Figure 3.1. Cloud textile, Bouroullec brothers (bouroullec, 2009).

literature study

CHAPTER 3

"We put thirty spokes together and call it a wheel; but it is on the space where there is nothing that the utility of the wheel depends. We turn clay to make a vessel; but it is on the space where there is nothing that the utility of the vessel depends. We pierce doors and windows to make a house; and it is on these spaces where there is nothing that the utility of the house depends. Therefore, just as we take advantage of what is, we should recognize the utility of what is not."

-Lao-tzu, Tao Te Ching, 6th century B.C.

The chapter firstly provides an overview of **traditional space-defining** elements, and secondly, introduces textiles as **alternative space-defining** elements. This information is summarised in a comparative diagram. The diagram provides an overview of various examples of both traditional and alternative space-defining elements found within the interior and acts as a way-finding mechanism for the ensuing visual investigation. The visual investigation includes sketch diagrams as well as images of the contemporary interior examples presented in the comparative diagram. The unique character of textiles are discussed shortly as well as associations related to textiles.

space and textiles

3.1.
TRADITIONAL SPACE-DEFINING ELEMENTS

Space is perhaps one of the most complex aspects of the interior. Space could be considered from a number of viewpoints. Clive Edwards, in the book Interior design, a critical introduction (2011:115) states that space is a permeable volume, bounded by the physical nature of a building. This suggests that interior spaces are volumes bound by the organisation of the building around it. Francis D.K. Ching (2007: 94) similarly states that space constantly surrounds us. He explains that the volume of space allows us to move, '*see form, hear sound, feel breezes, smell fragrances…*' and although the volume of space manifests as a material substance, it is also a formless vapour (Ching, 2007: 94).

Ching (2007: 96) further describes form and space as opposing elements that produce an inseparable reality and that the combination of form and space results in architecture. Therefore, form cannot exist without the consequence of space, and space is undetermined without form. Just as a flat two-dimensional figure on a sheet of paper influences the shape of the remaining space surrounding it; a three-dimensional form is capable of articulating the volume of space around itself. This affords the three-dimensional form with a territory of its own (Ching, 2007: 102).

Ching (2007: 124) divides the elements of form that define space into the two main categories, namely horizontal and vertical. Horizontal and vertical elements of form consist of various configurations which define specific types of space. Where vertical boundaries are simply inferred rather than clearly defined, horizontal planes are still able to define fields of space (Ching, 2007: 124). **Ching (2007: 103) refers to horizontal elements that define space as: Base plane, Depressed base plane, Elevated base plane and Overhead plane.** Refer to section **3.3. Comparative visual study**. Number **3.3.1. - 3.3.4.** provide examples of traditional and alternative HORIZONTAL space-defining elements. Further textile-only examples can be found in number **3.3.5. - 3.3.7.**

Vertical elements of form play a critical role in establishing visual limits within our spatial fields. Visually, vertical forms manifest more prominently than horizontal planes, facilitating the formation of volume, enclosure and a sense of privacy. Further, vertical elements separate spaces from one another and so establish mutual boundaries between exterior and interior environments (Ching, 2007: 124). **Vertical elements that define space are listed by Ching (2007: 125) as: Vertical linear elements, Single vertical plane, L-shaped plane, Parallel planes, U-shaped plane and Four-planes that form an enclosure.** Refer to section **3.3. Comparative visual study**, number **3.3.8. - 3.3.13.** provide examples of traditional and alternative VERTICAL space-defining elements. Further textile-only examples can be found in number **3.3.14. - 3.3.16.**

Traditional or 'hard' space-defining elements refer to elements and materials such as: concrete walls, -floors and -roof slabs, dry-walling elements, suspended ceilings, brick walls, steel frames, -structures and –floors.These materials would typically make up the horizontal and vertical planes that Ching (2007: 94-125) describes.

3.2.
TEXTILE AS ALTERNATIVE SPACE-DEFINING ELEMENT

Textiles have the capacity to be light, flexible, transparent, opaque, thick, bulky, fine and delicate, foldable, textured and much more. They provide protection from heat and cold, absorb noise, and give control over the amount of light that enters a space (Kruger, 2009: 6). Textiles also possess unique, sensually tangible, often poetic aesthetics that other static architectural materials often cannot mimic.

While much of the current textile technologies are highly advanced, the basic principles of fabrics have ancient roots. The earliest evidence of woven textiles goes back approximately 7000 years, placing it almost immediately after the last ice age. Textiles were also found in the Palaeolithic settlements in the form of portable tent-like huts clad with animal skins; an example of its long history as an architectural material (McQuaid, 2006: 106; Quin, 2006: 23). The shelters of the Palaeolithic settlements also created some of the first man-made interior spaces.

Further examples of textiles applied in the interior throughout history (As written in A History of Interior Design by John Pile, 2005), are as such: The early Christian, Byzantine and Romanesque interior attributed its colourful spaces mainly to the use of textiles. Here textiles could be seen as furniture covers, bed curtains and various wall hangings (Pile, 2005: 66). Islamic interiors were sparsely furnished, with low benches and couches covered in textiles, rugs and carpets (Pile, 2005: 74-76). Likewise, the Indian interior space mostly consisted of rugs of varied design as furniture did not play a major role in the historic Indian interior (Pile, 2005: 85). In China, interior spaces initially consisted of only mats or sacks of fabric for seating as furniture was only developed at a later stage (Pile, 2005: 92-93). From the Renaissance up until the early 20th century textiles were seen mostly in interior applications. Furniture items such as chairs, loose cushions, carpets, rugs and curtains became evermore commonplace. The basic living space of the Renaissance period can be seen as the inception of the "fully furnished" interior (Pile, 2005: 143). Furniture design of the Baroque and Rococo design shared the scale and rich ornamentation that characterised the interior design of the period. Textiles were prevalent in wall and floor coverings as well as upholstered armchairs and sofas (Pile, 2005: 178 and 181). The industrialisation of the first decades of the 20th century brought about change in the use of textiles.

The fathers of modernism believed that a simplification of form by the reduction of ornament was a hallmark of good architecture. Furniture items included simple, anonymous, mass produced bentwood and upholstered chairs, purist paintings on plain white walls and rugs (Pile, 2005: 342). The modernist aesthetic encouraged the production of a vast range of geometric pattern and solid colour textiles suitable for drapery and upholstery. Unlike the functional orientation of modernist design, the Art Deco style was a more fashion oriented and strongly decorative style. Furniture and textile designs included specially designed patterns in the Art Deco style.

Over time textiles were replaced with timber, stone, concrete and masonry structures, diminishing the use of textiles as building material (Garcia, 2006: 14). The transience of textile materials means that textiles are often perceived as flammable, temporary and weak with a vulnerability to water, whereas architecture is associated with mass, permanence and solidity (Quin, 2006: 25; Kruger, 2009: 26). Therefore, as a building material, textiles are often incorporated as decorative elements but rarely exploited specifically for utilitarian purposes.

Clive Edwards (2011: 115) explains that other than horizontal and vertical space-defining elements, contained elements also have the potential to define space. They allow for the occurrence of events and accommodate people. Cathy Smith (2004: 96) mentions that contained elements - such as decoration and other interior objects - are often viewed as inferior to the space that is defined by traditional space-defining elements. Smith (2004: 93) focusses specifically on alternative ways of formulating the physical interior environment. She states that the re-appropriation of typical interior materials and objects as traditional space-defining elements challenges the boundaries that make up the architectural envelope. In this case the internal and external limits of interior spaces are questioned, allowing for objects to be associated with functions other than what they were originally intended (Smith, 2004: 96).

In the book Textile Architecture by Sylvie Kruger (2009),

contemporary textile installations similarly illustrate a departure from the traditional applications of textiles and indicate an inclination toward the innovative use of textiles as space making agent.

The diagram on the following page is based on the categories as defined by Kruger (2009). See Figure 3.2. Textile as space-defining element (following page). It identifies the two main categories of VERTICAL and HORIZONTAL ELEMENTS, similar to those found within traditional space-defining elements. The diagram also identifies a third category as three-dimensional space-defining elements. Further, each category is divided into subcategories as identified in the book Textile Architecture (Kruger, 2009). Even though the main categories correlate directly with those of traditional space-defining elements, the subcategories represented within the diagram do not. Refer to section **3.3. Comparative visual study,** number **3.3.17. - 3.3.18**. provide examples of alternative THREE-DIMENSIONAL space-defining elements.

3.3.
COMPARATIVE VISUAL STUDY

Figure 3.3.Comparative diagram, poster 4 (opposite page) provides an extensive overview of various examples of both traditional and alternative space-defining elements found within the interior. The diagram situates each example within the categories Horizontal elements, Vertical elements and Three dimensional elements. Further these categories are divided into various sub-categories. This ensures a clear and visible link between the familiar traditional elements (left) and the possibly unfamiliar alternative opportunities (right). Sketch diagrams illustrating the traditional manifestation of the space-defining elements are included on the right-hand side of the diagram for reference. This is contrasted by a set of icons for the alternative examples on the left-hand side.

The Comparative overview diagram is the culmination of literature as found in sections **3.1. Traditional space-defining elements** and **3.2. Textiles as alternative space-defining element**. It also serves as an index or reference point for the succeeding exploration of space-defining elements within this section. The succeeding exploration is divided into three sections namely: horizontal elements (nr. 3.3.1.-3.3.7.), vertical elements (nr. 3.3.8.-3.3.16.) and three-dimensional elements (nr. 3.3.17.-3.3.18.). Lastly it acts as a discussion area for the concepts presented in section **3.4. The unique character of textiles.**

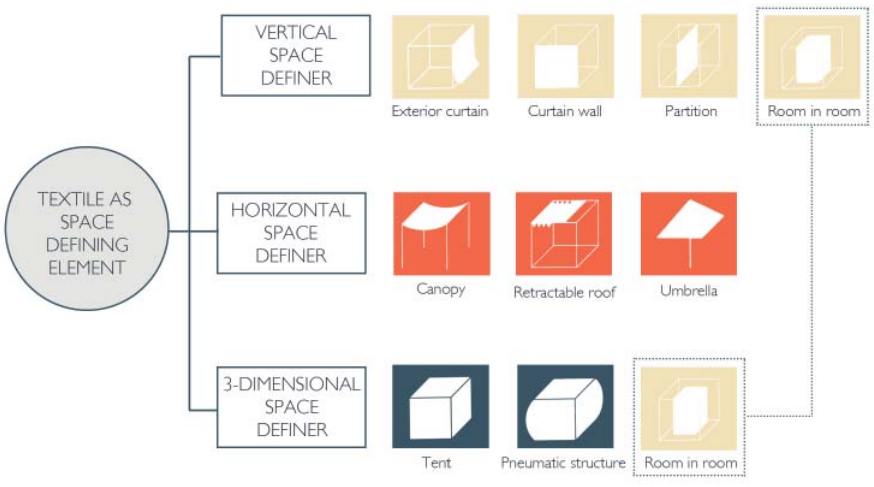


Figure 3.2. Textile as space-defining element.

The diagram is adapted from the theory as available in the book, *Textile architecture*. (Kruger, 2009).

space-defining elements

A COMPARATIVE DIAGRAM

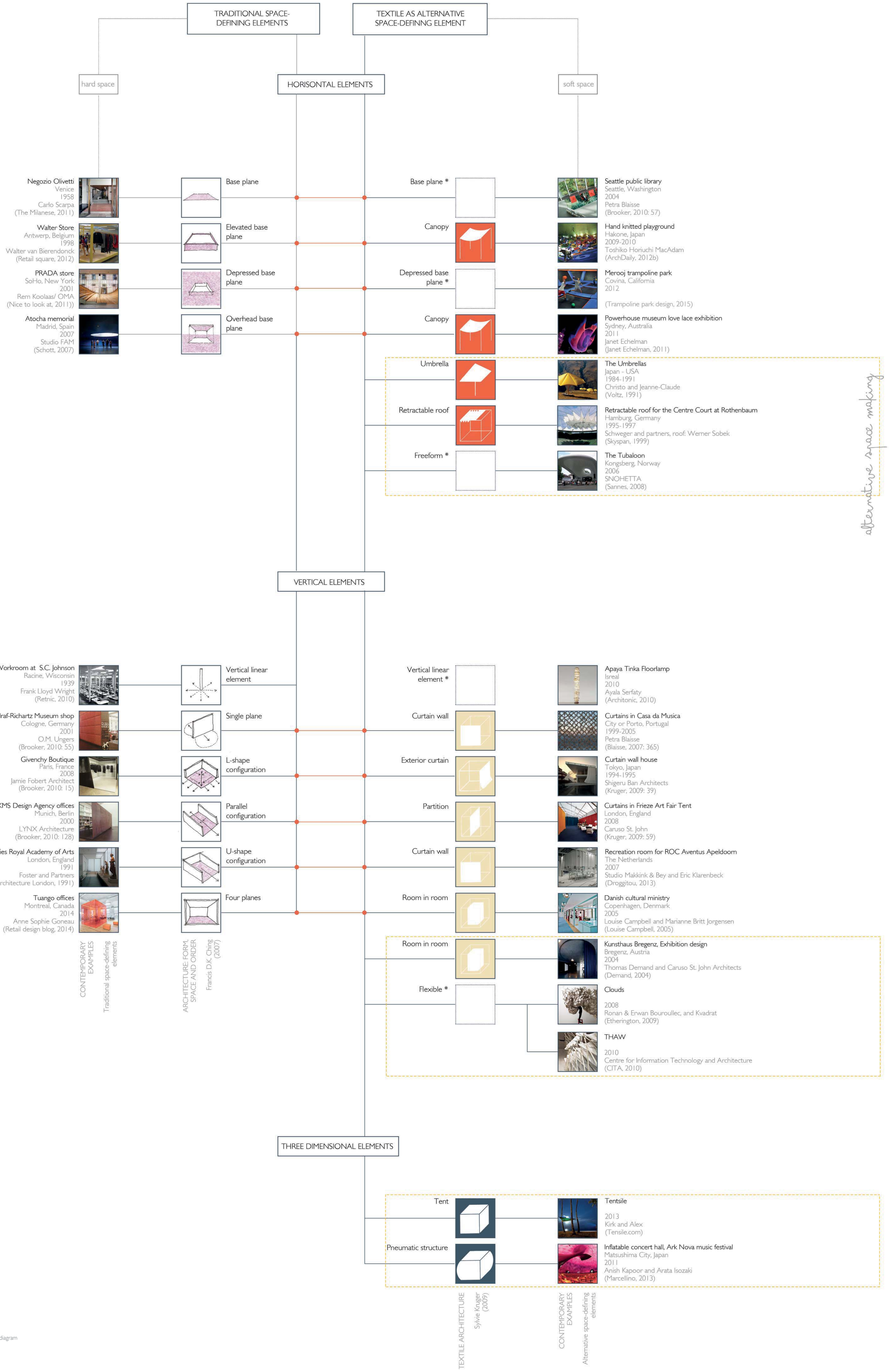
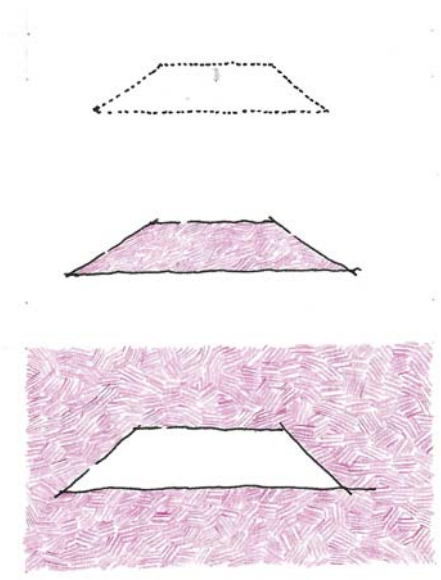


Figure 3.3. Comparative diagram

3.3.1.
HORIZONTAL ELEMENT
BASE PLANE

A base plane is a spatial field defined simply by a horizontal plane or figure placed on a contrasting background. Perceptible colour contrast, texture or tonal change between a surrounding area and a surface can define this spatial field. The boundaries of the spatial field do not block the flow through the zone (Ching 2007: 103-105).

Figure 3.4. Sketches of base plane (adapted from Ching) below



(top) Figure 3.5. Negozio Olivetti, Venice, 1958, Carlo Scarpa (The Milanese, 2011).

Figure 3.6. (above)
SEATTLE PUBLIC LIBRARY
SEATTLE, WASHINGTON
2004
PETRA BLAISSE
(Brooker & Stone, 2010: 57)

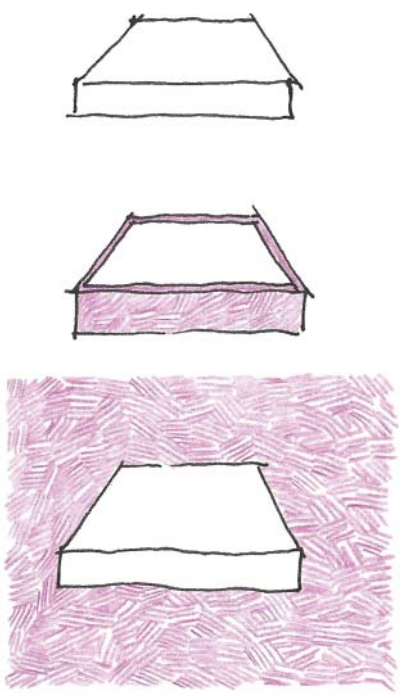
The huge graphic carpets within the Seattle Public Library delineate specific areas of the library. These soft spaces demarcate the limitations of particular activities within the large open plan area. Thus the carpet or base plane creates a spatial zone that allocates specific functions into more defined areas.

Canopy

3.3.2.
HORISONTAL ELEMENT
ELEVATED BASE PLANE

An elevated base plane is an elevated portion with the base plane and delineates a specific territory. The level change defines the boundaries of the spatial zone and interrupts the spatial flow. The boundaries can be accentuated by means of colour of material change. This separates the spatial zone from its surroundings (Ching, 2007: 106-111).

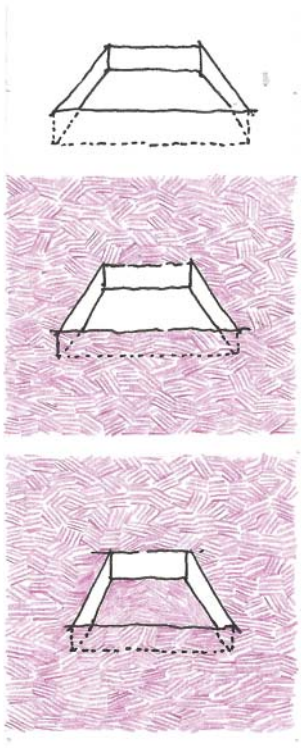
Figure 3.7. Sketches of elevated base plane (adapted from Ching) below

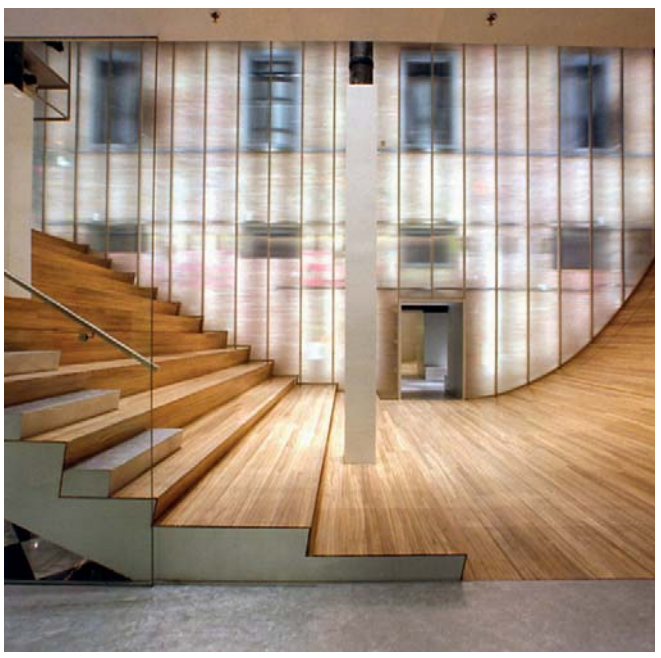


3.3.3.
HORISONTAL ELEMENT
DEPRESSED BASE PLANE

The lowered portion of the Base Plane creates and isolated area. This lowered spatial zone is distinctly different from its surrounding context. The vertical elements formed by the depression creates visible boundaries (Ching, 2007: 112-117).

Figure 3.10. Sketches of depressed base plane (adapted from Ching) below.





(top) Figure 3.8. Walter Store, Antwerp, Belgium, 1998, Walter van Bierendonck (Retail square, 2012).

Figure 3.9. (above)
HAND KNITTED PLAYGROUND
HAKONE, JAPAN
2009-2010
TOSHIKO HORIUCHI MACADAM
(ArchDaily, 2012b)

The large hand knitted playground acts as an elevated base plane on which children can run and play. See section **4.1.2.Hand knitted playground**, poster 8 (page 41). The elevation of the base plane creates a spatial zone that is seperated from its surroundings. The use of colourful rope accentuates the boundaries of the elevated spatial zone.

(top) Figure 3.11. PRADA store, SoHo, New York, 2001, Rem Koolaas/ OMA (Nice to look at, 2011).

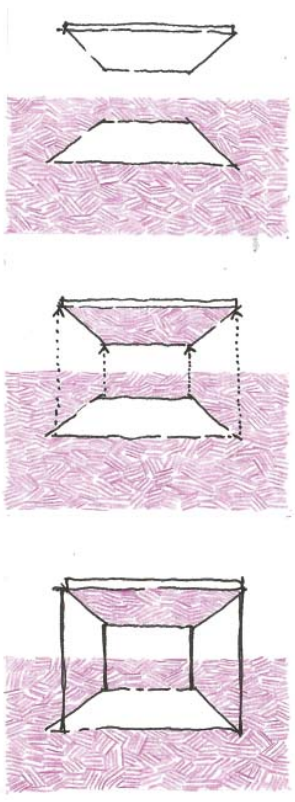
Figure 3.12. (above)
MEROOJ TRAMPOLINE PARK
COVINA, CALIFORNIA
2012
(Trampoline park design, 2015)

A depressed base plane does not naturally form part of soft spatial zones. However the Merooj Trampoline park creates a depressed plane by combining hard and soft elements to form a tensile trampoline structure. This structure includes vertical elements that create visible boundaries to differentiate the depressed zone form its surroundings.

3.3.4.
HORISTONAL ELEMENT
OVERHEAD PLANE

A plane that establishes a spatial zone through the invisible boundaries created by its edges. The formal qualities of the spatial zone is determined by the height, shape and size of the overhead plane (Ching, 2007: 118-123).

Figure 3.13. Sketches of overhead base plane (adapted from Ching) below



(top) Figure 3.14. Atocha memorial, Madrid, Spain, 2007, Studio FAM (Schott, 2007).

Figure 3.15. (above)
POWERHOUSE MUSEUM LOVE LACE EXHIBITION
Sydney, Australia
2011
Janet Echelman
(Janet Echelman, 2011)

The installation by Janet Echelman is a canopy or fixed expanse of textile that is attached to a supporting structure, forming a spatial zone below. Traditionally a canopy is installed mainly for weather protection, but the installation by Echelman acts mainly as a sculptural structure, yet still defines a spatial zone below.


Umbrella

3.3.5.
HORIZONTAL ELEMENT
UMBRELLA

An umbrella consists of a spoked substructure fixed around a ring. This ring moves around a central mast (allowing the umbrella to be put up and down). A textile membrane is spanned over the top creating a prominent spatial zone below (Kruger, 2009: 114). The physical boundaries of the spatial zone is limited to the edge of the substructure and textile membrane and is the most temporary in nature, as the object is often mobile and can always be stowed.

Figure 3.16.
THE UMBRELLAS
JAPAN - USA
1984-1991
CHRISTO AND JEANNE-CLAUDE
(Voltz, 1991)

The Umbrellas, designed by Artists Christo and Jeanne-Claude, were employed in Japan and the USA simultaneously to reflect the differences and similarities between the uses of the object in two inland valleys (Christojeanneclaude). The Umbrellas each articulate their own distinct spatial zones within the vast surrounding landscape. The capacity of textiles to expand and retract around a rigid frame is displayed in the essence of what an umbrella is. Without this characteristic, the umbrella cannot exist.

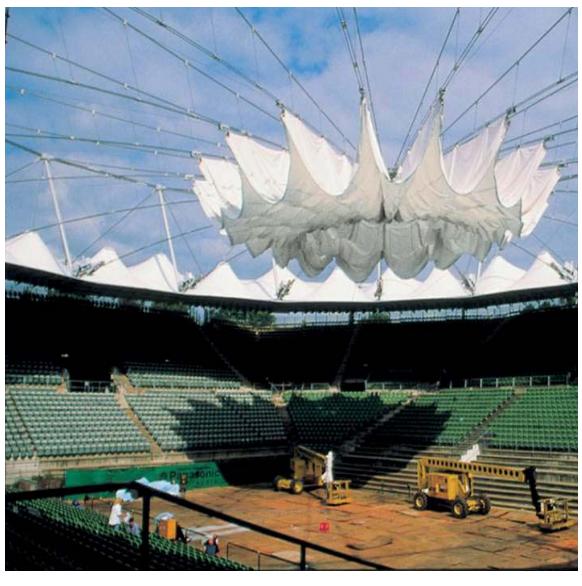

Retractable roof

3.3.6.
HORIZONTAL ELEMENT
RETRACTABLE ROOF

Retractable roofs are flexible textile membranes that can be horizontally opened and closed. The primary function is to provide rain and sun protection (Kruger, 2009: 104). Spatial zones created by retractable roofs are temporary in nature as they can be closed and stowed away, but more permanent than the zone created by an Umbrella as it is mostly fixed into place for the mechanisms to function.

Figure 3.17.
RETRACTABLE ROOF FOR THE CENTRE COURT AT ROTHENBAUM
HAMBURG, GERMANY
1995-1997
ROOF: WERNER SOBEK
(Skyspan, 1999)

The translucent textile membrane used at Rothenbaum provides temporary sun protection but does not block out the sun completely. The retractable nature of the structure allows for a spatial zone to form over a large group of people without inhibiting or influencing movement within the zone formed below.



*


3.3.7.
HORIZONTAL ELEMENT
FREEFORM

Freeform as an element that forms spatial zones, is not defined by either CHING (2007) or KRUGER (2009). However, this type of space-definer can be considered natural to textiles. In other words, it is in the nature of a textile material to be malleable and to be shaped and formed into free forms.

Figure 3.18.
THE TUBALOON
KONGSBERG, NORWAY
2006
SNOHETTA
(Sannes, 2008)

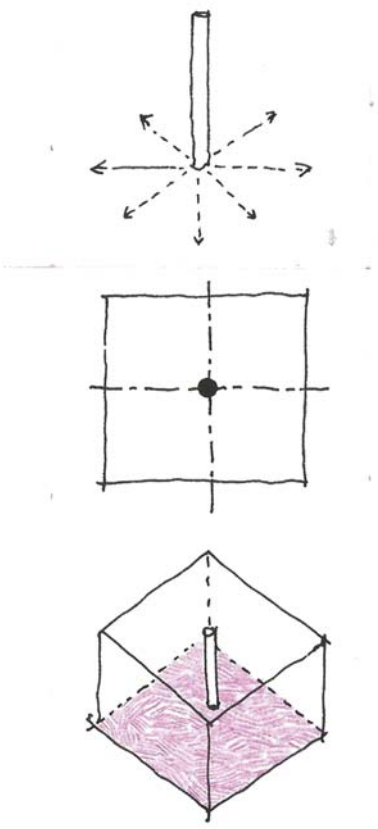
The Tubaloon textile structure serves as the roof of a stage at Scandinavia's Kongsberg Jazz Festival. This freeform structure can be seen as a combination of more traditional space-defining elements: such as a single vertical plane combined with an overhead base plane. This creates a very dynamic spatial zone below that interprets qualities of both traditional space-defining elements mentioned.

textile - only elements...

3.3.8.
VERTICAL ELEMENT
VERTICAL LINEAR ELEMENT

Vertical linear elements establish a point on the ground plane. This makes it visible in space. A single linear element is nondirectional except for that path leading toward its position in space. When located within a defined volume of space a column generates a spatial field by itself by interacting with the defined spatial enclosure (Ching, 2007: 126).

Figure 3.19. Sketches of vertical linear element (adapted from Ching) below



(top) Figure 3.20. Workroom at S.C. Johnson, Racine, Wisconsin, 1939, Frank Lloyd Wright (Retnic, 2010).

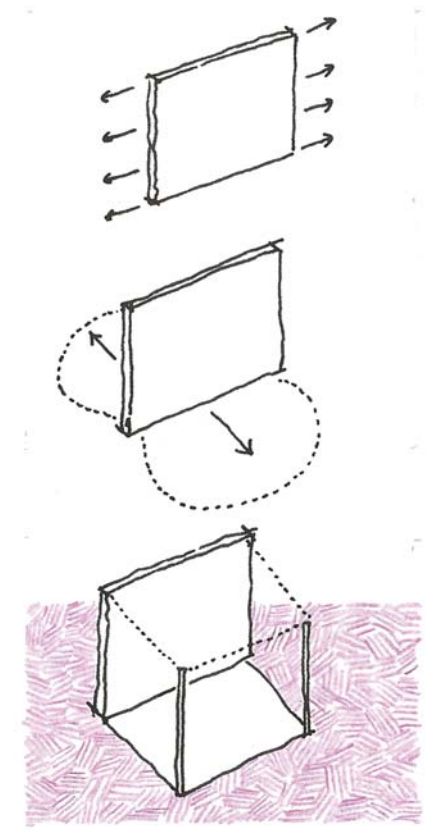
Figure 3.21. (above)
APAYA TINKA FLOOR LAMP
ISRAEL
2010
AYALA SERFATY
(Architonic, 2010)

The Apaya Tinka Floor lamp is a vertical linear element within a defined volume of space. When in use the lamp not only generates a spatial field through its form, but also by its function. Light emited from the lamp increases the effect of the vertical linear element within a room.

3.3.9.
VERTICAL ELEMENT
SINGLE VERTICAL PLANE

A single vertical plane defines the volume it fronts by dividing a volume of space. These frontal qualities establish the edges of two spatial zones. As a dividing barrier the single vertical plane interrupts visual and spatial continuity by means of height which can provide a strong sense of enclosure or division of space (Ching, 2007: 134).

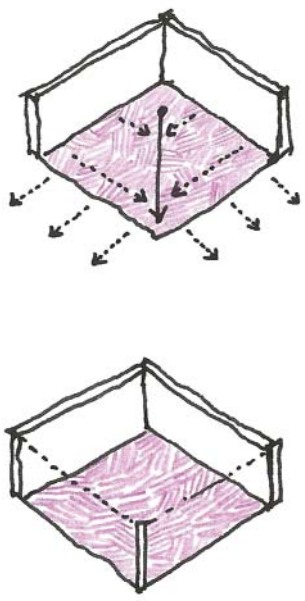
Figure 3.22. Sketches of single vertical plane (adapted from Ching) below



3.3.10.
VERTICAL ELEMENT
L - SHAPED CONFIGURATION

The strongly enclosed and defined spatial zone generates a field of space from its corner outward along a diagonal axis. The two vertical edges are well defined but the remaining edges are ambiguous. An L-shaped configuration provides a sheltered 'room' to which the surrounding context is directly related (Ching, 207: 125, 138-143).

Figure 3.25. Sketches of L-shaped configuration (adapted from Ching) below



(top) Figure 3.23. Wallraf-Richartz Museum shop, Cologne, Germany, 2001, O.M. Ungers (Brooker & Stone, 2010: 55).

Figure 3.24. (above)
CURTAINS IN CASA DA MUSICA
CITY OR PORTO, PORTUGAL
1999-2005
PETRA BLAISSE
(Blaisse, 2007: 365)

The large hand knotted curtains created by Petra Blaisse act mainly as a visual space-definer within the shell of the Casa da Musica. See section **3.4.2. Curtain as architecture**, poster 6 (page 35). The large glass facades however allow an abundance of light to enter the space, and here the textile space-definer not only acts as a view filter but also a sun filter, blocking harsh light. The curtains together with the glass facade, define the boundary between inside and outside.

(top) Figure 3.26. Givenchy Boutique, Paris, France, 2008, Jamie Fobert Architect (Brooker, 2010: 15).

Figure 3.27.
CURTAIN WALL HOUSE
TOKYO, JAPAN
1994-1995
SHIGERU BAN ARCHITECTS
(Kruger, 2009: 39)

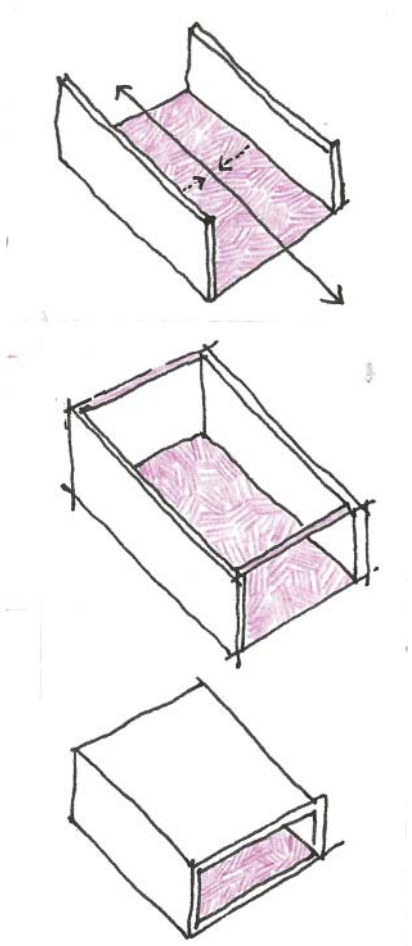
The exterior curtains designed by Shigeru Ban is an example where traditional hard materials (walls) were replaced with an alternative soft material (curtain). The softness of the *exterior curtain wall* makes for a permeable interior space but still creates a boundary defining particular interior and exterior spatial zones. The L-shaped configuration of the curtain is a response to the roof overhang.

Partition

3.3.11.
VERTICAL ELEMENT
PARALLEL PLANES

Parallel planes define a volume of space between them. The spatial field thus has a strong directional quality. The spatial field is oriented primary toward the open ends of the configuration (Ching, 2007: 144, 149).

Figure 3.28. Sketches of Parallel planes (adapted from Ching) below



(top) Figure 3.29. KMS Design Agency offices, Munich, Berlin, 2000, LYNX Architecture, (Brooker & Stone, 2010: 128).

Figure 3.30. (above)
CURTAINS IN FRIEZE ART FAIR TENT
LONDON, ENGLAND
2008
CARUSO ST. JOHN
(Kruger, 2009: 59)

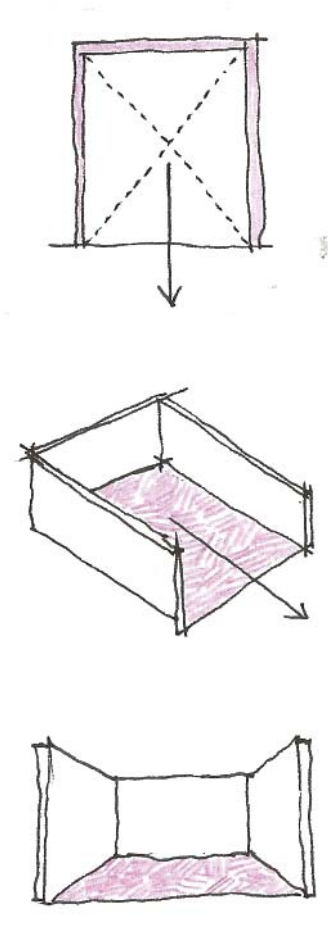
The parallel curtain planes creates a distinct spatial zone that directs the user of the space towards the end of the passage. Here the use of a single vertical plane (curtain) redirects the path of the user. The space-defining elements here are employed mainly for the purpose of circulation and secondly acts as a division of spaces with different functions.

Curtain wall

3.3.12.
VERTICAL ELEMENT
U-SHAPED CONFIGURATION

The field of space defined by U-shaped configuration of vertical planes is focussed both inwardly and outwardly (Ching, 2007: 150).

Figure 3.31. Sketches of U-shaped configuration (adapted from Ching) below.



3.3.13.
VERTICAL ELEMENT
FOUR PLANES: CLOSURE

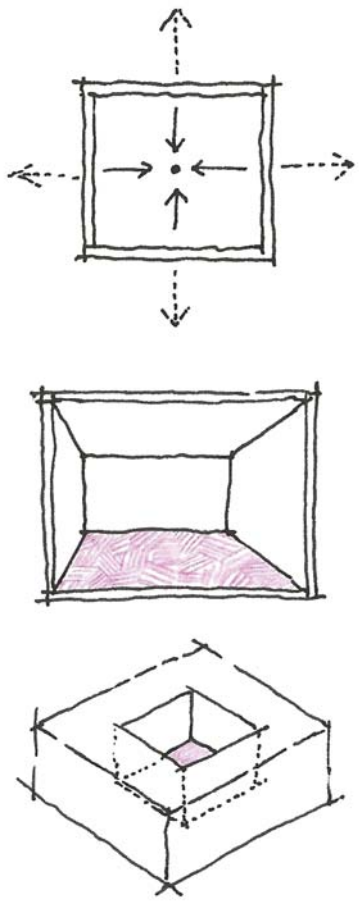
Four planes create a very strong spatial definition. The four vertical planes create as enclosed space with an introverted nature. The boundaries also influence the spatial zones of the larger context (Ching, 2007: 125, 156).

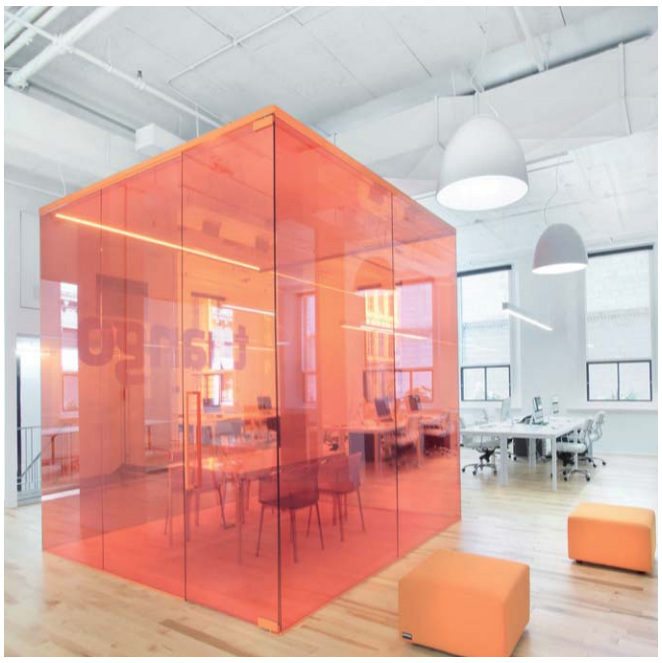
Figure 3.34. Sketches of Four planes closure (adapted from Ching) below

(top) Figure 3.32. Sackler Galleries Royal Academy of Arts, London, England, 1991, Foster and Partners (Modern Architecture London, 1991).

Figure 3.33. (above)
RECREATION ROOM FOR ROC AVENTUS APELDOORN
THE NETHERLANDS
2007
STUDIO MAKKINK & BEY AND ERIC KLARENBECK
(Droggitou, 2013)

The U-shaped configuration of the curtains create a semi-enclosed interior space. Although the curtains form a distinct U-shape, the spatial zone is not completely isolated visually due to the height at which the curtains hang. The curtains thus control and restrict sight lines of users within and outside of the recreation room, creating a specific amount of privacy within the internal spatial zone.





(top) Figure 3.35. Tuango offices, Montreal, Canada, 2014, Anne Sophie Goneau (Retail design blog, 2014).

Figure 3.36. (above)
DANISH CULTURAL MINISTRY
COPENHAGEN, DENMARK
2005
LOUISE CAMPBELL AND MARIANNE BRITT JORGENSEN
(Louise Campbell, 2005)

The four planes created by the structural frame and curtains in the Danish Cultural ministry create a strong spatial definition when closed. However the temporal and mobile nature of the curtains within this space allows the normally introverted space to become part of the larger context. The structure with open curtains however enforce a visual spatial zone without constricting flow and movement through the zone.

3.3.14.
VERTICAL ELEMENT
ROOM IN A ROOM

Vertical expanses of textile allow convertible rooms- that can be opened and closed at will - to be created within solid walled spaces. Closed textile structures can create spatial zones that become self-contained, temporary havens or individual areas for diverse uses (Kruger, 2009: 60).

3.3.15.
VERTICAL ELEMENT
FLEXIBLE

Flexible elements that forms spatial zones, are not defined by either CHING (2007) or KRUGER (2009). However, this type of space-definer can be considered unique to textiles. It is in the nature of a textile material to be malleable and to be shaped and formed and re-formed into textile space-defining elements.

3.3.16.
VERTICAL ELEMENT
FLEXIBLE

See 3.3.15. Flexible elements (left).

Figure 3.37.
KUNSTHAUS BREGENZ, EXHIBITION
BREGENZ, AUSTRIA
2004
THOMAS DEMAND AND CARUSO ST. JOHN ARCHITECTS
(Demand, 2004)

The temporary room within the foyer of the Kunsthauz Bregenz was created for screening a film. The floor-to-ceiling dark blue curtains move by means of a motor to form an enclosed dark room that can disappear when the curtains are opened. The curtains create a very distinct yet temporary spatial zone within a larger interior space. When closed the curtains disrupt the flow of movement, block views and create a certain sense of privacy. When opened these qualities disappear with the curtains. .

Figure 3.38.
CLOUDS

2008
RONAN & ERWAN BOUROULLEC, AND KVADRAT
(Etherington, 2009)

Clouds, by the Bouroullec brothers, are completely flexible space-defining elements. These textile elements can be reduced in size by disconnecting sections of the textile and can be expanded by adding sections. Further, the textile can be used horizontally as well as vertically, or as both horizontally and vertically at the same time. The configuration of spatial zones are endless and the quality of the spaces formed are whimsical and transient.

Figure 3.39.
THAW

2010
CENTRE FOR INFORMATION TECHNOLOGY AND ARCHITECTURE
(CITA, 2010)

THAW, a student project done at the Centre for Information Technology and Architecture, explores tensile structures in architecture. The structure is formed by combining the unique capacity of textiles to expand and retract with the stiffness that timber has to offer. The expansion and retractions qualities of the element is translated into the spatial zone that is formed on either side of the vertical plane. Creating a spatial zone with boundaries that change with the flexible textile element.

textile - only elements...


Tent


Pneumatic structure

3.3.17.
THREE-DIMENSIONAL ELEMENT
TENT

Tents traditionally consist of a supporting structure with a textile skin, allowing for an endless variety of tents. Most tents can be transported, easily set up and taken down. However, certain tents are also used as permanent yet mobile dwellings or as permanent and fixed installations for arenas or exhibition areas (Kruger, 2009: 150). Thus the spatial opportunities offered by tents are very changeable.

3.3.18.
THREE-DIMENSIONAL ELEMENT
PNEUMATIC STRUCTURE

Pneumatic structures are based on the tyre principle, the membrane covering is also the supporting element. The difference in pressure between the interior and the exterior stabilises the structure. Pneumatic structures are often employed to create temporary spatial zones for public events. However pneumatic structures can also be incorporated into building structures as permanent skins (Kruger, 2009: 166).

Figure 3.40.
TENTSILE

2013
KIRK & ALEX
(Tentsile, 2015)

The Tentsile tent exploits the unique ability of a textile to be stretched until it becomes a 'hard' surface, as well as its ability to be rolled into a small element that can fit into a bag. The Tentsile tent creates a spatial zone within the interior of the tent with increased separation from the ground plane. This also allows for a secondary spatial zone to be formed below the stretched textile floor plane of the tent.

Figure 3.41.
INFLATABLE CONCERT HALL
ARK NOVA MUSIC FESTIVAL
MATSUSHIMA CITY, JAPAN
2011
ANISH KAPOOR AND ARATA ISOZAKI
(Marcellino, 2013)

The purple membrane of the inflatable concert hall, forms an interior as well as exterior spatial zone. This pneumatic structure exhibits the unique character of textiles and its capacity to form spatial zones by becoming its own structure. The large interior spatial zone that is formed is temporary in nature, and will once again form part of the exterior spatial zone when the structure is deflated.

textile - only elements...

3.4.
THE UNIQUE CHARACTER OF TEXTILES

Traditionally architectural space-defining elements are static, dense, heavy and 'hard' whereas textiles have the capacity to manifest as the complete opposite. Kruger (2009) identifies a number of characteristics of textiles which can be supplemented by those identified by Hendrieka Raubenheimer (2012: 25) in her dissertation WARP + WEFT: Translating textiles into Interior Architecture. Raubenheimer (2012: 25) conducted a physical exploration of textiles by manipulating various textiles and photographing the outcomes. In response to both Smith and Raubenheimer's findings, this dissertation proposes that textiles have the natural capacity to:

Expand & retract, Drape, Flow, Sway, Fold, Absorb, Crease, Screen, Twist, Tear, Unravel, Ripple, Be soft, Be fluid, Disintegrate, Be irregular, Bleed colour, Be bulky, Be thick, Be transparent, Be fine, Be textured, Fold, Be delicate, Be light, Be opaque, Stretch, Knot, Weave, Be furry, Offer acoustic control, Be structural, Be tensile, Be translucent, Be malleable, Temporal, Cover

See Figure 3.42. Collection of textile images, on poster 5 (immediately right) Section **3.3. Comparative visual study** provides example images that illustrate the character of textile soft spaces. The **precedents** on the opposite page highlight the character of textiles when utilised as space-defining elements. See Figure 3.43. - 3.45. on poster 6 (opposite page).

the character of textiles


EXPAND & RETRACT


COVER

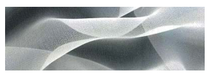

TEMPORAL


BULKY


THICK


TRANSPARENT


SOFT

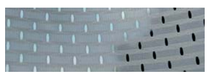

FINE


TEXTURED


FOLDABLE


DELICATE


LIGHT


OPAQUE


BLEED COLOUR

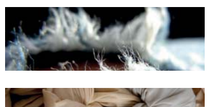

IRREGULAR

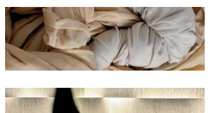

DISINTEGRATE


FLUID

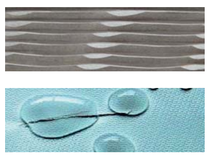

RIPPLE


UNRAVEL


TEAR

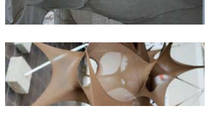

TWIST

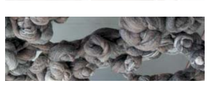

SCREEN

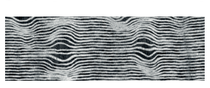

CREASE


ABSORB


SWAY

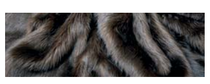

DRAPE


STRETCH

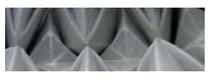

KNOT


WEAVE


BRAID


KNIT


FURRY


ACOUSTIC CONTROL


STRUCTURAL


TENSILE

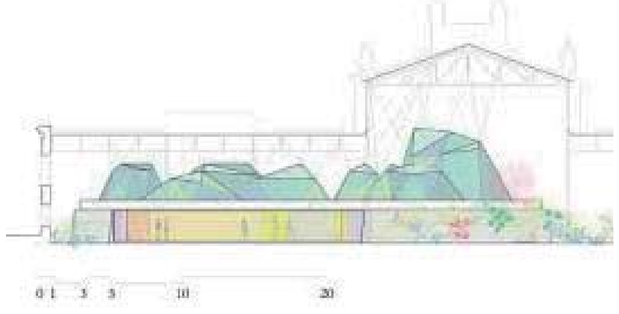

TRANSLUCENT

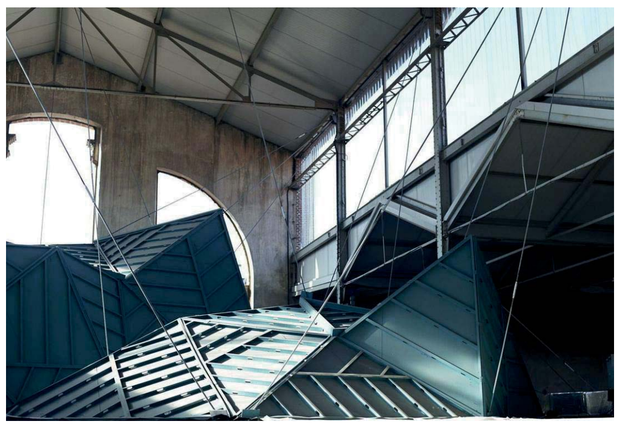
MALLEABLE

textile space-defining elements

PRECEDENT STUDIES

3.4.1.
ANNUAL INTERNATIONAL MUSIC FESTIVAL
RED BULL MUSIC ACADEMY
Langarita-Navarro Arquitectos
Matadero, Madrid, Spain
Event installation (medium-term project)
2011

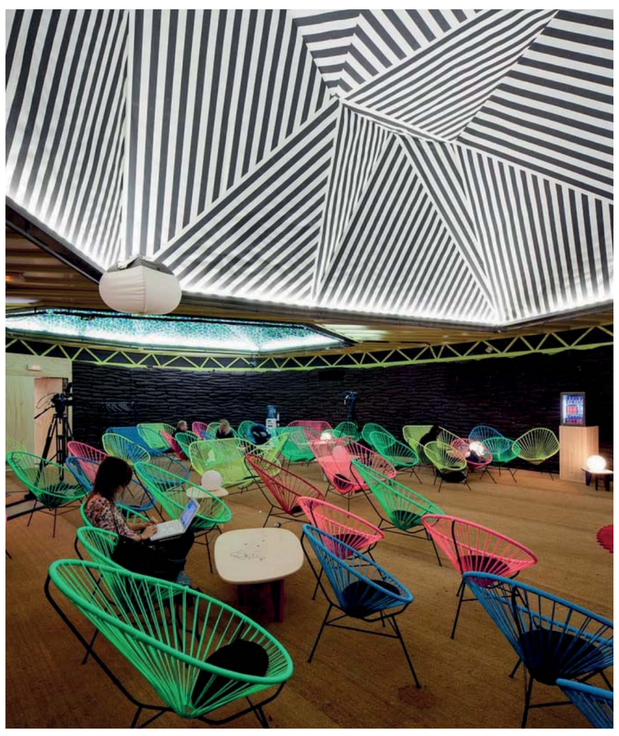




The Red Bull Music Academy (RBMA) is a 'nomadic' music festival held annually. Every year the event takes place in a different city around the world in order for producers, musicians and DJ's to exchange knowledge and ideas on an international scale. In 2011 the RBMA was intended to take place in Tokyo but due to the devastating effects of an earthquake at the time, the location was changed. The city of Madrid became the new location and the event was planned and executed in Matadero Madrid in an industrial warehousing complex (Designboom, 2012; ArchDaily, 2012a).

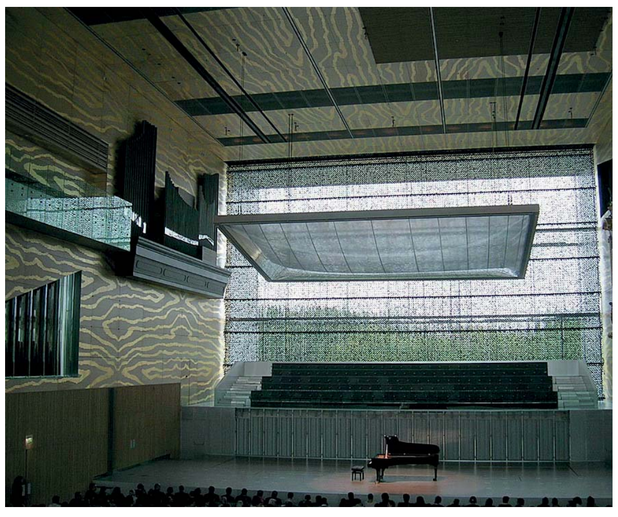
With a time constraint of only five months to design a new venue, local Spanish firm Langarita-Navarro Arquitectos designed a sequence of spaces to be constructed within two months. The design intervention intruded minimally on the existing shell and illustrated ideas such as adaptability and standardization (ArchDaily, 2012a). Due to the experimental nature of the proposed intervention and the heritage value of the warehouse, the construction project was approached as a temporary project with plans for future removal (Designboom, 2012; Langarita Navarro, 2012).

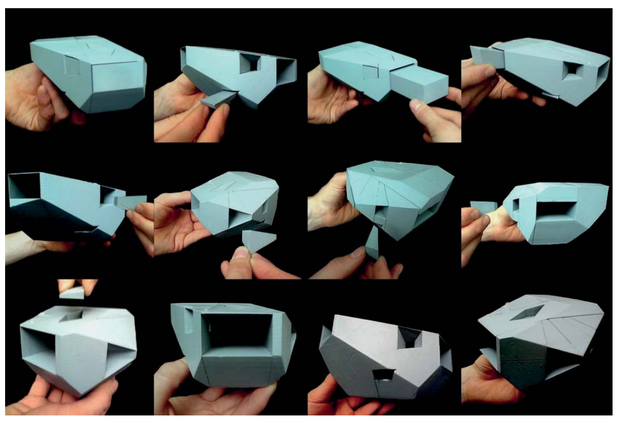
The music based programme **required** internal spaces with very **specific acoustic properties**. These requirements made the design of **textile spaces the perfect solution** and therefore many of the interior spaces consisted of canvas overhead planes and textile bags filled with sand as vertical wall planes. These elements could be **easily constructed and easily removed** but still afforded the spaces with the necessary acoustic properties. This design intervention illustrates the capacity of textiles to be very temporary **yet perform a myriad of other functions**, such as the definition of spaces with different functions, acoustic control, 'softening' of harsh steel surroundings and colourful playful interiors.



Room in room

3.4.2.
CURTAIN AS ARCHITECTURE
CASA DA MUSICA
Rem Koolhaas + Petra Blaisse
City of Porto, Portugal
New build
1999-2005





The Inside Outside studio of Petra Blaisse is concerned mainly with the **exploration of textile spaces**. Blaisse **questions the conventional notion of the wall** with its traditional structures and materials as it occurs in the architectural practice.

The Casa da Musica appropriates textiles as a functional architectural material within the interior. Contrary to conventional performance halls, the Casa da Musica consists of large voids impinging the building perimeter. This is mainly because the halls were 'excavated from the massive volume' that forms the buildings shell. Initially the notion of curtains served a purely visual function within the architect's model and was represented as scraps of textile inserted as place holders (Blaisse, 2007: 365; Weinthal, 2011: 272).

The requirements and expectations of the curtains changed as the design team realized that even the slightest alteration of scale, materials, position or structure significantly impacted on the performance and potential of the rooms. Eventually the use of blackout curtains mediated between the light and acoustic performance within the halls in order to enhance the visual and auditory quality of the spaces (Weinthal, 2011: 274, 275).

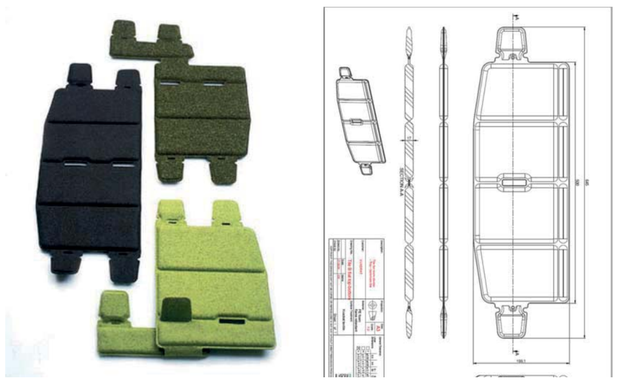
The product of collaboration between Rem Koolhaas and Petra Blaisse exemplifies the capacity of **textiles to enrich space** to an **aesthetic** level whilst simultaneously fulfilling a **utilitarian function**. This challenges the typical preconceptions of textiles as chiefly aesthetic in nature. The acoustic and atmospheric definition offered by the textile curtain is used to full effect in the project. The Casa da Musica illustrates the potential of exploiting the unique characteristics of textiles in place of traditional 'hard' space-defining elements.

Curtain wall

3.4.3.
TEXTILE CAFE
MUDAM CAFE AND BOUTIQUE
Ronan and Erwen Bouroullec
Luxemburg
Installation
2006-2007

The Musee d'Art Moderne Grand Duc Jean (MUDAM) restaurant, designed by Pei Cobb Freed and Partners, is located within a large interior space that carries a glass roof. Ronan and Erwin Bouroullec designed and developed a textile pavilion to provide relief from the solar radiation entering the glass roof and establish a soft space on a more human level than the surrounding architecture (The collection, 2005). The pavilion consists of a wooden structure that supports the textile cladding. The textile cladding system is composed of a series of tiles, titled "North Tile" (Kruger, 2009: 124,125). Other than relief from harsh sunlight entering the glass roof, the textile cladding enhances the space's acoustic climate and contributes to creating a soft and welcoming aesthetic.

The pavilion illustrates the capacity of textiles to perform both utilitarian and aesthetic functions. Although the textile tile emulates the form and function of a traditionally hard and cold material, the nature of textiles as a material allows it to perform beyond these restrictions. The use of the **textile adds an intangible experiential quality** to the space below the overhead plane that other traditional materials cannot provide. Further, the pavilion also illustrates how textiles can form an intimate spatial zone by means of a textile overhead plane which is not merely a tent.



Canopy

Section 3.4.1. (from top to bottom)
Figure 3.43.a. Red Bull Music Academy, section (Langarita Navarro, 2012).
Figure 3.43.b. Red Bull Music Academy, roof detail (Designboom, 2012).
Figure 3.43.c. Red Bull Music Academy, sound insulation (Designboom, 2012).
Figure 3.43.d. Red Bull Music Academy, textile ceiling plane (Designboom, 2012).
Section 3.4.2. (from top to bottom)
Figure 3.44.a. Casa da Musica, Stage curtain (Infoteli, 2010).
Figure 3.44.b. Casa da Musica, Building models (Infoteli, 2010).
Figure 3.44.c. Casa da Musica, Curtain knot detail (Infoteli, 2010).
Section 3.4.3. (from top to bottom)
Figure 3.45.a. Mudum cafe and boutique, View of temporary café structure (Mimoa, 2006).
Figure 3.45.b.Mudum cafe and boutique, North tile detail (The collection, 2005).
Figure 3.45.c. Mudum cafe and boutique, View indicating glass overhead façade (Mimoa, 2006).

3.5.
TEXTILE ASSOCIATIONS

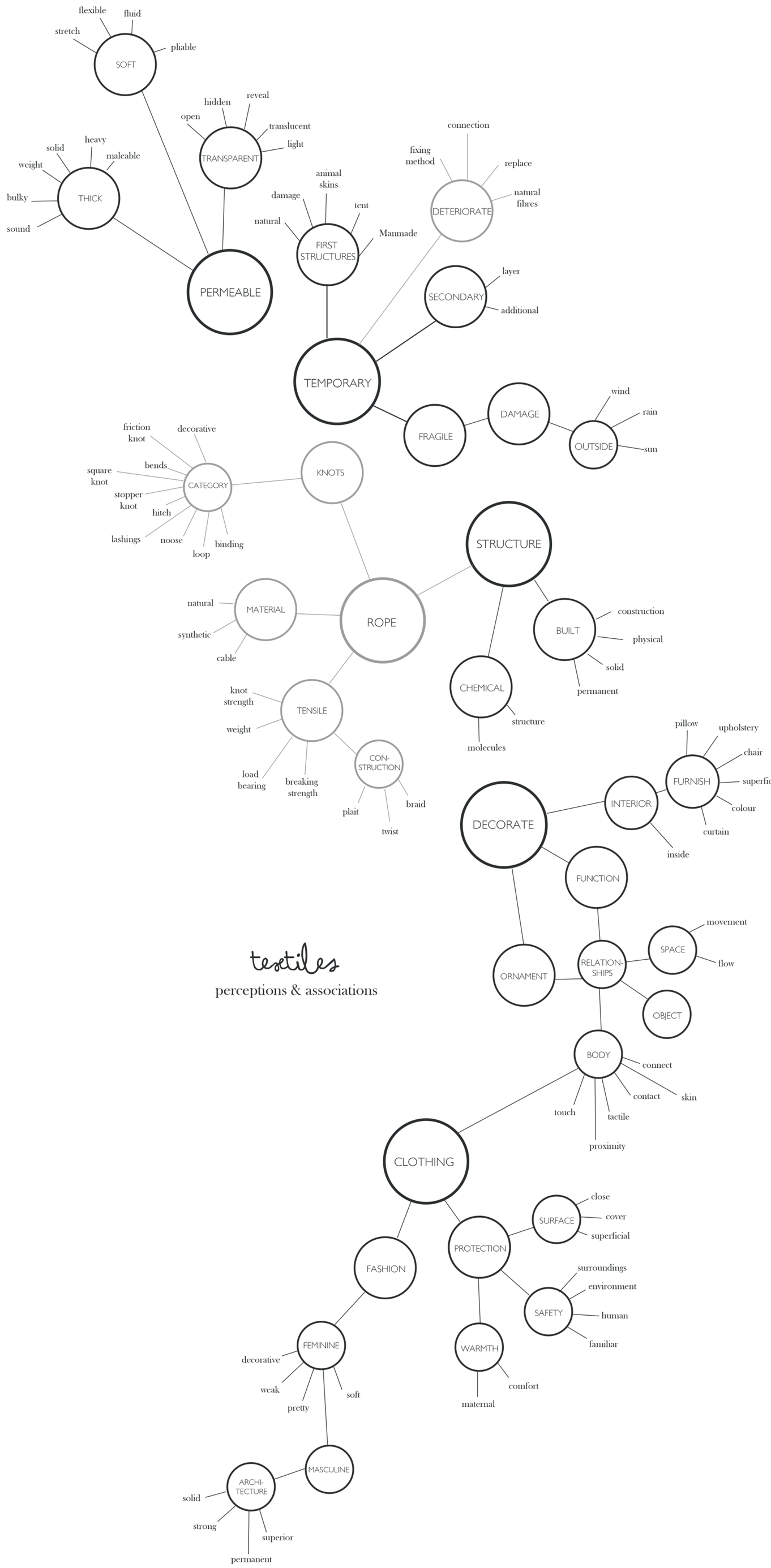
"Associations generate meaning by making connections in the mind to other objects; in this way it transmits meaning and cultural capital from other objects to the interior artefact." (Konigk 2015: 226).

Earlier on in the study it was argued that the associations or connections that existis between textiles and decorating (Hoskyns 2007: 85) contributed to the devalued status of textile within the interior as well as its current conventional application within the discipline of interior design. **The research aims to re-evaluate this position and reclaim this valuable lost territory through alternative contemporary textile applications.** New associations and perceptions can be established through these alternative applications.

Figure 3.46. Textiles, personal perceptions and associations is a heuristic exploration of the materials of textile and rope. The exploration was completed before and during section **3.3. Comparitive visual study.** The diagram is not based on empirical data but acts as an observation (See CHAPTER 2: Methodology for further discussion of the methods).

Further, personal associations with the hand-knotted textile, rope and rope-like materials can be found in the form of small bubble diagrams on specific posters throughout the presentation.

Figure 3.46. Textiles, personal perceptions and associations.



3.6
CONCLUSION

The chapter investigated various examples of traditional as well as alternative space-defining elements. These examples provide opportunity for further investigation into the potentials and restrictions that textile as an alternative material offer in terms of space-making. These potentials and restrictions will be discussed in **CHAPTER 5: Design development.** Further, the precedents investigated provided a means of discovering the unique character of textiles. The Chapter also briefly introduced certain associations and perceptions that are linked to textiles as a material. These associations and perceptions will be introduced again later in **CHAPTER 5: Design development.**