Introduction

The nature of materials, making and detailing

1.1. Background

If you think of Brick, you say to Brick: “What do you want, Brick?” and Brick says to you: “I like an arch.” And if you say to Brick: “Look, arches are expensive, and I can use a concrete lintel over you. What do you think of that, Brick?” Brick says: “I like an arch”. —Louis Kahn

The nature of materials has an influence on the manner in which they are used in construction. As structural elements, bricks perform best as arches, while timber elements are most economically used perpendicular to one another, as seen in traditional Japanese architecture. This has spatial implications: arches and domes form a different spatial experience to the linearity of lintels, and timber decking results in a rectilinear geometry. Construction details extend beyond nuts and bolts; they can reveal and memorialise construction methods, and this can lead the user to understand the built landscape and how it is made. For example, the triglyphs of Greek temples of the Doric order were made of stone, but were retained in the form of the wooden beams that would once have supported the roof (Tucci 2015:245; see figure 1). Can this influence the conventional design process that landscape architects follow?

Historically, architects were considered master builders, being both designers and craftsmen. In contemporary landscape architecture, there is typically a separation between the act of designing and the act of making, often causing a lack of practical knowledge of the capabilities of materials and their relationship to one another. This is perhaps the reason behind the recent increase in design-build workshops and -courses taken by students of spatial design; only by building does one truly understand construction.
1.2 Problem statement

Tectonic theories aim to explain how materiality and the art of construction can play a central role during the building design process. However, there is not a well-known body of work regarding the art of constructing landscapes. This knowledge is important as the design of robust yet expressive elements in public spaces requires an understanding of materiality and making.

1.3 Research objectives

The aims of this dissertation are:

1. To explore a design process that starts with detailing and material exploration.
2. To follow a research strategy based on hand-making and prototyping as design tool.
3. To investigate, apply, and contribute to the current body of knowledge regarding landscape architectural tectonic theories.

1.4 Thesis statement

Detailing and the joining of materials can inform the physical appearance of a built landscape on a larger scale, reveal its context and show the user the construction methods followed in its fabrication. This can be optimised by prioritising detailing as a starting point of the design process. Furthermore, an understanding of the material identity of a region will enable detailing representative of its setting. By actively incorporating making as a design tool, landscape architects can discover the potential of the materials available in an area. A landscape architectural tectonic theory will add to the knowledge gained through this process.

1.5 Project overview

The design process is initiated by theory and design ideals, and, as such, a programme, site and users are only identified at a later stage. The process of discovery reveals opportunities and constraints as the designer progresses. A set of criteria is established at the start of each phase of investigation.

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A set of criteria is established at the start of each phase of investigation. When the criteria are met, or when new information is discovered that could change the course of the design, the phase is reflected upon and responded to with an amended set of criteria. These criteria are a tool by which the investigations are measured against, and also act to control the time spent on each phase, which is a limiting factor due to the fixed duration of the study.
1.6 Definition of terms

detailing the way in which two or more components of a landscape or building are joined

experiential (also phenomenology) the experience of built space

expressive construction using a material’s properties to guide their aesthetic potential through patterns and repetition; the joining of materials in a functional yet aesthetic way (see figure 2)

fabrication the making or building of an item or space

forces natural phenomena that have an observable effect on the landscape, such as rain and water flow, wind and sunlight

hyperbolic paraboloid an infinite surface in three dimensions, with hyperbolic and parabolic cross-sections

hypar a hyperbolic paraboloid shape cut from the full infinite surface

immersive experience when a user feels completely captivated by a space

kit-of-parts a subcategory of pre-fabrication focusing on demountability, disassembly, and reuse

mountain fold a crease where the paper or sheet-like material folds away from the crease

parametric design the use of a computer to design objects by modelling their components with real-world behaviours and attributes

pavilion a stand or structure often found in parks and other public spaces

poetics of construction paying close attention to the joining of separate elements in a structure

pre-fabrication manufacturing components of a structure and afterwards transporting them to a different site where the structure is to be located

space-definer elements that imply form

stereotomic elements of architecture and built landscapes that are perceived to be heavy and solid

techne making useful objects by hand in an artful way

tectonic elements of architecture and built landscapes that are perceived to be lightweight

tectonics see poetics of construction

textile a flexible material consisting of a network of fibres, formed by knitting, weaving, knotting, crocheting or felting

yarn a continuous length of interlocked fibres

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