

6 TECHNICAL INVESTIGATION

THE DESIGN CONCEPT MANIFESTS IN THREE OVERLAPPING COMPONENTS: LIGHTWEIGHT ROOF STRUCTURE, HEAVY WEIGHT WALLS, AND GROUND SURFACE. EACH IS INVESTIGATED SEPARATELY, PRIOR TO THEIR COMBINATION INTO THE REALISED FORM.

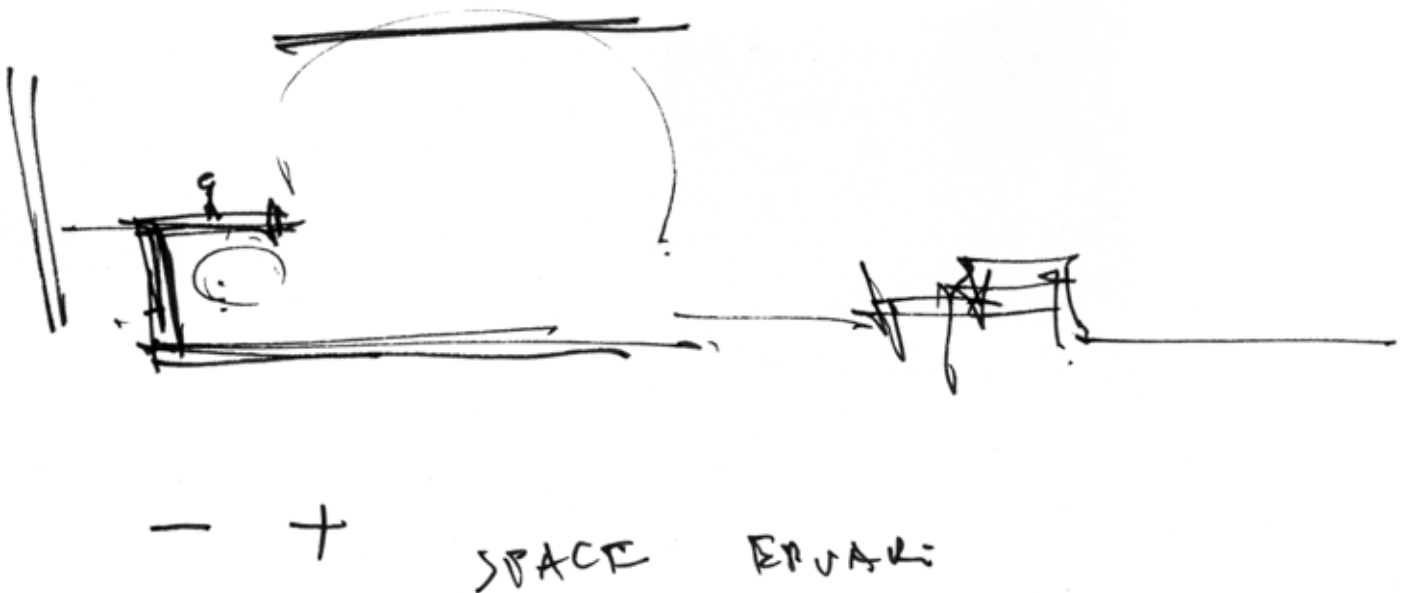
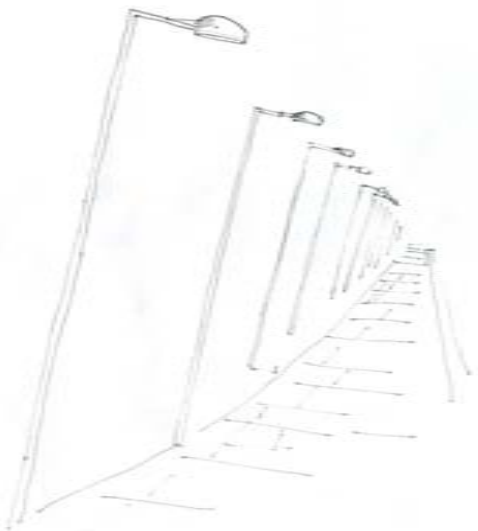
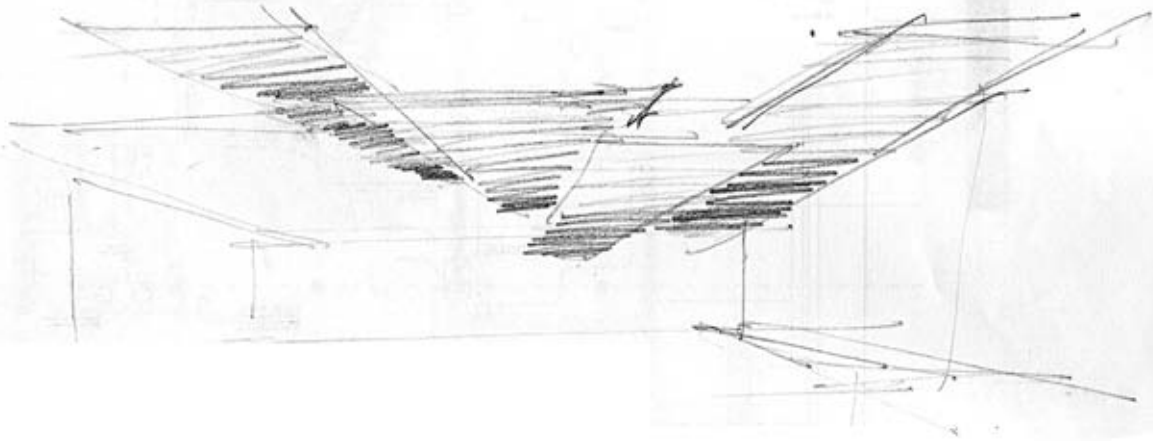


FIGURE 59

Diagramme illustrating positive and negative spatial experience.



Framptom (1995:5) describes the art of tectonics as follows:

Tectonics is the art of joining material, most successful when there is unity in form and structure. Semper would classify the building crafts into two fundamental procedures: the tectonics of the tensile timber lightweight frame and the stereotomics of the load bearing stone earthworks. The cosmic associations they evoke is that of affinity of the frame for the immateriality of sky and the propensity of mass form not only to gravitate towards the earth but also to dissolve in its substance.

6.1 TOP STRUCTURE, ROOF

The top structure comprises of a linear steel lightweight construction accommodating various planned and unplanned activities along the route. The structure becomes a unifying element used to organize the activities of the site. The structure is derived from shading elements encountered in the area, offering a sense of enclosure and protection against rain and sun, retaining an unobstructed visual connection to the site. The roof structure is an adaptation of a portal frame used repetitively. In its singular line form it is used in areas where taxi shelter, informal trade, and storage facilities need this protection. The singular line (structure) is thickened to gather larger spaces while allowing for height variations, making light and ventilation possible.

The roof covering is lightweight steel sheeting, with a corrugated polycarbonate sheeting siding to provide natural lighting. Rainwater is collected from the roofs that are at a 1:200 slope. All rainwater is stored in water tanks and used for landscape irrigation.

The main roof structure is a modular N-braced girder with diagonal roof supports. Components are manufactured off-site under controlled conditions to ensure structural stability and quality. Smaller steel components are manufactured on site. These structures also make reference to the existing historic steel roof pavilion and industrial steel lighting structures on the site.

Glazing

The covered area that requires waterproofing is protected by establishing a layer of polycarbonate sheeting infill panels between roof edges. The glazing layer allows for thermal control in the building using ventilation. North facing panels, which are made up of 80% translucent

sheeting, allow maximum reflective light. South facing panels of diffuse sheeting enhance light quality and visibility of movement.

Shading

The steel beams are cantilevered, exposed and covered only with angle iron slats toward the edges of the structure, creating a play of light and manifesting the threshold spaces.

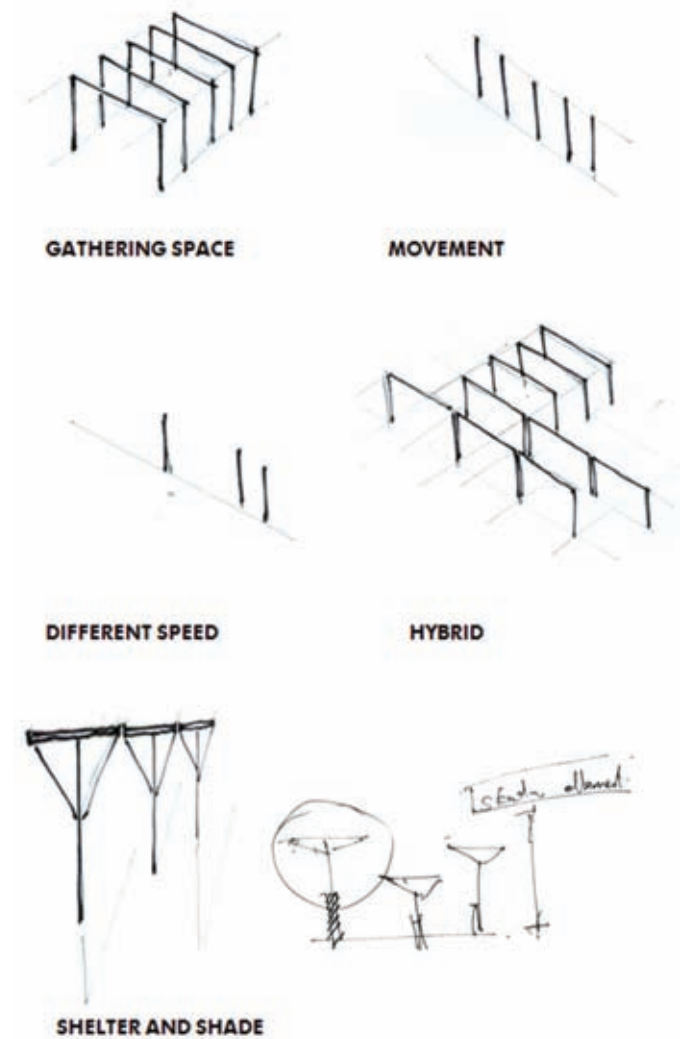


FIGURE 60

Diagram of structure and roof.



FIGURE 61 (top)

Section trough roof structure.

FIGURE 62 (following page)

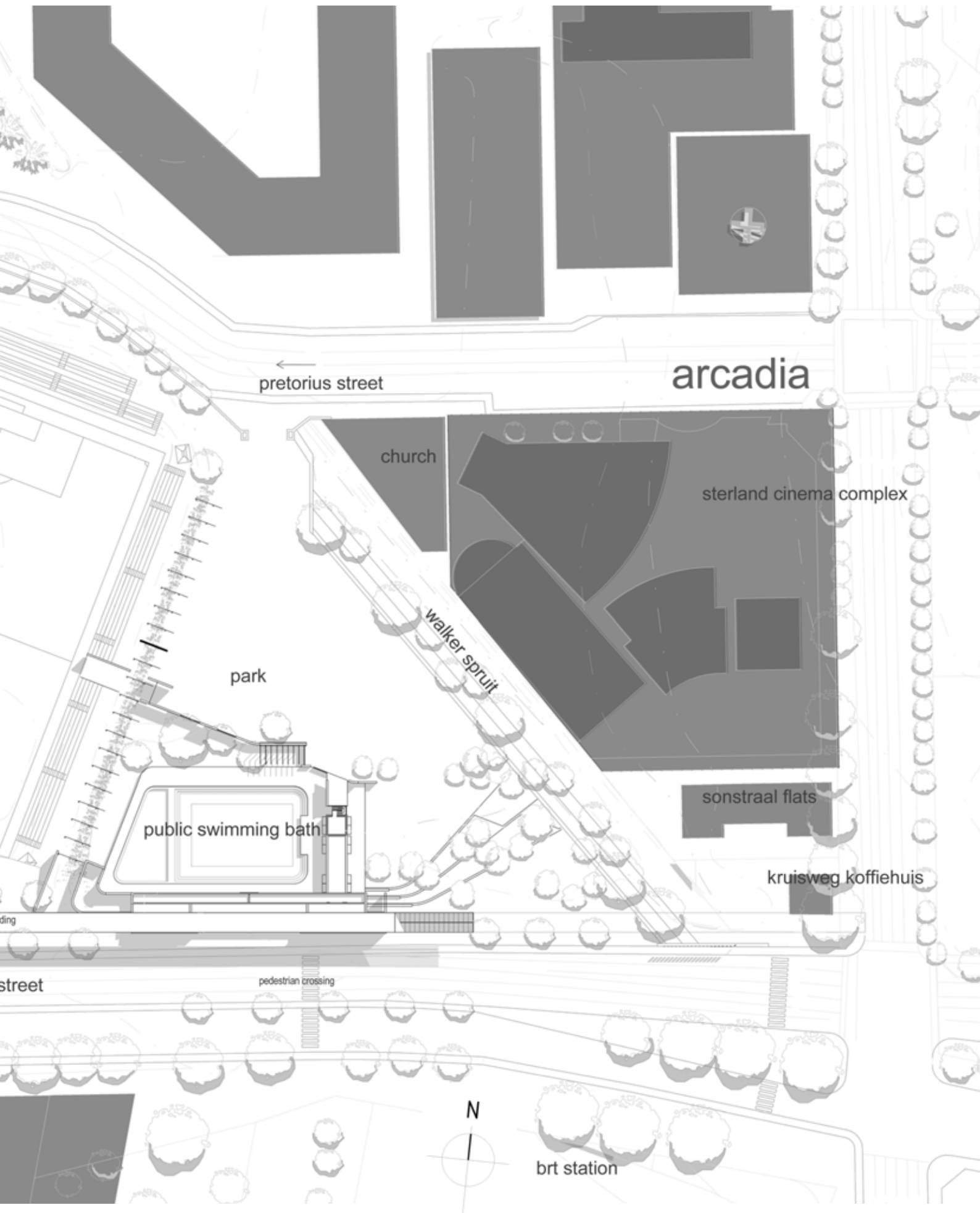
Site plan.

SITE PLAN



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6.2 FLOOR, SURFACE

James Corner (1999:6) states that:

The worst enemy of modern architecture is the idea of space considered solely in terms of its economic and technical exigencies indifferent to the ideas of the site. Site must instead be seen as a means to resist the homogenisation of the environment by also heightening attributes and a collective sense of place.

The manipulation of surface aims to encourage diversity in use and experience of the terrain. The halls exploit the existing mounds created for the sports fields to establish a linear pavilion along the edge of the terrain, resulting in an amphitheatre abutting the mounds of the main soccer field. The pavilion becomes a continuous entity with varying degrees of openness and enclosure, seating and platforms.

Hunter (1979:624) states that:

Noguchi's Play Mountain was the kernel out of which have grown all his ideas relating sculpture to the earth. It was also the progenitor of playgrounds as sculptural landscapes.

The playgrounds and playground equipment designed by Noguchi is works of art that instead of being viewed from a distance were meant to be interactive, suggesting activities without precisely demanding them. This led to a physical but creative use of each structure, and invites all levels of participation from the oldest to the youngest visitor (Hunter 1979:625).

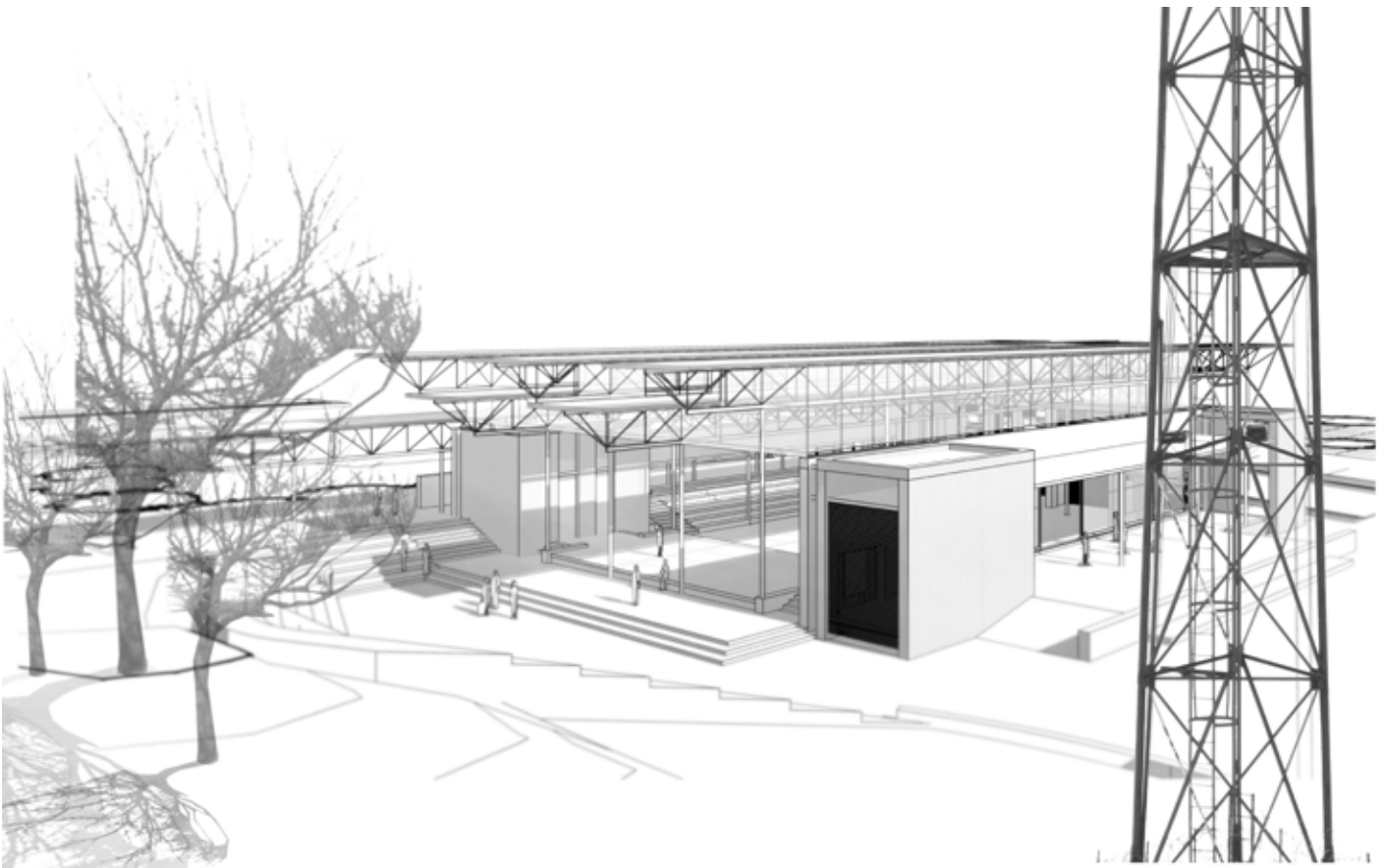


FIGURE 63

Amphitheatre and stage as surface development.

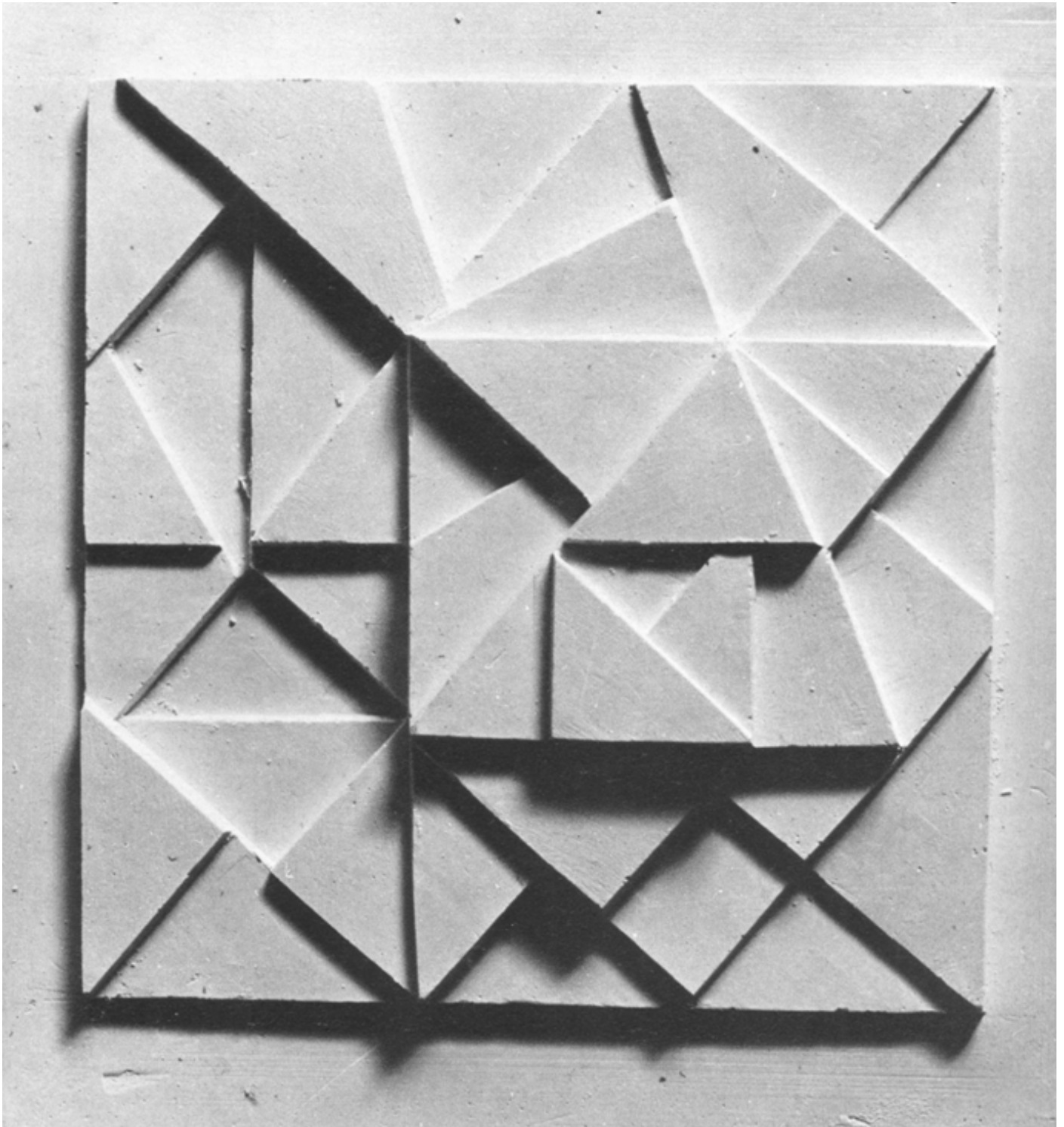


FIGURE 64

Noguchi's Play Mountain.

Walker Spruit is re-established as a natural entity by widening the river edge toward the park with embankments, introducing green recreational areas to the park. See figure 65.

The cycling and walking routes next to the Apies River gradually transform into ramped landforms to accommodate skating as illustrated in figure 66.

Public spaces are defined with porous non-slip pavement blocks to allow ground water recharge. Planters containing trees for shade against the sun interrupt the concrete surface.

Circulation routes are concrete with a brushed finish to aid ease of movement by wheelchair users. The routes are illuminated and where trading occurs water and electricity services are provided.

Bicycle racks are provided along the routes.

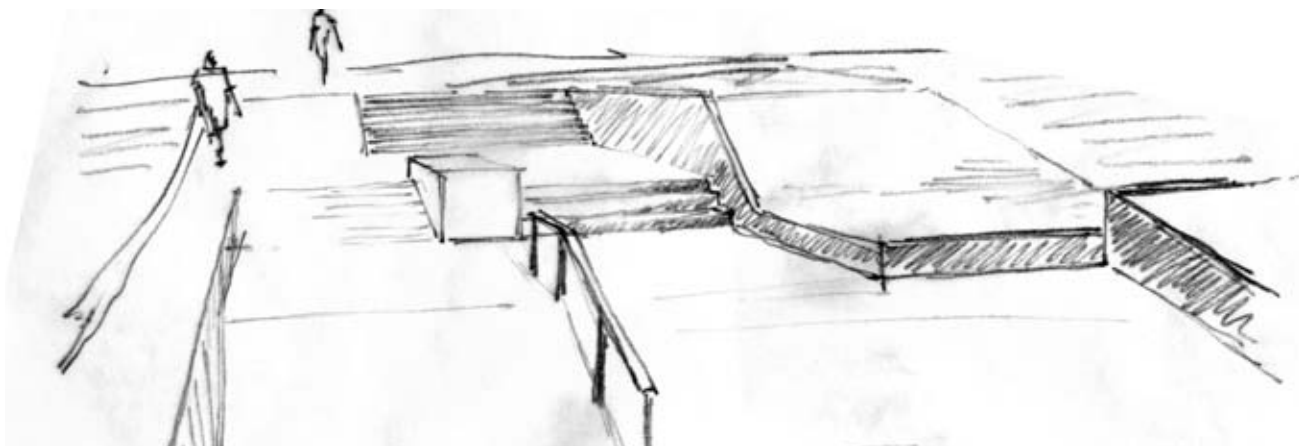


FIGURE 65 (top)

Section illustrating manipulation and development along Walker Spruit storm-water channel.

FIGURE 66 (bottom)

Surface development into skate park.



FIGURE 67

Apies River edge as surface development.

6.3 WALLS, BASE STRUCTURE

Mass for the earthbound structure not only thickens the earth's surface but embodies the connection to earth. Cast in situ slabs on concrete columns, brick perimeter and infill walls house storage and ablution facilities and become the surface for activities and circulation.

The brick walls extend beyond the ground plain as perforated perimeter walls and form light and ventilation shafts, establishing varieties of pattern and light infiltration.

Lightweight prefabricated composite timber and steel support walls are used as infill for adaptable dressing rooms and ablution configurations.

Exposed brick walls, as illustrated by figure 49, woven in a predominant east west direction house the lockable programmes, and resonate with the red brick of the surrounding buildings as part of Pretoria regionalism.

Lightweight prefabricated composite timber and steel panels are configured in various ways as to accommodate for different opening and shading requirements. Both the hall and the pool adopt this approach.

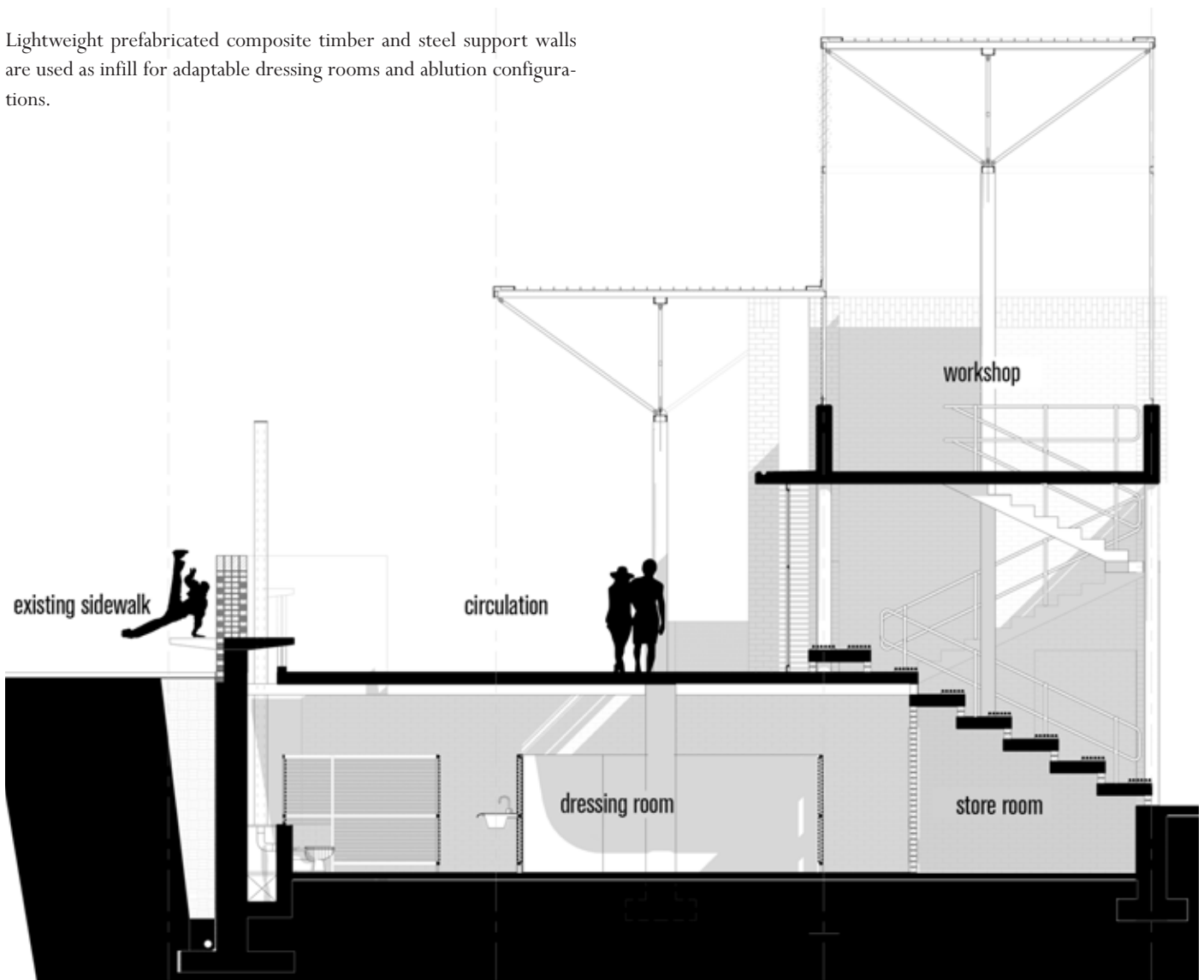


FIGURE 68 (top)

Section through basement.

FIGURE 69 (opposite page)

Model of walls that create the western edge of the building.



6.4 SENSORY QUALITIES

In the design of the buildings, experiential qualities are favoured above form.

Light

Johani Pallasmaa (2005:47) states that:

In great architecture there is a constant deep breathing of shadow and light; shadow inhales and illumination exhales light.

Spaces are articulated by the use of shade and shadow. These spaces are redefined during the day by the different position of the sun, creating different possibilities for usage.

The roof structure of the hall facing the Apies River dissipates towards the edges. As is visible in the top image, the solid roof structure creates a shadowed line defining the entrance of the building.

The top third of the hall is evenly illuminated, emphasizing lightness. White translucent sheeting generates a soft white glow of light. Southern light is enhanced using diffuse sheeting for the exhibition spaces. This light filled space is contrasted with the dressing rooms. Here the user is made aware of light that is focussed from above by means of a light shaft, creating a private and secure area.

Materiality

Concrete and brick work not only refer to Pretoria regionalism but also enhance the sensory qualities and associations with this red palate of brick. Shadows reveal the texture of the walls.

A layered materiality is established through the timber infill panels that mimic the rhythm of the brickwork. Shadow lines are deeper, providing a softer surface on the exterior of the building. The use of timber on the interior is mainly for acoustic considerations.

Exterior concrete pavilions are left bare, in a light grey hue. The seating of the interior pavilion is covered with timber slats reminiscent of the park benches in the area.

Water

In the swimming pool building water is centerpoint of the design. All

structures are orientated round the twenty five by seventeen meters pool. Water is symbolically represented on street level as movement barrier between the street edge and the pool. One enters the structure through the eastern side. Upon entrance the pool of water is revealed.

Water is enclosed through programme, which include braai-facilities, cloakrooms and lawned terraces. The terraces provide seating and integrates the pool with the park.

The street level sidewalk is extended over the site, forming a cave-like structure. The showers are non-structural timber infill so as to ease cleaning, and give a sense of openness.

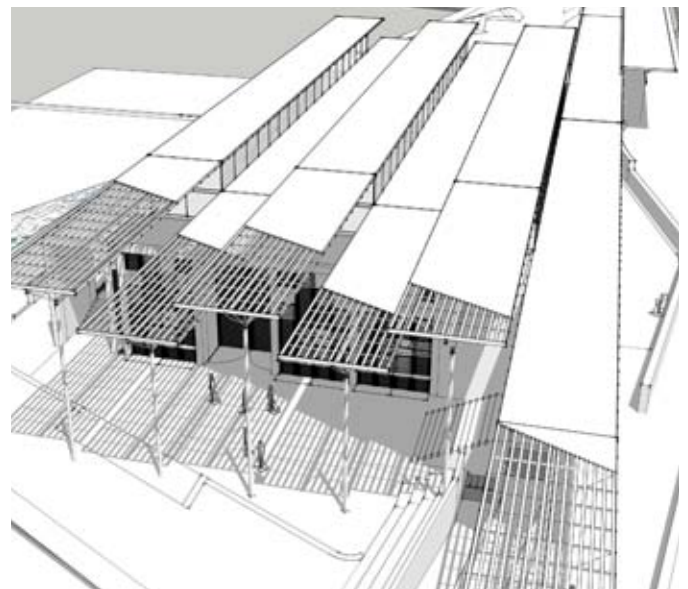


FIGURE 70

Perspective view: Fore court facing Apies river, illustrating roof shadow lines.

