FORMS AND IDEAS MATERIALISE
THE MATERIAL AGENCY OF THE DESIGN MEDIUM IN
ARCHITECTURAL PRACTICE

A project submitted in fulfilment of the requirements for the degree of Doctor of Philosophy

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Declaration

I certify that except where due acknowledgement has been made, the work is that of the author alone; the work has not been submitted previously, in whole or in part, to qualify for any other academic award; the content of the project is the result of work which has been carried out since the official commencement date of the approved research program; any editorial work, paid or unpaid, carried out by a third party is acknowledged; and, ethics procedures and guidelines have been followed.

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ABSTRACT

By engaging with immediate material contingencies through drawing and making in a situated design process, the PhD develops an approach to architectural practice in which the material agency of design media plays an important role in the evolution of forms and ideas. In this way ideas develop out of an intimate engagement with materials. The project is a self-examination of my own creative practice. By posing a set of seemingly straightforward questions – *How and why do I make?; What do I make with?; What have I made?; and Where do I make?* – the research has aimed to articulate a way of working that is particular and specific, but broader in reach.

Along the way, these apparently personal questions open up complex issues more broadly relevant to the discipline of architecture and the role of making within it. This includes a confrontation with the nature of the design medium; the status of the made artefact; and the nature of the web of spatial relations that bind the materials and actions that comprise a making process. The work therefore also seeks to contribute to an existing field of research that examines how ideas are generated and represented in architecture and challenges the presumption of a linear design process from idea to drawing to building. Specifically, it is the role of the
design medium in this process that is of focus here, through
an examination of the engagement between the material of
the medium and the architect as maker of artefacts –
drawings, models and maquettes. The research questions
the primacy of architectural representation, the hyperopic
(longsighted) condition of those representations, and the
relationship between representations and the generation of
knowledge in the act of making.
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INTRODUCTION

At the commencement of this PhD I was driven by an interest in the treatment of materials in architectural practice and discourse – how materials are engaged in a work of architecture, but also what we as architects understand of materials and how we think about and discuss them. It seemed to me that there were perhaps three obvious positions in relation to materials that were evident in the discipline.

One mode of thinking, which is consistent with the school of thought that pervaded my training in architecture, is to treat materials principally in relation to how they engender subjective experiences within the occupant of a building through material phenomena. A second position seemed to exist in the marginalisation of materials in favour of the expression of conceptual content through building form and composition, where the actual material of the architecture matters little, and the building takes on a semiotic function. Finally, a third position was typified by a technical and technological preoccupation with material – researching and testing what is possible in a given material. It struck me that these three positions were quite distinct and that there might be space between them that would be useful to mine that might also be informed by more recent thinking on materials.
in both architecture and philosophy. Unsure of what exactly would be revealed, I kept this thinking in mind as I commenced the various projects that have come to form the PhD.

As the projects and research progressed, the role that making and materials play in my daily practice led me to the realisation that a way forward that held the potential of an original contribution could come through a careful consideration of the role that materials and making play inside practice. From this realisation onwards, this PhD has principally become a close examination of how I work, what’s going on in the act of carrying out my creative practice, and the role that making and materials play within that process. I’m interested in the everyday of practice, the situation from which it emerges, the materials and spaces that are implicated as one goes about making, and the agency these have within the evolution of forms and ideas. Ultimately, the aim has been to undertake a deep exploration of the role of making and materials and the status of made artefacts through my own practice in order to offer contributions to the broader discipline of architecture.

I share an architectural practice with my partner Zuzana Kovar that was established at roughly the same time that I commenced this research project. Partly out of necessity, our practice is a multifaceted one – we’re engaged in making commissioned projects, that mostly take the form of residential renovations and extensions in Brisbane, and simultaneously are also engaged in non-commissioned
projects – architectural competitions, self generated making projects, drawings, exhibitions, writing, research and architectural teaching. Architecture is a slow endeavour, it takes years for projects to come to fruition, if they do at all, and over that time a project ebbs and flows, stops and starts, which means we’re often afforded the time to indulge in our own projects that a busier commercial practice may not be afforded – allowing for making, drawing and thinking on a different time scale.

I’m interested in understanding the relations that bind together this constellation of activities within my practice, and more specifically, what role making plays. A series of apparently straightforward questions setup the framework through which I undertake an examination of my practice; How do I make?; What do I make with?; Where do I make?; What have I made?; and How do I know? The development of a methodology that is framed through an enquiry into one’s own creative practice can be partly attributed to the influence of the writing of artist Patricia Cain, whose work served as an example of how personal practice is indispensable to the kind of research that I’m undertaking here. Cain’s book Drawing: The Enactive Evolution of the Practitioner evidences the value of practice led research and is drawn on at various points throughout this document.

The thinking developed here draws from, and hopes to contribute to, two related but distinct fields of enquiry within the architectural discipline; material thinking, or the nature of matter and our relationship to it; and secondly, the
longstanding and persistent enquiry into the nature of making and drawing processes. Firstly, over the past three decades, architecture has seen an influx of new ideas from other disciplines, including philosophy, material sciences, robotics and computer sciences, that have transformed notions of matter and material relations. Largely drawing on the philosophy of Deleuze and Guattari and thinkers that share similar concerns, a trajectory that could be grouped under the banner of ‘new materialism,’ there is a major movement within architecture that no longer understands matter as inert stuff awaiting intervention at the hands of a maker, but as vibrant, constantly in flux and possessing agency. This has been part of a shift toward process based thinking and emergent phenomena. Secondly, I’m interested in the implications new materialist thinking holds for understanding processes of making, the role that materials play in this and gaining clarity around the nature of making processes more generally.

The discourse around making and drawing in architecture clearly has a long history, but has gained new momentum in recent years through a number of key publications and the emergence of contemporary practitioners that are reconciling digital tools with physical craft practices, along with the persistence of more traditional analogue making methods. As a practitioner, I’m not only seeking to understand my own processes of making, but by reflecting on project work undertaken over the course of the research, I’m looking to reconcile observations about the way I develop ideas and
forms through making with accounts of this process in the broader discourse.

It is at this juncture – between my own observations and those offered within the existing discourse that gaps emerge in the way architecture conceives of the relation between ideas, making (including drawing), materials, media, artefacts (drawings and models) and buildings.

A central idea that has emerged from within this PhD is the notion of knowing through the action of artefacts, both made and in the making – a strategy for making that attempts to find new approaches to developing ideas and knowledge within a design process. This strategy involves attentiveness to both the agency of material media and the richness of their interactions within a making process that is often overlooked.

The non-representational action of drawings (a notion that I elaborate on throughout this dissertation) is also central and has formed a focus of the project work that has ensued over the course of my research. Though perhaps all types of architectural representations, even the most common and conventional possess action and can do, I'm interested in subverting the primacy of representation within architecture and making works that more overtly act and affect in and of themselves rather than in relation to something represented. It is the present and actual that I’m most interested in within the act of making.

The projective nature of architectural representations however tends to remove us from the present and
Furthermore, the prior assumptions, knowledge or ideas that we carry as baggage into the process can dull our receptiveness to the subtle innovations that can occur in the making. It should be noted however that my intention is not to argue against the complexity, value and power of conventional architectural representation, but is simply to explore other means of making that reveal things that would not otherwise be possible. It is true that my own practice still heavily relies on conventional architectural representation and the making of other, less conventional drawings or other artefacts does not supplant their role.

A note on the structure of this dissertation;

Practice is ongoing in nature; projects are constantly evolving and constantly demanding attention, and the thinking that has developed over the course of this PhD has not existed independent of this, but has emerged concurrently with the practice work. As such, the following dissertation document attempts to weave project work and writing, with accounts of making processes presented along with the insights, observations or realisations that may have come about in the act of making.

Each chapter is preceded by a *making anecdote*, in an attempt to foreground the practice and set the ground for the questions that I pose in the subsequent chapter. The project work is presented not in a sequential manner, but rather is drawn on where appropriate to facilitate the discussion.
Chapter I commences by beginning to develop a detailed picture of the complex nature of the making process, and the web of relations and interactions that constitute that process. Each subsequent chapter then seeks to examine an aspect of that process of interactions; including design media, the made artefact, ideas, the maker’s body, and the space of making.

Having established that the medium is a central aspect of the process of making, it becomes necessary to probe further into what exactly constitutes design media in an effort to further understand its role in Chapter II. Prompted by the question, *what do I make with?* I attempt to approach some of the complexity of design media, which is constituted by not only materials and tools, but also ideas and knowledge. In doing so, this chapter seeks to draw attention to a pre-existing condition of design – that it occurs in space, and that it is engaged with via a medium.

In reference to my own practice I examine my own choice of media and how this affects specific instances of making. Issues that are relevant to the discipline of architecture addressed in Chapter II include a questioning of what constitutes design media – both material and immaterial; making a distinction between tools and media; and clarifying the agency of the design medium in architectural practice. It is at this point that I also seek to clarify what I understand by the term agency, and how this applies to design media.
The process of making is woven into a set of spatial relations – by examining the settings where my making occurs, Chapter III seeks to understand this aspect of making; that it is an inherently spatial process. This enquiry is framed by the question, *where do I make?* The site of the architect’s endeavours is not only the building site or the projected space of constructions yet to come, but is also the space of architectural production – the space of making that we occupy with drawings, paper, models, materials, computer hardware, prototypes, maquettes, our bodies and various other bits of hardware that support the process of design. How then does the physically situated space of making affect the process of design, and in turn, if we are to consider design as a creative act of occupying space, what might this reveal about the buildings that house our design practices? Prompted by the question to myself – *what have I made?* –

Chapter IV will examine the tendency to overlook the richness of made artefacts within an architectural design process, and argue for attentiveness to this complexity and the inherent potential within. The made artefact – the outcome of a making process – is embedded with a level of complexity and nuanced material expression by virtue of the confluence of forces that inflect this process – a complexity that is nonetheless often overlooked.

Having developed a rich and nuanced picture of making in architectural practice over the preceding sections of the dissertation, the final chapter, *Knowing Through the Action of Made Artefacts*, examines the value of a way of making that
has emerged in my work over the course of the research. It is here that I articulate the development in my own practice along with the contribution made by the PhD to creative practice more generally. What role do ideas and knowledge play in making, and how do I come to know through making? In other words, how is new knowledge generated in the act? That which is unanticipated forms a potentially productive role within processes of making. That is to say, the complex relations that are entered into when making, between material, or media, ideas, and the body of the maker, often lead to unexpected outcomes, and if we are attuned to the revelations that can occur through making, then perhaps we can evade known or premeditated solutions to common design problems. In this chapter I recount how the non-representational action of drawings and other artefacts allow new knowledge to emerge from within my projects. Central to this process is the subversion of the primacy of architectural representation – the codes and shorthand that stand in for known conventions of architectural construction.

A note on key references;

Over the course of the PhD, I’ve drawn on a broad range of writing and thinking with respect to making, drawing and materials, both from within and beyond the discipline of architecture. This group of texts have been used to establish an understanding of prevailing theoretical positions in relation to making and materiality, and has helped to shape my own thinking, but has never been intended, or presented as an exhaustive survey of the writing in these areas.
As a PhD by practice, the thinking presented in this dissertation has predominantly been arrived at through my own observations of my practice, which are then set against specific texts that have in some way made an impact on my thinking over the course of three and a half years of practice. I’ve intentionally drawn on writing in a number of disciplines – architecture, art, anthropology and philosophy – and writing from both practitioners of drawing or making alongside practitioners of theory.

Theorists that have been key with respect to notions around drawn representations within architecture have included, Robin Evans, Jonathan Hill, Marco Frascari, Alberto Pérez-Gómez and Louise Pelletier (and to a lesser extent other figures such as Peter Cook and Juhani Pallasmaa). With respect to the discourse around new materialism within architecture, some key recent texts have included the edited books *Matter: Material Processes in Architectural Production*, Gail Peter Borden and Michael Meredith, ed. and *Material Matters: Architecture and Material Practice*, Katie Lloyd Thomas, ed. These texts, and others, reveal some consistent threads of thinking with respect to drawing, making and materials within the discipline of architecture that contrast with the notions presented by writers and practitioners of other disciplines. The anthropologist, Tim Ingold, for example presents one of the clearest explications of the relationship between materials, making and thinking that I’ve encountered in any discipline – and yet Ingold is not what I would refer to as a making practitioner as such. And so it becomes useful to set Ingold’s writing against the observations made by making
and drawing practitioners such as the artist Patricia Cain, or practising architects such as Smout Allen, who often present a more matter of fact account of making.

I’d also like to acknowledge and clarify that whilst the philosophy of Deleuze and Guattari repeatedly surfaces in relation to contemporary conceptions of materials and also making, I’ve made a point of not going to the source directly, but rather have drawn on the sources that take Deleuze and Guattari’s thinking and apply it in the specific context that is of concern to me in this PhD – principally so as to limit the scope of the PhD and also in recognition of the fact that it is research by practice, not by thesis. I’ve also come to find that much of the writing in architecture that deals with materials and making takes on a somewhat phenomenological tone, that I find at times unhelpful.

Architectural writers such as Pallasmaa and Nat Chard amongst others present an account of making or drawing and of materials that is very much subject centred. This places the maker at the centre of the process and as a consequence downplays or fails to reveal the critical role of other aspects, such as the active role of materials in making. Far from becoming obsolete, however, such writing may be reframed through a more contemporary lens and remain a valuable reference. An account of the subjective experience of an encounter with the material of a drawing medium can for example be turned on its head and reframed as an understanding of the affective agency of that medium.
A note on key terms;

The focus of this PhD has been the process by which designs and ideas develop in not only my own architectural practice, but also that of others. It follows then that where the terms making and material are employed in this dissertation, it is with specific reference to the act of making and the materials used in the design process, rather than the making and materials of buildings. Making may encompass the act of drawing, model making, and fabricating prototypes amongst other methods. Materials in this dissertation refer to the media through which these acts of making are engaged in.

Throughout this dissertation the term agency is used to describe the capacity for the materials engaged in an act of making to affect the course that such an act of making takes. Agency is a contentious term in contemporary philosophical discourse, and particularly so when it is used in relation to inanimate things – drawing media for example. To ascribe materials with agency in the context of this PhD is to draw attention to the fact that materials can and do have an influence over the way an act of making proceeds by exerting some degree of agency within the human-nonhuman assemblage that is the process of making. Such an understanding of agency draws on the thinking of writers such as Jane Bennett, and it must be acknowledged that ascribing a level of agency to inanimate things has raised various philosophical problems that continue to be debated. Bennett herself has acknowledged the provocative nature of this thinking and has sought to clarify that objects do not
have a will or intentions but nevertheless are powerful actants in operation with others. Bennet describes an actant as:

...an entity or a process that makes a difference to the direction of a larger assemblage without that difference being reducible to an efficient cause; actants collaborate, divert, vitalize, gum up, twist, or turn the groupings in which they participate.¹

It is this understanding of agency that has come to frame the way I consider making and material processes in this research, and whilst the complex philosophical problems around agency are worthy of engagement, this PhD has not sought to engage at great length in this discourse, as it is not the discipline of philosophy that I seek to make a contribution to, but rather the understanding of making practices within the discourse of architecture. The particular understanding of agency in relation to making adopted in this research is elaborated on in detail throughout this dissertation – particularly so in Chapter II.

A note on the focus of this research

This research draws upon various related disciplines beyond architecture where relevant. As noted above, this research does not seek to contribute to philosophical discourse, and nor does it seek to contribute directly to anthropology or the visual arts. Where relevant however, thinking, and/or projects

¹ Janell Watson, co-Sensibilities: An Interview with Jane Bennett, Minnesota Review 81, no. 1 (2013) 149
from these related disciplines have been drawn upon to enrich the arguments of the PhD – particularly in reference to materials and the making process. The work of anthropologist Timothy Ingold for example is instructive in understanding the role of materials in the making process.

The focus and scope of this PhD however does not include an exhaustive discussion of the implications of Ingold’s work for the field of anthropology. Similarly, my creative practice, which is examined through this research, is not in the visual arts, but in architecture. The work of visual artists therefore has been referred to only selectively, where productive parallels could be drawn with my own work. A comprehensive review of arts practices that may otherwise have some relevance to this research was not deemed essential to undertake.

Physical making and materials have been the predominant focus of this research, firstly because this is reflective of my practice and where my interests stand. Secondly, making by hand continues to endure as a relevant field of enquiry within architecture and other creative practices. This relevance is evidenced by the large number of ongoing research projects of this nature, including many at the School of Architecture and Design at RMIT that have been developing alongside my own research. Although many of the ideas developed through this PhD correspond with the interests and concerns of those engaged in digital practice, it has not been the aim of this research to investigate those linkages in detail.
Finally, it is worth clarifying that although this research questions the role that conventional architectural representations play in practice, and the way these representations have been understood historically, the aim is not to undermine the importance or relevance of architectural representations within the discipline. Rather, the aim is to identify other ways in which drawings, models and other made artefacts and processes of making can operate beyond the representational.
A CATALOGUE OF PROJECTS

The following is a selective catalogue of project work that was undertaken over the course of the PhD candidature, and which formed key contributions to the development of the research. Throughout this document, projects are drawn on in a non-chronological manner where appropriate to facilitate discussions of various making and material processes. Whilst each project is discussed in greater detail throughout, the following serves to briefly introduce the project work and to act as an index to locate references to each through the document. Page numbers at the bottom of each project indicate locations throughout the document where the project is further discussed. This catalogue may also be read in conjunction with the catalogue of making methods that follows Chapter I.
ROYAL ADELAIDE HOSPITAL COMPETITION

Description
In 2013 zuzana&nicholas architects where shortlisted as finalists for the second stage of the Royal Adelaide Hospital (RAH) International Ideas Competition. The hospital was due to relocate from its present site to a new facility that was under construction in 2013 when the Office for Design and Architecture South Australia released an international call to architects for ideas to redevelop the existing RAH site. A collection of red brick heritage listed structures on the site had been somewhat overwhelmed by sporadic, large scale, and poorly master-planned development over a number of decades that had left the site in a congested, labyrinthine state. Our practice presented a scheme that edited out the non-heritage building stock and replaced it with a lower scaled set of public buildings and urban spaces. The proposal referenced the form and material of Adelaide’s red brick vernacular, including the heritage buildings on the site, with a terracotta roof canopy that stitched together the large, fragmented former hospital site. The material expression of the roof canopy partly developed out of mark making drawing projects that I was concurrently engaged in, including the Paper Carvings and Graphite Curtain projects.

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Pages 36; 38-41; 181; 243-244; 246; 252-254; 299
**Description**

The Graphite Curtain is a drawing installation that was completed for the Building Movements exhibition curated by Pia Ednie-Brown at the RMIT Design Hub in 2014. The project explores notions of the spatialised drawing, and the capacity for acts of making to reveal new understandings of the spaces that are engaged in the making process. The work consists of three scrolls of carbon-coated paper that are perforated with repetitive marks across the length of the scroll, and were installed – curtain-like – from the ceiling of the Design Hub exhibition space. Sitting somewhere between drawing and spatial installation, the work reacted dynamically with the space within which it was housed – billowing gently with the movement of air through the building, and filtering light and views through its perforated surface. Opportunities for drawings to act beyond the representational are brought to the fore with this project, which emphasises the material and spatial potentials of the drawn surface.

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*Pages 42; 44; 45; 147; 166-171; 178; 180; 181; 248; 283; 305*
THINK BRICK COMPETITION

Description
A proposal for a series of brick follies sited in the Brisbane River flood plain formed our practice’s entry to the 2013 Think Brick Ideas Competition. The proposal was developed through a series of coloured pencil renderings that sought to describe a material surface quality that gained its particular expression through the repetitive, free-hand pencil marks that rendered the brick surfaces. It is the particular surface quality arrived at through an aggregation of similar, but subtly varying marks that is of value here. Each mark on the page correlates with the stacking of a brick – the individual placement of which contributes incrementally to the expression of a larger surface. Parallels can be drawn between the making methods employed in this project and others that achieve material expression through aggregated gestures / mark making, including the Paper Carvings, Graphite Curtain, Graphite Drawings and Wall Paper Carving.

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Pages 46; 48; 49; 142; 143
RED HILL STUDIO

Description
A studio workspace designed and built to house zuzana&nicholas architects, consisting of new interventions inserted into the undercroft of an existing timber cottage in Red Hill, Brisbane. The project allowed for reflection upon the wilfulness of existing building structures and the visceral experience of constructing new interventions within such spaces. The construction of new window joinery, doors, walls and tiling was undertaken by ourselves, circumventing the need for a comprehensive drawing set to communicate design intent to a builder. Loose drawings were made, but details of the design had to be adjusted and resolved in the act of making to respond to the raw and chaotic quality of the existing space.

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Pages 11; 50; 52-57; 200-220
workers cottage above

new works

existing undercroft
RED HILL BUNKER

Description
A speculative project for a bunker-like studio space at the rear of an existing timber cottage in Red Hill, Brisbane. This project was concerned with exploring casting as a method of making – inspired by the rough DIY cast concrete that exists underneath and alongside the existing cottage that occupies the site. A series of drawings and models were produced in graphite and plaster that progressively developed ideas of surface expression through casting processes. Attentiveness to the nuances of each artefact drove the project forward, by informing the course that each subsequent iteration of making would take. Emphasis is placed on the correlation between processes of drawing, modelling by way of casting, and constructing buildings through similar methods. Again, the capacity for drawings and models to act beyond the representational is of interest here.

Index
Pages 32; 58; 61-63; 82; 84; 93-100; 122; 136; 138; 305; 318
ALBION HOUSE

Description
A commission to extend a timber Queenslander in Albion, Brisbane. Commissions such as these are typical of the scale and type of project that small architectural practices in Brisbane attract – alterations and additions to the city’s vernacular housing stock. The undercroft beneath the existing elevated timber building is quintessential of houses in Queensland – a space typically enclosed by an informal timber screen at the perimeter of the building – a charming, often rambling space that captures the imagination of anyone who has grown up or dwelled in a Queenslander. As many owners of such houses do, our clients had commissioned us to formalise this undercroft territory into habitable internal spaces. Although the undercroft was to be formalised, our interest in these raw spaces led us to find ways to carry forward the qualities of the undercroft in the renovation works. The project consequently included the design of a timber screen – evocative of the original battened enclosure, referencing the vernacular context, and which was developed through an extensive series of paintings that studied the effects of colour and light in space. The project corresponds with others that work with methods of mark making, by achieving an expression through repeated, similar elements or ‘marks’ – in this instance the repeated components of the timber screen.

Index
Pages 64; 66-69; 262-280; 302
PAPER CARVINGS

Description
An ongoing drawing experiment that involves the generation of a textured surface by carving into the face of a heavy sheet of watercolour paper with carving tools. The project explores an interest in material surface expression that is arrived at through the aggregation of similar by subtly varying, repeated gestures. The completed works draw attention to the material qualities of the page in its own right, often otherwise suppressed when paper is treated as a substrate for another medium. The quality of surface achieved in the Paper Carvings influenced the development of the material expression for the RAH Competition project.

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Pages 6; 9; 70; 72; 73; 130; 146; 148; 238-234; 240
GRAPHITE DRAWINGS

Description
A series of drawings that again question the relationship of applied medium to substrate. Pages of lightweight newsprint are filled edge to edge with thick graphite, such that the mass of the applied medium rivals that of the substrate. The drawings avoid a figure-ground composition by extending the graphite to the edges of the page, suggesting (as do the paper carvings) that the marks that fill the page may continue infinitely beyond its limits. At first inspection, the drawings appear as a black mass with little expression, however when viewed in glancing light a field of marks become apparent that reveal the gesture by which the graphite was applied. There are overlaps here with the drawings produce for the Red Hill Bunker, where graphite is ‘cast’ into a page, but then selectively removed to reveal a figure. The gestures that form the expression for the Graphite Drawings, also become integral to the expression of the figure in the Red Hill Bunker.

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Pages 14; 74; 76-77; 151; 152; 153; 154; 248; 249; 250; 318
WALL PAPER CARVING

Description
A project that explores the spatial agency of drawing and mark making by working directly into the face of a wallpapered interior surface. The wall paper, dating from the 1970s, adorns the surfaces of a room in our house – a timber workers cottage in Brisbane, built in the early 1900s. Tracing the pattern of the wallpaper with a carving tool results in a relief pattern that serves as a trace of the original surface texture, which was subsequently painted over in the process of associated renovation works. ‘Drawing’ into the surface of the space builds a narrative about past occupations of our house that we continue to add to and alter with our own occupation.

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Pages 10; 78; 80; 81; 191-194; 219
RAY ROAD HOUSE

Description
A residential extension project that included the production of cardboard and balsawood models – a process akin to a three dimensional sketch, with a corresponding level of improvisation and approximation in the making. A less deliberate and methodical approach to model making is afforded by the use of cardboard and balsawood – the models are easily edited and altered along the way, often resulting in a rough and improvised product, and allowing for the adjustment of ideas mid-process. This is in direct contrast to the use of plaster casting as a model making method for example, where adjustment occurs with each iteration of the model, rather than in the middle of the process. Methods of making that are quick and flexible are well suited to a commissioned project such as this with its time and financial constraints, and where client feedback directs the development of the design,. The project was under construction at the time that this PhD was submitted for examination.

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*Pages 82; 84; 85; 140; 141*
KENILWORTH AMENITIES COMPETITION SCHEME

Description
A proposal for a set of public amenities in a rural setting that continued the two and three-dimensional making investigations that commenced with the Albion House. The proposal takes the form of a large billboard like structure that references roadside structures and timber agricultural constructions found throughout Kenilworth and the Sunshine Coast hinterland. The design proposal seeks to embed itself in the landscape of Kenilworth and its surrounds, and hence become part of the broader experience of that landscape as one moves through it. By inflating the scale of the architectural intervention, the building can be read at the scale of the landscape – a wall or billboard scaled surface that directly engages with passing motorists as they move through the valley, allowing this project to become an iconic marker for the town – more than just a roadside rest stop and public toilet. The painted timber screen is applied with contrasting colour hues to opposite faces that vary with the direction from which it is approached, and subtly shift as vehicles pass by as more or less of each surface colour comes into view. As the culmination of an ongoing series of making processes, this project served as evidence of the value of making and attentiveness to material nuances of design media as a means for generating ideas.

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Pages 86; 88-91; 276-278; 305; 312
The house is a timber-framed workers’ cottage, bearing evidence of decades of alterations performed by a previous owner who happened to craft tombstones for a living. As a result, many of these alterations were undertaken in concrete and terrazzo; concrete planter beds, terrazzo kitchen counters, tiles and shower hobs, concrete topping slabs poured directly over timber floors, concrete stumps replacing what would have once been timber; and most notably, an incredible terrain of concrete slabs that formalise the undercroft beneath the elevated cottage. The Red Hill Bunker is a project for a one room cast in situ concrete studio in our backyard, the desire for which developed out of a fondness for the house we live in that occupies the rest of the property.

The drawings and models produced for this project work through the notion that there might be a correlation between the process by which the drawing or model is made, and the process through which the architecture is made. The process of designing began with the production of a series of plaster cast models that were the very first stage in testing ideas for form and material surface. The use of cast plaster was deliberate, as it allowed for a study of casting methods that
suggest specific outcomes – perhaps similar to those found in the existing house. Casting is a unique process where a significant proportion of the effort of making is concentrated in the production of a mould or formwork that will ultimately be discarded, and where a plastic medium that can conform to the contours of the mould is required. These characteristics of the casting process inform the outcome of the making and the way that the design proceeds.

The nature of the material from which the formwork is fashioned – in this instance 4mm plywood and balsa – determines the level of detail and articulation that can be achieved in the resulting cast, and in this instance also contributed to the texturing and patina of the cast surface. The grain of the plywood veneer imprinted itself in the face of the model – generating a striated surface, and leaving behind a subtle stain of red-brown from the tannins in the timber. The nature of the plaster, much like concrete, dictates a homogeneous, solid expression – the material begins to fail at acute corners, producing feathered edges that chip and fall away.

The first set of models were deliberately produced prior to the production of any drawings, so as to avoid the predetermination of geometry that occurs when drawings precede a model making process. A degree of happenstance is embedded in the outcome of the cast models as a consequence – the result of undeveloped, partly preformed ideas and the wilfulness of an imprecise method of making.
The subsequent iteration in developing the project involved the translation of the cast models to drawn form. A series of plans, sections and elevations were generated that attempted to work through the notion of *casting* a drawing. Having mapped out the skeleton of the built form on the page, the extents of the paper where filled with graphite and charcoal, in the same way a mould receives plaster, porcelain slip or concrete, with the sketched skeleton acting as the positive around which the medium flows, allowing the form of the plan or elevation to be revealed.

Subsequent iterations of the elevations proceeded without the mapping of an elevation, simply filling the page and then subtracting the graphite with drawing tools, as though one were carving a positive solid, revealing a figure within the dark mass on the page, and generating a very particular surface expression, the result of remnant graphite that was too stubborn to be removed, leaving a striated texture within the figure of the elevation.

Having produced the rendered studies in graphite and charcoal, the process shifted back to a casting process employing plaster and balsa wood moulds. Rather than attempt to cast the entire form of the building, the casts were intended as a direct extension of the drawings and so took the form of relief elevations that were a study of surface texture and expression. Using balsa from which to construct the moulds allowed a certain amount of precision in articulating the surface — like making an architectural model in negative. Balsa is also soft enough to receive marks
etched into its surface—a wood block carving tool gouged valleys into the face of the mould that approximated the marks made in graphite and charcoal in the prior drawings.

Once cast, the relief elevations depart from the drawings that had preceded, in their capacity to receive light and shadow in the depth of their surface, therefore setting up a dynamic relation between the artefact and space it occupies. This was all anticipated to a certain extent—I knew that the value of making the casts was that they would reveal how the striated surface could impart tactile and spatial affects. What is difficult to anticipate however is how the wilfulness of the plaster will shape the making process. Despite having carefully constructed a mould with precise and sharp corners and junctions, the casts took on their own qualities as a result of the wilfulness of the plaster; corners became rounded where the liquid plaster slip couldn’t quite reach; clefts and folds formed around air pockets; and where angles in the form became too acute, the plaster edge feathered and chipped away.

The artefact presented a kind of dilemma, or maybe a little ripple or disturbance of the process; raising questions about whether to dismiss these occurrences in the model as unfortunate mistakes or accept them as novel innovations to be exploited and taken forward in the project?
I
THINKING IN THE MEDIUM / HOW AND WHY DO I MAKE?

Introduction

The initiation of this doctoral research coincided with the formation of an architectural practice with Zuzana Kovar. The agenda for my research from the outset therefore was partly an attempt to define how we wished to go about practice on our own. I’m not drawing the research out of an existing, developed body of work, but rather the research is emerging from within the practice. I’ve always valued and enjoyed modelling and drawing with physical media and have been disappointed by the lack of engagement with these modes of making in practice, where digital tools predominate. However, rather than position the research as a critique of how others practice or to weigh into a digital versus analogue debate, my research is a way into understanding how and why I make, how it can become a productive part of my practice, why I value physical media, and how those media affect and hold agency within the process.

I’m concerned with these questions because, whether it be the case or not, I self-consciously feel that making by hand has become an extraneous activity in contemporary architectural practice. The value of practice-based research is of course that it has the capacity to sharpen the focus and
clarify the specific interests and working methods of the practitioner whilst also seeking to contribute more broadly to knowledge by addressing concerns and questions relevant to the discipline as a whole.

By examining my own practice of making, I’m also attempting to contribute to a broader understanding, and in this chapter I’ll begin by developing a detailed picture of the complex nature of making processes in architecture. Such a task will by necessity draw on existing discourse in the discipline, including a review of the longstanding view of making, and in particular drawing within architecture. I’ll also attempt to extend that discussion by reflecting on my own understanding of making from personal experience, and that of other creative practitioners such as Patricia Cain, along with recent thinking on the subject by writers such as Tim Ingold amongst others who have sought to articulate the relationship between mind, body and material. The questions that sit behind this first chapter, and provide much of the impetus for embarking on this research as a whole are; How and why do I make? and; How can making be understood as a mode of thinking?

In a practice that by necessity produces large amounts of computer generated material, where does making by hand find a productive place? Perhaps the key to addressing this question is to understand that making by hand is a way of thinking with a physical medium that yields a specific way of
understanding a design problem or an idea. Both drawing and modelling in architectural practice oscillate between the role of representational device, and the means through which we think about design and develop ideas. Of these two, it is the latter, processual aspect of making that I am most interested in understanding.

Through practice, I’ve come to know the process of designing as being the accumulation of numerous small decisions that aggregate to form the design for the subject of that process – whether it be a house, an object or an exhibition. So how do we come to form these judgements? Very often, for me at least, it is through the act of making. Drawings and models synthesise a whole array of concerns and ideas for a project and give them graphic or physical form. The resultant drawing or model allows us to pause for a moment and reflect and make judgements about aspects of the design based on what we hold in front of us, arriving at decisions that are fed back into the process, with the next iteration edging closer to a resolution. In this sense, making can be understood as an act of working and thinking through a problem. But how exactly does making relate to thinking and what role does the medium of the drawing or model play in this process?

*Conceptions of Making*

When one experiences making first hand, it becomes apparent that it is a process of emergent form rather than an infallible execution of a predetermined idea. An external,
objective witness to a made object, might presume that the outcome correlates perfectly with the maker’s intentions – yet as a maker myself, I know this to rarely, if ever be the case.\textsuperscript{2} If I am to develop an understanding of what it is like to make, and how ideas and forms emerge and are transformed through making then I might hope to productively engage with the parameters of this process.

Over the course of the PhD I’ve encountered a number of conceptions of the process of making, both within architecture and other disciplines that are worth briefly recounting here, so as to give a sense of the various ways making is conceived of within the existing discourse on the subject. Amongst these theories of making, including amongst others, the writing of Tim Ingold, Jonathan Hill, Mark Wigley, Robin Evans and Juhani Pallasmaa, there are a number of views that have some degree of accord with my own experiences of making, but also others that seem to be at odds with what I’ve observed in the act of making. Over the subsequent section I’ll attempt to reconcile these various views with my own.

In \textit{Making: Anthropology, Archaeology, Art and Architecture}, Tim Ingold suggests that historically, within the four disciplines that are the focus of his book, academic writing has privileged the image and the object over the process

\footnote{The assumption that intent can pass through a making process and the outputs remain unchanged or unaffected also defines the aspiration of architectural drawings in relation to the buildings they are used to build. Anyone who has been exposed to the process of building construction could of course readily poke numerous holes in this assumption.}
through which either come to be formed.\textsuperscript{3} For Ingold, such a focus on image and object, or the input and output of a process, is consistent with a hylomorphic model of making – where form is imposed on inert material;

The hylomorphic model, Simondon (2005: 46) concludes, corresponds to the perspective of a man who stands outside the works and sees what goes in and what comes out but nothing of what happens in between, of the actual processes whereby materials of diverse kinds come to take on the forms they do.\textsuperscript{4}

I am concerned with \textit{knowing} making from the inside, and my own experiences of grappling with materials in an attempt to give form to an idea feels consistent with Ingold’s reading of making as not so much the imposition of form onto mute material, but as a confluence of forces and materials within a form-generating or morphogenetic process.\textsuperscript{5} To assume that a made artefact has its perfect correlate held in the mind would also suggest one enters into a task of making with the aim of perfect replication of an idea or model. Though this may be the case for some, it directly contradicts the pleasure that I think most makers, myself included, take from entering into a process of making, of working with material, and the satisfaction at the unexpectedness of the result. Archaeologist Carl Knappett observes the same tendency


\textsuperscript{5} Ibid., 22.
that Ingold identifies, wherein someone who views making externally infers intention or input from the made object. Knappett describes this as a reverse engineering of the process, or an *a posteriori* perspective that does not sufficiently account for the emergence of ideas in the act of making and the tempering of intent by the wilfulness of the process.\(^6\)

In contrast to this view – of looking back to the process as reconstructed through the object – is the forward looking, or *a priori*, perspective of the practitioner who moves forward with and follows the flows of the materials. \(^7\) Knappett in other words is characterising an *a posteriori* perspective as one where only the final made object is encountered, and assumptions are made of the process of making through an analysis of the object, whereas an *a priori* perspective is one with direct knowledge or experience of the making process that *preceded* the object.

What is it about the way that we view an object that would lead us to conclude that its outward form was always assured and never a thing of conjecture? This would be to privilege the form of the object as it appears to us now, over the process by which it came into being, and the processes by which it continues to become (because how can we presume that it is finished?). I’d have to imagine that such a position could only be maintained by remaining ignorant to what it is


actually like to make that object and any understanding of the role that materials play in the process – consider for example the different level of appreciation that one might derive from an artefact if that person were to have first hand familiarity with the materials and processes through which it were formed. And yet, we are told by Ingold that it is within disciplines such as art and architecture, which presumably are familiar with the processes of making – image and object have still been privileged over process.

Ingold is among a number of thinkers who have claimed that the discipline of architecture has a propensity to conflate abstract ideas held in the mind, with lines on a page, and those same lines with physical form in the building. Such a position subjugates the importance of the processes of making both drawings and buildings – it is an a posteriori perspective, as per Knappett, that privileges object / outcome over process. Most of these thinkers (Ingold included), trace this prejudice back to the advances that the practice of drawing made in the Italian Renaissance, during which time drawing became the definitive skill of architects, distinguishing them from the stonemasons of the day.

Jonathan Hill picks up this critique in *Immaterial Architecture*, tracing the etymology of design, to the Italian word *disegno* – a term brought into popular use by the 16th century Italian architect Giorgio Vasari, and which translates as both to draw a line and to draw forth an idea. Hill notes that this forms the basis for an understanding of drawing as the recording of an
idea formed in the intellect.\textsuperscript{8} Such an understanding of
drawing quite obviously marginalises the material aspect of
the act, which for me plays a key role in the process. Hill
acknowledges “…a concept latent in disegno is …that ideas
are superior to matter”\textsuperscript{9} Not only is this an incomplete
characterisation of the process of drawing – that it is
principally intellectual – but it clouds from view the richness
and complexities that can be accessed through an
engagement with the material potentials of making. It is
debatable whether this view of drawing (or modelling), as a
matter of directly translating idea to page is also held in
practice.

I suspect that most practising architects would describe a
process of gradual, iterative evolution of ideas that require
‘testing’ through the production of drawings, models and
other artefacts. Juhani Pallasmaa in \textit{The Thinking Hand}
gives one of the better accounts of the non-linear nature of
architectural design;

\begin{quote}
Design is a process of going back and forth among
hundreds of ideas, where partial solutions and details
are repeatedly tested in order to gradually reveal and
fuse a complete rendition of the thousands of
demands and criteria.\textsuperscript{10}
\end{quote}

\textsuperscript{9} Ibid., 39
\textsuperscript{10} Juhani Pallasmaa, \textit{The Eyes of the Skin}, (West Sussex: Wiley, 2012), 108.
Pallasmaa also rejects the idea that creative thinking involves unexpected and effortless flashes of insight, likening it instead to labour, and points to the value of maintaining a mental state of uncertainty, hesitation and undecidedness as a productive force in the process.\textsuperscript{11} This state of uncertainty refocusses the emphasis on the process itself as the site where the idea emerges. I’ve also found parallels to this notion within descriptions given by practising artists of shifting in and out of conscious and sub-conscious modes of thinking and states of ‘not knowing’ whilst making. Drawing practitioner Patricia Cain is one such artist who I’ll return to later.

Pallasmaa’s account of designing as being tentative, iterative and slow, hardly seems to uphold the notion of \textit{disegno}, where ideas flow seamlessly from mind to page, and yet when Pallasmaa describes the dynamic between hand, eye and mind he ascribes the pencil with the role of a \textit{bridge} between two realities – that of the physical drawing and the mental space that the drawing depicts.\textsuperscript{12} I would like to imagine, and attempt to demonstrate, that the process of making within the context of design is a more complex process than would be suggested by a \textit{bridge} (which is no better than any other linear metaphor – conduit, highway etc.) between mind and drawing.

\textsuperscript{11} Ibid., 110.
\textsuperscript{12} Tim Ingold, \textit{Making: Anthropology, Archaeology, Art and Architecture} (Oxon: Routledge, 2013), 60
Ingold, who like Hill takes issue with the concept of *disegno*, also finds cause to critique Leon Battista Alberti’s notion of lineaments;

...a precise and complete specification of the form and appearance of the building, as conceived by the intellect, independently and in advance of the work of construction (structura).\(^\text{13}\)

Ingold goes on to equate the Albertian lineaments with Euclidian geometry in lacking anything by way of body, colour, texture or any other tangible quality.\(^\text{14}\) Mark Wigley adds to the argument in his article *Paper, Scissors, Blur*, concluding that following the advancement of drawing during the Renaissance, the work of the architect could henceforth be considered theoretical, rather than practical, and that the drawing became indistinguishable from the idea.\(^\text{15}\) For Ingold and Hill, the main concern of their critique is to break down the fallacy of equating the drawing with the building, which for the authors, diminishes the role that skill, creativity and craft plays in the construction of the building itself;

It has, of course, long been the conceit of the architectural profession that all the creative work that goes into the fashioning of a building is concentrated in the process of design, and that the subsequent

\(^{13}\) Ibid., 50.
\(^{14}\) Ibid., 51
phase of construction adds up to little more than its realisation in the proverbial ‘bricks and mortar’ of the built environment.  

We can see then that there has been a sustained critique in recent times of the historical understanding of drawing in architecture by writers including Hill, Wigley, Ingold and numerous others. It is important to note however that it is the fallacy of equating drawings with buildings that is the subject of their critique, rather than that of equating ideas with drawings. Unpacking this fiction is also the central tenet of Robin Evan’s texts Translations from Drawing to Building, and The Projective Cast. According to Evans, architecture has been concerned with the maximum preservation of meaning and ideas between drawings and buildings.  

However, where these writers are (quite rightly) reasserting the significance of the actual act of construction, my particular focus is the role that making plays in thinking and the development of ideas in the design process itself, and furthermore, the role of materials and media in this process – in other words the act of designing the architecture, rather than that of construction. Acknowledging this interest in my practice can partly address the question, why do I make? Part of the impetus for emphasising making as a key concern within my practice is this interest in pursuing a process where daily acts of making – drawing and modelling – inflect the  

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way a design process proceeds and the work of architecture that emerges.

Amongst contemporary anthropologists, of whom Ingold is a prominent example, we find a push to understand the process of making beyond the made object. Ingold characterises the way of the maker as the *art of inquiry*, where knowledge emerges from practical and observational engagements with the fluxes and flows of the materials with which they work.¹⁸ This approach to making shifts the focus away from a predetermined idea or image, which is imposed upon material, towards a process where ideas, knowledge and form emerge in the making. Ingold refers to this engagement as a *correspondence* with materials. It is a conception of making that draws upon material thinking that has developed over the preceding two or three decades that has ascribed agency and dynamism to matter and moves us away from the notion that materials are inert and fixed. Ingold draws on the philosophy of Gilles Deleuze and Félix Guttari in establishing his own material thinking and the implications it has for making;

…whenever we encounter matter ‘it is matter in movement, in flux, in variation’, with the consequence that ‘this matter-flow can only be followed’ (Deleuze and Guttari 2004: 450-451). Artisans or practitioners who follow are, in effect, itinerants, wayfarers, whose

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task is to enter the grain of the world’s becoming and bend it to an evolving purpose. 19

To suggest that a maker follows the flows of matter, is an entirely less egocentric portrait of the maker than is suggested by a model where one masters a material and exerts form upon it. It also strongly implies that the materials – the media – with which we make hold a significant agency within the process and affect the forms that emerge, and this is exactly what I’m interested in better understanding – the agency that the medium exerts within the process of making; “Quite clearly, the properties of the material are directly implicated in the form generating process,” as Ingold says. 20

It would be wrong though to presume that the maker blindly follows materials without any preconceived ideas or notions of where the making is headed. It might be useful to place different types of making on a spectrum that is defined by the degree to which ideas are preformed prior to the act of making and the degree to which forms are anticipated. One might for example enter into an act of making with no intention other than to see what is possible in working with a material. At the other end of the spectrum, the making could be guided by quite well formed ideas that evolved via preceding iterations of making – and I think it is this scenario that we are most familiar with as architects, perhaps the former might be more familiar to certain visual arts or craft

20 Ibid., 45
practices. *Following the flow* of materials to me also seems to suggest a kind of harmonious and agreeable engagement with materials in making, but might it not be possible to go against or across the flow, to struggle with materials and experience a kind of friction? Ingold gets toward something of this when he states; “It is precisely where the reach of the imagination meets the friction of materials, or where the forces of ambition rub up against the rough edges of the world, that human life is lived.”

In outlining his understanding of materials, Ingold rails against the notion of objects in all their static fixedness, and instead adopts Martin Heidegger’s notion of the *thing* as a key frame of reference. In a world where materials are constantly in flux, we nevertheless encounter artefacts that have a recognisable and relatively stable (though not static or mute) form. In this context, Heidegger’s *things* allows Ingold to discuss these artefacts without resorting to the rhetoric of objects – things instead are a “gathering together, or interweaving of materials in movement,” as Ingold summarises.

In *Making*, Ingold provides an extended critique of the emergence of academic thinking in recent years that has attributed agency to objects, including in particular, Jane Bennet’s *Vibrant Matter*. Although Ingold holds many of the same views as Bennett – that materials are inherently lively,

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and that it is necessary to counter human exceptionalism – he argues that “…the attribution of action to an ‘agency’, of which that action is the effect, is perverse.”

Neither objects, nor humans hold agency Ingold argues, but are rather possessed by action – and only by reading that action retrospectively back to an apparent root cause could one conclude that anything has agency.

Ingold’s distinction between material action and agency may be an important one in consideration of what it means for making. It may be that the actual distinction in terminology between action and agency is beside the point however – for if something is possessed by action, and that action affects an outcome, then surely we could attribute that thing with agency?

The key point ought to be what we mean by agency, and I get the sense that the sticking point for Ingold in Bennett’s thinking is that object agency seems to be ascribed with intentionality. Materials form, shift and decompose of their own accord – they act, but with not the least bit of intentionality. This for me is critical to an understanding of making as it not only reinforces the conception that firstly materials are not static and inert, but secondly, neither are they dependent on our intervention to illicit a response or action, but rather are already constantly in flux. Whilst the act of making then might be a momentary coupling of materials

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24 Ibid., 96.
(of the media, of our bodies, mind and environment), the materials pre-existed the act, and will continue to exist subsequent to it, even while the act of making has shifted the direction in which the materials unfold. The making has produced a thing – a “gathering together, or interweaving of materials in movement.”25 Exactly what we can understand by the term agency in relation to design media is an issue that I will continue to unpack in chapter II.

It is a deeply immersive picture that Ingold paints of making where we are embedded in material flows – sometimes it feels that Ingold gets us so close to the material that we can no longer see or feel the thing we’re making, we can only perceive the grain of its matter. If this is the case, is it possible to put enough objective distance between oneself and the material, so as to evaluate where the making might be headed? Archaeologist Carl Knappett approaches this question in his essay titled Networks of Objects, Meshworks of Things found in Ingold’s edited book Redrawing Anthropology. Knappett notes that the “injunction to ‘follow the materials’ resonates at the microscale”26 but what happens should we wish to zoom out, gain critical distance, and observe or record relations between materials and their flows?

Is it not useful to take a step back and recognise that the grouping of matter that we’re working with might be an object – a lump of wood perhaps – that has known tendencies, perhaps to splinter, or rot with repeated exposure to moisture, before diving back in and finding where the grain of its material leads us? Knappett advocates for a shuttling backwards and forth between these two scales of knowing materials, and for me this seems a productive understanding.

It is useful at this point to shift from Ingold and Knappett, who are writing as anthropologists, to others who are practised makers – artists and craftspeople – who can provide a first hand account of acts of making. Patricia Cain is one such artist who makes a comprehensive study of what it is like to think through making as a drawing practitioner in her book *Drawing: The Enactive Evolution of the Practitioner*. In many respects Cain extends beyond what Ingold is able to achieve in describing the process of making, precisely because she is a practised maker. Cain’s investigation to understand how we think and come to know through drawing is prompted by a hunch that not consciously *knowing* what one is doing is a productive aspect of making a drawing.\(^\text{27}\)

That the outcome of the drawing can perhaps be anticipated but not *known* from the outset, or even throughout the process, lends weight to the idea that form, as Ingold establishes, is emergent within making practices rather than predetermined.

\(^{27}\) Patricia Cain, *Drawing: The Enactive Evolution of the Practitioner* (Bristol, Intellect, 2010), 18.
Cain foregrounds the investigation into her own drawing practice with theories of cognition and embodied thinking developed by biologist Francesco Varela, including autopoiesis, a theory that understands living organic systems to be defined by the processes and relations through which they come to be formed rather than the physical material of the components of the system. This grounding allows us to understand the drawing practitioner as being part of a system, rather than acting independently and external to the process.\textsuperscript{28} Cain goes on to ask; “As a living system, could the drawing practitioner be considered a ‘domain of interactions’?”\textsuperscript{29} For me, this makes for a more vivid description of what it is like to draw – whereas to follow the flux and flow of materials is rather an abstract notion, to understand the maker as a living system defined by processes of interaction, both cognitive (invisible), and material (physical, spatial and bodily) starts to paint a picture of the real interactions and affects that flow back and forth between the maker and the material.

The second theory of Varela’s that is key to Cain’s enquiry is that of enactivism; the idea of embodied thinking – that the mind is not only in the head but also in the body and the external environment with which it interacts – the active loop between brain, body and environment.\textsuperscript{30} With respect to drawing practice this begins to allow us to understand the

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\begin{itemize}
  \item \textsuperscript{28} Patricia Cain, Drawing: The Enactive Evolution of the Practitioner (Bristol, Intellect, 2010), 49
  \item \textsuperscript{29} Ibid., 50
  \item \textsuperscript{30} Ibid., 51.
\end{itemize}
I started to think of drawing as a method by which to explore the world in its own right instead of being simply a matter of representing an outer world.31

I’m attracted to the notion of drawing as a method of exploration rather than representation, as it helps to articulate part of the impetus behind why I draw or make as I do – to reveal the affect of a gesture upon a surface, or to place one colour next to another in space and in the process produce an artefact that does something in its own right, as well as telling us something of a quality that may be translated to a building. This is different altogether to producing a drawing or other artefact as pure representation that neither holds nor reveals any of the qualities of the subject of that representation.

It is important to note that I’m referring here to architectural representations, which have a specific character and meaning, as compared to how the notion of representation might be understood in another discipline, such as the visual arts for example. Architectural representations – which I will unpack further in subsequent chapters – are conventionally understood as a vehicle for transmitting information for the fabrication and assembly of building components, largely achieved via well-established written and graphic codes. As a

31 Patricia Cain, Drawing: The Enactive Evolution of the Practitioner (Bristol, Intellect,2010), 52
result, the status of an architectural representation as an artefact, with its own material qualities and presence is rarely acknowledged. I’m conscious to also clarify at this moment that I don’t wish to undermine the critical role that conventional architectural representations play, or to negate their use and relevance in my own practice, but rather wish to clarify the specific role that they play in practice and how they might differ from other made artefacts.

By being attentive to the way in which artefacts are made, as an exploration of the world through an engagement with materials then we might hope to gain something new, as simple as it may be – perhaps the relation between the mechanics of visual perception and a composition of juxtaposed coloured surfaces, which becomes knowledge that may then be embedded in a design.

Cain’s notion of drawing as a means of embodied thinking and knowledge production seems to sit comfortably with my understanding of design as a process of aggregating decisions that are arrived at through an iterative making process. Another way of describing this is that design is the *thinking through* (in the sense of thinking through a problem, or working through a set of issues) that occurs within an act of making, and comes to form ideas that accumulate to define a *design*. I also find it useful to understand making (as Cain does drawing), as a system of interrelated processes within which we might understand the component processes to include ourselves as makers, the material media engaged in drawing and modelling, and the environment within which
this occurs. In many respects the making of drawings and models sits at the very centre of this system, as it is through their making that we synthesise all of these interactions into a design outcome. It is important to note that it is the role of the material media within this system of processes that I wish to emphasise, and it is this emphasis that allows the made artefact to depart from conventional architectural representations.

Translations – From Idea to Artefact to Building

If making can be understood as an act of thinking through and of consequently producing ideas, we might then ask what ideas perhaps existed prior to entering into the making process. Such a question confronts the problem of the relation between ideas, making, made artefacts, the translations between them, and in the case of architecture the translation to buildings. Cain acknowledges a sense of absentmindedness in the act of making, and although post explication is possible, knowing the direction that the process is leading when engrossed in the act is less accessible.  

Not all drawing or making tasks would necessarily be characterised by such conditions, but if a making process is to be explorative and to uncover new ideas, then it might best be embarked upon without absolute premeditation of the course that it will take; “I had a hunch that ‘not knowing’ what I was doing whilst making a drawing was as productive and

32 Patricia Cain, Drawing: The Enactive Evolution of the Practitioner (Bristol, Intellect, 2010), 17.
as formative in terms of thinking as any explicit account could be.”

What one doesn’t know is really the key question here, rather than ‘not knowing’ as such – one might proceed with an act of drawing for example with an established idea of how one will draw, including the medium to be used (i.e. a degree of premeditation), however one can not absolutely know what the precise outcome will be or what new understanding might be gained through the drawing without first engaging in the process.

A further question that Cain poses is that though predetermination may exist, to some degree it may be impossible for the act of making to not shift the course of the process in some way – lending weight to the notion that knowledge emerges from within the act rather than wholly existing prior. If I had not chosen to work with the materials and drawing method that I did for the Red Hill Bunker, then perhaps I would not have developed the idea to exaggerate the striated surface texture of the elevation that became the focus of investigation in later plaster casts. A small innovation admittedly, but one that was borne out of a making process nonetheless.

To return to the question posed in Making Anecdote 1: Red Hill Bunker – do we accept or dismiss the unintended consequences of an act of making? – I am most interested in

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33 Patricia Cain, Drawing: The Enactive Evolution of the Practitioner (Bristol, Intellect, 2010), 18.
the gains made by attentiveness to the forces that play and shift the course of the making and that consequently are translated to the made artefact. This leads us to the question of how ideas translate or move through an act of making to be embedded in an artefact that itself projects toward a built work of architecture?

The collaborative nature of architectural design and building production is more obvious and visible. …the many intermediaries and intermediary stages stretch and blur the link between idea and matter, author and product.34

Taking a closer look at the notion of translation between ideas and made artefacts such as drawings and models, I’d like to draw attention to the non-linear, emergent relationship between ideas and artefacts that I’ve experienced in my own work. Robin Evans states in his book The Projective Cast;

What connects thinking to imagination, imagination to drawing, drawing to building, and building to our eyes is projection in one guise or another, or processes that we have chosen to model on projection.35

IDEA / INTENT

translation from idea to artefact + generation of idea through making

feedback from artefact transforms idea

ARTEFACT
Whilst it may be a simplification of the process, it holds true that a building could be understood as a projection of an idea. Rather than being an unmediated projection from idea to building, however, sitting between the two are of course artefacts of representation produced in design, by the architect, including drawings and models and prototypes that serve as the medium of design and the means through which ideas are translated to buildings.

Continuing to flesh out this process we can identify thresholds between ideas, artefacts and buildings that are defined by the acts of translation between these respective states. It is the act of making (of drawing and modelling) that seemingly bridges the gap between immaterial and material in moving from idea to artefact, and the act of construction that translates artefact to building. But is it really the case that ideas and artefacts sit either side of a gap or threshold, bridged by making? Are the relations truly as linear as this, or do ideas, artefacts and making occupy the same space and time and emerge concurrently rather than sitting either side of a ‘threshold’? As Evans notes in *Translations from Drawing to Building*;

> Architecture has nevertheless been thought of as an attempt at maximum preservation in which both meaning and likeness are transported from idea through drawing to building with minimum loss.\(^{36}\)

Evans makes his own well-known critique of this notion of preservation in his essay that emphasises the value in the difference found between drawings and buildings. Of course there are a number of other assumptions also worth challenging in this process – firstly that it is linear, and therefore also temporal – an assumption that requires that the idea pre-exists the artefact, and the artefact the building. My own experience of making has been that ideas, artefacts and buildings relate in a more horizontally, non-hierarchical, non-linear arrangement that allows each to co-exist and overlap with the other in time and space as far as the design process is concerned, so that the process is shown not to be linear, that the building is not an endpoint, that ideas persist after the work is built, and that the making of the artefact and the making of the building not only transforms the idea but that ideas emerge in the making.

The idea, the initial impetus for a work of architecture is complex, multi-faceted, difficult to pin down and more than likely only partially formed in the first instance. The act of making that constitutes the threshold between idea and artefact is therefore more than just a process of translation, but is in fact generative, where the idea emerges from a fragment to a more fully formed state through this act of making and is transformed in the process.

Finally, it is important to acknowledge that the representations of the building – which I refer to as artefacts - are not direct facsimiles of the building, but take abstract and coded forms that are particular to specific media and conform
to established conventions of architectural representation within the discipline, whether it be perspective or orthographic representation, scale models or digital models. I think our familiarity with these modes of representation as architects causes us to sometimes lose sight of just how abstracted and removed from the subject of the representation they really are. Rather than a linear process, the movement between idea, and artefact and building forms feedback loops, where the making of the artefact and of the building evolves the idea, and this feeds back into the process. And of course these feedback loops are iterative – with multiple drawings and models produced in a continual process of evolving the idea – each of these iterations affecting the evolution of the process.

Why Make? A Short Note on the Value and Pleasure of Making

It is worth acknowledging that there’s something gratifying and pleasurable about making. It also follows that the enjoyment that an act of making brings me goes some way to addressing the question; why do I make? Another aspect to the why, can simply be linked to the value that an act of making brings – that it generates ideas in the process, and is therefore productive. What interests me is that I feel that these two aspects of making – the pleasure and value derived from it – are inseparable. Put simply, part of the excitement and gratification of making is bound up in the experience of an idea emerging – when that idea
materialises in the form of a drawing, painting or model. It’s hard for one’s curiosity not to be piqued by the prospect of delving into what’s possible in a given material, or in trying to reconcile an emerging idea with a material form. In a discipline that is so intent on projecting toward future constructions, there’s something interesting in shifting the focus onto the present and immediate – the sensuousness of engaging with materials in an act of making.

What am I doing now at this moment, why is it important and what does it mean for my broader practice? What do I value or take pleasure from in my daily practice? It’s not simply enough for me to hold out for the completion of a project that may take years – or never come to fruition at all. I value a sense of production on a shorter time scale as well.

Whilst there are multiple factors that provide an impetus for, or shape the direction of an architectural project – anything from references to the history of architecture, to physical context and landscape, and not to mention client, brief and budget etc. – I also find it useful and rewarding to draw on a practice of explorative making through which to generate ideas that can bring a level of interest and richness to projects. It may be a spatial, material or other idea, and it can very often come about through an act of making that is otherwise extraneous to the pragmatic solution of a design problem. However it is also this way of working that in part helps to sustain my enthusiasm for making architecture. Making generates ideas, and an interesting work of architecture is in need of ideas.
The questions, around which this research is centred, are driven by a desire to understand my own process of designing. What exactly is happening when I’m making? What role do the materials I’m working and my own physical situation play in this? I know that my ideas have shifted as a result of having made an artefact but at what point did that happen, and how do I even embark on a making project if the direction in which it will unfold is unknown? It is a pre-existing condition of design that it is situated in space and is engaged with via a medium – and it is this that I am seeking to draw attention to, such that firstly this condition may be recognised for the agency it holds over architecture, and secondly, that we might be more attuned to innovations in design that occur in the process of making.

Rather than ideas and artefacts occupying two sides of a threshold, bridged by making, they rather occupy the threshold together, simultaneously, emanating from the one space. It is the act of making that draws forth both forms and ideas – this is a significant aspect to the question of how I make, how making proceeds and how thinking, ideas and making are interrelated. Making is plagued by uncertainty, tentativeness and friction between material media, the body of the maker and space – but can we reframe all of these qualities as productive agents in the design process rather than unwanted tensions?
The other aspect to how I make relates simply to the methods of drawing, painting, modelling and other processes that have been adopted and developed in my practice. Often these ways of making engage with media that are otherwise unconventional in the context of an architectural design process – specifically for the reason that these materials then have a way of actively shaping the manner in which the making proceeds. Why I make is, as I’ve described, partly motivated by the pleasure that can be found in an act of making, derived from the simple act of working with materials, but more significantly, also derived from the excitement of developing an idea and witnessing that emerge or materialise.
Aside from a theoretical explication of how making processes proceed, it is useful to collect and describe the means by which I make in a personal sense, in an effort to address both how and why I make. The following is a condensed selection of various methods that I engage in design processes, which reveal something about not only how I make, but also why a specific medium might be used over another. It should be noted that whilst digital methods of making also constitute a significant aspect how I practice, my focus here is on the explorative types of making that usually inhabit the early stages of a design process. CAD drawings by contrast typically occupy later stages of a project, and whilst critical to the process in other ways are of less interest to me in the context of this research.
A page is filled from edge to edge with graphite, forming a thick, opaque layer, using a solid block of graphite, rather than a pencil to apply the material. Once an even layer of graphite is achieved across the page I work back into it with an eraser to remove portions of the graphite across the page, allowing forms to emerge from the background of graphite. As a means for making drawings, this method is subtractive and evokes a process more like carving or casting a solid mass rather than the additive accumulation of lines that is typical of conventional drafting.
Casting has the capacity to make an object that is homogenous and massive in nature as compared to other modes of model making. As a result of casting from a hollow form – cast artefacts tend to emphasise exterior form and surface, principally because the model excludes the interior, which becomes solid and consumed by the material of the cast. Certain ways of making buildings can be anticipated by casting that would not be possible with a cardboard model for example. The casts that I make tend to employ moulds constructed from cardboard or wood. Although the final artefact becomes the plaster cast – almost all of the energy of the making process goes into the construction of a mould, and casting is a unique process in this sense, as it bears the evidence of two materials – that from which the mould is formed, and that of the plaster slip.
IMPROVISED MODELLING

The cardboard and balsa model is akin to the improvised sketch – the softness of the timber and the ease with which it is cut and shaped allow for a quick and fluid form of making and thinking. The results, like a sketch, tend to be crude in form, but are often potent with ideas. Adjustments can be made mid-process – which is distinct from other methods of making that require multiple iterations to allow adjustment.
Repeated marks aggregate to form a surface with unlimited, albeit subtle, variation. Much like the paper carvings, the combination of a medium and a hand gesture result in a particular mark that can be repeated, but will vary – with the sharpness of the pencil, or the weariness of the hand for example. The quality of the surface is derived from this subtle variation, that carries with it the traces of its making.
Layering of vertical bands of colour is employed to test various densities and rhythms of verticals and juxtapositions of colour. Acrylic paint when thinned with water attains a transparency that results in a perceived dimension of depth when the vertical bands overlap. There’s a moment of *materialization* when one colour is applied adjacent another where I come to understand how one effects the other – and though this moment can be anticipated, it’s never quite possible to *know* the result prior to the act of making.
Carving implies mark making – but with depth. Projects such as the Wallpaper Carving, Graphite Curtain, and Paper Carvings engage cutting and carving tools to work into a surface and lift its laminations, or perforate it entirely. By working into the depth of the surface the drawing approaches a spatial quality that is otherwise lacking where a drawing is made by laying a thin medium over a substrate.
MAKING ANECDOTE 2
HOW MUCH DOES A DRAWING WEIGH?

In his well known illustration of the preservation of matter in translations from one form to another, Immanuel Kant asks, *how much does smoke weigh?* Weight is not a property that one might intuitively associate with smoke, and so Kant’s query even now remains a thought-provoking reminder that smoke is in fact matter. In the making of a series of works I’ve labelled the *graphite drawings*, I was interested in the effect of filling an entire page with a thick layer of graphite.

By filling the page to the edges the drawings evade a figure ground relationship and the articulation of the drawing is reduced to the texture produced by the gesture of applying the graphite, which remains visible in the surface of the work. What is perhaps more interesting however is the relationship between the medium of graphite and the substrate of the paper, which in this case was a thin, fragile newsprint. By thickly applying a layer of graphite, the medium begins to consume the substrate and take on an equivalent or possibly even greater thickness and mass to that of the paper. The drawing becomes weighty (relatively speaking), and perhaps the relationship between substrate and applied medium becomes confused.

Drawing is a particular form of representation that we’re not accustomed to associating with qualities of matter, and yet it might be productive to ask, *how much does a drawing weigh?*
II
DESIGN MEDIA AND THE MATERIAL SITUATEDNESS OF MAKING / WHAT DO I MAKE WITH?

Introduction

Having established that the medium is a central aspect to the set of relations and interactions within a making process, it becomes necessary to articulate what exactly constitutes design media in an effort to understand its role in that process. Confronting this question is to consider; what do I make with? For me it is important to approach some of the complexity of design media that might be constituted by not only materials and tools, but also ideas and knowledge. An examination of the role of design media in relation to specific projects within my own practice will be set against instances where the notion of design media, often referred to as design tools, has been examined in architectural discourse.

Two aspects of design media will be unpacked through this examination – medium as material and tool; and medium as artefact. Finally, this chapter will seek to extend on my developing understanding of design media to consider additional aspects of the making process – its situated and materially engaged nature and the implications of this for the translation between ideas, artefacts and buildings. Robin Evan’s thinking again becomes a key reference at this point.
Defining the Design Medium

In coming to a clear articulation of my understanding of design media, it’s useful to examine the common usage of the term medium in the English language as a starting point. Amongst the various interpretations of the term medium, as defined by the Oxford Dictionary, there emerges a sense of an in-betweenness – both in the way that a medium can be understood as an average between two extremes, but also that it may be the intervening substance through which something is conveyed from one place to another, such as soundwaves through air or water or language as a medium that carries communication. In this sense a medium is also the means through which something is done, and the dictionary acknowledges the common understanding of the medium of the artist being the materials through which they work, citing oil paint as an example.

Furthermore, a medium may also act as something within which other things may be suspended or carried, such as a liquid (oil or water) within which pigments are suspended to form paint, or the nutrient-rich medium within which cells are grown in a laboratory. All of this gives a sense of a medium being a vehicle for transmission, of being a substance that can carry, hold or suspend things both material and immaterial (in the instance of language for example), and that the medium is between – it mediates. At its most fundamental level, a medium is an enabler. All of this
translates well to the way in which I understand the medium within the context of design. The design medium carries content – that content being ideas, or in other words, the design itself.

The medium becomes the means through which to transmit ideas and embed actions in the world, it affords us the agency to make. Making is always a making with and the medium is the thing with which we make. As the vehicle through which to transmit designs and bring them into being within the world, the medium also colours that transmission in the process. Just as the sentiment of a communication may subtly vary depending on the language (the medium) through which it is delivered, a design is nuanced by the particular medium through which it is carried.

To be specific, I see the design medium as being the vehicle that carries design intent, the medium within which ideas are formed and recorded. I say vehicle because it implies a vessel that can carry, but also suggests that it is going somewhere – being transmitted and received. Making within a design process is rarely for the sake of recording alone, but always going some place, progressing an idea and communicating intent. An understanding of the design medium in this way therefore can remain both broad and specific in the same instance, in the sense that it may encompass words, written text, drawings, models, computers and software, physical and digital tools, raw materials and our own bodies – any of the means through which we make designs come into the world. The design medium enables the
very act of design and therefore possesses a degree of agency within that process.

The notion of mediation suggested by the term medium implies a level of separation, however the medium itself is that with which we come into direct contact and enter into immediate relations with. This immediacy is important for me in the manner in which one engages with the design medium through the act of making in a design process. The lived moment in the act of making is constituted by the engagement with a medium being worked. Though one might be thinking about the implication of a line constructed in future space, we might simultaneously also take pleasure in the way a pencil turns a corner and makes a particular mark on the page. I’m interested in the moment where these two moments meet – the future projection and the act of committing form to a medium.

*Material, Tool and Artefact as Medium*

Two aspects or ways of understanding design media are necessary to identify and unpack – firstly the materials and tools that are engaged in the act of making; and secondly the artefact itself – drawing or model – that becomes the vehicle for ideas. The following section will begin by unpacking the former – medium as material and tool. This aspect of the design medium is consistent with the conventional understanding of the medium in the context of art practice – the painter’s oils or the sculptor’s clay – and is also consistent with historical descriptions of the means by which
architects draw – pens, set squares, tracing paper etc. In this sense, the medium could be said to be the material engaged with directly in the act of making. I would like to expand this conventional understanding of media to encompass all aspects of the apparatuses that architects engage in the generation of design ideas – from raw materials to language.

The other aspect to design media – beyond the materials and tools that are engaged with directly in the making – is the artefact itself; the drawing, model, maquette, prototype or other such artefact that is the focus and outcome of the making itself, and which becomes the vehicle through which ideas emerge and are carried, and through which a design is developed. It is difficult to distinguish between these two aspects of the medium, but they are joined by the act of making. The artefact as medium will be addressed in more detail later in this chapter – this notion of the medium is consistent with the way that Robin Evans refers to drawings as the means by which ideas are translated to a building. Identifying these two aspects to the medium is necessary and useful as it allows us to identify both the agency that materials and tools hold inside the act of making, and further the capacity that the artefact has to shape and carry ideas and meaning.

In architectural discourse, a more commonly used term to describe the means by which a design is brought into being is that of the design tool. Immediately bringing to mind implements and technology employed to make drawings and models with which to design and convey designs, the term
tool for me brings to mind an anthropological characterisation of these implements, and perhaps also an anthropocentric point of view, where the tool is the implement put to use by the master architect or draftsperson. By contrast, the term medium has other connotations (such as those discussed above) that allow it to be employed more readily in my discussion of the agency that it holds within the making process.

It’s necessary to clarify that I don’t see tool and medium as interchangeable terms – though a tool might form part of the armature or vehicle through which a design process is undertaken and so might be a component of design media, I simply don’t find the term ‘tool’ broad enough conceptually to describe all aspects of what I understand to be design media.

Elke Krasny’s book *The Force Is in the Mind: The Making of Architecture* presents a rich survey of the tools favoured by a number of architectural practices, both past and present. Despite the difference in nomenclature (Krasny favours the term tool), this research is nonetheless a useful source in the context of clarifying what I understand the design medium to be. In the opening essay to the book, Krasny poses the question; “How do the relationships and constellations between architects, their tools and their work spaces combine in the process of designing?”37 Krasny suspects that the way in which tools are used exerts an influence on the design act, its course, and the way it is represented and,

ultimately on the architecture itself. A ‘little lexicon of tools’ is offered as a final appendix to the book with brief histories and descriptions of the following tools:

-Pencil; tracing paper; sketchup; drawing pens; razor blades; cad; compass; stencil; indy; set-square; t-square; vectorworks; pantograph; print machine; photocopier; paper; Letraset; airbrush; Stanley knife; glue; 3D plotter; 3D modelling; Bezier curves; render engines; plasticine; hot wire cutter; methylen chloride; protective mask; needles; draw plates; chisels; tweezers; cutting matt; foam core; drawing set stamp; lettering machine scriber; lettering stencils; drafting table; dry transfer and rubbing pens.

Though fascinating as a historical survey of the tools used by architects, I find such a catalogue somewhat dry and unrevealing as to the role that such things play in the process of design. Each item on the list also conforms happily to a conventional understanding of a tool as an object, often held in the hand, and manipulated by a user. A richer and more nuanced understanding of the tool in architectural practice is revealed by Krasny’s conversations with both contemporary practicing architects, and former staff of influential modernists such as Alvar Aalto. Many various interpretations are offered to the understanding of a design tool; “a) Orchid, b) a rifle, c) pieces of Lego, d) cigarette ash, e) a bed, f) rustic chests, g)
trees, h) watercolours, i) solutions from the history of architecture, j) words, k) taking a stroll, l) cinema, m) suspended cords, …”39

One of the most interesting revelations from Krasny’s survey of practices is the degree to which language is treated as a design tool – in the sense that conversations, both with clients and within the practice, along with the written word are used to develop a practice’s thinking. French architects Lacaton and Vassal in particular express a preference for developing a project through conversation first before committing pen to paper so to speak; “A project develops for the most part through discussions, but also through plans in the computer.”40 So that the possible development of a project can remain indefinite for as long as possible and to avoid overhasty decisions, they delay producing illustrations. “In fact the important thing is the question of doubt, the possibility of remaining open to change”.41

Denise Scott Brown of Venturi Scott Brown & Associates also identifies the importance of writing to her practice, describing the private space within their office where she writes as a kind of cubbyhole, filled with volumes of past lectures; “Writing is a tool with clients, but it also explains our ideas to

colleagues from the world.” Though many practices canvassed in *The Making of Architecture* describe a consistent working method and set of tools that repeat from project to project, others describe a broader array of tools that are adopted for specific projects. Elizabeth Diller describes working closely with a seamstress who was pulled into Diller Scofidio + Renfro’s model shop to assist in the development of a light fitting using bag making techniques; “*I think more than almost any other studio the projects are so extremely varied that we kind of customize methodologies to each project.*”

What is of particular interest for me out of all of this is the breadth of what may be understood as the design medium. But also that there is an implication that specific media may be required for a specific project, enabling something in the process that another medium may not. When speaking with practitioners, the presence of the medium and its role within a design process can be keenly felt. In the recent publication *Process: Material and Representation in Architecture*, Gail Peter Borden also discusses the role of tools in design process. Though Borden gives preference to the term *tool*, he also seems to equate tools and media;

Technique is determined by the tool. The media and methods by which and with which something is represented has tremendous influence on the

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resulting outcome. Its form and perception are dependent upon this initial tool and its associated use to define method. The type of mark is determined by the tool and its intrinsic limitations and capabilities.\textsuperscript{44}

Borden’s focus in this book is the relationship between architectural representations and built form, and hence the tools discussed in this instance tend to be drawing tools and an emphasis is maintained on the historical development of graphic systems of representation over and above any other form of developing and making architectural propositions.

Beginning with traditional drafting tools, Borden notes the implications tools hold for the drawing process – T squares privilege horizontal and vertical datum from which tangents are struck at increments defined by other drafting tools such as set squares and compasses; curves or splines allow curvilinear flexibility but with controlled precision and repeatability; depth perception is achieved with control of line thickness / weight; and a system of points, lines and fills is established to represent columns, walls and mass.\textsuperscript{45}

Furthermore, a brief but thorough description of the development of conventions of architectural representation across previous centuries is given by Borden – from the development of perspective and the introduction of accurate, scaled orthographic representations through to the subversion of and innovation upon these conventions by late


20th century architects such as Lebbeus Woods, Neil Denari and Zaha Hadid amongst many others, and finally the process oriented digital methods of 21st century architectural practices.

Borden’s description of the means of architectural production presents a commonly accepted and conventional understanding of architectural practice as image production projecting toward built material outcomes. I think this is symptomatic of how the architectural medium is understood, both from within the discipline and from outside – representations are the medium of the architect. I find this a completely reductive characterisation, partly because the design medium could be understood in much richer and more inclusive terms – as is touched on by Krasny – but also because the typical discussion of tools avoids any acknowledgement of the material of the medium itself, the situatedness and the process of the act of making.
*Graphite Curtain – Building Movements Exhibition*

The *Graphite Curtain* installation undertaken for the Building Movements exhibition at the RMIT Design Hub building in 2013 served as a moment in this PhD process in which to reflect on the role of design media within a specific context. An example of an act of design that was affected by material contingencies, the *Graphite Curtain* actively revealed new ideas and knowledge of the building it was installed in. My research is concerned with a dynamic relationship between material and maker in the design process, where the resistance provided by the medium introduces a problematic yet productive friction. The installation work undertaken for the Building Movements Exhibition allowed me to directly and physically engage with not only the medium of design, but also the space of the Design Hub Building through a site-specific spatial installation. I rubbed up against the building and felt the friction that it introduced into the process of making the installation. New ways of thinking about and understanding the building were revealed to me, and in turn the building and the medium affected the outcome of the work itself.

A single work situated within a broader design practice, the Graphite Curtain is representative of a particular stream within my work that involves speculative making and drawing projects that are self generated and not tied directly to architectural commissions. These speculative projects are the site for testing and generating ideas that then ultimately
find a voice, in some form, through more conventional architectural projects.

Consisting of three scrolls of graphite transfer paper 3.6m long x 0.3m wide, the curtain is an exploration of the drawing as spatial device. In this instance the drawing is no longer simply a representation of material and space – it is material and space. The paper was adopted for its specific material presence – the colouration and sheen of the graphite reacts in specific ways with space and light, and the volatility of the thin layer of graphite, designed for transfer, renders any body that comes into contact with it in a layer of grey smudge.

Each scroll is fully perforated across its surface, such that it becomes more like a woven mesh than a solid surface. This perforation is important to the installation as it heightens the capacity for the drawing to act spatially when it is hung as a curtain – allowing it to filter light and views, and to share the lace-like quality of the elaborate skin that wraps the building in which the exhibition was housed. The unexpected feathering and tearing at the point of perforation in the surface – a result of the fragility of the transfer paper and resistance to the making of a clean, precise cut – add to the character of surface. The outcome of the work is contingent on the material employed and the variables present in the process of making – it is not, in other words, a straightforward translation of an already fully formed idea to physical form.
The Design Hub resists any attempt to hang work on its interior (unusually so for a building that houses design studios) due to the nature of the steel grid mesh surfaces. Partly for this reason, the Graphite Curtain was hung not against a vertical wall surface (as a drawing might typically be), but in the centre of the room – slipped between the flanges of the steel gridded ceiling and suspended with magnets. The drawing as curtain therefore now becomes spatial divider, and its physical presence is further animated as it billows in the flow of air through the building – fluctuating with the movement of people and the opening and closing of lifts.

As an artefact, the graphite curtain references some of the qualities of the Design Hub building – the perforation of its surface evokes the pattern of the building’s outer skin, and enters into a moiré effect when the two are viewed overlayed. However the drawing installation is also the antithesis of the building – fragile, temporal and contingent on atmospheric conditions (including airflow and the movement of people). The Design Hub is anything but fragile – in fact it is unrelenting and imposing in its physicality.

When occupying this building, one is conscious of the artificial disconnect from the atmospheric and aural qualities of the exterior. As the Graphite Curtain billows in the movement of air generated by lifts or doors opening and closing and HVAC systems fluctuating, it draws attention to the artificiality of these mechanical breezes in an otherwise hermetically sealed box. In terms of the outcome of the work
itself, this engagement between the installation and the air quality of the interior has introduced a kinetic dimension to the work that was completely unanticipated.

The light, powdery paper of the drawing is, in material terms, about as distinct as it could be from the walls of the building and its serrated steel surfaces. The steel grid mesh surface that lines the interior of the building is flecked with coarse shards of metal across the surface of each blade – presumably a result of the sparks produced in the welding process. Each of these flecks of metal catch and tear at the paper of the drawing. An intimate knowledge of the spatial and material condition of aspects of the building is gained through this spatial engagement via design. Through its installation in the Design Hub, the Graphite Curtain has produced a new, unexpected architecture that sits at the nexus between the installation and the building itself, and in doing so, the work has alluded to new ways of thinking about and therefore critiquing the existing building.

By equal measures, the nature of the building has transformed the work into something entirely other. Both the space of the Design Hub, and the material employed in the work introduced a productive friction to the process of making and installing the graphite curtain. The process of making this work could be described as a negotiation between the medium of the paper, myself as maker and the space of the Design Hub building. The idea for the work and its final form emerged through this process of active negotiation through
making, and the outcome could not have been anticipated prior.

Agency of the Medium

The *Graphite Curtain* project allowed me to reach a point in my practice where I was able to articulate the agency that design media hold inside the process of making, and further, to understand that making itself is very much a physically situated act. The following section seeks to unpack these observations further, and again draws on Robin Evan’s thinking to consider the agency of the made artefact in the translation from ideas to material forms.

It is worth clarifying at this point what exactly the term agency might mean in relation to the design medium in this context. When I say that the design medium holds agency within the process of making, I simply mean that within the assemblage of relations that it is situated, the medium has the capacity to affect change and alter the course by which the making proceeds. The agency comes both out of the specific qualities of the medium itself, but also through relations with other aspects of the making process. The specificity of how that set of relations comes together is important; the way a design medium affects a making process will depend not only on its material constitution, but also the method or actions through which the medium is deployed in the making of a drawing for example, or the nature of the surface upon which the marks are received perhaps.
Annabel Jane Wharton gives a useful clarification of her understanding and use of the term agency in the introduction to *Architectural Agents: The Delusional, Abusive, Addictive Lives of Buildings*. My own use of agency throughout this PhD accepts that non-human entities can be ascribed with agency, and Wharton makes the point that there is historical precedent for this in fields such as law, philosophy and chemistry; “*In chemistry, as in law, no intentions are ascribed to agency; an agent is a substance, not a person, that has a physical, chemical, or medicinal effect on proximate things.*”46 The recent philosophical field of New Materialism is also in part concerned with the agency of materials and the role they play in the world – Jane Bennett’s *Vibrant Matter* is an obvious example of this.

As in Wharton’s description of an agent in chemistry and the agency ascribed to materials in the field of New Materialism, I understand the design medium as a material agent that has the capacity to affect other proximate things it is brought into relation with through the process of making. A glaze applied to a ceramic vessel for example will react in specific ways with burning oxygen when fired at high temperatures; or a brush or pen will make specific marks dependent on various factors such as the consistency of ink or paint and the porosity of the substrate to which it is applied, in turn affecting the made work itself.

Though we might be accustomed to thinking of the maker as the key agent in a making process, I am favouring a less hierarchical model where the maker is but one aspect of the process that has the capacity to affect the course that the making takes as well as the forms and ideas that emerge.

Wharton’s assertion that intent or will is separate from agency is critical here, and as noted in the introduction to this dissertation, Bennett also acknowledges that objects do not hold these qualities, but what they can do is become actants when brought into an assemblage with other things within a making process and therefore hold implications for the outcome of that process. Bennett further distinguishes between the kind of agency an object may hold and that of an animate being, in the sense that an individual object does not have agency in the strong sense, but that it may be a powerful actant in operation with others. 47

Materials – the design medium – must be brought into an assemblage of relations that defines an act of making to exert any influence within the process. Additionally, the maker themselves, another of the actants within the assemblage, exercises free will in selecting specific media for the task at hand. Issues of free will and the worrying possibility of a perceived reduction in human culpability are among the philosophical problems that have been raised in relation to object based agency, and whilst it is not the aim of this PhD to contribute to the philosophical discourse around

47 Janell Watson, co-Sensibilities: An Interview with Jane Bennett, Minnesota Review 81, no. 1 (2013) 149
these issues, it is useful and important to acknowledge that the maker is the one agent that does exercise intent and free will in the act of making. I do so when selecting a specific drawing implement and surface to draw on – decisions that are usually made with a specific end in mind, and which have a significant influence over the process, but which also do not lessen the degree to which that medium may also affect the outcome once it’s brought into the process.

By separating free will/intent and agency, Bennett goes some way to addressing critiques of this rethinking of agency. So whilst this research does not wish to minimise the role of the maker as an agent – perhaps the key agent – and despite the at times problematic nature of object-based agency, it holds true that design media act very much in the manner of Bennett’s actant – as a difference maker within a larger assemblage.

When a drawing is being made, actions and processes are staged in space and immersed in matter. An implement works into a surface – let’s say a pencil – that leaves some of its graphite core behind, some engrained in the surface in question, some in my skin as the drawing proceeds. If the surface is paper, it will compress under the weight of the marks – even if minutely. I too can feel the opposite and equal compression transferring from the pencil to my hand and through my arm until it is seemingly deposited in the shoulder and neck muscles. As the drawing evolves, the affect upon my body of the physicality of drawing becomes more acute, and this of course is translated to the drawing
itself. Marks on the page become tighter and more forced as the hand, arm, and eye become weary. Other spatial apparatuses that support or even hinder the drawing process are also revealed – the incline of the working surface and height of the easel or desk alter the way marks are received on the page. In the case of drafting, other mechanical aids are introduced and become armatures to the production of the drawing.

The physical, material situation from which architecture emerges – the physical space and medium the architect engages with through design – remains largely tacit within the typical conception of architectural practice. The media and apparatuses (whether digital or analogue) employed through design are however, far from inert in the production of architecture. It is worth understanding the agency of design media and the translation of this agency to the built work.

Robin Evans helps to clarify the role of design media (specifically drawing) and in particular, the peculiar separation between the architect and their built work in Translations from Drawing to Building. Evans inverts the inherent conflict presented by the gap between drawing and building to reveal the productive potential in the transformations that occur in passing between the two.

It is the virtual, non-physical character of the architectural drawing that is important to Evans’ thesis; “Recognition of the drawing’s power as a medium turns out, unexpectedly, to be
recognition of the drawing’s distinctness from and unlikeness to the thing that is represented, rather than its likeness to it.” 48 A second opposing approach to drawing is also outlined by Evans – one that emphasises the corporeal properties of things made – an approach that is aligned with the valorisation of the drawing as an artistic artefact in its own right, apparently leading drawings to be “...less concerned with their relation to what they represent than with their own constitution.” 49 This leads Evans’ to make the distinction between drawings as pure representation and drawings as the product of a fine arts practice.

The implication is that the drawings physical constitution is of little or no concern where it is functioning in a representational mode – which of course is the most common form that drawings take in the discipline of architecture. Are we then to accept that the physical material of the design medium – whether it is a drawn or modelled medium – is of no consequence to the artefacts produced in design and therefore by extension of no consequence to the architecture of which these artefacts represent?

The key here is that architecture is a process defined by translation – as Evans reminds us, a significant distinction between architecture and the visual arts is “... the peculiar disadvantage under which architects labour, never working

49 Ibid., 160
directly with the object of their thought. It is this condition of architectural design that for Evans asserts the significance of the role played by the drawing in the generation of architecture, which for the purposes of my research could be expanded from the drawing to the broader idea of design media, inclusive of other various modes of production involved in design, resulting in both physical and virtual artefacts – models, collages, animations etc. Important to this is an understanding that the drawing or other direct output of the design process pre-exists the architecture. Evans illustrates this point with an analytical comparison of Karl F. Schinkel’s The Origin of Painting, 1830 with that of David Allan, 1773; “Of the two, it was the architect who was obliged to show the first drawing in a pre-architectural setting, because without drawing there could be no architecture, at least no classical architecture constructed on the lines of geometrical definition.”

Whilst Evans’ focus is the process of translation between drawing and building, less so than the actual processes of the drawing itself, there is the implication in his essay that drawing is a pure act of transcribing thought to paper. This is partly through the lack of address given to the actual act of drawing in the essay, but is also more strongly implied through Evans’ analysis of Schinkel’s The Origins of Painting, in which Diboutades traces the silhouette projected by her

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50 Robin Evans, Translations from Drawing to Building and Other Essays (London: Architectural Association Publications, 1997), 156
51 Robin Evans, Translations from Drawing to Building and Other Essays (London: Architectural Association Publications, 1997), 164
lover onto a stone surface. In Schinkel’s rendition of the classic scene, the act of drawing is delegated to an anonymous shepherd, suggesting the distinction between thought and labour.\textsuperscript{52}

For me, this marginalises the agency of the medium and the process through which the drawing occurs, contradicting my own experiences of making through design, where the wilfulness of my thinking is tempered by the agency of the medium and my capacity to manipulate it. Where the artefact produced through the design process is imbued with a character as a direct result of the engagement between maker and matter, it must follow that this has implications for the translation to building. This comes back to the notion of the artefact as medium, which acts as a vehicle for ideas that are developed toward a work of architecture. In the case of the Graphite Curtain installation, although the work is not a direct representation of a future architecture, it nonetheless holds qualities and ideas that are of interest in the potential application to building. For the most part, these qualities are only partly predetermined by the design intent, and are transformed or enriched by the material of the medium, the process of the making and the engagement of the work with the space in which it was housed.

If we concern ourselves with the material constitution of the design medium, and specifically, the material and spatial processes involved in the manipulation of that medium, are

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\textsuperscript{52} Robin Evans, \textit{Translations from Drawing to Building and Other Essays} (London: Architectural Association Publications, 1997), 164
there implications for how we work with space and material as designers? I’m interested in revealing the entanglement of design process in real material contingencies – not to emphasise the direct output of the architect (drawings, maquettes, prototypes) over the built work itself, but to consider what might be gained by a situated, materially engaged practice. Although architecture must pass through an imagined, non-space between the drawing board (so to speak) and the building site, it originates in the physical, material reality of the design space.

The agency of material media in even the most abstract of processes – that of drawing – is illustrated by art theorist and philosopher Henri Focillon in his book *The Life of Forms in Art*;

Matter... by virtue of being controlled, compressed and divided on the paper – which it instantly brings to life – acquires a special power. Its variety, moreover, is extreme; ink, wash, lead pencil, charcoal, red chalk, crayon, whether singly or in combination, all constitute so many distinct traits, so many distinct languages.53

Focillon supposes that a work by one artist copied by another in a different medium becomes a new work entirely; ‘...the substances of art are not interchangeable, or in other words, form, in passing from a given substance to another

substance, merely undergoes a metamorphosis. The forms involved in an architectural design process are similarly contingent on the medium engaged with through that process. If one can say that design media has an impact on the development of forms, it would seem likely that one might find the ‘voice’ (or at least whispers and traces) of those media in a built work. In other words, if we are attentive to the developments gained through the act of making, couldn’t the course that a design process travels shift accordingly whether we model with clay, timber, or vectors in a software package?

Although the Graphite Curtain installation is not a representation of a building, it is nonetheless a mode of testing and developing ideas within a broader design practice – perhaps akin to a material prototype. By demonstrating the degree to which the outcome of the installation has been affected by the materials employed, we can extrapolate that the ideas or knowledge taken forward from the project into other areas of the practice, including the making of buildings, has at least in part, been directed by this material engagement.

Here we may need to return to the question of what kind of agency we can attribute to the design medium in this process of translation, transformation and generation of the idea through making. In contrast to more explorative works, identifying the innovations that occur through the making of a

detailed architectural model can be harder to pinpoint. This is partly dependent upon the moment at which the model is created in the design process. A model such as that made for the Royal Adelaide Hospital competition second stage entry undertaken by our practice was obviously preceded by quite developed drawings. The idea that pre-existed the artefact in this instance was already well formed. A presentation model such as this is made with enough precision to efface the hand of the maker and the materials (balsa wood and hardwood) are familiar enough that we can anticipate how they will react under the process of making. But yet if we are attentive to the outcome of the artefact we might yet find innovations that suggest new directions for the architecture.

The material grain of the model might imply material treatments for the architecture. The abstraction and reduction of detail required to produce a model of a certain scale can lead to new ways of thinking about objects that had previously taken different, more detailed forms of representation. These models are distinct from a work such as the Graphite Curtain where it seems that the making is more intuitive and concerned with less familiar materials; the material agency of the medium becomes more apparent.

It becomes obvious therefore that the agency of the medium can be attributed to more than its material constitution, and relates perhaps to its whole structure, which could be thought of not only in material terms (i.e. ink on mylar, wax, charcoal, wood) but also the constraints imposed by architectural representational conventions, and the limits of what can be
represented at scale through a specific mode – whether it be a physical model, or drawn perspective, axonometric or section. In *The Projective Cast*, Evans describes both the liberation provided by orthographic projection to Renaissance architects, and the constraints imposed by this framework on the realisation of what was a new wave of Deconstructivist architecture at the time. Evans suggests that the advent of the representational framework of the plan, frontal elevation and axial long section in the Renaissance architecture can partly explain the prevalence of symmetrically organised monumental structures.\(^{55}\)

That Evans was writing at a time when architecture was on the cusp of the introduction of entirely new means of representation by way of the computer, but still confined to physical means of representation hundreds of years old begs the question as to how Evans would extend his thesis in response to contemporary digital practices of representation.

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What Do I Make With? A Selection of Media

Similar to Elke Krasny’s lexicon of tools, the following is an indicative selection of the media that I’ve engaged with over the past three years of practice. This schedule distinguishes between media that could simply be referred to as materials, those that are clearly tools, and those that are made artefacts. Many of these items could slip from one column to another, and clearly a tool or an artefact doesn’t cease also being material. All of these are items that I consider to be an instance of design media, when used in the context of an act of making in a design process. Design media is the apparatus or armature that we engage in the act of making and designing, and all of these items have formed a component of that apparatus for me, at one point or another. Ultimately, it is the artefact - the made object - that becomes the vehicle for the idea. By collecting this schedule of design media that I’ve practiced with, my hope would be that it enables a degree of reflection upon what I make with.
<table>
<thead>
<tr>
<th>MATERIALS</th>
<th>TOOLS</th>
<th>ARTEFACTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acrylic paint</td>
<td>Apple IMac</td>
<td>A page filled with graphite</td>
</tr>
<tr>
<td>Balsa wood</td>
<td>Autocad</td>
<td>Perforated paper</td>
</tr>
<tr>
<td>Brass</td>
<td>Digital Photography</td>
<td>A timber model</td>
</tr>
<tr>
<td>Concrete</td>
<td>Digital Video</td>
<td>Plaster cast building elevations</td>
</tr>
<tr>
<td>Charcoal</td>
<td>Felt tip pen 0.4</td>
<td>Plan and section of our house</td>
</tr>
<tr>
<td>Enamel paint</td>
<td>Pencil 5B – 2H</td>
<td>Graphite Curtain</td>
</tr>
<tr>
<td>Glass</td>
<td>Sketchup</td>
<td>Paper Carvings</td>
</tr>
<tr>
<td>Graphite</td>
<td>Paintbrush</td>
<td>Recorded conversations</td>
</tr>
<tr>
<td>Hardwood</td>
<td>Foam roller</td>
<td>A written project brief</td>
</tr>
<tr>
<td>Indian ink</td>
<td>Mould</td>
<td>An Essay</td>
</tr>
<tr>
<td>Linen</td>
<td>Orthographic projection</td>
<td>Timber Screen Maquettes – painted pink and green</td>
</tr>
<tr>
<td>Plaster</td>
<td>Language</td>
<td>A colour study – acrylic paint on plywood</td>
</tr>
<tr>
<td>Plywood</td>
<td>Perspective</td>
<td>A pencil drawing – repeated marks form a figure</td>
</tr>
<tr>
<td>Tracing paper (white)</td>
<td>CNC Router</td>
<td>Cast brass vessels</td>
</tr>
<tr>
<td>Tracing paper (yellow)</td>
<td>Laser Cutter</td>
<td>Digitally printed and bound booklet</td>
</tr>
<tr>
<td>Wax</td>
<td>Scalpel</td>
<td>Hardwood carved by a CNC router</td>
</tr>
<tr>
<td>Watercolour paper</td>
<td>Cutting mat</td>
<td>A digital model of a house</td>
</tr>
<tr>
<td>Graphite powder</td>
<td>Set Square</td>
<td>A materials and finishes schedule</td>
</tr>
</tbody>
</table>
Something to note in relation to the above ‘schedule’ of media, is the presence of a diversity of types that include both digital and physical media. For me this observation is indicative of the fluidity with which I move between different types of media – and this is probably true of most contemporary architectural practitioners, as evidenced by Krasny’s examination of the media architects use.

A diversity of media seems to be important to my practice precisely because each medium enables a different way of thinking and therefore different outcomes and ideas flow from this. In other words – digital drafting might be valued for its precision and measurability to the (fraction of a) millimetre, whereas plaster casting might be valued for the wilfulness of that process and the propensity to throw up unexpected results. Both such types of media could be valuable within the one project.

Behind the question – *what do I make with?* – is a desire to clarify what exactly constitutes design media and to understand the role that media plays in the act of making and generation of ideas. My own conception of design media, as developed over the course of this PhD, is a broad and complex one, that encompasses firstly the means by which design is enacted, the materials and tools engaged in the making, and secondly the artefact itself – the drawing, model, written brief or recorded conversation that is the vehicle for carrying and developing ideas that emerge in the making.
The nature of the medium can be shown to have a level of agency within the evolution of those ideas and ultimately affect the development of the work of architecture – it might be the material makeup of that medium, or the conventions of a particular mode of representation, or the language of a written brief that inflects the way an act of making proceeds. Of particular interest in the context of my own practice is the former of these examples – the material agency of the medium and the affect it exerts within a physically situated making process, such as the light weight, fragile and powdery quality of the transfer paper used to make the *Graphite Curtain* for example.

This specific interest is revealed through the straightforward task of scheduling the various materials that I’ve engaged with in acts of making over the course of this PhD – a set of materials that are often wilful in nature, and with that an acknowledgement of how this way of working can direct a specific course of practice, as it has done for my own.
MAKING ANECDOTE 3
SPATIALISING THE DRAWING

The wallpaper carvings project began with a desire to find a way to embed a memory of an existing wallpaper pattern within our house that was soon to be painted over. The pattern of the wallpaper was traced with a wood block carving tool, digging into the surface, making a relief of the pattern. The metal blade of the tool gouged the surface of the paper and revealed the powdery interior and horsehair of the old plasterboard behind. This process was repeated for the full height of the wall across a section approximately one metre in width. Once the wall was painted over and the colour of the paper was concealed, the carving revealed a subtle, textural tracing of the pattern now embedded in the depth of the wall.

Employing the surfaces of the house as the substrate for the mark making draws attention to the status of the drawing and the spatial potential of drawing practices – and furthermore the capacity for the practitioner to engage with and occupy space through the act of drawing. I’m interested in the status of the architectural drawing as something that is typically understood as distinct and separate from the work of architecture – the building. A number of visual arts practices probe the possibility of spatialising the drawing – Matthew Barney’s *Drawing Restraint* project is a prominent example that comes to mind. How a drawing might occupy space and enter into relations with the volume and surfaces of a space is a pertinent question for architecture.
III
MAKING AS A CREATIVE ACT OF OCCUPATION /
WHERE DO I MAKE?

Introduction

The site of the architect’s endeavours, as we have seen, is not only the building site or the projected space of constructions yet to come, but is also the space of architectural production – the space we occupy with drawings, paper, models, materials, computer hardware, prototypes, maquettes, our bodies and various other bits of hardware that support the process of design. The act of making is woven into a set of relations – within which the space of making or architectural production is central. Once this physical situatedness is drawn attention to, it becomes difficult to disentangle the space within which design occurs from the process of engagement between design medium and maker and that non-space of imagined constructions – there is an overlapping of each of these conditions, and often as designers, we are occupying each simultaneously.

How then does the physically situated space of architectural production affect the process of design, and in turn, if we are to consider design as a creative act of occupying space, what might this reveal about the buildings that house our design practices? This chapter will seek to understand and elaborate on this aspect of making – that it is an inherently spatial
process. The question to myself of my own practice is not only – *where do I make?* – but further, what role does that spatial situation play in the making and the generation of knowledge and ideas in my practice?

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*Making as Spatial Engagement*

In *Actions of Architecture*, Jonathan Hill states that;

> To use a building is also to make it, either by physical transformation, such as moving walls or furniture, using it in ways not previously imagined, or by conceiving it in a new way. Just as the reader makes a new book through reading, the user makes a new building through using.\(^\text{56}\)

If we take Hill’s notion of a creative user and apply this to the act of design, can we not also understand the process of design itself as an act of space making through both the actual physical act of making and the population of space with the artefacts produced in the process? In this sense the Graphite Curtain installation is a making new of the Design Hub building, as were all of the installations that formed the Building Movements exhibition. The development of the installation work was a negotiation and, at times, confrontation with the Design Hub that directed the eventual outcome of the work and revealed new understandings of the building in the process. The atmospheric conditions and the

\(^{56}\text{Jonathan Hill, *Actions of Architecture* (New York: Routledge, 2003), 72}\)
affect of doors and lifts opening were revealed by the billowing of the Graphite Curtain in the artificial air movements, which in turn activated the work with a kind of kinetic dynamic. Attempts to hang works revealed the building’s stubborn resistance to such acts and further drew attention to its prickly tactility. To extend Hill’s notion, to use a building is not only to make it anew, but to also understand it and be affected by it.

Making is a physical engagement between maker and material and space, and there may be many environmental variables that could be tangibly seen to impact upon this process. It may be the nature of a working surface, the quality of available light, the scale and material presence of the space, and the impact any of these qualities have on supporting or hindering the making process. However, aside from the physical act of making, design is at the same time an intellectual exercise that involves the production of artefacts as a way of generating and exploring ideas. The intellectual space, or the realm of ideas, is not separate and distinct from the making and the material.

As designers we are shifting between an imagined space and a physical space, often occupying the two simultaneously. The space we physically occupy with our own body, serves as a useful yardstick for making judgements about future spaces that are otherwise only imagined and therefore immeasurable without some material reference. We might, for example, shift our gaze from computer screen or drawing board to measure a corner of a space we know intimately to
reassure ourselves of a design decision in the process of being made. The imagined space, which is yet to exist, is projected onto the space within which our bodies are housed. Due to our intellectual capacity to suspend critical disbelief – my studio underneath a timber workers’ cottage might be transformed into the corridor of a hospital I am in the process of designing, as I use my own body to gauge scale and comfortable spatial proportions – or equally, working on a scaled cardboard model of a house can feel very much like constructing its full scaled counterpart – the conceptualised space overlayed upon the occupied space. The act of occupying space whilst in the process of design therefore is a rich exchange between multiple locations.

Beyond the manner in which our physical environment might help or hinder the mechanical act of making, there may be other aspects to this space that unconsciously impact on the more cognitive processes of design. In the instance of working to create an installation within the Design Hub for example, the desire to flirt with the restrictions on creative occupation imposed on users by the building (and the operators of the building), whether conscious or not, probably had a tangible affect on the work produced for the Building Movements exhibition. As Hill notes, Michel Foucault in *Discipline and Punish* “…recognizes the pervasiveness of social ordering in buildings. …Whether a building is
authoritarian or democratic is not dependent on form and space alone.”57

Roland Barthes’ text *The Death of The Author* is drawn on by Hill in *Actions of Architecture* to question the authority of the architect in making architecture, just as Barthes’ challenges the authority of the author in constructing texts. Hill advocates for a creative user that is able to transform architecture through use, and an architect aware of the creativity of the user. I would like to extend Hill’s notion of a creative user and apply it in consideration of the act of designing and making such that we can understand both as a creative act of occupation. To do so is useful to a discussion of the situatedness of design process as it alludes to the engagement between maker / designer and their physical surrounds.

We could even describe the spatial support that houses a design practice as an armature to the design process just as we already conventionally understand drawing and modelling media as instrumental to the process of design. Many of the installation works that participated in the Building Movements exhibition actively coopted the space and material of the Design Hub building in the production of the installations by involving floors, walls, lift cores, bench seats, dust and debris and air movements within the work. This mode of engaging space through the design process most closely resembles Hills notion of appropriating space, where the creative user

appropriates existing spaces and attacks the functionalist domination of the architecture. The actual act of making, in the process of design, or in producing installation works as per the Building Movements exhibition, shares a nice correlation to Hill’s account of skateboarders who unexpectedly appropriate pieces of the city;

…the skateboarder creates a new space by a dialectical engagement of the body with the physical environment: moving in reaction to the city and projecting bodily movements onto the city.

One could say that the skateboarder has generated new knowledge of the city and overlaid new meaning upon it through creative use, just as the Building Movements exhibition allowed for a critical reflection upon the Design Hub building to occur.

Red Hill Studio

The Red Hill Studio involved the design of a small studio space from which our practice now works, and involves the occupation of the undercroft of our timber workers cottage at the edge of a street in Red Hill, Brisbane. As a result of the lack of boundary setback between our house and the street, we were afforded the opportunity to make a very public engagement with the street via a new shopfront. We have undertaken the modifications to the existing building and construction of the new works ourselves where possible –

with the exclusion of services such as electrical and plumbing. As a result the project serves as a unique way of reflecting upon my thinking regarding design medium, translations from drawing to building, materially engaged practice and the separation of manual and intellectual labour in architecture. Due to our intimacy with the building – living in it whilst modifying it – and the age and character of the building, the project also draws to the fore the physical, bodily engagement with the house.

The original timber workers cottage, probably built sometime between 1900 and 1910 would have originally been raised on timber stumps allowing the natural grade of the land to slide underneath the building. Over the course of 100 years, successive occupants have slowly occupied the underside of the house with an informal, haphazard concrete landscape that cuts into the ground below the house. More than likely the original undercroft would have been open to the street and rear garden, however when we came to occupy the house the spaces below had been wrapped in layer upon layer of skins – recycled timber cladding of unknown origin, masonite, asbestos and flaking paint. The asbestos, which we left to others more qualified to remove and dispose of, had been laid directly over timber boards that had been installed in a previous generation. The outer layer of cladding preserved the layers of paint on the timber boards, the paint was left with a stippled pattern embossed into it from the rear side of the outer lining. The paint on the outer face, exposed to the sun, was chalky and left white stains on one's skin. The smallest of gaps between the two layers allowed silt and
debris to gather – falling from the wall cavity above, collecting as brittle old timbers decay, or deposited by insects and geckos.

We removed the lining of masonite sheeting ourselves that had been installed to the internal face of wall framing and underside of the timber floor above. The masonite sagged and showed signs of decades old water damage – maybe an overflowing drain or rusting roof from above. The sheeting hid from view a cavity large enough for piles of dust and objects to collect, and for rodents and possums to nest. The process of peeling back layers from the house felt like a freeing of the structure – the exposure of the floor framing revealed the sagging of joists under the added weight of a topping slab that had been inexplicably poured over the kitchen timber floor above. It became clear that any interventions made here would have to bend to the wilfulness of the house. Nothing was straight or level.

The stripping of the many layers that wrapped the undercroft eliminated the cavities that had allowed the collection of displaced matter – decayed materials collected over years. We disposed of more than a tonne of old materials and added very much less in the process of reoccupying the space. The new works are all single skin, bones exposed, and the existing structure remains revealed. New insertions sit loosely within the old fabric – details were developed to accommodate the lack of a square and level envelope. The design process for the studio began as most do – through sketches and conversation.
The design intent became clearer as more layers were removed from the house. Many details could not be resolved until more was revealed and could be understood of the existing structure. Rudimentary drawings were made out of necessity so materials could be calculated and obtained.

A process of continual adjustment, observing the existing structure, remeasuring and rethinking details characterised the making of the new work. Drawings became less important as they were no longer required as a form of communication (short-circuited by the lack of an external builder), and further because they were quickly made redundant by new discoveries within the old house and the ongoing need to make dimensional adjustments to suit. Trades that we could not complete ourselves were briefed with conversations in the space and sketches on the wall – x marks the spot for the pendant light or the exposed plumbing. The house has a wilfulness that owes to its history and previous occupants, and to its material make-up. That wilfulness directed the outcome like a silent third-party in the process of designing and making.

If the architectural drawing upholds the falsehood that the architect has absolute control and authority over the translation from idea to building, then a bodily engagement with a building such as our construction of the studio reveals quite the opposite. There is a subtle negotiation that occurs between the design intent or idea, the material being worked, and the body of the maker. In the instance of our making of the Red Hill studio of course the material being worked with
directly is not the design medium but the material of the building itself. This same cyclical relationship however could be applied to the process of design and the manipulation of design medium. Cyclical because each affects the other – idea, medium (material), and body. The process of making is woven together in space as a confluence of actions and materials that very much shape the course of the act of making.
workers cottage above

new works

existing undercroft
Spatialising the Drawing

The Red Hill Studio was an overtly spatial act of making, however even in the more conventional act of hand drafting for example, the marks that are inscribed on the page are inflected by the bodily posture that my chair and table induce, and the marks themselves are only made possible through the engagement with physical, mechanical drafting aids, and the size of the drawing will be limited by the scale of the drawing table.

Nat Chard examines the notion of spatialising the drawing in his book Drawing Indeterminate Architecture, Indeterminate Drawings of Architecture; “The conventions of architectural drawing are particularly resistant to interpretation. To circumvent the static interpretation of objective drawings, Chard suggests “…the drawing can become spatial, so that it requires a direct and phenomenal relationship with us.”60 Chard describes a number of examples where the drawing becomes spatial, including a description of draftsmen at Ford’s Willow Run aeroplane factory, making full scale drawings of an aeroplane – due to the scale of the drawings the draftsmen lay on top of the table and have a bodily relationship with the drawing itself – they must take care not to sweat on the fragile tracing paper, their shoes are either wrapped in cloth or dangle off the edge of the table to avoid scuffing the surface, limiting their reach and determining what

they can draw from any one position. Here the draftsmen enter into an affective relationship with the drawing that highlights their existence beyond a representational form.

Perhaps unlike architecture, the visual arts are accustomed with associating the qualities of a made artefact with the actions and event or process through which it was produced – the gesture of applying pencil to page or paint to canvas and the subsequent marks reveal much about the act of making and the actions of the artist. The expressive gestures of the abstract expressionists of the 1940s and 50s for example embed in their painting signs of the physical, spatial constructs that were engaged in the making of the work. Even the scale of the work evokes the huge, often decrepit, Manhattan lofts that the painters occupied, and which allowed the making of the heroically scaled paintings. Harold Rosenberg coined the term *Action Painting* in his 1952 essay *The American Action Painters* to describe the work of artists such as Jackson Pollock, Franz Kline and numerous others;

At a certain moment the canvas began to appear to one American painter after another as an arena in which to act — rather than as a space in which to reproduce, redesign, analyse or ‘express’ an object, actual or imagined. What was to go on the canvas was not a picture but an event. The painter no longer approached his easel with an image in his mind; he went up to it with material in his hand to do something
to that other piece of material in front of him. The image would be the result of this encounter. 61

Rosenberg’s description of action painting for me is a wonderful evocation of an act of making that is concerned principally with engaging directly with the material of a medium – a moment, or an event as a situated, creative act of occupying and acting in space. Rarely are the architect’s endeavours of drawing or modelling so described. Historically perhaps, drawings made in the context of constructing a building have been more connected to space and material – taking the form of drawn templates from which masons cut blocks of stone, or string lines that composed plans and elevations, rather than exhaustive drawing sets that document the entire structure prior to its commencement. Even when on construction sites now, the builder and ourselves are often drawing on the surface of the work itself to enable a conversation about the way in which a detail will proceed. The drawing becomes a record on site until it is sheeted over, demolished or painted out.

Matthew Barney’s ongoing Drawing Restraint project is another interesting reference point in this regard as an act of making that could be described as making as creative occupation of space. Using elaborate mechanical restraints, harnesses, trampolines and scaffolding etc. Drawing Restraint 1 through 6 in particular quite literally play out an event as an engagement between Barney’s body, a drawing

medium and the space of his studio, documented in photography and film. Again, similar to the Action Painters, Barney’s work is very much an overt expression of spatially and bodily engaged making, but it stands to help make the observation that any act of making is spatially and materially engaged, and that we might co-opt the environment within which we’re working and draw it into the process of making and thinking about design. It is a way of working that I’ve come to find productive, such as in the Red Hill Studio, The Graphite Curtain, or Wall Paper Carvings, all of which are characterised by direct action in space and material without the pretence of making an image.

The key here is that the act of making is constituted by an assemblage of relations, of which the maker is but one moving part, and which is also composed of other materials, spaces, objects etc. that may move in or out of this assemblage as the making proceeds. Once recognised as such, it becomes impossible to disentangle the act of making from this web of relations, and whilst the maker remains a key aspect within this, we are able to shift away from a conventional understanding of making, with the maker at the centre, and acknowledge the agency that other aspects hold within the process – such as the design medium as we’ve seen, and the spatial situation or framework of the making.

The field of action painting, as described by Ronsenberg, and Barney’s Drawing Restraint project render this set of relations explicit in the work itself, where it becomes a defining feature or quality of the drawing or painting. For that reason these
examples are useful in the context of discussing the spatial situatedness of making, however it’s important to acknowledge that all acts of making are fundamentally engaged in a web of spatial and material relations, including more conventional forms of making such as architectural drafting.

It is interesting to note that Barney’s *Drawing Restraint* works are contrived through the imposition of what could almost be described as handicaps or modifications on the capacity for the body to move and act in space. In doing so, Barney sets in motion a very specific set of relations that then play out in the making of the work. Of course most making practitioners set out to contrive a specific set of conditions within which they make their work to at least some degree – usually to aid the production of the work, and perhaps also to enter the right ‘frame of mind’ within which to work.

There might also be something to be said of the pleasure that is brought by an environment that is conducive for making. The painter may seek out space with indirect natural light and tall walls as a setting for painting from models, imagination or reference images; or they might paint *en plein air* – the implication of that phrase being that the process and outcome will differ accordingly. Anecdotally I’ve heard a writer say they can only function creatively from their bed in a laying position, as though that somehow sets in place some kind of optimal condition for writing. Of course the point to acknowledge here is that the context from which the making emerges cannot be separated from the work itself.
Reflecting on the specific context within which our practice operates gives me cause to consider to what degree our studio setting impacts on our work. Beyond the fact that we physically made the studio space ourselves, there are other qualities that on reflection seem important to the way we go about practice. The studio, though situated under our house and hence closely tied to our domestic spaces, also has an immediate relation to the public space of the street – an important point, as it literally connects the activity of the studio with a public space, and acknowledges the fact that the works of architecture that come out of that space are also connected to a broader public realm.

This relationship with the street is manifest in other ways beyond simple proximity – in designing and making the studio we’d always thought of it as a shopfront, with glazing and materials that in some way evoke traditional shop fronts that we’ve always admired, including a datum of tiles below the sill of the street facing windows. Half of the studio’s footprint is open air, secured only by a highly permeable screen of brass and timber. This space, which houses a meeting table, is bound on one side by garden and on another by the street. Meetings that take place here are visible to passers by, and we value the presence of both the street and the garden within the studio space equally, both contributing to a set of conditions that we find conducive to practice – connectedness to a public realm; presence of vegetation; a lack of mechanical ventilation; and materials that are more consistent with a garden setting than an office environment – concrete, timber, tiles, brass.
We once had a visiting client comment that the space felt ‘very Zen,’ which at the time I found a bit daggy and even embarrassing! In retrospect though I find his comment endearing, and it probably reflects our distaste for hermetically sealed, sterile office spaces, which this studio certainly isn’t. In winter the honey like scent of blossoming wattles enter, but so to does the cold, or the heat in summer, dust from the road at times, or the noise of trucks that interrupt phone calls. It seems though that on the whole, this heightened interconnectedness (sometimes pleasurable, other times mildly uncomfortable) that the our studio affords makes for a unique setting for practice, and I suspect it also fosters a sensibility for similar qualities to which we aspire in the architecture we make for others as well.

The question of - where do I make? – relates to my interest in the everyday of practice, and the capacity for the situation from which an act of making emerges to influence the course of that process. Acknowledging this effect has lead me to further develop my understanding of drawing, and other making practices as inherently spatial acts – and this observation lends itself to tailoring future projects to explore this notion and the potential for architecture, just as the Wallpaper Carvings were an attempt to overlay a drawing onto a domestic interior. Spatialising the drawing in this way suggests that a practice of making within the context of an architecture practice might move beyond the bounds of the page or the screen. In this sense, the question – where do I
*make? – is not just a question of the precise location where I practice, but also a question of how a practice of designing and making can thoughtfully engage with and extend into space.*
Repeated gestures across a page come to form a surface as they aggregate – at one scale, where the surface fills the breadth of one’s vision, it reads as a field; expansive and without edges. Hold the page at arms length however and the field can be read as a figure – a form defined by the boundary between the aggregation of gestures and the rest of the page. Hoping to evade the expression of a figure on ground however, my drawings allow the repeated gestures to reach the edge of the page – eliminating the boundary and implying that the field might just keep on going indefinitely if the page were of infinite proportions. Such an approach favours a closeness to, and intimacy with the material over identification with a formal figure.
IV
ATTENTIVENESS TO MATERIAL RELATIONS IN DESIGN / WHAT HAVE I MADE

Introduction

The act of making is a complex confluence of forces that shape the direction in which the making proceeds, and it follows that these forces then find a voice in the outcome of the process, the made artefact itself. Within the context of an architectural design process however, the complexity and richness that is embedded in the artefact is often overlooked by virtue of the fact that the drawing or model is representational, and projective in nature. Prompted by the question to myself – *what have I made?*; this chapter will examine the tendency to overlook the presence and material nuances of the made artefact in architectural discourse, and will seek an approach that values attentiveness to the inherent potential often left unseen and unexplored.

The Status and Material Presence of Made Artefacts

In *Drawing: The Enactive Evolution of the Practitioner*, Cain interviews two contemporary artists, Richard Talbot and Oliver Swink, in an effort to have them articulate how they
think when drawing, how decisions are made and how the making progresses accordingly. Delving further into the analysis of each practitioner’s work, Cain attempts to recreate works by each artist respectively. In recreating Talbot’s work in particular, Cain makes an observation about technical drawings and the way we perceive them that resonates with the status that is afforded to architectural representations. Constructed using drafting aids and drawing conventions such as perspective, Talbot produces complex, fine line drawings that evoke 3-dimensional wire frame renderings, and share qualities with technical representations. After reproducing Talbot’s drawing ‘Glass’, Cain observes that;

Because our eye tends to imbue technical drawings with a trusting sense of reality, it is possible to forget in some ways that we are looking at drawings and are simply imagining what they can be. I stopped seeing the drawing in this way and started to read the marks by reference to process instead. 62

Rather than looking through the drawing to an imagined object of representation, Cain came to understand the knowledge and meaning embedded within the drawing, the decisions that led to specific outcomes, and the role that the making process and the media engaged in the making played in shaping that outcome. As with other technical drawings, architectural representations are similarly

62 Patricia Cain, Drawing: The Enactive Evolution of the Practitioner (Bristol, Intellect,2010), 143.
projective in the sense that they look toward an object yet to be realised, and for this reason fall victim to a gaze that is often focussed on the distant future, causing us, as Cain observes, to sometimes forget that we’re looking at a drawing (or model perhaps) at all. We overlook the material nuances and other aspects of the making process that embeds a level of complexity and richness within the artefact itself.

Amongst the complex web of relations entered into when making – between ideas, knowledge, materials, forms, the body of the maker and so on, what status is afforded to the made artefact, the thing that emerges from the making? To add to the question, how and with what do I make, I’m concerned with what I’ve made, how I understand it, and what may be learnt from it and taken forward. Is the made artefact representational, standing in for something else, or do we take it at face value as a material thing in its own right? Or both? These relations are synthesised through the act - the process - of making itself, and the dynamic between idea and material form is constantly in flux.

When I’ve made an artefact, I’m often left with a sense that something has changed, accompanied by a feeling of unexpected surprise at the result of the process as it emerges. In other words, it seems that the made artefact has somehow parted from, or become more than what was defined by my original set of intentions. But how do we articulate the nature of these relations and what has changed throughout a making process? This is the problematic that propels my research interest in this PhD project – an urge to
articulate the web of relations within making, and in doing so, develop a richer knowledge of the role that making plays in my practice, and the nature of the artefacts that I produce along the way.

Artefacts made in an architectural design process have a curious status – they’re more often than not valued less as artefacts in their own right; not made for their own sake, but as part of a process of working through a problem, or communicating design intent through representational means. Do we as a result marginalise these artefacts as made, material things in their own right? Are we less likely to value the architectural model or drawing for its own specific qualities, as to do so might distract from the ultimate pursuit of the process – to make a building? Of course many architectural representations are greatly admired for their own qualities – for the skill exhibited in their making and the insight they provide into the working process, however the status of these artefacts tends to then shift to that of an archival document;

Since exhibited drawings are normally taken as artworks or as end results in themselves, they are often isolated from both the original flow of their cultural contexts and the corporeal act of making the drawing.63

The drawing as artefact is unimportant, it is rather a set of instructions for realizing another artefact. By valuing the material constitution of the drawing, or any other made artefact, I’m not seeking to remove it from the context of the act of design, but rather, I’m interested in revaluing made artefacts in the design process in a slightly different way; as things that have an unexpected material complexity that if we are attentive to, may affect the course of the design process.

It could be said that the projective nature of architectural representation leads to a kind of long-sightedness, or hyperopic condition. In other words, we fail to see the physical, material thing in front of us, in favour of the idealised content (the idea) that projects towards an as yet unrealised work of architecture. But what implications might the subtleties of the material thing in front of us hold for that work of architecture. How do we bring that which is in front of us into focus?

Part of the pleasure of working with cast plaster for example is the beauty and particularities of the material itself – that it takes to any mould, but not always perfectly; the air pockets and tiny bubbles; and the chalky white, smooth surface quality. Plaster is also messy and volatile, it overflows, finds any tiny gap or break and escapes the mould; it relies on the

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perfect ratio of dry plaster to water or it won’t achieve the correct consistency, it is wilful. But is any of this relevant to the designing and making of a building? What do the laminations of fibrous paper of the cardboard model, or the transparency of ink on trace paper matter to the representation? To be specific, I’m hoping to understand what I’ve made – the status of the artefact produced in the act of making, and its role within the process.

There are of course many architects for whom the made artefact does carry weight and presence in their practice. A contemporary case in point would be the London based practice Smout Allen whose work finds its voice through complex and meticulous drawings and strange, dynamic models and installations. Peter Cook observes in relation to their work the lack of distinction between the drawing and the model;

There would always be the drawing wanting to be the model, the model turning into a drawing, exploring the manoeuvre, space and presence of the object.65

The models Smout Allen make often incorporate moving or interactive components that may be manipulated in a dynamic and playful way. As Laura Allen explains, this allows other people to have a greater level of connection with a project and to be able to interrogate it in some way that might

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be more accessible than a drawing might otherwise allow.\textsuperscript{66} Their Lunar Wood project, produced for \textit{Nurturing the Spirit}, a residency that brought together the Osamu Ishiyama Laboratory, Waseda University, Tokyo; Smout Allen and the Design Unit of the Welsh School of Architecture in Cardiff consists of 6 large slabs of wood, whose form and surface has been carved by a CNC router from a digital model. The slabs are counter balanced and seesaw in response to little jets of air pushed up from underneath, and weighted metal arms that rotate and shift the balance of the timber, resulting in a landscape that moves in a rhythmic wave. In the practice’s own words, Lunar Wood speculates on intriguing mythical beliefs and traditional attitudes that pervade our understanding of natural materials.\textsuperscript{67} The model is very explicitly an artefact that \textit{does} something, has an affective presence and forces us to encounter the object.

Mark Smout describes their initial hand drawn work as affording an ‘incubation’ phase within a project, floating around and avoiding precision. Cook again observes in this regard;

\textit{The key thing about the drawing is it doesn’t have to be literal. You can draw something, and say that it has a certain atmosphere; that it might do something; or you might come upon it in an odd way; or a variety of types of materiality. Whereas the working drawing}

\textsuperscript{66} Ibid., 71.
\textsuperscript{67} Laura Allen, Mark Smout. "Http://Www.Smoutallen.Com/Lunarwood/."
is showing: ‘This is what it is’; ‘That is what it is made of’ – end of conversation. With what you two do there isn’t an ‘end of conversation’ – it’s probably only the beginning of a conversation.\textsuperscript{68}

For my own practice, having made an artefact with physical presence means that it also logically comes to occupy a space within our studio, and needn’t cease to exist at the end of a project. The artefact almost becomes a little talisman that one carries around in their back pocket so to speak, and which holds ideas that have uncanny ways of seeping into other parts of the life of that practice.

\textit{The Hyperopic Condition of Architectural Representations}

An important part of unpacking and understanding the material relations at play in a design process begins with an attentiveness to what is actual and present within the made, the maker and the setting within which design occurs. Although this seems self evident, it runs counter to the projective nature of architectural thinking and representation. The architectural drawing itself is rarely valued on its own terms, as Jonathan Hill points out; “…the architectural drawing refers to something outside itself. Its value as a drawing is secondary to its primary purpose which is to describe a building.”\textsuperscript{69} Bradley Starkey discusses what I’ve referred to as the hyperopic condition of architectural

\textsuperscript{68} Will Hunter and Peter Cook, ”Drawing: Smout Allen.” \textit{The Architectural Review} CCXXXIII, no. 1395 (2013), 64
representations in his essay *Post Secular Architecture: Material, Intellectual, Spiritual Models* with reference to Jay David Bolter and Richard Grusin’s notions of *immediacy* and *hypermediacy*;

Immediacy refers to forms of mediation where the presence of the medium is perceived as invisible or transparent…. Bolter and Grusin write: ‘It is important to note that the logic of transparent immediacy does not necessarily commit the viewer to an utterly naïve or magical conviction that the representation is the same thing as what it represents.’ Whilst the viewer is not completely deceived by immediacy, however, ‘the user is no longer aware of confronting a medium, but instead stands in an immediate relationship to the contents of that medium’. 70

Bolter and Grusin’s use of immediacy could be somewhat confusing when set against how I’ve adopted it in previous sections – in their case immediacy describes an immediate relationship with the representation, whereas I have used immediacy to describe an immediate relationship with material. With this in mind, Bolter and Grusin’s notion of immediacy (with the representation) nonetheless aptly describes our relationship with architectural representation – particularly as architects, with our training that allows a fluent reading and translation from what is an otherwise abstract 2-

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dimensional representation, to a complex mental image of a space or an object. We certainly don’t experience a visceral confrontation with the material medium in this instance. In opposition to Bolter and Grusin’s immediacy, is their notion of hypermediacy – if the former implies transparency and neutrality on the part of the representation, then hypermediacy acknowledges the presence of the medium, and expresses the indirect, hybrid and mediatory role of the representation.71

My own experience with making drawings and other artefacts within a design process is that it becomes all too easy to overlook the material complexities of the made thing and the implications this might have for a work of architecture. To allow ourselves to mentally project from the artefact to the imagined building, we must suspend our disbelief that the artefact is not the building, and this process lends itself to a glossing over of the unintended, misshapen little furry bits of the artefact. But mightn’t this be exactly where innovations can be made and new knowledge found? Perhaps for this reason I’ve always been drawn to make artefacts that have an overt materiality, in the hope that something of the materiality of the drawing or model, or the mechanics of how it was produced, might reveal something new about the object of design.

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Such attentiveness requires a fairly literal focus on the constituent parts of the artefact, rather than an abstracting into codes of architectural representation. Hypermediacy suggests that we both confront the presence of the artefact and acknowledge its agency as a thing, even while it performs the role of a representational projection – bringing that which is immediate and present into sharper focus, overcoming the long-sightedness that seems to define our relationship to architectural representations.

The Paper Carvings drawing series for example are an exploration into paper as a medium – drawing attention to the material composition, thickness, surface and weight of the paper – in other words, pursuing attentiveness to the nature of the artefact itself. The surface of the page is disrupted by the repeated gesture of a small carving tool with a scalloped metal blade and timber handle, held in one hand, digging into the fibres of the paper and lifting its laminations to form a raised surface. The surface expression that is arrived at in the work is a direct result of repetitive but subtly varying marks made across the surface. Defying the convention of paper as a ‘flat’ substrate, no other medium is applied to the page in the production of the work. The raised surface fills the entire sheet – as though the gesture of hand and tool on paper were infinitely repeatable, with only a fraction of the surface captured on the finite limits of the sheet – defying a figure / ground – medium / substrate relationship. It is a laborious and sometimes painful process that engages the body in the production of the work.
The Paper Carvings challenge the notion that firstly, paper is an inert substrate and secondly, that drawing is a perfect act of transcribing thought to page – free from any material engagement. Both of these assumptions underpin the understanding of the drawing as a window onto the intellect and as a truthful representation of future form. As an exploration into surface and composition through repeated gestures, the drawings forego codes of architectural representation for actual material articulation. Rather than relying on graphic means to evoke a material condition that one must read visually and reconstruct in the mind – the Paper Carvings instead become a surface with depth that can exert spatial and experiential affects.

The Paper Carvings might be best understood in terms of drawing as analogue as opposed to drawing as representation. Whereas architectural representation describes the building through codes, Hill’s notion of drawing as analogue suggests that the drawing is like (or analogous to) the building in a material and/or physical sense. Though of course there is also a degree of representation in an analogue as well – a certain sense of standing-in-for – the drawing as analogue would share more qualities with the building than a codified, graphic representation might.
A notion introduced by Hill in *Immaterial Architecture*, drawing as analogue allows more subtle relations of technique, material and process between drawing and building. Allowing the design process to be directed by the engagement of body and design medium, it follows that the material of the medium finds a voice in the built work. It is about attentiveness to the design medium itself and the implications of this for the architecture;

Some of the most innovative architectural developments have arisen not from speculation in building but through the translation of particular qualities of the drawing to the building. One important characteristic of the drawing – that it is associated with mind rather than matter and is less material than the building – encourages architects to build with an equal lack of material, to try to make architecture immaterial. That the products of architects’ daily endeavours – words and drawings – are of limited physical presence undoubtedly affects what they do and think, whether conscious or not.

A work such as the *Paper Carvings* deliberately avoids overt representational content to emphasise other material qualities and affects beyond the representational. It could be said that much of the project work made over the course of my research operates in a manner similar to Hill’s notion of drawing as analogue – that is, they act more *like* the building.

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than a conventional architectural representation might. If we examine the common understanding of the term analogue we find at its root it is a thing that can be seen to be comparable to another. So the drawing as analogue may be understood as a drawing that shares qualities, affects and actions with that of the building that is the subject of the exploration.

A straightforward example is the capacity for the Paper Carvings to catch light and cast shadow across the surface of the page – a spatial affect that would be flattened and removed in a conventional architectural representation. All drawings may be possessed with action, however we may chose to emphasise this in the artefacts we make. The simple decision to add a dimension of physical depth to a drawing has the immediate effect of imparting it with qualities that might predict those of the building. The Paper Carvings subtly do so through the lifting of the surface of the page into raised scallops, the Screen Paintings do so more overtly by becoming an artefact that we can experience in the round as it engages dynamically with space and light. It is useful at this point to make a distinction between the drawing as analogue and a prototype of a building or component of one.

A conventional understanding of a prototype would be a component or whole section of a building made ahead of the final architecture itself, but fabricated from the same materials and through the same processes and in that sense is clearly not in the realm of architectural representation as a drawing of model is. However the drawing as analogue might yet be understood as a prototype for an affect or encounter
with a material surface for instance – rather than strictly delineating between drawing and prototype we might be better to understand these artefacts on a continuum between the purely representational at one end and the fully realised architecture at the other.

The *Paper Carvings* begin to suggest a rule for composition, and quality of material surface that has developed directly out of the constraints of a materially engaged process. As an attempt to unpick the implications of this mode of working I'll describe the dialogue that has occurred between the Paper Carvings Project and the Royal Adelaide Hospital Competition scheme produced by our practice. The RAH competition brief called for design propositions that addressed the soon to be vacated RAH site at the fringe of Adelaide’s CBD. A central idea to our proposal for the first stage of the competition was to unify the site with a folding canopy that connected the expanse of new urban space and building with a consistent material gesture.

Our practice was shortlisted for the second stage of the competition, allowing the opportunity to develop the idea in detail. The material surface takes the form of a canopy of terracotta tiles that performs multiple tasks for the architecture. The material presence of the terracotta tile engages the narrative of Adelaide as a red brick town, along with the strong presence of red brick in the existing heritage building stock on the RAH site, whilst the unrelenting repetition of the surface across the architecture aids in developing a coherence and clear identity for the project. The
formation of the surface recalls the process by which the Paper Carvings are generated. Importantly however, it is not a direct application of a ‘pattern’ found through the paper carvings, applied directly to the architecture. Rather it is the application of the process by which such a surface is formed – the repetition of similar components en-masse across a surface, not contained by a frame, but repeated seemingly infinitely. By perforating the canopy through the removal of individual tiles and revealing the reverse side of the skin, with the back side of tiles and framing exposed, the canopy moves beyond a flat surface to become a spatially engaged element with thickness and grain.

The paper carving drawings that preceded and also ran alongside the development of the RAH project could perhaps be understood as prototypes – not in the typical sense of an architectural prototype that seeks to confirm the constructability of technical details – but as prototypes for an encounter with a surface, and the affective potential of that surface.

In the continued development of the RAH competition proposal, a 1:50 timber model of a portion of the building was constructed as a further testing ground for the tiled surface. The variation of expression in the canopy that is achieved through the construction of the model at a scale that allows each component of the building to exist individually begins to approach the same level of expression achieved in the paper-carving project. Again the interest in the surface is derived from the repetition of similar yet varying components
– the combined action of hand, scalpel and balsa wood inevitably result in a level of inaccuracy that, through aggregation forms a specific quality of surface. At this juncture, the designer has the option to disregard the charming effects of the inaccuracies in the model making and wilfulness of the balsa wood as simply being the undesirable outcome of working by hand. But by being attentive to the outcomes of this process and the true nature of the artefact itself, there is the possibility to productively engage the material tensions present between designer and medium.
As Robin Evans describes, the architect requires a certain suspension of critical disbelief to carry out their task. Of course the model or the drawing is nothing like the architecture to be built, and one must suspend this disbelief to be able to fully conceptualise the eventual translation to building. In this way it is possible for the designer to conceptually eradicate the anomalies that occur in the process of making – kinks and creases are ironed out and no longer suggest new possible directions for the work. Through processes of reflection however, it is possible to allow these anomalies to inflect the outcome of design;

The craft of the architect is concerned with the making of representations of an artefact to be made by others. But it is through the making of those representations that the attentive practitioner may also develop a feeling for the implications of the artefact being represented at smaller and larger scales — from detail to context, from the front doorstep to the city.

A condition of hyperopia, or longsightedness, within the realm of architectural representation implies that the subject of the drawing is held at arms length – at a distance that emphasises the object. If longsightedness places the artefact at a distance and emphasises the object – then the opposite

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75 Mike Davis, "Pursuing a sense of the emergent through craft practices in architectural design" Craft + Design Enquiry 5 (2013): 69
would be to bring the object closer, perhaps close enough to eliminate the frame, so that it becomes less object and more material, less picture and more thing.

The attentiveness to the artefact that I’m pursuing requires a closeness and an intimacy with the material surface – not a thin superficial surface as that term might imply, but one that has depth and reveals material grain and complexity upon inspection. This focus has driven much of the project work that has occurred over the course of this PhD. Where possible, the figure, or the object is eliminated, whatever frame exists is only dictated by the scale of the page, and even then the material flows over the edge and the implication is that it would continue indefinitely if the page were unlimited. Many of the made artefacts are composed by repeated gestures that fill a surface and imply infinite repeatability, as in the Paper Carvings, Graphite Curtain and Graphite Drawings and others. I’m attracted to emergent texture that is generated through these repeated gestures – marks made by a simple gesture on a page or in space, repeated again and again, with each gesture varying ever so slightly, imbuing the composition with a subtle variation and complexity.

The Screen Paintings, which I discuss in chapter five, could equally be understood as repeated gestures in space, that through repetition result in a particular spatial affect. The density of the placement of sticks that compose the Screen Paintings determine the degree to which the work may be read as a surface – the denser the components the more
surface-like it becomes; whilst a looser arrangement becomes more frame-like, bringing the rear surface into play. To add to this, the density of sticks results in variations to the mixing of colour hues – more sticks applied with a particular hue obviously increases the percentage of that colour to the overall colour mix of the work, altering ones perception of it.

Though the tendency toward repeated gestures and emergent textures was not a conscious one in my work initially, it is interesting and useful to observe and reflect upon how it relates to my interest in evading the object of representation and bringing the material closer. Furthermore, a thread that binds all of the works mentioned above is their ongoing nature as a series of works – not singular unique works, but each as a part of an ongoing set. The tendency towards a series relates to my interest in repeated gestures and emergent textures insomuch as the differences and developments from one iteration to the next attest to the variability inherent to the act of making.

In other words, each iteration within the series will inevitably be a unique instance of the subtle variance that may be achieved with the same gesture, or with incremental adjustments to that gesture – as much as the gesture might remain the same, each time the page is filled a new composition is formed through the accumulation of subtle variations. The effect is to emphasise the process by which the work is made, the role the chosen medium has played in shaping the outcome, and a consideration of the specific qualities this renders in the resulting artefact. The Graphite
Drawings are a case in point in this regard – viewed from the certain angles with no reflected light, the drawings might appear as a solid black page with no expression. The page is filled from edge to edge using a stick of solid graphite, so that no object or figure is revealed, but what emerges is a surface of thick, waxy graphite. By virtue of the sheen of the graphite, a trace of the gesture through which each mark of graphite was applied remains visible in the surface when viewed with glancing light – in this way the works are not unlike that of painter Pierre Soulages, whose black oil paintings derive their expression purely from the affect of ambient light on the textured surface of the thickly applied paint which is scraped and screeded into evocatively patterned surfaces.

The expression of the surface of the Graphite Drawings is one of accumulated, repeated gestures, evading any kind of figure ground relationship, but instead evoking something more like a field, which when viewed from above takes on complex patterns by virtue of the manner in which it has been cultivated. The analogy of a cultivated field seems like an appropriate one, because it has material depth beyond that of a thin surface, and is a complex ecosystem, or set of relations, that is constantly in flux and emergent, but also has an expression that emerges through the intervention of the hand of a maker.

Where one aspect to challenging the hyperopic condition of architectural representation is about bringing the artefact
closer, the other side to this is addressing the time based aspect and future oriented perspective of architectural projection. My interest in this regard is to bring attention to the present and the process of making, to give it equal accord to the future projection. Past ideas and knowledge are carried into the act of making, and the whole premise of making assumes that there is an artefact forthcoming – this being even more acute in the context of architectural design, where the artefact of the making process predicts a future work of architecture. Of course there is also the present moment of the act of making itself – and it is this moment that I’m interested in bringing into greater focus through attentiveness to what I’ve made.

Simply asking this question promotes an attentiveness to the made artefact that allows me to overcome the hyperopic, longsighted aspect of architecture’s relationship with representations. The impetus for doing so comes back to the question of why I make and work in this manner at all – that there are ideas to be teased out and value to be found in the making of and attentiveness to material artefacts.
MAKING ANECDOTE 5
NON-REPRESENTATIONAL ACTION

Two colours only – blue and yellow – applied to adjacent surfaces in three dimensions, become at least three colours, and every possible hue in between when viewed in space, and not by mixing liquid colour, but only by their adjacency. The leading edges receive no reflected light, only direct light from within the room, and hence display the ‘truest’ rendering of hue. Faces receding from the leading edge receive the reflected light of the face adjacent – painted in the opposing colour, and hence even when the opposite face is not visible it renders the adjacent blue with reflected yellow resulting in a green-grey – and vice versa. Reflected light aside, the breaking up of the object into strips of two colours renders the whole composition a mix of the two hues that shifts dramatically depending on one’s vantage point relative to the object and the relative proportion of blue and yellow that is revealed at that point in space.

To achieve the same affect through representational means, one would be reduced to literally recreating the array of colours and tones that appear in space – literally mixing liquid colour to evoke the actions of the object. The representation never approaches the complexity of the material.
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KNOWING THROUGH THE ACTION OF MADE ARTEFACTS / HOW DO I KNOW?

Introduction

As a PhD by practice, this research has been first and foremost a reflection upon my own creative practice, and in particular the role that making plays within that practice. As a result I’ve developed a richer and more nuanced understanding of the complex nature of making processes, and my hope would be that the project therefore contributes to the furthering of the discourse around the role of making in architectural practice. Another key contribution is the articulation of a specific way of working that is afforded by the self-examination of one’s own practice. For me that way of working is concerned with how I make and engage with materials. The articulation of that way affords an understanding of the value of making and the capacity it holds for generating ideas within my practice.

The artefacts that I’ve made over the course of the research have been a means through which to explore and generate new ideas and knowledge and less about describing or representing ideas. To avoid overstating the ambitions for generating new knowledge, the kind of ideas that I’m pursuing might be as humble as – what happens when I
place one plane of colour against another?; what kind of surface is generated by a repeated gesture in a specific material?; how does the visual effect of foreshortening cause a screen of sticks to collapse into a consistent surface when viewed obliquely? If I had to describe this way of working in succinct terms it would be; knowing through the action of artefacts both made and in the making – in other words forming ideas through the making of artefacts – drawings or otherwise – and observing the way they act as material things. My making allows me to explore the world in immediate relation to materials rather than through the mediated means of conventional architectural representation. In this chapter I will recount how the non-representational action of drawings and other artefacts has allowed new knowledge to emerge from within my projects.

Albion House Screens

That which is unanticipated forms a potentially productive role within processes of making. That is to say, the complex relations that are entered into when making, between material, or medium, ideas, and the body of the maker, often lead to unexpected outcomes, and if we are attuned to the ideas that can emerge through making, then perhaps we can uncover new ideas for design problems through the making process. It is through the material action of made drawings and artefacts that we may approach new ideas and knowledge by activating the drawing. Central to this process
is the subversion of the primacy of architectural representation – the codes and shorthand that stand in for known conventions of architectural construction. Architectural representation and knowledge are inseparable – representations rely on assumed prior knowledge of that which is represented – whereas if we are to approach made artefacts as material things that exist in the world themselves, and that have affective potential and act, rather than standing in for something else already known, then we can remain open to possibilities outside of common or collective knowledge.

In 2015 our practice was commissioned to undertake an extension to a hundred year old timber Queenslander, in the inner Brisbane suburb of Albion. As a small practice in Brisbane, adaptations to the city’s timber vernacular housing stock are the most common commissions we’re afforded, and we’ve therefore become intimately familiar with both the charms and pitfalls of these houses. Characteristically perched on legs elevating the building up to a full storey or more above ground, these houses offer a number of predictable opportunities for extending and renovating.

The first of such adaptations usually involved partially or fully enclosing the original verandas that skirt the edges of the house core. Another typical adaptation undertaken early on in the life of these houses was the informal enclosure of the undercroft between the floor of the house above and therambling, often sloping landscape below. Most usually achieved economically with a timber batten skirt that traced
the perimeter of the undercroft, this adaptation rendered the undercroft occupiable as storage and laundry spaces, and made for an informal but beautiful space, punctuated by striped sunlight, filtered by the battens, and serving as a refuge for playing kids and sleeping cats.

Architecturally the batten skirt seems to have been understood as part of the Queenslander’s suite of decorative details, and so has often been painted with the same colour as the house’s other timber trimmings, which in contrast to the bulk of the main house’s white or cream weatherboards, were picked out in heritage reds and greens. In the mid to latter parts of last century however (when many of these houses were given their most recent major make-over), homeowners broadened their palette to pastel blues and pinks and other unlikely colours and shades. Decades on when we’re commissioned to renovate and extend these kinds of houses, we’re struck by the beautiful but ramshackle, homemade renovations, cloaked in faded and worn pastel timberwork. So how to approach a familiar design problem with countless precedents and avoid a known or automatic solution?

Inevitably, to satisfy a client’s contemporary appetite for space, when we undertake such a project we’re required to further formalise the remaining space in and around the house, either by permanently enclosing and internalising the undercroft (which also often involves lifting the existing house to squeeze rooms of legal head height under), or extending into the rear garden, which respectively represent the third
and fourth generation of additions and alterations most Queenslanders undergo. What we found at Albion was a building with a quintessentially battened undercroft, but with the unusual (for Brisbane), distinction that the house was too big for its block. The batten skirts that enclose the undercroft therefore double as boundary fences, providing only meagre separation between our client’s spaces and another undercroft to one side boundary, and a neighbour’s veggie patch and backyard over the other boundary.

The immediacy of the relationship between private domestic spaces made the batten skirt in this instance an even more potent device. This curious condition also had the potential to exacerbate an unwelcome quality that results in most build-under projects - a lack of access to good light and ventilation for the new rooms now tucked into a zone that once had a charming informality, but was never suited or intended for occupation with conventional interiors. Our problem was a conflict between a client who wanted to maximise space, and building codes that would prohibit us from placing windows in built to boundary walls.

Encouraged by our admiration for the qualities of the existing undercroft, along with the image of a timber house resting on a pastel painted batten skirt, we developed a notion for a metre thick band of space that wrapped the perimeter of the house and adopted the language and qualities of the existing undercroft. By separating the interiors from the boundary, this porous buffer, which took the form of a new timber skirt, would also deliver light and ventilation to the lower storey,
filter views, and act as a substrate for climbing plants. The offset of the timber screen from the line of the internal spaces would allow us to make window openings that were set back from the boundary, and protected by the screening. Elsewhere we proposed to line the external walls with translucent cladding to gain further illumination for the interiors. Importantly, the architecture was intended to interpret and re-deploy the qualities of light and space characteristic of the original undercroft, and the composition of the elevated house resting on a skirt of timber could be maintained.

In response to the importance of light and colour in the development of our idea for the new batten skirt, I began a process of drawing and painting through which to test such qualities. Aside from the pragmatic and spatial solutions that the new batten skirt would provide, it also presented interesting opportunities to layer the screen and test how it might read against a background of varying colour and texture – i.e. the wall of the house proper. I was also particularly interested in how the timber would receive and filter light – in other words, to examine what the painted timber screen does, how it exists in the world, enters into relations and affects.

A series of 1:1 painted studies resulted from this thinking, using thinned acrylic paint applied to heavy paper with a roller. Two layers of vertical stripes were arranged on the page – each layer varying in colour and rhythm. Applying paint with a consistency that allows the bottom layer of
stripes to bleed through the top suggests a level of transparency, while adjusting the rhythm of the spacing of each layer is suggestive of the kind of visual movement that occurs between two such layers of screening relative to a moving viewer.

As a number of iterations of the paintings were produced, it became evident that the density of the stripes – i.e. the proportion of gap width to stripe width – in combination with the variation in rhythm between the two layers were important factors in registering a sense of movement in viewing the works. Where the density became too great and white space between the stripes was eliminated, pattern and movement became less legible. The same occurred when the rhythm of the top and bottom layer of stripes varied independently to each other. The most successful outcomes from the point of view of registering a sense of movement resulted from retaining the same rhythm for the two layers, but slightly offsetting one from the other, so that the bottom layer just peaked out from behind the top, and at least a thin stripe of white space was maintained between the two. Various colour combinations were tested – each layer of stripes afforded its own hue, contrasting with the corresponding layer.

The more effective outcomes seemed to be the paintings where the two layers had the greatest separation in hue and tone – optically this seems to place more space, or depth, between the two layers by virtue of the distinct contrast in colour, which in turn amplifies the effects of movement
perceived in the composition. The way in which these paintings act, and enter into an affective relationship with the viewer, could not be anticipated without their making, or be described through representational means. It’s a case of acting on an idea, embarking on a phase of making, reacting to an outcome, and edging in a certain direction in the subsequent iteration as a result. New knowledge (rather than prior, assumed knowledge) is accumulated as one proceeds with the making, and it is the material action of the work that affords this.
Testing the screens through this series of paintings at a scale of 1:1, and with methods that evoke layering and movement, or the way that colours mix optically through their adjacency, allows the paintings to affect and exist as a material thing in their own right, rather than simply standing in as a representation of a design. As an artefact it does more than describe. Where typical architectural documentation relies on codified conventions that describe what an object is and how its parts are composed, the screen paintings are more concerned with what the thing does and its affective potential – in other words, how it acts.

The work therefore moves beyond the purely representational quality of conventional architectural drawing. Reductive in their level of architectural detail (though richer in material presence) as compared to architectural documentation, the paintings avoid explicit prescription of what the screen should be. Rather, they distil some of the qualities and allow a conversation to be held around those qualities, without pinning anything down in fixed detail.

As the project progressed, the next iteration of screen tests took the more physical form of three-dimensional ‘paintings,’ which recognised that the sticks of timber that would make up the designed screen would of course have their own dimensions and multiple faces that could receive light and colour independently. In a sense these works begin to move away from drawing and toward something more like a prototype, however there are some key differences between
the screen paintings and what would conventionally be understood as a prototype.

As previously discussed, it is more useful to understand a work such as this as sitting on a continuum between pure 2-dimensional representation and a fully realised construction prototype. The difference lies in the associations that architectural prototypes hold for me – that they are generally a literal construction of a building component, produced for the purpose of proving the technical correctness of the design, and further, that a prototype serves as a model for a future product yet to come, marginalising the autonomy of the prototype as a thing in its own right.

Proving is a key word here, which differs significantly to the task I set for drawings, paintings or other artefacts in my process, which are intended to be explorative and open up possibilities rather than close them down or represent an idealised outcome as a prototype might. Although these screen paintings bore some direct relationship to the actual screen – the timber elements are of the same dimension as that which we intended to use for the screen – they didn’t seek to resolve constructional detail or the means of fabrication. Rather, the paintings simply furthered the thinking of the works on paper, by testing the density and rhythm of the sticks, along with the capacity for the screen to receive and filter light and shade, and for colours to mix by their adjacency on different surfaces.
In that sense it could be said that the paintings are a prototype for an encounter with the eventual screen, however I’m still uncomfortable with the tendency for the term prototype to divert attention away from the presence of the paintings as they exist now as a material thing in their own right, rather than simply standing in for a design yet to be fulfilled. Introducing a dimension of depth, the screen paintings are able to enter into a spatial relationship with a viewer – more so than the works on paper might.

The affect of the screen varies significantly depending on its relation in space to an observer and the resultant viewing angle. In seeking to exploit this, different faces of the vertical elements are treated with different colours (a reference to painted timber colours observed in the Brisbane context), so that as an observer moves relative to the screen, more or less of each colour comes into view, and the screen takes on a different character. As the two colours sit on adjacent surfaces they blend optically – the presence of one colour affects how we perceive the other – and as more or less of one colour comes into view the resultant mix of hues shifts as well. Importantly, for both these works, and those on paper, the contribution that they make to the thinking and development of ideas in the project hinges largely on their qualities as physical and material things. And this is true not only in the making of the artefacts, but also in the viewing of and reflecting on them.
The affective potential of these works leaves open the possibility of entering into relations with them and to be affected by them – in the same way that we can have an encounter with a battened undercroft below a timber house. The paintings are active – possessed by action and in that sense depart from pure architectural representation. Such an encounter differs from that which we might have with a coded representation that draws on common knowledge. The knowledge that is gained from these paintings is new knowledge drawn directly from a material encounter, and it can thus inflect the design process. Making allows us to suspend our assumptions about what something is and allows us to experience what it does.
In the context of a discussion of subverting the primacy of architectural representation, and with reference to the Albion Screen project, I’m drawn to the movement of abstract art, particularly American abstract painting from the 1940s onwards. Though a comprehensive study of abstract art is well beyond the scope and intentions of this PhD, it remains useful to touch on some common threads within this movement that help to articulate an approach to non-representational making.

In particular, I’m interested in the second generation of that movement of American painting (sometimes referred to as abstract minimalism) in New York from the 1950s that strove to emphasise the painting itself (or other art object) as the subject, and drew attention to the picture plane as a material thing in itself as opposed to more accepted representational or figurative modes of painting that strove for realistic reproduction of a subject.

It follows then that some of the ideas that for the basis of the abstract art movement may have something to contribute to my interest in subverting the primacy of representation in the architectural discipline. Resonating with this is Gail Peter Borden’s observation in *Process: Material and Representation in Architecture*, that abstraction in the 20th century art removed the reference object, moved away from the figurative toward the purely abstract and required “…the
engagement of object with self to generate response.” With reference to abstract art – the self referred to here is typically that of the viewer, however my interest is typically more concerned with the relation between an artefact and the maker rather than a separate third party. Abstract minimalist artists eroded boundaries between painting and sculpture, and sought to enter into a phenomenological relationship with the observer.

Although the rhetoric around abstract minimalism emphasises the work itself as an object, and the experience is centred around a phenomenological subject, it is possible to reframe a discussion of this work with language that emphasises the material agency and affective potential of it rather than focusing on the experience of a subject. In this way minimalism can become a useful reference point for my own work as a movement concerned with the material presence of an artefact, and the subversion of representational modes of making. Perhaps the most useful point to take away from this art movement is the way in which the artwork is always in the making through its role within a network of relations. The work can never be disentangled from this set of relations, which includes the space within which it is presented, the materials with which the work is constituted and the bodies of those who view and engage with it.

A work such as *Hang Up* by Eva Hesse, 1966 seems to approach all of these notions simultaneously – the subversion of the picture plane, boundaries between painting and sculpture, and the status of the work as a non-representational material thing in its own right. In this work, a string bound frame is hung on the wall, as a conventional painting would typically be. Projecting from the frame into the space of the gallery is a gestural line of bent tube that has the expressive quality of a drawn line on a flat page, and yet has spilt over into three-dimensions.

Hesse’s practice has been noted for the way that it shifts between conventions of painting and sculpture. Catherine de Zehger notes that “…while Hesse located her work in what Krauss has called the sublimated, front-parallel plane of Modernist opticality, she defied its meaning, “intuitively recognizing that the abstract concept known as the picture plane is, in the material realm, simply a thing of cloth,” which she unravelled, consistently and literally, in her oeuvre.”

The discussion of the picture plane and the material presence of the work appears to be far richer in discourse surrounding the visual arts than when it comes to considerations of the architectural drawing.

Another minimalist contemporary of Eva Hesse was the painter Agnes Martin. Though her work never left the two-dimensional surface of the canvas, Martin discussed the

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77 Catherine De Zegher, "Drawing as Binding/Bandage/Bondage or Eva Hesse Caught in the Triangle of Process/Content/Materiality," In Eva Hesse Drawing, edited by Catherine De Zegher, 59-116. (New York: The Drawing Centre, 2006), 75.
experiential affects she wished her paintings to exert, through entirely non-representational means. Nancy Princenthal quotes Martin as stating:

When people go to the ocean they like to see it all day. They don’t expect to see, to find all that response in painting. There’s nobody living who couldn’t stand all afternoon in front of a waterfall. It’s a simple experience, you become lighter and lighter in weight, you wouldn’t want anything else. Anyone who can sit on a stone in a field awhile can see my painting. Nature is like parting a curtain, you go into it. I want to draw a certain response like this... that quality of response from people when they leave themselves behind. My paintings... [are] about merging, about formlessness,... A world without objects, without interruption.⁷⁸

The majority of Martin’s acclaimed work was composed on 6-foot square canvasses that had the capacity to consume the majority of ones visual field when standing in front of the canvas. Martin said of the scale of the paintings; “It’s a good size [when] you can just feel like stepping into it. It has to do with being the full size of the human body.”⁷⁹ Although an abstract minimalist, whose compositions were entirely non-representational, Martin was able to evoke the affective qualities of landscapes through her paintings. Apparently

⁷⁹ Ibid., 101.
numerous titles given to Martin’s work, that often evoked landscape settings – The Harbour; The Spring, White Flower etc. – were attributed to friends of the artist who had been affected by the work and sought to attribute associations or meanings to it.80

Subverting the primacy of architectural representation

In the making of the artefacts, both in the Albion project and others over the course of the research, it has struck me that they operate in a different way to most architectural representations – the difference lies in the way these artefacts subvert the primacy of representation, by emphasising their importance as material and physical things in themselves. I’m reminded of the observation made by Patricia Cain that I drew on in Chapter I and which feeds back nicely into this discussion of representation; “I started to think of drawing as a method by which to explore the world in its own right instead of being simply a matter of representing an outer world.”81

In the same spirit, the artefacts that I’m making are not simply a matter of representing an outer world, but are a method by which to explore the world in its own right, resituating the speculative nature of architectural design in the world of here and now – what happens if I place one plane of colour against another, or tilt it this way, or conceal

80 Nancy Princenthal, Agnes Martin: Her Life and Art, (New York: Thames and Hudson, 2015), 81.
81 Patricia Cain, Drawing: The Enactive Evolution of the Practitioner (Bristol, Intellect, 2010), 52
one plane so that it’s colour is only perceived as it bounces off another visible surface. In most architectural documentation (and this is well understood in the discipline), the picture plane dissolves, and we don’t perceive the material thing itself so much as what it represents. Of course this only holds true for conventional architectural documentation, which is purely representational. Many exceptions to the rule exist – the rich tradition of ‘paper architecture’ of the 1970s and 80s is an obvious example.

Thom Mayne’s drawings for the Sixth Street House produced with Andrew Zago are an example of subtly subverting common means of architectural representation, foregrounding the drawing as an object in its own right. Each drawing, of which there are 10, includes multiple views of the house – a plan and associated section or elevation, along with an isometric study of a key component. Each of these drawings are overlayed, so as to produce a complex web of graphics that seeks to convey a level of complexity that a standard set of drawings would dilute.82

Importantly, the section or elevation in each drawing is taken at a view oblique to the principal axis of the plan, and secondly, each page is constructed as though a façade of the building, with the edges of the page correlating to the edges of the building, consequently setting out a logic to the location of the associated plan and isometric on the page. This move seems to me to be critical not only because it establishes the

rules by which the composition of the drawing is formed, but also because by making the page analogous to the building elevation it allows the paper itself to begin to assume the status of an object itself, rather than a mere picture plan through which we look to the representation. Though the drawings set out with fairly conventional means of architectural representation, the result is anything but conventional due to the subversion of these conventions. Part of the appeal of the drawings is the complex labyrinthine nature of the composition, but they also manage to impart a greater complexity and quantum of information and understanding of the design by this method.

Mayne’s drawings are but one example among countless others that subvert conventions of architectural representation – Daniel Libeskind’s *Micro Megas* and *Chamber Works* are one that come to mind for their use of conventional drafting techniques to make radical and dense spatial descriptions, overlaying seemingly multiple modes of representation – plan, elevation, perspective and axonometric all overlaid at once; Bernard Tschumi’s *Manhattan Transcripts* for their use of drafting and collage techniques to weave an event narrative are another. Examples notable for their more overtly physical and material form include Frederick Keisler’s incredible models for the *Endless House* that so closely anticipate the material of the building; Constant Nieuwenhuys’ models, collages and drawings for *New Babylon*; and even Alvar Aalto’s experiments in plywood and bent wood for their direct
engagement with the capacity for form and expression in a specific material.

When it comes to conventional architectural documentation however, which comprise the large bulk of drawings produced in practice, it holds true that they take codified forms of representation, that not only marginalise the material presence of the drawing, but actively suppress it. Architectural documentation is a visual language that requires acquired knowledge – a thick line represents a cut wall, dash-dot is a boundary line, a hatch of stippled dots and irregular triangles is concrete viewed in section and so on. Any material presence is only likely to distract from the intended, correct reading of the drawing.

As Mark Wigley puts it, paper is the site for the drawing, or, ‘the support’ for the drawing. The material characteristics of the page – its thickness, weight, texture, and its laminations of fibres – are usually ignored; so as to become an inert substrate for the marks it will receive. This allows paper to act as a bridge across the classical divide between material and idea – a certain way of looking at paper, or rather a certain blindness to it, allows physical marks to assume the status of immaterial ideas.83 Of course in architecture the condition whereby the material presence of the drawing becomes marginalised is particularly acute due to the unavoidable reality that almost all architectural drawings refer

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to something else outside of themselves, i.e. a building that either does not yet exist, or exists in a location physically removed from the drawing.

Noam Andrews addresses this condition in his essay *The Architectural Gesture*;

Imaginative projection takes the spectator of the architectural drawing away from the physical page by appealing to an imagined materialization that occurs elsewhere. But it also takes the spectator into the page, again bypassing the materiality of the two-dimensional surface and the lines inscribed upon it, by requiring adherence to the representation conventions of projection and the resulting spatial construction.\(^8^4\)

By deflecting focus away from the material constitution of the artefact, architectural documentation foregrounds an objective reading. Even if the drawing is imperfect, we understand that it represents an idealised form, and that there is an intended, or ‘correct’ reading of the drawing – ideas and forms are known and fixed. This brings to mind Patricia Cain’s observation in relation to technical drawings with which I opened Chapter IV – that our eye tends to imbue technical drawings with a trusting sense of reality, deflecting our reading of the actual artefact or drawing itself. In contrast, I’m interested in the artefact as part of an assemblage of relations – the relation between the colours of the screen

paintings for example, or the relation of the paintings with the quality of light within which they’re cast, or the quality of the material surface against which they’re hung, or even the humidity of the space which cases the timber to warp and deflect, and my perception of the paintings are all aspects of the network of relations within which the work is situated. Understanding the artefact as such allows me to remain open to a richer life for that making process which may shape the ongoing evolution of ideas and forms.

The transparent, immaterial condition of architectural representation is particularly acute when it comes to documentation produced for the purpose of construction contract documents. Picking up on this point, Louise Pelletier and Alberto Perez-Gomez chart the course along which architectural representations have progressed from ancient Greece through to current times in their book *Architectural Representation and the Perspective Hinge*. They describe a contemporary condition were all ambiguity is sought to be eradicated from the drawing;

> Projective representations ...are expected to be absolutely unambiguous to avoid possible (mis)interpretations, as well as functioning as efficient neutral instruments devoid of inherent value other than their capacity for accurate transcription.
Professional architects generally see architectural drawing in this light.\textsuperscript{85}

Even further defining or narrowing the scope for interpretation of the drawing is the notion that it becomes a \textit{contract document}, binding a builder to translate the contents of the drawing in accordance with the terms of the building contract. Any translation outside of the range of \textit{correct} interpretations is a \textit{breach} of that contract – and hence the architect strives for clarity in the drawing to protect themselves, their client, the builder and the project.

The very point that there is a correct reading of the drawing is important here – what exactly that is might be disputed by different parties, but a correct reading is nevertheless something which is sought. It is also true that the notion of authorship in the making of a construction drawing is suppressed – indeed any single drawing in an architectural office may claim numerous authors. The conventions adopted to construct the drawing are carefully upheld to ensure that a drawing may be shared throughout the office over the course of a project, and so that the same marks, repeated across a drawing set can be unambiguously interpreted. This is to take nothing away from the great complexity (and often graphic beauty) inherent to construction documents, or the importance of their place within the process of translating a design to construction. My point is to demonstrate that such architectural

representations are not intended to operate at the level of a thing with material presence and action or to open up to divergent readings and exert affects as an object in their own right. The architectural representation can be descriptive of material, of experiential phenomena, of movement, weight or light – but it cannot be that material or phenomena.

The representation is always projective, rather than present. Much like the score for the performance of a piece of music, the architectural construction drawing is a set of notations, that in themselves can imply movement and action, can communicate emphasis here or there and can dictate or guide the process of the making of a thing – but must be interpreted with specialist knowledge and subsequently enacted.

Of course the construction document is just one drawing type amongst many common to the architectural discipline. Another significant type – the diagram, is just as codified and abstract as the construction drawing, if not more so. It might be said however that the architectural perspective, or drawn spatial impression imparts a more embodied experience for the viewer. Though for the most part architectural drawings, including digital renderings, do little more than provide pictorial representations that lean on the well-understood mechanics of visual perception.

As Pelletier and Perez-Gomez note, subsequent to the renaissance, perspective representation developed to become “…a simple re-presentation of reality, an empirical
verification of how the external world is presented to human vision.” At the level of pictorial representations of space, perspectival architectural renders I would argue are just as codified and abstract as drawings intended for construction.

To be specific, I use the term pictorial here in the sense that these representations are illustrative – where the drawing is not so much generative or seeking to evoke ideas of spatial and material phenomena, but rather to illustrate, or communicate spatial dimensions to an observer. Although arguably a more embodied representation than for example the impossible viewpoint of the plan, section, or axonometric, the drawn spatial impressions that seek to construct a perspectival view and so place the viewer relative to the space beyond the picture plane nevertheless rely on a culturally engrained understanding of the way spatial geometrics translate onto a flattened picture plane – including the diminishing scale of objects receding from the picture plane, and the effect of the ground plane lifting towards the horizon.

Although most of us are probably completely unconscious of the construction of perspective when viewing spatial representations, a system of conventions nonetheless sit behind these drawings and allow them to be interpreted, just as other conventions are used to construct the more overtly codified construction drawing. A pictorial spatial view simply leans on much more widely understood conventions of

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representation that have been absorbed into our highly visual culture. Patricia Cain makes this point in her analysis of the drawing *Glass* by Richard Talbot;

By choosing to use this system (perspective) Talbot is immediately curtailing the types of mark-making decisions and judgements he might have made had he chosen to use other methods or materials, because perspective drawing adheres to a formalised set of rules or conventions which rely on representation through the measurement of ruled lines.⁸⁷

A particular approach to architectural representation of note in this context is Atelier Bow-Wow’s Graphic Anatomy project, catalogued in two separate publications; *Graphic Anatomy* and *Graphic Anatomy 2*. The drawings produced for this project, which document much of the practice’s built work, sit at the nexus between construction document and pictorial, perspective representation, giving equal emphasis to detailed constructional information as to signs of habitation. Taking the form of a scaled plan or section cut, the drawings also describe the interior space beyond in one point perspective. Dimensions and material notes annotate the section cut, whilst human figures, furniture, pets, plants and other daily objects populate the interiors and give a sense of the daily life of the buildings. The preface to Graphic Anatomy states;

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If they were photographs, probably a great many would be necessary, but contained within a single picture is the composition of rooms and components, the adjacent exterior environments, actions and locations, and the relationships between objects. This provides the appearance of multiple intentions fraught with contradiction and confrontation, organically linked through the medium of specific architectural elements, as well as producing the appearance of unexpected phenomena of light and daily life, in response to the physical constraints on each individual house. 88

Although there is a great richness to the presentation of material and constructional detail and the relationship between subtle design manoeuvres and the intended habitation of the spaces, the drawings still remain in the realm of pictorial representation – the drawings still have to be read and processed, and furthermore the reading of the drawings and what is taken from them will vary according to the degree of specialised knowledge held by the observer. All of the representational graphics in these drawings require some form of knowledge to be interpreted – some specialised, some not so much. Graphics that describe building materials such as wobbly lines for insulation or directional arrows indicating the rise of stairs are specific to construction disciplines, whereas the silhouette of a human figure or plant are of course more universal, but importantly,

both are instances of acquired knowledge, simply because both are graphic abstractions of what we understand to be insulation blankets, a human figure or a plant. Once a graphic abstraction comes into common usage, it becomes sign and symbol. Both construction drawings and conventional perspective based spatial representations describe as much if not more than act.

Rather than describing, or representing an outer world, the process of making that I’m interested in, and which drives the development of ideas in my practice, is a means to explore the world in its own right, as per Cain. Whereas conventional representations employ signs and codes to refer to things outside of themselves, I find value in the made artefact that is the thing itself, and which may exert its own affect upon ourselves and other proximate things. This is the distinction that I draw between conventional architectural representations, even those as successful as the Bow-Wow perspectives, and the drawings, models and other material studies that form the content of this PhD.

As Irenée Scalbert notes in relation to the work of 6a Architects; “6a do not subscribe to the view that architecture needs to make a statement. But they believe instead that architects make statements when they make things in a certain way as opposed to another.”89 Rather than the architect as the maker of the statement however, it may be

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the *way of making* that makes the statement as such. Rather than exerting a predetermined idea or image upon material, such an approach is concerned with moving towards a process where ideas, knowledge and form emerge in the making. It’s important to me to stress that I’m not seeking to establish a dichotomy between conventional architectural representations and the type of artefacts I’ve described here and am attempting to make, but rather to suggest that there are other means by which representations – artefacts of the design process of various kinds – can act beyond mere projection from image to building.

Made artefacts can also have a more transversal relationship with the work of architecture, sharing qualities and a sensibility through which each is made. Without diminishing the importance and role of conventional architectural representations, recognising and articulating the capacity for artefacts to act in other ways has allowed me to clarify the role that making plays within my own practice, and also help to develop a potential framework for understanding and valuing the work of other practitioners such as Smout Allen, 6a Architects, MATSYS and others who are also making in non-representational or non-projective forms.

Although rendered or pictorial architectural representations still lean on codes and conventions to convey content, there is something to be said about the way certain drawings describe qualities that are perhaps less about a linear projection from drawing to building, and more about capturing a shared sensibility between drawing and building. The
immaculately rendered beaux-arts cross section is one example that comes to mind – where the section cut itself remains blank and void of detail, and in contrast the interior is heavily rendered to describe material, surface, light and space, in such a way that whilst the drawing evokes qualities, in doing so it also obscures detail that could easily be translated to built form. A more recent example might be Marion Mahony Griffin’s renderings of the Canberra masterplan that seamlessly embed into the landscape the architectural elements depicted and engender them with those same qualities of the landscape. The watercolours of Steven Holl, or Peter Zumthor’s charcoal renderings are further prominent examples of this type. Holl says of his drawings;

*The process starts always on 5 x 7 inches. Sometimes it is just a painting, it is not necessarily a built one. Might be a building later, might be a piece of furniture.*

And a member of Holl’s staff comments; “*Steven’s watercolours are kind of a conceptual guide for us, to guide us through the development of the project.*” Rather than describing detail that can be translated in a linear manner to a building, Holl’s sketches seem to become like a talisman, which is carried through a project to remind one of a certain quality that is sought after in the building.

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Zumthor’s charcoal renderings of the *Bruder Klaus Chapel* in rural Germany share many of the wonderful qualities of the building itself. The concrete chapel was cast using a formwork of regular ply shuttering to the exterior, with raw stacked tree trunks forming the interior lining of the formwork. The great thickness of these concrete walls dictated that the concrete be poured in stages, resulting in visible bands at the joints between each pour. Once the final layer of concrete was poured and cured, the interior lining of tree trunks was removed by burning, rendering the interior volume in thick, deep black charcoal, and revealing the scalloped surface left by the trees. The wonderful drawings of this project capture all of these qualities, the medium of the drawing evoking the charred inner surface, and the careful application of the charcoal also capturing the layered bands of concrete – almost as though the drawing itself had be made by methods of casting.

This last point reminds me of a comment that the artist Rachel Whiteread made in relation to some of the drawings she often makes as studies for casting works such as those made for *Stair*. Such drawings, usually made on mundane blue or black lined graph paper are typically rendered in a combination of pencil or pen and white correction fluid. The textured field of the graph paper, and the thick quality of the correction fluid allow the figure rendered in white to have a sense of solidity as though it really were a casting we might be able to appreciate in the round, not just as a two-dimensional representation. Whiteread has said that in these studies she is interested in the making of a drawing by
means of casting. Again, a shared sensibility exists between the drawing and the built work itself. This is a context I can relate to aspects of my own work. Less concerned with straightforward projection, but more concerned with a quality, or affect that may carry over to a work of architecture.

This is a realisation that I’ve made late in the PhD, but one which had been lingering at the edge of my thinking for some time. It seemed for example that there was some kind of quality that was shared between the articulation of surface through aggregated gestures in the paper carvings, and the ambitions our practice had for the material qualities of the roof canopy for our RAH competition scheme, but that this shared quality had nothing to do with projection – I had no intention of scanning the paper carving and turning it into a scaled up building surface for example, something about doing so would have seemed to pervert the intention of the drawing. I’m brought back to the writing of Robin Evans, which was instrumental in affecting my understanding of the relationship between drawings and buildings at the beginning of the PhD. Evans of course articulates the distance and distinction between drawings and buildings;

\[ ...in \text{ the one corner, involvement, substantiality, tangibility, presence, immediacy, direct action; in the other, disengagement, obliqueness, abstraction, mediation and action at a distance.}^{91} \]

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Despite this distance, there’s something to be said also of the similarities, and shared qualities between drawings, or other artefacts of the design process, and buildings, and I think that emphasising the agency of the material relations within making has led me to confront these similarities and understand and articulate something of them.

Knowing through attentiveness and presentness

The attentiveness to material relations in the act of making that I’m pursuing cultivates a being-present with things that could be seen to have implications for ongoing practice more broadly and suggests a possible emphasis in future practice and research beyond the limits of the PhD. Being more present with, and attentive to things suggests a practice where ideas emerge from or are encountered within the specific situation of a project for instance, rather than being predetermined or overlaid, and this goes some way to addressing the question that frames this final chapter of how do I know? I wonder also what the emphasis on the present implies for how we value what we – as architects – produce day to day, as compared to the greater value typically placed on the ‘culmination’ of the process – the built work.

As I’ve discussed, the subtleties found within material relations in an act of making, and the ideas that may be developed out of these relations requires a presentness with things – a refocussing on the present and immediate, rather than the future projection of a work of architecture yet to
come. A slowing down of the design process to allow for a contemplation of the made artefact also helps to refocus on the present and the act of making as the source of ideas. Nigel Thrift presents a framework in *Still Life in Nearly Present Time* that might be used to continue examining the notion attentiveness and presentness in the act of making. Thrift describes the development of *sense of body* practices over the last 150 years which, “…constitute and value the present moment, rather than spearing into the future.”

An intensified attention to the present is cultivated through these practices – Thrift draws on such practices in his critique of recent theories that we live in a *speeded-up* world. Such a notion of intensified attention to the present sits well with the way that I’ve come to think about and value making, and the correlation between the two warrants additional unpacking in future research and practice. There is comfort in focussing on the present and concerning myself with the nuances of the process of making, for it is out of that present moment of making that the architecture materialises, and so by tending to the present moment and the process we also, in turn, tend to the outcome. Overemphasising the future projection on the contrary feels a little like putting the cart before the horse.

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KENILWORTH AMENITIES PROJECT
EVIDENCING THE CONTRIBUTION TO MY PRACTICE

In contrast to conventional architectural representations, but without taking anything away from the utility and importance of these drawing types, I'm interested in artefacts of the design process, be they drawings or models, physical or digital, that *depart* from the pictorial and descriptive, and begin to do something more. It is at this point where the accepted conventions of architectural representation are foregone in favour of other methods to develop ideas through a direct engagement with material media.

Each of the projects that I've undertaken over the course of the PhD has in one way or another sought to emphasise the presence and material action of the artefact itself – to understand what affects the drawing or model might exert, and how it might therefore suggest new ways of approaching a design problem. The graphite drawings for the *Red Hill Bunker* for example were imbued with a texture and materiality of their own that reacted with light and generated a specific surface quality, which subsequently led to the development of a means for casting plaster into timber moulds to further test the possibilities for the craggy, textured surface. The important thing to note is that the drawings in the first instance were a means by which to generate an idea for the project, and that it was the material action of the drawing that enabled this. The *Graphite Curtain* for the
Building Movements exhibition actively engaged with the space of the Design Hub – it billowed with the artificial movement of air in the building, entered into visual affects as the perforations overlapped with the textures of the building skin, and had a material presence specific to its medium – it acted, and through its action revealed potentials for space making and generated knowledge of the space that it occupied. The Screen Paintings for the Albion House enabled the exploration of affects of colour and surface in space in a direct and unmediated way. This subversion of the primacy of architectural representation, and a knowing through the action of artefacts has become a framework that I’ve been able to identify and exploit in my practice.

Having been able to articulate this manner of making within my work allows me to now focus on and engage it with intent in current and future projects. Though the Albion House project ultimately didn’t progress beyond preliminary design work, the ideas that were developed within it have filtered into various other projects, and have continued to be a persistent source for ongoing thinking.

The content within the screen paintings and the methods by which they were produced has continued to serve as a fruitful means of testing ideas. This fact speaks to the value of explorative making in my ongoing practice – ideas developed by these means continually seep into and find a voice in other projects. Drawings, models and paintings, like the talisman in the back pocket, continue to have a physical presence in our studio and guide our work.
The Kenilworth Public Amenities competition recently entered by our practice is one such example. The competition brief called for a set of public toilets located adjacent a road that courses through the Mary Valley – a rural area inland from the Sunshine Coast in Queensland – and called for designers to propose a structure that would elevate the amenities building to something culturally significant for the town. The area being within a flood plain led to the requirement for the amenities to be elevated 4m above ground.

Our proposal sought to inflate the scale of the structure such that it could be appreciated as an object at the scale of the landscape, and we further hoped to engage with the movement of vehicles through the valley by drawing on ideas I’d previously developed in the *Screen Paintings*. Similarly to the battened undercroft at Albion, we designed a simple timber screen – billboard like in proportions – that sidled up to the roadway and was applied with contrasting colours to opposite faces. The result would be a subtle engagement between the structure and the arc of vehicles that move past on their way through the valley. From the project description;

*The design proposal seeks to embed itself in the landscape of Kenilworth and its surrounds, and hence become part of the broader experience of that landscape as one moves through it. By inflating the scale of the architectural intervention, the building can be read at the scale of the landscape – a wall or billboard scaled surface that directly engages with passing motorists as they move through the valley,*
allowing this project to become an iconic marker for the town – more than just a roadside rest stop and public toilet.

Drawing equally on the vernacular of local timber agrarian constructions and the architectural expression of roadside structures, the proposed building is familiar and sympathetic to its context, but also elevated to the level of an artistic landscape intervention. The painted timber screen is applied with contrasting colour hues to opposite faces that will vary with the direction from which it is approached, and will subtly shift as vehicles pass by as more or less of each surface colour comes into view.

The architecture therefore engages with passers-by moving through the valley, regardless of whether they stop to use the amenities, and hence the architecture becomes an iconic part of the journey through the landscape, using only affordable, familiar and contextually appropriate timber construction. To best engage with the passing traffic, the building is pushed north towards the road and runs east-west, allowing it to act as a screen or buffer shielding much of the park from the road, improving the amenity of the park and opening up views to the north as one ascends the ramp to the amenities.

The effect of the painted screens, leaning against our studio walls develops day to day as one moves around them and
observes the dynamic of two colours on adjacent surfaces mixing in different proportions. The Kenilworth Amenities project benefits from this exploration, and the presence of the original works in the space of our studio, redeploying the ideas in an entirely new context.

On a personal level, specific to my practice, this has been a contribution that the PhD process has made for me – the articulation of a way of working that ultimately lends itself to making further work. Notwithstanding the need to sometimes eventually ‘fix’ forms and ideas in place for a contractual purpose, I've developed an approach to practice that engages ways of making and thinking that opens possibilities and extends the time spent occupying that space in a project where ideas and forms are emerging, but not yet pinned down. In other words, a design process that remains open and explorative through a practice of making. Even once a project reaches a point where external pressures dictate that forms and ideas become fixed and documented, the practice of continually making means that even ideas that have found a fixed form for one project, inevitably seep into another making process and continue to develop.
CONCLUSION

ARTICULATING THE CONTRIBUTION TO KNOWLEDGE

Beyond the self-examination of my own practice, and stepping back to a view of this research project within the context of the discipline as a whole, the contribution here can be seen as twofold.

Firstly, by having sought to more deeply understand and articulate the making processes that emerged intuitively – or without always consciously knowing in advance why these approaches were valuable – I’ve been able to identify and unpack nuanced relationships at work inside those processes of making. By working and discussing that work through an unusually close proximity to the act of making and the material engagement involved, the research has proposed that materials involved in the process of making have more agency (or agentic power) than generally recognised. This has allowed me to add to the discourse surrounding theories of making in architecture more broadly

Secondly, the articulation of a way of working can contribute to ways of understanding the nature and value of the making processes of other practitioners, especially those with a
particular attentiveness to the artefact itself. My hope is that my own studies and observations will be of value to practitioners embarking on related explorations through their work. A future, related avenue to pursue with this research, beyond the limits of this PhD, would be to take the framework for understanding making that I’ve developed in my research and use that as a lens through which to examine the work of other contemporary making practices, so as to yield a fuller picture of the status of artefacts and making processes, and the relationship between materials, representations and ideas in the discipline.

This is at the core of the contribution that design research by project is able to make – revealing an understanding of how, why and what we do within our own practices ultimately also reveals something about the discipline as a whole.

At the commencement of my PhD I observed that there were gaps that emerged between my own observations and those offered within the existing discourse in relation to the way the architectural discipline conceives of the relation between ideas, making (including drawing), materials, media, artefacts and buildings. It seemed a key gap is the lack of address given to the capacity for physical media to shape ideas and knowledge and the effect of material agency – the process of design on the designed artefact.

Matter, in the context of making within an architectural design process, is often cast as inert and subservient to the idea represented, rather than being seen to actively shape that
idea. Research questions that emerged then were; *how might one engage in an architectural design process that subverts the primacy of representation and allows ideas to be inflected by material in the making process?* And; *In a practice that by necessity produces large amounts of computer generated material, where does making by hand find a productive place?* By examining my own making practice and reconciling my observations with emerging thinking on materiality and making in architecture, art, philosophy and anthropology I’ve been able to address these questions, firstly by critiquing the common characterisation of making, and more specifically drawing in architecture as a linear translation from an idea fully formed in the mind to marks on a page.

The aim of this research has been to extend the discussion in this area and demonstrate the greater layers of complexity that are inherent to an act of making, including an insistence that ideas emerge or at least are shaped through the act of making rather than simply applied to it. This is supported in recent discourse around making by theorists such as Ingold and thinkers/practitioners such as Cain, among others. I’ve observed that often I’m struck by the departure from initial, partly formed ideas in the act of making, and the wilfulness of the medium – all of which runs counter to the characterisation of the medium as a threshold through which ideas pass and emerge unscathed in material form on the other side. In that sense the role of the medium and the agency it holds within the process has been a key question to
which this research has sought to contribute additional understanding and knowledge.

The commonly accepted and conventional understanding of architectural practice as image production projecting toward built material outcomes is symptomatic of how the architectural medium is understood, both from within the discipline and from outside – that the medium is simply the representational tool of the architect. This research has aimed to characterise the design medium in much richer and more inclusive terms, acknowledging the material of the medium itself, and the situatedness of the act of making. The value of acknowledging the key role that the design medium plays has been in the opportunity it affords to then knowingly adopt specific media in the hope that it will direct a novel or innovative course for the design work. The conversation between ‘cast’ graphite drawings and cast plaster models in the Red Hill Bunker project, and the surface effects and material qualities these media brought forward in the making is a case in point.

A further avenue for future research would be to extend this thinking around the agency of design media to the field of emergence theory in architecture and the use of digital tools in design processes. By working with algorithms or coding architects are arguably embedding agency into the medium with which they are working. Work in this digital/coding territory would offer additional and alternative insight into the propositions developed here, but have remained outside the scope of this study.
This research has involved challenging the primacy of architectural representation and the architectural discipline’s long sightedness toward artefacts of the design process. Attentiveness to that which is made in design is central to the way of working that I’ve articulated, but more often the artefact of architectural representation acts as a transparent picture plane through which we project toward an architecture yet to come. This research proposes that this idea is not entirely accurate, suggesting ways of working that embrace the capacity for materials to operate as actants within design activity. As architects, what we choose to make and how we make, is bound by a set of relations through which materials and ideas are intimately linked – rather than separated by a sharp line with representations wedged in the middle.

To reiterate again, the notion of agency ascribed to materials in the making process here is that of an actant within a larger assemblage – a notion invited by Bennett’s work in *Vibrant Matter*. This sense of agency does not rob the animate being of free-will, or pretend that the individual object acts with intent or autonomy – which are among the points that some have found problematic within this rethinking of agency put forward by Bennett and others. Rather, this research has shown the capacity of design media to affect change within the assemblage of relations that occur within an act of making (within which the maker is obviously a key agent also), and to shape the outcome of this process. Regardless of ones take on agency as a concept – and a particularly contentious one in contemporary discourse at that – the wonderful and complex nuances that materials bring to
making processes seem indisputably evident. It is precisely these material nuances that are so often overlooked in the discipline of architecture, and which this PhD strives to bring attention to.

Returning to the overarching title for this dissertation – Forms and Ideas Materialise – the contribution to knowledge that this PhD offers is explicitly embedded in this title. The term materialise in particular succinctly captures what this research has been able to articulate with regards to ideas emerging in material form – i.e. materialising – through a process of making. What I've taken away from this research as a practitioner is a confidence in the capacity of an act of making to draw out ideas, without those ideas requiring a conceptual resolution before embarking on the process. The confidence to move straight into a process of making in the knowledge that ideas will emerge out of that sets up a framework for future practice that is framed by the pleasure and value found in making.


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