

# Tectonic theory and textiles

# 3

## The art of fabrication

### 3.1 Introduction

In *Studies in Tectonic Culture*, Kenneth Frampton devised a theory on the art of expressive construction in the field of. This can only be applied to landscape architecture to a limited extent, as there is a fundamental difference between buildings and landscapes, and that is the application and harvesting of forces that act upon them. Even though these forces are similar regardless of whether an artefact is a building or a landscape, the successful design of these spaces lies in the relationship that landscapes have to external elements. Buildings are designed to withstand natural phenomena such as wind, rain and sun. In contrast, landscapes require these very forces to sustain themselves. Because landscapes are in a constant state of flux, a unique tectonic theory needs to be devised for landscape architects as guidance for not only expressive construction, but also in embracing the dynamic nature of the natural environment.

"Architectural design is not about having ideas, but about having techniques, techniques that operate on a material level. It's about making matter think and live by itself."(Lars Spuybroek)

### 3.2 The poetics of making

The roots of tectonic theories in architecture can be found in the 1851 publication of Gottfried Semper's treatise *Die vier Elemente der Baukunst* (Frampton 1995:5). Semper divided building craft into two practices, the first being the joining of lightweight, linear components into a tectonic framework, and the second being the stacking of heavyweight elements to form stereotomic mass (Frampton 1995:5). Furthermore, Semper explained that the act of joining arose due to the intrinsic properties of the materials used in their execution (Broughton 2012:15). The materials thus determined the way in which things were put together, which, in turn, determined the appearance of the space they resulted in. As an example, stone can be used to create space simply by stacking, which results in undulating lines and spaces because no complex joining techniques are

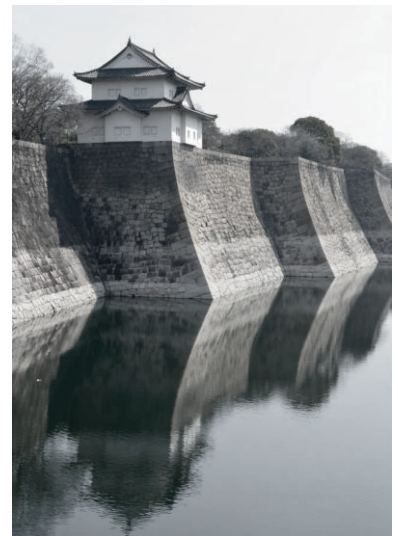


Figure 5: Stacked stone forming curved retaining walls in Osaka, Japan (Author 2016)



Figure 6: Joinery of pergola elements at the Fushimi Inari shrine, Kyoto, Japan (Author 2016)

required in its assembly (see Figure 5).

Heidegger (1977:1) states that *techne* is when “something concealed comes into un-concealment”; materiality and detailing can reveal construction techniques, and repetition and exaggeration of this can lead to patterns that further illuminate its fabrication. Even though Heidegger’s phenomenological approach is theoretical and philosophical in nature, and thus in opposition to this dissertation’s focus on making as learning tool, it can give a deeper insight into making as an act that extends beyond the artefact. Heidegger (1977:6-8) describes objects as a product of *techne* as having four “causes”: the *causa materialis*, the material; the *causa formalis*, the form that the material takes on; the *causa finalis*, the end use; and the *causa efficiens*, the maker. The materials that comprise constructed space reveal their processes of production, their constituent raw materials and the elements and forces that change them over time. Form as a product of *techne* refers to the character of the building or landscape: how it meets the earth and how its materials are joined together (Norberg-Schulz in Armstrong & Bell 2015). The maker refers to those who design and construct a building, landscape, or construction materials.

For example, wood is a commonly used material in traditional Japanese architecture due to its abundance. As a result, a vast number of joinery techniques have been developed by Japanese carpenters over a period of 1000 years, using the inherent characteristics of wood to fasten and secure timber members to one another without the use of glues or other fasteners (see figure 6 for an example of a recently built structure that makes use of historical techniques). The junctions range from simple to highly complex, and all require the skill of a set of craftsmen (Satoshi 2006:2-5). The wood used in Japanese architecture is naturally resistant to pests, and its darkening over time makes visible the forces that act on the material. Japanese joinery also influences the transmateralisation of timber to stone. Figure 7 illustrates the use of stone in the same manner that wood would have been used in the same structure. Thus, the *causa materialis* is wood as a reflection of its context; the forests as provider of materials, and stone as embodiment of wood joinery techniques. The *causa*



Figure 7: Stone abutment at Shinkyō bridge, Nikko, Japan (Author, 2015)

*formalis* is the rectilinear form that the structure takes on due to the way in which the wood members are joined together. Finally, the *causa efficiens* is the skilled carpenter that also acts as architect. Furthermore, because of the repetition of joinery throughout the wooden structure, an aesthetically appealing pattern emerges, making it an example of a craft form that combines functionality (the joining of wood to form a structure) with decoration (patterns and repetition).

Building on this, Kenneth Frampton attempted to further define and augment the tectonic theory in his *Studies in Tectonic Culture*, which centres around the “poetics of construction” (1995). This was in response to post-modern architecture (Mallgrave in Frampton 1995:ix), where the diverse architectural appearances were determined by the quirks of the architect and the meaning behind the building. Frampton's theory attempted to shift the focus of architecture away from theories of style, and back to the tangible and “material presence” (Soroka 1997:75) of spaces; from meaning to being.

In landscape architecture, there isn't a well-known theory of how landscapes ought to be constructed expressively. It will be insufficient to merely apply Frampton's theory to landscape construction, as there is a fundamental difference in the way buildings and landscapes exist, which is the nature of the elements acting upon them. Thus, a tectonic theory specific to landscape architecture needs to be developed.

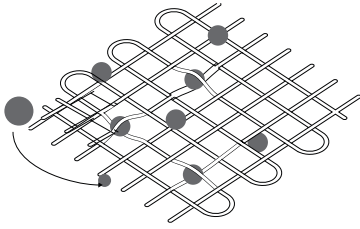
### 3.3. Landscape architectural tectonics

Broughton (2012:1) states that a tectonic theory for landscape architecture has yet to develop, as no channel of discourse is dedicated to the relationship between construction and resultant form. As a result, she attempted to present a tectonic theory relevant to the discipline. Her theory focused on textiles, as “landscape architectural discourse offers little in terms of how textiles can be used as a material in landscape architecture” (Broughton 2012:4).

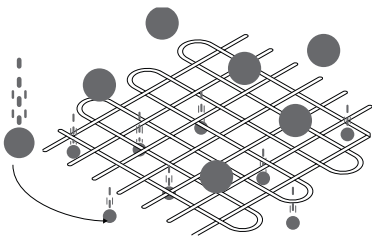
Broughton (2012:9) states that “in built landscapes the process of construction is doubled”, as elements constantly manipulate the designed

The word *textile* is from Latin *texere*, which means "to weave", "to braid" or "to construct" (Gillow & Sentance 2005:10).

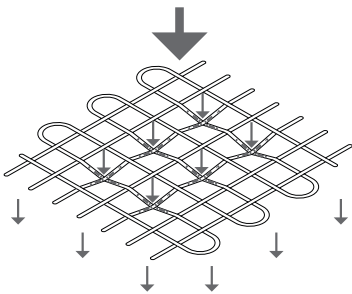
would consider these elements to be destructive, Broughton (2012:39) claims that textiles have the ability to engage with these forces in a constructive manner: "By strategically utilising materials that can structure contingent environmental forces, landscape architects might configure these forces to work in support of their design intent" (Broughton 2012:39).



textiles that integrate materials



textiles that selectively filter



textiles that diffuse forces

Figure 8: The mechanisms by which textiles interact with the landscape (Broughton 2012:28-34)

Broughton justifies the decision to investigate the material properties of textiles in the landscape by referring to the importance of textiles in the development of an architectural tectonic theory. Semper described the role of textiles in early space-making in *Stoffwechselthese*, where he considered carpets, not masonry, to be the original separators of space in a home. It illustrates how "textiles have been transmaterialised into stone and steel and other constituent parts" (Spuybroek in Tramontin 2006:53), similar to the Doric temple triglyphs and stone bridge abutments discussed on page 11.

Not only do textiles have a history in the development of tectonic theories, but they also meet the requirements of the selection of materials for investigation in this study: they are commonly available, easily manipulated, and affordable.

### 3.4. Textile tectonics

Broughton focused the development of her tectonic theory on textiles as a material that integrates and responds to environmental forces, specifically their unique ability to absorb materials, selectively filter materials from flows, or to diffuse or slow forces (Broughton 2012:27) (see figure 9). The emphasis of Broughton's tectonic theory is thus on functionality and the response of this specific material to landscape forces (refer to figure 10). There is opportunity to build on this theory by focusing on the use of textiles as not only a functional material, but also as a space-defining element.



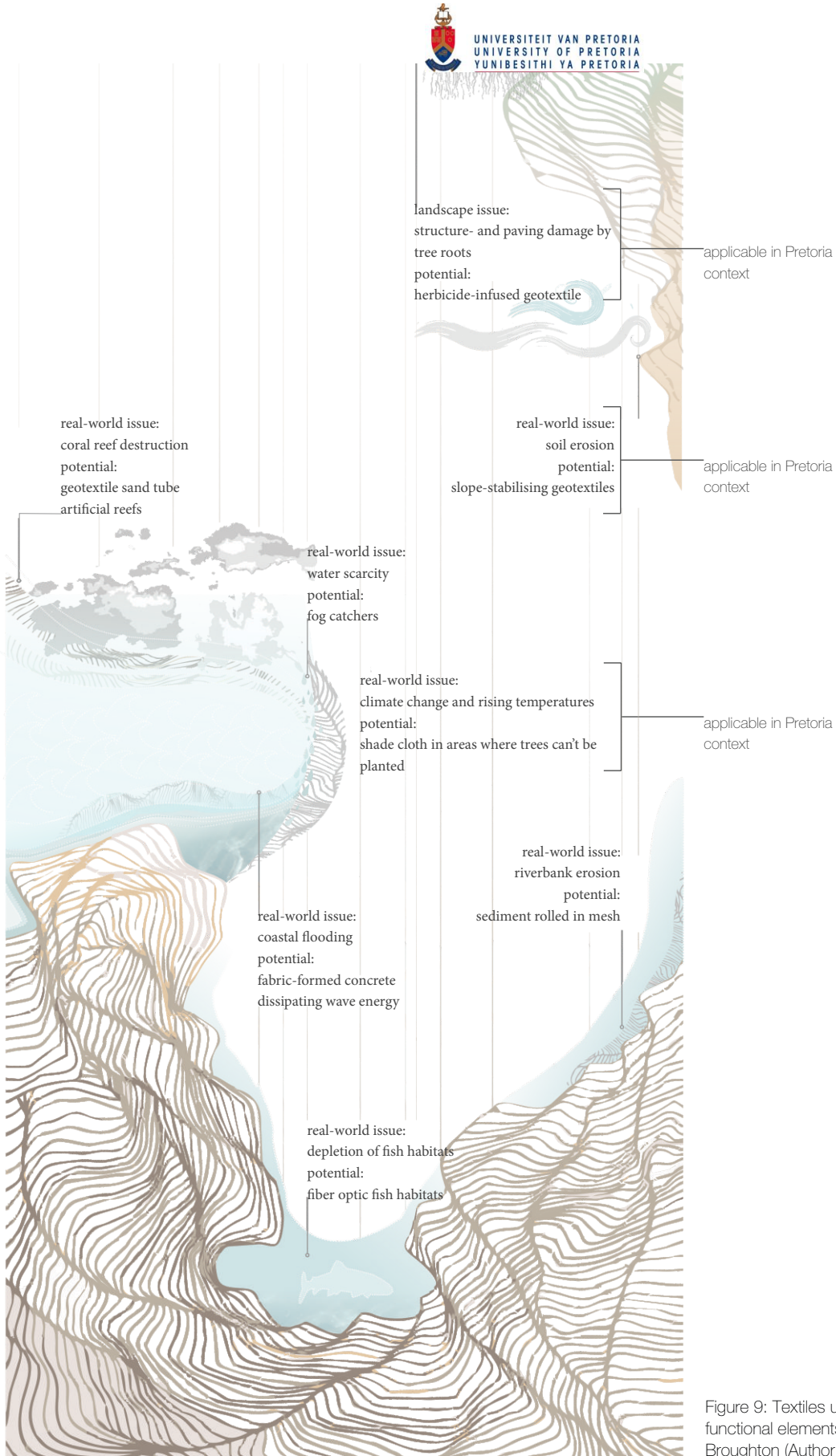


Figure 9: Textiles used in the landscape as functional elements as described by Broughton (Author 2016)