

## chapter four Making

In the nature of this study which employs making as the methodology, paper is chosen as the material that will be investigated as the artefact for the spatial intervention.

Currently the use of paper within the discipline of interior design is limited by the perception of its technical limitations. Paper as a material in the built environment holds opportunity for a unique character and identity to be expressed and therefore this project explores the unique and latent characteristics of paper as a material for innovative three dimensional spatial applications.

This chapter introduces the concept of new materiality followed by the elaboration of paper, where the objectives of the material study is established. A visual study is the initial step in the making and design process and an intuitive material exploration follows as the first phase of making. The chapter investigates the aesthetic character of the *cybrid* archive and integrates the paper as the visual link between the physical and digital realms.

## 4.1 NEW MATERIALITY

Interior space is constructed of boundaries and these boundaries only become real once we fill them with materials, and these in return give certain sensual qualities that we can perceive through our senses and understanding. We understand the materials of our surroundings by touching contours and textures, seeing the contrasts of light and shadows cast on surfaces, feeling hot or cold and hearing sounds that come from echoes or voices in the space. Materiality allows the designer to create a sense of place and through materials a space becomes something that has its own character, atmosphere and identity.

Vergheze (2005:3) highlights the idea of abstraction in the design process, and argues that the development of abstraction lies in materiality. Abstraction defines design as both a process of producing an outcome as well as the outcome itself, and can be described as reducing something to its essence. Abstraction holds a lot of potential for developing new ideas yet there is a misplaced perception that the professional world belongs to reality, and it is creating a lack of abstraction in the approach taken by interior designers. Vergheze (2005:8) stresses the fact that interior designers are designing with an outdated process where materials are selected as an outcome to the design and they are falling short to the abstract ideas that new materiality has to offer. Addressing materiality in the early stages of the design process helps to generate a clear understanding of the qualities that a material could contribute to a design. Materiality takes the space further than mere spatial organization but adds value through the abstract qualities that creates emotional responses in a place. A new methodology such as research through the act of making is needed to address the issues that are currently found in the design process as explained earlier in this chapter.

If a sense of place is established through a material enclosure, Vergheze (2007:197) then explains that new materiality could address a sense of place in a new manner. Then use of innovative materials creates opportunities for these environments to evolve and to meet the needs of the user. Vergheze (2007:199) make the relevant statement that *new materials by themselves do not constitute change, or design innovation. It is the application of these materials within a context that issues forth a new era in design, and that new era must coincide with the implementation of new materiality into the process of design and not solely as an aspect of the outcome.*

Paper at present does not yet have a clearly defined spatial language in the building environment therefore through the exploration of this unconventional material in an innovative way creates the opportunity for a new interaction and experience. Paper becomes a symbol of the old paper archive that has been re-interpreted in the *cybrid* archive where this new space embodies qualities of both the physical realm and the digital realm that are experienced in novel ways. Refer to chapter 3 section 3.3 Comparative Analysis.

Materiality should form part of the whole design process and not just be the outcome. It is not necessarily the use of new technologies but rather new approaches to old technologies, innovative ways to apply and rethink what materials can become or would be able to do that could enable the manifestation of novel experience in a space such as the *cybrid* archive.

## 4.2 PAPER

Williams (2005:7) expresses the potential of paper in the following quote.

*Paper is amazing. You can write, draw, paint and print on it, you can cut and fold it, you can mould it, and that's not all – the list of things you can do with it is boundless.*

Paper is a thin material made through the process of pressing together fibrous pulp derived from wood and other natural fibrous substances to create thin flexible sheet which could be used for drawing, writing, printing and packaging amongst many other uses. The name paper is derived from the word papyrus which Williams (2005:169) describes as a material made of sliced sections of the flower stem of the papyrus plant which was found in Egypt, laid in two layers, pressed together and dried and was used by the Egyptians, Greeks and Romans as a paper-like material for writing, but the type of paper used today was originally created in China around the end of the first century and was the most important carrier of information in the past.

Schmidt(2009:9) begins to explain that our relationship with paper is most of the time a troubled one, as it reminds us of homework books and report cards and the notebook that was nothing more than a record of our achievements. However there was always the opportunity given to us by a blank untouched page, that allowed us to dream and forget about all the errors and bad grades, allowing us to feel unchallenged and without fault. Yet a blank piece of paper can also become challenging, and this could possibly be a fear of commitment.

Schmidt (2009:9) explains that on paper our abilities manifest. Scant facts, garrulousness, or perhaps even talent: here it all becomes visible. For on paper it is not easy to hide inadequacies. Those who write, record something, sometimes for eternity, sometimes just for a moment.

Paper is present in our everyday lives, we interact with it throughout the day from the most mundane toilet roll of tissue to office stationary or a book we read at the end of the day, it also becomes a bearer of cultural heritage and a means of mass communication. It is one of the most accessible and widely distributed materials across the world with a seemingly endless stream of applications.

Williams (2005:8) explains that there has been an anticipated disappearance of paper due to the growth of the digital era, but the complete opposite has appeared to happen and paper production is growing every year. Now the well-known material that has previously been taken for granted is being re-looked and an exponential growth in the use of the material amongst product designers, fashion designers as well as architects who are experimenting with the properties of paper.

For the purpose of this study the material will be investigated as a medium for 3 dimensional design manifestations. Paper has a high value due to the easy production and the wide range of possibilities for use and many ways which it can be shaped. Although this material has so many opportunities and variety of applications it is still viewed as a fragile, temporary and unsophisticated material which we dispose of after use.

### 4.2.1 PAPER IN ARCHITECTURE

Paper has been an extremely important part of the design process for many architects and designers. It is one of the first steps in the design process and models built express sculptural qualities that inform many designs. A paper model can easily be altered to explore and understand scale or we can experiment with shapes and spaces, and these qualities add to the significance of the use of paper in the design process. Apart from the design process, paper has not been a material for building application until recently, only as an exception as the surface based application of wallpaper and Japanese shoji screens. Architect Shigeru Ban pushes the boundaries of this unsophisticated and fragile material. Refer to section 4.3.1 for further elaboration on the work of architect Shigeru Ban.

Many creative artistic expressions have emerged from developing paper as an artistic medium as well as product based material exploration but there still remains very little exploration of paper as a material for spatial intervention, which goes beyond the technical limitations and surface based application. Refer to the visual study done in section 4.3.



## 4.3 VISUAL STUDY

The visual study, figure 4.3.8 on the opposite page, is used to place paper in a larger context of design applications to be able to identify the current status, character and identity of the material. The visual study supports the initial insight to the material as a medium for making from which making techniques are identified for the material exploration see section 4.5 for clarification.

### 4.3.1 SHIGERU BAN

To place paper in the context of the built environment, a section of the visual study is focussed on Japanese architect Shigeru Ban who is known for his innovative application of cardboard and other paper based materials. Hill (2014) states that Ban has been applying paper and cardboard tubes as material in his building constructions since 1986. He focusses on design for disaster relief and is attracted to paper because of the low cost, recyclability and availability which allows for efficient building construction.

The first application of paper as construction material was for the Alvar Aalto Exhibition in 1986 where Ban experimented with paper tubes to construct the building, the kind of paper tubes found in textile factories. According to Hill (2014) the constraints of the budget as well as the recyclability of the installation was the main justification for the use of cardboard tubes and this became Ban's main argument for the use of this material.

Ban enables cardboard to go beyond the technical limitations through the investigation of meticulous and innovative joinery and techniques. By designing intricate fittings for the cardboard tubes to be fixed to additional materials and surfaces, a vast amount of opportunities are presented for light weight, sustainable and efficient construction. However the predominant use of cardboard tubes as substitute to conventional materials such as timber poles results in a lack of paper application in all its possible manifestations. Ban's structures do not express the unique qualities of the paper-like material to its full potential.

The Japanese pavilion at the expo in Hanover expressed sustainable design which was the central theme of the expo. The pavilion was designed to be dismantled after the expo to be used again. The pavilion was constructed of recycled materials, which consisted of the timber frame, cardboard tubes plastic as well as waterproof paper.

The use of innovative joining solutions enabled the lightweight construction with the use of cardboard and contributed to the overall aesthetic character of the pavilion. Detail (2000) describes the structure as having a lattice grid shell made of cardboard tubes which spans over the main hall, while the walls are cable-tensioned honeycomb cardboard construction. The skin that covers the entire structure consists of a layered fire and waterproof paper membrane, see figure 4.3.1.

For the purpose of this study, paper will be investigated as an artefact in an interior environment which expresses the unique latent character. The exploration becomes focussed on enabling paper to do which it ordinarily cannot, due to the limitations inherent in its technical characteristics, through meticulous joinery which allows for a novel expression of an unsophisticated material. The exploration of paper will therefore be supported by additional materials that would act as armature to the paper artefact.

Figure 4.3.1 Japanese Pavilion (Anderson. 2014)

Figure 4.3.2 Close up of Pavilion (Designboom. 2013)

Figure 4.3.3 Pavilion Detail (Ricther. n/a)

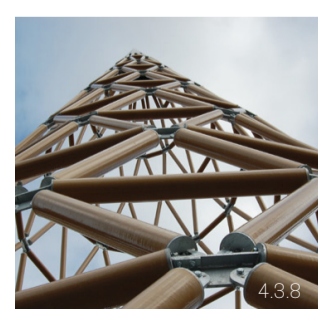
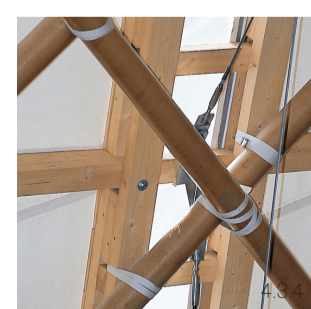
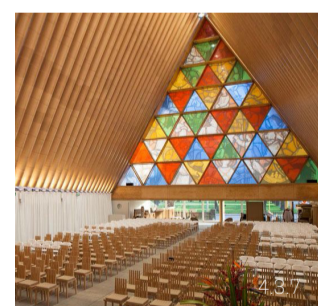
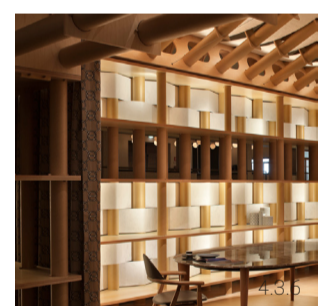
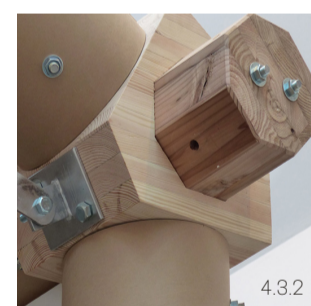
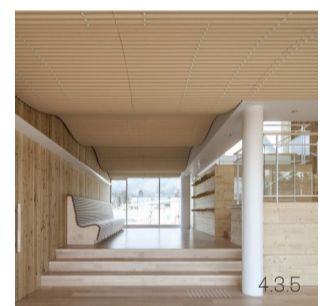
Figure 4.3.4 Detail joinery (Ricther. n/a)

Figure 4.3.5 JR Onogawa station (Hirai. 2015)

Figure 4.3.6 Hermes pavilion (Designboom. 2011)

Figure 4.3.7 Cardboard cathedral (Anderson. 2014)

Figure 4.3.8 Paper Tower (Designboom.2009)







The exploration becomes focussed on enabling paper to do which it ordinarily cannot, due to the limitations inherent in its technical characteristics, through meticulous joinery which allows for a novel expression of an unsophisticated material.

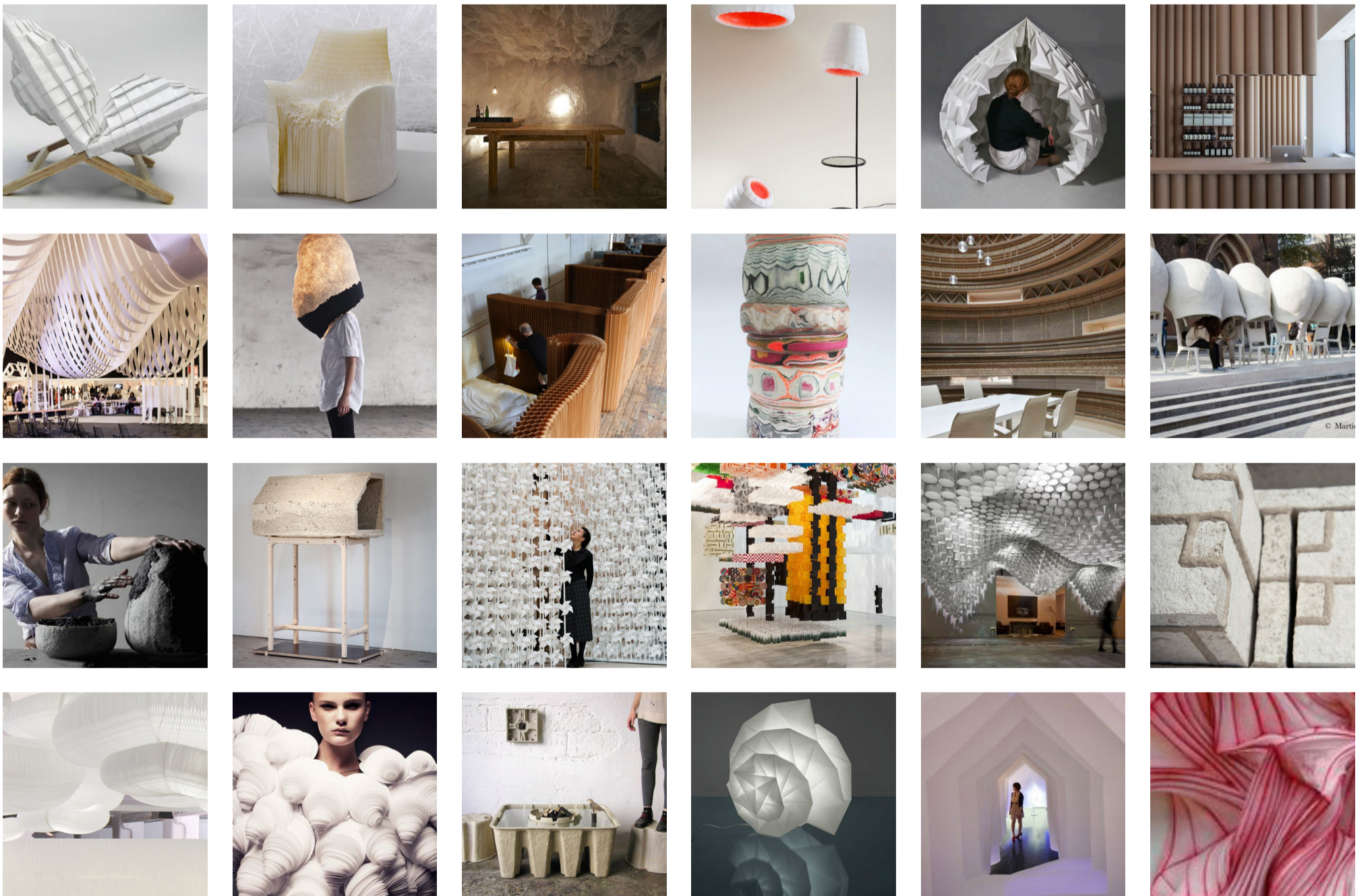


Figure 4.3.9 Collage of paper products and interior application (Various Sources)



## 4.4 PAPER OBJECTIVE

The focus is not to create an individual creative object, but to explore what the relationship is of paper to the materiality of an interior environment. The question is focussed to what the materiality of paper can contribute to the aesthetic of interior space as the mediator in the convergence of the physical and digital realm, as elaborated in Chapter 3 section 3.3.

The intention is to investigate paper as a medium to create a visual link in the convergence of the digital and physical realm, to express a novel character of the *cybrid* archive. Within the context of this study, the aesthetic material qualities should root us to the ground as material beings through the application of a rich sensory experience. The material and immaterial qualities of paper therefore becomes the rare and exotic material and tactile experience in a sea of technology. Refer to figure 4.4.1 as well as section 4.5.4 where through the act of making, unique qualities have been extracted which will serve as guide to the intended spatial aesthetic and character.

Paper will be explored as the artefact that becomes the aesthetic joinery on a larger spatial scale as well as the application of intricate material to material joinery.

The unique expressive characteristics of paper are celebrated through novel application within the architectural *cybrid* archive where designing architecture on paper takes a shift towards paper becoming the architecture.

The exploration of paper for spatial intervention will be driven by both the artistic expression as well as the technical limitations, see figure 4.4.1, as preliminary associated characteristics attained through theoretical and visual studies.

| PAPER      |  |
|------------|--|
| OPERATION  | Record and document                    |
|            | Carrier of information (communication) |
|            | Blank canvas                           |
|            | Lasting                                |
| IMMATERIAL | Dynamic                                |
|            | Ephemeral                              |
|            | Unsophisticated                        |
| MATERIAL   | Thin                                   |
|            | Fragile                                |
|            | Flexible                               |
|            | Lightweight                            |

### NEW SPATIAL AESTHETIC

Exploration not only of one or the other but the integration of both, to define a new spatial aesthetic, as the material and immaterial joinery between the digital and physical realm to support the *cybrid* character.

What is the aesthetic language in an interior environment that captures the artistic and goes beyond the technical limitations?

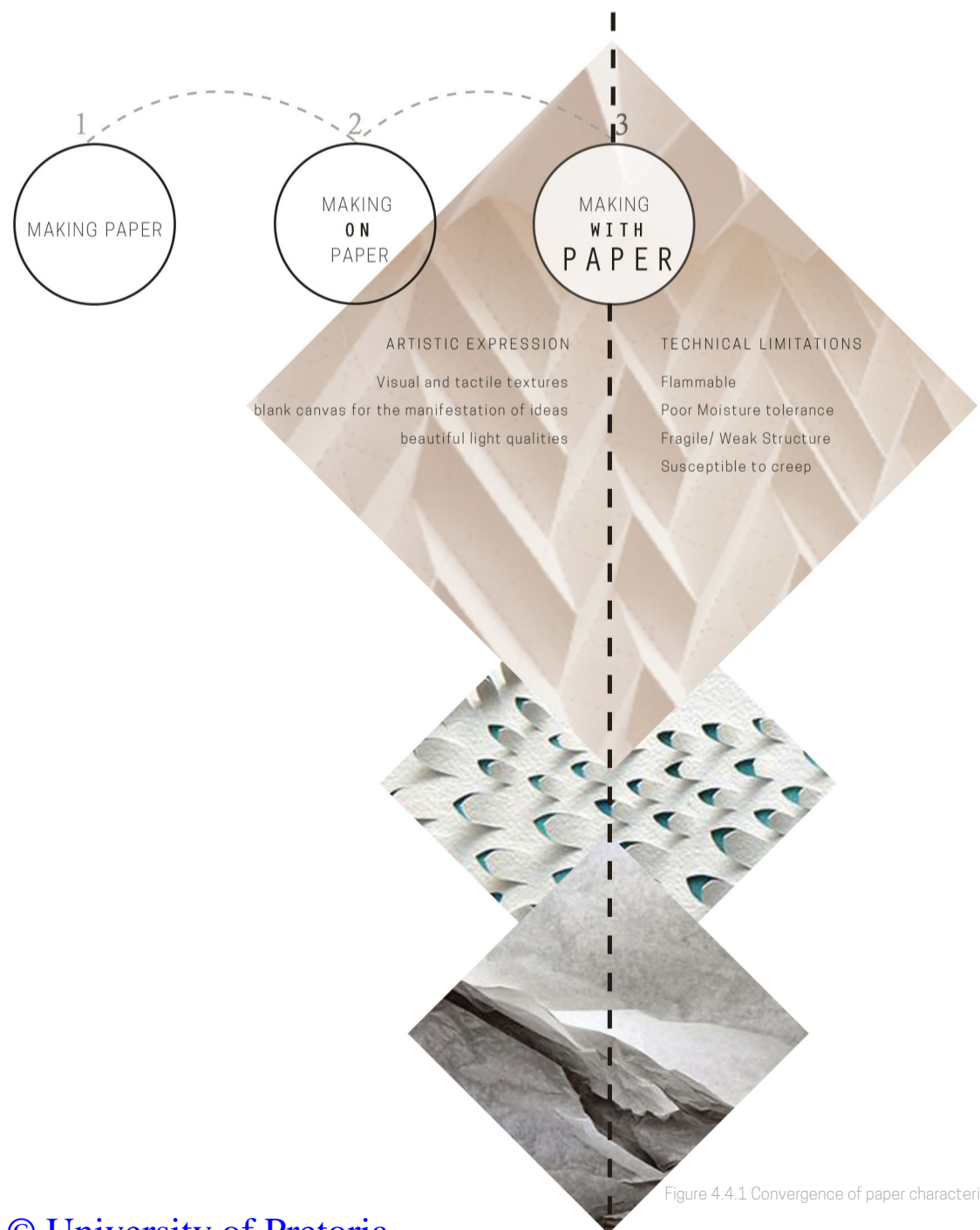


Figure 4.4.1 Convergence of paper characteristics (Author. 2016)

## 4.5 MATERIAL EXPLORATION

TWIST



ROLL



WEAVE



FOLD



CUT



LAYER



MACHE



*My experience of making my own design ideas convinced me that understanding materials, and gaining practical experience of using them, was essential to developing ideas and finding ways of making them happen.* (Heatherwick. 2013:10)

Nimkulrat (2012:1) explains that the act of making by hand can be seen as a way of thinking through the senses. Through the making process a deeper understanding and insight of the paper is achieved. An intuitive exploration was conducted to gain the insight and to further extract the unique qualities inherent in paper, through the use of the hybrid process which is supported by a rigorous documentation of the observations made and reflection to the samples as proposed by Wherry (2015).

The visual study served as inspiration point for further exploration to be done, from which crafting techniques are identified to move into material exploration. There is an endless range of crafting techniques that could be used for the exploration of paper which was identified through the process of doing the visual study. They could be categorised into industrial processes which require machinery and technologies for the material exploration, and hand craft processes which requires only the skills of the maker for the material exploration. Within the boundaries of this project techniques are identified which do not need a sophisticated workshops and technologies. The following crafting techniques were selected for exploration through acquiring a better understanding from the visual study as well as prior knowledge attained of paper.

The intention of the first phase, see figure 2.3.6 Synthesised design process in Chapter 2 section 2.3.3, of making as an intuitive exploration is to define the unique characteristics of paper which would inform the design of the spatial intervention.

Figure 4.5.1 Techniques for making with paper



## 4.5.1 FOLDS

Technique:

Folds

Description:

Process of folding paper allows the flat sheet to become 3 dimensional through specific folded patterns. Samples include 2-4, 9, 15-19, 22-26 refer to Appendix A for clarification of individual samples.

Observation:

Creating intricate folds is a timely process and therefore time becomes a limitation when making by hand. The fold samples made are small scale and simple patterns and it would be beneficial to explore more complex folds that could manifest into more organic forms.

Aesthetic Quality:

Intricate three dimensional forms are created through different folding techniques which allows for various textures to be explored. The textures from samples 17,18 and 22 are visually stimulating as they have a complex yet organized pattern. The folded samples add a new dimension to the paper creating defined planes with shadows. The folded paper has a rigid and geometric pattern as well as defined sharp edges and has organic movement.

Potential:

The folded samples create intriguing visual textures and could be employed to give a flat surface new dimension. The fold patterns have strong defined sculptural character which could become a focal point within the whole intervention which would contribute to the aesthetic value of the space. Textures can be explored further to create irregular patterns to avoid a monotonous texture in a larger scale. Sample 3, 4, 17 and 18 holds potential for kinetic application in the interior environment, creating opportunity for adaptable spaces. Selected folds have structural potential to carry itself and not additional weight. Sample 4, the symmetrical repeat fold, inspired movement in the space.

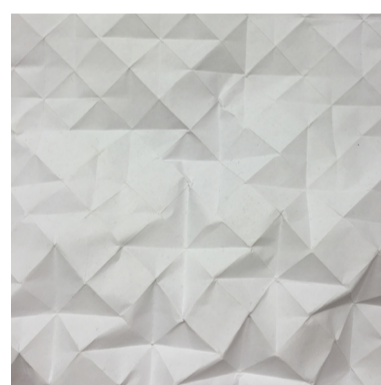
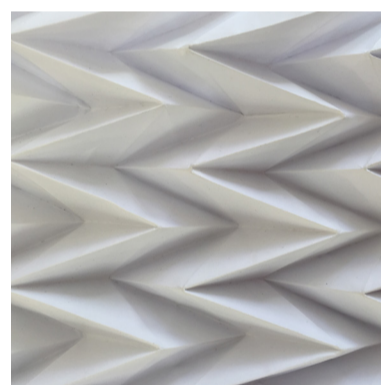
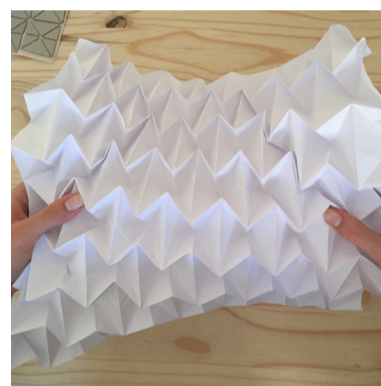
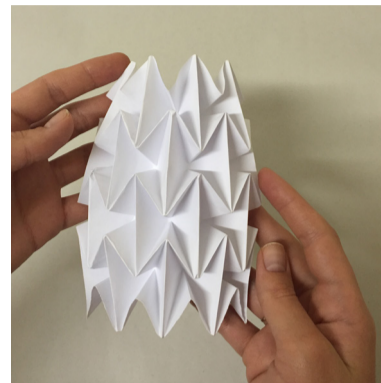


Figure 4.5.2 Folds: Material Exploration

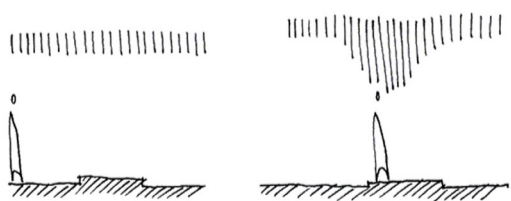


Figure 4.5.3 Sketch development: adaptable plane (Author. 2016)

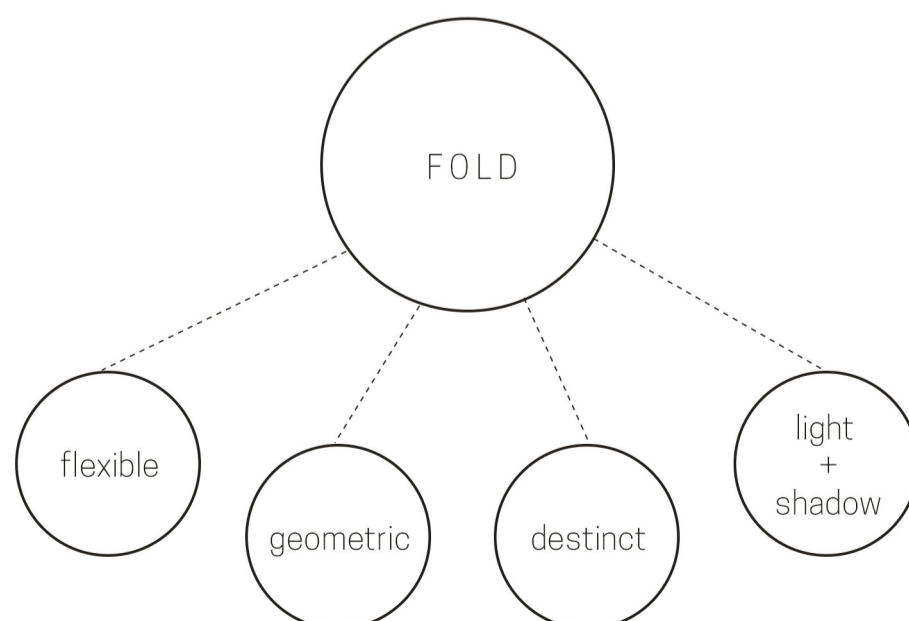


Figure 4.5.4 Associations of folding (Author. 2016)

## 4.5.2 PAPER MACHE

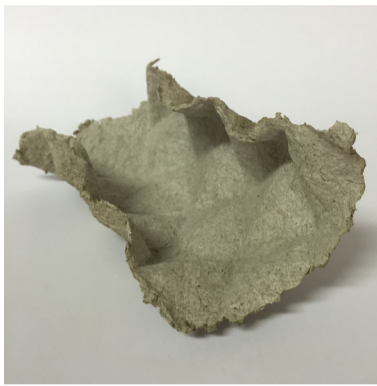


Figure 4.5.5 Paper Maché: Material Exploration

Technique:  
Maché

Description:  
Mixture of paper pulp and glue or of layers of paper glued and pressed together, which can be moulded when wet, becoming hard and stronger when dry. Samples include 8, 11-13 Refer to Appendix A.

Observation:  
Processing material creates new material that is extremely malleable and could take almost any form. Although the pulp consists mainly of paper, after processing it obtains new characteristics and loses its flexibility and malleability after it has dried. No longer allows light through. Paper pulp could be dyed to explore a colour palette. Could be explored with additional materials such as cement.

Aesthetic Quality:  
The paper maché samples have a rough and irregular surface texture creating a rough and crafted look and feel. A hand crafted quality is clearly expressed through the samples and could contribute to a deeper association of hand craft, making and process to the aesthetic of the archive.

Potential:  
The pulp has a lot of structural potential to carry weight and could be treated to achieve moderate level of durability. The paper pulp can be moulded into a variety of three dimensional shapes that requires low tech processes. Material is extremely lightweight and strong, can be employed as space defining or furniture element.

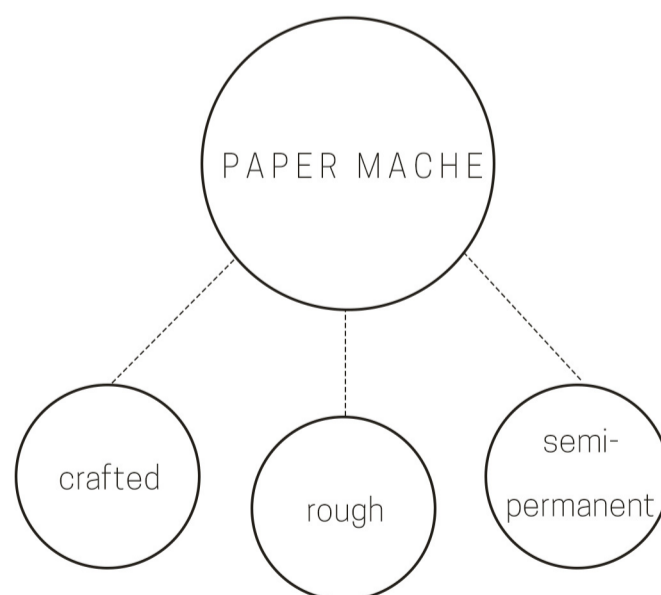


Figure 4.5.6 Associations of paper maché (Author. 2016)

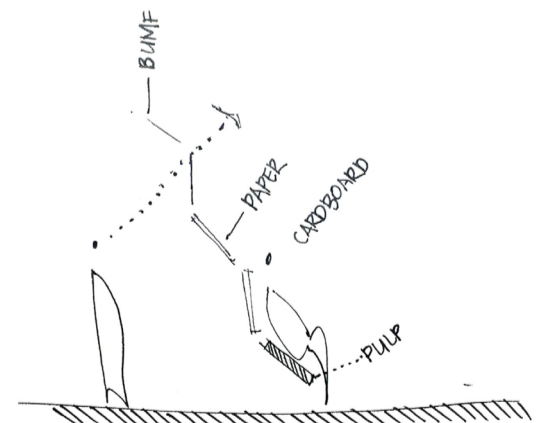


Figure 4.5.7 Sketch development: Potential application (Author. 2016)

### 4.5.3 CUT AND LAYER

Technique:  
Cut and Layer

Description:  
Cutting and Layering samples include 6, 7, 14 and 27 refer to Appendix A.

Observation:  
Cutting and layering with paper is one of the simplest methods of making with paper, however the configurations could have extremely intricate outcomes by shaping the planes in successive sequences.

Aesthetic:  
Layering paper, as per figure 4.5.8, creates a pleasing visual texture whilst allowing light to create a dappled effect. The use of tracing paper contributes an ephemeral feeling due to the thin fragile quality of the paper. The way the light reacts with the layered paper emphasises the sculptural qualities and potential of the sample.

Potential:  
Layering the paper vertically holds potential for adding a new layer of depth to the space and volume. The paper can be cut in endless configurations that could define the space in multiple artistic expressions.

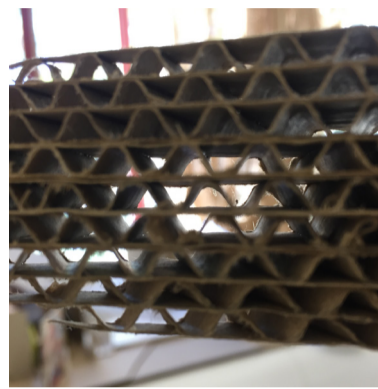


Figure 4.5.8 Layered: Material Exploration (Author. 2016)

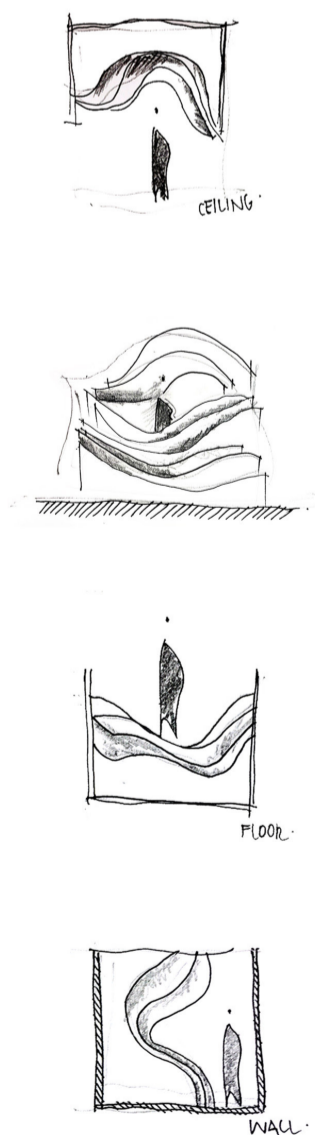


Figure 4.5.9 Sketch development: layered paper planes (Author. 2016)

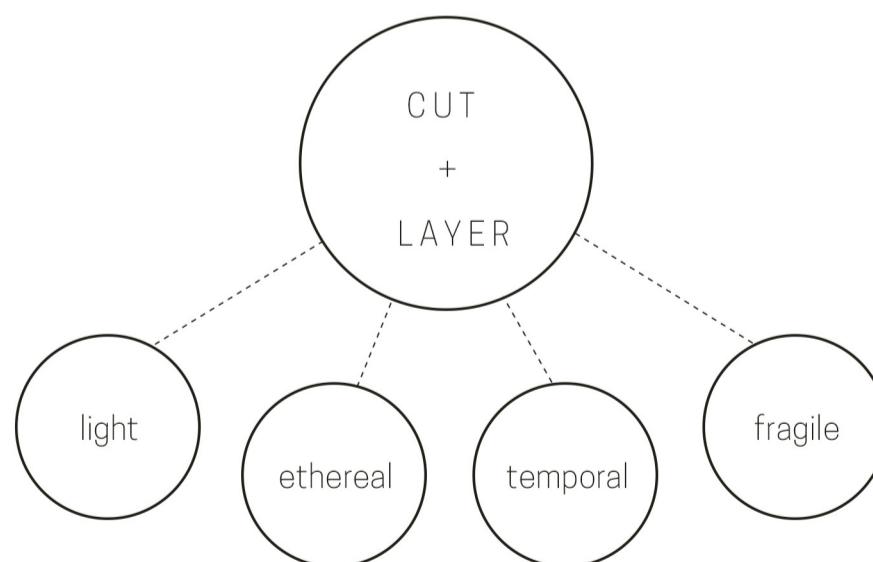


Figure 4.5.10 Associations of cutting and layering (Author. 2016)



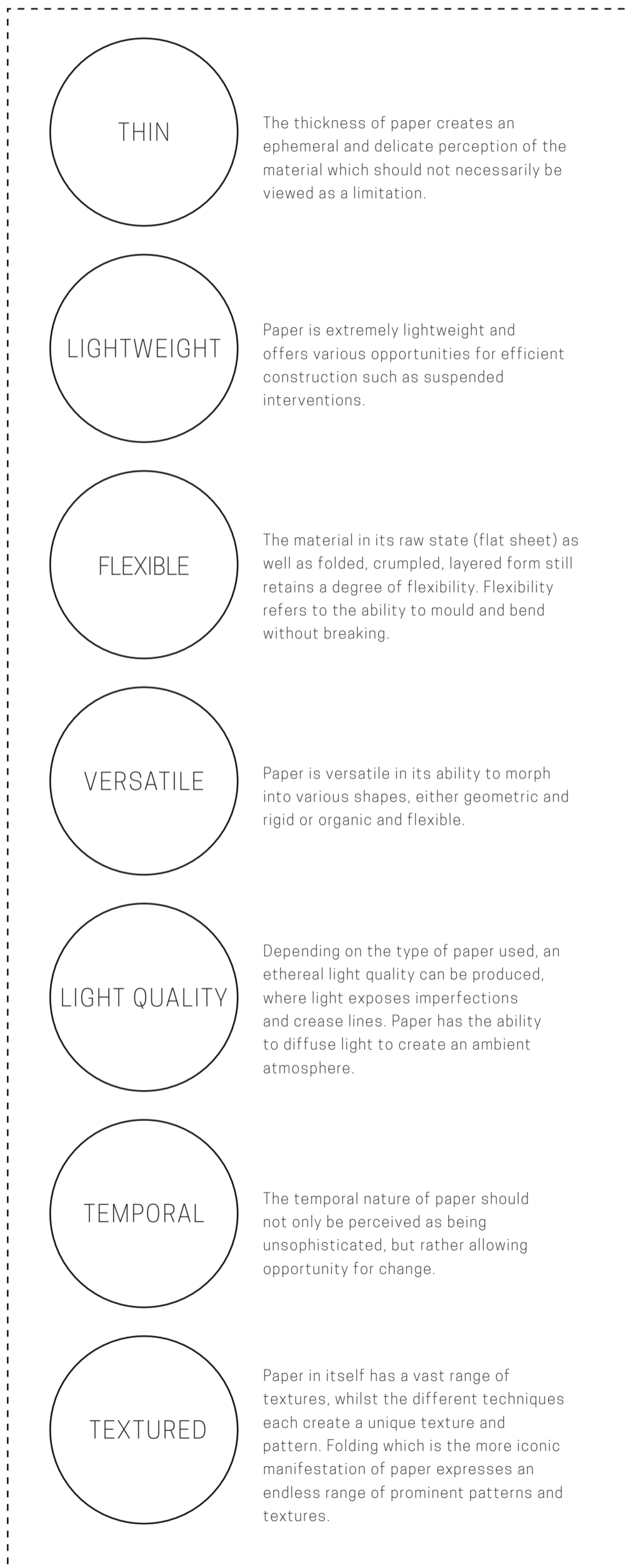


Figure 4.5.11 Qualities of paper(Author. 2016)

#### 4.5.4 CONCLUSION

Through the process of exploring the potential and character of paper, a clear understanding was achieved of the material's potential and limitations. The act of making allowed ideas to develop for possible spatial application whilst designing in a conventional manner (two dimensional spatial planning and design sketches) alongside the making process. Refer to Chapter 2 section 2.3.1 and 2.3.2 for further elaboration on the proposed parallel design process.

All of the samples could be explored as hybrid methods to enhance and redefine the qualities of paper. For further exploration of paper this study takes a tectonic approach to the making with paper. In the following phases of making an armature will be considered to enable paper to go beyond the perceived technical limitations.

The material exploration was conducted by manipulating different types of paper and photographing the outcomes to extricate the character of paper to inform the spatial design development. Figure 4.5.11 elaborates the characteristics and qualities extracted from both the visual study and the material exploration done.

## 4.6 MATERIAL ANALYSIS

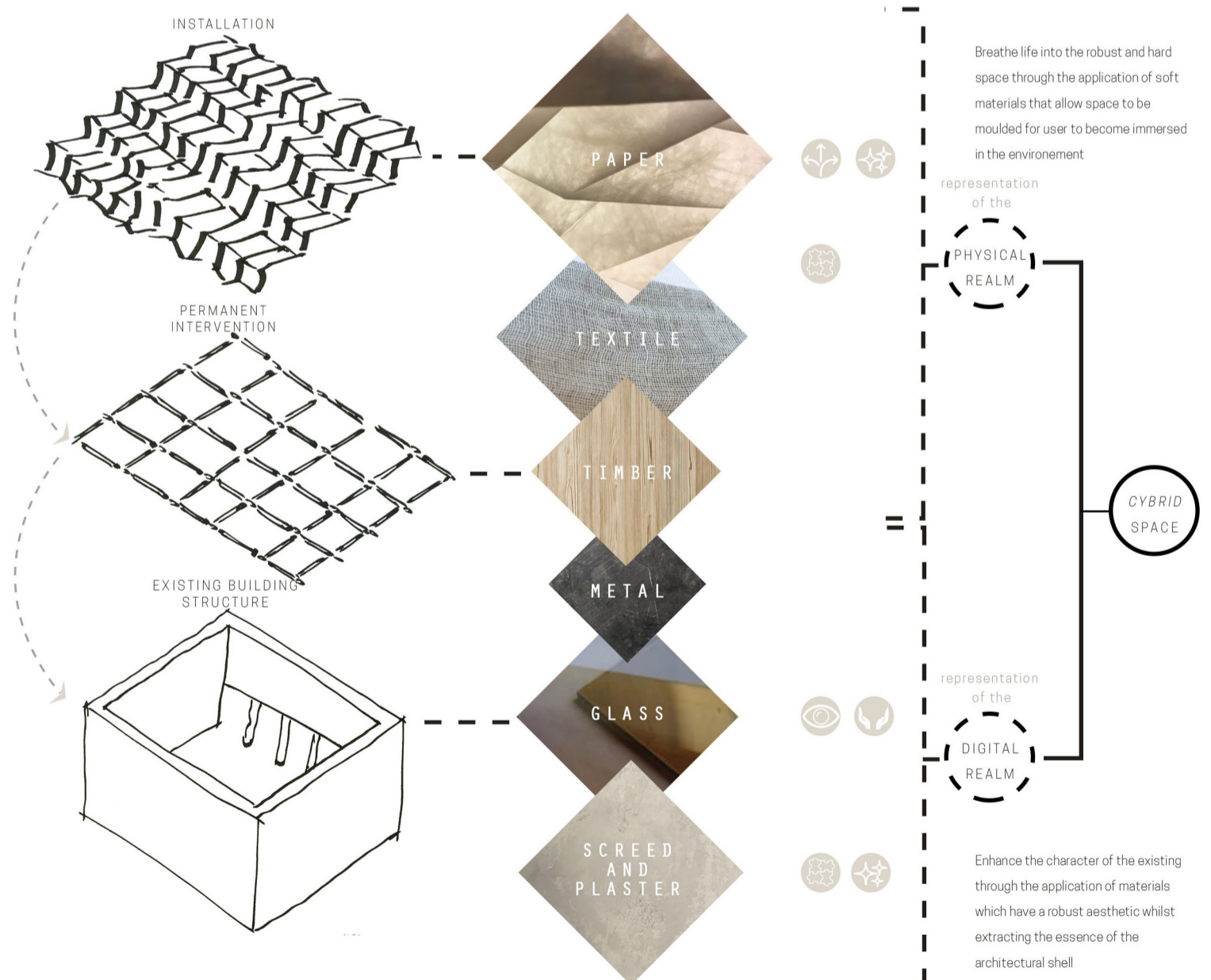
This study places emphasis on the exploration of material as an initial step in the design process, where the expression of paper becomes the crux of the design investigation. It becomes clear that the selection of supporting materials for the intervention is vital for the development of the spatial character and artefact. The additional materials, as indicated in figure 4.6.1 and 4.6.2, are chosen according to the similarities in attributes as listed in table 4.6.1.

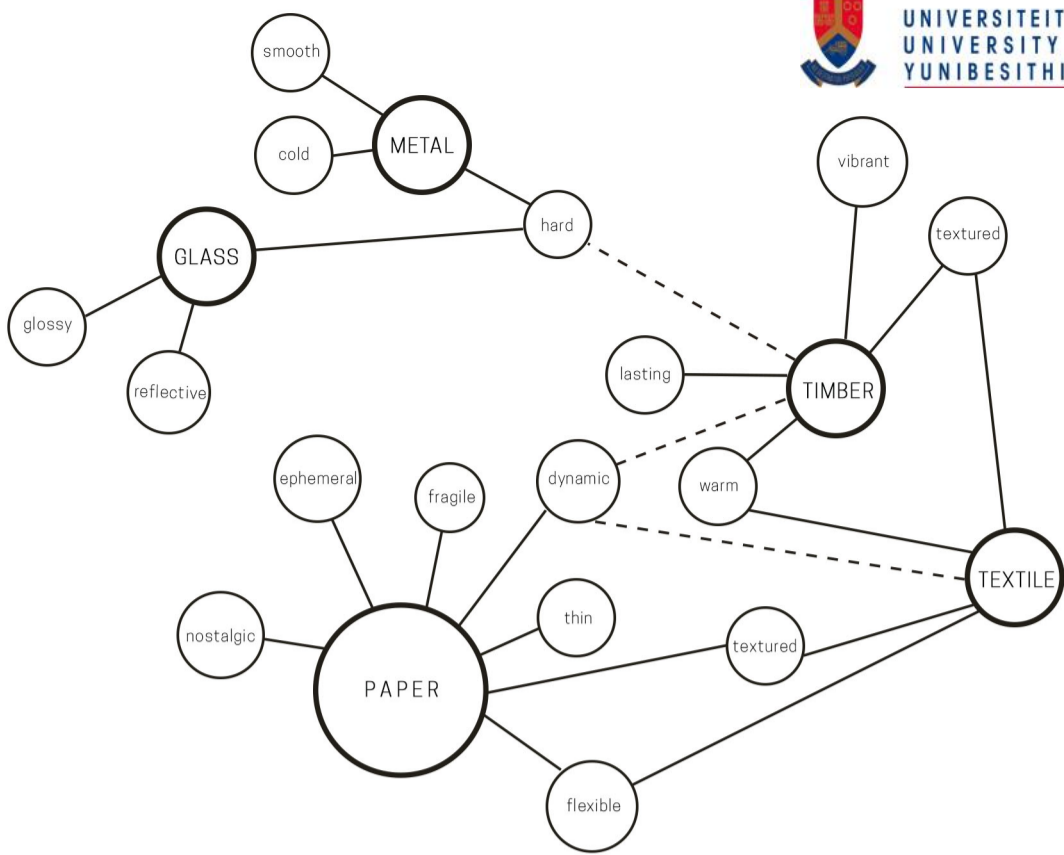
Figure 4.6.1 Material Associations (Author. 2016)

Figure 4.6.2 Material palette (Author. 2016)

Table 4.6.1 Material Analysis (Author. 2016)

| PHYSICAL  | DIGITAL  |
|---|--|
| Paper presentation is determined by the student's own taste and the fibre board wall allows for a variety of arrangements | The digital screen presentation is defined by the screen size and format. Less space is required as technology allows pin up to be controlled by user. |
| Form of the space and artefact expresses its content and function   | Form expresses its general function but does not express the specific content.   |
| Aesthetic attributes:<br>Textured<br>Warm   | Aesthetic attributes:<br>Smooth<br>Cold<br>Glossy<br>Reflective<br>Hard  |
| Perceived attributes:<br>Organic<br>Vibrant<br>Nostalgic<br>Lasting   | Perceived attributes:<br>Monotonous<br>Futuristic<br>Fleeting  |
| Spatial Manifestation   | Manifestation through object   |
| Dimmed lighting, only illuminated when in use   | Screen is illuminated to reveal content  |






**MATERIAL PALETTE**


**FLOOR**


 Floorcrete  
as per CemCrete  
Colour: Dusky Rose

 Existing mosaic tile

 5mm Brass floor strip

**CEILING**

 PLASCON one coat ceiling paint  
Ultra matt finish  
Colour: Misty Dawn GR G04

 PLASCON one coat ceiling paint  
Ultra matt finish  
Colour: Zaire Junctions GR N03


**PAPER**


 75 gsm DuPont Tyvek Graphics  
Style: 1073D  
Colour: White  
Finish: Tyvek Fire Curb flame  
retardant coating

**WALL**


 Cemplaster  
as per CemCrete  
Colour: Milano Milk

 Cemplaster  
as per CemCrete  
Colour: Pavilion Grey

 PLASCON Evolution Super Matt  
VOC free paint  
Colour: New York Square GR N02

 InsulVue Double Glazing wall  
PG Building Glass  
ColourVue: Cool Bronze

**ARMATURE**

 Veil 100% Cotton handloom  
as per organic fabrics  
Colour: Natural

 SA Pine  
Finish: ProNature wax balm



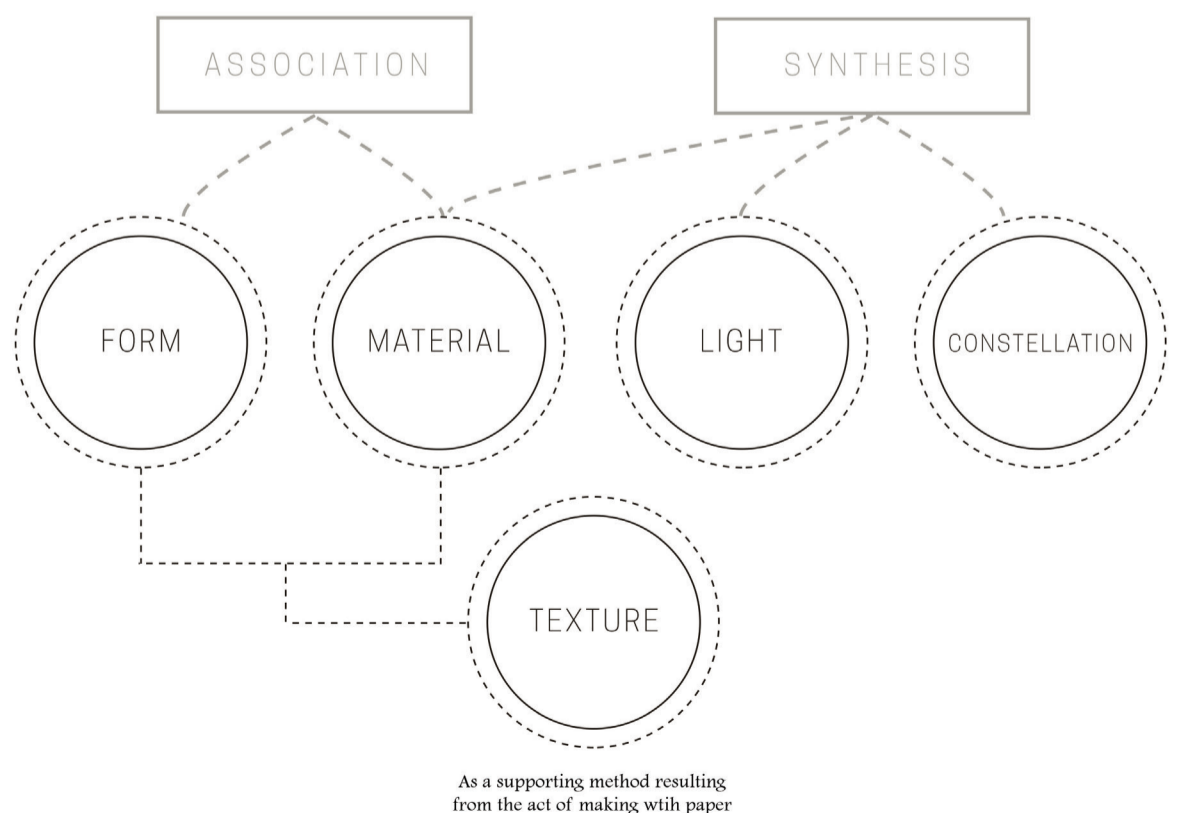


## 4.7 AESTHETIC

The role of the interior designer becomes focused on creating a seamless spatial aesthetic for the cybrid space refer to Chapter 3 section 3.3 Convergence of *cybrid* space. With reference to the comparative analysis, see Chapter 3 section 3.3.1, it becomes clear that we are losing valuable tangible qualities that create rich aesthetic and sensory experiences in the interior environments, therefore the materialization of the unique qualities of paper and of the *cybrid* archive becomes a key element to the design of a vibrant/elegant spatial aesthetic. Goldblatt (2007:11) uses the term aesthetic *as the perception of qualities generating feeling and emotion*. Within the context of this study the aesthetic quality of the space denotes the atmospheric and immaterial qualities experienced through physical and non-physical interaction of the space. Thackara in Roscoe (2007:105) brings to light that, *in response to our overexposure to digital objects and environments delivered through immaterial culture, that which remains tangible, tactile and material has the power to potentially root us to the ground as human beings*.

Mitchell (2002:428) illuminates the effect of technology on our perception to environments and explains that because technology makes it possible to locate oneself anywhere, *you will locate to where it's particularly attractive in some way* which he refers to as the revenge of place. Roscoe (2007:105) states that *as more experiences become immaterial, that which remains material may actually attain a new status as the exotic, the rare, and perhaps, the more meaningful*.

It becomes evident that the spatial aesthetic plays a significant role in the making of an integrated interior environment. The **exploration** of a new concept of *cybrid* space allows for opportunity to reintroduce a vibrant atmosphere and sublime beauty into the architectural archive.



The exploration of a new concept of *cybrid* space allows for opportunity to reintroduce a vibrant atmosphere and sublime beauty into the architectural archive.

Figure 4.7.1 Methods of Making (Author. 2016)

#### 4.7.1 METHODS OF MAKING

With the investigation of the new concept of a *cybrid* archive, the use of theoretical guidelines to serve as tools for defining the requirements (conceptual + functional) for the re-representation of the architectural archive. The two methods with their specified codes as discussed below are chosen as the most relevant tools to support the design development of the interior spatial intervention. The investigation of these two methods as primary focus does not disregard the additional three methods listed, as it becomes part of the intuitive design process.

König (2015) lists five methods of constructing meaning in an interior. The five main categories for the production of culture and meaning in interior design are synthesis, proximity, associations, timeliness and technification. Under each of these categories König (2015) identifies different codes used to construct the interior and he explains that these codes represent interior design actions in their use.

Focus is placed on association and synthesis to support the process of creating the new aesthetic character. The five most relevant codes namely: form, material, light and colour are identified to support the process of defining the *cybrid* character, but are not limited to only these codes. The design and making is an intuitive process which makes use of guidelines, refer to Chapter 3 Section 3.5 and Chapter 4 Section 4.7.3, to guide the decision making process throughout in order to achieve a cohesive aesthetic and spatial outcome.

The first method is *synthesis* and is defined by König (2015:151) as the selection of meaningful components and bringing them together as a cohesive whole. These components make up a complex interior space in a meaningful way to create a cohesive space. To counter the effect of fractured space refer to Chapter 1 section 1.2.1, synthesis is the appropriate method to be used for the design of the new *cybrid* space that would allow for both the physical and digital realm to be merged.

Synthesis comprises of twelve codes which are colour, constellation, curation, ensemble, light, material, object, style, symbolic motif, synthesis, taste good and techneme as determined by König (2015:169). The predominant codes selected for synthesis for the investigation of this study are light, constellation and material.

The second method is *association* which König (2015:205) defines as components of the interior space that creates connections in the mind that infer meaning, therefore without the association between the artefact and its referent the user would not be able to interpret its meaning. König (2015:225) denotes eleven codes for the concept of association which include analogy, boundary object, form, image, intertextuality, iteration, material, narrative, performance, tradition and wit. The predominant codes selected for association are material and form.

König (2015:208) explains the importance of the relationship between synthesis and association in the following quote:

*Various elements with their own associations communicate a sense of diversity. The interactions between meaningful elements generate depth and diversity in the message which makes it more subtle than if single elements were employed. This indicates the reliance on synthetic methods to generate associations in the interior.*

The influence and application of these methods and their codes are clarified through reflection and observations documented as an outcome of the act of making in section 4.8.



## 4.7.2 TEXTURE

Garcia (2009:9) highlights that pattern (texture) has always been a significant element of style, and elaborates pattern as being style, decoration, adornment, structure and detail. He further states that spatial pattern includes order, complexity, hierarchy, joint, expression, imagination, scale, function, unity, organization, balance, symmetry, symbol and creativity. Schumacher (2009:39) highlights the significance of pattern (texture) in the following quote:

***What things look like matters. Architectural patterns are a potent device for architectural articulation. Pattern emphasized function.***

As the result of the act of making with paper, particularly folding, it has become evident that tactile and visual texture manifest. The flat object (paper sheet) is manipulated into a three dimensional object and texture is no longer surface based, but the paper object becomes the texture, it attains a new dimension.

Djonov (2011:342) uses the study of visual surface textures to determine the meaning making potential of texture, as it is also a means for expression and communication for artists and designers. There lies potential in the act of making with paper from this study, to define spaces through the application of textures derived from the paper samples. The intention is to explore how the complexity of texture could articulate function within the larger archive space.

Schumacher (2009:39) clearly states that the concepts of expression and aesthetic character were traditionally used to show that decoration, particularly texture, was related to the space's purpose. He continues to explain that:

***Planning, structure and decoration are together involved in expressing the character of the building. Ornamental pattern convey atmospheric values which translates into the atmosphere of the spaces which conveys the character and expression*** Schumacher (2009:40).



### 4.7.3 CYBRID CHARACTERISTICS

The characteristics which define the aesthetic of the *cybrid* archive will be defined through the interpretation of associations extracted from both the digital and physical realms as identified in Chapter 3 table 3.3.1: Comparative analysis and section 4.6: material analysis, as well as throughout the theory and precedent analysis done. The most significant characteristics are taken from each realm and are translated into a *cybrid* column which denotes the *cybrid* space, refer to table 4.7.1 for further elaboration.

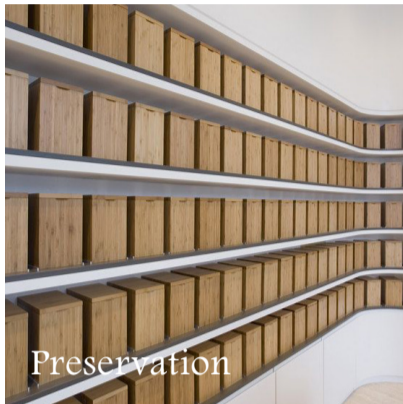
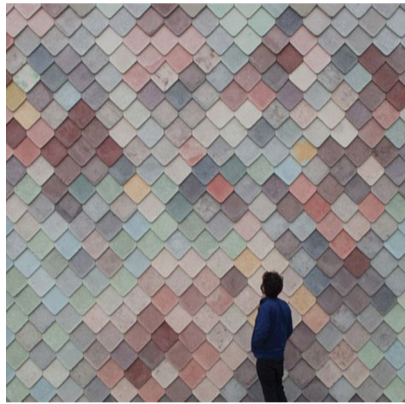
The characteristics listed in the table below, are key elements which drive the decisions made for the spatial aesthetic and function of the intervention, and will further be elaborated in the application of each design element, see Chapter 5: Technification. The aesthetic palette on the opposite page serves as inspiration for the application of the characteristics listed in the *cybrid* column of table 4.7.1, to create a space which captures an ethereal quality through material, form, and light.

CYBRID CHARACTERISTICS

|            | PHYSICAL REALM  | DIGITAL REALM                               | CYBRID SPACE  |
|------------|---|---|---|
| OPERATION  | Preservation<br>Collect, Document and Record<br>Process | Preservation<br>Efficiency<br>Accessibility | PROCESS: exposure of how space and systems work<br>PRESERVATION: preservation of valuable qualities threatened by dematerialization<br>VISUAL ACCESSIBILITY: creating access to information in all its manifestations |
| IMMATERIAL | Permanence<br>Nostalgic<br>Tangible                     | Transient<br>Futuristic<br>Intangible       | MORPH: how the interior environment accommodates various scenarios through a space that changes over time.<br>ETHEREAL: an exquisite atmosphere that captures both the nostalgic and futuristic qualities.            |
| MATERIAL   | Vibrant<br>Textured                                     | Reflective<br>Smooth                        | METICULOUS JOINERY: elaborating the material to material joinery to deliberately emphasize the contrasting characteristics.   |

Table 4.7.1 *Cybrid* Characteristics (Author. 2016)

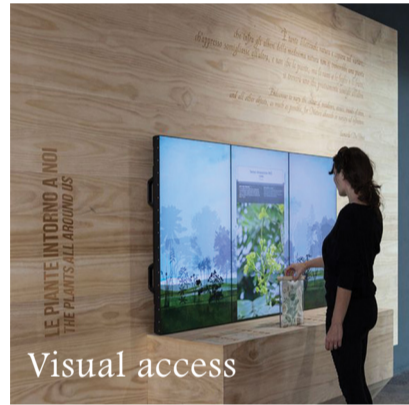
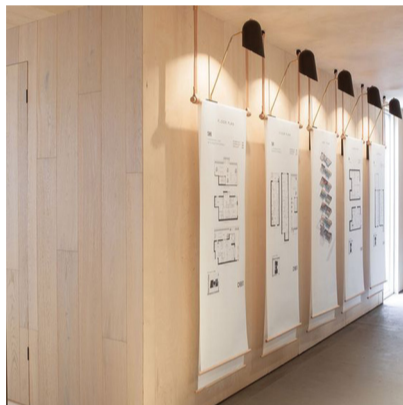




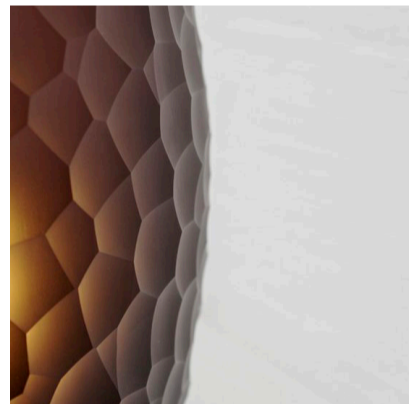
Preservation



Morph



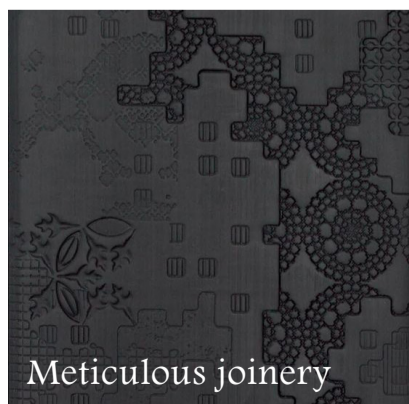
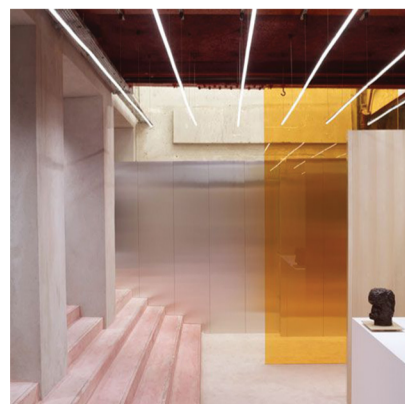
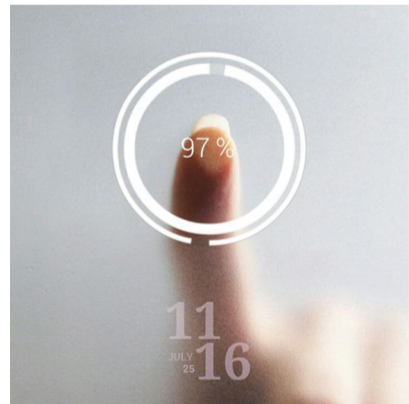
Visual access



Nostalgic



Ethereal light quality



Meticulous joinery

Figure 4.7.2 Spatial Character (Author, 2016)





## 4.8 MAKING IMAGE

Moving from material exploration to spatial planning and layout design proved to be a struggle and resulted in a very two dimensional understanding of the space, making it extremely hard to imagine and design for the intangible spatial experience. The design process shifted away from conventional two dimensional drawings and planning back to making to further explore the spatial expression of the paper.

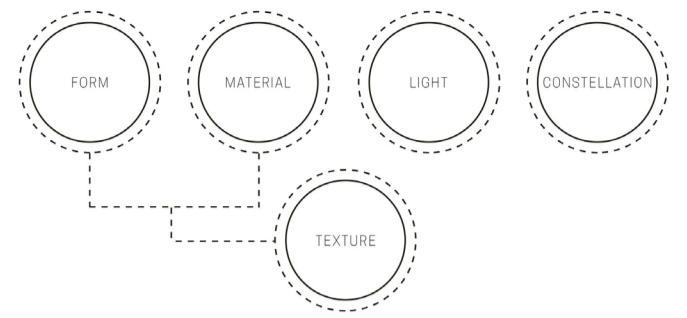
Nimkulrat (2012:10) explains that in order to understand the experience of the users of the space, the designer must embody the attitude of the user while making the artefact, which will give the designer maker more insight into the qualities expressed through the material to encourage the user to interpret and experience the artefact in a specific way. Through making we stimulate our own senses as designers.

The study has taken a shift away from the material exploration (material as product) as is the nature of the research through making methods, towards a spatial exploration through the expression of materiality. The making process now shifted focus to how one can make space by using the material (paper) not only as a creative outcome but as an expressive process which is intertwined in the spatial intervention. The aim is to investigate a method that allows one to develop an imagined image (space) through the exploration of a 3 dimensional physical image (model). The model should capture qualities of the space that cannot be easily explored on a conventional plan or section. The making process now starts to look at how a designer can make space through exploring a material spatially and volumetrically rather than developing a material artefact that could be applied to the space.

Heatherwick (2013:12) makes an interesting statement regarding the act of making as a powerful tool for imagination:

*Adopting a spirit of purposeful aimlessness, I was trying to avoid needing an outcome. Although giving myself permission to experiment, I remained open and receptive to the possibilities that the material in my hands were offering, ready to convert them into something useful.*





## 4.8.1 MODEL 1

**Description:** Model 1 was the initial step in the process of making the image to spatially express, within the specific context of the proposed interior space, the paper samples made. A section extrusion through all the significant spaces is used to explore the integration between different volumes.

**Observation:** The model clearly expresses the possibilities of what the paper artefact could be in this interior environment. Making the models takes definite shift away from material exploration toward more spatial exploration where a sample is translated into a volumetric application.

The scale of the paper installation in the space is over exaggerated, but it creates opportunity for the paper to be explored as a material that could be moulded into the space as it is an extremely malleable and flexible artefact once folded. The geometry of the fold patterns create interesting spatial forms, refer to figure 4.8.2, whilst creating a beautiful light quality on the folded planes.

**Reflection:** Documenting all the models in an informal manner during the making process allows for thoughts and observations to be recorded without breaking the creativity which connects to the informal nature of making.

The scale and ratio of fold to the space folded artefact could be explored further, to investigate the aesthetic effect as well as the spatial articulation of activities. Investigate the lighting effect as a result of the manipulated paper.

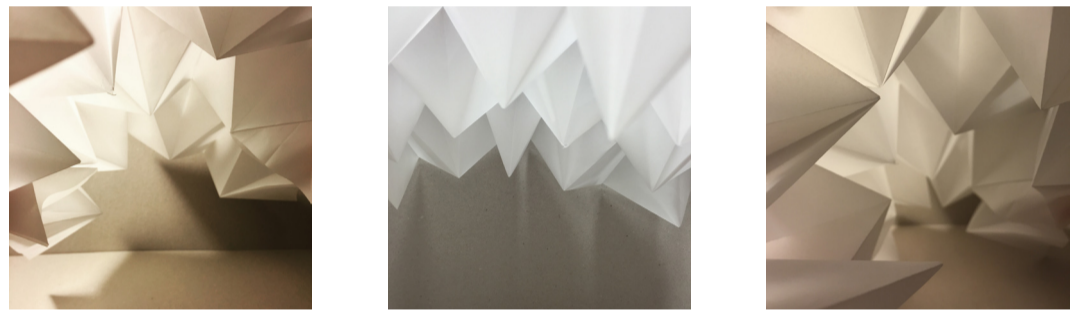


Figure 4.8.1 Collection of photographs: Test 25 (Author. 2016)

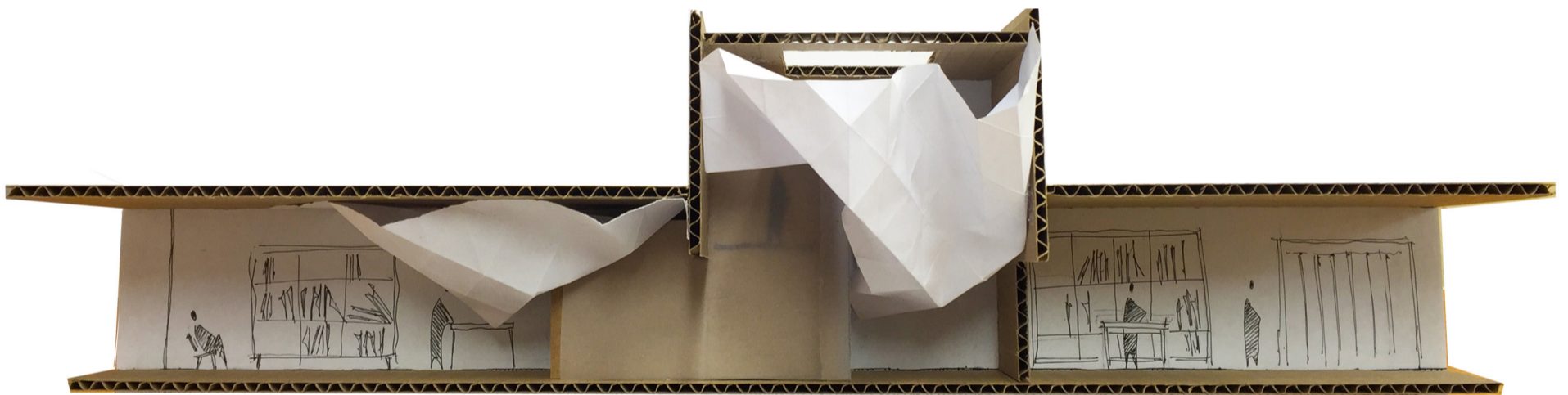
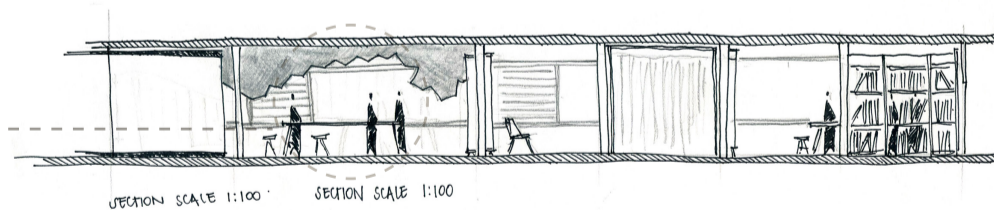


Figure 4.8.2 Sectional Model 1 (Author. 2016)

Moulding the artefact to articulate spaces.



Overhead plane is exaggerated in spaces where significant activities take place.

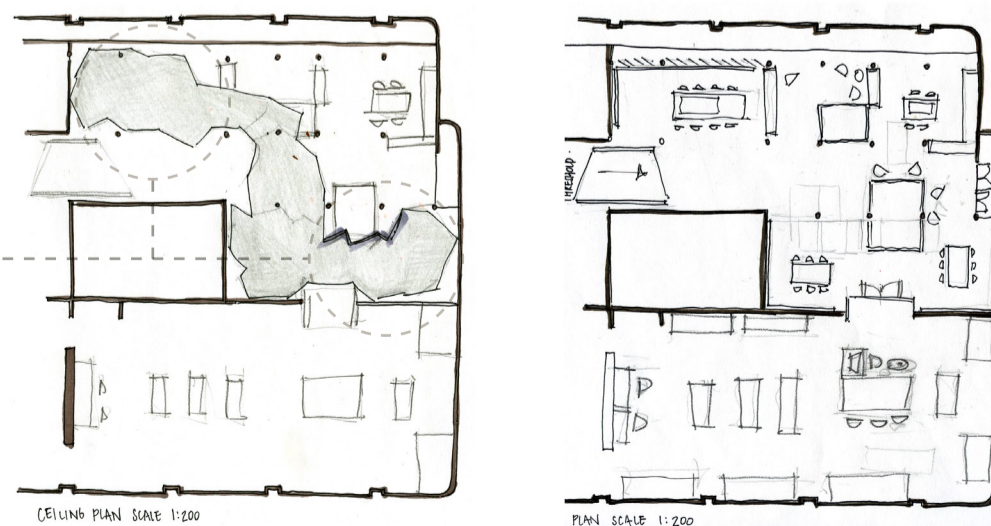
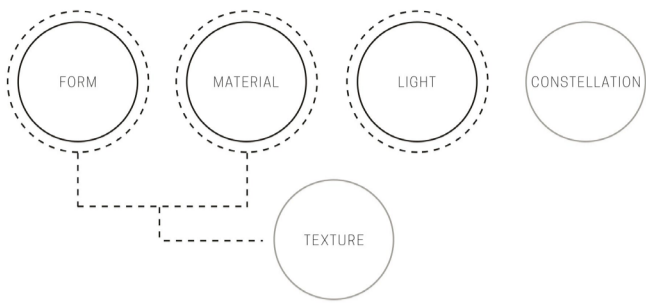


Figure 4.8.3 Spatial development sketch: Reflection to model 1 (Author. 2016)





## 4.8.2 MODEL 2

**Description:** Model was built roughly scale 1:100 and from sample 27 sketches where explored, refer to Appendix A sample 27, for possible spatial applications where after an intuitive exploration was done to express the material and its intangible qualities throughout the whole space. The sample, as per figure 4.8.4, was developed to investigate the effect of light with the translucent paper as well as the fluid planes.

**Observation:** Section extrusion model becomes inspiration for the whole interior space. Exploring the application of layered paper in one section allows the image created to be applied in the rest of the interior intervention. Caution should be taken as the design easily becomes focused on one cut plane in the same direction.

With support of objects in the space, the paper articulates spaces through unconventional form and texture, see figure 4.8.4 and double volume in figure 4.8.5. The fluidity of the paper planes as well as the translucent material creates unique shadows and allows light quality to change if the source of light is adjusted.

**Reflection:** Conventional plan and section drawings should be investigated for the application of the artefact as a whole for a well-integrated design outcome. Layering as technique in the space gives unique ethereal spatial effect which could be taken further in investigation of associations. Layers can be explored as individual elements with alternative techniques such as paper maché to strengthen individual layers. Explore possibility kinetic design.



Figure 4.8.4 Collection of photographs: Test 28 (Author. 2016)

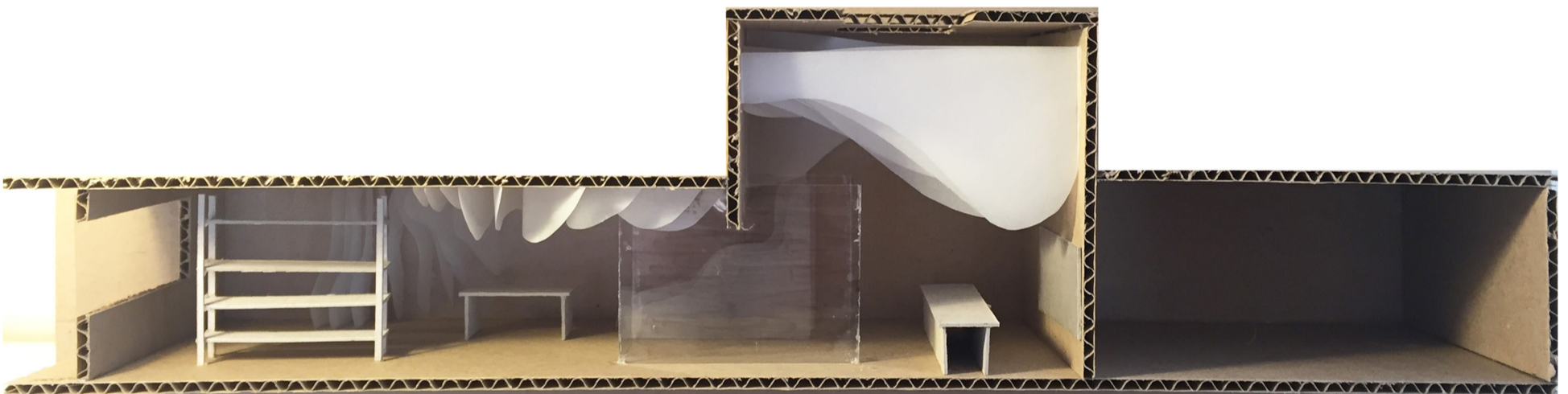
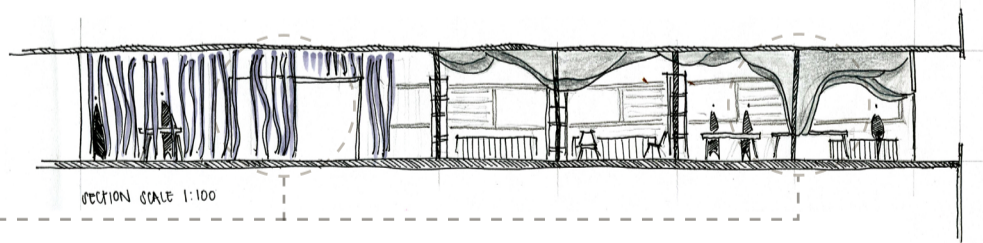


Figure 4.8.5 Sectional Model 2 (Author. 2016)

Layering with the paper allows for the views and transparency of spaces to be challenged.



Layering creates opportunity for privacy to be controlled to support the activities in the space.

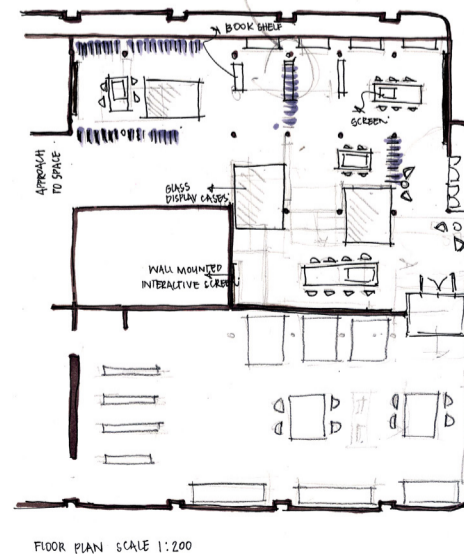
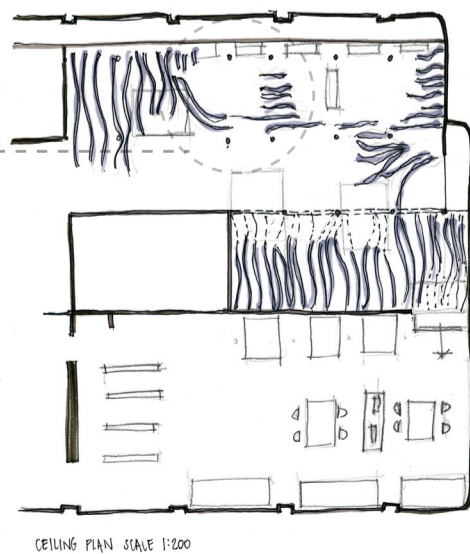
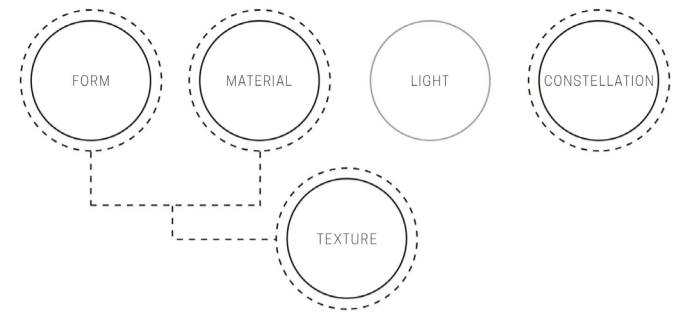


Figure 4.8.6 Spatial development sketch: Reflection to model 2 (Author. 2016)



### 4.8.3 MODEL 3

Description: : Model 3 is a reflection on model 1 which investigates a similar folded quality but through the use of an additional loose woven textile layer that serves as armature to the paper. The paper expression in the model is a response to test 8, see Appendix A. The model is built to explore the application of the hybrid paper sample in a different spatial configuration.

Observation: Section is cut only through one space therefore limits the spatial exploration as a whole. Adjacent spaces are separated from the model exploration and results in a fragmented outcome for the application of the paper artefact.

The series of photographs in figure 4.8.8 are used to investigate the flexibility and potential of movement of the artefact.

Reflection: Kinetic potential of folded paper should be explored as a method to create constellations within the space, to define spaces for activity.

The application of an armature to the paper artefact should be investigated to enable and manipulate artefact.

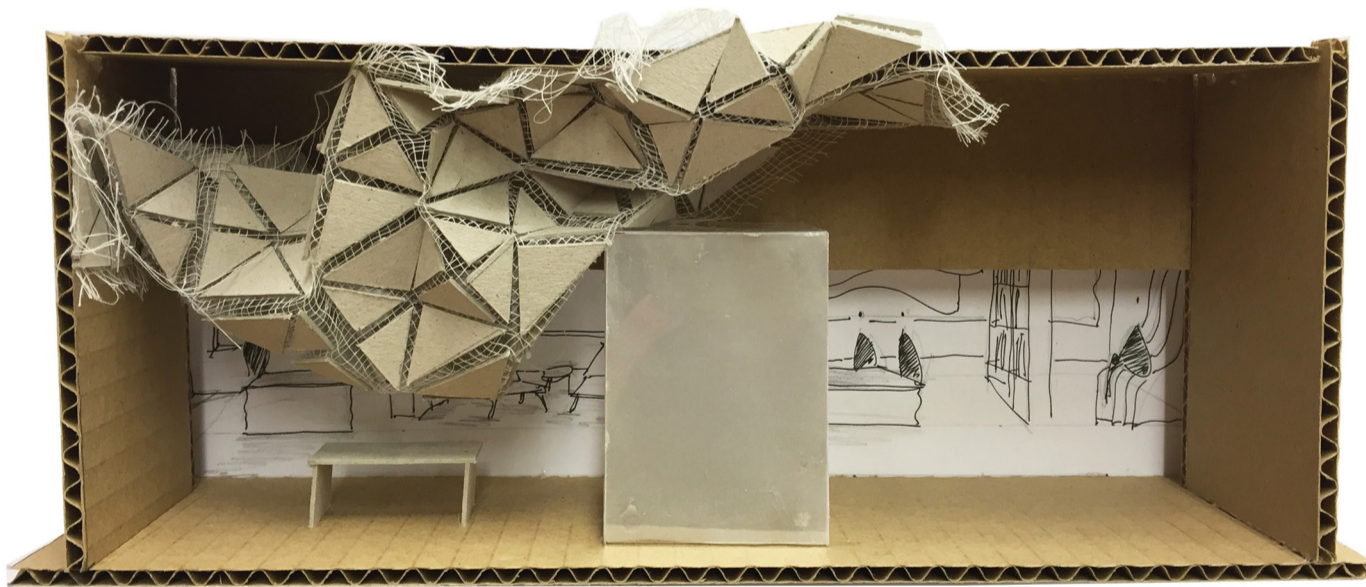


Figure 4.8.7 Sectional Model 3 (Author. 2016)

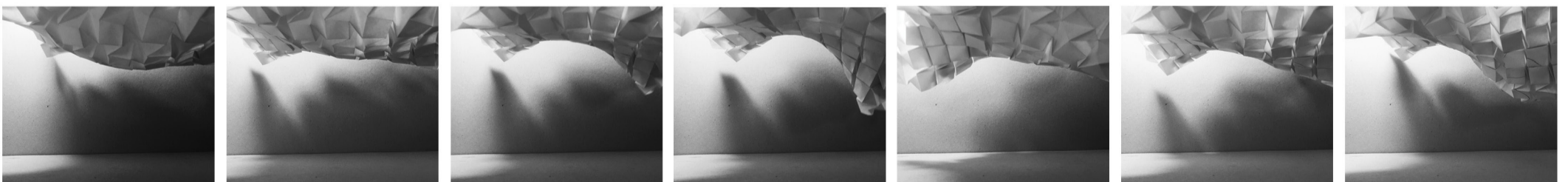
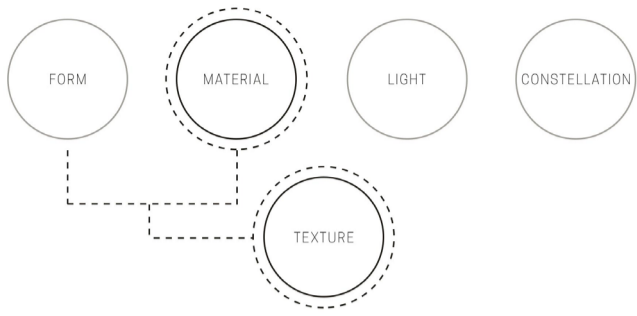


Figure 4.8.8 Collection of photographs: Test 26 (Author. 2016)





#### 4.8.4 MODEL 4

Description: : Model 4 aims to explore alternative applications for the paper artefacts apart from ceiling based interventions.

Observation: The artefact loses its dimension when applied as a vertical surface treatment and does not have enough spatial impact because spaces are not defined enough through this intervention. This application does not contribute to the spatial experience of the space.

Reflection: Vertical application of paper as space dividing element will not be investigated further as it shows the least potential to achieving a intriguing spatial and aesthetic impact and is perceived as a surface based application. Textures show diversity, refer to figure 4.8.9, and should be explored as elements to articulate space.



Figure 4.8.9 Collection of photographs: Test 23 and 26 (Author. 2016)

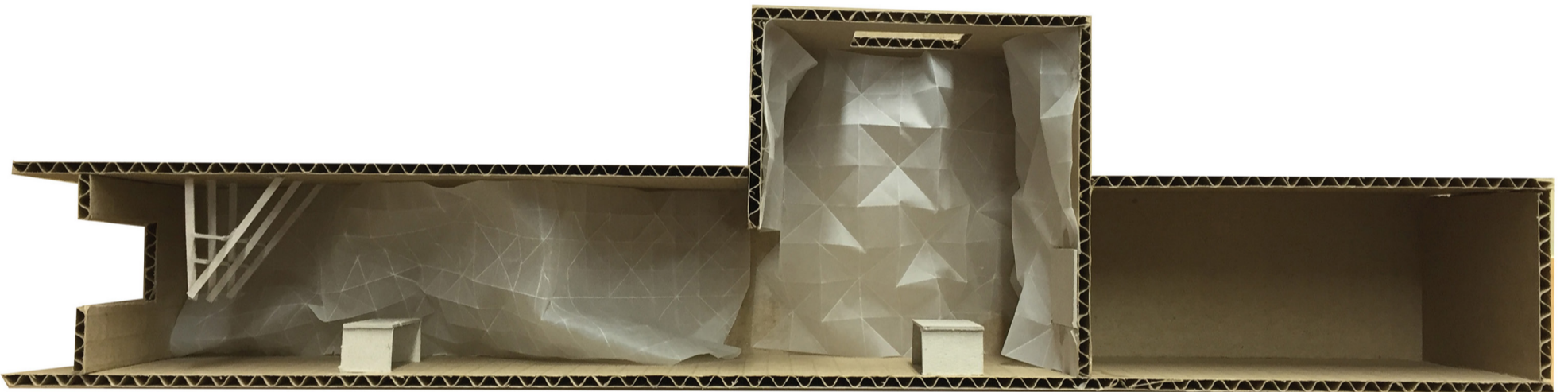


Figure 4.8.10 Sectional Model 4 (Author. 2016)

Vertical planes obstruct view in the space and creates too many smaller spaces, resulting in a disjointed environment.

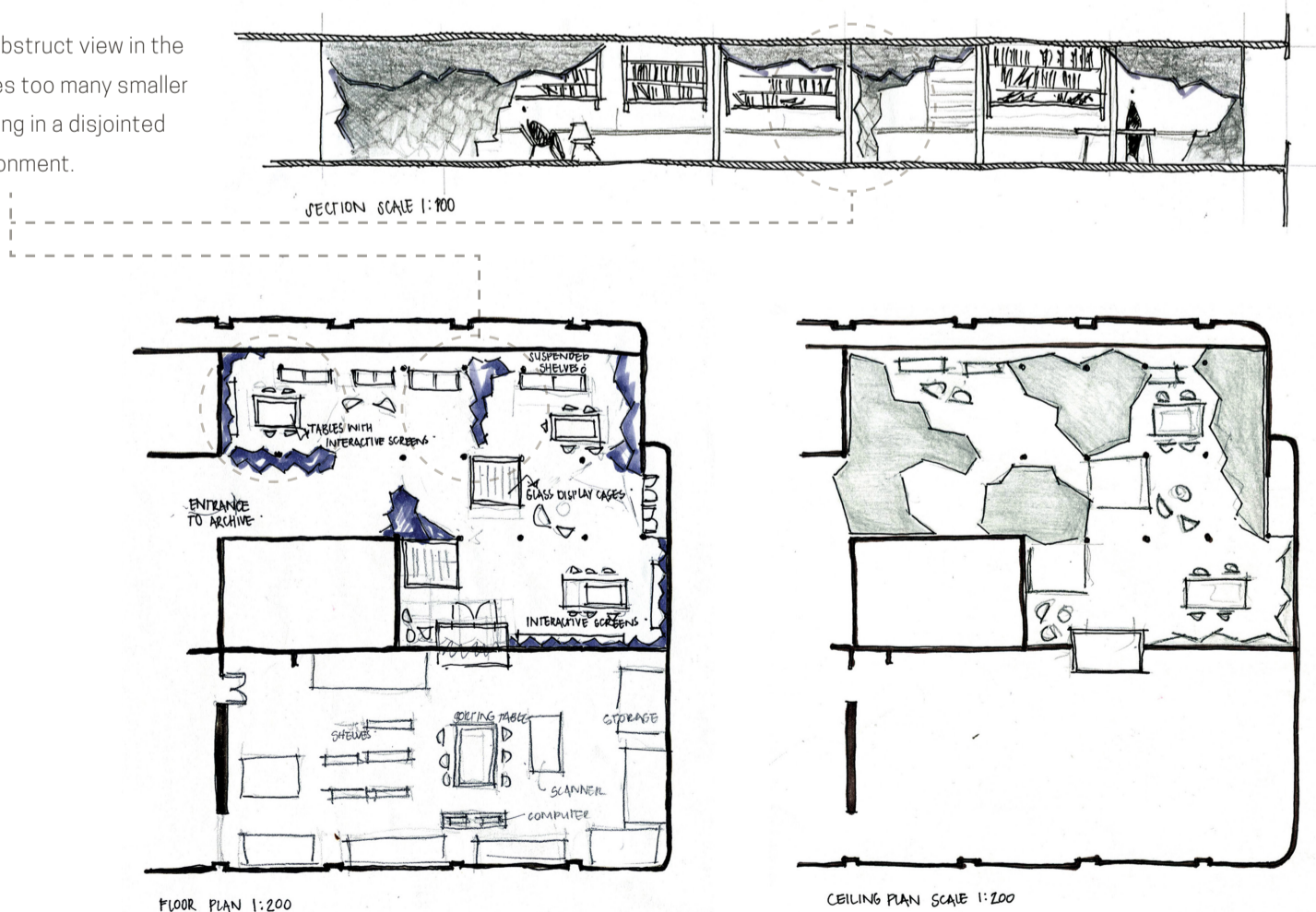


Figure 4.8.11 Spatial development sketch: Reflection to model 4(Author. 2016)

## 4.8.5 REFLECTION

The process of exploring the potential of paper within a spatial application through the use of a three-dimensional model contributes valuable and imaginative thought to the design development process. With the freedom to express the material in an intuitive manner without the pragmatic restrictions of two-dimensional plans and sections, creative insight to the overall spatial aesthetic experience is reached.

### Observation:

The application of paper as a floor element was eliminated as it did not align with the qualities extricated in section 4.4.4, see figure 4.4. The investigation of a vertical wall application was terminated, due to the anticipated lack of spatial impact in order to achieve the ethereal quality and ability to morph as specified in table 4.7.1 at section 4.7.3.

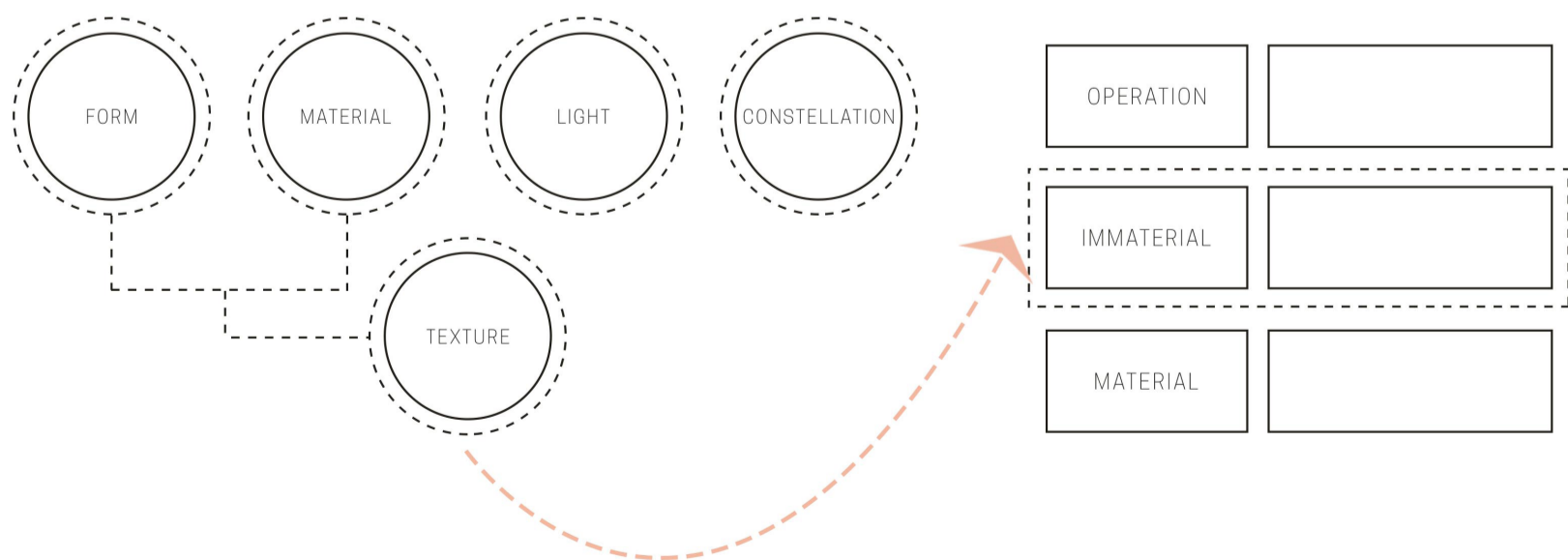
### Reflection:

The most successful explorations were models 1, 2 and 3. Through the manipulation of the form, material, light and texture, the immaterial qualities as specified in table 4.7.1 of *cybrid* characteristics was achieved. The quality of movement captured in figure 4.8.8 of model 3, inspired the manipulation of the space through the possible application of a kinetic suspended paper installation. This concept of movement could be investigated in more depth as an element to create constellations in the space.

The application of paper for further investigation and technification, will be focused on the development of a suspended overhead installation as a space defining element. The lightweight quality of paper allows for an installation of a temporary nature as infill to the existing structure with the support of an armature.

The development of form, texture and constellation will be elaborated in Chapter 5: Technification.

The quality of movement captured in figure 4.8.8 of model 3, inspired the manipulation of the space through the possible application of a **kinetic suspended paper installation**.



Through the manipulation of the five codes, the immaterial *cybrid* characteristics are met

Figure 4.8.12 Integration of codes and *cybrid* characteristics (Author, 2016)



## 4.9 CONCLUSION

The process of exploring the potential of paper within a spatial application through the use of three-dimensional models, contributes valuable and imaginative thought to the process. With the freedom to express the material in an insightful manner without the pragmatic restrictions of two-dimensional plans and sections, insight into the overall spatial aesthetic experience is developed.

The intention of Chapter 4 was to capture the essence and intangible character of the paper within the context of an interior spatial intervention. The chapter concludes with the conceptual approach which would inform the design decisions to follow.

The following chapter will focus on the physical, tangible aspects of the design development, where the technification of the paper artefact and the spatial will be investigated. Chapter 5: Technification will also address the technical requirements for the archive, such as lighting and climatic control.





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