Leaves are the most conspicuous and physiologically possibly the most important organs of a green plant.

- Prof. Kristo Pienaar on leaves.

(Pienaar 1979:22).

**Interspecific Competition** – In ecology the term is used to describe the process whereby individuals of different species compete for resources e.g. food or living space. For a tree to survive in a dense forest, it must grow taller than its neighbours, absorbing as much sunlight as possible (Begon, Townsend & Harper 2006:5).

**Form** - The building is planned on the Northern tip of the old Plant Pathology building. The eighteen meter high building relates to the scale of the Union Building. The idea behind the building was to recreate a forest environment through the architectural envelope, recreating an environment in nature through the building. A spiraling staircase guides visitors up the tree canopy to two viewing decks. The upper deck is a platform overlooking the Union Buildings.

Fig. 124: The Social Struggle of plants: Two different specimens of white oak (Quercus alba). The specimen on the left is a free-standing tree, while the tall, slender tree on the right grew in a forest.
STEEL & BAMBOO VIEW TOWER

200 x 200 x 10 STEEL SQUARE SECTION COLUMNS, SECURELY FIXED TO BASE PLATE WITH M30 BOLTS.

2 x CELTIS AFRICANA (WHITE STINKWOOD)

ACCESS STAIRS TO VIEWPOINT

RAMP

LILY POND

OLD - BIOSYSTEMATICS BUILDING // TIMBER FOLLY.
1. **Bamboo Post and Beam Horizontal Cladding:** Locally sourced 80 x 125 x 10,000 mm laminate bamboo beam with 80 x 80 x 10 mm support posts spaced 1500 mm intervals.

2. **38 mm Timber Decking:** 114 x 38 mm structural timber battens, securely fixed with 4mm galvanized fixing nails.

3. **200 x 200 x 4.5 mm Square Hollow Section Steel Support Brace:** Securely fixed with M30 bolts.

4. **Bamboo Lattice Work:** Irregular angles of 80 x 125 x 10,000 mm bamboo beams to follow line of 8.5 m and 17 m platforms, securely fixed to vertical supports with 80 x 80 x 6 mm equal angles.

5. **Beam Hanger:** 80 x 80 x 6.6 mm angles clavet, securely welded to 200 x 200 x 4.5 mm square hollow section mild steel support brace.

6. **Grab Rail:** 12 mm Ø circular steel handrail, fixed to 12 mm Ø post with 10 mm Ø circular steel supports.

7. **Beam Hanger:** 200 x 200 x 5 mm edge plate, welded to rail and 200 x 200 x 4.5 mm square beams.

8. **200 x 200 x 10 mm Edge Plate to Top of 200 x 200 x 4.5 mm Square Beams.**

**Fixing Bracket Scale 1:10**

- 200 x 200 x 4.5 mm square hollow section mild steel support brace, securely fixed with M30 bolts.

- 200 x 200 x 4.5 mm square hollow section mild steel support brace, fixed to footing pads with M30 bolts.

- 114 x 38 mm structural softwood battens, fixed in long lengths with steel brackets onto steel beams. Use 4mm Ø galvanized fixing nails.

**Fixing Bracket Fixing Plate Securely Welded to Inside of Section.**

**Timber Folly Details**

**Timber Folly Section**

**Timber Folly Details**
A fountain is perhaps the most delightful of all the ornamental accessories that go to complete a garden, and one in which the sculptor may find the greatest scope and freedom of his fancy and skill.

- Abstract from *Sex in the Garden.*

**WATER HYDROLOGY** - Ecologists view water as a defining part of all ecosystems. Through the process of erosion, water has grafted the form of almost all our physical landscapes. Water shapes all living ecosystems by its quantity, amount, distribution and occurrence (BEGON, TOWNSEND & HARPER 2006:65).

**FORM** - Built on the footprint of the old Plant Pathology building, the lily pond is a gathering place for water in the entrance garden. A stream of water flows from the pond to House Vrede, indicating the movement route to visitors. The pond is designed to exhibit indigenous water plants.

Fig. 131: Hydrologic cycle: The water cycle plays a key role in ecosystem functions and processes.
LILY POND
SECTION & DETAIL

HISTORIC WALL
WALL DETAIL: 280 mm IN SITU CAST CONCRETE WALL WITH SPECIAL MAJONESY CLADDING, EXISTING UNITS REUSED AND GLAZED AS WATERPROOFING AND AESTHETIC WALL FOR POND. JOINING AND ACHIEVED FINISH AS PER ARTISTS DETAIL.

75 MM CONCRETE SURFACE BED WITH 3 mm TORCH ON BITUMINOUS FELT WATERPROOFING TO SEAL SURFACE

EDGE DETAIL

150 x 750 mm IN SITU CAST STUB WALL

MENTIS GRILL, PLACED AT 250 mm UNDER WATER LEVEL

75 MM CONCRETE SURFACE BED WITH 3 mm TORCH ON BITUMINOUS FELT WATERPROOFING TO SEAL INSIDE OF CHANNEL

DETAIL: DIRECTION CHANNEL

SCALE CHECKED BY
DRAWN BY
DATE
PROJECT NUMBER

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F – EXHIBITION HALL:

IDEA - The aim of the building is to create a shielded environment for the exhibition of plants. The roof of the building encloses the space to form a sheltered place. Shaded and protected from the African sun, the space mimics a cave-like atmosphere for the exhibition of more sensitive plants i.e. orchids and other epiphytes.

BRIEF AND ASSIGNABLE AREA - With a floor area of 1080 square meters, the exhibition hall has a schedule area of 220 assignable square metres. Built on the footprint of the old maintenance building, the programme of education and exhibition are covered by a large-span green roof. The education facilities include an outdoor amphitheater and stage for workshops and lectures.

SITTING AND BUILDING PLANNING – Located on the east edge of a platform formed by structures on the site, the building is cut into the landscape. A two-meter level difference is accommodated by a access ramp. Facing west, the programmes in the building are arranged round the ramp. Movement and functions in the building are covered by three ten-meter wide concrete roofs that open up to the east edge of the site - allowing users to access historic trails of the Union Building estate.

FORM - The form terminates the Eastern end of the entrance podium as a cave that connects to the landscape. The building form is dominated by its roof, a concrete roof fans out in three ten-meter wide parts that puncture the landscape. The 200 mm thick roof is covered with grass. The idea behind the roof allows the landscape to fold over the structure, connecting the exhibition buildings on the platform to the adjacent Union Building gardens.

INDOOR EXHIBITION – Two light-wells are cut in the slanting roof. Built at a 110° angle to the floor plan, movement in the space is directed by a thirty-meter wall. The plane forms a mouth dividing the interior space from the landscape, inviting users to the building.

Fig_136: Concept diagramme of the exhibition building.
EXHIBITION HALL

SECTION

- **UPSTAIRS BEAM AND SAFETY RAIL:**
- **GREEN ROOF:**
  - Medeinafrica Green Roof System:
  - Lawn planted on loam/sand on SABS Approved Waterproof Membrane
- **AMPHITHEATRE**
- **STAGE**
- **INDOOR EXHIBITION**
- **200 mm thick, 15 MPa in situ cast concrete roof. Admixture to facilitate waterproofing of roof, structural ribs to run length of the membrane.**
- **Steel dowels or mechanical key anchor foundation wall to footing of concrete columns.**
- **500 mm in situ cast concrete retaining wall with structural ribbing. Strip foundation to run length of wall.**
- **150 Grout fill with slope 1:250 covered with stone and geotextile.**

Scale: 1:100

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Checked by: [Signature]

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Project Number: A130

Project Name: [Project Name]

Owner: [Owner]

Author: [Author]
HISTORIC WALL LILLY POND

WALL DETAIL: 280 mm IN SITU CAST CONCRETE WALL WITH SPECIAL MASSEAR HYDROPHOIN AND GEOTEXTIL

JOINING AND ACHIEVED FINISH AS PER ARTISTS DETAIL.

STEEL DOWELS OR MECHANICAL KEY ANCHOR FOUNDATION WALL TO FOOTH OF CONCRETE COLUMN

GREEN ROOF: MEDIAINAFRICA GREEN ROOF SYSTEM, LAWN PLANTED ON LOAM/SOIL ON SABS APPURED WATERPROOF MEMBRANE

UPSTAND BEAM AND SAFETY RAIL

VERTICAL EXHIBITION WALL, 1000 mm THICK IN-SITU CAST CONCRETE WALL, WITH 28 mm S/S FARREL SLEEVES SPACED AT 1000 x 1000 GRID.

EXISTING: 1 x KIRIKIA ACUMINATA (WHITE SELINGA)

7000 x 2000 mm MOVABLE EXHIBITION TABLES, 2 mm S/S WITH LOCKABLE CASTERS.