

Relational drawing as agency: negotiating the tangible and intangible of Samoan diaspora social space

Karamia Muller : The University of Auckland, New Zealand

ABSTRACT

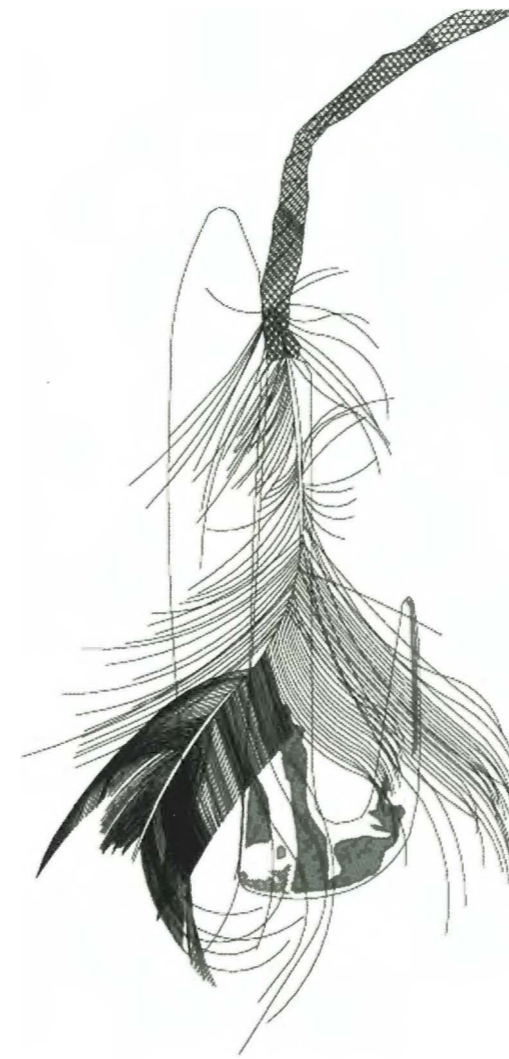
Se'i motu le pa 'a 'ua iloa

'May the pearl shell fish-hook never be lost before it has been shown to others. He who has a fine-hook should not nervously hide it, but allow others to see it and admire it; else he could not proclaim its eventual loss.' ¹ Samoan Proverb

This paper will discuss how drawing production has enabled experimentation into and critique of conventional spatial representational systems from a Samoan cultural perspective. It considers how relational documentation can be used to advance a spatial design practice concerned with interrogating indigenised agency. To introduce this paper the Samoan proverb 'se'i motu le pa 'a 'ua iloa' is used. Within Samoan culture the proverb suggests that 'it is mean to hide one's possessions' so that they may not be shared. ² Indeed, the display of possessions informs the function of relational drawing practice, which 'displays' the Samoan diaspora's attitude to their material culture. It is proposed that Samoan value systems underpin contemporary Samoan approaches to their tangible and intangible culture and that these values challenge contemporary Western conventions. This paper proposes that a paradigmatic shift, from the formal to the relational, needs to occur in order to appreciate Samoan buildings and their interiors. Relational drawing practices are employed to analyse the ancillary architecture utilised by Samoans living in Aotearoa New Zealand. Relational drawing is presented as agency for Samoan research and studio practice, enabling the display, through depiction, of Samoan diaspora's cultural values as they are played out in daily life and manifested in domestic architecture.

WINDS OF MIGRATION

The Samoan diaspora's place in New Zealand began with the earliest migration winds that brought - and still brings - them to New Zealand. The eastern winds carrying Samoans to New Zealand have assisted a Polynesian migration that had begun 800 years prior with Maori settlement. However it was to be the colonial system established by *Palagi* (European) settlers that would greatly influence the terms by which Samoans would settle over the past two centuries.



Beginning with a breeze of transient Samoan migrants intent on completing educational and theological instruction in the mid-nineteenth century, a later gust brought a larger and more influential group of Samoan migrants to settle in New Zealand.³ Following the Second World War, motivated by the work and educational opportunities available, Samoans took advantage of three-month visas offered by the New Zealand Government.

Indeed the number of Samoans resident in New Zealand grew from 6,481 in 1961 to 11,842 in 1966.⁴ New Zealand was keen to expand its economy and suffered from a shortfall in its labour pool. Initially, this led to lenient policing of immigration regulations and Samoans settled in the major New Zealand cities of Auckland, Wellington and Christchurch and the township of Tokoroa to undertake un-skilled and semi-skilled employment.

For a period, this arrangement suited both the Samoan diaspora and the host country. Migrants were able to contribute to their families' livelihood in Samoa through remittances, and New Zealand strengthened its economic stability and industrial self-sufficiency through the burgeoning blue-collar labour force.⁵ The demand was satisfied by rural Samoans who were young and, as anthropologist Cluny Macpherson summarises: 'The majority of Samoans in this wave were thoroughly committed to a Samoan worldview and lifestyle. They were assertively Samoan and in a relatively short time replicated many elements of Samoan village social organization.'⁶

Samoan migrants brought to New Zealand a continuation of their customs and practices and also a fervent commitment to the Church. Their conservatism⁷ and alienation from the host country led to these customs persisting despite resettlement. Samoan migrants in Auckland, along with other Pacific communities, established Pacific 'satellite' villages by settling in inner city areas. Later gentrification of these areas, however, by a new class of young, up-and-coming, middle class *Palagi* made living in the city unaffordable for the growing Polynesian community.

During the 1960s and 1970s the Labour Government implemented schemes that encouraged home ownership. The State Housing Corporation was assigned the task of financing the construction of conventional homes for low-income nuclear families. Contractors tendered for such business with a range of plans that satisfied the brief set out by Government Housing advisors. The homes were sold to families in a package in which private contractors arranged financing and the required building permits. For Samoan migrants, uncomfortable with regulatory bodies, these packages conveniently circumvented interactions

Above
Figure 1: Karamia Muller, Drawing of a pearl shell fish-hook, 2011.
ArchiCAD drawing.

with authority. For their part, contractors sensed the demand and opportunistically employed Samoan sales people to directly market potential clients.

Despite taking advantage of this niche market, the resultant dwellings failed to take into consideration the particular needs of Samoan migrants. Indeed, the three to four-bedroom homes with their rigid treatment of social space did not comply with the Samoan diaspora's social requirements.⁸ Macpherson notes that, instead, cultural needs were frequently addressed by the conversion of a kitset garage into a multi-functional space that could be periodically re-designated to accommodate a range of cultural activity.⁹

In addition to challenges associated with the repurposing of domestic interiors to suit cultural needs, some members of the Samoan diaspora were also subjected to hostility by the New Zealand government. From the mid-1970s, the National Government targeted Polynesians in dawn raids intended to evict so-called 'overstayers'; a policy that caused much grief to the affected Samoan families and inevitably damaged New Zealand's reputation. Despite the fluctuating history of support from the New Zealand Government, Samoan migrants have continued with settlement in New Zealand. However, it is a settlement based on class and societal systems that marginalise their customs and life choices. Having to choose from ill-suited housing options in extremely pressurised circumstances, none of which were on their terms, the Samoan diaspora has nevertheless negotiated solutions for themselves, resolutely regarding New Zealand as home.

Ancillary structures attached to domestic dwellings have proved vital in enabling the Samoan diaspora to recreate their culturally-specific social spaces in New Zealand. These structures, although varied, are typically single cell, adjacent to the domestic dwelling, retrofitted with reused cabinetry, decorated with a range of contemporary and traditional objects (such as photographs of ancestors), and furnished with household items. The kitset garage, known in Samoan as the '*fale ta'avale*', became popular amongst Samoan migrants as a status symbol,

and it also presented a practical and economical method of extending social space, seemingly without having to engage with unsympathetic authoritarian systems, specifically city council authorities for building compliance. The use of the pre-fabricated garage gave Samoan migrants a larger covered area, the function of which could be re-designated according to their needs and requirements. In examining the various functions that the *fale ta'avale* enables, it is clear that Samoan families (*'aiga*) have been able to manipulate such ancillary spaces to accommodate day-to-day activities and significant family events in a way that respects the cultural and social protocols of the Samoan diaspora.

Such spaces have become a social resource that the *'aiga* manages, rather than a literal equivalent of the customary Samoan dwelling, the *fale tele*. As well as utilising existing structures, another emergent practice, identified through interviews and web mapping, occurs with the construction of new ancillary structures to a number of the Samoan diaspora's domestic dwellings.¹⁰ These ancillary structures are also utilised to extend the *Palagi* nuclear home, like the *fale ta'avale*. Case studies have highlighted key similarities.¹¹ Defined as complementary to the domestic dwelling, such structures are not often fitted with a complete range of utilities, so they still utilise service areas of the domestic dwelling, including the kitchen and bathroom. The structures also utilise the resources and relationships of the *'aiga* to maximise social areas.

Different spatialities are activated through the relationships of members using the ancillary spaces at any given time. For example, the masculine spatiality activated when used as a socialising space for men, disperses once the space is cleared and utilised for the formalised discussion forum or *fono*. Analysed thus, it is assumed that these spaces, as conceptualised by Samoan diaspora, tend to be independent of architectural tectonics. They are framed by migration history, in an act of negotiation by Samoan diaspora characterised by anthropologist Te Rangi Hiroa in this way: 'The pleasure derived from the exercise of native institutions is perhaps the most important factor that has led to the persistence of Samoan customs and helped them to resist the disintegration that has taken place in other parts of Polynesia.'¹²

It is proposed that the prevalent use of the *fale ta'avale* as a facilitator of relational space is an architectural marker in migration history, a point when Samoan migrant homeowners began to view their property as a fluid landscape in which they could build with construction principles used in Samoa, rather than as a fixed built environment. In her study of Tongan architecture, architecture graduate and historian Charmaine Ilaiu identified that one of the persistent principles in contemporary *fale Tonga* is that the 'building process is just as important as the building itself'.¹³ This is also true for the Samoan *fale tele* in two respects. Firstly, construction requires the engagement of a family community, where the familial network employs a 'design-as-you-build' construction methodology necessary to produce a *fale* that satisfies the particular requirements of family and community.¹⁴ Secondly, an absence of working drawings does not affect the construction process, as this methodology depends on relationships between people. In lieu of building documents to consult, there is an intense level of participation by all individuals, actively engaged in the task at hand.

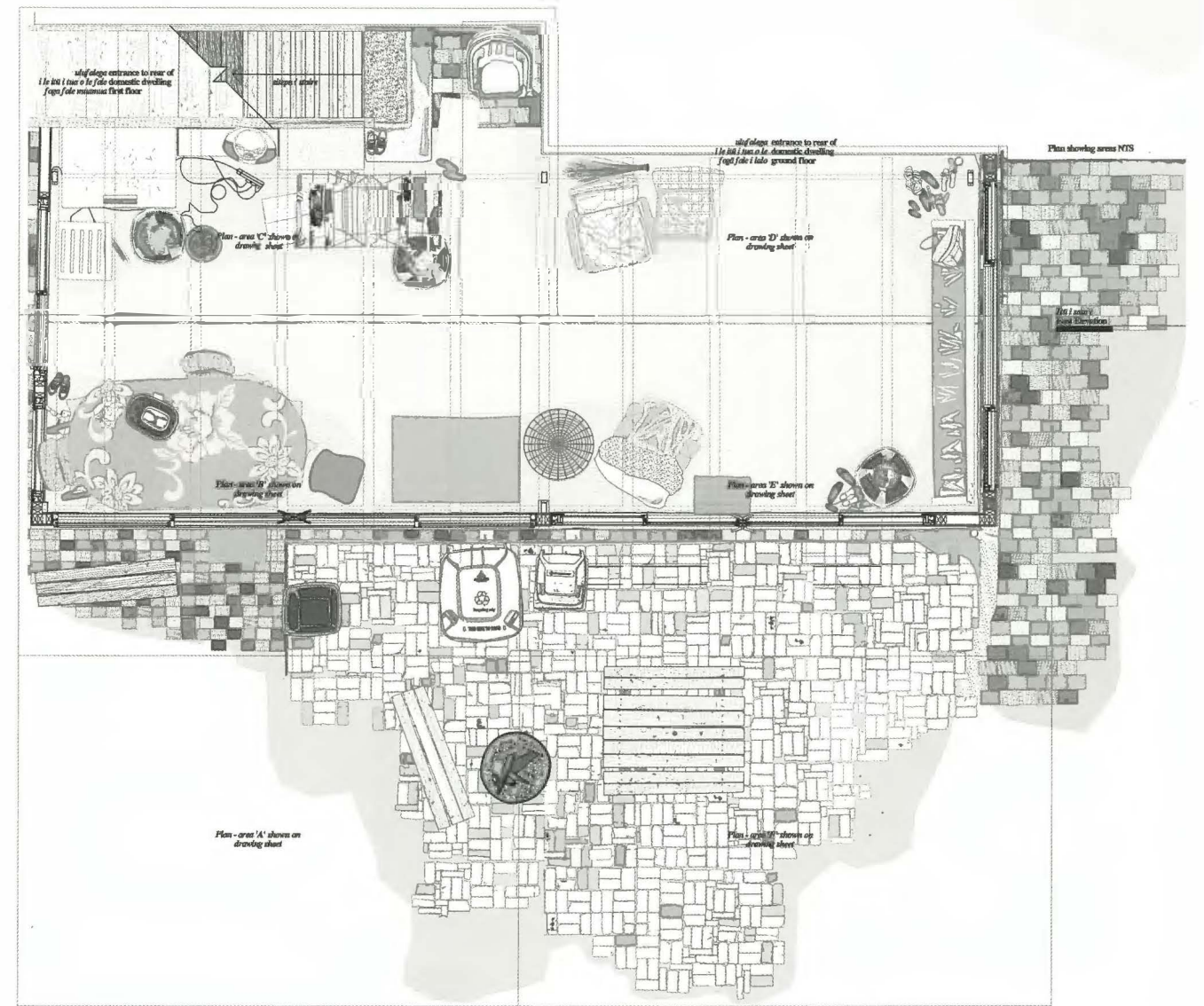
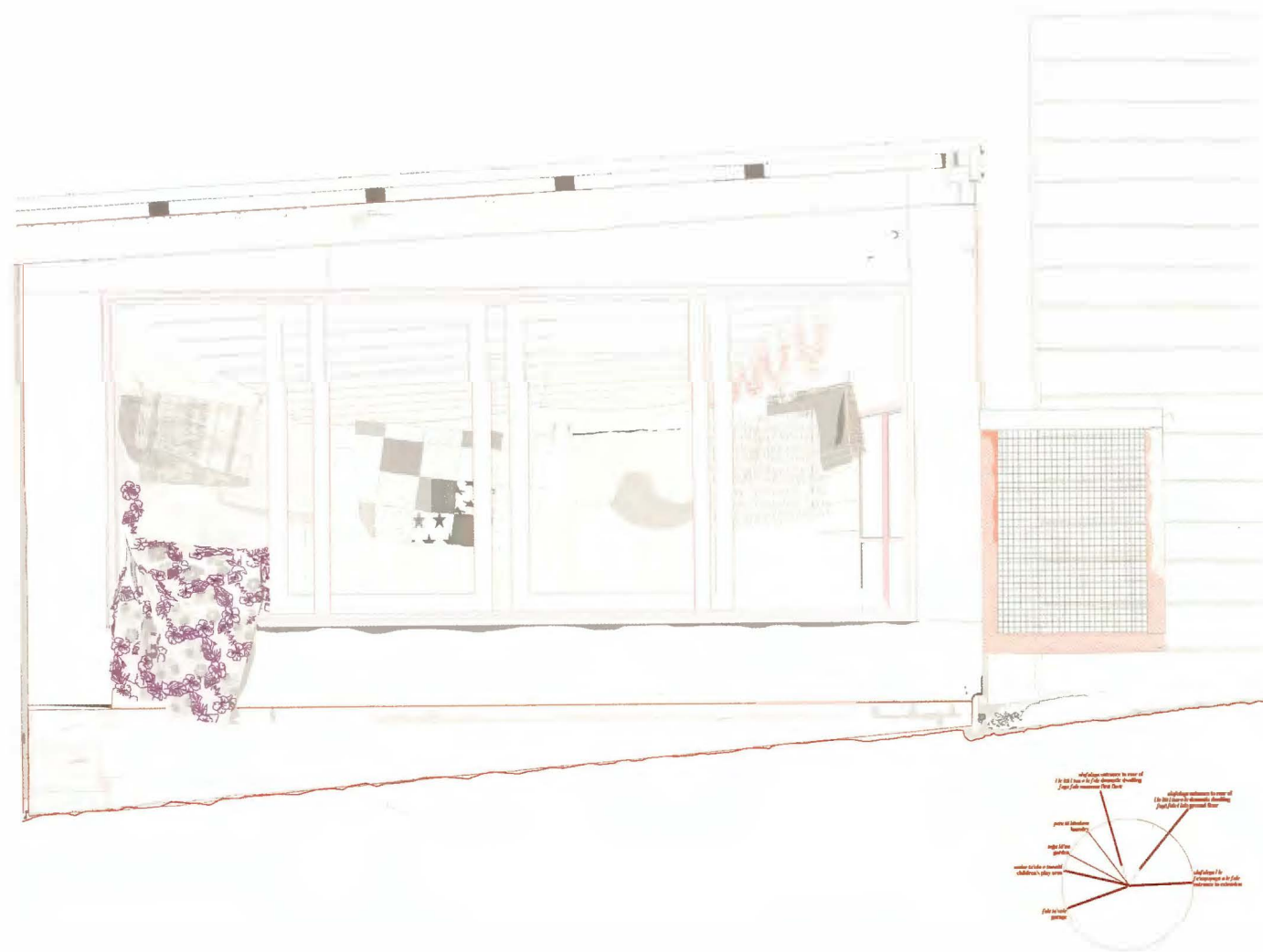
Anthropologists Cluny Macpherson and La'avasa Macpherson identified the same methodology in traditional building¹⁵ as it operated historically within the village context.¹⁶ The *'aiga* gathered appropriate local materials, and the house owners and their families prepared these for construction, then worked together to construct the house. Throughout the construction process, a series of relationships are activated that secure the labour and materials necessary to complete the project, incurring social debt which would be acknowledged and settled at a later date.¹⁷ This contrasts with the Western practice of construction where work is paid by instalments of money and only remedial obligations remain after project completion. This social interaction where debt is incurred and must be repaid is entrenched within the ideologies of Samoan culture.¹⁸ In Samoan culture social debt is a legitimate tender. It can be said that Samoan culture places more value on maintaining good relationships than on material wealth.¹⁹ These prevailing building processes are identified as relational construction throughout this paper. As such, they require a method of documentation that foregrounds relational information, treating it as equally significant as the representation of structure and façade.

A RELATIONAL CASE STUDY

Drawing documentation of ancillary structures in a New Zealand-based Samoan family home commenced with a single case study to test research assumptions and questions, and to demonstrate an understanding of these assumptions and questions through relational drawing. The case study was selected on the basis that the homeowners were comfortable with the numerous site visits that were required to develop the relational drawing process. Documentary issues included unique junctions, inventive use of materials, and difficulty in accessing areas of the ancillary structure. Elements difficult to examine, such as hidden structural members, were captured through photographic documentation, however they still required analysis on site to understand their locations relative to the structural whole. The drawing production process, using standard office architectural software, was based on a pre-existing computer-aided drawing (CAD) skill set that had been developed during architectural studies and in professional practice.²⁰ The final set of relational drawings shown as: *East Elevation; Plan A; Plan B; Plan C; Plan D; Plan E; Plan F* (Figures 2 – 8) are the product of this documentation process and also demonstrate methodological, theoretical and technical development.

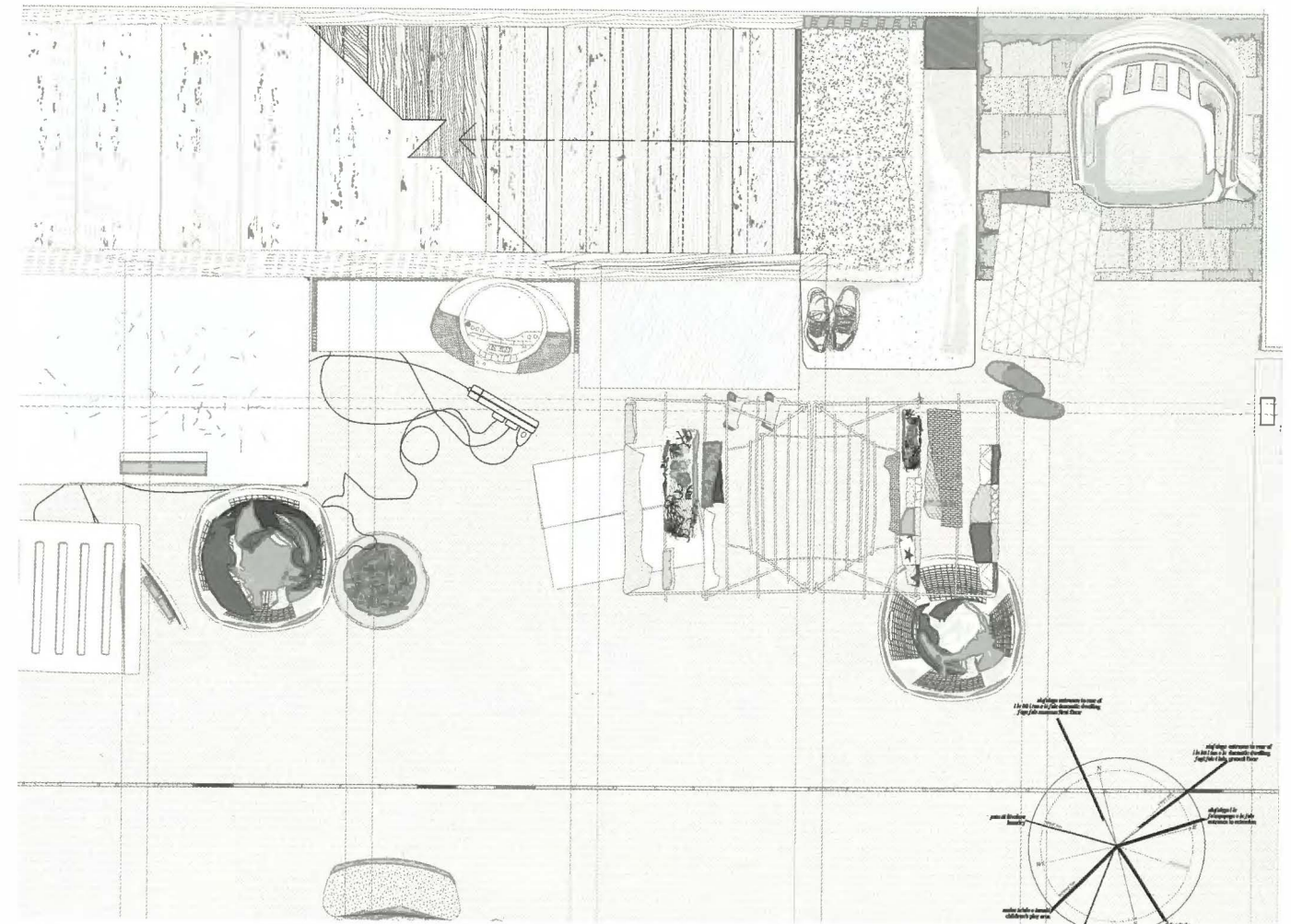
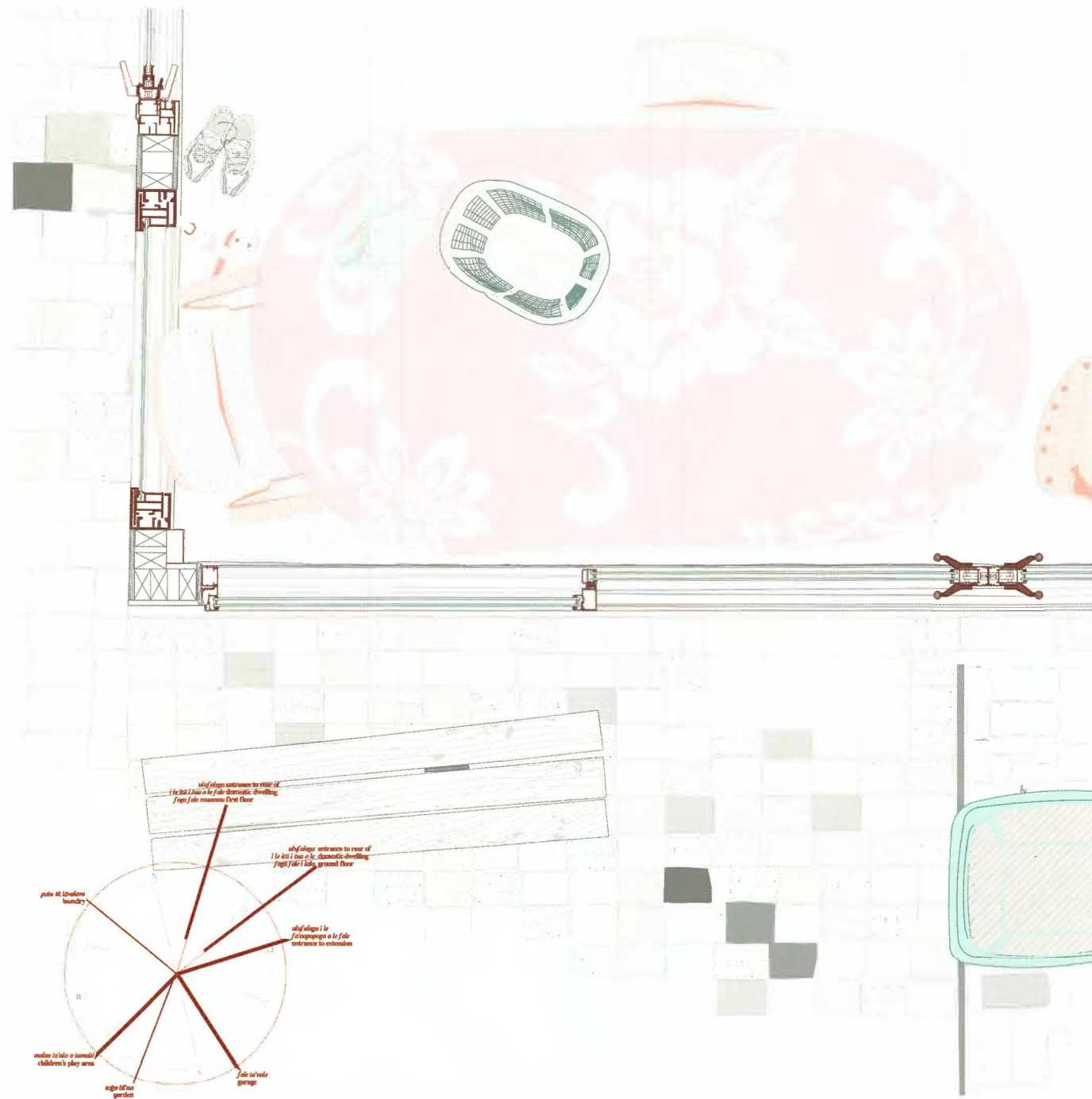
Conventional architectural representation has been instrumental in developing a culturally authorised critique of non-Western architectural and interior design practices. Commencing with conventional processes to generate traditional measured drawings, site visits to the case study house included measuring major dimensions and the development of sketches showing structural locations, supplemented by photographic documentation. Through discussions, members of the *'aiga* imparted their experiences of the construction process and how this ancillary structure functioned. These insider perspectives provided insight into the intangible values and elements of the structure.

A virtual model of the structure was built using standard library parts (data-enhanced parametric objects) in a 3D design software package (ArchiCAD) commonly employed to produce building documentation. In their first iteration, the generated



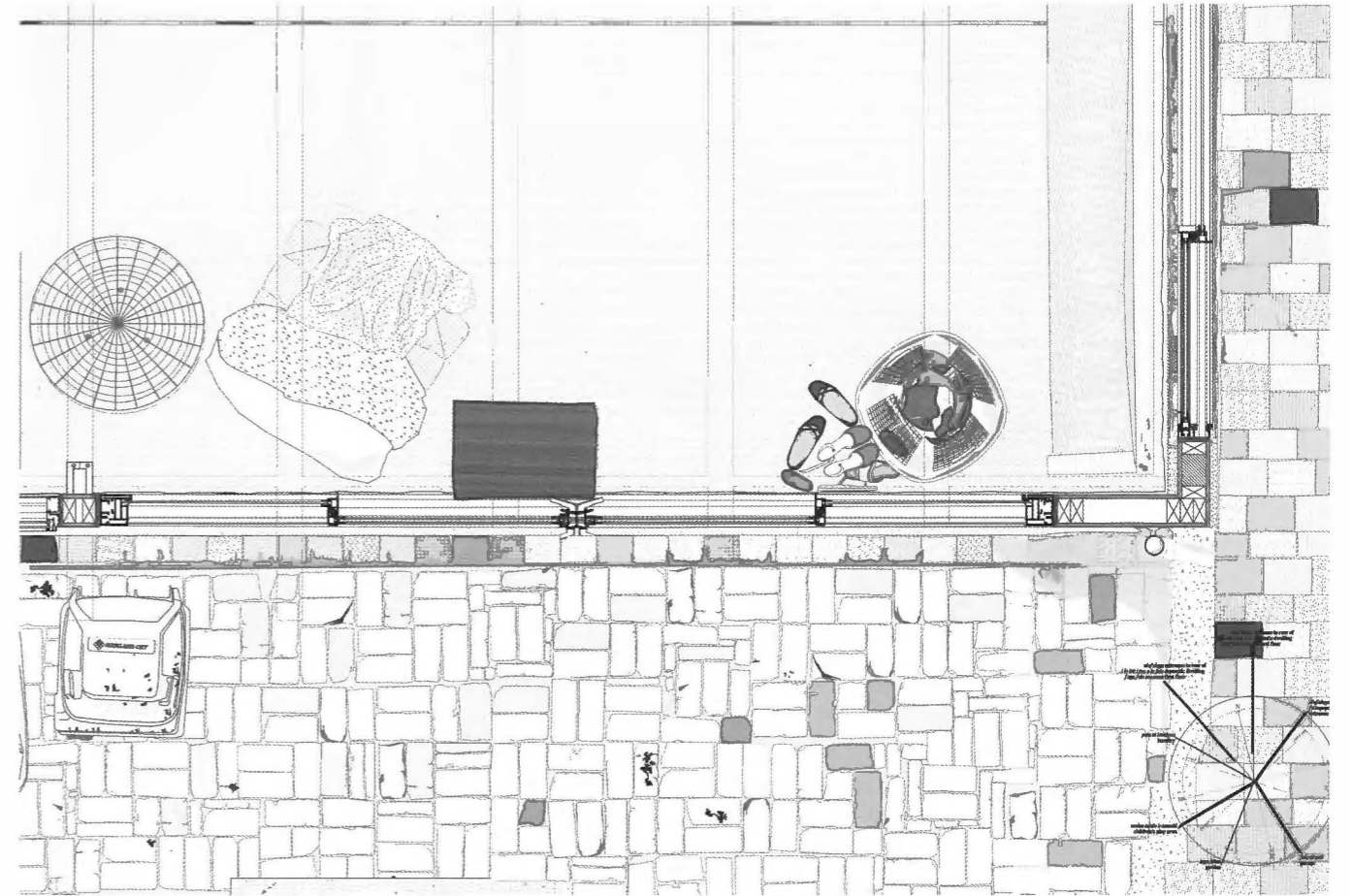
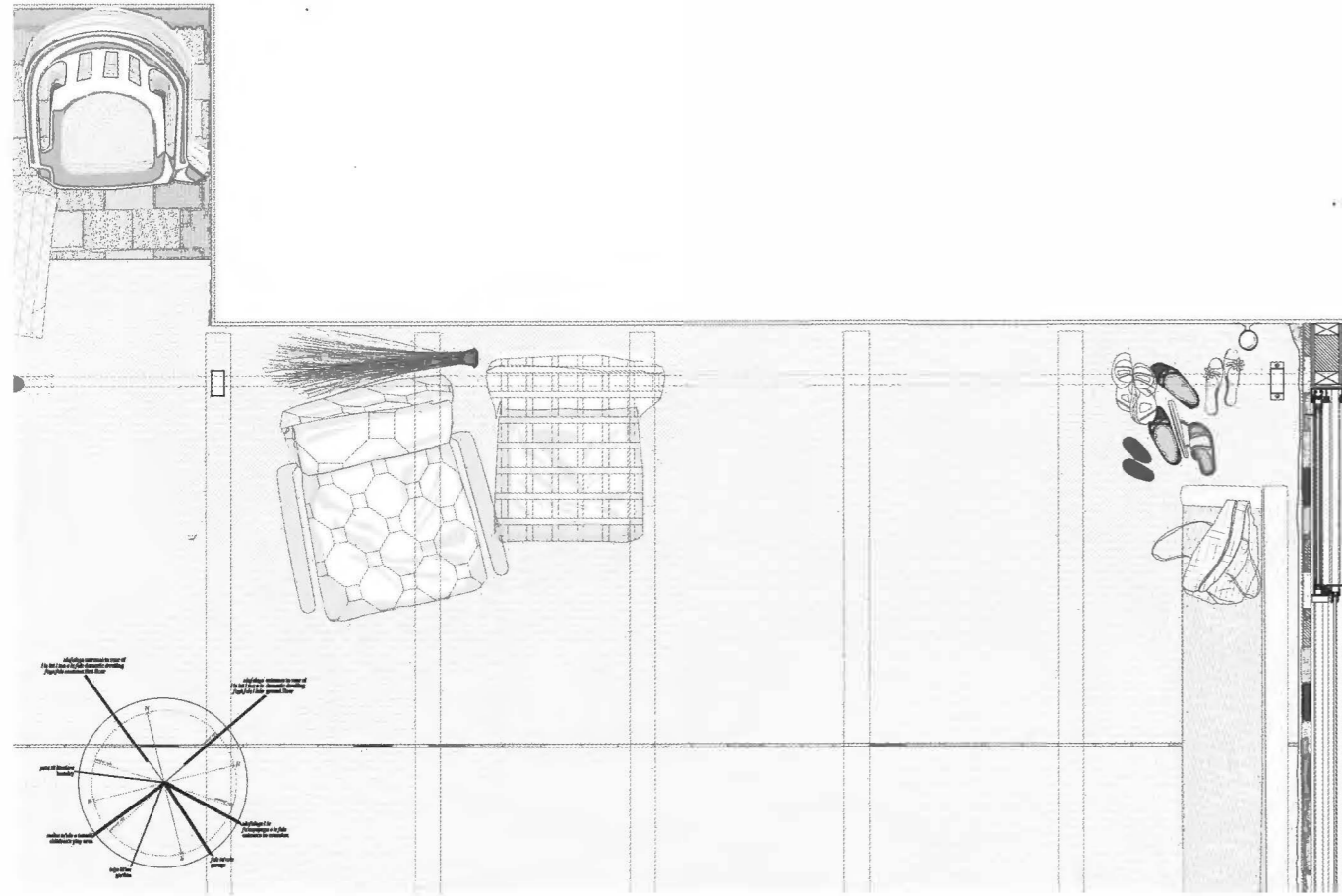
Opposite
Figure 2: Karamia Muller, Gafa East Elevation,
2011. ArchiCAD CAD drawing.

Above
Figure 3: Karamia Muller, Gafa Plan A, 2011.
ArchiCAD drawing.



Opposite
Figure 4: Karamia Muller, Gafa Plan B, 2011.
ArchicAD drawing.

Above
Figure 5: Karamia Muller, Gafa Plan C, 2011.
ArchicAD drawing.

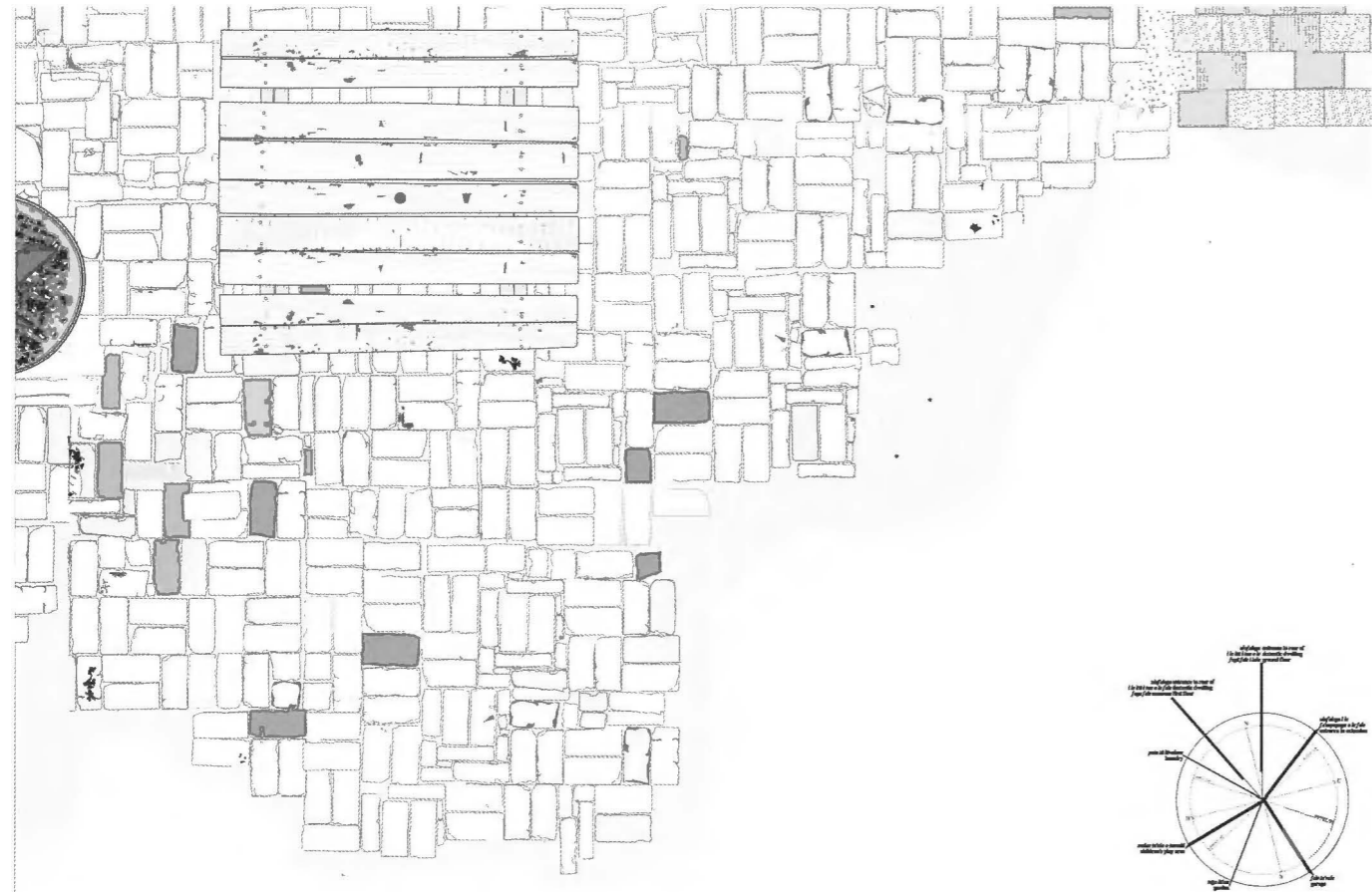


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Figure 6: Karamia Muller, Gafa Plan D, 2011.
ArchiCAD drawing.

Above

Figure 7: Karamia Muller, Gafa Plan E, 2011.
ArchiCAD drawing.



measured drawings from this virtual model did not convey a culturally accurate illustration of the ancillary structure, as had been described in discussions with the homeowners and building participants. The measured drawings lacked contextual richness and detail. This deficit in cultural accuracy was addressed through the development of the relational drawing process.

Relational drawing was used to critique particular drawing conventions entrenched in the Western paradigm of architecture and space and to recalibrate the cultural hierarchies present

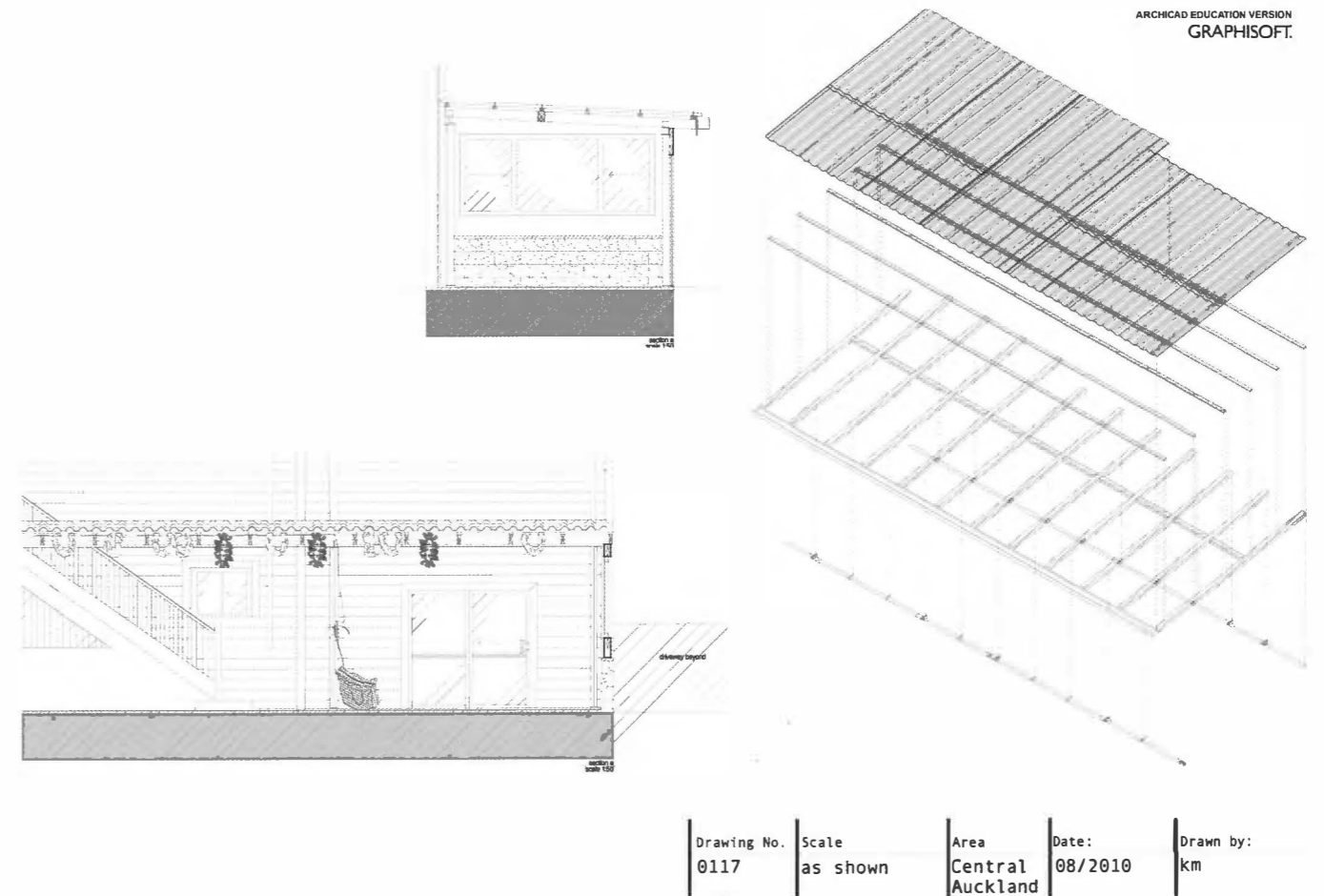
in conventional architectural drawing. Relational drawings, developed for this project, are representations that render together architectural and interior elements with household objects and other decorative items. The drawings accord each element an equivalent status, negotiating between structural data and relational information.

Unlike a building designed and constructed using standard details and materials, buildings constructed by relational processes often consist of complicated junctions with varying structural elements

and materials. The documented ancillary structure became a test case study for the development of not only measuring techniques and drawing conventions but inventive building processes and details that needed to be understood in order to record the ancillary structure. The unique quality of these structures can be difficult to document and required strategies to cope with the diverse information collected.

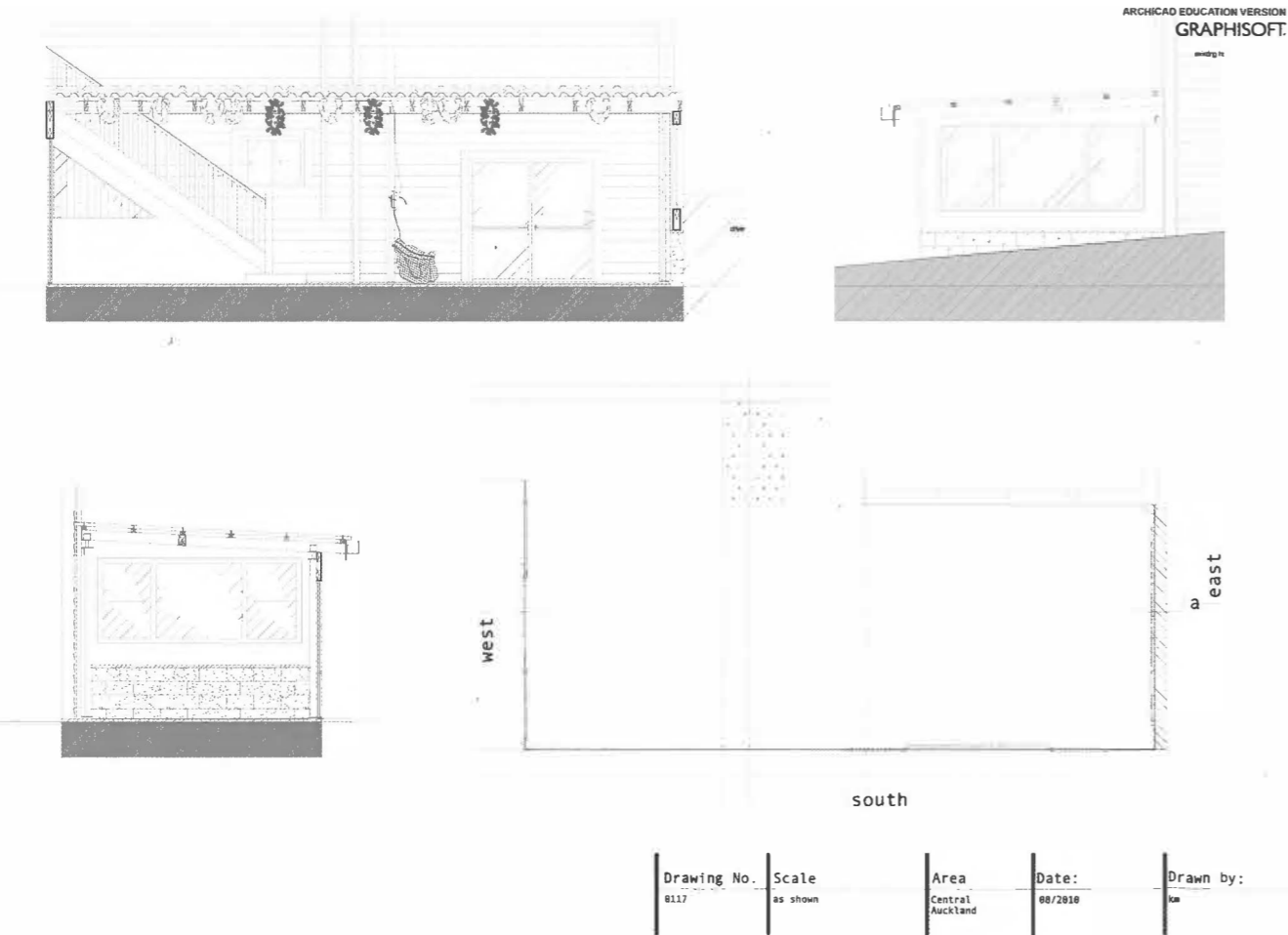
The interior was documented with a combination of measuring, sketching and photographing. According to the current

homeowner there is no building documentation for this ancillary structure as it was erected without any conventional plans, elevations or sectional drawings. To assist the modeling process industry specifications for building modules were consulted and compared to the existing built elements to gain a better understanding of the modular nature of the construction. On compiling this information the case study was modeled using ArchiCAD's virtual environment functions to recreate the ancillary structure.



Opposite
Figure 8: Karamia Muller, Gafa Plan F, 2011. ArchiCAD drawing.

Above
Figure 9: Karamia Muller, Preliminary study for drawing set of the ancillary structure including a section, elevation and an axonometric view, 2010. ArchiCAD drawing.



A preliminary drawing set of the ancillary structure including a plan, section, elevations and an axonometric view was generated (Figures 9 -10). Despite the level of accuracy, the generated set of initial measured drawings along with axonometric views and details appeared elementary, contrasting with the contextual richness captured in the photographic documentation. The drawing set also lacked the atmospheric, contextual, and material conditions experienced within the case study ancillary structure.

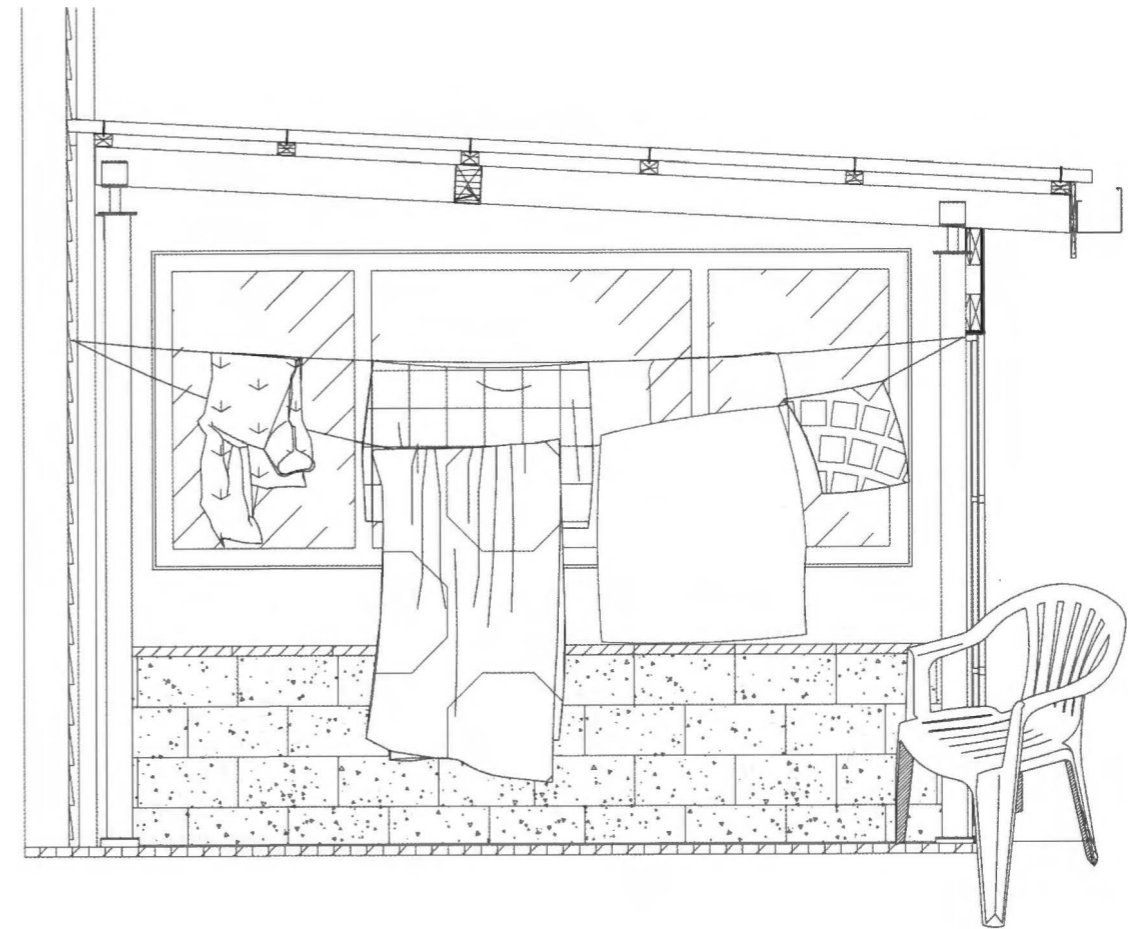
It became necessary to undertake research on alternative architectural representations that capture contextual richness and atmosphere. The work of Japanese architectural practice Atelier Bow-Wow was used as a precedent for developing relational drawing techniques. Of particular relevance were the drawings produced for a guidebook of small urban structures, an archetype identified by Atelier Bow-Wow as 'pet architecture'.

These drawings recorded unregulated constructions and elements of the constructions' interiors and, in the opening text to the book: *Petto akitekucha gaidobukku = Pet architecture guidebook*, co-founder of Atelier Bow-Wow and architect Yoshisharu Tsukamoto describes how these exceptionally small buildings in Tokyo were understood: 'Most of those buildings are cheaply built, and therefore they are not spectacular in design and they do not use the forefront of technology. However we are attracted to them. It may be because their presence produces a relaxed atmosphere, and made us feel relieved.'²¹

The guidebook further categorises the various pet architecture archetypes found using a site plan and a single axonometric view of the building annotated with major dimensions. A cut-out photograph of a man and a small dog was collaged onto the layout to provide the building with a sense of occupancy and scale.²²

To better understand the ancillary structures as relational buildings and interiors, information was formatted using a similar method of presentation. However, the drawings still had an absence of contextual information vital to their appreciation. This data was introduced into the drawings using an attentive representational technique. For instance, the washing line hanging along the interior perimeter of the ancillary's eastern elevation was depicted in detail with the specific geometries of the various fabric patterns included.

Drawing in the washing line marks a departure from the standard Western architectural convention employed in the documentation process. The washing line itself was chosen as it connected the opposing walls of the building, already conventionally illustrated by the domestic surface from which the laundry hung. Furthermore, its inclusion inspired the addition of other aspects of the interior such as the plastic leis decorating the rafters and the raffia plastic bag storing excess linen. Including such household effects common to Samoan diaspora required a shift in conventional measured drawings.



Opposite
Figure 10: Karamia Muller, Preliminary study for drawing set of the ancillary structure including a plan, section, and elevations, 2010. ArchiCAD drawings.

Above
Figure 11: Karamia Muller, Preliminary drawing of washing line along internal wall of eastern elevation, 2010. ArchiCAD drawing.

With the inclusion of social and textural details a more rigorous rendering technique was required and a tracing technique was utilised to assist in capturing the relational aspects of the ancillary structure and its interior. Applying this technique to the ancillary structure, information from site photographs was imported into the ArchiCAD file. Design tools scaled objects in the photographs against measured elements; for example, shoes were scaled against a measured floor mat shown in the plan drawings. Once proportionally scaled, the selected objects were traced using varying drawing tools. As an extension to drawing convention, line weights were selected to convey an object's proximity to the viewer.

RELATIONAL DRAWING: GUIDING PRINCIPLES

Relational construction is a defining principal in these ancillary structures which Samoan diaspora construct to accommodate cultural and social protocols brought with the winds of migration. Moreover, like the unregistered nature of ancillary diasporic structures, relational information in architectural practice has been previously unrecorded due to Western architectural drawing privileging structure over the relational, and the tangible over the intangible. The relational drawing technique dissolves these hierarchies. Guidelines for such a drawing practice have been developed and are outlined as follows:

Relational line: Convention dictates that architectural lines are diagrammatic. Mono-toned (black) rectilinear or simple lines outline: major geographical features, such as boundary lines, describe building elements like floor plates and accurately represent dimensional information. However, the conventional diagrammatic line carries with it the symbolism of a smooth surface indicative of building completion. Furthermore, the diagrammatic line represents the splitting of an area by a physical element.

It is proposed that using the diagrammatic line to describe traditional and contemporary non-Western buildings rejects their relational value and in turn prioritises a Westernised worldview of building as form, colonising the relational values of the building. As an alternative, the relational line is multi-tonal and multi-directional. It recognises the meeting of materials as not

only elements that simply touch, but as elements that intertwine their surfaces together in keeping with a Samoan understanding of relationships, tectonics and aesthetic values. The use of this line to describe elements acknowledges that while the building may be composed of Western materials, the command over those materials is in keeping with the contemporary Samoan social and construction values.

Relational view: Convention dictates that when rendering a building's facade its surface is treated as a two-dimensional surface plane. Typically, windows and doors are shown as closed and glass elements are rendered as a flat whiteness completed by outline (in the diagrammatic line) and a symbolic key (usually an arrow) to denote opening direction. This is a result of a predetermined focus on architecture as a 'shell'. Moreover, fenestration exists to allow in light, enable ventilation, frame views and contribute aesthetically to the facade.

It is proposed that this convention does not address the Pacific view of connections in space that are located in the relational rather than distinct enclosed spaces. The relational view illustrates this perspective of space by rendering joinery in a state of openness. Furthermore, the joinery glass is rendered completely transparent, and therefore shown as a material that does not split space but continues space. The relational view thereby resists the Westernised concept of enclosure defining space and instead foregrounds alternative perceptions of space.

Relational scale: Drawing protocol determines particular drawings follow an assigned scale, and in doing so it establishes a hierarchy of information. Conventionally, either the first horizontal section in a traditional 'set' of architectural drawings describes the building location geographically or the building's overall form at prescribed scales. At a smaller scale details of a building are referred to separately in conventional drawing systems. Relational scale prioritises material detail using ratios that allow objects such as clothes pegs and elements of decay to be seen concurrently with formal and structural elements, such as the run of a stair. It allows one to experience the drawing

as the interior of the structure is utilised. This method resists the spatial model of architectural drawing, where a building and interior are represented through areas, structural elements and surfaces.

Positional compass: Traditionally the geographic compass features on the plan to indicate environmental conditions and indicate how a building may respond to such pressures through the building's orientation. While this is an important concern for occupants, it is proposed that this has prioritised Western modes of thinking by privileging orientation in relationship to occupation. By repositioning the value systems of Samoan diaspora the positional compass presents the other forces at work within these ancillary structures. No longer susceptible to the same environmental conditions as in the Pacific Islands, it is proposed that Samoan diaspora position themselves relative to their 'aiga' and social elements within the ancillary structure. The positional compass foregrounds such alternative orientations that are culturally and socially relevant to those inhabiting, using or visiting versus the cardinal directions of the Western compass.

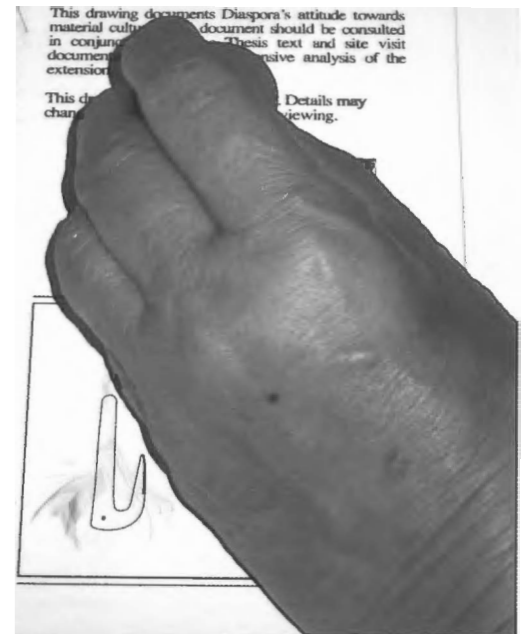
There is a less obvious but sinister agent at work in the geographical compass that has its roots in recent history. The majority of contemporary practitioners suggest that in order to design and build architecture of intelligent value one must consider the elements in its siting, planning and design. This implies that architecture made outside of this system is sub-standard by being inarticulate and negligent. Such an assumption is based on the premise that social, cultural and economic standards are the same for all those who reside in New Zealand. This is not the case. Samoan diaspora have been (and continue to be) exposed to external forces that dictate life decisions. Through constant negotiation with external circumstances, they demonstrate an admirable resolve to retain their life values in the relational context.

Relational title block: In keeping with relational construction and documentation intentions, the Samoan language was used in the title block to respectfully acknowledge Samoan cultural and social protocols as vital to the drawings' cultural authority.

This drawing is a record of time based building practices and experiences. The material culture recorded here is specific to the domestic space but is designed for significant life occasions. The structure is designed as a multi-functional space.

This drawing is a document of relational construction techniques. Appropriation of materials is rendered using tracing techniques to indicate their relational value rather than their constructional value. As such details are rendered at a smaller scale and should not be regarded as constructional measurements.

This drawing contains participant specific information and documents the material culture specific to the participant. The full range of material culture present in the participant's domestic environment is not recorded.



The conventional title block within the relational drawing uses the indigenous language, Samoan, concurrently with English. Furthermore, standardised information in the title block includes relational information, such as the recorder's genealogy and their position within that genealogy. In contemporary practice, it is conventionally a platform for referring builders to specific consultants. The relational title block, by comparison, includes information important to Samoans, in particular the family of the documenting agent.

Using the Samoan oratorical convention for formally addressing another person, individuals' chiefly titles (*matai*) are included. To

Opposite
Figure 12: Karamia Muller, Final drawing submitted for approval from case study occupant and owner, 2011.

assist with the cultural authority of the title block, a descendant of a respected Samoan orator was consulted. In doing so attention has been paid to ground the title block in Samoan social protocol. This acknowledgement of Samoan values informs the entire title block, and the language consultant is identified through *matai* title first, and Christian name second. As a form of respect for his title and his standing in the community, his details are placed first in the block and the *matai* title written in bold font to mark status.

Documenting using relational drawing principles requires interrogating which conventions require discarding or reinvention. To draw using the relational line one must question what is recorded as opposed to following conventional systems and recording hierarchies. Moreover, it is necessary to make decisions on appropriate colour and line weight, referring to diagrams as an accurate methodology for understanding indigenous space. In terms of a relational view, the document renders relational processes through connections rather than structural elements. Using relational scale, the drawing is printed on A0 stock, its large format consistent with Samoan arts practices like decorated bark cloth (*siapo*) and fine mats (*ie toga*). The positional compass locates one not only according to Western orientations of longitude and latitude, but also according to the temporal and domestic relationships between 'aiga, and life-based occasions. Finally, the relational title block informs the genealogy of the recorder and the recorded, framing the drawings as a part of the infrastructure of the relational set, authorised finally with the re-appropriated red stamp of approval (Figure 12).

A critical value of the final drawings has been the depiction of the multifunctional interior and the ancillary structure. The building envelope does not limit the activation of space to indoor/outdoor activities, but rather contributes to various spatial configurations activated as people occupy the spaces in and around the building's form. In Western architectural practice formalism is given precedence over other aspects of design and use, as is apparent in building documentation which privileges the shell or façade. However, in analysing these ancillary structures from a relational drawing perspective it is apparent that the building's envelope is part of a more complex use of space,

which is as reliant on soft furnishings, materiality and interiorities as it is on the structural elements. These drawings recalibrate drawing conventions by giving equal treatment to relational information, and use meaning informed by function. Drawing and technology can act as agents of negotiation that mediate between conventional drawing practice and the invention of new, culturally-responsive and responsible representation techniques. Furthermore, the homogenised and the individual in the diasporic condition are mediated in the drawing content.

The relational measured drawings fulfilled a personal quest to broker Samoan diasporic identity with personal practice. However, the production has raised broader issues appropriate for further research. Firstly, there is scope for indigenising and decolonising drawing further by examining conventions not addressed in this paper. Describing Samoan buildings through plan and elevation does not adequately reflect contemporary and past diasporic building practice. The drawings completed for this research have used these conventions, but further discussion is needed on whether relational representation needs to be completely independent of Western hierarchical conventions, or if it is a successful mediation and authorises these structures as a part of the domestic architecture of Samoan diaspora.

Relational drawing has brought into view the tangible and intangible values of the Samoan diaspora. It also invites reflexivity and development in order to record a contemporary architectural condition. A consistent theme in relational drawing is mediation. It retains aspects of convention and negotiates this with drawing inventions to describe Samoan value systems. The process is one that plaits and intertwines Samoan perspectives and values to present an alternative drawing practice in contemporary Pacific discourse. Moreover, in 'resisting' conventional, hierarchical modes of representation, a contemporary indigenous voice has been found to describe Samoan value systems as they are manifested in domestic architecture.

NOTES

1. Dr E. Schultz, *Alaga'upu Fa'a Samoa: Samoan Proverbial Expressions* (Auckland: Polynesian Press, 1980), 45.
2. Ibid.
3. Cluny Macpherson and David Pitt, *Emerging Pluralism: The Samoan Community in New Zealand* (Auckland: Longman Paul Limited, 1974), 11.
4. Cluny Macpherson and David Pitt, *Voluntary Separation and Ethnic Participation: Samoan Migrants in Urban New Zealand* (Nuffield Foundation, 1971), 14.
5. Cluny Macpherson and La'avasa Macpherson, *The Warm Winds of Change: Globalisation in Contemporary Samoa* (Auckland: Auckland University Press, 2009), 52.
6. Cluny Macpherson, "A Samoan Solution to the Limitations of Urban Housing in New Zealand," in *Home in the Islands: Housing and Social Change in the Pacific*, ed. Jan Rensel and Margaret Rodman (Honolulu: University of Hawai'i Press, 1997), 153.
7. Te Rangi Hiroa, Sir Peter Henry Buck, *Samoan Material Culture*. (Honolulu, Hawaii, Bernice Pauahi Bishop Museum, 1930), 5.
8. Cluny Macpherson, "A Samoan Solution," 152.
9. Ibid.
10. Using personal networks a number of case studies were selected. Several methodologies were used to record these case studies and inform drawing production. See Marie Muller, "Mata'upu-fausaga fa'aopopo i fale ma maota o tagata mai le atu nu'u Samoa." (Master's thesis, University of Auckland, 2011), 5.
11. For other case studies See Marie Muller, "Mata'upu-fausaga fa'aopopo i fale ma maota o tagata mai le atu nu'u Samoa." (March thesis, University of Auckland, 2011)
12. Buck, *Samoan Material Culture*, 5.
13. Charmaine Marie Ilaiu, "Persistence of the fale Tonga." (Master's thesis, University of Auckland, 2007), 20.
14. Ibid.
15. Although Macpherson and Macpherson observe that with the introduction of kitset houses this is less common as it offers an economic advantage in terms of labour and material costs.
16. Cluny Macpherson and La'avasa Macpherson, *The Warm Winds of Change*, 154.
17. Ibid.
18. Melani Anae, "Fofoa-i-vao-ese: the identity journeys of NZ-born Samoans." (PhD thesis, University of Auckland, 1998), 78.
19. Feleti E. Ngan-Woo, *Faa Samoa: the world of Samoans* (Auckland: Office of the Race Relations Conciliator, 1985), 50.
20. In terms of professional practice, ArchiCAD aids the documentation process through Building Information Modelling technology, which can be conceptualised as virtual building. Building information is managed through standardised construction elements represented as three-dimensional objects

- within virtual space creating a virtual model of a building.
21. Atorie Wan and Tokyo Institute of Technology, *Petto akitekucha gaidobukku = Pet architecture guidebook* (Tokyo: World Photo Press, 2001), 9.
 22. Ibid., 15.