Tāone Tupu Ora
Indigenous knowledge and sustainable urban design

Edited by
Keriata Stuart &
Michelle Thompson-Fawcett
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Sustainable Cities
Acknowledgements

Bhara taku toa i te takitahi, engari ko taku toa ko te takitohi;
my strength does not lie in working alone, but in working with others.

Our thanks go out to:
Wiki Walker, who suggested the title
Shirlee Allerby, for her photographs
Jan Logie, for her project management support
Philippa Howden-Chapman, for setting the koupapa and for reviewing the papers
Hula Publications, for editing support

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Front cover photo: Maungakiekie One Tree Hill from the northwest, 3.30 pm 11 August 2010.
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Back cover: The wetlands at Frank Kite Park as seen from the water (Architects: architects+).

National Library of New Zealand Cataloguing-in-Publication Data:

Tūpua pōwhiri : Indigenous knowledge and sustainable urban design / edited by Kerista Stuart & Michelle Thompson-Fawcett.; Includes bibliographical references and index.
ISBN 978-1-877577-23-0
1. Tikanga tuku iho. I. Stuart, Kerista. II. Thompson-Fawcett, Michelle. III. Title.
307.1376098—dc22

Production: Matthew Bartlem, Logan Allen
Cover: Lynn Peck
Printed by Astra Print, Wellington

Published in 2010 for the
New Zealand Centre for Sustainable Cities
centred at University of Otago, Wellington
www.sustainablecities.org.nz

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CHAPTER 2

Micro-urbanism: Regenerative buildings and the architectural landscape of the pā

Amanda Yates

Amanda Yates is a registered architect and academic. Since beginning her research-based architectural practice, Archiscape, in 1999 she has focused on developing contemporary architecture influenced by pre-contact Māori-built environments. She has continued to develop this architectural built research since joining Massey University's Spatial Design programme. Amanda has whakapapa links to Njūri Whakane, Ngāti Rangitawhiti, Rongowhakaata, Te Aitanga-a-Mahaki and Ngāti Pākeha.

We are now an urban species (1) whose practices are rapidly overwhelming the productive capacity of the planet (2). Determining how urban areas can become productive, rather than consumptive, environments that are sustainably linked into the resource and energy cycles of the whenua is an increasingly urgent task. When used in relation to urban design, the contested and complex term ‘sustainability’ has tended to mean the reduction of negative impacts. However, as the discourse around sustainability has developed, many researchers and practitioners (3, 4) have suggested that the built environment must become a net producer of resources. As Janis Birkeland asserts in her book Positive Development:

[Given the Earth’s diminishing biodiversity and carrying capacity, development can only be considered sustainable where it increases natural capital and reduces overall resource flows – as well as meet[s] ... conventional sustainable development criteria. (5)]

Reconceptualising the built environment as a generative site requires a major paradigm shift, for in the West cultural productions such as architecture have been conceived as separate from the living and physical environment’s resource

"The terms generative or regenerative are used in this chapter to reference the way a regenerative system provides for continuous replacement, through its own functional processes, of the energy and materials used in its operation. (6) At the architectural scale, continuous replacement may not be achieved, but may occur in the wider productive and networked urban architectural landscape."
and energy flows. In this chapter I discuss Māori architectural landscapes, or pā, which link a productive, venerated and carved landscape with the built environment; and I propose a contemporary urban design strategy which links sustainability with this Indigenous knowledge.

Operating at the intersection of urban planning, architecture, landscape architecture and landscape urbanism, urban design is a cross-disciplinary discourse concerned with the massing and formation of buildings, public space and green zones. Introducing sustainable practices or considerations into urban design requires broadening already extensive urban design factors to include social, economic and ecological issues. Holistic sustainable urban design parameters must incorporate the urban environment, including architecture, public and green space, and the spatial ordering and interrelationships of urban activities; transport planning, including pedestrianisation; energy; service and resource systems, including urban agriculture, forestry and waste management; and the development of local ecosystems (3–8). In short, sustainable urban design strategies must consider issues of both culture and nature, so that our cultural practices can contribute positively to the ecologies within which they operate.

In this chapter I focus on the development of sustainable design strategies that are influenced by indigenous knowledge. While there are examples of both sustainable and unsustainable indigenous practices, I am interested in the reverence for and connection to the environment that underpins indigenous cultures and which, I suggest, is an essential component of sustainable design. Introducing indigenous cultural paradigms and practices into discourses dominated by a hegemonic culture is a complex endeavour (9). Yet there is a growing body of Aotearoa New Zealand-based work that models strategies for introducing Māori knowledge into contemporary discourses (10–13), as well as a number of studies recently completed or in progress* on the relationship between indigenous knowledge, resource management and urban design. Such work acknowledges that customary principles and practices have value in the contemporary world and can enable new knowledge. I explore here concepts such as mauri and whenua, and customary indigenous design practices such as the architectural landscape of the pā. These principles and practices acknowledge the intrinsic value of the environment as a whole and the essential interrelation of people and nature.

I also refer to contemporary Western design strategies, such as regenerative and positive development design, which operate within a holistic model and aim to positively generate or regenerate energy, resources and ecological systems (3–5, 14–16). These strategies focus on the interrelations within and between multiple systems. They also require an ability to work across disciplines from ecology to engineering, architectural planning and between development. Janis Biddle achieves net positive conditions by having development work that will leave the ecology better off as achieving net positive conditions regenerative development.

Discussions of urban and (u)urban areas are wellestablished and form part of the core of urban areas. Surviving in more healthy, stimulating and sustainable places can generate a net economic gain.

Sustainability specialises in making a landscape more regenerative. This notion of a conscious concern for ecological sustainability with a focus on regenerative development requires that we develop new knowledge that is not only appropriate but also sustainable.

This notion of a conscious concern for ecological sustainability with a focus on regenerative development requires that we develop new knowledge that is not only appropriate but also sustainable.

God is regarded as the source of all knowledge. The concept of an indigenous worldview in which humans are not separate from nature but are a part of it has led to the creation of sustainable and regenerative development strategies.

By contrast, many indigenous worldviews in which humans are not separate from nature but are a part of it have been destroyed. These worldviews are often not considered by modern society.

In the current dominant worldview, from materials extractions to the design of body of the transverse section of second.
engineering, architecture to landscape architecture, industrial design to urban planning and between different culture’s knowledge systems. Describing positive development, Janis Birkeland asserts that it achieves net positive impacts during its life cycle over pre-development conditions by increasing economic, social and ecological capital. Positive development would not only generate clean energy, air and water, it would leave the ecology better than before development. It would be ‘reversible’ as well as achieving net positive impacts over its life cycle... (5)

Discussing the urban environment, Birkeland notes that urban areas are widely perceived as places where natural systems cannot survive or do not even belong. But through urban ‘re-design’ we could create more healthy, stimulating and beautiful urban living environments that reunite humans and nature. Cities can solve serious ecological and social problems at a net economic gain. (5)

Sustainability specialist Bill Reed also aims to reunite humans and nature: he defines regenerative design as being more than simply making a landscape and local habitat more productive and healthy. Effective regeneration requires that we engage the entirety of what makes a place healthy – the core interrelationships between earth systems, humans and the consciousness or spirit that connects them. (4)

This notion of a consciousness or spirit which links environment and people aligns with, for example, the Māori concept of mauri, but sits awkwardly with dominant Western concepts of nature and culture as distinct and separate conditions. While the perception of the relationship between nature and culture has shifted over time in Western culture, the construction of the two as separate identities has origins in Aristotelian philosophy and in a Christian tradition in which God is regarded as the creator of nature, meaning that nature in this denoted sense is distinct from God, but also that He is related to it as a creator or artisan is to a piece of work, or as a master to a servant. (17)

By contrast, many indigenous or non-Western knowledge systems share a worldview in which humanity arises from the natural environment and remains linked to nature by ancestral ties (11). In this sense nature is both super-natural, existing as a revered deity or pantheon of deities, and also familiar and familial. These worldviews or knowledge systems are embedded in cultural practices. In the current dominant Western model, our cultural productions are formed from materials extracted without consideration for sustainable harvesting, and are designed to be thrown away after use, buried in the ground or distributed through bodies of air or water in a natural environment which is considered to be separate and secondary to human industry. Yet as architect and sustainability
writer William McDonough writes, "away" does not really exist (3), and such industrial practices have led to a decline in almost every ecosystem on the planet (3).

Our effect on the planet is now so marked that some scientists suggest we are in a new geological epoch, the "anthropocene", which began either at the start of the Industrial Age or much earlier with the establishment of agriculture (18). A recent paper entitled Planetary Boundaries: exploring the safe operating space for humanity suggests that the definition and holistic monitoring of essential Earth system processes and biophysical thresholds is necessary as "anthropogenic pressures on the Earth System have reached a scale where abrupt global environmental change can no longer be excluded" (19). Of the nine planetary "boundaries" identified, three - biodiversity loss, nitrogen cycle and climate change - may have already been crossed, with consequent negative effects for Earth's intermeshed processes.

Developing more sustainable industrial practices and design strategies requires a return to first principles, which recognise how culture arises from nature and remains embedded in and reliant on natural resources. Polynesia's monumental landscapes offer an intriguing example of a worldview and cultural practice that blends the cultural and the natural as the ground is sculpted to enable habitation. These architectural landscapes were complex and site-specific constructions which, like the Māori pā, performed multiple functions, acting as markers of place and signifiers of collective prestige, as well as communal habitat or, potentially, defensible refuge. The term pā commonly refers to fortified villages as well as fighting stockades and redoubts, these diverse structures linked by their martial characteristics. However, my use of the term is restricted to elevated and terraced landscapes, and focuses on them for their urban qualities, their architectural and agricultural functions and, most importantly, for the way they combine these functions with a deep sense of connection to and reverence for the whenua. The largest examples of pā supported many thousands of people, and I contend they offer a model for a contemporary sustainable architectural and urban design practice that merges nature and culture as a synthesised whole.∗

Tangata whenua - people of the land

Western and indigenous worldviews are underpinned by radically different perceptions of the relationship between human culture and the "natural" environment. Throughout Polynesia the people and land are seen as fundamentally linked. The Māori term whenua refers to both land and place and as ecologist Geoff Park notes:

∗ I discuss the architectural potential of Māori constructed landscapes in a paper entitled 'On nature, culture and sustainable design' (22).
words like whenua – fenua, fanua, famua – and with similar meaning, can be heard in Tahiti, Samoas and Tonga respectively; wherever in the Pacific that Polynesian cultures reached. But whenua’s roots are far older than anything Polynesian. An ancient Austronesian concept from when people first entered the south-west Pacific, whenua shares linguistic roots with the vanua of Fiji and the famua of Bali, both conceptualisations of identity in which the historical relationship between human beings and the land is vital. (20)

Kaupapa Māori, a term that describes Māori ideology, is a papa or ground upon which Māori culture is based and from which tikanga or practices arise. While kaupapa Māori is a differentiated knowledge system, with each iwi and hapū having its own customs, there are common foundational values. Māori academic Sir Mason Durie describes a worldview in which people are deeply linked with an environment which has a spiritual as well as a material aspect (11).

In Māori origin narratives, the land is body, the body of the Earth mother Papa-tū-ā-nuku, from whom all humans descend. Tangata whenua as a descriptor locates a people relative to their ancestral lands; yet it also holds within it a deeper reference to our origins as children of the Earth mother. The term ūkaipo refers both to the breast-feeding mother and to the land of one’s childhood, the link between land and mother again apparent in the etymology of the reo (21). Māori academic Aroha Yates-Smith refers also to ‘te kōpū o Papa-tū-ā-nuku’, or the Earth’s womb in which bodies are interred. The green leaves worn by the mourners and adorning the deceased’s body invoke the connection to Papa-tū-ā-nuku and evoke the sense of connection between the human dimension and the ancestors present in the surrounding environment, the tangible link between the physical and spiritual dimensions, and the fragility of life. (21)

The environment is conceptualised as dynamic and living, for as the Māori scholar and academic Makereti wrote in 1938:

[j]o the Māori of old, not only human beings, but everything, such as trees and all plants in the forest, fish, birds, animals, mountains, and rivers, had a mauri or life principle, (22).

To exist in this world would have meant a deep sense of interconnection as an integral, rather than dominant, part of this system of relations.

By contrast, orthodox Western thought, with its pattern of binary oppositions, commonly pairs the term nature with culture – the two being understood as antithetical. Given this thought construct, any cultural practices or outputs have tended to be understood as existing in a separate sphere from nature. The term nature derives from the Greek physis, meaning ‘everything’ and therefore suggests that there is ‘nothing that is not nature’ – it has no opposite (17). Yet over time this expansive definition has reduced to the point where ‘nature’ is now commonly understood as ‘the world apart from human influence’ (17).
The nature/culture binary opposition is a cultural construction that has had particular currency in Western thought over the last 200 years and, rather than being universal, is specific to that cultural tradition.

In the last 50 years, groups within Western culture, including environmentalists and proponents of sustainable design, have begun to challenge the dominant conception of the relationship between nature and culture. The exploration of indigenous knowledge by Western ecologists has become more common as awareness has grown that indigenous cultures throughout the world have long understood that any small part of a landscape—a bird, a forest or lake—is part of a larger system and contributes to its harmony through internal circuits and flows. (23)

Ecologist and writer Geoff Park reflects this shift when he writes that ‘[w]hen a tree is cut, it appeals to an ecologist’s sensibility because it speaks to ecology’s most vital, and perhaps wisest, principle: that everything is connected’ (20). Discussing the Māori concept of mauri, Park asserts that this encourages us to see that sense of connection that has confronted Europeans throughout the Pacific. In the elemental terms of matter and energy, people ultimately are land, no more, no less than the birds, insects, trees and seeds and the constant processes of their birth, growth and decay and the movement of them and their parts through the landscape. (20)

Indigenous customary knowledge and practices offer important precedents in the search for sustainable practices that are culturally specific and of their place.

While Western conservation theory has consistently sought to separate people from the land to keep the environment untouched and ‘natural’, Park suggests rather that conservation may be the act of ‘allowing the life forces of culture and nature to continue expressing themselves’ (20) as an interactive and evolving process. For Park, the nation of Tonga represents an example of how the customary knowledge of local ecosystems and an ethic of guardianship led to a sustainable and richly productive small island landscape for the 3000–2000 years the islands have been occupied (20). The Tongan environment featured a ‘natural’ forested landscape interspersed with pockets of cultivated crops in a manner that enabled ongoing soil fertility, but which in Western terms blurred the boundaries between the natural and cultural. Indigenous customary knowledge, like the concept of mauri, and practices such as the Tongan forest cultivations offer important precedents that can assist in the search for sustainable contemporary practices that are culturally specific and of their place.

Polynesian architectural landscapes

Polynesian architectural landscapes, like Tongan forest cultivations, also overlaid the ‘natural’ and the cultural, rendering the two a complex hybrid. In this tradition the ground was articulated, formed into furniture, ceremonial platforms or inhabited space sculpted from the ground. This practice of earthworking was part of a complex of monumental architectures evident across Polynesia, which ranged

In type from earth or stone mounds and places, and ditch and bank performed a range of functions of political hierarchies and families’ (26). Archaeologists have pointed to the symbolic and defensive features of little attention to architecture of their earthworks. Yet the largest pā in Aotearoa constructions. But a dissection of the site of the monument at Tinakori, one of the few at this earthworking practice in Polynesia (28). The description of a defensive stronghold, being a nor the size of the monument. Austin, the site of the monument at Tinakori, one of the few at this earthworking practice in Aotearoa New Zealand is a constructed landscale headland and spur in it has been shaped for use attached to these early Human settlement of the island hilltops, known as pā.

Sarah Treadwell, in her *the architecture of the Hū* describing them as ‘mas the . . . land’ (31).

The term pā means as to clump or group to the term to describe fort or residential sites refers to an archaelogical mound, a kāinga (1) earthworks, though mounds of ra, hangi, tukutuku (3 recessed whare (houses), and bank constructions
in type from earth or stone platforms or temples (the heiau of Hawai'i and raised stone mātave of Tonga and Samoa), earthen or stone mounds for habitations or burial places, and ditch and bank fortifications (24, 25). These monumental architectures performed a range of functions that included displays of status, the establishment of political hierarchies and 'the assertion of territorial ownership of productive regions' (26). Archaeologist Douglas Sutton describes pā as 'complex monuments [that] ... were important to people in various ways, which included ceremonial, symbolic and defensive purposes' (26). These inhabited landscapes have received little attention in architectural and urban design discourses; perhaps because, given their earthen materiality, colonists understood them only as landscape elements. Yet the largest pā in Aotearoa New Zealand, such as Maungakiekie, were complex constructions; both a dense urban site inhabited by some 5000-7000 people (27) and an evocation and embodiment of ancestral connection as well as: this chapter suggests; the powerful mauri of the living world.

Discussing the monumental landscapes of Aotearoa New Zealand, archaeologist Ian Barber writes that 'the number of Māori pā is without precedent in Polynesia' (28). The greater scale of New Zealand pā is suggested by the description of a defensive settlement on the Hawaiian Island of Maui as 'a true stronghold, being a natural hill fortified with a palisade, although nowhere near the size of the monumental Pa fortresses in New Zealand' (29). Academic Mike Austin, one of the few architectural commentators who have discussed pā, links this earthworking practice with architectural monumentality, suggesting that the Aotearoa New Zealand landscapes

as a constructed landscape. More importantly, every prominent hill, island, headland or spur in the North Island ... the ika of Maui (the fish of Maui) has been shaped for settlement for hundreds of years. There are many stories attached to these carved and tattooed artefacts. Māori repeatedly reinforce how important the land is to their world view ... these carved and terraced hillside heiaus known as pā, are our monuments. (30)

Sarah Treadwell, in her text *Categorical weavings: European representations of the architecture of the Hikari*, also refers to the terraced landscapes of Māori, describing them as 'massive architectural constructions' and an 'architecture of the ... landscape' (31).

The term pā means to block up, obstruct or close off an open space, as well as to clump or group together (32). Both meanings are evident in the use of the term to describe fortified villages or fighting stockades. In this chapter, the term pā refers to an architecture marked by major and monumental earthworks: by contrast, a kāinga (village) is understood as a settlement without major earthworks, though minor earthworking practices may be evident in the form of rūa, hangi, takuhi (storage pits, earth ovens, hearths) and, in colder areas, recessed whare (houses). The major earthworks that distinguish pā include ditch and bank constructions and terraces (28) along with a characteristic elevation
of site and clearing of vegetation. Terracing was a practical way to achieve a flat living platform on steep hills and ridges, while the elevation and the ditch and bank structures provided defence against attack. Elevation and the clearing of bush land also enabled the terraced landscape to perform as a monumental site.

Pa varied across territories, depending on resource levels, topographies and population densities. Something in the order of 6000 pa sites have been discovered, and it seems that pa proliferated in a short period of time during the 15th and 16th centuries (35). In their monumental scaling they represented an enormous commitment of resources. Aotearoa New Zealand historian Anne Salmond links pa with an attempt to claim status through a display of prosperity, asserting that at this time

population pressures and a growing competition for resources and prestige were being reflected in the construction of elaborate fortified villages (pa) and food stores, the secret burial of the dead, and the display of wealth in greenstone ornaments and probably also in carving. (34). Archaeologist Douglas Sutton, writing in The Archaeology of Aotearoa, also ascribes a 'symbolic' function to pa, asserting that it

may well be significant that many of these pa sites began as large storage facilities ... Concentration of a large amount of food in one place implies that display was also an important component of such sites, demonstrating success to other groups ... the elevated position, while taking advantage of natural defensive features, also had an element of display ... The alteration of the large, physically dominating cone was a clear statement about 'place' and the ownership of 'place'. Simply clearing the forest vegetation and forming terraces broadcast a highly visible statement about occupation of the landscape. Covering these terraced spaces with structures filled with stored wealth amplified that statement (26).

Sutton goes on to assert that the practice of pa building was time-consuming, and that if defence was the only reason for these structures it is likely that pa would have been hidden. Instead, the pa-in volcanic cones advertised their presence even more strongly than before by constructing highly visible lines of demarcation across the rim of the cone and around its highest points (26). This description suggests a dual role of both spectacle and defensive structure for pa, a duality which is evident also in James Cook’s account in his journals of the 1769-70 exploration of Aotearoa New Zealand:

'Tops hath all along told us that they were Moris [marae] or places of Worship, but I rather think that they are places of retreat or stronghold where they defend themselves against the Attack of an Enemy. (35)

Sutton suggests that pa were

both strongholds and marae. Pa are complex monuments and were important to people in various ways, which included ceremonial, symbolic and defensive purposes. (36)
These monumental landscapes, like other Polynesian monumental architectures, are concerned with the
creation and intensification of highly visible, material symbols made up of strongly demarcated or bounded areas, placed so that they dominate the surrounding landscape. (28)

As such, these constructed landscapes performed as signifiers which linked identity to place.

Historian James Belich also questions the assumption that pā were primarily defensive sites, suggesting rather that pā
were so difficult to take that there was often little point in trying... They are evidence of the presence of reserves, not their absence. They must post-date, or emerge in tandem with, the successful shift by some groups from an extractive to a sustainable economy. (33)

The idea of a sustainable economy underpins archaeologist Ian Barber's theories on pā. Discussing the过度use and subsequent failure of a primary food resource, Barber questions whether

pā of the 15th and 16th centuries at least may represent a monumental reaffirmation of and appeal for the extension of a more beneficent and productive order into a now more permanently capricious island world. (28)

Barber goes on to suggest that the act of working the land may have been understood as an integrating practice with the earth itself. He writes:

In its symbolism, the pā landscape... united expressions of 'cultural' landscaping with 'natural' sacred ancestral prominences... pā-building extended and re-integrated the traditional landscape. (28)

There is, in this theory, a complex merging of the cultural and the natural.

From pā to Te Whare Whenua

The largest pā were urban in scale and complexity of use, Maungakiekie, a volcanic cone pā in Auckland, may have had some 5000-7000 people living in it at times of peak use (22). In a report written for the Department of Conservation, anthropologist Susan Bulmer describes Maungakiekie pā as being, with the Mangere volcanic cone:

one of the two largest (46 ha) and the most complex of the Tamaki cone pā [sic]. The cone is completely terraced from summit to base. It has three peaks and two promontories, which were fortified with ditches and banks, formed on a complex of three cones joined together. (36)

The terraces of Maungakiekie were densely occupied: on some of the terraces pits for storing kūmara were dug, while postholes indicate that light-weight buildings

Maungakiekie's history is discussed in more detail by Bulmer in Chapter 4.
such as whare, pātaka and kākā were located on the terraces, as were recessed hearths, earth ovens and middens (36). The pā was a site of intensive cultivations on the hill and in the surrounding lava fields. Kūmara would probably have been a primary crop, along with taro and gourds (37).

As a kind of urban architecture, pā such as Maringakiekie allowed for dense inhabitation and, as a generative landscape, enabled local agricultural production and communal economic activity. Rising above the plain the carved whenua was - and remains in the case of Maringakiekie and many other pā - a powerful and living embodiment of the intertwining of whenua and whakapapa; environment and linked lineage over time. The synthesis of natural environment, architectural construction and resource production evident in the pā offers a way to rethink our urban and architectural practices; linking them with the productive landscape and with the cultural principles and practices of this land.

In this strategy, the city becomes a site not just for habitation and commerce, but also for urban agriculture and forestry, for grid-linked micro-generation of renewable energy for waste and pollution. Yet, forests in the urban landscape, and the regeneration of local use of renewable gases with consequent positive local production of new energy security in a way that is not prohibitively expensive (or familial), a series of buildings that define the landscape of the pā. It is an urban landscape of buildings that function as strategies by which the city can become a site of sustainable urban agriculture and forestry.

Figure 1. Ground House - a folded landscape which recesses into the ground (above), and a terraced pā landscape (left).

Figure 2. Sounds House - a pā (above), and a manau (part).
of renewable energy, for the remediation of waste and pollution via wetlands and forests in the urban precinct, and for the regeneration of local ecologies. The use of renewable generated electricity for transport and the development of urban native forests reduces pollution with consequent positive health effects.

Local production of resources like food and energy enables greater food and energy security in a world where non-renewable transport fuels may become prohibitively expensive (2). Most importantly, as a materialisation of veneration for and familial connection to the environment, the pa foregrounds contemporary culture's under-valuing of the environment both literally, in terms of the value attributed to natural resources such as clean air and water, and metaphorically.

In my own design research practice I have, over the last decade, developed a series of buildings that draw on the principles and practices of the architectural landscape of the pa. I have focused on what I see as key architectural elements or strategies by which space is made; the constructed landscapes which, like the recessed whare, form inhabitable space within the ground; and the transient and lightweight shelter structures that provide roofs and partial walls for those
earthen spaces. In projects such as the 'Ground House' (Figure 1), I have formed continuous concrete 'landscapes' that make space inset within the ground and fold, floors becoming walls, becoming benches.

In the Sounds House (Figure 2) I tested out a shelter structure that was partially open to the exterior, had an open platform at its centre and glazed walls which could slide back to open up the interior to the outside.

Tokatea (Figure 3) sited on a steeply sloping hill, brings together three spatial strategies, a rearticulated concrete landscape following the contour of the site, wall-floor blending with the exterior when the glazed boundary walls are retracted. Phase two of this project involves the development of the roof as a generative landscape which is a site for photovoltaic panels and solar water heating, as well as for plantings. The combination of architecture and productive landscape is the third characteristic of the architectural landscape of the pat i focus on. The generative

Figure 3: Tokatea—folded landscape and openness to the exterior (above), and generative roofscape (below).

Figure 4: Te Whare Whenua and an ordinary New Zealand potato plantations around it (right).

Te Whare Whenua is intended to small-scale test of regenerative strategies with the these be deployed more subsequent building.

Te Whare Whenua

Te Whare Whenua, a proj ect by Ngāti Whāua, employs work while also testing it has a range of sustainability intended as a focus for the architectural landscape. It technologies: thin film photovoltaic devices, and glass panels an electric car exterior a concrete and poured earthen materials.

1 'Ground House: Archiscape in association with JDA: Project leader Amanda Yates.
2 'Sounds House: Archiscape in association with TBA Project leaders Amanda Yates and Stephen Bunnington.
3 Tokatea: Archiscape: Amanda Yates.
Figure 4. Te Whare-Whenua (above) and an ordinary New Zealand pa with potato plantations around it, 1842 (right).

The landscape is intended to act as a small-scale test of regenerative design strategies with the aim that these be deployed more fully in a subsequent building.

Te Whare Whenua

Te Whare Whenua, a project developed to concept design stage with Auckland University, employs the architectural languages developed in the earlier work while also testing regenerative design strategies more intensively. The inte has a range of sustainability programmes currently in place and the building is intended as a focus for these. Te Whare Whenua is conceptualized as a generative architectural landscape. It also aims to test out experimental as well as familiar technologies; thin film photovoltaic technology is incorporated into areas of steel cladding and glass panels generate renewable energy to power the building and to electric car; exterior and interior mass walls are formed from low-carbon concrete and poured earth; rainwater and grey water is stored for filtering and

1 The material is currently being tested and uses geopolymer cement to achieve its low carbon state.

2 A technique in which earth is mixed with water and poured into in-situ formwork.
use, while composting toilets turn waste into a resource that can be returned to the earth. In the outdoor room and on the planted roof terrace native ecologies are nurtured along with native plantings and edible crops. Te Whare Whenua is intended as a small-scale test for a multi-storey, mixed-use building.

A key aspect of the principles underpinning the pā is the sense of veneration for and connection to the environment. While Te Whare Whenua is proposed as an architecture that generates resources it also, more radically, aims to construct a connection between people and the dynamic living landscape through design. Like the earlier buildings described in this chapter, Te Whare Whenua is influenced by the spatial qualities of the pā and its monumental folded landscapes and lightweight, open architectures. The building combines mass with lightness and permeability. Low-carbon concrete or poured earth walls, floors, and benches establish a continuous folding ground plane which creates a sense of landscape within the building, while large areas of wall slide away to make space contiguous with the exterior and the outdoor room with its native plantings. Breezes and bird song enter the space, as exterior and interior, ‘natural’ and cultural, merge (Figure 4).

Conclusion

Making the urban realm sustainable requires not only a reconfiguration of the technical or material aspects of our society but, more radically, reconceptualising the very basic principles by which we live. The dominant Western Knowledge system, which views nature as a separate and inferior condition, is inherently unsustainable in that it fails to adequately recognise essential planetary processes or value limited global design strategies with design practices that are more sustainable.

Discussing indigenous traditional values and world, where new hol solutions to global pā and landscape, Indigenous and West.

Working with tikanga M to be expressed and cultural. While founded have new knowledge em concept of indigenous lives that Indigenous people.

As a complex system holistic thinking inherent populated, operated as a ancestral and living links the natural and the culture pā reminds us to establish a responsive architecture and.

Approaching sustainability the micro-scale of a build connected urban fabric requires the architect to that local ecologies are renewable energy resources and not just ‘outside’ the local ‘nature’ architecture and landscape helping to model a cultural between people and the the building is filled with fruiting trees on building and the building itself is (Figures 4 & 5).

Figure 5: Te Whare Whenua - outdoor room and rooftop landscape.
Auckland Architect
or value limited global resources. I suggest that developing sustainable urban design strategies with respect to mātauranga Māori can enable contemporary design practices that are more carefully attuned to their place here in Aotearoa New Zealand.

Discussing indigeneity, Māori academic Garth Harmsworth suggests that traditional values and knowledge are seen as increasingly relevant in a complex world, where new holistic perspectives and ideas need to be integrated to find solutions to global problems. In many areas we are seeing a realignment of indigenous and Western thinking. (38)

Working with tikanga Māori enables formerly marginalised indigenous principles to be expressed and celebrated in the material practices of our contemporary culture. While founded on traditional concepts, such indigenous practices will have new knowledge embedded within them. As such, as Sir Mason Durie writes, the concept of indigeneity will change over time and will be about ‘embracing the lies that indigenous peoples live in modern times’. (39)

As a complex system the urban environment is well suited to the kind of holistic thinking inherent in indigenous epistemologies. The pā, at its most populated, operated as a dense urban-scaled environment which also celebrated ancestral and living links to the land, modelling a connected worldview in which the natural and the cultural merge. As a model for contemporary urban design, the pā reminds us to establish the urban condition as a hybrid of an environmentally responsive architecture and a productive and valued landscape.

Approaching sustainable urban design as a scalar condition that repeats from the micro-scale of a building to the macro-scale of a metropolis creates a rich and connected urban fabric. Rethinking architecture as a kind of micro-urbanism requires the architect to consider all the issues of sustainable urban design, so that local ecologies are nurtured; wastes are converted to resources and food and renewable energy resources generated. When this occurs, architecture—which at its weakest privileges only aesthetic form—becomes an interdisciplinary discourse linked to its local ‘natural’, built, social and economic environments. As both architecture and landscape, the pā sets the kaupapa for this reconceptualisation by helping to model a cultural practice that reverentially celebrates the connection between people and the productive environment. As an architectural landscape the building is filled with maori or life force, as native birds call and eat from fruiting trees on building terraces, the sun’s energy is harvested, rainwater caught and the building itself is formed from the earth, the body of Papa-tū-ā-nuku (figures 4 & 5).
Chapter 2: Micro-urbanism: regenerative buildings and the architectural landscape of the pā

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2. How could Maori values inform an agenda for the 21st century city?

3. What can Indigenous knowledge tell us about how to write more sustainable design for the future?

Tānie-Rangi Ora suggests answers to these important questions, bringing together perspectives on a broad range of urban issues, from Maori development to architecture, town planning to strategic growth management. It collects stories of lived experiences in the 21st century, and suggests principles and theories on which to base change.