1 Movement
2 Vegetation
3 Materials
4 Details

10 technical

Landings

8m level difference/1.5m intervals for landings =5.3 landings

5 landings x 1.2m length for landing

= 6m needed for landings in total.

Ramp at slope 1:15

1m rise= 15m distance

thus 8m rise =120m distance

6m landing +120m distance = 126m ramp

Ramp at slope 1:12

1m rise= 12m distance

thus 8m rise =96m distance

6m landing +96m distance = 102m ramp

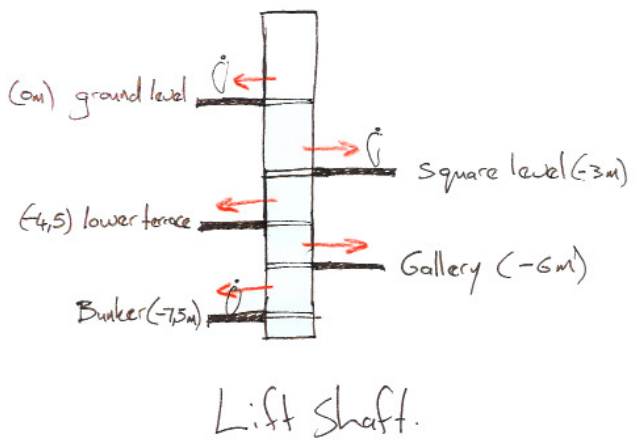


Fig:234. Different levels that need to access lift (Author 2010)

10. Technical

10.1. Movement

The various areas of the design require easy access for the disabled. However a ramp needs to have a min slope of 1:12 with a landing of 1.2m long at every 1.5m interval (SABS 0400 SS2: 152)

The level differences in the design add up to a total of up to 8m. The first attempt was to create a ramp that comfortably navigates this height difference at a slope of 1:15.

In order to navigate 8m at slope 1:15 will require 126m of ramp in total. Because of spatial restrictions the ideal ramp of 126m is not feasible, and thus the minimum requirement of 1:12 will have to be used. In order to navigate 8m at slope 1:12 will require 102m of ramp in total.

Even though 1:12 is 24m shorter than 1:15 it will still have severe spatial implications. 102m of ramp is also not ideal because it is uncomfortable to walk on and will be exhausting for the disabled to transverse. At 1.5m wide the ramp would occupy a floor space of 153m2

An alternative to this would be using a lift. This will have less severe design implications as it requires a min of 1.1m x 1.4m and a small machine room.

The three lift systems investigated include: Traction elevators, machine-room less elevators and hydraulic platform lifts.

Traction elevators are heavy duty lifts for large multi story buildings and require a lift room on top of the lift. In the design the lift needs to be as subtle as possible therefore the extra height of the lift room is not ideal. This type of lift is over kill for such a minimal height.

Machine-room less elevators don't require a lift room as

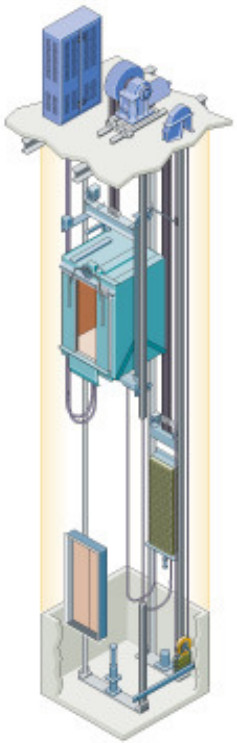


Fig:235. Traction elevators
(www.OtisGen2.com)

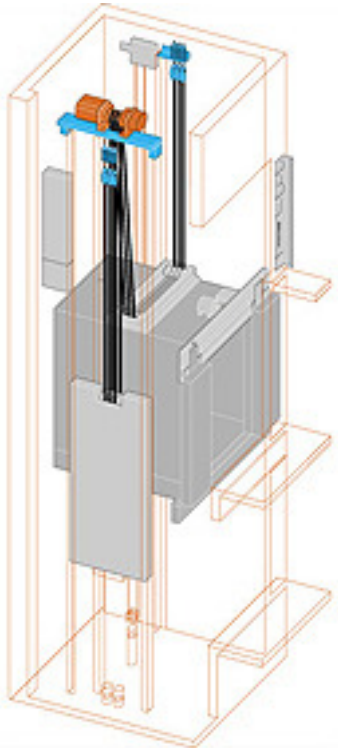


Fig:236. Machine-room less elevators
(www.OtisGen2.com)

Fig:237. Hydraulic platform lifts.
(http://www.lift-mech.com/pro_hpl.html)

the machine is fitted within the shaft. This is more appealing because it takes up less space and will have a smaller visual impact. These lift operate between two and 30 stories.

The third option investigated was the hydraulic platform lifts. These lifts ideally operate between two and five stories and require a minimal pit depth of between 120mm and 1400mm however require a pump room. This option is most feasible because it is the cheapest and the lift is not dependent of its shaft, therefore offering multiple interesting design solutions and finishes.

The lift needs to be accessible from two sides in order to access intermediate levels. The key to the placement of the lift is finding a spot that all of the various levels intersect.

Fig:238. Hydraulic platform lifts.
(http://www.lift-mech.com/pro_hpl.html)

10.2. Materials

The approach to sourcing material and construction is based on consideration such as heritage, making use and recycling of onsite resources and uplifting the surrounding community through job creation skills development.

The existing resources on site include timber from the large invasive trees that will need to be removed, steel from the dismantling of power plant boiler rooms, ash from the clearing of the ash ponds and plant material from the already established on site nursery. This is aimed at job creation, skills development and saving of construction costs.

10.2.1.Timber

There are many large hard wood invasive trees on site such as blue gum and eucalyptus that would be ideal for decking and site furniture. The initial idea was to tie in with the onsite furniture workshop in order to create site furniture from these trees. However in order to process these trees the timber would have to be transported to a lumber mill processed there and then returned to site. This outweighs any initial benefits due to the fact that there are relatively few trees and no lumber mills in the area.

Alternatively the timber can be put through a shredder in order to create wood chips that can be used for mulch throughout the park.

10.2.2.Steel

The existing power plant contains large amounts of mild steel plates, profiles, balustrades, pipes and grating. In Pretoria West there is a large pool of steel working skills due to the various industries and workshops, thereby using steel will create jobs for the immediate community and use existing skills.

10.2.3.Vegetation

The onsite nursery is already established in phase one and therefore can cultivate plants for successive phases. Plant cultivated in the nursery creates jobs and can supply the design with well establish plants at a low cost. For example trees can be grown from seedlings and transplanted into the design at a later stage offering established vegetation at a fraction of the cost.

10.2.4.Ash

Fly ash can be used for a number of applications including the manufacturing of cement, bricks and rammed earth walls, it can also be used to stabilise soil and increase fertility and water retention. The PPC cement factory is located in Pretoria west, and already utilises ash from the power plant and because of its close proximity concrete will be sourced from there.

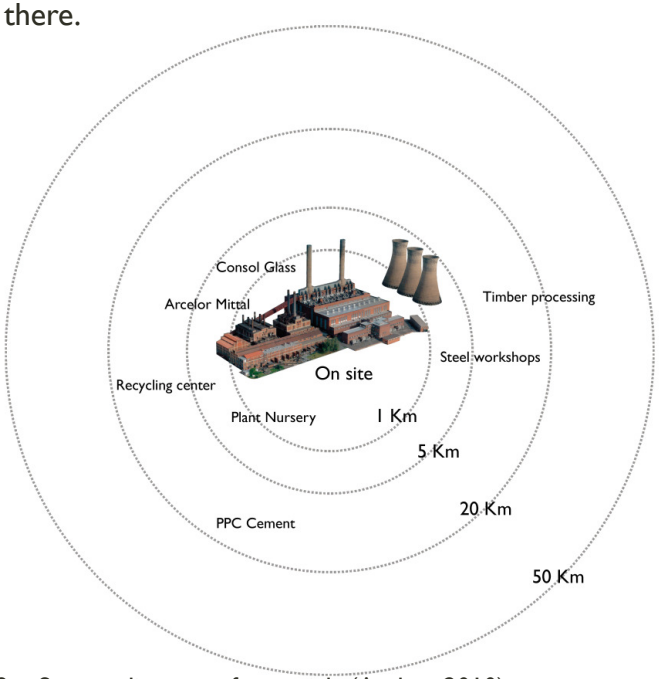


Fig:239. Source distance of materials (Author 2010)

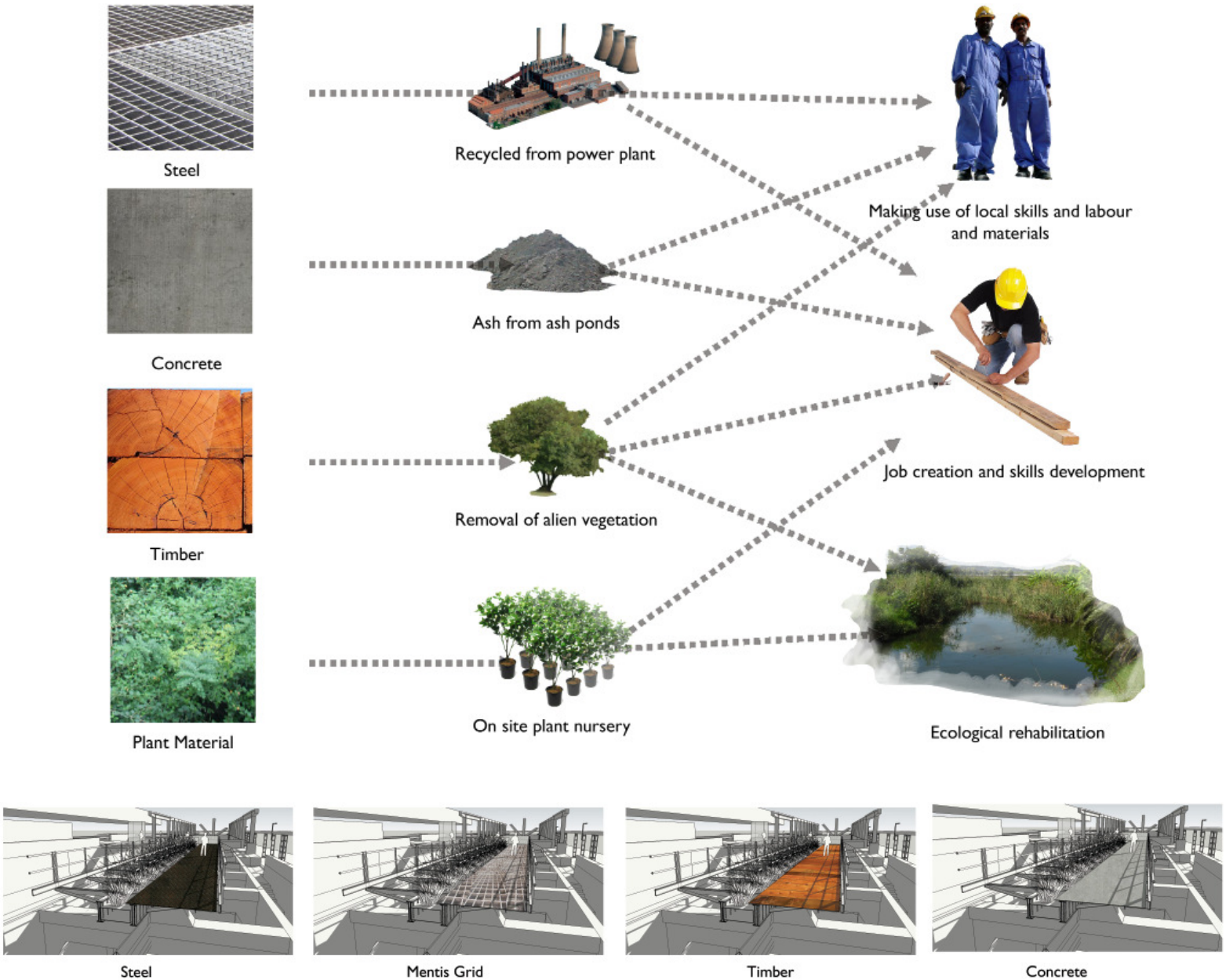


Fig:240. Conceptual intention for selection of materials (Author 2010)

10.3. Vegetation

10.3.1.Entrance Square

The entrance square experiences full sun and can thus be compared to a northern slope. It should facilitate pedestrian movement between the street and the station and provide shaded seating areas. Once movement lines have been drawn there is little room to plant trees and therefore the trees should have a spreading crown.

The tree selected is a *Acacia sieberiana var. woodii* or Paperbark Thorn. It reaches a height of 12m and has a spreading crown of up to 16m. This will provide ample shade whilst not obstructing movement as well as attract birds and insects.

In the planter at the foot of the trees vegetation must be at least 0.5m tall in order to accompany seating around the planters. Species include *Gladiolus dalenii, Watsonia pillansii and Crocosmia aurea.*

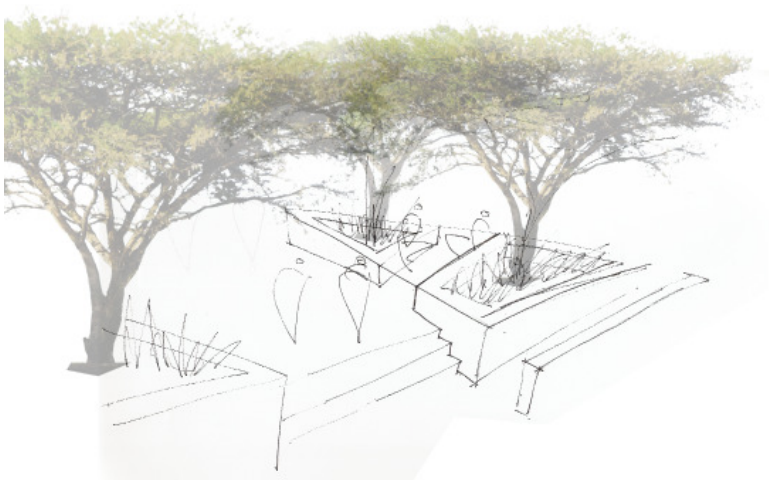


Fig:241. Conceptual image of entrance square (Author 2010)

10.3.2.Bridge

The bridge experiences full sun. Planting should create a safety barrier bur not grow too high. Planting should spill over and hang into the spaces below therefore *Rhoicissus tridentate* or bushman's grape was selected..

10.3.3.Bunker A

Bunker A is sunken and partially covered by overhead structure therefore semi shade. It is creates similar environments to that of a kloof. Therefore the species selected will be those naturally found within kloof areas of the Magaliesberg. Species include *Ficus abutilifolia* or large leaved rock fig, various ferns such as *Thelyperis confluens* or the lady fern and *Adiantum capillus-veneris* or maidenhair fern as well as perennials such as *Schizostylis coccinea* or crimson flag and *Scardoxus puniceus* or royal paintbrush.

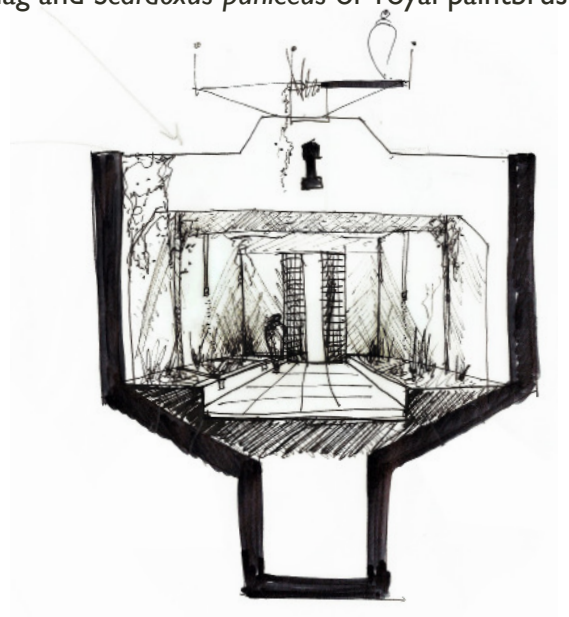


Fig:242. Bunker A with overhead bridge (Author 2010)

Creepers

Asparagus asparagoides

Asparagus asparagoides

Bunker A north

Brachiaria serrata

Eragrostis chloromelas

Eragrostis lehmanniana

Monocymbium ceresliforme

Schizachyrium sanguineum

Cymbopogon excavalus

Digitaria eriantha

Themeda friandra

Hyparrhenia hirta

Bunker A south

Shrubs

Buxus macowanii

Pteris vittata

Freylina Tropica

Euclea crispa

Ground covers

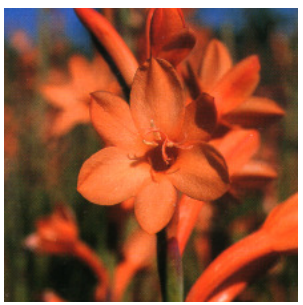
Scardoxus puniceus

Schizostylis coccinea

Chlorophytum saundersiae

Knipovia praecox.

Crocosmia aurea



Watsonia spp.

Adiatum capillus-veneris

Cyperus prolifer

Trees

Acacia sieberiana

Ficus natalensis

Oliea europea. Subs. Africana

Viewing platform

Asparagus densiflorus spengere

Senecio macroglossus

Dietes grandiflora

Crocosmia aurea

10.4. Details

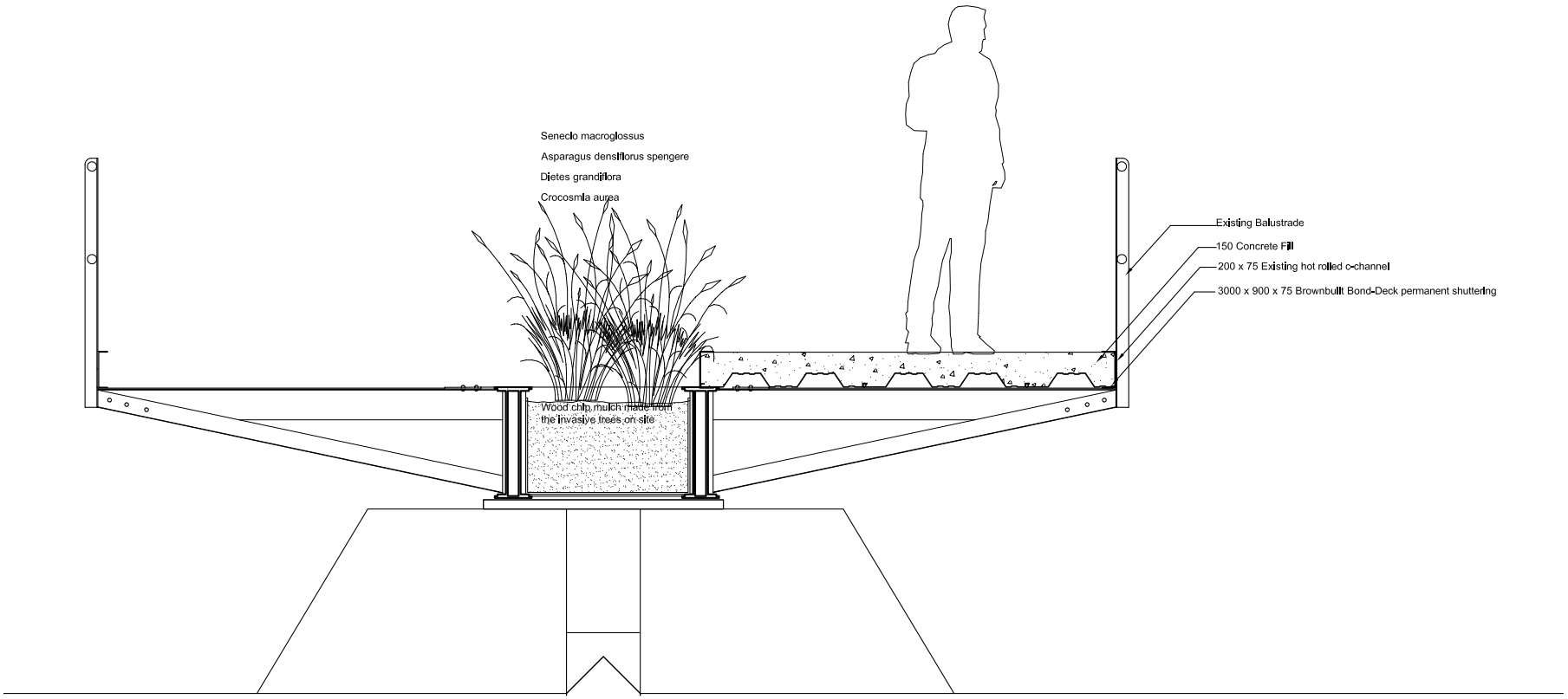


Fig:243. Detail of Viewing Platform, not to scale (Author 2010)

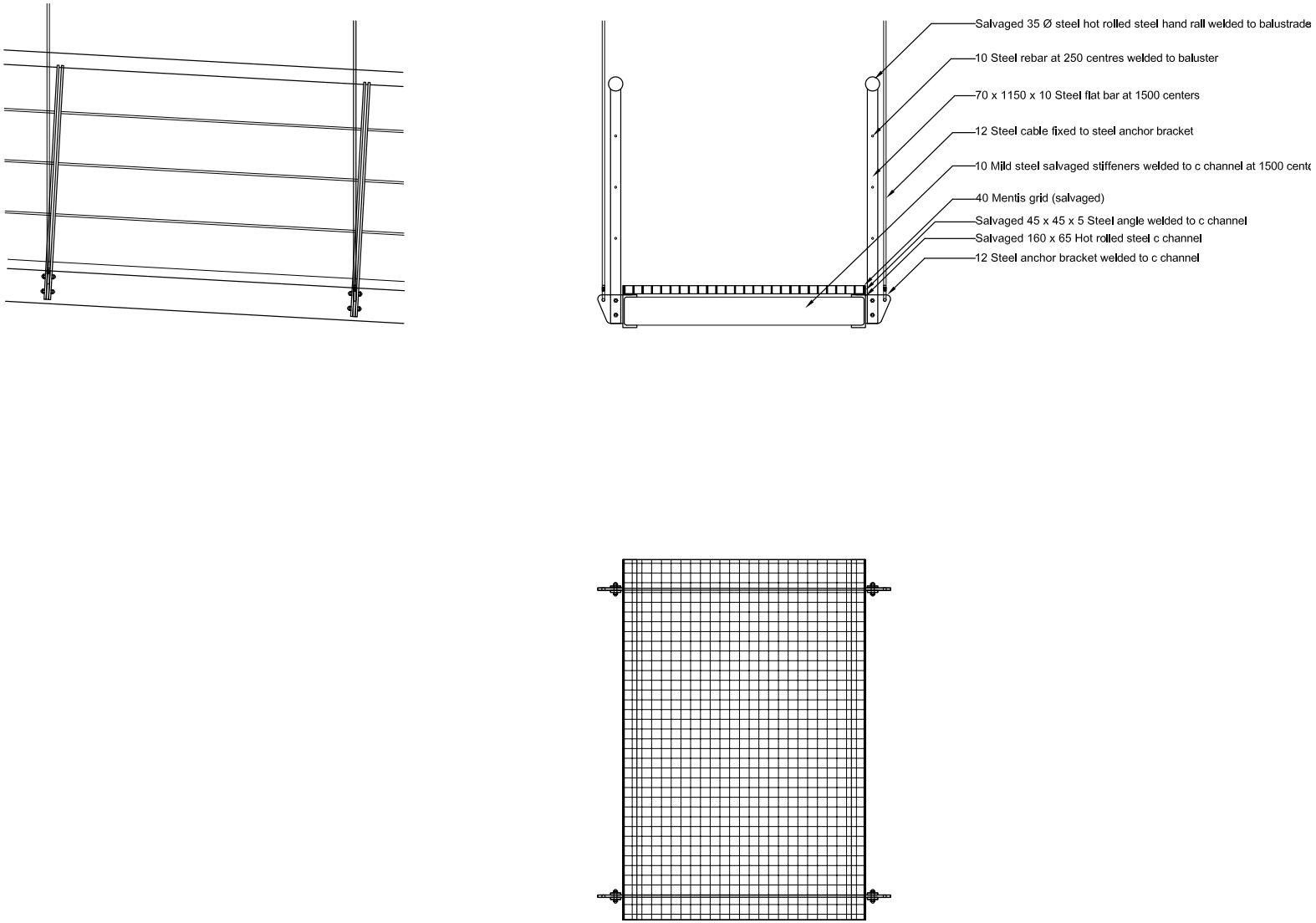


Fig:244. Detail of suspended walkways in bunker A (Author 2010)

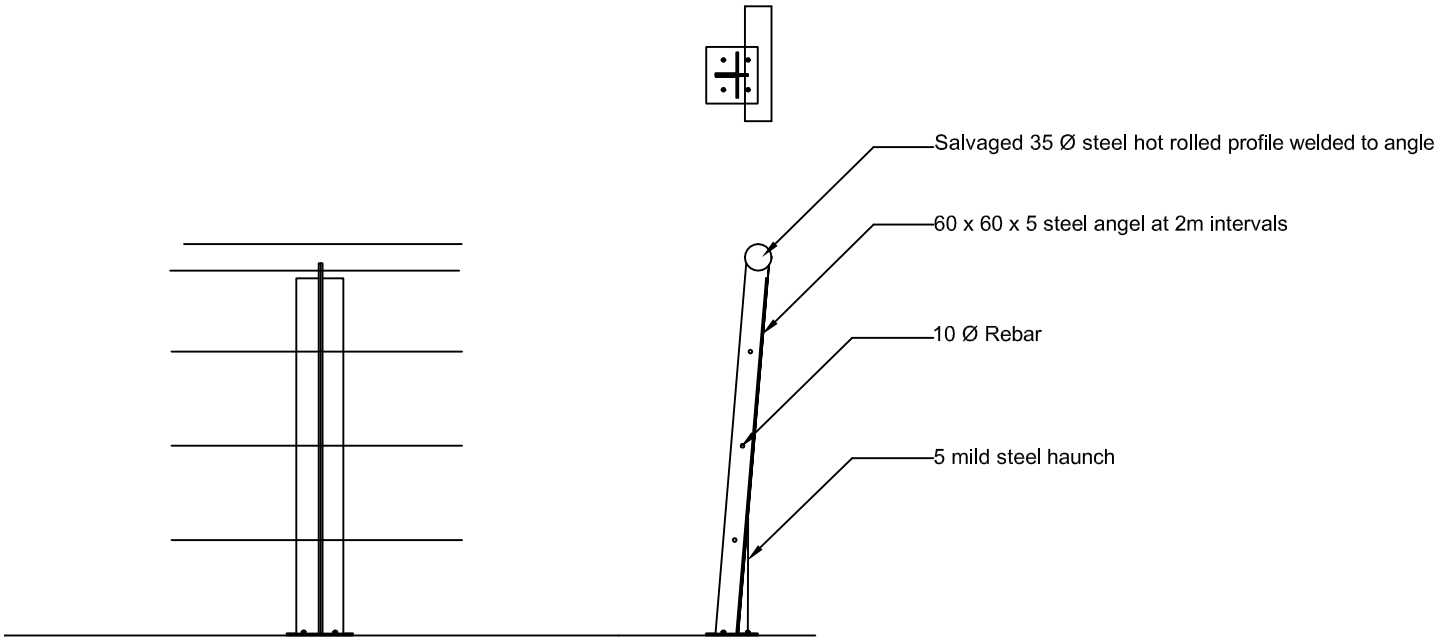


Fig:245. Ballustrade Detail, not to scale (Author 2010)

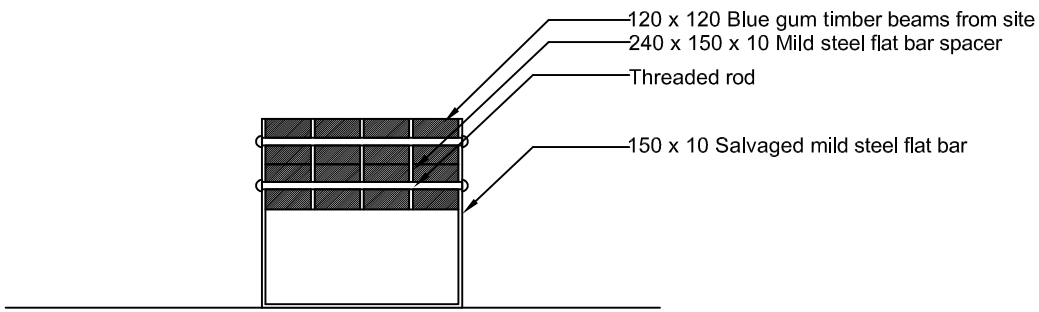


Fig:246. Bench detail (Author 2010)