant of the domiciliary space before proceeding¹⁵.

Designing to reduce the negative impacts of the sharing ethic on environmental health

A number of initiatives were first undertaken by architects in Central Australia in the 1980s, to ensure that some important items of furniture and possessions were not subject to obligatory sharing rules and stayed in the house. These efforts applied particularly to items that contributed to healthy living. This aim was achieved either by designing architectural fixtures such as veranda seats, kitchen tables and seats, and stainless steel wash troughs¹⁶ as baby's baths, or by providing security measures, like 'fridge pantries'. These were lockable, vented food-storage rooms that incorporated a refrigerator as well as larder storage¹⁷.

Designing for culturally-specific socio-spatial behaviours

A complex set of spatial rules based on kinship is expressed in the arrangement of a customary camp or settlement¹⁸, and designers need to understand the relevant socio-spatial behaviours enacted in Indigenous households. In traditionally oriented communities, avoidance rules applicable to adult brothers and sisters, parents-in-law and children-in-law, need to be strictly observed. Feelings of tension and stress can be created by poorly designed room layouts and lines of vision. In her contribution to TAKE 2, Fantin further analyses subtle aspects of avoidance behaviour, such as those related to the visual surveillance of approaching persons and the positioning of toilets.

The Domiciliary Space

Anthropological researchers have consistently described domiciliary space, variously referring to it as the residential space, the household activity area, the nuclear area or the core domestic area. Domiciliary space

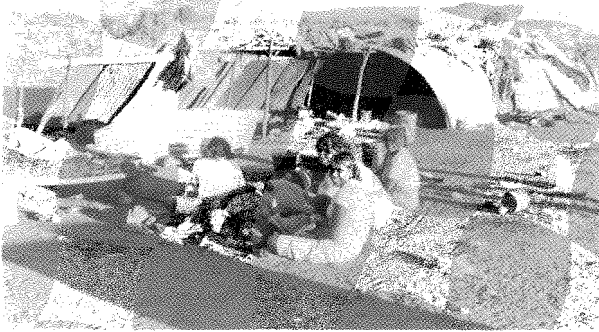


Figure 4 A women's domiciliary group in Yuendumu, Central Australia, photographed in May 1987 next to their self-constructed shelter (jilimi). [Photographer J. Ricketson. Source: AERC, University of Queensland.]

is made up of shelters, hearths and activity areas. Artefacts, food, water and various resources are stored in it. The ground surface is kept clean and refuse removed. The types of shelter constructed in a domiciliary space will vary with the climatic conditions. Shelters can be generally divided into three basic categories: windbreaks, enclosed shelters and shade structures.

In windy but otherwise fine weather, a windbreak was used as a main shelter almost everywhere on the continent. It still is in many places. The windbreak allows the entry of sunshine, and together with warming fires, provides protection from cold wind. The height is such that the occupant can see over the wall. Enclosed shelters, roofed and partly or wholly walled, were and are used in inclement weather as a main shelter. This occurs especially in wet weather and at camps where residence might continue for more than several months. The functions of the main shelter include sleeping, seeking privacy, obtaining protection from inclement weather, and storing goods and equipment. Shade structures were and are regularly used diurnally in most parts of the continent, especially in summer. They were usually not the main shelter of a domiciliary group, but more often a centre for socialising with a mixed group of camp people¹⁹. Since architects have come to understand this simple three-fold division, the incorporation of their functions into Aboriginal house design has formed a baseline for the design process.

In windy but otherwise fine weather, a windbreak was used as a main shelter almost everywhere on the continent. It

In nuclear family households the domiciliary space is sometimes divided into male and female activity zones²⁰. Customarily, nuclear family camps were often abandoned during the day, especially in larger camps when husbands gathered at the single men's household and wives at the single women's household²¹. Many examples of domiciliary spaces can be divided into sleeping areas, general diurnal activity areas, and areas where meat is roasted in a pit. Researchers have noted much variability in the location of traditional household activities, especially in single gender households²².

The relationship between large Indigenous households and crowding²³

In many contemporary Indigenous Australian settlements, the customary types of households continue, but more complex ones have also emerged because of the cultural change effected in domestic economics and social authority structures. In many cases we find several customary family units occupying a single house, each residing in a separate bedroom. Houses therefore do not necessarily correlate with single family units in contemporary Indigenous societies. In contrast to the national trend, in which increasing proportions of households are being made up of single persons and childless couples, Indigenous households tend to be larger and more complex, often including a number of family sub-groups.

If one examines the size of Indigenous households in the central and northern regions of Australia, one finds on average that they contain five or more persons²⁴. A survey of a sample of Aboriginal houses from across the Northern Territory²⁵ revealed that the average number of permanent residents per house was 8.9, and per bedroom was 3.2. Household sizes of six to 12 people were common, and much larger ones of up to 20 members were regularly encountered in the survey. In reality, these averages are even higher at particular times during the year because of visitors. In the largest households, it is normal to find each bedroom occupied by a family unit comprising of, for example, a couple with infants, a single parent with a child, or a group of single men or single women. They may also contain a grandparent with several infants or teenagers, as well as conventional nuclear families. Such a sub-unit would be considered a family unit in mainstream Australian society. In some cases these families are residing together, because of a shortage of

housing, and are experiencing crowding. However, in many other cases they may choose to reside in such large household groupings, in keeping with their traditions, and the designer should not assume they are crowded.

A single Indigenous house may sometimes be doing the job of three or more houses as mainstream society might conceive their capacity. They may be occupied by, not 2.7 persons—the current national average household size—but two or three times this number. Unfortunately this circumstance is often overlooked by funding agencies and architects in the Indigenous housing sector, who consistently continue to provide houses to Indigenous people that are equipped for relatively small nuclear families²⁶.

Designing houses for large household sizes

Designers may need to cater for large households, providing sufficient sleeping areas, toilets, bathrooms, and bedrooms. In some cases large households can overflow onto verandas. The kinds of activities carried out in bedrooms include sleeping, eating, storage of food and other possessions, watching TV/videos, and listening to music. Household sub-units often wish to store all their personal items in their own rooms, which can include fridges, hunting gear, clothes and toiletries²⁷.

A further important factor is the ability of house designs to cope with large numbers of visitors, in addition to householders. According to Aboriginal kinship practices, the sharing of accommodation with certain kin is a social responsibility²⁸. As a result, visitors either occupy living room spaces or the bedrooms especially vacated by some householders. An associated problem set includes the over-taxing of toilet and shower facilities, and septic systems. Visitors will usually stay at a relative's house for anywhere between a few days and a number of months, for example in the wet season. Aboriginal housing in remote locations particularly needs to be designed with the impact of these visitors in mind. Some strategies that have been developed by architects include the provision of generous verandas and equipping yards with facilities like properly drained taps, VIP²⁹ toilets, and shade³⁰. A further consideration is whether to make verandas secure for use as sleep-outs (see later paper by Dillon.)

If bedrooms are too small or too few, regular household members or visitors will sleep and live in the 'living room' of the house. Living rooms need to be designed to accommodate mattresses and people sitting on the ground facing one another in conversation. This differs from the typical Australian living room, which features a couch and television. Sufficient spaces are required in the house for individuals to congregate in small groups without compromising avoidance relationships³¹.

Room planning and privacy in houses

In large households made up of a number of discrete sub-groups, between whom tensions may arise, consideration must be given to allowing each person or sub-group the independence, and visual and aural privacy they may have previously obtained in self-constructed domiciliary spaces³².

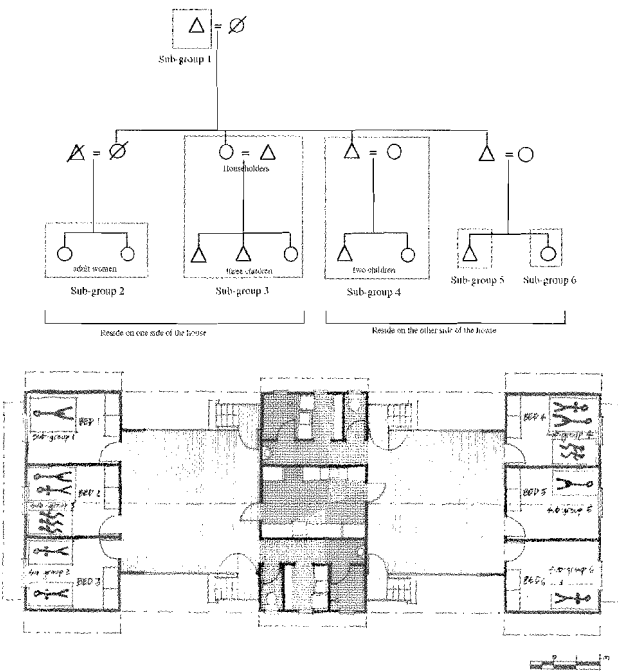


Figure 5 A house built at Ngukurr (Roper River, N.T.) during 1998-99 and designed to accommodate a complex Indigenous household. The household genealogy and floor plan show the sleeping locations of the six household sub-units or groups. The total population of the household was 14. [Architects, Northern Building Consultants, Darwin, Source: Memmott et al, 2000.]

Dogs as members of Aboriginal households

Dogs are a characteristic feature of Aboriginal domiciliary spaces and they fulfil both functional and companionship roles. For example, they warn and protect against unwanted visitors, assist in hunting and are objects of affection—puppies are treated like newborn babies. Households of older people without children tend to have larger numbers of dogs and maintain a deep emotional attachment to them. In the Western Desert³³, dogs act as essential sentinels, warning against approaching malignant spirits or *mamu*, which are invisible to humans. I have observed dogs in Warlpiri households being assigned a social class (a subsection) and accordingly addressed as kin by the residents and their visitors.³⁴ Dogs also have a significant symbolic status since, right across the continent, they feature in Aboriginal religion as sacred ancestors and are often the subject of ceremonial practice.

Designing to reduce the environmental health threat of dogs

Dogs can transmit illness to humans—through bacteria and parasites such as scabies—and some preventative architectural measures have been formulated to prevent this. These include storage places being set out of reach of dogs and external tap drainage being designed to prevent ponding in which dogs can leave excrement. Despite these design measures, dogs still pose regular potential health risks³⁵.

Customary hearth-based activity

Aboriginal hearths are often multi-functional, but in many cases, especially in larger domiciliary groups, they can be clearly divided into several functional categories. These are: sleeping, warming, mosquito repelling, nocturnal illumination, general cooking, and roasting oven fires. There are also fires, or hearths, used during the manufacture of artefacts and for carrying out clothes washing, which maintain other fires and deter malevolent nocturnal spirits.

Most commonly, night fires were, and are, located at the foot, or by the side, of sleeping positions. Fires are kept alight through the night for warmth in the cold months, and for driving mosquitoes away during and after the wet season. At night they can be devices with a number of subtle purposes; their size being carefully controlled and their light differentiating the space inside and outside of shelters and camps, even when no shelter structures are present.

In established camps, cooking and other daytime fires were, and are, usually located separately to the night's warming fires. A cooking fire may serve at least one domiciliary group and possibly several adjacent ones if the occupants are close relatives. Customarily, most cooking was carried out on unlined campfires either directly on the coals or in the ashes. Roasting pits were used for large game like kangaroos, emus, wallabies, euros, or plain turkeys, as well as for yams. Roasting was a male-centred activity, which occurred outside those parts of the domiciliary space maintained by women. Hot and hazardous fires were burnt to quickly generate a large quantity of roasting coals³⁶. Kinsmen often congregated around the male householder in charge of a roasting pit, with the expectation that they may receive a share of meat.

During March 1976, Heppell and Wigley³⁷ mention a domiciliary space in an Alice Springs town camp in which the determinants of the cooking area's location were the ability to observe other households in the camp, and its exposure to sun in the early morning and shade in the late afternoon. Here, as in many rural and some remote communities, external food benches—conventional tables—were used to prepare food and store cooking utensils.

Accommodating external cooking activities in semi-enclosed house spaces and yard areas.

In central and northern Australian communities, many families continue to cook on external fires, especially game like kangaroos, wallabies, emu, dugong, and turtle, which is too large to cook on conventional stoves. However, hearth location will be selected according to a number of factors including wind direction and velocity, other weather conditions like sun, shade and rain, and socio-spatial preferences. One design challenge is how to facilitate improved environmental health in this context.

Providing fixed exterior cooking hardware, such as barbecues and benches, often proves to be unsuccessful³⁸ as hearth locations will shift around the house due to climatic (diurnal and seasonal) and social reasons. The yard needs to contain an adequate number of suitable cooking spaces in preferred locations featuring well-drained ground and some landscaping (shade, windbreaks). Health hardware experts have, in the past, promoted external cooking benches. The ease with which utensils and food can be passed from the kitchen to an outdoor bench should also be considered — but note Wigley's warning. The relationship between toilet, bedroom and shower, windows, and external living areas also needs to be considered. A further related issue is the provision of appropriately sized washing facilities for hearth hardware such as large billies, pots, camp ovens, and five-gallon drums³⁹.

Nocturnal behaviours

Warming fire is employed in camps on winter nights to enable comfortable sleeping, although one must regularly awake to stoke it and change one's body position in relation to it. Sleepers often lie parallel to one another, between the hearths. The preferred orientation for sleeping in Central Australia has one's head facing east and one's feet facing west⁴⁰. This is believed to facilitate good dreams and spiritual health. There is little research on the composition of contemporary sleeping groups in either camps or contemporary Aboriginal households⁴¹, despite the fact that good house designs are predicated on an understanding of the composition of sleeping groups.

Location of toilets for nocturnal use

Despite general arguments in support of toilets being located on verandas or in yards, residents in certain communities may not be prepared to use them at night. The possible causes of this aversion, all well reported in the Aboriginal housing literature, include: fear of malevolent spirits (particularly problematic in the Western Desert); fear of persons using toilets whose actions are considered suspicious (possibly involving a threat of violence or sorcery practices); and aged or disabled residents experiencing difficulties negotiating routes to external facilities. Another, more general reason for dislike of external toilets, is that they are inconvenient to use in inclement weather. In communities where alcohol violence occurs, external toilets may engender a fear of night-time assaults⁴².

The external orientation of behaviour

The ethnographic literature for both Central Australia and other regions of Aboriginal Australia consistently records the high degree to which domiciliary spaces are externally orientated.

Aborigines prefer to spend most of their time out of doors. Apart from excretory and sexual activities, very little that an individual engages in takes place outside the gaze of others. It is very important for each person to be able to observe much of what goes on around him, for in this way he [or she] can keep abreast of all developments in the ongoing relationships within the group and in activities which are being planned. For example, arguments and fights are invariably of interest and concern, not only because of the complex network of kin relationships that binds every individual to many others and involves expectations of aid and reciprocity, but also because such clashes, potentially, can rip a group apart⁴³.

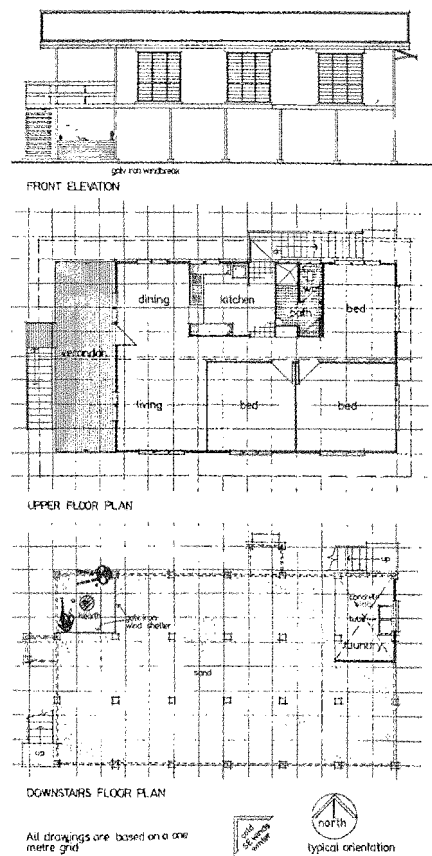


Figure 6 The Queensland Government's house design type S1559—one of only two types used for Indigenous people throughout the State during the late 1960s and early 1970s—showing how they were adapted for external living with sand being spread underneath and the installation of a windbreak and hearth, at Mornington Island in the Gulf of Carpentaria. [Source: P. Memmott, University of Queensland.]

The auditory environment within the camp was constantly monitored, especially to detect potential emergencies such as fights, children crying, and calls for help from the elderly. Any of these cues may have resulted in individuals responding with assistance or support⁴⁴.

There are two other important reasons reported for maintaining this surveillance. The first involves knowing when a neighbour was about to apportion newly prepared food, in which case, if one was in an appropriate kinship relationship to receive a share, one would quickly attend that individual's domiciliary space⁴⁵. Residents utilised sign language to pass messages between domiciliary spaces, including invitations to share in the consumption of excess food⁴⁶. A second reason for maintaining an external orientation is to allow people knowledge of who is approaching one's domiciliary space. If some severe restraint or avoidance relationship is in place, both individuals may take evasive action⁴⁷.

Heppell and Wigley⁴⁸ identify an underlying value that inhibits internally-oriented behaviour: '[a]ccording to traditional values, any person or family which conducted most of its affairs in private had something to hide and therefore was regarded as being up to no good.'

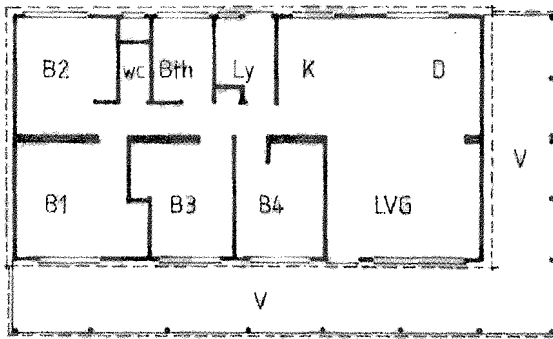


Figure 7 A prefabricated, transportable house provided to Aboriginal families in Wilcannia, New South Wales in 1980. Note the lack of attention given to external space, the poor sun-shading, narrow verandas and the ablution facilities that are deeply embedded in the plan—all negative design attributes. [Source: Memmott, P. 1991:213.]

Designing for exterior visual surveillance

Aboriginal people value highly their ability to maintain surveillance of their social and natural environments. This includes monitoring external community activities, events and conversations, observing children playing and participating in long-distance communication, such as with sign language⁴⁹.

The desirability of maintaining external surveillance from within the house was one of the early significant findings of Wigley's research in Alice Springs⁵⁰. Residents required that their windows relate to subjects in the surrounding camp environment, which were of interest to them, like other related

households and camp entrances. Wigley's architectural successor at Tangentyere Council, Dobkins, later wrote that he had been able to provide views in three directions from the kitchen and living spaces in most of his designs⁵¹. A lack of European furniture, and a preference or tendency to sit and lie on mattresses or blankets on the floor, also means that conventional sill and balustrade heights are often too high to see over⁵².

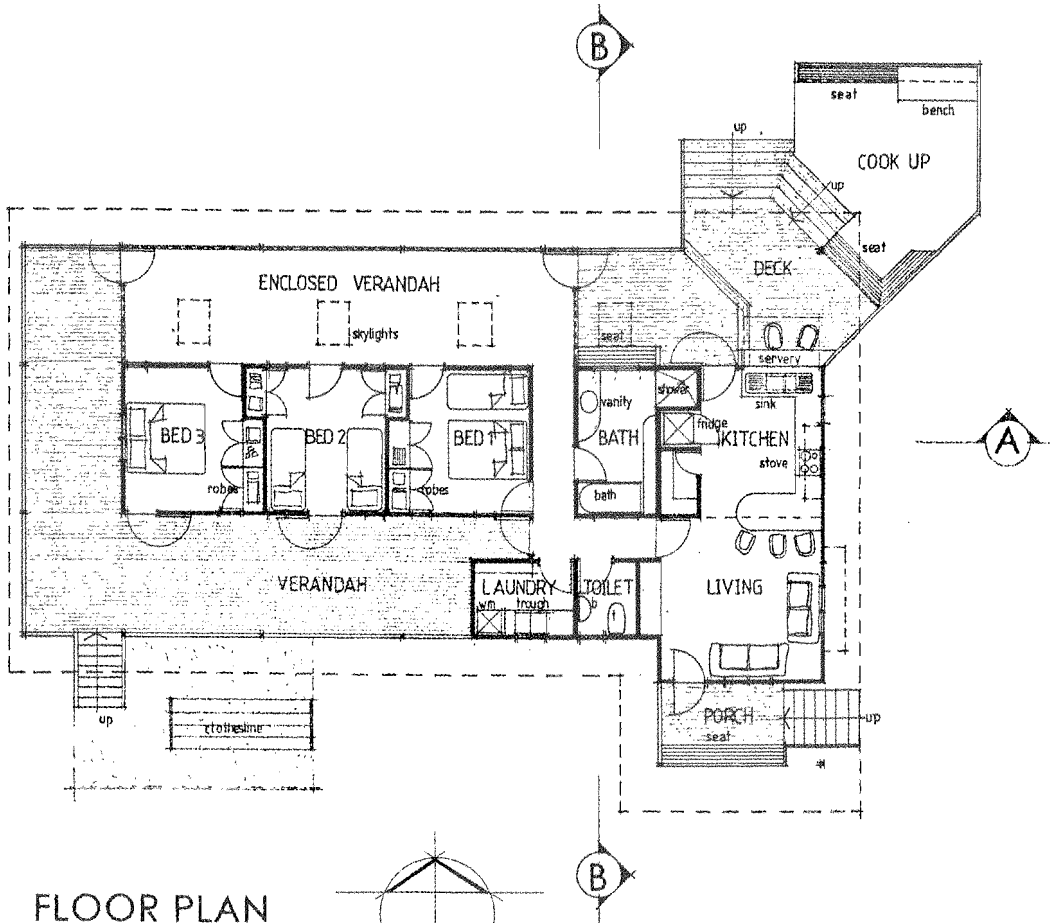
Whilst it is often important to provide some form of privacy to veranda spaces (screens, slats, blinds), people also wish to have clear views; therefore veranda edges must be designed with the sometimes competing concerns of surveillance and privacy in mind. The veranda edge also must permit communication with those walking along pathways and roads, which may involve close-range and distance hand signalling⁵³.

Designing for activities in outdoor and semi-enclosed spaces

An externally-oriented lifestyle requires the provision of suitable semi-enclosed or unenclosed peripheral spaces. A challenging problem is to design such spaces so as to provide maximum protection from inclement forms of weather under all seasonal conditions. These include cold seasonal and dry-hot seasonal winds, driving rain and hot sun. Shady summer places are required, as are sunny winter places (especially for morning use). Places must also be oriented to catch prevailing breezes in humid weather. They should be three or more metres wide to accommodate small and large seated groups. Verandas one or two metres wide are not practical⁵⁴.

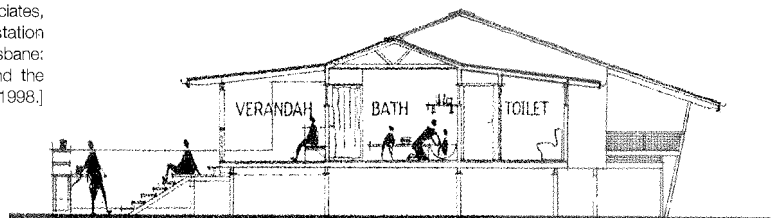
People prefer to sleep and sit outside unless this is made too uncomfortable by mosquitoes and rain. If verandas fail to provide adequate protection under varying climatic conditions, the household is forced to withdraw to internal rooms. This may create a number of potentially stressful situations especially when one considers the sometimes poor climatic performance of internal rooms, and the needs of large and complex household structures. Verandas have to perform a number of seemingly conflicting climatic control functions—to provide maximum exposure to ventilation in hot-dry and hot-wet times, and to provide protection from wet weather. However, a balance is achievable with good design.

Veranda spaces must accommodate both the householder and their daytime or overnight visitors. For example, there may be single gender groups who meet and socialise daily or regularly at a particular house. It is important to note that some people will sleep on verandas at night-time, whilst other people or households will not for reasons of safety and privacy⁵⁵.



FLOOR PLAN

Figure 8 The floor plan and section of a house designed for Gregory Outstation in north-west Queensland designed by Deborah Fisher and Carroll Go-Sam during 1998. Note the generous verandas and externally oriented living areas. [Source: Paul Memmott & Associates, and Fisher, D., "Gregory Outstation Design Development Report", Brisbane: Prepared for Project Services and the Bidunggu Aboriginal Corporation, 1998.]



SECTION B-B

Conclusion

The rationale of this paper is that architects cannot successfully design housing and plan settlements for Aboriginal people unless there is an understanding of their everyday behaviour. The customary use of domiciliary space supports distinct types of household groups and sub-groups, typical diurnal/nocturnal behaviour patterns suited to different seasonal periods, as well as characteristic socio-spatial structures. Culturally distinct behaviour includes set forms of approach and departure, external orientation and sensory communication between domiciles, different concepts of privacy and crowding, sleeping behaviour and sleeping group composition, cooking and use of hearths, and storage of artefacts and resources. A range of direct links between customary camp behaviour patterns and contemporary housing design issues have been demonstrated, some of which will be examined in further detail by other TAKE 2 contributors. However, there are further culturally distinct aspects that have a bearing on housing design and settlement planning, and are the subject of ongoing research, such as frequent residential mobility, different values and attitudes about the possession and sharing of objects, including shelter, and response to the death of a householder⁵⁶.

Endnotes

- 1 The material in this paper on customary behaviour comes from the following sources: early explorers and ethnographers (Sturt, Mathews, Horne and Aiston); anthropologists working from the 1930s to 1960s (Elkin, Tonkinson and Meggitt); ethnoarchaeologists (Gould, O'Connell, Binford and Denham); and architectural ethnographers working since the early 1970s (Memmott, Hamilton, Keys, Heppell and Wigley). The material on housing design application is mainly drawn from Memmott, P., 'The Development of Aboriginal Housing Standards in Central Australia: The Case Study of Tangentyere Council' in Judd, B. & Bycroft, P. (eds), *Evaluating Housing Standards and Performance (Housing Issues 4)*, Canberra: Royal Australian Institute of Architects, National Education Division, 1989, pp.115–143 and Memmott, P., Long, S., Fantin, S. & Eckerman, E., *Post-Occupancy Evaluation of Aboriginal Housing in the N.T. for IHANT: Social Response Component*, Brisbane: Aboriginal Environments Research Centre, University of Qld, 2000. The findings in Memmott, et al, *Post-Occupancy Evaluation of Aboriginal Housing in the N.T. for IHANT: Social Response Component* are based on a survey sample of household interviews and inspections carried out at Nguiu, Galiwin'ku, Wadeye, Ngukurr, Papunya, Nyirpi and an anonymous Central Australia community in early 2000. The 18 social/behavioural design issues documented were those that were seen in the questionnaire responses most widely and consistently across the sample of communities.
- 2 The centre has dry sunny weather for some of the year, but a range of climatic extremes do occur: temperatures from minus 70C in winter to 45C in summer, dust storms, strong winds, and occasional torrential downpours and flooding.
- 3 The term 'conjugal family' is also sometimes used for nuclear family. White, I. M., 'Sexual Conquest and Submission in the Myths of Central Australia', in Hiatt, L. R. (ed.), *Australian Aboriginal Mythology*, Canberra: Australian Institute of Aboriginal Studies, 1975, pp.123–142, writing about family composition in Western Desert camps, has provided some behavioural observations on the transforming relationships between members of the nuclear family—husband and wife, and parent and child.
- 4 Meggitt, M., *Desert People: A Study of the Walbiri Aborigines of Central Australia*, 2nd Edition, Chicago: University of Chicago Press, 1965, p.79.
- 5 Denham, W., 'Population Properties of Physical Groups Among the Alyawara Tribe of Central Australia', *Archaeology and Physical Anthropology in Oceania*, 10, 2 (1975), p.136.
- 6 There is one unique report of children's domiciliary groups (from the age of about seven to pre-puberty) at a large semi-sedentary camp of Pitjantjatjara dialect groups from the southern part of the Western Desert at Ooldea in 1942, see Berndt, R. M. & C. H., 'A Preliminary Report of Field Work in the Ooldea Region, Western South Australia', *Oceania*, 12, 4 (1942), pp.305–330; 13, 1 (1942), pp.51–70; 13, 2 (1942), pp.143–169.
- 7 Meggitt, *Desert People: A Study of the Walbiri Aborigines of Central Australia*, p.79.
- 8 Tonkinson, R., *The Jigalong Mob: Aboriginal Victors of the Desert Crusade*, Manila, Philippines: Cummings Publishing Company, 1974, p.46.
- 9 The reason for Tonkinson's use of inverted commas here is unclear. It possibly implies this person is a classificatory wife.
- 10 Eckermann, A., 'Culture Vacuum or cultural vitality?', *Australian Aboriginal Studies*, 1 (1988), p.32.

¹¹ Keys, C., 'Defining Single Aboriginal Women's Needs in Central Australia: Dealing with Issues of Culture, Gender and Environment', *Architectural Theory Review*, 1, 1 (April 1996), pp.69–77 and Keys, C., 'The Architectural Implications of Warlpiri Jilimi', PhD Thesis, Brisbane: Department of Architecture, University of Queensland, 1999. Also refer to Keys' later TAKE 2 paper.

¹² Elkin, A. P., 'Kinship in South Australia Part 2', *Oceania*, 9, 1 (1938), p.71.

¹³ Elkin 'Kinship in South Australia Part 2', p.69.

¹⁴ What social functions avoidance behaviour serves is the subject of some debate amongst anthropologists (for example, see Elkin, 'Kinship in South Australia Part 2'; Beckett, J. R., 'Marriage, Circumcision and Avoidance Among the Maljanganba of North-west New South Wales', *Mankind*, 6, 10 (1967), pp.460, 461; and Hiatt, L., *Arguments About Aborigines: Australia and the Evolution of Social Anthropology*, Melbourne: Cambridge University Press, 1996, p.154, but the orthodox explanations are based on incest taboos in the case of close blood relatives. To date, no systematic comparative analysis has been made of such relationships between all tribes, language groups or regions. Such an analysis would have to consider the avoidance structures in relation to the systems of social organisation, which also vary across the continent. If the function of avoidance behaviour is fairly common amongst Aboriginal groups then it may be that there is some consistent and underlying explanation/s of the way these relationships are structured from group to group. The most in-depth study to date has been done by Fantin, S., 'Housing Aboriginal Culture in North-east Arnhem Land', PhD Thesis, Brisbane: School of Geography and Planning, University of Queensland, 2003 for several language groups of Yolngu. (Note that Elkin in his early writings did make a gloss for the entire continent, saying in 'Kinship in South Australia Part 2', p.69 that the various rules, avoidances and taboos were much the same throughout Australia. Undoubtedly, this assertion would be questioned by contemporary anthropologists. See Tonkinson, *The Jigalong Mob: Aboriginal Victors of the Desert Crusade*, p.52 for an example of a variation.

¹⁵ Meggitt, *Desert People: A Study of the Walbiri Aborigines of Central Australia*, p.77; Hamilton, P., 'Aspects of Interdependence between Aboriginal Social Behaviour and the Spatial and Physical Environment' in *Aboriginal Housing*, Canberra: Royal Australian Institute of Architects, 1972, p.11.

¹⁶ Recommended for inclusion by the Nganampa Health Council Inc, South Australian Health Commission, & Aboriginal Health Organization of South Australia, 1987 Report of Uwankara Palyanyku Kanyintjaku: An Environmental and Public Health Review Within the Anangu Pitjantjatjara Lands, Alice Springs, December 1987 report, which deals with Aboriginal health and housing design.

¹⁷ Memmott, 'The Development of Aboriginal Housing Standards in Central Australia: The Case Study of Tangentyere Council' in Judd, & Bycroft, (eds), *Evaluating Housing Standards and Performance (Housing Issues 4)*, p.132.

¹⁸ Elsewhere I have written about larger scale customary socio-spatial structures, that of the settlement (Memmott, P., 'Sociospatial Structures of Australian Aboriginal Settlements', *Australian Aboriginal Studies*, 1 (2002), pp.67–86), which pertains to the practice of town planning in Aboriginal Australia, see Memmott, P. & Moran, M., *Indigenous Settlements of Australia (Technical Paper)*, Canberra: Environment Australia, 2001, last viewed at <<http://www.ea.gov.au/soe/techpapers/indigenous/introduction.html>> in March 2003.

¹⁹ The use of shades by the Alyawarr correlates with daytime highs that average 36–38C for 6 to 8 hours on any given day, see O'Connell, K., 'Alyawara Site Structure and its Archaeological Implications' *American Antiquity*, 52, 1 (1987), p. 82.

²⁰ Binford, L., 'Researching Ambiguity: Frames of Reference and Site Structure' in Kent, S.C. (ed.), *Method and Theory for Activity Area Research an Ethnoarchaeological Approach*, New York: Columbia University Press, 1987, pp.449–512.

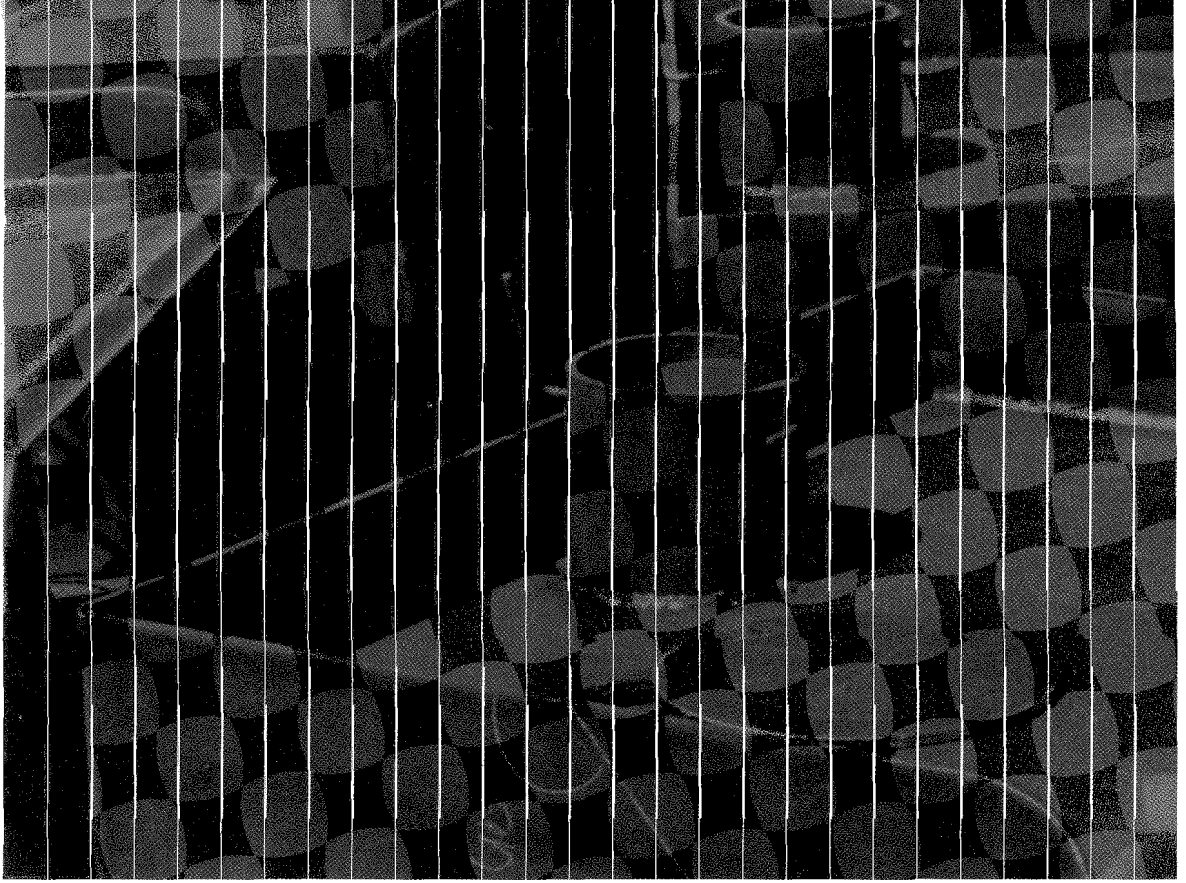
²¹ Binford, L. & O'Connell, J., 'An Alyawara Day: The Stone Quarry', *Journal of Anthropological Research*, 10, 1 (1984): p.159.

²² eg. O'Connell, K., 'Alyawara Site Structure and its Archaeological Implications' *American Antiquity*, 52, 1 (1987), p.74–108; Keys, 'The Architectural Implications of Warlpiri Jilimi'.

²³ In 1991 the current author published a cross-cultural model of crowding, which pertained to North American, European and east Asian groups and drew on environmental psychology literature. It was contained in Memmott, P., *Humpy, House and Tin Shed: Aboriginal Settlement History on the Darling River*, Sydney: Ian Buchan Fell Research Centre, Department of Architecture, University of Sydney, 1991, pp.255–258. This model holds that states of crowding involve high-density settings displaying various stimuli, some of which induce stress in setting participants according to their values of the environmental acceptability and non-acceptability of these stimuli. The result may be perceived loss of control, comprising a perceptual/cognitive component of the crowding model. Alternatively a coping mechanism may be used if one is available; a reactive behavioural component of the model. The values that are employed to evaluate the setting state (its stimuli), and to select an appropriate coping mechanism, vary cross-culturally.

- ²⁴ See Australian Bureau of Statistics, 1994 National Aboriginal and Torres Strait Islander Survey: Social Atlas, Canberra: Australian Bureau of Statistics, Catalogue No.4155.0, 1997, p.26; Australian Bureau of Statistics, 1994 National Aboriginal and Torres Strait Islander Survey: Social Atlas, Canberra: Australian Bureau of Statistics, Catalogue No.4155.0, 1997, p.22; and Queensland, Department of Aboriginal and Torres Strait Islander Policy and Development (DATSIPAD), Queensland Aboriginal and Torres Strait Islander Youth: A Statistical Profile, Brisbane: Program Development Branch of the Department of Aboriginal and Torres Strait Islander Policy and Development, 1999, p.17.
- ²⁵ Memmott, P., Long, S., Fantin, S. & Eckerman, E., Post-Occupancy Evaluation of Aboriginal Housing in the N.T. for IHANT: Social Response Component, Brisbane: Aboriginal Environments Research Centre, University of Qld, 2000, p.40
- ²⁶ Memmott, P. & Moran, M., Indigenous Settlements of Australia (Technical Paper), Canberra: Environment Australia, 2001, last viewed at <<http://www.ea.gov.au/soe/techpapers/indigenous/introduction.html>> in March 2003.
- ²⁷ Memmott et al Post-Occupancy Evaluation of Aboriginal Housing in the N.T. for IHANT: Social Response Component, pp.41, 46.
- ²⁸ Memmott et al Post-Occupancy Evaluation of Aboriginal Housing in the N.T. for IHANT: Social Response Component, p.40.
- ²⁹ VIP stands for Ventilated Improved Pit. These toilet or latrine products were developed by the Centre for Appropriate Technology in Alice Springs to provide remote Aboriginal communities with an economic and hygienic toilet facility the use of which did not incur the problems inherent in water-reliant disposal systems. They also offer protection against flies and odours.
- ³⁰ Pholeros, P., Rainow, S. & Torzillo, P., Housing for Health: Towards a Healthy Living Environment for Aboriginal Australia, Newport Beach, New South Wales: Healthabitat, 1993; Memmott et al Post-Occupancy Evaluation of Aboriginal Housing in the N.T. for IHANT: Social Response Component, pp.40, 47.
- ³¹ Memmott et al Post-Occupancy Evaluation of Aboriginal Housing in the N.T. for IHANT: Social Response Component, p.41.
- ³² Memmott, 'The Development of Aboriginal Housing Standards in Central Australia: The Case Study of Tangentyere Council' in Judd, & Bycroft, (eds), Evaluating Housing Standards and Performance (Housing Issues 4), p.133; and Heppell, M. & Wigley, J., Black out in Alice: A History of the Establishment and Development of Town Camps in Alice Springs, Monograph 26, Canberra: Development Studies Centre, Australian National University, 1981, pp.146-149.
- ³³ See Berndt, R. M., 'Aboriginal Sleeping Customs and Dreams, Ooldea, South Australia', Oceania, 10, 2 (1939-40), p.291; Hamilton, A., 'Aboriginal Man's Best Friend?', Mankind, 8, 4 (1972), pp.289, 294; Tonkinson, R., 'Social Structure and Acculturation of Aborigines in the Western Desert', M.A. Thesis, Perth: Department of Anthropology, University of Western Australia, 1966, p.199; and p.c. Hamilton 1997.
- ³⁴ In one case, I witnessed a Yuendumu family bury their dead puppy in the front yard of their house, and in the grave they placed a pack of cards, fifty dollars and several music cassettes.
- ³⁵ Pholeros et al, Housing for Health: Towards a Healthy Living Environment for Aboriginal Australia.
- ³⁶ O'Connell, 'Alyawara Site Structure and its Archaeological Implications', p.82.
- ³⁷ Heppell and Wigley, Black out in Alice: A History of the Establishment and Development of Town Camps in Alice Springs, pp.135, 138.
- ³⁸ In the early 1980s a protective wall was designed to accommodate a semi-external hearth and cooking area in some Alice Springs town camp houses. However, in many communities, tenants consistently locate hearths at a wide range of points around the house depending on climatic, seasonal and social circumstances, see Memmott, 'The Development of Aboriginal Housing Standards in Central Australia: The Case Study of Tangentyere Council' in Judd, & Bycroft, (eds), Evaluating Housing Standards and Performance (Housing Issues 4), p.125. These fixed walls are therefore of doubtful value, being too inflexible.
- ³⁹ Memmott et al Post-Occupancy Evaluation of Aboriginal Housing in the N.T. for IHANT: Social Response Component, p.47.
- ⁴⁰ Keys, 'The Architectural Implications of Warlpiri Jilimi', p.165.
- ⁴¹ See White, 'Sexual Conquest and Submission in the Myths of Central Australia', in Hiatt, (ed.), Australian Aboriginal Mythology, pp.134, 135; Biernoff, D., 'Traditional and Contemporary Structures and Settlement in Eastern Arnhem Land with Particular Reference to the Nunggubuyu' in Heppell, M. (ed.), A Black Reality: Aboriginal Camps and Housing in Remote Australia, Canberra: Australian Institute of Aboriginal Studies, 1979, Fig. 4; and Keys, 'The Architectural Implications of Warlpiri Jilimi'.

- 42 Memmott et al Post-Occupancy Evaluation of Aboriginal Housing in the N.T. for IHANT: Social Response Component, p.42.
- 43 Tonkinson, M. & Tonkinson, R., 'Modern Housing for Sedentarised Nomads' in Heppell, M. (ed.), *A Black Reality: Aboriginal Camps and Housing in Remote Australia*, Canberra: Australian Institute of Aboriginal Studies, 1979, p.202 on the Jigalong camp.
- 44 Heppell & Wigley, *Black out in Alice: A History of the Establishment and Development of Town Camps in Alice Springs*, p.134.
- 45 Hamilton, 'Aspects of Interdependence between Aboriginal Social Behaviour and the Spatial and Physical Environment', 1972, p.10.
- 46 Heppell & Wigley, *Black out in Alice: A History of the Establishment and Development of Town Camps in Alice Springs*, p.134)
- 47 Tonkinson, & Tonkinson, 'Modern Housing for Sedentarised Nomads' in Heppell, (ed.), *A Black Reality: Aboriginal Camps and Housing in Remote Australia*, p.202.
- 48 Heppell & Wigley, *Black out in Alice: A History of the Establishment and Development of Town Camps in Alice Springs*, p.161.
- 49 Memmott, 'The Development of Aboriginal Housing Standards in Central Australia: The Case Study of Tangentyere Council', p.122.
- 50 Heppell & Wigley, *Black out in Alice: A History of the Establishment and Development of Town Camps in Alice Springs*, p.152-171.
- 51 Dobkins, W., 'Section 3.8: Styles, Building Materials, Tools and Techniques in Aboriginal Shelters' in Foran, B. & Walker, B. (eds), *Science and Technology for Aboriginal Development*, Melbourne: C.S.I.R.O., 1986.
- 52 Memmott et al Post-Occupancy Evaluation of Aboriginal Housing in the N.T. for IHANT: Social Response Component, p.43.
- 53 Memmott et al Post-Occupancy Evaluation of Aboriginal Housing in the N.T. for IHANT: Social Response Component, p.44.
- 54 Heppell and Wigley, *Black out in Alice: A History of the Establishment and Development of Town Camps in Alice Springs*; and Memmott, P., 'The Development of Aboriginal Housing Standards in Central Australia: The Case Study of Tangentyere Council', pp.119, 125.
- 55 Memmott et al Post-Occupancy Evaluation of Aboriginal Housing in the N.T. for IHANT: Social Response Component, pp.43, 44.
- 56 There has been insufficient space in this paper to deal with this complex aspect. There are many ethnographic references on the subject, for example, Meggitt, *Desert People: A Study of the Walbiri Aborigines of Central Australia*, Ch. XVII; O'Connell, J., 'Room to Move: Contemporary Alyawara Settlement Patterns and their Implications for Aboriginal Housing Policy', *Mankind*, 2, (1977); and Tonkinson, & Tonkinson, 'Modern Housing for Sedentarised Nomads' in Heppell, (ed.), *A Black Reality: Aboriginal Camps and Housing in Remote Australia*, p.199.



House Design in Alice Springs Town Camps
Jane Dillon and Mark Savage

This article documents some of the ideas we developed while working, during the 1980s, as architects within Tangentyere Council: an Aboriginal community council/resource agency based in Alice Springs. Its content is greatly influenced by the research undertaken by Memmott, and Morel and Ross¹ during this period. A fit of youthful polemics produced a paper by Dillon², which argued that the design of individual houses was often of less significance than the method used to implement the housing program. We believe much of this is still relevant, refer later to Barker's paper, but will concentrate here on issues more directly connected with design.

The Alice Springs Context

Tangentyere Council manages the 18-odd special purpose leases or town camps located in and around Alice Springs, and provides support services to the 1200—1800 residents. Most of the people living in the town camps are traditionally oriented Aboriginal people who view these areas as the only places within Alice Springs where the continuation of Aboriginal cultural values and customary laws can be fostered.

Working at Tangentyere was intrinsically different from the role that most consultants play in the provision of Indigenous housing. Its Design Department was part of an integrated community resource organisation and directly controlled by Aboriginal executives and senior management. Unique among Aboriginal housing organisations, Tangentyere not only directly employed architects to assist with acquiring additional leases, community planning, providing essential services and building design, but also constructed and maintained the houses and provided land management services. It continues to do so.

Tangentyere was interested in modifying and improving houses to suit changes in housing experience, aspirations and technology. The refinement of designs was undertaken using direct feedback from residents, community workers and tradespeople, as well as more formal post-occupancy evaluation techniques. The organisation was also able to commission research and build up a historical overview of housing practice, which contributed significantly to the resources and information available to housing providers, residents and designers.

General Design Issues

The philosophy or approach of Tangentyere's Design Department was founded on detailed consultation with residents to determine their specific needs and aspirations. We encountered important and sometimes conflicting design considerations, including the need to respect traditional Aboriginal customs and values; the preference for outdoor living areas; the range and size of domiciliary groups, such as extended and nuclear families, single women and men, elderly or disabled people to be accommodated; and the effect of fluctuating visitor populations. Other factors to be considered were the extremes of an arid zone climate where temperatures ranged from minus 70C to 45C, the durability of finishes and detailing in coping with high usage levels and unfamiliarity with household technology, social problems, security needs, the desire for conventional looking houses and restricted budgets. We found that the siting and orientation of a house was often more important than its plan. The following discussion about design considerations represents a distillation of what we learnt in Alice Springs' town camps.

Outdoor Spaces

Aboriginal people in Central Australia tend to live around their houses rather than in them. This allows them to: maintain close contact with activities occurring throughout the camp, benefit from breeze and sun, use traditional campfire cooking methods, gather informally in large groups, supervise playing

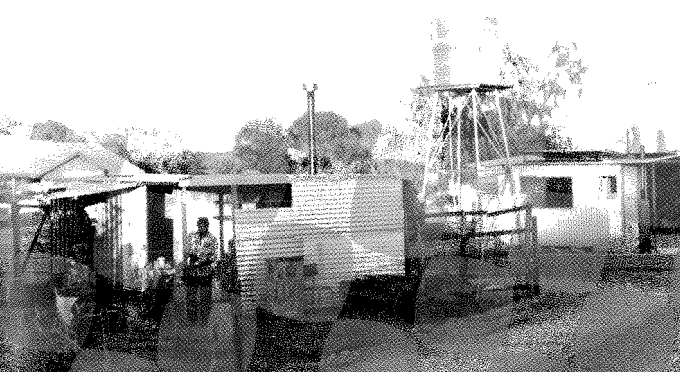


Figure 1 A photograph of an Alice Springs town camp under development in 1987, showing both steel sheds and a conventional house (background left). [Source: AERC, University of Queensland. Photographer: J. Ricketson.]

children, engage in activities such as painting or carving, sleep in comfort under a shade structure or next to a fire and accommodate visitors. Consequently, we found that the design of the building perimeter and the adjoining yard areas is vital to the successful functioning of a house. As climatic and social needs can vary significantly, a range of spaces are required that include:

- Verandas with a solid floor raised above the surrounding earth for painting and other activities that need to minimise dust—the shape of the veranda is important, being wide rather than long to accommodate group activities;
- Sheltered but sunny places for use during cold weather;
- Solid windbreak walls high enough to provide shelter without impeding the vision of a person seated on the ground (also useful as seating or storage);
- Areas with earth floors shaded by roofs or vines—considered by some people more comfortable to sleep or sit on (we used deciduous vines on eastern and western walls to provide summer shade and winter sunlight);
- Freestanding shade structures with shade cloth or traditional thatched roofs (often located away from the house to provide more privacy when visitors are staying);
- Semi-enclosed sleep-outs, which provide summer accommodation or act as an overflow space for visitors, with low walls to encourage breezes and screens for security and insect control (canvas blinds were sometimes added for additional weather proofing).

The landscaping of the yard is critical for both health and social reasons. Planting can be used to reduce dust and provide fresh, nutritious food. Trees providing shade, windbreaks, fruit and firewood were popular additions to yards as they provided a focus for outdoor activities and could act as a buffer between different social groups. Fencing is significant in defining the extent of individual house yards and differentiating areas within them. Large rocks can be used to restrict car access in order to protect planting and prevent damage to absorption trenches.

Size and Type of Household

Most of the Tangentyere houses accommodated a large number of permanent residents as well as a fluctuating number of short- and long-term visitors. The composition of households varied and ranged between conventional nuclear families, usually with several children; extended families with multiple generations; husbands with multiple wives; groups of single men or women of several generations; and, very infrequently, single people or couples.

In response to such high occupant numbers, a house's design should provide spaces of adequate size and variety to allow groups or individuals within the household to maintain privacy and securely store valuable possessions. In most houses the use of space is not differentiated to the same extent as in conventional Western housing; people sleep in living rooms and kitchens, and use bedrooms for eating and recreation as well as sleeping. A room designated as a bedroom may need to be large enough to accommodate two to three adults and several children. Aboriginal perceptions of crowding are not necessarily related to density but rather the relationships between people. Providing extra rooms will not automatically lower the density per room, instead it may allow for the accommodation of additional family members³.

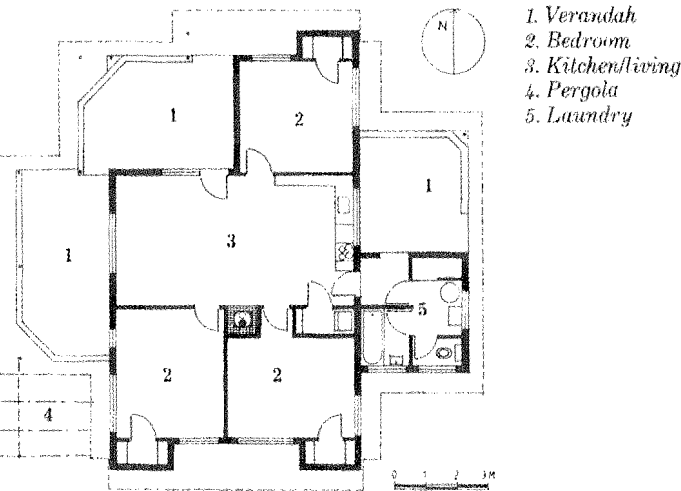
Sufficient service areas must be provided to cope with the number of people needing to cook, wash and use bathroom facilities. Separating toilets and showers allows them to be used by more than one person at a time. Additional bathroom facilities located for convenient use by visitors camping outside can reduce stress for permanent household members. Locating bathrooms on the perimeter of the house rather than internally, means that sewer blockages do not have to make the whole house uninhabitable. While detached bathrooms may offer several advantages, such as easy access for visitors and removal of potential contamination problems from the main house, they are often unpopular with residents for a variety of reasons that include lack of security, inclement weather and fear of malevolent spirits at night.

Although cooking is often done outside at fires, kitchens can still be used very intensively when meals are prepared throughout the day by different household groups. Stoves, taps and bench-tops all need to be durable to withstand these loads. Steel frames with stainless steel or compressed fibre-cement bench-tops are more expensive initially but can prove cost-effective over time. The success of attempts to provide fixed outdoor cooking facilities has been mixed. Generally, less formal individual cooking fires located to suit specific weather conditions and social activities are more popular because of their flexibility; these are frequently sheltered by shade structures and windbreaks. Easy access to raised storage and water can provide significant improvements in cooking hygiene.

Most households have dogs, so secure storage for food that is above ground or in a closed pantry is essential. Many households also request that the lockable pantry space is properly ventilated and large enough to fit a refrigerator. Lockable cupboards are also useful in each bedroom. They can provide security for guns, electrical goods and food, rather than store more conventional clothing items. External storage for tools and firewood can be located on verandas; locks on these cupboards are also greatly appreciated.

Climatic Design

For half the year Central Australia is extremely hot and mostly dry, although torrential rain can fall with little warning and cause severe, localised flooding. In the relatively short winter, days may be pleasantly warm, or cold and overcast with persistent cold winds. Night-time temperature can drop well below zero.



We found that the standard Western housing provided, had used a combination of light and heavyweight construction, and deep surrounding verandas, to deal with these climatic extremes. In the hot season a house's heavyweight construction kept it relatively cool during the day but made it retain heat at night, therefore lightweight sleep-out areas⁴ were more comfortable. In winter the deep verandas allowed little direct sunlight to penetrate and warm the house, and interior spaces had to be heated with wood burning stoves or open fires.

Figure 2 An example of a concrete block house provided by Tangentyere Council and designed by Dillon and Savage for Alice Springs town camps between 1984—86. The design is characterised by extensive veranda and sleep-out areas for external activities and visitor accommodation, pot belly stoves for winter heating, lockable storage cupboards, a refrigerator inside a lockable pantry, pergolas with deciduous vines, ablution rooms separable in case of effluent blockages, and security grilles. The 1987 photograph illustrates the kind of use to which an external living area was put. [Photographer: P. Memmott. Source: AERC, University of Queensland.]



In arid zones in other parts of the world, housing tends to be built of heavyweight materials. There are often thick, earth walls with minimal openings, and internal courtyards and roof terraces that are used at night when the temperature cools. Some designers have achieved limited success in their efforts to adapt this model to Aboriginal housing. The layout and structures of a traditional Aboriginal camp would alter to accommodate social, personal and seasonal variations. Because structures were lightweight and impermanent, they did not inhibit the ability—so crucial to maintaining social harmony—of occupants to see and hear what was going on in the camp. The internalised design and opacity of much arid-zone housing severely limits widely ranging visual or aural communication.

Our Tangentyere houses attempted to moderate the extremes of climate while also allowing the residents to maintain visual and aural surveillance of the surrounding area. This was achieved through passive methods such as appropriate orientation of the houses, large north-facing windows, and a range of shading options including verandas and pergolas with deciduous vines that allowed winter sun penetration and kept the house relatively cool in summer. Active climate control methods included ceilings high enough to allow safe installation of ceiling fans and winter heating with slow combustion stoves. Windows and highlights were located to provide natural cross-ventilation and additional observation points.

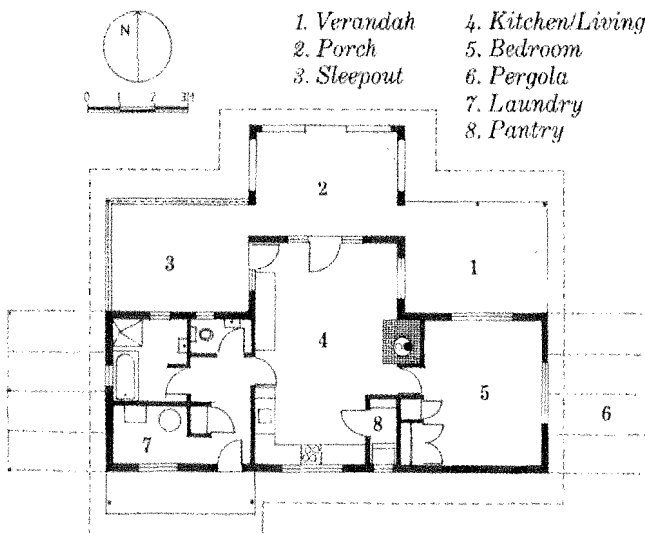
Generally the houses were constructed with concrete floors and concrete block walls. The use of conventional building materials and techniques reduced construction costs and minimised problems with difficult and unfamiliar detailing. In houses that were appropriately oriented and shaded, the need for artificial heating and cooling mechanisms was reduced by solar access and the building's thermal mass. The large diurnal temperature range and careful design allowed the houses to cool down at night, even in mid-summer; though in extreme heat many residents still preferred to sleep outside, on verandas or sleep-outs.

Appearance of Houses

We find many people are surprised at the conventional appearance of most of the town camp housing, usually anticipating that detailed consultation with Aboriginal clients will produce designs with an innovative look. Most of the Aboriginal families living in the camps have limited experience with different housing types. Often they have only seen houses in Central Australia where the majority are of masonry or fibrous cement construction and have pitched steel roofs. Many of these are poorly designed or oriented but superficially attractive, because they are kept artificially cool and well maintained with established gardens.

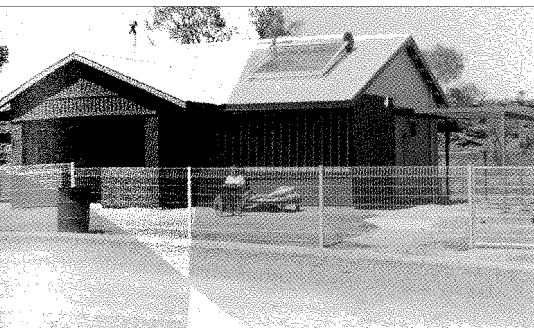
Generally Central Australian Aboriginal people request that their houses look like standard Western housing. They make a reasonable assumption that if this is the preferred housing for non-Indigenous people then alternatives may be inferior. Rarely do town campers feel the need to use the appearance of their houses to make a statement about Aboriginal identity; this may be because traditional culture is still vibrant and Western buildings are seen as having little relevance to its continuance. Many residents move frequently between the town and bush, town camps, and houses. An individual house may have little significance to its residents other than as a place to seek shelter, security and useful services.

Figure 3 A further example of a concrete block house provided by Tangentyere Council and designed by Dillon and Savage for Alice Springs town camps between 1984—86. [Source: Photographer: J. Ricketson. Source: AERC, University of Queensland.]



While houses are not used to define status to the same degree as is common in Western society, many Aboriginal people are aware of the role they play in indicating social standing. The more recently constructed and most solidly built proper brick houses, become the most desirable ones and are likely to be lived in by more influential community members. It is not uncommon for important people to progressively occupy newer houses.

Poorly designed houses may be superficially attractive, but many Aboriginal residents soon realise their disadvantages and move to more traditional shelters. If Western-



style housing does not provide significant benefits, it will be abandoned for alternatives that do provide improved temperature control and better visibility, and require less maintenance, but do not require major financial outlays.

When houses were painted during construction and renovation, residents were always consulted about colours. The responses we received varied. Some people choose

dark browns assuming that they would be easy to keep clean, others chose a palette of colours closely reflecting the ochres used in traditional sand paintings. However, mostly bright clear colours were picked, which led someone to remark that the houses looked like a group of rainbow finches.

Household Technology and Detailing Issues

In Central Australia, most electricity is diesel generated at great expense. Natural gas is sometimes piped to distant locations, but is generally available only in gas bottles. Sewerage systems cause endless problems, often due to poor construction but sometimes due to the way that they are used. Water is obtained from underground aquifers, its quality being variable. Often it is extremely poor and contains high levels of salts.

Ideally an appropriately designed house would provide for greater flexibility. It would adapt to the number of full-time residents and smaller social groups within the house, as well as to fluctuating numbers of visitors and varying climatic conditions. A tension exists between such flexibility and the need to provide a robust dwelling that can cope with large numbers of people, limited maintenance budgets and the occupants' lack of familiarity with household technology. Often it is most effective to provide a range of spaces that can be used in various ways, rather than to expect that movable parts will be tough and flexible enough to provide the degree of adjustment required.

Most houses have solar hot-water systems, which utilise the long hours of daylight and make significant energy savings. These systems need to be carefully selected and installed. Pipes can freeze in winter and poor quality water can block pipes over time. Closed circuit collectors using specially developed fluid have proved effective. Pressure relief valves need to be located in sheltered areas beneath the eaves so that they do not freeze and burst. As water can become extremely hot during summer, for added safety it can be temperature delimited. Toughened glass panels or mesh screens can be used to help protect the roof-top collectors from damage.

Septic absorption trenches need to be located where they will not be driven over, as the soil becomes compacted and the drains do not work effectively. Large stones or landscaped areas can be used to control vehicle access. Specifying large pipes for lines running to and from the tanks can help reduce blockages.

Solid core doors and good quality locks on internal and external doors are cost-effective in the long-term as they reduce maintenance costs. If sliding doors are used, they should be hung from their tops on heavy-duty tracks—floor-mounted tracks can fill with sand and dust. Security is an important issue for many residents so metal screens on windows can be installed to prevent unwanted entry. These will hinder the ease with which windows can be escaped through during a fire, unless the screens are of a type that can be easily pushed open. Occasionally residents asked for only one external door to be installed to improve security, but for safety reasons this was generally refused.

Diurnal temperature can vary by about 20C. Insulating houses, particularly their roofs and ceiling spaces, can help reduce the effect of this. Verandas with unlined steel roofing can become very hot, so the installation of sisalation and soffit linings is worth considering. Bulk insulation products, such as mineral wool, should be used over internal areas to reduce heat gain in summer and heat loss in winter. Even town blocks in Alice Springs are not connected to piped stormwater systems so gutters are not usually installed.

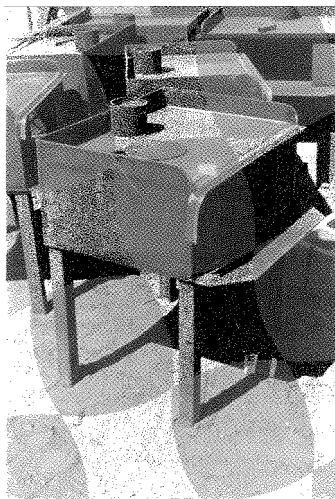


Figure 4 Wood stoves custom-made for Alice Springs town camps and Central Australian outstations by Tangentyere Council in the late 1980s. [Photographer: P. Memmott. Source: AERC, University of Queensland.]

However, heavy rain falling on roofed areas can drench the surrounding ground. One solution is to put lengths of guttering in strategic locations and ensure that the ground to which the water is directed is protected from erosion with suitable gravel drains.

Floors can be finished with relatively durable surfaces such as smooth concrete or vinyl tiles. As most households have limited cleaning products and tools, a preferred method for cleaning floors is to hose out the rooms. Unless the room opens directly onto an outdoor area, a drain has to be provided in the floor, which is protected from vermin entry by a frog flap on the external wall.

Conclusion

Designing housing for traditionally oriented Aboriginal people requires an understanding of how they use their environment in and around their dwellings. Complex, sometimes conflicting, cultural, behavioural and climatic factors need to be considered. Western-style houses need to be flexible and robust enough to accommodate extended family groups and fluctuating populations of visitors without causing undue stress. Housing aspirations continually change as more houses become available and residents gain greater experience, so well designed houses should be adaptable to future needs.

Endnotes

1 Memmott, P., 'Aboriginal Housing, State of the Art (or non-State of the Art)', *Shelter: National Housing Action*, 5, (July 1988): pp.36–45; Memmott, P., 'Aboriginal Housing, State of the Art (or non-State of the Art)', *Architecture Australia*, (June 1988): pp.34–47; Memmott, P., 'The Development of Aboriginal Housing Standards in Central Australia: The Case Study of Tangentyere Council' in Judd, B. & Bycroft, P. (eds), *Evaluating Housing Standards and Performance (Housing Issues 4)*, Canberra: Royal Australian Institute of Architects, National Education Division, 1989, pp.115–143; and Morel, P. & Ross, H., *Housing Design Assessment for Bush Communities*, Alice Springs: Tangentyere Council, NT Department of Lands, Housing and Local Government, 1993.

2 Dillon, J., 'Section 3.9: Aboriginal Housing: Process Not Product', in Foran, B. & Walker, B. (eds), *Science and Technology for Aboriginal Development*, Melbourne: C.S.I.R.O., 1986, pp.166–168.

3 Also see Memmott's TAKE 2 paper on this.

4 The Tangentyere sleep-out, as developed by its architects in the 1980s, comprised a 650–800 millimetre high base wall made of blockwork (with weepholes) surmounted by timber or steel framing between which insect screening was stretched. The wall's height was sufficient for a person on a low bed to receive relief, in humid conditions, via breezes. It would also provide security and insect protection. The walls of the sleep-out would be protected in extreme weather with roll-down canvas blinds. (Memmott, 'The Development of Aboriginal Housing Standards in Central Australia', p.135.)

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Designing for the Northern Tropics
(or how to avoid mango madness)

Su Groome

Many of us who live in tropical Australia love the dramatic annual cycle of wet and dry weather. The wet is a time of intense heat, high humidity and torrential rain. Plants, birds and insects thrive; people and animals wilt. After the wet the floodwaters recede and we receive a brief reprieve as the weather cools. But the heat returns and the night skies crackle with electrical storms, hinting of rain that does not come. Mango madness sets in.

These weather patterns place huge demands on houses, which must offer relief from the heat, and shelter from rain and wind, while also withstanding attack by rust, rot and termites. This paper suggests some design strategies for responding to these demands. However, our houses are not merely physical shelters, they must also meet the needs of our families as determined by our cultural traditions, social patterns and personal preferences; and this is no less true for Indigenous families living in tropical Australia.

Tackling Temperature

During tropical summers there is minimal diurnal variation in temperature, so houses have few opportunities to cool down. The challenge is to keep the house as cool as possible using passive design rather than artificial cooling mechanisms.

Walls and Floors

Traditionally, tropical houses in northern Australia were built of lightweight materials, particularly timber and steel. These materials have low thermal mass and respond quickly to small changes in ambient air temperature, such as cool breezes and slightly lower night temperatures. Lightweight materials are even more effective if lined with sisalation to reflect heat, and they may benefit from insulation if exposed to direct sun for prolonged times.

In many remote communities, concrete slab floors and concrete masonry are preferred due to their high durability. The disadvantage of using concrete is that it has a high thermal mass: daytime heat gains are stored in the walls and floors and are released into the house at night, negating any benefit from cool breezes or lower temperatures¹. These heat loads can be minimised through design by shading the walls from direct sun with verandas, roof overhangs, plants and external screens or louvres. Generating a flow of slightly cooler air across the walls—such as that cooled by a shady garden—can also help to remove excess heat.

Although verandas are an easy way to shade walls and create outdoor living spaces, they can make indoor spaces very dark, causing high power bills and damp mouldy rooms. A solution is to site verandas on more exposed walls, in combination with eaves on the north and south that shade walls from summer sun yet admit daylight in winter. Clerestory windows can also be a good option for admitting daylight.

Cross-Ventilation

In the tropics, air movement, such as that created by a fan, makes people feel cooler. Houses that encourage natural ventilation and harness natural convection processes associated with rising hot air will feel cooler due to the constant movement of air through the building. For example, ceiling and roof vents, and operable high-level windows will draw hot air from the house, causing cooler air to enter through open windows and doors. Orienting lower windows towards the prevailing breeze will improve the efficacy of this approach. It is also important that rooms have windows on at least two walls, or a window and a ceiling vent.

For cross-ventilation to be effective, the house needs to be as open as possible. If window or door systems are poorly chosen or positioned, residents may keep them closed due to concerns about security, privacy or insects, or simply because a hinge has failed. Door and window selections need to take into account: durability, particularly in humid, dusty or corrosive environments; protection against rain, awnings, casements and louvres can be angled against rain; and the ability to capture breeze, casements and awnings can funnel non-direct breezes.

Ideas for further consideration include:

- Use of obscure glazing or solid louvres at lower levels where privacy is critical, combined with clear materials above eye height to admit light;
- Windows for airflow close to floor level where people may be sitting or sleeping;
- High level openings opposite the prevailing breeze to exhaust hot air and establish convection currents;
- Some fixed ventilation—if the cyclone regime and winter temperatures permit—to ensure air movement even when the house is closed up;
- Security and insect screens to all openings, allowing doors and windows to be left open without compromising security.

The Roof

A critical strategy for reducing heat gain in houses and encouraging convection currents is to design a big roof that will provide maximum shade to walls in summer, shelter openings from rain, and allow window to be left open for ventilation. Ideally the roof will have a pitch of at least 15 degrees; higher pitches create more ceiling space to buffer the living areas from built-up heat under the roof². It will have low thermal mass and high reflectivity to prevent heat storage—ideally it will be light in colour and lined with sisalation. Insulation can also assist in reducing heat load on the roof, particularly if installed directly under it. However, a high-pitched, well-ventilated roof space may be just as effective.

Mechanical or fixed roof ventilation devices, such as ridge, gable and eave vents, reduce heat loads by allowing hot air in the roof space to escape. Ceiling vents can also be used with roof vents to encourage ventilation through the house, as discussed previously. When using mechanical vents in coastal areas it will be necessary to select a system that is suited to high winds and a highly corrosive environment.

Verandas and Outdoor Living Spaces

A good tropical house incorporates outdoor living spaces that offer both a shady retreat from the heat of the day and a place to enjoy the evening breezes. A solution is to include at least one outdoor living space in a house and its yard, such as a veranda, deck, 'bough shelter' or shady tree. The value of allocating some of the budget to landscaping cannot be underestimated. Big trees often create favourite outdoor spaces, and a well-planted garden is one of the most effective ways to shade walls and create a cooler microclimate around the house.

The inclusion of cooking facilities, such as a BBQ or fire pit and a sink or tub, will provide a welcome alternative to cooking inside on very hot days and nights. When siting outdoor living spaces take into account cooling breezes in summer and protection from hot sun, driving rain or cold winds.

Regional Differences and Extremes

Throughout the tropics there is substantial regional variation in climate. For each project it is essential that the local microclimate be profiled, including summer and winter rainfalls, seasonal and diurnal temperature ranges, storm threats, prevailing seasonal breezes and climatic impacts on site access.

Tropical winters can get cold; the inland tropics in particular can experience freezing temperatures at night and persistent cold, dry winds during the day. In these locations, temperate design strategies, such as the use of thermal mass to capture warmth from the winter sun, will be useful. However, these should not compromise wet season performance.

Confronting the Extremes

Tropical housing must shelter residents from extreme events such as floods and cyclones in the wet season, and fires, dust and electrical storms in the dry. Determine the risks of these events with the community and ensure houses can respond appropriately. Some suggestions are made below, but the needs of every community will vary.

Flooding and Inundation

Some remote tropical communities and outstations are subject to flooding. In these situations there may be mandatory requirements to construct floor levels above one-in-100 year flood levels and to design footings and substructure to withstand flood conditions. Other strategies include providing adequate above-ground storage, using water resistant floor coverings and fittings at lower levels, avoiding in-ground waste water systems and securing rainwater tanks, gas bottles and other heavy components.

Even houses not directly subject to flooding may suffer local inundation during heavy storms. Where gutters are used they need to be large enough and have sufficient downpipe capacity to cope with water flow from the roof. If gutters are not used, edge treatments, such as gravel drains, will be required directly under the drip line at the edge of the roofing sheet, and further away where water spills off the roof in downpours. Yards need to be shaped and drained to direct stormwater flow away from the house: either capturing it in swales for the benefit of the garden or directing it to stormwater drains, natural drains or creeks.

Cyclones and Storms

In order to respond to cyclonic wind conditions, confirm the extent of the threat, the relevant code rating and whether the community and residents have particular requirements for cyclonic design. These can include cyclone shutters for openings; a reinforced cyclone shelter in the house; weatherproof storage; emergency lighting; and use of gas stoves, solar hot-water and/or rainwater tanks in the event that town services are lost.

Other weather conditions that may require a design response are:

- Dust storms — houses need to be completely sealed against the storm;
- Electrical storms — ensure the house is well earthed, and manage fire sources in the yard;
- Fires — refer to Bush Fire Design Codes if working in fire prone areas.

Combating the Nasties

During the wet, intense rain combines with the tropical heat to create nature's hothouse in which life thrives, including mould, mosquitoes, termites, cockroaches, ants, rust and rot. These tropical nasties can play havoc with buildings. It is important to confirm the extent of these problems during the design stage and incorporate appropriate design responses.

Mould

Mould blooms in the wet season, particularly in warm and damp areas such as kitchens and bathrooms. It can be controlled with adequate natural light and ventilation, for example, if it is likely that bathroom windows will be kept closed for privacy, consider using windows or fixed ventilation above eye level. Other tips include mould retardant additives for all paints, stains and clear finishes, and vents in doors, floor, ceiling and shelves for cross-flows. Mould loves silicone, rubber, grout and other sealants and will cause these materials to perish, a solution is the use of mould resistant alternatives.

Mosquitoes

Mozzies carry several significant diseases, some of which can be fatal. The design of houses and communities can reduce mosquito breeding with effective stormwater drains, screening of waste water systems and rainwater tanks, and control of livestock. In many tropical communities it will be necessary to provide insect screens to houses. It is possible to investigate the different options for screens, and to try to use screens that are as durable as possible.

Termites

Steel frames are usually the better structural option in northern Australia where termites are so voracious they will eat car tyres. For other building components, termites can be managed through appropriate treatment and detailing. The costs of chemical treatment under slabs can be prohibitive in some remote settings and the chemicals can leach out in extreme wet conditions. Alternatives include mechanical

separation—for example, suspended floor on steel sub-floor structure and physical barriers such as stainless steel mesh or composite membranes.

Where timber is used in houses it must be treated to Australian Standard 1604. Because termites and rot are attracted to wet timbers, careful detailing is needed to waterproof wet areas and protect weather-exposed walls. Treat wall frames in these areas as though they are external; specify minimum Class 2 hardwoods or H3 treated softwoods and ensure end grains and hidden faces are sealed prior to installation. Use of paths or gravel beds around houses can assist in keeping walls dry and ensure easy inspection for termite tracks.

Cockroaches

Cockroaches love dark, damp, warm places and are found in kitchens and cupboards throughout the tropics. Although difficult to eliminate, cockroaches can be reduced by:

- avoiding the use of particleboard, polystyrene or similar products that cockroaches can lay eggs in;
- ensuring cupboards and bench-tops have few nooks and crannies where cockies can breed, particularly around sinks, tubs and basins;
- raising cabinets off the floor by at least 400millimetres;
- using mesh shelving (cockies cannot walk on mesh);
- using mesh or vents in doors to admit light;
- eliminating narrow gaps and unsealed holes (tubular steel framing needs to have all ends sealed).

Cockies also love living in stud wall frames, as do rats. They can move through gaps around windows and at the base of external cladding if there is no skirt. The detailing of wall junctions and openings is critical for preventing this.

Ants

Most ants are simply an annoyance, however some like to eat the insulation on wiring. This can cause electrical fires and shocks. To reduce this risk, take steps to keep vegetation away from buildings and ensure electrical fittings are well sealed. Consider using conduit for wiring. Provide safety switches on all power and light circuits and undertake regular safety checks. Pest control will also help. Some ants also eat silicone, which can lead to water penetration problems. Minimise the use of silicone, and find alternative sealants.

Rust

The selection and detailing of structure, framing, connections, fixings, claddings and hardware must take into account the propensity of the product or material to rust, which can be established by inspecting existing buildings. In coastal communities, thin galvanised steel products such as framing anchors, bracing straps and cold-folded steel sections will fail in a few years. Even hot dipped galvanised steel is not immune. The delivery of materials by barge further increases the risk of rust. Consider stainless steel and aluminium fixings and hardware, and avoid mild, chromed, and cold-folded steel and framing anchors. Check that the specified roofing screws will not rust out the roofing! In extreme cases, use aluminium or stainless steel roofing systems. Also ensure that steel to be encased in concrete is free of rust, otherwise it can cause significant deterioration of the concrete. Other rust-vulnerable elements include light fittings, fans, hot-water units, handrails and appliances. Investigate alternative products constructed of aluminium, stainless steel, timber or UV stabilised plastics.

Life's simple pleasures...

Northern tropical Indigenous communities are often heavily reliant on fishing because they are located on the coast or near rivers. Tenants may appreciate secure storage facilities outside the house for fishing gear and boat fuel. These storage spaces will make living areas safer for children, and can be used to secure loose items in the event of a cyclone.

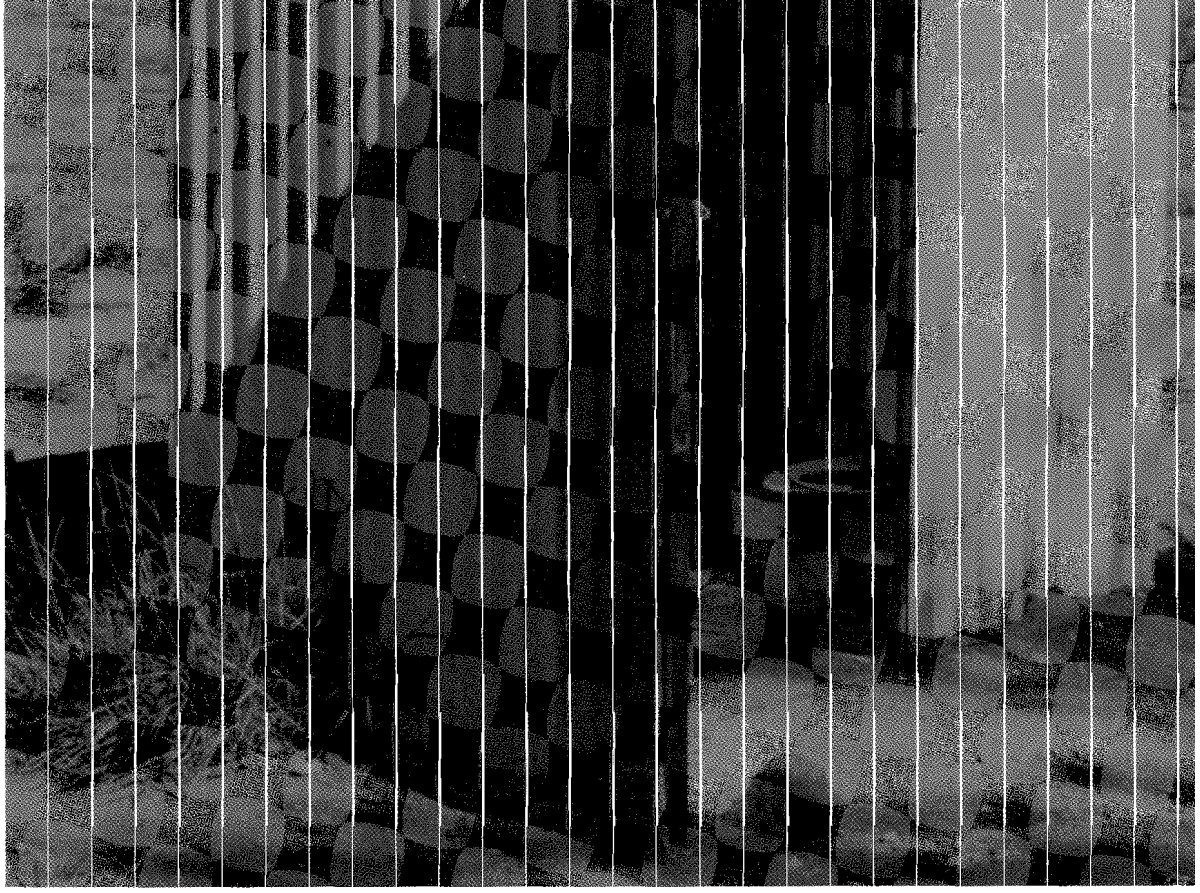
Table: Health Hardware in the Tropics

<p style="text-align: center;">E N E R G Y</p>	<ul style="list-style-type: none"> • Electrical problems can multiply in the tropics. Ensure all electrical installations are fitted with adequate safety switches and earth leakage devices. Consider using weatherproof fittings on verandas, in bathrooms, even throughout the house in extreme conditions. • Secure gas bottles against high winds and/or flood waters and use stainless steel hose for the connections. • Consider solar hot-water units, which have little or no operational costs for tenants and supply hot-water when there is no power. • Smoke detectors can be subject to a high rate of false alarms due to insects and high humidity. Investigate different types of systems, such as optic or heat detection, also different options to mount systems to make them more insect and gecko proof.
<p style="text-align: center;">W A T E R</p>	<ul style="list-style-type: none"> • In some tropical communities water quality is poor or unreliable. Consider options to provide a secure potable water supply for houses, such as a rainwater tank. If using tanks, specify fittings that prevent contamination and insect breeding, and discuss options for ongoing maintenance with the community. • Aggressive water will destroy copper and brass plumbing components. In these conditions specify polyethylene or polyester pipe work and stainless steel breach pieces. • Hot-water systems may be subject to attack from the inside, by aggressive water, and the outside by corrosion. Several manufacturers make systems using stainless steel and aluminium that are worth considering, particularly if the system is externally mounted.
<p style="text-align: center;">W W A A S T E R</p>	<ul style="list-style-type: none"> • Safe disposal of waste water is an issue where there is inundation or a high water table. Consider sand mounds instead of sub-surface effluent trenches, composting toilets or package treatment systems. • When choosing a system it is critical to determine whether essential external inputs, such as power, chemicals, servicing and parts, can be guaranteed. • For all drainage systems, ensure that inspection openings, pumps and other inlets are well clear of the ground, so that stormwater cannot enter the system. Consider fitting one-way flaps to the inlet of septic tanks, so groundwater cannot flow back into the septic tank.

Appropriate strategies for dealing with climatic conditions represent another essential layer of information that must inform the design of houses for Indigenous communities. Personal and cultural needs will sometimes conflict with responses to the physical environment; at such times the design consultant has a responsibility to synthesise these constraints to create an appropriate and enduring home in consultation with the client.

Endnotes

- 1 We have monitored masonry houses that did not get cooler than 30C over a 24-hour period.
- 2 Take into account whether the houses are being built and/or maintained by community members without much experience working on roofs. If so, a roof pitch of greater than 20 degrees may be unsafe.



Housing for Health, or Designing to Get Water In and Shit Out
Paul Pholeros

The design process for a house is often founded on a preliminary assumption that basic services such as running water, power and waste will be connected and operational. Other common design preconceptions concern those who will use the house, for example, the number of people who will be occupying it and the ability of each household to afford to run and maintain it. Wealth tends to ensure that the basics are achieved and certain preconceptions satisfied—essentially that the house functions. To help maintain the health of residents, certain key elements must be present in a house, including a safe electrical system, a working water supply and mechanisms for safe waste water disposal. A healthy living environment is particularly important for younger children under five years of age.

However, the houses of many Indigenous Australians in rural and remote areas do not deliver these basic services¹. The projects discussed below show that it is possible, and of the highest priority, to immediately improve the living situation of these people. The suggested steps may appear minor to those who are reading this in relative comfort but a well-targeted budget can provide safe working lights, a functioning shower with enough hot water for a family of 12, and working drains and toilet. These will be seen by many Indigenous people as major improvements. While these works are being carried out, the types of, and reasons for, housing failure can be recorded. Such details can then provide the basis of the design brief used by those skilled and creative design practitioners working in all aspects of the living environment. Rather than working from false givens and preconceptions this brief should really emerge from an examination of existing Indigenous housing.

Background to Housing for Health and Fixing Houses for Better Health projects

What started in the mid-1980s as a small environmental and public health review in Central Australia², has gradually grown throughout many states and is now a national program that aims to make urgent safety and health hardware³ repairs to existing housing and surrounding living areas.⁴

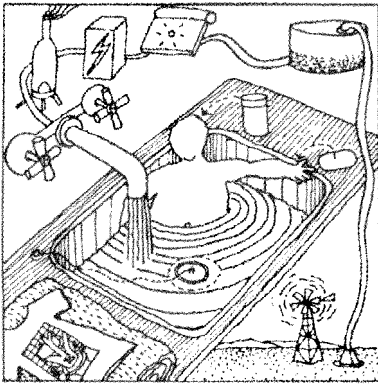
The Housing for Health and Fixing Houses for Better Health projects have the following key concerns:

1. To bring about immediate change, ensuring that on the first day of every project, fix work commences;
2. To prioritise all work on the basis of maximum health gain (healthy living practices or HLPs are explained in more detail below);
3. To use defined, standard, and repeatable tests for a house and its components; to collect accurate, detailed data in order to ensure that small-scale immediate improvement goes hand-in-hand with careful documentation of longer-term needs and basic housing faults⁵;
4. To employ local Indigenous people on every project, ensuring that some local people receive on-the-job tools training about how to test and do minor fix work on their houses;
5. To employ licensed tradespersons to carry out more extensive fix work within 24 hours of the project's commencement;
6. To use the data generated by projects to expose building and product faults, and to help define the principles essential for producing better designs and specifications.

These projects have not involved the building of new houses, or even major upgrade works, they have focused on assessing and fixing the health hardware in existing houses and living areas, which are necessary for families to maintain healthy living practices. These give an indication of what a house provides for its occupants. When healthy living practices can be conducted in a house, it fully functions and becomes successful housing. Each healthy living practice delineated here has been thoroughly researched over 18 years, giving the Healthabitat team detailed information about the likely health benefits of implementing a particular improvement. An example of a critical healthy living practice (CHLP) is the washing of children and adults, and the following discussion will use this CHLP to demonstrate how this process operates.

Designing to wash a child

The simple drawing over keeps the focus on washing the child not on the necessary water supply (town, rain, bore or river water), the tanks, pumps, hot-water systems, taps, spouts, tubs, plugs or even the soap,



shampoo, towel and clean clothes—all of which are needed. Additionally, many skills are required to achieve this CHLP including engineering, plumbing, electrical, geological, industrial and architectural design, building, and store managing. Most importantly, they must all be working in collaboration to achieve the desired result.

Washing children and adults

Why is washing so important? Diarrhoeal and respiratory diseases are the major cause of morbidity amongst Aboriginal children and also play a major role in the malnutrition often experienced during their first three years of life. The main route

by which diarrhoeal disease is transmitted is faecal-oral. Washing children can reduce its prevalence and therefore the likelihood of it spreading. Also, in Central Australia, hospital admission rates for X-ray proven pneumonia were 80 times greater for Aboriginal children than for non-Aboriginal children. Chronic nasal discharge and middle-ear disease are common; in some regions of Australia up to 80 per cent of Aboriginal children may have hearing loss that is related to middle-ear disease.

Skin infection is another of the most common problems experienced by Aboriginal children. It is the cause of chronic illness and discomfort. Persistent scabies infections can lead to an increased risk of infection from other bacteria, especially group A streptococci, which is associated with impetigo. Constant skin infections can predispose sufferers to developing kidney disease, which in adulthood can be fatal or cause chronic disability requiring lifelong medical care. Many other childhood infections also contribute to this condition. Streptococcal skin infections may also cause the later development of rheumatic fever and heart disease. The most important step in preventing these skin infections is regular washing.

There are high rates of trachoma and bacterial eye infections in Aboriginal children. Trachoma is known to be associated with poverty and poor living conditions. Other infectious conditions such as bacterial conjunctivitis can be transmitted via secretions. Some studies have shown a reduction in the prevalence of eye infections with regular face washing.

The healthy living practices (HLPs) defined through Healthabitat's previous work have been prioritised so that limited funds are expended on those parts of the living environment most important for health. They address the risk factors contributing to the situation outlined above and are:

1. Safety (life-threatening safety issues, especially electrical safety);
Then in order of importance:
2. Washing children and adults;
3. Washing clothes and bedding;
4. Removing waste water safely;
5. Improving nutrition;
6. Reducing crowding;
7. Reducing harmful contact between animals, insects, vermin and people;
8. Dust control;
9. Temperature control;
10. Reducing trauma or minor injury.⁶

An essential feature of this work is the specific function tests that have been developed for the health hardware and services of a house. Such tests allow their performance to be quantified and not just observed from a distance. To continue the previous example, one way to wash a child is using a shower. A test of this important device involves the items outlined in Table 1 and Figure 2 opposite.

Table 1 Shower test procedure and scoring

	Tested Item	Test Procedure (item rating)
4.1	Shower water in: hot OK	Leave running for 1 minute and check water flow & pressure OK. (1= pass, 2= fail)
4.2	Shower water in: cold OK	Leave running for 5 minutes and check water flow & pressure OK. (1= pass, 2= fail)
4.3	Hot water: temp. OK	Run for 1 minute & use thermometer. (1= temp.> than 44 °C 2= temp. < than 45 °C)
4.4	Shower taps: hot OK	Turn on and off at least 3 times check handle secure and no drips. (1= pass, 2= fail)
4.5	Shower taps: cold OK	Turn on and off at least 3 times check handle secure and no drips. (1= pass, 2= fail)
4.6	Shower rose OK	Check it is secure and not leaking at the joints and water is flowing OK. (1= pass, 2= fail)
4.7	Shower drainage OK	Check after cold water has been flowing for at least 5 minutes. (1= pass, 2= fail)

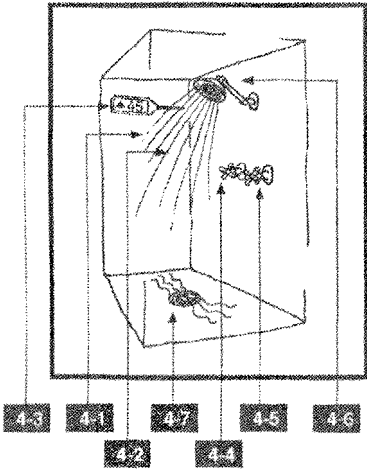
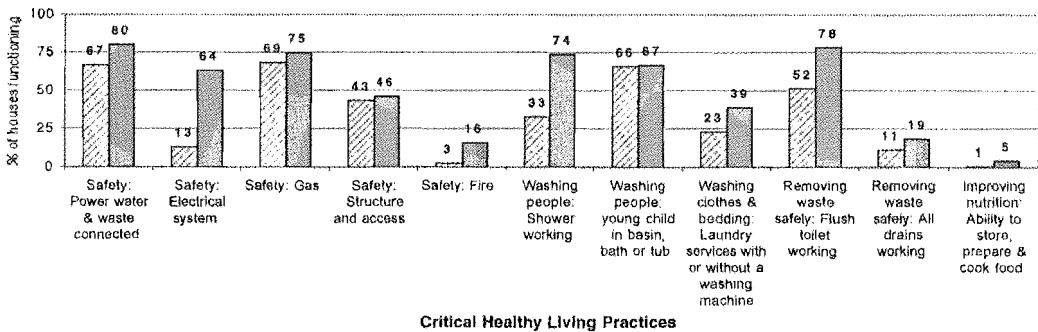


Figure 2 Seven critical hardware performance points for a functioning shower.

According to the procedures developed through the projects described above, if the shower is to be recorded as functioning, all of the above checks must receive a pass rating. The data in Table 2 give a detailed picture of the state of health hardware in rural and remote Indigenous housing in four states between 2000 and 2001⁷. Each item listed was tested in a similar manner to that described in Table 1 and Figure 2. The improvements indicated in the table between the first and second Survey-Fix were achieved with an average budget of \$3,500 per house.

During the first Survey-Fix some 792 houses from 21 communities in four states were tested and repaired. At the subsequent Survey-Fix, conducted approximately six months after the first, 777 of the original houses were re-tested and additional repairs were completed if required. Why were the results from the first Survey-Fix so poor? The most common responses to such negative results, and the ideas underpinning them, can be categorised as follows:⁸

1. Tenant damage: While often put in many ways, the most common explanation offered for the poor performance of houses is tenant damage, misuse or misunderstanding of how to use the house. This frees designers and builders of much responsibility as whatever gets built will be damaged in much the same way.
2. The age of the houses: Much Indigenous housing stock is old and the figures simply reflect this fact. This pushes debate into the arena of new housing provision. Combined with the need for new housing, is usually the need for many more new houses. This often reduces the budget and specification levels that can be allotted to them. New housing will perform better than old.
3. Poor design: Inappropriate design has not allowed people to interact with the house properly. It has not provided for the needs of the users. More and better informed consultation at the design stage will improve the performance of housing.



□ National average Survey Fix 1 ■ National average Survey Fix 2

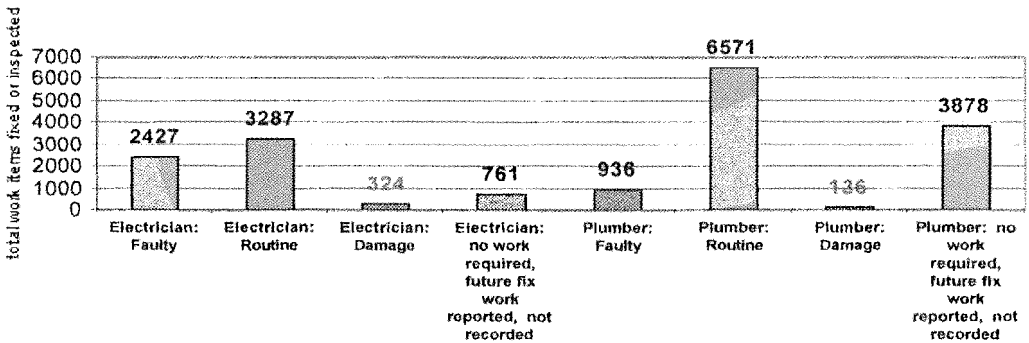
Table 2 Comparison of national average function rates between Survey/Fix 1 (792 houses, in 21 communities, in four states) and Survey/Fix 2 (777 houses).

4. Poor construction: Buildings are built badly and therefore fail. They need to be built of stronger materials and generally in a more robust fashion.
5. Poor data: The data does not properly reflect the condition of Indigenous housing. Housing is far better than this data would indicate. Other state and national data show the better performance of housing.

It is important to analyse these responses, as the attitudes they reflect often set the housing design, construction and maintenance policy agendas in the relevant region and state or territory, as well as nationally.

Tenant damage

A detailed breakdown of the reasons identified by the licensed trades for fix work being required is presented in Table 3. It is important to note that the majority of all repair works (70 per cent) were impelled by a lack of routine maintenance and less than three per cent were required because of vandalism, damage, overuse or misuse. This is particularly important as it reinforces similar data collected by Healthabitat during similar projects undertaken over the last 17 years and provides further evidence to contradict the popular opinion that Indigenous housing's main problem is damage caused by tenants.



Reason for repair as identified by the licenced trades

Table 3 Plumbing and electrical work items and the reason repair work was required, as identified by the licensed trades. (This table collates data from reports received from 42 licensed trades, where 13,681 items have been repaired from a total of 18,320 work items identified.)⁹

The age of the houses

While much Indigenous housing is old and the figures reflect this fact, there is no clear evidence that new housing is performing better than old. Table 4 compares the age and overall function of approximately 200 houses in four widely scattered communities from one state. Reducing the cost of new houses to provide budgets for building more houses, to address real problems of over-crowding, will often reduce the money spent on key specification items. This leads to a loss of house function. Common reductions are made in areas such as: little or no insulation; hot-water system, tapware, door and window quality; light fitting number and quality; less inspections of work; and no yard works or fencing.

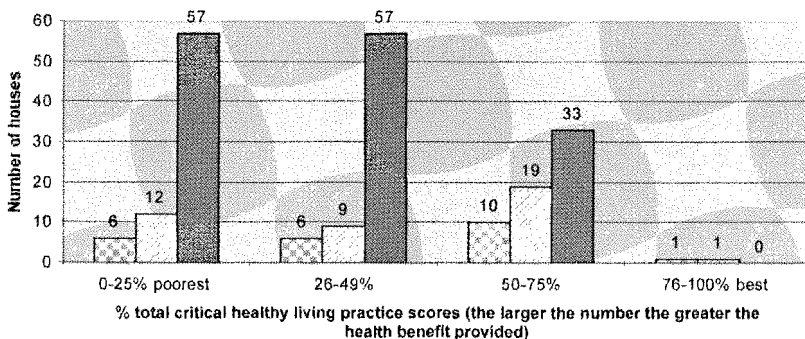


Table 4 Comparing the performance (using the total critical healthy living practice score) and the age of houses in four communities from one state. (211 houses from four communities before any fix work commenced.)¹⁰

- 1= house or major upgrade works less than 2 years old, (total 23 houses)
- 2= 2 to 10 years old, (total 41 houses)
- 3= more than ten years (total 147 houses)

Poor design

The standard of design and detailed specification does contribute to the poor performance of houses. However, as outlined above, damage is not the major issue, nor is making the house more robust if it is done solely to counter vandalism. Robustness of the house's fittings, and hot-water and waste system in response to overcrowding and aggressive water quality should definitely be considered. Areas needing better design, and careful specification and detailing include:

- waste water systems able to cope with large numbers of people;
- hot-water systems, considering water quality, running costs and house population;
- bathroom layouts to cope with large numbers of people and floor drainage;
- shower roses, considering water quality;
- light fittings and energy saving bulbs or tubes;
- doors and hardware, particularly locks;
- windows and new ways of insect screening;
- cook tops and ovens;
- kitchen bench splashbacks;
- kitchen storage units;
- solutions to keeping food cool and pest free;
- usable yard areas with cooking, sleeping and storage potential;
- thermal performance equivalent to sitting outside the house under a tree.

Poor construction

In Table 3 it is important to note the high level of routine maintenance faults that may well have been caused by poor initial construction. For example, drains with minimal falls are more likely to become blocked by heavy use. More disturbing is the amount of fix work that is required because original plumbing and electrical work has been assessed as faulty by licensed trades. Over 2,400 electrical repairs were due to the original work being installed incorrectly; either the wrong part or component has been fitted or an essential item is absent from the house. Poor construction coupled with lack of supervision leads to houses that do not function properly. Improved consultation processes, and levels of design and specification will not produce better housing unless it can be ensured that those decisions made during the design process are enacted on the building site.

Poor data

There has been constant criticism leveled at the Fixing Houses for Better Health project data, perhaps because they tell an unpalatable story about house function. Some typical criticisms have been:

- The questions are too hard and no house would pass! The simple test is to examine the questions in detail. For example, with the shower test, ask yourself which items you would not want in your house when showering tomorrow morning.
- The data are collected by Indigenous teams who are untrained. The teams are given training in the field, first with demonstration boards on which electrical and plumbing fittings can be tested and fixed. They are supervised in the field by team leaders and the data sheets are checked at various stages to ensure accuracy. As the majority of the Survey-Fix teams come from the participating community they quickly see that the marks they make on the form lead directly to a licensed trade fixing the house and therefore have every reason to ensure accuracy.
- What use are the data? They are too complex. The data are firstly, and most importantly, used to identify fix work in the house so that immediate change can occur. The example below shows how data can also be used later in the process to determine building component failures and foster better design.

An example using the collected data from the above project may make the point clearer. The reader is referred back to Table 1 and Figure 2 on shower performance.

National comparison Survey Fix 1 and Survey Fix 2

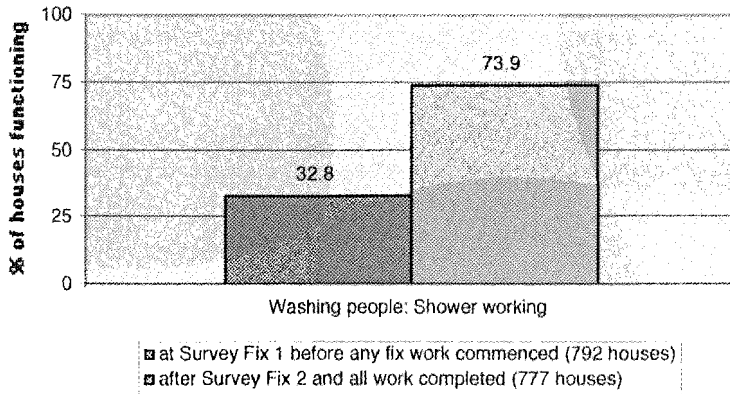
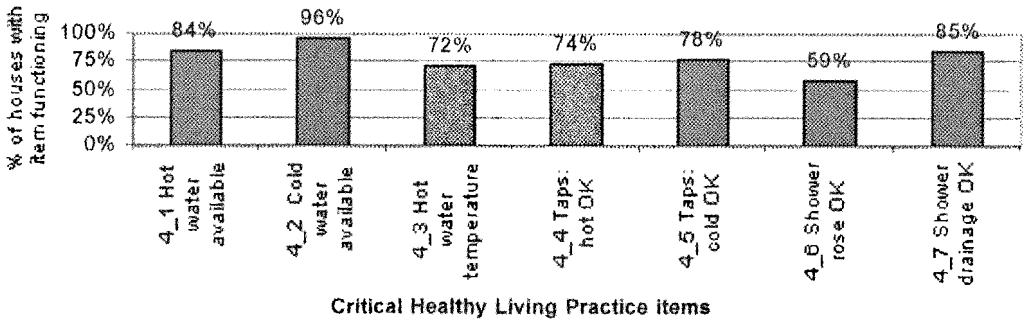


Table 5 National comparison of the 'washing people—shower working' test done on the houses assessed during Survey-Fixes 1 and 2.¹¹

So how do we improve the design and specification? By using the data obtained around the country we can examine which parts of the shower are not functioning.



Critical Healthy Living Practice items

Table 6 National Analysis of Critical Healthy Living Practices (CHLP), 'Shower working' Practice. (Item performance tested in 792 houses at Survey-Fix 1 before any fix work completed.)¹²

Having examined Table 6 above and determined where the highest number of common failures occur, the following design actions can be taken:

- (i) improve the specification of shower roses;
- (ii) look for more detail about the performance and type of hot-water service specified;
- (iii) improve the hot and cold taps.

If hot-water systems appear to be a major issue, further data is available, which assist in a more detailed analysis. For example, the following tables have been extracted from the second edition of the National Indigenous Housing Guide¹³ published by the Commonwealth Department of Family and Community Services. It provides further useful analysis on hot-water system performance.

Table 7 Type of hot-water systems available at Survey-Fix 1

	% houses	No.houses	Total houses
Hot-water system power type: solar	43%	339	784
Hot-water system power type: electric	49%	387	784
Hot-water system power type: gas	6%	48	784
Hot-water system power type: heat pump	1%	4	784
Hot-water system power type: solid fuel	0%	0	784
Hot-water system power type: NO Hot-water system available	1%	6	784

Table 8 Function of hot-water systems at Survey-Fix 1 before any fix work was commenced.

	% functioning OK	No.houses OK	Total houses
Hot-water pressure release/relief valve OK (on ALL systems)	54%	421	784
Hot water per person (>50 litres / person considered a minimum)	42%	309	740
Temperature warm enough for washing			
Temperature OK (>44°C) at time of survey: solar	68%	230	339
Temperature OK (>44°C) at time of survey: electric	79%	306	387
Temperature OK (>44°C) at time of survey: gas	23%	11	48
Temperature OK (>44°C) at time of survey: heat pump	75%	3	4

Temperature stored above required temperature leading to possible burns and higher power charges)	% NOT OK	No.houses NOT OK	Total houses
Temperature too hot > 62°C at time of survey: solar	20%	68	339
Temperature too hot > 62°C at time of survey: electric	43%	168	387
Temperature too hot > 62°C at time of survey: gas	6%	3	48
Temperature too hot > 62°C at time of survey: heat pump	0%	0	4

Common faults identified in houses assessed throughout both the Housing for Health and Fixing Houses for Better Health projects have been documented and forwarded to the National Indigenous Housing Guide.

Conclusion

Design professionals often remark that the various projects undertaken by Healthhabitat, including that described above, are not grand enough and lack a big picture view or major concept. Perhaps the major concept is to provide housing that supplies the facilities considered by much of the Australian population and all of the design professions as basic. It is hoped that a clear definition of the day-to-day housing needs of people actually living in the houses will form the basis for a more sustainable and health providing architecture.

Endnotes

¹ Healthhabitat, 'Fixing Houses for Better Health: summary national function data', c.2001. Pholeros is co-director of the firm Healthhabitat, which has been in operation for 17 years. His co-directors are Paul Torzillo and Stephan Rainow.

² Nganampa et al, 1987 *Report of Uwankara Palyanyku Kanyintjaku: An Environmental and Public Health Review Within the Anangu Pitjantjatjara Lands*, 1987. Commonly called the UPK report. In the language of the Pitjantjatjara—some of the people served by the Nganampa Health Council—*uwankara palyanku kanyintjaku* translates to—stop people getting sick—hence UPK.

³ The term health hardware was first used by Dr Fred Hollows to describe all parts of the living environment that provide some health benefit.

⁴ Refer to the Memmott and Go-Sam introduction to *TAKE 2* and their discussion of the environmental health paradigm for more detail on the work of Pholeros and Healthhabitat. Following the work conducted for the Nganampa Health Council, further funds were obtained in 1991 to survey and maintain houses in the Pipalyatjara community, a small Pitjantjatjara settlement in South Australia. In 1996 the Healthhabitat team conducted similar work in Pomppuraaw, a Cape York community. These were called Housing for Health projects, and furthered the principles set out in the original UPK report. In recent years the team has been engaged in the large-scale Fixing Houses for Better Health ATSI-funded project. It has also been responsible for preparing a national Indigenous housing guide (Healthhabitat, *The National Indigenous Housing Guide: Improving the Living Environment for Safety, Health and Sustainability*, 1999).

5 Currently 253 checks and tests are carried out on each house. These specific function tests have been developed through the Housing for Health and Fixing Houses for Better Health projects.

6 These healthy living practices (HLPs) were first defined in 1985 for the UPK environmental health review completed in Central Australia. This report featured nine key HLPs that have been constantly updated since. In 1999, Safety—meaning all urgent life-threatening safety issues—was formally added to the list as the highest priority HLP.

7 Data are from the ATSIIC funded Fixing Houses for Better Health (1) project 2000–2002, and include approximately 200 houses each from WA, NT, QLD and SA. NSW also participated in the project but final data was not available at the time of writing. The project involved a cycle of survey and fix work, or what were called Survey-Fixes.

8 These categories represent a compendium of responses encountered over 18 years of conducting surveys on poorly performing houses for Indigenous people. The sources for such responses have ranged between government officials and tradespeople.

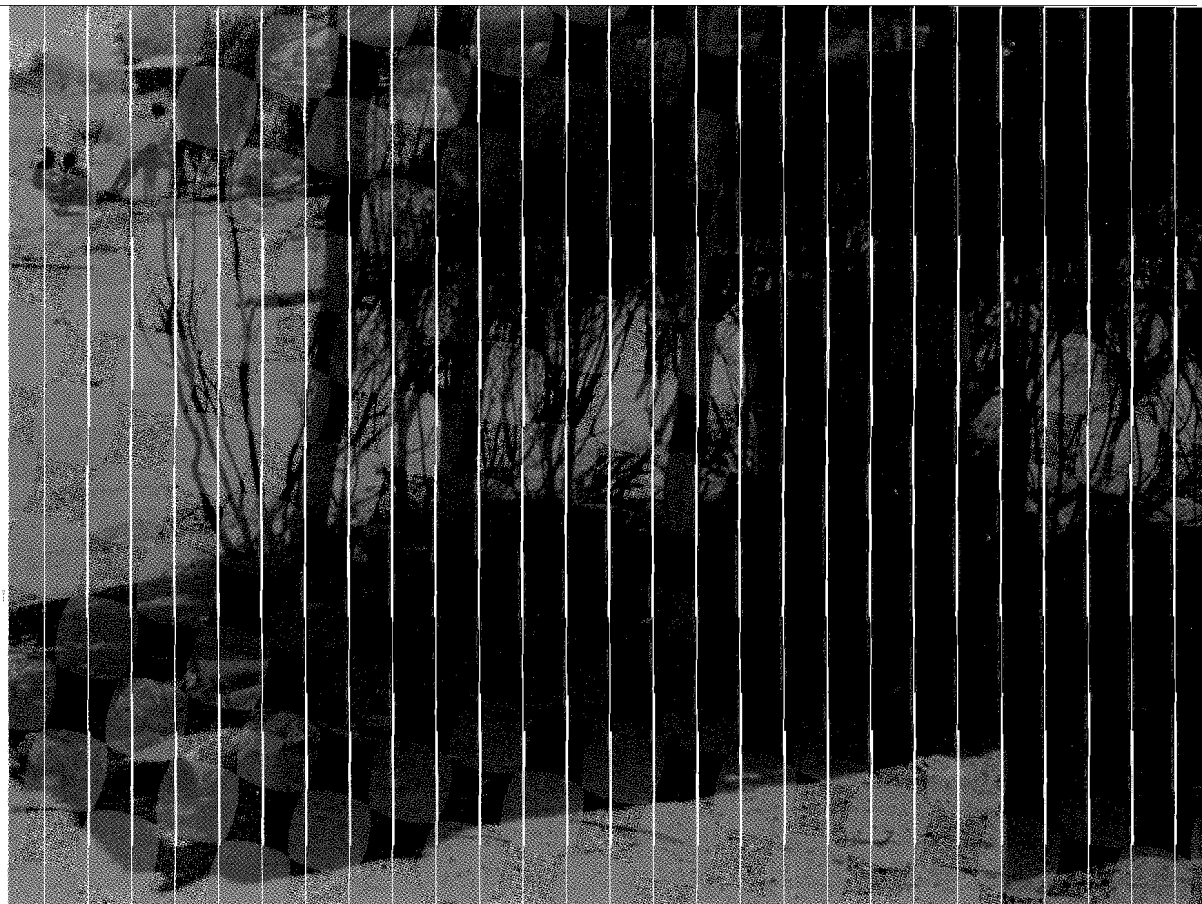
9 Data are from the Fixing Houses for Better Health (1) project 2000–2002.

10 Data are from the Fixing Houses for Better Health (1) project 2000–2002.

11 Data are from the Fixing Houses for Better Health (1) project 2000–2002.

12 Data are from the Fixing Houses for Better Health (1) project 2000–2002.

13 Healthabitat, The National Indigenous Housing Guide, 1999



Housing Design Principles from a Study of Warlpiri Women's *Jilimi*
Catherine Keys

Many involved in the provision of housing to Aboriginal people in Australia have argued that their culturally derived domiciliary practices are not successfully accommodated in European or Western house designs and settlement plans. These arguments have been made in terms that are often too general and lack the support of community-specific examples from which architects, designers and social theorists can learn. In an effort to contribute some detail to this picture, as it pertains to Warlpiri women living in Yuendumu in Central Australia, this paper will examine some design principles that have been derived from a close analysis of the social and physical properties of their jilimi, or single women's camps.

First I shall introduce readers to Yuendumu, and discuss my doctoral research undertaken between 1994 and 1999, and its examination and documentation of Warlpiri women's jilimi. Then I will consider the findings that concern the social and physical properties of jilimi in terms of some design problems involved in providing women with appropriate housing. This discussion will illustrate the complexity of the culturally derived domiciliary environments built and used by these single women and the spatial and social properties associated with them, as well as some of the culturally derived beliefs determining domiciliary behaviour.

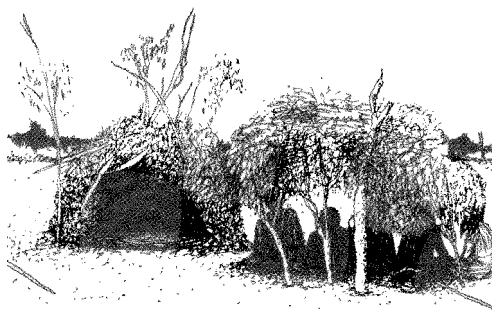
Warlpiri People and Yuendumu

Yuendumu, situated 290 kilometres north-west of Alice Springs, is a large Aboriginal settlement whose population in 1998 numbered approximately 1,000 people. Indigenous people living at Yuendumu belong to a language group called Warlpiri and occupy the southernmost part of its territory. The settlement was established in May 1946, when a group of about 150 Warlpiri speaking people were brought by the missionary Francis McGarry to a place in the vicinity of the government drilled Rock Hill Bore, where some 200 Warlpiri people were already camped¹. It was intended as a short-term training and assimilation centre for the area's Aboriginal people, preparing them for 'integration' into European centres like Alice Springs².

Since before the period of contact with non-Indigenous settlers, Warlpiri people have organised their societies into three distinct domiciliary groups. These are the yupukarra (married or family camps) containing a man, and his co-wives and children; jilimi (single women's camps) containing women, girls and very young boys; and jangkayi (single men's camps) containing older men and/or adolescent men and boys. A person's residency within, and access to, these very different groups changed over their lifetime and depended on gender.

Pre-contact Warlpiri people used four distinct ethno-architectural structure types to create their living environments; these were the yunta (wind-break), the malurmpa (bough shade), the yama-puralji (shade tree) and the yujuku (enclosed shelter) (see Figure 1). Almost all Warlpiri people living in Yuendumu in the 1950s continued to live in self-constructed living environments and abide by the rules of traditional domiciliary practice. Their camp locations, some distance from the European housing settlement, facilitated this level of social independence³. However, between the 1950s and 1970s, public concern and the government's policy of assimilation resulted in transitional housing⁴ being built for the Warlpiri. The designs were based on an Anglo-Australian family model consisting of one man and woman, and two or three children, but were then allocated to Warlpiri married people whose families consisted of one man and several women, and their children and other relatives. The domiciliary needs of residential units made up of single men or women were largely ignored because they fell outside the domiciliary model assumed by government agencies⁵. While the 1980s witnessed various experiments with different housing types, by the early 1990s Warlpiri women were campaigning for houses designed specifically for groups of single women. I carried out my research on jilimi in the context of this new potential housing type.

Figure 1 Drawing of a domed Warlpiri yujuku (enclosed structure) (left) and malurmpa (shade structure) (right) based on a photograph taken near Coniston Station by Michael Terry in 1928. [Source: Keys 1999, Fig.15. Artist: C. Keys.]



Jilimi Occupants

Warlpiri people at Yuendumu continue to live in three distinct domiciliary groupings. I documented 32 examples of jilimi in this settlement and found that '[t]he social relationships between jilimi residents reflect the complex nature of Warlpiri kinship patterns and social organisation based in Warlpiri religion'⁶. The highest proportion of jilimi occupants were aged widows, many choosing to live in groups with more than three members and some simply pairing off with other widows. A smaller proportion of jilimi were occupied by women from several generations. Only two camps were found to be the exclusive, primary living environments for young women and children. Apart from sheltering women after their frequently older husbands had passed away, the situations precipitating a jilimi's occupation ranged between childbirth and post-natal recovery, and waiting out a separation from an absent husband. Married women often visited the jilimi of related women during the day and some co-wives resided there while a husband's other wives lived with him.

Types of Jilimi and their Properties

I found that spatial arrangements particular to jilimi living environments were created in association with houses, verandas, yards and sorry camps (mourning camps)⁷, and included various combinations of the four main ethno-architectural structure types. A quarter of jilimi were established in and around houses in varying states of repair that accordingly provided their occupants with a range of highly sought after services, such as cooking and ablution facilities, and power for household appliances. Veranda and yard areas were occupied in conjunction with the interior spaces of these houses, so social activities and sleeping occurred in bedrooms, on verandas and in self-constructed shelters in the yard depending on weather conditions, the number of occupants, and the degree of social tension existing between household members. Aside from core residents, I found that houses with operational services were heavily utilised by jilimi guests and visitors.

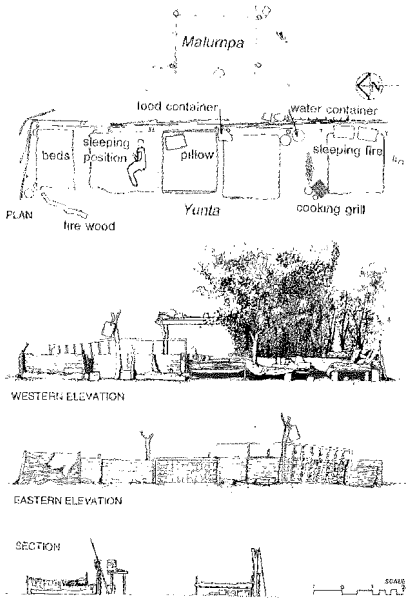


Figure 2 A plan, sections and elevations describing a Warlpiri yunta in a jilimi (women's residence) that was documented during May 1994 in Nyirripi, a settlement located approximately 350 kilometres west of Alice Springs. [Source: Keys, 1999, Fig.41. Artist: C. Keys.]

lived in and around their self-constructed built environments. Water and other amenities had to be accessed elsewhere, at great inconvenience.

The largest numbers of jilimi were found in multi-faceted sorry camps, which were located on the outskirts of Yuendumu. Occupied on a shifting basis, these mourning camps were distant from housing and had very limited services. Their populations peaked following a death when large numbers would occupy them. These people would gradually return to their houses in Yuendumu over a period of weeks or months. As there were no other forms of shelter available, ethno-architecture was most widely used in these jilimi settings, the sparse vegetation of each site necessitating the importation of building materials.

Externally Oriented Living, Visual Surveillance and Feeling 'Safe'

The ability to visually survey social and environmental conditions was highly valued by Warlpiri women and carefully considered when they constructed living environments. The essential difference between the living environments that Yuendumu women constructed themselves in sorry camp settings and the houses supplied to them was that the former supported a lifestyle with a predominantly external orientation, while the latter were designed to support an internally focused one. The externally oriented ethno-architecture associated with jilimi maximised the opportunity for their occupants to conduct visual surveillance of the surrounding scene.

All self-constructed living environments, particularly those in camp settings, had at their core a central, general activity area. To the east were placed structures used for night-time living. These were the yunta and yujuku and they were oriented along a north-south axis providing a low solid wall to the east. This wall defined the eastern boundary of a single women's camp and openings faced west. As one moved from the solid wall to the general activity area of the camp, space became less personalised. The ethno-architecture used to create daytime living environments, the malurmpa and the yama-puralji, were located on the western side of the general activity area, served as a semi-transparent screen to the west, and defined that jilimi boundary (see Figure 3). Access into these pieces of ethno-architecture was usually from the east, but occasionally from the north and south.

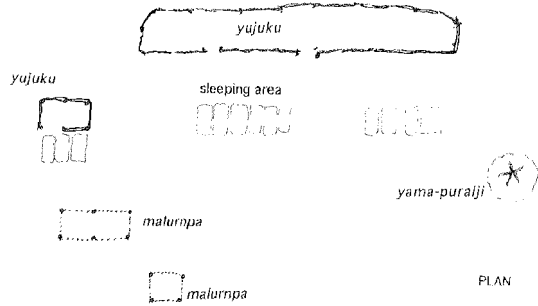


Figure 3 A plan showing the relationship between yujuku, malurmpa and yama-puralji within a Warlpiri domiciliary space. [Source: Keys, 1999, Fig.69. Artist: C. Keys.]

Moving from the eastern general activity area to the sitting area beside the western screen, space became increasingly personalised. While visual surveillance was unhindered from either the north or south, from the west and east a series of physical, social and human screens filtered its course. In contrast, the manner in which houses in Yuendumu had been designed, particularly their internal spaces, hampered women's efforts to see outside. It was impossible to conduct a visual survey because of solid doors and walls.

Visual surveillance of the sky and ground increased Warlpiri people's sense of security in their environment, and was vital to their ability to predict or analyse social and climatic conditions. Women told me that they felt safer when this behaviour was possible. The scale of mainstream Australian domestic architecture, being so much larger than Warlpiri ethno-architecture, prevents people from readily seeing between, over and behind houses from a fixed point. The Warlpiri women I interviewed were familiar with a range of house designs and frequently chose to occupy spaces that did not confine their practice of visual surveillance. Designs need to take this practice into account and recognise the importance of externally oriented domiciliary behaviour and living environments. For example, it is valuable to support older women's practice of sitting on ground or floor planes by designing sill heights accordingly.

I also ascertained from my research in Yuendumu that roof planes and tree branches were the most common storage places in camp environments. The height at which roofed ethno-architecture structures were built allowed the regular use of roof planes as storage spaces, while also permitting a standing adult to survey both the surrounding area and the stored items. A range of storage places for women was generally not provided in, on or around houses. Further to this, the need to visually monitor storage places that had been established was not accommodated by the house designs I analysed.

Climatic Considerations

The climate of the area in which Yuendumu is located is characterised as hot-dry, however, the winter months produce very uncomfortable living conditions as cold temperatures combine with strong winds. Winds blow predominantly from the east and the largest falls of rain occur in the summer months, a period

characterised by extremely high temperatures and large diurnal temperature ranges. So it can be argued that the passive climate control mechanisms to be implemented in a Yuendumu house design should involve both heating and cooling strategies⁹.

When building, I found that Warlpiri women themselves were readily able to make their living environments respond directly to desert conditions. Their designs directed wind around or through self-constructed shelters, depending on the heating or cooling result desired, or wall and roof planes were positioned according to the movement of the sun (see Figure 4). While the settlement's houses have been largely unsuccessful in passively responding to the area's climate, Warlpiri ethno-architecture was found to provide solutions to a range of conditions. It would therefore be useful to inform house designs with some of the features found in ethno-architecture. For example, as trees have traditionally been an important source of shade and become a focus of women's daytime activities, it is essential that the location of houses be considered in relation to them.

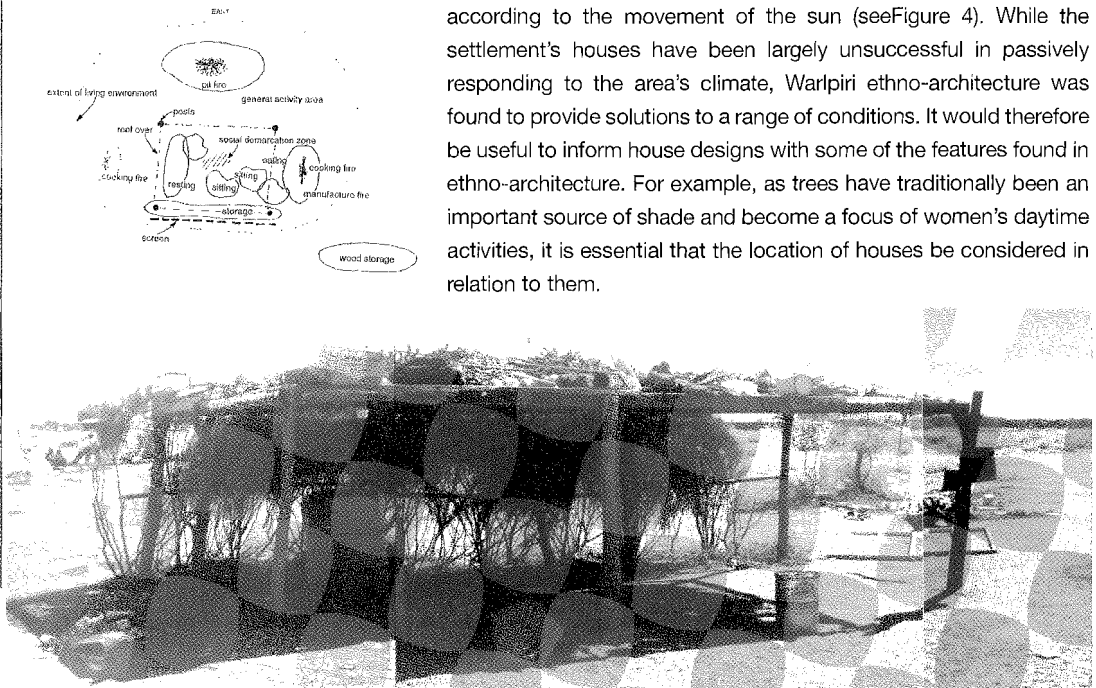


Figure 4 A photograph and spatial diagram describing a malurpa or bough shelter documented in Yuendumu during 1997. [Source: Keys, 1999, Figs.57 & 58. Photographer & Artist: C. Keys.]

The ventilation of cooking spaces is another important aspect of the climatic design of self-constructed living environments. Depending on the age of residents and the time of day, some cooking smells were considered dangerous to people's health. Culturally specific beliefs about the strength of cooking fat and smells make it important to separate well-ventilated kitchens from those rooms used for sleeping. A safe living environment would not expose residents to these potential dangers. Warlpiri women's ethno-architecture filters the climate, and supports culturally specific beliefs and behaviours in a multitude of ways. This brief discussion suggests areas for subtle design investigation when considering future houses.

Housing Location Supporting Social Responsibility

Traditionally, the location of camps reflected the occupants' married status, with yupukarra being located centrally, jilimi located to the west and jangkayi located to the east. The fieldwork I conducted in Yuendumu established that jilimi were located near the houses that belonged to closely related family members, like married children. The nature of this association differed between sorry camps and the other established housing areas of the settlement. In sorry camps, where people had control over where they located their living environments, I noted that yupukarra tended to form satellites around large single women's camps. This pattern contrasted with jilimi being clustered around a number of houses occupied by families with a direct kinship link to their occupants. I suggest that appending single men's and women's houses to existing clusters of family houses would accommodate the larger familial groupings that are an integral part of Warlpiri domiciliary behaviour.

A primary reason for women in Yuendumu changing their residential location was the dictates of Warlpiri law,

which necessitates house desertion following a death. Women's houses that were abandoned in such a manner were allocated to an appropriate family member, usually an uncle. A design philosophy that fails to recognise that over the course of its life a house will be occupied by groups with very different complexions is at odds with the reality of Warlpiri customary practice. If several clusters of houses were designed to include *jilimi*, *jangkay* and *yupukarra* it would be possible for entire family groupings to fulfil their obligations under customary law and swap residential locations within a community. It is important that any new dwelling is considered in relation to its wider role among a grouping of nearby houses.

Cultural Change and Social Identity

Warlpiri people living in Yuendumu in the 1990s met their domiciliary needs by combining features of Aboriginal and non-Aboriginal living environments and material culture. The people themselves describe this practice as living in two ways—respectively *yapa-way* and *kardiya-way*. As an example of *yapa-way*, I noted that in periods of fine summer weather people would set up their bedding and television under the stars and in cooler weather they would retreat under the roof of a veranda, making small fires on metal sheets to keep warm at night (see Figure 5).



Figure 5 A Nomad house positioned alongside a Warlpiri *jilimi* in May 1987. [Photographer: P. Memmott. Source: AERC, University of Queensland.]

From a close examination of the spatial planning that characterises *jilimi*, one might conclude that a Western style house has no real place in a central Australian Aboriginal settlement, but this concern is not shared by Warlpiri women themselves who were generally united in wanting proper white-fella houses. This desire relates to issues of cultural change and social identity. Also the experiences of co-residents may differ considerably and result in widely variant ideas about what constitutes an ideal house. For example, I found during my 1990s research that Warlpiri women had become highly sensitised to mainstream media coverage that portrayed their living environments as substandard. I ascertained that they wanted houses, which conformed to the visual and functional properties of those found throughout all Australian towns and cities. Houses made of concrete block were considered to be proper white-fella houses, while a house with an identical floor plan and features, but constructed with insulated sheet metal wall panels, was considered a rubbish house. The appearance of steel-clad houses was directly associated with earlier, substandard sheds that had been provided to the community as housing. This preference was strong, despite the fact that the steel house probably performed better climatically.

It is important that architects and designers acknowledge the many ways Warlpiri people live, and are sensitive to people's aspirations in terms of what constitutes a proper house. Little is known about precisely

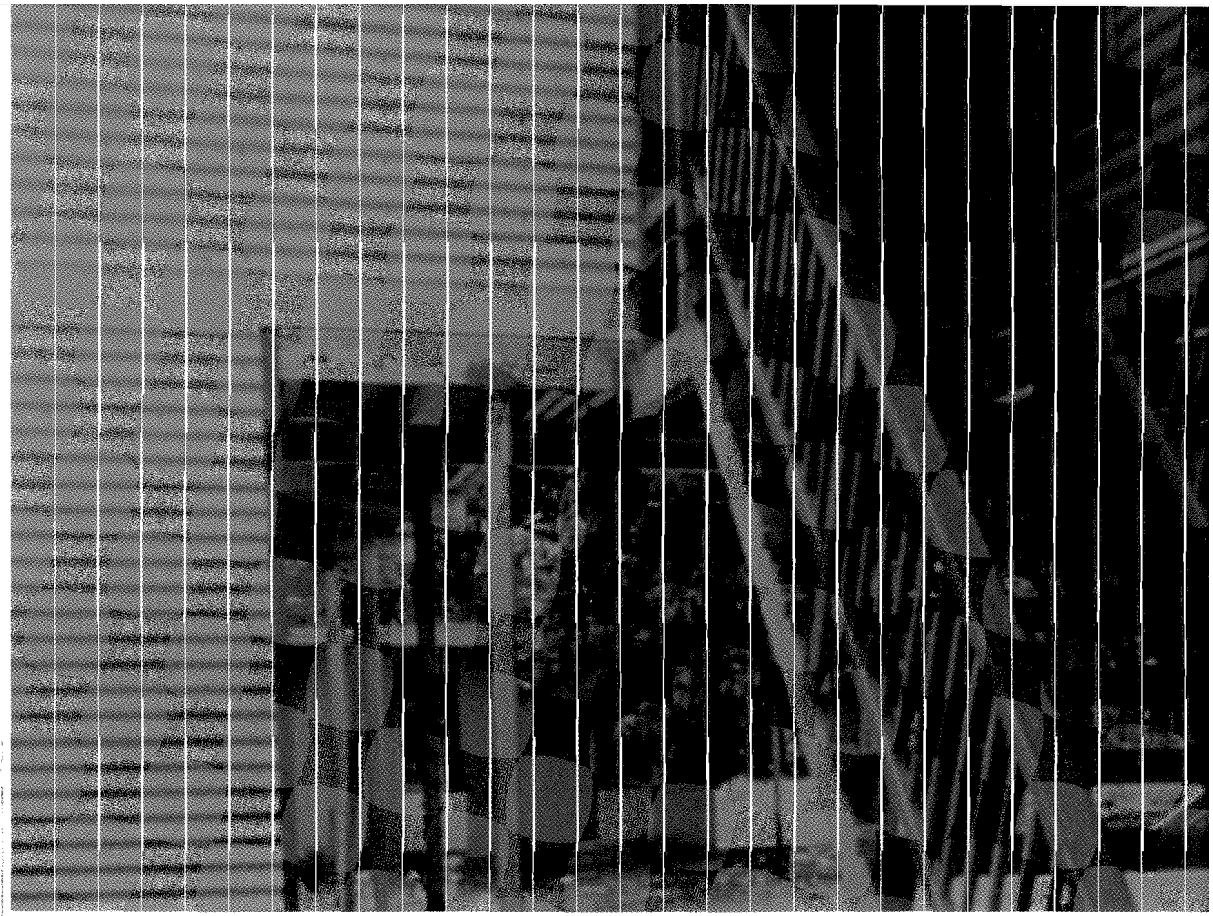
what women identify as the essential qualities of a proper white-fella house and further investigation is warranted because such ideas impact greatly on the housing choices they make.

Conclusion

The preceding discussion has put forward a number of general design principles, which were formulated in response to the Yuendumu women's domiciliary beliefs and behaviours I researched. Little is known about the degree to which contemporary houses succeed or fail in meeting women's domiciliary needs, and the question requires further investigation, through such mechanisms as post-occupancy evaluation. Housing provision teams, including architects and designers, persisting with the assumption that Warlpiri women occupy houses and settlements in an Anglo-Australian way will only create more socially and physically unsatisfactory houses.

Endnotes

- 1 O'Grady, F., *Francis of Central Australia*, Sydney: Wentworth Books, 1977, p.111.
- 2 Dept of Territories 1963: p.12 in Tatz, C. M., 'Aboriginal Administration in the Northern Territory of Australia', PhD Thesis, Canberra: Australian National University, 1964, p.12.
- 3 Keys, C., 'The Architectural Implications of Warlpiri Jilimi', PhD Thesis, Brisbane: Department of Architecture, University of Queensland, 1999, p.68.
- 4 The government of the time envisioned that this kind of housing would serve as the setting for Aboriginal people's transition from 'primitive nomadism to western urbanism (and its concomitant culture and values)' (Tatz, 'Aboriginal Administration in the Northern Territory of Australia', pp.141, 142). Various types of houses would be provided in stages, so as people became accustomed to living in permanent structures they would be given larger, more complex houses. Refer to the Wigley & Wigley contribution to *TAKE 2* and to Chapter 2 section 2.4 of my doctoral thesis (1999) for more information on transitional housing.
- 5 Keys, 'The Architectural Implications of Warlpiri Jilimi', p.84.
- 6 Keys, 'The Architectural Implications of Warlpiri Jilimi', p.129.
- 7 Refer to the Wigley & Wigley contribution to *TAKE 2* for a definition of the term sorry camp.
- 8 Keys, 'The Architectural Implications of Warlpiri Jilimi', pp.126-127.
- 9 Keys, 'The Architectural Implications of Warlpiri Jilimi', p.34.



Yolngu¹ Cultural Imperatives and Housing Design:
Rumaru, Mirriri and Galka
Shaneen Fantin

Between 1997 and 2003 I worked as consultation and design architect on three National Aboriginal Health Strategy housing and infrastructure projects conducted at Galiwin'ku and Ramingining in north-east Arnhem Land, and undertook fieldwork for my PhD thesis². Whilst undertaking these projects I found that many Yolngu householders were interested in ways of incorporating particular cultural imperatives into the design of their living environments. A collaborative design process was established that supported the inclusion of Yolngu beliefs and behaviour patterns, which other provisions of housing had previously inhibited. In this paper I will focus on avoidance laws and their associated behaviours, as well as sorcery, beginning with an overview of both topics. I will then move on to discuss what implications these cultural imperatives have for the design of Yolngu living environments. The architectural issues I consider include the accommodation of visual surveillance, access to houses and yards, landscaping, lighting, ablutions design, and security. At the close of the paper I identify some contradictions between design outcomes, resulting from consideration of avoidance laws and sorcery beliefs, and certain elements of various environmental health guidelines currently in use.

In the context of this paper, cultural imperatives should be viewed as prescribed rules or customs perceived by a group as an essential part of their system of beliefs and social identity, and as necessary for the continuance of their culture. The cultural imperatives of the Yolngu discussed in this paper comprise avoidance laws and behaviours (rumaru and mirriri) and beliefs in sorcery (galaka). This is only a small sample of Yolngu cultural practices³ that have implications for the design of living environments, but it highlights the significance of understanding the relationship between cultural beliefs, behaviour and design.



Figure 1 A house designed and constructed during the first stage of ATSIC's National Aboriginal Health Strategy project for the Ramingining Aboriginal community in north-east Arnhem Land, 1999. [Architects: Troppo Architects Pty Ltd. Photographer: S. Fantin.]

What is Yolngu avoidance behaviour?

Yolngu avoidance law consists of a set of culturally prescribed rules governing behavioural relations among kin, which when broken can create stress and conflict. Avoidance law is of prime importance to Yolngu in terms of control of their living environments and finds expression in how they occupy and use dwellings.

For the Yolngu, avoidance behaviour is best described as a form of strictly choreographed, ritualised respect between parties⁴ that manifests itself in people avoiding each other through their physical orientation, spatial distance, and visual and verbal behaviour. In its most extreme forms, avoidance behaviour requires parties not to look at or speak to each other and to take long spatial detours around settlements to avoid one another. Violation of such prescribed behaviour patterns may cause shame, fear and anger, and sometimes lead to violence. Avoidance relationships are sometimes colloquially called poison relations⁵.

Of the 18 avoidance rules that Yolngu acknowledge⁶, the relationships between brothers and sisters, and mothers-in-law and sons-in-law, require the strictest behaviour patterns and are easily observed in everyday environments. The relationship between mothers-in-law and sons-in-law — and many other kin connected through one's mother-in-law — is called rumaru, whereas the relationship between brothers and sisters is identified as mirriri. Mirriri is described by Burbank⁷ as 'a ritualised form of aggression in which a man throws spears or otherwise attacks his sisters on violation of brother/sister etiquette, particularly its avoidance components.' In contemporary societies men no longer spear their sisters but do become angry and threaten violence if their sisters transgress social laws, such as using a toilet or shower in their brother's aural or visual range.

One of the strongest characteristics that defines Yolngu avoidance relationships is respectful restraint. In

rumaru relationships, people act in a particularly respectful way toward one another with regard to language usage and spatial orientation. When communicating with one another, people will avoid direct eye contact or speak through a third party in a linguistic style particular to avoidance relationships⁸. Most rumaru relationships require that a generous spatial distance of over three metres is maintained between parties at all times⁹.

Generally, it is not acceptable for any avoidance relatives to touch one another or each other's personal belongings such as clothes or hunting equipment. As such, they will not sleep in the same room together, unlike women who are sisters, or parents and their young children¹⁰. Usually avoidance relatives live in separate dwellings, but if they are in the same dwelling, which sometimes occurs when women live with their daughters and sons-in-law, they always sleep in separate spaces.

With regard to the brother/sister relationship, it is taboo for a man to hear or see any reference towards his sister's bodily functions or sexual actions, either directly from a sister or from others discussing her in conversation. If a man were to hear or see such things, this would incite his anger and potentially lead to acts of violence called miriri. This form of auditory and linguistic avoidance does not apply to avoidance kin associated with the mother-in-law.

Galka: sorcery and security

Families at Galiwin'ku and Ramingining express varying degrees of concern about the potential danger of galka. They describe galka as a fear of people or spirits who intentionally cause harm to others. In the anthropological literature on Aboriginal Australia, galka corresponds to sorcery¹¹. Concerns about galka emerged in discussions I had predominantly about yard and landscape planning, fencing, exterior lighting, access points into the house and yard, and laundry and toilet security.

There are two main categories of sorcery: that of specialist sorcerers and that which every person is potentially capable of performing¹². The latter type manifests in various forms of singing and imaging of potential victims in which excrement, soiled clothing, or a trace of a victim—such as a track, imprint of action, or bodily fluid—are used in a ritual to make that person unwell¹³. The use of such personal effects in sorcery has implications for yard and house security, because when Yolngu fear the actions of galka they may experience chronic stress and sometimes debilitating illness.

Yolngu fear sorcery when they or a member of their clan have transgressed Yolngu law¹⁴. The members of Yolngu society who are most likely to suffer from galka-related stresses are men aged 30 to 45¹⁵. Men in this age range are often the ceremonial and social leaders of their clan group; they are the mediators of inter-clan conflict and have many responsibilities with regard to land and the management of ceremony. These roles, and the animosity that the conduct of which can sometimes generate, can make the men targets for acts of sorcery.

Reser and Eastwell provide a number of case studies in which people suffering stress created by the fear of sorcery hallucinated about others prowling outside their house, or heard noises outside their house that they interpreted as galka waiting to kill them¹⁶. In some examples, the fear of falling prey to acts of sorcery was alleviated for the victim by their going to live at another family's outstation where security could be assured. Reid also provides examples of Yolngu describing how galka broke into a house to carry out a sorcery attack on their victim¹⁷. In another example, it was evident to Yolngu that the death of an older woman was due to her missing skirt and underpants having been stolen and burnt in hot rocks in the sand. This led to her having extreme abdominal problems and eventually dying.

Sorcery is both an implicit and explicit part of Yolngu culture. To pretend it does not exist devalues the richness of Yolngu culture and the socio-medical knowledge that accompanies it. I propose that designers and housing consultants need to recognise that galka is a concern, and that they can respond by trying to

design living environments in collaboration with Yolngu to alleviate the potential psychological stresses it can create.

Some design implications of avoidance behaviour and sorcery

The following analysis is not intended to provide an exhaustive or prescriptive brief for designing housing that accommodates avoidance behaviour and sorcery concerns; it aims to discuss ways of approaching such cultural practices in design. It is important to note that the design implications of each cultural imperative can either complement or contradict one another and juggling them is a necessary part of the design process.

Visual surveillance, access, landscaping and lighting

In order to carry out avoidance behaviour respectfully, pre-empt potential avoidance situations and control security in and out of houses and yards, Yolngu people employ visual surveillance over long distances and in a wide peripheral arc. Visual surveillance is not only used for observing avoidance kin, but is a critical behaviour that impacts on all aspects of living. Maintaining it over one's environment ensures that the immediate actions and traces of other humans and animals—their tracks and other signs of their activities, or remnants of their body fluids—can be observed. Bodily fluids can be used in sorcery, particularly those forms that everyone can carry out such as singing and imaging.

About a third of the 41 households at Galiwin'ku and Ramingining consulted about galka were concerned with minimising the number of possible entry points into a house, and ensuring that all openings were protected with security screens. However, I found that a contradictory imperative was to provide a variety of access points in and out of dwellings to ensure easy escape from avoidance relatives. This was coupled with a need for visual surveillance to occur unhindered, enabling signing behaviour¹⁸ to be carried out from inside a building. I have observed Yolngu people sitting on the floor inside houses adjacent to windows signing with their hands to people across the road or in the yard. Yolngu said they often leave the front door of their house open so that they could sign to people outside if required and warn relatives of an approaching avoidance relative.

Fitting security screens not only relates to preventing unwanted entry into dwellings but also stops intruders from reaching inside the house and removing personal items that could be used in sorcery. Many Yolngu slept and sat on the floor in living rooms, which opened onto veranda spaces. If the windows between these spaces allowed for prowlers to touch people's hair or body, then they were considered insecure. However, standard window-sill heights of 900 millimetres hinder views from a sitting or lying position. Depending on the Yolngu family and client with whom one is working, a balance or prioritisation of preferences needs to be established between the design requirements of security for galka, and flexibility of movement for avoidance practices.

Dwellings designed for Yolngu should contain enough separated living and socialising spaces—such as verandas, yards, and living rooms—for people in avoidance relationships to occupy those in the same building without creating stressful situations. The polygynous nature of Yolngu marriages means that a man may find himself living with several mothers-in-law simultaneously. In consideration of this, a dwelling needs to be flexible in a way that allows visitors and avoidance relations to comfortably co-exist without causing stress. In north-east Arnhem Land, this particularly applies during the wet season when people can be forced to spend long periods inside dwellings. Providing at least one living/sleeping space in a dwelling that is clearly separated from other living/sleeping spaces by other functions, and that has multiple points of access and entry to it, might alleviate the cramped feelings experienced during the wet season.

With regard to galka, controlled landscaping around houses and in yards can improve the conditions for visual surveillance of entry points into the house and of the yard in general. Many Yolngu proposed having sand deposited around their house, which they said recorded the tracks of intruders, was comfortable for

sitting on, and useful for creating external hearths. Some Yolngu requested the exclusion of any low shrubbery or vegetation screens from the perimeter of the house, because it might hide intruders or harbour snakes and other vermin. Nearly all Yolngu requested fencing of some description to control roaming people and animals, particularly at night. Existing Yolngu houses at Galiwin'ku were lit from the outside at night so that approaching people would be seen from inside the house. Housing recipients of the NAHS programs also requested lighting in yard areas that were not sufficiently lit by veranda lights.

With regard to the distance between houses, Yolngu sometimes preferred to be physically more distant from their avoidance relatives than from other relatives. They indicated that they were happy to have dwellings close together (less than 10 metres apart) if their neighbours were close kin such as children or siblings. However they requested greater distance between dwellings when their neighbours were more distant kin, for example, cross-cousins. An awareness of preferred Yolngu yard boundaries with regard to different kin

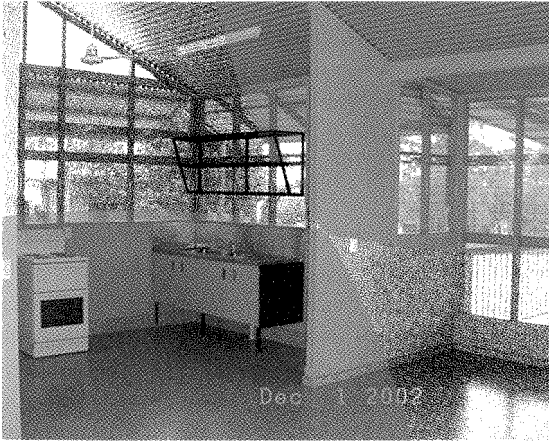


Figure 2 A kitchen and living area in a house designed and constructed during the second stage of the National Aboriginal Health Strategy project for the Galiwin'ku Aboriginal community in north-east Arnhem Land, 2002. [Architects: Troppo Architects Pty Ltd. Photographer: R. Layton.]

is also relevant because the edge of a yard for an approaching avoidance relative might be more distant than that for a parent, grandparent, same gender sibling or child.

Avoidance, security and wet areas

The spatial rules for the brother/sister relationship require that men should not see, hear or smell anything in regard to their sisters' bodily functions and sexual behaviour, or conflicts with her husband. If relationships between brothers and sisters are to be carried out respectfully they should also not see or touch each other's personal belongings. One appropriate design outcome might be separate lockable storage areas associated with separated sleeping and living areas for

different kin. For example, brothers may be able to share storage areas with other brothers but brothers and sisters or people of opposite gender generally prefer not to do so with personal items. I observed that communal storage areas in houses, such as pantries or cupboards located in social spaces, were not used because they were not the designated responsibility of one person or sub-group in a house.

Living in the same dwelling as one's brother or sister can be difficult, particularly if there is only one toilet centrally located to all sleeping and living areas. The following design considerations should be applied in relation to ablutions and avoidance behaviour:

- Arranging the toilet and bathroom so that they have multiple access points, enabling women to access toilets from two alternate directions if needed and maintain visual privacy from their brothers;
- Ensuring that access to ablutions is not directly off a social living area;
- Ensuring that sounds and smells are insulated in ablution areas and will not travel to other areas of the building;
- Ensuring that multiple ablution facilities are separated in different areas of the house and yard, rather than being stacked together in one place. This issue is important not only for mirriri, but because toilets are more likely to be maintained if they are associated with one or two sleeping spaces and the responsibility of a particular person or sub-group in the house.

The design of wet areas also needs to consider Yolngu behaviours in response to galka. Excrement and soiled clothing can be used in sorcery to make victims ill¹⁹. At Galiwin'ku many houses had laundry spaces, which were externally oriented or underneath elevated houses. The residents of these houses indicated that the security of the laundry spaces was inadequate because intruders could steal personal items for use in

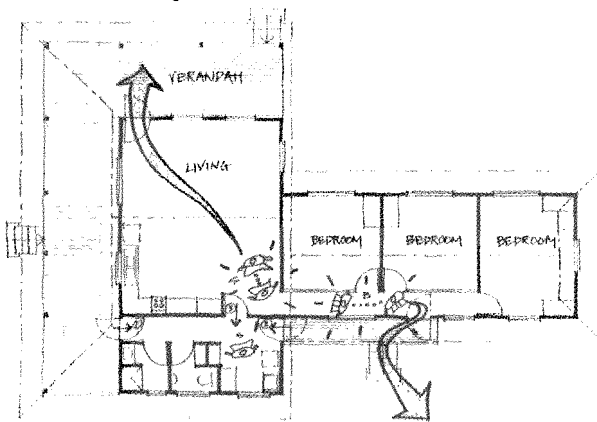
sorcery. Yolngu at Galiwin'ku rarely left their clothes or bedding to dry on a clothesline overnight, or unobserved during the day, for the same reason. Therefore laundries, showers and toilets need to be secure from intruders in Yolngu houses.

The application of design considerations for ablutions-related avoidance affects the location of public amenities blocks and also applies to groups of buildings. When ablution blocks were centrally located between houses and were in full public view the toilets were rarely used by Yolngu women because they feared being seen by their brothers. They were also not used at night because of sorcery and spirit fears. If public amenity blocks are deemed appropriate and necessary in a Yolngu community, then they should be sensitively located in well-screened locations with multiple access points.

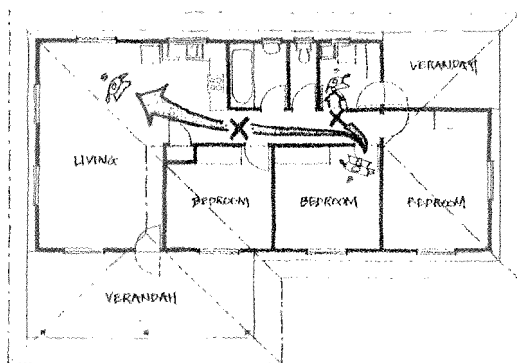
Many elderly Yolngu complained about having to go outside at night to go to the toilet. They said they were afraid of leaving the house at night if it was dark outside and the path to the toilet not well lit. Generally Yolngu opted to have their bathroom spaces located within the envelope of the overall house²⁰. One resident explained that she preferred this layout because she could see who was using her toilet and shower, whereas if it were outside anyone could use it unobserved and potentially collect excrement for sorcery.

Obviously, sorcery and avoidance behaviour are not the only contributing factors to the design concerns presented above. Visual surveillance, access into houses and yards, and secure wet areas might also be responses to wanting security from violence (domestic or otherwise) and theft that may not be associated with galka, rumaru or mirri. In any case, these issues were raised as important design considerations by many residents at Galiwin'ku and Ramingining.

Figure 3 The avoidance rule between adult brothers and sisters in Top End communities and the implications for housing design. The two floor plans are recent houses at Nguiu. The top plan readily accommodates brother/sister avoidance behaviour in its design by reducing the possibility of 'running into each other', whilst the bottom plan does not. Note, in both plans, if the sister is sleeping in the living/kitchen room, her brothers cannot access the kitchen.



Plan A



Plan B

Contradictions in design needs and guidelines

The proposal of having internalised wet areas is counter to the recommendations of the National Indigenous Housing Guide²¹ and the Environmental Health Standards set for remote area Aboriginal housing in the Northern Territory²². Both documents recommend the separation of ablutions and laundries from other areas of the house to improve environmental health through locating potential waste hazards away from sleeping and living areas²³. This is often realised in designs where such facilities are situated outside houses or on verandas. When designing houses for Galiwin'ku residents, one must also consider the impact of concerns about galka on the use, security and surveillance of these areas. The challenge is to find solutions that meet the cultural needs of clients and also respond to the environmental health guidelines set out in various codes.

When designing in tropical environments such as north-east Arnhem Land, architects should aim to maximise air flow through spaces in order to keep people cool, and to avoid the added expense of air-conditioning. The placement of security screens over windows and doors can reduce airflow by up to 30 per cent, which has an effect on the comfort of people sleeping and living inside.

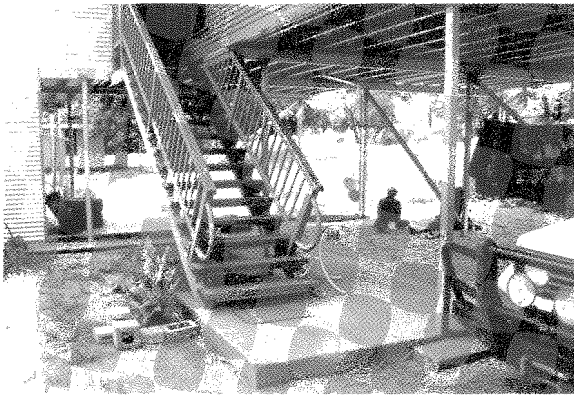


Figure 4 A living space created under a house designed and constructed during the second stage of the National Aboriginal Health Strategy project for the Galiwin'ku Aboriginal community, 2002. [Architects: Troppo Architects Pty Ltd. Photographer: S. Long.]

At Galiwin'ku residents were more concerned about nocturnal security than breeze flow and they tended to shut windows in the evening. Designers need to consider alternative ways of ventilating living and sleeping spaces and keeping residents secure at night. Working through these kinds of design issues with Aboriginal clients is essential to understanding and creating environments that respond to their particular needs.

Conclusions

This paper demonstrates the complex and often contradictory nature of the various design considerations that have to be juggled by all the relevant parties. While working on housing programs with

Yolngu I learned to ask them to prioritise their culturally driven or prescribed design needs. The cultural needs that they most emphasised and that raised widespread concern, I have termed cultural imperatives. I suspect that those discussed in this paper would be invisible to most non-Indigenous housing consultants and architects, as Yolngu beliefs in rumaru, mirriri and galka have no equivalents in Euro-Australian culture, which affect people's behaviour, as they do in Yolngu society. Designers working with Aboriginal communities have a responsibility to learn about and understand relevant aspects of these people's world-view. Such an approach is required if they hope to collaborate in creating culturally appropriate environments that satisfy their clients needs.

Endnotes

- 1 Aboriginal people living in the settlements of Yirrkala, Galiwin'ku, Milingimbi, Ramingining, and Gapuwiyak in north-east Arnhem Land use the term Yolngu to refer to themselves as distinct from non-Indigenous people whom they refer to as Balanda.
- 2 Fantin, 'Housing Aboriginal Culture in North-east Arnhem Land', 2003. My PhD thesis focuses on the relationship between Aboriginal beliefs and practices and their implications in housing design.
- 3 An extended sample of Yolngu cultural practices would include those connected to mortuary related beliefs, the effects of the natural environment on people's behaviour and kinship beliefs other than avoidance.
- 4 JG 13/4/99, HR 29/4/99 (These abbreviations are of Yolngu names and refer to discussions with specific Yolngu people. Their privacy is respected through the use of abbreviations.)
- 5 A number of arguments purport to explain why avoidance relationships occur in Aboriginal Australia. Anthropologists such as Warner (*A Black Civilisation: A Social Study of an Australian Tribe*, 1958) and Hiatt (*Kinship and Conflict. A study of an Aboriginal Community in Northern Arnhem Land*, 1965; and *Arguments About Aborigines: Australia and the Evolution of Social Anthropology*, 1996) have argued that these relationships exist primarily for the control of incest in Aboriginal society, although this is not expressed as such by Yolngu research assistants. Hiatt goes on to discuss the mother-in-law/son-in-law relationship using a Freudian psychoanalytic framework, suggesting that taboos are created by strong inclinations in the unconscious (*Arguments About Aborigines*, p.154). However, other contributions to the avoidance relationship discussion by Burbank (*Fighting Women: Anger and Aggression in Aboriginal Australia*, 1994) and Merlan ('The Mother-in-law Taboo: Avoidance and Obligation in Aboriginal Australian Society' in Merlan, F., Morton, J. & Rumsey, A. (eds), *Scholar and Sceptic*, 1997, p.114) emphasise the importance of familial obligation (particularly to in-laws), and acknowledge the existence of ritual etiquette in Aboriginal societies.

All of the scholars agree that avoidance relationships contribute to the social and behavioural maintenance of Aboriginal society.

⁶ Fantin, 'Housing Aboriginal Culture in North-east Arnhem Land', p.71.

⁷ Burbank, *Fighting Women*, p.151.

⁸ Yolngu people will generally avoid calling each other by name unless they are very close kin such as mother and child or same gender siblings. In avoidance relationships people should never call the other person by name or say their name in conversation to someone else. Instead, Yolngu use people's subsection names or kin-terms as alternative references for avoidance kin. See also Cooke, *Aboriginal Languages in Contemporary Contexts: Yolnu Matha At Galiwin'ku*, p.39.

⁹ However, there are certain rumaru relationships between less biologically close kin, such as mother-in-law's brother, that have a joking aspect allowing parties to be in close proximity and taunt each other in a friendly manner.

¹⁰ During fieldwork I recorded household composition data on over 50 houses and at no time were avoidance relatives recorded sleeping in the same space. Fantin, 'Housing Aboriginal Culture in North-east Arnhem Land', pp.160–161, 192.

¹¹ Detailed accounts of sorcery in Arnhem Land can be found in the work of Elkin (*Aboriginal Men of High Degree*, 1977), Warner (*A Black Civilisation*, p.183–212), Berndt & Berndt (*The World of the First Australians. Aboriginal Traditional Life: Past and Present*, 1964), Reid and Williams ('The Dangers of Surgery: An Aboriginal View', 1978), and Reid (*Body, Land & Spirit: Health and Healing in Aboriginal Society*, 1982; and *Sorcerers and Healing Spirits: Continuity and Change in an Aboriginal Medical System*, 1983).

¹² Reid, *Body, Land & Spirit*, p.84.

¹³ Warner, *A Black Civilisation*, pp.196–200 and Reid, *Body, Land & Spirit*, p.43.

¹⁴ Berndt ('Sickness and Health in Western Arnhem Land: A Traditional Perspective', pp.125–130) and Biernoff ('Psychiatric and Anthropological Interpretations of 'Aberrant' Behaviour in an Aboriginal Community', pp.145–147) indicate that sorcery can be avoided if people practise appropriate behaviour and social etiquette. They provide examples of measures that can be taken to avert the possibility of sorcery including: keeping away from places that are taboo, such as places associated with sickness or areas, which are sacred to other Aboriginal groups; protecting country and participating in relevant ceremonies to prevent other people breaking the law by trespassing and having unauthorised access or use of land; not eating food that is forbidden because of particular social or age related factors; and adhering to appropriate marriage rules, not taking sweethearts or stealing others' betrothed partners.

¹⁵ Reser & Eastwell, 'Labeling and Cultural Expectations: The Shaping of a Sorcery Syndrome in Aboriginal Australia', *Journal of Nervous and Mental Disease*, 169, 5 (1981): p.304.

¹⁶ Reser & Eastwell, 'Labeling and Cultural Expectations', pp.306–309.

¹⁷ Reid, *Body, Land & Spirit*, pp.37, 43.

¹⁸ Signing behaviour can involve an elaborate system of gestures and is widespread in Aboriginal Australia. These gestures are examples of alternate sign languages, which are distinct from the primary sign languages used to communicate among deaf people. It can be used in a number of situations, including when conversing at a distance, when speech is inappropriate, when there is desire not to be overheard, and for emphasis. Refer to Memmott's TAKE 2 contribution for a further discussion of signing behaviour.

¹⁹ See Warner (*A Black Civilisation*, p.199), Berndt ('Sickness and Health in Western Arnhem Land', p.128) and Reid (*Body, Land & Spirit*, p.43).

²⁰ Yolngu concurrently supported the idea of separating the wet areas from sleeping and living areas for environmental health reasons, but they reiterated the need for access to such spaces to be secure particularly at night.

²¹ Healthhabitat, *The National Indigenous Housing Guide: Improving the Living Environment for Safety, Health and Sustainability*, 1999.

²² Territory Health Services (THS), *Environmental Health Standards for Remote Communities in the Northern Territory*, 2001.

²³ Also refer to Pholeros et al, *Housing for Health: Towards a Healthy Living Environment for Aboriginal Australia*, 1993



Designing for Spatial Behaviour in the Western Desert
Philip Kirke

A Good Place to Camp

An obvious paradox confronts the architect who works with more traditionally oriented Aboriginal groups. Architects are concerned with the design of habitable structures, though usually more complex in type. Yet traditional Aboriginal culture, whilst having immensely sophisticated social and religious components, manifests an apparent simplicity in its aspirations towards built interventions in the environment.

The enormous practicality of the traditional desert shelter, the *wiltja* lies in its economy of means; pre-tensioned saplings achieve useful though modest spans using minimal material. The resulting form resembles a variation on the simple barrel vault, offering privacy, shade and shelter from the wind. However, very little else can be inferred from such modest structures, although the way in which they are grouped, originally according to family ties and social position, provides important information about interpersonal relationships and the rules governing them.

Individuals with whom I have worked have recounted their childhood memories of remote waterholes like Kunawarriti, as well as their first encounters with government authorities that were to lead to the 'final' removal of the last nomadic groups from their traditional lands. 'Final' that is, until the advent of the 1980s 'Homelands' movement when the flow out of the desert was reversed and significant camps once again flourished at traditional waterholes that had served people for tens of thousands of years.

What now exists is a hybrid. The architect who chooses to work in this unique environment is not involved in some attempt to recreate something long past—Aboriginal people need no help to build elegant and useful *wiltjas*. Neither should they be transposing a suburban model, something suggested by the occasional use of terms such as 'normalising' the infrastructure and housing 'serving' communities. Similarly, the drives toward standard, repeatable prototypes that are occasionally attempted by various agencies and authorities are, I suggest, premature in the extreme. We are involved in a creative act, one that is not yet played out.

The best architectural projects I have executed have involved a process built on friendship and enthusiasm, in which knowledge and ideas from both the Aboriginal client and architect have created something new: something neither party was able to envisage before they sat down around that great black iron pot of tea for days at a stretch. And during that process, an understanding of Martu law and the important impositions it places on the behaviour of individuals within the group, as well as the simple fact of what the people of these camps envisage life in a good camp to be about, must be teased out.

As the problem is approached in this way, camping overnight together at a variety of waterholes, gorges, bloodwood groves and other sheltering, life-supporting places, one overarching idea begins to take hold. The architect working in the Western Desert is engaged in the process of making a good place to camp. It is no coincidence that the word 'camp' is frequently heard in reference to the houses of particular individuals. 'That's so-and-so's camp'. What makes a good place to camp? After acquaintance with the Martu, certain things stand out. Some are not surprising, while others contradict common suppositions. They include the following key spatial issues.

Shelter

The desert *wiltja* offers only modest shelter from extreme diurnal temperature ranges, and given the availability of other contemporary forms of protection from extreme heat and cold, most Aboriginal people prefer to use them. The lightweight, transportable materials and methods of today, as with those of ancient times, seem to be the most expedient. So the construction of highly insulated, but very lightweight houses, has been largely adopted as the norm.

Relationships Between Individuals and Groups

Aboriginal society is highly regulated with regards to relationships between kin and they are subject to

sophisticated patterns of mutual obligation. An offshoot of this is the requirement that some individuals, such as mother-in-law and son-in-law have as little to do with one another as possible. Other relationships demand individuals operate close mutual rights. Accordingly, a clear understanding of who occupies any given house or camp needs to be gained by the architect as buildings are ultimately only shells in which relationships and events take place. Despite these complexities, the nuclear family and its immediate extensions remain central to Martu social structures and still form a solid basis for the design of housing.

Relationships to the Land (Ngurra)

Much has been made of the Aboriginal connection to land. It is partly expressed in the preference for spending much of the day and night outdoors. This having been accepted, our architecture has responded by attempting to make indoor spaces more outward looking and outdoor spaces more habitable. Living spaces have resulted, which open up on two or more sides to function, when required, as breezeways. Occasionally indoor living rooms are completely abandoned, instead outdoor areas have been fitted with built-in furniture, power points, and various screening devices to reduce the effects of wind, glare and dust, and to effect a degree of privacy.

Possessions

Traditionally, the storage of valued possessions was an issue for the Martu, with sacred and personal objects being temporarily stashed in a hollow tree at a camp. So too today, lockable rooms are considered highly desirable as safe repositories for valued possessions while an individual is away for extended periods at another camp.

Temporary, Periodical and Cyclical Occupation

The ancient, annual cycle of Law business that requires groups to move widely over and beyond their traditional country, as well as contemporary events such as football matches, continue a pattern of mobility across a home range that includes a well-known series of watered camps. Accordingly, even

the new 'permanent' settlements of the country, are only ever partially occupied at any given time. This places architectural edifices in a different light; they are places to camp.

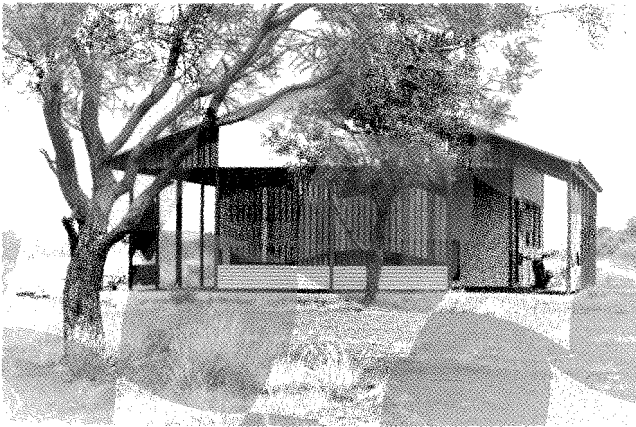


Figure 1 A photograph of a housing unit designed and constructed in 1998 for the Aboriginal community at Mount Divide Cattle Station in the Western Desert of Western Australia. [Architects: GHD Pty Ltd (Western Australian office). Photographer: P. Kirke.]

Mount Divide Cattle Station

At Mount Divide, I was invited to design suitable housing for the fluctuating population of Aboriginal workers, their families and visitors from neighbouring communities. The outcome was a housing unit with three double bedrooms for married couples, three single bedrooms, a communal kitchen, male and female ablutions and a very large covered outdoor living area. (see Figure 1)

The last space responds well to the Aboriginal preference for living outdoors. Built-in furniture provides lockable cabinets, power points, an aerial connection point, conduit and wire for satellite TV and video, as well as power points to boil a kettle conveniently next to the sitting areas. A central truss supports a folding, timber-slatted screen, which can be used to divide the space in two. This idea, initiated by an Aboriginal Elder, cleverly allows the space to function when occasional, forbidden combinations of kinship groups are staying over. Considerable discussion between the architect and client was held on the subject of required cultural separations between individuals, in an attempt to understand how it might be achieved spatially. The degree of separation required is subtle, meaning that a semi-transparent timber screen can provide a 'filtered' relationship

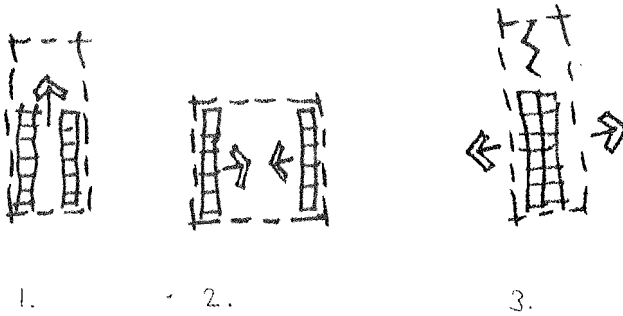


Figure 2 Diagram 1 describes the option wherein rooms would be arranged along a central corridor that fed into a communal area at one end. Diagram 2 describes an arrangement where two room wings are positioned to create a central covered breezeway that becomes a shared living area. Similar options have been regularly realised for small nuclear families and work well for the Martu at that social scale. However at Mount Divide, visitors were accommodated from a broader range of kin making forbidden (or avoidance) encounters likely. Diagram 3 describes the arrangement that was finally selected. Rooms are aligned back-to-back with circulation along perimeter verandahs feeding into a single, dividable communal area. The whole solution represents a simple device to manage complex socio-spatial structures. [Architects: GHD Pty Ltd (Western Australian office). Artist: P. Kirke.]

between the two divided halves of the space. As one gazes towards the horizon, the successive layers of undulating, timber screens create an ambiguous sense of depth. The occupants of each successive space and the landscape beyond are always in relationship, though it is carefully modulated.

Alternative arrangements of individual rooms in relation to circulation spaces were explored. The ideas of either using a central corridor or a communal covered outdoor space onto which all rooms opened were both rejected, as they would expose individuals to encounters with people they were prohibited from meeting. Though apparently simple, the solution of externally accessed rooms, two halves being accessible from each side of the building, was

selected by the client because it allowed a variety of arrangements when rooms are allocated, and alternative routes to and from those rooms, thereby overcoming the problems described above. (see Figure 2)

Camp Shelters at Parnngurr

When asked to solve the problem of houses being periodically overcrowded, I determined that a lateral solution was required. The brief originally called for existing houses to be extended with verandas to accommodate sharp periodic increases in resident numbers. A community of 70 will increase to 500 when Law, funerals or football matches bring the Martu from all over the desert to one community. During the initial design consultations the idea of designated nomadic camp shelters was suggested and readily supported as an alternative to overstressing existing houses that were heavily occupied. Spatially, a degree of separation between resident families and more distant relatives was identified as desirable. Only close relatives are likely to stay in residents' houses.

The scheme is a meditation on the rudiments of shelter, which were identified as protection from the sun, rain and wind, and the provision of privacy and somewhere to cook. The dune-like forms of the sunshade structures are reminiscent both of the wiltja and the landforms of the Western Desert. A series of free-form, curved and stabilised earth dividing walls permits an infinite array of options for occupying the spaces, depending on the size and configuration of visiting groups. In this way, the sheltered spaces may be occupied as a series of camps in the same way that natural topography offers a choice of places to camp, and may be exploited for privacy and shelter.

This scheme was never built in its original form. It was built in a far more modest, 'homestead' style, serving the practical but fewer of the poetic aspirations of the original.

The apparent paradox of creating architecture with and for Aboriginal groups with strong traditional ties resolves itself once the problem is engaged. We are engaging a new phenomenon, one with a rich past and an entirely unknown but important future. Good architecture will not result from posturing, either intellectual or aesthetic. Neither is there likely to be a single correct nor permanent prototype—an ultimate architectural destination. However an honest and open intellectualism and an aesthetic of the heart may well lead us to a good place to camp.



Outstation Design — Lessons from
Bawinanga Aboriginal Corporation in Arnhem Land
Simon Scally

This paper will summarise the lessons I have learnt during 12 years of working on housing and infrastructure projects for the Bawinanga Aboriginal Corporation (BAC) on outstations in the region of Maningrida, north-central Arnhem Land. Maningrida is located in the wet-dry tropics and road access is cut by floodwaters for up to five months during the wet season. BAC is an outstation resource centre, managed by an annually elected executive, and providing services that support approximately 750 people in 32 outstation communities located on their traditional clan estates, over an area of approximately 10,000 square kilometres¹. It coordinates a range of activities, from crocodile harvesting to banking, and provides infrastructure such as the supply and maintenance of water supplies, power and waste-water systems, roads and housing. BAC has a strong commitment to establishing infrastructure that is suited to its location, people's needs and the organisation's ability to maintain it. All its projects are developed in consultation with the end users.

Outstations, or homelands, differ from other Indigenous communities in three significant ways: they are often very remote and difficult to access; they are generally not serviced with reticulated services such as power and sewerage; and in their day-to-day lives residents see cultural traditions perpetuated. Ceremonial activities, hunting, fishing and customary land management are all regularly practised by residents. Traditional landowners and their relatives generally occupy outstations, with population numbers varying between one family and 50 or more. Residents obtain permission to live there from the senior traditional landowner.

The infrastructure needs of BAC's constituent outstations have changed substantially over the past decade. In 1992 the region experienced a chronic shortage of housing. Most residents lived in home-made shelters built from salvaged iron, fencing wire, bush poles, tarpaulins and bark, which had only dirt floors. Some people occupied the approximately 40 houses that were available. These consisted of two bedrooms, a breezeway and verandas, and were generally clad in steel sheeting. A small number were constructed from locally manufactured mud bricks. They did not contain toilets, showers or kitchens. There were only five water-reliant toilet and shower facilities in existence across the region, however, they had failed for a number of reasons including inadequate water supply, inappropriate use and lack of maintenance.

During the early 1990s, efforts were focused on improving the health of outstation residents through the provision of communal toilets and showers. By the end of this decade most outstations had at least one communal facility and new houses were being provided with their own. Around 45 new houses were built predominantly from locally manufactured mud brick. While overcrowding and a shortage of housing remain as problems in the region, a large component of BAC's work now involves the maintenance and upgrading of houses. BAC management has always been conscious of the importance and high cost of maintenance, and has actively developed and trialled low maintenance options for housing and infrastructure.

Lifestyle Issues

As my fellow TAKE 2 contributors and I have found, lifestyle issues can impact greatly on design decisions. For example, in these outstations food is generally cooked on open fires on the ground, and many attempts have been made to formalise these areas through concrete-rimmed hearths, steel barbecue plates being placed over concrete slabs, and the installation of slow-combustion stoves. The current model developed and used by BAC involves a covered area with a sand floor close to a fly-screened kitchen and food store. The location of this area is discussed with householders during the design process. The simple sand floor caters for the variety of cooking styles employed, from a small surface mud-crab fire to a large, deep coal wallaby fire. It is easy to rake out and keep clean. One result of traditional cooking methods being employed is that very little fat and grease empty into the sewerage system of houses.

BAC has also developed and trialled a small on-site wastewater system. It suits outstation needs and can be serviced without specialised skills or equipment. Transpiration beds are planted out with bananas, pawpaws and other fruits. (see Figure 1, following page) (For more information, see Glen Marshall's reports.²)

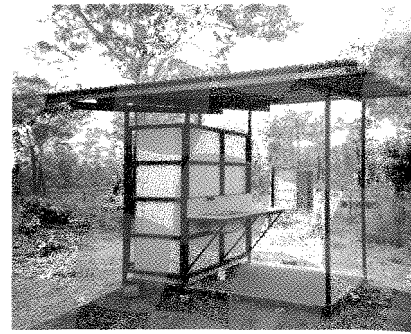
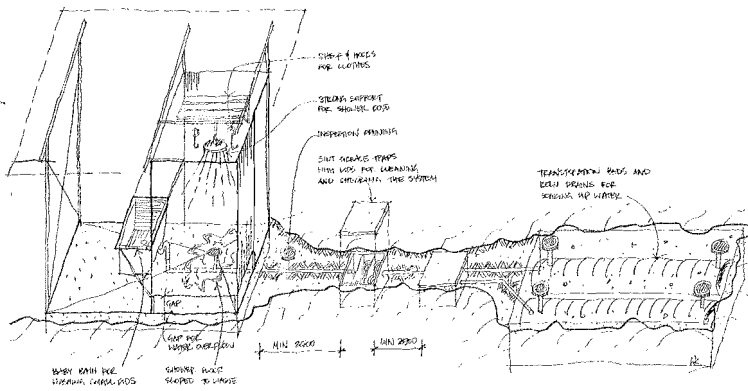


Figure 1 A drawing and photograph of a shower and laundry waste-water system designed by Build Up Design and installed in Arnhem Land outstations for the Bawinanga Aboriginal Corporation. [Photographer & Artist: S. Scally]

Town Planning and Land Servicing Issues

The service infrastructure of the BAC outstations is generally limited to reticulated water, each house having its own power and sewerage system. Consequently, settlement planning does not have to follow the rectilinear service layout used in most towns and can be more effectively driven by cultural concerns. Householders, in conjunction with senior traditional owners, will agree on new house locations and orientations. As a result of these freestyle planning opportunities, outstations in the BAC region may seem visually haphazard, however in reality, the arrangement of houses closely accords with the cultural and social requirements of their Indigenous inhabitants. Accurate site plans have been documented, which provide an important record of infrastructure, in particular underground works. These plans and accompanying aerial photographs provide an important planning tool as residents consider a range of development issues including, new building locations, dust mitigation, flooding, erosion, vehicle access restriction and exclusion zones around bores.

Access Issues

Outstations are remote; some BAC outstations are a three- or four-hour drive on dirt roads from Maningrida, which is itself eight hours by road from Darwin. Many road routes into outstations in the region are cut off by floodwaters during the wet season from November to April. The implications for housing and infrastructure are that it is costly to have construction, repairs and maintenance conducted by outsiders, and at the best of times it is difficult and only possible during the dry season from May to October. The costs involved in establishing and running a construction site are high, with builders having to provide their own camp, power supply, and food. If projects are to be completed on time and budget, project schedules must be carefully timed and consideration given to which construction systems are used.

Construction Systems

Construction costs are high in remote areas. Prefabrication of building elements reduces the time spent on site and therefore cost, while allowing for increased quality control. BAC fabricates toilet and shower units from steel in the Maningrida workshop and transports them to site as completed units, requiring only placement with concrete and plumbing.

Demountable buildings are often seen as a quick fix option in remote areas, offering reduced site time and subsequently cost. Great care should be taken when considering demountables to ensure that the materials, structural system and construction details will withstand the rigors of transport on bush roads, and high occupancy rates.

The separation of trades during construction is desirable. If each trade can complete its work in one visit, without interruptions as they wait for a second trade, costs can be contained. The BAC construction system allows each trade to work without reliance on others. The work is staged as follows: the groundwork and slab are completed; steelwork, roof and windows are installed; and bricks are laid. Single-skin metal work

and conduits allow electrical and plumbing works to be completed in one visit to the site. Finally the carpenter fits doors, joinery and hardware.

The Top End provides the habitat for a voracious termite, *Matotermes darwiniensis*. Chemical spraying and re-treatment by qualified personnel is the usual control system employed in urban areas, but is very expensive in remote areas and as a result does not happen until after infestation occurs. BAC's approach is to limit the use of timber products, using steel and mud brick construction so that there is nothing for the termites to eat.

Management and Maintenance

BAC developed a Housing Management Plan in 1999, which identified the skills and finances required to maintain its existing stock of housing and infrastructure. BAC has a small staff base with limited skills or knowledge of construction trades. Plumbers, electricians and other trades need to be brought to the outstations. These tradespeople are generally recruited from Darwin and live in Maningrida, with housing and vehicles provided by BAC. Skilled staff are difficult to recruit and expensive to equip and employ.

BAC's approach has been to:

1. Adopt a lifecycle approach to development: assessing the maintenance requirement of all design decisions to ensure that development is within the long-term management and financial capability of the organisation.
2. Manufacture as much as possible locally, which provides local employment opportunities and reduces cost: BAC manufacture mud bricks, shower and toilet blocks and often fabricate and construct their own housing.
3. Install simple technology: pit toilets are preferred over wet or composting systems because they require virtually no maintenance.
4. Install technology that allows for repairs to be done by residents: an example is plastic irrigation-style plumbing fittings, which do not require special tools to repair.
5. Limit technology with a high recurrent maintenance requirement: stand-alone solar power systems are installed on houses as they have a lower maintenance requirement than generators and do not require fuel, which is difficult to transport and store. Gel batteries store the power and require less monitoring and management than wet cell batteries.
6. Maintain rather than repair: BAC has regular maintenance runs by salaried tradesmen to reduce costly and urgent repair call-outs. (see Figure 2)

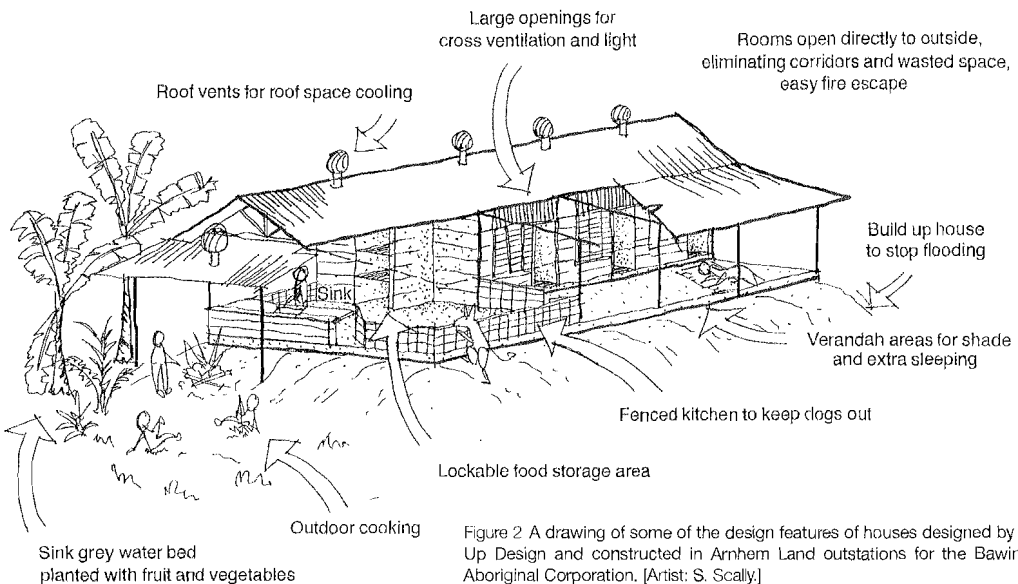


Figure 2 A drawing of some of the design features of houses designed by Build Up Design and constructed in Arnhem Land outstations for the Bawinanga Aboriginal Corporation. [Artist: S. Scally]

Building Contract Issues

The effective control of construction and contractors in remote areas can be difficult. High quality documentation is essential. Details should not be determined on-site. Because of the travel distances, site visits take a long time, are expensive and will generally be limited to the minimum required to ensure effective project quality control. Additional materials will be costly to deliver and time delays could result in high penalties if workers are idle.

Contract conditions should include clauses in relation to building contractors' behavior, alcohol consumption, protocols for obtaining permission to hunt and fish, sacred areas (where known) and in particular, waste disposal. Builders in remote areas can be under the false impression that the usual occupational health and safety, and environmental requirements do not apply.

Architectural Methodology

To summarise the methodology I have evolved in my work with BAC and its outstation communities:

1. Research and assess cultural issues, services infrastructure, water quality, site issues, road conditions and the organisation's capacity for maintenance and management of assets.
2. Examine the full range of options available and the lifecycle implications.
3. Involve the client body and end users in the design and decision-making process; they are the people who will live in the house and be responsible for its maintenance.
4. Design appropriately for the climate and local factors.
5. Apply technology that is durable; preferably it should be within the residents' capacity to repair, but definitely within the resource centre's capacity to repair and maintain without specialists. If suitable, chose a low technology option.
6. Document the project thoroughly.
7. Ensure the contractor is aware of local protocols and contracted to act within them.
8. Supervise the construction to ensure the documented quality of work and materials is achieved.
9. Evaluate the success of the finished product with the occupants and management organisation to ensure that past work informs future work.

The issues faced by Bawinanga Aboriginal Corporation are not unique. Many Aboriginal communities are remote, have an unskilled local workforce and limited financial resources. I have detected a strong tendency among housing provision agencies to blame Aboriginal people when houses fail, as encapsulated in the statement, 'We give them houses and they destroy them'. From my experience most of this blame should rest with inadequate briefs and designers—there is a failure to assess the local conditions and then buildings are produced that fall outside of the community's financial and physical capacity to repair and maintain them.

Endnotes

¹ Bawinanga Aboriginal Corporation (BAC), Annual Report 2000–2001, Maningrida, NT: Bawinanga Aboriginal Corporation, 2001.

² Marshall, G., 'Successful greywater systems in Arnhem Land', *Renew*, 76 (Jul–Sep 2001), Alternative Technology Association <<http://www.ata.org.au>> and Marshall, G., 'Sanitation systems for Arnhem Land Aboriginal outstations—evolving to suit lifestyles and maintenance capabilities' in Proceedings of Community Technology Conference, CT2001, held at Murdoch University, 4–7 July 2001,



Community Building and Housing Process:
Context for Self-Help Housing
Paul Haar

In the rural and remote settlements of Indigenous Australia, the culture of housing has long been driven largely from outside those settlements. Government agencies, external consultants and contractors take charge as the active providers, while the families to be housed remain passive recipients. But between the cracks in this prevailing practice of 'housing delivery' (as it is often termed by government), another culture survives and flourishes. Down the back, at the end of the track and by the creek there are sure to be sites of resistance, independence and commonsense where a self-constructed shelter or two can be found. These may lack some structural integrity and health amenity, but will be rich with self-expression and resourcefulness, and occupied by campers with a story to tell¹.

The early part of my career as an architect, during the 1980s and early 1990s, involved a number of small self-help housing projects at Lake Tyers (East Gippsland, Victoria) and Mt Catt (Arnhem Land, Northern Territory), along the Murray and Darling Rivers (Victoria and NSW), on Moa Island (Torres Strait, Queensland), and on Palm Island (Queensland). My path was predicated on the theory² that all communities, regardless of their ethnic and socioeconomic background, should be free to participate centrally in their housing processes, and allowed the time and space to explore, and appropriate for themselves, a meaningful architecture. With a focus on participatory process, communities might find themselves building people as well as houses. Meanwhile, external agents including design professionals, tradespeople and administrators might find themselves providing considered educational and modest financial support for community self-development, rather than handing out material services.

During those years of youthful idealism, I think I managed to advance the case for self-help housing in at least a few small pockets of northern Australia. Overwhelmingly, I learnt that the great potential, challenges and difficulties inherent in self-help housing involve not the 'hardware' like planning, materials or construction solutions, but the 'software' or the dynamics of human nature, relationships, and politics, and the way they impact on the design and construction process³. Fundamentally, self-help housing is about building people and community.

The wonderful people and places I encountered, presented many good prospects for camp siting, house planning, climate-conscious design, material selection, construction detailing and service systems. More important than design, material and construction methodologies, the essential ingredients for immersion in a self-help housing project include an open mind, patience, and an eye for detail and diversity. The aspirations for constructed housing outcomes and appropriate logistics for community-based housing processes varied enormously between individuals, families, communities and regions. This made the notion of searching for the 'authentic Aboriginal voice'⁴ or the quintessential Indigenous house a romantic fantasy at best.

Mt Catt Homeland Centre—Arnhem Land Northern Territory (1984—1985)

Beginning in the 1970s as part of the outstation movement, several clans of Rembarrnga people from the greater Katherine region returned to their traditional homelands in south-central Arnhem Land. I was invited to join a small community of these people in early 1984, only a year after they had first re-established themselves beside Mt Catt. At that time the 'Mt Catt mob' comprised maybe a dozen people, including two old law men or tribal elders. The daughter of one of the elders was married to a compelling and energetic tribal man, known as 'the manager', who diplomatically represented the community's views to relevant government agencies. The rest were predominantly single men of varying ages who circulated between other neighbouring settlements.

The mob's vision was to fence its homeland and breed water buffalo for the export market. To operate this enterprise they required simple camp facilities, fresh water, communal wet season shelter and enclosed storage space. This community vision and the drive of the manager generated a local understanding about work time at Mt Catt. Had the mob resettled a few years earlier, it would have qualified for government funds to access the only housing products on offer, which were Yulngu Cabins. These were small one or two room

all-steel shelters with no internal linings or services, which were pre-fabricated in Katherine and assembled on site by outside contract labour for an astronomical cost (\$72,000⁵ per two room cabin). But the Mt Catt mob only had a \$12,000 government grant, which it was intended would partly meet that year's interim camp facility needs. The determination of the manager, the naïve exuberance of a young architect and simple necessity led the community to press on with its vision of designing and constructing the first house at Mt Catt. It would be owned by the manager and his wife, but would also be available to the entire community.



Figure 1 Previous work experience at Top End cattle stations had equipped the Mt Catt mob for the challenge of hoisting heavy pole timbers into the roof structure. [Photographer: P. Haar, 1987.]

It was patently clear to all of us that most of the building materials would need to be sourced from the bush. There were a few abandoned structures with roofing iron and sawn hardwood, and the mob quickly identified these as a reusable resource. I was taken to straight stands of durable coolbah (wallan), ironwood (miniara), stringybark (gardeika) and woolybutt (gunguru), which were sized suitably for pole construction. The men taught me how to identify and so avoid felling hollow cored trees, and they laughed hysterically as I walked in circles through their flat savannah woodlands under a zenith sun. I was shown extensive outcrops of loose flat sandstone not far from the camp, and clay soils suitable for earth brick construction. The men had an intimate understanding of the land and its features, and a good knowledge of timber pole construction developed from their backgrounds as cattlemen. (see figure 1) While they had no previous experience building with stone, earth brick or antbed⁶, they were well aware of the successful use of these materials elsewhere in the region. So we constructed a few sample floors and walls. A decision was made by the men to construct the first house initially as an open pole-framed roof structure to provide shelter from the hot sun. Then stone infill walls, antbed floors, gutters and a raised water tank (20kL) would be added as time and funds allowed.

The manager chose to site his house, and thereby the entire future camp, primarily facing an existing landing strip for the weekly mail plane. He was mindful of the prevailing easterly dry season wind and planned to locate future roads so that the dust that rose from them drifted away from rather than through the camp.

The overwhelming preference of the Mt Catt mob was to have the house unserviced; to cook outside by a veranda, and to have separate shower, toilet and laundry facilities for reasons of hygiene. Through some amended funding arrangements, two pit-vault toilets and one shower/laundry block were delivered to the community during 1984. The siting, as directed by the manager, and detail design, as standardised in Katherine, of these pre-fabricated all-steel buildings flew in the face of the ethno-specific design principles identified for Yolngu people in north-east Arnhem Land by Shaneen Fantin⁷. The dry pit-vault toilets did not last long because, in the climate of a Top End dry season, their deposits would not readily settle or decompose as required. And I never found out what the community's response to the shower/laundry block was because, during and several years after my time at Mt Catt, it had no water supply connected.

Having become conversant with our options for siting, materials, structure and services, four design processes were established in parallel, each with participants as directed by the manager, namely he and his wife, the single men, a middle-aged couple, and the children. Design processes based on a technique of crude model-making using grocery box cardboard, Blu-tack and drinking straws⁸, proved very effective. They centered on the rough and ready use of non-precious materials, which allowed the designer to relax with the essential processes of manipulating the model and continually redeveloping ideas. They aided effective realisation of three-dimensional space, and provided a visual focus for discussion and negotiation between participants. They had the designers communicating intuitively through hands-on craftwork, as well as intellectually through contemplation and discussion. They encouraged thoughts regarding construction,

and of course they were simple and enjoyable. I saw my own role in these design sessions as one of facilitation: to supply and encourage effective use of model-making materials, to nurture an appreciation of building scale, both in itself and as it related to the models (toy people and furniture all scaled at 1:25 assisted with this), and to ask troubleshooting questions. The manager's design proposal was chosen for construction, but it included several concepts for effective internal cross and stack ventilation that were presented by the single men.

Constructing a substantial house for minuscule capital cost meant sourcing, processing and erecting huge quantities of very heavy building materials. This involved a lot of hard labour, at times making progress on site demoralisingly slow. For both practical and political reasons, the community's tractor and trailer were not always available to us for carting materials. Machinery repair often seemed to take forever, if only because we had poor access to spare parts in the Top End. Our small government grant was spent entirely on roofing and guttering, fasteners, a water tank and construction tools. The real cost of this housing approach lay in hard yakka, patience and time. But throughout the course of the project, the community saw the constructed outcome as justifying this cost. The community building that took shape, by measures of health, skill, self-esteem, independence, friendship, belonging and a story to tell, was priceless.

During my time in the region, interest in our construction approach grew both at Mt Catt and amongst neighbouring communities. In subsequent years many more stone and timber pole houses were built by several communities in south-central Arnhem Land, with the assistance of an independent supervisor and some reliable equipment, albeit to repetitive designs.

St Paul's Village Moa Island—Queensland (1986—1988)

In the mid-1980s, several extended families returned from the mainland to their birthplace at St Paul's Village on Moa Island in the Torres Strait region of Far North Queensland. They were seeking a more traditional lifestyle, yet also brought with them many aspirations and skills acquired from the Australian mainstream. As new returnees in an established community that always struggled to attract adequate government funds for delivery of new rental housing stock, these families knew they stood at the end of a long queue. Also, they recognised that housing delivered by government was unsuited to the local climate and traditional lifestyle, and adopted expensive and complex construction methods, which discouraged the input of local labour. Housing funds did not go far, either in building roofs over heads or in promoting self-expression in what are otherwise socially and culturally rich communities. Recognising the limitations of contemporary housing options, but loaded with the drive and ability to help themselves, three families decided to design and build their own homes. Through their community council they asked me to assist.

Experience has taught me that self-help housing can attract considerable attention and empower those who are active in it. Unfortunately because of this, it can also challenge, and be challenged by, the political agenda of onlookers from within government and the community. It was absolutely crucial to me that this project, the first of its kind in the region, was durable in its process and exemplary in the outcome it achieved.

The key project parameters were therefore:

- a small and achievable scale of works;
- a generous time frame, realistic for self-help;
- a few truly committed and self-motivated prospective owner-builder families;
- a genuinely and unanimously supportive community council;
- modest financial support with no strings attached from one or two fair dinkum public servants operating in low profile at the local level; and
- a commitment by myself to live and work with the community through both the design and construction phases.

The St Paul's Village project was able to commence with all these ingredients essentially in place.

Torres Strait Islanders have a strong sense of ownership of their land and waters. Many St Paul's families

also aspire to owning their own homes, yet most are limited in their capacity to repay mortgages. For the project the Aboriginal Development Commission (ADC) made available a revolving loan fund of \$115,000, which in its first cycle had to be shared between the three families. However, conventional building materials and skilled contract labour supplied to the remote outer islands of the Torres Strait commanded roughly twice the price they did in Brisbane. The families' acknowledgment of these factors, coupled with their re-emerging attraction towards a more local and traditional building culture and aesthetic encouraged them to use local bush materials such as stone, sand, clay, anthill, bamboo and forest timbers and to adopt simple construction methods suited to the community workforce.

By trialling these materials and construction methods, viewing relevant slides and videos, discussing local climate and lifestyle aspirations and implementing the same crude model-making technique as used at Mt Catt, the owner-builder families were able to develop appropriate low-cost housing concepts through very effective and enjoyable participatory design processes. (see figure 2) In their planning, the houses closely reflected local lifestyle aspirations. Typically they had a large central space for kai kai (extended family meal gatherings), and extensive verandas for shady outdoor living and visitor sleeping. There was a desire to keep ablution areas separate from living spaces, and to accommodate ever-expanding households in detached bungalows near a central house.

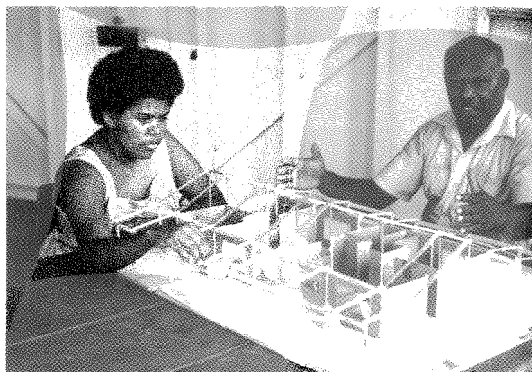


Figure 2 Using a rough and ready cardboard model, Hobson Levi and his daughter Anna negotiate a thoughtful design for their new home at St Pauls Village, Torres Strait. [Photographer: P. Haar, 1986.]

Here, as at Mt Catt, the attraction towards stone and earth walling was interesting. While it was understood to offer no thermal benefit in a tropical climate, it was chosen not only for its free availability but because 'it looked solid'. Traditional materials such as bark, brush, bamboo and woven palm were favoured for temporary structures and home decoration, but as primary building fabrics they were perceived to provide inadequate storm shelter, pose a fire risk and harbour vermin. The Anglo-Australian desire for 'proper solid' housing had clearly been taken on board by these communities, both in a functional and aesthetic sense. So, in the Torres Straits, my romantic vision of 'utopia tropicana' was challenged. I had to accept the reality of community aspirations, and allow an architectural style to emerge from the Islanders themselves as they explored designed, and built what was meaningful to them.

It took the community three years of determination and hard work to complete three large and beautiful homes for extended families at St Paul's Village. Progress on each building site fluctuated enormously from day to day. It depended at least as much on the family heads' talent for maintaining a strong and enthusiastic workforce, as on my effectiveness in skill sharing and technical supervision. Our workforce comprised of about 60 men, women and children, all with vastly different levels of skill, strength, energy and motivation. My challenge was to support these people in functioning as a close-knit team through thick and thin. That required careful observation, quiet listening, political diplomacy, counselling and immense patience, skills that do not all come naturally to me.

I came to realise that it was smart to encourage good workmanship while accepting what was less than perfect and to make the building site a fun place, where rugby ball and ghetto blaster were essential tools of trade. I came to accept that fishing lines were sometimes more attractive than deadlines, and that during this time out the human obstacles to building progress that had me so hot and bothered—family issues and intra-community politics—were being resolved quietly and without my knowledge.

The technology of the St Paul's houses⁹ included walls and strip footings of rubble stone and cement mortar, ram-pressed and hand-puddled earth bricks, pole roof frames, split bamboo partitions, and puddled and waxed earth floors. The milling of door and window timbers from bush poles, using a chainsaw with a simple

guide attachment, was a satisfying process. (see figure 3) But the slow pace of this work and the ecological problem in removing the largest, straightest and most millable poles from already degraded local woodlands, has me retrospectively questioning what at the time was regarded as appropriate technology. I also learnt that as the transfer of an understanding of culture and community from one place to another is problematic so too it is with anthills. The remarkable cementitious properties of the crushed antbed of south-central Arnhem Land, did not exist in the Moa Island variety (maybe due to different soils or termite saliva). So trials are always worthwhile.

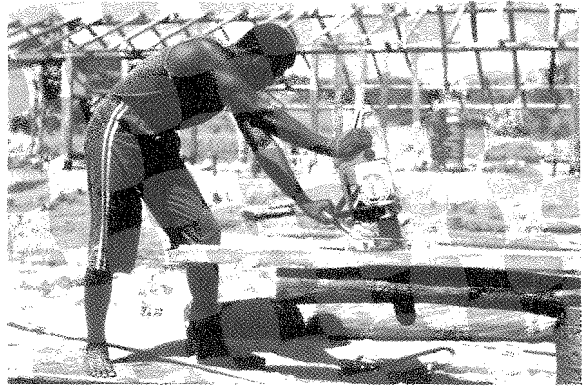


Figure 3 Robbie Ware mills window frame timbers from local mast-wood (*Podocarpus greyii*) using a chainsaw and simple 'Granberg Mini Mill' attachment, St Pauls. [Photographer: P. Haar, 1987.]

Overwhelmingly however, the self-help housing approach taken at St Paul's Village produced good results and attracted wide interest from other communities and government agencies because it brought home ownership within reach of families who were prepared to work hard. (see figure 4) This in turn released community councils from the cost of maintenance and problems with rent collection that were so significant with council-owned housing. Its low cost allowed many more houses to be built with limited government funds. The three self-built homes at St Paul's had on average five bedrooms each, a fully enclosed covered area (FECA) of 133 square metres and an unenclosed covered area (UCA) of 145 square metres. They cost each family roughly \$48,000 for materials, and the government roughly \$27,000 for construction training input. Meanwhile, four bedroom cement sheet kit homes, with FECA's of 92 square metres and UCAs of 49 square metres, were being erected on neighbouring islands by external contract labour to repetitive designs at a cost of around \$269,000 each. Self-help housing provided community people with opportunities for skill development in building design and construction, and thereby helped them to become more independent of government agencies in providing for their own housing needs.



Figure 4 Hobson Levi shows the chairman of neighbouring Boigu Island how to lay mud bricks. [Photographer: P. Haar, 1987.]

Visiting St Paul's Village again in 1992, I was in awe of the artistry with which the owner-builders had decorated their new homes. Pole timbers had been superbly crafted with relief depictions of tropical flowers, shark, dugong, and crocodile chasing wild pig in the mangroves. Lacquered split bamboo provided visual screening. (see figure 5) Colourful cotton print curtains billowed gently as the cool sea breeze passed freely through internal spaces, and shell-tassel doorway curtains rustled in reply. These families had really made homes for themselves through faith, perseverance and hard work.

Many of the outcomes of self-help housing at St Paul's Village were expressed in people and politics. While my intention was purely to share appropriate technical strategies, I indirectly and unintentionally influenced significant change in the social and political order of the community. During the course of the project, one of the owner-builder family heads was elected chairperson for St Paul's, one was the subsequent chairperson, and the other became regarded throughout the community as 'a changed man' with new self-esteem and improved physical health after successfully completing his family's new home.



Figure 5 Suzi Wigness with her son in a beautifully carved doorway in the home that her family designed and built, St Pauls. The mud bricks, pole timbers and bamboo were all sourced from the local bush. [Photographer: P. Haar, 1992.]

On a less positive note, because a few normally inconspicuous families drew attention to themselves through their success in self-help housing, they, and I as their accomplice, fell out of favour with some traditionally prominent families in the village. Also, our fair dinkum public servant was chastised by his superiors for allowing the St Paul's Council to lend government money to individual families for capital development on land for which legal title was unclear. Continued financial support for self-help housing was not forthcoming because the Mabo ruling on Indigenous land rights could not be resolved locally.

Great diversity exists within and amongst the Indigenous communities of northern Australia. The potentials and challenges in community-based housing work are effectively addressed not only with solutions in technology, but more so through human relationships. One cannot underestimate the value of allowing remote communities to appropriate their own dwelling experience, to design, construct and

take pride in their own homes, and to again embrace housing 'as a symbol of the self'¹⁰. By no means is the self-help housing approach suited to everyone, but successful outcomes do breed new aspirations. My ambition as an architect often has me instinctively focusing on being clever with materials and technology, with statements on art and society. While I like to think this preoccupation has its place, it is of lesser importance when working with Indigenous Australians. Here I have learnt to have faith in and make real space for the breadth of creativity and aspirations amongst these dynamic people and to treat them not as needy recipients of our expertise, but as equal partners in developing a just and vital Australia.

Endnotes

¹ Self-constructed shelters and settlements have evolved through Indigenous Australia without external assistance of any kind, as symbols of independence and resistance. Characteristically these camps are erected at minimal capital cost using lightweight and often recycled materials. They start small, then grow and change to reflect the needs and resources of the household. In my travels I have seen wonderful examples of this in the Torres Strait and Katherine regions, at Dareton and Wilcannia NSW, on Palm Island, and in many other places. Stephanie Smith's account of Aboriginal housing at Goodooga NSW ('The Tin Camps: Self-constructed Housing on the Goodooga Reserve, New South Wales, 1970–96' in Read, P. (ed.), *Settlement: A History of Australian Indigenous Housing*, Canberra: Aboriginal Studies Press, 2000) captures the inimitable richness of this architecture. While sometimes lacking in structural integrity and health amenity, these are places of resourcefulness, self-expression and good humour. They are not the hapless hovels so readily depicted by our mass media. Yet, because they attract the ire of governments and their middle-class constituencies, they are almost always doomed for early demolition. Through my years with Aboriginal and Torres Strait Islander communities, I came to believe more and more that it is the aspirations, the talents and the achievements of these owner-builders of self-constructed shelters that should be acknowledged and nurtured towards development of appropriate Indigenous housing cultures for rural and remote communities.

² Nurtured by Professor Allan Rodger, School of Architecture and Building, University of Melbourne (1980–1983); Fathy, H., *Architecture for the Poor: An Experiment in Rural Egypt*, Chicago: University of Chicago, 1973 and Turner, J. F. C., *Freedom to Build: Dweller Control of the Housing Process*, New York: Macmillan, 1972.

³ Some of my experiences in this regard are described in Haar, P., 'A Self-help Approach to Remote Area Housing: St Paul's

Village, Moa Island, Torres Strait, 1986–92' in Read, P. (ed.), *Settlement: A History of Australian Indigenous Housing*, Canberra: Aboriginal Studies Press, 2000.

⁴ A notion explored in recent years by architects Glenn Murcutt and Sean Godsell, together with the academics and journalists who follow their work. Tributes to and critiques of Murcutt's Yirrkala House (RAIA Special Jury Award 1994) are particularly problematic as presented in Dovey, K., 'Architecture about Aborigines', *Architecture Australia*, 85, 4 (July/August 1996), pp.98–103; Quarry, N., *Award Winning Australian Architecture*, Sydney: Craftsman House, 1997 and Brennan, B., 'Windsong and Water Lines', *Vogue Living*, November 1994, pp.104–111.

⁵ This cost and subsequent costs for construction have been indexed to 2003 (inc. GST).

⁶ Crushed anthill wetted and rebedded as cementitious material for floor slabs or wall mortar.

⁷ See Fantin's design considerations concerning Yolngu avoidance behaviour and sorcery as presented elsewhere in *TAKE 2*.

⁸ Inspired by Professor David Stea, School of Architecture and Urban Planning, University of California, Los Angeles USA.

⁹ The three houses at St Paul's had:

- strip footings of stone rubble bedded with cement mortar in what were very stable foundations.
- external walls of either:
 - * load-bearing stone rubble bedded with clay/antbed mortar in recycled timber formwork,
 - * load-bearing ram-pressed earth brickwork laid with earth mortar, or
 - * non load-bearing hand-puddled earth brickwork laid with earth mortar.
- internal walls of stone or earth as above, of split bamboo, or as timber partition/shelving.
- roofs framed with pole timbers and clad with corrugated steel sheet.
- floors of concrete or puddled and waxed earth.

¹⁰ Turner, *Freedom to Build: Dweller Control of the Housing Process*.



More than a House:
Some Reflections on Working with Indigenous Clients
on the Housing Process
Geoff Barker

Housing is a complex architectural field in which to work and cross-cultural situations add a further dimension to this. The insights I have gained about architecture and the housing process lead me to suggest that engaging in them resembles working on a puzzle: it requires that the architect gain a detailed understanding of the overall picture and adopt focused strategies for its pieces. Continuing the analogy, as an external agent, the architect needs to comprehend the pieces, understand how they go together and work with them, all the time being cognisant of the broader issues and outcomes that can be achieved by working collaboratively. With some planning, careful handling, respect and consideration, the housing process has the potential to be successful and empowering, incorporating an exchange of ideas between clients, users and external specialists. It also has the potential to lead to successful, appropriate and sustainable outcomes that reach beyond the scope of a physical structure.

Consideration of the big picture has become increasingly important in many professional areas. For example, many health practitioners encountered in Australia's Aboriginal communities now understand the state of Indigenous health to include a range of factors that impact on the person and family. Wellbeing is understood to be a comprehensive concept of health in which a person's physical condition is only one part of a more holistic view of the person and their environment. A person displays symptoms that are impacted upon by their physiological, social, cultural, emotional and spiritual situation, as well as the physical conditions in which they live.¹

My experience with Indigenous clients in remote and regional communities throughout Northern Australia has shown me the difficult circumstances in which many people attempt to live their lives; high levels of family violence and chronic illness being only two of the realities they must overcome. Equity programs and development projects funded through myriad government departments are provided in order to address needy Indigenous situations such as these. To an outsider it sometimes appears as though the delivery of these programs will make a difference. But the statistics suggest that such a methodology has not produced the desired results. Programs that focus on the delivery of a physical product alone, such as housing, have not produced the improved life and health conditions, which were expected.²

Many architectural practitioners³ believe that housing is a process wherein people can significantly improve their situation on many levels. This happens through people being made the centre of their housing process, determining their own needs, being involved in planning and design, having a role in funding, and implementing the steps toward delivery of appropriate and sustainable living environments. Achieving change requires much more than people being consulted about the type, shape and design of the structure and its surrounding environment. It is about recognising the potential for people to control and manage their own process, and implementing a framework in which this can happen successfully. In recent times there have been some important revisions made to how programs can be implemented more effectively⁴.

A Development Framework

When embarking on a project, it is useful to consider the broader situation in terms of where housing might sit in relation to other development areas. A diagram of Community and Regional Context including the key development areas is presented in Figure 1 (following page). This recognises that a community is much more than a collection of physical infrastructure in a particular geographical location.

In a real community, the components described in Figure 1 are closely intertwined, therefore when considering an issue it is important to keep this web of inter-relationships in mind in order not to oversimplify matters. From a holistic point of view for example, it would be useful to examine the potential for a housing program to link up with other development areas and produce outcomes in these contexts, while also delivering its own required outcomes. Each development area embodies a wide range of issues and considerations, which need to be explored when action is being proposed. This can be done successfully with 'community people' and their representatives.

Figure 1 Level 1

Community - Areas of Development

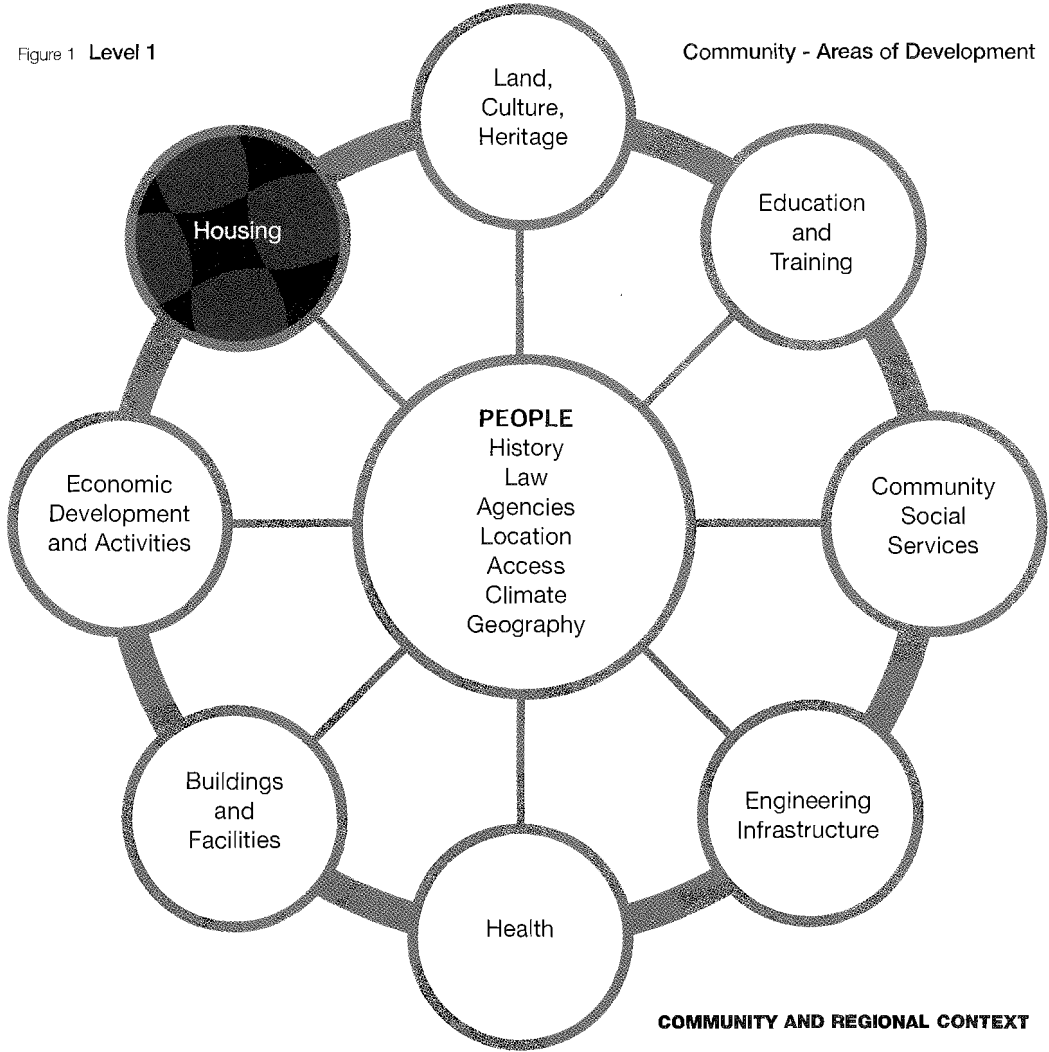


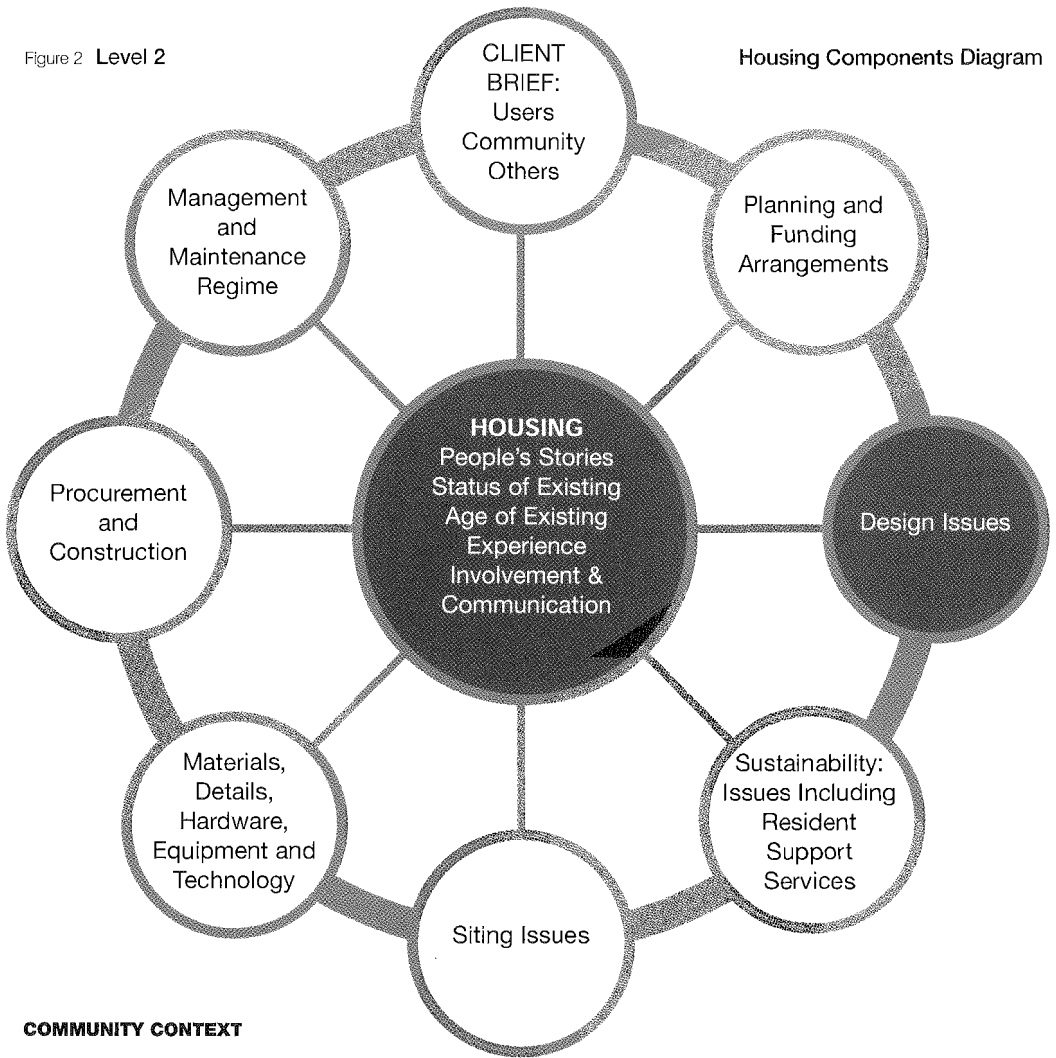
Figure 2 shows the Housing area from the previous Level 1 diagram broken up into the core components of a housing process. Experience suggests that community people are keen to be involved at many different levels. When given the opportunity to contribute, they will tell their housing stories and debate issues about existing conditions, living requirements and the benefits gained from previous housing projects.

The more traditional view of the architectural process holds it to be largely linear or implemented sequentially through time, rather than fitting within an embracing or holistic community picture as shown in the framework above. The housing process consists of at least the eight components of Figure 2, which are also connected to other development areas. Each component in the diagram carries both constraints and opportunities depending upon how and when resources are allocated to the implementation of the overall process. A discussion of each can be expanded to include issues or elements that describe a detailed housing process. This technique is applied to one of the components of Figure 2—Design Issues—in the following diagram.

Figure 3 is indicative of the level of detail that is typically required for each of the eight components illustrated in Figure 2, including the Design Issues component (or stage) of a housing process. In some cases it might be necessary to take these elements to yet another level of detail in order to properly explore the issues, constraints, opportunities, options and potential solutions. This aim can be successfully achieved with community clients.

Figure 2 Level 2

Housing Components Diagram



COMMUNITY CONTEXT

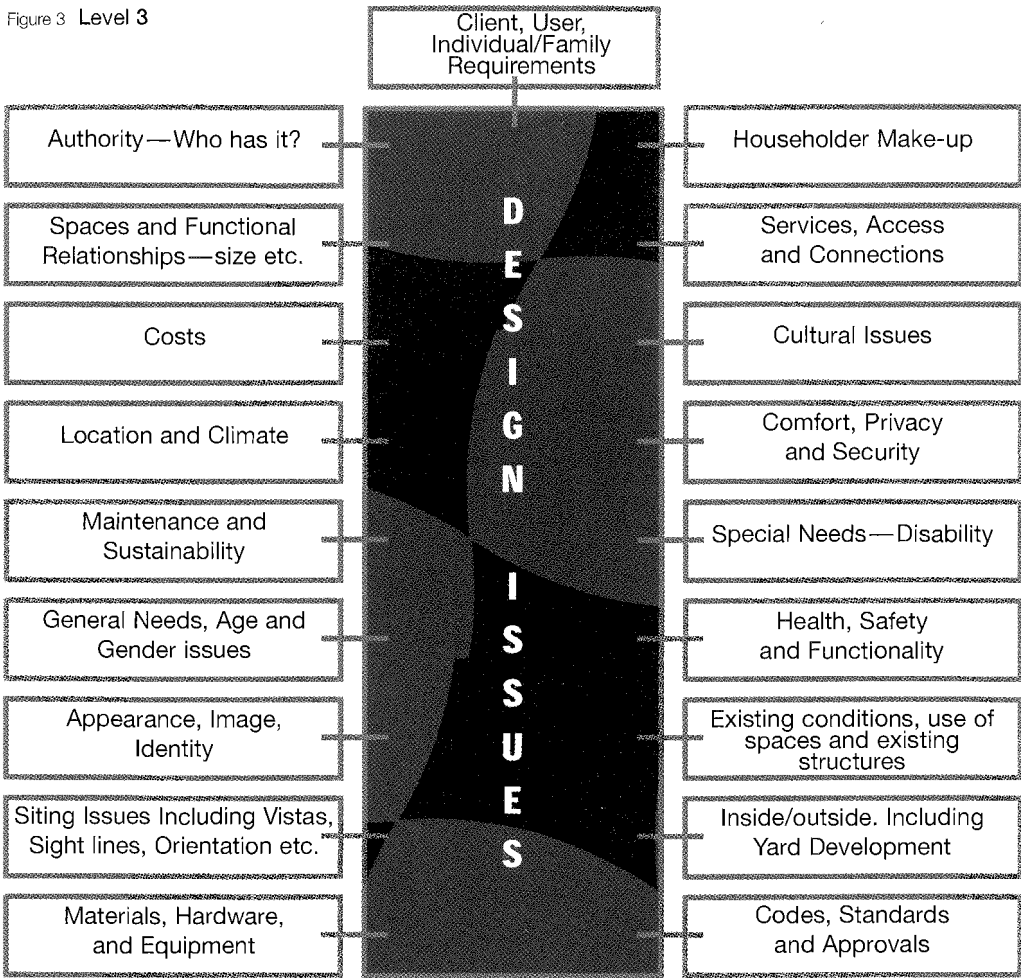
Drawing a picture that identifies what might be involved in a housing process is simple, but actually conducting the process will bring out all the complexities and issues concerning community development and cross-cultural interaction. The following strategies can be employed to offer a different level of involvement and interaction with people based upon the theoretical housing process described above.

Some Reflections on the Housing Process

A key objective of many housing programs is to get the community or people to own the product being promoted. This sense of ownership is promoted through people being consulted or involved in the delivery process in a special way. The way is not always nominated and the outcome, to achieve sustainability, is sometimes assumed to come from a concerted consultation process. There are a number of problems with this approach:

1. The idea of involving people or consulting with people once the idea for a project or program has been already formulated is potentially problematic; the chance of people owning the whole idea is lost.
2. One of the problems with ownership is that it can be transferred, sold or neglected, especially if it is something that has been externally provided or comes with onerous conditions attached.
3. The values associated with ownership vary between cultures and the outcomes that people want from a project are often different to those that are promoted by a provision agency.
4. Consultation has limitations as a part of an ownership strategy if it is the only form of involvement; it can become dominated by specialists asking questions of a limited set of participants rather than being broadly interactive. (see Figure 4)

Figure 3 Level 3



An architectural methodology that relies on a restrictive categorisation of building users when choosing informants during the design consultation process can exclude the opinions of other community people who have a strong interest in the development of their wider environments and spaces. There is limited potential

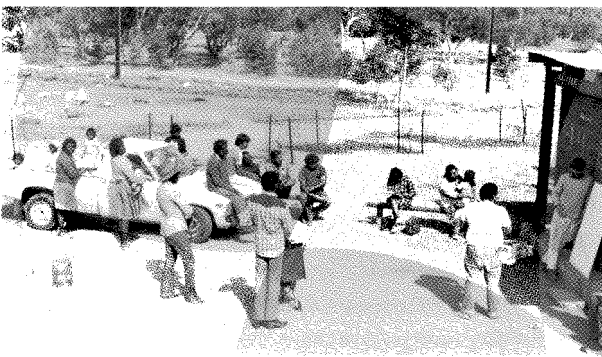


Figure 4 A photograph showing housing officers talking to Aboriginal house-holders at a meeting about housing management issues held in an Alice Springs town camp in 1987. [Photographer: J. Ricketson. Source: AERC, University of Queensland.]

for eliciting added benefits from this type of approach. From my experience, an effective development strategy requires firstly, that the people who can be involved retain a belief that what is being offered has the potential to make a difference to their situation, and secondly, that they are committed to following the process through. In order to achieve this, participants need to develop an understanding of the full range of potential outcomes available from a comprehensive housing process, and pledge their commitment.

Getting Started

Designers should understand that when engaging with a client—community, group, family or individual—they are not entering a vacuum waiting to be filled with their important contribution, project or program. People have their own lives filled with pressures and demands to live, as well as ideas and

priorities about housing. Our time with a client needs to be planned but flexible, strategic but opportunistic, innovative but familiar, effective and positive. Before commencing any interaction, it is important to be prepared by carrying out background research regarding issues and previous projects. The following reflections build on this idea.

Project Protocols

In the beginning, it is useful to establish a series of project protocols with the community representative organisation—the local grantee organisation, usually the elected council, committee, or other community governance entity—which will ensure appropriate emphasis is given to community events and the special nature of the place in which the consultant team is working. Protocols might include items relating to responsibilities, time frames, resources needed, people involved, accountability and key events to be planned.

Cultural Awareness

Within many communities there are groups who have the authority and responsibility to impart cultural awareness to outsiders. Identifying and collaborating with these people can prove invaluable in building local knowledge and understanding, and engaging with the history and culture of the particular client group.

Local Project Team Member

Wherever possible, engage a local person to work with the project team as a key partner in all facets of work—someone who can discuss issues in the local language and receive feedback without embarrassment. This role involves more than liaison, it develops over time and can expand as the person gains confidence, an understanding of the project, and the ability to successfully impart ideas to, and receive feedback from, the community.

Time in the Community

Spend adequate time in the community so that opportunities for interaction are based on local time frames and availability rather than on externally generated fly-in/fly-out programs, in order to develop an evolutionary interactive process. This means that people are given the opportunity to gradually develop an understanding of the issues and respond during a series of informal and formal contacts. In a cross-cultural situation this is a more effective strategy than sitting with people in set meetings at set visiting times. This also ensures that local staff have the opportunity to be involved over a period of time, thereby personnel who might not otherwise be available will not be missed.

Action based Activities

To achieve the best outcomes, the involvement strategy should rely on an action based approach. Target short-term goals and get things done while the team is discussing issues, ideas, and proposed facilities. The Survey-Fix methodology (see Pholeros's paper) is an example of such an approach, following on from Fred Hollows' declaration of 'No Survey Without Service'. Visits that could benefit the community should be coordinated with others such as health promotion workers. This enables the project to have an impact or presence immediately and ensures that the team engages with the broader community early in the project.

Local Office

At the outset of the project, establishing an office or display in the centre of the community to work on and finalise the planning and design stages makes the project real for the people in the community. They can see what is involved in project development as it happens. The process becomes open and continuous rather than intermittently experienced over a series of visits in between which little is seen to happen. It enables community interaction within a locally appropriate time frame rather than one that is imposed by external consultants and bureaucrats. Also, initiate a place for meeting and from which to disseminate information, in a location where all stakeholders feel comfortable.

Involvement in Design and Planning

It must be recognised that living environments are partly created by the people who occupy them. This process encompasses cues, prompts and familiarities that enable people to feel comfortable and at home. There is a relationship between the type of housing process implemented and its constituent parts, as well as the materiality, make-up, functionality and finish of spaces, and what happens within and between them. It is therefore imperative that people are involved in the planning and design of their own living environment to the extent outlined in Figure 3. This is not just about producing house designs, but about making decisions concerning future living environments, and how they might be managed and maintained while sustaining an appropriate level of functionality. This requires a detailed understanding of community, cultural and family issues, and a process of exploring, challenging, negotiating and debating their relevance.

By actively involving people, families and community representatives in the development process, the potential for a wide range of positive outcomes is enhanced, such as:

- Establishing real opportunities for people to contribute ideas to the outcomes being planned;
- Recognising that people have many of the answers to the formulation and management of their own living environments;
- Promoting the idea that involvement can actually work towards the achievement of change;
- Encouraging a positive identity;
- Showing a belief in the creative skills of people;
- Engendering a sense of ownership of the proposal;
- Establishing an opportunity for people to gain confidence in contributing to a development process.

The success with which the housing process can be fully explored relies upon the implementation of sound involvement and communication strategies, of which consultation is only one. (see Figure 5)

Communication Strategy

In planning sessions, the architect is not a passive recipient of design information and ideas. As external agents we can operate as facilitators and mediators working with groups of people to probe issues, challenge ideas, and provide technical, design and community support that will enable a series of prescribed but locally-derived objectives to be achieved. Such a role requires more than an understanding of relevant technical issues. A broad range of factors play a part in effective communication in remote Indigenous communities, including: language, remoteness, familiarity with planning and design concepts, the complexity of interaction between various community interests and development issues, different cultural and social requirements, and access to local knowledge. For the architect to deal with these things, regular contact and engagement that builds rapport and confidence with the client or user group must be established. Users must be recognised as legitimate and valuable members of the project team. It is also useful to observe and document activity patterns for further discussion with relevant stakeholders.

The methods of communicating need to be negotiated so that local people are confident in their ability to take responsibility for decisions and manage the development process. This means evolving strategies for local people to manage their own affairs to a plausible extent. Honesty and respect for people and their potential, starts from the first meeting, however tentative it might be.



Figure 5 Participants in a workshop on community housing management that incorporated both cultural needs and the requirements of Queensland tenancy legislation into workable community policies and rules, 1998 [Photographer: P. Memmott. Source: AERC, University of Queensland.]

A range of communication tools and techniques that encourage the effective sharing of ideas and information are essential. It can be useful to ensure that as wide a range of people from within the community are given the opportunity to contribute to the planning process, including school children, women and the elderly. These groups should be provided with both informal and formal opportunities to participate. Displays in various locations like the store or community office, which impart information and glean responses, can be set up. People can be encouraged to draw diagrams of their community indicating constraints, priority and development areas, and other ideas for the team to consider. Using hand-drawn laminated plans, on which people can draw and write notes as they tour the community, especially where a town plan is being reviewed, is particularly helpful. Walking around a locality, including through dwellings, is by far the best way to identify and confirm issues, constraints, and opportunities for the community and its members. Local residents (adults and children) can be asked to take photos or videos of a range of things, including important places and areas to be recognised in the plan, such as recreational and play areas. PowerPoint presentations can also generate productive discussion.

It is important that some strategies are based around specific community and project requirements. These would include: details that inform people about issues that may impact on the needs of the broader client base; innovative materials; ideas about efficient energy and water management; appropriate climatic responses; culturally appropriate design considerations; and principles of sustainability. All must be consistent with locally available repair and maintenance technologies and management systems.

Conclusions

The suggestion that improvement or change is exclusively the result of externally generated projects is inherently flawed. Many community people are convinced that unless they are allowed to take back responsibility for action there will be no substantial change in community living standards⁵. It would be a major improvement if development were to happen in an integrated way so that the many potentialities of a community can be activated for the broad and long-term benefit of its members.

Community representatives and individual families talk about housing as being central to achieving some sense of wellbeing. The housing provision process explored in this paper focuses on maximising the potential to involve people in the process, to impact positively on peoples lives and wellbeing rather than focusing solely on the delivery of a product. While a building itself cannot deliver wellbeing, the product does have the potential to impact negatively if it is poorly designed, constructed and maintained. If the housing process is implemented and managed well then the outcomes can satisfy broad development needs as well as achieving appropriate and sustainable living environments.

Endnotes

¹ In his Hierarchy of Needs, Maslow postulated a simple view of needs that must be satisfied by individuals. He asserted that basic physiological and safety needs had to be dealt with before energy and effort could be put towards satisfying needs on higher levels. Located on the higher levels of his needs hierarchy were those related to belonging, self-respect, and being valued and recognised. It is of course much more complex than such a model indicates.

Refer to <<http://www.hcc.hawaii.edu/intranet/committees/FacDevCom/guidebk/teachtip/maslow.htm>>.

² Australian Bureau of Statistics, *Housing and Infrastructure in Aboriginal and Torres Strait Islander Communities, Australia, 1999*, Canberra: Australian Bureau of Statistics, 2000.

³ As an example, refer to Turner, J.F.C., *Freedom to Build: Dweller Control of the Housing Process*, New York: Macmillan, 1972.

⁴ Some recent examples from Western Australia include education programs supported by the Graham [Polly] Farmer Foundation and comprehensive community health strategies embodied within Nindilingarri Cultural Health—Fitzroy Crossing.

⁵ Although it might be methodologically difficult to prove that the approach described in this paper actually leads to positive changes, or to more healthy living environments and an improved sense of wellbeing, my experience suggests that the involvement of people in their own projects at a level beyond consultation does bring added benefits to a community and its residents.



Indigenous Housing Design:
Social Planning Determinants at Redfern
Col James, Angela Pitts, Dillon Kombumerri

As the social problems of metropolitan Indigenous communities grow more complex, architects and urban planners find themselves increasingly involved in synthesising goals related to the physical environment with social and economic goals. By way of a case study, this paper examines the initial steps that have been taken to achieve better housing for an urban Aboriginal community in Sydney. It outlines the housing design implications resulting from a set of agreed objectives identified in a community social planning and consultation process.

One of the most notorious Aboriginal communities in Australia is the 'Block' at Redfern, now 30 years old and at the end of its third wave of self-destruction and renewal. In the early 1970s lack of appropriate housing in the market led to the formation of the Aboriginal Housing Company (AHC) on a site approximately 0.8 hectares in size. Its building stock consisted of 85 dilapidated Victorian terrace houses and two industrial structures located next to Redfern railway station. (see Figure 1) Incorporated in 1973, it was the first Aboriginal housing collective in Australia, and was acclaimed in the Whitlam era as a genuine attempt to create an innovative self-determining community of Aboriginal households secure on the first urban land rights in the nation. The Minister for Aboriginal Affairs, Gordon Bryant argued: 'It will be a model for inner city communities who wish to preserve their homes and the identity of areas.' He said that the project was significant in that it gave urban Aborigines a rare opportunity and incentive to develop as a community.¹

Figure 1 Louis Street in Redfern showing the wear and tear on the Aboriginal Housing Company's terrace houses. [Photographer: P. Vallis.]



Following this brave beginning, there was a decade of non-Indigenous backlash, a further decade of alcohol abuse and despair, and then the third decade saw the infiltration of a heavy drug culture and associated street crime. During 2002-03, in response to the escalating social problems and the deteriorating housing stock, the AHC Board, staff and local volunteers² developed the Pemulwuy Redevelopment Project for inclusion in the NSW Strategic Plan for Redfern, Eveleigh, and Darlington—the RED Strategy. This effort received welcome encouragement from the NSW Premier's Department, South Sydney City Council and the University of Sydney. A major outcome of the project will be 62 homes commemorating the *Gadigal* people, the original Sydney tribe who were wiped out by smallpox and other colonial impacts shortly after European settlement. Pemulwuy was a famous Aboriginal warrior who led the resistance to early European occupation in the Sydney region.

The AHC Community Social Plan

The agenda for the Pemulwuy Redevelopment Project has been driven by the AHC's Community Social Plan, prepared by Angela Pitts, a Black American researcher currently at the University of Sydney. Through a comprehensive planning process, the Community Social Plan³, as driven by the AHC, outlined a grass roots response to the magnitude of the physical and social degeneration on the Block, the severe stress and social disadvantage experienced by the Aboriginal tenants and the continued inaction on the part of relevant government bodies and institutions. The plan has guided and facilitated the AHC's commitment to generating new sustainable and culturally appropriate housing options for the Redfern Aboriginal community and rebuilding a spirit and sense of community for both former and prospective residents of the Block.

The Community Social Plan provided avenues for the Aboriginal community to express their visions, goals and objectives, which were then incorporated into the strategies and guidelines of the Redevelopment Project. A set of 12 social planning objectives were identified during the community consultation process⁴ and from these the following design policies emerged⁵.

1. Reconciliation and Social Harmony

In a deliberate move to counter the 'no-go' reputation of Eveleigh Street, Michael Mundine advocated opening up the Block to scrutiny and extending a welcome to groups and individuals to mix and interact with the Aboriginal community. This idea led to the development of an open civic place over the railway lines and ramping down to Caroline Street. It seemed appropriate to offer this place the name Red Square in tune with the RED Strategy.

Red Square not only enhances the heritage frontage of Redfern Station but also promises to be a space where practical reconciliation might take place. The brief for a proposed competition for the design of Red Square has not yet been written, but the AHC planning team has proposed a ceremonial gathering place for managed celebrations and performances that also features a meeting place and a large digital screen for important events (similar to Federation Square in Melbourne). Also proposed are a contemporary sculpture of Pemulwuy to celebrate Australia's first freedom fighter and a water spectacle involving a *Gadigal* totem.

2. Appropriate and affordable housing

Since the company is providing the land, it is expected that all development costs will be forthcoming from both federal and state government sources. With this in mind, project finances have been modelled to realise a healthy surplus after three years and will not require the input of ongoing funding. This model was derived from the nearby City West Housing Company at Ultimo-Pyrmont, which has flourished over the past 10 years providing affordable housing for a social mix of middle to low income families. The 12 tenants still residing on the Block will be re-housed and others on a waiting list will have an employment, family or residential association with Redfern maintained. These Aboriginal families will require three and four bedroom homes. Rents and potential equity sharing will be geared to 30 per cent of gross household income.

3. Culturally appropriate service and facility needs

From among the NSW Premier's 10 best urban design examples of 2001⁶, the AHC Board was unanimous in selecting Newington at Homebush Bay as the model most closely matching their ideals for Redfern. The stepped house and garden terraces enjoying a northern aspect and spectacular views of Sydney City provide an equal capacity for outdoor and indoor living spaces. These ideas will be adapted for the Block's Master Plan, in which, in most cases, new homes will have a large garden area equal to the floor area of the house to accommodate the indoor/outdoor lifestyle preferences of Aboriginal residents. In addition, common access ways will promote social contact and encourage community building. Supporting services will include a hostel catering for country visitors and Aboriginal students, and the Elouera Gym for exercise and sport. In addition, Aboriginal craft will be integrated into the interior design of each of the 62 homes, and specific public spaces will celebrate the local identity using Aboriginal sculpture and landscape designs.

4. Community safety

The general principles of removing crime opportunities and increasing local surveillance with 'eyes on the street' have been adopted following a series of AHC community safety workshops and street walks with police, local residents, local government councillors and planners. All homes will overlook public places and a landscaped billabong and spiritual place will have adjacent live-in caretakers. Discreet lighting at corners and entries together with sensors will also be utilised in the design. These will work in tandem with a closed circuit television system, which will monitor all front doors, gardens and parking areas. The project design will discourage lanes and alleyways, and encourage activity generators such as local recreation and sporting activities.

5. Supporting families, women and children

Redfern already has a high concentration of Aboriginal support services serving the metropolitan area, but is in need of family support services. The project's design will encourage facilities and services that provide

positive parenting and family provision programs. Murawina — a former kindergarten site on the Block — has been proposed as a special family support unit to help families to flourish within the new development.

6. Aboriginal health

As part of the overall planning strategy, the AHC held a series of workshops on health and sustainability that focused on the national Indigenous housing guidelines⁷ and additional requirements for wheelchair access. A specific room type — to be known as the home clinic — will combine the second bathroom required by social housing standards for three and four bedroom apartments with habitable laundry provisions and a spare bed for family members who may have an infectious disease. It is intended that this room will enjoy garden access to assist recuperation and solar drying and also to serve the purposes that country laundries in rural houses used to provide.

7. Aboriginal identity, culture and spirituality

The notoriety of the old Railway View Hotel in Eveleigh Street had made it symbolic of the Block as a poisoned waterhole. The hotel, currently converted into offices, is to be removed and the site ceremonially cleansed to make way for a new commercial building including a hostel for visitors to Redfern and Indigenous students at nearby tertiary and adult education centres. In addition, a billabong will be created to act as a rainwater retention basin. It will be landscaped to represent the mixing of salt and fresh water and become the bubbly brackish water that is symbolic of the reconciliation process.⁸

Life-size sculptures of Pemulwuy, the Rainbow Warrior, and Murawina mother and child are to be commissioned to inhabit the new development's public places, to inspire all, particularly the next generation. The history of the early residents on the site, the *Gadigal* clan, and the Aboriginal railway workers from all over NSW who helped build the railway system and were employed at the nearby Eveleigh railway workshops will be remembered. Recent history will also be recorded. For example, then Prime Minister, Paul Keating's, 1992 Redfern oration, which not only contained an apology to Aboriginal people but set an agenda for change to meet Aboriginal aspirations by 2002, will be recorded graphically in a public place.

8. Training, skills development and employment

Local Aboriginal youth in particular will be employed through building apprenticeships contracted through the Redfern Aboriginal Corporation. Gardening, caretaking, laundering, security, and revolving public art and craft projects will provide ongoing work. In addition, the AHC intends to commission wood-crafted door handles, letterboxes, notice boards and signs from the local Tribal Warrior Association who have previously used their skills on local houses and boats.

The project design provides support accommodation for students in the form of 30 rooms in the hostel together with an Internet café and recreation outlets. In 2002 there were over 300 Aboriginal students enrolled at Sydney University.

9. Ownership and management

The Aboriginal Housing Company will implement a planned social mix of middle to low income Aboriginal residents who have an existing relationship with Redfern through work or family residences. Plans include the capacity for all residents to gain title over their homes to allow these Aboriginal families to transit from tenancy to home ownership. However, there will be a restriction to this capacity that will ensure the land remains in community hands. The company will enact strict rules and certain aspects of traditional law to involve the whole family in legal obligations to stamp out drug trafficking. Management will include regular on-site meetings for all tenants and owners to ensure a build-up of social capital amongst residents.

10. Aboriginal enterprise

The Redfern community already has at least 32 local, regional and national Aboriginal organisations providing it with training and job opportunities. A fundamental objective of these agencies is to maintain

services to stem the drift of Aboriginal families away from the Block. It is hoped that the commitment to build new high-standard family housing will restore community confidence and thereby increase the Aboriginal population and local employment levels.

11. Ecological and environmental sustainability

All 62 homes will enjoy passive solar conditions with access to light and ventilation on three sides together with generous shade and sunny outdoor rooms.⁹ Rainwater will be collected for gardening at every level and judicious use of Indigenous plant species will be guided by Aboriginal horticulturalist, John Lennis, from the Sydney Botanic Gardens. It is proposed that a nearby branch nursery will be established by the South Sydney City Council before construction starts to provide advanced plants already acclimatised to the local environment and decent local jobs.

12. Contact with nature

The commitment to large gardens for every home, with bush plants to support bird life, will inspire outdoor living and gardening. The establishment of a nursery will support this provision. The recent publication of *Greening Sydney* has guided the planning team’s requirement for specific green housing provisions.¹⁰ (see Figures 2 and 3)



Figure 2 A master plan drawing showing the proposed redevelopment of North Redfern and Red Square prepared by Cox Richardson, Architects & Planners. [Reproduced with the consent of Planning NSW, July 2003.]

The future and the next generation

The vision of the AHC’s CEO, Michael Mundine, for the *Gadigal* community is to provide living conditions for his people, which both respond to contemporary design standards and blend with the local community. However, the difference will lie in the nature of the larger families and lifestyles enacted by the Aboriginal community of Redfern.

In 1972, just before the Aboriginal Housing Company was established, Dr H.C. Coombs said:

Only the Aborigines will determine the pattern of their future lifestyle and the degree to which it will be achieved. Whether it is won from us in bitterness and in conflict or whether it develops as an honoured and

welcome diversity in the fabric of our national life can, however, be for us to decide.¹¹

The AHC planning team is committed to continuous evaluation of the community social planning strategies over a sustained period of design implementation. Stage 1 of the project – consisting of 24 homes – will be occupied before stage 2 commences, allowing for first-occupancy evaluation studies to be conducted. Some changes can be implemented as variations to the later stage of work. Further post-occupancy evaluations will be carried out following completion of the second stage and will inform the constant monitoring process established by the social planner and the AHC. Reporting to the relevant funding bodies should ensure that worthwhile feedback is produced for other Aboriginal communities.

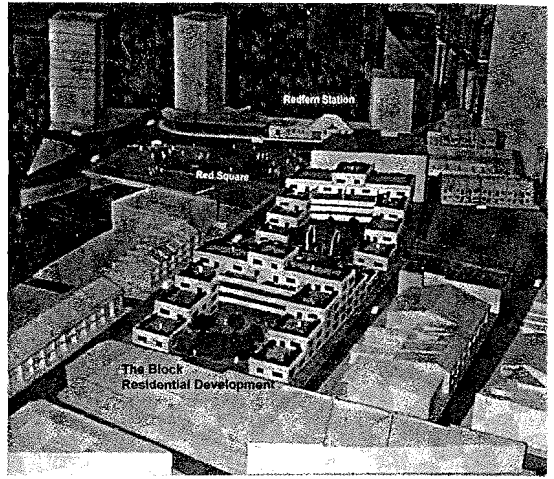


Figure 3 Aerial view of a master plan model of the proposed redevelopment of Red Square and The Block, looking north. Redfern Station is in the background. [Model Artist: Dao Trang. Photographer: P. Vallis.]

Michael Mundine says he sees no reason why Aboriginal families in Sydney should not enjoy the best housing design possible. It is anticipated that the Pemulwuy Redevelopment Project will provide models that will significantly reform the provision of urban Indigenous housing

Endnotes

- 1 Quoted in 'Aboriginal Australia: The Redfern Example,' *Aboriginal News*, 1, 9 (October 1974), p.19.
- 2 The AHC team included: CEO Michael Mundine, project manager Peter Vallis, social planner Angela Pitts and honorary architect/planner Col James.
- 3 Pitts, A., 'Community Social Plan: Pemulwuy Redevelopment Project Redfern,' Redfern: Aboriginal Housing Company, 2001. The plan achieved an award for innovation in community housing at the National Housing Conference in Brisbane, 2001. Refer to the website <<http://www.ahc.org.au/splan/sp.html>>.
- 4 Prepared by Pitts, A. and Sarkissian, W. in 2001. Refer to Appendix A of the AHC Community Social Plan.
- 5 These are part of the expressions of interest proposal that was used to seek responses from design/construct consortia in mid-2003. See Pitts, A., 'Community Social Plan,' 2001, p.66.
- 6 NSW Department of Urban Affairs and Planning, *Residential Flat Design Pattern Book*, Sydney: DUAP, 2001.
- 7 Healthabitat, *The National Indigenous Housing Guide: Improving the Living Environment for Safety, Health and Sustainability*, Canberra: Commonwealth, State and Territory Housing Ministers' Working Group on Indigenous Housing (Australian Department of Family & Community Services and Aboriginal and Torres Strait Islander Commission), 1999.
- 8 Yunupingu, M., 'Yothu Yindi: finding balance,' in Semmler, H. (ed.) *Voices from the Land: 1993 Boyer Lectures*, Sydney: ABC Books, 1993, pp.1–11.
- 9 Sustainability advice has involved both local designer Michael Mobbs (Mobbs, M., *Sustainable House: Living for our Future*, Marrickville: Choice Books, 1998) and long-term supporter Nick Hollo (Hollo, N., *Warm House Cool House: Inspirational Designs for Low-energy Housing*, Marrickville: Choice Books, 1995) who have guided practical applications of ideal provisions.
- 10 Johnson, C., *Greening Sydney: Landscaping the Urban Fabric*, Sydney: Government Architect Publications, 2003.
- 11 Coombs, H. C., *The Future of the Australian Aboriginal (George Cohen Memorial lecture)*, Sydney: University of Sydney, 1972.



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Errata

Footnote 11 on page 79 should cite Williams, N. & Reid, J. 1985 "Voodoo death: whose reality?" in *American Anthropologist*, March, Vol. 86, No. 1, pp. 121-133 rather than Reid, J. & Williams, N., 'The Dangers of Surgery: An Aboriginal View', *Medical Journal of Australia*, 1, 2 (1978)

Please note that some italic formatting has been lost in the body and the endnotes due to font corruption.

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