LIVING/MOVING

DESIGNING ADAPTABLE DOMESTIC FURNITURE FOR A WORLD IN FLUX

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Master of Art & Design [Industrial Design and Innovation]
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ATTESTATION OF AUTHORSHIP

'I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the award of any other degree or diploma of a university or other institution of higher learning, except where due acknowledgement is made in the acknowledgements.'

_____

DATE //2013

ACKNOWLEDGEMENTS

This project was completed with the patience, support, and guidance of a number of people to whom I am very thankful.

To my family, and specifically my parents, for their tireless answering of my endless questions and for their technical knowledge. To my friends who entered into longwinded conversations over the predicaments, and frustrations. To the businesses who have helped me with their expert knowledge and for their empathy towards my bank balance. To my peers for their insights, company, and conversation, and to my supervisors for their encouragement, buoyancy, and enthusiasm, even when mine was lacking.

TABLE OF FIGURES

All other images; photographs, drawings, diagrams and graphics are generated and provided by the author of this document.

ABSTRACT

With the invention and constant improvement of international travel and global connectivity our options and opportunities are expanding rapidly. As we negotiate this constantly changing world we must rely on our possessions to accommodate and adapt to transitions and not impede them. What might domestic furniture look and behave like in this flux?

This research project aims to posit ideas for a furniture system which sits outside and adjacent to traditional domestic furniture models.

Employing nostalgic and utilitarian inspirations this project follows an experimental approach to generating a domestic furniture system which is intuitive and practical to use, whilst also engaging with a sense of fun and whimsy.
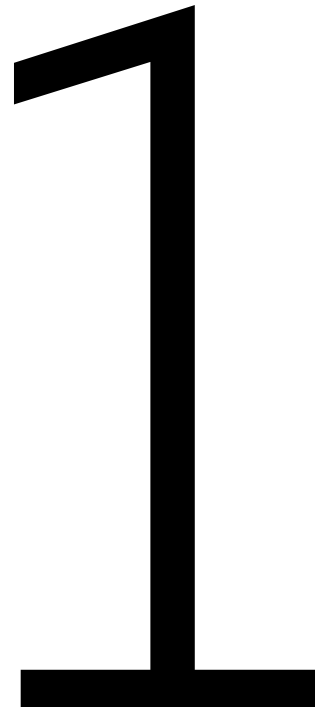
INTRODUCTION

1

RESEARCH QUESTION

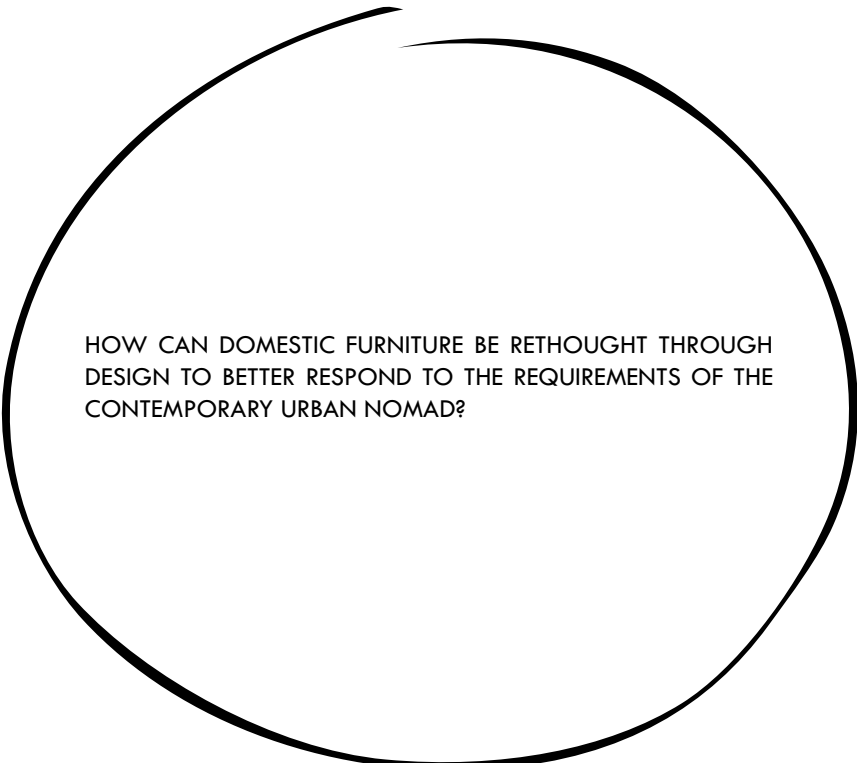HOW CAN DOMESTIC FURNITURE BE RETHOUGHT THROUGH DESIGN TO BETTER RESPOND TO THE REQUIREMENTS OF THE CONTEMPORARY URBAN NOMAD?

PROJECT CONTEXT

There is a current and growing trend towards a new way of living, which I will define as contemporary urban nomadism. Traditionally the word nomad refers to a person of no fixed residence who moves about as opportunity or necessity dictates. When placed in a contemporary urban context the new nomad's roaming is incumbent on accommodation and career opportunities in the same way that a traditional nomad is mobile because of seasonal shifts, trading, or driving animals to new pasture. Important aspects of this question involve a look at whom the urban nomad is, their requirements, what problems they face as part of this lifestyle and how design may be used to facilitate an enhancement of life through furniture.

This urban nomadic lifestyle can be traced back to several explanations, sometimes overlapping. With globalization comes an ease of access through the internet to information previously inaccessible. This access to information has led to a dramatic change in career possibilities and opportunities nationally as well as internationally. "Career trajectories are becoming more and more flexible and a-typical. The traditional linear career has been replaced by a multitude of different career trajectories" (Valgaeren, 2005). This has resulted in the possibility of changing

careers, and changing housing more often "when a win-win relationship is no longer possible" (Valgaeren, 2005) between a person and their career or accommodation. This notion along with the availability to seek work and study opportunities around the world has enabled and supported a means of changing living situations as required or desired. An increase in the population of renters and decrease in private home ownership is also indicative of a less permanent lifestyle becoming more prevalent (Davidson, 2011; Hopkins, 2008; Statistics New Zealand, n.d.). As population density has grown in urban centres, housing has become smaller to accommodate more people in a smaller land area (Statistics New Zealand, n.d.). This may be seen as another critical factor in determining when and how often a change in accommodation is necessary, as household occupancy or income fluctuates, accommodation size must change to support these fluctuations. These issues which determine a nomadic lifestyle come with several restrictions regarding possessions, and specifically furniture including: the size, weight, and volume of possessions; the space available; and floor plan of the living space. Because of these restrictions the nomadic lifestyle is not conducive to conventional furniture and requires an analysis of requirements, and of needs versus wants.

Currently, furniture that complements a less permanent lifestyle is limited; two forms being, what might be called disposable, and flat-pack. The idea of disposable furniture is that it can be bought at each instance of relocation and then disposed of at the termination of occupancy. This method of disposable living eradicates the need for furniture to travel if it is economically or physically unsuitable to do so. While in a way it solves problems relating to the difficulties of moving, it is not ideal. From a user-oriented design perspective the disposable living solution is a symptomatic response to an issue which only tackles the ease of movability in an object. The priority is seen in the cost efficiency of disposable furniture above other considerations, including environmental, because it is perceived as a short term solution, a quick fix. From an environmental stance this method is irresponsible because it relies on an unsustainable system of production and destruction; until a system such as cradle to cradle (Braungart, McDonough, Bollinger, 2006) or design for disassembly (Dr. Chiodo, 2005) can be implemented the waste produced will become landfill.

Another furniture option for the urban nomad is flat-pack furniture. Popularised by IKEA, the aim with flat-pack furniture was the reduction of shipping cost per unit, therefore providing access to well-designed furniture at reduced retail cost (Schwartz-Clauss, von Vegesack, 2002). One of the benefits of this mode of furniture, aside from the cost, was the customers' ability to take the product home on their own, negotiate any possibly restrictive architectural issues such as staircases or narrow halls, and then assemble the product themselves. The flat-pack method made moving furniture into your home easy. However, problems arise with flat-pack furniture when viewed in the context of the nomad. While able to be deconstructed and reconstructed the process of doing so, along with relocating is time consuming and labour intensive. The disposable option, and to some degree the flat pack option have the feeling of an interim solution, when what is needed is a solution which moves with the user. These problems suggest that a change is needed in how furniture is designed for the population of nomads in urban areas, specifically how to design for their significantly different needs and requirements from the domestic space, compared to those of the population who are largely settled.

An issue existing outside of the physical requirements for the nomadic lifestyle may be considered as an emotional requirement, the need for the idea of home, along with the comfort and security associated with it. Because of the likelihood of moving homes this feeling can't be attached to the permanent architecture of a living space, but must become inherent in the objects that travel with you. Duchamp's Boite-en-valise (box-in-suitcase), 1942-54, could be seen as a parallel to this idea. During the occupation of France at the time of the Second World War Duchamp worked on Boite-en-valise. He produced several iterations of previous works in miniature which would be contained inside a suitcase (valise). "My whole life's work fits into one suitcase" (Bonk, Duchamp, 1989, as cited in Demos, 2002), was how he described it. Duchamp's work is an echo of the attempts of displaced people worldwide to maintain a sense of self, of personal and cultural history in a state of flux (Demos, 2002). These issues translate to the lives of urban nomads in a contemporary context because they are in a position that directly limits the amount of possessions to the space available to store them and the convenience to move them.

PERSONAL STATEMENT

Throughout a nine month stay abroad, with six months spent enduring and completing a stint in the Finnish defence forces, and the remaining time spent backpacking, day tripping, and living between urban cityscape and rural country, I have been able to experience the world for the first time as a contemporary nomad. This experience has been paramount to my understanding of what it is to be living in a constant state of flux, with little in the way of constancy or permanence.

During this time I was able to gain an appreciation for what it feels like to be without a sense of home, and how important the idea of home is to my feeling of comfort and security. My time throughout the defence forces was often incredibly trying in regards to personal comfort; both physical and emotional, as well as security, and privacy. Day-long marches and week-long excursions camping in the wilderness were completed in an information vacuum, fortifying discomfort in an already uncomfortable situation. In these scenarios small personally controllable measures like, eating home brought snack foods, changing into dry socks, and using a smuggled mobile phone helped to connect to a feeling of home. The notions of comfort and security, usually attached to the privacy and constancy of a building, had to be realised in

personal possessions instead, which created a strong attachment. I see this attachment as vital to inspiring comfort and security in a population without a permanent home.

I was also able to build an awareness of how liberating, if sometimes uncomfortable, it is to be without the physical and mental burden of excess possessions. The entirety of my expedition was seen through with a 35litre pack and a further 20kg of equipment stored in a suitcase. Largely, the suitcase remained in situ at either my city or country space, with only my pack making almost every move with me. While backpacking I allocated 50% of my pack to necessities, which allowed me to travel long distances on foot and with public transport with ease, and for the collection of souvenirs.

My personal nomadic experience translates to the growing trend towards a nomadic lifestyle in urban centres and its population. This lifestyle differs greatly from the traditional domestic model, which is the primary concern of most designers working in the domestic product market, and which fails to meet the unique requirements of the urban nomadic population. This new mode of living not only opens up an exciting design challenge, but also inspires a behavioural change, at its most basic level, away from

MY MILITARY LOCKER
DIDN'T LEAVE MUCH
ROOM FOR PERSONAL
BELONGINGS

BACKPACKING AROUND
EUROPE IN WINTER
WITH A SATCHEL
AND 35 LITRE PACK

current social norms, and the consumerist model. The nomadic lifestyle, at its core, is seemingly incongruent with consumerism in regards to possession acquisition as the physical impracticality of frequent location changes requires a minimal living philosophy.

Through this project I aimed to begin a personal design dialogue with the idea and practice of the urban nomadic lifestyle, where the primary goals were to design a pragmatic product solution which is manifest in a resolved physical prototype, and to incorporate design thinking tools into my visual arts background to better pursue a more holistic design process and practice.

CRITICAL FRAMEWORKS

Frameworks were selected in accordance with personal values as an approach for considering and evaluating decisions pertaining to the design process. These frameworks offer a lens through which to critically examine outcomes against existing ideals and related context.

Social Innovation

Social innovation is needed as a focus towards generating positive change through "new ideas that work" (Mulgan, 2007). Mulgan discusses innovation as being different to creativity or invention due to a need for systematically vetting ideas, where creativity and invention imply spontaneous results. This definition situates social innovation as a process based paradigm for instigating social change. Present within the focus of this project is the underlying theme of minimal living as the nomadic standard, and through designing for the urban nomad, opportunity is presented to promote a shift towards a more minimal lifestyle through an innovative design response. This shift towards a minimal lifestyle can be seen to be a step towards a more sustainable and sustainability conscious living practice where decisions regarding purchases and possessions are given greater consideration as a requirement of the adopted minimalistic way of life.

Design for Disassembly

Design for disassembly is a technique for sustainability primarily concerned with responsible material and construction choices, and is a method envisioned to aid the in the economic feasibility of product disassembly and recyclability or re-use when it has reached the end of its life. Design for disassembly is guided by three principal considerations (Dr. Chiodo, 2005).

The selection and use of materials:
Designing single material products or products that are easily separable into pure material parts ensures that the contamination of pure materials is not an outcome of recycling.

The design of components and product architecture:
Designing the construction of a product with less component parts and minimisation of material types aids to decrease the amount of time needed for disassembly.

The selection and use of fasteners:
Designing a product with the least amount of fasteners and fastener types, and avoiding adhesives and welding, help to cut down disassembly time and material contamination.

draw focus to the form and materiality.

This honesty in design is applied to my project as a method of evaluating the outcomes, and as a method for formulating decisions relating to construction and materials. Minimal living is what I envision to be the philosophy of the contemporary urban nomad. The urban nomad as I define it is any person who chooses to live without the unnecessary, instead curating a small collection of a few precious or essential items, allowing for a freer lifestyle away from the burden of possessions.

User Centred Design

User centred design is a philosophy which gives the requirements and limitations of the user extensive attention during the entire design process (UPA, n.d.). Generally accepted as an action research based problem solving method, consideration for the end user is required at each stage of the design and validating assumptions and prototypes throughout with observation and roleplaying. The central idea of user centred design, that a product or service be designed with the specific user involved in some form, is applied as a basic framework behind this project.

Minimalism

Minimalism describes a movement seen in art, design, and architecture, which moves toward exposing the bare essentials of a subject, and can be described as a style which aims to eliminate all non-essential information while still retaining the essential core elements (Lancaster, 1953). Truth to materials or material honesty, and aesthetic purity are the core themes of the aesthetic style which are directly linked to conceptual implications of the style. Minimalism has developed as an influence and a critical framework behind this project and during my career as a visual artist. Minimalism is applied as both a design ethos and as a principal philosophy of living. Minimalism as a way of designing is an innately honest process with integrity visible in the quality of construction and materials. Mid-century designer/architect Alvar Aalto can be seen as a minimalist, and is exemplary of this material honesty. His works with bent plywood exhibit minimal materials both in volume and variety, and focus on form through the materials' natural propensity for flexibility. This approach leads to a clean aesthetic which juxtaposes the organic with the precision of machine. Similarly, other designers of the era show great resistance against contrived aesthetic decisions and visual conceits, instead focusing on detail and the quality of craft to

PROJECT POSITIONING

Positioning this project against other art and design practices illustrates essential influences ranging through aesthetic considerations and design philosophies, whilst also building a community of ideas and works which this research fits within.

In the text Design as Art (1966) by Bruno Munari, the author discusses the role of a designer, defining the designer as the builder of formal coherence. It is in this definition that similarities to my own practice can be found, not only in my role as a designer but also as a personal design aesthetic situated around function, where objectivity meets personal taste. Munari goes on to further elaborate on the need for objects to establish a formal coherence, reconciled with function, as a psychological requirement by the user. Munari defines, and explains his impression of the difference between aesthetic beauty and formal coherence. Where beauty is likened to style, and suggested to be a set of aesthetic attributes arbitrarily applied to any given object in spite of function, the idea of formal coherence is free from this pretension, instead suggesting that appearance is inextricably linked to an object's function. This idea implies a gulf between decorative form and function which separates the traits irreconcilably. This separation, however, allows for form through function, rather than form supplanting function as a concern with the power to veto utility, suggesting that "an object [is] beautiful in so far as it [is] functional". This notion is relevant to this project as a way of negotiating the aesthetic considerations by allowing form to follow from function rather than contriving aesthetic decisions through a process separate to the design of function.

While form though function at its base level makes unlimited pragmatic sense, it seems over serious and with little ability to engage with human needs outside the strictly pragmatic. The addition of other qualities into a design becomes relevant when considering these needs as well as the various idiosyncrasies of the user. In the text Familiar – Not so Familiar Louise Schouwenburg discusses the theme of memory, present in the work of many of the Droog designers. This theme offers a direction for driving design innovation through reinterpretation of the past using a contemporary design lens, while also providing designs with emotional qualities; nostalgia, surprise, intuition. Stories are attached to designs through this way of creation which provides more than pure functionality but without delving into the realms of the extraneous, this is because these stories are only suggested by the design's material, function, or construction with the user

reaction, the desire to touch and to operate. The interrogation of the everyday and how it is reimagined provides insight into how desirability and interaction may be generated by design, ideas which I am also attempting to engage the user with, and that are vital to the success of this project.

Fig 1. Top image:
Roy Mcmakin, 2002.
PARK01.

Fig 2. Bottom image:
Tejo Remy, 1991.
Chest of drawers.

imparting their own interpretations and building personal histories. These ideas are important to my own practice because they showcase solutions for engaging with user needs outside of the physical, establishing methods for building connections between product and user. Nostalgia and the theme of memory are also vital to my practice, forming the inspiration for this project.

Many Droog designs inspire a feeling of the whimsical and irreverent, while establishing themselves as useful, if also conceptual. These traits can also found in the work of artist designer Roy McMakin, whose work often sits in the divide between the seemingly disparate disciplines of art, and design. McMakin challenges expectations of the banal and specifically domestic furniture, drawing attention to the invisibility of an everyday functioning object by removing its functionality, or by exhibiting the mechanics of functionality, the object suddenly becomes at odds with expectations of it. This idea is an interesting method of bringing about a reassessment of traditional domestic furniture and relevant to an experimental approach to designing for the domestic environment. Aesthetically and tonally similar, McMakin's twin practices are difficult to differentiate without close visual interaction providing his work with the potential desire for physical

REFRAMING PROJECT

During 2012 I began this project reimagining domestic furniture for the contemporary urban nomad. I established that the most important single piece of furniture in observed homes was the sleeping surface. This information formed the basis of a research project centred on the design of a sleeping surface in line with the highly specific requirements of a population I have defined as being contemporary urban nomads. This population, due to lifestyle, tend to move homes frequently and therefore require possessions which are able to adapt to changes in location, possessions which are easy to move and transport and that are highly useful.

Developing a sleeping surface was an immense challenge. The difficulty was primarily in the conflict between two integral requirements, comfort and mobility. Compromising on either of these two requirements affected the whole and the project was never able to reach a satisfactory conclusion.

During the examination of the product and project at the end of 2012 issues regarding its success were discussed and elaborated on. One important critique came from the failing of the product to serve more than the singular purpose of acting as a sleeping

or seating surface. This critique is founded in the necessary requirement for nomadic furniture to serve multiple uses. As the contemporary urban nomad lives with fewer possession it is vital that many tasks may be accomplished by fewer possessions meaning that each possession must do double duty.

The scope of the project meant that this element was under developed due to the time available, though thought had initially been applied during the exploration and concept stages.

During further discourse it was agreed that the success of the research project lay primarily in the potential for further development of the sleeping surface, and for extended exploration into the design for the contemporary urban nomad.

Following on from my research in 2012, critique and reflection I decided to respond by shifting my focus, while still engaging with the design of domestic nomadic furniture. Leading into the regeneration of this research I decided to undergo a more intuitive, creative, experimental approach, while still considering previously gathered empirical evidence.

Accessing these needs is difficult due to their innate subjective nature; interpretation of these needs may vary considerably from person to person, user to user. In light of this variable, consideration was given to more general elements which describe atmosphere; light, unique personal space, and interaction. These elements along with the subjective nature of emotional needs suggests that a design must be many things to different people, generic but individually customisable.

Exploration continued from this point, extrapolating on these notions to generate ideas which aim to conflate and satisfy both physical and emotional requirements.

DIAGRAM POSITIONING THE SLEEPING SURFACE BETWEEN COMFORT AND MOBILITY

THE SLEEPING SURFACE DEVELOPED IN 2012, THE FIRST YEAR OF THIS PROJECT

COMFORT   2012 PROJECT   MOBILITY
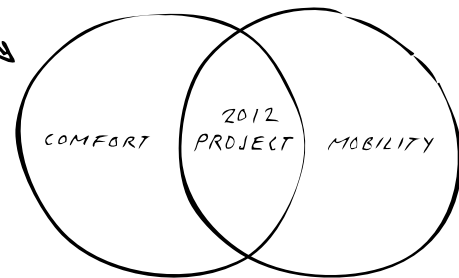
A chapter in the book 'Design as Art' by Bruno Munari called 'and that's not all' elaborates on the many variations of the chair, the endless iterations produced by endless options and nuance. The subtext of this chapter can be interpreted as a discussion on the complete lack of achievable perfection in design, that there is no singular example of a chair which would serve all situations and please every user. From this idea it becomes much easier to step back from the pressure of designing 'the' solution and to be more at peace with designing 'a' solution, allowing for the possibility of failure as an educational step towards a smarter design. With the parameters for success redefined in this way the design process may then become more about play.

The regeneration of this project utilizing a different design approach offered a valuable opportunity to experiment with ideas outside of strict empirical need, while still focussed on the specific requirements of the urban nomad. A more experimental approach leaves room to engage with requirements not easily quantifiable or justifiable through secondary research. These requirements could be thought of as emotional needs, describing the mental need for fun, privacy, security, the idea of home.

METHODOLOGY

RESEARCH METHODOLOGY
RESEARCH METHODS
ETHICAL CONSIDERATIONS
PROJECT MAP

2
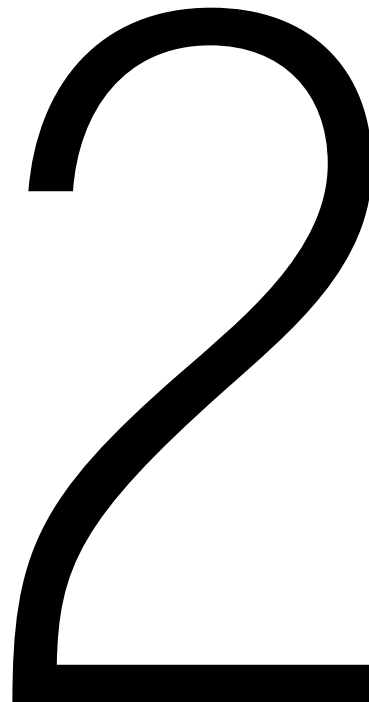
METHODOLOGY & METHODS

The following discusses the methodological approach to research structure as well as the methods used within that structure to generate ideas, and develop a design solution in line with established critical frameworks and personal values.

Research Methodology
Action research is an iterative process which begins with the observation of a problem. The researcher then decides upon a plan of action based on information gathered prior, then proceeds by acting on this plan, observing the outcome and evaluating the results (O'Brien, R, 2001). This process is repeated until a satisfactory outcome is achieved. Using various methods generally common to the qualitative research paradigm, action research employs a more holistic approach to problem solving, as opposed to a single method for collecting and analysing data. Action research was selected as the methodological approach for this research project as it allows for the first hand gathering of primary research; learning through doing. It is an approach which is focused by the researcher, their personal values, as well as a collaborative dialogue with the wider context of the project. These focuses are critical to a user centred design approach where the research aims to affect change or improvement as a result of research because they give insight into the specific issues and concerns of the given user.

Utilising pertinent action research methods is essential for gathering information truly relevant to building an understanding of the needs and requirements of the urban nomad, and for creating a successful user centred design solution as an outcome. Along with a literature review, observation and roleplaying, a vigorous drawing and prototyping practice is vital for the formulation and evaluation of ideas.

PLAN   ACT   OBSERVE   REFLECT
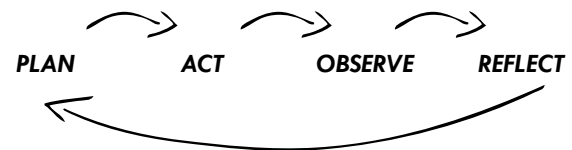
Fig 3: Action Research Cycle
(Kolb, D.1984)

have also been framed to focus on the direction of this project.

A heuristic design approach involves utilising experience based information and is used to speed up the decision making process to come to preliminary conclusions which may then be more rigorously tested through the action research cycle. A heuristic approach has been applied to streamline the concept and prototype design stage because it allows for impulsive idea generation and quick decisions based on prior research as well as personal experience. Because heuristic decision making is based on individual experience it is prone to personal biases which may not lead to the most appropriate design solution. However, this project is focused on the generation of domestic furniture artefacts where the rigours of more quantifiable design research means are not necessarily vital for a satisfactory outcome.

A literature review is a research method which employs the collection and collation of information from multiple secondary sources as a way of examining, interpreting, and evaluating existing information relevant to a particular subject. It enables the researcher to gather a body of relevant information to provide background and build an understanding of the context in which their research project fits.
Searching for information which might be pertinent to the context of this project was achieved through catalogue and database searches. Key words were located through investigation into the traditional definition of the word 'nomad', the history of the nomadic way of life, as well as from personal values regarding aesthetics, sustainability practises, and former personal experiences. These key words helped to identify texts relating to the background surrounding, or lateral to the focus of this project which were analysed and reflected on to deepen understanding and broaden the scope, and area of focus.
Through the literature review I was able to examine themes and frame-works critical to my research project through the subjective thoughts and opinions of others.

Observation is useful as a practical evaluation technique to identify any issues that arise with the interaction between product and user; it offers different subjective viewpoints and a lens to actively view instinctive user-behaviour. Observation was used as a method to broadly evaluate how people live, and to pinpoint the core furniture essentials in a given home, and how they are used.

Research Methods
A mixed methods approach was implemented as a way to gather a more diverse and comprehensive range of information vital to building context around the focus of this project. This approach allows for critical evaluation, and enables the research project to be examined from an array of different perspectives. These mixed methods include heuristics, a literature review, observation, roleplaying and a range of visual and physical design tools. Research is structured to operate in two modes: research for design, and research through design. This allows each to inform and supplement the other continuously throughout the investigation. This research structure will allow these two modes of research to be analysed and reflected upon simultaneously.
Research for design consisted of locating existing available information from mixed sources and examining it to find correlation and common factors to isolate and examine areas for exploration, while research through design was Action Research based, generating information from the design process.
A heuristic approach to this project has been adopted, placing the onus of initial design concepts on personal experience and previous research as a base point to start this investigation. Research methods previously encountered and proven valuable

The homes of a variety of people: home owners, renters, travellers, and myself, were closely inspected to assess the commonalities between each living situation and the priority of furniture objects in a given home. Observation was also used to investigate environments outside of the domestic, specifically focussing on how transitory spaces operate to gain understanding and inspiration. Construction sites, public furniture and public transport fit-outs were examined to provide insight into the construction and fixing methods of spaces where generic systems must be adjustable to generate a site specific outcome.

Observation was important in providing insight into information that the user might not necessarily think to share and for assessing existing construction methods for temporary or adjustable systems.

Roleplaying allows the researcher to physically engage directly with the constraints of a given situation, which allows the researcher to gain first-hand experience and understanding of the scenario. This experience is vital in user centred design as it locates the designer in the role of user. To an extent, my time abroad and particularly backpacking and military service act as an informal roleplaying exercise where the constraints of luggage weight and use of nothing but public and military transportation, and walking were pushed to their limits. These experiences also gave insight into the mental, physical, and emotional stress of relocation, and the anticipation of moving. Other experiences with the use of construction systems both nostalgic and utilitarian have also pre-emptively acted as roleplaying exercises building into an ingrained understanding of temporary constructions. Specifically, using building blocks and other construction toys as a child has served as the nostalgic inspiration for this project, while erecting scaffolding on worksites reignited an interest in temporary structure systems. Insights into the practicality, utility, and ease of use were gained through extensive roleplaying throughout the development of this project, feeding information back into the action research cycle as each element was tested.

Roleplaying was invaluable as a practical research tool for evaluating the outcomes of the action research cycle, as it offered immediate tacit knowledge which could then be put into practice in the next iteration of the design process.

The ideation phase utilised information gathered from earlier research to begin developing ideas in relation to the primary requirements of the project and how they might be best resolved. Following this phase of idea generation drawings and scale prototypes were used as the primary means of translating thought to visual and physical depiction through a process which doesn't require a fully realised thought to establish an idea. Drawings, both quick sketches and illustrations are immensely vital throughout the design process for triggering ideas and fleshing out the physical mechanics before rapidly prototyping. Scale prototypes are also an incredibly beneficial method for understanding and refining physical dimensions, as well as simply getting an idea of how an idea might look from different angles and how it might behave in relation to other components.

Evaluation is needed as an integral part of an action research cycle and as a means of deciding the success of the design. To measure the success of the design it was checked against criteria identified, and found to be relevant through prior research. These criteria fell into two distinct categories: physical, and emotional. Physical criteria consisted of: ease of assembly and disassembly, ease of transport, practicality and utility. These principles were self-tested through roleplaying of suitable scenarios. Packing and unpacking, lifting, moving as well as transportation by various means was used to test transportability, while constructing and using the system in multiple ways was used to demonstrate and test practicality and utility.

Emotional criteria will comprise less solidly identifiable notions of security, and desirability, including aesthetic value. While a feeling of security will be judged against personal experience, the desirability of the product will be evaluated against the critical framework of minimalism.

ETHICAL CONSIDERATIONS

Careful consideration was given to ethical issues which may have arisen during this research project. Research and evaluation methods such as user interviews, user testing and observation of user testing would have been incredibly valuable, however, due to time constraints these methods were outside the scope of the project.

In order to circumvent ethical issues and a need to gain ethical approval from AUT specific research methods were selected. These methods included observation of static environments, and roleplaying, as well as gleaning information from published materials; databases, journals, books, video, and image. These methods, and particularly roleplaying, helped to grow a living knowledge of how the user might respond to the design.

To gain comprehensive user insights and validation of the final design ethical approval would be needed to enable testing and evaluation by the user.

PROJECT MAP

1   2   3   4   5   6   7

2012

2013

AS THIS PROJECT DEVELOPED
THE AREA OF FOCUS NARROWED,
WHILE OFTEN MAKING LATERAL
MOVEMENTS
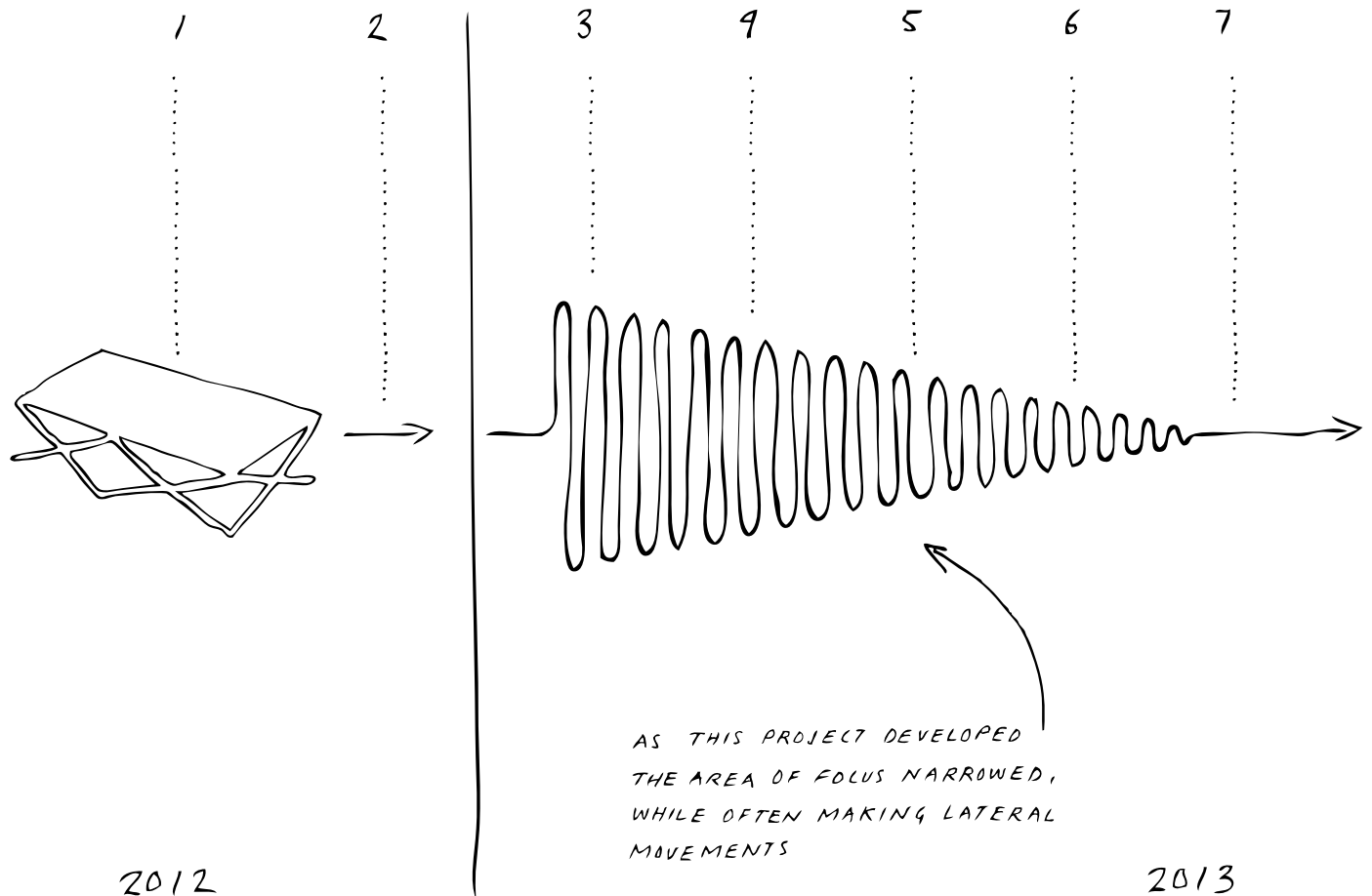
8   9   10

KEY	
1	2012 PROJECT CONCLUSION
2	EXAMINATION AND CRITIQUE
3	REFRAMING PROJECT FOCUS
4	EXPLORATION
5	CONCEPTS
6	DEVELOPMENT
7	REFINEMENTS
8	TESTING
9	FINAL PRODUCT
10	EVALUATION

FUTURE

DOCUMENTATION OF RESEARCH

EXPLORATION
CONCEPTS
DEVELOPEMENT
REFINEMENT

3

EXPLORATION

EXPLORATION DRAWINGS

Exploration combines research insights, user requirements, tacit knowledge, and critical frameworks to build a collection of preliminary design solution ideas. Ideas can then be evaluated and selected ideas refined during the concept stage.

INSIGHTS: LITERATURE REVIEW

CONNECTIONS DRAWN THROUGH
THE LITERATURE REVIEW

A literature review (refer to appendix A) interrogating a wide range of texts surrounding the research focus was completed to generate a context for which this project may be located within. The review discussed the definition of the urban nomad in the context of this project, the possible reasons for an increase in the urban nomadic population, and the practical issues associated with this lifestyle. These issues are explored through an examination of the kinds of furniture available on the market today, and how practical issues are inextricably linked to the emotional needs specific to a population living without a long term home. Questions around social sustainability and environmental sustainability are discussed against existing frameworks as an outline for designing solutions into the product throughout development. Together, these texts have laid a foundation on which to generate ideas and develop the pragmatic practical aspects of the design action research cycle.

TEJO REMY

JURGEN BEY

DROOG

INSPIRATION

JOE COLUMBO

JAMES HENNESSY
VICTOR PAPANEK

EXISTING IDEAS

URBAN NOMAD

WAYS OF THINKIN

RESTRICTIONS

MATERIALS

TECHNIQUES

FRAMEWORKS

FLAT PACK

SUSTAINABILITY

EMOTIONAL NEEDS

HOME

CRADLE TO CRADLE
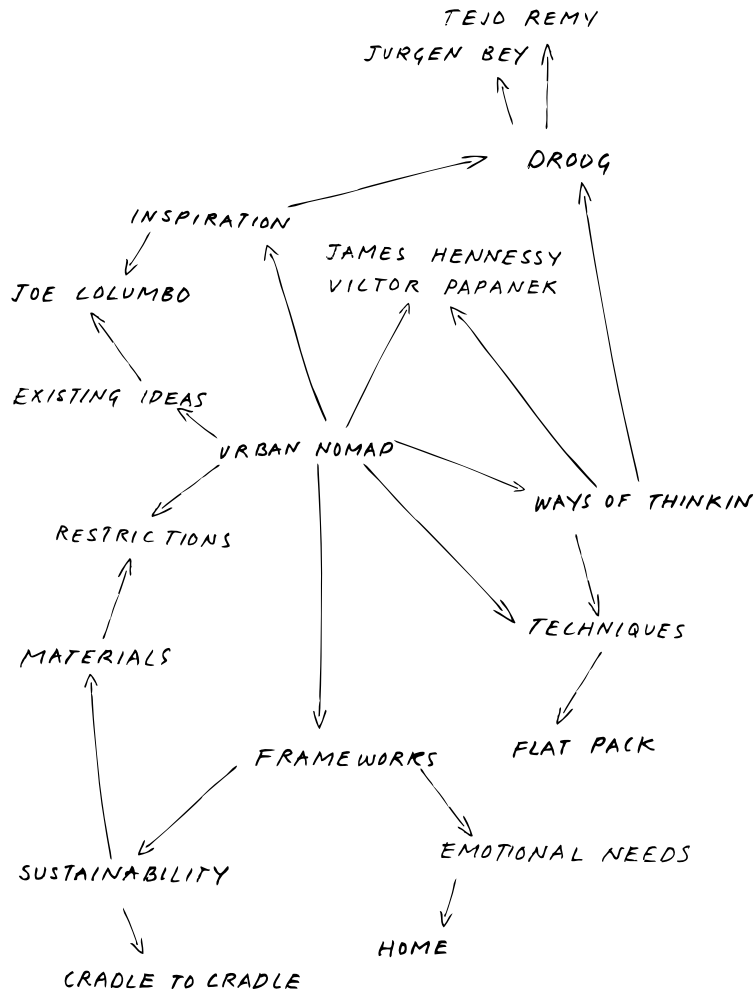
INSIGHTS: OBSERVATION; INTERIOR

Observation of interior spaces was carried out in an effort to examine the similarities in organisation and of furniture use in a variety of homes. Many of the homes I observed contained a large amount of possessions despite their inhabitants proscribing to an otherwise nomadic state of existence. This overabundance of possessions can be seen to be indicative of a mind frame where ideas of home, of self, and of comfort are largely imbued in physical objects. This mind frame is seemingly at odds with requisite minimalism of a truly nomadic existence. This observation of the importance of objects to many people cannot simply be ignored in favour of an idealised notion of a nomadic lifestyle as positioning a product in such a lifestyle would not be congruent with the requirements of the urban nomadic population.

These images depict a selection of spaces observed and recorded. Many show evidence of user constructed elements of furniture, adapted from existing furniture as well as improvised with found materials.
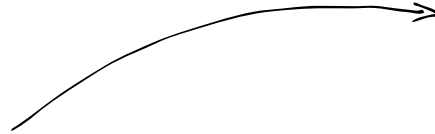
INSIGHTS: ROLEPLAYING

Roleplaying was used to test personal furniture requirements in a small living space and to draw out and understand issues with such a space. Engaging with this scenario generated little information that wasn't already assumed. The experience did however highlight the importance of storage as a requirement. Clothing in particular was recognised to be difficult to organise, as individual items travelled down the scale from clean to dirty at different rates. This meant that clothing needed to be sorted in to multiple sections; clean, to be worn again, laundry, etc.

These images show the various activities performed while roleplaying in a small space scenario. For 10 days I slept, worked and relaxed in a space 2m x 2.5m in an attempt to understand the difficulties of small space living. This scenario was enacted to trial what items of furniture were most necessary when space was restricted.
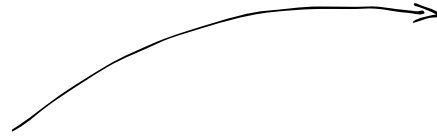
EXPLORATION: OPEN

At the outset of the exploration stage I decided to draw anything that came to mind under the banners of nomadic, multi-use, mobile, and adaptable. This broad exploration and experimentation was used to generate ideas and to create a visual vocabulary to describe a direction to move this project forward in.

CLIP ON ACCESSORIES

INSET TRAY

HANGING SHELVING

INTEGRATED POWER SOCKETS
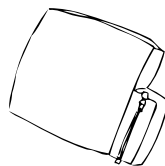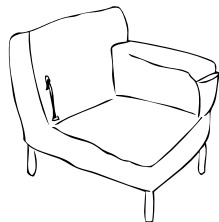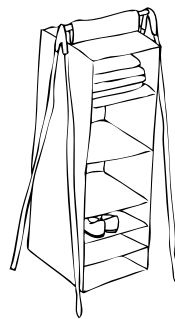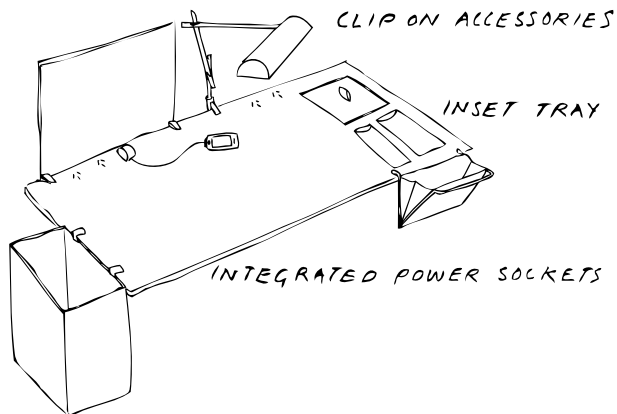
MULTI USE ITEMS ARE
NECCESSARY IN A
SPACE RESTRICTED SITE

NESTING CABINET
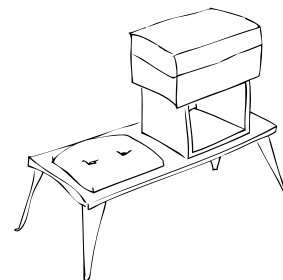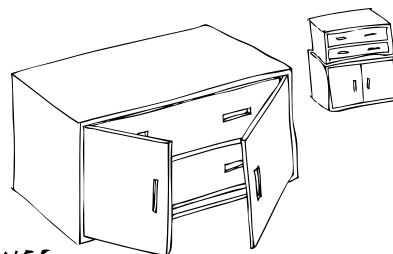
TABLE AND LAMP COMBO

COMBINED UTILITY

MULTIPURPOSE COFFEE TABLE
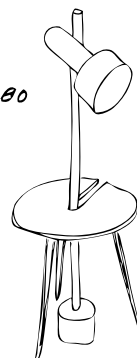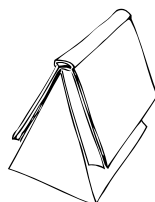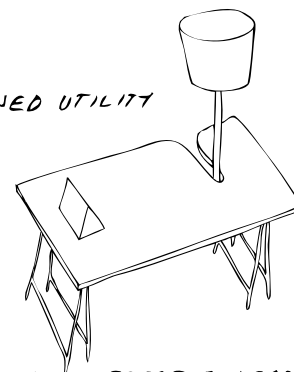
FOLDABLE TRESTLE LEGS

INTEGRATING COMMON
ITEMS INTO SMALL
FURNITURE OBJECTS
UTILISES WASTED SPACE
AND COLLECTS THESE
ITEMS INTO
MANAGABLE GROUPS
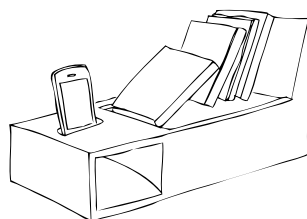
INTEGRATED STORAGE

ACOUSTIC SPEAKER
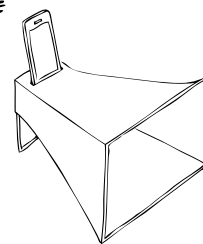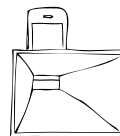
INTEGRATE LAMP AND POT PLANT

INSET STATIONARY HOLDERS
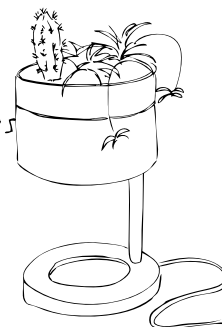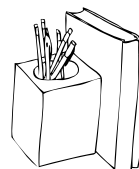
INTEGRATED BOOKEND AND STATIONARY HOLDER

SMALL STORAGE
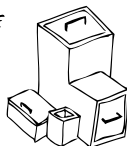
MULTIPLE STORAGE OPTIONS
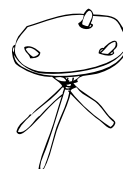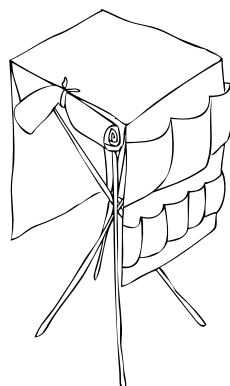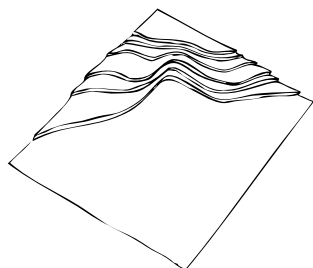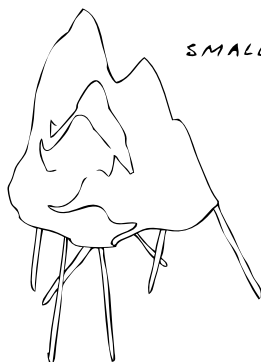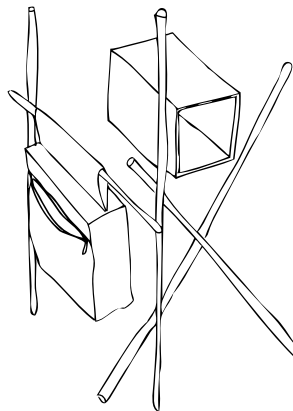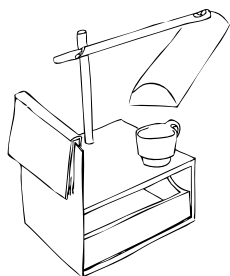
COMBINED USE FURNITURE
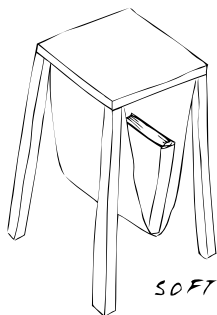
SOFT STORAGE
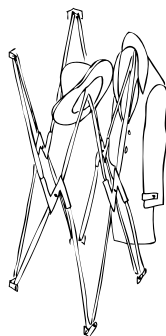
FOLDING MECHANISM
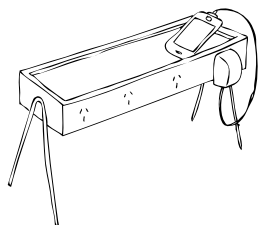
GADGET POWER STATION

FOLDABLE STOOL

CAMP-LIKE FURNITURE
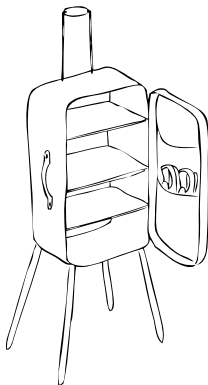
SOFT STORAGE DRAWS
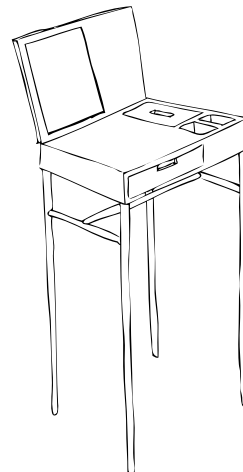
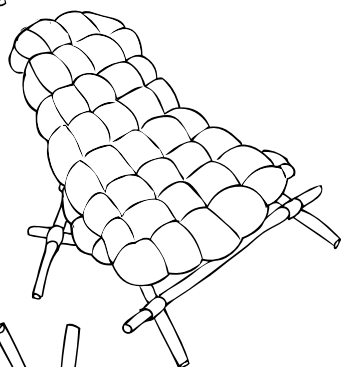RE-IMAGINING FURNITURE
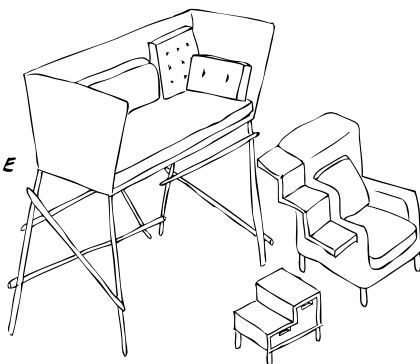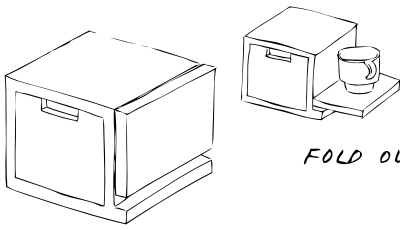
FOLD OUT SHELF
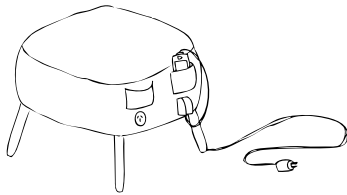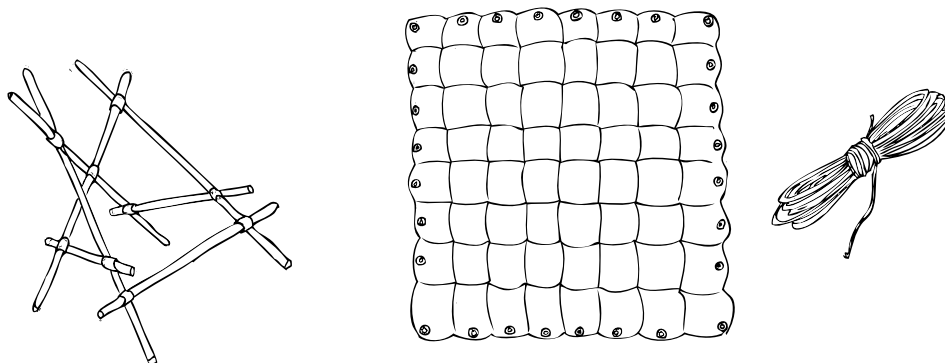
ADJUSTABLE LAMP

FOLD OUT TABLE
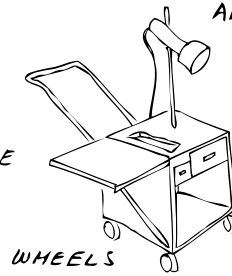
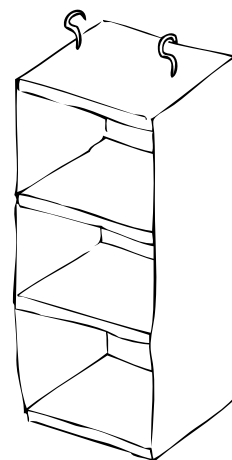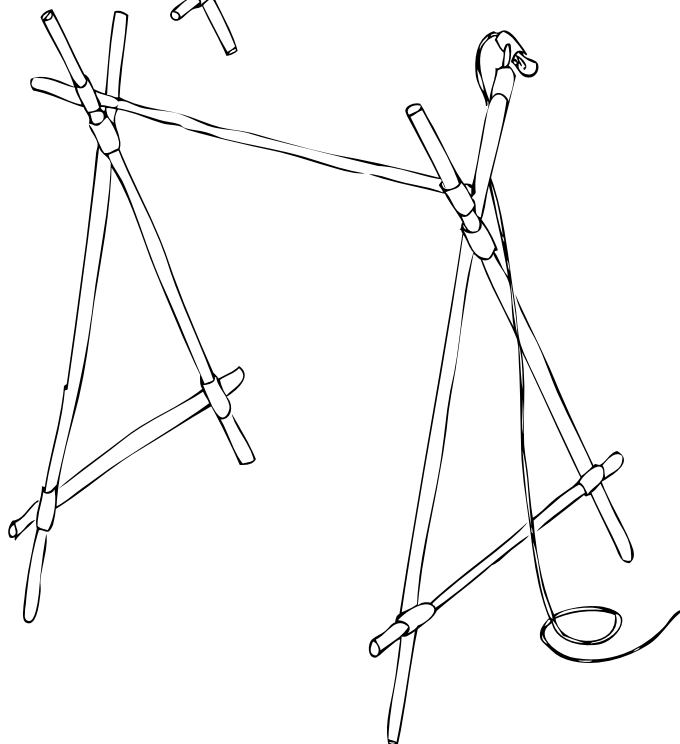WHEELS
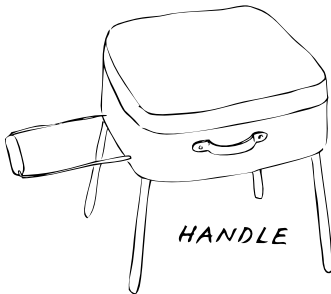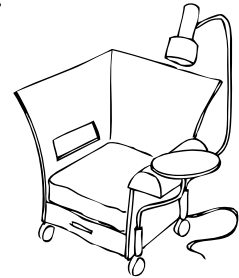
HANDLE
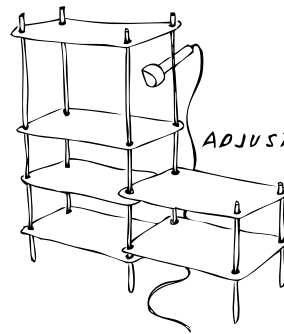
ADJUSTABLE SHELVING
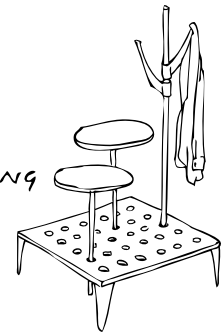
CHANGEABLE
COFFEE TABLE
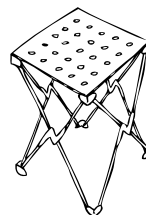
OBJECTS WHICE ARE
ADJUSTABLE TO
SUIT VARIOUS SPACES
ARE VITAL

SCAFFOLD-LIKE FURNITURE

PROJECT FOCUSSING

PROTOTYPED IDEAS FOR A SOLUTION FURNITURE SYSTEM BASED ON SCAFFOLDING, A CHAIR AND OPEN WARDROBE

Domestic furniture system

Nostalgia is a powerful feeling and a visceral connection to the past, and is therefore an important feeling to think about within a user oriented design investigation. It is past experience which allows us to go through life without reading the instruction manual every time, instead making unconscious but educated decisions on the best way to tie our shoes, or negotiate social situations. From this understanding I've reflected on particularly strong nostalgic memories, many of which are related to physical construction, and more importantly, physical construction in collaboration with another. Building blocks, tree houses, sandcastles, gardening, and cooking are all well remembered and have served to inspire that notions of community and collaboration are designed into the project, to build a product with a sense of familiarity and fun.

It is from these nostalgic experiences that have led to thinking about designing domestic nomadic furniture as a system of components which may be used to construct a multitude of furniture artefacts.

Several key influences, both direct and indirect can be located as inspiration for the direction of this project, ranging through interpretation of childhood toys to observation and interaction with temporary construction architecture.

Construction toys in their many forms play a large role in the aesthetic of this project, but primarily in the action of construction and deconstruction inherent in their design. It is in these actions that ideas for a design solution can be found for the physical requirements of nomadic furniture, but also in the ability for personalisation. Building blocks, along with Lego and Meccano consist of largely generic components which can be used in different configurations to produce unique compositions, or can be connected according to instructions of an existing model.

This presents an interesting method of engaging with the requirements of the contemporary urban nomad and the design of nomadic furniture. Adapting elements of construction toys into the design of nomadic furniture provides the physical benefit of being able to reduce the size of a structure by deconstruction, allowing for easy transportation and storage. While emotional benefits of adaption can be found in the opportunities for personalisation, interaction and fun.

An aspect of designing a domestic furniture construction system
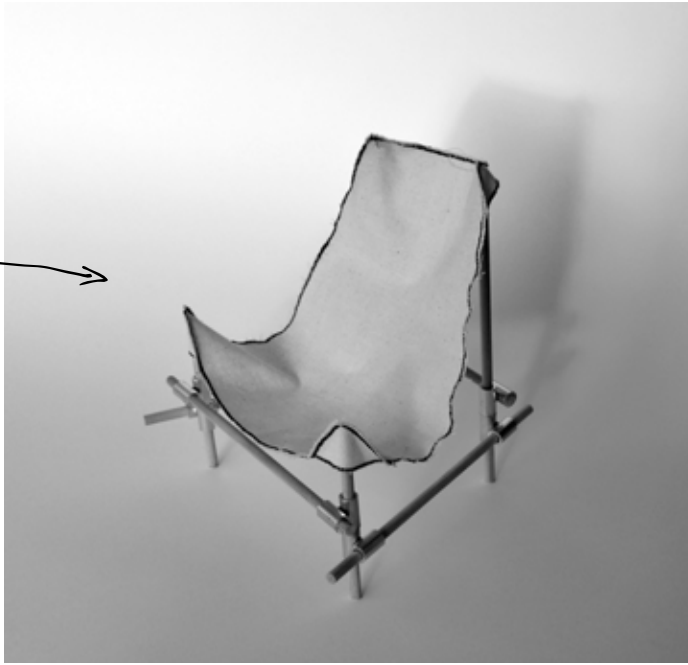
widely adaptable in how it is used and where, and will be able to incorporate artefacts outside of the designed system. It will be intuitive and open to interpretation, allowing for creative use and individual user response. It will encourage collaboration between users, and continue a collaborative practice between user and designer. Most importantly, it will evolve with time and through change.

must be that it is easy to use, and that it requires few or no tools. The Lego system offers an example of a system which is both fairly robust and fairly easy to deconstruct without tools. While Lego is inappropriate for large scale adaption there are other existing construction systems which provide a better platform for appropriation.

Construction scaffolding can be seen as a very direct influence on the direction of this project, in terms of its mechanics, its components, and its aesthetic. Scaffolding appeals as an appropriate system for reinterpretation into a domestic furniture system because of its strength, versatility, and simplicity, all important qualities for embodiment in a system of furniture. Appropriation of construction scaffolding into the domestic environment provides an interesting juxtaposition between the original context and current location, as well as providing a point of separation from the dynamics of traditional furniture.

Together, these influences converge to create a language which describes an intention and direction which was interpreted as a domestic furniture system. This system may be constructed and deconstructed in multiple ways. This furniture system will be

DESIGN BRIEF

Writing a brief

In order to generate ideas in line with the research question and with the needs of the user a design brief was outlined to establish specific requirements the resulting solution must embody. These requirements were developed and refined through multiple research methods and in accordance with user needs for and from domestic furniture.

As the focus of this project is on the urban nomadic lifestyle, which is inherently restrictive in terms of the weight and volume of possessions, many of the requirements are directed at the physical attributes of the design solution, with broader aspects of the design process examined through critical frameworks.

These broader aspects are concerned with aesthetics as well as generating sustainable behaviour through social innovation, and thought towards recycling when the product has reached its end point.

Considerations

Designing a nomadic furniture system requires consideration into the specific requirements of the urban nomad. These requirements are seen as either physical or emotional, with further consideration given to established critical frameworks.

> *Physical considerations:*
> Easy to assemble and disassemble
> Easy to transport by multiple means
> Adaptable to multiple locations and purposes

> *Emotional Considerations:*
> Fun and engaging to use
> Able to be personalised

SCAFFOLDING CLAMP

After focussing the project in the direction of a domestic furniture system, observations into existing methods for adaptable and temporary construction were located in the banal everyday urban world. The mechanisms used to construct readily adaptable and transformable public street objects relies largely on hardware which applies significant pressure for the purpose of attachment, rather than the use of hardware which would damage the primary structure such as screws, nails, bolts... This observation illustrates a vital means for constructing securely while also allowing for easy changes or adjustments.

These images depict a selection of existing methods for an adaptable system which remains able to be changed and added to.
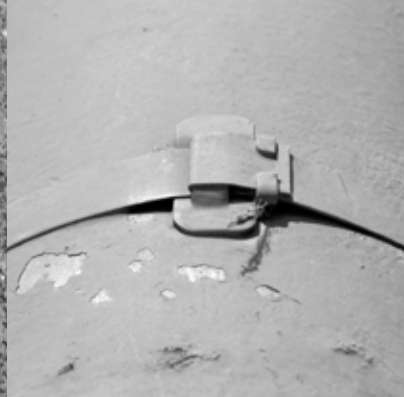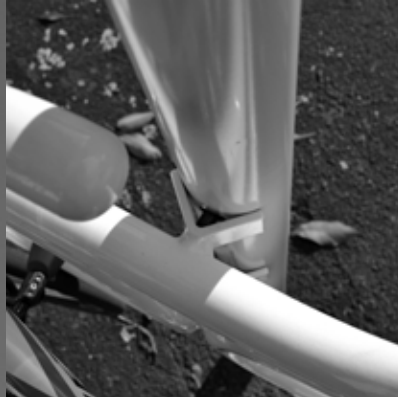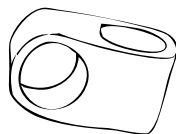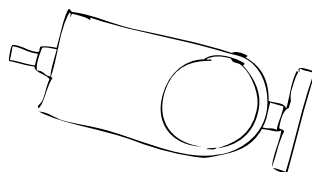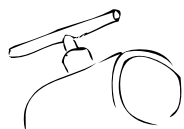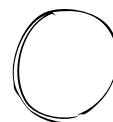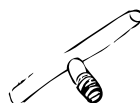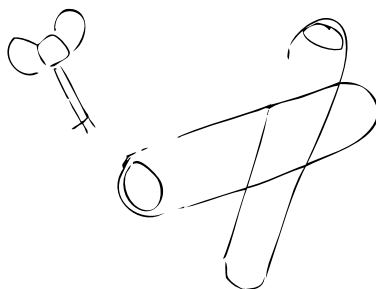
EXPLORATION: JOINT

Following the decision to design a furniture system inspired by construction toys, temporary architecture, and specifically scaffolding, it was important to isolate the vital components. The most vital component of a scaffolding system, alongside the lengths of material which provide the systems structure is the joints which tie the structure together. The mechanics of how this joint would operate was explored against existing methods discovered through observation and through the critical framework of design for disassembly.
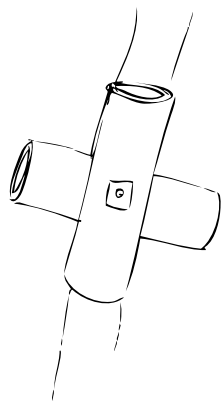
KEEPS A RIGID 90° ANGLE

WING NUT
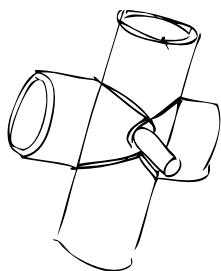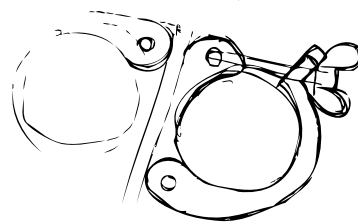
3 8 10
4 1 28

UA2379 — TUBE 37 mm 3mm WALL

35 mm

DIFFERENT IDEAS FOR A WING NUT

ALUMINIUM CROSS SECTION

WELD

TAPERED SIDE TO ACCEPT
WEDGE TO TIGHTEN

WELD

ELASTIC WITH A PIN
FITS INTO DOWEL
WITH HOLES DOWN
ITS LENGTH

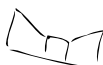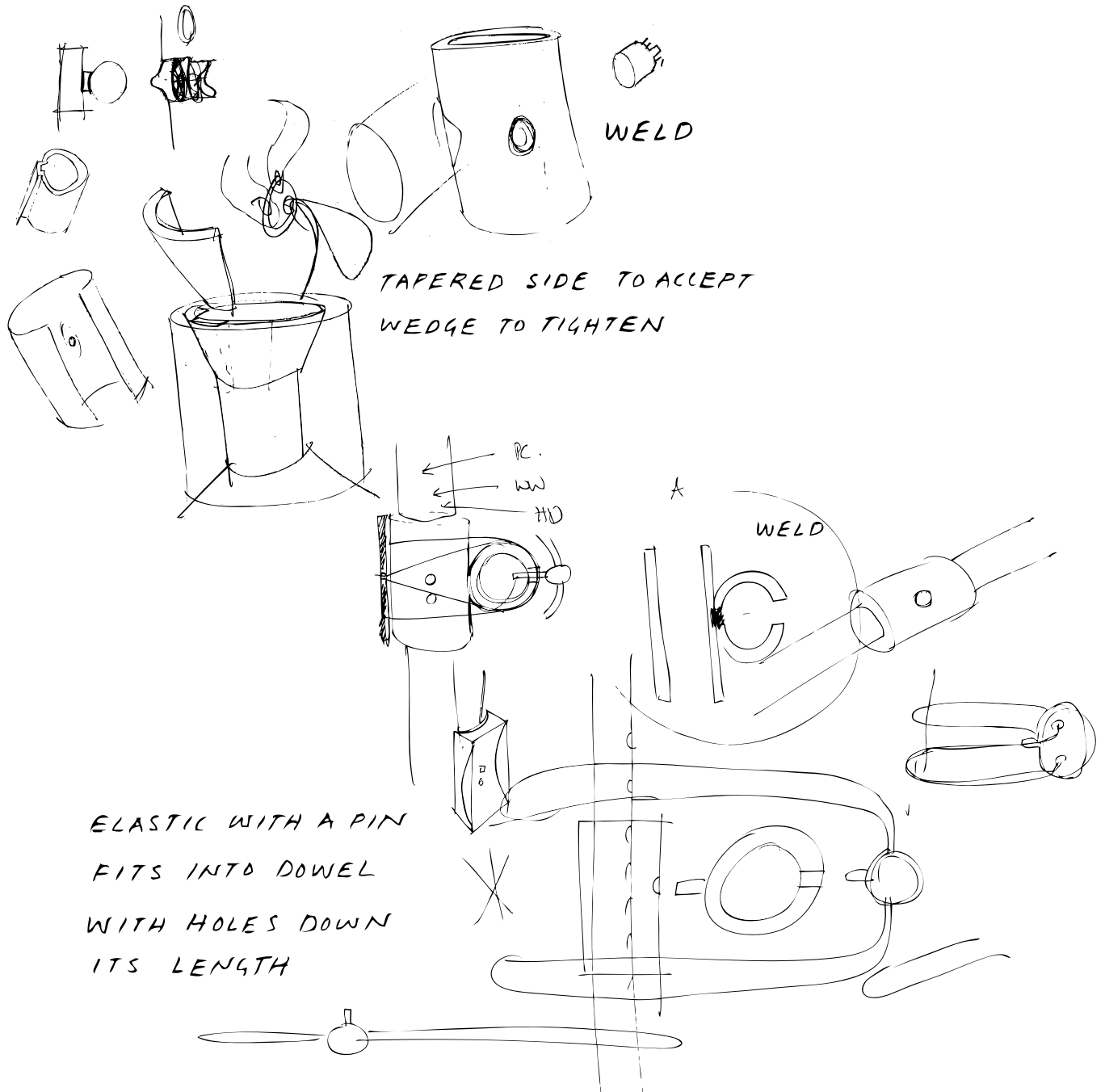SCREW THAT TIGHTENS INTO TIMBER DOWEL
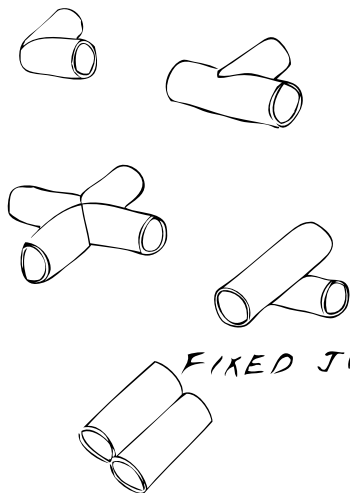
FIXED JOINTS FOR MULTIPLE JOINS

CAM CLIP
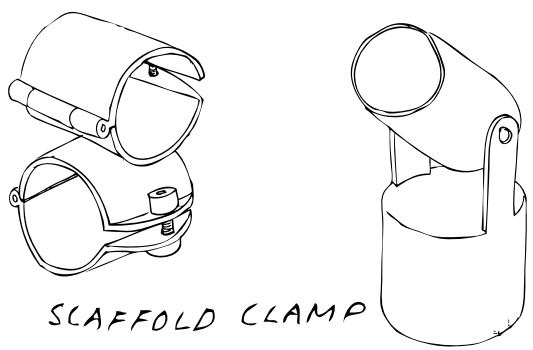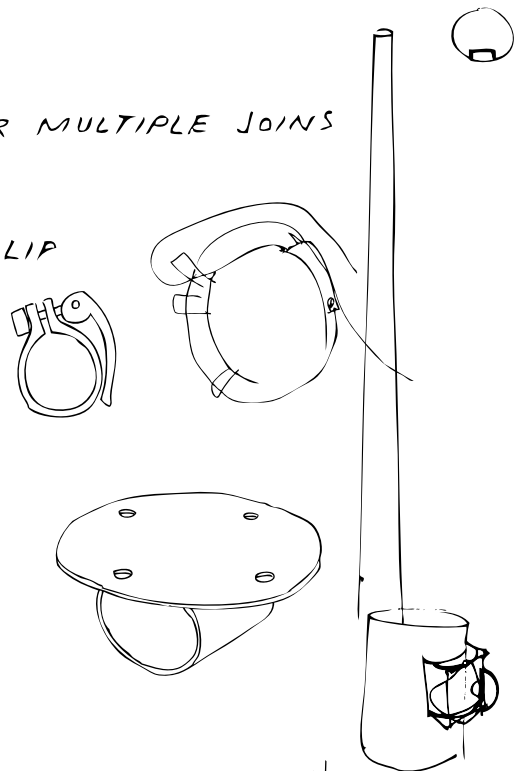
SCAFFOLD CLAMP
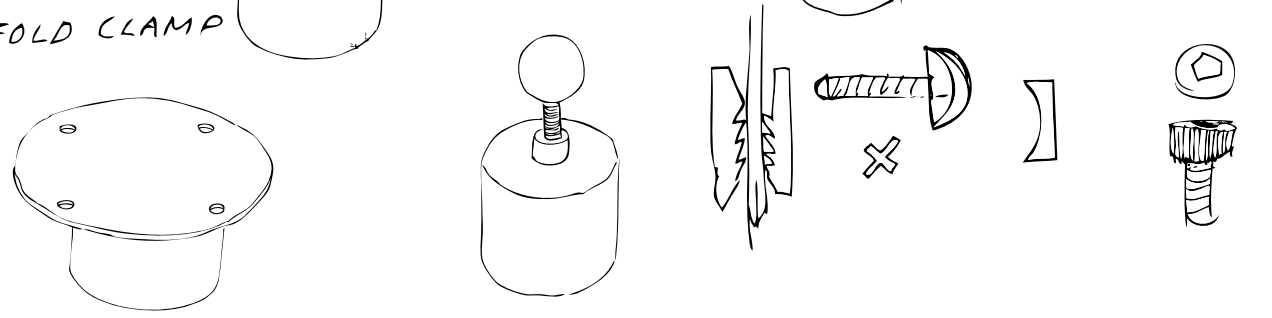
EXPLORATION: ACCESSORIES

Engaging with the idea of a system requires exploration into possibilities for secondary components which are aesthetically and mechanically cohesive with the rest of the system, and provide opportunities for system expansion. Several ideas for further exploration and development were located as being important secondary components. These secondary components seek to push the system possibilities both practically and emotionally. Storage and organisational ideas fulfil strictly practical requirements. While a light source and room division ideas fulfil both practical and emotional requirements through the possibility of generating a sense of privacy, security and atmosphere.

PRIVACY

ROOM DIVIDER   BUILD TEMPORARY WALLS
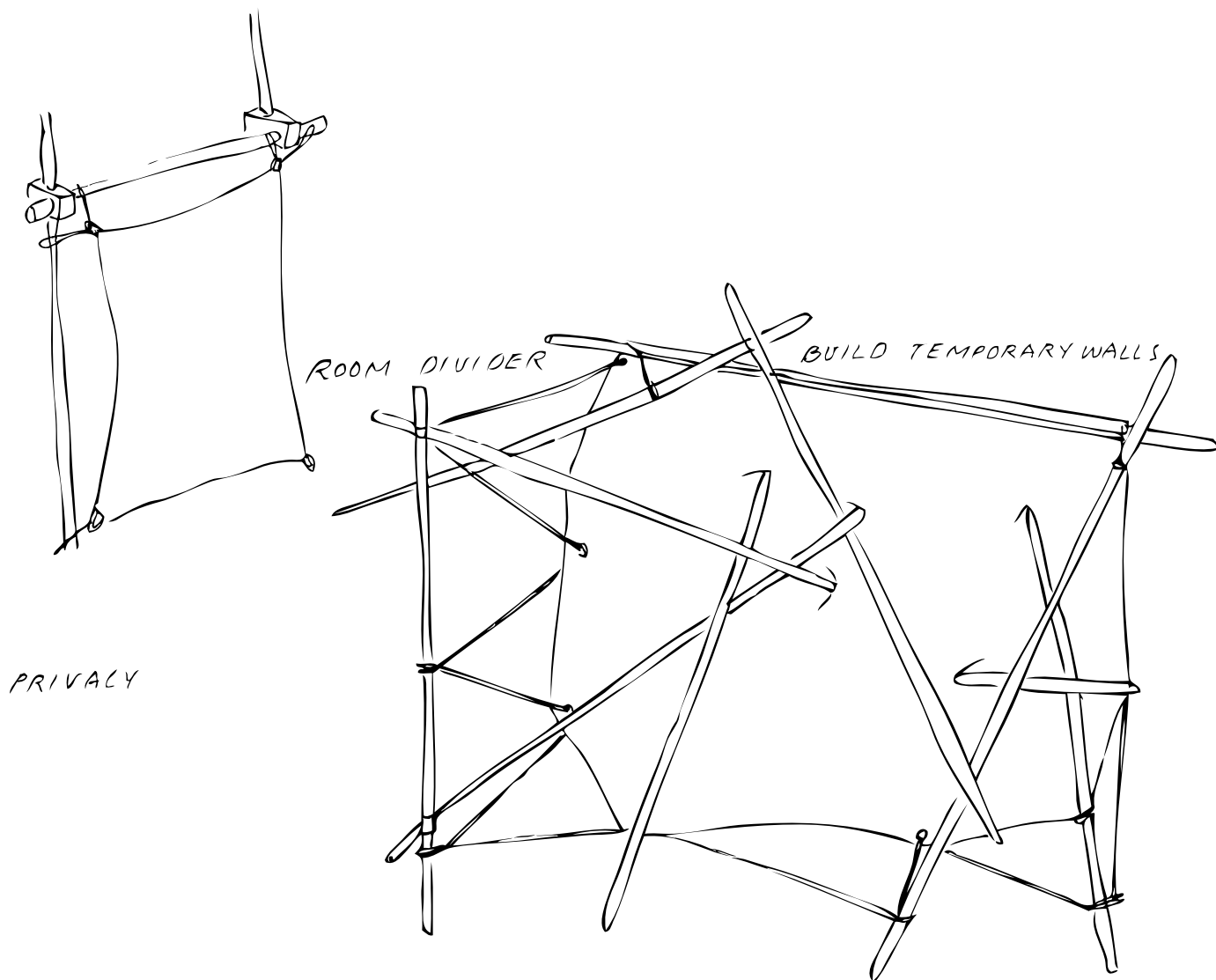
AN ADAPTABLE
SURFACE WHICH
COULD BE USED AS
A SHELF OR A
SMALL TABLE IS
USEFUL FOR CUPS
OF TEA, A BOOK
OR A PLACE FOR
KEYS, MOBILE OR
SPECTACLES
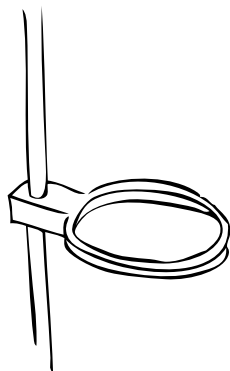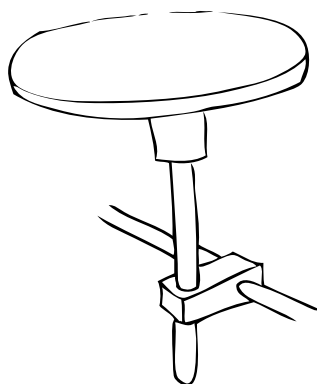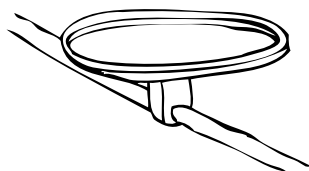
HAVING A
SMALL MIRROR
AT ADJUSTABLE
HEIGHT IS USEFUL
FOR INSERTING
CONTACTS OR
APPLYING MAKEUP
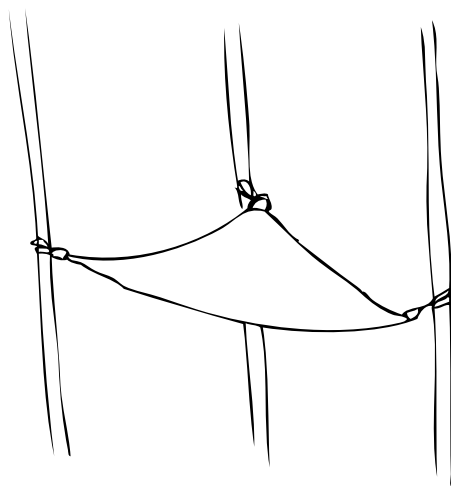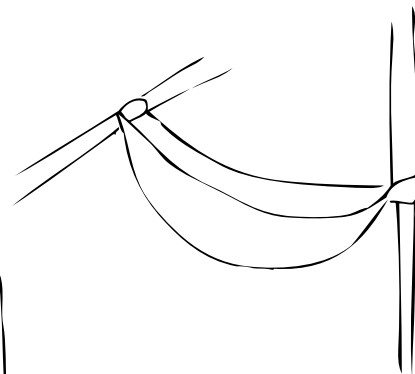
A SMALL HAMMOCK SHELF
IS USEFUL AS OPEN
STORAGE FOR COMMON
OBJECTS AND CLOTHING
BECAUSE YOU
CAN SEE EVERYTHING
THAT IS STORED
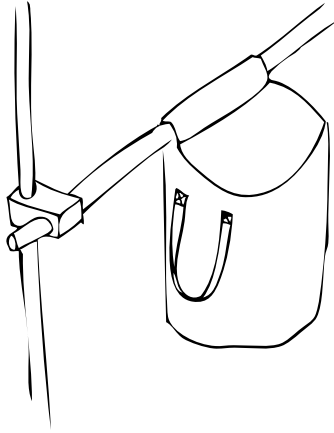
STORAGE OPTIONS
LIKE BAGS ARE
USEFUL BECAUSE
THEY CAN COLLAPSE
WHEN NOT NEEDED
ADDING HANDLES
TO BAGS DOUBLES
THIER USE BY
MAKING THEM
USABLE AS
LUGGAGE
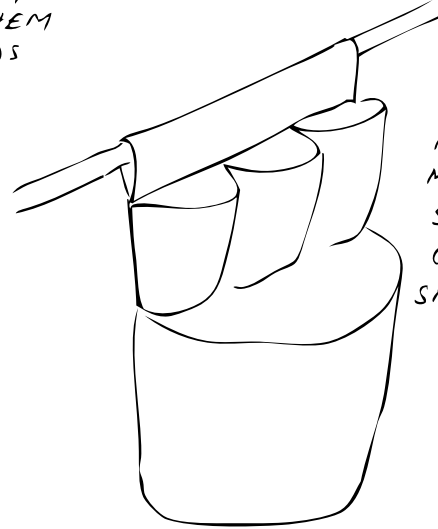
MULTIPLE
POCKETS FOR
MULTIPLE USES
STORING PAIRS
OF SHOES OR
SMALL ITEMS OF
CLOTHING

A PLACE TO
KEEP A POT PLANT,
BECAUSE PLANTS
ARE WONDERFUL
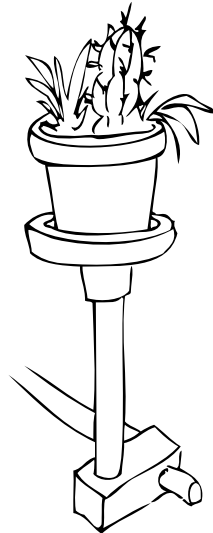
'S' SHAPED HOOKS
FOR EVERY PURPOSE;
USED INDIVIDUALLY
FOR COATS OR
SCARVES, OR TO
HOLD BAGS

MAINS POWERED
ITEMS IN THE HOME ARE
NUMEROUS, DRAW ATTENTION
TO THE UBIQUITY OF POWER
CORDS BY PUTTING THEM
IN FULL VIEW
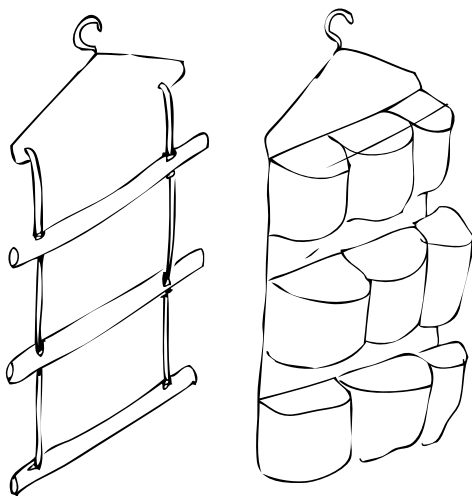
REIMAGINING THE
COAT HANGER TO DO DOUBLE
DUTY AS STORAGE FOR
OTHER ITEMS, WHILE
ALSO ABLE TO ROLL UP
OR OTHERWISE COLLAPSE
FOR TRANSPORT OR
WHEN THEY ARE
NOT NEEDED
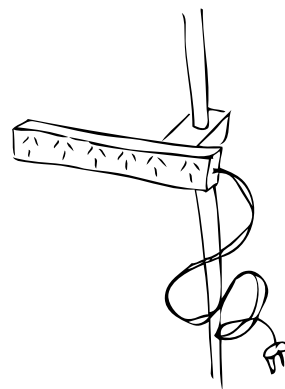
AN EXPLORATION
OF LAMP SHADE
SHAPES

ULTRA THIN PLYWOOD
COULD BE CUT WITH
SPECIFIC SLOTS TO
MAKE A BENDABLE
LAMP SHADE
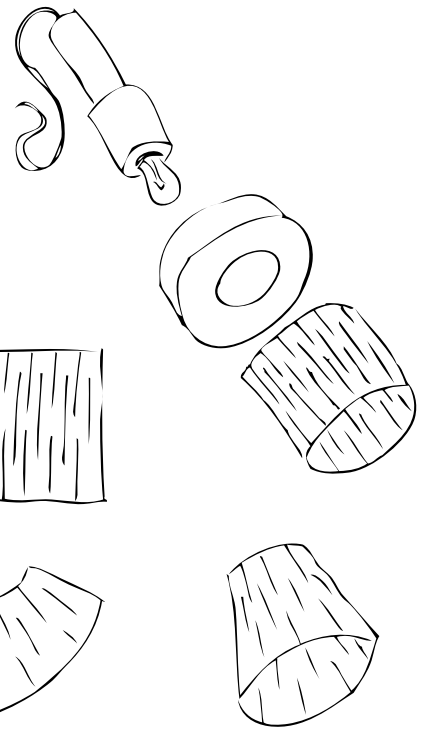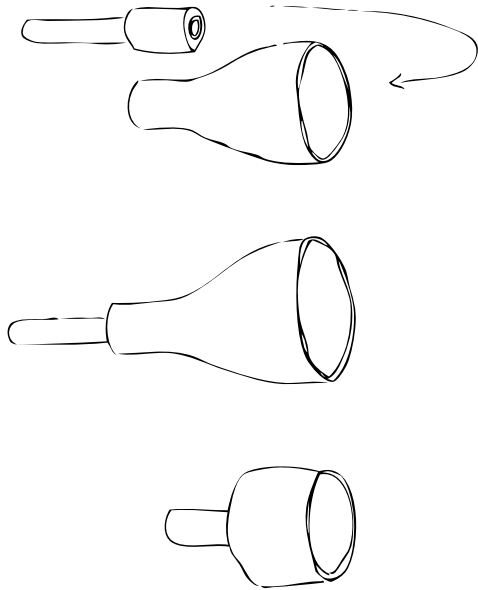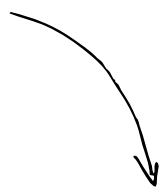
DESIGNING THE LAMP
SO THAT THE SHADE CAN
EASILY DETACH IS IMPORTANT
TO MAINTAIN AESTHETIC
VERSATILITY AND EASY
STORAGE WHEN NOT IN USE
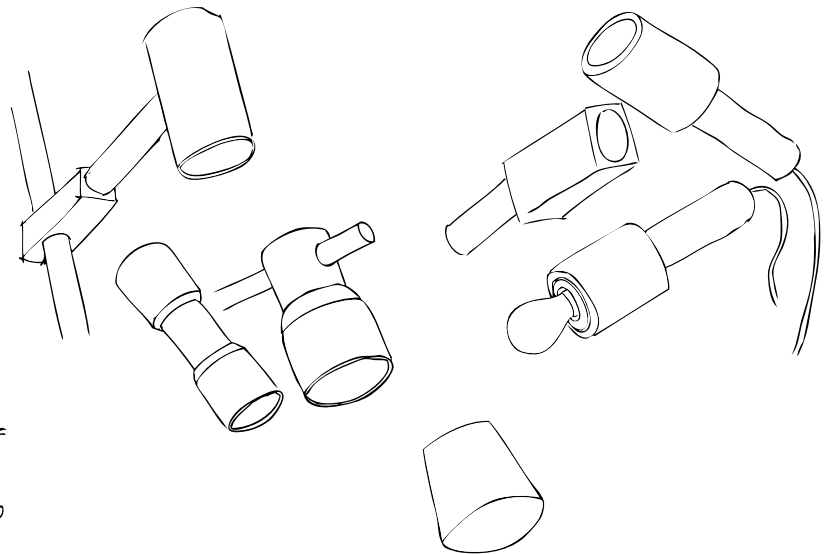
IDEAS FOR HOW A
LAMP ACCESSORY
MIGHT WORK
TOGETHER WITH THE
SYSTEM, BOTH
MECHANICALLY AND
AESTHETICALLY

CONCEPTS

CONCEPT PROTOTYPES

The concept stage takes the most interesting and suitable ideas generated during exploration, and acts to investigate the viability of an idea through prototyping; assessing the success or failing of physical action, material choice and aesthetics in order to find an idea to develop further.

CONCEPTS: JOINT
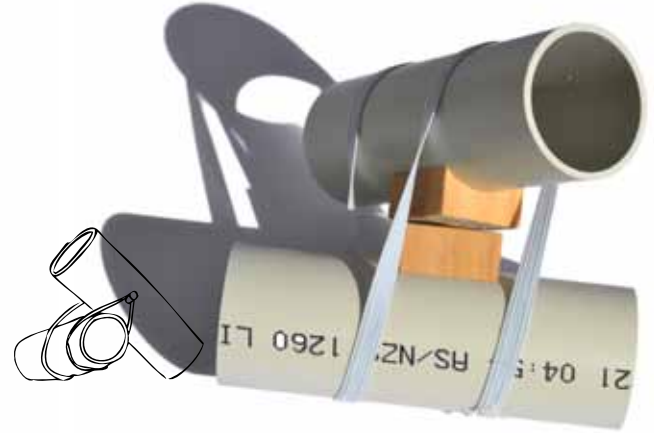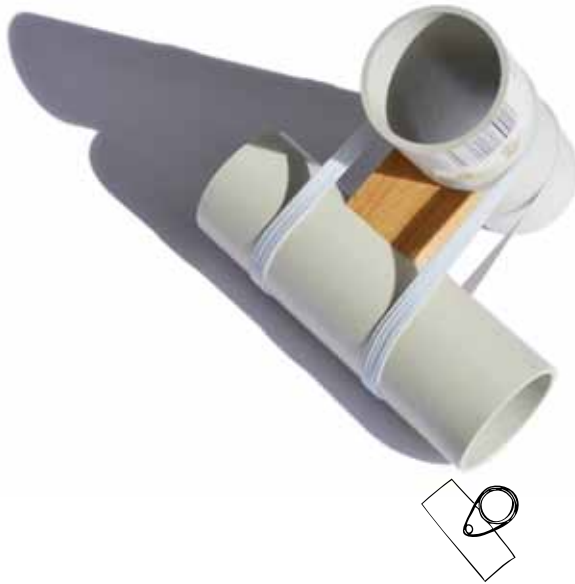
Concepts 1.1 1.2 1.3

These concepts were initial ideas for a joint which would involve some very easily separable components; elastic, pipe, small formed intervention to offer support. None of these three ideas were developed further as the method for construction, and how it would be secured could not be resolved.
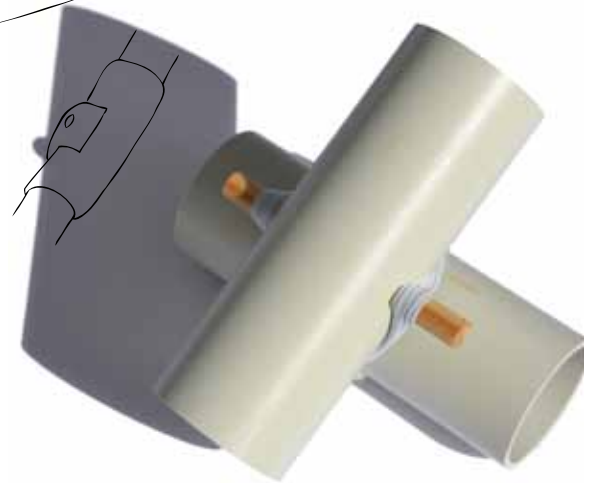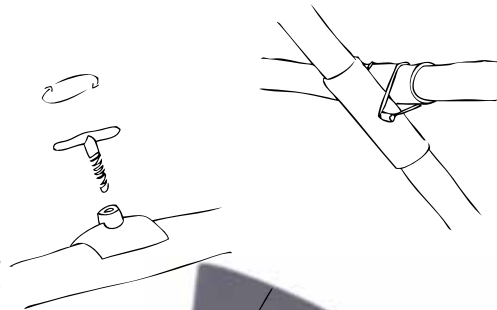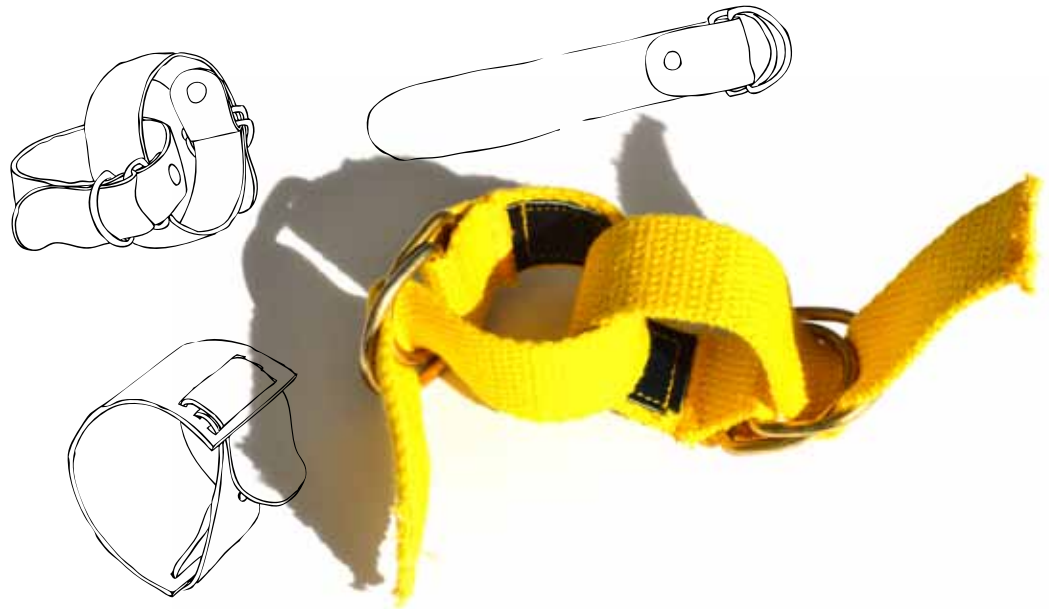
Concept 2.1

This concept involves the use of two interconnecting belts which are secured by weaving the loose ends through the double ring closure at the other end. This idea worked quite well to secure the dowel. The addition of a leather patch on the inside of the belt also helped to add more grip to the belt. The downside of this idea is in the loosening of the belt over time. A benefit or drawback is this joints ability to adopt multiple angles.

TIGHTENS VERY SECURELY
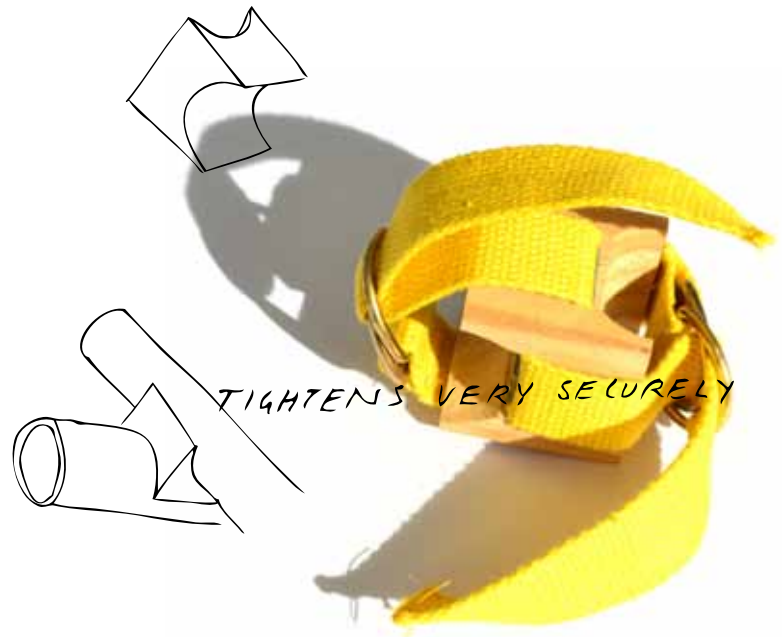
Concept 2.2

This concept is similar to the previous concept, differing only in the formed cradle which sits between belt and dowel at the intersection. This cradle offers a locked 90 degree angle to offer greater support and rigidity to the structure. Like the previous concept, the belt system has the downfall of becoming looser over time.

Concept 3.1

Heading in the direction of a tighter and more inflexible joint while still maintaining a low tech securing method this concept takes the basic look of a wooden toy block. This idea secures very tightly and offers a simple model of construction, and multiple choices for materials colours and finishes.
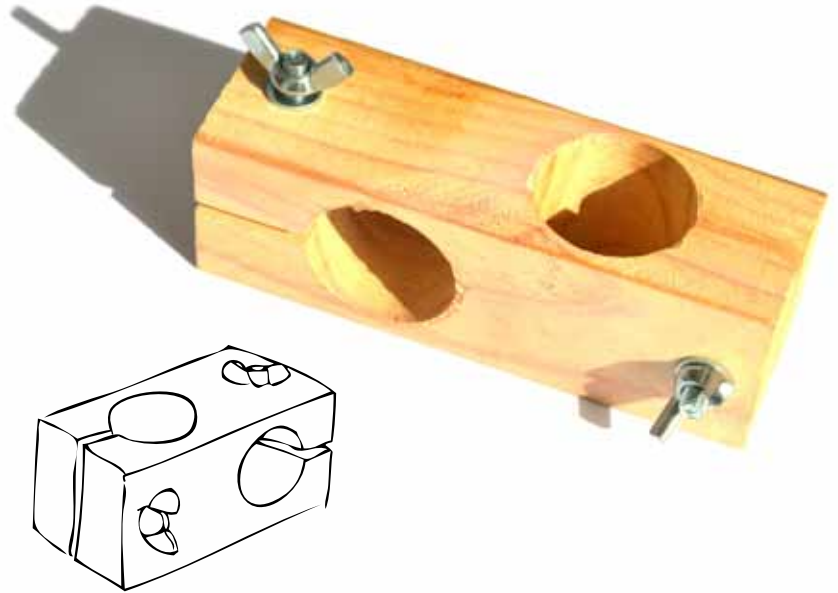
Concept 3.2.1

This concept follows the same basic idea and form of the previous concept substituting the rope closure with a surer method; wing nut and bolt. This closure offers a very easy and secure method of closure and a slightly more industrial look.

Concept 3.2.2

Because the previous two concepts are locked at 90 degrees this option was generated laterally to the prior concept, offering the same aesthetic and material choices as well as changeable and lockable angles.
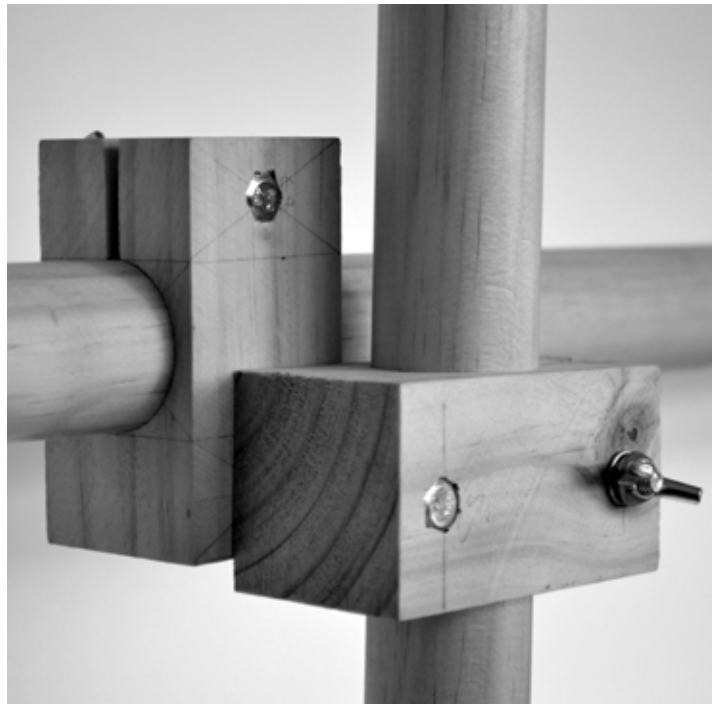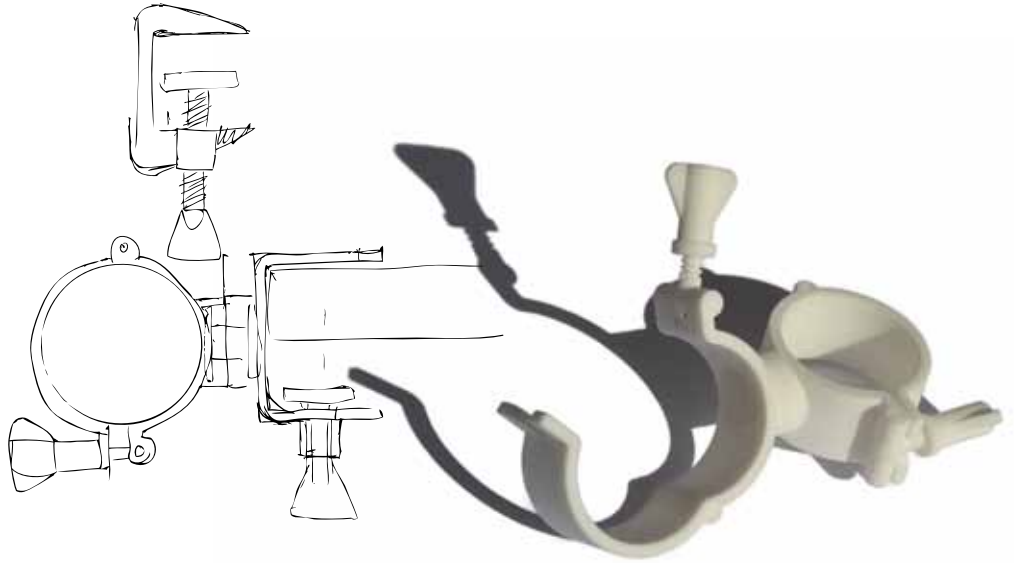
Concept 4

Investigating other methods of prototyping and production led to the development of this interpretation of a scaffold clamp using a 3D printer. This concept refines the idea of the scaffold clamp, minimising materials and visual bulk while still offering multiple angles and a secure closure.
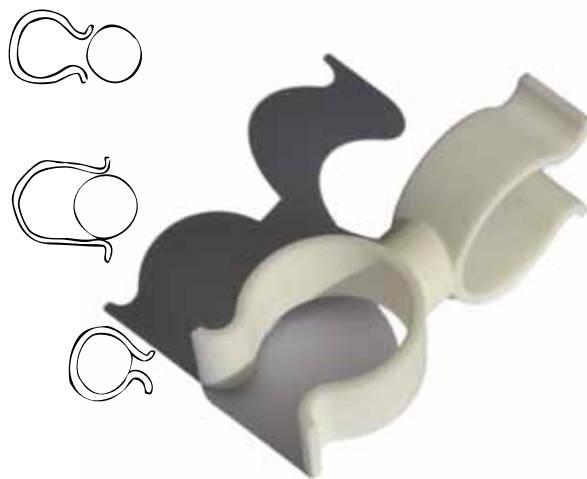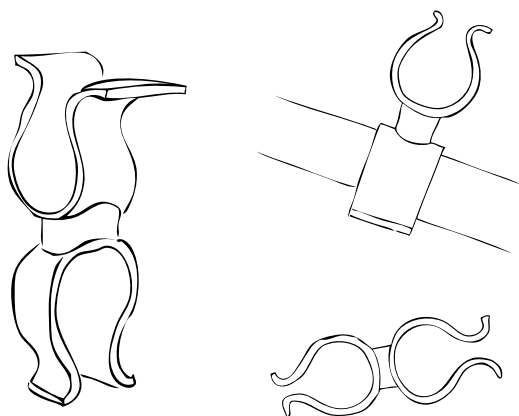
Concept 5.1

Following on from the intricacy and multitude of parts required in the previous idea while still using the same production method, this concept offers a high tech approach to a low tech solution. Using friction and pressure as a means of securing the dowel was not very successful though may have potential in a non-structural application.
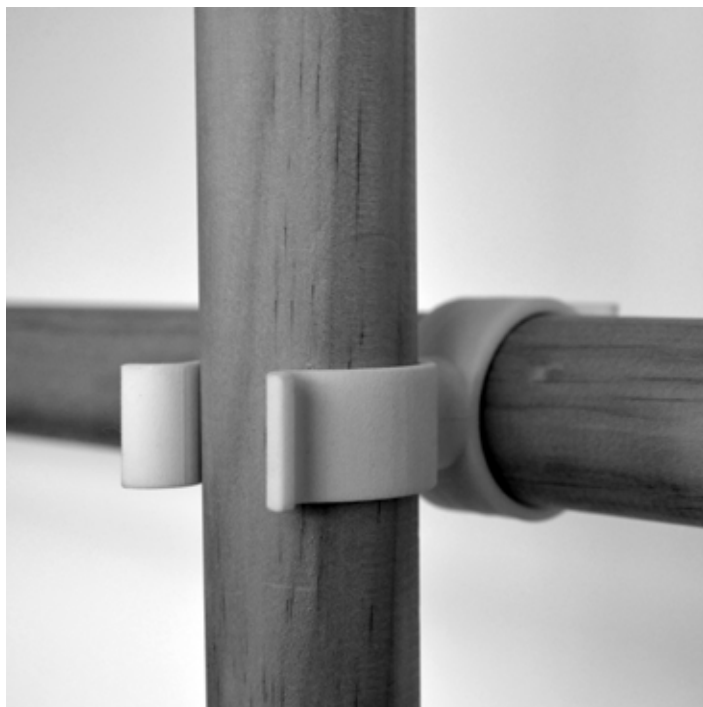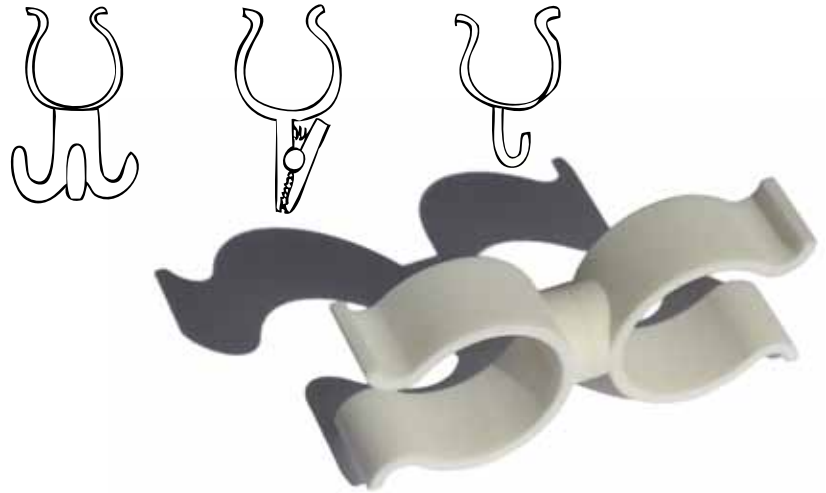
Concept 5.2

This concept follows directly from the previous idea differing only in that is allows for multiple angles where the previous idea was locked at 90 degrees.

CONCEPTS: ACCESSORIES

Soft storage

Storage solution ideas have manifested themselves as soft storage. These bags are collapsible and can be used to store small items of clothing; socks, underwear, or shoes, as well as for storing laundry. Multiple ideas for securing these storage bags to the structure were tested including Velcro closures and belt ties. Experimentation with design, material and finish techniques were explored in-line with the aesthetic of the rest of the system, taking an honest construction approach.
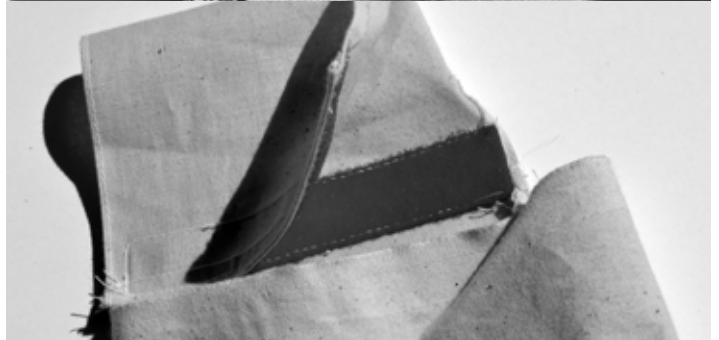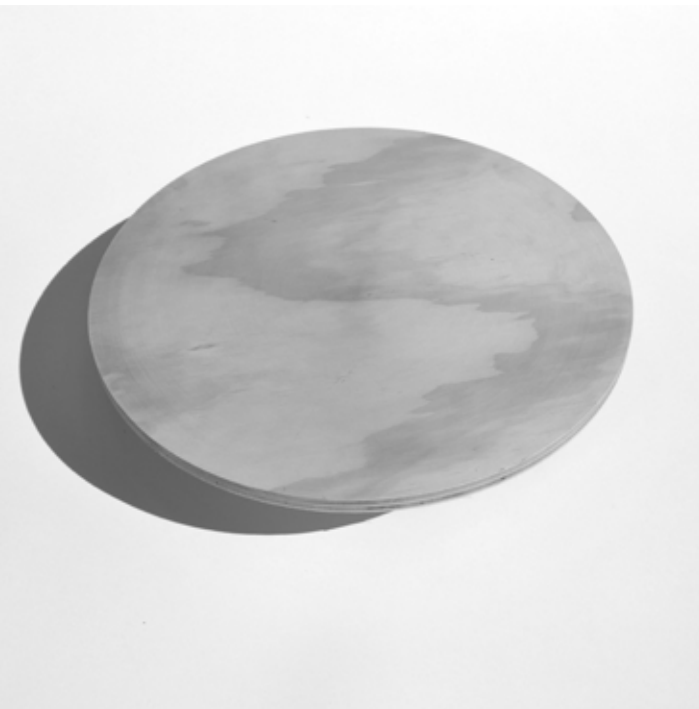
Surface

This concept for a surface which could be used as a small shelf or table has a single point of attachment to the structure and as such must be tightened very securely to remain level. This single point of attachment is beneficial because it makes it easy to attach to use, but also a drawback because it may be tipped out of level too easily.
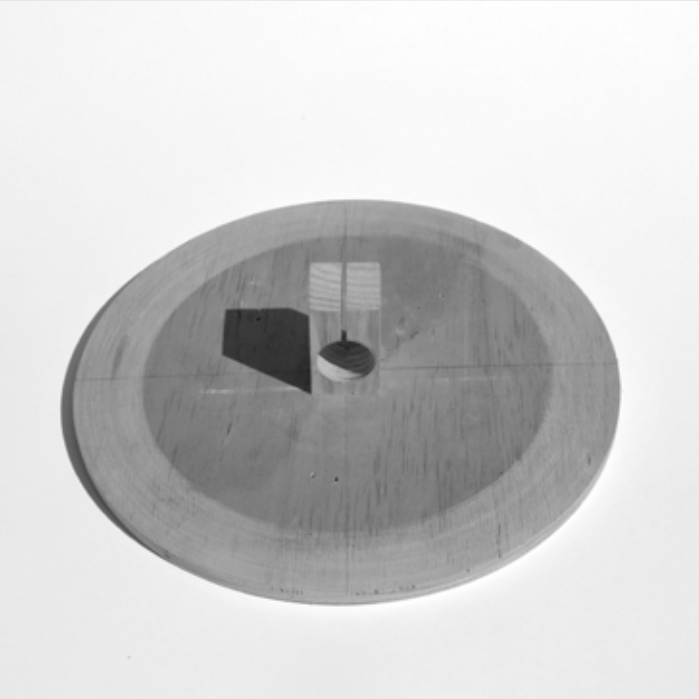
Lamp

Several iterations of ideas for lamp design were drawn and a few fabricated and tested. Initial designs called for a long dowel arrangement where the electrical cord would exit from the end of the dowel, this idea turned out to be problematic so the electrical cord was moved to the side of the lamp holder, having the added benefit of making the lighting component smaller.
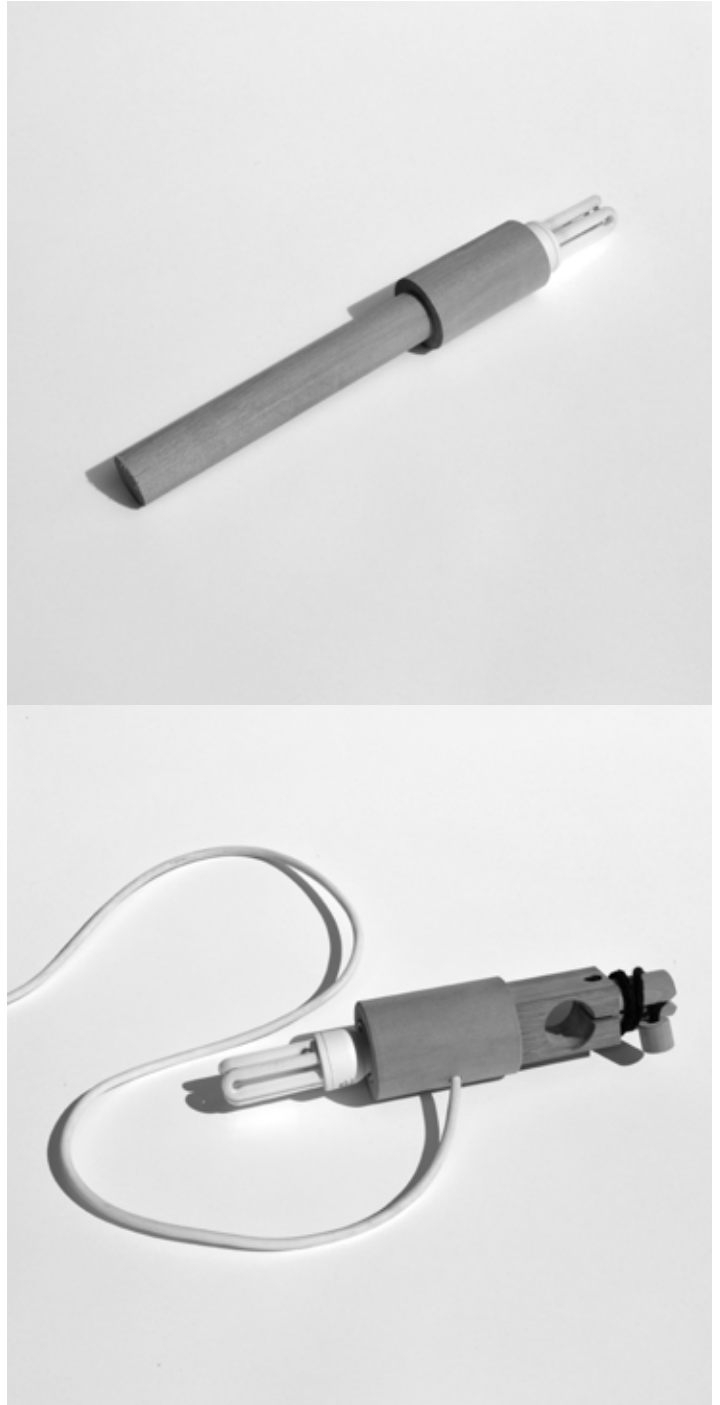
SELECTED CONCEPTS

The continuation of this project could easily follow either of two paths on the continuum between mass production domestic design, or small scale production with an emphasis on craft. Both directions are valid, each having advantages and disadvantages. When deciding on the direction this project should follow these advantages and disadvantages were explored and engaged with through the lens of my own personal philosophies, along with the critical frameworks and context that this project has been developed within.

Looking at following a mass production route the project takes on the possibility of a democratic design philosophy where mass production can allow for cheaper unit prices and wide spread availability. This notion of democratic design sits well within my critical frameworks, specifically where user centred design is concerned, while design for disassembly could also easily be satisfied with the choice of an appropriate design. Mass production and its inherent cost efficiency would also place this product in the price range of the user this product is most likely to attract. Other factors to consider for mass production include material selection, recycling and whether there is the possibility of using salvaged, recycled or composite recycled materials.

The question of material selection is an important deciding factor for the direction this project develops in. Mass production allows for the possible use of recycled composite materials because quality can be produced consistently, however, mass production is less ideal for using salvaged materials like timber while still delivering a consistent product.

Small scale production operates oppositely to mass production in this area. Because of lower production numbers, the supply of salvaged material would be more easily found to fill demand, allowing for the fabrication of a consistent product. A benefit of small scale production is that it allows for rigorous inspection as each piece is over seen by a crafts person. It is in this element of craft that small scale production appeals. The nature of small scale also means that innovation and alteration can continue at a base level where improvements may be implemented much sooner than would be possible with mass production. A potentially large drawback of small scale production comes in the form of cost per unit, which may negatively affect the appeal of such a product to its target user. This negative may be able to be overcome through the selection of fabrication techniques, materials, and design simplicity.

Selecting a concept in line with these concerns, benefits and drawbacks, the most appealing option is to take this project in the direction of small scale production, with the possibility of further development towards larger scale production at a later date.

The concept which most easily fits within this manufacturing direction whilst also comprising a simple design is concept 3.1. This concept incorporates a simple but dynamic mechanical action and few materials making it an appropriate option for small scale production, while also fulfilling the intension for fun and interaction within the designed product, as well as satisfying critical frameworks.
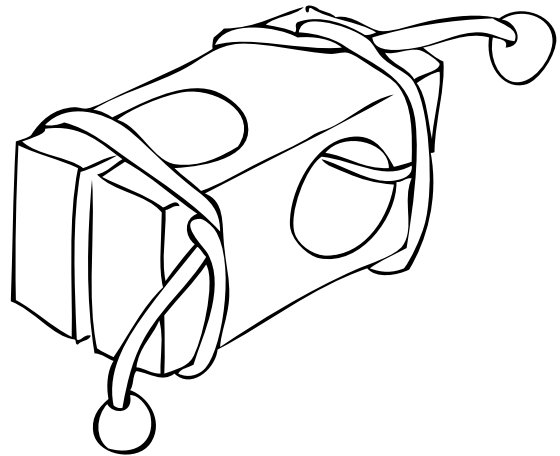
DEVELOPMENT

The development stage follows on from the selection of a concept or concepts. Spending greater time and focus on construction issues and fabrication techniques along with physical and aesthetic concerns ranging through material, colour and finish selection.

MATERIALS.COLOUR.FINISH

In accordance with crittical frameworks; design for dissassembly, and minimalism, material selection along with colour and finish desicions are important to the tone of this project.

Pine was selected as a default for the fabrication of this project because it is a highly renewable resource and is available in many varaitals. Pines are an easy timber to machine because they are fairly soft. These reasons, along with affordabily and availability, make pine an ideal choice.

However, near the beginning of this project I was offered a significant amount of remaindered rimu dowel in the dimensions I was after. The oportunity to use a native New Zealand timber appealed because it has become a rarity due to its lack of commercial growth. This posed a problem concerning the choice of timber for the other components. Using a pine seemed to no longer be an option, purely for personal aesthetic reasons. The ideal choice would be to use a highly contrasting timber or finish or to use rimu throughout. The option to use rimu throughout was an easy decision to make as I have, in the past, collected rimu framing timber from demolition and renovation projects. Rimu proved very difficult to machine with the methods I have available

so I was forced to consider other timbers. My first choice was to use another reclaimed timber in my collection, kauri.

A heavy weight cotton canvas and a lighter cotton duck were selected to make up the shell and lining, respectively, of several storage solutions, with all trim manufactured in natural materials wherever possible. The heavy canvas was dyed to an uneven mid grey to contrast with the timber tone while still remaining fairly neutral. The lining was chosen in a bright yellow to add a vibrancy to the product in a way which is a little more subtle due to the location of it's use.

Black was selected as the colour of trim throughout the various components of this project to add a sense of continuity and because it is a universal manufacturing colour, it wears well and provides a neutral contrast to the red tone of the timber.
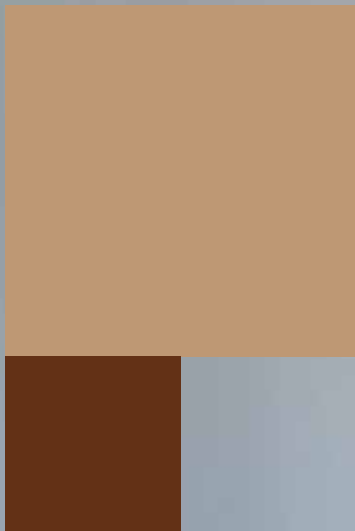
RIMU DOWEL

PINE DOWEL

KAURI
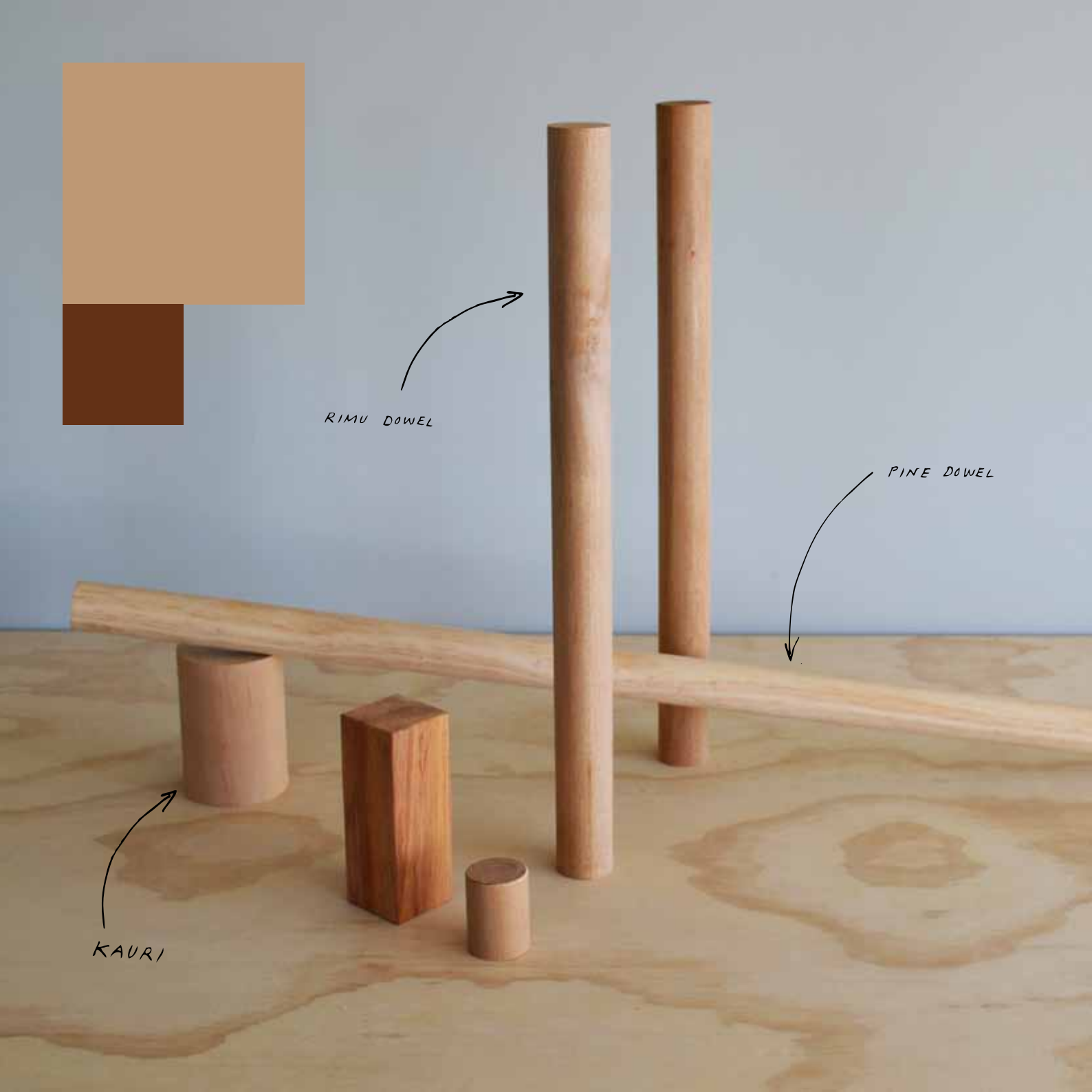
YELLOW COTTON DUCK

HAND DYED GREY CANVAS

COTTON WEBBING

COTTON ROPE

BRASS HARDWARE
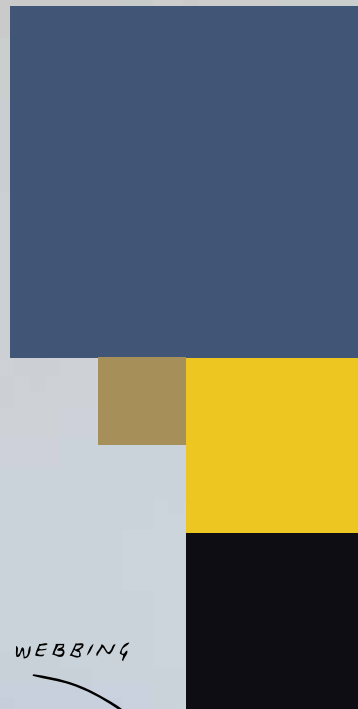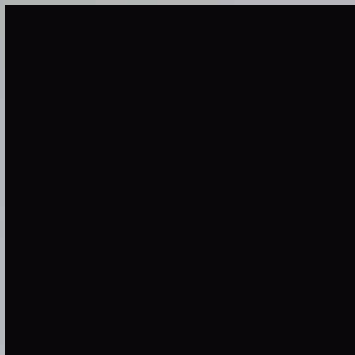
BRAIDED ELECTRICAL CORD

CERAMIC LAMP HOLDERS

SIDE ENTRY WALL PLUG

FABRICATION PROCESS

Each timber component went through multiple machine processes during fabrication. Because these components were fabricated individually they have slight variances in geometry and are significantly labour intensive to produce. Further development for fabrication of this system would require investigation into CNC fabrication to speed up production and produce perfectly uniform components.

IMAGES FROM LEFT TO RIGHT

TABLE PLANER used to correct warped timber lengths
TABLE SAW used to cut timber lengths into approximate dimensions
BANDSAW used to make preliminary cuts or to cut dynamic shapes
SLIDE COMPOUND MITRE SAW used to accurately cut lengths into individual units
THICKNESSER used to refine timber length dimensions
BENCH SANDER used to smooth flat surfaces
LATHE used to turn square timber lengths into cylinders
DRILL PRESS used to drill and bore holes
ROUTER used to cut a radius into the corner edges
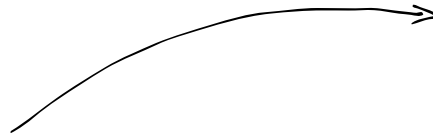
JOINT

After selecting the most appropriate joint concept, in line with the project philosophy, collected frameworks, and project context the development of the joint focussed on refining aesthetic and material qualities, fabrication processes, and user mechanics.

The rough concept prototype was very minimal in both its fabrication process and it's look, in order to improve the ease with which it was used some of this visual and process simplicity had to be compromised.

35mm diameter sections of dowel were glued into bored holes at each end of the main body before a cut was sawn up to each of the two main holes. This cut allows the holes to flex; to tighten and loosen. The added section of dowel creates a longer lever, making it easier to tighten while also providing a body to tighten around. The cut through the dowel and into the hole provides a tapered opening allowing the loose end of the rope to be secured.

The method of fabrication used to construct these joints raised some issues of concern, among them the strength of the glue used to secure the different timber elements of the joint together, and especially when under constant pressure. A possible method of

fabrication to overcome this issue would be to fabricate the entire unit from one piece of timber of to use a moulded plastic or composite material. Another issue raised by the used fabrication method is the irregularity produced by hand construction; this could be solved using more accurate fabrication processes, or using an automated machining or moulding process.
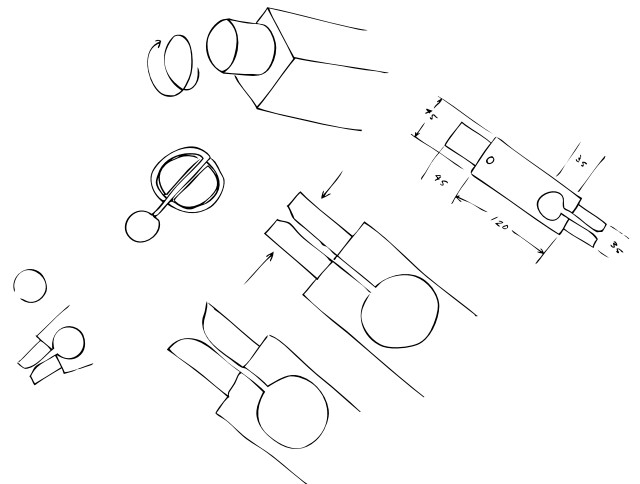
LAMP
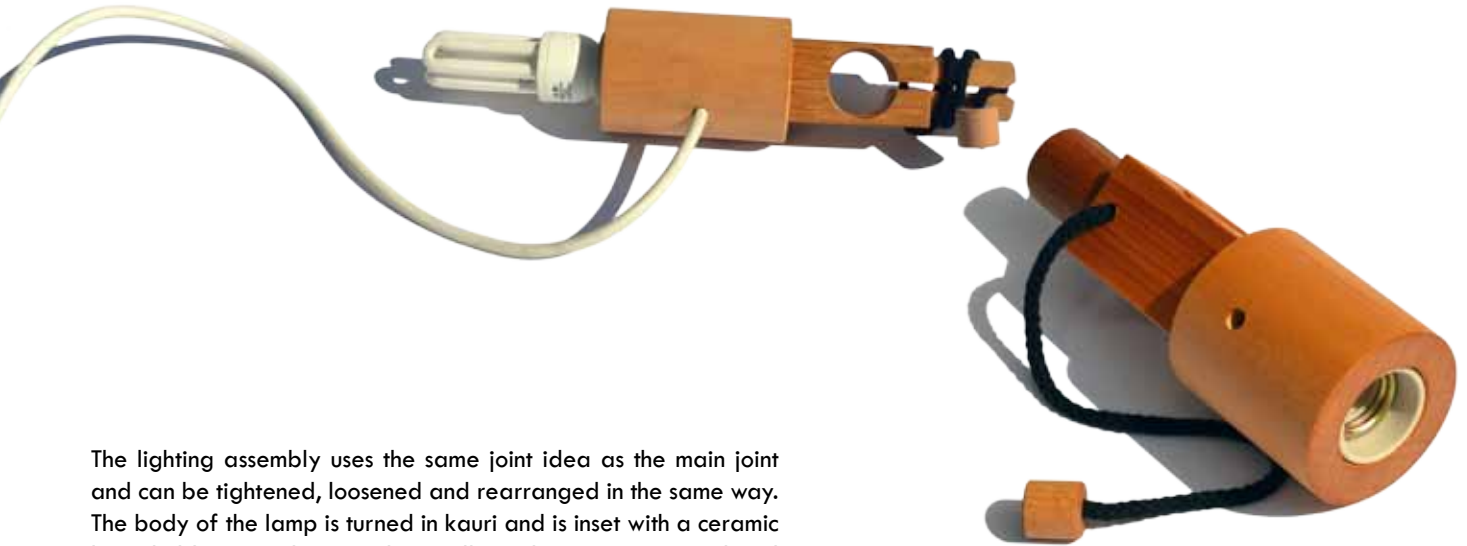
The lighting assembly uses the same joint idea as the main joint and can be tightened, loosened and rearranged in the same way. The body of the lamp is turned in kauri and is inset with a ceramic lamp holder providing an electrically and temperature insulated housing for a light globe.

Because the lamp may be positioned at variable heights it was decided to install a switch on the cord approximately 1000mm from the lamp housing rather than integrating it into the housing itself. Installing the switch on the cable means that the lamp may be operated even when the lamp is well above head height.

One concern with this design comes in the form of electrical compliance with national codes. While this prototype lamp has been seen by an electrician and the construction deemed appropriately safe it has not faced any other examination by authorities and would need to be further considered for continued development.
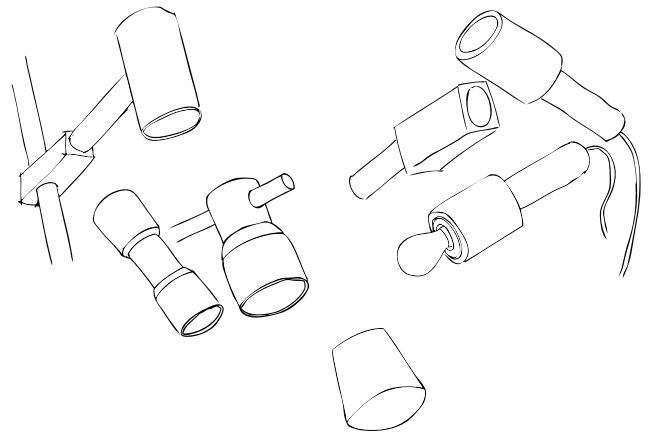
SURFACE

A prototype for a surface to be used as part of this system uses the same joint idea used in the main joint and the lamp. A surface idea was prototyped in laminated, recycled rimu, and machined using a CNC table router.

This prototype was not completed because of issues with materials and an unsatisfactory testing result.

Almost as soon as the glue was dry the laminated timber panel began to warp. This warp was temporarily corrected at the time of machining but was not able to be maintained. A couple techniques were attempted to permanently correct the warping; the surface was first dampened to swell the concave side and then the timber was dried under pressure after which the surface was oiled to resist over drying and humidity. Both attempts failed and further development of a surface component would need to be carried out. Changing the thickness of the timber panel, or using a composite timber panel may help to solve the issue of warping. A more complicated issue to solve with this particular prototype is the tightness required from the joint to provide enough friction to keep the surface from tipping when in use. The timber joint used in other areas of this system may not be appropriate for a surface component. Further investigation is required into the interaction method between surface and structure.
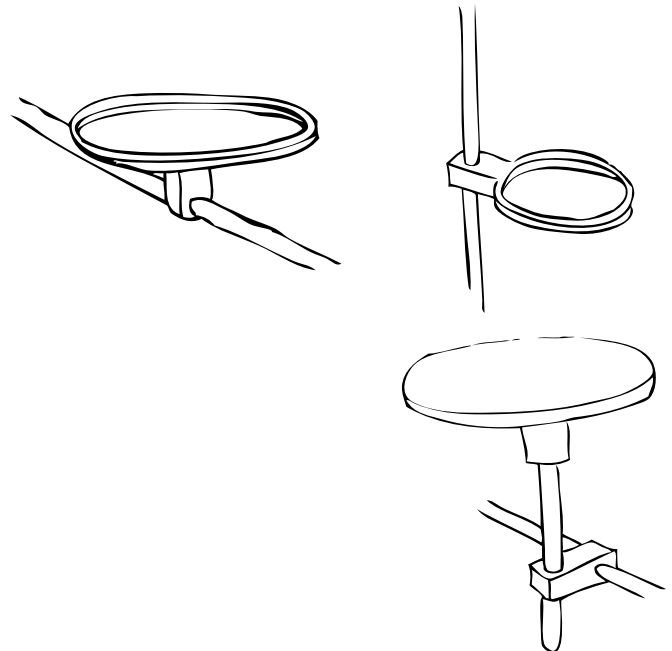
SOFT STORAGE

Development of a soft storage component is not complete, needing more time to investigate options for construction and usability details.

Heavy canvas was chosen and dyed dark grey for the shell of the bags, using a bright contrasting cotton canvas duck has been used as the lining. A lining was incorporated to add further structure to the soft storage, as well as to add a bright colour to the otherwise neutral colour scheme of this furniture system.

Soft storage for this system should be able to serve the duel purposes of acting as stationary storage, and for use as luggage for user possessions or for the components of the furniture system. To serve these dual purposes consideration has been given to details which will aide both stationary and transport uses. Providing some structure to the mouth of the bags, allowing them to remain semi rigid and open would help with accessing contents when the bag is hanging from the structure, and adding handles to the bags helps in transportation when they are being used as luggage.

Another consideration for the soft storage component is providing an easy method for attaching and removing the bags from the structure, Velcro was selected for this purpose as it was the most suitable option tested.

DOCUMENTATION OF SYSTEM CONSTRUCTION

The process of constructing the nomadic furniture system was performed as testing, and the process documented to illustrate how it may be used and adapted to.
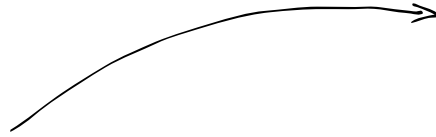
USER GENERATED COMPONENTS

As with any construction system, the possibilities for ever more specific components are near limitless. In the specific case of this project outcome there are a multitude of considered component ideas ranging through pot plant holders, multi pocket storage panels and power points. The time frame of this project is limiting of the amount of components developed, but more importantly, a wish to encourage creative responses by users for their individual needs is responsible for the minimal system components developed for this system.

I remember having played with Lego as a young child. The first sets which I received consisted of many largely generic brick shapes which would be used to build, following instructions, for a specific model but which could also be used to make any number of user designed models. Today it seems that Lego sets are made from more specific shaped bricks used to build a model of closer likeness to that which it is modelled on, but which also limit the applications of each brick. This difference between the generic or simple, and the specific can be interpreted as a down-side for the adaptability or creativity of a system when it becomes too highly specific. In the text *Open Design* (van 't Spijker, 2006), the author discusses similar ideas applied to design in a broad sense.

"Within the new experience economy two design attitudes have developed, that address experience in a totally opposing manner: closed and open specificity (open = undefined; specific = highly defined). Out of these two positions, the first pretends to deliver unique experiences, whereas the second actually does provoke unpredictable and thus per definition one-of-a-kind reactions." (van 't Spijker, 2006, p. 54)

This idea suggests that the role of designer can also manifest in one of two opposing ways. These two ways could be described as director, where the manner of use is defined; or as instigator, where the responsibility for how something is used is shared by designer and user. In my role as designer I am much more interested in the idea of being an instigator, for activating creative response, and where the terms of use are freely explored by the user; however, I am also aware that aspects of the role of director are implicit in design. It is from this understanding that a decision to develop just a few accessory components, alongside the main joint component, to highlight the system's possibilities.

Opportunities for user generated content are numerous and could be developed from many off the shelf products located in haberdasheries, hardware stores, or made from found materials. Components and uses prime for user generation include:

> Shelves made from new, recycled, or found timber or cardboard and secured to the structure with rope, zip ties, tape, or pipe brackets.

> Room dividers and privacy walls made from timber sheeting, fabric, or by hanging a poster, pot plants or clothes on the structure.

> Box or bag storage made new or from existing objects and stacked within, hung from, or secured to the structure.

DISCUSSION

EVALUATION
DISCUSSION
FURTHER DEVELOPMENT

4

EVALUATION

DISCUSSION

As the world and its growing population moves towards its collective future it is evident that there must be a thorough and widespread reassessment of existing systems, ideologies, and traditions. Future generations will be faced with greater personal and global challenges, amongst them the way they operate in domestic spaces which are changing rapidly, and are likely to continue to evolve.

Current trends in population growth, property prices and sizes along with assumptions regarding lifestyle wants in a time with wide spread global opportunities led to the generation of this research project which aimed to investigate how the relationship between user and domestic furniture might look and behave like in the changing domestic environment.

Through the investigation of this project's research question and the more general challenge of designing for the contemporary urban nomad it has become clear that directions, lenses, and focuses are incredibly diverse and multitudinous, offering many pathways for further exploration.

Despite the time and research spent on this investigation into nomadic domestic furniture this project has raised more questions than it has answered and has exposed to me the vast quantity of opportunities for design and development for the population of contemporary urban nomads.

By aiming to rethink domestic furniture for a growing population of contemporary urban nomads I have been able to reassess my understanding of what is necessary and what is desire, a conflict that is omnipresent in contemporary society. This new understanding underlines a desperate need for a global reassessment of the value placed on possessions, and perhaps a domestic paradigm shift towards a more minimal less possession driven lifestyle.

Concurrently, the adoption of a more minimal lifestyle may lead to greater consideration for sustainable design practices, long life products and away from disposable or seasonal design.

This personal revelation proves to be an exciting discovery for myself and my interest in further exploration into the varied fields of the nomadic lifestyle and their requirements has increased.

Instead of providing a complete solution for such a broad research

area, this project is able to posit a singular method for how we might look at rethinking traditional models to fit within a world which is quickly out growing them, and adding to a dialogue around how domestic life may be engaged with differently against the context of future restrictions.

FURTHER DEVELOPMENT

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APPENDICES

APPENDIX A: Literature Review

There is a current and growing trend towards a new way of living, which I will define as contemporary urban nomadism. Traditionally the word nomad refers to a person of no fixed residence who moves about as opportunity or necessity dictates. When placed in a contemporary urban context the new nomad's roaming is incumbent on accommodation and career opportunities in the same way that a traditional nomad is mobile because of seasonal shifts, trading, or driving animals to new pasture. Important aspects of this question involve a look at whom the urban nomad is, their requirements, what problems they face as part of this lifestyle and how design may be used to facilitate an enhancement of life through furniture.

This urban nomadic lifestyle can be traced back to several explanations, sometimes overlapping. With globalization comes an ease of access through the internet to information previously inaccessible. This access to information has led to a dramatic change in career possibilities and opportunities nationally as well as internationally. "Career trajectories are becoming more and more flexible and a-typical. The traditional linear career has been replaced by a multitude of different career trajectories"

(Valgaeren, 2005). This has resulted in the possibility of changing careers, and changing housing more often "when a win-win relationship is no longer possible" (Valgaeren, 2005). This notion along with the availability to seek work and study opportunities around the world has enabled and supported a means of changing living situations as required or desired. An increase in the population of renters and decrease in private home ownership is also indicative of a less permanent lifestyle becoming more prevalent   (Davidson, 2011; Hopkins, 2008; Statistics New Zealand, n.d.). As population density has grown in urban centres, housing has become smaller to accommodate more people in a smaller land area (Statistics New Zealand, n.d.). This may have the effect of creating a closer relationship between incomes, occupancy, and housing area leading to a likelihood of changing locations when an increase or decrease of either income or occupants has occurred. These issues which determine a nomadic lifestyle come with several restrictions regarding possessions, and specifically furniture including; the size, weight, and volume of possessions, the space available, and floor plan of the living space. Because of these restrictions the nomadic lifestyle is not conducive to conventional furniture and requires an analysis of requirements, and needs versus wants.

Currently furniture that complements a less permanent lifestyle is limited; two forms being, what might be called disposable, and flat-pack. The Idea of disposable furniture is that it can be bought at each instance of relocation and then disposed of at the termination of occupancy. This method of disposable living eradicates the need for furniture to travel if it is economically or physically unsuitable to do so, while in a way it solves problems relating to the difficulties of moving, it is not ideal. From a user-oriented design perspective the disposable living solution is a symptomatic response to an issue which only tackles the ease of movability in an object. The priority is seen in its cost effectiveness above other considerations because it is perceived as a short term solution, a quick fix. From an environmental stance this method is irresponsible because it relies on an unsustainable system of production and destruction; until a system such as cradle to cradle (Braungart, McDonough, Bollinger, 2006) can be implemented the waste produced will become landfill. Another furniture option for the urban nomad is flat-pack furniture. Popularised by IKEA, the aim with flat-pack furniture was the reduction of shipping cost per unit, therefore providing access to well-designed furniture at reduced retail cost (Schwartz-Clauss, von Vegesack, 2002). One of the benefits of this mode of furniture, aside from the cost, was the

customers' ability to take the product home on their own, negotiate any possibly restrictive architectural issues such as staircases or narrow halls, and then assemble the product themselves. The flat-pack method made moving furniture into your home easy. However, problems arise with flat-pack furniture when viewed in the context of the nomad. While able to be deconstructed and reconstructed the process of doing so along with relocating is time consuming and labour intensive. The first of these two examples as well as the second to some degree have the feeling of an interim solution, when what is needed is an adaptive solution which moves with the user. These problems suggest that a change is needed in how furniture is designed for the population of nomads in urban areas, specifically how to design for their significantly different needs and requirements from the domestic space, compared to those of the population who are largely settled.

Another issue with the nomadic lifestyle may be thought to be more personal in terms of the user, how can the idea of home, and the comfort and security associated with it be maintained. Because of the likelihood of moving in this lifestyle this feeling can't be attached to what can be considered the permanent architecture of a living space, but must become inherent in the objects that travel with you. Duchamp's Boite-en-valise (box-in-suitcase), 1942-54, could be seen as a parallel to this idea. During the occupation of France in the Second World War Duchamp worked on Boite-en-valise. He produced several iterations of previous works in miniature which would be contained inside a suitcase (valise). "My whole life's work fits into one suitcase" (Bonk, Duchamp, 1989, as cited in Demos, 2002) , was how he described it. Duchamp's work is an echo of the attempts of displaced people worldwide to maintain a sense of self, of personal and cultural history in a state of flux (Demos, 2002). These issues translate to the lives of urban nomads in a contemporary context because they are in a position that directly limits the amount of possessions to the space available to store them and the convenience to move them. Furniture utilised in this lifestyle should therefore employ specific traits that allow some form of personal interaction and connection with the user to build up a personal history and associations of comfort.

The idea of open specificity has been discussed as a methodology for involving the end user in the process and utilisation of the product. Where closed specificity "pretends to deliver unique experiences" (Van 't Spijker, 2006) by dictating a set of values

or aesthetic, "open specificity is interested exclusively in its own agenda, and by doing so leaves space for everyone's own interpretation" (Van 't Spijker, 2006). An example of this is Droog designer, Tejo Remy's Chest of Draws, 1991, which can be arranged and rearranged at the whim of the user. The Chest has been designed in a way that requires the user to determine how it is used, and enables them to integrate other artefacts or remove drawers as they like. This way of thinking is interesting because the individualistic qualities of each piece are determined by use rather than outward appearance, and therefore can be produced en masse while still maintaining a sense of the bespoke. The designer is not proscribing a trend, but instead facilitating the means for an individualised end result.

The idea of the designer being a tool to facilitate a solution is an interesting model because it doesn't assume the prospective user needs to be told what they require, it allows for the users own opinion and ability to generate their own response, as well as to take an active role in how furniture can be utilised to best suit their personal requirements. This idea brings up the notion of enabling solutions and disabling solutions (Manzini, 2005). Because of the way products and services have been, and are, designed to make life as comfortable as possible we have constructed a system that allows us to be passive participants in our own lives. These disabling solutions have been described as the idea of "comfort as the minimisation of personal involvement" (Manzini, 2005) with the goal of improved quality of life. Manzini argues that it is the meaning associated with living better which needs to be reassessed. Enabling solutions has been put forward as a response; it aims to correct this passivity by using design thinking to integrate more interaction into the solution. In a strictly furniture design based context this can be interpreted as the creation of an object where the user has influence over how it is used, and allows for imaginative problem solving and experimentation.

As long as there has been furniture there has been mobile furniture. The design of collapsible beds made by North African nomads can be traced back to similar designs found in the tomb of Tutankhamen. Forms of mobile furniture have developed and evolved over time to meet our changing needs. During the 1960's and 70's, at the height of the space age optimism there was a push from many designers to change the way our lives function within the home, the static walls and furniture of the past were no longer thought to be relevant to the time (Schwartz-Clauss,

2002). Largely conceptual and incredibly intriguing these designs by pioneers like Joe Colombo with his Total Furnishing Unit, 1971, were too far ahead of their time, and restricted by application to break through into the mainstream. Some elements of these ideas were more successful leading to popularity in modular storage and seating which provided flexibility to customise and rearrange. However, these objects largely deal with the ability for furniture/interior-architecture to be mobile within the constraints of an outer architectural perimeter, and don't necessarily translate well to a pick up and move scenario. Themes of customisation, flexibility of purpose, movability, and efficient use of space are evident in many of these designs as key factors, and it is these themes that will need to be explored and developed to produce furniture for the urban nomad.

Another consideration is material choice. The cradle-to-cradle (Braungart, McDonough, Bollinger, 2006) Ideology is an alternative to the more wide spread eco-efficiency idea. Where eco-efficiency aims to cut emissions and reduce the use of natural resources cradle-to-cradle proposes a complete re-think of the relationship between industry and environment. It is not so concerned with the idea of reduction, more with the implementation of a complete resource loop. Cradle-to-cradle states resources fall into two categories, technical nutrients (metals, plastics, etc.) and biological nutrients (natural textiles, food, etc.) (Braungart, McDonough, Bollinger, 2006). Technical nutrients can be infinitely recycled with no loss in material quality, whereas biological nutrients return to the environment to continue their cycle. Both eco-efficiency and cradle-to-cradle have their benefits and drawbacks. Eco-efficiency can be seen as a way of slowing down the negative factors contributing to environmental issues, a decrease in emissions, and expenditure of natural resources and a push for recycling. However, it doesn't focus on the cause so much as the symptoms. Where eco-efficiency falls short in its future ability to halt environmental issues, the cradle-to-cradle theory assures a solution, although this solution will take time and huge costs to implement and is heavily reliant on the will of apathetic industry and society. As well as ecologically, material choice will need to be decided in line with requirements for weight and strength, durability and long-term user satisfaction (Fenko, Schifferstein, Hekkert, 2009). The selection of materials is important because the end product will need certain qualities to be successful. It is required that it be easy to move so it is important that it is light, regardless of scale. Because the artefact

may be moved frequently is must also be strong and durable. Together the material, durability, and usability will result in a piece of furniture which has the ability to be recycled, therefore minimising the impact on the environment, but the capacity to stand time and use.

In order to facilitate a sustainable and engaging living experience for the urban nomad, new ways of thinking must be used to create an innovative solution. By instigating these ideas, the way it is possible to live, and the quality of life achievable without a permanent home may enjoy a positive change.

APPENDIX B: Maslow's Hierarchy of Needs
Maslow's hierarchy of needs is an organisation of human needs categorised into levels, with the most basic needs at the bottom, those which we must all achieve for life, and self-actualisation situated at the top as the highest form of human need. Maslow suggests with his theory that a person must, generally, achieve basic human needs before seeking fulfilment of needs further up the chain of hierarchy (Maslow, 1943). While I feel there must be many exceptions to this theory it is helpful in illustrating the importance of the feeling of safety in its broadest sense, within an existing body of research.

Self-acualisation · · · · · · · · · Morality, creativity, spontaneity, problem solving, lack of predjudice, acceptance of facts.

Esteem · · · · · · · · · · · · · · · Self-esteem, confidence, achievement, respect for others, respect from others.

Love/belonging · · · · · · · · · Friendship, family, sexual intimacy.

Safety · · · · · · · · · · · · · · · Security of: body, employment, resources, morality, the family, health, property.

Physiological · · · · · · · · · · · Breathing, food, water, sex, sleep, homeostasis, excretion.   (Maslow, 1943)