Application of the pavilion
Final design

9.1 Introduction

The relevance of the pavilion will be tested on two sites that represent open space in Pretoria that will benefit from the pavilion. Venning Park embodies the typical Pretoria urban park (Figure 60), and is used mostly by people employed in the surrounding Sunnyside and Arcadia areas during daytime hours. The rooftop of the Prinschurch building in Pretoria central represents the typical urban renewal project typology. To fully illustrate the forces acting on the landscape, an alternative to steel scaffolding was considered for the final design. Bamboo will not only overcome the weight restrictions of a mobile pavilion, but will change colour upon sun- and rain exposure (see Figure 59). Weathering of exposed bamboo occurs as a result of the interaction between different climatic conditions, such as variations in temperature and relative humidity (Shröder 2016). Pretoria rain events typically occur as short but intense afternoon downpours, preceded and followed by sun exposure. This leads to small cracks on exposed bamboo poles. Furthermore, ultraviolet radiation causes the breakdown of cellulose found in bamboo, and this leads to a change in colour (Shröder 2016).
structural members designed based on lengths of 2.5 m, as this is the bamboo pole length available from suppliers in Pretoria.

1 x structural unit carrying a single canopy
- 32 x bamboo poles
- 4 x 50 mm thick spreader plates to carry structural loads

1 x hyperbolic paraboloid canopy
- 8 x bamboo poles
- 2 x double block-and-tackle pulley systems with hand winches
- 216 textile modules
- optional: plants with irrigation

1 x convertible bicycle rack

surface modules
- weathering steel with perforations for plant growth
- lightweight composite pavers ramp
- edges

type A: 100 x 100 mm perforations
- type B: 75 x 75 mm perforations
- type C: 50 x 50 mm perforations
- type D: 25 x 25 mm perforations

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structural members designed based on lengths of 2.5 m, as this is the bamboo pole length available from suppliers in Pretoria

1 x structural unit carrying a single canopy
1 x hyperbolic paraboloid canopy
32 x bamboo poles
4 x 50 mm thick spreader plates to carry structural loads
8 x bamboo poles
2 x double block-and-tackle pulley systems with hand winches
216 textile modules
optional: plants with irrigation system
thin-film photovoltaic canopy
1 x convertible bicycle rack
optional: seating
table

Figure 61: Parts of the pavilion (Author 2016)

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Venning Park is situated in Arcadia, bordering Arcadia Primary School and in close proximity to embassies and restaurants (see Figure 65). A small building used to function as a café, but has since closed. The park’s three ponds are empty, and only some of the formal flower beds are planted. It has electricity- and water supply and lights for night use. There are some shade trees and benches, but few of the seats are situated in shady areas. The park will benefit from the kit-of-parts pavilion by attracting users and acting as a catalyst point for activity and further development.

The parts of the pavilion kit that will be suitable for Venning Park are the textile canopy, seating, bicycle rack, serving table, surface and lighting. Furthermore, the energy required to power the luminaires will be provided by a network of thin-film photovoltaic cells (Figure 64). These are not only a light-weight alternative to conventional photovoltaic panels, but will also move in the wind and create a striking visual effect during daytime.
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thin-film photovoltaic cell canopy

textile canopy

bamboo structure

bicycle racks

serving table

seating

Figure 67: Park pavilion parts (Author 2016)

adjustable decking pedestals creating a stepped surface due to the slope of the site

hand winch controls the pulley system during assembly, disassembly and maintenance of the pavilion canopy

Figure 68: Section perspective of park pavilion (Author 2016)

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Figure 67: Park pavilion parts (Author 2016)

- thin-film photovoltaic cell canopy
- textile canopy
- bamboo structure
- bicycle racks
- serving table
- seating

Figure 68: Section perspective of park pavilion (Author 2016)

- hand winch controls the pulley system during assembly, disassembly and maintenance of the pavilion canopy
- adjustable decking pedestals creating a stepped surface due to the slope of the site

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The Prinschurch building is situated in Pretoria central, and is part of a redevelopment initiative by City Properties. It forms part of 012central, a cluster of refurbished buildings similar to Johannesburg’s Maboneng precinct. The spaces are used for events, and the Prinschurch building is currently an unoccupied building primarily used for its rooftop space overlooking the State Theatre and Sammy Marks Square.

The pavilion will provide not only a sense of human scale to the space, but will also be a source of planting in an urban environment where this is lacking. In addition, it can provide atmospheric lighting and seating. Due to the higher wind speed at this increased altitude, textile weights are added to the spreader plates in order to secure the structure. Due to the relatively flat slope of the roof, no steps are needed, and the gentle slope can be compensated for by adjusting the decking pedestals.
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Figure 69: Location of the pavilion as an urban rooftop intervention (Author 2016)

Figure 70: Rooftop event space at the Prinschurch building (Author 2016)

Figure 71: Views from the Prinschurch roof to Sammy Marks Square (top) and the South African National State Theatre (bottom) (Author 2016)

Figure 72: Pavilion on the Prinschurch roof (Author 2016)
Figure 73: Rooftop pavilion parts (Author 2016)

- Textile canopy
- Bamboo structure
- Textile weight bags
- Serving table
- Seating
- Surface
- Lighting

Figure 74: Rooftop pavilion in isolation (Author 2016)

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Figure 73: Rooftop pavilion parts (Author 2016)
- textile canopy
- bamboo structure
- serving table
- seating
- textile weight bags
- lighting

Figure 74: Rooftop pavilion in isolation (Author 2016)
- access ramp
- seating
- bar table
- lighting

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Materials influence the way in which they are used in the landscape. Expressive construction encompasses staying true to a material’s properties, and revealing their construction techniques in an exaggerated and patterned way. A repetitive pattern of folded textiles used as a canopy not only reveals its construction (folding) but this acts as an aesthetic element. Regional aesthetics also plays a role in revealing the material’s context. Shweshwe is a textile typically used in traditional Sotho garment construction, and is iconically South African. Landscape architectural tectonics harvests natural forces to reveal, sustain, and guide the form-making of pre-manufactured elements. The patterned and repetitive use of a functional element such as folded surface panels that allow the growth of plants through their openings over time reveals natural processes over time. Through the process of hand-making, combined with computer modelling, the properties and potential of textiles were discovered, leading to an iterative design response which progressed from a detailed to a larger scale.

Conclusion

Knowing through making