08 technical exploration

technological aesthetic...

The pre-school reads as a series of modular boxes sitting at what may first seem as a random composition. Yet these structures are strategically placed on a tartan grid network. The lightweight classrooms are more abiding to the grid where as the grounded structures [housing the administration, utilities and dining components] tend to merge over the lines. Routes and circulation are made into features and can be clearly read.

The supporting structure of the classrooms is over compensated for and emphasised as they serve a dual role to become climbing equipment. Aluminum cladding on the classroom facades also reflect the notion of a modular system as the recesses, where the cladding is fixed to the supporting frame, can be seen.

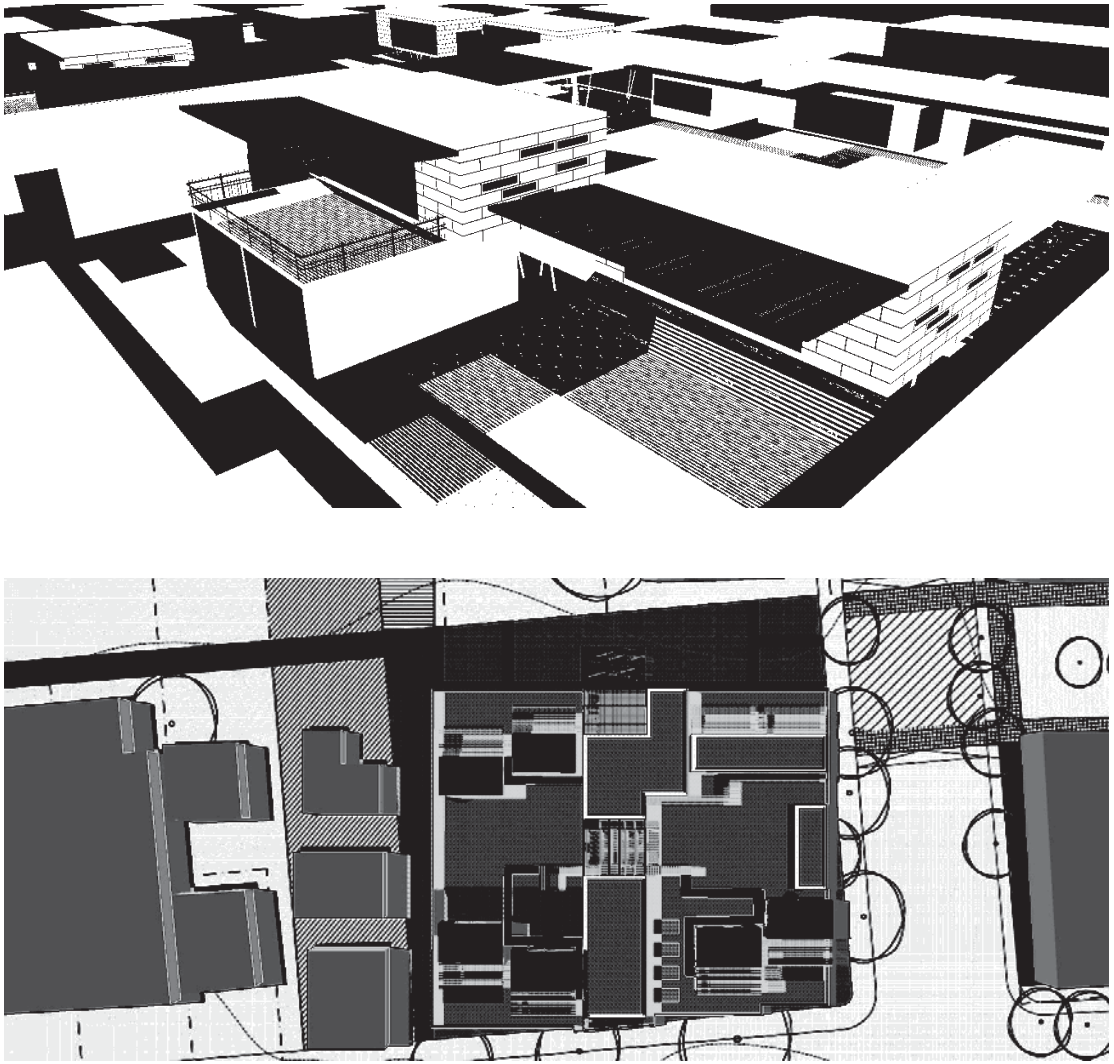
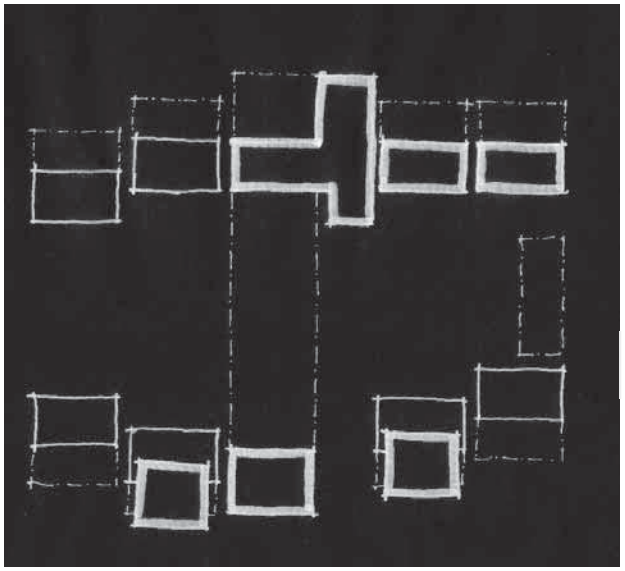
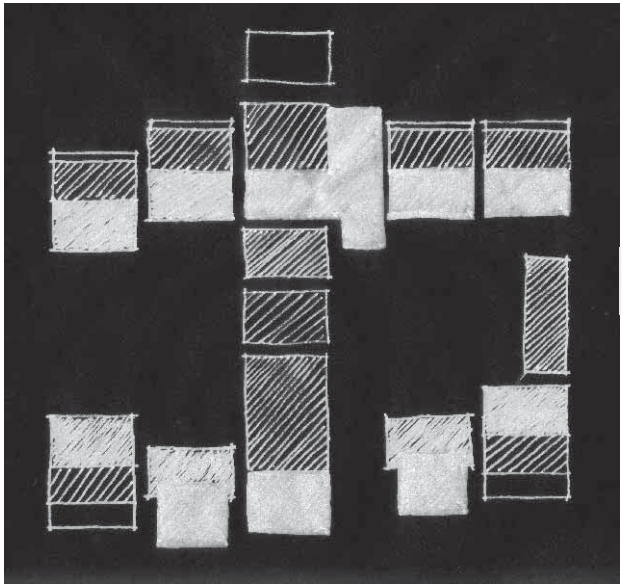


figure 8.1 3D models expressing modularity

stereotomic and tectonic





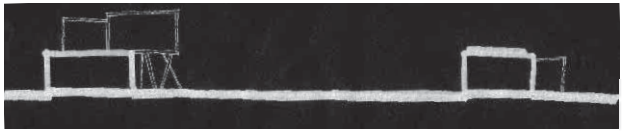


figure 8.4 **diagrammatic section differentiating between stereotomic and tectonic structures**

The pre-school complex is made up of a series of stand-alone structures. Where the materials and structural composition of each of these structures are reflective of the function it houses.

figure 8.2 **diagram differentiating between stereotomic and tectonic structures**

The entrance and administrative components of the complex, as well as those facilities accessed by all the children, are of a stereotomic nature consisting of brick cavity walls, concrete floors and roof slabs topped with roof planting.

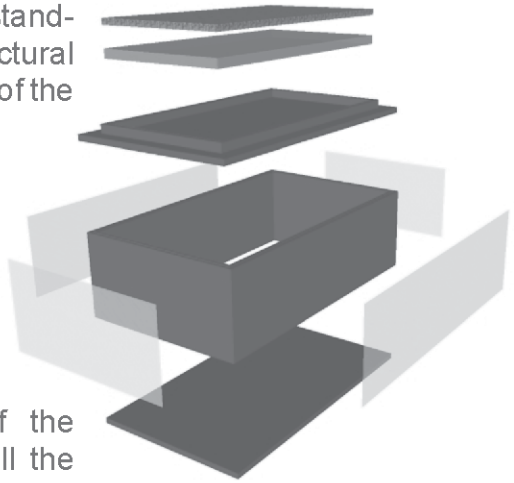


figure 8.5
3D stereotomic model

figure 8.3 **diagram showing enclosed spaces, covered outdoor spaces and open spaces.**

Classrooms are tectonic steel frame constructions with aluminum cladding on the external surfaces and are cladded with timber on the interior surfaces. These are roofed with metal roof sheeting.

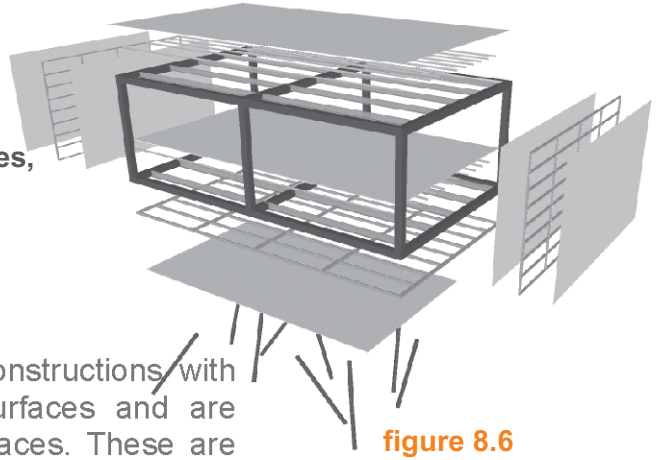


figure 8.6
3D tectonic model

structural aesthetic...

Stereotomic

Primary

- load bearing brick cavity walls consisting of a 50mm cavity between the two brickwork skins of 110mm each
- 150mm concrete surface bed

Secondary

- 200mm reinforced concrete roof slab with integrated 300mm downstand beam and 300mm upstand beam recessed 500mm from the perimeter

Tertiary

- plaster and paint
- planting on the roof

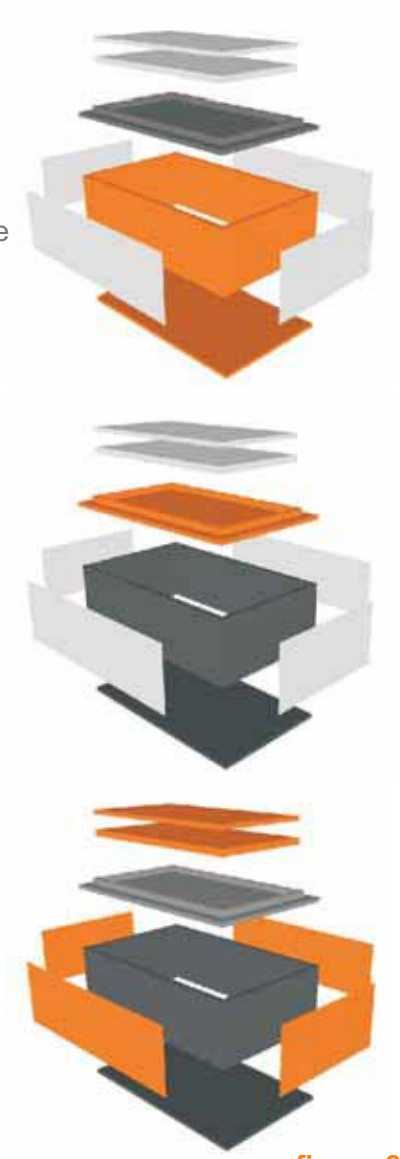


figure 8.7

Tectonic

Primary

- 100mm to 150mm mild steel diameter tubular pipe columns
- 200mm by 200mm square hollow section beams

Secondary

- 50mm diameter tubular pipe bracing
- sub-structures onto which the cladding and roof sheeting is fixed

Tertiary

- powder coated aluminum cladding [external]
- marine plywood cladding [internal]
- glasswool insulation between the cladding
- corrugated roof sheeting

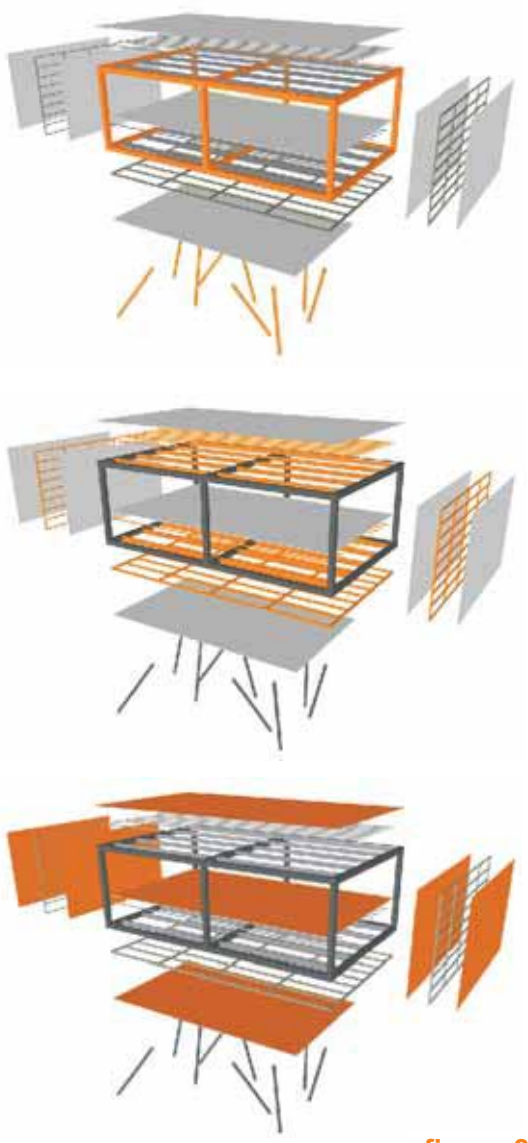


figure 8.8

materiality...

The selection of construction materials, to reiterate, were chosen to differentiate between the use each seperate structure accommodates

A more contemporary selection of building materials was selected in keeping with the progress of the area as reflected in the aesthetic of the recently constructed Bloed Street Mall.

The general material pallette of the pre-school is neutral colours with splashes of accents [red, blue, yellow and green] provided by vinyl inlays in classroom glazing.

Aluminum cladding was chosen to reflect the industrial nature of the area.

Timber was introduced to assist in softening the appearance of the complex, creating a friendlier environment for children.

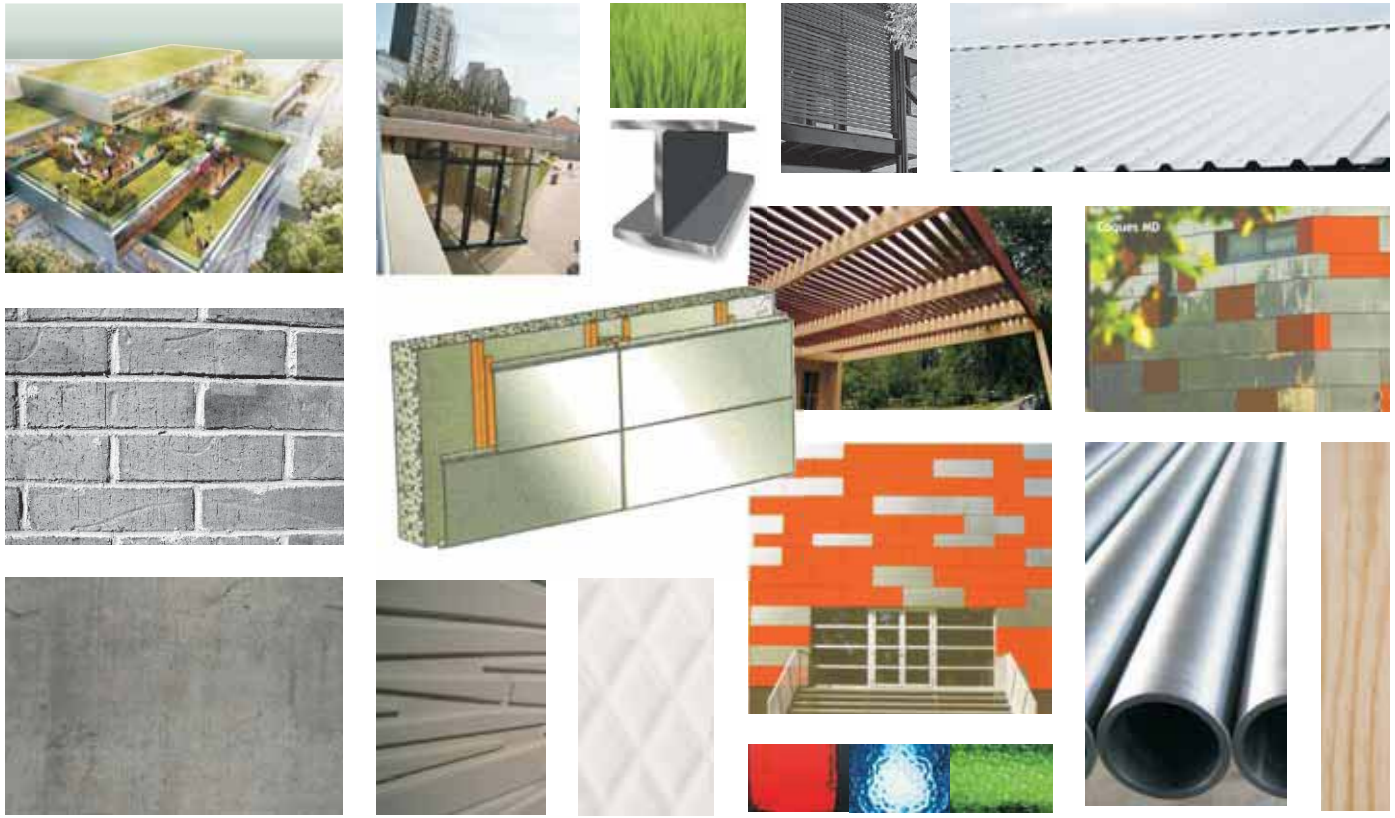


figure 8.9 materiality collage

The sustainable building assessment tool [SBAT] was used to predetermine the design process and applied to optimise good design practice. The following is a culmination of the most applicable aspects of the three fields outlined [social, environmental and economic issues] in the SBAT manual , are used to best explain the design decisions of the pre-school.

social issues...

Occupant comfort
Comfort is paramount in an educational facility as it has a direct impact on the health, happiness and productivity of the users. Children need to be as alert as possible to best absorb the teachings imparted to them.

Lighting
The pre-school is orientated to so that all spaces receive maximum amount of natural light so that no space requires a constant electrical supply. East and west facing facades having minimum glazing while glazing is most prominent on the north and south facing facades. Glare and harsh light, especially from the north, are controlled by appropriate shading devices.

Ventilation
All spaces have sufficient controllable openings so that they are naturally ventilated. The Issue of thermal comfort is an important aspect as human performance is negatively influenced when room temperatures are above 28 degrees Celsius or below 18 degrees Celsius. Thermal comfort is achieved by sufficient insulation provided by the walls an roof structural compositions.

Air movement and humidity must be ideal for hygienic comfort especially when the space caters children.

Noise
Traffic noise from busy Bloed street is decreased by the buffer created by proposing the office block. Additional sound insulation is provided in the music and movement room to assist in decreasing the projected noise levels.

Views
All spaces have maximised visual access to the exterior to further enhance the connection from inside to outside. All users are located within 6 meters of an opening at any given time.

Inclusive environments
The site was specifically chosen for its position near existing bus and taxi transport nodes. A parking facility has been proposed for the western end of the block and the proposed bus rapid transit routes passes close to the site. Pedestrian routes through the block have been proposed in order to best traverse the area.

Access to green outside spaces
This aspect is the driving force of the intention to integrate landscape and architecture. It is vital in a proposal of this sort that opportunities for play are encouraged and all children have easy access to the social green play spaces.

User adaptation
Adaptation of spaces is implemented in the form of inter-room partitions so the size os the room can be increased or decreased as the necessity arises. The three year old's classroom can open into each other to form a single large space.

Community involvement
Space is available in the proposed office space to house services for local use.

Security
Access to the site is controlled as security is vital for the safety of the indefensible occupants. Measures have also been taken to create clear visual links between spaces and routes.

Health
A sick bay has been provided for in the accommodation as children are prone to injuries and are easily susceptible to childhood illness that require a degree of quarantine.

environmental issues...

Water

Rainwater and grey water are to be collected and stored in underground tanks to be used in irrigation of the landscaped areas. While storm water runoff will be reduced by using pervious and or absorbent surfaces. The planting used will be indigenous species with low water requirements.

Energy

Energy consumption will be reduced as passive ventilation and lighting conditions have been employed. Using play equipment that harvests kinetic energy produced by children playing with the equipment has been investigated however this technology has not been explored to its full potential and products are not easily available in South Africa.

Recycle and reuse

Organic waste produced from the kitchen will be composted and used in the educational vegetable patches.

Neighbouring buildings

The proposal is sensitive to the buildings surrounding the site especially to the small scale heritage buildings to the west and residential block to the north.

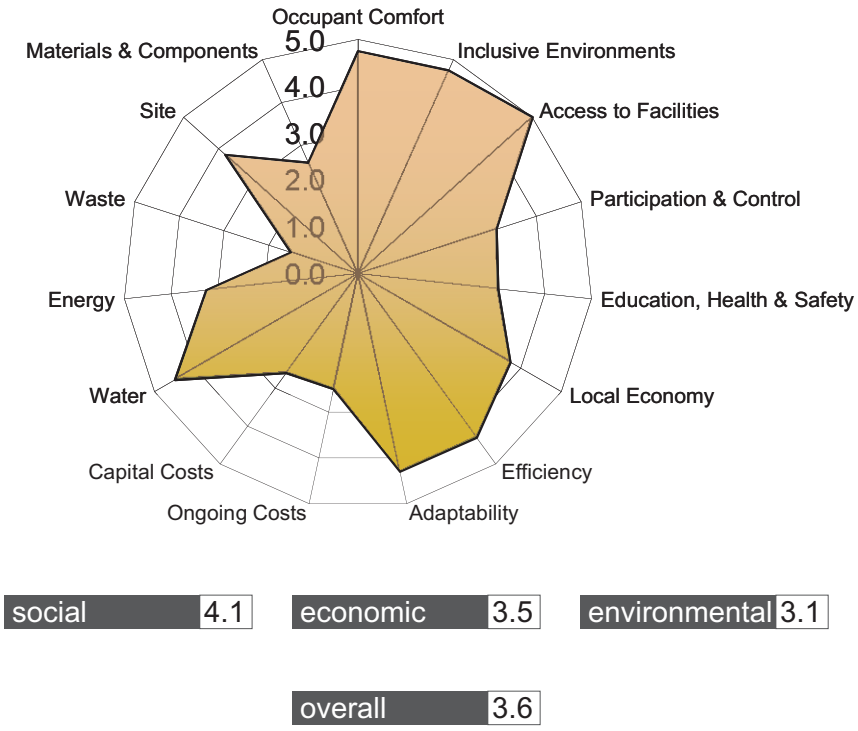
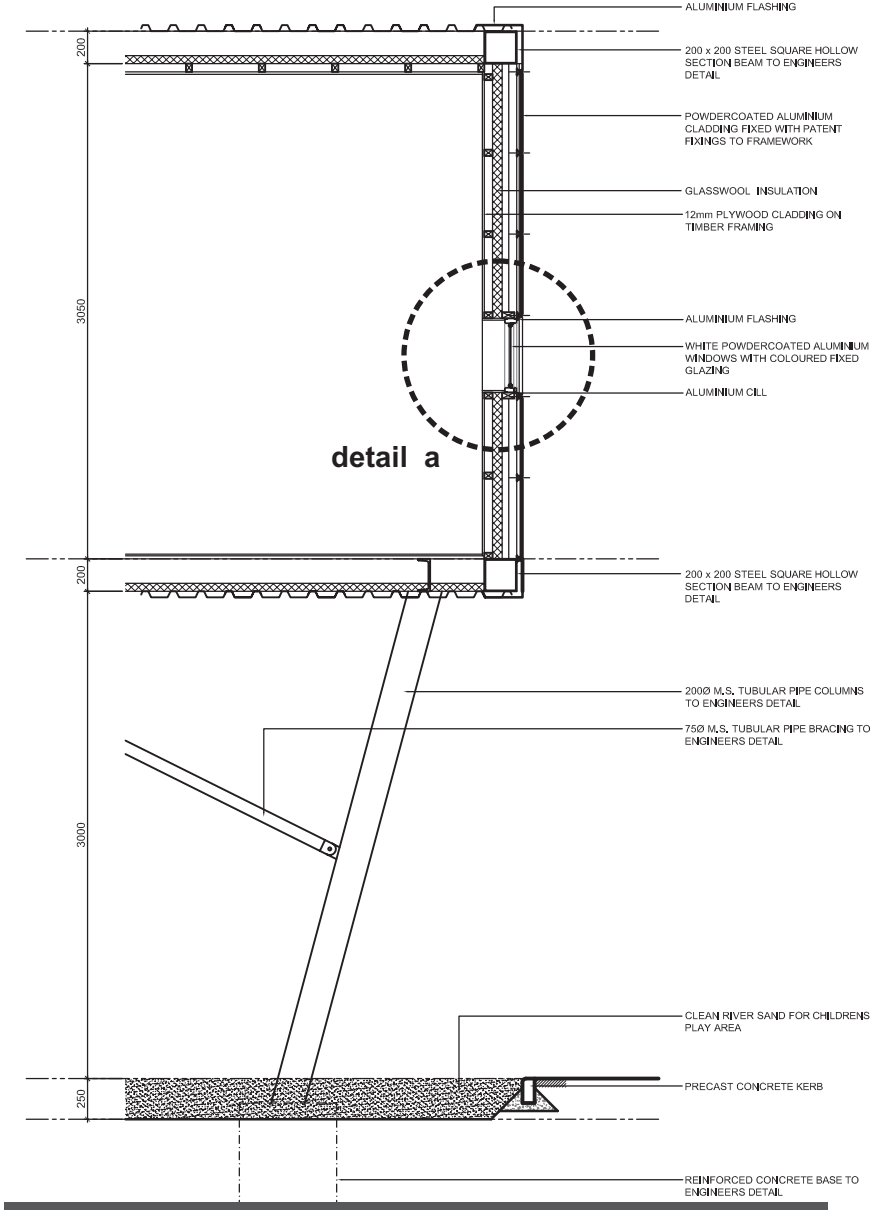
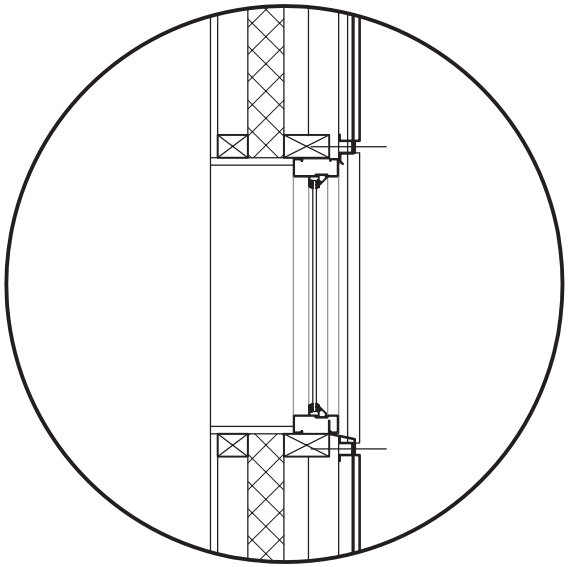


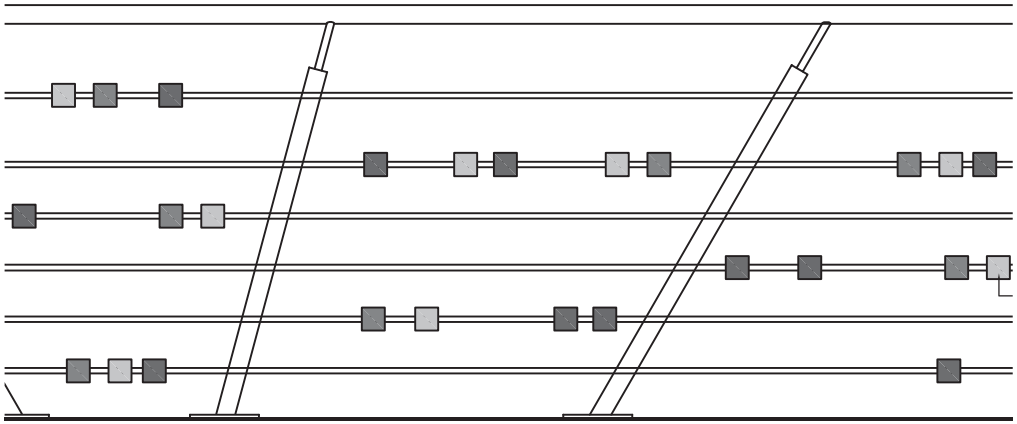
figure 8.10 **results generated by SBAT questionaire**



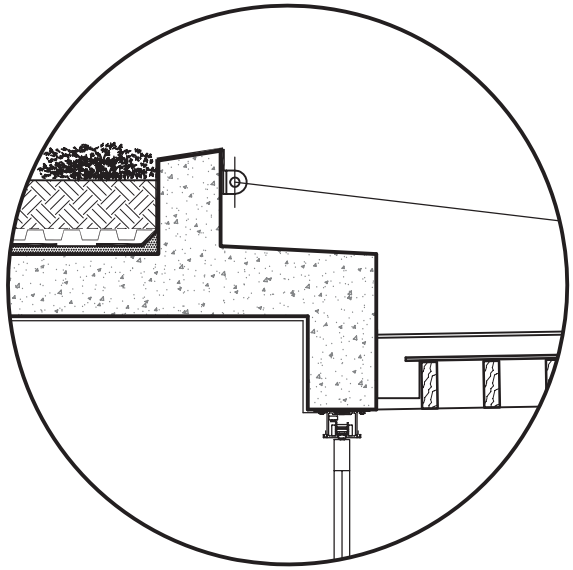
typical section a



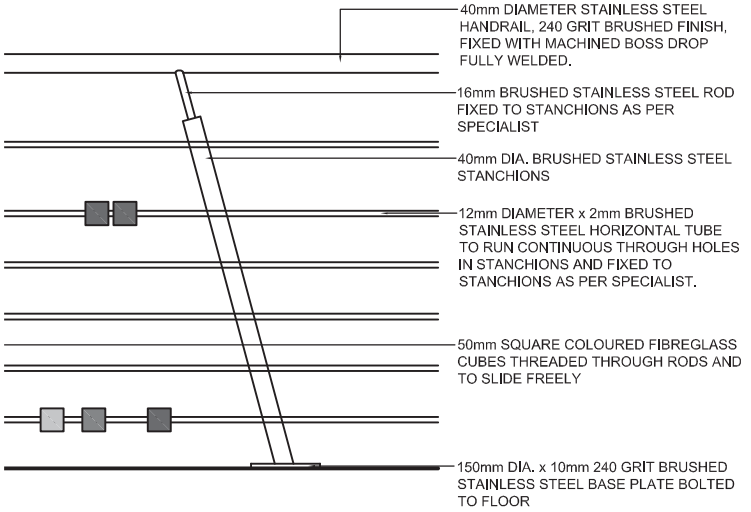
detail a



typical balustrade detail



detail b



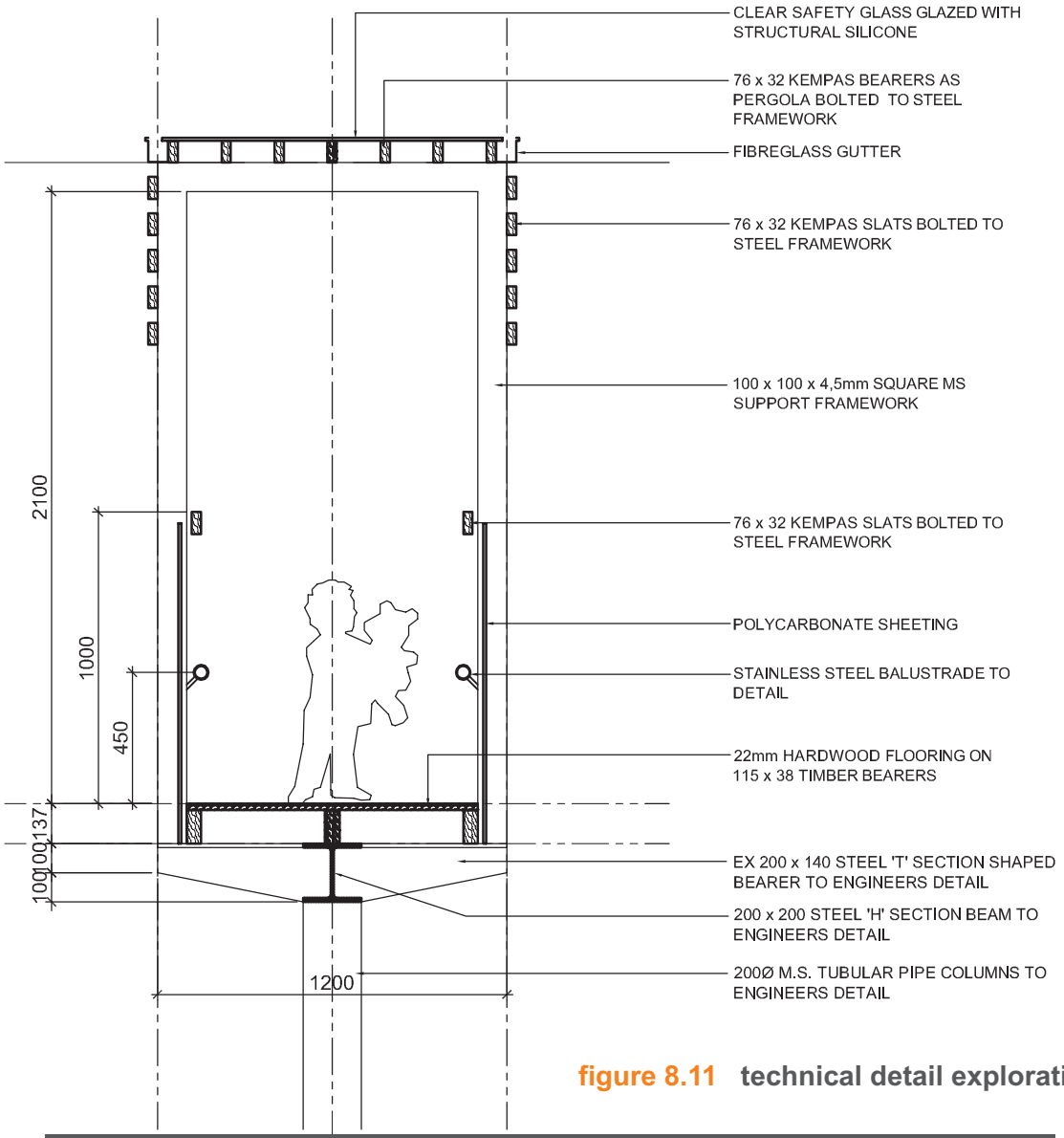
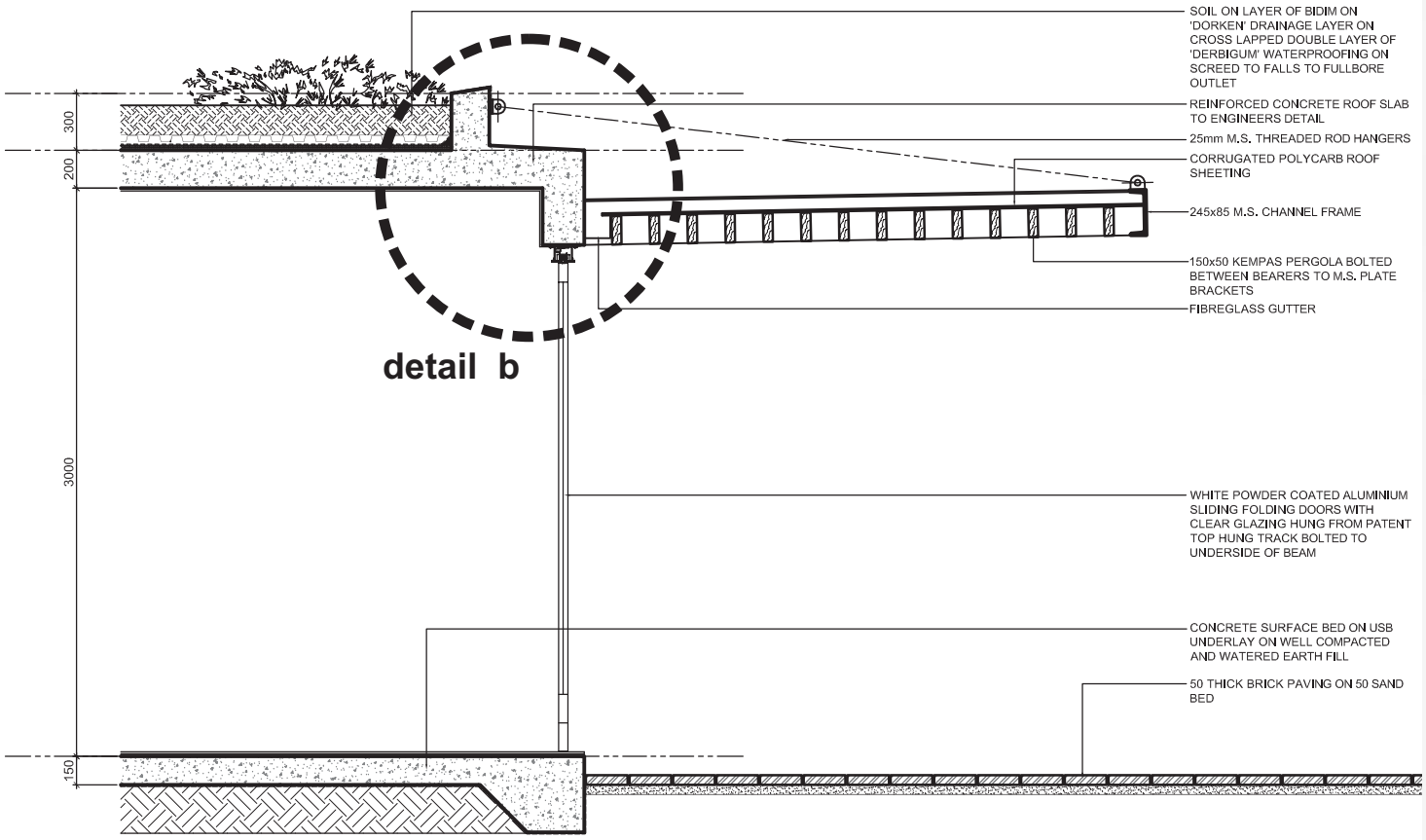
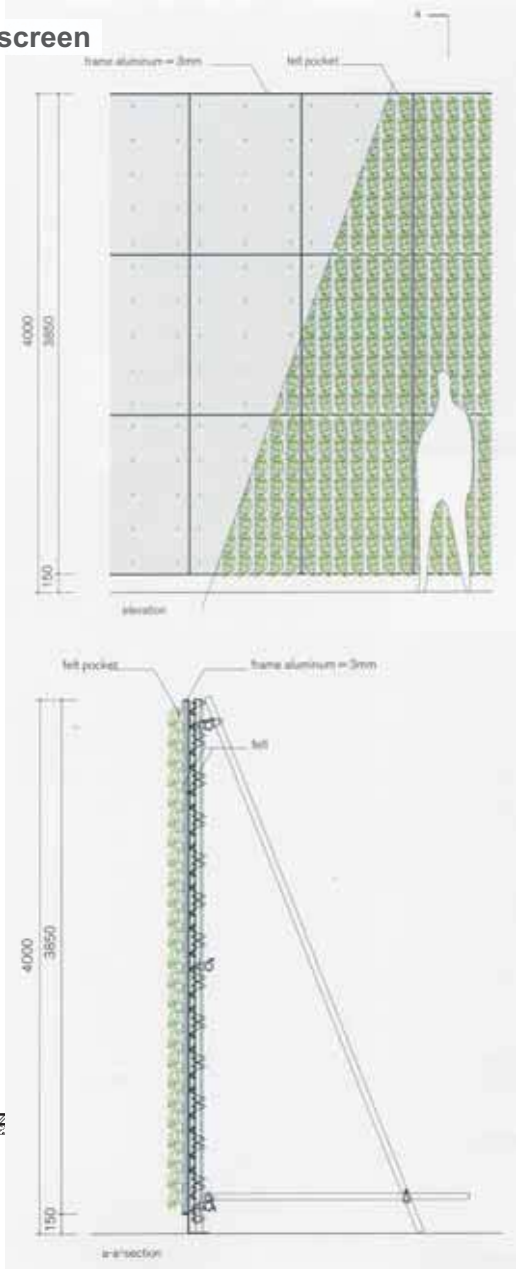


figure 8.11 technical detail exploration

section through circulation tube

figure 8.12 detailing of green screen





typical section b