SURFACE BUILT

MAKING THE **NEW ZEALAND** HOME

LAURA FORD

2010

SURFACE BUILT

Making The **New Zealand** Home

A thesis presented in partial fulfilment of the requirements for the degree of Masters of Design in Spatial Design at Massey University, Wellington, New Zealand, 2010

Surface Built

Surface is the skinning spread all around home
Coated with languages of texture and chrome
The library of traces of who here has beens
Roughed to our body's round edges and leans

Mottled by bath water and hung ornaments dandy
Victim to the violence of the people called handy
Collisions all day with shoes, toes and shoulders
Stabbed by the plug holes and toothbrush holders

Tired skins go away – rolled back like old hosiery
Layer on layer of flowers, stripes and Chinoiserie
Wear-holes that ladder and expose the dark nooks
Nudes shivering patiently for new linings and hooks

Papered, painted with quite suffocating coverage
A way inside requiring of quite forceful leverage
Fractured to behold the under unseen structures
Exposing the 'neath through gapping big punctures

Our oily dark smears – the coats between coat
An anthology of remembering on which we all dote
Patinas polished to smoothed and roughened stasis
Marking our heights and lives on a day to day basis

Peppered with our hairs and dusty fragments of skin
Becoming untidy and marred till we flee and wherein
Abandon the place that once was our intimate hovel
Break new ground and begin again elsewhere novel

Laura Ford
2009

Abstract

The potential for prefabrication has been sidelined by the process of the design>build>do-it-yourself model of building, maintaining and updating houses in New Zealand. Working from an industrial design perspective this research charts the possibility of a shift in home construction from site building towards factory-manufacture. Mindful of New Zealand's creative, do-it-yourself heritage and personal rituals of homemaking, this study explores domestic ritual and the iterative nature of amateur home alterations. Just as we have the right to alter our own body's surfaces so too should the homeowner have the ability to alter the surfaces and services they own and with which they interact. Flanked by the design-to-manufacture model promoted by industrial design and the emphasis on inhabiting and rearranging the home from spatial design a hybrid notion of housing design and production is put forward. Suggesting a product that deals affordably with the home's surfaces and services, within the customs of daily and seasonal acts of maintenance in the home, offers an area of prefabrication that seems attainable for New Zealand interior.

Acknowledgements

I would like to thank my family, Imelda, Rodney, Beth and, Emily Ford and Tobias Mathieson, for their continuous support. Additionally I thank, for guidance, my supervisors, Rodney Adank and Sven Mehzoud and postgraduate directors, Dorita Hannah and Julieanna Preston, as well as graphic designers, Eric Thompson and Rebecca Steedman. Thanks also to my friends, Morgan Sissons, Patricia Crangle, Jane Apthorp, Kenneth Young, Catherine Vasilenko, Neaam Alhaseny, Jennifer Schroder, Jay Crangle, Marie-Louise Chiaroni, Holly Hall, Simon Wain and Julietta St John, Alexander Tuxford, Leigh Tuxford and Gabriella Trussardi.

CONTENTS

FIGURES LIST

82 – Paul Clemence, Mies Van Der Rohe's Farnsworth House (Atglen, PA: Schiffer Pub., 2006). 58
83-86 – Wallpaper, 2008, Emma Hack, "http://www.emmahackartist.com/wallpaper2.php" 60
87 – Maslow's Hierarchy of Needs, "http://en.wikipedia.org/wiki/Maslow%27s_hierarchy_of_needs" 61
88 – Number of Houses Owned and Rented by Private Landlords, 2003, Department of Building and Housing, "http://www.dbh.govt.nz/rta-long-form-themes-and-issues6" 63
89-90 – Schrader, Ben. We Call It Home : A History of State Housing in New Zealand. Auckland: Raupo Publishing (NZ) Ltd, 2005., 142, 143. 64
91 – Anderson, Mark & Peter. Prefab Prototypes: Site-Specific Design for Offsite Construction., New York: Princeton Architectural Press, 2007. 66
92-96 – Engaging Ceramics, Emma Lacey, 2005, "http://www.emmalacey.com/ceramics.html" 68
97-101 – by Author courtesy Simon Wain, Torbay 70
102-113 – One Week, Buster Keaton & Edward F. Cline, 1920. 71
114 – Ulrich, Karl T. Product Design and Development. Edited by Steven D. Eppinger. 4th ed. Boston: McGraw-Hill Higher Education, 2008., 166. 73
115 – DIY It's In Our DNA Advertising Campaign, Mitre 10 & Mitre 10 Mega, http://www.mitre10.co.nz/media/mitre_10_television_commercial_sandpit.cfm 76
116-119 – Starter Home Design Competition, 2008, Department of Housing and Building, http://www.dbh.govt.nz/starter-home-design. 78
120 – Your House, Your Sandwich: an Architectural Drama in five parts, Nathaniel Russel, Dwell, 2007, 160. 80
121-124 – Lockwood Houses, "http://www.lockwood.co.nz/" 82
125-129 – Digitally Fabricated Housing for New Orleans, MIT, 2004-8, MoMa. "Home Delivery: Fabricating the Modern Dwelling "http://www.momahomedelivery.org/." 84
130-134 – Burst*008 House System, Jeremy Edmiston and Douglas Gauthier, 2005-8, MoMa. "Home Delivery: Fabricating the Modern Dwelling "http://www.momahomedelivery.org/. 85
135-139 – Cellophane House, Kieran Timberlake Associates, 2007-8, MoMa. "Home Delivery: Fabricating the Modern Dwelling "http://www.momahomedelivery.org/. 87
140 – Archigram. *Archigram*. Edited by Peter Cook. (London: Studio Vista, 1972)., 66-7. 88
141 – "http://www.ehow.com/about_6362692_clothing-care-labels-symbols.html" 88
142 – Spectrum of Prefabrication, Glossary, FabPrefab.com, 2003-4. 89
144 – Prefab Classroom for removal, Wellington, TradeMe.co.nz, May 2009,

FOREWORD

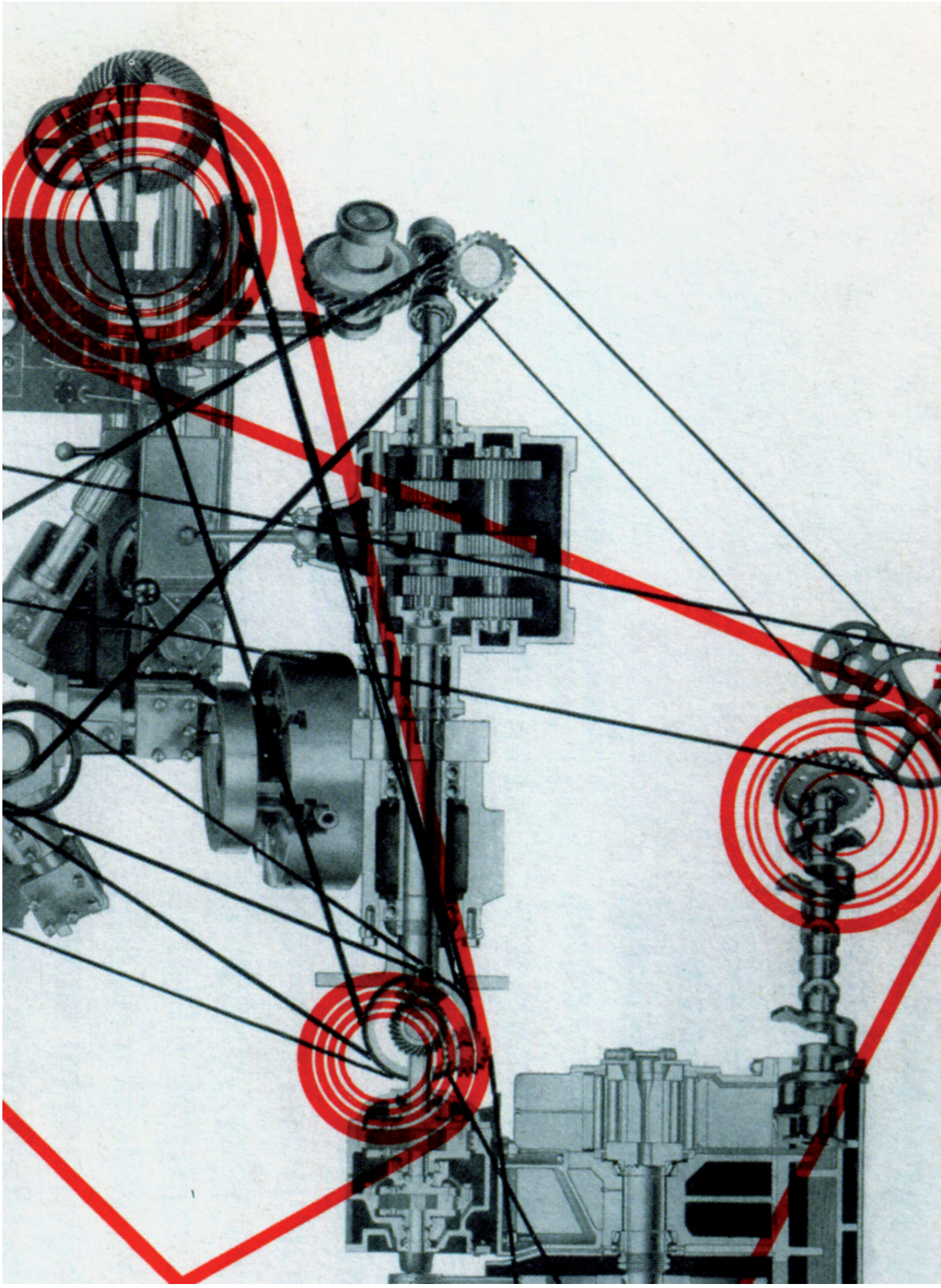


Figure 1 – What is a House?

Interconnected structure and services: the house of today is more of a system than a building.

As an industrial designer I was familiar with the home via household objects, which were broadly the focus of my four years of undergraduate study. My decision to study spatial design came about through my curiosity surrounding architecture. Having grown up with the architectural drafting of my mother I was keen to learn more about houses and their creation. My previous training tilted my approach toward our intimacy with household objects and how this related to our dealings with the home. Accordingly, the direction of my master's study took me was towards the examination of our relationship with the surfaces of domestic spaces and objects.

Surface is an area of significance for all designs, albeit on varying scales. In industrial design product surfaces are a site of intimate bodily sensation through our touching, carrying and using of items.[1] In spatial design, the treatment of surface is part of the experience of a design on a grander scale, like walls, ceilings and floors that give us enclosures and places to perform different rituals.[2] Surfaces are ubiquitous in the home's interior and aid in defining and categorising these spaces. Their forms are larger than our bodies, protecting us from the wilderness outside and in their interior signaling the separation of different tasks. My research aimed to gain an understanding of how the surfaces, of spaces and objects, came to reside and be operated on within the home. This conception of the home through surface is what led me to the format of this study: *Surface Built: Making the New Zealand Home*. This research has altered my design perspective. Through this examination of the relationship between surfaces in the home and of household objects I have recalibrated my design perspective include the dimension of surface tactility. This emphasis on surface qualities has exposed the home as not just a container for objects of everyday use but also a framework of surfaces that present functional and both experiential and kinesiological features to the dweller.

1 Elaine Scarry, The Body in Pain: The Making and Unmaking of the World (Oxford: Oxford University Press, 1985)., 175.
2 Graeme Brooker and Sally Stone. "From Organisation to Decoration." In *Thinking inside the Box: A Reader in Interior Design for the 21st Century*, edited by Scotland Interiors Forum, 125-32. London: Middlesex University Press, 2007., 126.

Initially this was a project to design on an architectural scale, to create a mechanical-core, to service and arrange a prefabricated New Zealand town house.[3] It was a design project that was on an architectural scale but undertaken in the manner of an industrial *design-to-manufacture* process. Accordingly my literature review was to canvas domestic ritual and the needs of the dweller in order to provide a design solution that could be mass or batch manufactured – like white ware, appliances and garden sheds. The discussion of prefabricating such a service core soon became dwarfed by the significance of the ritual factors that were active in the New Zealand home. So the work shifted focus from the putative production of one type of dwelling to the far broader material culture within the New Zealand home. I moved from the form of the home alone to what it represents, and how it came to be that way in ritual, design and manufacturing terms.

I suggest the contemporary New Zealand home revolves around four themes; homemaking, the hearth, the factory and its surfaces; topics that developed into my four chapters. Homemaking is the area, alternately termed *Home Economics*,[4] that in this study includes both domestic rituals and the creative realm of do-it-yourself home alterations. The hearth (or fireplace) was our incubator of our domestic rituals. Fundamental in our nineteenth and twentieth century homes the residues of the hearth still influence our speculations of what the homes of the twenty-first century might become. In conjunction with the factory, an instigator of new technologies like electricity, phones and digital communications, the social and technological advances of the past two centuries have brought about substantial changes to the objects and structures of the modern home. These changes are apparent in our treatment of materials and surfaces within the domestic setting. The increased notion of the pliability of our homes' surfaces makes up the final discussion on the New Zealand home. Surface is explored here through an examination of the do-it-yourself building traditions that manipulate it via the current *design>build>do-it-yourself* model of New Zealand home building.

This thesis, rather than charting the design of one architectural solution, documents these related ideas through writing, images and my processes of experimental making. Investigating the house

3 The Birdhouse Project within Affect, Massey University's centre for affective design research.
4 Ellen Lupton and J. Abbott Miller, The Bathroom, the Kitchen, and the Aesthetics of Waste: A Process of Elimination (Cambridge, Mass.: MIT List Visual Arts Center: Princeton Architectural Press, 1992)., 12.

building and the homemaking that could be is further considered in a speculative modular approach to New Zealand architecture. As I proceeded into this area of design inquiry, making became one method of in my analytical arsenal for deciphering meaning. The iterative and investigative nature of making things acted as a procedure of drafting ideas that engaged my senses and modulated through superficial perceptions of the home. This kind of making posed questions that guided my subsequent readings of literature and design precedents. The outcome of this work therefore is an understanding of domestic interactions or rituals through words, designs and a physical exploration of domestic space.

This thematic emphasis on surface molded the layout of these pages, viewed as one continuous surface. Images bend around the French folded page edges behaving like the heterogeneous surfaces of the home. Promoting the reader to adopt the viewpoint of the dweller and engage both with domestic surfaces and the theories offered. Images on this surface, like the details installed in the home's surfaces, offer a break into the spaces beneath – into the cavities of the interstitial realm of the architectural undersides. These elements do not respect the ordinary bounds of the page and, like the cultures of ritual and serviced infrastructures, flow from page to page, redressing their definition in relation to adjacent texts and dodging their typical categorisation.

In summary, the intention of this work is to illustrate not just the virtues of mass-manufacture, as favoured by industrial design, but to specify the advantages of prefabricating homes in New Zealand. It presents an approach that addresses the collaborative potential between the disciplines of industrial and spatial design and the equivalent value of their practices in the domestic, suggesting an approach to manufacture that is tailored to our post-colonial building heritage and geography, rather than merely a generic, economically driven model without specific local character.

INTRODUCTION

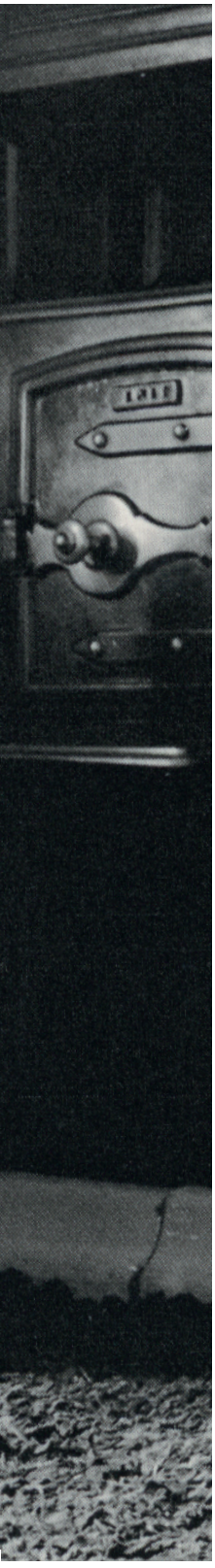


Figure 2 – Miners House, Ashington, Northumberland, Edwin Smith, 1936

The New Zealand home is formed by the material culture of its designed interiors and the artifacts it contains. In our daily homemaking we engage in this culture through personal rituals and the uses of space along with the artifacts therein. Making and unmaking is a constant feature of this way of life. As homemakers, we engage in the wiping away of one day's work with that of the next.[5] We make food, make clean and make repairs, and in doing so we *make home*. These makings, whether directed at the spaces or objects themselves, constitute our personal customs that, over time, renovate the features and services of the home.[6] Looking at the interlacing of these items, enclosures and intimacies initiates a prevailing perception of the home – as a space of diverse surfaces and networked services.

The traditionally fractured nature of household disciplines into architecture (or spatial design), industrial design, textile design, engineering, and trades has come to define and constrain the home's shape and progress. The stratification of design outputs has held these fields back by inhibiting the interchange of their practices. Studying industrial design has made me aware of the significance of the consumption of mass-manufactured objects as well as the formal concerns of the architectural status quo; houses whose life spans are predictable and supported by present compliance procedures and processes of construction.

I believe the reasons for the rigidity of the house's materiality results from the compliance and cost structures within its manufacture. Obviously the need for houses to be physically rigid and strong for safety and longevity is not being denied. What is questioned is the aesthetics of alteration of the current format of home building.[7] A space's components or objects are made for use; they become part

5 Kathleen Anne McHugh, "Experimental Domesticities: Patricia Gruben's the *Central Character* and Zeinabu Davis's *Cycles*." In *American Domesticity: From How-to Manual to Hollywood Melodrama*, (New York: Oxford University Press, 1999), 178, 180.

6 According to Elaine Scarry's *The Body in Pain: the Making and Unmaking the World,* making is a social act. Thus the acts of homemaking and making for designers are a manner of drawing out this social dimension in the home. Acts that convey and elicit a response and so engage us in social acts; be they in verbally communicating our rituals or engaging in rituals that are shared amongst family, friends or lovers. Scarry, The Body in Pain: The Making and Unmaking of the World., 175.

7 Stephen Kieran and James Timberlake, *Refabricating Architecture: How Manufacturing Methodologies Are Poised to Transform Building Construction* (New York: McGraw-Hill Companies, Inc., 2004)., 92-101.

of the home and at intervals are redeployed in acts of homemaking. Homemaking done by the dweller and a designer's making – done in the studio and factory – unseen by the dweller, both contribute to the spaces that the home holds and objects occupy. But what is the significant difference between the recurring making in the home and the making that designers or manufacturers do in the conception of these objects? Obviously there are economic differences, with the paid and unpaid work distributed differently between male and female inhabitants as well as the gendered nature of such tasks themselves.[8] What I sought to examine however was the reach of the making process across the spectrum of its manufacture and use. Household objects are created in the factory and are made use of in the home. These processes relate to the building and maintenance of the home itself and are also aligned in some ways with the factory, by both professionals and the occupier. Through a conceptual approach to making as a research method and a theoretical investigation that covers both industrial and spatial design territories I sought an alternate approach to our residential building in New Zealand – one that considered the intimacy of surfaces and services.

An industrial designer, I am positioned outside the ordinary architectural critique of the home. As Elizabeth Grosz discusses, in *Architecture from the Outside: Essays on Virtual and Real Space*, the position of the outsider to architecture is one that offers an interpretation that values ideas that are exterior but interlaced with of her own position as philosopher.[9] "The outside of one field is the inside of another"[10] and thus my industrial design training provides a different bias to that of the architect, a stance promoting the product *design-for-manufacture* approach being applied to building. Positioned alongside the present building customs my approach draws on the scholarship of Jane Rendell[11]who delves into the abuse of architecture to come free of her taught architectural concerns. Though I am not trying to unlearn architecture as she did, I draw on my knowledge of objects to add a hybrid but cogent voice to this discussion.

8 Ellen Lupton, *Mechanical Brides: Women and Machines from Home to Office*, ed. Museum Cooper-Hewitt (New York: Cooper-Hewitt, National Museum of Design, Smithsonian Institution: Princeton Architectural Press, 1993)., 12.

9 E. A. Grosz, Architecture from the Outside: Essays on Virtual and Real Space (Cambridge, Mass.: MIT Press, 2001)., xvii.

10 Ibid.

11 Jane Rendell, "Doing It, (Un)Doing It, (Over)Doing It Yourself: Rhetorics of Architectural Abuse," in Occupying Architecture: Between the Architect and the User, ed. Jonathan Hill (New York: Routledge, 1998)., 230, 232.

Central Proposal

Hence this study puts forward the New Zealand home as a region of engagement between the disciplines of spatial design, industrial design and the creativity of the dweller; where the practices of product and building creation are viewed as equivalent and readily exchanged. Currently the home and its objects are created domestically and in the factory as fits the conventions of their industry. The site-built house however, does not equal the sophistication in manufacture exhibited by the factory-manufactured products contained therein[12]. Products are made on mass and this makes them more affordable as the cost of their development can be spread over many units – they are designed for manufacture.

This study proposes that an evolutive product range geared at the do-it-yourself amateur, a strong ritual construct in New Zealand building, may be a foothold for *design-for-manufacture* within this market. Considering New Zealand's unique ritual, domestic and geographical concerns what would be an appropriate advancement of this country's building practices towards such a *design-for-manufacture* approach to prefabricating houses?

Domestic Heritage and Home Building

Homemaking rituals involve both designed products and spaces in their practice. The disciplines that create the home, its objects and everyday rituals require definition and evaluation. Domestic ritual was activated by the first installed domestic technology, the hearth. In New Zealand and elsewhere, the hearth facilitated both ritual and our synthesis of space. How did the hearth and its associated rituals underpin New Zealand home design and building?

The industrialisation of manufacture and consumption has altered the New Zealand home and brought about a higher standard of living. Though the home is strewn with these manufactured products, the process of building the home itself is detached from the factory-stationed precision of such forms of factory manufacture.[13] Looking at these industrially designed objects and mindful of our geography,

12 Kieran and Timberlake, *Refabricating Architecture: How Manufacturing Methodologies Are Poised to Transform Building Construction*., 6-11.
13 Kieran and Timberlake, *Refabricating Architecture: How Manufacturing Methodologies Are Poised to Transform Building Construction*., 6-11.

home ownership and do-it-yourself heritage, what hybridized ways of producing architecture could we adopt prefabrication into our home building?

Thesis Structure

The sections of this thesis are divided up into four chapters: *Homemaking*, *Hearth & Home*, *Factory Made* and *Surface Built*. These four areas mark the significant notions that I discuss in the body of this work and my own research process.

The first chapter, *Homemaking*, looks at the making employed by both industrial and spatial designers and artists, offering definitions of these sectors and their approaches. Furthermore it describes my own process of making that I have paralleled with homemaking, as well as citing the seminal works that have directed this study's approach to investigating domestic ritual. This section lays down the groundwork from which subsequent sections connect with one another.

The second chapter, *Hearth & Home*, examines the chronology of the home. The hearth as a fire lit on the ground was the first form of technology installed in the home. Though fire is not physically present in most contemporary homes the hearth's residual social customs have remained in the way that we have come to relate to other modern shrines, such as the radio and later the television.[14] As such this conceptual or cultural hearth has continued to govern the domestic, chiefly in the ephemeral nature of ritual and the hierarchy it has placed on the arrangement of the home. This culture has even been built into our engagements with our products in the home, that though they might be manufactured, have a shrine-like quality reminiscent of the primordial rituals of the fireside, such as the adornment of areas like the top of the television that may have once been reserved for the mantelpiece above the hearth.[15]

14 Ralph Caplan, *By Design: Why There Are No Locks on the Bathroom Doors in the Hotel Louis XIV, and Other Object Lessons*, 2nd ed. (New York: Fairchild Publications, 2005)., 79.
15 Wolfgang Herrmann, "The Basic Elements of Architecture," in Gottfried Semper: In Search of Architecture / Wolfgang Herrmann (Cambridge, Mass.: MIT Press, 1984), 198.

The third chapter, *Factory Made*, marks the change in the home brought about by the Industrial Revolution. As the home began to accumulate manufactured objects every manner of household task began to change. Even the process of home building itself began to take on these manufactured parts, taking us to the point we have in current construction practices whereby components made in the factory are assembled on the building site. Here I introduce the industrialisation of building viewed as a continuum – spanning from *all on site* to *all in factory* (or prefabricated) building. Examining where New Zealand housing sits on this continuum, the potential for a tailored approach to prefabrication is proposed as a way forward.

The fourth chapter, *Surface Built*, delves into a New Zealand approach to prefabrication tailored to our geographic and economic concerns. Here the notion of surface is twofold: the outer surfaces that we see and touch and those behind walls and beneath product casings. This duality is what makes the home a place both of aesthetic and serviced qualities. Such a reading of the home as a collection of surfaces references the regions of our own skin and its healing qualities along with the practices of skinning and surgery. Dealing with a house as an anthropomorphic structure, as is the approach used, leads to ramifications for our concept of house, and relevance to our Do-it-yourself building heritage and practices.

Scope of the Study

This thesis maps the chronology of home building alongside the present day stages of production and occupation of the home. It looks at the status quo of our buildings as well as the potential gains to be had from prefabricating them. It does not offer a one-size-fits-all design solution, nor am I proposing a national guideline by which to build. Rather a foothold for prefabrication in the discussion of New Zealand housing; is proposed, one considerate of the professionals involved in and the established conventions of this country's building heritage.

HOMEMAKING

Figure 3 – Deadset Wallpaper, Geneveive Packer, 2007

Shadowy impressions of a range of objects that New Zealanders may have made at home or in the technology classroom at school. Familiar silhouettes in the domestic. Artefacts of the Do-It-Yourself heritage of a post-colonial nation of handy men and women.

The home is a place of many definitions: a place of refuge and services for the dweller and designer and as well as setting of aesthetic and technical concerns for the range of building professionals. Defining this space, even on a national scale, requires the addressing of the creative concerns of both the dweller's homemaking, inclusive of Do-it-yourself maintenance, and the home building, done by designers and building professionals. Different in their skills and agendas, these contributors give the home its format and the objects for our rituals. This chapter outlines the everyday situation of home, offering definitions of the spatial and industrial design industries, and their roles in the process of building the home.

Spatial design, responsible for our interior architecture, and industrial design, devisers of manufactured objects, together mould the form of home's interior. Though they are both located in the domestic arena, their design practices appear to be needlessly sectarian. Building on the knowledge possessed by these two disciplines, my own research and training in industrial design has sought to view their contributions as equivalent in significance, in the everyday home itself, and in the home building process. Rather than fostering an approach that marks their differences I wanted to underscore their simultaneity within ritual as a unifying theme. This forms a premise for designing for the domestic that makes aspects of interchange between disciplines more adoptable for New Zealand design and construction industries.

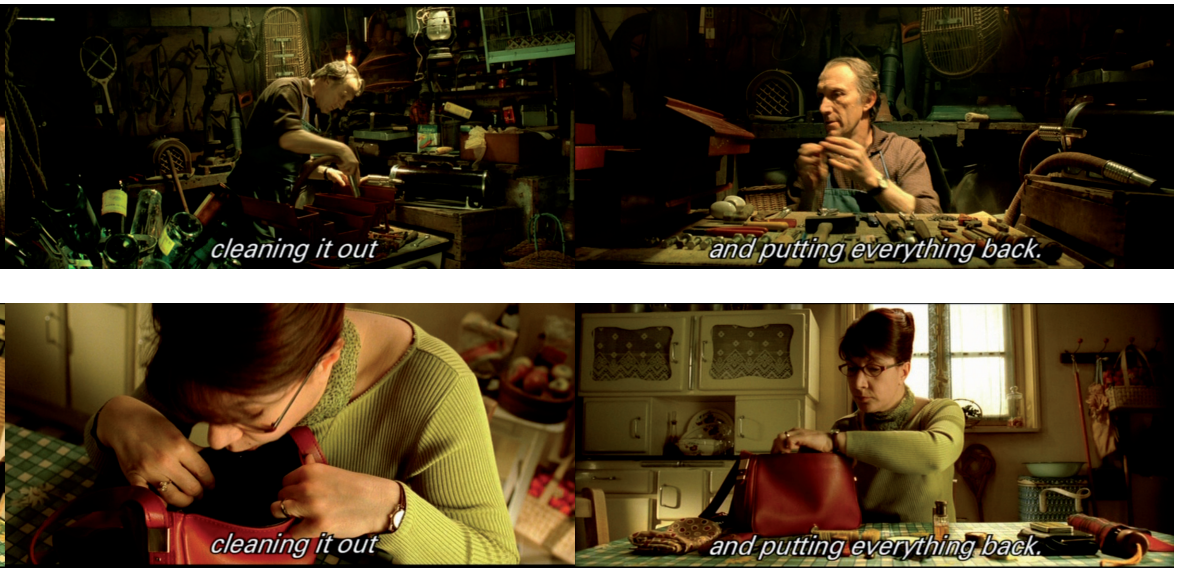
Mixing the practices of a designer's making with the homemaking of a dweller, my design research looked to unpeel the home situation and identify the nature of its rituals, both the personal and those more widespread within the New Zealand context. Some of these topics, like the hearth, factory and surface, are of wider theoretical significance. Some are in common with other western or formerly colonial nations, whilst others are distinctive to the realities of being a geographically isolated Pacific island nation. The national factors identified in this research are then further examined in the subsequent chapters of the

thesis, concluding with an outline of a proposed hybrid approach to future New Zealand building and housing.

Everyday Homes and Holmes

The everyday home is a place both inconspicuous and unassuming – veiled in the routines of the monotonous and in our affections for the familiar.[16] It is a place of subtle rhythms, intimate acts and rituals practiced many times over – a trialing of space that produces dramatic moments of reflection that cause us to question the basis of our philosophies or established knowledge.[17] It is a setting whose existence is only apparent via the extraordinary events, or as Highmore terms them, phantasmagoria, consisting of details illustrates that interrupt which illustrate the interruption of its everyday patterns.[18] The time spent in the home daily, creates the *everyday* by the agency of our repeated homemaking rituals and the tangible objects and spaces that support (or negate) these acts. For this reason there is a difficulty in defining the everyday – for how does one detach from the entirety of our daily life?

16 Not the show homes or the ideal homes of reality television renovations but those that we actually live in are private and not viewed by the public.
17 Henri Lefebvre, *The Production of Space*, trans. Donald Nicholson-Smith (Oxford, Cambridge: Blackwell, 1991)., 417.
18 Ben Highmore, Everyday Life and Cultural Theory: An Introduction (New York: Routledge, 2002)., 16.

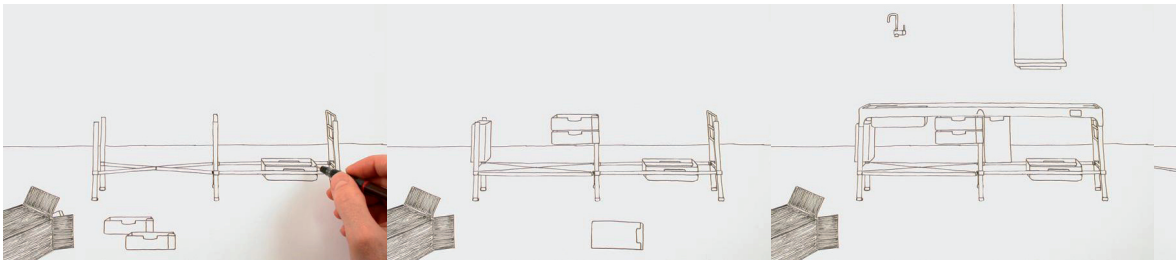


Figures 4-11 – Amelie's Parents' Rituals

Favorite household chores and fetishes of a mother and father demonstrate the nature of ritual and its potential for pleasure and satisfaction.

Due to the evident but elusive nature of the everyday, one needs a strategy to study it. As cultural theorist, Ben Highmore suggests "The everyday offers itself as a problem, a contradiction, a paradox: both ordinary and extraordinary, self-evident and opaque, known and unknown."[19] In such an everyday place as the home we must assume the lens of the detective and in doing so, are likened to Highmore's master of the everyday, Sir Arthur Conan Doyle's fictional investigator, Sherlock Holmes. Holmes' ability to examine the facts brings the situation as a whole into view in a logical and poetic way. Via his analysis, the extraordinary within a scenario become the evidence of the overarching plot. In this study of the home, the extraordinary facts have been collected from poetic methods of design research and through seeking out the rational within the process of home building, as Holmes might do, leading. This leads me to question whether the manner in which New Zealand homes are built is logical? Prefabrication (or factory building) is, from the industrial designers standpoint, a more rational way for the home to be erected due to the ability to control the outcome via quality control mechanisms and the ability of *mass-customisation* to lower costs without loosing variability.[20] By investigating the other

19 Ibid.
20 Davies, Colin. *The Prefabricated Home*. (London: Reaktion Books Ltd, 2005)., 186-9.



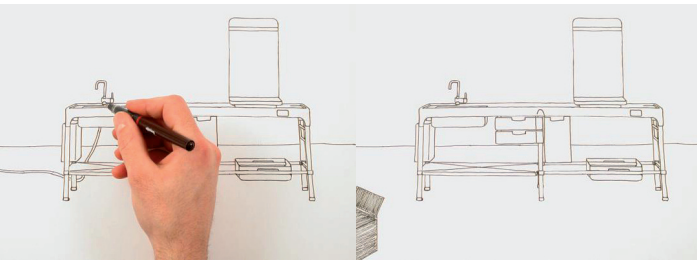
Figures 12-18 – Bouroullec Brothers' Disintegrated Kitchen for Capellini, 1998

Drawings (overleaf & above) illustrate the design/assemby of a plumbed kitchen bench concept. This system appears to be a product (top right overleaf) and a spatial system (bottom right overleaf). French Industrial Designers, Erwan and Ronan Bouroullec's incursions into spatial design territory show the overlaps of small product-scaled components in formating wider systems. Here systematically addressing space management and serviced needs like plumbing.

designed aspects of this environment, their use and manufacture, a case for an increased level of factory manufacture for the New Zealand house is examined.

Looking at the home in a poetic way does not mean ignoring the tangible issues of reality it encompasses. We cannot of course live in a pristine notion of the home; we still need to live in its reality. "For designers the everyday represents the site of actual use - the messy reality where designs are negotiated."[21] To test this I looked at the home as the site of everyday tasks. Through this process of observing and participating in tasks the ritual aspects of the house rose to the surface. There was a notion of making and unmaking, giving us a net zero change, in the arrangement of objects and employment of space in these tasks.[22] What we put into operation, in making food or using objects, we do our best to polish away by the cycles of cleaning and rearranging. It is only in the scuffs, scratches and worn parts do these objects and structures visibly demonstrate their use. Designed objects and structures are simultaneously united within household ritual – unified in their service to dwellers. The home and household objects are assembled and manufactured rather differently. The dweller treats household objects and structures as broadly linked within their use during ritual. Spatial designers and industrial designers do occasionally design projects that belong to the other's territory,

21 Andrew Blauvelt, Strangely Familiar: Design and Everyday Life, ed. David Morrow Guthrie, 1st ed. (Minneapolis, Minnesota & New York Walker Art Center & Princeton Architectural Press, 2003), 24.
22 Ellen Lupton and J. Abbott Miller, The Bathroom, the Kitchen, and the Aesthetics of Waste: A Process of Elimination, 2.



but this has not encouraged their wider industries to engage in the other's practice. The outputs of both of these groups have ramifications for ritual; accordingly their definition will help to illustrate the cultures they bring to the home.

Disciplines and Definitions

Spatial design and industrial design operate on different scales in the production of a house. Spatial design, inclusive of both architecture and interior design, is responsible for the treatment of surfaces, arrangement of textiles, fittings and structures[23] that together define the home in its materials and the regionalisation of its layout. Whereas industrial design, or product design as it also known, creates the packaging, tools, furniture, home wares, personal care products, appliances and installed details, such as door handles, that supply the inhabitants with specific functions. Together these disciplines house us and store our daily provisions and belongings.

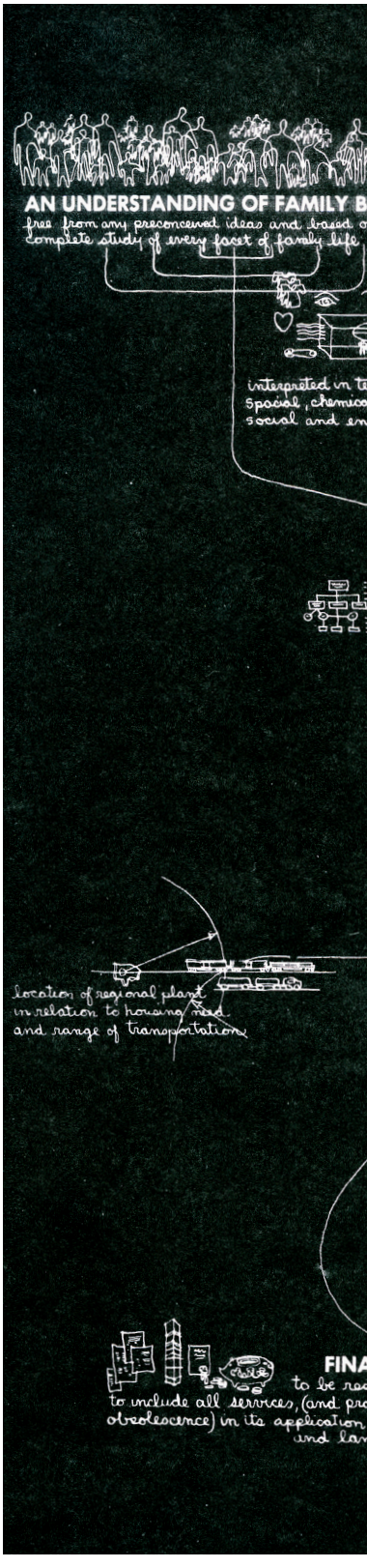
Although these disciplines together make tangible the everyday qualities of the home, the manner in which they are manufactured is quite different.[24] Household products are mass-manufactured in factories, whereas the home's structure is constructed, bespoke onsite – each assembled as one-off prototypes.[25] Though these parts are

23 Brooker and Stone, "From Organisation to Decoration.", 126.
24 Kieran and Timberlake, *Refabricating Architecture: How Manufacturing Methodologies Are Poised to Transform Building Construction.*, 7.
25 Duncan Joiner. Chief Architect of the Department of Building and Housing, Personal Communication, 2009.

themselvesmass-manufactured the value of *design-for-manufacture*[26] in the conception of the house, as a whole or system, is largely underexploited. The idea of streamlining the manufacture of architecture by prefabricating parts or all of our houses is not a twenty-first century idea, as MoMA's *Home Delivery: Fabricating the Modern Dwelling Exhibition*[27] has illustrated. The home could indeed be made on the production line in the manner of any other household product but it is the conventions of industry that stand in the way.[28]

Manufacturing our household products and fittings, has made them more affordable due to economies of scale,[29] they are also more precisely made and easier to clean; surely these, benefits which could be applied to building. Especially in New Zealand, whose average homeowner in 2008 spent 27.8% more on servicing their mortgage than as recently as 2006,[30] not to mention the long-term costs of maintaining their properties. There are factors in the affordability of housing that we as designers cannot control: the prices of land, labour and materials and indeed aspects of legislation, but with the approach of *design-for-manufacture* we can manage the design and systems of the house to perhaps provide enhanced services and affordable maintenance to the homeowner.

These issues of prefabricating and enhancing affordability within housing have been addressed in a number of



26 Ulrich and Eppinger outline this type of approach to product development and the value and considerations that it builds into the product design process. The involvement of both engineers and designers in this manner of design process manages the users' needs from the product and the requirements of the manufacturer. Karl T Ulrich. *Product Design and Development*. Edited by Steven D. Eppinger. 4th ed. Boston: McGraw-Hill Higher Education, 2008., 170.

27 *Home Delivery: Fabricating the Modern Dwelling*, ed. Barry Bergdoll, et al. (New York: Museum of Modern Art, 2008), MoMa, "Home Delivery: Fabricating the Modern Dwelling" http://www.momahomedelivery.org/.

28 The advantages of the prefabricated approach to housing are further examined in the third chapter, *Made in the Factory.*

29 Being able to buy materials and components in bulk provides considerable benefits in production, as well as being able to manage wastage more carefully.

30 For those making mortgage payments, median weekly mortgage payments rose from $256 to $328 (up 27.8 percent) between 2006/07 and 2007/08. Statistics New Zealand, http://www.stats.govt.nz/browse_for_stats/people_and_communities/Households/HouseholdEconomicSurvey_HOTPYeJun08.aspx#

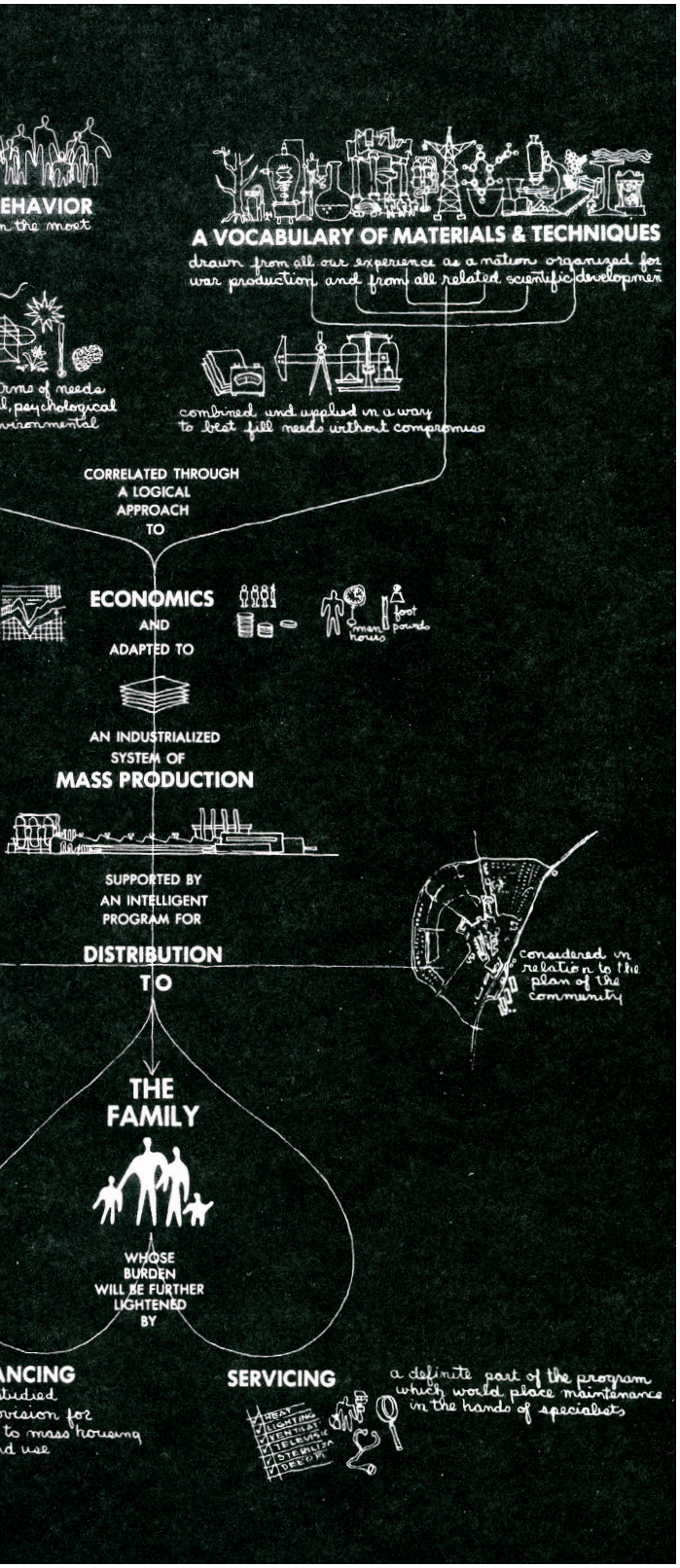


Figure 19 – Ray & Charles Eames' Diagram of 'What Is a House?', 1944

An illustration of the contexts that go into the Twentieth Century home. The Servicing section (bottom of this page) highlights the area that in New Zealand is carried out by both Do-It-Yourself amateurs to reduce the ongoing costs of maintaining the home.

research approaches. In 2008 MoMA's exhibition explored systematising and manufacturing housing.[31] Also in that year, there was the *Starter Home* competition by the New Zealand government's Department of Building and Housing, whose emphasis was designing a NZ$1400 per square metre dwelling whose plans were destined for multi-use to reduce compliance costs.[32] In addition there were the suggestions from the 1986 Trade Commission report *Manufactured Housing in the United States*[33] on market opportunities for New Zealand to export prefabricated timber houses or kitsets to America. In these studies the emphasis has been on the building of the house – period. The issues of

31 *Home Delivery: Fabricating the Modern Dwelling*, ed. Barry Bergdoll, et al., 9.
32 Department of Building and Housing, http://www.dbh.govt.nz
33 Los Angeles NZ Trade Commissioner, "Manufactured Housing in the United States," in *Product profile (New Zealand Trade Commission)* (New Zealand Trade Commission, Wellington, 1986).

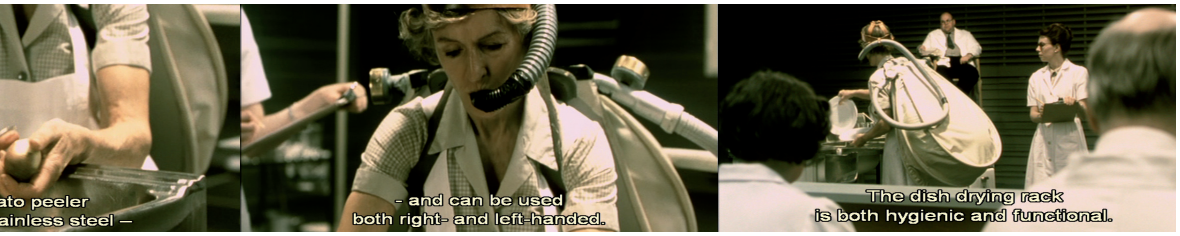
affordability reside in building and dwelling,[34] as highlighted by Ray and Charles Eames although the dwelling portion does not seem to be of prime consideration in the affordability debate.

The notion of serviceability (see bottom left figure 19) of the infrastructure and devising economic processes of maintenance are significant in reducing the homeowner's investment of both money and time. As a part of the broader practice of homemaking is an area in which New Zealanders have a strong tradition. Prior to the advances in transport and globalisation, we, as a far-flung island nation, have had generations of practice in *making-do* in the home.[35] Prior to the feminist movement of the nineteen-sixties such homemaking tasks were subject to gender, divisions[36]: home crafts were female and home maintenance male, but this has been dismantled in part due to the inclusion into the workplace of both genders. We have graduated into a time when the idea of Do-it-yourself is open to anyone who can navigate a building or home improvements store and read a set of pictorial instructions. This supports the notion of autonomy rather entrenched in the national psyche: that of *doing-it-ourselves*. New Zealand is a nation where a long weekend is not so often for recharging ourselves as it is for repainting, restoring or rearranging our homes.[37]

Types of Design Research

The prominence of homemaking and Do-it-yourself amateurism practiced in the home led me to reassess how design research might acknowledge and even imitate homemaking. Formally, design research

34 Mary Corbin Sies, "Stories of Home and Affordable Housing," *Home Cultures* 1 (2004), Sam Davis, *The Architecture of Affordable Housing* (Berkeley: University of California Press, 1995).
35 Jim Hopkins and Julie Riley. *Blokes & Sheds*. (Auckland: HarperCollins, 1998.)
36 Lupton, *Mechanical Brides: Women and Machines from Home to Office*,. 7.
37 *'Did It Myself'*, Commission New Zealand. National Housing (Wellington: National Housing Commission, 1984).



Figures 20-24 – Kitchen Stories, 2003

Concerned with economising the dwellers movements in the kitchen of the single Norwegian man this film charts the difficulty of researchers to be objective observers when dealing with subjects.

can be divided into three types of inquiry.[38] It can be scholarly, in the mode of the design theorist or historian;[39] *research into design* works or design as a field. It can be undertaken to provide context or data to allow a design work to be created; *research for design*.[40] Or it can be carried out as an experimental means to an end; *research through design*,[41] in order to gain knowledge about a design problem, process or designed work. In this study I have *researched into design* of and within the home, but I have also used making, a mode of *research through design*, to decipher an aesthetic sensitivity to the domestic setting and homemaking practices in New Zealand. These modes of research helped me to expand on the hybrid approach to building inclusive of both industrial and spatial design practices.

Spatial design offers an understanding of the treatment of domestic space as an enclosure or framework for ritual. This makes the understanding of the home defined by the interrelationship of a series of surfaces that people live amongst. This understanding of domestic space relates to knowledge gained from inhabitation and the symbolically meaningful ways we can dwell. This is visible in the types of making that spatial designers engage in to arrive at or refine concepts. Such conceptual features of this process are conveyed by the drawings and marquettes that spatial designers produce to communicate the design of a space.

38 Downton, Peter. Design Research. Melbourne: RMIT Publishing, 2003., 19.
39 Joseph Rykwert, "House and Home," in *Home:A Place in the World*, ed. Arien Mack (New York: New York University Press, 1993), Yi-fu Tuan, *Space and Place:The Perspective of Experience* (London: Edward Arnold, 1977).
40 NZ Trade Commissioner, "Manufactured Housing in the United States."
41 "Starter Home Design Competition." Department of Building and Housing, http://www.dbh.govt.nz/starter-home-design. MoMa, "Home Delivery: Fabricating the Modern Dwelling".

At the other extreme, industrial design focuses on the details of material interface of a product's parts to one another and as such how they touch or must not touch the human body. Through the relationship of these parts the designer aims to create a modular product architecture that can have parts swapped with other similar products in order that they may be composed of the appropriate set of components. Such part relationships take the following factors of interaction into account: who will install the product, who will use it daily, who will be responsible for any maintenance or adjustment of the product, who might dispose of or dismantle the product.[42]

Research through making, done by both spatial and industrial designers is used to solve or elaborate on design problems, albeit in sector specific ways. In spatial design, making is part of uncovering the formal or spatial qualities of materials and matching them to deliberate affective qualities for a space; a process that deals with the intimate notions of space and treatments of surfaces and arrangements.[43] Whereas in industrial design, though material and surface exploration is practiced, making is typically that of user-focused form studies that deal with the ergonomics or details that makes an object's engagement with the body appropriate, often an iterative process – modeled on the objective methods of the sciences.[44] Using versions of these methods of making to investigate the New Zealand home and its building, I was able to reconsider aspects of the object-space relationship in our domestic rituals. I identified a process that abstracted the methods of homemaking and do-it-yourself amateurism and in doing so identified factors in our traditions of building and homeownership.

Making and Homemaking as Research

Making, namely homemaking, is the most prevalent variety of everyday ritual in the home. Tasks like washing dishes or sweeping floors, though they are sometimes unpopular, alter our perception of the home and its material form. Design making is similar to these rituals in their repetition. In addition, like the household tasks of a daydreamer,[45] design making is able to offer a contemplative view of the household setting. This reverent engagement with ritual was envisaged as a mode

42 Karl T Ulrich, *Product Design and Development*, ed. Steven D. Eppinger, 4th ed. (Boston: McGraw-Hill Higher Education, 2008)., 168.
43 Brooker and Stone, "From Organisation to Decoration.", 126.
44 Hamer, Bent. "Kitchen Stories." Norway, 2003.
45 Gaston Bachelard, *The Poetics of Space*, trans. Maria Jolas (Boston: Beacon Press, 1964)., 68.

Figure 25 – Frank Lloyd Wright's Jacobs House, Burning Fields, Living Room to Fireplace

Wood panelling radiates out from the fire, contrasting the permanence of brick in the Hearth with the more ephemeral nature of timber.

of reviewing the face value of household tasks and tapping into the creativity of the dweller's actions. Making, as a designer or as a homemaker, are both creative human processes that, regardless of technology, still have a social dimension.[46] Making, be it of objects or spaces, or, in homemaking, of situations,[47] assists in honing our aesthetic responsiveness and informs us of the nuances of our surroundings. As Elaine Scarry suggests in her influential work on the making[48] and unmaking of humanity, "The daily projection of his or her body intothe artifact has its record in the artifacts themselves, in the recreation and rearrangement of the material world".[49] We rearrange the forms of raw and refined materials into objects or uses that, in our homemaking, have a purpose. These creative collisions affect us through all of our senses and allow us to *make ourselves more at home*. There is reciprocal exchange of the thoughts and actions in this process, as Matthias Gmachl and Rachel Wingfield put it "the meditative quality of making can allow us to extend a way of thinking into the act of making and vice versa."[50] This process of partnering making and thinking encourages us to divest ourselves of linear thought "and the concept [of] clear dichotomies: such as past

46 Scarry, The Body in Pain: The Making and Unmaking of the World, 175.
47 Caplan, *By Design: Why There Are No Locks on the Bathroom Doors in the Hotel Louis XIV, and Other Object Lessons*., 138.
48 Elaine Scarry's The Body in Pain: The Making and Unmaking of the World maps the unmaking of the body through the pain and violence of torture and the contrasts this process with the creativity of making objects. She crafts a dichotomy of the doing and undoing that the body possesses in its creative potential in the world, and the lack of transferability or communicability of aspects, such as pain, within the human experience. Scarry, The Body in Pain: The Making and Unmaking of the World.
49 She further elaborates that the materials we see morph into our objects of function. We see "… clay rearranged into bricks (its spreading pointlessness transformed into small, handheld fragments of materialized geometry); dispersed bricks arranged into a wall (functionless geometry transformed into an object that protects); thread rearranged into lace (its nearly invisible linear persistence converted into the complex form of a visible presence)." Scarry, The Body in Pain: The Making and Unmaking of the World., 266.
50 Mathias Gmachl and Rachel Wingfield, "Auspicious Tangents," in Responsive Textile Environments, ed. Sarah Bonnemaison and Christine Macy (Halifax: TUNS Press, 2007), 32.

and future, material and spiritual – enabling us to approach complex situations from multiple perspectives and to assimilate knowledge found throughout history."[51]

Contemplative Making

The process of this research took on this reciprocal format to discovery through making and how homemaking makes us *feel at home*. The theories of others and my own practice coated my process with different theories, delving into the seminal research of Gaston Bachelard, Joseph Rykwert, Yi-Fu Tuan and Henri Lefebvre gave a framework for interpreting the surface nature of the home. Additionally the artistic works of Rachel Whiteread, Elizabeth Diller and Ricardo Scofidio as well as Gordon Matta-Clark, were instrumental in illuminating the aesthetics of the domestic setting.

Seeking a contemplative view of the home is the approach of Gaston Bachelard[52] and reading his work directed me toward the details of the dwelling experience. As a phenomenologist, Bachelard elaborates on the nature of domesticity with details of the home's nooks and corners, attics and cellars. The home to him is a place steeped in personal history, whose features speak a certain language, a dialect of intimate enclosure. His treatise emphasises the nostalgic qualities of dwelling in the French home, a Eurocentric conception that seemed to emphasize the traditions of Europe as paralleled with our post-colonial South Pacific way of life. What this highlighted was the emphasis in Bachelard's scholarship on houses long gone by, similar in New Zealand to the nostalgia for the State House.[53] Because in my making I was emphasising ritual for this Pacific geography I wanted a common denominator that predated a particular cultural notion of built space. I needed an emblem of the home that defined domestic ritual relating to the objects and the space, rather than merely a study paying homage to past dwellings.

51 Ibid.
52 Bachelard, *The Poetics of Space*., 17.
53 Ben Schrader. We Call It Home: A History of State Housing in New Zealand. Auckland: Raupo Publishing (NZ) Ltd, 2005., 82.

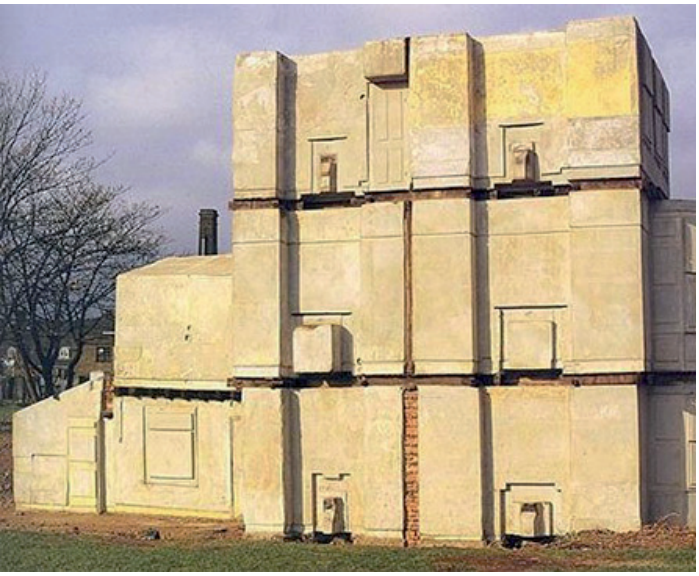


Figure 26 – Rachel Whiteread's House, in East London, 1993

A three dimesional mirroring of the home's space – this casting work resembles architecture but in an uncanny and tactile way. An imprint of the gritty patina of the domestic.

In searching for a more common denominator prior to the built home, I took on geographer Yi-Fu Tuan[54] and architectural historian, Joseph Rykwert's[55] *hearth* as the ultimate domestic anchor. The hearth's influence on the home, as elaborated in the next chapter, was a primordial human necessity. Tuan touts the hearth as the divider of the home from the cosmos – parting the interior and exterior. Alternately Rykwert's hearth is an arranging force that both draws peoples in and compels the centrifugal projection of its domesticities, somewhat uncontainable, he suggests, by even hefty architectures. It is a force that acts on people and our desires to be secure and have each other close by. As such the hearth[56] was adopted into my research as an indicator of our primary ritual engagement with domestic space – initially through fire lit on the ground.

This research through design, rooted in making was subject to my personal occupation of domestic space. The contemplative making of test-objects that (was a process emulous of spatial design practice), just as a poet's selection of words can offer small subjective incursions into the home's tangible reality. In industrial design, these poetic or affective qualities of an object are gained more often by systematic and observational means. This immersive observation of the settings

54 Yi-fu Tuan, "Cosmos Versus Hearth," in Textures of Place: Exploring Humanist Geographies, ed. Steven Hoelscher Paul C. Adams, Karen E. Till (Minneapolis: University of Minnesota Press, 2001), 321.
55 Rykwert, "House and Home.", 47.
56 This definition of the hearth is not intending to treat our multiculturalism in a reductive manner. But rather to appraise New Zealand architectures in a way that acknowledges a more poetic and sensitive focus to our occupation therein.

of products' operation – their ethnography,[57] is part of this systematic approach to learn the latent (or invisible) needs. So I decided that I would combine these two approaches by immersing myself in household tasks (and the dweller's mindset) whilst making small objects that investigated domestic ritual.

My objective was not to create new rituals but to tap into the latent knowledge within these everyday objects and events. The work of others in this culturally charged domestic arena, the sculptures of Rachel Whiteread and the works of architects Elizabeth Diller and Ricardo Scofidio and the installations of Gordon Matta-Clark were my departure point. Their works treated the surfaces of the whole and parts of the interior respectively, to create a more keenly articulated aesthetic engagement with the domestic. These revealed the significance of surface in the home and its wear, manipulation and political agency in these artists' works.

Rachel Whiteread's *House*

Rachel Whiteread's explorations in *House,* (figure 26) an East London townhouse interior cast in concrete and dismantled, held a mirror up to the interior for an impression to be viewed. Shelley Hornstein suggests that within *House* "All the cultural values – and secrets – expressed in a home and invisible to an outsider, are sedimented in concrete."[58] This work, though an abstracted mirror image of a house, due perhaps to scale and materiality, is still incredibly architectural. Though the house is removed the space of the interior remain as a stony monument to its interior surface. The intimacy of the textures, crevices and sooty hearth grates were all exposed to the onlooker like a person wearing all of their clothes inside out. These concrete forms showed the areas of wear that the unseen rituals of the dwellers had created. Making what is a cavity into a solid negative and with it the points of contact in ritual between spaces, tools and bodies perceivable to the eye and to the touch.

The idea of surface being worn as a deliberate marker of ritual was one that emphasises the homemaker's presence in the dwelling. As human we are the agents of household tasks, making their sequence occur and progress. Whiteread's castings showed these micro-journeys in the

57 Design Research: Methods and Perspectives, ed. Brenda Laurel, (Cambridge, Mass.: MIT Press, 2003)., 32-3.
58 Shelley Hornstein, "Matters Immaterial: On the Meaning of Houses and the Things inside Them," in The Art of Rachel Whiteread, ed. Chris Townsend (London: Thames & Hudson, 2004), 67.

Figure 27 – Gordon Matta-Clark's Splitting, 1974

A cross-section collage of the home sliced in two that displays the edges of surfaces and the barrier that they provide between rooms of the home.

surfaces of the building. This wearing exhibits the sequence of tasks and what was kicked or cleaned most often. Could other designed objects involved in ritual have the sequence of their task stored in them too?

Diller & Scofidio's *Bad Press: Dissident Ironing*

This project by Diller & Scofidio was another exploration that dealt with surface, but in a more deviant manner. Creating fifteen ways of pressing a collared shirt, (figures 28-35) aside from the conventional rectangular parcel,[59] this looked at the surface of the cloth and the flexibility of where folding could occur. The shirt did not suggest any points to fold other than its seams. This was interesting to me in the sense that the object could itself be suggestive, design that could articulate a stage or the sequence of its use in its details. Diller & Scofidio had challenged the surface of a plain dress shirt by folding it in different places from the shoulders and in horizontal and vertical directions. They had taken the ordinary and altered its pattern of use, disturbing form and redefining ritual. Could the things I make perhaps give altered engagement with ritual through features that suggest their sequence?

Gordon Matta-Clark's *Splitting*

The works of Gordon Matta-Clark, (figure 27) who trained initially as an architect, exposed the hidden layers of architectural space with

59 Elizabeth Diller, Flesh: Architectural Probes, ed. Ricardo Scofidio, Georges Mutant body of architecture Teyssot, and Scofidio Diller (New York: Princeton Architectural Press, 1994)., 43.

Figures 28-35 – Elizabeth Diller & Ricardo Scofidio's Bad Press: Dissident Ironing, 1993

An exquisite approach to disrupting ironing and as such the learnt social conventions of being presentable and tidy. The shirt's starched surface becomes a sculptural medium.

a single vertical slice through a condemned house – revealing an intriguing and visceral view of the home and surface.[60] By cutting through ceiling, walls and staircases the home's innards are forced into plain sight. Through these works my understanding of the home and surface was being shifted beyond the visible. Not just a surface engagement of an ordinary kind; Matta-Clark's work instigated violent ruptures – showing there was more to be known about surface than merely the visible.

This began to spark questions about our engagement with our house and household objects. When did we go beyond their surfaces? What more of surface was there to engage with than that which is in everyday view? Was this sort of violent exploration of the unseen uncommon? This led me to think more about the walls and floors and ceilings of the interior. Mostly they are static and closed off from the dweller but occasionally the tradesperson or the do-it-yourself amateur, usually a dweller in the house, penetrates them. What were the ritual circumstances of these incursions beneath the outer crusts of the home?

60 Gordon Matta-Clark, Gordon Matta-Clark, ed. Corinne Diserens, et al. (London: Phaidon, 2003)., 22.

Making Sense of the Domestic

What these three works now made clear was the relevance of surface in this discussion of the home and its object-space relationships. The sequence of performing a task, the suggestion of a task in a designed form and the potential to alter our passive relationship with the underside of the home's surfaces became vital to my handling of the home. The products themselves could affect or nag you to do their tasks. This was Scarry's social dimension coming out in these household objects. These tasks are shared, sometimes reluctantly, between members of a household; acts of social conformity[61] and teaching. Like these BEE household products[62] (figure 36) with their cheeky labeling we constantly make comments to one another about the state of the home and the objects inside.

To gain an understanding of New Zealand domestic ethnography I played out the part of the homemaker. This immersive technique, of just doing all the tasks I could see that needed doing, as if they were set out to catch my attention. Tasks such as sweeping the floor, wiping the bench, washing the tea towels or dishes all gave small clues like – the sort Sherlock Holmes[63] might use to triangulate the context of the suspect (or in this case dweller). Demonstrating the emotional engagement in the users' experience. I began to take the experience on in the manner of Jane Rendell and her writings on the abuse of

61 Ellen Lupton, *Mechanical Brides: Women and Machines from Home to Office*, ed. Museum Cooper-Hewitt (New York: Cooper-Hewitt, National Museum of Design, Smithsonian Institution: Princeton Architectural Press, 1993)., 7.

62 "Making sustainability sexy: B_E_E." Our Stories: designworks, http://www.designworks.co.nz/B_E_E.html

63 Highmore, Everyday Life and Cultural Theory: An Introduction., 16.

Figure 36 – BEE Household Products, brand by Designworks

They are reassuring and nagging at the same time, like the banter between family members and flatmates. A New Zealand range of products with a New Zeaalnd attitude to match.

architecture.[64] In this work she talks about her own dalliances into *(un)doing architecture*. Dismantling her learning of its teachings and vandalising its structures and strictures, she finds different ways to do-it-herself and at times to over-do-it. Her work demonstrated a sort of personal dialogue between the expected (or taught) and unexpected ways of *doing architecture*. In anticipating doing these tasks I too found myself thinking things like, 'Those dirty dishes are not going to *do themselves*' and 'This clean washing is not going to *fold itself*'. I was beginning to project the task onto the object. This signaled the type of objects I would make, by tampering with an object or material I could suggest the task's sequence in its form. I engaged in an intimate, hands-on task – washing and drying of a small dish. This task required the use of a sink, water, detergent, dish brush, a dish rack and dishtowel to perform the whole sequence.

Washing a Small Dish

1. Prepare meal, put it on dish and eat it at the table or in front of television, perhaps with cutlery.
2. Rinse dish and place in or next to sink.
3. Walk away. Return when it seems unavoidable that the dish be cleaned, due to arrival of another or needing that dish again.
4. Make sure dish drying rack is at hand – preferably on the left for me as I am right handed.
5. Run tap with hot water and a squirt of detergent. Swish water around till bubbles appear.
6. Wash dish with gloves on, if there are any. Rinse dish. Choose from either step 7 or 8 to finish.
7. Put on the drying rack, with the wet gloves, and walk away, it will drip dry and then get put away.

64 Jane Rendell, "Doing It, (Un)Doing It, (Over)Doing It Yourself: Rhetorics of Architectural Abuse," in Occupying Architecture: Between the Architect and the User, ed. Jonathan Hill (New York: Routledge, 1998)."

8. Alternately put in drying rack and use clean dishtowel, stored folded into three lengthways and width ways, from dishtowel drawer in bottom drawer below the one that holds the cutlery, to dry dish and then put it away in cupboard or on shelf. Put dishtowel to dry over oven handle.

I distilled this task into notions of *Wetting & Drying, Heating & Cooling, Lightening & Darkening* or *Storing & Retrieving*. The dish itself undergoes *Wetting & Drying* as well as *Heating & Cooling* by air and evaporative drying and the dishtowel experiences *Lightening & Darkening* and also *Storing & Retrieving*. These pairings each with their own dynamics in space also relate to the different materials of their environments. Most if not all our daily household tasks come under these categories. This is also illustrated by the kitchen setting of the dishwashing act. The melamine bench and towel can deflect and absorb respectively any moisture, the steel sink the heat of the water and dish any scrubbing done to it by the nylon brush bristles. Keeping these aspects of daily ritual in mind offered me an everyday framework by which to later examine the do-it-yourself extension of New Zealand homemaking rituals.

All of these materials, laid out in a designed way, are engaged in this process of ritual. Richard Bradley talks about rituals as processes that are public, private and collective – forming a continuum.[65] In such a way these pairings were conceived not as binaries but rather each as extremes of a process, as continuums, for example, it is possible for objects and bodies to be very wet, very dry but also to be damp – somewhere in between. The sequence of these stages is the reality of ritual. Rituals are affected by their environment, utensils and also by time available to do them. Time can make these acts quick and routine or slow and pensive.[66] When time is limited, as is often the case in household tasks, ones that are slower are singled out as ones of pleasure or detail. Noting this, I tried to capture the slowness of these tasks by creating ritual studies that magnified the details apparent at this pace.

65 Richard Bradley, *Ritual and Domestic Life in Prehistoric Europe* (London: Routledge, 2005)., 34.
66 Bachelard, *The Poetics of Space*., 68.

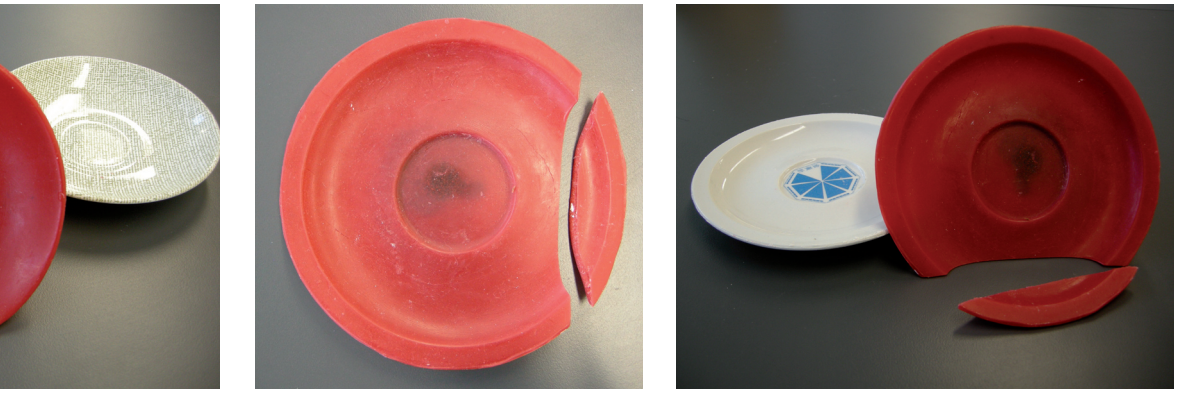


Home Make By Itself?

Taking the lead from these observations from my dishwashing, I went on to design a dish that dried itself and a cloth that folded itself. My approach was to make details in the objects and whose surfaces signal the next step in their task's sequence.

Leaning Dish

To make the dish dry itself I settled on the idea that it should be in some way self supporting, removing the need of a dish rack in favour of dish that leant against the workbench and wall to drain. Because I did not have any ceramics equipment to throw a dish I decided to cast an existing dish and make a wax cast duplicate of it to manipulate. I made plaster casts of the two small saucers; a New Zealand made Crown Lynn one with a fine upturned rim, and one newer, Chinese made one that was thicker and flatter. When the moulds were complete I cast the dishes in wax, so that bending them or any cutting could be achieved with the help of heat gun or oven. Using a heat gun I bent the finer rimmed wax dish so that it curved up a little on one edge. At some point when carrying the thicker dish I dropped it and split a slice off it. This accident was rather serendipitous as the position of the split was close to the dish's edge. Seeing an opportunity (like a do-it-yourself enthusiast) to make use of this split I heated up an oven tray over an element on the stove and melted the edge on the hot tray till it was at a 60-degree angle suitable for the dish to stand on to lean against the wall. Though these dishes would not be eaten off the making them as cast objects meant that their value as tests of ritual would be imaginable from their forms.

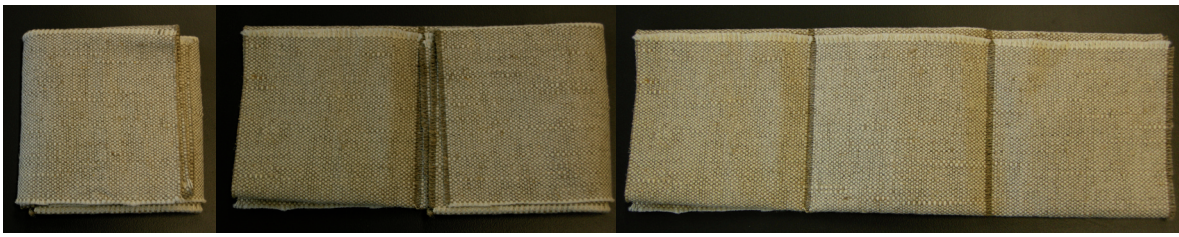


Figures 37-41– Leaning Dishes, Wax, 2008

Subtle alterations to surface – cast wax dishes that lean against horizontal benchtop and vertical backsplash or wall. The thinner edged dish is bent (left and overleaf) and the thicker edged dish is split and its edge melted to 60 degrees.

Folding Cloth

To make the towel fold itself I re-examined Diller & Scofidio's shirts that had quite naturally folded at their seams. The nature of a dishtowel is a humble thing, not like a tailored shirt that is full of seams and careful workmanship. Rather than adding seams for folds I looked at injuring the surface of the fabric. I wanted to mimic the effect of scoring paper but with a woven fabric. So I used pulled thread work, removing threads from the warp and weft at intervals, to encourage it to fold. After ironing these weak fold lines several times and storing them folded up their injuries caused them to want to fold at these points. Picking these clothes up by their corners they tried to collapse back into their folded state.



Altered Surface States

The altered forms of the *Leaning Dishes* and *Folding Cloth* by editing and injuring their surfaces respectively made the stages of their ritual more pronounced. What if this approach could be applied to the design of the home's surfaces? Perhaps making them more open to being edited or altered via do-it-yourself interventions would be preferable to a New Zealand audience? Changing the system of hard plasterboard or firm surface claddings into surface typologies that can be undressed, instead of destroying the wall's surface, could allow dwellers to get into the cavity beyond more easily. A house that has walls and surfaces that anticipate being easily altered could be a more economical one to renovate – its interior changed in the way we change our clothing or jewellery. Thus dress and architecture are aligned and the connections between human anatomy and that of the building are drawn.[67] Like the work of Zoë Quick[68] (figures 47-48 overleaf) who looked at dressing the home and garden for all seasons I was looking at dressing the home for the needs of ritual – like pieces in a wardrobe.

Envisioning the home's surfaces as pieces in a wardrobe led me to the idea that surfaces could be treated more overtly as the building blocks of the home. Architect Paul Rudolf once remarked, "The manufactured house is [to be] the building block of the twenty-first century".[69] This was thinking on the scale of cities or developments, but I was thinking of manufactured housing as more in line with the term *archi-textures*[70] coined by Henri Lefebvre's in reference to the diversity of buildings and their contexts. How might we make up a manufactured house? What would the building blocks of such surfaces or *archi-textures* be? The New Zealand model of prefabrication could be based on the creation of surfaces with such variegated potentials.

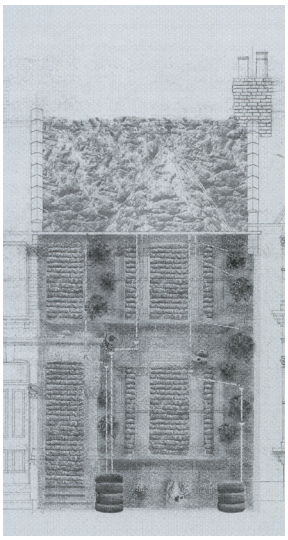
67 Peter Wood, "Sticks and Stones: Skins and Bones," in *Surface Consciousness*, ed. Mark Taylor (London: Wiley-Academy, 2003)., 66.
68 Jonathan Hill, "Compost," in *Immaterial Architecture* (New York; London: Routledge, 2006).
69 Bruce Mau, Massive Change (London: Phaidon, 2004), 33.
70 Lefebvre, *The Production of Space*., 118.

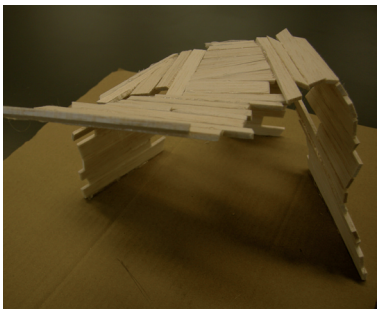
Figures 42-46 – Folding Cloth, Cotton/ Linen, 2008

Cloth with cotton thread in one direction and linen in the other. Threads were pulled out to weaken it (overleaf) and fold lines ironed over– suggesting folding it open and closed.

Toying with surface in the home brought about the idea of having new base units[71] of wall construction, other than slabs of plasterboard to laminates. Surfaces brought about with a tendril or a shaving of surface rather than the brick, slab or sheet. I made small marquettes of these ideas and then came back to compare them to my previous makings that focused on ritual. What I realised is that these were not aligning closely enough with what I had gained from the ritual investigations. The ideas about *Wetting & Drying*, *Heating & Cooling*, *Lightening & Darkening* or *Storing & Retrieving* were not apparent enough as departure points. By re-examining the idea of breaking through these novel surfaces new ways to engage with ritual became apparent.

71 Scarry, The Body in Pain: The Making and Unmaking of the World., 266.





Do-It-Yourself Surfaces

I was now on a mission to create surfaces that were at a more human scale rather than tiny maquettes. No longer just imitating the homemaker as with the ritual investigations, I was now also becoming the do-it-yourself amateur. By visiting the local large hardware chain store and sewing department store to gather supplies I made experimental walls that could be ruptured to allow a means of access to the home's services on the underside of the home's surfaces.

Figures 47-48 – Home Clothing, Zoe Quick

Clothing a hedge (above left) for a cosier and more insulating windbreaker.

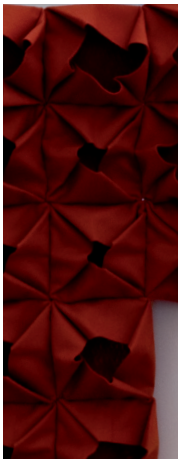
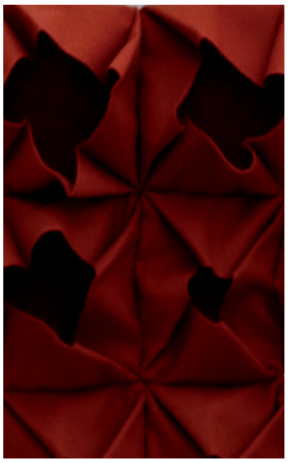
Figures 49-61 – Surface Maquettes, 2008

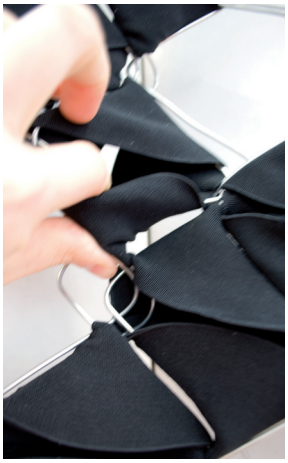
Though I went in with a concept of surfacing that connected to each of the ritual pairings, the forms these experiments took was also altered by wandering around the stores. Full of every manner of manufactured joinery and materials, the process of deciding what to choose began to emerge from what I knew how to use from experience and from what packaging or sales people could tell me about the products. Using this process of being a do-it-yourself consumer and builder I set about making a surface that corresponded with each of the ritual pairings. These were not intended to be prototypes, but rather conceived as full-scale proof of concept models, these were made with enough detail to communicate the ideas and how they might also be in more sophisticated materials.




Lampshade Shavings – Lightening & Darkening
This wall section was inspired by the shavings created by sharpening a pencil and how these sharpenings look like a lampshade. After sharpening lots of veneer off a dowel rod in my earlier maquettes I decided that this concept could be demonstrated in cork to create an aperture that could direct light from the underside of the wall to the dweller's side. By laser cutting holes in a 6mm sheet of cork and then attaching six 1mm thick circles, each cut once from centre to perimeter, I was able to mimic the effect of drilling a 3 dimensional spiral cut into the solid surface. If made with a memory metal or plastic these curls could conceivably be refixed in their original place with little more than a few almost decorative incisions scarring the wall's surface.

Draining Board – Heating & Cooling
This experiment took the concept of the channels that drain moisture on a draining board and applied it to a vertical wall. With the nylon tubes being reinforced with dowel vertically and wire horizontally; they were rather firm and easy to wipe clean. The areas that were empty of dowel could be parted open to get to the underside of the wall and to continue to be open for wires or pipes to be brought through. When applied to an area like the bathroom belongings could even stay inside the wall when not in use filling the walls with items like a medicine cabinet.



Enfolded Apertures – Storing & Retrieving
These rather flower-like fabric tiles modeled with polyester flooring material were woven together at the back with wire. They were made from cross-shaped units sewn together between the arms of the crosses with the resultant box shapes able to fold in on themselves and their raw seams. The area that made the floor of these boxes (the surface that is always vertical when they are installed) could have holes made in them where needed with the folding format of the tiles being able to hide or reinforce any of these holes later. These could even be used to hold small objects; the way the space beneath floorboards can store secret things like money or small children's treasures.

Porous Panel – Heating & Cooling
The format of this experiment took form from the cyclone or chain link fencing we commonly see outdoors coupled with the idea of the pores of the skin that regulate temperature. By doubling the wires that make up this structure elasticized pores could be sewn onto each adjacent diamond of the wire structure. Each covered diamond has a split that if you pry it open another split runs perpendicular to the first. These little peepholes or pores can be used to bring wires or pipes through the wall or if made with a heat reactive polymer could open for themselves to regulate heat in between rooms.

Figures 62-70 – Do-It-Yourself Surfaces, 2008

Lampshade Shavings (far left overleaf), Draining Board (left overleaf), Enfolded Apertures (far right), Porous Panel (right) and altogether on display panel (left).

On the Surface

In making these ideas three-dimensional additional aspects for the maquettes' function and use became apparent. These four surfacing concepts showed that the intention, or rituals, that one might design for could and would most likely be added to our altered by the dweller. In some cases the designer indeed is also the dweller as in the case of do-it-yourself alterations. The wide range of industrially designed and mass manufactured products available to the amateur through retailers provides opportunities to change the home quite drastically with relative ease, even for a beginner. This is not to say that the beginner is any smarter than they used to be. These days however what the novice lacks in experience they have gained from exposure to design and renovating through reality television shows that both entertain and inspire.[72] The increases[73] in sophistication of manufacture and design of kit products, like kitchen and cupboard sets, have given us over to the role of assembler and cosmetician in the home. Though we may be more time poor than ever[74] our do-it-yourself amateurism as a creative pursuit is more accessible than ever.[75] The resultant morphable state of the home is largely anchored around the alteration of domestic surfaces. Through painting, wallpapering, installing switches and hanging pictures, not to mention remodeling the floor plan of the interior we make meaning and affect change in the space we have before us.

72 Helen Powell, "Time, Television, and the Decline of Diy." *Home Cultures* 6, (2009)., 94.
73 Ibid.
74 Ibid., 94-6.
75 Between Mitre 10, Mitre 10 Mega, Placemakers, Bunnings Warehouse and Hammer Hardware it would be hard to find a town without one of these chain stores.

Making Depth Out of Surface

Everyday we grapple with the material space within our home environment, trying to craft the dwelling experience anew. The home is a constant reminder of the maintenance that it requires[76] to comply with our societal or familial conventions. These conventions manifest as rituals and are influenced by the time available to complete them and the reverie they can conjure. Conceptual examinations of dwelling rituals and ritualised surface typologies have sought to provide this research with an everyday significance. The recurrent acts of *Storing & Retrieving, Wetting & Drying, Heating & Cooling* as well as *Lightening & Darkening* are all part of the domestic sequences we encounter in the household. These ritual pairings have formed a tangible communication of this thinking in order to investigate domestic ritual.

The capture of these actions in the objects or surfaces or floors of the home itself helped to give this investigation a vehicle for understanding their sequence. This notion of making and unmaking has also been examined through four models of permeable surface. The works of Rachel Whiteread, Diller and Scofidio and Gordon Matta-Clark have contributed to unlocking a view of the domestic and its rituals, a perspective that is intrinsically linked to the hearth, the factory and the wider layered notion of surface. Taking the knowledge gained from these incursions into making, the next three chapters explore the cultures, manufacturing and customs that tether New Zealand building to its current practices and what an emphasis on surface might embolden them to try in the future.

76 Lefebvre, *The Production of Space*., 191.

HEARTH & HOME

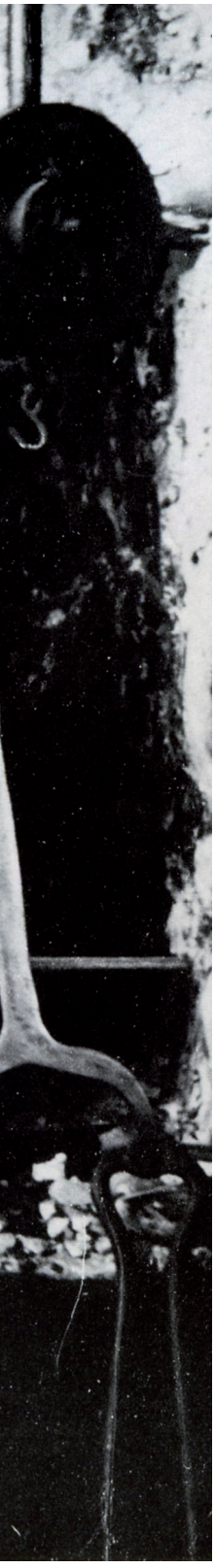


Figure 71 – Hearth and Home, Alexander Turnbull Library

Marcel Proust details the hearth as "an immaterial alcove, a warm cave carved into the room itself, a zone of hot weather with floating boundaries".[77] This was the hearth in a domestic interior – a tamed version of fire's primal state – a cultivated spot in the wilderness. Scratched into the ground and then later carved into the wall's surface – the hearth is the home's foundational technology. A carnal and historic force in domestic architecture, its provision of a common domestic culture inside the home interior answered our need to be intimate. As our seminal fire, it gives us control over our conditions, offering both heat and light by which to conduct rituals – tasks that were previously reliant on the sun's incidence.[78]

The hearth is a protector from outside threats, a provider of material comforts[79] and an instigator of rituals that together characterise homeliness in the home.[80] This chapter examines the hearth – as master component of homemaking and the formal qualities of the house. Representative of sunlight and fire's cultural remainder in the presence of newer technologies, the hearth is a marker of time, ritual and space in the household. Embodying the fleeting nature of the everyday, unlike our mechanised time offered by clocks, the hearth is both a constant and ephemeral influence. Providing us with time into the night and fire was central to the customs of the hearth that consequently made ritual cycles palpable in our architectures. Though other more sophisticated technologies have taken over from fire in the nineteenth and twentieth centuries via products and services installed in the home the importance of the hearth to our personal domestic customs is still relevant.

As the Romans once did, we formulate our spaces around the everyday rituals that form the plots and geographies of our homes.[81] Beginning as a single chamber around the fire, the house has been fractured into a series of rooms – that each still bears its residue. These spaces and

77 in Juhani Pallasmaa, The Eyes of the Skin: Architecture and the Senses (Chichester: Wiley-Academy, 2005), 58.
78 Norman J.G. Pounds, Hearth & Home: A History of Material Culture (Bloomington: Indiana University Press., 1989)., 189.
79 John R. Gillis, A World of Their Own Making: A History of Myth and Ritual in Family Life (Oxford: Oxford University Press, 1997)., 95.), Rykwert, "House and Home.", 47.
80 Freud as in Anthony Vidler, "Unhomely Houses," in The Architectural Uncanny: Essays in the Modern Unhomely (Cambridge, Mass.: MIT Press, 1992)., 24.
81 Bradley, *Ritual and Domestic Life in Prehistoric Europe*, 34.

their functional services map out the sequence and pathways of ritual. This relationship with ritual, however, is pliant and in these spaces we remodel these actions and their enclosure iteratively, by means of the affectionate and fickle alterations we perform on the home – an intimate space of our own making.

Ritual and the Ephemeral

According to Wolfgang Herrmann "The hearth is the germ, the embryo, of all social institutions...The house altar was the first object to be singled out for adornment; throughout all periods of human society it formed the sacred focus around which the other separate elements were crystallized into a whole."[82] This status made the hearth a locus of activity in the home in control of what we did and indicative of when we should do it. Through its agency the manner of time we keep was able to extend beyond sun and moon. We were able to use its light to ward off wild animals and have a feeling of mastery over, and connection with dwelling places.

With the hearth present, we are able to cultivate a sense of public or private, personal or collective in our performances of ritual. "As a result of such processes, rituals form a continuum: they are not set apart from other areas of life, as prehistorians have often supposed."[83] These rituals of the hearth, at the private end of the spectrum, provide a mode of operation for our domestic tasks. The repetition of rituals engraves traces on the home and on its occupants. Examining these rituals and the tension exerted on them by the hearth begins to illustrate the reciprocity between the house and the dweller in domestic space and the ritual cycles that occur there to make one *feel at home* in the home.

The Home's Dual Modes of Time

The tension between the hearth and our daily plots helps us to learn the ways of *our* house and, when necessary, how we might alter it to fit our ways. As Yi-Fu Tuan explains that which "begins as undifferentiated space becomes place as we get to know it better and endow it with value."[84] This endowment of value occurs through our daily engagement with these spaces though dwelling. This cyclical model of repetition

82 Wolfgang Herrmann, "The Basic Elements of Architecture,"., 198.
83 Bradley, *Ritual and Domestic Life in Prehistoric Europe*, 34
84 Tuan, *Space and Place: The Perspective of Experience*, 6.

is an additive process – *a multiplier of the meaning*.[85] We begin in these spaces as novices, and we gradually become masters. Through experiencing the nuances of texture, light, smell and taste of these interiors and our habituation therein imprints these spaces upon us – a process with the potential to be elevated to the status of ritual.

As the foundation of the contemporary home, the hearth is the domestic construct from which the sequence of our tasks arise. These stages of its own literal operation: setting up the grate, lighting firewood, and cleaning it afterwards engage us physically in the performance of these cultural conventions. This conditioning by the hearth of our time and spaces has lead to the instigation of other rituals, acts that have sprung up from the hearth's example. This ability to centralise ritual around such a point in the home has given ritual a material presence in the home and promptly in the objects that have continued the hearth's traditions. As instigator of Tuan's *cycle of multiplied meaning*[86] these repetitions offer a way of keeping time and forging an intimate connection to our allotted domestic space.

This is not to say that repetition alone transforms an act into a ritual. I do not pretend that mindless sameness or drudgery should be the motifs of ritual. Ritual needs to appeal to a higher aesthetic engagement with a space.[87] This is an engagement that occurs by employing all of our perceptual skills and through the reverent reflection that occurs organically in these private spaces. Bachelard describes such an aesthetic engagement in the chores of Henri Bosco's Sidione – a servant whose daydreams whilst washing sheets or table clothes and polishing brass candlesticks make each moment and movement pleasurable.[88] Through the act of daydreaming in spaces, we too can find peace of mind in the domestic. In this way ritual clarifies and sets free the mind to reverie - that which makes these acts more poignant and meaningful over their multiplication. Though they maybe tasks of servitude and humble home maintenance the repetition of Sidione's tasks gave her the ability to elevate the actions beyond drudgery toward reverie and a personal significance. When we allow ourselves time to do these things in our homes we let down our guard. We are not rushing or doing things because someone is watching. The reverent engagement with our

85 Ibid.
86 Ibid.
87 Empire of the Senses: The Sensual Culture Reader, ed. David Howes (Oxford; New York: Berg, 2005)., 197.
88 Bachelard, The Poetics of Space., 68.

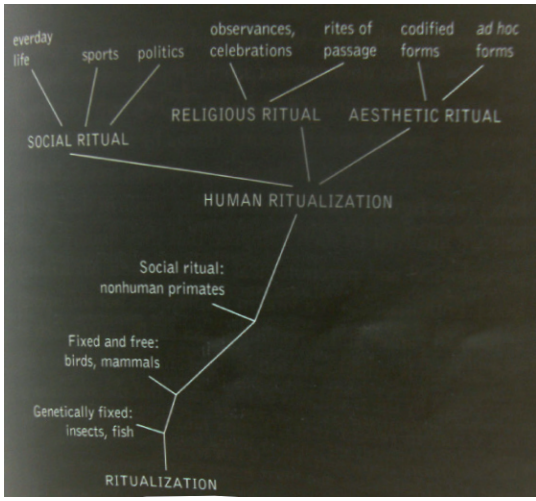


Figure 72 – Evolution of Ritual, Richard Schechner

household rituals allows us to find our own personal groove – to form our own ritual conventions through which to cycle.

Through this turnover of tasks the hearth, is a tangible centre of the ephemeral in the home, and offers its tasks up to reverie and ritualisation through repetition. The home as an environment of "The everyday is situated at the intersection of two modes of repetition: The cyclical, which dominates in nature, and the linear that dominates in processes known as "rational"."[89] These dual time cycles rely on our personal history in a place; a connection to its format or to one that it resembles. Bachelard suggests that it is our first house that creates for us a personal diagram of inhabitation and its functions. "We are the diagram of the functions of inhabiting that particular house, and all the other houses are but variations on a fundamental theme."[90] This imprint left on us by our houses teaches us, alongside the people that we live with, how to conduct our rituals and feel at home there.

Ritual, Routine & Homeliness

As Richard Schechner illustrates (above) ritualisation is in every facet of human enterprise. However in this study however the definition of ritual is limited to a domestic context where it constitutes the everyday situations in the home. Though it can be collective or individual this kind of ritual is a very personal one. Over time these rituals develop in parallel with our values and life stages. Like the literal hearth that morphs from kindling to flames, embers, ashes and finally a swept cavity, these phases are always on the verge the next step in their sequence. We too are constantly anticipating the next move in our domestic rituals. We clean the kitchen to cook there – the cooking task presents more things to clean – the kitchen is then again cleaned to later prepare for the next meal.

89 Henri Lefebvre, "The Everyday and Everydayness," in Architecture of the Everyday, ed. Steven Harris and Deborah Berke (New York: Princeton Architectural Press, 1997), 36.
90 Ibid., 15.

We live in our own cycles that relate to sleeping and waking, when we get hungry or thirsty, leave or arrive. Though routine or habit might suggest an order in which to carry out these daily tasks it is through ritual that we truly connect with the nostalgic hearth culture in our homes and duly gain from these spaces a sense of homeliness. The performance of such rituals harks back to an era where life was materially simpler[91] and centered on the hearth and family. This nostalgia tints our vision of the domestic setting, making our engagement with objects and spaces enactments of the fireside's customs and the social values we hold. The rituals of preparing food, telling stories and being together with others around the fireside are all strongly social activities. How we perform these rituals, our movements in space and care of one another, is another way we convey these values non-verbally.

We are taught these values by our families[92] and by others we might live with, such as flatmates or lovers. As these rituals are established and become steps of our routines, they affect our behaviours and become subject to our emotions. As indicated in Pieter Desmet's Basic *Model of Emotions*[93] (figure 73 opposite) we are stimulated by the home and as such repeatedly appraise the home. I suggest that these appraisals lead to different emotional responses at different times. This varied repetition of conduct, similar but never the same any two times, opens the home up to the deviating reality of ritual. Our moods and fickle natures create different versions of interactions within these spaces – as they themselves are ever changing via time of day and the seasons. The ability to have this personal approach to ritual, to be relatively autonomous in our choices about our domestic conduct, allows us the security and privacy that allow us to *feel at home*.

When such privacy and security exist we can perform these rituals with zeal one day and ambivalence the next as we please. The flow of these tasks is organic, though specific to an individual, in their paths and repetitions, but still harks back to the hearth for their basis. The hearth is a workstation and its form conveys our anticipation of one part of a task to the next, tensioning each step with its former and later in a sequence. The hearth arranges space according to the order tasks are carried out. In its established form inside homes the hearth had many

91 Pounds, *Hearth & Home: A History of Material Culture*., 184.
92 Gillis, *A World of Their Own Making: A History of Myth and Ritual in Family Life*., 93.
93 Pieter Desmet, Designing Emotions (2002.) 107.

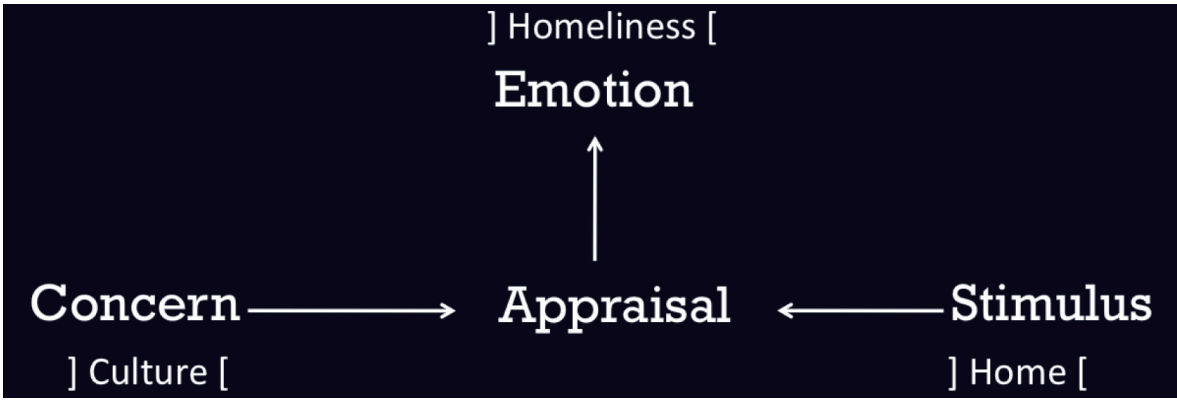


Figure 73 – Basic Model of Emotions, Pieter Desmet

Headings show Desmet's themes and the labelling below how these notions reside in the domestic.

features that specialised its abilities. Hung beside and above the fire were the tools to stoke the embers, and hooks to hang pots over the fire. It had a grate in which the wood burnt that collected the cinders and embers. All of which these were part of the *inglenook*, the close space, which included a seating ledge, warmed by the hearth, that held all of the aforementioned activities in addition to heating water for washing, laundering, eating and any night time leisure pursuits or story telling. Now without this palpable inglenook space our rituals are centered on objects that provide aspects of these previous culture. The oven cooks our food. The television provides us with company and stories. Our wired security systems keep us safe from the approach of outside threats.

Cycles and the Transmission of Ritual

The inglenook represents the hive of activity in the home throughout the day and night. A space such as this was mapped out by these actions and its time gauged by their duration. Though it might have been the sun that got people in and out of bed, the cooking of breakfast and performance of chores signaled the progress of the householder's daily routine. As more sophisticated products and foods entered the home from the factory these routines began to quicken. The amount that could be done in a day increased enormously with the labour saving devices, like washing machines, and processes that went with

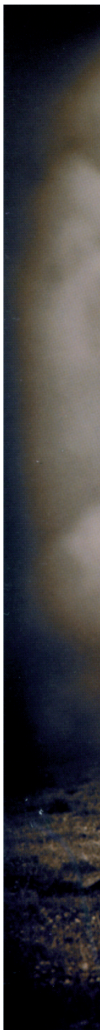
them.[94] Now the marking of time was also done by the application and consumption of new items, complete with their own new rituals. The cycle of use was different to the old, less mechanised methods of homemaking encouraging us to buy more bought things. We did not just use things, like washboards anymore, we used things up – like soap powder.[95]

The sun and hearth's cycles have an organic nature progress along with the light they offer. This light, and heat in the case of the hearth provides for the needs of nourishing and comforting the family. The cycles offered by the factory, however, cycle around the using products up objects in order to buy more – to consume. Lefebvre states that the old organically occurring cycles, such as day into night and the seasons, are suppressed by the factory's linear modes of consumption.[96] These linear modes are committed to the factory's one-way consumption process, as Lupton and Miller term it, the "process of elimination".[97] They are preoccupied with combating entropy – wiping away the evidence of the previous day to create order with the consumables of the day that follows. A time that is marked by the arrival and departure of new products into the home, with which industry would intoxicate us, and with which we, influenced by advertising,[98] would regale promote to each other with their emphasising the shrine-like qualities of these products and their arrangement in workstations[99]. Knowledge of these newfangled ideas, and things, trickled down through media channels and from neighbour to neighbour gradually crowding pantries, cupboards and bench-tops.

These cultural processes illustrate that ritual is transmitted socially – a learnt series of behaviours. These social lessons are also evident in the home itself whose format has the ability to convey and educate inhabitants. "To the non-literate people the house may not be only a shelter but also a ritual place...Such a house can communicate ideas even more effectively than can [explaining or miming] ritual. Its symbols form a system and are vividly real to the family members as they pass

94 Lupton and Miller, *The Bathroom, the Kitchen, and the Aesthetics of Waste: A Process of Elimination*., 14-5.
95 Ibid., 6.
96 Lefebvre, "The Everyday and Everydayness.", 13.
97 Lupton and Miller, *The Bathroom, the Kitchen, and the Aesthetics of Waste: A Process of Elimination*., 1.
98 J.M. Woodham, *Twentieth Century Design* (Oxford: Oxford University Press, 1997)., 71.
99 Susan Buck-Morss, *The Dialectics of Seeing: Walter Benjamin and the Arcades Project* (Cambridge, Mass.: MIT Press, 1991)., 250.

through the different stages of life."[100] Arriving in an unfamiliar house we do not learn its customs from the labeling of a floor plan, denoting the functionality, but from the forms of these spaces and the products that tell us where we are. The fittings and surfaces in the house might resemble others we have seen or used, with attributes that indicate they are suitable for getting wet or textures that indicate dryness and preserving warmth. Or alternately we learn by doing what others have learnt to do, like as in the instance of removing your shoes before entering for the sake of culture or hygiene when you see rows of shoes at a door.[101]



Architects have often tried to make the houses themselves didactic structures that mould their inhabitants into upright and modern beings of cultural appreciation and austerity.[102] But in the wake of such ideological fashions these houses become antiquated in social and technological terms. After all the amount of molding a house can perform on its dwellers is only tolerated till newer ritual or functional needs call for better, or simply more up to date living arrangements. The home is subject to these sorts of alterations many times over as new ideas emerge. Sometimes these rituals change the function or use of a room, but most often they bring them up to date with new services, like data cabling or cosmetic changes that in New Zealand are orchestrated by the dweller or the professional tradesperson. These changes often bring ideas in from outside the domestic realm of the hearth drawing in other newer notions and additions from the outside or *cosmos*.

The Cosmos and Domesticity

The hearth is counteracted in space by the cosmos – the outer realm beyond the hearth and home's perimeter. Preceding the home's enclosure the cosmos was the original location of the hearth.[103] Ritual began in this setting, forging the connection between the hearth and us. It was through these interactions that we came to guard and demarcate places for ourselves.[104] "Purposive movement and perception, both visual and haptic, [gave] human beings their familiar world of disparate objects in space. Place is a special kind of object. It is a concretion of value,

100 Tuan, Space and Place: The Perspective of Experience, 112.
101 Akiko Busch, *Geography of Home: Writings on Where We Live* (New York: Princeton Architectural Press, 1999)., 54.
102 Wigley, *White Walls, Designer Dresses: The Fashioning of Modern Architecture.,* 104.
103 Tuan, "Cosmos Versus Hearth.", 320.
104 Gillis, *A World of Their Own Making: A History of Myth and Ritual in Family Life*., 116.

Figure 74 – Tony Carter, 2003

The hearth makes us feel housed and gives us roots and an identity.

though not a valued thing that can be handled or carried about easily; it is an object in which one can dwell."[105] This act of settling and dwelling beside fire, and later in enclosures, set up a reciprocal relationship whereby the house would shelter us and we would maintain its structure.

The hearth speaks of a primordial division between people who reside inside the house and that outside the house. It draws us in with its synthesis of light and warmth but it also has the capacity to disperse. Joseph Rykwert describes the hearth as constantly seeping out from its central position. "Yet almost always *home* is at the centrifugal hearth, the fire burning at the centre of my awareness, as its light once spread like a stain in the hostile night."[106] In the cosmos's wider space it is both a beacon to the welcome and a warning of internal solidarity to the unwelcome. It was in this wild landscape that we first turned away from the sun and looked inward to the hearth creating the first interior – between our bodies – with walls made by our outward turned backs. It was only after this primary act of enclosure that we begin to dissect the home by the hearth's agency into our own hierarchy of space.

A Hierarchy of Space

The hearth has irreversibly stained the layout of the modern home through its impact on the translation of the dwelling from original one-room structures to a segmented vessel housing single families. According to geographer Yi-Fu Tuan the house's form not only shelters outright but moreover "its hierarchy of spaces answers social needs." Defined originally by the hearth and then by newer electrical and gas

105 Tuan, *Space and Place: The Perspective of Experience*, 12.
106 Rykwert, "House and Home," 50.

technologies, such as electricity and gas, that emulate it, this hierarchy has come to govern not only our perceptions of the home but also the relationships between regions of function within the interior.

The centralisation that the hearth once provided has been dispersed throughout the rooms of the house and with it the grounding that the hearth provided our predecessors. In the act of examining the hearth in its tamed, fragmented form, there is a sense that it remains intact and continues to affect the domestic. As the functional regions of function, such as kitchen and bathroom arose, we became more aware of a so too did our desire to seclude ourselves from others and to categorize tasks to certain rooms. This fractured form of the home segregated tasks, giving each its own identity and exclusive space.

The Author of our Spaces

The hearth acts as an author of our spaces, providing for our immediate needs of shelter and security.[107] Gottfried Semper identifies the four motives of architecture as having arisen from these needs, namely "the roof, the mound, the enclosure and, as spiritual center of the whole, the social hearth."[108] The hearth is the crucial element as each of the remaining trio refers to it for placement. In pre-industrial society it was largely the roof that served as the marker of our division from the cosmos. Inclusive of livestock and all manner of valuable stores, the roof was the divider between the heavens and us on earth. It is the walling, however, that is our modern determinant of prosperity and security. The wall has significance in the modern lifestyle that the roof alone cannot supply.

The notion of privacy and the idea of our right to it is one that is entangled with the modern ideas of hygiene and the luxury of the segmented house. Walls gave rise to the regionalisation of functions on either side of them. As Charlotte Gilman discusses, the tendencies of each room in the twentieth century to be available for special

107 Tuan, "Cosmos Versus Hearth.", 116.
108 Harry Francis Mallgrave, "Introduction," in Style: Style in the Technical and Tectonic Arts; or, Practical Aesthetics / Gottfried Semper (Los Angeles: Getty Research Institute, 2004), Herrmann, "The Basic Elements of Architecture.", 199.

Figure 75-76 – Pleasure/ Pain Miedicine Cabinet, Elizabeth Diller & Ricardo Scofidio, 1991

The private pleasures (overleaf) and pain (left) of civilising the body are categorised and made visible in the objects that facilitate the rituals we perform with them.

functions has ultimately led to their separation from one another.[109] The themes that each room encompasses define its separation from its neighbours. The use of other objects in the home is governed by their public or private statuses. Whereas the dishtowels for drying dishes might be slung over an oven's handle, other possessions like face cloths, razors and tweezers are hidden away, their use to be carefully timed and their carnality protected.[110]

These notions of privacy laid out dedicated places for eating, sleeping and washing, places specifically tailored to these needs. This demarcation of interior space, by the agency of the wall also gave us a new relationship to the hearth; one in which we were divided from or brought closer to the physical hearth. This tension between our spaces and the hearth as been further altered by our return to the fewer rooms, open plan layouts of modernists, like Mies van der Rohe's Farnsworth House. These attempts to create spaces of a more universal nature for multiuse has meant that the objects and workstations that have taken over from the hearth, like the inglenook, become spaces charged around these possessions and fittings,

The Home's Layout

These divisions in the home were not necessarily expelling the need of the hearth. The hearth, so integral in these ritual tasks, now on either side of these walls, was not cleanly severed and did not give over to removal from the sequence of household tasks. The processes of washing and cooking still both needed the hearth but were no longer acceptably housed beside one another as they had done in the house of one room. In some cases this caused a multiplication of the hearth. However the benefits that the hearth provided were also being succeeded by the new innovations of science, namely gas and electricity. The old tasks were being practiced with newer, specialised objects; objects that represented a dissection of the hearth. Where once the hearth had been the only provider of light

109 Charlotte Perkins Gilman, *The Home; Its Work and Influence* (Urbana: University of Illinois Press, 1972)., 146.
110 Elizabeth Diller, Ricardo Scofidio, and Georges Teyssot. *Flesh: Architectural Probes*. (New York: Princeton Architectural Press, 1994)., 136-7.

and heat, these new conveniences and appliances were splitting the communal aspects of the social hearth into services, like gas or electric lamps, stoves and piped hot water; systems that replaced the hearth within the household. These mechanisations also changed the social fabric of the home. No longer did we gather in to live within arms reach of the hearth and in close quarters with our families.

In Robin Evans' *Figures, Doors and Passages* he traces the segregation of the home's layout through the Victorian age. At this time the very carnal aspect of our domesticity began to be was being denied by the home's roomed structure. It became a place that ferreted away the naked body and undesirable chance meetings. Unlike the rooms of Renaissance Europe, whose entry was gained by many doors from different adjacent spaces, the Victorian home became segmented and focused on the upkeep of modesty, hygiene and the separation of family and servants.[111] The home was now a series of rooms each with their own social or functional aspects and each with or without a hearth, as deemed appropriate by the room's intended use and the wealth of the owner.

The nineteenth century saw the official division of the hearth from its formal space. Where once the cooking, dining, socialising and bathing were carried out in front of the fireplace rather publicly, in respect to our modern domestic ideals, the more structured roomed-house began to change this. The compartmentalisation of the home into a divided set of spaces as rooms began to fragment the ordinary operations carried out near the hearth.[112] Though walls were dividing the home, the needs the hearth provided for were still existent on either side of these dividers. The hearth began to follow the dwellers into each room; initially this was by adding additional fireplaces. In Victorian homes bedrooms, sitting rooms and kitchens might each hold a fireplace.[113] This began to make the hearth's reach come closer to the tasks of each private function-specific room.

As electricity proliferated lighting began to be installed on the wall and ceiling's surfaces, instead of the fireside. Initially this was all that electricity was used for but as the needs for heating and other powered appliances grew and power supply became more developed, the inlets

111 Robin Evans, "Figures, Doors and Passages," in Translations from Drawing to Building (Cambridge, Mass.: MIT Press, 1997)., 89-91.
112 Pounds, Hearth & Home: A History of Material Culture., 194.
113 Charles Rice. *The emergence of the interior: architecture, modernity, domesticity*. (London; New York: Routledge., 2007.), 146.

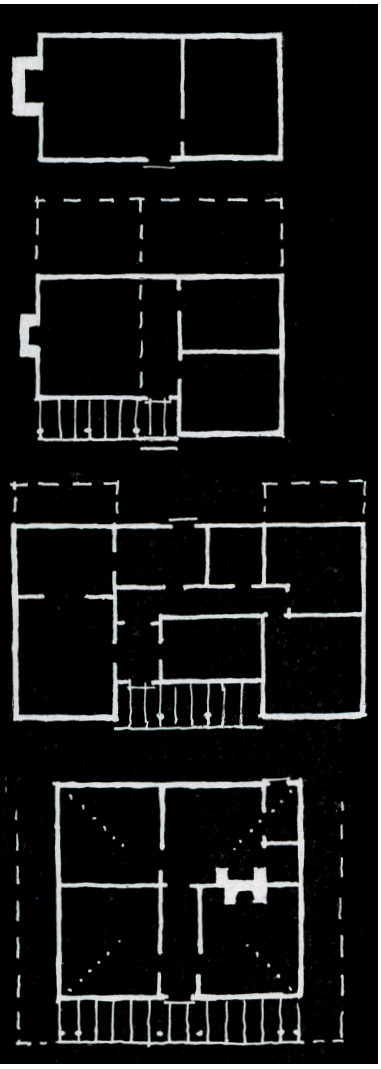


Figure 77 – Early House Shapes of New Zealand, c.1860-1900, William Toomath

Here the hearth is seen to move and multiply in the New Zealand home. These rectangular cabins became zoned, with verandas (dashed lines), stairwells to second storeys and fireplaces that multiplied (bottom) into adjoining rooms.

moved off ceilings and away from the lights themselves towards their current state - peppered around the home at knee, table and bench height.

As the twentieth century wound to a close the hearth began to see competition from the technological developments of industry. The coal or gas range, the electric oven and piped hot water systems amongst others, each provided the heating that the hearth had once delivered. In addition to heating, its ambient glow was seized by candles, gas lamps and the electric bulbs that were to simulate its flames in the home. Even the hearth's position as social nexus was usurped by the radio, the television[114] and later the computer. With the twenty first century under way there seems to be very few houses within which a fiery hearths, themselves pastiches of history and technology, exist at all. Appearing only as nostalgic evocations they act as large ornaments that for the most play second fiddle to the television.

Centrifugal Cultures and Conveniences

With the physical form of the hearth revised by the factory-influenced mechanisation – its rituals survived as objects, services and romantic remainders of the past. It was as though the hearth's first real integration into the walls of the pre-industrial house as a chimney stack and stone surround[115] had offered it up to be absorbed into and beneath the houses surfaces as amenities of the kitchen and bathroom and beneath its floor as central heating.

114 Caplan, By Design: Why There Are No Locks on the Bathroom Doors in the Hotel Louis XIV, and Other Object Lessons., 79, 145.
115 Pounds, Hearth & Home: A History of Material Culture., 195.

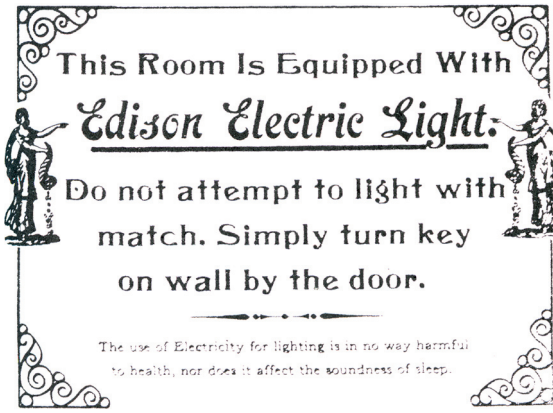


Figure 78 – Edison Electric Light, Evening Post, Jeremy Salmond

Small print... "The use of Electricity for lighting is in no way harmful to health, nor does it affect the soundness of sleep."

Though Joseph Rykwert's labeling of the hearth as centrifugal[116] was a comment on the primordial wild hearth this notion also predicts the newer hierarchy of interior space created by the hearth's successors – serviced infrastructures and products, such as hot water faucets, toasters and heaters. Fire's luminous light and heat, foremost seen by outsiders in the distance, and felt up close, has been refracted into the interior as technology and convenience. The need for these conveniences too has spread to the edges of our domestic frame. The diffusion of newer needs like internet, data networking and home workspaces now present in the domestic mean that aspects of home begin reciprocally to travel to other locations within the interior.

This *distributed domesticity* as critiqued by environmental psychologist Jamie Horwitz[117] shows domestic areas like kitchens becoming extended to other places such as kitchenettes in our home offices. This spatial dispersal of the hearth's provision for everyday needs into locales nestled around and outside the home marks the reinstatement of the cosmos. The cosmos is the hearth's natural opposite within the home and is brought inside by the networked and serviced needs of modern dwellers. Through the acts of piping and cabling into and out of the home we reinforce the interaction with the outside and continue the evolution of the hearth as a primordial agent of spatial and ritual definition. As such the hearth is a strong element of the home but not impervious to the tampering of the cosmos via objects and networks brought in by the factory and other outside establishments.

Where once the hearth was the centre and fulcrum of domestic tasks,[118] we now have a home that has an array of dedicated workstations. Each of these workstations bears a resemblance to the hearth in its

116 Rykwert, "House and Home.", 50.
117 Winifred Gallagher, House Thinking: A Room-by-Room Look at How We Live, 1st ed. (New York: HarperCollins, 2006)., 88.
118 Rykwert, "House and Home.", 47.

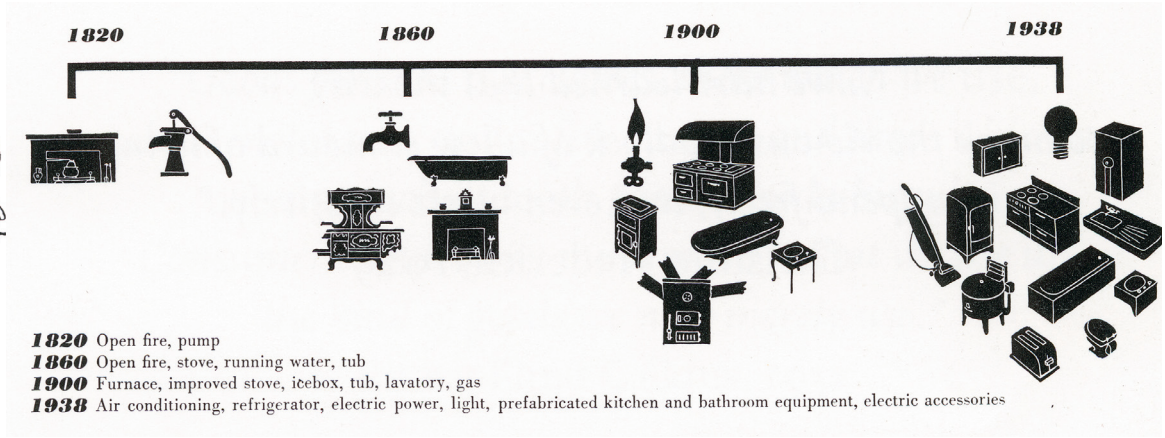


Figure 79 – Multiplication of Objects and Services in the Home, 1938, Ellen Lupton & J. Abbott Miller

The explosion of fittings and labour saving devices that hit the American market over this period, mirrored gradually by New Zealanders.

nature as an altar of sorts to each task. But the resemblance is not any longer one that corresponds as closely physically as perhaps the hearth and the stove do. The visibility of the hearth in the home has become unspoken: it is drawn upon as a reference to domestic conventions rather than its functional history as a high performing technology. The hearth is now dealt with as an abstract and poetic evocation of the old life – for marketing lifestyles. As illustrated by the feminine romanticism of faux-log fires and the continued obsession with the masculinity of fire-like possessions like barbeques.

The cultural force of the hearth is one that not even the modernists, who followed the technologies that toppled it, can resist. This is exemplified in Ludwig Mies Van de Rohe's Farnsworth House (figures 80-82 opposite) with his abstract placement of a literal hearth within a stark, twentieth century modernist context. The building's rectangular footprint is sectioned into various dwelling zones by the asymmetric placement of a service core. This freestanding unit supplies stations for work; two bathrooms, built in kitchen and cabinets, a mechanical room and a fireplace. The "solid volume of the core is placed so sensitively that the procession of space from one area into the next provides a harmonious balance between continuity and separation."[119]

119 Paul Clemence, Mies Van Der Rohe's Farnsworth House (Atglen, PA: Schiffer Pub., 2006), 9.

Separate Sections

It is this theme of separation that has been most markedly seen in the morphing of the house from single space, roofed and walled, to multiple rooms each with their own cultures. Lupton and Miller note that between 1890 and 1940 these demarcated rooms began to see the specialisation and elevation of the kitchen and bathroom spaces to their twentieth century podiums.[120] As the Farnsworth House's closeted bathroom attests, the house was becoming zoned and with it the hearth culture. The bathroom was now a compact, secret laboratory for the cleansing and regarding of the body, at once "physically clean and culturally dirty".[121] Through this aggrandisement of function and modern technology the kitchen too became less of the servile zone as it took its place as "the chief entryway for purchased goods, and the main exit point for…discarded products."[122] Thus we began to gain a vision of the house being a fractured collection of spaces that are unified in their existence below one roof, and yet partitioned to keep the secrets concealed and the prized objects of modern living on display.

Splitting the home into rooms such as bathroom and kitchen began to regionalise the home by using walling surfaces as dividers. The bedrooms became areas of privacy and sleeping whereas the lounge and dining room cater for the social and communal nature of eating and leisure time. The significant tasks of cooking and washing – that had demanded so much of the hearth – became the emblems of public and private as the kitchen and bathroom respectively. The kitchen and bathroom became not only the spaces of technology but also the defined spaces of the hearth's utility and dominion in the home as "twin temples to the process of elimination, offering technological environments for the care of biological and economic consumption."[123] The kitchen became the entryway for the cosmos and the bathroom for

120 Lupton and Miller, The Bathroom, the Kitchen, and the Aesthetics of Waste: A Process of Elimination., 65.
121 Ibid., 9.
122 Ibid., 1.
123 Ibid., 65.

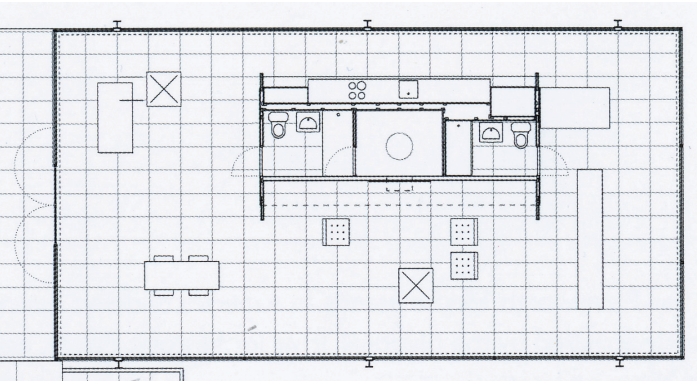


Figure 80-82 – Farnsworth House, Mies Van de Rohe for Dr Edith Farnsworth, 1951

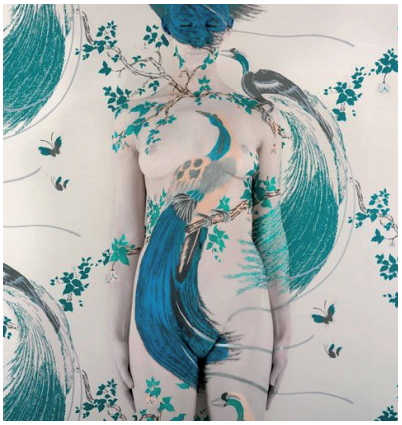
The kitchen (overleaf and above) and the fireplace and lounge (right) sides of the core mark out the zones of this very open plan, experimental home. Each end of the core give entry to a bathroom; one ensuite and one for guests.

the concealing of the civilization of the naked body[124] both of which were operated by the agency of services and surfaces. This sectioning of the home meant that, like the body, there were surfaces that were to be public and private. Similar to our internal organs the home was developing its own anatomy of orifices and skins.

Into Services & Surfaces

Both services and surfaces are engaged in the dwelling rituals of the New Zealand home. Services offer benefits to the dweller and have engineered requirements like the hardness of a pipe or the flexing of a cable; these are based on the process of specifying requirements and implementing materials to achieve these specifications. Surfaces, ubiquitous in domestic space, coordinate and support the serviced parts that combine to form a situation or a framework for activities.

124 Ibid., 3.



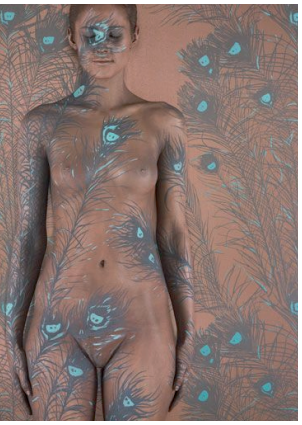
Ritual combines these two material aspects to demarcate space and give sequence and acceptable outcomes, be they emotional or tangible, from its activities.

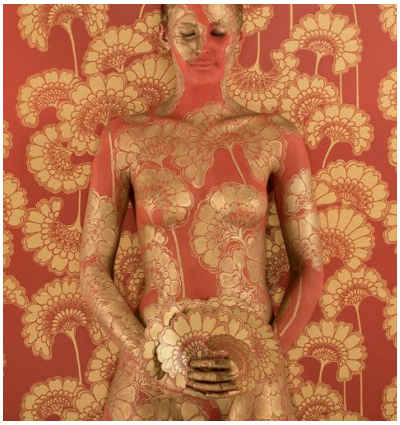
Cultivating Serviced Space

The hearth gave us the notion of interiority via its provision of benefits to dwellers. Giving out both heat and light it allowed us to have command over our housed territories, a control that uncultivated space denied other creatures that had only partial and impermanent control over dens and burrows. By this flickering firelight, our culture of dependence on services began divesting us of a focus on the horizon and positioning us around the sun-like flames – our backs to the outside world. This inward looking position is one that persists, expressed in habits of owning and acquiring possessions, like televisions and computers, which entertain and enhance the cardinal comforts of the interior. These installed services, or objects, offer benefits to the dweller, can be retrofitted, come as chattels when a home is bought, or are installed in the first instance of building.[125]

The conception of services in the design of the home happens initially in the design of the home. Using the plans devised by the architect or spatial designer, engineers, quantity surveyors, architectural specifiers and trades people, specify and calculate the products and installation points for appropriate solutions for a dweller's needs. Services such as gas, electricity, data, telephone cabling and wireless internet, plumbing and waste pipes or septic tanks, lighting, heating, water filtration or rainwater collection, solar-electric panels and alarm systems all create a more hospitable interior for inhabitation. These objects or fixed nodes in the house, attached to wider networks, provide an interface through its surfaces.

125 "'Did It Myself'"., 4.





Figures 85-86 – Wallpaper, 2008, Emma Hack

Body illustrator Emma Hack recreates the wallpapers of Florence Broadhurst on the body. Challenging the normal notions of keeping the body (or home) private.

Surface Splitting

Where once the hearth was the sole marker of our modes of operation and services, in the present day home, our consumption and traces of inhabitation are evident on the surfaces of the house. With each change of fashion these spaces are clad in the newest materials, grafted skins corresponding to their localised purposes. Thus the modern behaviours of home decorating, such as repapering the walls every seven years[126] began to focus the dweller on progress, via upgrading the interior, as much as their predecessors once did on the constancy, in the stone of the historical hearth. These evolutive spaces, with the aid of their inhabitants, learnt new patterns of editing – cycles preoccupied with services and surfaces that in New Zealand has become so ingrained with our model of homeownership.[127]

Due to the habits and aspirations of New Zealanders to own their own homes, their form becomes a marker of status.[128] Buying an older home, or a house formerly part of the government's housing stock (a *State house*),[129] that is old but has potential (a *doer-upper*) and then spending every moment outside of work remodeling it[130] is the acme of homeownership. This editing is part of the wider ritual

126 Stewart Brand, *How Buildings Learn: What Happens after They're Built, Rev. ed.* (London: Phoenix Illustrated, 1997)., 13.
127 "Did It Myself,"., 27-29.
128 Ibid., 14.
129 Ben Schrader, *We Call It Home: A History of State Housing in New Zealand.* Auckland: Raupo Publishing (NZ) Ltd, 2005., 82.
130 "Did It Myself.", 14.

Figure 87 – Maslow's Hierarchy of Needs, Abraham Maslow, 1943

The top tier of self-actualisation occurs through rituals like homemaking and Do-It-Yourself tasks. Having a home and the independence to alter and rearrange it as suits your way of life.

cycles (over years or decades) of homemaking in the home – practices imbued with the modern values of industrialisation and consumption. These practices, as in Desmet's *Basic Model of Emotions*, reinforce the emotional dimension of such ritual processes, giving the dweller a means to make their needs a reality in domestic space.

Resourcefulness and Self-Actualisation

As Abraham Maslow outlines when shelter, security, belonging and self-esteem are obtained we will desire self-actualisation.[131] The importance of this process is part of our geography and colonial history. As a nation of immigrants, predominantly from the Pacific and European origins, we have relied on our resourcefulness to fashion our homes and necessities. The vast distances between these homelands and emigrants meant that what was not brought with them would need to be created from available materials or components. This pioneering approach, also visible in North America and Australia,[132] formed our approach to Doing-It-Ourselves as a means of maintaining and economising

131 A. H. Maslow., "A Theory of Human Motivation" (Psychological Review, 50, 370-396.: 1943), http://psychclassics.yorku.ca/Maslow/motivation.htm

132 Jeremy Salmond, Old New Zealand Houses 1800-1940. Auckland: Reed Methuen, 1986., 27-8.

processes in the home. Wanting to own our own homes (and sometimes build) or alter these spaces is the architectural manifestation of this colonial cultural of ingenuity, probably also bolstered early to mid last century by the scarcity of goods during the two world wars.[133]

The Right to Own and Alter

New Zealanders consider this aspect of their independence somewhat of a right. Indeed the ability to alter the home's structure itself is the most significant ritual available to a dweller in the wider scheme of homemaking. The proliferation of retail chains, such as Hammer Hardware, Placemakers, Bunnings Warehouse and Mitre 10, peddling manufactured goods such as tools, raw materials and kitsets, attests to the patterns of consumption that continue this national fixation with home improvement. With no capital gains tax directed at profit made in selling these properties, home ownership embodies not just comfort but also wealth creation for the individual.[134] The relative security of property allows homeowners with equity in their home to use this towards purchasing another investment (rental) or holiday property that may too be a *doer-upper.* The losers in this scenario are the first homebuyers without any equity, who are easily priced out of the market by those of the older generations with this financial backing.

Subsequently the old fashioned New Zealand dream of owning a modest home that over time one would bring up a family in and renovate has become more difficult. The results of inflation and steadily increasing land and property prices have meant that supply does not meet up with demand and prices stay high in relation to average earnings. This creates a landscape of unaffordable established housing stock and a market filled with buyers whose desperation seems to launch them into paying more than they can afford and being mortgaged to the hilt. As New Zealand Member of Parliament Maryan Street explained in her speech on housing "Home ownership rates have fallen from 74 per cent to 67 per cent between 1991 and 2006. If current trends continue, this rate will fall to about 62 per cent by 2016, a scenario unpalatable to me and a great many other New Zealanders… there is a broad range of steps [the government and industry] can take

133 Hill, "Compost.", 98.
134 "*Standards of property management are variable*", Department of *Building and Housing,* *http://www.dbh.govt.nz/rta-long-form-themes-and-issues6*

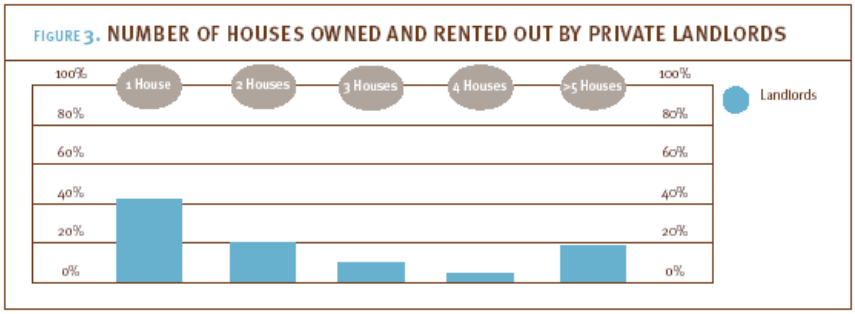
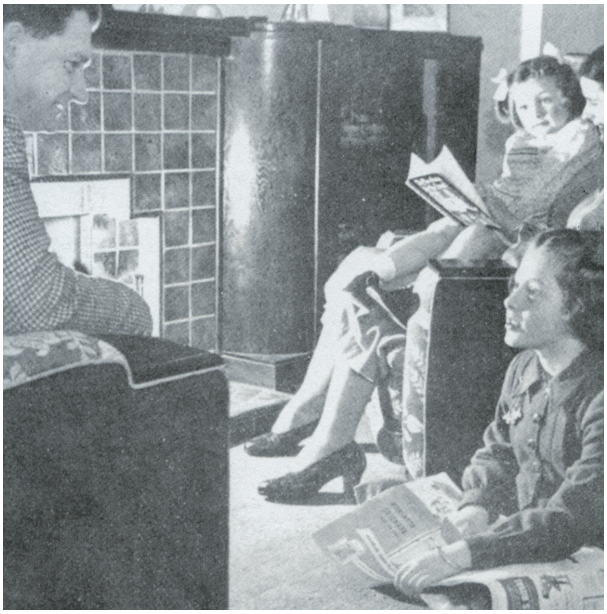


Figure 88 – Number of Houses Owned and Rented by Private Landlords, 2003, Department of Building and Housing

collectively to tackle the affordability issue."[135] The New Zealand Government has taken measures to streamline compliance procedures so that new housing can be made affordable to first homebuyers[136] and encouraged architects and designers to assist in remedying this issue. Though this has encouraged progress I propose that it is the manufactured nature of our domestic consumables that offers a more broadly applicable and effective solution to affordability in building and ongoing future maintenance carried out by inhabitants.

The high functionality and relatively low cost of the home's appliances[137] and installed services – which are focused on the purpose of providing the everyday functions, sets an example for architecture. The residues of the historical hearth provide the home's hierarchy of spaces. Displaced by new technologies, but not erased from our consciousness, it offers a culture of utility to the regions of function, namely the kitchen and bathroom. These traces of consumption, seen in the bathroom and kitchen, become the visible aspects of our homes' inhabitation. While these aspects deal with the house as a place and as an object shaped by the hearth they also hold sway over the inhabitant. The experience of the modern home is guided by and also influenced by progress and thus upgrading becomes an ephemeral culture of its own.

135 Maryan Street, "Affordable Housing Initiatives Speech," ed. New Zealand Government (www.scoop.co.nz, 2008).
136 "Starter Home Design Competition." Department of Building and Housing, http://www.dbh.govt.nz/starter-home-design & http://www.dbh.govt.nz/annual-report-2007-08-5
137 The precise capabilities and ingenuity of company's like Fisher & Paykel, with products like the Dish Drawer, are able to manage manufacture and waste much more carefully than the building site can.



Figures 89-90 – The Hearth and the State Home, Ben Schrader

The notion of the hearth held the ideas of family and social values that were encouraged by the government-built *State Houses*. These houses epitomised the desire for affordable, modest housing that New Zealanders would want to call their own. Interestingly the hearth was also used by manufacturers, in this case of crumpets, to communicate values that the rituals of thier products might put into practice.

Over the course of industrialising the home, the hearth has become pliable and has been rolled out into services concealed by surfaces within the home's interior. Though it might seem that the marketing of new designs and manufacture fuels this sort of upgrading consumption, these systems are now inextricably linked to the rituals of the do-it-yourself amateur who installs taps, plugs and fittings as and when he or she see fit.

FACTORY MADE

Figure 91 – A Building that Builds Buildings, Silver Crest Western Homes Factory

This housing manufacturer makes 3 homes per day, employing 300 workers and using a million US dollars worth of materials a week. Because they are off-site they never loose a day to poor weather.

The hearth's contribution to the home formulated domestic space. This conflation of hearth and home led the way for a way of life to go with its enclosure. But the hearth's rituals were not the only force to create culture in this place. The advent of the Industrial Revolution and modern manufacture made way for a new producer of habits and rituals – those of the factory manufactured object. At each step more progressive and technologically advanced than the last, the manufactured objects that first challenged the supreme reign of the hearth in the nineteenth century are even still more highly developed in our twenty-first century dwellings.

Encapsulating the domesticity of the hearth, but built and operated by more progressive technologies, we saw the rise of manufactured objects – such as kitchen appliances. These novel shrines enticed inhabitants with their precise edges and gleaming outer casings. As these objects proliferated they began to jostle former homemade objects for pride of place. Their manufactured technologies began to overshadow and rub off on the home's process of construction via manufactured parts and kitsets. Where once the home, like the hearth, was hewn from on-site materials, these factory made components made building more accurate and with material qualities that were easier to maintain.

As design and manufacturing ideas began to become more closely aligned during the early twentieth century the notion of prefabricating, or entirely factory building the home, took seed. Prefabrication has been met with both delight and derision for well over a century but has only been implemented on a small scale globally. The New Zealand home too has developed; incorporating manufactured parts but has fallen short of adopting prefabrication wholeheartedly. The reasons for this are due in part to geography and building heritage – a history that is inextricably linked to do-it-yourself amateurism. This chapter suggests a potential niche for a tailored model of prefabrication in New Zealand considerate of the skill base and retail support systems available to the amateur builder.



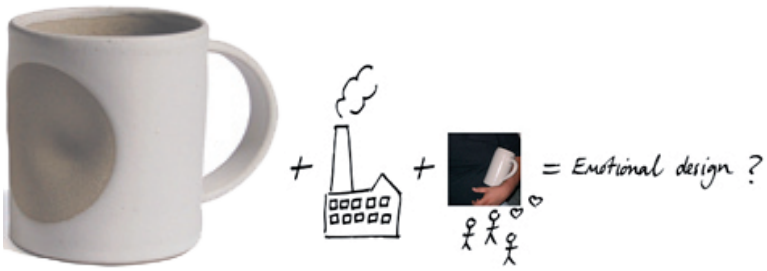

The Manufactured Object

As Gaston Bachelard explains though, the home is an intimate place, its nostalgia evoked through the details of that space; within rooms by their "components and furnishings, which can be touched and smelled as well: the attic and the cellar, the fireplace and the bay window, the hidden corners, a stool, a gilded mirror, a chipped shell. "In [the experience of these] smaller, more familiar things,"…This surely is the meaning of home – a place where every day is multiplied by all the days before it."[138] These objects that surround us and assist in this multiplication in the twenty-first century home have been made almost entirely in the factory. Though this may be their origin these objects still make a specific point of contact in space with the memories and rituals with which they are associated. As manufactured objects have proliferated they have also become the centres of new rituals – and as such part of the process of knowing the home better.

Emotionally Invested

These rituals convey the values of the hearth and our lifestyles. Ritual is encapsulated within these designed objects and makes apparent the values held by users or occupants. Just as the Japanese tea ceremony[139] is represented and held visible in the teapot and cups that the ceremony requires, so too can the house and belongings visibly provide a physicality for our values and the emotional dimension of domestic ritual. This area of values and emotions creates an interesting premise for designing to engage the dweller in ritual in a new way. Emma Lacey's range of *Engaging Ceramics* (figures 92-96) connect the principles of

138 Freya Stark in Bachelard, *The Poetics of Space*, 144.
139 Emma Lacey."Does Ceramic Tableware Offer Opportunities for Emotional Design?" In Design & Emotion, 2008., 4.



Figures 92-96 – Engaging Ceramics, Emma Lacey, 2005

Click (overleaf), Duo (overleaf) and Everyday cups and mugs have slightly altered tactile qualities. Using design Lacey has made these manufactured objects more aesthetically engaging. Heightening their emotional status in the hopes they will be kept longer rather than be mere throw-away consumables.

emotional durability and affective design with the rituals of tea and coffee drinking. The significance of such everyday rituals, socially and aesthetically, led her to design ceramics that could surprise, delight and allow room for reinterpretation of these familiar rituals through engagement with her products.

By interviewing users to gain product ethnography she produced a series of ceramics for emotional and social user engagement. As she identifies in these ceramics, manufactured objects have the potential to provide insight into our domestic ritual and a ritual engagement within space.[140] Though they might have been mass-manufactured, rather than handcrafted, these objects of homemaking are still intended for an intimate relationship with the dwellers that use them. Though not made *by* human hands, they were still made *for* human hands. These intimacies have become increasingly important in the manner products are regarded and designed since the nineteen-nineties.[141] This emotional dimension to our objects and their increasingly technological forms over the last few centuries has meant that all these everyday things become shrouded in surfaces beneath which resides the mystery of their workings.

140 This ability to examine or reform rituals, though initiated with the object's design, allows the user the notion of self-actualisation that they partake in the do-it-yourself rituals of home maintenance. As described in the earlier section: *Resourcefulness and Self Actualisation*.

141 Donald Norman in Lacey. "Does Ceramic Tableware Offer Opportunities for Emotional Design?", 5.

History of Objects and Innards

Suddenly the interior of the object itself became the holder of secrets: sealed inside was something that only professional trades people or manufacturers were privy to, details not accessible to the humble owner-operator. The outer surfaces of products were a place under the dweller's dominion and object's interior cavities were marked as the realm of the professional – each had their place and knew it.[142] Leddy observes that in everyday life we often tend to neglect the outer, everyday aesthetic qualities of surfaces[143] – the use of them by the dweller making objects worn, sheathed in dirt and grime. These surfaces are the point of contact with our bodies; they become worn and show their histories through the patina they wear.

Registered by our skin as readings of the "texture, weight, density and temperature of matter. The surface [or patinas] of an old object, polished to perfection by the tool of the craftsman and the assiduous hands of its users, seduces the stroking of the hand."[144] As Pallasmaa explains we like to touch things, like door knobs, that have been made smooth with wear and this "tactile sense connects us with time and tradition: through impressions of touch we shake the hands of countless generations."[145] The home and its objects are both part of this tactile engagement. But these rituals of getting to know an object or space

142 Lupton and Miller, *The Bathroom, the Kitchen, and the Aesthetics of Waste: A Process of Elimination*., 8.
143 Yuriko Saito, Everyday aesthetic. (Oxford: New York: Oxford University Press, 2007), 152.
144 Pallasmaa, The Eyes of the Skin: Architecture and the Senses, 56.
145 Ibid.



Figures 97-101 – Balloon Framing, Plasterboard and what lies beneath, by Author, courtesy Simon Wain, Torbay.

The current site built framing does not allow for an open realtionship with walls or services running beneath them. They are installed and sealed away.

are limited to the surfaces that are presented to us. In homes made of solid stone or brick, as was the European tradition, these aspects of wear happened to the outside of the material, shaving fragments off the whole – each chip merely showing the depth of that surface. But as the objects of the home became increasingly encased in plastic and metals or wood veneering technologies these interactions became limited to what designers and manufacturers had planned for – a designed limit of depth. These objects with their complex casings and skins kept us away from their secrets and became holders of manufactured technologies.

The Factory and the Home

These manufacturing methods, represented by their resultant objects were little sparks of industry sitting in our homes – heralding the demise of our antiquated site-building.[146] The home was beginning to feel the effect of the factory. With the mass-production of nails, standardized milling of timbers and other carpentry tools and supplies the importing of materials to build houses became a sensible alternative to milling and carting nearby timbers to make the house from the ground up.[147]

146 Mika Pantzar, "Domestication of Everyday Life Technology: Dynamic Views on the Social Histories of Artifacts " *Design Issues* 13, no. 3 Autumn (1997)., 54.
147 Davies, *The Prefabricated Home*., 48. William Toomath, Built in New Zealand: The Houses We Live In.

Figures 102-113 – One Week, Buster Keaton & Edward F. Cline, 1920

A prefabricated kitset house proves to be more than this newly-wed couple bargained for as they set about building it over a week. When a jealous ex-lover of the bride changes the numbers of the boxes of parts the resultant house is skewed. The rituals of the occupants have to change to keep up, ultimately it ending in catastrophe .

As settlers flooded in from different parts of Europe, this imported, partially standardised models of building sprang up in many of our main settlements. Built in the Balloon framed structure (opposite), named after the buildings in Chicago that an onlooker had described as inclined to fly away with a bit of wind[148], they were unlike the custom of post and lintel homes of Europe and elsewhere. This model of timber building was affordable to build and did not require the type of skilled labour that typically only a carpenter, not the ordinary handyman (pictured above and overleaf), would have been capable of. These wall systems, assembled in a vertical grid flanked each side by interior grade sheet material (or lathing and plaster[149]) with exterior grade weatherboards to both strengthen and finish them. Built largely from timber, some of these kitsets were shipped on the same vessel as immigrants in numbered kitsets ready for assembly on arrival. In time, combined with the new technologies of piped water, phone lines and electricity the New Zealand home was becoming rather fond of its comfortable factory assisted conveniences – provided by objects of the factory like toilets, telephones and kitchen appliances.

Auckland: HarperCollins, 1996., 11-2.

148 Davies, *The Prefabricated Home*., 45.

149 Salmond, *Old New Zealand Houses 1800-1940., 113-6.*

Overshadowed By Objects

These manufactured objects and fittings began to overshadow the built spaces to which they belonged and to advocate new ways that the home might be constructed. Such objects and other new fangled processes began to put the idea of making in the factory into common existence within the home. Though Ford Motor Company's moving production line (a large component of this factory making) was credited with the explosion of factory made wares in the home and workplaces it was not so much this format but the precise way that his steel parts were made that revolutionized manufacture.[150] His parts were so precise that every male and female part off the line would fit its opposite, reducing the waste of labour or materials.

Over time these methods of manufacture, developed into our modern modes of production. Methods like *Lean Manufacture* and *Mass Customisation*[151] both from the vehicle industry push the ideas of manufacture into the sorts of rational, logical modes that would perhaps seem more acceptable to Sherlock Holmes than how we build currently. *Lean Manufacture* revises the idea of stockpiling components rather making them to a schedule whereby they are timed to be made and arrive as needed. *Mass-Customisation* incorporates manufacturing considerations and the interchangeability of parts to produce outputs that maximise the creation of many models in one factory. The studio end of this process is known as *design-for-manufacture* where

150 Davies, *The Prefabricated Home*., 132-3.
151 Ibid.

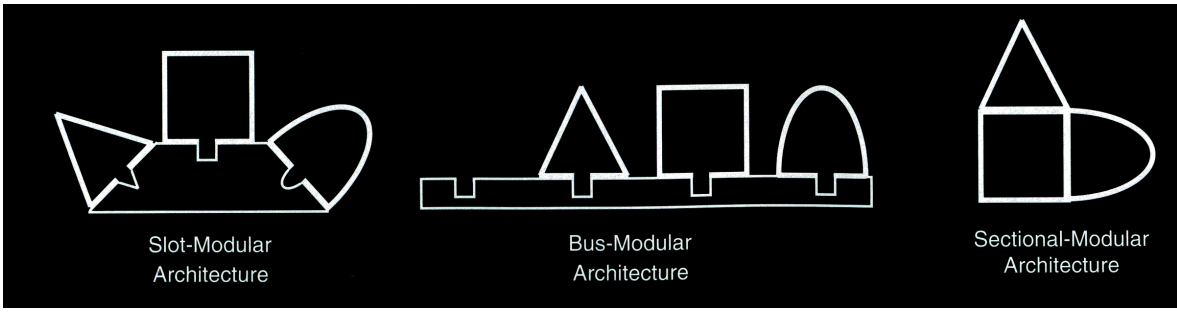


Figure 114 – Three types of Modular Product Architectures, Karl Ulrich & Steven Eppinger, 2008

These three formats allow for mass-customisable results. Imagine a house with these different modular appraches to adding rooms or new fittings. Changing plumbing or wiring could become as easy as plugging a USB (Universal Serial Bus) device into a computer (above centre).

Product development teams create product assemblies (or architectures) made of parts or chunks (groupings of parts) to be upgraded, added onto or adapted, by the manufacturer. This approach also allows users to replace worn parts or consumables, like printer ink cartridges, or to add different attachments, such as lenses on a camera.

designers and engineers design products to take advantage of the sizes that raw materials come in order to reduce waste and offer *Mass-Customisation* to manufacturers.[152] The result of these strategies are products that come out of the factory in many different forms, or for the sake of housing comparison many different styles, but with underlying similarities that make them economic to manufacture, like similar framing beneath their differentiated façades. *Mass-Customisation* gets rid of the negative cookie-cutter Model-T Ford analogy attached to manufactured housing[153] and makes its production outputs totally variable.

The Status Quo of Building

This reliance on a certain constrained degree of factory manufacture in New Zealand building has set the scene for the current mix of site and factory building. The brute force approach of the Industrial Revolution[154] has formed a New Zealand landscape of predictable buildings that fits firmly within the industry conventions that surround them. The dweller's engagement with the home, characterised by homemaking and do-it-yourself amateur alterations, has come also to fit within these conventions, and, as time goes by, further cements these methods of

152 Ulrich, *Product Design and Development*., 170.
153 "Affordable 'Model T' House for the Masses." (2008), http://www.stuff.co.nz/print/4455675a26959.html., 1.
154 William McDonough and Michael Braungart, *Cradle to Cradle: Remaking the Way We Make Things*, 1st ed. (New York: North Point Press, 2002). 30-31.

interacting with the home in the New Zealand context. The feeling that altering one's own home is a right perpetuates this *design>build>do-it-yourself* model of building which is in many ways adaptive over time to the needs of it inhabitants. Unfortunately this dynamic creates buildings that are adaptive on an unsophisticated level – changes being rendered impinging on the integrity of surfaces, like breaking through plasterboard to gain access to the services beneath. These types of buildings do not regard the future, evolutive needs during their design and fabrication. The neglect of prefabrication or *design-for-manufacture* in these structures means that absorb technological change poorly and are not being built to deal with the long term versatility that may save dwellers money in the future and make their purchase more affordable from the outset.

Brute Force Building

If the first Industrial Revolution had a motto, it would be "If brute force doesn't work, you're not using enough of it." The attempt to impose universal design solutions on an infinite number of local conditions and customs is one manifestation of this principle"[155] This brute force approach applied to housing development has been underpinned by the architecture, building, compliance, finance, component manufacturing, engineering, project management, property developing, quantity surveying, real estate and trade industries continuation of a model of too much reliance on on-site building.

This scenario of home-ownership relies on the home buyer saving a deposit, to secure a mortgage whereby they can purchase an existing home or land to build on which, in either case, are paid off over the term of the mortgage contract subject to interest rates. If they are to build on their land they might bring in an architect and team of builders, a project manager, quantity surveyor, engineers and trades' people to consult on and erect the house. Alternately, they might seek a plan and building package from a developer whereby they will consult with a representative who will help them to design or adjust an existing plan that is then built by agents of that firm. Occasionally, there are individuals who have the skills and courage to build the house almost on their own, bringing in the odd trades person to provide the more difficult plumbing or electrical features that are legally required

155 Ibid.

to be fitted by a registered professional. With all of the above scenarios the plans and site work need to undergo a process of council inspection to ensure that the home will be compliant with the national residential building codes and will be safe to live in, which is carried out at different process milestones by the region's building inspectors.[156]

Aside from the studio work of the architect and calculations of the surveyors and engineers all of this work is carried out on the building site itself making the management of the building of a house one that involves the co-operation of this range of professionals and their tasks. The fragmented nature of this process means that communication can break down causing unnecessary and sometimes costly errors. These extra costs can be seen in the time it takes to fix a mistake and the additional materials needed to complete the change. Though the use of factory made parts and materials has made the homes quicker to erect and more precise, building in this manner perpetuates the gap between the potential accuracy of systems of quality controlled and factory made components versus the risks of the more weather dependent site-built model. This disconnection between the controlled nature of these components and the practice of on-site building is a result of the industries and compliance procedures mentioned above but also the persistent practice of do-it-yourself amateurism in New Zealand.

Plight of Do-It-Yourself

This continuation of site-building conventions may also relate to the protection of the do-it-yourself New Zealand way of life and our sense of entitlement to a right to alter what we own. The site-built home is a mode of building that retains the option of self-building for New Zealanders. The ability to reside in your home during renovations or from a certain stage of building and being able to complete part of it yourself greatly reduces the labour costs of building your own home. But there is also the remnants of that immigrant culture of perseverance that makes these practices a part of New Zealand's social positioning and identity making. Roni Brown discusses the key role of the amateur builder in forming their identity and their surroundings simultaneously

156 "Building consent and inspections process", Department of Building and Housing, http://www.dbh.govt.nz/blc-building-consentinspect-process

Figure 115 – DIY It's In Our DNA Advertising Campaign, Mitre 10 & Mitre 10 Mega Home Improvement Super Stores

Two Kiwi blokes (kindergarten boys pretending to be men) discuss the deck they are going to build on the weekend.

within the building process.[157] Living with the space allows for the natural adaptations and adjustments to be made over time, a factor that would not be lost in a thorough *design-for-manufacture* housing solution. Though the Department of Building and Housing's *Simple Housing Guidelines,* the potential of which was demonstrated in the 2008 *Starter Home* Competition, illustrates some aspects of the manufacture they do not take the perspective of including a product *design-for-manufacture* sensibility.

Starter Homes

The *Starter Home* Competition signaled the encouragement of the architects, designers and students to devise houses that were equal to or less than NZ$1400 per square metre[158] and were congruent with the draft of the new *Simple Housing Guidelines*. Similar in its focus of affordability to Secca's *Artist and the Community* series' Home House Project held in America,[159] this competition sought to produce a new range of affordable housing types for New Zealand, with a focus on standardised components, but with less emphasis on prefabrication or technology as the Americans. These New Zealand houses looked to provide, (in a manner focused on private home ownership), the cultural and solid ideals that the archetypal State Houses that were so appealing had when they had begun to be sold off.[160]

157 Roni Brown, "Identity and Narrativity in Homes Made by Amateurs," *Home Cultures* 4 (2007)., 262.
158 Duncan Joiner. Chief Architect of the Department of Building and Housing, Personal Communication, 2009.
159 This project sought to encourage a range of innovations from architects and designers. These included technologies and manufacturing on a large scale as well as simple houses made from standardised parts – like the *Starter Homes. The Home House Project:The Future of Affordable Housing.* Edited by David J. Brown and Steve Badanes ... [et al.]. (Cambridge, MA: Southeastern Center for Contemporary Art, Distributed by MIT Press, 2004.)
160 Schrader, *We Call It Home :A History of State Housing in New Zealand*., 52.

This competition had two categories, the first that aligned with the drafted *Simple Housing Guidelines* (more like the current the site-built status quo) and the second that deviated from them (and provided other insights into practice and technology). Though this competition may have lacked in outright support for manufacturing as a path for innovation, it showcased design's ability to draw together designing for affordability and manufacture, especially where it pertains to houses becoming more economical to build in accordance with the draft of the *Simple Housing Guidelines*.[161] Partnering these guidelines with product design industry input might move home building forward and make it easier to get council approval for homes that conform to their ethos and industry recommendations. Although winning entries were praised for their modularity this competition unfortunately stopped short of challenging site building or the predictable territory of the plasterboard clad balloon frame model of the current New Zealand interior.

A Predictable Product

The attraction of such a seemingly unsophisticated system is its potential to be altered or edited in order to remain relevant to the dweller. The site built and do-it-yourself altered home is predictable.[162] We have access to how these structures are made, as viewed when we pass by building sites, and via childhood exposures to do-it-yourself

161 "Starter Home Design Competition.", http://www.dbh.govt.nz/starter-home-design

162 However it is worth noting that the poorly designed or built cladding and roofing systems that lead to the so-called *Leaky Building Syndrome* refutes this predictability. This old fashioned system is of course not necessarily immune to negligent practitioners who cut corners or simply do not comply with the national building codes, but it does not take advantage of the methods of production that could meet and exceed these codes through factory fabrication's quality control mechanisms.

Figures 116-119 – Starter Home Design Competition, 2008, Department of Housing and Building

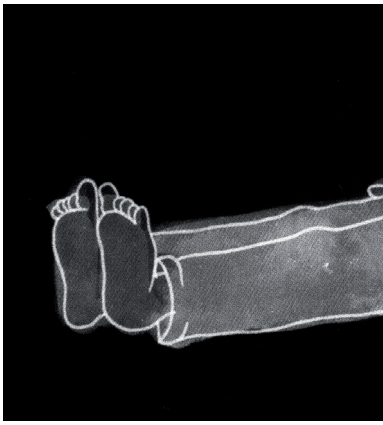
Category One - Complying with draft Simple Housing Guidelines. Category winner: Tony Koia (overleaf left). Runner up: John Wright (overleaf right).

Category Two - Varying from the Simple House Guidelines. Category winner and supreme winner: Stephen Smith (above right). Runner up: James Raimon (above left).

renovations from which we glean how such built structures are altered after the initial build. Altering the surfaces of the home is easy to do – this involves paint or wallpaper and is often rather cosmetic, however altering the home's services is a more destructive ritual of *reverse engineering*.

Removing parts of our walls' cladding and working with the wires and the parts beneath, thus eliminating the old surface of plasterboard, and with it the investment in surface finishes like paint and wallpaper, makes the waste leaving the site considerable in original value, and requiring financial calculation in addition to the capital required to restore that portion of the wall, floor or ceiling's surface. These surfaces do not respond to the advances of technology and *design-for-manufacture* that we see in the product development sector.

If the surfaces of the home incorporated a more carefully designed and manufactured approach, like the trapdoors in battery operated products that allow you to replace batteries, then it could be as easy to alter these surfaces and services in the home as it is to add new batteries to a torch. The home made by the factory could be infinitely more predictable than the homes we live in now. They could come manufacturer guaranteed complete with instruction manuals and numbered parts for do-it-yourself amateurs. Perhaps the seemingly stiff nature of prefabricated housing may have scared some homeowners off them as a housing type. However, the right strategy for introducing prefabrication to



the national housing market could even reinvigorate the home improvement pastime presently under threat from legislation and other leisure pursuits.[163]

The Prefabricated Home

New Zealand's current practice of constructing houses in-situ is an antiquated tradition. Prefabrication offers the scaffold to make houses more affordable and of better quality through the accuracy and mass customisation offered by building in the factory. Though the idea of factory production of the house has been understood in theory since the advent of modernism, we are yet to actively embrace them as a part of the New Zealand construction process. Therefore the current state of the building industry is examined within the spectrum of building completely on site to building completely in a factory that at present constrains the progress of prefabrication in this country.

The perception of prefabrication has been long skewed by the process of the *design>build>do-it-yourself* model of building and maintaining houses. Having explored the manufacture-focused industrial design approach; the ways that prefabrication and *mass-customisation* could be implemented in the New Zealand context is crucial to an expansion of current building practices. The significance of the 2008 Museum of Modern Art's recent *Home Delivery: Fabricating the Modern Dwelling Exhibition* emphasises the growing authority of prefabrication in the contemporary architectural discourse. The three of *Home Delivery's* projects examined in this chapter highlight the aspects of prefabrication that have the potential for individualization. Combining the value of such mass-customisable manufacturing methods with the strength of do-it-yourself culture in New Zealand, this section realigns the notion of factory building with the current plethora of factory made products that we come into contact with in the home improvement and hardware stores in out local communities.

163 Powell, "Time, Television, and the Decline of Diy.", 94. "Restricted building work and DIY frequently asked questions", Department of Building and Housing, http://www.dbh.govt.nz/lbp-faqs-restricted-building-diy.

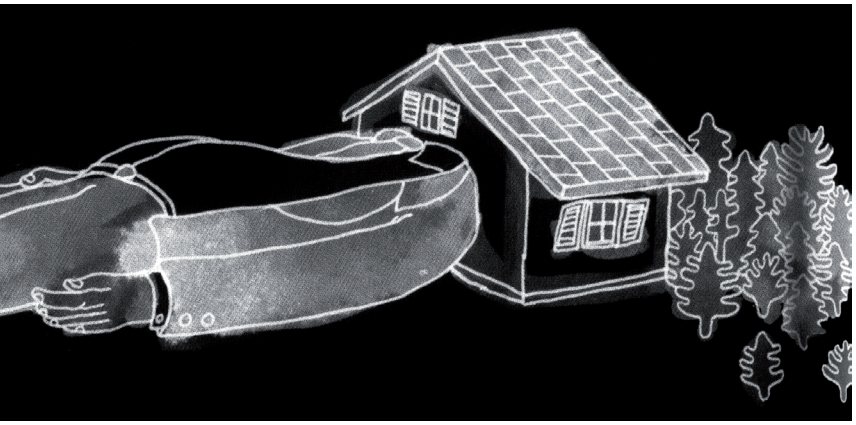


Figure 120 – Your House, Your Sandwich: an Architectural Drama in five parts, Nathaniel Russel, Dwell, 2007

The heads of industry not so much stuck in the sand as in the ordinary house.

Industry Inertia

The predictability of the current site building of homes has caused the building and design industries to become static. Perhaps, as Mark Wigley notes, it is the very nature of architecture being resistant to weather and its surroundings that forms this inertia.[164] We build to resist the elements and therefore we also foster a philosophical inertia. Houses are created to give us a sense of constancy and perhaps this constancy is being confused with tradition. We have the economic motivation to change but not the mechanism to implement that change in our wider industries.[165] At present so much seems to rely on the status quo – contracts, jobs, manufacturing, supply chains, wholesalers and retailers have livelihoods riding on the current of building industry structure. In the wake of the *Leaky Building Syndrome* innovation is even more fraught with difficulties. The risks in innovating with such large structures making architects and builders alike view experimentation with caution, given the minefield of liability and expense that correcting underperforming weather tightness has caused for compliance authorities and liable practitioners. It is no wonder that the recent building regulations have tightened up the registration of builders and tried with the *Simple Housing Guidelines* to return to a New Zealand housing of a recognizable and manageable benchmark.

164 Mark Wigley, "Towards Turbulence." *Archis: Volume* no. 4 (2006)., 6.
165 Davies, *The Prefabricated Home*., 203.

The view that as a population of below five million New Zealand is too small to sustain an industry of prefabrication is already refuted in the success of housing companies like Lockwood, established 1951, whose patented prefabricated timber walling system has seen strong growth over its history. Lockwood deliver fully serviced houses or garages straight to the site showing that New Zealand can sustain businesses with systems of factory manufacture. Lockwood's four ranges (above) include their original designs: one for the environmentally conscious, one more up- market contemporary range and a variety of affordable houses, all using the Lockwood system. According to chairman and son of its founder, Joe La Grouw, their entry-level *Initial* series is all about "clean urban design and affordability and are available from as little as $1300m: you choose the roof style, the cladding and the fixtures so you're getting a home with your initials on it."[166]

Lockwood shows that prefabrication as such, just as Colin Davies points out in his history of prefabricated industry, theory and practice, does not result in a scenario of thousands of houses that look and the

166 Lockwood. "Initial: Looking for Value." http://www.lockwood.co.nz/.

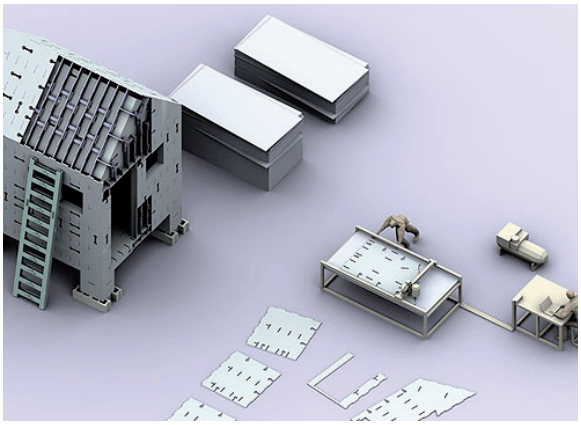
Figures 121-124 – Lockwood Houses, Rotorua, 1951-2010

Four archtetypal houses (and New Zealand consumer profiles) (overleaf) and the sandwich-style timber panelling with integrated aluminium sidings (above).

same,[167] which is a good outcome, since the state housing and *Starter Home* schemes have shown that the potential for difference is still desirable to the New Zealand market. As history has shown, the balloon frame, once a new and thwarted construction – due to its radical difference from post and lintel construction has now become a norm which is an example of how a shake up of the building industry could happen again. There is no reason for the weaknesses, like lengthy building processes and high labour cost, of the on-site building to persist. The manufactured approach does not deny the value of people employed in the current scenario, rather just shifts the place where they do their jobs and their methodologies.

Imagine a factory of builders, plumbers, engineers, quantity surveyors and design professionals all able to collaborate and not affected by the weather. In addition systems that ensured quality control and appointments with building inspectors might be made so that a dozen houses at a time could be inspected – bringing both compliance and labour costs down. As both Kieran and Timberlake[168] and Davies[169] explain, prefabrication could easily perpetuate the exact built structures that are current in onsite practice,[170] as in Japan, for example, where homes made on

167 Davies, *The Prefabricated Home*., 186-9.
168 Kieran and Timberlake, *Refabricating Architecture: How Manufacturing Methodologies Are Poised to Transform Building Construction*., 133-5.
169 Davies, *The Prefabricated Home*., 186-9.
170 Kieran Timberlake looks at the issue of prefabrication from the perspective of practicing architects, as is illustrated by their Cellophane House in the next section. They are in a position to set an example within of their practice to make the architectural world take notice. In contrast Davies comes from the



barcode-guided customized factory assembly lines are indistinguishable visually from site built ones.[171] Or we could have homes that go beyond this and address new ideas of surface and serviceability like those initiated by the Museum of Modern Art's exhibition, *Home Delivery: Fabricating the Modern Dwelling*.

Home Delivered

MoMA's New York Exhibition, *Home Delivery: Fabricating the Modern Dwelling*, put together an extraordinary and thorough survey of prefabrication in its historical and contemporary contexts. Of particular interest to this study were the five commissioned houses that were built on the museums vacant inner city lot

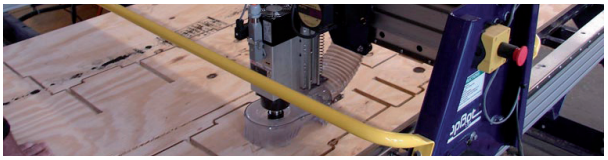
"continuing MoMA's rich history of presenting full-scale architectural projects. Five individuals and architecture firms have been given the unprecedented opportunity to deploy both commercially viable domestic creations and entirely new, speculative prototypes."[172]

Three of these, as I will outline, have made bridging the gap between the combined notions of services, surfaces and prefabricated manufacture seem more conceivable Especially through the *Instant Houses* that highlight the value of the do-it-yourself model of assembly and customisation that springs from surfacing and ornamentation. The

perspective of academic skepticism in regards to the architectural profession. Although he is a part of it, in his title of architectural historian, his agenda is foremost arousing the reader as to the reproachable status of the industry at present and the theoretical, historical and practice-related reasons for this.

171 Davies, *The Prefabricated Home*., 186-9.

172 MoMa, "Home Delivery: Fabricating the Modern Dwelling"



Figures 125-131 – Digitally Fabricated Instant Housing for New Orleans, MIT, 2004-8, MoMA New York

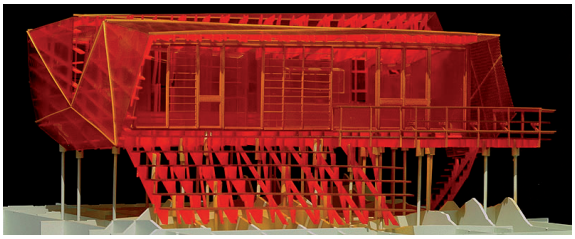
Interlocking pieces hammered together required careful design and adjustments during installation – with the order of pieces being of paramount importance.

*Burst*008* system investigates the high manufacturability system of plywood as a tensioned surface and structural hybrid. While the *Cellophane House,* whose manufactured skeleton and interchangeable partition system shows the relative responsiveness of materials and layout that the home's surfaces can enable via a dissemble-able building strategy, is also discussed. These three examples begin to shift the outdated notion of prefabrication as static or underperforming into a type of building that burgeons with potential for the New Zealand market.

Instant Houses for New Orleans, MIT School of Architecture and Planning, 2004-8

Designed as a solution to the devastation wreaked by Hurricane Katrina this *Instant House* concept embodies the ornamentation of New Orleans' French quarter and Garden districts via a clever house scale version of the slotting components that make up many interlocking children's toys. These four shotgun houses made up of a shed at the tail end and front porch "decorated with a sort of pixelated historicism"[173] are made from flat CNC (Computer Numeric Controlled) cut sheets but assembled on site by hand. Their sophisticated off-site manufacture, created for around US$40,000 (if mass-produced)[174], shows the key aspect of identity creation through surface – that architects have

173 *Home Delivery: Fabricating the Modern Dwelling*, 198.
174 MoMa, "Home Delivery: Fabricating the Modern Dwelling"



Figures 130-134 – Burst*008 House System, Jeremy Edmiston and Douglas Gauthier, 2005-8, MoMA New York

A systems approach to housing that takes surface to a new structural and aesthetic plane.

increasingly invested to fulfill new roles for identity making.[175] They are the epitome of a high-tech manufacture coupled with a low-tech (or amateur) mode of assembly. Their beautiful and simple forms – constructible by two people and a rubber mallet – produce a solution that shows the inbuilt intelligence that design can bring to the housing sector through design-for-manufacture. Though this has a more basic format it is its simplicity that makes it both highly replicable and adaptable. The creative opportunities open to processes like laser cutting, though they focus on cutting in two dimensions, have almost endless options for decoration. In terms of the Do-It-Yourself paradigm such a system, though it relies on parts being added in a specific order, could be interchanged over time to keep up to date with trends or simply to keep in repair.

Burst*008 System, Jeremy Edmiston & Douglas Gauthier, 2005-8

The Burst*008 house takes the idea of a flat packed kitset to a more dynamic and structural state. This house is the newest iteration of a systematic approach driven by software that codes the requirements of digital architectural drawings into a three dimensional form according to the parameters entered – known as parametric modeling. The pieces to construct the house are then laid out into laser cutting patterns by

175 Farshid Moussavi and Michael Kubo, *The Function of Ornament* (Barcelona: Actar, 2006)., 615-8.

software called String IT (traditionally employed in product design), to produce the 1,100 pieces out of over 300 sheets of plywood with a minimum of waste – like a dressmakers' pattern on fabric. The resultant forms of plywood spines are clipped together to create a concertina, using the insertion of siding panels between the spines to give it its structural integrity – only fully firm when the last piece is inserted.[176] The final layers of its surface create the integral step in finishing the home structurally and cosmetically. What this approach to surface offers is a designed relationship between parts – how the modules fit together. No matter what the floor size of the home desired the format can be reconfigured around this method of joinery to manufacture the right pieces at the correct proportional fit.

Cellophane House, Kieran Timberlake Associates, 2007-8

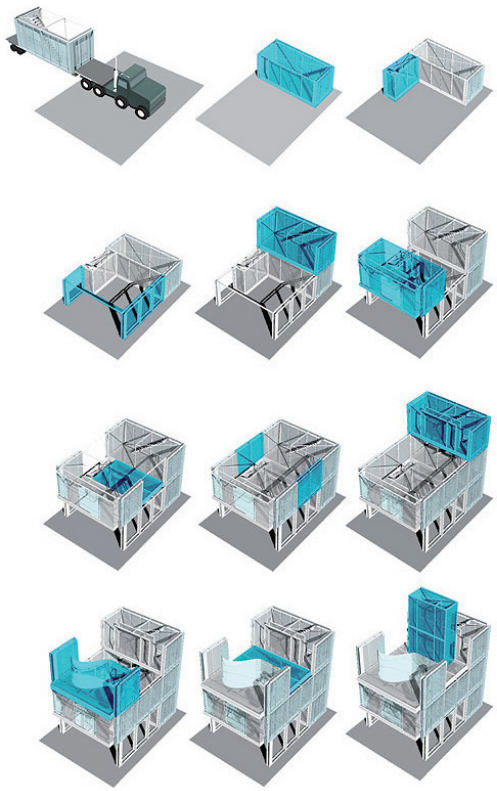
Again by parametric modeling this type of system, *Building Information Management* (BIM), uses software to calculate tolerances and materials. This project relies on technology to streamline the relationship between the drawing board (or computer) and the factory floor. Attacking the notion of current architectures at a layer-by-layer level, the *Cellophane House* looks at the reconfiguration of the home's construction. With a skeletal Bosch frame, panelised flooring and walls, volumetric service cores and a thin-film (hence cellophane) outer wrapper impregnated with Photovoltaic (or solar) cells - for both day lighting and energy capture. This house is built from parts that relate to one another and

176 MoMa, "Home Delivery: Fabricating the Modern Dwelling"




are highly interchangeable.[177] Due to its steel framing system the interior of the building can be reconfigured, a concept that harks back to Michael Web's 1966 *Rent-A-Wall* collage (figure 140 overleaf) for *Archigram*.[178]

Web's concept offers an as-you-need-when-you-need it version of the home interior and mimics the more systematic formats of exhibition design rather than traditional forms of segmented architectural programming. In the *Rent-A-Wall* concept components and trends could be administered by the retailer to fit the whims of the dweller and then taken away after the trend passed. Although the format of Web's diagram seems to poke fun at his highly commodifying model of architecture it still offers up a format that fits quite effortlessly into what we accept as a way to advertise. Offering a level of adaptability to the interior and the dwellers' needs over time suggestive of temporary partitioning in the domestic that might be leased in the manner of current trade exhibition systems. This format of prefabrication takes a highly standardised approach to the sourcing of



Figures 135-139 – Cellophane House, Kieran Timberlake Associates, 2007-8, MoMA New York

A house whose form and lifecycle promote transparency.

177 Ibid.
178 Archigram. *Archigram*. Edited by Peter Cook. (London: Studio Vista, 1972)., 66-7.

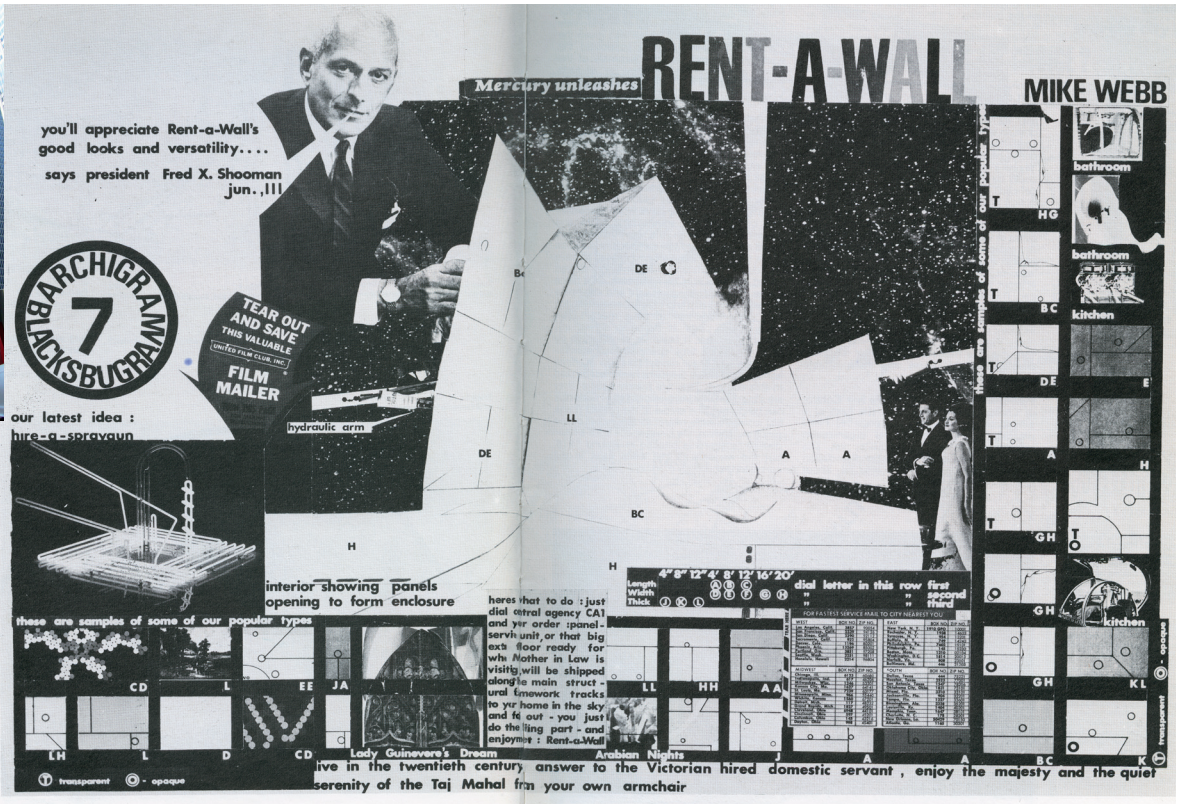
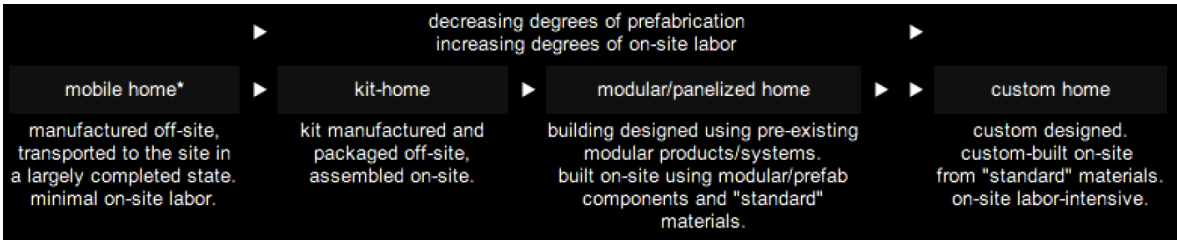


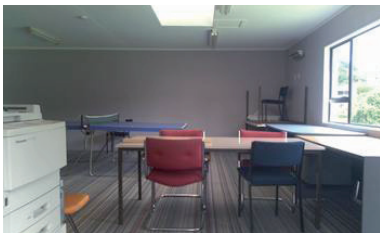
Figure 140-141 – Alternative Notions of Building & Transparency of Origins, Michael Webb, Archigram, 1966 & eHow.com,

The idea that we could lease our walls gives a new concept of upgrading the interior (top). So too the notion of labelling homes or parts with more clear information about their origins and who should attempt to alter them. Like this t-shirt label which states that it's (debateably) your mother's job.

parts – all manufactured to low tolerances and all with the potential to be extracted and reused. This is the most sophisticated of the three case studies in terms of engineered parts used and bears the closest resemblance to the sorts of underlying structures of mega-structures like skyscrapers or ships.[179]

179 Kieran and Timberlake, *Refabricating Architecture: How Manufacturing Methodologies Are Poised to Transform Building Construction*., 68-83.





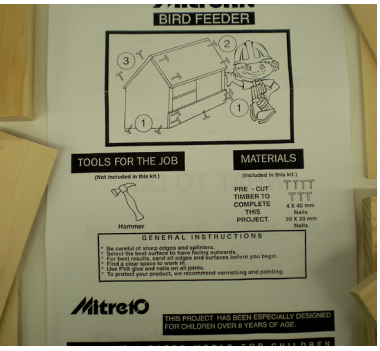
Figures 142-144 – Spectrum of Prefabrication, Glossary, FabPrefab.com, 2003-4; Prefab; Prefab Classroom for removal, Wellington, TradeMe, May 2009, Listing #: 156231808

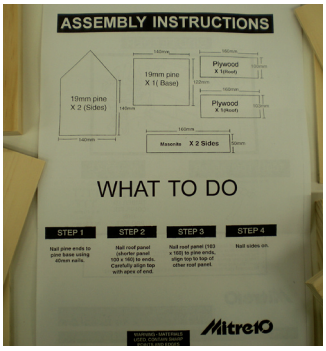
In New Zealand with some parts of our homes, like framing, doors and windows factory made we sit somewhere between the modular/panelised home and the custom home. Still a long way away from the factory (left) end that has been sorely misrepresented in New Zealand by prefabricated classrooms across the country.

Spectrum of Prefabrication

What these three precedents illustrate is that the level of manufacture in a prefabricated house can vary widely. Though all of these are prefabricated to some degree they do not all comply with one standard amount of prefabrication and are not without some site assembly. They all sit on a continuum between prefabrication and site building. The typical site built New Zealand home, as *The Factory and the Home* section discussed, sits at a point between these two extremes but rather closer to the site built end. To say that we simply should all aspire to live in and build totally manufactured houses would of course be naïve and this research does not suggest that the solution is New Zealanders all living in lowest common denominator shipping container houses[180] that are built in an industrial-space age interior style. These sorts of misconceptions about prefabrication arise from its unfamiliarity to the ordinary dweller.

180 Although interesting this has serious merits for the reduction *double bunking*, two prisoners to one cell, within the overcrowded prison system. It is a solution that would see many prisoners warmer and healthier than those in poorer areas of the country. Container crate prison cells ready in April, NZPA, New Zealand Herald, http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=10623876, Feb 3, 2010.





Figures 155-158 – MitreKit Bird Feeder, Mitre 10, 2008, Assembly: Author

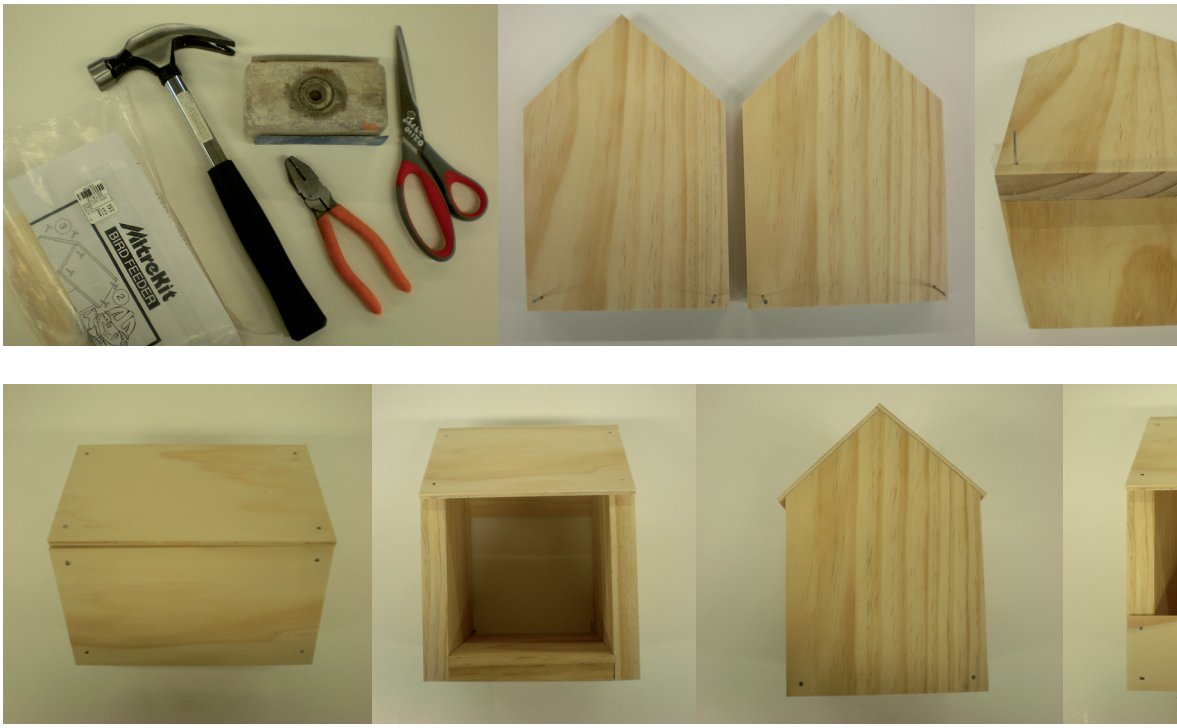
This kitset bird feeder illustrates the positive aspects of pictorial instructions and precisely machined parts. It also shows up the potential for incorrect assembly if a kit is not designed carefully enough. Following the instructions still not ensure, for example, that the roof pieces would be joined straight – still relying on the skill of the maker. This product shows how the factory can take us so far but without detailed *design-for-manufacture*. Products and architectures need to be designed with installing and the manufacturing taken into account.

Prefabrication is an abstract concept for New Zealanders, whereas site building is real and done in plain sight. Part of securing a foothold for manufactured housing will be how the word prefabrication is promoted and managed. Bombarding the public with the term *prefabricated* would risk immobilizing the word rendering it a buzzword, the way that *sustainability* has unfortunately been used and abused.[181] To maximise the efficacy of prefabrication in the New Zealand architectural discourse we need to sever its ties from the drafty *prefab-classrooms* emblematic of our public schooling and make it adjunct to the amateur building cultures already evident in New Zealand. If the home improvement and hardware stores around the country embraced prefabricated building systems, (as their kitset products already do) and got them out there in front of consumers in a non-threatening environment then I believe this position would shift. Rather than large product like buildings or modules, of unknowable closed natures in the manner of large appliances like fridges, they instead would be systems of products that combine to create adaptable domestic buildings that the user has a part in and agency to reconfigure.

Just Like a Bought One

Architectural prefabrication, producing the whole or parts of the house in a factory, has the capacity to make homes that are affordable and varied like any other manufactured product. *Mass-customisation*, as enabled by digital management of designs and production as outlined by the aforementioned precedents, allows for this varied output by having some standardised methods of connection

181 Tony Fry, "Know Your Enemy: Defining the Problem of Unsustainability "(paper presented at Shaping the Sustainable Millennium. Queensland University of Technology: EcoDesign Foundation, Sydney, Australia, 2000.), 5.



or structure within a design that can be rearranged to create varied products. These options for housing, as seen at the MoMA exhibition in 2008, can be kitset or flat pack (highly transportable), modular (to be transported as chunks and then connected) or as integrated units (transported as a whole).[182] The potential for the New Zealand market sits in the scope of producing a system that could enter the home interior market at the level of the home improvement or hardware retailer – a realm already familiar to New Zealanders and suited to deal with a level of retrofitting and new building that is currently faced in the building sector. A scenario that aligns prefabrication and do-it-yourself amateurism in this way allows the everyday contact we have with surfaces, in our homemaking, to be extended in to the way we can interact with the building in the less frequent rituals of home renovation. Making the house's interior surfaces the focus of this adaptability enables the dweller to gain a sense of homeliness via changing things within this designed framework to suit their lifestyle or taste.

182 MoMa, "Home Delivery: Fabricating the Modern Dwelling".

Creating a product that deals with the surfaces that dwellers engage with daily but with potential for the seasonal or less common acts of maintenance in the home offers an area of prefabrication that seems attainable for New Zealand interior – one of services and surfaces. The advantage to such a product-based strategy is the ease of adoption through current market structures and retailers. A scheme that uses a modular product designed for assembly and disassembly removes the issues of the limited accuracy of site building rather harnessing the site for assembly only – ensuring the low tolerances and controlled standards of the factory are not compromised by rough or makeshift work on site. This way forward looks to gradually advance current methods towards prefabrication. Importantly this does not treat prefabrication as an industrial panacea, rather it puts the onus on suitable steps towards factory building that do not promise too much or become obsolete quickly. As Lockwood has shown by focusing their product innovation on an interlocking exterior walling, prefabrication can yield solutions that New Zealanders can identify with, in that case through the nostalgic forms of weatherboard that reinforce national history and identity. Taking both servicing and surfacing and their associated rituals into account, a similarly focused approach to walling the home interior is an achievable strategy for building in New Zealand.

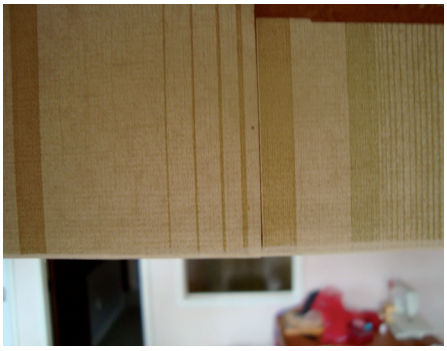
SURFACE BUILT

Figure 159 – Pantry Wallpaper, Photograph by Author, Torbay, 2009

Old layers of wallpaper in the home's cupboards – a layered surface history.

The contemporary home is a result of two authorities, the domestic hearth and the industrial factory. Though the factory's technologies disembodied the traditional silhouette of the hearth it is reformed in the objects, services and surfaces of our home's workstations, such as the kitchen sink, oven and television and entertainment units. This field of outer casings and coatings marks a shift in the home from a preoccupation with overall structures in the layout of the home to a format concerned with outer surface – as the at times visceral part of the house with which we readily engage in ritual. Like our own skin's surface, whose seeming smoothness belies the organic wires and pipes that traverse its underside, the home's underneath is a labyrinth of seldom-seen gaps and crawl spaces. These cavities, concealed by the barrier of surface from our immediate experience of the domestic, are the guts and organs that make the house of technologies function.

In New Zealand building culture the interface with these surfaces expands beyond everyday ritual into the creative realm of our do-it-yourself renovation. This type of amateurism, supported by architectural nostalgia and legislation, produces buildings of familiar traditions and qualities of modification. We live a house that was built on-site and then living in it and we, as do-it-yourself amateurs, continue to manipulate the form of that house to suit our needs. Indeed it exists as a context of interface for our serviced needs. Accessed through hybrids of the technological shrines and domestic infrastructures these spaces are brought to our attention via their outward surfaces. Surface acts as an agent for the home's reticulated services in our everyday living, becoming more complex as technologies advance and contexts are outwardly simplified.



Accordingly, this final chapter puts forth a definition of surface as a conduit for services, comprised of two realms – the outer-side and the underside. The outer-side is the human-scaled side of ritual, walling and decoration, the side designed by the professional and under the authority of the amateur and the dweller. The underside is the outer side's double, a dusty negative and unknown wilderness that it is not within our control but under the reign of the professionals of serviced infrastructures. Splitting surface in this way offers a cross-section of the politics of home alteration. A place that mingles the factory produced and the do-it-yourself homemade[183] – a combination that addresses homemaking and its implications for prefabricated hybrid's in New Zealand homes and industries.

Surface Collisions

Architect and critic Mark Wigley states that his "discipline pretends that architecture is thick, that it is the materials beneath the outer skin and not the skin. There is a congenital fear of being superficial."[184] He touts architecture as "the thinnest art"[185] This thinness however, is not a superficial format, on the contrary, surface hints at the depth of innards in the designed parts of the domestic. The tension between the outer and the undersides of walling surfaces is made over daily through ritual maintenance – not just built and stagnant. These outer crusts condition a sensuous interaction with the body. A barrier to the unknown, such surfaces also behave as a safety mechanism. They are a membrane keeping us away from the hazards beyond their façades.

183 Brown, "Identity and Narrativity in Homes Made by Amateurs."., 263..", Banham in Lupton and Miller, The Bathroom, the Kitchen, and the Aesthetics of Waste: A Process of Elimination., 8., Brand, How Buildings Learn: What Happens after They're Built., 12.
184 Mark Wigley, "Alternative Architecture 2: Paint Space." *Domus*, 2005, 43.
185 Ibid.



Figures 160-164 – Under the Pelmets Lurks the Past, Torbay, Photographs by the author, 2009

What was visible in the pantry and cupboards was even more pronounced under the window pelmets. An area where the old surfaces remained and the new layers of paint just touch.

Surface creates a material sheerness in which we dwell – a state of fragility, a tear away from the exposure of what Reyner Banham describes as the *other culture* of technical function and engineering.[186] The knowledge that goes into creating the house and making it continue to operate well is alien to the obvious aspects that are visible on the exterior of its walls.

Enclosures and Casings

At first glance an enclosure peppered with objects, the home has gathered fittings and installed technologies making it a place of intimate interface with networks and utilities. The conception of these structural and product surfaces come together in John Brown's definition of designing the interior: "an interdisciplinary practice that is concerned with a range of environments that articulate identity and atmosphere, through the manipulation of spatial volumes, placement of specific elements and furniture and the treatment of surfaces."[187] This treatment of the home's spaces, as a field, "wrapped in a continuous film…uses an array of products to maintain the integrity of this thin layer",[188] ubiquitously implicated in the dweller's rituals within the home.

Despite this utter ubiquity, design remains for many people a mysterious force. This is in part because it presents itself through the myriad of

186 in Lupton and Miller, The Bathroom, the Kitchen, and the Aesthetics of Waste: A Process of Elimination., 8.
187 Brooker and Stone. "From Organisation to Decoration." 126.
188 Wigley, "Alternative Architecture 2: Paint Space.", 43.

objects and images it creates – autonomous and mute things, which tend to conceal rather than reveal the process of their making."[189] Thus the individual's access to design is limited to an end product that may not show the intricacies of its manufacture or operation. Cloaked in skins, the inner workings of the home's fittings and industrially designed products[190] streamlined their crusts – a transformation from solid forms to complex, hollowed ones. Where once the handmade implements and the home itself were constructed largely in plain sight of village dwellers, holding little mystery,[191] the manufactured casings of objects and practices of veneering made ordinary things more mysterious. Only in the damage of these items do we learn their undersides, as few of us would dare to uncase most of the objects we own. Such peeling open would render many technical devices, like cheap DVD players or televisions, useless, if not cause us harm due to the hazardous parts inside them.

Zone of the Unknown

Like our own skin's surface, the smoothness hides the unseen zones of the home. These unseen spaces represent the un-homely areas of the home – walled out from our immediate experience of the domestic by these barriers. Such boundaries are deliberate and for the most part of the dwelling experience remain closed. But as the previous sections on homemaking and the rituals of the hearth have stated this static nature does not fit with the ephemeral quality of our rituals. As Robert Frost's poem[192] advises before a wall is built one should ask "What I was

189 Blauvelt, Strangely Familiar: Design and Everyday Life, 36.
190 Lupton and Miller, *The Bathroom, the Kitchen, and the Aesthetics of Waste: A Process of Elimination*., 65-9. Ellen Lupton, *Skin: Surface, Substance & Design / Ellen Lupton with Essays by Jennifer Tobias ... [Et Al.]* (London: Princeton, NJ: Laurence King, Princeton Architectural, 2002)., 29-31.
191 Bradley, *Ritual and Domestic Life in Prehistoric Europe*., 184.
192 In The Mending Wall Frost's purpose of walling is to preserve a property boundary in a field, but

Figures 165-170 – The Borrowers Television Series, UK, BBC, 1992

Mary Norton's tiny characters who dwell under the floorboards. Travelling through the crawl spaces and wall cavities they borrow items they need from the Human Beans.

walling in or walling out[?]"[193] In the New Zealand house walls create boundaries and allow for rituals on either side to occur – it is not just a case of *what* is being walled out but also with *whom* and *why*. Walls between the services and dwellers keep us separate from the dangers and workings of the systems that supply us with phone, data, water, electricity and gas.

They are the spatial filters that mark out our territory as dwellers,[194] which we sometimes cross as the do-it-yourself amateur. With recent changes to legislation[195] this realm is becoming less accessible to the dweller with the requirement to become registered in order to perform certain home maintenance or building projects. Though, laudably, these changes allow jobs to be traced back to their authors, the idea that bureaucracy is encroaching on the dwellers' autonomy endangers the homeowner's perceived independence. The dweller's ability to enhance the value of the home, as their primary investment for wealth creation in later life (as discussed above in *The Right to Own and Alter)*, needs to be considered and not totally obliterated by rash overhauls of the current industry structures. Just as we have the right to alter our own body's surfaces so too should the occupier have the ability to alter the surfaces they own.

more importantly whose ritual seasonal mending reinforced the kinship between neighbours.

193 Robert Frost, "The Mending Wall." In *North of Boston*, (Fairfield, Iowa: 1st World Publishing 1914), 8.

194 Wood, "Sticks and Stones: Skins and Bones.", 66.

195 "Building Law and Compliance" http://www.dbh.govt.nz/building-law-and-compliance

Skinned Deep

We often regard the terms skin and surface as synonymous when describing an object's exterior. Our own skin is our body's outer surface. However the idea of skinning and of surface are not as interchangeable in the field of architecture. "Skin is … a spatial filter between states, demarcating proprieties of interiority and exteriority – the traditional responsibility of architecture",[196] and the products and the textiles that we use and wear everyday. Everything has a surface, however not everything has been deliberately covered in a designed skin. In the natural world adding skin is part of the holistic development of an organism. These develop alongside the complex interior of that organism in the womb or egg. In Spatial and Industrial Design the addition of skin is conscious and comes after the innards are formed, providing finite exteriority and a surface for contact with outside

196 Wood, "Sticks and Stones: Skins and Bones," 66.

Figure 171-182 – Brazil, Terrry Gilliam, UK, 1985

A world of old fashioned mechanisation gone wild and enough bureaucracy to make even a regional building inspector squirm.

elements and the body. Experience is on the surface of our human skin. As we "touch objects in the world, they seem to rise to their own surfaces, to meet [us] in the shape that [we] present to them...We depend on the world to give us the shape that we present to it, in order to feel it."[197] The evidence of depth is hidden on these surfaces.[198]

197 Steven Connor, "Complexion," in The Book of Skin (London: Reaktion, 2003), 35-6.
198 Hofmannsthal in Marco Belpoliti and Francesca Picchi, "Tattoo Design: Skin to Skin," Domus 2006, 53.

The similarities between walling and human skin show the anthropomorphism we apply to architecture. "The body's surface itself is everywhere a potential exit, because it can open or be induced to open anywhere. Wounds, bulges or tears are channels from which something flows that would otherwise choose a different route."[199] The plasterboard wall can also allow us entry into its innards to channel what flows beneath it. With a little *brute force* plasterboard can be cut into easily but the process to heal the gashes is not as elegant as that of the skin. Where the body regenerates and plumps up the area with scar tissue, plasterboard needs to be filled in manually and rubbed back to regain its homogenous façade. The wall does not bear witness to its penetration beyond just being damaged as the scars are hidden unlike the skin in its scarring and healing response. The wall denies its disruption by the dweller. It is as through the wall's attempts to be solid do not support the idea of being materially rearranged, or edited by its inhabitants as needed. To do this the walls must be acted on by the surgical practices of the professional tradesperson or the do-it-yourself amateur, whose territories are signaled by its barrier.

Breaching the Barrier

In the last century the New Zealand home interior has been largely clad with plasterboard, timber or water repellent laminates and ceramics. Effectively "To occupy your house is to move about in a millimetre thick bag of made of paint on the walls and ceiling and the clear coat of varnish."[200] These façades give a clear demarcation of the domain of the dweller and that of the professional tradesperson. Day to day these barriers are accepted and respected but when repairs need to be made they must often be breached. These materials can be broken into – but this process is both destructive and wasteful, more a model of *breaking and entering* than a deliberate and reversible incursion. As my earlier investigations into do-it-yourself surfaces examined, these holes cannot be healed without further materials being applied. This do-it-yourself behaviour has a history of economising on the labour costs of maintenance when performed by the dweller but risks the flawed finish of an ignorant or unskilled amateur.

199 Claudia Benthien, "Penetrations: Body Boundries and the Production of Knowledge in Medicine and Cultural Practices," in Skin: On the Cultural Border between Self and the World (New York, Chichester, West Sussex: Columbia University Press, 2002), 39-40.
200 Wigley, "Alternative Architecture 2: Paint Space.", 43.

This said it would be unlikely New Zealanders would accept a scenario where do-it-yourself is tantamount to illegally trespassing into these cavity spaces, like in Terry Gilliam's 1985 dystopian future *Brazil*. In *Brazil* paperwork and bureaucracy flank all maintenance and such tasks cannot be undertaken without official approval and technicians. Protagonist, Sam Lowry, is himself one of these bureaucrats who even although is actually being part of this system cannot overcome it to be an independent citizen. When his apartment's heating malfunctions (fixed illicitly by heroic Archibald "Harry" Tuttle, a renegade technician) he finds himself complicit in this illegal act. Harry's removal of the apartment wall panel exposes a heaving mass of chaotic wires, kept secret from the occupier of the apartment.[201] This barrier represents as much about the politics of that society as it does about the burgeoning networks of technology that now surrounds us.

Though in New Zealand practical skills were passed from some adults to children, designers could also offer such knowledge embodied in the design of *user-edit-able* surfacing systems. As Stewart Brand asks, "What would a building look like and act like if it was designed for easy servicing by the users themselves? Once people are comfortable doing their own maintenance and repair, reshaping [would come] naturally because they have a hands-on relationship with their space, and they know how it actually works and will have ideas about how to improve it."[202] The current level of sophistication observable in retail level do-it-yourself product design is a testament to the knowledge obtained from product forms and instructions that make their installation both achievable and satisfying acts for the amateur.

Rather than excluding the home dweller from this mode of engagement with surface, as might have been forecast in the tightening up of recent legislation, these products may in fact empower the dweller. Designing the options for intentional alteration of a product, developed and made compliant by the iterative product design process, forms an integral part of the contemporary do-it-yourself amateurism and its democratisation of building practice.[203] Through such reflexivity this process could produce spaces highly adaptive spaces easily altered to fit the needs of the dweller. This hybrid approach to product development crossed with spatial design would essentially constitute a system of micro building (or

201 "Introducing Harry Tuttle" in Terry Gilliam, "Brazil." (UK, 1985.)
202 Brand, How Buildings Learn: What Happens After They're Built, 189.
203 Brown, "Identity and Narrativity in Homes Made by Amateurs.", 263.

building-blocks) of manufactured architecture. Building blocks that, like my own experiments with surface, produce an adaptive non-destructive method of providing services and surfaces that dwellers can conceive of editing in their houses.

Hybrid Surface

This section presents three such hybrid precedents, each one more progressive than the last, as potential prefabricated strategies for the New Zealand interior. All three have a product-based approach to furnishing the home with services and spatial division, some venturing into larger scale prefabricated elements. The first, Dutch Studio JSPR's *Cover Tiles* for Cor Unum Den Bosch, deals with the idea of retrofitting. These tiles employ the current plasterboard wall format but advocate a poultice effect on its services – drawing them to the surface so that more controlled *incursions* or incisions can be made into their surfaces.

The second, the French Bouroullec brothers' *North Tiles* for Danish textile manufacturer Kvadrat, is a modular approach to dividing space, creating a pliable and repositionable quality of space encompassing the idea of fittings and surface less *fitted* and easier to don or shed like clothing. This interior, like Kieran and Timberlake's *Cellophane House,* requires a perimeter that protects it from the outdoors with interior boundaries created via tiled fabric quilts and structural prefabricated elements to add context and functional breaks in its surface.

The third, FAR: frohn&rojas' *Wall House*, takes the most radical approach of the three, *delaminating* the conventions of surface into several layers that deal with the definitions of space in a new, more obviously divisible manner. In this house, tent and furniture making processes are seen to evolve into prefabricated elements. Thus the building's fixed and pliable outer layers create a novel, stratified model of domestic space.

Cover Tiles, Studio JSPR

The outer surfaces of our houses, like skin, offer us a visible indication of the services like plumbing and electricity that lie beneath via the nodes to these surfaces such as taps and plugs. These stretches of planar enclosure are what we pierce in order to draw cables and pipes through for water, information and electricity in our homes. Though current walling solutions offer one way to broach this, as discussed above in *Breaching The Barrier,* what New Zealand surfaces lack is the ability to have controlled incursions into such surfaces. The nature of our body's surface allows such organic incursions through the presence of orifices. Pre-Enlightenment thinkers recognised a myriad of such openings across the body including "eyes, ears, nose, mouth, breasts, navel, anus, urinary passages and vulva…These "orifices" are primarily exits whose intentional direction [like the wall's] points to the outside [surface]."[204]

Though homes do have some orifices, such as outlets for gas, power, water and waste; they lack the seasonal or diagnostic ones that repairs and maintenance require. This secondary structure of the home, made up of pipes and wires that course beneath walls, floors and ceilings, has become a more intricate and technical force in the discourse and aesthetics that accompanies them. The high-tech stylised approach of the late nineteen seventies epitomised in the Pompidou Centre (figure 197) whose "Colour-coded ducts are attached to the outside of the building: blue for air; green for fluids; yellow for electricity cables; and red for movement and flow (elevators) and safety (fire extinguishers)… [In order] to maximise functional movement and flow, freeing up internal space by building the ducts and conveyance systems (stairs, elevators etc.) on the outside."[205] On a more domestic scale, Studio JSPR's *Cover Tiles*, positions shower fittings and pipes ostentatiously on their surface. These fifteen centimetres square bathroom tiles draw the hidden plumbing to the surface as both a surface aesthetic and functional assembly replete "with water lines, taps, showerhead and connections… [and the encased pre-bent] …waterpipes and the inside of showerheads."[206]

204 Benthien, "Penetrations: Body Boundries and the Production of Knowledge in Medicine and Cultural Practices," 39.
205 Centre Pompidou, "Architecture of the Building: Original Architecture." http://www.centrepompidou.fr/pompidou/Communication.nsf/0/B90DF3E7C7F18CAEC1256D970053FA6D?OpenDocument&sessionM=3.1.12&L=2.
206 JSPR, Studio. "Cover Tiles." http://www.jspr.eu/wb/pages/collections/cover-tiles.php.


HOT


design by
studio JSPR
car system

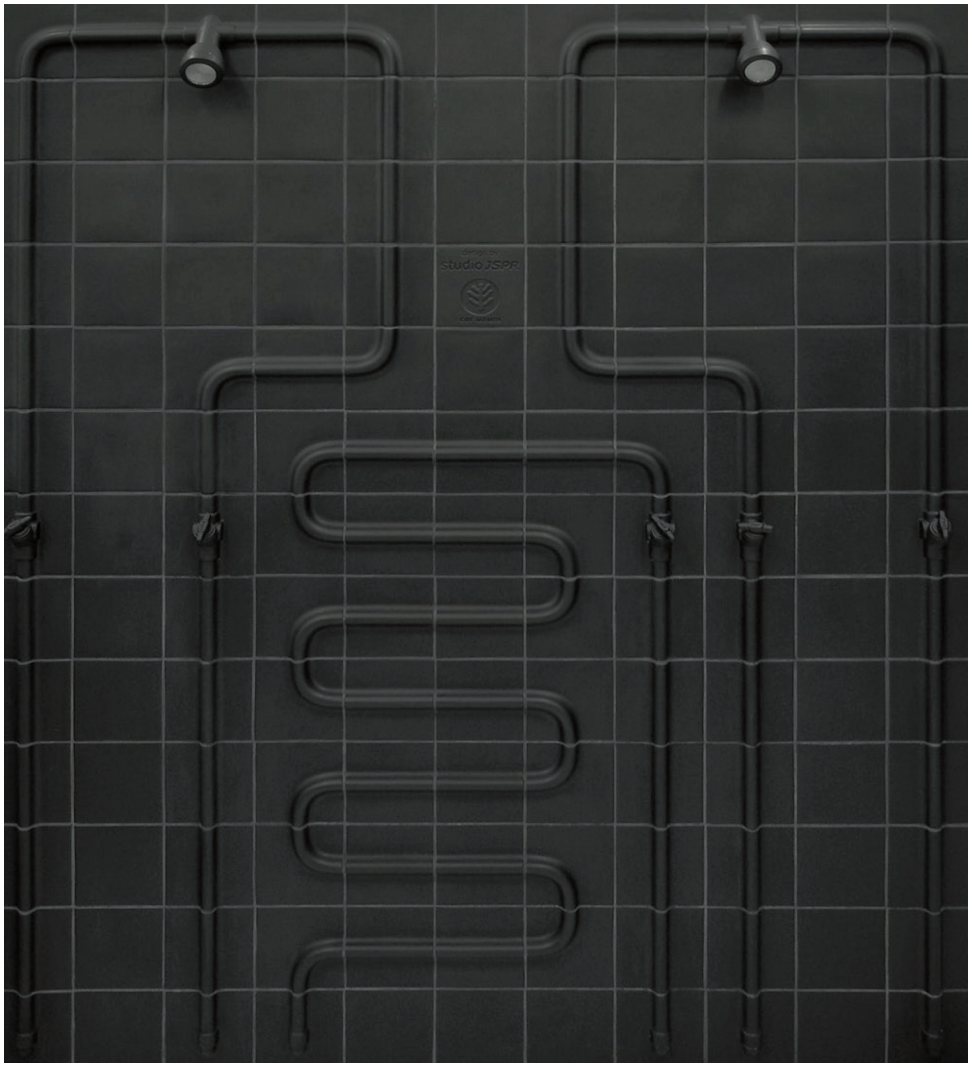


Figure 183-195 – Cover Tiles, Studio JSPR for Cor Unun den Bosch, Netherlands, 2009

The veins of the bathroom brought to the surface of its ceramics. An innovative version of servicing and surfacing with one product.

Though their grouted application is flawed in respect to trying to reclaim its parts for re-use, their potential with regards to diagnostics and repairs is greatly increased by the easy location and therefore accessibility of the piping via their piped aesthetic. If their mode of attachment allowed removal then fixing existing or adding new parts would be easily achieved – a great help to the maintenance process. Even the potential datedness of these surfaces as a style could be indicative of when they were installed and hence when they might

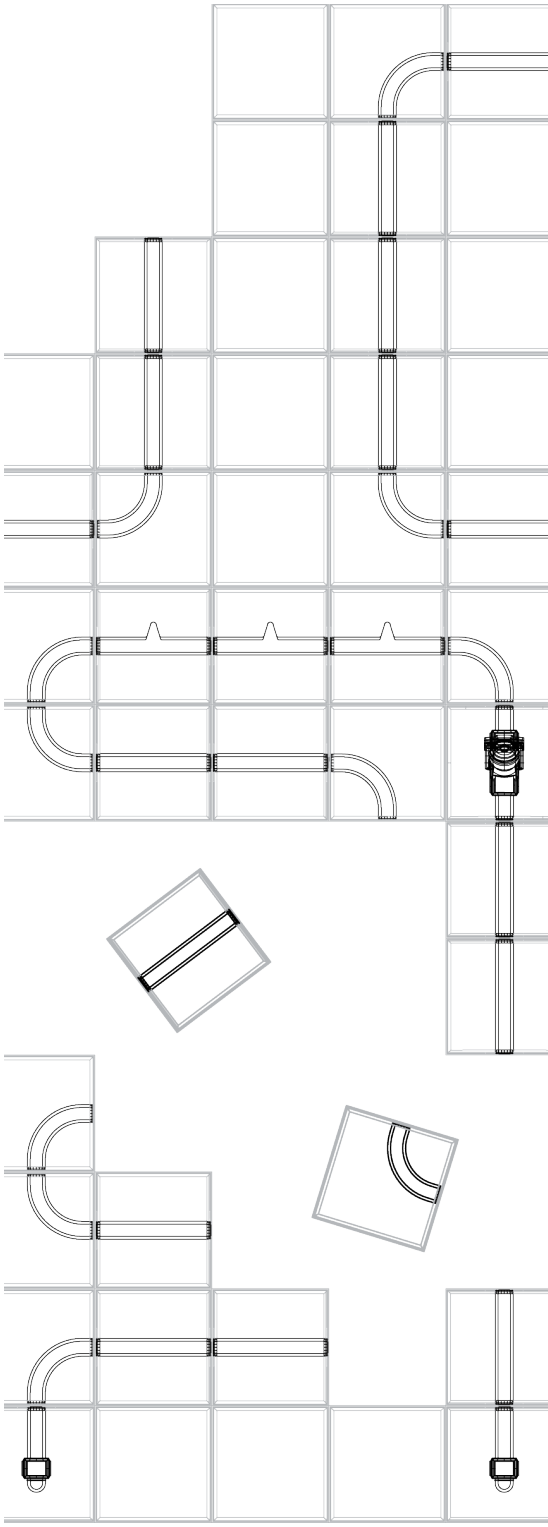
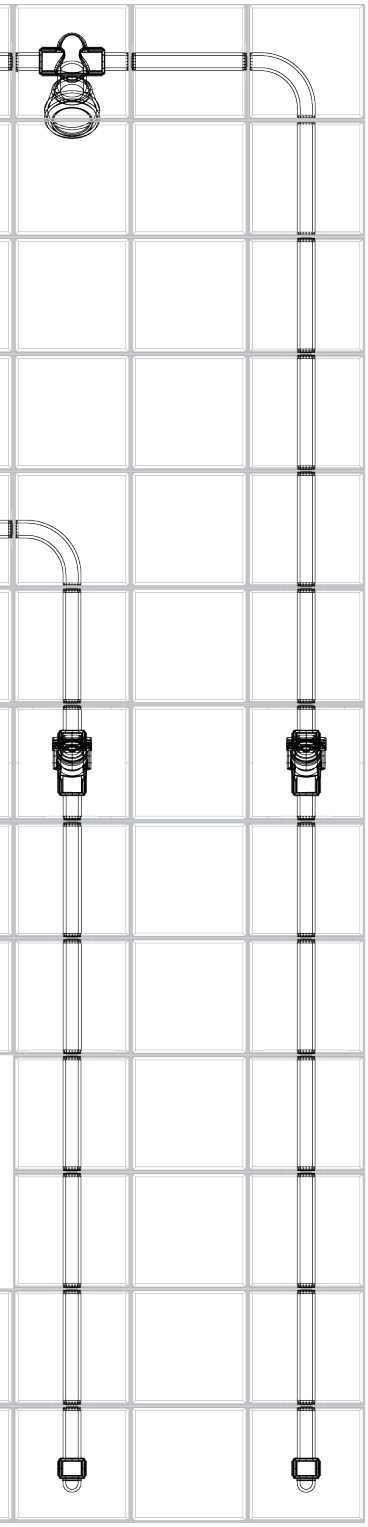


Figure 196 – Centre Pompidou, Beaubourg, France, 1977, Putting Cheese in Mouseholes, 2007

A building turned inside out – the Centre Pompidou displays the industrial aesthetic at its mechanised extreme. A style that was revolutionary at the time in terms of its looks and ideas for servicing the buildings needs.

need replacement – enabling the diagnosis or mitigation of split old pipes and other faults. This would be a scenario similar to the service dating written on hot water cylinders or water filters in the home at present, to indicate when replacement or servicing should occur.

Beyond the wipe-able low relief materials, like laminates and ceramics in bathrooms presently, these Cover Tiles of high relief offer the amateur or professional more information regarding their operation and possible maintenance requirements. As Belpoliti suggest their "systems… [and] Skin speaks of itself through incisions and superimpositions … The idea of the world as an inviolable surface, a boundary that cannot be surpassed, except through touch and sight, has been taken over



by tattooing and the many practices of making marks."[207] These coursing pipe forms give visibility to the mysterious underside of these walls – like a tactile x-ray view. Bringing the underside to the surface without it actually breaking through, and/or disturbing the balance between the outer side and underside of the wall barrier. These tiles offer insight into what lies beneath these smooth surfaces – bringing attention to the world of architectures undersides.

North Tiles, Erwan and Ronan Bouroullec

Henri Lefebvre's suggestion that architectures could be viewed as *archi-textures* brings the specificity of their contextual application into focus. The specific needs of different regions, as outlined above in *For Hearth and Home,* indicates that each room has a functionality that needs to be considered in its themed claddings. Designing to meet these evolving needs is essentially a gamble as they change and, as Brand asserts, "All buildings are predictions. All predictions are wrong."[208] He encourages rather a *loose-fit* approach to design that can leave room for future adjustments that mitigate our tendencies to "overestimate technology in the short run and underestimate it in the long run".[209] Envisaged as a display system for fabric showroom samples, Kvadrat's *North Tiles* employ a modular basis for such a looser approach to dividing space.

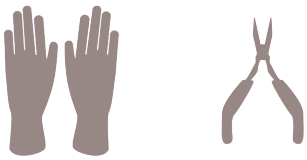
"Based on a modular base unit, with slight variations to deal with the edging of the wall and production of gaps for doors and windows this slotting tile and rail system embody the aim to conquer just two base requirements, dividing space and providing acoustic insulation."[210] This isolation of the scope of the product, to regionalisation of the space and acoustics, means that it can traverse the gap between industrially designed module and spatial application within a finite set of parameters. This modular basis is able to support interruption by doors, or windows, that Erwan and Ronan Bouroullec describe

207 Belpoliti and Picchi, "Tattoo Design: Skin to Skin," 52.
208 "Ronan & Erwan Bouroullec Design," http://www.bouroullec.com/.
209 Ibid.
210 Ibid.

equipment you need

A table (minimum 3 metres long)

Two ladders or scaffolding for high walls



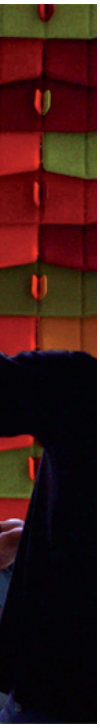
Tight rubber gloves and/or a soft tongs (taking care not to damage the tiles)

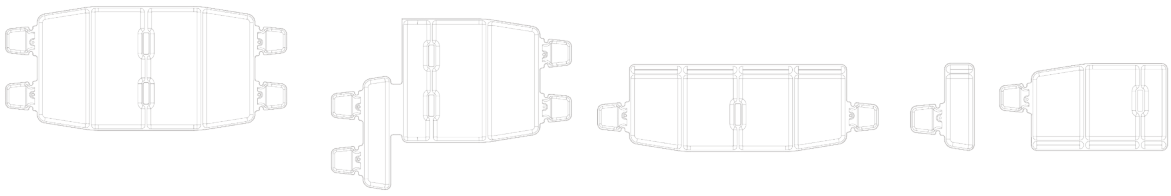
For larger projects at least three people are recommended
One person has to be responsible for the drawing and concentrate on finding the correct tiles
The other two should do the assembly

Time frame: 300 tiles per person per day

Figures 197-204 – North Tiles, Erwan and Ronan Bouroullec for Kvadrat, Denmark, 2006

Quilted surface – this room-divider provides a soft muffled acoustic quality to its spaces. Capable of many colours (above) and using a modular system (left & overleaf) they engage the user in the creative act of the assembly.





as “self-supporting and mobile modules like « furniture-boxes »”[211] that are themselves prefabricated units. The manufacturing process a mere “20 seconds… needed to mould the hard foam core between 2 pieces of material”[212] with different fabric coverings, allows for *mass-customisation* within a *design-for-manufacture* approach. These modules behave like building blocks – akin to Lego, also a Danish creation, their scaly form allowing the construction of a multitude of autonomous spaces of angular or organic variations. This approach combines the idea of a kitset surface with the idea of prefabricated modular structures that relate to the surfaces, making the breaking through to the undersides of walls a controllable and reversible act – a way to both do-it and un-do-it-yourself.

211 Ibid.
212 Ibid.




Figures 205-221 – Wall House, FAR:frohn&rojas Architects, Santiago, Chile, 2004-7

A delamination of the layers (above and overleaf) that make up the Wall House. Part fabric tent, part plastic sheets, part plywood cupboards and part concrete cave.

Wall House: FAR: frohn&rojas Architects

In the man-made interior the intentional donning of surface skins is a considerable aspect of a space's tactility. Adding skins creates a filter[213] between the visible and hidden experience of dwelling – the visible side which Le Corbusier deemed the building's *ultimate surface*.[214] For human beings clothing acts as our primary item of surfacing after and over our innate skin. Like the conventional building surface – clothes shield our vulnerable parts from the sight and touch of outsiders. The act of dressing each day offers us a variable outer surfacing – a range of qualities and extents of protecting ourselves from the weather and each other. Walls, floors and ceilings are all dressed in outer materials[215] in order to offer us specific qualities of enclosure.

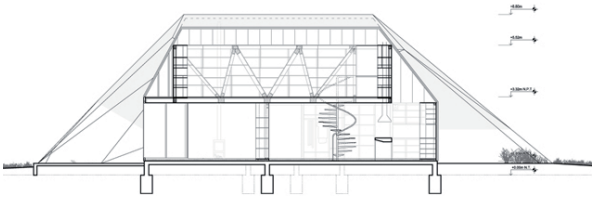
Stripping away the traditional approach to devising surface through the floor plan, the *Wall House* demonstrates "how the qualitative aspects

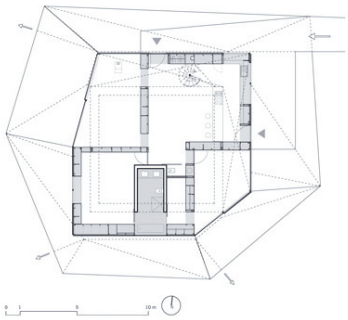
213 FAR-Architects, Frohn&Rojas. "Wall House, Santiago De Chile" http://www.f-a-r.net/projects2.htm.
214 Le Corbusier in Wigley, *White Walls, Designer Dresses: The Fashioning of Modern Architecture*., 112.
215 FAR-Architects, "Wall House, Santiago De Chile"

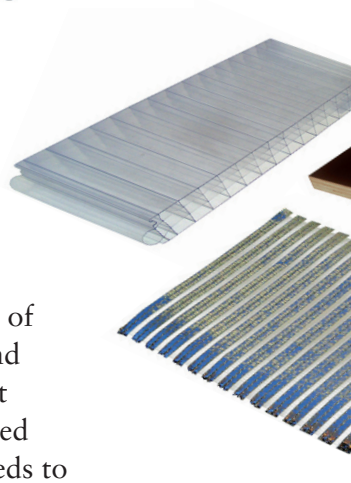



of the wall, as a complex membrane, structure our social interactions and climatic relationships and enable specific ecologies to develop."[216] Breaking down the ordinary sandwich-style layering of clad framing, this dwelling instead relies on a highly separable format composed of firm interior elements. As well as a *concrete cave, stacked shelving* and two shiftable veils of a plastic *milky shell* and *soft shell* tent "in between which the different spaces of the house slip".[217] Such a notion of layering, like in clothing the body, allows for a new manner of composing boundaries with the specificity of materials selected – a sort of prefabricated *bones and skin* approach to structure that behaves more like a tent than a static structure – with the underside available via the peeling back of layers rather than the creation of holes. "From the inside out the layers build upon one another, both materially and geometrically, blurring the boundary between the interior and the exterior."[218]

216 Ibid.
217 Ibid.
218 Ibid.





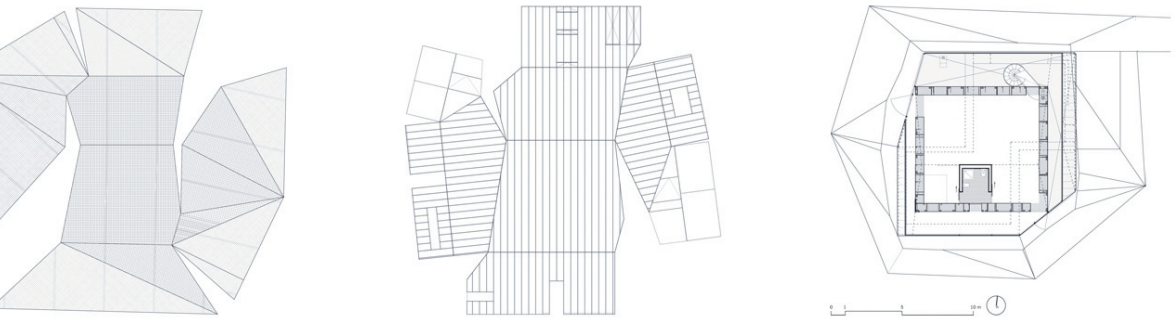


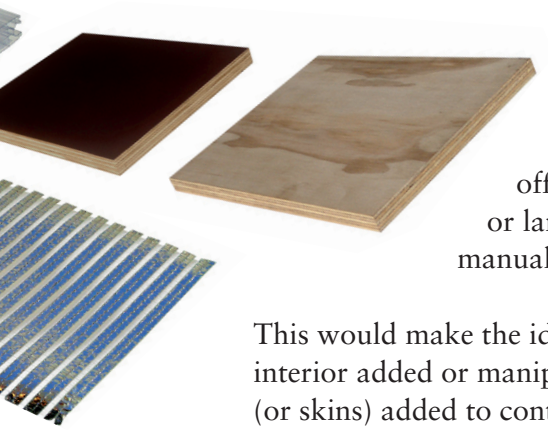
New Zealand Purpose Built

These three surface hybrid precedents represent a systematic strategy to manufacturing architecture, not relying on the utter perfection of a one-size-fits-all home but rather a system or framework that offer room for reconfiguration. This trio rather emphasises the evolving nature of systems – including trialing combinations and the interchangeability of parts; a series of formats that could be grounded in New Zealand homemaking and building rituals. As a country that prefers to own rather than rent our homes such a system would be best produced by an established manufacturer of building products or domestic fittings. There needs to be a product range with the potential to be edited and expanded with a catalogue of parts – an evolutive response to *design-for-manufacture* of interior surfaces and services. The ability to keep patronizing that supplier for parts, take-back, recycling or trade-in would be mutually advantageous.[219] The ability to purchase fittings or surfaces that offer a high level of customisation, like the above *Hybrid Surfaces*, would give the dweller a higher level of personalization. A model that enhances the renovation process's ability to offer the emotional and psychological benefits of self-actualisation involved in the do-it-yourself style installation should a professional not be required, would be a further advantage.

Having a price for the system corresponding to differing levels of its assembly may also be an advantage to such a product range. As Karl Ulrich and Steven Eppinger suggest, the amount of customer assembly in a product can help to bring down manufacture costs,[220] which this might

219 McDonough and Braungart, *Cradle to Cradle: Remaking the Way We Make Things*..., 114. Susan Bates, and Chris Kane. *The Future of Housing in New Zealand.* Centre for Housing Research Aotearoa New Zealand and Building Research, 2006., 40.
220 Ulrich and Eppinger, *Product Design and Development*., 182.





encourage a level of professional training for the do-it-yourself amateur regarding the product system. A professional agent could do the initial system installation, simultaneously offering a guided demonstration for the dweller or landlord, accompanied by an online and printed manual.

This would make the idea of a home more of a structural shell with its interior added or manipulated as necessary, like the digital interfaces (or skins) added to content management websites – allowing an expert determined level of user editing.[221] These frameworks allow different levels of edit-ability, an ultimate level carried out by an administrator (or in household terms a technician or trade professional) and a restricted level of dweller editing (that fits the skill level of the do-it-yourself amateur). This would allow these interior structures to be rearranged from home, to studio office to business settings as occupation or needs change.

The customisability of such a system could be tailored to different floor areas and price ranges and could also mean that the repayments made against money borrowed to install them could be visualized as actual sections of the house. You would be able to say which parts of the house you own and which parts you are making repayments on and subsequently which parts you would be able to sell off, perhaps online or through a demolitions reseller, if you needed extra capital. This would mean that smaller components, like Kvadrat's *North Tiles*, could be dismantled and reused without any extra recycling manufacture procedures reducing the logistics costs involved in transporting them

221 Lupton, *Skin : Surface, Substance & Design / Ellen Lupton with Essays by Jennifer Tobias ... [Et Al.]*., 148.

back to the manufacturer for disposal or recycling. They might even be able to be updated every few years by sending them back to the supplier to be reupholstered like a sofa – an existing industry that works to prolong a piece of furniture's lifespan via a new surface of fabric.

This would of course have an impact on industry involvement and hence employment of building professionals, designers and trades people. But the introduction of the product by an established manufacturer would actually open up a whole new type of manufacture in this country – one that needs individuals with building skills in the factory environment. If the systems were designed, marketed and supported well enough they would even be able to be exported to other countries with similar housing affordability issues and amateur building enthusiasts. Such an industry shift could still take advantage of the raw materials available in our primary industries, such as wool and timber, to create components that respond to the tactility of the interior in new or revised ways – creating added value to such primary industry exports. Even some of the new technologies, like at-home three-dimensional printing, might be harnessed to enable us to download or upload designs for fittings to a larger digital community. Similar in ethos to the Pokono, a website where laser cut designs and objects or commissions, are bought or arranged.[222]

As Henri Lefebvre suggests, no matter the nature of knowledge or ideology, "nothing and no one can avoid *trial by space*"[223] – the home will be tested by the dwelling experience. Therefore treating the interior surfaces and services as a testing area – as pliable providers of benefits for the dweller – they become defined as *conduits for services*. Not simply boundaries to each zone in the home, its surfaces link us to the reticulated services that make the home function and help us conduct our rituals, and enjoy the receipt of networked utilities. This is comparable to how wireless routers liberated the computer, once cabled to a modem. The home interior might become connected to services and technologies but less tied down in shapes to their outmoded formats – more aligned to a new domesticity through systems of do-it-yourself centred technology that can have parts added and removed with ease.

222 davidtenhave. "Pokono: About." http://blog.ponoko.com/about/.
223 Lefebvre, The Production of Space. 416.

A Conduit for Services

The development of the home from discrete objects in space to networked nodes of ritual shows the pliability of surface as an interface or conduit for services. We can now view the home interior as double – in its outer and undersides of walling. These two realms occupied by, and visited by, the dweller begin to rearrange the roles of construction within the New Zealand home interior. There is no longer the same stratification of designer, builder and do-it-yourself amateur within the home as systematic approaches to editing space becomes a task as accessible as any other homemaking ritual. "As technology merges into our walls, floors and clothes, then we no longer 'consume' technology, but live with it side-by-side as it supports and facilitates our daily living, an invisible helper at the ready"[224] These surfaces no longer dictate ritual but instead are elastic forms that we trial and alter by do-it-yourself rituals.

Outer-side of Walling

The home, originally a place of the hearth's rituals, has now become the arena of our daily confrontation with hybrid surface as a conduit for services. Modern Industrial and Spatial Design have peeled away the traditional solidity (solid stone, brick and timber) in favour of a layered and rationalised sort of surface (layered plasterboard, services, insulation and structural timber or steel.). Our bodies engage with our buildings' outer crusts – points of everyday collision often only a matter of millimetres thick. This "everyday is covered by a surface: that of modernity."[225] We are constantly touching these modern surfaces, putting fingerprints on them, being molded by their protrusion into our spaces. Surface is thus an interface for the domestic, an engagement in homemaking that as a discipline is intricately connected to the designing and disciplining of this environment.

Through the agency of the factory, walls have become faster to make, via streamlining surface; cleaner, by minimising gaps that could accumulate dirt, and blanker, that they might slip universally behind our belongings which are themselves shining examples of designed modern surface. These spaces perform a role that is not simply enclosure but the nodes to networks that are reached beyond the home's periphery. Homemaking rituals ensure that these nodes to the outside stay

224 Josephine Green, *Democratizing the Future : Towards a New Era of Creativity and Growth*. (2007), 14.
225 Lefebvre, "The Everyday and Everydayness," 37.

connected. This connectivity rearranged the home from an array of discrete objects to fixed nodes of services – such as taps or sinks.

"With the introduction of plumbing to the nineteenth-century household, formerly portable body appliances – bathtubs, wash stands, and chamber pots – assumed a fixed position in the home, tied to a water supply and waste disposal pipes." Gideon has described this as a shift from "nomadic" to "stable" conditions...This transformation was articulated in the design of bathroom equipment, which moved from its origins in conventional furniture types to its modern incarnation as overtly industrial "fixtures"."[226]

With the advent of technologies like cordless phones and wireless Internet these trends have started to push back in the opposite direction and "The house of the future will look more like the house of the past than the house of today."[227] As we disintegrate the traditional format of serviced space into more modular and accessible models of surface, like those discussed above, we find the "Outside and inside are both intimate-they are always ready to be reversed, to exchange their hostility."[228] This exchange creates a new heightened level of interface for these outer areas that breaches their barriers and exposes the underside beyond the ordinary realm of the dweller.

Underside of Walling

Beyond the dweller's interior lies its alternate – the underside. Becoming more engaged in this underside begins to redefine the surfacing done by the factory, and with the help of modular products and user-adjustable design, this realm becomes a new form of do-it-yourself

226 Lupton and Miller, *The Bathroom, the Kitchen, and the Aesthetics of Waste: A Process of Elimination*, 27.
227 Stefano Marzano in Green, *Democratizing the Future: Towards a New Era of Creativity and Growth*., 15.
228 Bachelard, *The Poetics of Space*, 217-8.

Figures 222-225 – Repulsion, Roman Polanski, UK, 1965.

Carol's psychosis becomes manifest in the shifting and heaving walls of her apartment (overleaf). Her home's surfaces become unstable phenomena.

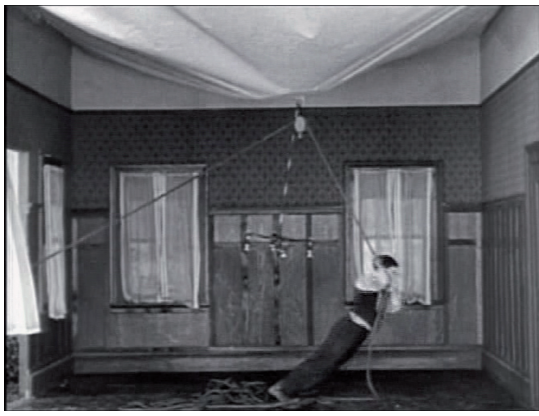
amateurism – one that can address the increased regulation of the barriers in the home. These enhanced sensory actions or breaking through and healing surfaces furnish an authentic "architectural experience… grounded in the tectonic language of building and the comprehensibility of the act of construction to the senses. We behold, touch, listen and measure the world with our entire bodily existence and, the experimental world becomes organised and articulated around the centre of the body."[229]

Our second hand houses, built by others but occupied by us in the present, typify the arrangements representing past ideas of home however this new reflexive home would deal rather with the immediacy of dwelling. This revised anthropomorphism of the home's surfaces becoming a more relatable way to inhabit space. Shifting away from being do-it-yourself cosmeticians into being the house's partners, it receptive to our marks and we sustaining of its rituals of enclosure. In this way the homeowner retains their independence, initiated by the hearth and factory and provides a flexible future. This encourages the fashioning of its surfaces in a way that is less wasteful and encourages a more modular approach to the reuse of old and building of new residential buildings; beginning a transfer of building rituals from the site to the factory floor.

Role Reversal & Dispersal

As the roles of the outer and undersides of surface experience alter so too do the traditional methods that formed this barrier. As builders, engineers and designers take up their positions in industries of

229 Pallasmaa, *The Eyes of the Skin: Architecture and the Senses*, 64.



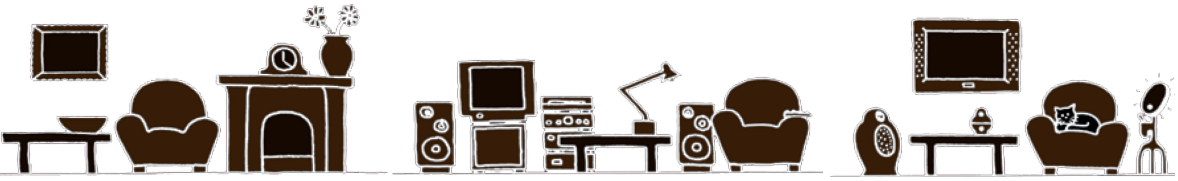
Figures 227 – Pliable celing, One Week, Buster Keaton & Cline, Edward F, USA, 1920.

prefabrication the home dweller's role also begins to change shape. What we are now faced with is not master builders of the past, who were also architects,[230] but instead the notion of the *master homemaker*. This is a person well versed in design and enabled by thorough product development to engage in the home's maintenance and repairs. Who is able to deal with the scenarios, whereby used parts would be of value and able to be sold on to other dwellers. Around this system, which regular servicing (like warrants of fitness for vehicles) and recycling strategies could improve the quality of privately owned homes and provide ongoing employment. Although I do not completely agree with Brown's statement that "The design process of self-building (alongside some forms of DIY) is far more continuous and iterative than is the case within mainstream product design and manufacture (where detailing the design generally precedes manufacture)"[231] I do concede that as he points out "the nature of self-building...allows many of the more detailed design decisions to occur during the process of construction"[232] a feature that the designer can design into do-it-yourself products. The context of industrial or spatial design in the home thus becomes a place where we design more *loosely*[233] and leave room for the dweller in the creative equation. The arrangement of space, or *design of the situation*, as Richard Caplan[234] terms it, thus becomes a mechanism to alter space to make ritual more poignant and meaningful for and by the dweller.

Adapting to a Context Economy

At this point we truly enter into Josephine Green's notion of a domestic *context economy*. "In the context economy… passive consumers become active producers of their own lives, as they search for and appreciate

230 Kieran and Timberlake, *Refabricating Architecture: How Manufacturing Methodologies Are Poised to Transform Building Construction*., 27.
231 Brown, "Identity and Narrativity in Homes Made by Amateurs," 278-9.
232 Ibid.
233 Brand, *How Buildings Learn: What Happens after They're Built*., 56-7.
234 Caplan, By Design: Why There Are No Locks on the Bathroom Doors in the Hotel Louis XIV, and Other Object Lessons., 138.



Figures 228-230 – Context Economy, Josephine Green, Philips Corporation, Denmark, 2007.

The home of the past, present and of tomorrow. A progression of the domestic by design and technology – the home of the future may look more like the ones of the past than of the present.

ways of interacting with, controlling and creating their environments."[235] In this mode of designing and living, users co-determine their experiences and more emphasis is on creative self-actualisation, through a personal engagement with the designed environment. The qualities of the home's built space constantly influence our ritualised interactions. Over time the collisions of our bodies with these surfaces, as instigated by ritual, provides an embodied knowledge of these spaces and their materiality. "What becomes increasingly important is the quality and choice of the interaction. It is about a deep customization, based on a live-in relationship with technology, in which interaction and access are important."[236] A modular prefabricated approach to domestic surface represents such a model. It is far away from our focus on architecture as a static solid setting toward *archi-textures* – contexts both traditional and technological with which their networks connect through modular products that make systems more intelligent and easier with which to connect.[237]

235 Green, *Democratizing the Future:Towards a New Era of Creativity and Growth*. 16.
236 Ibid.
237 Lefebvre, *The Production of Space*, 118.

CONCLUSION

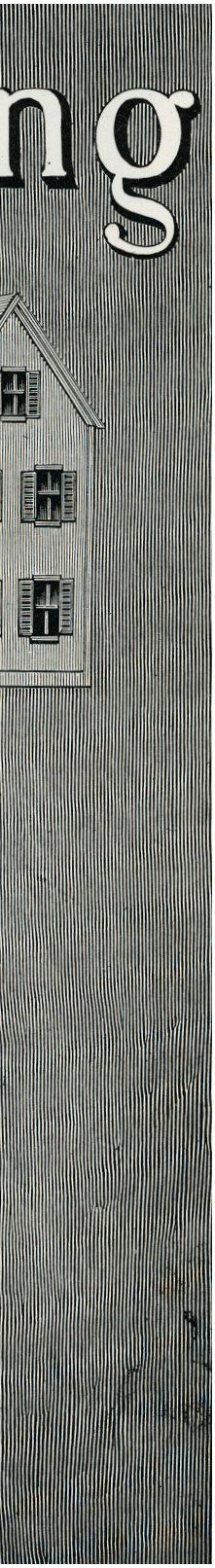


Figure 231 – House Cleaning : Millions Now Use Pearline Advertisement, Ellen Lupton & J. Abbott Miller, USA, 1993

House work, of men and women, through its tactility give us the feeling of homeliness. A reverent type of contemplation that makes us feel accomplished and independant.

"Architecture is inescapably concrete and it forms the fabric and the setting of everyday life. Consequently, to approach everyday life through architecture—architecture with a lower-case a, understood in its broadest sense to encompass the entire material world (or "cultural landscape") that people make and think—is to be forced to pin down, in ways too often lacking in theories of the quotidian, the precise ways in which everyday life is experienced and the specifics of its relationships to other aspects of life and landscape. So architecture's materiality makes it a natural conduit to the specificity of everyday life."[238]

Make Yourself At Home?

This investigation of the everyday home was carried out with the dweller and the designer in mind. We are all home-dwellers and this contributes to our deciphering of *everydayness* as a feature of form and ritual in the home. Our engaging with the everyday begins with our daily rituals; these personal and practical actions provide for our physical needs. We gain knowledge about the home by performing these homemaking tasks – learnt from the objects and our social interactions.[239] As designers we too make discoveries through making, a practice of aesthetic engagement, that along with theory informs our design decisions.

By approaching the home through its rituals of homemaking (and home building) an oblique view of its qualities is seen. My navigation of the home through the contemplation of making used my whole body's senses to engage in selected ritual phenomena. This engagement produced designed pieces that addressed and disrupted the expected modes or sequences of domestic tasks. These pieces, defined by the ritual processes of becoming in the home, synthesised a view of ritual as tasks of *Lightening & Darkening*, *Wetting & Drying*, *Heating & Cooling* and *Storing & Retrieving*, thus illustrating the rhythms of the

238 Peter De Bolla, "Toward the Materiality of Aesthetic Experience," Diacritics 32, no. 1 (2002): 707.
239 Tuan, *Space and Place: The Perspective of Experience*., 12.

hearth and the linear consumption initiated by the home's receipt of the factory's products and surfaces.

Taking these notions deeper and eyeing the home through a design lens offered this study a practical and poetic engagement with everyday domestic space.[240] This was an experience of the space that, rather than privileging a visual focus, took me toward a greater, more holistic aesthetic engagement which acted to advance my aesthetic and theoretical perception of New Zealand domesticity. Engagement with the physicality of the home ruled by the authorities of hearth and factory are determined by the agency of its surfaces. These surfaces formed by rational manufacture and poetic engagement with ritual suggested alternate formats for the stratification of surface in the New Zealand home interior.

Home Is Where The Hearth Was

Prior to the Industrial Revolution, the hearth was the fulcrum of domestic activity I, it served as a point of focus and was the stage for the scripts performed each day.[241] The nostalgic force of the hearth drove the sequence of household time keeping and the home's form. Part shelter mechanism and part hearth culture the suburban house protects us.[242] This sheltering of us along with the hearth made it our territory of refuge – distinct from the outer wilderness from which we turned our back on to gaze at the fire.[243]

Within this refuge, the hearth's domestic fire provided all the technological sophistication to be seen in the home. Lighting the darkness, cooking food and offering warmth in the principal room where dwellers lived and slept.[244] But as product technology progressed, the notions of privacy and hygiene overtook domesticity, segmenting the home into rooms with their own themes and conventions. This dissected home still bore the ritualised aspects of the hearth, in factory-made objects. However with the loss of the physical fireplace the factory ushered in a new domestic age, one of manufactured surfaces and reticulated services. The hearth thus morphed into a svelte and hidden force of wires and piping spread throughout the home. Though

240 *Empire of the Senses:The Sensual Culture Reader*., 197.
241 Rykwert, "House and Home.", 47.
242 Ibid.
243 Tuan, "Cosmos Versus Hearth.", 319-22.
244 Pounds, *Hearth & Home:A History of Material Culture*., 194-5.

a conceptual state of the hearth remained in our everyday rituals, the physicality of the hearth was now embodied by every service, object and surface. Through the dweller's engagement with these services and surfaces the aspects of wear and editing, in the mode of do-it-yourself traditions, became another level of their ritual. This system of the *hearth-incognito* occupies either side of the wall's surfaces and aids our emotional engagement with daily and seasonal actions. Embodying our personal histories the house is a diagram of the fickle rituals of dwelling.

Can't Get No Satis*factory*

Though the hearth was initially the technological centre of the home, its authority was challenged by industrialisation. The objects that hurtled off the factory production line annexed the hearth's domestic territory. These hearth-objects became small shrines to the ideals and technologies they embodied and the specific rituals they aided in performing. This motion towards rationalizing the home's utilities and objects slowly overshadowed the house building process. Eventually manufacturing began to be integrated into New Zealand's building practice via parts and refined materials. No longer was the house built out of just what was available on-site: its very materials and components were revolutionized from the inside out.

The New Zealand home had begun to move along a continuum from on-site building toward being built in the factory. With the advent of these more accurate materials and components the construction process became less about *brute force* and more about a *predictable product*. These more improved site-built houses were still, however, one-off prototypes that perpetuated the do-it-yourself traditions and ignored the economies of scale and advanced product-architectures that the factory facilitates.

Though economic pressures have brought affordability to the fore in the media and legislation[245] the status quo is still perpetuated by initiatives like the New Zealand Department of Housing and Building's *Starter Home* Competition. The ideal of producing the entire home in the factory – better managing labour, material usage and producing a more repeatable standard of quality seems to be paralyzed by industry conventions and fears of the repercussions of experimental architecture.

245 "Affordable 'Model T' House for the Masses." 1.

Though legislation has reviewed homeowner's Do-It- Yourself practices and reduced the cost of compliance procedures, the ongoing need for affordability produce a compelling argument for factory building homes. Though there is awareness of past and present models of prefabrication, as in exhibitions like MoMA's *Home Delivery,* New Zealanders still seem to be content with the onsite – builder constructed convention. If New Zealanders are happy for everything – including the kitchen sink – to be factory manufactured, why not the house itself?

Surfaced Impressions Last

The presence of, and constant collisions with, household products and structures exposed the duality of surface. These outer crusts of skin-like casings and planes keep us safely away from the unknown zones of these products and the home's utilities. Surging beneath these skins are the visceral venous and skeletal parts of the home's reticulated services. Adopting human skin as a model of pliability and sophistication, the idea of breaching its barrier becomes anthropomorphic. A hybrid notion of skin and surface sees this breach as akin to wounding, incising and healing. These surgical acts, perpetrated by the professional tradesperson or do-it-yourself amateur, identifies the skin as a model of surface pliability.

With the examination of walling precedents by architects and interdisciplinary design practitioners, three progressive or alternate models of prefabricated surface were suggested for the New Zealand home. This trio puts forth schemes considerate of retrofitting, renovating and new home building that incorporate prefabricating into the systematic fabric of the New Zealand home. This hybrid approach, mindful of current industry and heritage, proposes a style of prefabrication that the New Zealand do-it-yourself retail market could absorb. Putting prefabrication into the do-it-yourself arena gives it an accessible and democratized appeal to the post-colonial psyche and an existing framework in which of retailers reside.

This pliability of surface, foreshadowed by the elastic rituals of the hearth and espousing the exploits of factory production, allows a reinterpretation of the roles of the outer and undersides of surfaces as contexts of interrelationship. Disregarding surfaces' characterization as static, the potential exchange between the outside and the underside of walling produces a home of dynamic and heterogeneous materiality. A tactile and spatial definition of domestic space that through the scrutiny of the home as a collection of surfaces and as a context of services delaminates the interior and marks a basis for prefabrication in the New Zealand home.

WORKS CITED

"Affordable 'Model T' House for the Masses." (2008), http://www.stuff.co.nz/print/4455675a26959.html.

The Home House Project: The Future of Affordable Housing. Edited by David J. Brown and Steve Badanes ... [et al.]. 1st MIT Press ed. Cambridge, MA: Southeastern Center for Contemporary Art, Distributed by MIT Press, 2004.

Archigram. *Archigram*. Edited by Peter Cook. London: Studio Vista, 1972.

Bachelard, Gaston. *The Poetics of Space*. Translated by Maria Jolas. Boston: Beacon Press, 1964.

Belpoliti, Marco, and Francesca Picchi. "Tattoo Design : Skin to Skin." *Domus*, 2006, 50-55.

Bates, Susan, and Chris Kane. "The Future of Housing in New Zealand." Centre for Housing Research Aotearoa New Zealand and Building Research: Funded by the Building Research Levy, 2006.

Benthien, Claudia. "Penetrations: Body Boundries and the Production of Knowledge in Medicine and Cultural Practices." In *Skin: On the Cultural Border between Self and the World*, 37-62. New York, Chichester, West Sussex: Columbia University Press, 2002.

Blauvelt, Andrew. *Strangely Familiar: Design and Everyday Life*. Edited by David Morrow Guthrie. 1st ed. Minneapolis, Minnesota & New York Walker Art Center & Princeton Architectural Press, 2003.

Bradley, Richard. *Ritual and Domestic Life in Prehistoric Europe*. London: Routledge, 2005.

Brand, Stewart. *How Buildings Learn: What Happens after They're Built*. Rev. ed. London: Phoenix Illustrated, 1997.

Brooker, Graeme, and Sally Stone. "From Organisation to Decoration." In *Thinking inside the Box: A Reader in Interior Design for the 21st Century*, edited by Scotland Interiors Forum, 125-32. London: Middlesex University Press, 2007.

Brown, Roni. "Identity and Narrativity in Homes Made by Amateurs." *Home Cultures* 4, (2007): 261-85.

Buck-Morss, Susan. *The Dialectics of Seeing: Walter Benjamin and the Arcades Project*. 1st ed. Cambridge, Mass.: MIT Press, 1991.

Busch, Akiko. *Geography of Home: Writings on Where We Live*. New York: Princeton Architectural Press, 1999.

Caplan, Ralph. *By Design: Why There Are No Locks on the Bathroom Doors in the Hotel Louis Xiv, and Other Object Lessons*. 2nd ed. New York: Fairchild Publications, 2005.

Clarke, John R. *The Houses of Roman Italy, 100 B.C.-A.D. 250: Ritual, Space, and Decoration*. Berkeley: University of California Press, 1991.

Clemence, Paul. *Mies Van Der Rohe's Farnsworth House*. Atglen, PA: Schiffer Pub., 2006.

Connor, Steven. "Complexion." In *The Book of Skin*. London: Reaktion, 2003.

davidtenhave. "Pokono: About." http://blog.ponoko.com/about/.

Davies, Colin. *The Prefabricated Home*. London: Reaktion Books Ltd, 2005.

Davis, Sam. *The Architecture of Affordable Housing*. Berkeley: University of California Press, 1995.

De Bolla, Peter. "Toward the

Materiality of Aesthetic Experience." *Diacritics* 32, no. 1 (2002): 19-37.

"Building consent and inspections process", Department of Building and Housing, http://www.dbh.govt.nz/blc-building-consentinspect-process

"Restricted building work and DIY frequently asked questions", Department of Building and Housing, http://www.dbh.govt.nz/lbp-faqs-restricted-building-diy.

Desmet, Pieter. *Designing Emotions,* 2002.

Design Research: Methods and Perspectives. Edited by Brenda Laurel. Vol. 197.380 Albany Set Text 2008. Cambridge, Mass.: MIT Press, 2003.

"Making sustainability sexy: B_E_E." Our Stories: designworks, http://www.designworks.co.nz/B_E_E.html

"Did It Myself." edited by Commission New Zealand. National Housing, 32 p.: ill. ; 30 cm. Wellington: National Housing Commission, 1984.

Diller, Elizabeth, Ricardo Scofidio, and Georges Teyssot. *Flesh: Architectural Probes*. New York: Princeton Architectural Press, 1994.

Downton, Peter. *Design Research*. Melbourne: RMIT Publishing, 2003.

Du Vall, Nell. Domestic Technology: A Chronology of Developments. Boston, Mass.: G.K. Hall, 1988.

Empire of the Senses: The Sensual Culture Reader. Edited by David Howes. Oxford; New York: Berg, 2005.

Evans, Robin. "Figures, Doors and Passages." In *Translations from Drawing to Building* Cambridge, Mass.: MIT Press, 1997.

FAR-Architects, Frohn&Rojas. "Wall House, Santiago De Chile", http://www.f-a-r.net/projects2.htm.

Frost, Robert. "The Mending Wall." In *North of Boston*, 7-8. Fairfield, Iowa: 1st World Publishing 1914.

Fry, Tony. "Know Your Enemy: Defining the Problem of Unsustainability " Paper presented at *Shaping the Sustainable Millennium*. Queensland University of Technology: EcoDesign Foundation, Sydney, Australia, 2000.

Gallagher, Winifred. *House Thinking: A Room-by-Room Look at How We Live*. 1st ed. New York: HarperCollins, 2006.

Gillis, John R. *A World of Their Own Making: A History of Myth and Ritual in Family Life*. Oxford: Oxford University Press, 1997.

Gilman, Charlotte Perkins. *The Home; Its Work and Influence*. Urbana: University of Illinois Press, 1972.

Gmachl, Mathias, and Rachel Wingfield. "Auspicious Tangents." In *Responsive Textile Environments*, edited by Sarah Bonnemaison and Christine Macy, 70 p.: ill. (chiefly col.), ports. ; 25 cm. Halifax: TUNS Press, 2007.

Green, Josephine. *Democratizing the Future: Towards a New Era of Creativity and Growth*. (2007), http://www.design.philips.com/shared/assets/Downloadablefile/democratizing-the-future-14324.pdf.

Grosz, E. A. *Architecture from the Outside: Essays on Virtual and Real Space*. Cambridge, Mass.: MIT Press, 2001.

Hamer, Bent. *Kitchen Stories*. Norway, 2003.

Herrmann, Wolfgang. "The Basic Elements of Architecture." In *Gottfried Semper: In Search of Architecture / Wolfgang Herrmann*, 196-203: xxii, 320 p.: ill. ; 24 cm. Cambridge, Mass.: MIT

Press, 1984.

Highmore, Ben. *Everyday Life and Cultural Theory: An Introduction*. New York: Routledge, 2002.

Hill, Jonathan. "Compost." In *Immaterial Architecture*, 98-100. New York; London: Routledge, 2006.

Home Delivery: Fabricating the Modern Dwelling. Edited by Barry Bergdoll, Peter Christensen, Ron Broadhurst and Art Museum of Modern. New York: Museum of Modern Art, 2008.

Hornstein, Shelley. "Matters Immaterial: On the Meaning of Houses and the Things inside Them." In *The Art of Rachel Whiteread*, edited by Chris Townsend, 51-67: 224 p.: col. ill. ; 24 cm. London: Thames & Hudson, 2004.

JSPR, Studio. "Cover Tiles." http://www.jspr.eu/wb/pages/collections/cover-tiles.php.

Kieran, Stephen, and James Timberlake. *Refabricating Architecture: How Manufacturing Methodologies Are Poised to Transform Building Construction*. New York: McGraw-Hill Companies, Inc., 2004.

Lefebvre, Henri. "The Everyday and Everydayness." In *Architecture of the Everyday*, edited by Steven Harris and Deborah Berke, 33-37. New York: Princeton Architectural Press, 1997.

———. *The Production of Space*. Translated by Donald Nicholson-Smith. Oxford, Cambridge: Blackwell, 1991.

Lockwood, *Initial: Looking for Value*. http://www.lockwood.co.nz/.

Lupton, Ellen. *Mechanical Brides: Women and Machines from Home to Office*. Edited by Museum Cooper-Hewitt. New York: Cooper-Hewitt, National Museum of Design, Smithsonian Institution: Princeton Architectural Press, 1993.

———. *Skin: Surface, Substance & Design / Ellen Lupton with Essays by Jennifer Tobias ... [Et Al.]*. London: Princeton, NJ: Laurence King, Princeton Architectural, 2002.

Lupton, Ellen, and J. Abbott Miller. *The Bathroom, the Kitchen, and the Aesthetics of Waste: A Process of Elimination*. Cambridge, Mass.: MIT List Visual Arts Center: Princeton Architectural Press, 1992.

Mallgrave, Harry Francis. "Introduction." In *Style: Style in the Technical and Tectonic Arts; or, Practical Aesthetics / Gottfried Semper* 980 p.: ill. ; 27 cm. Los Angeles: Getty Research Institute, 2004.

Matta-Clark, Gordon. *Gordon Matta-Clark*. Edited by Corinne Diserens, Thomas E. Crow, Judith Russi Kirshner and Christian Kravagna. London: Phaidon, 2003.

A. H. Maslow. "A Theory of Human Motivation", Psychological Review, 50, 370-396.: 1943.

Mau, Bruce. *Massive Change*. London: Phaidon, 2004.

McDonough, William, and Michael Braungart. *Cradle to Cradle: Remaking the Way We Make Things*. 1st ed. New York: North Point Press, 2002.

McHugh, Kathleen Anne. "Experimental Domesticities: Patricia Gruben's the Central Character and Zeinabu Davis's Cycles." In *American Domesticity: From How-to Manual to Hollywood Melodrama*, 178. New York: Oxford University Press, 1999.

MoMa. "Home Delivery: Fabricating

the Modern Dwelling" http://www.momahomedelivery.org/.

Moussavi, Farshid, and Michael Kubo. *The Function of Ornament*. Barcelona: Actar, 2006.

Container crate prison cells ready in April, NZPA, New Zealand Herald, http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=10623876.

NZ Trade Commissioner, Los Angeles. "Manufactured Housing in the United States." In *Product profile (New Zealand Trade Commission)*: New Zealand Trade Commission, Wellington, 1986.

'Did It Myself' Edited by Commission New Zealand. National Housing. Wellington: National Housing Commission, 1984.

Pallasmaa, Juhani. *The Eyes of the Skin: Architecture and the Senses*. Chichester: Wiley-Academy, 2005.

Pantzar, Mika. "Domestication of Everyday Life Technology: Dynamic Views on the Social Histories of Artifacts " *Design Issues* 13, no. 3 Autumn (1997): 52-65

Pompidou, Centre. "Architecture of the Building: Original Architecture." http://www.centrepompidou.fr/pompidou/Communication.nsf/0/B90DF3E7C7F18CAEC1256D970053FA6D?OpenDocument&sessionM=3.1.12&L=2.

Pounds, Norman J.G. *Hearth & Home: A History of Material Culture*. Bloomington: Indiana University Press., 1989.

Powell, Helen. "Time, Television, and the Decline of Diy." *Home Cultures* 6, (2009): 89-107.

Rendell, Jane. "Doing It, (Un)Doing It, (over)Doing It Yourself: Rhetorics of Architectural Abuse." In *Occupying Architecture: Between the Architect and the User*, edited by Jonathan Hill, xiii, and 253 p.: ill. ; 26 cm. New York: Routledge, 1998.

Rice, Charles. *The emergence of the interior: architecture, modernity, domesticity*. London; New York: Routledge., 2007.

"Ronan & Erwan Bouroullec Design." http://www.bouroullec.com/.

Rykwert, Joseph. "House and Home." In *Home: A Place in the World*, edited by Arien Mack, 47-58. New York: New York University Press, 1993.

Salmond, Jeremy, *Old New Zealand Houses 1800-1940*. Auckland: Reed Methuen, 1986.

Scarry, Elaine. *The Body in Pain: The Making and Unmaking of the World*. Oxford: Oxford University Press, 1985.

Schrader, Ben. *We Call It Home: A History of State Housing in New Zealand*. Auckland: Raupo Publishing (NZ) Ltd, 2005.

Sies, Mary Corbin. "Stories of Home and Affordable Housing." *Home Cultures* 1, (2004): 315-22.

Street, Maryan. " Affordable Housing Initiatives Speech." edited by New Zealand Government: www.scoop.co.nz, 2008.

Tuan, Yi-fu. *Cosmos & Hearth: A Cosmopolite's Viewpoint*. Minneapolis: University of Minnesota Press, 1996.

———. "Cosmos Versus Hearth." In *Textures of Place: Exploring Humanist Geographies*, edited by Steven Hoelscher Paul C. Adams, Karen E. Till, 319-25. Minneapolis: University of Minnesota Press, 2001.

———. *Space and Place: The Perspective of Experience*. London:

Edward Arnold, 1977.

Toomath, William. *Built in New Zealand: The Houses We Live In*. Auckland: HarperCollins, 1996.

Ulrich, Karl T. *Product Design and Development*. Edited by Steven D. Eppinger. 4th ed. Boston: McGraw-Hill Higher Education, 2008.

Vidler, Anthony. "Unhomely Houses." In *The Architectural Uncanny: Essays in the Modern Unhomely*, 17-44. Cambridge, Mass.: MIT Press, 1992.

Wigley, Mark. "Alternative Architecture 2: Paint Space." *Domus*, 2005, 43.

———. "Towards Turbulence." *Archis: Volume* no. 4 (2006): 6-9.

———. *White Walls, Designer Dresses: The Fashioning of Modern Architecture.* Cambridge, Mass.: MIT Press, 1995.

Wood, Peter. "Sticks and Stones: Skins and Bones." In *Surface Consciousness*, edited by Mark Taylor, 65-68. London: Wiley-Academy, 2003.

Woodham, J.M. *Twentieth Century Design*. Oxford: Oxford University Press, 1997.

Woudhuysen, James, and Ian Abley. *Homes 2016*. Vol. One, Blueprint Broadsides2004.

BIBLIOGRAPHY

"B_E_E Cleaning Products New Zealand Non-Toxic Cleaning & Laundry Products." Shop Naturally, http://www.shopnaturally.com.au/images/bee.jpg.

"Methods Table and Methods." http://www.usabilitynet.org/tools/methods.htm.

(Art)Ifact: Re-Recognizing the Essential of Products. Edited by concept and art direction by Victor Cheung, edited by viction:ary and preface by Luisa Santos]. Hong Kong: Viction:workshop, 2007.

Absolutely Public: Crossover: Art and Architecture. Edited by Steffen Lehmann. Mulgrave, Vic.: Images Publishing, 2005.

Ackerman, Diane. A Natural History of the Senses, New York Routledge

Adam D. Weinberg, Mark Wigley, Anthony Vidler and Art Addison Gallery of American. Andover, Mass.

Addleson, Lyall, and Colin Rice. Performance of Materials in Buildings, a Study of the Principles and Agencies of Change. Third ed. Oxford: Butterworth-Heinneman Ltd, A member of the Reed Elsevier Group plc Group, 1995.

Allen, E. *How Buildings Work, the Natural Order of Architecture*. Oxford: Oxford University Press, 2005.

Ambasz, Emilio. Shigeru Ban. Edited by Shigeru Ban. London: Laurence King, 2000.

Anderson, Mark, and Peter Anderson. Prefab Prototypes, Site-Specific Design for Offsite Construction. First ed. New York: Princeton Architectural Press, 2007.

Archer, Jennifer. "Becoming-Interior Toward a Nondual Philosophy of Design for Dwelling-in-the-World A Thesis Presented in Partial Fulfillment of the Requirements for the Degree of Master of Design at Massey University, Wellington, New Zealand / Jennifer Archer." 2005.

Archigram. Archigram. Edited by Peter Cook. London: Studio Vista, 1972.

Architecture of the Everyday. Edited by Steven Harris and Deborah Berke. New York, N.Y. Princeton Architectural Press, 1997.

Arieff, Allison, and Bryan Burkhart. Prefab. Layton, Utah: Gibbs Smith, 2002.

Arn-Grischott, Ursina. Doubleweave on Four to Eight Shafts Ideas for Weaving Double and Multilayered Fabrics. Loveland, Colorado: Interweave Press, 1999.

Arroyo, Salvador Perez, Rossana Atena, and Igor Kebel. Emerging Techniques and Housing Prototypes. Translated by William Bain and Lucille Banham. Madrid: Berlage Institute, Postgraduate Laboratory of Architecture.

Auckland [N.Z.] FACT Liverpool University Press

Bachelard, Gaston. The Poetics of Space. Translated by Maria Jolas. Boston: Beacon Press, 1964.

Bachman, Leonard R. Integrated Buildings The Systems Basis of Architecture. New York: J. Wiley & Sons, 2003.

Badessi, Laurent Elie. Skin. Edited by Sondra Gilman. Zurich; New York: Stemmle, 2000.

Baldwin, J. Bucky Works, Buckminster Fuller's Ideas for Today. New York: John Wiley & Sons, Inc., 1996.

Banham, Reyner. Theory and Design in the First Machine Age. London: The Architectural Press, 1960. Reprint, Second (1962).

Bates, Susan, and Chris Kane. "The Future of Housing in New Zealand." Centre for Housing Research Aotearoa

New Zealand

Bayley, Stephen. General Knowledge. London: Booth-Clibborn Editions, 2000.

Beaver, Robyn. 100 Top Houses from Down Under. Mulgrave, Victoria: The Images Publishing Group Pty Ltd, 2005.

Bechthold, Martin. Innovative Surface Structures Technology and Applications. Abingdon [England], New York: Taylor & Francis, 2008.

Belich, James. Making Peoples A History of the New Zealanders From Polynesian Settlement to the End of the Nineteenth Century. Auckland: Penguin, 2007.

Benjamin, Walter, Passagen-Werk. Cambridge, Mass.; London Harvard University Press, 2002.

Benthien, Claudia. "Penetrations: Body Boundries and the Production of Knowledge in Medicine and Cultural Practices." In Skin On the Cultural Border between Self and the World, 37-62. New York, Chichester, West Sussex: Columbia University Press, 2002.

Benthien, Claudia. Haut. New York: Columbia University Press, 2002.

Berge, Bjorn. The Ecology of Building Materials. Translated by Filip Henley. English ed. Oxford: Architectural Press, an imprint of Butterworth-Heinneman Ltd, 2001.

Beylerian, George M. Material Connexion The Global Resource of New and Innovative Materials for Architects, Artists, and Designers / George M. Beylerian and Andrew Dent; Edited by Anita Moryadas. London Thames & Hudson, 2005.

Bijlefeld, Marjolijn. It Came from Outer Space Everyday Products and Ideas from the Space Program / Marjolijn Bijlefeld and Robert Burke. Westport, Conn. Greenwood Press, 2003.

Bilstein, Roger E. Testing Aircraft, Exploring Space An Illustrated History of Naca and Nasa / Roger E. Bilstein. Baltimore Johns Hopkins University Press, 2003.

Blake, Peter. Philip Johnson. Edited by Philip Johnson. Basel; Boston: Birkhauser Verlag, 1996.

Blaxter, L., C. Hughes, and Tight. M. How to Research. Buckingham, Philadelphia: Open University Press, 1996.

Bloemink, Barbara J. Design [Does Not Equal] Art Functional Objects from Donald Judd to Rachel Whiteread. Edited by Joseph Cunningham. London: Merrell, 2004.

Bourses Federales De Design = Eidgen√∂Ssische F√∂Rderpreise Fur Design = Swiss Federal Design Grants 2007. Edited by Kultur Switzerland. Bundesamt fur and contemporains Musee de design et d'arts appliques. Basel: Birkhauser, 2007.

Bourses Federales De Design 2005 = Eidgen√∂Ssische F√∂Rderpreise Fur Design 2005 = Borse Premi Federali Di Design 2005 = Swiss Federal Design Grants 2005. Edited by Kultur Switzerland. Bundesamt fur and contemporains Musee de design et d'arts appliques. Basel: Birkhauser, 2005.

Brand, Stewart. How Buildings Learn: What Happens after They're Built. Rev. ed. London: Phoenix Illustrated, 1997.

Branz Plumbing & Drainage Guide. Porirua: BRANZ, 1999.

Brooke, Sheena, and Shirley Tourret. Hearth and Home A Short History of Domestic Equipment. London: Mills and Boon, 1973.

Brown, John. "From Organisation to Decoration." In Thinking inside the

Box A Reader in Interior Design for the 21st Century, edited by Scotland Interiors Forum, xiv, 283 p. ill. ; 23 cm. London: Middlesex University Press, 2007.

Brown, Roni. "Identity and Narrativity in Homes Made by Amateurs." Home Cultures 4, (2007): 261-85 %U http://www.ingentaconnect.com/content/berg/hcu/2007/00000004/03/art00003.

Buck-Morss, Susan. The Dialectics of Seeing Walter Benjamin and the Arcades Project. 1st ed. Cambridge, Mass.: MIT Press, 1991.

Bulleyment, Alan. Plumbing & Drainage Guide. Edited by Zealand Building Research Association of New. 2nd ed. Porirua: BRANZ, 2004.

Busch, Akiko. Geography of Home Writings on Where We Live. New York: Princeton Architectural Press, 1999.

Callicott, Nick. Computer-Aided Manufacture in Architecture The Pursuit of Novelty. Oxford, Boston: Architectural Press, 2001.

Caplan, Ralph. By Design Why There Are No Locks on the Bathroom Doors in the Hotel Louis Xiv, and Other Object Lessons. 2nd ed. New York: Fairchild Publications, 2005.

Carter, Paul. Concurrent Design of Products, Manufacturing Processes and Systems. Edited by Ben Wang. Amsterdam, Carlton, Vic.: Gordon and Breach Science Pub., 1998.

Chang, Gary. Suitcase House. Hong Kong: MCCM Creations, 2004.

Cicero, Marcus Tullius. De Natura Deorum The Nature of the Gods. Translated by Horace C. P. McGregor. Edited by John MacDonald Ross. Harmondsworth: Penguin, 1972.

Clarke, John R. The Houses of Roman Italy, 100 B.C.-A.D. 250 Ritual, Space, and Decoration. Berkeley: University of California Press, 1991.

co-labarchitects. "Co-Pod, a Revolutionary Approach to Off-Site Construction." (2007), http://www.co-pod.net/.

Cofaigh, E.O., J.A. Olley, and J.O. Lewis. The Climate Dwelling, an Introduction to Climate Responsive Residential Architecture. Dublin: James & James (Science Publishers) Ltd on behalf of the European Commission, Directorate General XII for Science Research and Development, 1996.

Collingwood, Peter. The Techniques of Sprang Plaiting on Stretched Threads. London: Faber, 1974.

Condor, Tony. Branz House Building Guide. Rev. ed. Porirua: BRANZ, 2000.

Conference, Design and Emotion. Design and Emotion The Experience of Everyday Things. Edited by Deana McDonagh ... [et al.]. London: Taylor & Francis, 2004.

Connor, Steven. The Book of Skin. London: Reaktion, 2003.

Constant, Caroline. Eileen Gray. London: Phaidon, 2000.

Constantine, Mildred, and Jack Lenor Larsen. Beyond Craft: The Art Fabric. New York: Van Nostrand Reinhold Co., 1973.

Constantine, Mildred, and Jack Lenor Larsen. The Art Fabric Mainstream. New York Van Nostrand Reinhold, 1981.

Constructing Architecture: Materials, Processes, Structures, a Handbook. Edited by Andrea Deplazes. Basel, London: Birkhauser; Springer [distributor], 2005.

Cox, Cliff. Sk-Interfaces Exploding

Borders Creating Membranes in Art, Technology and Society

davidtenhave. "Pokono About." http://blog.ponoko.com/about/.

Davies, Colin. The Prefabricated Home. London: Reaktion Books Ltd, 2005.

Davis, Sam. The Architecture of Affordable Housing. Berkeley University of California Press, 1995.

De Botton, Alain. The Architecture of Happiness. Oxford, London: Hamish Hamilton, 2003.

Dean, M.A. Green by Design, Creating a Home for Sustainable Living. Utah: Gibbs Smith Publishing, 2003.

Design and the Elastic Mind. Edited by Paola Antonelli ... [et al.]. New York, London: Museum of Modern Art, New York Thames & Hudson [distributor], 2008.

Design Like You Give a Damn: Architectural Responses to Humanitarian Crises. Edited by Architecture for Humanity. New York: Metropolis Books, 2006.

Design Research: Methods and Perspectives. Edited by Brenda Laurel. Vol. 197.380 Albany Set Text 2008. Cambridge, Mass.: MIT Press, 2003.

Design through Making. Edited by Bob Sheil. Chichester: Wiley-Academy, 2005.

Did It Myself. Edited by Commission New Zealand. National Housing. Wellington: National Housing Commission, 1984.

Digby, Susan. "The Casket of Magic: Home and Identity from Salvaged Objects." Home Cultures 3, (2006): 169-90 %U http://www.ingentaconnect.com/content/berg/hcu/2006/00000003/02/art00004.

Diller, Elizabeth, Ricardo Scofidio, and Georges Teyssot. Flesh Architectural Probes. New York: Princeton Architectural Press, 1994.

Downton, Peter. Design Research. Melbourne: RMIT Publishing, 2003.

Drew, Philip. Tensile Architecture. London [etc.] Crosby Lockwood Staples, 1979.

Du Vall, Nell. Domestic Technology A Chronology of Developments. Boston, Mass.: G.K. Hall, 1988.

Duarte, Nancy. Slide:Ology The Art and Science of Creating Great Presentations. 1st ed. Sebastopol, CA O'Reilly Media, 2008.

Elizabeth, L, and C. Adams. Alternative Construction Contemporary Natural Building Methods. New Jersey: John Wiley & Sons, Inc., 2000.

Elwall, Robert. Evocations of Space, the Photography of Edwin Smith. London, New York: Merrell Publishers Limited, 2007.

Empire of the Senses: The Sensual Culture Reader. Edited by David Howes. Oxford, New York: Berg, 2005.

Epson New Zealand Professional Photography Awards 2003. Auckland: Barkfire Press, 2003.

Evans, Robin. "Figures, Doors and Passages." In Translations from Drawing to Building Cambridge, Mass.: MIT Press, 1997.

Faegre, Torvald. Tents Architecture of the Nomads. London J. Murray, 1979.

Finch, Paul. "Beyond the Wall: This Singular Design in Santiago Is a Sophisticated Reinterpretation of the Domestic Exterior." The Architectural Review 222, no. 1330 (2007): 42(4) %U

http://find.galegroup.com/srcx/infomark.do?&contentSet=IAC-Documents&type=retrieve&tabID=T002&prodId=SRCCE-1&docId=A173176616&source=gale&srcprod=CCRA&use

Fletcher, Alan. The Art of Looking Sideways. London: Phaidon, 2001.

Foster, Stuart. "Being @ A Thesis Presented in Partial Fulfillment of the Requirements for the Degree of Master of Design at Massey University, Wellington, New Zealand." 2006.

Foucault, Michel. Mots Et Les Choses. London: Routledge, 1989.

Frampton, Kenneth. Studies in Tectonic Culture The Poetics of Construction in Nineteenth and Twentieth Century Architecture. Edited by John Cava and Arts Graham Foundation for Advanced Studies in the Fine. Cambridge, Mass.: MIT Press, 1995.

Freeman, June. The Making of the Modern Kitchen A Cultural History. Oxford Berg, 2003.

From Models to Drawings Imagination and Representation in Architecture. Edited by Marco Frascari, Jonathan Hale and Bradley Starkey. London, New York: Routledge, 2007.

Frost, Robert. "The Mending Wall." In North of Boston, 7-8. Fairfield, Iowa: 1st World Publishing 1914.

Fry, Tony. "Know Your Enemy: Defining the Problem of Unsustainability " In Shaping the Sustainable Millennium. Queensland University of Technology: EcoDesign Foundation, Sydney, Australia, 2000.

Fuad-Luke, A. The Eco-Design Handbook; a Complete Sourcebook for the Home & Office. New ed. London: Thames & Hudson, 2004.

Gainsford, Jennie. Lockwood From Innovation to Icon in 50 Years. Edited by Committee New Zealand Historic Places Trust. Bay of Plenty Branch. Vol. 206.424 Extramural Text Recommended 2008. Tauranga: Bay of Plenty Branch Committee, New Zealand Historic Places Trust, 1972.

Gallagher, Winifred. House Thinking A Room-by-Room Look at How We Live. 1st ed. New York: HarperCollins, 2006.

Garner, Philippe. Eileen Gray Design and Architecture, 1878-1976. Edited by Eileen Gray. Koln: Benedikt Taschen Verlag, 1993.

Gauzin-Muller, D. Sustainable Architecture and Urbanism: Concepts, Technologies, Examples: Birkhauser, 2002.

Geiser, Ken. Materials Matter Toward a Sustainable Materials Policy. Cambridge, Mass. MIT Press, 2001.

Gilliam, Terry. "Brazil." UK, 1985.

Gilman, Charlotte Perkins. The Home; Its Work and Influence. Urbana: University of Illinois Press, 1972.

Givoni, B. Climate Considerations in Building and Urban Design. New York: John Wiley & Sons, Inc., 1998.

Gmachl, Mathias, and Rachel Wingfield. "Auspicious Tangents." In Responsive Textile Environments, edited by Sarah Bonnemaison and Christine Macy, 70 p. ill. (chiefly col.), ports. ; 25 cm. Halifax: TUNS Press, 2007.

Gordon Matta-Clark. Edited by Corinne Diserens, Thomas E. Crow, Judith Russi Kirshner and Christian Kravagna. London: Phaidon, 2003.

Goslett, Dorothy. Professional Practice for Designers The Professional Practice of Design. 3rd rev. ed. London Batsford, 1984.

Green, Josephine. "Democratizing the Future Towards a New Era of Creativity and Growth." (2007), http://www.design.philips.com/shared/assets/Downloadablefile/democratizing-the-future-14324.pdf.

Grimes, Ronald L. Rite out of Place: Ritual, Media, and the Arts. Oxford; New York: Oxford University Press, 2006.

Gropius, Walter. The New Architecture and the Bauhuas. Translated by P. Morton Shand. Second ed. London: Faber and Faber Limited, 1935.

Grosz, E. A. Architecture from the Outside Essays on Virtual and Real Space. Cambridge, Mass.: MIT Press, 2001.

Grosz, E. A. Chaos, Territory, Art Deleuze and the Framing of the Earth. New York: Columbia University Press, 2008.

Hall, J. Storrs. Nanofuture What's Next for Nanotechnology. New York: Prometheus Books, 2005.

Hamer, Bent. "Kitchen Stories." Norway, 2003.

Handisyde, C.C., and D.J. Melluish. Thermal Insulation of Buildings. London: Department of the Environment, Directorate of Research and Information, Her Majesty's Stationery Office, 1971.

Hartoonian, Gevork. "The Fabric of Fabrication." Textile: The Journal of Cloth and Culture 4, (2006): 270-91.

Hausladen, Gerhard. Climaskin. Edited by Michael de Saldanha and Petra Liedl. Basel, Boston: Birkhauser, 2008.

Hays, K. Michael, and Lauren Kogod. "Twenty Projects at the Boundaries of the Architectural Discipline Examined in Relation to the Historical and Contemporary Debates over Autonomy." Perspecta 33, (2002): 54-71.

Heidegger, Martin. Poetry, Language, Thought. Translations and Introd. By Albert Hofstadter. 1st ed. New York: Harper & Row, 1971.

Herrmann, Wolfgang. "The Basic Elements of Architecture." In Gottfried Semper In Search of Architecture / Wolfgang Herrmann, 196-203: xxii, 320 p. ill. ; 24 cm. Cambridge, Mass.: MIT Press, 1984.

Herrmann, Wolfgang. Gottfried Semper In Search of Architecture. Cambridge, Mass.: MIT Press, 1984.

Highmore, Ben. Everyday Life and Cultural Theory An Introduction. New York: Routledge, 2002.

Hill, Jonathan. Immaterial Architecture. 1st ed. New York; London Routledge, 2006.

Hodge, Brooke. Skin + Bones Parallel Practices in Fashion and Architecture. Edited by Patricia Mears, Art Museum of Contemporary and Bijutsukan Kokuritsu Shin. Los Angeles New York, N.Y.; London Museum of Contemporary Art; Thames & Hudson, 2006.

Holl, Steven. Questions of Perception Phenomenology of Architecture; CA Routledge, William Stout, 2009.

Home & Hearth [Picture] Domestic Life in New Zealand at the Turn of the Century. Edited by National Library of New Zealand Sue Bennett for Education Services. Wellington: Education Services, The Library, 1990.

Home Delivery Fabricating the Modern Dwelling. Edited by Barry Bergdoll, Peter Christensen, Ron Broadhurst and Art Museum of Modern. New York Museum of Modern Art, 2008.

Home, New Directions in World Architecture and Design. Auckland: David

Bateman Ltd, 2006.

Hopkins, Jim, and Julie Riley. Blokes & Sheds. Auckland: HarperCollins, 1998.

Hornstein, Shelley. "Matters Immaterial: On the Meaning of Houses and the Things inside Them." In The Art of Rachel Whiteread, edited by Chris Townsend, 51-67: 224 p. col. ill. ; 24 cm. London: Thames & Hudson, 2004.

Houze, Rebecca. "The Textile as Structural Framework: Gottfried Semper's Bekleidungsprinzip and the Case of Vienna 1900." Textile: The Journal of Cloth and Culture 4, (2006): 292-311 http://www.ingentaconnect.com/content/berg/tjcc/2006/00000004/03/art00005.

Ideas A History of Thought and Invention from Fire to Freud. Edited by Anthony Burke and Therese Tierney. 1st ed. New York Princeton Architectural Press

Ierley, Merritt. Comforts of Home The American House and the Evolution of Modern Convenience. 1st ed. New York: C. Potter, 1999.

Immaterial/Ultramaterial Architecture, Design and Materials. Edited by Toshiko Mori. New York Woodbridge George Braziller; ACC Distribution, 2002.

Jefferies, Janis, and Diana Wood Conroy. "Shaping Space: Textiles and Architecturean Introduction." Textile: The Journal of Cloth and Culture 4, (2006): 233-37 %U http://www.ingentaconnect.com/content/berg/tjcc/2006/00000004/03/art00001.

Jeunet, Jean-Pierre. "Amelie." France, 2001.

Jones, D.L. Architecture and the Environment, Bioclimatic Building Design. London: Laurence King Publishing Ltd, 1998.

JSPR, Studio. "Cover Tiles." http://www.jspr.eu/wb/pages/collections/cover-tiles.php.

Juracek, Judy A. Soft Surfaces Visual Research for Artists, Architects, and Designers. 1st ed. New York W.W. Norton, 2000.

Kieran, Stephen, and James Timberlake. Refabricating Architecture: How Manufacturing Methodologies Are Poised to Transform Building Construction. New York: McGraw-Hill Companies, Inc., 2004.

Kimball, Roger. "Architecture and Ideology." In Eisenman/Krier Two Ideologies A Conference at the Yale School of Architecture, edited by Architecture Yale University. School of. New York Monacelli Press, 2004.

King, Peter. The Common Place The Ordinary Experience of Housing. Aldershot, Burlington: Ashgate, 2005.

Klassen, Filiz. "From the Bazaar to Space Architecture: Fabrics Reshape Material and Spatial Qualities of Built Environments." Textile: The Journal of Cloth and Culture 4, (2006): 256-69 %U http://www.ingentaconnect.com/content/berg/tjcc/2006/00000004/03/art00003.

Kratochvil, Milan, and Charles Carson. Growing Modular Mass Customization of Complex Products, Services and Software. Berlin: Springer, 2005.

Lacey, Emma. "Does Ceramic Tableware Offer Opportunities for Emotional Design?" In Design & Emotion, 2008.

Lafranchi, Guy. Jean Prouve The Poetics of the Technical Object. Edited by Alexander von Vegesack, Catherine Dumont d'Ayot and Bruno Reichlin.

Weil am Rhein Portchester Vitra Design Museum ; Art Books International [distributor], 2006.

Langdon, W.K. Movable Insulation, a Guide to Reducing Heating and Cooling Losses through the Windows in Your Home. Emmaus, PA: Rodale Press, 1980.

Laseau, Paul. Graphic Problem Solving for Architects and Designers. Second ed. New York: Van Norstrand Reinhold Company Inc., 1986.

Leatherbarrow, David, and Mohsen Mostafavi. Surface Architecture. Cambridge, Mass. MIT Press, 2002.

Le Corbusier. The Modulor, a Harmonius Measure to the Human Scale Universally Applicable to Architecture and Mechanics. Translated by Peter De Francia and Anna Bostock. Second ed. London: Faber and Faber Limited, 1951.

Lefebvre, Henri. "The Everyday and Everydayness." In Architecture of the Everyday, edited by Steven Harris and Deborah Berke, 33-37. New York: Princeton Architectural Press, 1997.

Lefebvre, Henri. Production De L'espace The Production of Space. Translated by Donald Nicholson-Smith. Oxford, OX, UK; Cambridge, Mass., USA Blackwell, 1991.

Living in Motion: Design and Architecture for Flexible Dwelling. Translated by Manfred Alli√© [et al.]. Edited by Mathias Schwartz-Clauss and Alexander von Vegesack. [Weil am Rhein] Vitra Design Museum, 2002.

Lloyd-Jenkins, Douglas. At Home A Century of New Zealand Design / Douglas Lloyd Jenkins. Auckland, N.Z. Godwit, 2004.

Lockwood. "Initial Looking for Value." http://www.lockwood.co.nz/.

Lucy + Jorge Orta Pattern Book. Edited by Paula Orrell. London: Black Dog Publishing, 2007.

Lupton, Ellen, and J. Abbott Miller. The Bathroom, the Kitchen, and the Aesthetics of Waste A Process of Elimination. Cambridge, Mass.: MIT List Visual Arts Center: Princeton Architectural Press, 1992.

Lupton, Ellen. Design Your Life The Pleasures and Perils of Everyday Things. Edited by Julia Reinhard Lupton. 1st ed. New York: St. Martin's Griffin, 2009.

Lupton, Ellen. Mechanical Brides Women and Machines from Home to Office. Edited by Museum Cooper-Hewitt. New York Cooper-Hewitt, National Museum of Design, Smithsonian Institution Princeton Architectural Press, 1993.

Lupton, Ellen. Skin Surface, Substance & Design / with Essays by Jennifer Tobias ... [Et Al.]. London, Princeton: Laurence King, Princeton Architectural, 2002.

Mallgrave, Harry Francis. "Introduction." In Stil in Den Technischen Und Tektonischen Kunsten, Oder, Praktische Aesthetik, Ein Handbuch Fur Techniker, Kunstler Und Kunstfreunde. English

Mann, Thorbjoern. Time Management for Architects and Designers Challenges and Remedies. New York W.W. Norton, 2003.

Marsden, Nick. Shedding Skin. Auckland, N.Z. Penguin, 2005.

Martin, Cat. Surface Texture Book More Than 800 Colour and Texture Samples for Every Surface, Furnishing and Finish. London Thames & Hudson, 2005.

Mau, Bruce. Massive Change. London: Phaidon, 2004.

McDonough, William, and Michael Braungart. Cradle to Cradle Remaking the Way We Make Things. 1st ed. New York: North Point Press, 2002.

McKeon, Michael. Donald Judd. Edited by Nicholas Serota. London, Baltimore: Tate, Johns Hopkins University Press, 2004.

McQuaid, Matilda. Extreme Textiles Designing for High Performance. Edited by John W. S. Hearle [and the] Cooper-Hewitt National Design Museum with essays by Philip Beesley ... [et al.] ; with contributions by Alyssa Becker, Smithsonian Institution. New York: Princeton Architectural Press, 2005.

McQuiad, Matilda. Shingeru Ban. London: Phaidon Press Ltd, 2003.

Melvin, J. …Isms, Understanding Architecture. London: Herbert Press an imprint of A&C Black Publishers, 2005.

Membrane Structures: Innovative Building with Film and Fabric. Edited by Klaus-Michael Koch, Karl J. Habermann and Brian Forster ... [et al.]. Munich; London: Prestel, 2004.

Memux. "Concrete Curtain." (2008), http://www.memux.com/.

Merleau-Ponty, Maurice. Phenomenologiede La Perception. London: Routledge & Kegan Paul, 1962.

MoMa. "Home Delivery: Fabricating the Modern Dwelling " http://www.momahomedelivery.org/.

Montagu, Ashley. Touching The Human Significance of the Skin. 3rd ed. New York Perennial Library, 1986.

Morris, Mark. Models Architecture and the Miniature. Chichester: Wiley-Academy, 2006.

Mostaedi, A. Sustainable Architecture, Low Tech Houses. Barcelona: Carles Broto I Comerma.

New Zealand's Own Guide on How to Do It Yourself and Enjoy It! Edited by Jens Hauser and Fact. Liverpool

New, Jennifer. Drawing from Life, the Journal as Art. New York: Princeton Architectural Press, 2005.

NZ Trade Commissioner, Los Angeles. "Manufactured Housing in the United States." In Product profile (New Zealand Trade Commission): New Zealand Trade Commission, Wellington, 1986.

Occupying Architecture: Between the Architect and the User. Edited by Jonathan Hill. Vintage Books ed. London; Vintage Books, 1998.

Olgyay, V. Design with Climate, a Bioclimatic Approach to Architectural Regionalism. New York: Van Nordstrand Reinhold, 1992.

Open House: Architecture and Technology for Intelligent Living. Edited by Alexander von Vegesack and Jochen Eisenbrand. 1st ed. Weil am Rhein Vitra Design Stiftung, 2006.

Orta, Lucy. Body Architecture. Edited by Lucy Orta and Courtney Smith. Munich: Verlag Silke Schreiber, 2003.

Pallasmaa, Juhani. The Eyes of the Skin Architecture and the Senses. Chichester: Wiley-Academy, 2005.

Pantzar, Mika. "Domestication of Everyday Life Technology: Dynamic Views on the Social Histories of Artifacts " Design Issues 13, no. 3 Autumn (1997): 52-65

Papanek, V. The Green Imperative; Ecology and Ethics in Design and Architecture. London: Thames & Hudson, 1995.

Papastergiadis, Nikos. "Part I: 'Everything That Surrounds Art, Politics

and the Theory of the Everyday' Chapter 3: A Brief History of the Everyday." In Spatial Aesthetics Art, Place and the Everyday, 26-41. London, Sydney, Chicago: Rivers Oram Press, 2006.

Paschich, E., and Zimmerman J. Mainstreaming Sustainable Architecture, Casa De Paja: A Demonstration. New Mexico: High Desert Press, 2001.

Peng, Yangjun. Muji. Edited by Jiaojiao Chen. London: Southbank, 2003.

Pilar, Echavarria M. Portable Architecture - and Unpredictable Surroundings. Barcelona: Link Books - Arian Mostaedi.

Polanski, Roman. "Repulsion." 105 min. UK, 1965.

Pompidou, Centre. "Architecture of the Building Original Architecture." http://www.centrepompidou.fr/pompidou/Communication.nsf/0/B90DF3E7C7F18CAEC1256D970053FA6D?OpenDocument&sessionM=3.1.12&L=2.

Pompidou, Centre. "Architecture of the Building." http://www.centrepompidou.fr/pompidou/Communication.nsf/0/B90DF3E7C7F18CAEC1256D970053FA6D?OpenDocument&sessionM=3.1.12&L=2.

Pople, Nicolas. Textures of Place Exploring Humanist Geographies

Porteous, J. Douglas. "Home: The Territorial Core." Geographical Review 66, no. 4 (1976): 383-90.

Pounds, Norman J.G. Hearth & Home A History of Material Culture. Bloomington: Indiana University Press. 1989.

Powell, Helen. "Time, Television, and the Decline of Diy." Home Cultures 6, (2009): 89-107.

Ranciere, Jacques. Partage Du Sensible / the Politics of Aesthetics The Distribution of the Sensible. Translated by Gabriel Rockhill. London, New York: Continuum, 2004.

Reichlin, Alexander von Vegesack & Catherine Dumont d'Ayot & Bruno. Jean Prouvé The Poetics of the Technical Object. Portchester: Vitra Design Museum, Art Books International [distributor], 2006.

Rendell, Jane. "Doing It, (Un)Doing It, (over)Doing It Yourself: Rhetorics of Architectural Abuse." In Occupying Architecture Between the Architect and the User, edited by Jonathan Hill. New York: Routledge, 1998.

Renewable Energy Authority Victoria (Energy Victoria), East Melbourne, Victoria. "Energy Efficient Housing Manual, Design Guidelines and Case Studies,." (1994).

Responsive Textile Environments, Edited by Sarah Bonnemaison, Christine Macy and Workshop Metabolic Network Sensory. [Halifax, N.S.] Springer, 2007.

rGroupName=massey&version=1.0.

Rice, Charles. The Doubleness of the Interior Inhabitation and Bourgeois Domesticity Phd Dissertation, Faculty of the Built Environment, the University of New South Wales. Sydney: University of New South Wales, 2003.

Roaf, Sue, Manuel Fuentes, and Stephanie Thomas. Ecohouse A Design Guide: Architectural Press, an imprint of Butterworth-Heinneman Ltd, 2001.

Rocca, Alessandro. Natural Architecture. New York, Milan: Princeton Architectural Press; 22 Pubs. 2007.

Ronan and Erwan Bouroullec. London: Phaidon, 2003.

Rosenfeld, Max. The New Zealand

House. 7th rev. ed. Auckland, [N.Z.] New Zealand House Design Publications, 1960.

Rykwert, Joseph. "House and Home." In Home A Place in the World, edited by Arien Mack, 47-58. New York: New York University Press, 1993.

Saito, Yuriko. Everyday Aesthetics. Oxford, New York: Oxford University Press, 2007.

Santamouris, M. (ed). Energy and Climate in the Urban Built Environment. London: James & James (Science Publishers) Ltd., 2001.

Scarry, Elaine. The Body in Pain: The Making and Unmaking of the World. Oxford: Oxford University Press, 1985.

Schechner, Richard. Performance Studies An Introduction. 2nd ed. New York Routledge, 2006.

Semper, Gottfried. Style in the Technical and Tectonic Arts; or, Practical Aesthetics. Translated by Harry Francis Mallgrave and Michael Robinson. Edited by Harry Francis Mallgrave. Los Angeles: Getty Research Institute, 2004.

Sennett, Richard. The Craftsman. New Haven: Yale University Press, 2008.

Silvester, Miriam Dorothea. Adding Value, Extending Use Exploring Interactive Surface Pattern Design as a Strategy for Extending the End Use of Textile Products An Exegesis Presented in Partial Fulfillment of the Requirements for the Degree of Master of Design in Textile Design at Massey University, Wellington, New Zealand, March 20072007.

Skin Deep: Il Corpo Come Luogo Del Segno Artistico. Edited by Luigi Meneghelli, Giovanna Nicoletti, Giorgio Verzotti and Rovereto Museo d'arte moderna e contemporanea di Trento e. Milano Skira, 2003.

Skin. Edited by Stephan Schmidt-Wulffen and Heide Hatry. Heidelberg, Maidstone: Kehrer, Amalgamated Book Services, 2006.

Slavid, R. Micro Very Small Buildings. London: Laurence King Publishing Ltd, 2007.

Small Houses. Edited by Paul C. Adams, Steven D. Hoelscher and Karen E. Till. Minneapolis

Smith, Kendra Schank. Negotiating Domesticity Spatial Productions of Gender in Modern Architecture. Edited by Hilde Heynen and Gelsem Baydar. New York: Routledge, 2005.

Softspace: From a Representation of Form to a Simulation of Space. Edited by Sean Lally and Jessica Young. London; New York Routledge, 2007.

Soleri, Paolo. Arcology: The City in the Image of Man. Massachusetts: MIT Press, 1969.

Sommer, Robert. Personal Space; the Behavioral Basis of Design. Englewood Cliffs, N.J.: Prentice-Hall, 1969.

Spacecraft: Fleeting Architecture and Hideouts. Edited by Robert Klanten and Lukas Feireiss. Berlin: Gestalten Verlag, 2007.

Spigel, R, and D Meadows. Green Building Materials, a Guide to Product Selection & Specification. Second ed. New Jersey: John Wiley & Sons, Inc., 2006.

Staples, David E. No Place Like Home: Organizing Home-Based Labor in the Era of Structural Adjustment. New York: Routledge, 2006.

Steele, J. Ecological Architecture: A Critical History. London: Thames & Hudson, 2005.

Stewart, Di. The New Zealand Villa. Revised 2002 ed. Auckland: Penguin

Books (NZ) Ltd, 1992.

Street, Maryan. " Affordable Housing Initiatives Speech." edited by New Zealand Government: www.scoop.co.nz, 2008.

Sunset, Books. Sunset Ideas for Western Kitchens. 1st ed. Menlo Park, Calif.: Lane Pub. Co., 1955.

Surface Charge. Edited by Elana Herzog, Sabine Russ, Gregory Volk and Gallery Anderson. Richmond Anderson Gallery, Virginia Commonwealth University, School of the Arts, 2006.

Teige, Karel. The Minimum Dwelling = L'habitation Minimum = Die Kleinstwohnung The Housing Crisis, Housing Reform ... Translated by Eric Dluhosch. Auckland, N.Z.

Tellier-Loumagne, Franscoise. The Art of Felt Inspirational Designs, Textures and Surfaces / Text and Photographs by Franscoise Tellier-Loumagne. London: Thames & Hudson, 2008.

The Art of Rachel Whiteread. Edited by Chris Townsend. London: Thames & Hudson, 2004.

The Articulate Surface Dialogues on Paintings between Conservators, Curators and Art Historians. Edited by Sue-Anne Wallace, Jacqueline Macnaughtan, Jodi Parvey, Centre Australian National University. Humanities Research, Australia National Gallery of and Surface Articulate. Canberra Humanities Research Centre, Australian National University and National Gallery of Australia, 1996.

The Built Surface. Edited by Christy Anderson and Karen Koehler. Aldershot, Burlington: Ashgate, 2001.

The Design Culture Reader. Edited by Ben Highmore, Juhani Pallasmaa and Alberto Perez Gomez. 2nd ed. London; New York, NY; San Francisco: 2009.

The Function of Ornament. Edited by Farshid Moussavi and Michael Kubo. Barcelona, Cambridge, Mass.: Actar; Harvard University, Graduate School of Design, 2006.

The Home House Project: The Future of Affordable Housing. Edited by David J. Brown and Steve Badanes ... [et al.]. 1st MIT Press ed. Cambridge, MA: Southeastern Center for Contemporary Art, Distributed by MIT Press, 2004.

The Oxford Handbook of Aesthetics. Edited by Jerrold Levinson. Oxford: London: Oxford University Press, 2003.

Thinking through the Skin, Edited by Sara Ahmed and Jackie Stacey. London: Routledge, 2001.

Toomath, William. Built in New Zealand The Houses We Live In. Auckland: HarperCollins, 1996.

Transmaterial 2 A Catalog of Materials That Redefine Our Physical Environment. Edited by Blaine Erickson Brownell. New York: Princeton Architectural Press, 2008.

Transmaterial: A Catalog of Materials That Redefine Our Physical Environment. Edited by Blaine Erickson Brownell. New York: Princeton Architectural Press, 2006.

Trubridge, Sam. 1:1 (Manifestoes for a Theatre of Matter) A Thesis Presented in Partial Fulfillment of the Requirements for a Degree of Masters in Design at Massey University, Wellington, N.Z2005.

Tuan, Yi-fu. "Cosmos Versus Hearth." In Textures of Place Exploring Humanist Geographies, edited by Steven Hoelscher Paul C. Adams, Karen E. Till, 319-25. Minneapolis: University of Minnesota Press, 2001.

Tuan, Yi-fu. Cosmos & Hearth: A

Cosmopolite's Viewpoint. Minneapolis: University of Minnesota Press, 1996.

Tuan, Yi-fu. Space and Place The Perspective of Experience. London: Edward Arnold, 1977.

Turner, Victor. Dramas, Fields, and Metaphors Symbolic Action in Human Society. 1st pbk ed. New York, London: Cornell University Press, 1975.

Ulrich, Karl T. Product Design and Development. Edited by Steven D. Eppinger. 4th ed. Boston McGraw-Hill Higher Education, 2008.

Upton, Dell. "Architecture in Everyday Life." New Literary History 33, no. 4 (2002): 707-23.

Vandenberg, Maritz. Farnsworth House Ludwig Mies Van der Rohe. London, New York: Phaidon Press, 2003.

Vidler, Anthony. "Unhomely Houses." In The Architectural Uncanny Essays in the Modern Unhomely, 17-44. Cambridge, Mass.: MIT Press, 1992.

Wang, Linda Groat & David. Architectural Research Methods. New York: John Wiley & Sons, Inc., 2002.

Wang, Ying. Filmic Space: Reverie and Matter A Thesis Presented in Partial Fulfillment of the Requirements of the Degree of Master in Design at Massey University, Wellington, New Zealand2005.

White Walls, Designer Dresses The Fashioning of Modern Architecture. Edited by Gegenwartskunst Migros Museum fur and Art ≈Åaznia Centre for Contemporary. Geneva Cambridge, Mass. JRP Editions

Wigginton, Michael. Intelligent Skins. Edited by Jude Harris. Oxford: Butterworth-Heinemann, 2002.

Wigley, Mark. "Alternative Architecture 2 Paint Space." Domus, 2005, 43.

Wigley, Mark. "Inside the Inside." In The Architectural Unconscious James Casebere + Glen Seator / Essays by Adam D. Weinberg, Mark Wigley, and Anthony Vidler, 16-23. 62 p. ill. (some col.); 30 cm. Andover, Mass.: Addison Gallery of American Art, 2000.

Wigley, Mark. "Towards Turbulence." Archis Volume no. 4 (2006): 6-9.

Willson, R. J., 40 Home Plans and Designs. Edited by R. J. Selected house plans for New Zealand Willson. [Auckland, N.Z.] Plans and Specifications Ltd., 1981.

Willson, R. J., Practical Flat and House Plans (with Specifications)

Willson, R. J., Selected House Plans for New Zealand. Auckland Heinemann Educational, 1975.

Willson, R. J. Adding to or Altering Your House: House Alterations and Additions A Do-It-Yourself Guide to the New Zealand Timber-Framed House. Edited by Dept Palmerston North. City Planning. Palmerston North, Auckland: Reed Methuen, 1980.

Wolff, Colette. The Art of Manipulating Fabric. Radnor, Pa.: Chilton Book Co., 1996.

Woodham, J.M. Twentieth Century Design. Oxford: Oxford University Press, 1997.

Woods, Lebbeus. System Wien. Translated by Michael Strand and Sonja Illa-Paschen. Ostfilden-Ruit: Erschienen im Hatje Cantz Verlag, 2005.

Woudhuysen, James, and Ian Abley. "Homes 2016." In Blueprint Broadsides, 2004.

Massey University
COLLEGE OF CREATIVE ARTS
Toi Rauwharangi

WRITTEN ASSIGNMENT ORIGINALITY DECLARATION

(Each student to complete for every written assignment)

Student ID:	03098486
Surname:	Ford
First Name:	Laura
Paper Number:	197.800
Paper Title:	Masters of Design Thesis
Assignment Title:	Surface Built : Making the New Zealand Home

Declaration

- I declare that this is an original assignment and is entirely my own work.
- Where I have made use of the ideas of other writers, I have acknowledged (referenced) the sources in every instance.
- Where I have made use any diagrams or visuals, I have acknowledged (referenced) the sources in every instance.
- This assignment has been prepared exclusively for this paper and has not been and will not be submitted as assessed work in any other academic courses.
- I am aware of the penalties for plagiarism as laid down by Massey University.
  A copy of the Assessment and Examination Regulations can be found under the Statutes and Regulations section on the Massey University website (http://calendar.massey.ac.nz/)

_____ _____

Student signature Date

Attach this originality declaration as an appendix to your written assignment.
An assignment without this declaration will not be accepted.