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embodied architecture

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abstract

The human body is what we come to know the world by.
Everything is relative.

Using a body centred approach, the relationships held between the Body, Clothing and Architecture are explored through the identification of Skin, Intimacy and Boundary. Beginning with the layers and skins closest to the body, a process of building around and working out is used to establish an understanding of the relationships held between the three subjects. This methodological approach is used throughout the thesis, both theoretically and by design.

The body is approached from a phenomenological perspective where experiential design methodologies are employed with the intent of altering the body's understanding of itself; its lived experience, embodied cognition and sensory perception. Photographic images capture experiential design moments, translating and expressing the theories being discussed throughout.

The architectural conditions studied are contained within the parameters of the domestic. This environment represents the most intimate architectural expression of the self, grounding the body in context.

A 1:1 scale structural model identifies the potentials of what contemporary architecture can be and how it can act on and with the body to alter the lived experience. It generates dynamic spatial conditions, demonstrating architecture's ability to engage with the body. The interactive spatial changes experienced stimulate both physical and psychological shifts and as a result generate new embodied experiences.

As the body is used to ground the generative design processes, clothing and architecture are brought together through the amalgamation of skin, intimacy and boundary, resulting in the production of the Embodied Architecture structure. The theoretical basis for the production of this architectural intervention seeks to be pushed further, challenging contemporary architecture to engage the body and enrich the lived experience.

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1.0 introduction

1.0 - introduction

This research seeks to challenge the identity, potentials and production of architecture from a body centred perspective. It draws on the relationships held between the human body, clothing and architecture, all of which are explored and analysed through the identification of skin, intimacy and boundary. It is important to note that this thesis is not only a design led piece of research but also an object making led exploration.

By using the human body as the starting point, a progressive process of building around and working out from the body is used to investigate the spatial, experiential and material relationships held between the body, clothing and architecture.

This thesis aspires to produce a new understanding of architecture's abilities to interact with and alter the body's perception of itself and connection with its environment.

The thesis negates conventional architectural design methodologies as the project seeks to generate a new means of producing design solutions through privileging the body and designing through making. This methodology enables the project to maintain a three dimensional bodily presence, the spatiality explored through making allows complex relationships to be established and manipulated in ways that conventional architectural drawing processes would not. Photographic images describe relationships being tested and experienced, they capture momentary design expressions, where the environment of the body is altered and as a result a new understanding of the relationships being explored is developed.

The thesis begins with a brief account of the relationships between the human body, clothing and architecture. It sets the scene providing a contextual basis, highlighting the relevance and connections between the subjects being examined from a historical perspective.

As the human body is the core focus its presence is used as a means of grounding the relationships being discussed between subjects. It is the primary subject informing the reader of its position in relationship to the progressive layers beyond the body, those being; clothing and architecture.

The body is explored from a phenomenological perspective. Concepts relating to the experiential body are explored by theorists such as Maurice Merleau-Ponty where he considers the body to form our 'point of view on the world'¹. Juhani Pallasmaa's acute readings of sensory and embodied experience reinforce this body centred perspective, identifying momentary relationships and their effects on the body and perceiving self.

Neil Leach's theories relating to ideas of environmental assimilation and camouflage are present throughout the thesis, continually reinforcing the relationships the body holds with the aesthetic and material world. It explores the body's ability to adapt and mimic environments, essentially becoming representational of an imagined reality. The power of the imagination in understanding the possibilities associated with lived experiences is played on as a method of generating opportunity for heightened experience and understandings of the body and mind combined.

Case studies provide an opportunity to analyse existing projects and theories dealing with the relationships between the body, clothing and architecture. They also facilitate design, prompting the testing of various relationships, allowing a physical narrative to develop, exploring researched potentials and spatial possibilities not yet realised.

The subjects being researched become tools for design exploration. The theories and ideas behind the functions and relationships being discussed highlight opportunities to be worked on and investigated through design with intent of heightening the body's lived experience.

Psychological transformations allow the body to feel space differently, to experience clothing spatially and interact with furnishings mindfully. This thesis identifies opportunities to prompt these psychological and experiential shifts and as a result alter the body's relationship it has with itself and surroundings.

1 Entwistle, J. (2000). "Fashion and the Fleshy Body: Dress as Embodied Practice " *Fashion Theory* 4(3): 334.

For the purposes of this research the relationship between body and architecture is exclusively contained within the realm of the domestic environment. This homely environment allows an in-depth study of the intimate relations between body, clothing and personal space. It limits the parameters of the architectural setting, focussing directly at the point where the dweller has a sense of control over the space. The domestic is the most intimate architectural expression of the self providing both a mental and physical structural framework for the body to function within. Further more it has been identified that architecture plays a vital role in the forging of our personal identities.² The home environment becomes an integral part of us.

The making of a 1:1 scale model is used to test the ideas being explored. It presents design opportunities as a means of furthering the understandings and potentials of architecture. The insertion of this structure within the domestic environment manipulates both the body and space when engaged with. Interactive and kinetic in its function, the structure redefines preconceived ideas and understandings of skin, intimacy and boundary. It repositions the body and its relationships with space. The structure seeks to enhance the body's awareness of itself through the implementation of architectural intervention.

Theoretical research ideas presented throughout the thesis are continually translated into experimental design expressions, explorative of the ideas being discussed throughout the thesis. This process is circular in its approach, both the design and theory are continually influenced and generated by one another. This active design methodology has meant the project's findings could not be pre-disposed or predicted, instead the methodologies employed allowed the project's findings and development to evolve naturally, leading to new design solutions. This ensured that both the design and theoretical research maintained an interconnectedness, relevance and clarity.

Because the thesis and research is centred around the body naturally the Body sections are more developed than the proceeding Clothing, Architecture and Design sections. The content explored in the Body sections is used as the foundations for all further relationships discussed.

² Leach., N. (2006). Camouflage. Cambridge, MIT Press. P7.

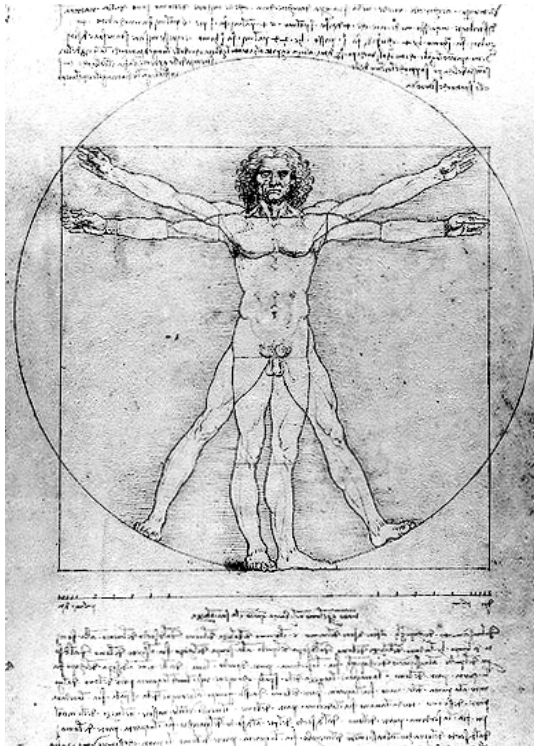


Figure 1: *The Vitruvian Man* - Leonardo da Vinci's study of the male human proportions, based on text written by the ancient Roman architect Vitruvius.

Image source:

www.italian-renaissance-art.com/Vitruvian-Man.html

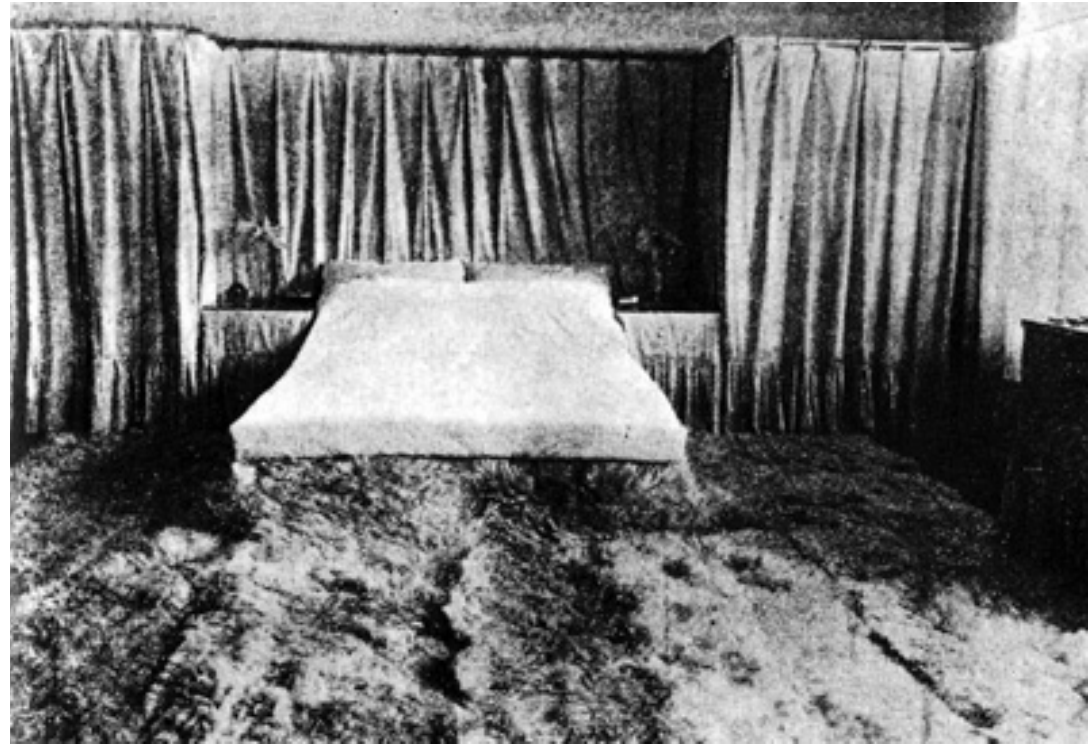


Figure 2: Adolf Loos' flat, Lina Loos' bedroom photo taken in 1903.

Colomina, B., Ed. (1992). *Sexuality & Space*. New York, Princeton Architectural Press.

2.0 setting the scene

2.0 - a brief background

Architecture and clothing have been intrinsically linked for centuries and at the centre of both disciplines is the human body. The body's scale and proportions have been used as a means to evaluate, understand and create both architecture and clothing¹. Leonardo da Vinci's study of the human body can be cited as an early depiction of this concept displaying the body's proportions using geometric and mathematical relationships.

Historically clothing and architecture have been closely related to the point where their material palettes are shared and boundaries blurred. It can be said that "clothing first provided the body with wearable shelter, with architecture manifesting as a framework to support the animal hides and panels of fabric that became roofs and walls."²

In Adolf Loos 1898 essay 'The Principle of Dressing,' the primacy of dress was acknowledged as a basic shelter, encouraging architects to first engage with textiles³. He is said to be the one who has brought us "intimately and inevitably to the crossroads of these cultural and material readings of surface and clothing."⁴ Textile structures are not a new concept, however Loos can be identified as having introduced an abundance of soft furnishings into the interiors of some of his architecture, hiding the structure beneath or behind. A good example of this is the bedroom Loos designed for his wife Lina, this could be acknowledged as an early and conscious move to dress or clothe architecture. Thomas Demonchaux describes the 1903 bedroom's 'angora blanket' as "typologically extending from bed into bedroom, from blanket into carpet, summoning a vertigo of scale."⁵

In Beatriz Colomina's essay, she quotes Loos article from his magazine *Das Andere* stating; "...it is interesting to note that some studies of nineteenth century culture have noted a shift of attention around 1890 from the dwelling (first need after food) to clothing. This shift had to do with the emergence of metropolitan life and the abandonment of a traditional, rooted culture in the anonymity of the big city."⁶

1 Quinn, B. (2003). *The Fashion of Architecture*. New York, Berg. P5.

2 Ibid. P2.

3 Loos, A. (1987). *The Principle of Cladding. Spoken into the Void; Collected Essays 1897-1900 (Translation by Jane Newman and John Smith.)*. New York, MIT Press: 66-69.

4 Demonchaux, T. "Coat Check: Notes on Surface, Clothing and Architecture." *Practice*.

5 Ibid.

6 Colomina, B. (1988). *Adolf Loos: das andere. Architecture and Body*. New York, Rizzoli. Subtitle 2;Fashion

This statement highlights the importance and role clothing plays in the expression of self identity and the cultural implications associated with clothing, such as the identification of class, taste and wealth.

Both architecture and fashion have been inspired by one another for centuries. However, it hasn't always been a conscious relationship, links and similarities can be seen throughout history, as noted in Bradley Quinn's book 'The Fashion of Architecture';

"James Laver identified parallels between the steel domes of Sir Joseph Paxton's Pavilion for the Great Exhibition of 1851 and the structure of the crinoline frame. Paxton had no intention of influencing women's dress, but his design inspired a voluminous device that continued to dominate fashion for the following two decades."⁷ This similarity and observation connecting both fashion and architecture is discussed in Jonathan Glancey's article 'Foundation Garments' where multiple examples of fashion and architectures mimicry behaviour is identified. Like Laver, Glancey states "At a time when Europeans sought to construct the highest spires to crown their churches, so French and Burgundian ladies took to wearing improbably tall, coned hats."⁸

This has a lot to do with the fact that both architecture and fashion condition each other, meaning that an architectural space is designed to accommodate a specific activity or setting for a particular person or people. Within this space it is expected that the inhabitants will behave in an appropriate manner defined by the environment surrounding them, this is also reinforced by their clothing or fashioned dress.



Figure 3: Photograph of Joseph Paxton's Crystal Palace that housed the Great Exhibition of 1851. Photograph taken by Benjamin Brecknell Turner, about 1852.
Image source: www.vam.ac.uk/users/node/4929

7 Quinn, B. (2003). *The Fashion of Architecture*. New York, Berg. P2.

8 Glancey, J. (2008). Foundation Garments. *The Guardian*. London.



Figure 4: Example of a crinoline petticoat, structural undergarment.

Image source: www.thefullwiki.org/Crinoline

In Neil Leach's book 'Camouflage', this concept is explored in depth, he writes;

"We human beings are governed by a chameleon like urge to blend in with our surroundings – to 'camouflage' ourselves within our environment. We need to feel at home, and to find our place in the world."⁹

This statement identifies the connection between the human body, clothing and architecture, as it seeks to extend the notion of identity beyond the body's immediate boundaries. By extending these boundaries and likening the environment surrounding the body to its own identity, a blanket of comfort and familiarity engulfs the body. Having identified itself with these surroundings the body develops a sense of security and belonging.

The role that clothing plays in this relationship between body and environment is one of mediation and projected identity.

These relationships between body, clothing and architecture will be investigated in depth through the exploration of skin, intimacy and boundary in the following sections.



Figure 5: Chair body.

3 . 0 b o d y

3.0 - body

As stated in the 'brief background section' the importance of bodily proportion has been identified as the starting point from which everything is and has been developed. The scale of the human figure is used not only as a mechanism with which we measure proportion, it is also the tool we use to understand space, mass and boundary.¹⁰

The human body is a complex subject, it allows us to experience with all our senses, it allows us to make judgement and interact with the things around us, it is the medium for which our understanding of everything is processed and conceived.

Joanne Entwistle's article 'Fashion and the Fleshy Body: Dress as Embodied Practice', delves into the way in which the body acts and perceives the world surrounding it through studying concepts developed by theorists such as; Maurice Merleau-Ponty, Sigmund Freud, Erving Goffman and Pierre Bourdieu.

She states that; "The body, in phenomenological terms, is the environment of the self, and therefore something acted upon as part of the experience of selfhood. This is in contrast to the semiotic model, which considers the body as a symbolic and discursive object worked on by culture."¹¹

For the purposes of this thesis, the body will be interpreted using the phenomenological model as opposed to the semiotic model. The reason this phenomenological theory will be used, is due to the fact that it positions the 'body at the centre', hence why it is both appropriate and necessary for following relationships to be established from. Phenomenology in this respect refers to the description of the conscious experience.

Entwistle writes:

"Merleau-Ponty places the body at the centre of his analysis of perception, arguing that the world comes to us via perceptive awareness, i.e., from the place of our body in the world. Merleau-Ponty stresses the simple fact that the mind is situated in the body and comes to know the world through what he called 'corporeal or postural schema': in other words we grasp external space, relationships between objects and our relationship to them through our position in, and movement through, the world."¹²

10 Quinn, B. (2003). *The Fashion of Architecture*. New York, Berg. P5.

11 Entwistle, J. (2000). "Fashion and the Fleshy Body: Dress as Embodied Practice" *Fashion Theory* 4(3): P333.

12 Ibid.

This quote defines the role the body plays in relationship to the external world or environment surrounding it. Entwistle continues; “As a result of his [Merleau-Ponty’s] emphasis on perception and experience, subjects are reinstated as temporal and spatial beings. Rather than being “an object in the world” the body forms our ‘point of view on the world.’”¹³

The body is the experiential, perceptive being, that transforms our experiences and interprets our immediate and imagined environments. Consequently the role of dress or being clothed is directly related to our experience and understanding of the world or environments surrounding us. “Dress works on the body which in turn works on and mediates the experience of self.”¹⁴ Merleau-Ponty is the founder of these concepts, he works with the ‘experiential body’ as opposed to the ‘body as object in space’ as Foucault identifies.

Juhani Pallasmaa also references Merleau-Ponty frequently in the book ‘Encounters’ identifying the poetic qualities in Merleau-Ponty’s writing as he describes the power of vision as bodily and imagined experience. Vision plays a huge role in our understanding and perspective of the world around us. It is the sense that senses before we touch, it is the sense that allows our imagination to touch without physically touching. It becomes an unconscious filter for our understanding and bodily experiences within the world.

However vision is not the body’s only form of sensory interpretation. As stated earlier the body is described as a ‘whole’ entire sensory being. It shows that the experience of touch and bodily positioning in relationship to the environment or settings surrounding us is greater than simply seeing the environment and understanding the sensory experience through eye sight, and sight only. Pallasmaa demonstrates the difference between the act of seeing and the act of bodily experience in relation to architecture;

“Authentic architectural experiences derive from real or ideated bodily confrontations rather than from visually observed entities. [...].The visual image of a door is not a true architectural image, for instance, whereas entering and exiting through a door are architectural experiences. Similarly, the window frame is not an architectural unit - whereas looking out through the window, or daylight filtering through it, are authentic architectural encounters.”¹⁵

13 Entwistle, J. (2000). “Fashion and the Fleishy Body: Dress as Embodied Practice “ *Fashion Theory* 4(3): P334.

14 Ibid.

15 Pallasmaa, J. (2005). *Encounters; Architectural Essays*. Helsinki, Rakennustieto Oy. P326-327.

Hugo Kükelhaus (Painter, Sculptor, Designer and advisor for many architectural projects) also explored the notion of lived experience and embodied cognition, “He saw experience as an ongoing transaction of organism and environment whereby both subject and object are constituted in the process.”¹⁶ Kükelhaus developed the project ‘Experience Field for the Development of the Senses’ where the body was encouraged to engage with 30 different ‘Experience Stations’. The body would gain awareness of itself through its lived experience. Swings, roundabouts and underfoot textures are just a few of the engagement stations he designed. Most importantly he transformed his theoretical explorations into physical expressions with which the body could engage and through engagement learn about itself.

In the book ‘Architecture and Body’, the role the body plays in relationship to the various environments surrounding it is also explored. The book section ‘Intimations of Tactility: Sentimental Topography’ highlights the intimate relations the body experiences when engaging with inanimate form or surface. It is suggested that the body brings to life the experience of the inanimate object when the body is placed in opposition to the inanimate form or environment.

It is not unlike the description Merleau-Ponty gives of the ‘experiential body’, where the body is both experiencing but also being experienced. Pikiotis and Frampton state;

“.....all forms other than bodily forms tend to be in opposition to the latter and never become one of them. It is the opposition offered to the body by space which makes it possible for the space to share in the life of the body, and reciprocally it is the body’s opposition which animates spatial form. Let us imagine a square, vertical pillar.....This pillar without base rests on horizontal blocks which form the floor..... A body approaches the pillar; from the contrast created between the movement of this body and the tranquil immobility of the pillar a sensation of expressive life is born, which neither the body without the pillar, nor the pillar without the body, would have been able to evoke..... Finally the body leans against the pillar, whose immobility offers it solid support; the pillar resists, it is active. Opposition has thus created life in inanimate form. Space has become living!”¹⁷

16 Luescher, A. (2006). “Experience Field for the Development of the Senses: Hugo Kükelhaus’ Phenomenology of Consciousness.” [International Journal of Art and Design Education](#) 25(1): P 73.

17 Marble, S., D. Simley, et al., Eds. (1988). [Architecture and Body](#) New York, Rizzoli. Subtitle 19; Body.

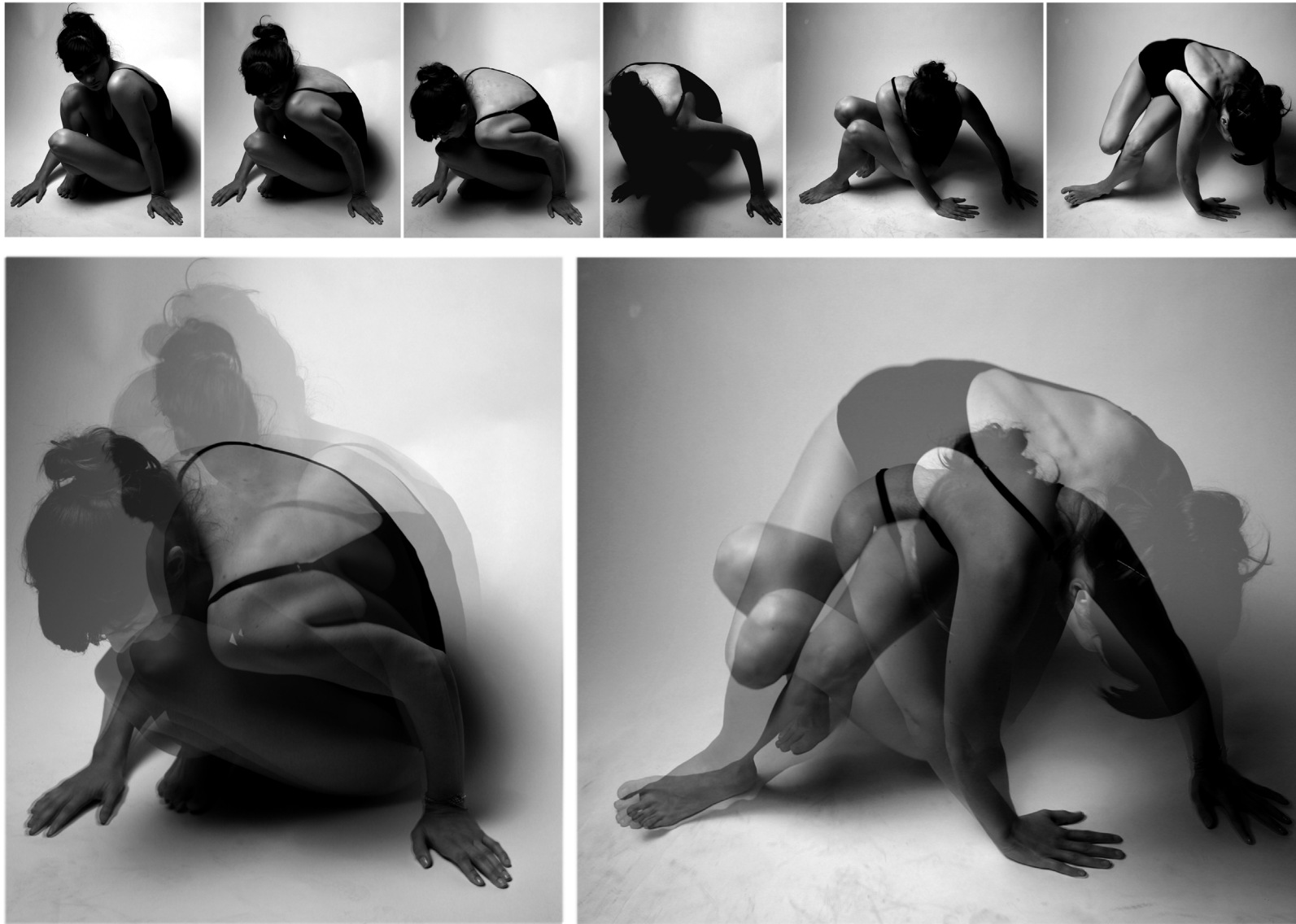


Figure 6: Grounded Experience. This image investigates the relationship and experience between the body and ground surface. The body dynamically experiences the support and stability of the ground surface, but the body is also being experienced by the ground surface. Here is a case of inanimate form being activated through the interaction and experience of the body.

The relevance and importance of this quote is stated where the opportunity for the body to interact with inanimate form brings both energy and life into the surroundings dynamically. For the body to experience its immediate setting through physical engagement, provides an opportunity to be worked on. It allows for this experience to be controlled, it also enables the possibility for the body's awareness to be heightened at various points, in turn facilitating this inanimate environment to be interpreted differently.

However, for the body to experience and be experienced requires more than just the physical relationships being explored here; the role the imagination plays can affect the experience the body has with itself and its surroundings profoundly. While the body is used to understand space, relativity and mass with reference to itself, it is the mind that projects the body as an entire being onto this environment and it is the mind that triggers the emotive and intimate connections from learned and prior experience.

Pallasmaa states; "I confront the city with my body; my legs measure the length of the arcade and the width of the square; my gaze unconsciously projects my body onto the facade of the cathedral, where it roams over the mouldings and contours, sensing the size of recesses and projections; my body weight meets the mass of the cathedral door; and my hand grasps the door pull as I enter the dark void behind."¹⁸

It is obvious from this quote that everything is relative to the body and what is interpreted or experienced can be imagined. Neil Leach investigates the role the imagination plays in relationship to the world surrounding us "...if we follow psychoanalytic thinking, what we take for the real is in fact the imaginary. It is precisely through the imaginary realm of representation that so-called 'reality' is acted out."¹⁹ Leach identifies the power of the aesthetic world and our ability to identify with it and mimic it. Through our engagement with this world, we live and identify ourselves with it, the boundary between the real and the imagined becomes so intertwined the imaginary becomes the real. Our imaginations are triggered and shaped by our experiences, we seek to live our experiences and identify ourselves with our environments. This leads to the notion of camouflage where a process of assimilation occurs. Leach quotes; "Camouflage operates through a process of assimilation based on representation. Here representation can be read in terms of the model, and camouflage amounts either to a modelling of the self on the other, or to assimilating to the other through the medium of the model."²⁰

18 Pallasmaa, J. (1996). *Polemics : The Eyes of the Skin : Architecture and Senses*. London, Academy Editions. P26.

19 Leach., N. (2006). *Camouflage*. Cambridge, MIT Press. P242.

20 Ibid. P243.



Pallasmaa reinforces this relationship expressed by Leach stating; “Our bodies and movements are in constant interaction with the environment; the world and the self inform and redefine each other constantly. The percept of the body and the image of the world turn into one single continuous existential experience - there is no body separate from its domicile in space, and there is no space unrelated to the unconscious image of the perceiving self.”²¹

The body extends itself out beyond its physical bounds, the body could be looked at as being a whole expression of any given environment. An extension of the self which encapsulates the self, a reflection of ourselves upon ourselves, it is an outward expression that continually challenges the public and intimately private, a layered process of exposure.

21 Pallasmaa, J. (1996). *Polemics : The Eyes of the Skin : Architecture and Senses*. London, Academy Editions. P27.

Figure 7: Chair Body 2. This image is an exploration of the body's relationship with the furnished architectural environment. The proportions of furnishings are typically based on the body's proportions, so in this instance the body not only fits the chair, but it's accommodated and supported by the chair, allowing the body to take on the shape of the furniture. This is a basic concept of environmental camouflage, where the body unconsciously takes on the form or dresses itself according to the surrounding environmental conditions.



3.1 - body - skin

The body's external surface, known as 'skin' provides the interface between the body's internal workings and the exterior environment beyond it. "The skin reads the texture, weight, density and temperature of matter"²² and acts as a physical filter, protecting from the various external elements while still allowing the body to feel and respond to the environment accordingly.

There are many poetic and metaphoric references associated with the term 'skin', which not only refer to the human body but also to the exterior layers we surround and protect ourselves with. Skin is a term that can be used as a descriptor for; threshold, boundary, material layer(s), flexible interface, membrane, casing, shell etcetera. It is used frequently in both the fashion and architectural disciplines. Traditionally body, clothing and architecture have been described as the three skins surrounding the soul, the first being the body's own skin, the second being the clothing that wraps and protects the body, and the third being architecture that shelters the body.²³

As discussed in the article 'Architecture Beneath the Skin' the term 'skin is phrased as a powerful linguistic image, aiming directly at the point where fashion and architecture meet'.²⁴ "In architecture, the skin is the interface at which various publics come together: those that are obviously public and the ones that remain intimately concealed."²⁵

The skin is directly associated with the notion of public and private. It is representative of the private and naked body that lies beneath layers of clothing protecting it from the public eye. Levels of bodily exposure or nakedness are indicative of particular spatial environments, for example; the bedroom represents the most private and intimate space in a domestic setting, where the body can comfortably strip down, wrap itself in sheets, or dress itself in preparation for the spatial environments beyond the bedroom. This ritualistic performance identifies the privacy and spatial typology required for the body to be naked.

22 Pallasmaa, J. (1996). *Polemics : The Eyes of the Skin : Architecture and Senses*. London, Academy Editions. P40.

23 Campays, P. (2001). *The Sacred and the Abode*. Auckland, University of Auckland. P156.

24 Seifert, J. (2007). *Architecture Beneath the Skin*. [More than Architecture 91°](#) P11.

25 Ibid. P9.

Figure 8: Exposure. This is a study of bodily exposure through the progressive undressing or revealing of the body. The various stages are associated with various environmental and socially appropriate situations. The intimately private and the exterior public. The half shade attracts the eye to the areas of the body that are shaded, whereas the completely blackened covered areas attract the eye to the areas of the body left exposed. This study helps recognise how the body is 'seen'.

While the body can comfortably express itself in a naked sense, exposing the skin entirely, it is however dressed by the surrounding personal belongings, furniture and architecture. These personal belongings are not only used to dress or adorn the space, they are an expression of the individual's identity. Therefore through the shedding of layers the body becomes surrounded by the clothes and layers that protected it beyond the bedroom environment. While the space between the body and its clothing is distanced there still remains an intimate connection between them. This intimate connection is reinforced by the markings and wearing patterns worn into the clothes, the creases where the body's elbows and knees bent, marks from where a handbag rubbed against the hip, stretch patches where the elastic has been worn for hours on end. The bodily interaction with this second skin remains present despite the body having shed these layers, and when the body returns to inhabit these clothes a sense of familiarity and comfort is provided, where the body fits back into the clothes activating the materials and further wearing into the creases created by the body.

Nudity and exposure of bare bodily skin are subjects that can both cause alarm, distress, disgust and fascination. As Joanne Entwistle states, "when we talk of someone's 'slip showing' we are, [...] speaking of something 'more than slight sartorial sloppiness'; we are actually alluding to the exposure of something much more profoundly ambiguous and disturbing . . . the naked body underneath the clothes."²⁶

The inappropriateness of this situation lies in the public or social setting, where the body is exposed to the eyes of those surrounding them. If the person was however in the privacy of their bedroom or home and was not surrounded by these eyes of judgement the situation becomes much more appropriate and the body is thus protected and dressed by the intimate setting of the home. It becomes apparent at this point that architecture takes on the role of dressing or clothing the body, protecting it, housing it, allowing the body to move freely within it, while supporting and providing a framework for it to function within.

However this social phenomenon regarding clothing and nudity or skin exposure, of what is deemed to be acceptable or unacceptable, comes down to our basic need to conform to the social parameters we adhere to. It highlights social insecurity and again this leads to the desire to camouflage ourselves in order to feel comfortable in our own skin. It also refers to social security and behavioural protocols, regarding subjects such as women's safety, child safety, work place etcetera.

26 Entwistle, J. (2000). "Fashion and the Fleishy Body: Dress as Embodied Practice " *Fashion Theory* 4(3): 338.

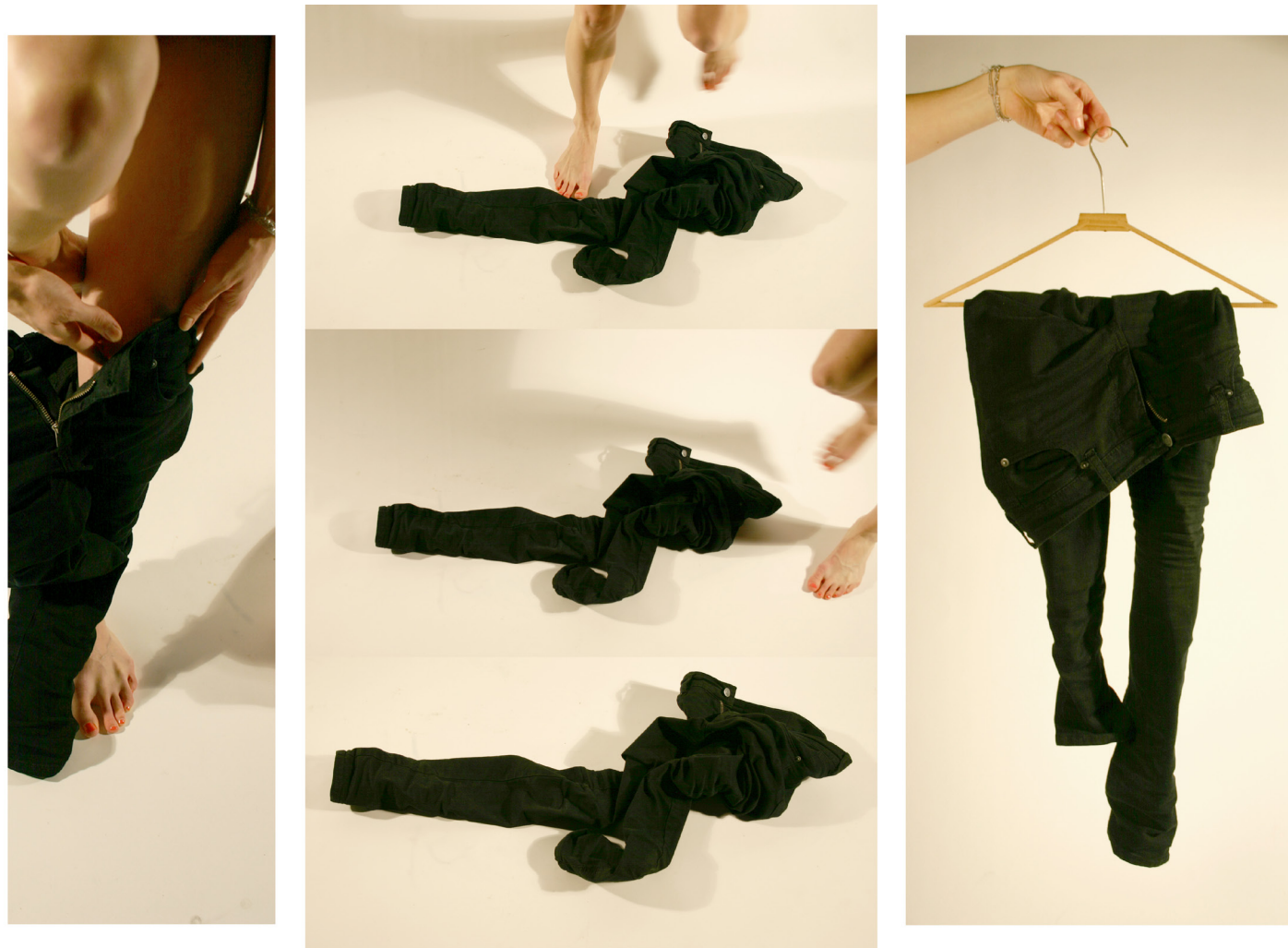


Figure 9. *Undressed Skin*. This collection of images looks at the relationship between the clothed body and the remnant bodily trace. As the second skin redefines the interpretation of the human figure the interaction the material experiences with this bodily contact is worn into the fabric, creases become deeper and softer, and are a physical expression of the relationship the material had with the body. It can be thought of as the material retaining a memory of the relationship it holds with the body. While these marks are signs of bodily interaction they are primarily representative of kinetic movement.

As we dress our bodies our senses are altered, our interpretation of the environmental conditions around us masked and filtered, our second skin becomes an extension and expression of our bodies and our desired outward appearance, but just like naked skin the material expresses its own qualities, the way in which it interacts with our bodies, the way it creases, stretches, pulls and rubs as it navigates the human form. When the body is dressed our second skin redefines the body's edges. Our physical boundaries are all of a sudden extended to incorporate the second skin that re-represents the bodily form.

Furthermore, Entwistle discusses the experience of 'epidermic self-awareness', where our body develops a heightened sense of its edges and boundaries²⁷. Clothes that are tight or extremely loose are obvious examples that act on the body as the skin interacts and experiences the clothes spatially. This involves various material restrictions or textile structures rubbing against the skin allowing a relationship with the space beyond this 'epidermic skin' to be experienced and engaged with. By acknowledging the boundary or 'edge' of the body, the exterior space beyond this skin is inherently involved, both being filtered by the clothing fitted to the body, but also asserting itself against the body and its fitted skins of cloth. The architectural environment surrounding this experiential body pushes up against the body, touching it in places, providing support for the feet, while it guides and defines spatial functions. At this point all three skins are interacting, supporting and manipulating one another. Again, this creates a profound opportunity to design and manipulate the relationships being evoked and experienced here. Design enables these interactions to be controlled, guiding the body's experience and hence the interpretation of its surroundings.

27 Entwistle, J. (2000). "Fashion and the Fleishy Body: Dress as Embodied Practice" *Fashion Theory* 4(3): 334.

Artist Lucy Orta embraces this opportunity by exploring fashion and architecture; she challenges their preconceived uses by combining both their roles to dress and shelter the body. She brings the second and third skins together, creating garments that double as habitable shelters and wearable clothing for the homeless or social outcasts. She states “My work breaks down barriers between clothing and architecture to remove many of the limitations they represent, with the intention of eventually leading to some sort of transformation.”²⁸ The transformative works further explore their potentials as identity and awareness are used to communicate with viewers. “From a design perspective, seeing a suit that can transform into a tent-like structure is visually very interesting. It brings awareness to the person inside it. As an artist I define the visual aspects of the work to transmit a message from the wearer to onlookers or passers-by.”²⁹

Orta’s ability to work with skins and challenge their relationship with the human body shows material potentials and exciting possibilities for bodily experience. She writes; “Since to inhabit a space means to consider it part of one’s body, clothes are fully entitled to become architectural dwellings, temporary shelters affording protection against cold and storms in the stopping places on the long journey of human existence.”³⁰ Orta’s work is proof that new environments can be created, a new lifestyle typology and means of existence. Through the bringing together of skins, the body can inhabit both clothing and architecture, an architecture that travels and protects the body, manipulating the experience of the wearer and the idea of ‘home’.

28 Quinn, B. (2003). *The Fashion of Architecture*. New York, Berg. P155
29 Ibid. P159.
30 Ibid. P160.





Figure 13: Body Intimacy

3.2 - body - intimacy

The realm of intimacy directly relates to both the human body and the layers and environments surrounding the body. The subject of intimacy is vital to our understanding of the relationship the body has with clothing and architecture. As Juhani Pallasmaa states with reference to an architectural setting, “there is a strong identity between naked skin and the sensation of home. The experience of home is essentially an experience of intimate warmth. The space of warmth around a fireplace is the space of ultimate intimacy and comfort.”³¹

The word intimacy and/or intimate was originally used (originating in the 1640's) as a euphemism for ‘sexual intercourse’, however it’s meaning has become somewhat diluted over time and now deals with the proximity of relations or relationships, associating itself with familiarity, closeness, affection, warmth, comfort and privacy.³² Intimacy and its associative meanings tend to place the body at the centre, again relating to and dealing with personal relations between oneself or with another. Intimacy can be used as a mechanism for defining and identifying the boundary between the public and private realm. The closeness of fabric on the body, the weight and touch on the skin, and the articulated openings that expose the skin, all contribute to the experience of intimacy.

It is through bodily feeling and identification of the environmental conditions around us that allow us to make decisions based on what the body requires to feel comfortable. The body responds to the world around it by choosing appropriate clothing, for example if the body feels cold it responds by wrapping itself in an overcoat. Without the coat the body would feel exposed and uncomfortable. Tadao Ando expresses this relationship between body and the world as a dynamic one; (Shintai is defined by Ando as being the union of spirit and the flesh. Usually Shintai directly translates to ‘Body’).

“The world articulated by the body is a vivid, lived-in space. The body articulates the world. At the same time, the body is articulated by the world. When ‘I’ perceive the concrete to be something cold and hard, ‘I’ recognize the body as something warm and soft. In this way the body in its dynamic relationship with the world becomes the Shintai. It is only the Shintai in this sense that builds or understands architecture. The Shintai is a sentient being that responds to the world.”³³

31 Pallasmaa, J. (1996). *Polemics : The Eyes of the Skin : Architecture and Senses*. London, Academy Editions. P41.

32 (1990). *The Concise Oxford Dictionary*. *The Concise Oxford Dictionary*. R. E. Allen. New York, Oxford University Press: 1452. P 622.

33 Marble, S., D. Simley, et al., Eds. (1988). *Architecture and Body* New York, Rizzoli. Book section; Shintai and Space by Tadao Ando 1st page.

These intimate experiences, of warmth and cool, space and enclosure, build up our understanding and recognition of the world and help us respond to our environments accordingly. Intimacy is not just experienced through how our body touches or moves through our surroundings, it is also experienced in the mind. Like Ando's description of the 'Shintai' (the union of spirit and flesh), an acute awareness of the momentary closeness or distance of a particular setting can be an intimate experience due to the mind and body's combined awareness of itself. When the body experiences mindfulness, it is able to feel with intensity, and interpret with the most sensitive of interpretations, allowing for a whole body experience.

Herein lies an opportunity to bring combined awareness to the body and mind when experiencing clothing and architecture and thus strive as a designer to explore the possibility of intimacy as a tool to engage the body and heighten its lived experience.

The body's lived experience in relationship to intimacy extends itself beyond the body's immediate layers and surroundings to incorporate intimacy of the familiar, where the body creates a psychological attachment to the environment of the familiar and routine.

In the book 'Camouflage', Neil Leach describes the experience of walking into an unfamiliar motel room, where the space feels unfriendly and slightly dishevelled, however as the visitor places their suit-cased belongings around them and becomes familiar with the new space a shift happens "we start to feel cosy there and develop a sense of attachment. Somehow – almost imperceptibly – a shift happened. What once appeared foreign and alienating now appears familiar and homely."³⁴

This process of assimilation happens as the inhabitant body begins to re-establish their sense of identity. By dressing the unfamiliar space with their personal belongings the room starts to reflect the person's identity which brings comfort and a sense of security to them. This is an example of the body, an animate being, identifying with inanimate objects as a mechanism of identifying themselves. It is an unconscious need to extend beyond the boundaries of the first and second skin, to mark the unknown territory as it was, in order to establish an intimate connection with this new place in the world. One they can identify with, and alter accordingly.

34 Leach., N. (2006). Camouflage. Cambridge, MIT Press. P4.



Figure 14: Wrap Me Up. Here the body takes on the material qualities, its form is now identified by the shapes and spaces defined by the cloth and at the same time the body allows the material to perform and evoke its unique properties.



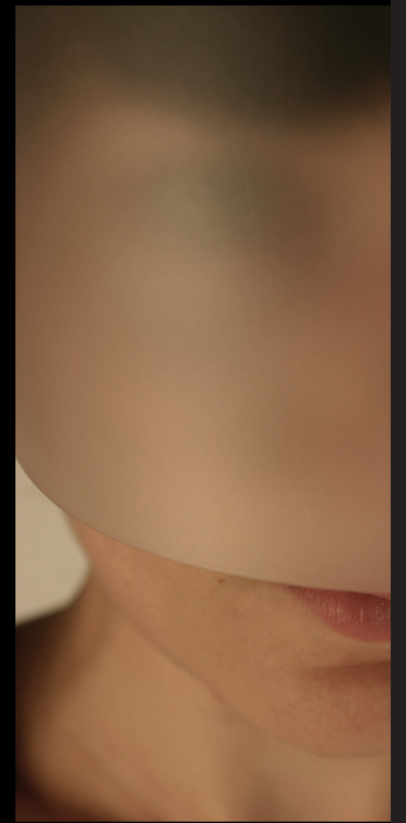
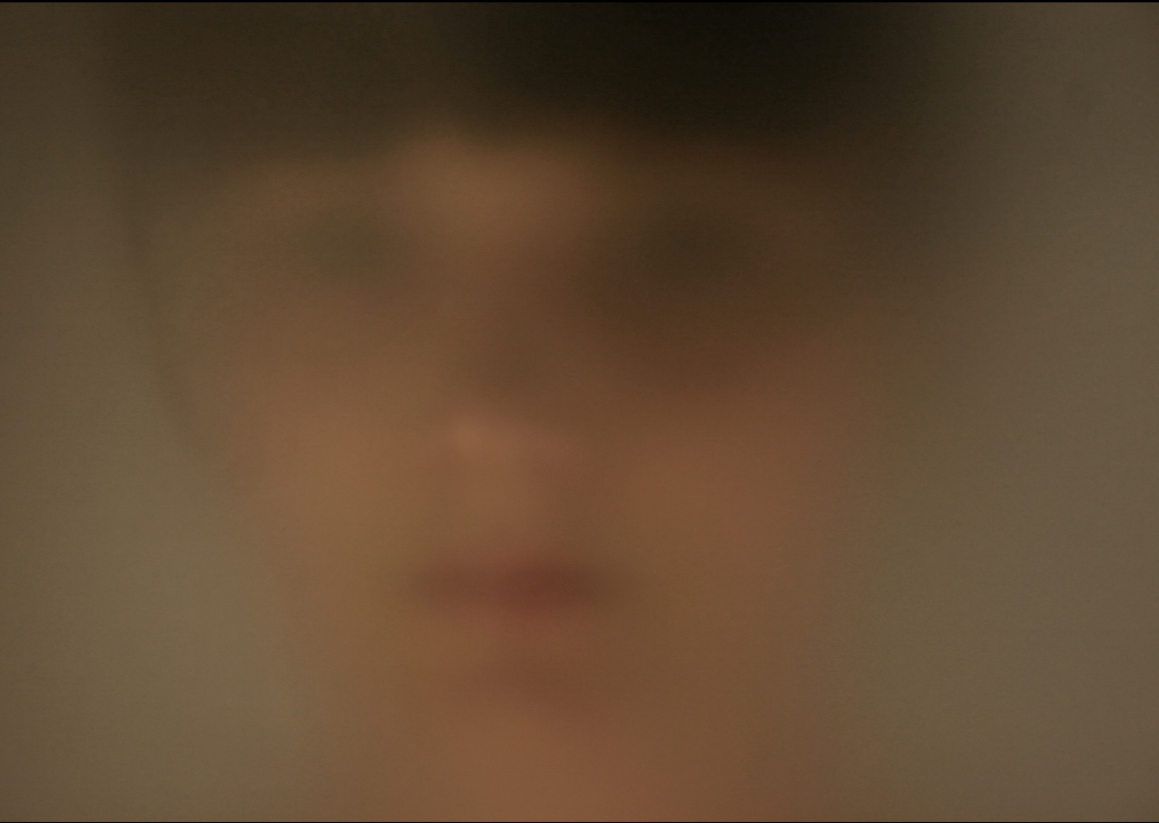
Figure 15: Intimate Skin.

While the body engages with new environments it is the eyes that interpret a place or space or observe an interaction first. As this initial interaction is processed through the act of seeing, a change happens where the body, once adjusted, becomes familiar with the new setting or situation. At this point the body begins to relax allowing the other senses to begin to work, feeling the space, smelling the air, touching the floor, the eyes operate as an extension of the body's sense of touch or feeling. "All the senses, including vision, are extensions of the sense of touch; the senses are specializations of the skin, and all sensory experiences are related to tactility."³⁵

Catherine Bagnall describes her body and its ability to feel and be felt, "I can't imagine a self without feeling, sensing the elements and enjoying the feeling of feeling. The act of looking, for me as an artist, is an agent for feeling."³⁶ To identify the 'act of looking as an agent for feeling' Bagnall opens up the possibility for intimacy to be felt through visual interpretation. This is a very powerful notion, as again the mind and its ability to imagine come into play. To accept that sight is an extension of the skin's ability to touch, allows the body to connect and understand its environment visually. Again the mind projects the body onto its surroundings, creating an understanding, interpretation and feeling within the body. An intimate connection is established.

35 Pallasmaa, J. (2005). Encounters; Architectural Essays. Helsinki, Rakennustieto Oy. P322.

36 Bagnall, C. (2008). Encounters with Simple Pleasures. Performance Design. Dorita Hannah and O. Harsløf. Copenhagen, Museum Tusulanum Press: 178-189.



3.3 - body - boundary

Boundary - Dividing entity – point of Demarcation – Parameter – Limit – Border – derived from Boundary Marker or Mark – point of difference.

Boundary can be seen as a literal and physical expression of where the body or skin finishes and material starts, it can also be defined and described as the point 'between the wearer and the seen.'³⁷ The experience of body and the definition of boundary can be explored in relationship to various contexts, and in turn the definition and understanding of boundary can be perceived and understood according to the specific setting. The body in a domestic or private environment interacts with clothing and space in a different way to the body in a public setting.

While boundaries can be observed and defined through the assertion of physical layers and demarcated space, Catherine Bagnall looks at boundaries between fashion and the body with reference to metamorphosis which “relates to both conceptual and physical shifts.”³⁸ With regards to metamorphosis she states “If margins and borders are conducive to such transformations, then clothing may be an especially productive site. As a kind of transitional frontier, it marks the boundary between the self and non-self through its physical and psychological operations.”³⁹ This statement identifies the opportunity to manipulate the self, the representation of self and the understanding of body in relationship to clothing and thus the boundary that is definitive to both. It also delves into the idea of the psychological boundary between the imagined and real. The imagined can be manipulated by the wearer and is a representation of self identity, however it is interpreted by the observer as real, as it defines the physical body. This is like Neil Leach’s description of the imaginary becoming the real, it is an example of this exact scenario, and is based on the representation of the image, or image of the representative body. Herein lies the opportunity for the notion of boundary to be challenged, for the representative body, which is identified by clothing, to be manipulated, and for the setting and understanding of body to be reinterpreted.

37 Quinn, B. (2003). *The Fashion of Architecture*. New York, Berg. P19.

38 Bagnall, C. and R. Sinclair (2002). *Productive Excess: Clothing, Landscape, Architecture*. *Making an Appearance: An International Conference on Fashion, Dress, and Consumption*. The University of Queensland.P3.

39 Ibid. P4.

Figure 16 opposite page: Body Boundary Blur.



Figure 17: Jürgen Mayer H's work *Lie* 1997.
Image source: www.jmayerh.de/50-0-Lie.html



Figure 18: Corpo Nove's work *Oricalco*
Image source: www.interactivearchitecture.org/smart-materials-1-definition.html

Clothing is often referred to as the boundary between the private body and public space. The closeness of cloth to the body and the function of the cloth in relation to the body defines the way in which the body is able to perform. As previously discussed this relates to bodily exposure and the representation of skin. Its understanding is dependent on the social situation or scenario, it relies on the perspective of the viewer as the interpreter of the present body in context, as opposed to the observation of the wearers experience. The intimate and spatial experience associated with the wearing of clothes explores the points of contact between skin and cloth and further more between the progressive layering of fabrics surrounding the body. The definition of boundary in this case is experienced and understood differently between the wearer and the viewer.

A good example of the exploration of boundary between cloth and body can be seen in Jürgen Mayer H's work. He uses the body and its heat to express its interaction with the fabric through the application of heat sensitive prints/colours. He uses this technology in furniture and bed sheets which when interacted with or worn show imprints of where the body has been and where it moves due to the heat reaction with the cloth or surface.⁴⁰ This explores both the boundary between cloth and body but also intimacy through performance.

Another example of the exploration of boundary between body and clothing is the work 'Oricalco', by Italian firm Corpo Nove. The textile structure has been designed to again respond to the body's heat however it works in unison with the body, acting to maintain the body's comfort. When the body reaches a certain temperature the shirt sleeves gently roll themselves up to cool and mediate the body temperature.⁴¹ While this shirt works with the body, its response is automated due to the inherent technological fibres imbedded within the garment, this leaves the body out of control of its exterior boundary and as a result its identity.

40 Seifert, J. (2007). *Architecture Beneath the Skin*. *More than Architecture* 91. P20.

41 *Ibid.* P21.

This then challenges the performative side of the exploration of boundary. To what extent the body is able to control its exterior layers and the implications of this interaction with regards to the bodily experience, or experience of the wearer.

This leads to the questioning and definition of boundary with reference to farther environmental controls or spatial interactions beyond the body and its clothing. Thus requiring a defined architectural scope, which for the purposes of this thesis is contained within the bounds of a domestic setting (as further discussed in section 5.1). Barriers between clothing, furnishing and architectural space are broken down as the body seeks to interact with various furnishings, engaging with the environment beyond the body and its clothing. This interaction can be seen as both reinforcing the definition of boundary but also challenging the preconceived notion of boundary in relationship to the body. The notion of boundary can be reinforced, for example, through the layers of clothing being pressed against the body's skin when sitting on a chair, or leaning against a table, making the body aware that it is being protected and covered by the bounds of the fabric protecting the body. However, this interaction can also be seen to be breaking down the boundary between these various physical entities, by simultaneously coming into contact with one another, experiential transference happens where, for example, the body experiences the chair it is sitting on, the layers of clothing become cold as the warmth of the body senses the cool chair. The relationship between chair and body experience one another, the chair supporting the body, and the body being shaped by the chair, the boundary between body and chair is blurred and mediated by the fabric worn on the body.

As these boundaries are blurred through bodily interaction, the differentiation of body, clothing and architecture is challenged. In Thomas Demonchaux's article 'Coat Check', he identifies what he considers to be indicative of boundary as being; the difference "between cladding and clothing becomes a question of scale", and goes on to say there are differences beyond scale, these being performative differences.⁴² While Demonchaux does not provide strict guidelines outlining the exact points of boundary or scale differences, he does state that;

"One important distinction might be called an efficiency of lamination: in cladding buildings, a certain stability and tight fit between volume or figure, on the one hand, and cladding, on the other, is the apparent objective. In clothing, by contrast, the movement of the clothed body, and utility of the contained volume between surface and body (for mobility, for storage, for insulation), prioritises a looseness or roominess, or a selective siting and range of loose and tight, between container and contained: a delamination between layers (and therefore ever more mediation between body and city)."⁴³

42 Demonchaux, T. "Coat Check: Notes on Surface, Clothing and Architecture." *Practice*: 122-123.

43 Ibid.





Figure 20: Second Skin. As we dress our bodies our senses are altered, our interpretation of the environmental conditions around us masked and filtered, our second skin becomes an extension and expression of our bodies and our desired outward appearance, but just like naked skin the material expresses its own qualities, the way in which it interacts with our bodies, the way it creases, stretches, pulls and rubs as it navigates the human form. When the body is dressed our second skin redefines the body's edges. Our physical boundaries are all of a sudden extended to incorporate the second skin that re-represents the bodily form. These images are explorative of this concept and delve into the reading of the human form in relationship to the cloth or being clothed.

Figure 19, opposite page: Body Boundary Blur 2. This frosted acrylic alters the perception and reading of bodily form, presence and perspective. It changes our understanding of the edges of the body, it also provides a commentary or dialogue between the physicality of the body and the physical qualities present in the plastic. Subtle pressure against the skin changes how we read the body, its interaction is physically expressed by the points of contact and the viewers perspective of the body altered.

It becomes apparent that Demonchaux defines points of boundary as an identification of proximity and movement in relation to the body. Distinguishing the layers in relation to how they allow the body to perform within their bounds.

This analogy is interesting in terms of how it responds to the attributes or layers that are flexible and responsive in an animate sense in comparison to the layers that remain inanimate or stationary. It also shows up the fact that the body has progressively less control or influence on the layers farthest from it. Neil Leach provides a reading of the recognition of the animate body in comparison to its inanimate surroundings stating; “One of the assumptions in the identificatory moment of assimilation is that, as animate creatures, we can somehow equate ourselves with our inanimate architectural surroundings. This introduces a distinction between life and death, animate and inanimate.”⁴⁴

While the body can identify itself with inanimate objects as a means of asserting its identity there lies a boundary between the living and non-living, a distinctive point of difference. While this difference is established it doesn’t negate the fact that the body can be influenced and manipulated by these inanimate objects or clothings. The body and its boundaries are in constant flux, altering one another continuously.

“In Goffman’s work, the body is the property of both the individual and the social world: it is the vehicle of identity, but this identity has to be ‘managed’ in terms of the definitions of the social situation, which impose particular ways of being on the body. Thus individuals feel a social and moral imperative to perform their identity in particular ways, and this includes learning appropriate ways of dressing.”⁴⁵ This is an example of a very elastic boundary, one based on social and cultural protocols and expectations. The boundaries of appropriateness are established by the expectations of the social group or scene. From this there become two bodies, a private and social or public body. Boundaries in this instance incorporate groups of people and associative settings creating specific behavioural expectations.

However, while boundary can be read in many ways as means of establishing controls and understandings of where we stand in the world, there will always be questions challenging the existence of boundaries and their functions. The boundaries of what a boundary is can always be pushed further and experienced differently. Design is a powerful means of exploring the notion and potentials of boundaries. As Demonchaux states “At what point, in scale, does one type of furnishing become another type. How big does fashion get, and how small architecture, in their encounters with body and city?”⁴⁶ The question of scale will always challenge and affect the body.

44 Leach. N. (2006). *Camouflage*. Cambridge, MIT Press. P11.

45 Entwistle, J. (2000). “Fashion and the Fleishy Body: Dress as Embodied Practice “ *Fashion Theory* 4(3): 336.

46 Demonchaux, T. “Coat Check: Notes on Surface, Clothing and Architecture.” *Practice*: 122-123.



Figure 21: Paper Hand. I have further investigated materiality in relationship to the human body with this paper series. While the hand asserts a grip of the paper, the material qualities inherent within the paper are expressed by this interaction. The hand becomes represented by the paper and in turn the paper is representative of the interaction with the hand. As the experience of the self is developed through experiencing the imagined, the body and its identity become a single expression challenging the understanding and performance of boundary.





4.0 clothing



4.0 - clothing

Clothing typically refers to fabric that has been fashioned into a specific garment to protect and clothe the body beneath. The beauty of fabric is that it can “be ephemeral, translucent, soft, it suggests impermanence, it is delicate, it transmits light. And it is fluid. Fabric takes the form it is given, moving in the wind, moving with the body, changing qualities when stretched or relaxed.”⁴⁷

Clothing provides many opportunities for the body's; image to be manipulated, movement to be altered, and experience of the surrounding environments filtered. The options are limitless and possible bodily experiences extensive. Clothing is also a strong cultural signifier, its implications can be huge, however for the purposes of this thesis it is the western form of clothing and dress that is studied. Cultural significance does not feature in this exploration, instead it is the physical qualities and psychological implications of coming into contact with clothing that is dealt with.

While clothing is usually associated with garments we choose to dress ourselves in, it can also refer to other physical conditions or bodily interactions we may encounter, such as being clothed by bed sheets, duvets and pillows, or being dressed by the architectural constraints we function within. Our bodies are continually clothed and redefined by a multitude of layers surrounding the body's surface.

The notion of the clothed body has been explored in brief in the Body Section's as the 'second skin' however, clothing as a spatial environment and its implications for design have not. This Clothing section will explore the role clothing plays within the domestic setting, delving into the relationships and interplay between the dressed body and the furnished environment. The term Clothing is looked at as an all-encompassing textile environment. Historical reference is used as a basis for solidifying the relationships being expressed and is used as a means of contemporary critique.

In this section the word 'clothing' is used as an umbrella term associated with the dressed body. The term 'fashion' is used when identifying how clothing informs identity. Fashion is also referred to as a means of examining the extents to which clothing is pushed. The work of fashion designers such as Rei Kawakubo is used to exemplify the extents to which clothing can be pushed and how it can perform on and with the body.

47 T.E.N.T (2009). Textile Tabernacle.

Figure 22 opposite page : Worn Pillows..

4.1 - a clothed environment

As the clothed body has been identified as an expression of the perceived and projected self, so too is the interior environment. Furnished as an expression of lifestyle or lifestyle intent, furnishings create a setting for the body to interact with and function within. There are many parallels that can be drawn between clothing and furnishings. These parallels are typically drawn from materialistic and physical relationships or explored as imagery scenes. However, the combined experience for the inhabitant of these two environments is something that goes beyond the physical realm to an integrated experience where the understanding of body, clothing and furnishings challenge the body's understanding of itself and its purpose within any given environment. At this point where the clothed body and clothed interior collide provides immense opportunity for design exploration and experiential experimentation.

As Myzelev and Potvin state "Too often questions pertaining to interior design have neglected to consider how fashion and furniture work together to create whole experiences and understandings of the material and cultural world."⁴⁸ They go on to further explain that both fashioned dress and furniture are intrinsically linked to the point where they generate a complete experience equalling the intended embodied self-image; "Fashion and furniture care for, protect, extend, enhance, detract, postpone, conform to, confirm and/or limit the contours of the embodied self. They 'create social position' or perhaps even the 'self itself'."⁴⁹

It can be noted that surface appearance and themed environments appropriate spaces and behaviour. Historically these relationships can be seen to control activities, movements and interactions within the home. "Beverly Gordon has suggested that in the later nineteenth century women decorated rooms as a reflection of their selves, their individuality and their personality. Gordon posited that when women dressed furniture with ruffles and fringes they were metaphorically making extensions of themselves."⁵⁰ She also states; "[....A] breakfast room might be decorated in with lightweight cottons and light colour linens, which reflect the 'kinds of fabrics worn by fashionable women worn before noon.' In the dining room 'richly coloured silks and velvets' with 'complex arrangements of drapery and trim' reflected evening dresses of the 1880s."⁵¹ From this quote it can be observed that the interior

48 Myzelev, A. and J. Potvin, Eds. (2010). *Fashion, Interior Design and the Contours of Modern Identity*. Surrey, Ashgate Publishing Limited. P9.

49 Ibid.

50 Gordon, B. (1996). "Woman's Domestic Body: The Conceptual Conflation of Women and Interiors in the Industrial Age." *Winterthur Portfolio* 31(4): 286.

51 Ibid.

environment becomes a stage for ritualistic performance, specific dress codes ensure the body adopts the required behavioural activities when clothed in various fashions. It is an obvious example of Neil Leach's concept of camouflage, where the wearer blends into the room setting appropriately and therefore is seen as inseparable and without question belonging to the spatial environment.

This connection between self-identity and surroundings was recognised in 1878 by Mrs Haweis. She wrote; "There is no doubt that people look different in different rooms. A pale person in a pale room is obliterated, whereas in a deep richly coloured room, the paleness might become enhanced and beautiful....[some people] look vulgar in one place and refined in another – so great is the effect of surroundings on the appearance."⁵²

It is interesting to note the attention to the dressed body in conjunction with a specific room setting as being interpreted and identified as a single image. This image defines the various appropriations and implications associated with wearing a particular dress type. It is assumed here that the self (body), dress, and the room setting are all one, linked together, influencing one another. This thesis goes beyond this historical view that links both dress and the domestic interior. It does not discount the fact that the interior furnishings are an extension and representation of one's identity just as dress is, but the body is not constrained in the same way, it is not purely interpreted as an image against a setting. Instead the image of the body and the representation of the present self are not interpreted solely in terms of how they look but more in terms of how the body interacts with the space, how it moves and is affected by it. This experiential view reinforces the body centred approach used throughout this thesis. As a result the present body is freed to connect with its surrounding environment more strongly; through the sensation of touch, points of interaction, leaving of trace, the shedding or multiplying of layers and the awareness of the presence of self in relation to the surroundings.

It is important to note the role textiles and furnishings play in defining the function of spaces, identifying their intended use and implied social function. The breaking down of material choice through, colour, texture, presence, arrangement and intended bodily interaction indicate the way in which the body is to function and engage with the space and others within it. The way these spaces and materials are interpreted varies depending on social and cultural norms. Clothing "expects the body to move in a specific way, to carry and be carried by the fantasy of what is being worn and the space being inhabited."⁵³

52 Haweis, M. E. J. (1878). *The Art of Beauty*. New York, Harper. P205.

53 Quinn, B. (2003). *The Fashion of Architecture*. New York, Berg. P25.

4.2 - clothing spatiality - layers of inhabitation

Clothing is not only given volume and form when worn, it also creates space for the mind to interact with what it represents to the wearer. Clothing's spatiality does not just refer to the physical experience of wearing various types or styles of cloth, it also provides a temporary platform for the imagined body to be projected as it wishes to be interpreted by the viewer. "Textiles for [Walter] Benjamin function as 'mediators –metaphors for a suspended existence, threshold, or dream-state.'"⁵⁴ Here Benjamin identifies the power of the imagination and its ability to be manipulated through the application of clothing on the body's frame. It displays the opportunity for psychological change to occur and be prompted by the manipulation of physical conditions, which in this case is the application of clothing on the body.

Clothing is used as an expressive form, a means of communicating an image, an idea, a position. It is made to work with and against the body, it is in itself an expression of identity. "Surfaces, whether with or without depth, narrativise the individual's corporeal and spatial identity."⁵⁵

Unlike the structural permanence and stability experienced in domestic architecture, clothing provides a temporary impermanent representation of a specific environment or personality. It is an accessible avenue of self-expression, not only for the body but for the interior environment too. Textiles furnish our worlds mediating our relationships and experiences within it. "Whether the structure was an architectural shell or the human frame, the use of textiles as a method of softening the look of the body or the interior ambience was important. [Walter] Benjamin considered the role of textiles in this softening process: 'Against the armature of glass and iron, upholstery offers resistance with its textiles'."⁵⁶

The use of the word 'resistance' by Benjamin in this instance is significant, it evokes powerful imagery not usually associated with textiles. As textile furnishings are typically described as 'soft' Benjamin introduces a language of strengths relating to the furnished environment, it creates an equal weighting or evenness to the significance and importance of textile furnishings in relation to the built environment. The idea of having textile environments that are resistant as opposed to forgiving changes the implied experience of a given space. The softening process all of a sudden has an

54 Myzelev, A. and J. Potvin, Eds. (2010). *Fashion, Interior Design and the Contours of Modern Identity*. Surrey, Ashgate Publishing Limited. P5.

55 Ibid. P6.

56 Ibid P73.

inherent strength, asserting its function and presence within a specific setting. With resistance comes tensions and like the description of the body and pillar relationship explained in the Body Section by Pikionis and Frampton, opposition generates opportunity for dynamism and expression.

Tensions experienced between body and cloth are teased out as the body stretches and wears its way into garments. Forgiveness as material softens is experienced when seat cushions are lived on, threads pulled and released as the body is momentarily supported. “Denoting and detecting these traces requires a sort of archaeology which aspires to locate embodied practices, [the] residue of the self, and expose the somewhat neurotic need to leave or locate material remnants of existence, a sort of endless deferred recognition of the self in material culture.”⁵⁷ This quote signifies the relationship between body and the lived materialistic environment we imbed ourselves in. Our worlds are endlessly furnished and continually morphing with wear, change and lifestyle choices. The way in which we move through these fields of change is buffered and shaped by our projected identities and the way in which we choose to display them.

While the body navigates varying scales of clothed environments it is moved and manipulated through spaces of transition. It continually positions itself with reference to the way in which it wants the world to view it. At the same time the body parallels this viewed existence by constructing the very environmental and social constraints it seeks to function within. “Dirk Lauwaert suggests that ‘clothing does not represent, it presents. Clothing does not define, it positions.’”⁵⁸ Lauwaert’s description of clothing and its function places the body as a dressed object, displaying itself as what it is with no associative implications of what it may mean. This quote counters the ideas discussed earlier about what clothing represents as an expression of the imagined self, it instead challenges ideas of perception and the present lived experience.

57 Myzelev, A. and J. Potvin, Eds. (2010). Fashion, Interior Design and the Contours of Modern Identity. Surrey, Ashgate Publishing Limited. P7.

58 Ibid. P70.



Figure 23 opposite page: Material Experience.

4.3 - case study

- body meets dress, dress meets body

Fashion Designer Rei Kawakubo of Comme des Garçons bought out a collection named Body Meets Dress, Dress Meets Body in 1997. This provocative collection challenged ideas relating to; the reading and understanding of bodily form, the experience of body, the experience of space beyond the body, perceptions of beauty and manipulation of the lived experience.

As seen in the images, Kawakubo's bump dresses distort the image of the body. They protrude in unpredictable places drawing attention to the representative body of the wearer. The construction of the garments alters the body's understanding of its boundaries, challenging the body to interact and experience space differently. "Her clothing reflects an ambivalence towards the boundaries of the body and a desire to make those boundaries even more ambiguous. She declared 'body becomes dress becomes body'."⁵⁹ It is interesting to note that through the manipulation of the body's contours, Kawakubo draws attention to the body beneath, prompting the mind to speculate as to what type of bodily form inhabits the bumps. Therefore the dresses can be seen to bring awareness to bodily form by consciously disregarding and breaking the image of the familiar bodily physique.

The Lump dresses "may brush against a wall or catch on the frame of a door. These extended bodies, provisionally connecting with the built environment through fashioned points of contact, highlight the fact that spatial experience is mediated through dress. Clothing may be a site for manipulating that experience."⁶⁰ This quote reinforces that bodily experience can be defined by dress. As the dresses bumps are padded out with feather stuffed pillow-like structures, it is then assumed that the experience for the wearer of the garments is altered due to the material composition. "Perhaps the pads work as dampers, insulating the body against sharp edges and harsh surfaces, or maybe they are amplifiers, magnifying sensation."⁶¹

Never does Kawakubo dissociate the body and garment from the spatial experience beyond. She designs entire environments. Her ideas are communicated multi-dimensionally where they are translated from garment, to body, to space. "It is as if she decided to apply everything she does to clothing to architecture."⁶² This highlights Kawakubo's ability to manipulate not only clothes and their effects on the body but she's able to apply this to

59 Sinclair, R. (2004). Dressed in Space: the Sartorial Architectures of Rei Kawakubo and Hussein Chalayan. SAHANZ 04. RMIT Melbourne, Massey University.

60 Ibid.

61 Ibid.

62 Silvette, J. (2000). "Rei Kawakubo of Comme des Garçons." *Architectural Design* 70(6): P81.



the space beyond the body, identifying her understanding of spatiality as a holistic experience. As Sinclair describes, “the dressed body is seen as an extension of the environment, where clothes are simply part of a continuum of enclosure. Kawakubo positions dress as a hinge between architecture and the body through which our comprehension of space and spatiality might be enhanced.”⁶³

While Kawakubo seeks to alter the lived experience through the wearing of carefully constructed garments, she also challenges ideas relating to beauty and body image. “She has subverted perceived ideas of how women should look and liberated them from the duty of looking ‘beautiful’ every day.”⁶⁴ While it is important to note that her works investigate issues concerning feminism, gender and sexuality, these aspects will not be investigated in this thesis, instead it is the experiential readings of body, garment and space that are of relevance.

Kawakubo’s Lump dresses identify many opportunities for extended investigation. They touch on the possibilities for the experience of space to be mediated through dress, for the body’s understandings and readings of space to be altered and reinterpreted. For how body occupies dress, and how dress occupies and interacts with space can always be pushed further and experienced differently.

63 Sinclair, R. (2004). Dressed in Space: the Sartorial Architectures of Rei Kawakubo and Hussein Chalayan. SAHANZ 04. RMIT Melbourne, Massey University.

64 Silvette, J. (2000). “Rei Kawakubo of Comme des Garçons.” *Architectural Design* 70(6): P80

Figure 24: Images of Rei Kawakubo’s collection *Body Meets Dress, Dress Meets Body*. Images sourced from: <http://lurvemag.tumblr.com/post/656210826>

5 . 0 a r c h i t e c t u r e

5.1 - architecture of the domestic realm - the importance of home

“In sum, because the body always is a body in space – or better, a spatialising body – it is by necessity an architectural body. Starting from the position that having a body includes having a world.”⁶⁵

Because this thesis approaches clothing and architecture from a body centred perspective it is important that the relationships explored and expressed in this section are continually referenced with the body in mind. Architectural ideas relating to intimacy, skin and boundary are intuitively placed throughout the discussions reinforcing the body’s relationship held with the domestic environment.

The realm of the domestic has been used to focus the research scope ensuring clarity to the relationships being explored is maintained. As the domestic is the most intimate architectural expression of the self it provides both a mental and physical structural framework for the body to function within.⁶⁶

A home functions as a safe place, a space of personal freedom and protection, defined by its exterior the home asserts its physicality and thresholds, identifying the boundaries between public and private, inside and outside. The significance of home as not only a place of physical protection but also a place of peace and personal refuge is described by Alla Myzelev and John Potvin stating;

“The domestic is the site of mastery and control, a space prescribed by codes of stability, longevity and moral rectitude. It is a sanctuary which protects its inhabitants from the public domain with its threats, transience, vagaries, conceits and never-ending fashions. The British critic John Ruskin famously proclaimed that the home ‘is the place of Peace; the shelter, not only from all injury, but from terror, doubt, and division. In so far as it is not this, it is not home; so far as the anxieties of the outer life penetrate into it, and the inconsistently-minded, unknown, unloved, or hostile society of the outer world is allowed by either husband or wife to cross threshold, it ceases to be home.’”⁶⁷

65 Hansen, M. B. N. (2006). *Wearable Space. Bodies in Code*. New York, Routledge. P183.

66 Campays, P. (2001). *The Sacred and the Abode*. Auckland, University of Auckland. P187.

67 Myzelev, A. and J. Potvin, Eds. (2010). *Fashion, Interior Design and the Contours of Modern Identity*. Surrey, Ashgate Publishing Limited. P4.

To be protected and function within a protected environment enables the body to relax, allowing it to be nurtured and liberated from the social constraints beyond the home. Juhani Pallasmaa refers to Gaston Bachelard's description of the home when defining the connectedness and support experienced between body and home "In our houses we have nooks and corners in which we like to curl up comfortably. To curl up belongs to the phenomenology of the verb to inhabit and only those who have learned to do so can inhabit with intensity, writes Bachelard. And always, in our daydreams, the house is a large cradle."⁶⁸

Pallasmaa draws on the sensory experiences of space and how we are affected by them. With sensory experience comes memories, nostalgia and many more associative emotive reactions. Sensory stimulation and bodily reaction shape our understanding of space. Within the domestic there is a large component of environmental control, where we as the inhabitant can make decisions about how the spaces are arranged, manipulate furnishings to please us and exercise our authority over a given space or place. Our senses help us make decisions about how we like to inhabit our environments, what feels comfortable, what works best etcetera. Architecture provides opportunity to shape these controls and prompt decision through spatial design. "All argue that a work of architecture's meaning, beauty, function, and value lie not just in its visual appeal, but also in how it addresses and affects the other senses: hearing, touch, smell, kinaesthesia, balance, and the feeling of temperature."⁶⁹ Architecture of the domestic provides a whole body experience. It not only accommodates the body, prompting it to feel a certain way, it also facilitates and supports personal identity and expression. Spatial intimacy is intensified with the dressing of the home. As items of personal significance hold memories, stories and dreams, the home touches the body, supporting these ideas and holding experiential references. The home becomes a collection of a life lived, an expression of values and aesthetics, a projection of identity extended beyond the bounds of the body, yet integrally attached to it in every way.

"Clothes that we wear on our bodies, that we feel and move in, that we care for and become attached to, bring us to the possible intimacy of architecture, to where it 'touches' us in so many different ways. It is no longer out there in front and at some distance, a sight/site only for the eyes and the intellect. It is instead all around us, whether we are indoors or out, giving us feelings and sensations, encouraging us to move in certain ways and not in others."⁷⁰

68 Pallasmaa, J. (1996). *Polemics : The Eyes of the Skin : Architecture and Senses*. London, Academy Editions. P41.

69 Benedikt, M. (2007). *Coming to Our Senses; Architecture and the Non Visual*. Harvard Design Magazine: P83.

70 Frank, K. A. (2000). "Yes, We Wear Buildings." *Architectural Design* 70(6): P95.

A reinforcing of bodily centred perspectives is introduced here by bringing clothing descriptors into the articulation of architectural analogy. This introduces a new language of intimacy between the body, clothing and architecture. A collection of observations based on the experience of the body as a whole body in space is used to confirm its connectedness with its surroundings and inherently identify the affects architecture has on the body.

However, while the functions of domestic architecture can be likened to the functions and experiences of being clothed, architecture supports the body in a different way to that of clothing. The environment of the home is continually affected by time. The body is never static in its state of being, time brings continual change. Architecture can appear to be static in its structure, materiality and presence, however it supports the changes and adaptations the body experiences, and with it can be viewed and understood as an environment for the facilitation and grounding of change. Neil Leach reinforces this view; “our engagement with the built environment is never a given, static condition, but an on-going process of constant adaptation. The logic of assimilation is constantly affecting our perception of buildings. Time therefore becomes a significant factor...”⁷¹ Assimilation is an important concept to consider when addressing time in architecture. The idea that through familiarity and routine we see and experience our environments differently is incredibly important when identifying elements of change. It also highlights the opportunity for design intervention to bring awareness to these environments through reorienting the body within a familiar space, allowing it to see and feel the familiar in a new way. As the body lives and grows older its understanding of given environments and appreciation for various aspects of these environments adapt and change. “In this respect, design can provide a form of connectivity, a mediation between individuals and their environment. Design can contribute to a sense of belonging.”⁷² Domestic architecture provides an anchor for the body, a sense of place, orienting and grounding the body in time. The home supports activities and routines that are engrained in the body’s mode of operating. Over time the domestic interior becomes so much a part of the body’s understanding of itself it essentially becomes a direct expression and reflection of self-identity. As quoted by Coco Chanel “An interior is the natural projection of one’s soul, and Balzac was right in giving it the same importance as to dress.”⁷³ To further cement the idea of embedded relations between body and home Myzelev and Potvin state “...we can surmise that home, and operations performed at home, are linked intimately with human identity. The process involves a two-way interaction. Not only do we grow into and become a part of our environment, but our environment becomes a part of us. Architecture, it would seem, plays a vital role in the forging of personal identities.”⁷⁴

71 Leach., N. (2006). Camouflage. Cambridge, MIT Press. P7.

72 Ibid. P9.

73 Myzelev, A. and J. Potvin, Eds. (2010). Fashion, Interior Design and the Contours of Modern Identity. Surrey, Ashgate Publishing Limited. P1.

74 Leach., N. (2006). Camouflage. Cambridge, MIT Press. P7.

Hugo Kükelhaus takes this idea of the body becoming a part of its architectural environment one step further expressing bodily mimetics in architecture, he:

“contended that structures need to reflect human organic needs and laws. His writings are filled with descriptions of the relationship between architecture and anatomy and how that relationship stimulates (or mutes) sensory awareness. He found that borders, such as walls, are articulate structures creating osmotic exchange. The incoming light unfolds, develops, and is shaped as it travels through the windows. Architectural proportion finds its basis in human anatomy and the rhythm of human movement. Feet need to be challenged by the floor; stairs are meeting places with a natural theatricality.”⁷⁵

Architecture in this sense becomes not only a stage for the body to perform within but it forms a partnership with the body, supporting it and moving it in multi-dimensional ways. In other words, we experience spatiality, materiality and architectural dynamics within us. We are made to feel a certain way; feel small in a tall space, feel elevated by the space above us, feel the weight in us through the solidity of material and explore the views that have been carefully chosen and framed. The experience of self can be completely architecturalised. It provides an opportunity to control bodily response and experiences through spatial design. It also provides an opportunity for the body to learn about itself in relationship to its environment. However, when the body is embedded within a familiar domestic space it becomes more difficult to prompt these moments of realisation, learning and bodily experience. The juxtaposition between the comforts of home and the stark experience of unfamiliar space is great. To design an architectural imposition that brings change to the home and the body’s relationship within these familiar spaces could prompt new experiences and perspectives associated with both the body and architecture of the home.

Pallasmaa expresses the power of the senses as the transformative embodiment of any given medium, whether it be through music, art, clothing or architectural space;

“We feel pleasure and protection when the body discovers its resonance in space. When experiencing a structure, we unconsciously mimic its configuration with our bones and muscles: the pleasurable animated flow of a piece of music is subconsciously transformed into bodily sensations, the composition of and abstract painting is experienced as tensions in the muscular system, and the structures of a building are unconsciously

75 Franklin, E. (1996). *Dance Imagery for Technique and Performance*, Human Kinetics, Library of Congress. P67.

imitated and comprehended through the skeletal system. Unknowingly, we perform the task of the column or the vault with our body. The brick wants to become a vault, as Louis Kahn said, but this metamorphoses takes place through the mimetic capacity of the body.

The sense of gravity is the essence of all architectonic structure and great architecture makes us aware of gravity and earth. Architecture strengthens the experience of the vertical dimension of the world. At the same time that architecture makes us aware of the depth of the earth, it makes us dream of levitation and flight.”⁷⁶

This statement highlights architecture's ability to transport both the body and mind, giving it power to stimulate memory, feeling and establish a strong sense of place. “Architecture strengthens the existential experience, one’s sense of being in the world, essentially giving rise to a strengthened experience of self.”⁷⁷

As architecture and the body mediate one another, there remain physical differences between the body and its architectural environment.

The assertion of boundaries and their performance as definitive entities remain as means of deciphering the living from non-living. The navigation of boundaries in architecture from a bodily perspective is a complex problem, as while there may be physical attributes that control, contain and filter various environments, the experience of navigation is fluid as the body continually references itself in relation to the space it is moving through. It is the placement of boundaries that guide the body, allowing it to make decisions about where to go and how to move through space. Fluidity in architecture challenges the idea and function of boundaries. Where physical conditions are able to be manipulated and adapted creates opportunity for architectural transience to occur where original functions and boundaries can be altered therefore creating a new type of experience or definition of spatial function to be lived.

The moving of boundaries doesn’t only occur at a physical level, the idea of a boundary to one body can be completely different to what a boundary is to another. As Gins and Arakawa state “Boundaries for an architectural body can only be suggested, never determined.”⁷⁸ This is a successful analogy, leaving room for movement and interpretation of the potentials of what boundary can mean in architecture and to the body.

76 Pallasmaa, J. (1996). *Polemics : The Eyes of the Skin : Architecture and Senses*. London, Academy Editions. P46.

77 Ibid. P28.

78 Gins, M. and Arakawa (2002). *Architectural Body*. Tuscaloosa, The University of Alabama Press. P68.

5.2 - architectural design case study

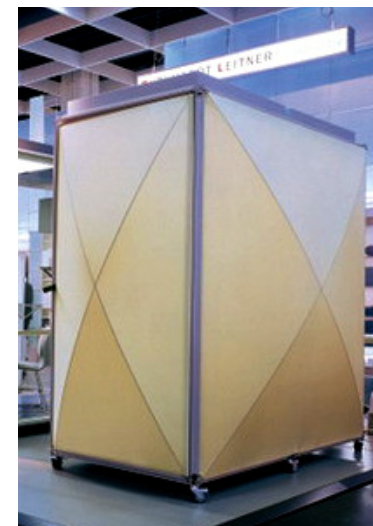
Recreation Box by Burkhardt Leitner Constructiv.

Recreation Box is not unlike the aspirations of this 'Embodied Architecture project', the use of filtered light and filtered exterior environmental conditions seeks to create space that is peaceful, focussed and emotive. The small scale of the recreation box reinforces its proposed use, bringing the body to a point of stillness, prompting mindfulness and momentary isolation.

"Designed as a space for relaxation, the Recreation Box mobile module is the right shape, colour and material for use as a chill-out zone in a contemporary office. Inside, the user is transported to a setting of subtle light and changing colours in a closed serene world. It can be used as a room for meditation, concentration, or a short siesta, [...] It is covered with a microperforated elastic membrane that allows light to filter in and affords natural ventilation while absorbing interior and exterior sound."⁷⁹

The filtering of conditions using perforated materials introduces a softness to the lived experience. The materiality visually evokes the intentions of the anticipated spatial experience. It is a good example of bodily mimesis "As the work interacts with the body of the observer, the experience mirrors the bodily sensations of the maker. Consequently, architecture is the communication from the body of the architect directly to the body of the person who encounters the work."⁸⁰

Recreation Box communicates its intentions as a small scale architectural intervention and pocket space successfully. "The designers hoped to employ technical and functional concepts to create a highly emotive object."⁸¹ The experience of engaging with the Box can only be transformative as the body must actively seek out the experience by inhabiting the space, therefore prompting both a physical and psychological change.



79 Bahamón, A., Ed. (2004). *The Magic of Tents Transforming Space*. New York, Paco Asensio. P132.

80 Pallasmaa, J. (1996). *Polemics : The Eyes of the Skin : Architecture and Senses*. London, Academy Editions. P46.

81 Bahamón, A., Ed. (2004). *The Magic of Tents Transforming Space*. New York, Paco Asensio. P132.

Figures 25, 26: Recreation Box 2002.

Image source: www.burkhardtleitner.de/index.php?page=136&modaction=showImage&modid=255&modid2=273

6 . 0 d e s i g n

6.1 - design intention

It is my intention to create an architectural intervention that functions to prompt a meditative experience where the body is stimulated to gain a heightened awareness of itself. Meditative in this sense is the combined experience of both body and mind, a unification of the senses generating a grounding of the present body in time.

Meditative spaces provide a physical, spatial and thought provoking dialogue between; body, clothing, interior touch or engagement, and space. They can be seen to parallel the experience of dress and how it acts on and with the body, dealing with the dialects of inside and outside.

The intent for this design exploration is to create a space that can respond to the body's desire to be isolated and intimately in tune with itself while being sited within in a familiar domestic setting.

It is important that the inhabitant can engage with the space within the bounds of their home as personal identity clothes the space potentially providing the opportunity for a strong juxtaposition of spatial conditions to occur.

The creation is to be a cradle for thought, it sets up a boundary between the body and its spatial identity, asserting its position between amalgamated and osmotic conditions. The physicality of the creation sets up parameters, controlling the body's movement and interaction within the space. It refocuses the mind through the filtering of spatial conditions. Visual associations with personal identity are screened, provoking interior thought.

The insertion of the architectural intervention within the domestic setting provides a new type of boundary, it redefines the body's boundaries within the space and the 'efficiency of lamination' is altered as the body engages with an in between space. It is created to de-clutter the mind, drawing consciousness to the physicality of the body and its engagement with the intervention.

The intervention is to be a small scale flexible space encouraging the body to be still. Immobility prompts mindfulness. The generation of the design is to be based on the body's proportions, limbs etcetera, chair proportions, clothing proportions. Relativity to the body will provide an intuitive intimacy. A small space allows for the mind to be freed, "Frenchman Noël Arnaud, in *L'état d'ébauche*, wrote: I am the space where I am."⁸²

82 Freeman, M. (2005). *Meditative Spaces*. New York, Universe Publishing.P75.

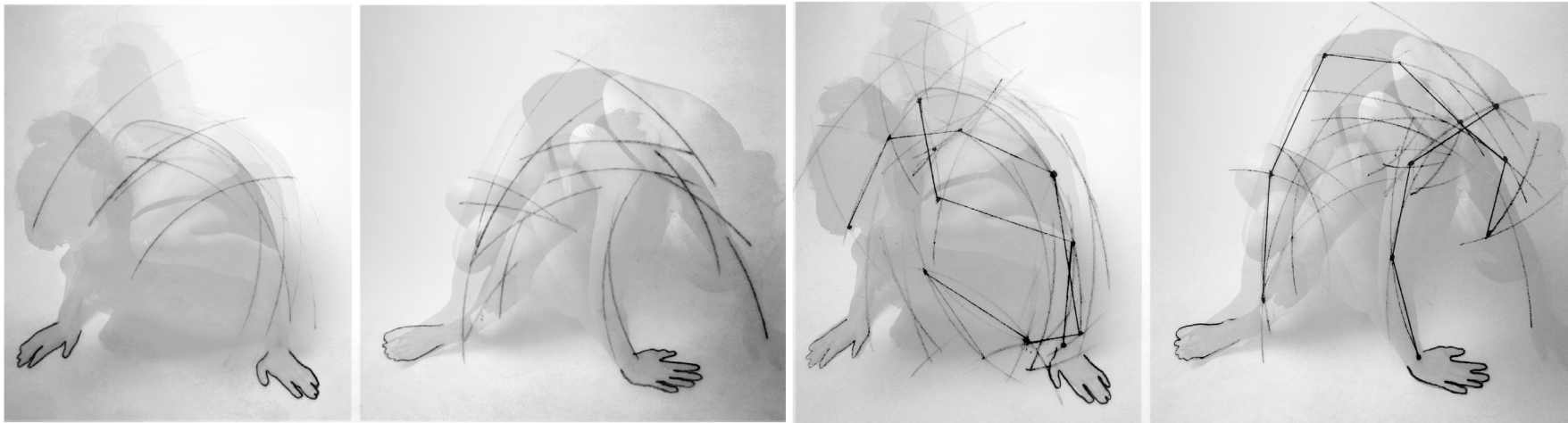


Figure 27: Bodily Trace.

6.2 - creative development process

DRAWING

Mapping the body's movements in time and highlighting fixed points of contact, the body travels through and manipulates space, however, space and physical impositions also manipulate the body and its range of motion. By tracking these movements through physically tracing trajectories and motion paths a dialogue begins to appear. One that captures momentary bodily motion. Patterns appear; where the body has changed position, its proportions and limbs altering and directing the path. These patterns appear like material folds or ripples on a pond, slowly changing, while maintaining a consistent rhythm. A representative trace of the present body is generated.

Structural points and nodes of flexion are highlighted and the structure becomes represented by lines of connection.

The dialogue between the structural lines and trajectory patterns begins to speak. The structural lines reinforce the body's scale while the cyclic trajectories are indicative of movement, space and time.

This could translate physically into a patterned or rhythmic structure with a film or skin linking the structure together, outlining and connecting the trajectory paths.

This is metaphoric of the body's skeletal structure being outlined and represented by clothing. The role clothing plays on the body represents the imaginations perception of itself, a skin that is supported by the body's structure and outlines the physical body.

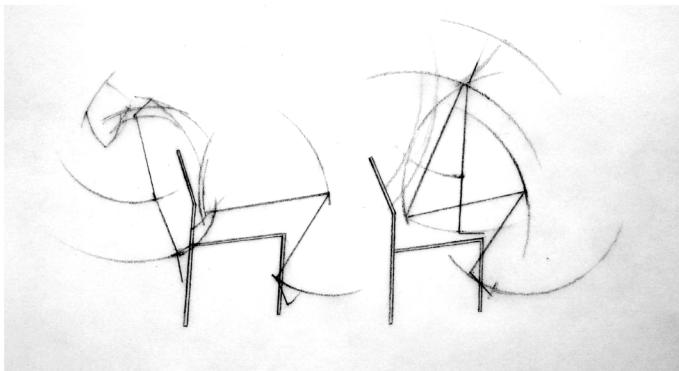
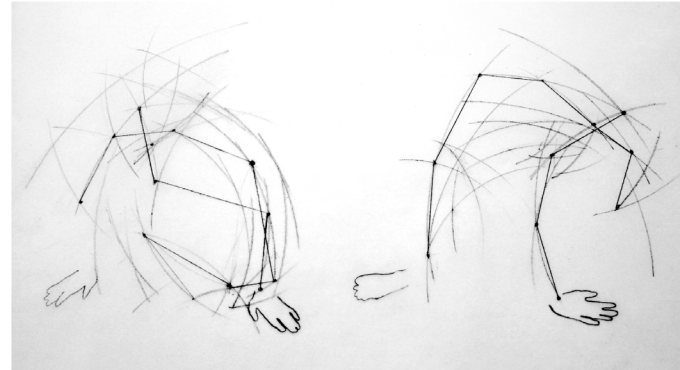
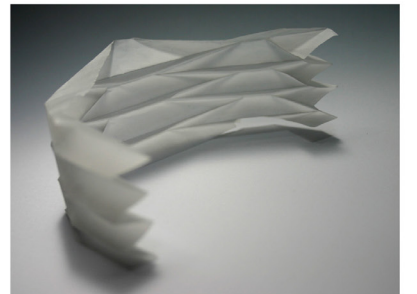
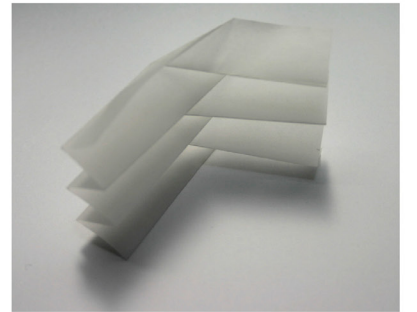
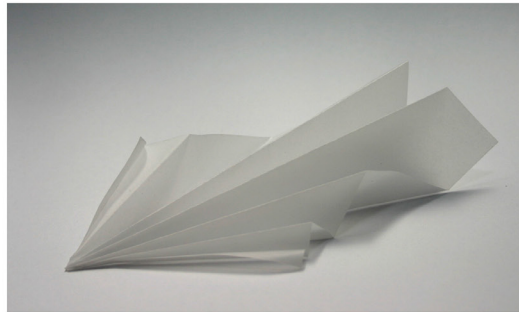
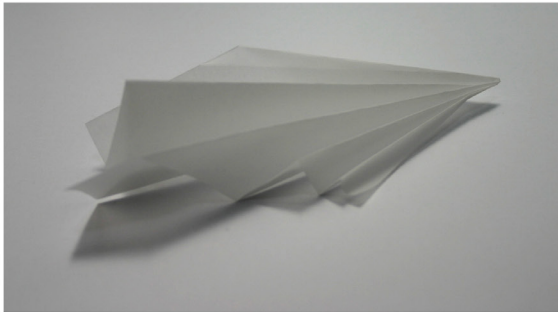
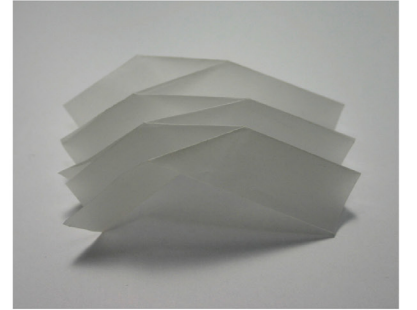
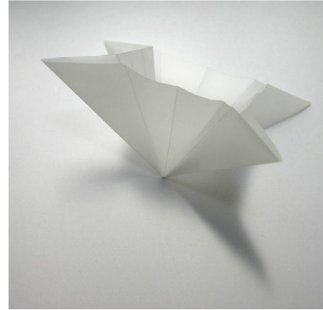
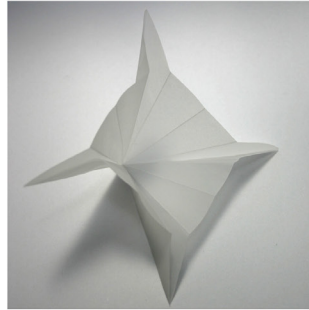
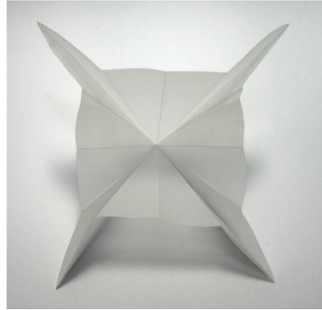
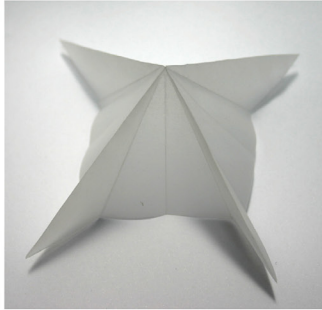


Figure 28: Series of bodily studies - Movement Trajectories.

Figure 29 opposite page : Folded paper structures exploration.



MAKING PROCESS

The consistent patterns present in the drawings are then investigated three dimensionally. The rhythms are explored through varying concertinaed pieces of draughting film, articulated bends in the concertinaed paper provide structure and identify points of flexion. These points of flexion begin to manipulate the space they move through. Becoming self-supporting structures they assert their presence while contacting the ground plane, they sit up, curve and touch with just a few points of contact.

While these structures appear to be stationary they are easily manipulated, pushing the folds together intensifying the pattern, squashing them down to what appears to be a single plane of folded film, or twisting to introduce curves through the folds. These moves are particularly significant as they explore the potential for a structured but flexible material to be used to create a shell that can diminish into itself and with contact be activated and engaged with, defining space and encapsulating the present body.

It is important to note that while the film paper provides explorations of potential forms and structural possibilities it is however not very durable or easy to engage with in terms of bodily contact or intimate engagement when used at human scale.

It does however provide potential patterns to be explored using other materials, and it does show the strength of material memory, when bent the draughting film holds the crease without collapsing, this is very powerful. Paper folding is not a new concept it has been around since the conception of paper and its qualities were explored thoroughly, this can especially be seen in origami forms, mathematical, tactile and precise explorations of patterns, structure and form.

The requirements for the material qualities in this project are specific, the material must be able to be manipulated when engaged with while holding its form, it must encompass the body, creating a visual block or screening, prompting disengagement with the surrounding environment. However the material must filter the environment with which it is in, allowing light to penetrate the space inside, it acts as a skin, filtering the environmental elements. Light provides shadows, definition and spatial depth which is important for the experiential body's understanding of the space, form and material qualities. This lends itself to a translucent type of material, one that allows light to be filtered through into the interior space. This is important as while the body becomes disengaged with its immediate surroundings it still remains connected with the wider environment, an awareness of self in conjunction with the external and uncontrollable conditions provides mindful perspective. Therefore the material must not be reflective or dense, it must

be light, strong and flexible. For the purposes of this project the colour of the material will remain neutral, light in colour. If colour is introduced then an entirely different experience may be achieved, also to maintain continuity throughout this design process I will be working with White.

EXPERIMENTS

- The Handkerchief

Fabric seemed to be a good possible material choice, light, flexible, and possibly able to be structured with some form of stiffener.

The addition of starch to the cotton fabric began the stiffening process, a process where the fabric took on paper like qualities as the starch built up with each ironing stroke. The handkerchief became a self-supporting fabric structure, allowing light to transmit through its weave and maintaining stiff structural posture. The scale of the handkerchief however was not large enough for a body to inhabit, rather only a hand could engage with the petit folds.

- The Sheet

To build on the scale of the handkerchief it seemed possible to iron and starch folds into a sheet of cotton fabric. While the folds built up, varying in scale to generate points of intensity, it became apparent that the weight of the material was not able to maintain the structure. Neither were the points of articulation able to be expressed at sharp enough angles. Instead the greater number of concertinaed folds compromised the precision folding required and as the material gained bulk the articulation of the bends became less accurate. This meant the structure was being compromised and any fold that wasn't perfect affected the entire structures integrity.



Figure 30: Folded Handkerchief. Folded Sheet.

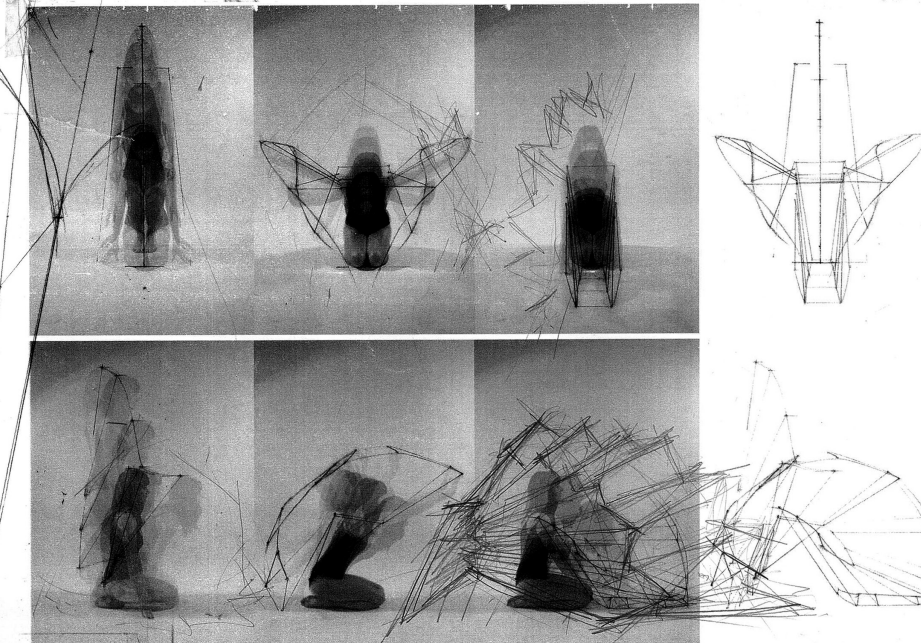
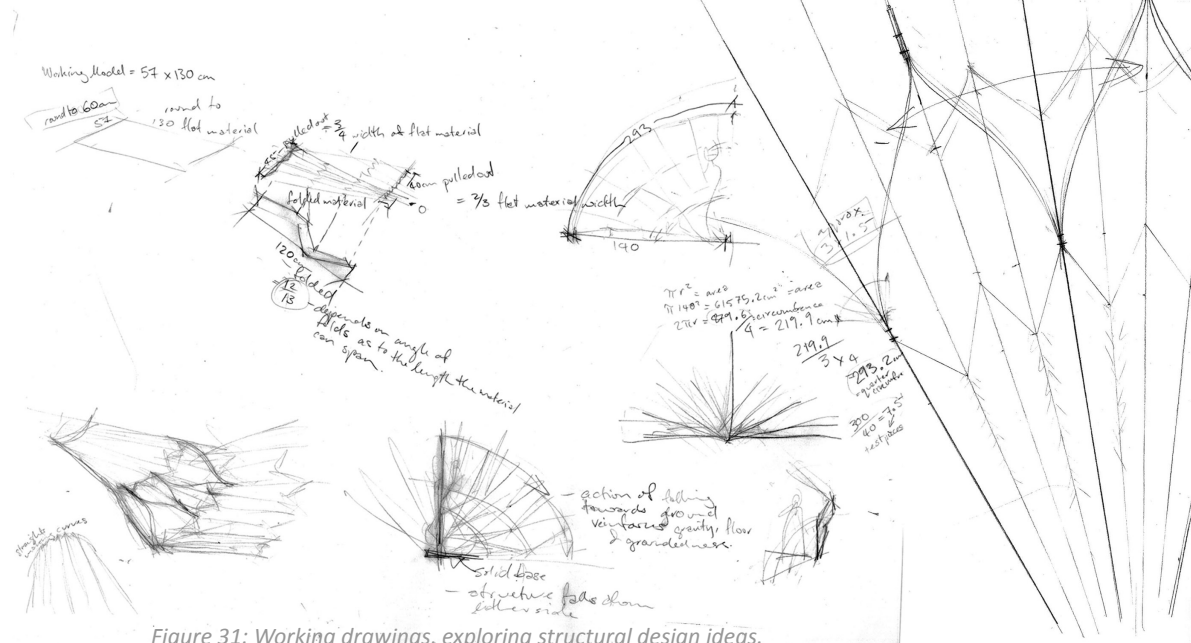
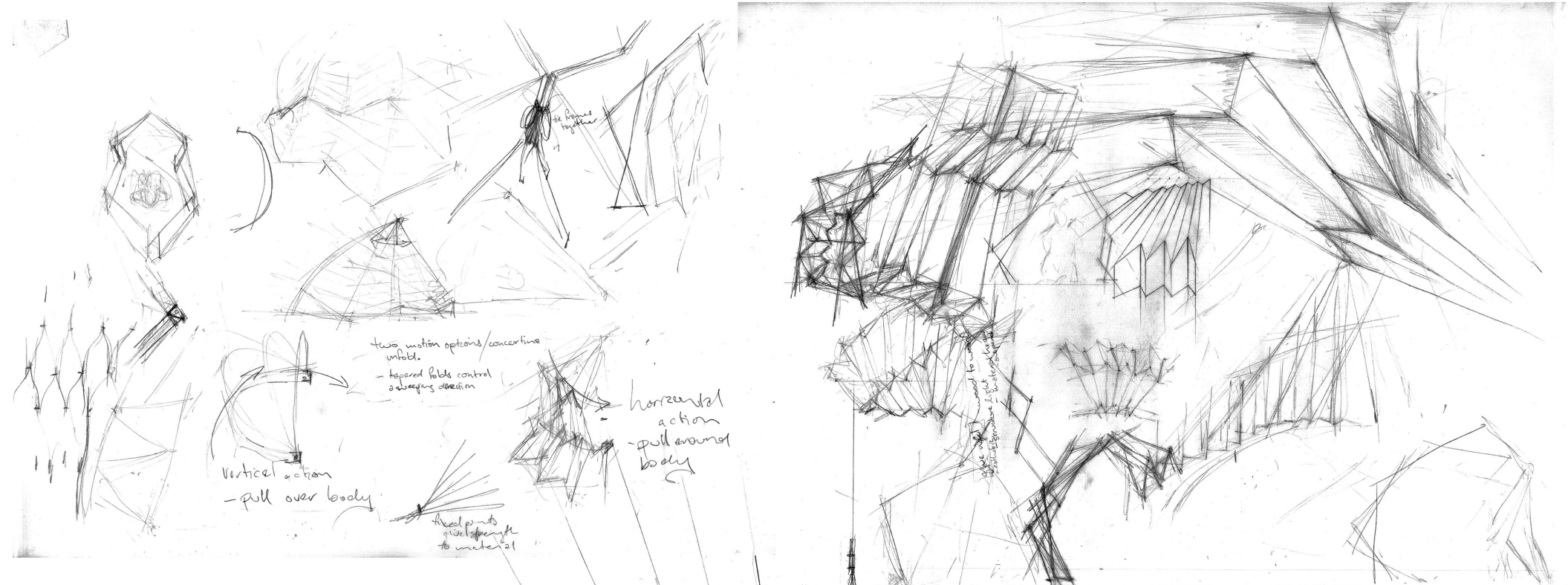


Figure 31: Working drawings, exploring structural design ideas.

It became apparent that the material needed to be a lot stronger and robust so it could successfully retain the folds pressed into it. After many material experiments it was decided that Thermakraft Water Gate Wall Wrap (Roll Dimensions: 30m long at a width of 2740mm) would be the most effective material to work with.

This product is incredibly strong, light, durable and translucent.

This building product held the crease pattern while providing a soft material feel and appearance. Being ironed at a low heat the concertinaed folds would hold similarly to that of the memory of paper folds. At a high heat the material would melt. This created the opportunity for possible adherence or lamination.

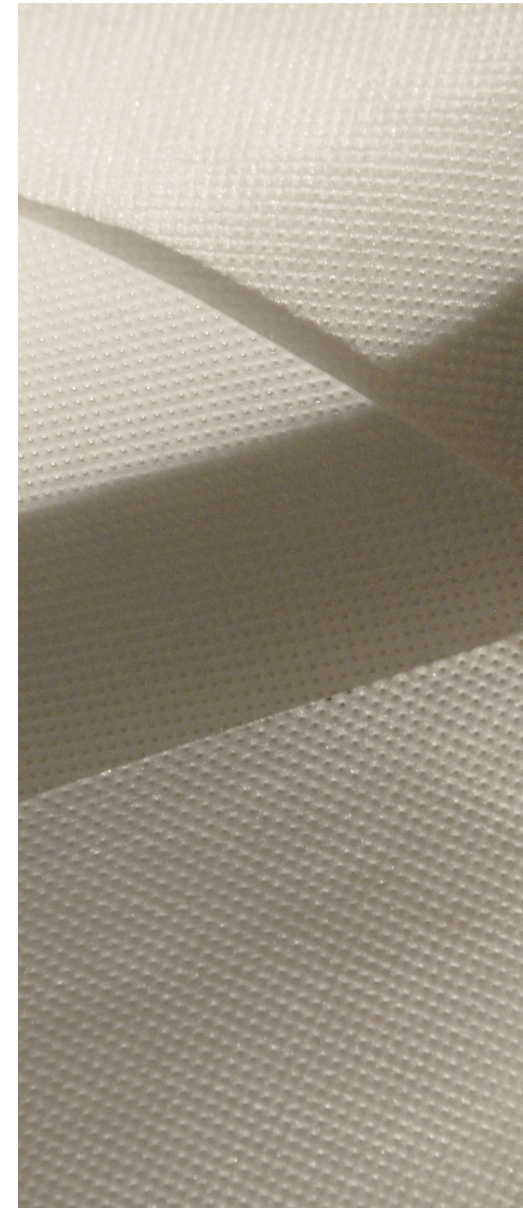


Figure 32: Example of Watergate by Thermakraft material qualities.

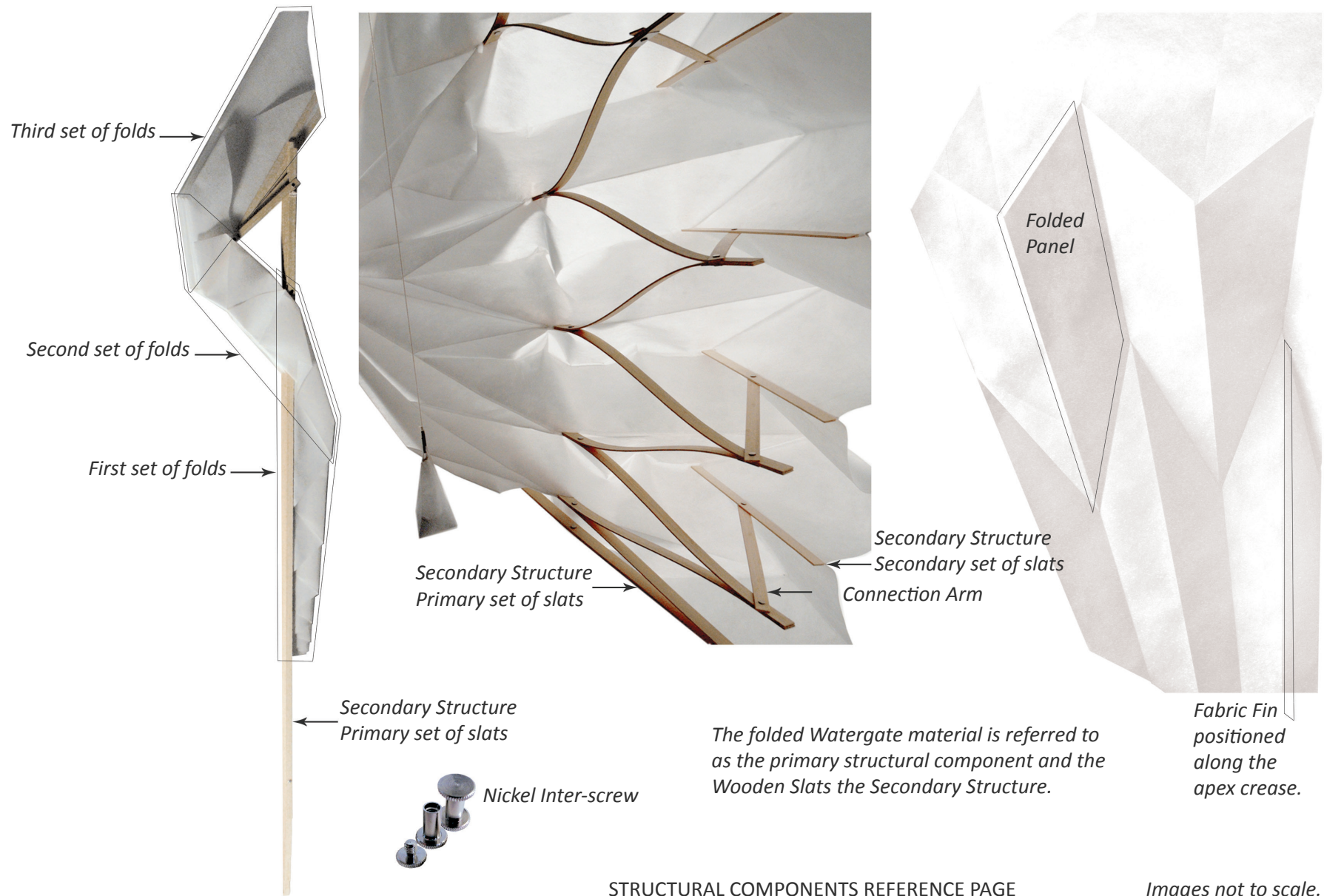
PROBLEM SOLVING THROUGH MAKING

It became apparent that problem solving through drawing was completely unsuccessful when the secondary structural members were introduced to the folded Watergate material sheet. The materiality of the components compromised the proposed movements indicated in the conceptual drawings. It was only through making that these problems could be resolved and appropriate solutions found.

Where the wooden slats ran along the material apexes the fold lines became softened due to the thickness of the structural slats. This was an issue as it meant that when the wood collapsed down to a simple stack the bulk of the wood compromised the fold pattern and put pressure on the crease patterns. This pattern stopped functioning cleanly and some of the folds experienced straining and puckering.

To minimise the interference between the material folds and wooden slats a fabric fin was sewn along the length of the material's main creases, this enabled the wooden slats to sandwich the fin, allowing the slats to sit 5mm off the crease apex. This tolerance means that the wooden structure interfered with the material patterning creases in a very minimal way while maintaining strength and supporting the shell.

With the introduction of the wooden slats to the folded material sheet the aesthetic is changed profoundly. It can be observed that the folded white Watergate material without the wooden structure evokes a strength and lightness, however with the introduction of the structural slats this feeling is changed. The scale of the material being supported requires added slats for strength. All of a sudden the white folded material has a weight, it's no longer self-supporting and with the structure visually present the aesthetic becomes conflicted, on one hand the delicacy of the wooden structure and the thinness of the material emits a lightness, fragility and feeling of impermanence but on the other the weight of materials becomes ever present and the slats refocuses the interpretation of the creased material. The folded material becomes more obvious due to the presence of the wooden structure, it no longer has the power to alter space through a simple fold, the fold is supported and as a result its relationship with the body, its interactions, space and interpretation are all changed. A new reading of space and material are developed, one that requires the material and structure to work together, speaking to one another.



STRUCTURAL COMPONENTS REFERENCE PAGE

Images not to scale.

Figure 33: Structural Components Reference Page.

6.3 - making process

MATERIAL PREPARATION

Watergate by Thermakraft; Dimensions of the working 1:1 sheet model = 2.1m x 1.7m.

STEP 1. - INK REMOVAL.

Removing the ink involved applying Jiff to the printed areas, leaving it to dry, and gently scrubbing off with a water wetted cloth. This process was replicated two to three times (depending on the ink content remaining) over the printed areas until the sheet was satisfyingly clean. The material was then doused with water and washed down to remove any excess Jiff, this was cleaned off and soaked up with absorbent paper towels.

The entire cleaning process wasn't unlike that of the cleansing of a body. The repetitive processes as well as the care required when dealing with the material replicated how one may deal with their own clothes or skin when washing. In this case the Watergate material was the cloth and skin of its own body, a body of prospective space and volume. A space to interact with the human body, to alter the relationship the body has with the surrounding space and with itself, a catalyst for reflection and focus.

STEP 2. - FOLDING

Folding structure into the Watergate material involved carefully ironing concertinaed creases one by one until the material resembled a neat stack of tapered folds. White cotton sheets were laid over the material to protect it from being damaged by the iron's heat.

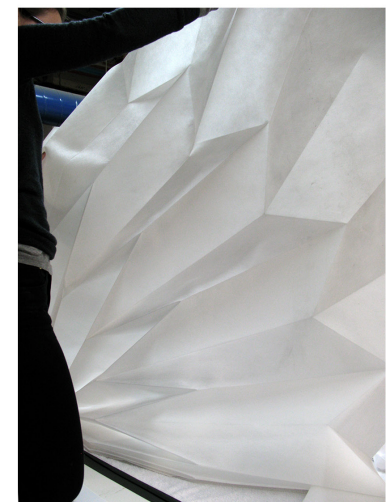
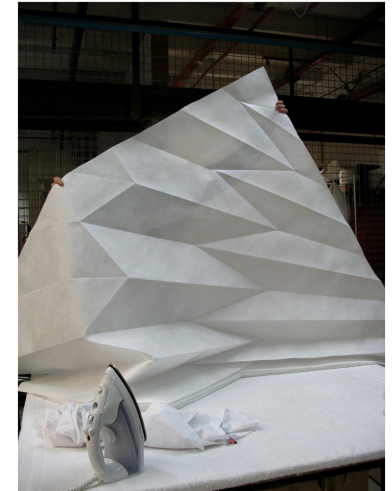
Once the first set of tapered folds was complete, a bend was introduced across them, creating a change of direction through the stack of material. A measurement between the two points spanning the direction change was taken. This measurement was marked in a zigzag pattern across the folds at the same place on each of the sections identifying the points where the second set of ironed creases would be introduced.



The original folds beyond the bend had to be re-ironed to invert their original direction allowing the bend to stack neatly and return to a flat position.

This process was repeated for the second bend across the folds. When the folds had been completed the concertinaed material could be opened up. The new formation created a structured, patterned volume, altering and manipulating the space it moved through.

Figure 34: Material preparation series.



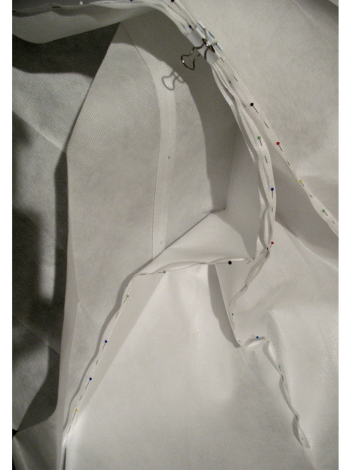
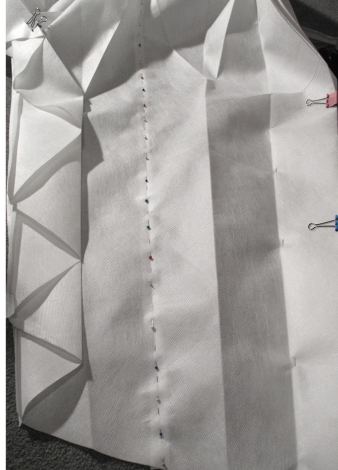
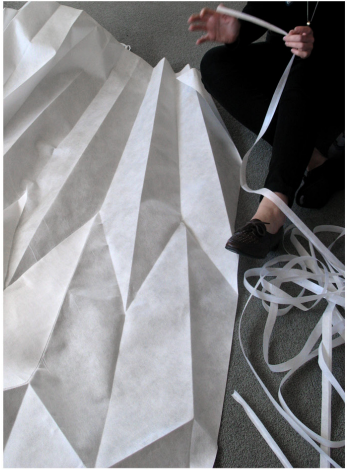


Figure 35: Fin application series.

STEP 3. - LAMINATION STRENGTHENING - PATTERN MAKING - TOLERANCES

The second set (mid-section) of folds were measured up and mapped onto a separate piece of material. These were then cut out as individual panels with the intention of being laminated to the main material structure. This lamination process involved putting both the thinly coated plastic sides of the panels together, and applying the iron so the plastic began to melt together and bond the two surfaces.

While this process added strength to the material structure there was a problem with the amount of heat the laminates required to bond successfully. The heat warped the Watergate material, just as any plastic does when melted, it began to show signs of shrinkage which would severely compromise the structures integrity and its ability to perform as intended. Instead of continuing with heat lamination the panels were sewn on. These panels show the potential for adding strength but also the ability to control light penetration and patterning.

It was very important the laminate panels were slightly smaller (5mm) than the original panel perimeter dimensions. This way the laminates didn't interfere with the creases or functioning of the folds. It also allowed a small border of light to penetrate the periphery of the laminates highlighting their position, presence and function. Only two laminates were applied to the folded material. There wasn't need for further reinforcement, however they represented possibilities and options for further development, or applications to a larger projects.

STEP 4. - FIN APPLICATION

Once it was decided to apply the fins to the outside of the folds, the size of the fins was calculated, so when sewn down the creases they could be doubled over and used to glue the wooden slats onto.

The width of the fins measured 20mm. This allowed for the fins to be creased length-wise at the 7mm mark, each fin was sewn to the main piece of material along the 7mm lengthwise crease, then folded together and sewn 5mm from the 7mm fold. The slats would be glued up to this 5mm line of stitching providing a consistent distance between the slats and the main material structure. This distance allowed the material folds to remain uncompromised when folding in and out, while maintaining minimal visual disturbance. The fins are barely detectable, and function at a purely practical level, facilitating an easy opening and closing action.

STEP 5. - INTRODUCTION OF THE SECONDARY STRUCTURE

It was decided that thin strips of wood could produce bending and also add strength to the folded Watergate material.

Thin strips of pine were tested, however due to grain runoff and inconsistencies in the woods strength it was decided to try other materials.

Thin bamboo ply products were tested, and proved to be the best product for the job. The bamboo came in 1.8mm thick (3 ply) sheets and 3mm thick (5 ply) sheets, ideal for making the slats.

Due to the bamboo's long fibres there were no issues with grain runoff meaning the bending radius was both strong and consistent. Slight splintering occurred when bent to breaking point but there were no direct points of weakness.

Two colours were available, natural and carbonised. Natural being light yellowy golden in colour while the carbonised was a darker shade due to the wood having been heated so the sugars would caramelise causing the colour to turn an oaky brown. It was decided the natural wood would be the most appropriate for the project as the darker shade would appear too dominant in conjunction with the white Watergate material. The bamboo's natural colour would add warmth to the project and experience without competing adversely with the white fabric.

1 x Natural Zen Veneer Range sheet; 1200mm x 2440mm x 3.0mm 5 ply was used to make up the Primary set of slats. The sheets were cut into 20mm width x 2440mm length slats, they were sanded and prepared for gluing. A 1.8mm 3 ply sheet was also cut into 20mm strips and used for the Secondary set of slats placed on the third set of folds. These folds simply required lightweight reinforcing as the loads carried through this part of the structure were minimal, meaning the folds were only required to hold their position within the structure.

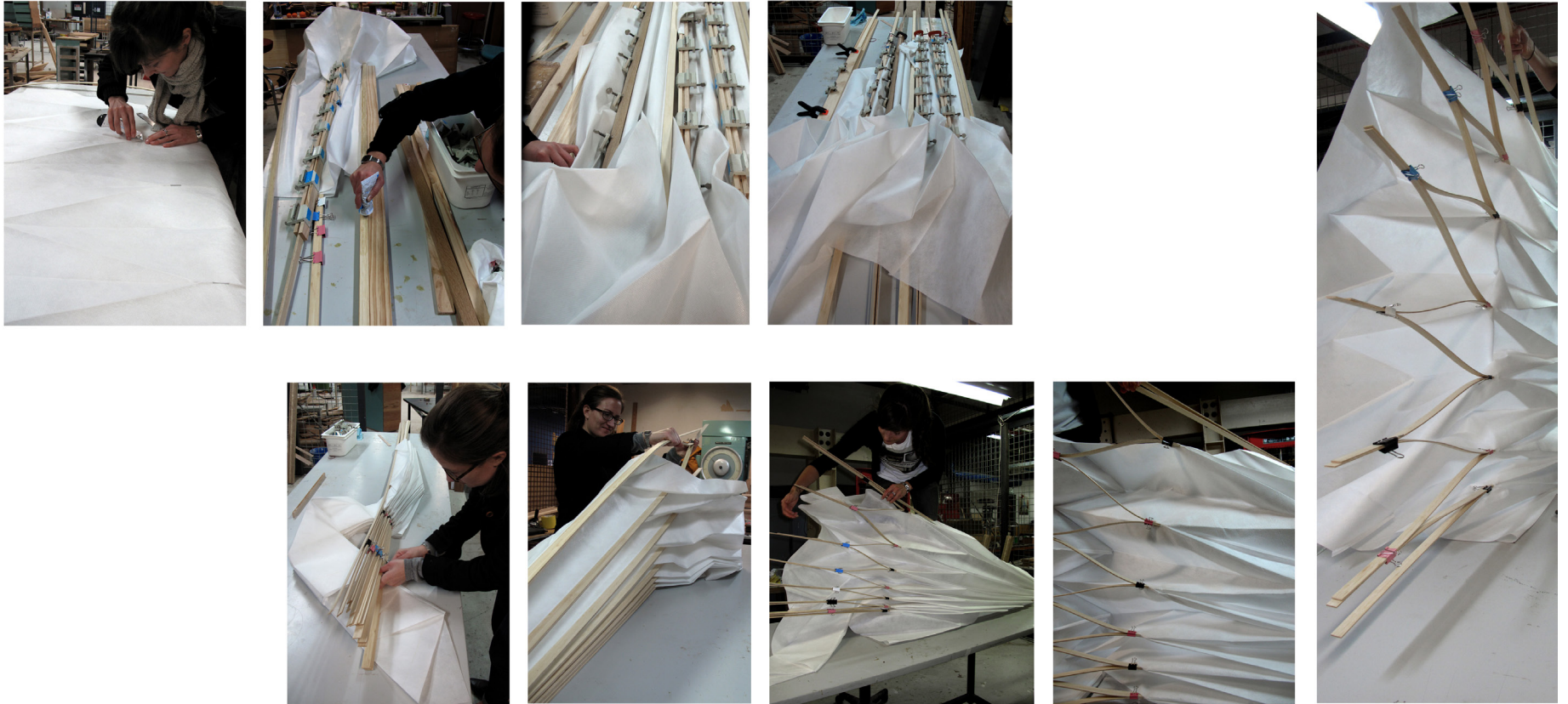


Figure 36: Gluing and Fixing Secondary Structural Slats series progression.

STEP 6. - GLUING AND FIXINGS

While a range of glues were tested, Selleys Liquid Nails Clear Glue was used as it provided strong adhesion while remaining flexible. The clear colour and slightly rubbery consistency meant that any residue was easily removed and un-noticeable. The glue did not corrode the Watergate fabric and married the two materials together seamlessly.

The primary set of wooden slats running the length of the structure sandwiched the material fins and were clamped in place while the glue cured for a 48 hour period. Once this first stage of gluing was complete the clamps were removed and the bamboo slats free ends were alternately paired together with dog clips to simulate the opening action. The clips were all placed in the same corresponding position to start with and when the structure was opened up it was restricted to about half of its potential opening area, both compromising the potential experience for the user and intended spatial impact. It became apparent that the clips needed to be staggered to establish the largest opening area. The bending radii of the slats when opened varied as it depended on the relative self-weight bearing on the slats, obviously the top slats took the majority of the force as they underwent the greatest tension loading. This meant that the distance between fixings needed to be smaller at the top so the bending potential was lessened meaning the slats would be able to withstand the forces being transferred through them. If the slats took on too much bending their strength would be compromised and they would break under load. So the staggering of the fixings ensured the forces were distributed more evenly without loading the top slats to breaking point. The staggered fixings also controlled the extent to which the material creases were to unfold.

A secondary set of slats was applied to the third set of material folds. These slats were introduced to support the fabric, ensuring it wouldn't collapse when open. To maintain their position connection arms were to be used to hold all of the folds in place and allow them to open, close and fall back into a neatly folded stack. The secondary slats were made of the 1.8mm thick (3ply) Bamboo sheets. They did not carry the same loads as the primary set meaning they could be lighter, reducing the overall weight of the structure and also lessening the size of the connection arms.

Because the material area and volume changed when being opened and closed the connection arms moved in two directions, experiencing both a pivoting and shortening action, thus creating a complex movement. Many calculations were made to develop a solution that would accommodate and support this movement. The connecting arm was developed theoretically on paper (as seen on the diagrams opposite) with the production of a double arm sliding connection. This supported the structures movement in theory. However through physical testing it was discovered that there were huge tolerances and uncalculated flex in the structure due to its materiality. These factors hadn't been incorporated into the mapping and calculations for the

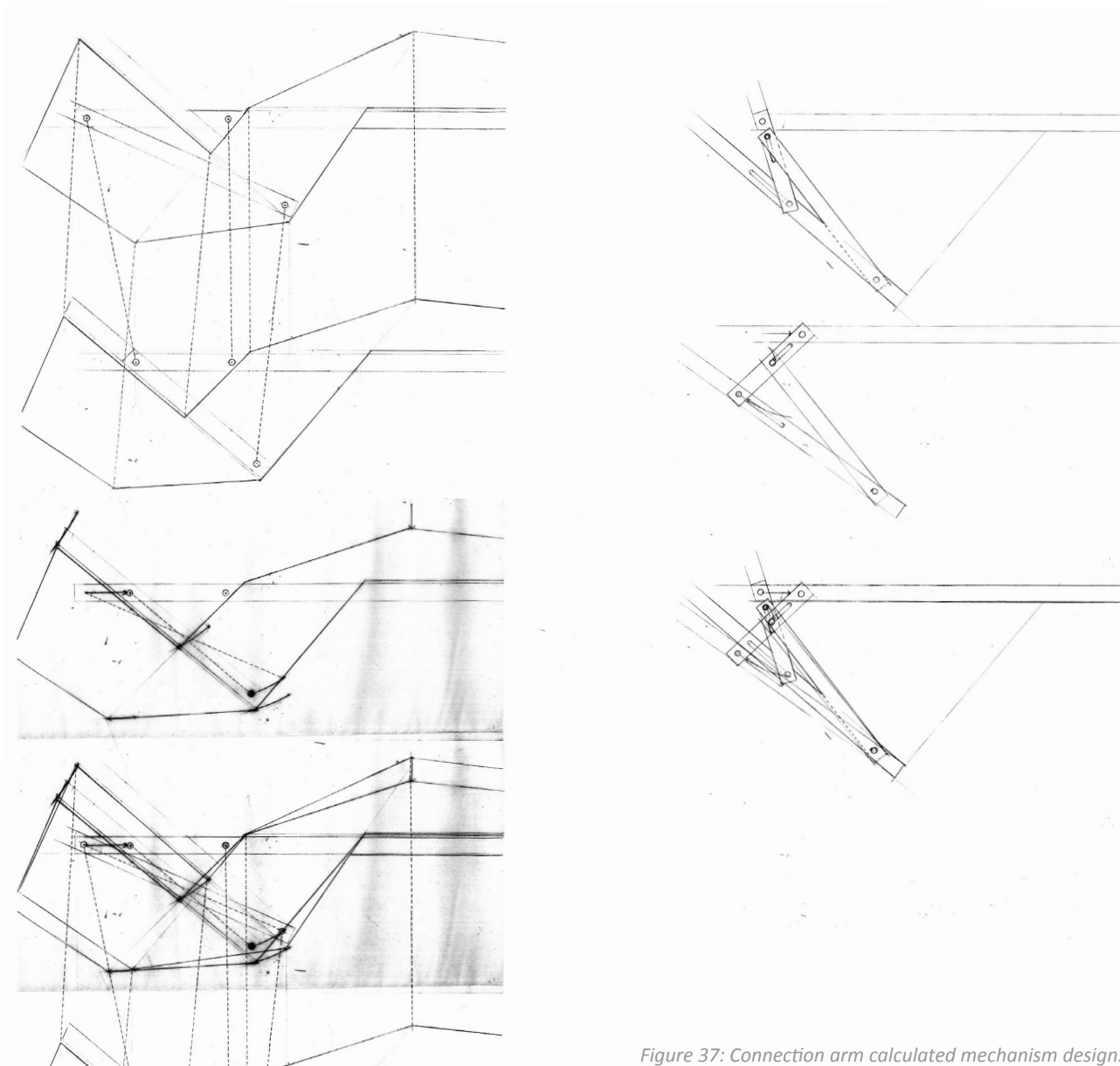


Figure 37: Connection arm calculated mechanism design.

theoretically generated solution, and as a result it became apparent a single pivoting connection arm would suffice as means of securing the connection and supporting the structures movement.

It is interesting to note the value in physical testing and modelling as opposed to purely theoretical design problem solving. The resulting solution was simpler and a lot more efficient. It ended up complementing the structures aesthetic too, maintaining simple lines and connections, reinforcing the overall aesthetic experience.

Simple nickel inter-screws have been used as means of fixing the fins and connection arms together. Because the external screw sheath is smooth it allows the connections to pivot with little resistance. It makes for a tidy connection and unencumbered movement.

STEP 7 - PULLEY SYSTEM

A pulley system was employed as means of supporting the structure's range of motion. The idea behind the suspended pulley system was to enable the structure to move freely when interacted with while remaining in a state of equilibrium. This range of movement was to be supported by a counter-weighted system that allowed the structure to open and close in a smooth controlled manner. At any point during this opening and closing process the structure should be able to hold its position and as a result, alter the light quality, spatial experience and relationship the structure has to both the body and its surroundings accordingly.

To begin with an arrangement of four pulleys was used to support the structure's range of motion. A cord connecting the bottom couple of pulleys to the structure was used, while a counter weight was attached to the cord's free end. The force required to counter the weight of the structure (this being 2.4 kg's) is 1/4 of this weight due to the four pulleys, equalling a weight of 0.6 kg's. While this composition requires only 0.6kg weight to counter support the self-weight of the structure, it does not account for the exponential tensions applied to the structure induced by the opening of the structural slats. As the structure continues to open up, greater tension is transferred through the slats, requiring a continually increasing counterweight to balance the system as the tensions grow.

To achieve conditions of equilibrium allowing the structure to balance at any point throughout the duration of the opening and closing motion, the supporting counterweighted system would have to be more complex than the structure itself. It would require a sliding weighted system, calculated to balance the exponential tensions applied by the slatted structure as it exercises its range of motion. The reality of implementing such a support system was unrealistic and unnecessary, as it would only change the experience of engaging with the structure very slightly. Thus the decision was made to make changes to the pulley system so as to allow the structure to balance in an open position.

The four pulley system presented another unforeseen problem, the length of the cord required for the structure to open fully, was four times the height of the structure when open. When open, the structure reached a height of 1.2m, thus meaning the distance the counterweighted free end would have to travel to support this motion would be 4.8m. It is very difficult to find a ceiling measuring 4.8m above floor level. The configuration had to be changed.

A system consisting of simply 3 pulleys, as shown in the diagram opposite was used, the configuration was very simple and it functioned as a 2 pulley system, the 3rd pulley was simply placed to project the cord beyond the structure ensuring the weight bag did not interfere with the structure when being

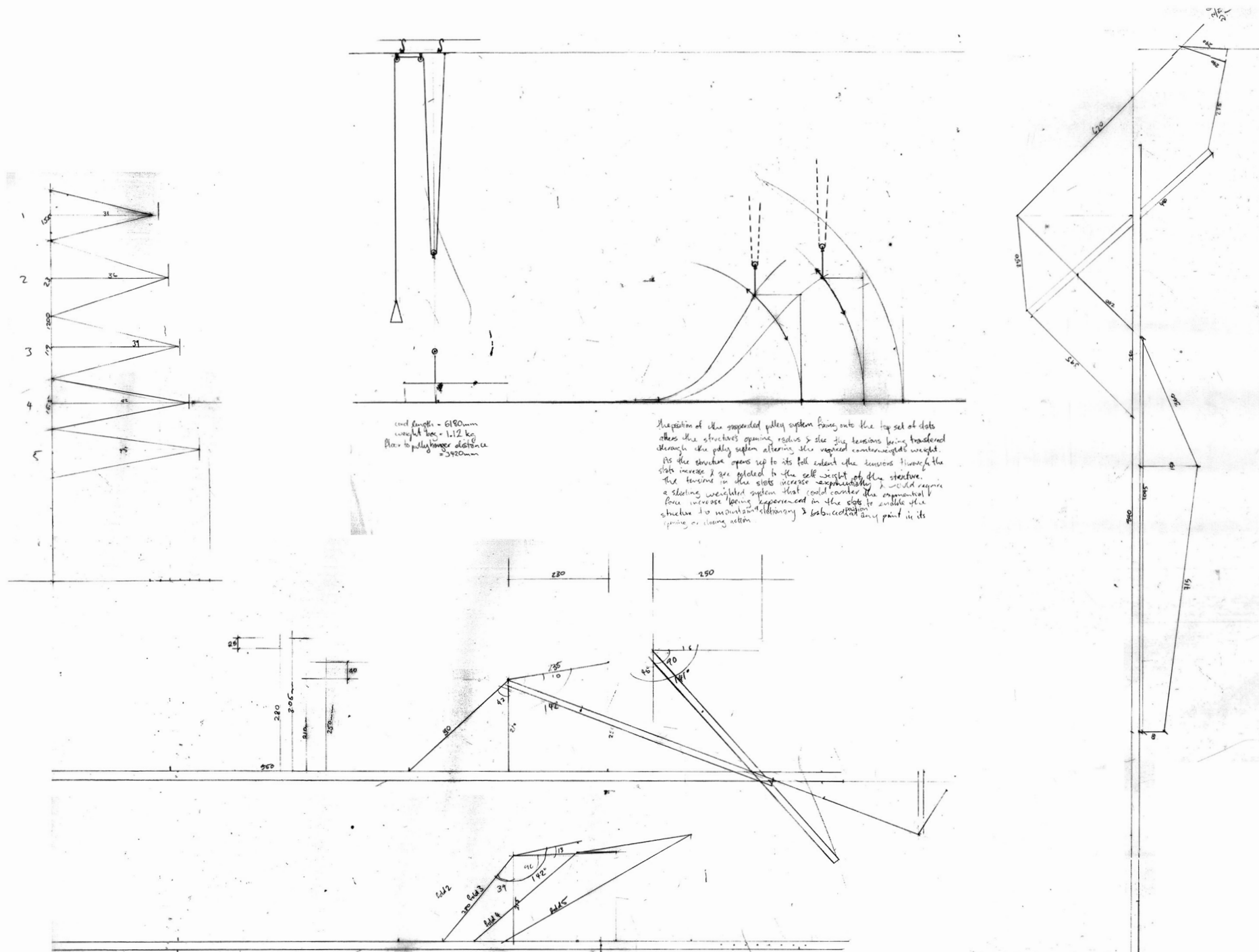


Figure 38: Working drawings, pulley system calculations, structural mechanism.

engaged with. Using this simplified system meant that the counterweight had to be at least half of the total self-weight of the structure and ended up being 1.12kgs. The length of cord required to support the opening and closing action was reduced to 2.4m, making it a lot easier to install in many different spaces providing the ceiling height was 2.4m or greater.

The lesser number of pulley's coupled with a greater counterweight increased the tensions and frictions experienced within the system. These increased tensions proved to positively affect the functioning of the structure as there was greater resistance experienced within the circuit allowing the structure to hold its position at multiple points throughout its moments of travel. Although the system didn't support an exponentially balanced counterweighted system, it did however function more effectively than the four pulley configuration in supporting the opening and closing action, holding its position at many points. The bodily force required to make the structure move was obviously more than that of the four pulley configuration, however it still remained lightweight and easy to engage with.

Once the weighted system had been completed the project was set up in the photographic studio for documentation purposes, effectively marking the end of the making process. The structure was complete.

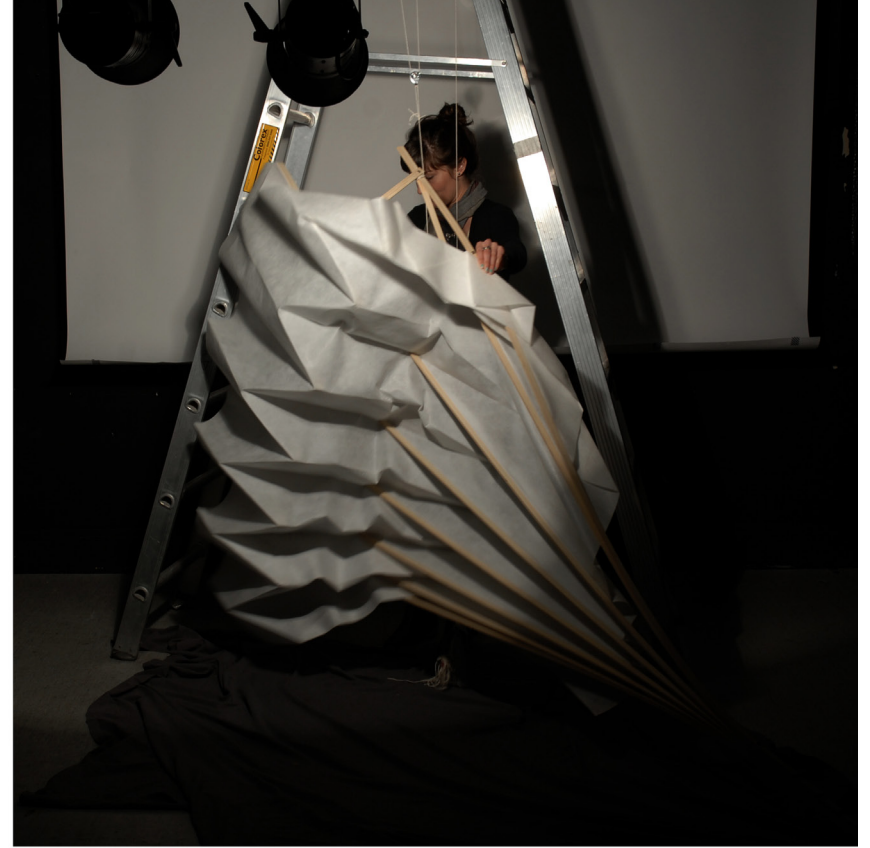
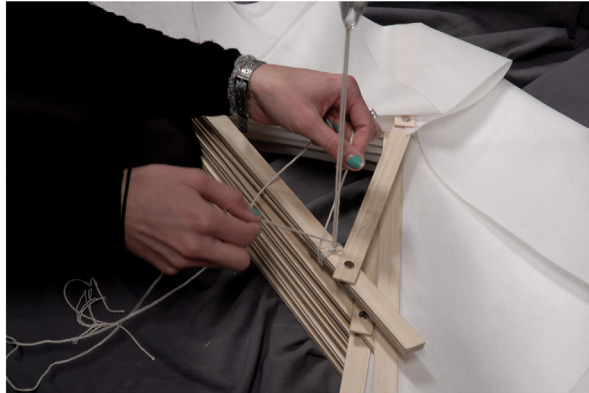


Figure 39: Finalising structure series.



Figure 40: Move: Choreographing You, photograph by Stephen Citrone. 2010.

Image Source: www.dezeen.com/2010/12/06/move-choreographing-you-exhibition-design-by-amanda-levete-architects

6.4 - contemporary comparative projects

move: choreographing you

The contemporary work; 'Move: Choreographing You' exhibition by Amanda Leveté Architects explores similar ideas to that of this Embodied Architecture project. The design methodologies employed as well as the works intent are comparative. Generated 'from relationships between choreography, geometry, movement and form and inspired by the photographic motion studies of the human body by Etienne-Jules Marey and Eadweard Muybridge,'⁸³ the work manipulates the space it inhabits, directing the bodies within it and thus controlling and facilitating specific experiences of engagement.

The work acts as a ribbon like spatial partition, weaving through and reconfiguring the gallery and its relationship to the exhibits. While the spatial impact and presence of the structural work is great, it is fixed in place, providing the viewer and present body with a static representation of the generative movement it was inspired by. While the form is fluid in its repetitive patterning and configuration, it is unable to be manipulated by the body or engaged with physically. It instead becomes an evocative architectural insertion within the space, expressively partitioning and performing as a static spatial manipulator.

The scale of the work promotes engagement with the space in two modes as described by Leveté; 'The spatial configurations defined by our dividers are intended to embody two types of performative experience: public and private. In the public experience, the ribbons frame views, carve space, and lead visitors to a fluid and communal experience of the interactive objects and installations. In the private experience, the ribbons are used to enclose and define smaller more intimate spaces for introspective and singular experiences with specific works.'⁸⁴

Expressed through the structure's materiality, there is a lightness to the work. The translucent nature of the Tyvek material gives an energy and softness to the structure's presence, allowing the spaces to reflect and filter the light conditions throughout the gallery.

83 Dezeen (2010). "Move: Choreographing You' exhibition by Amanda Leveté Architects ". 2011, from <http://www.dezeen.com/2010/12/06/move-choreographing-you-exhibition-design-by-amanda-levete-architects/>.

84 Ibid.



Figure 41: Thaw. Collaborators: Mette Ramsgard Thomsen, Karin Bech. Photographs by Anders Ingvarsten. 2010
Images source: cita.karch.dk/Menu/Projects/Behaving+Architectures/Thaw+%282010%29

thaw - a research project by CITA

Generated through the mapping of tensile relationships, Thaw has been designed using parametric relationships. It effectively expresses material potentials through calculated structural patterning. It provides a kinetic understanding of the materials used in its configuration, they work together allowing the structure to move and evoke softness in its flexibility. 'A pulley system draws Thaw in at a pulsing rhythm. The structure expands and contracts, inhales and exhales, resonating with its own material performance. As a wall membrane, Thaw explores the making of a woven structure made of ash slats braced together by steel joints.'⁸⁵

The slender structure and softness of the material panels allows light and shadow to play against the space with which it is installed. The movement continually alters the light qualities and spatial experience. While the structure disallows bodily engagement, the kinetic nature of the work continually affects the spatial dynamic, imposing its presence on the experiential body. Thaw performs as an architectural body, it inhabits the space, interrupts it, filters and manipulates the environmental qualities, expressing its materiality through movement.

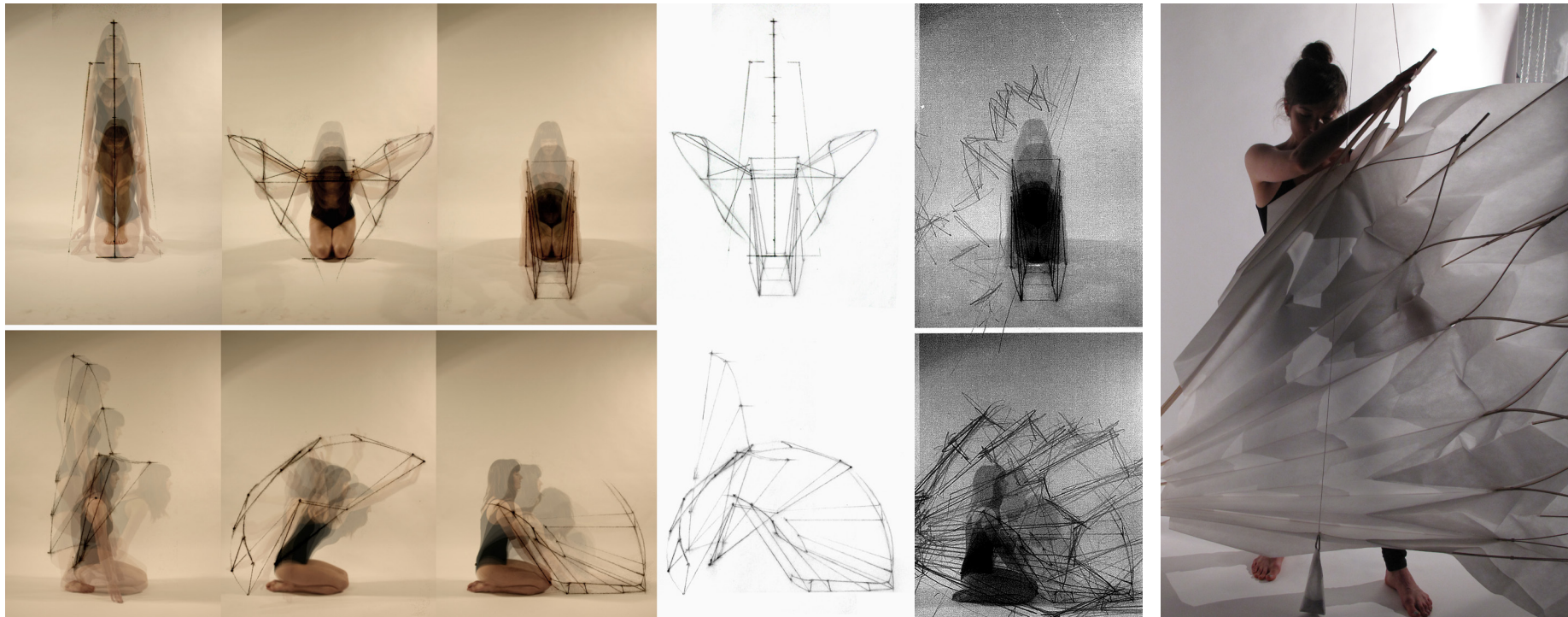
'Thaw asks: 1) How can textile principles suggest new ways of thinking structure at architectural scale? 2) If structure becomes soft how can the integration of movement allow us to suggest ways of embedding responsiveness and adaptability? 3) How would it be to live in a soft space?'⁸⁶

These questions have also been asked and challenged in this Embodied Architecture thesis. The responses and intents are different, however, similarities can be drawn in the material relationships. The materials seek to work together; supporting one another, responding to their expressive material potentials. The wooden slats in both Thaw and Embodied Architecture provide structural support for the fabric components while being held and controlled by the fabric itself. The spatial experience in both projects is manipulated by the light conditions being filtered by the structures kinetic performance.

The rhythmic configuration and geometries have been devised through the mapping of tensile relationships. Unlike Embodied Architecture, Thaw hasn't been generated from bodily movements or with the intent for bodily engagement or manipulation. It is a self-contained, stand-alone piece of architecture that speaks its own language.

85 Center For Informations Technologies Of Architecture, C. (2010). "Thaw." 2011, from <http://cita.karch.dk/Menu/Projects/Behaving+Architectures/Thaw+%282010%29>.

86 Ibid.



7.0 - putting theory into
practice

7.0 - embodied architecture structural project

'The experience' of bodily engagement with the structure challenges the potentials of architecture through exploring the role kinetics and bodily interaction can play in the manipulation of space, and also the understanding and awareness of bodily presence in space.

It identifies the potential for architecture to respond to the body, change shape, interact and essentially become an extension of the body's bounds. The structure interacts with the body to alter the understanding of self and its representative form in a similar way to that of Rei Kawakubo's Body Meets Dress, Dress Meets Body collection. While the bodily form is distorted in different ways to that of Kawakubo's work it is the interactive experience and distorted perception of body that work together to generate a heightened awareness of the relationship held between body and environment. Embodied Architecture identifies the possibility for architecture to interact with the body, move with and against it, to touch the body and respond, tracing interactive moments of connection.

Both the body and structure operate in synchronisation as the movements experienced by both result in reactionary and sympathetic relations. This relationship can be likened to that of two dance partners where both people are choreographed as a single expression, a combined interactive moment. The manifestation of these moments can be explored from both the perspective of the viewer and the experiencer. For the purposes of this thesis the experience has been explored from the experiencers perspective, however the representation of this relationship has been presented from the perspective of the viewer using photographic images. It is intended that the viewer interpreting the images can identify with the experience being presented by the image and described in the text. Just like the relationships described by Juhani Pallasmaa where the mind projects the body onto an environment as a means of understanding the relationships it holds with its surrounds. In the same way the photographs act as momentary glimpses into an imagined reality of what it means to engage with the structure.

Figure 42 opposite page : Progression Collection series.

Momentary isolation changes our point of view and perspective of the world surrounding us. As the structure opens up it dislocates the body's relationship with its surrounding environment. In phenomenological terms the structure works on the body, extending its periphery and altering the experience of self. Moments of engagement heighten awareness facilitating bodily mindfulness. As discussed in the architecture section, intimacy plays an important role in the facilitation of bodily mindfulness. Because the Embodied Architecture structure can only alter space when activated by the body's interaction it automatically becomes a conscious and intimate experience, enticing the mind to concentrate on the experiential and spatial changes taking place. The structure translates the body's movements into spatial manipulations, thus altering the body's position and understanding of itself in relation to its surroundings. Where the body touches the structure and integrates itself within its workings, expressions of intimacy can be observed as the body and structure experience one another simultaneously.

Embodied Architecture is placed in a context-less setting. The images present the structure in a naked space, removed from any spatial typology or items of personal identification. This disassociation with the domestic environment allows the reader/viewer to adopt their own understanding of the structure's function by placing it within their minds projected image of their own personal environment. The engaged viewer is able to relate to the structure on their own terms, based on their own readings of what the domestic represents to them. If an image placed the Embodied Architecture structure in a simulated contextual setting it would then alter the viewer's perception and personal understanding of how it could perform to alter their environment. The imagination is used here to implement this projected experience and understanding. How the structure performs in one person's mind is completely different to how it could be viewed and understood by another. Therefore the idea of projected experience is incredibly powerful in the understanding of space, spatial potential and the body's inherent interactions within the space.





Figure 44: Engage Me.

From the original conceptual sketches it can be seen that the initial intentions for the structural experience was to be one of greater enclosure and isolation, where a set of two structures would engulf the body entirely. This proposition was not fully explored, however while the experience for the engaged body is markedly different with a one sided structure as opposed to two, the Embodied Architecture structure provides foundation testing for further exploration. It is a primary iteration acting as a starting point for further architectural development.

The structure in this instance acts more as a manipulative spatial screen. It still functions as a filter and interactive kinetic environment but the level of bodily isolation within the domicile space is considerably less than if it was an enclosed unit. Nevertheless, the level of intervention within a space is still significant. As the structure asserts itself when opened it has an undeniable presence in space as it changes both the spatial topography and light qualities within.

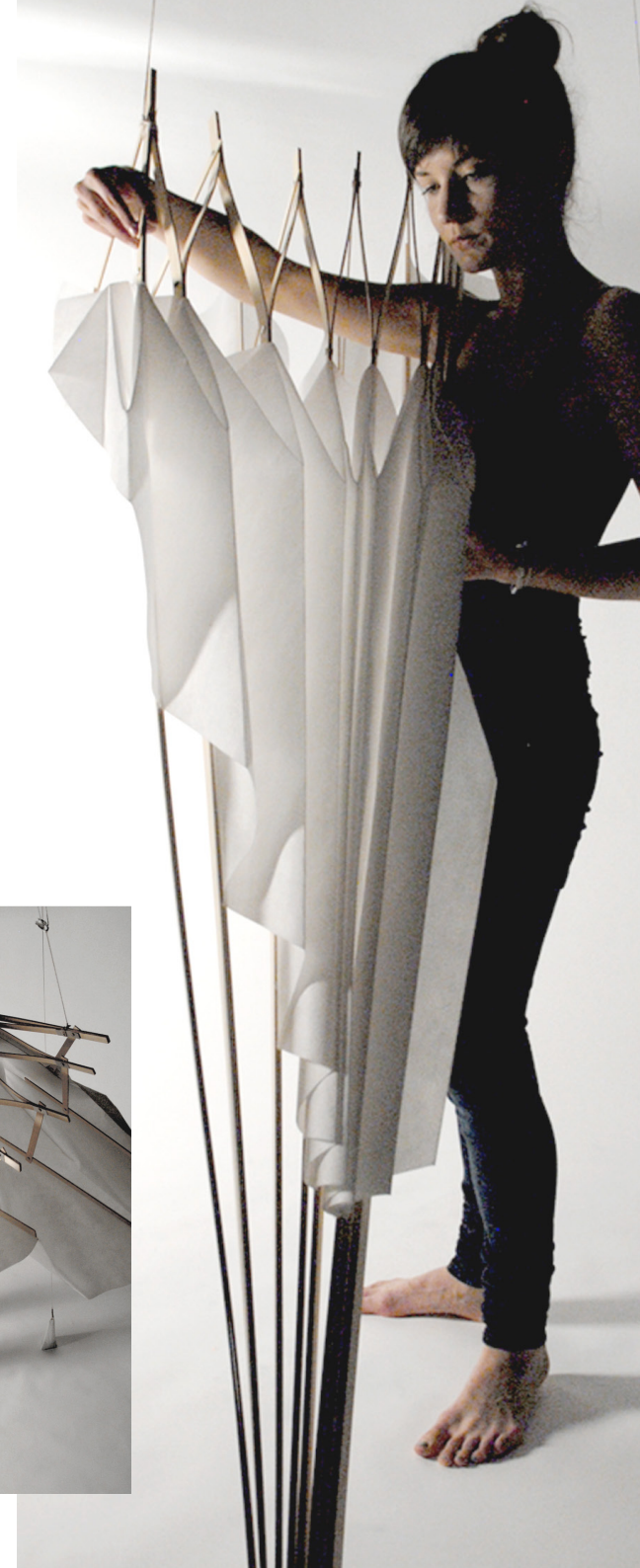
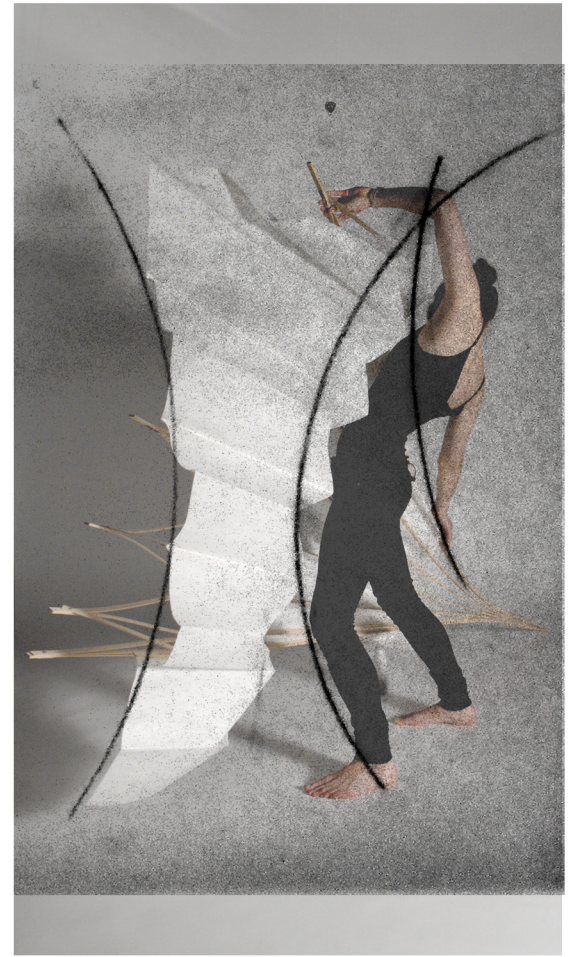




Figure 46: Grounded Shelter series.
Figure 45 opposite page: Embodied Architecture experience series.





ENVIRONMENT OF THE KINETIC BODY - SPATIAL EXTENTS:

The structure extends the space the body inhabits when interacted with. It both accentuates the movements, outlining trajectories and defines the space being engaged with through its position, presence and relationship it holds with the body.

The body naturally mimics the movement experienced within the structure, in this way body becomes an extension of the structures dynamics and mechanics. The body brings the structure to life, activated and controlled by points of momentary connection.

One evokes the other, the interactions between structure and body osmotically express the relationship being experienced by both. In this respect the structure performs similarly to the architectural bodily mimetics described by Hugo Kükelhaus where architectural dynamics are experienced within us, inherently altering our experiential readings of space.

As displayed in the images, the body and structure move and imitate one another, the shapes and proportions of the structural components influence the way in which the body engages with it. These moments of integrated expression between body and structure are a result of the embodied making methodologies used throughout the thesis.

Figure 47: Embodied Mimetics series 2

Figure opposite page 48: Embodied Mimetics series 1



SKIN:

Embodied Architecture performs as an interface between body and environment, challenging the notion of inside and outside as the structural slats weave their way through the material 'skin'.

It places itself at the intersection between the identification of clothing and architecture. Traditionally these two layers have been identified as the second and third skins protecting the soul, as identified in the 'Body – Skin' section. However, this project brings these two skins together, blurring the boundaries and preconceived understandings of protective layering.

The material folds continue to soften with use, not unlike the wearing marks clothes express when worn on the body. A material laxness around the bamboo structure can be observed where the material crease patterns are unsupported. However, these areas of material softening aren't a result of the body's direct contact with the fabric itself, it is instead a wearing relationship where the two materials (bamboo slats and Watergate fabric) work both with and against each other. In this respect the structure takes on the role of both body and skin.

While we use our body to measure ourselves in relation to our surrounds the structure interrupts our understanding of this, it becomes an extension of the body, distorting its proportions and presence within space. An intimate connection between body and structure is established and with it comes the opportunity for a new understanding of the body's relationship with itself and surrounding layers.

EMBODIED PRODUCTION:

Decisions concerning the placement of the material folds was based on intuition as opposed to predisposed mathematical relationships. This allowed the structure to take on moments of spontaneity in its production. It was a process of making by feeling, with consideration to material limitations and bodily proportions. A heightened awareness of the body's relationship with the structure was achieved using embodied processes. Never was the structure disassociated with the body in its production. Because the process for production was not predisposed, or drawn out, the decisions were based on the development and need to produce a specific experience. This approach allowed the structures material components to perform intuitively. The Watergate material was manipulated within its means, holding the wooden slats in place, filtering the light, maintaining the memory of the folded panel structure.

The wooden bamboo slats material qualities were displayed as controlled moments of bending and tension exercised the structure's physical extents. The physicality of the materials used was experienced throughout the making process, an embodied understanding of the material potentials ensured the structure would perform within its means. As described by Pallasmaa "The structures of a building are unconsciously imitated and comprehended through the skeletal system. Unknowingly we perform the task of the column or the vault with our body."⁸⁷ This quote indicates the body's inherent ability to experience material quality and composition within us. Through 'making' the body becomes familiar with the materiality and its potentials, and as a result the materials perform to inform the body how to be manipulated and utilised.

87 Pallasmaa, J. (1996). *Polemics : The Eyes of the Skin : Architecture and Senses*. London, Academy Editions. P46.

Figure 49: *Embodied Architecture Engaged series*.



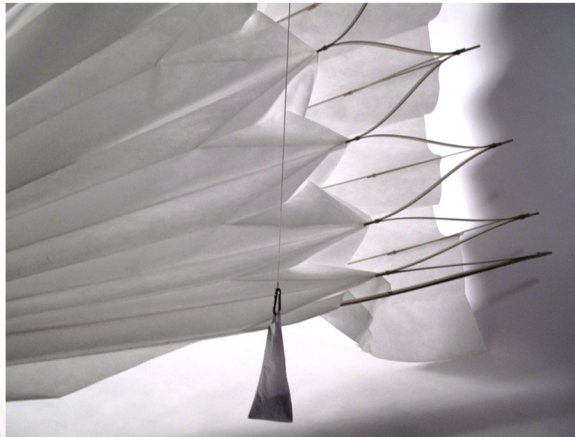
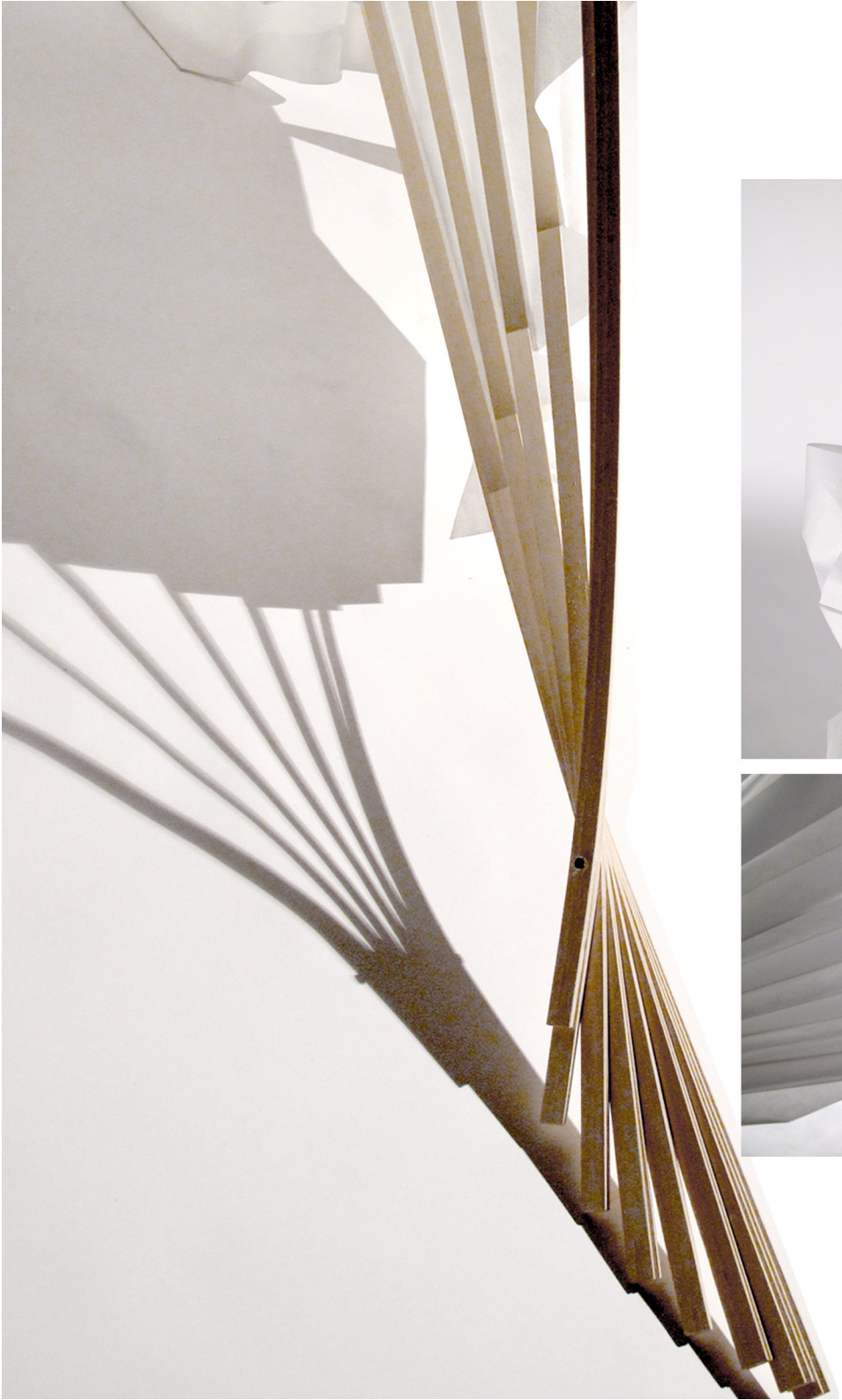


Figure 50: Embodied Architecture structural details series

LIMITATIONS:

While the structure is both mobile and self-contained, its length dimension and pulley system disallow it to be easily transferred from space to space. The required ceiling fittings for hanging the pulley system complicate the installation process compromising the original idea that the structure would be able to inhabit any space anywhere. However the hanging pulley system maintains an aesthetic lightness, where the structure can be fully suspended and manipulated in space without it having to be grounded to function. This function complements the interactive and aesthetic experience as the structure defies a groundedness that is present within most architecture, especially that of the domestic.

The materials expressed their inherent qualities dictating some of the design decisions. Experiments and material simulations provided greater understanding of the material limits resulting in slight changes to structural configurations and interactions. This wasn't an issue really, more a matter of understanding the scale at which the structure was being constructed at and the inherent limitations of the scale. If the project were to be any bigger the material would have required substantial reinforcing along its creases, changing the experience and softness of the space when engaged with.

FURTHER EXPLORATIONS AND DREAMS:

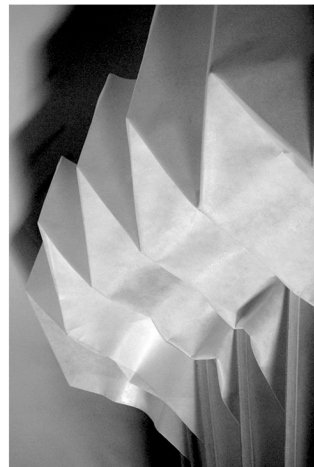
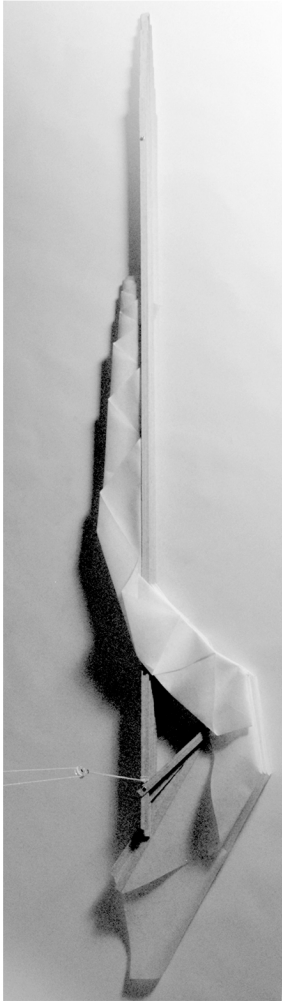
This project presents many possibilities for further exploration and development. The structure has been built at a 1:1 scale. While it functions as a relatively small scale architectural intervention it challenges the mind to think beyond, to expand its presence, to become one of many structures, manipulating a multitude of spaces and the bodies within them.

The structural system has the potential to be developed and applied to many scales, there are multiple opportunities where the ideas and mechanics behind the structure can be extended and developed further.

How would a space feel to have an entire wall screened with manipulative kinetic folded architecture, where the light filtered through the screens prompted the body to respond to the spatial conditions accordingly? How would it feel to have mobile self-standing shade structures on a beach, temporary and beautiful, shading and protecting the inhabitant, changing the body's experience and relationship with its environment? Could this type of architecture remedy broken unused spaces, bring life and meaning back to them? Could the soft materials interwoven with the tensile slats be used to shade and protect large urban areas? Are buildings asking to be softened, to be interacted with and re-experienced? How does the body feel when it can engage with a symbiotic environment, how does it change the body's understanding of its position and place in the world?

The use of new material combinations pushes the mind to think of new solutions when considering space and spatial qualities. What's not to say you can't have soft claddings, new breathable materials that challenge ideas of inside and out and spatial divisions? The tent like 'Wall House' by Frohn & Rojas presents some of these ideas. Where the textile environment of clothing interacts with the body at an architectural scale.

The questions and further potentials of this project are endless. It has been a successful generative process, highlighting future possibilities and methodological approaches towards contemporary architecture.



8 . 0 c o n c l u s i o n

8.0 - conclusion

Embodied Architecture provokes the body to engage with a new type of space, challenging the body's understanding of itself and identity in relation to its surroundings. It presents a dynamic narrative between body, clothing and architecture. The physical changes experienced when the body interacts with the structure prompt psychological shifts. Combined awareness of the physical body and mind stimulates a heightened embodied consciousness. It is at these moments of heightened consciousness that the body can experience with intensity, highlighting the possibilities for kinetic interactive architecture to alter the lived experience within the domestic environment. The structure created is a prototype of what embodied architecture can potentially be. It identifies how the body can actively manipulate space, how it can be used to generate form using body centred methodological processes.

Experience through bodily opposition and interaction with the structure brings architecture to life. The permanent spatial extents of the home are countered by the impermanent space change implemented by the presence of the structure. Expressive movement is displayed through the opening and closing of tensile members, as voluminous folds move through and manipulate space. It re-orientates the body's understanding of the predisposed spatial conditions lived in, challenging preconceived ideas of boundary and the role boundaries can play in the understanding of ourselves and our environments. It pushes to find a new understanding of how we could perform within our domestic spaces and learn to experience them differently, reflecting on where we belong and the relationship we hold with the things we surround and dress ourselves with.

The psychological shifts prompted by the interactive Embodied Architecture structure push the body to continue to grow and live new experiences. The physicality and composition of the structure shows the ideas in this thesis being explored, tested and represented. However, going beyond what the structure provides in terms of its physical and architectural potentials it is also necessary to acknowledge the opportunities for embodied change to occur through the implementation of spatial intervention in a wider context. The theoretical basis for this change to occur can be applied extensively to many architectural conditions and settings. The potential for interventions to stimulate greater embodied cognition is large. Grounding the theoretical principles around the body gives profound opportunity to manipulate the lived experience in many forms. The Embodied Architecture structure provides one reading of how the body can interact and be manipulated with and by architectural intervention.

Figure 51 opposite page: Voluminous Detail series.

The body asks to be moved, to be pushed in new directions, to interact and see things differently. It seeks to be absorbed within its environment, reading itself as an integral expression and part of any given moment. This project displays the power kinetic interactive architecture plays in the changing of spatial and bodily dynamics. It provides foundations for further exploration around body centred theories and methodologies in the production of architecture.

The project brings fashion techniques and architectural structural knowledge together. It highlights the potentials and advantages of exchange between the two domains. Where boundaries are blurred and points of connection created, the body is used to bind the conditions together.

This thesis grounds itself around the body and the lived experience. It explores the reasons why we feel what we feel, and the reasons we seek to choose the things we wish to engage with and identify ourselves by. The body cannot just be read as a single entity, its presence can be felt multi-dimensionally encompassing expressions of entire environments. We look to belong and understand, live and experience, to grow and develop.

Change prompts stimulation and knowledge, a new understanding.

9.0 bibliography

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(1990). The Concise Oxford Dictionary. The Concise Oxford Dictionary. R. E. Allen. New York, Oxford University Press: 1452.

Bagnall, C. (2008). Encounters with Simple Pleasures. Performance Design. Dorita Hannah and O. Harsløf. Copenhagen, Museum Tusulanum Press: 178-189.

Bagnall, C. and R. Sinclair (2002). Productive Excess: Clothing, Landscape, Architecture. Making an Appearance: An International Conference on Fashion, Dress, and Consumption. The University of Queensland.

Bahamón, A. (2004). The Magic of Tents Transforming Space. New York, Paco Asensio.

Benedikt, M. (2007). Coming to Our Senses; Architecture and the Non Visual. Harvard Design Magazine: 83 - 91.

Campays, P. (2001). The Sacred and the Abode. Auckland, University of Auckland.

Castle, H. (2000). "Beauty is the Beast." Architectural Design. 6(70): 43 - 47.

Colomina, B. (1988). Adolf Loos: das andere. Architecture and Body. New York, Rizzoli.

Colomina, B., Ed. (1992). Sexuality & Space. New York, Princeton Architectural Press.

Demonchaux, T. "Coat Check: Notes on Surface, Clothing and Architecture." Practice.

Dezeen (2010). "Move: Choreographing You' exhibition by Amanda Levette Architects ". 2011, from <http://www.dezeen.com/2010/12/06/move-choreographing-you-exhibition-design-by-amanda-levete-architects/>.

Entwistle, J. (2000). "Fashion and the Fleshy Body: Dress as Embodied Practice " Fashion Theory. 4(3): 323–348.

Frank, K. A. (2000). "Yes, We Wear Buildings." Architectural Design. 70(6): 94 - 97.

- Franklin, E. (1996). Dance Imagery for Technique and Performance, Human Kinetics. Library of Congress.
- Freeman, M. (2005). Meditative Spaces. New York, Universe Publishing.
- Garcia, M. (2006). "Impending Landscapes of the Architextile City." Architectural Design. 6(76): 136.
- Glancey, J. (2008). Foundation Garments. The Guardian. London.
- Grad, G. (2008). Notebook on Cities and Clothes. More than Architecture 91°. 130-139.
- Hannah, D. and O. Harslof, Eds. (2008). Performance Design. Copenhagen, Museum Tusulanum Press.
- Hansen, M. B. N. (2006). Wearable Space. Bodies in Code. New York, Routledge: 175-220.
- Haweis, M. E. J. (1878). The Art of Beauty. New York, Harper.
- Hodge, B. (2006). Skin + Bones Parallel Practices in Fashion and Architecture. New York, Thames & Hudson.
- Holub, B. (2007). Obsessed, Seduced, Exposed. 91° : More Than Architecture. Basel, Boston Birkhäuser Verlag AG.
- Küng, M. (2007). Walter Niedermayr/Kazuyo Sejima + Ryue Nishizawa/SANAA. New York, Hatje Cantz Verlag.
- Leach, N. (1996). Gaston Bachelard. Rethinking Architecture: A Reader In Cultural Theory. London, Routledge: 85-97.
- Leach, N. (1999). The Anaesthetics of Architecture. Cambridge, MIT Press.
- Leach., N. (2006). Camouflage. Cambridge, MIT Press.
- Loos, A. (1987). The Principle of Cladding. Spoken into the Void; Collected Essays 1897-1900 (Translation by Jane Newman and John Smith.). New York, MIT Press: 66-69.

- Luescher, A. (2006). "Experience Field for the Development of the Senses: Hugo Kükelhaus' Phenomenology of Consciousness." International Journal of Art and Design Education. 25(1): 67-73.
- Marble, S., D. Simley, et al., Eds. (1988). Architecture and Body. New York, Rizzoli.
- Myzelev, A. and J. Potvin (2010). Fashion, Interior Design, and the Contours of Modern Identity. Surrey, Ashgate Publishing Limited.
- Pallasmaa, J. (2005). Encounters; Architectural Essays. Helsinki, Rakennustieto Oy.
- Pallasmaa, J. (1996). Polemics : The Eyes of the Skin : Architecture and Senses. London, Academy Editions.
- Preston, J. (2003). "Sewing Surface: Ground Matters Beneath the Eiffel Tower." Architectural Design. 73(2): 82 - 85.
- Quinn, B. (2003). The Fashion of Architecture. New York, Berg.
- Seifert, J. (2007). Architecture Beneath the Skin. More than Architecture 91.10 - 21.
- Silvette, J. (2000). "Rei Kawakubo of Comme des Garçons." Architectural Design. 70(6): 78 - 81.
- Sinclair, R. (2004). Dressed in Space: the Sartorial Architectures of Rei Kawakubo and Hussein Chalayan. SAHANZ 04. RMIT Melbourne, Massey University.
- Sudjic, D. (1990). Rei Kawakubo and Comme des Garçons. New York, Rizzoli International.
- Thomsen M. and K. Bech (2010). "Thaw." 2011, from <http://cita.karch.dk/Menu/Projects/Behaving+Architectures/Thaw+%282010%29>.
- Wenders, W. (2007). Notebook on Cities and Clothes. W. Wenders. Australia, Madman Entertainment: 82 min.
- Wigley, M. (1995). White walls, designer dresses : the fashioning of modern architecture. Cambridge, MIT Press.

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a p p e n d i x

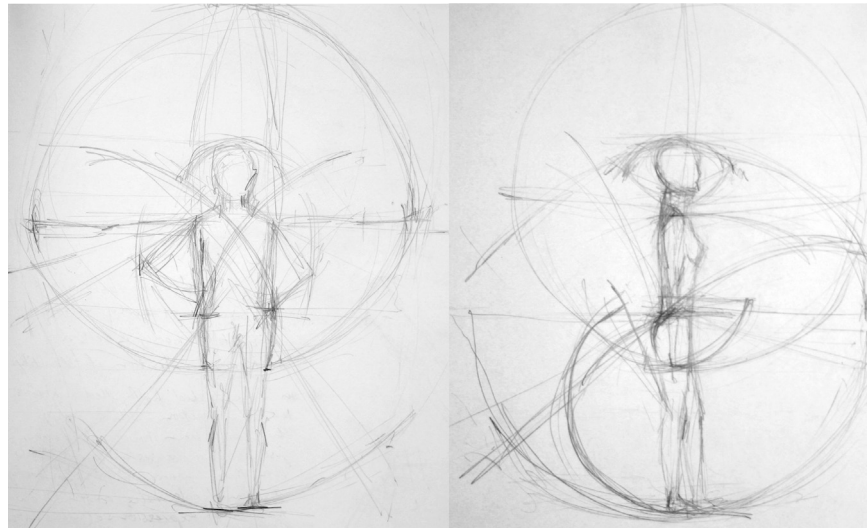
Image Bank: This appendix contains images that were created as explorative works throughout the production of the thesis. They are not included within the body of the thesis, however they do inform the processes and generative ideas explored throughout its production. The images are presented in chronological order so as to reinforce the development processes.

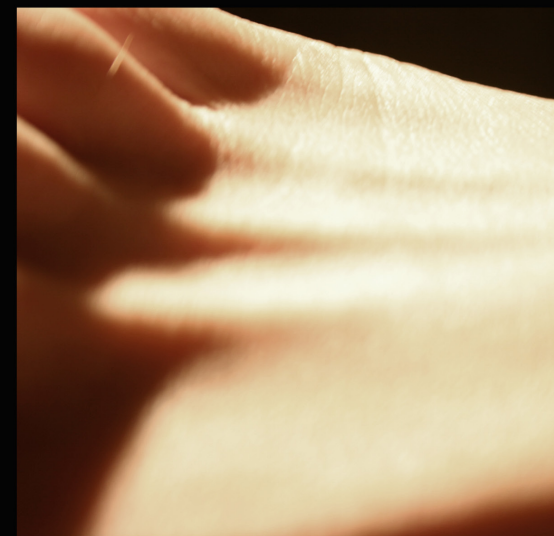
Sketch Ideas. Images are explorative of the human body's proportions and movement trajectories. Understanding the potential physical space the body can inhabit.

Small sketch of Fashion Designer Yohji Yamamoto, his chair is fitted with a material cover, clothed like himself the chair becomes an extension of his identity at that time.

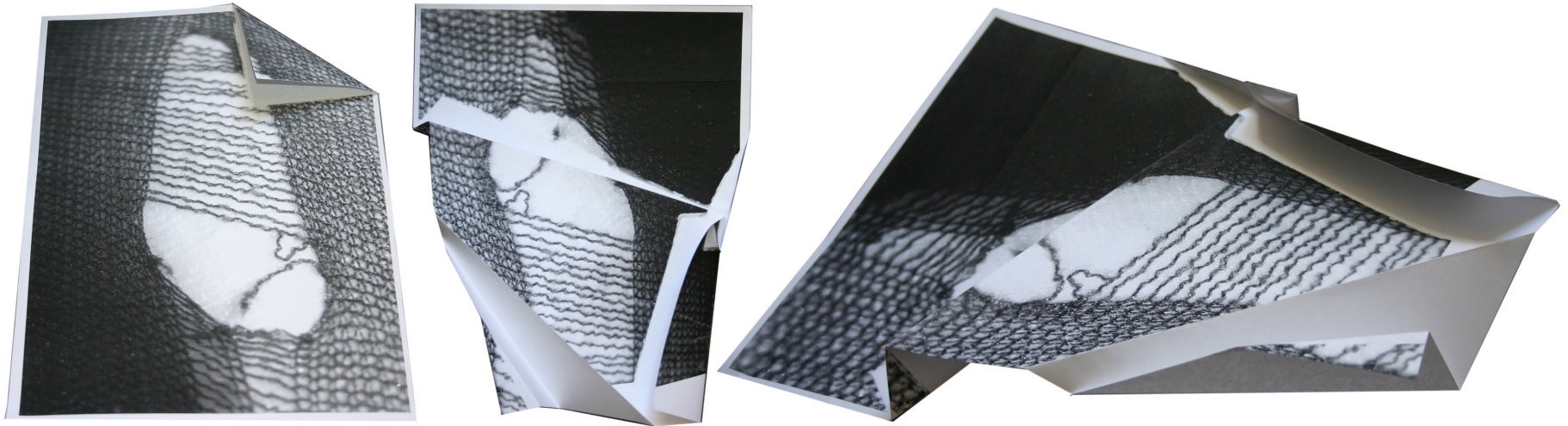
Opposite page: Study of the body's skin.

*Bodyly presence vs. presence of Body
present vs. implied
Fixed vs. blur
seen vs. feel
experience.*





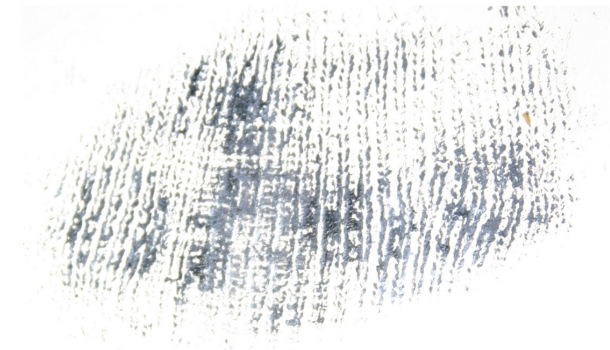


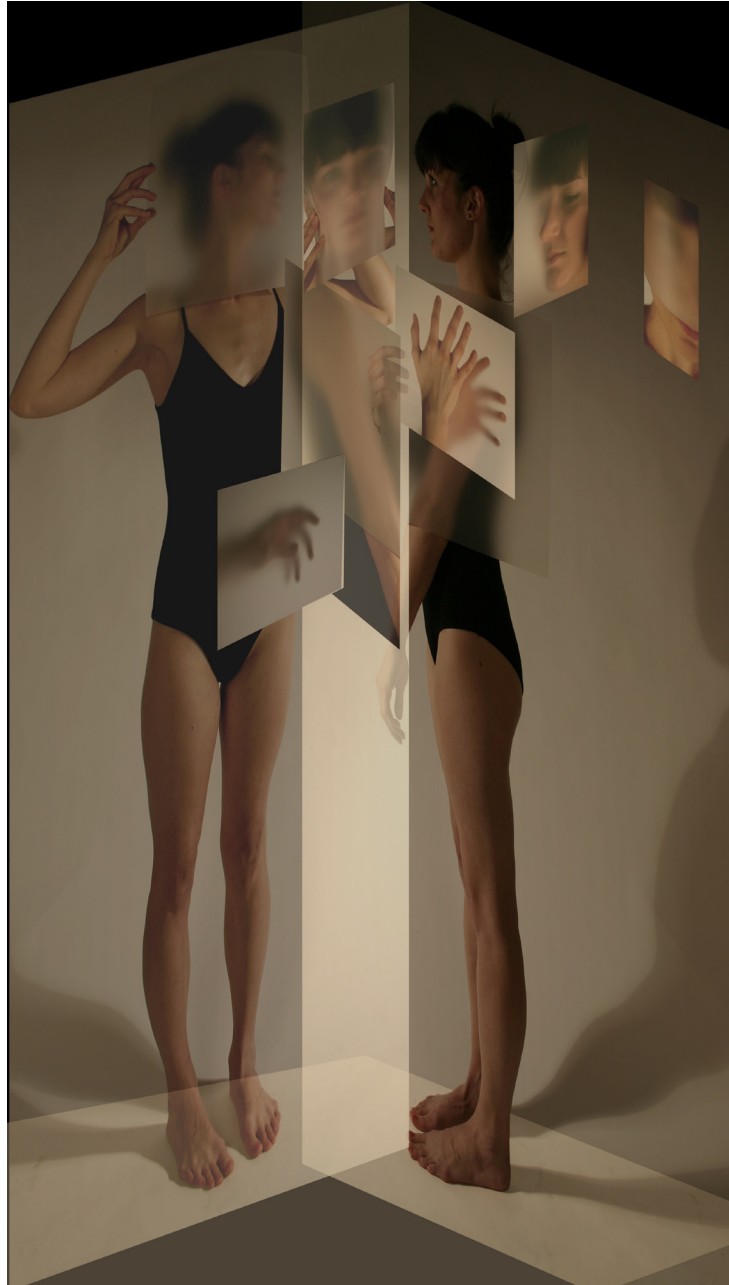
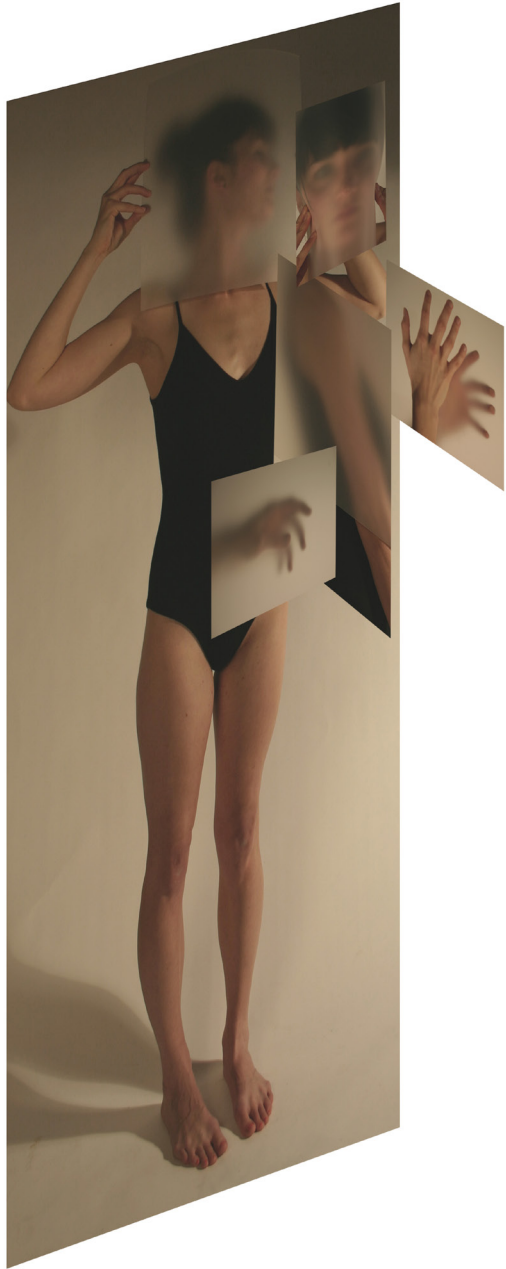


This series explores the body's skin and how clothing interacts to alter our understanding of body as a second skin.

Images of the stocking stretched over the skin were printed onto creased paper. This series explored how the ideas of body and cloth could be translated. The paper becomes the body, the printed image the clothing. The papers inherent qualities are displayed through expressive folds, manipulating how the printed image is viewed, prompting the viewer to become aware of the papers materiality.

Further exploration into how material interacts with paper is identified in this series of images where two types of fabric are dipped in ink and pressed onto the paper surface. The results show how the material qualities are affected by the interaction and how they perform when pressed into or on a surface. This could be likened to the interactive moment between body, cloth and chair, where the clothing on the body gets pressed against the chair and both the chair and material experience one another. The same can be observed here where the paper captures and experiences this interactive moment.





As a viewer we interpret environments and relationships from varying perspectives and proximities.

This series of images explores the notion of multiple perspectives and the representation of interaction, movement and experience. The viewer interprets the fragments in relationship to one another, the various perspectives evoke spatiality, time, movement and bodily intimacy.

This fragmented commentary is further explored when the bulk of the body is removed leaving only the hands, feet and face visible. These have been chosen as they are representative of the body's familiar and intimate points of contact. The feet ground the body and experience the ground surface, the hands are left exposed; tools to touch and interact with, while the face interprets its surroundings, expressing, guiding and connecting with others. The body binds all of these entities together as a single expression, however it is only the hands, face and feet that are typically left exposed or naked.

These images look at what can be removed while retaining similar spatial qualities. Expressive lines connect the bodily points of contact, maintaining connections and evoking movement and spatial intimacy.







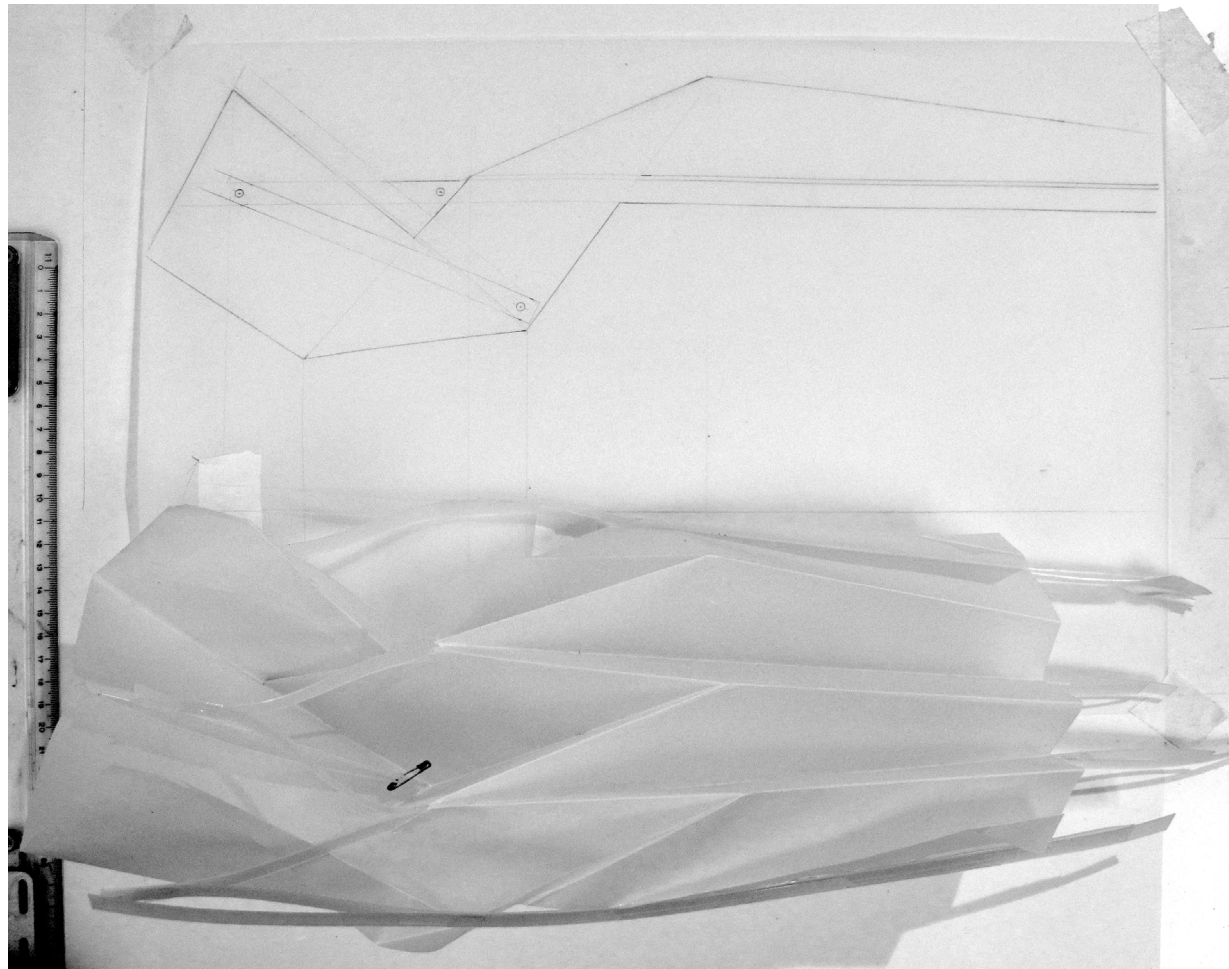
These images are further explorations of boundary conditions identified in the image series: Body Boundary Blur 2, and Second Skin.

They display the body connecting with two material conditions, one a paper like roll of Watergate building wrap and the other the pleated sheet. These materials interact with the body creating different experiential moments.

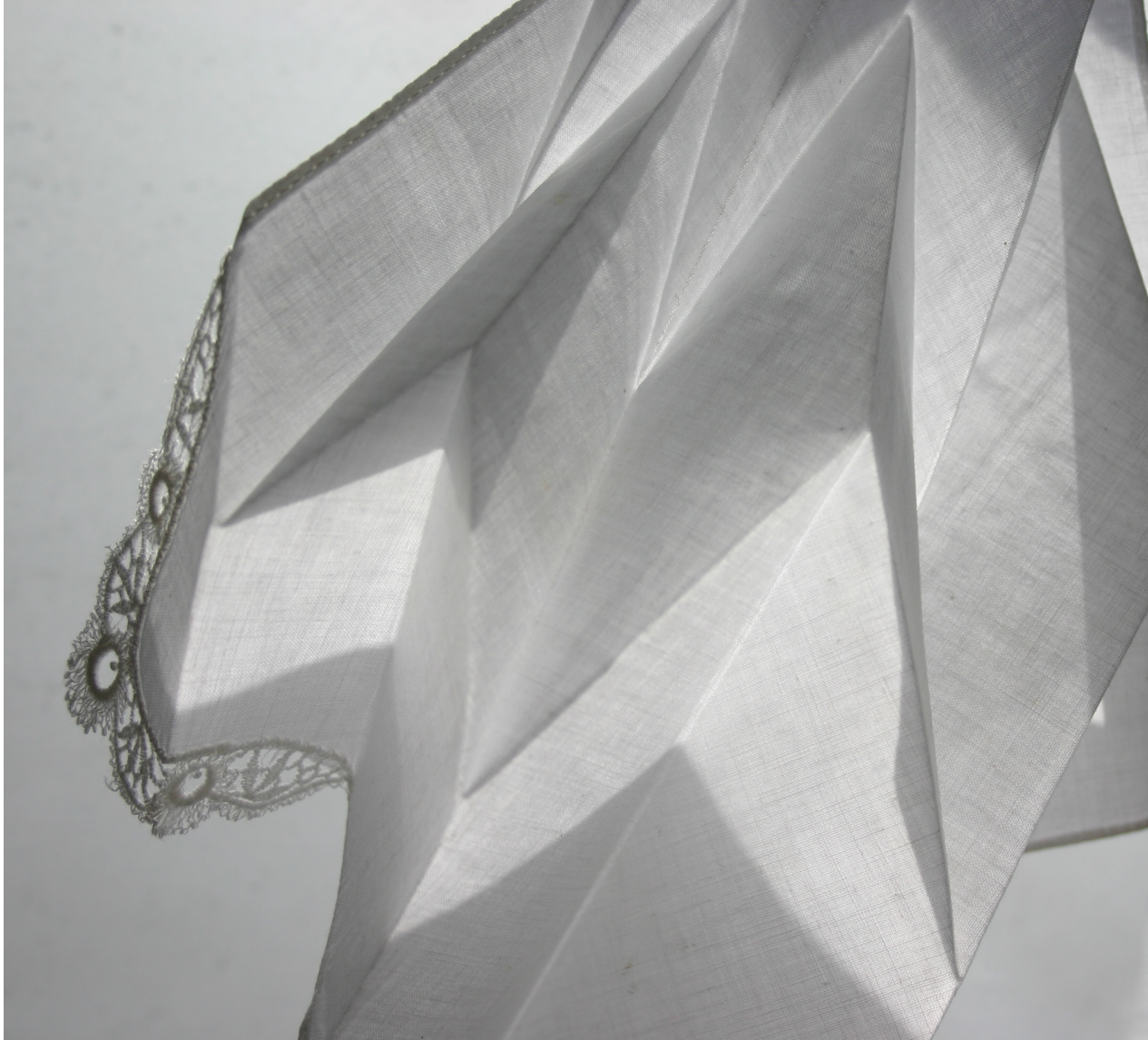
The material qualities alter the way in which the body interacts with them and in turn the materials evoke their physicality expressively through the way they move with and against the body.



This photograph depicts initial structural development and material testing with Pinus Radiata slats and Watergate Building Wrap. These tests informed the following design moves resulting in the production of the Embodied Architecture Structure.



The mock up model constructed from folded draughting film and frosted plastic slats is used to inform the technical drawing which was produced to better understand the complex movement experienced when the structure opened and closed. A mapping and plotting of the movements was recorded for further calculations.



Part of the handkerchief series, displaying the material qualities through light filtration and pleated form.

