Chapter 6

Detail Design
The Author has chosen to focus on the southern part of the Faerie Glen Nature Reserve for the detail design chapter. This area includes the parking area, arrival plaza, pause junction, concert lawn, stage, restaurant area, timber deck and bridge.

Individual sketch plans, sections and details will be drawn up for each area as indicated in Figure 6.2.
Material Palette

In order to create a landscape that is, and remains sustainable in the long term, materials should be used that are easily available, sourced from local manufacturers, have a low embodied energy and where possible, should be potentially recyclable. The maintenance requirement of each material was also taken into account as this also relates to the long term sustainability of a project.

Furthermore, as an aesthetic approach, materials have been chosen for their ability to withstand weathering and fade into the natural landscape thus reducing the visual impact of any intervention in the landscape on its surroundings.

**Exposed aggregate concrete paving** - Concrete paving with a fine exposed aggregate finish has been selected for the paved areas and pathways throughout this project. Organic shapes are easily paved due to the fluid nature of the material while exposed aggregate provides a non-slip finish.

Fly ash should be used in all concrete as a partial substitute for Portland cement. Fly ash is a by-product of the coal combustion process and is readily available in South Africa. Using fly ash offsets the carbon footprint by reducing the greenhouse gasses emitted in the production of Portland cement. Furthermore, the addition of fly ash results in a decrease of water required in the mixing process and an improvement in the workability of the concrete.

**Nutmeg clay brick paver** - The nutmeg clay brick paver will be used to pave the road surfaces in the parking area. Clay paving bricks are locally manufactured and readily available.

**Off-shutter concrete** - Off shutter concrete will be used for the construction of the built structures. The bulk of this material grounds it firmly into the land while its versatility allows the easy construction of sculptural forms. Off-shutter concrete stains over time alluding to its age and the environmental factors acting on it.

Similarly to the exposed aggregate concrete, fly ash should be partially substituted for Portland cement.

**Precast concrete grass blocks** - The grass block reduces water runoff by
decreasing the hard surface area of the paved surface. The block’s surface area comprises roughly 75% plantable area and 25% concrete. The grass block will be used to pave parking bays in the parking and the road surface in the overflow parking.

**Red clay brick** - The red clay bricks has been chosen for its visual aesthetic and will be used for the mowing edges which define the main pathway. Red clay bricks are locally manufactured and readily available.

**Sandstone tile** - Sandstone is a soft stone that weathers easily. It has been selected as a coping tile protect the waterproofing on the planted roofs. This materila has been chosen to compliment the off-shutter concrete.

**Slate** - Slate provides a strong visual contrast to the exposed aggregate paving in which it is set. Narrow slate tiles have been used to created an ‘architectural kiss’ where the similar materials of off-shutter concrete and exposed aggregate concrete paving meet. Slate tiles have also been used to create a shadow line on the stairs to make them more visible. Slate is readily available locally.

**Timber** - *Eucaluptus grandis* decking has been selected for the timber deck. As a category 2 invader species, *E. grandis* timber decking is readily available in locally. *Eucalyptus globulus* trees are present on the site and my be recycled in order to create sculptural furniture for the reserve.
Planting Strategy

A sustainable planting strategy should be employed across the reserve in order to create a landscape that is, and remains sustainable for the long term. Trees, plants, and veld grass must be planted in order to offset the carbon footprint of the project.

Due to the nature of the project, a single planting palette cannot be defined for implementation across the reserve. 16 Vegetation types have been identified in the Faerie Glen Nature Reserve and these should serve as the guidelines for planting.

Plant and tree species are to be selected for each sketch plan area individually based on the predominant vegetation type of the immediate area as defined in Chapter 3.

All plant species used in this project are to be indigenous to the ‘Middleveld’ region. Planting is to be carried out in a naturalistic style which compliments the integration of the built structures into the landscape.

Alien vegetation - Alien invader species are to be manually cleared from the reserve and the areas affected should be rehabilitated in order to restore the vegetation to its pristine state. The timber from alien tree species cleared is to be recycled and used on site. Other plant material should be used as mulching unless it will negatively affect the indigenous planting.

Lawned areas - Grass species must be indigenous. Lawns must be kept mown and tidy and are to be irrigated with 22mm of water per week. Lawn cuttings are to be used for compost on site.

Planted roofs - The planted roofs will be hydroseeded with veld grass and should be irrigated with 15mm of water per week.

Planters - The planters are to be hydroseeded with veld grass which is interplanted with small herbaceous perennial and succulents plant species. These areas should be irrigated with 40mm of water per week.

Trees - Trees species are to be grown from seed in the arboretum and conservation centre then moved into the reserve once established.

Veldgrass - Hydroseed mixes are to be determined by the predominant
Irrigation Strategy

Irrigation should take place in the early morning or late evening and a drip irrigation system should be used to prevent excess evaporation of water.

Irrigation requirements:

- Intensively landscape areas 40mm per week
- Extensively landscaped areas 15mm per week
- Lawned areas 22mm per week

Rainwater is harvested from the parking are, arrival plaza, pause junction, concert lawn, stage, restaurant area and picnic lawn. This water is stored and pumped out to irrigate the landscape.

The volume of water required for irrigation annually has been calculated as: 8116.80m³. The volume of stormwater that can be harvested annually has been calculated as: 8280.47m³.

By placing water tanks centrally in the reserve, stormwater can be harvested and used for the irrigation of the landscape. By harvesting the stormwater, runoff is decreased and the occurrence of increased flow in the Moreleta spruit is reduced.

It is therefore feasible to harvest rainwater in order to irrigate the landscape.

Water harvesting calculations have been attached as Appendix B.
Parking Area

The main entrance and parking area has been relocated to Glenwood road. The parking area is laid out around existing vegetation clumps and takes the slope of the area into account to prevent excess shaping of road surfaces.

A total 150 parking bays are provided. Of these, 70 are formalised with grass block paved bays and brick paved roads. The other 70 bays are informal and consist of cut grass bays and grass block paved roads. An area is provided to the west of the parking area in which busses are able to turn around.

The parking is linked via pedestrian paths to the entrance plaza where seating is provided. Natural planting is used in addition to the existing vegetation clumps as a buffer to decrease the visual impact of the parking area. Pedestrian crossing are raised from the road surface and serve as traffic calming elements.
Figure 6.19 Parking sketch plan

- Arrival plaza and meeting place
- Main entrance and administration building
- Drop off area
- Pathway to pause junction
- Disabled parking
- Road to stage
- Entrance and exit
- Glenwood road
- Nature trail
- Road to overflow parking
Arrival Plaza

The arrival plaza is located at the main entrance to the Faerie Glen Nature Reserve. The plaza is surrounded by bermed lawns which form a visual buffer between the plaza and the parking area. This space forms a transitional zone between the parking and the entrance to the reserve.

Seating walls are provided in the plaza for people who are waiting to meet friends or waiting to be picked up at the drop off/pick up area.
Figure 6.22 Section A - A through parking and arrival plaza

Red clay brick paver (on edge) mowing edge
1000 x 75 x 150 Precast concrete kerb

Compacted layer works
Concrete strip foundation on compacted layer works

Figure 6.23 Detail A1 - Paving connection
Scale 1:20

600 x 400 x 120 Precast concrete grass block
Planting medium
100mm gravel

1000 x 75 x 300mm Precast concrete kerb
Concrete haunching

Figure 6.24 Detail A1 - Kerb detail
Scale 1:20

600 x 400 x 120 Precast concrete grass block
Planting medium
100mm gravel
Compacted layer works
Figure 6.25  Detail A3 - Seating wall
Scale 1:20

Details:
- 100mm Precast concrete coping
- 110mm Red clay brick wall with flush joints
- Weepholes at 1200mm centres
- Concrete fill
- 10mm Polysulphide expansion joint
- 200 x 50 x 15mm Black slate tile
- 125mm In situ concrete paving with exposed aggregate finish

Construction:
- Compacted layer works
- Concrete strip foundation on compacted layer works
Pause Junction

This area forms the junction at which the path splits to either the restaurant area or the concert lawn. The space is located on the edge of a dense grouping of trees, which add to the sense of place and feeling of enclosure. When approaching the space from the main entrance, a ramp is positioned in such as way to open up the view to the Bronberg Ridge with every successive step until you reach the upper level (Figure 6.26).

Information about the reserve is displayed on the curved wall in order to allow visitors to understand and familiarise themselves with the reserve. This information includes details about the current ecological issues, activities in the reserve and information on the latest land art installation. The information conveyed to the visitor on this wall should be seen as a teaser of what the reserve holds in store for those who are prepared to spend some time and explore.
Figure 6.28 Pause junction sketch plan
Figure 6.29 Section C - C through pause junction

Figure 6.30 Section B - B through pause junction
Reinforced off shutter concrete retaining wall to engineers detail
Polysulphide expansion joint
200 x 50 x 15mm Black slate tile
125mm In situ concrete paving with exposed aggregate finish
Compacted layer works
In situ bitumen based waterproofing
100mm Ø Geopipe set in gravel and wrapped in a geotextile
Coarse stone wrapped in a geotextile
Reinforced concrete foundation to engineers detail on compacted layer works
Weep hole at 1200mm centres

Red clay brick (on edge) mowing edge
10mm Polysulphide expansion joint
125mm In situ concrete paving with exposed aggregate finish
Concrete strip foundation on compacted layer works

75 x 50mm Timber handrail fixed to galvanised steel handrail with a 5mm galvanised wood screw
Galvanised mild steel balustrade fixed to reinforced concrete wall with an M10 J-bolt
10mm Polysulphide expansion joint
200 x 50 x 15mm Black slate tile
125mm In situ concrete paving with exposed aggregate finish
M10 Galvanised mild steel J-bolt cast into reinforced concrete wall
Reinforced concrete retaining wall to engineers detail
Compacted layer works

In situ bitumen based waterproofing
Weep hole at 1200mm centres

Reinforced concrete foundation to engineers detail on compacted layer works

Figure 6.31 Detail B1 - Mowing edge
Figure 6.32 Detail B2 - Balustrade fixing
Figure 6.33 Detail C1 - Retaining wall
Concert Lawn and Stage

The concert lawn is an informal venue catering for music performances to audiences of up to approximately 350 persons. Seating walls created an informal terraced picnic lawn on which trees provide shade for the audience (who are welcome to bring along their own umbrellas). A plaza area acts as a foyer in which small stands can be erected for the sale of food if necessary. Ablution facilities are located in a ‘landscaper’ building to the south-west of the lawn.

The stage is designed as a sculptural object in the landscape. Grounded by heavy concrete walls, it sits nestled into an existing clump of trees. A light structure provides a frame on which indigenous creepers grow and provide shade for the performers while the Renosterkop provides a graceful backdrop to the ensemble. A grass block track provides vehicular link between the stage and the parking area for deliveries.

A berm holds the space by enclosing the south-eastern corner of the lawn as the trees become more sparse and the natural groundline falls away.
Figure 6.35 Concert lawn sketch plan
100mm Precast concrete coping tile
Concrete fill
110mm Red clay brick wall with flush joints
Weepholes at 1200mm centres
10mm Polysulphide expansion joint
200 x 50 x 15mm Black slate tile
125mm In situ concrete paving with exposed aggregate finish
Compacted layer works
Concrete strip foundation on compacted layer works

Figure 6.36  Section D - D through concert lawn
Figure 6.37  Detail D1 - Seating wall
Scale 1:20
Restaurant Area and Picnic Lawn

The ‘landscaper’ building is carefully located to remain hidden from the visitor almost up to the point at which you enter the plaza space in front of the kiosk between two retaining walls (Figure 6.38). The building is also positioned to gain maximum advantage of the view towards the Bronberg Ridge.

The building houses a small restaurant, a kiosk and ablution facilities. A large sculpted picnic lawn with children’s play equipment stretches before the building which sits snugly within the landscape which grows over, under and ‘through’ it.

The restaurant area is shaded by a planted pergola and provides a view to the Bronberg Ridge as it rises up before you. A grass block track provides access for vehicles to the delivery area behind the restaurant from the main parking lot.

A sculpted lawn provides an area for families to picnic in small shaded pockets while children run and play. A playing berm provides a slide, tunnel, balancing poles and hanging bars to entertain the children while the parents relax under a tree, or at the restaurant.

A kiosk provides visitors with the option of stopping for a quick drink and snack en-route up to, or back from the lookout decks. The kiosk also stocks a limited range of nature related books and merchandise.

Ablution facilities are provided and consist of gents and ladies areas (each with a disabled stall and a baby changing station) and a communal hand washing area.

A nature trail leads off from the eastern side of the plaza and runs along the Moreleta spruit.
Figure 6.40 Restaurant area sketch plan
Figure 6.41  Section E - E through restaurant area

Figure 6.42  Detail E1 - Steps
Scale 1:20
Figure 6.43  Detail E2 - Planted roof
Scale 1:20

- 200 x 300 x 10mm Sandstone coping tile to protect waterproofing
- In situ bitumen based waterproofing
- Cement screed to slope min 2% to full bore
- 300mm Reinforced concrete slab with 550 x 200mm ring beam
- 10mm Drip line

150mm min Planting medium with expanded vermiculite
100mm Drainage blanket of 19mm gravel wrapped in a geotextile
300mm Reinforced concrete slab with 550 x 200mm ring beam
10mm Drip line
Timber Deck and Bridge

The deck and bridge provide the main crossing of the Moreleta spruit on the main pathway between the restaurant area and lookout points. The deck spans the 1 in 50 year flood line which is included in the zone of highest ecological sensitivity.

A small pause area on the deck, separated by planting provides a place to sit and gaze over Weaver pool towards Renosterkop from a shaded bench. If you catch it at the right time of the day, you may see the reflection of Renosterkop on the surface of the water.

A concrete bridge spans the spruit. Its retaining walls are guarded by gabions and reno-mattresses from damage due to increased flow in the spruit caused by storms.
Figure 6.45 Deck and bridge sketch plan
35mm thick *Eucalyptus grandis* timber decking plank fixed with galvanised wood screws to be countersunk and plugged with colour to match timber

44 x 220 x 1800mm *Eucalyptus grandis* timber stringer fixed to concrete retaining wall by means M10 J-bolts cast into the concrete retaining wall at 500mm centres

381 x 102mm x 55kg/m Galvanised mild steel taper flange channel fixed to concrete retaining wall by means of a 15mm Ø galvanised mild steel J-bolts at 450mm centres

50 x 50 x 6mm Galvanised mild steel equal angle welded to taper flange channel

1800 x 150 x10mm mild steel bearing plate

15mm Ø Galvanised mild steel J-bolt cast into concrete retaining wall

Reinforced concrete retaining wall to engineers detail

**Figure 6.46** Timber deck and bridge sketch plan

**Figure 6.47** Detail F1 - Timber deck and bridge connection

Scale 1:20
Galvanised mild steel balustrade welded to steel to galvanised steel channel

Concrete fill with exposed aggregate finish

320 x 54 x 1800mm QC deck (by Q-Deck) fixed to equal angle by means of 3mm self tapping screws

50 x 50 x 6mm Galvanised mild steel equal angle welded to taper flange channel

381 x 102mm x 55kg/m Galvanised mild steel taper flange channel fixed to concrete retaining wall by means of a 150mm Ø galvanised mild steel J-bolts at 450mm centres

20 x 5 x 1800mm Galvanised mild steel flat welded to taper flange channel

35mm thick Eucalyptus grandis timber decking fixed to timber support with countersunk 5mm screws

44 x 220 x 900mm Eucalyptus grandis timber support

150 mm Ø Treated gum pole set into mass concrete footing

Figure 6.48  Detail section F2 through bridge edge
Scale 1:20

Figure 6.49  Detail F3 - Timber deck edge
Scale 1:10
Sustainability Rating

The Sustainable Building Assessment Tool (SBAT) was used in order to generate a sustainability rating for the proposed intervention at the Faerie Glen Nature Reserve. The SBAT rating system was developed to support sustainable development in the context of developing countries and sets out 15 objectives under the headings of economic, social and environmental that should be aimed for in buildings (CSIR, 2007).

The SBAT rating system is designed to deal with habitable buildings and thus cannot be applied purely to the landscape. In this case, it has been used to assess the ‘landscraper’ structures proposed by the author.

The project achieved the following ratings out of 5:

- Social: 4.6
- Economic: 3.7
- Environmental: 3.7

The project achieved an overall sustainability rating of 4.0 out of 5 which classifies the interventions as ‘good’.