Crafting the disused

Drawings Part I

Local waste material transformation potential and integrated waste management on a decentralised scale
Written by:
Frederice Koch
Student Number 4513924

Tutors:
Design tutor: Monique Smit
Research tutor: Jan Jongert
Building technology tutor: Paddy Tomesen

As part of:
The Architectural Engineering
Graduation Studio 17
Master of Architecture, Urbanism
and Building Sciences
Faculty of Architecture
Julianalaan 134
2628 BL Delft

Date:
May 19th, 2017
Cigondewah Kaler - Rice Fields

access to football field & site location
Cigondewah Kaler - Football Field

site location
SITE LOCATION
Climate & Details
**Roof Hood**

[Roofs are designed to overhang sufficiently to protect all walls from direct sun when at its highest point on any given day.]

**Roof Direction**

[Chimneys are directed towards the north west in favour of prevailing winds from the south east; chimneys are pulled towards the outer platform edge where possible, to increase the amount of rain water falling into the garden and water tank.]

**Garden**

[A garden in between the two volumes functions as a natural cooler - creating shade and pressure difference to encourage wind velocity in relation to the buildings.]

**Platform**

[A raised platform prevents exposure to occurring floods, as well as animals gaining access and simultaneously creates shaded space below for air to pre-cool before it enters the building from below the floor and within the walls.]

**Stack Effect**

[To support increased air velocity and to direct fumes from waste and/or heating of plastic upwards out of the building and in the case of the machine room to bring the fumes into an air layer above residential dwelling lines.]

**Anti-Flood Blockage Foundation**

[The foundations are designed to allow water to flow freely underneath the platform in the event of flooding, which is a common occurrence within the area. To protect the bamboo structure from water little ‘foundation hoods’ are raised up, while the primary foundation structure is just below ground (to allow for the water to run freely between the built volumes, the garden and surrounding ground. The foundation pads are connected all around to cater for seismic events and velocity in relation to the buildings.]

**Climatic Strategy**

1:200
RAIN WATER HARVESTING
[the roof shape is designed to primarily aid in increasing air velocity but secondarily in directing rain water either to a garden or directly into rain water storage tanks in the wall next to the cleaning section as well as the washrooms walls. Thus making direct use possible]

BIOGAS-DIGESTER
[a floating drum biogas-digester is positioned in the back of the garden. Weekly organic waste accumulations of the kampung suffice to generate 2.5 times the energy needed by the sampah bank and plastic processing facility. The outlet of the biogas-digester is used directly for the garden and surrounding farming activities.]

PUBLIC COMPOST TOILET
[the public toilet is directly connected to water tanks located in the bathroom walls and the toilet outlet itself is connected with the biogas digester.]

---

Energy & Water Strategy
1:200
**Roof cladding**
recycled plastic (HDPE, LDPE, PE)
roof shingles; [200mmx100mmx8mm]

**Roof Structure**
primary roof structure:
bamboo poles [ø 40mm];

secondary roof structure:
vertical glue laminated bamboo batten [60mmx20mm];
horizontal glue laminated bamboo batten [20mmx20mm]

**Wall Structure**
primary wall structure:
2x2 bamboo pole columns, columns centred at 500mm [ø 40mm];

secondary wall structure:
horizontal bamboo poles in x and y direction, spaced at 500mm [ø 40mm]

**Flooring**
cut & flattened bamboo flooring
with 5mm spacing [120mmx30mm]

**Substructure**
horizontal bamboo pole [ø 100] above
2x horizontal bamboo poles (vertically attached) [ø 100mm]

**Foundation**
bespoke reinforced concrete pole foundations (800mmx800mm) with 4
raised hoods per block for bamboo columns, connected via reinforced concrete slabs (200mmx200mm)
Detail II: Foundation and Bamboo Footing

1:10 & 1:5

**Section at 1:10**

- Reinforced concrete pad foundation with 4 raised concrete hoods per block;
- Connected via reinforced concrete slabs.

**Plan at 1:10**

- 3x3 bambusa bamboo columns [ø 40mm], up to a height of +500 above ground (in line with platform floor), with bamboo fibre lashing.

**Detail at 1:5**

- Bamboo flooring with 5mm spacing - cut & flattened (120mm x 30mm).
- Bambusa bamboo substructure beam [ø 100mm].
- Bamboo bamboo substructure beam [ø 70mm].
- Compressed gravel and fine grained river sand.

**Recycled plastic cap** (HDPE/LDPE/PE) footings for bamboo columns [ø 40mm].

**Mortar, poured into concrete footing once bamboo column has been fitted.**

**Recycled plastic (HDPE/LDPE/PE) footings for bamboo columns [ø 40mm].**
2x2 bambusa bamboo column [ø 40mm] continuation of 3x3 column with reduced bamboo poles, but extra pole on external side with rattan lashing

hook connection; recycled plastic (HDPE/LDPE/PE) [4mm x 8mm, approx. ø 40mm]

cladding tiles; recycled plastic (HDPE/LDPE/PE) [5mm x 250mm x 186mm (or 92mm in width)]

bamboo shelf board [20mm x 380mm]

bamboo beam [ø 40mm]

floor connection of cladding tile (matching position of hooks in relation to tiles above)

textile yarn gained from local textile waste

Section at 1:10

Detail IV - Wall, Cladding & Roof Connection
1:10 & 1:2
Detail III: Roof to Roof Ridge Detail

Diagrammatic plan; scale less

bespoke plastic grate (HDPE); with holes along the ridge to direct rainwater towards the funnel underneath (20mm thickness)

double layered bambusa bamboo truss (ø 40mm)

lowered, doubled rain catcher funnel (with enclosed and lifted sides to prevent rain water from entering the building) directing rain water to a garden via a 500mm overhang out of the roof (HDPE 20mm thickness)

recycled plastic (HDPE, LDPE, PE) roof shingle; [200mmx100mmx8mm]

water proofing membrane

bambusa bamboo truss [ø 50mm, 400mm in length]
Type 1: open structure

Type 2: open structure defining space and acting as storage unit

Type 3: clad but with open, usable storage from the inside

Type 4: clad & fully insulated

Detail VI: Wall Set Up’s
1:40
Visualisations
Reception

drop off and recording of waste
Storage Room

sorting, cleaning, drying, storing
Machinery Workshop

shredding, injecting, melting, compressing
Workshop

designing, pre and post processing