



CHAPTER 8

Technical investigation

Fig.8.1 Seating in Wupperthal
(Franklin 2015)

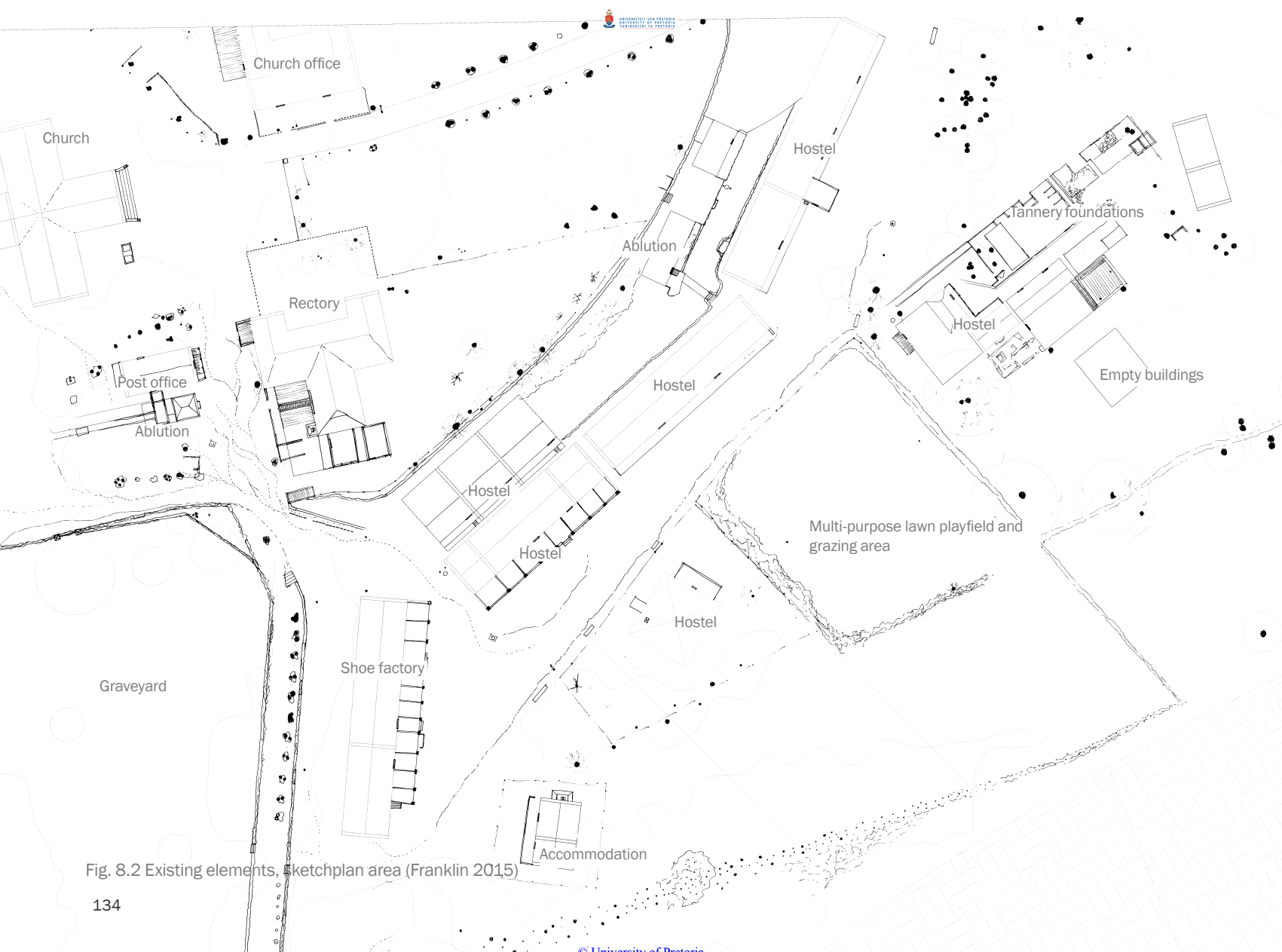


Fig. 8.2 Existing elements, sketchplan area (Franklin 2015)

This chapter will start with the planting strategy adopted in Wupperthal and move to the various industries investigated as part of the sketchplan. The sketchplan followed a different process to the traditional development of such a plan which formed part of the learning process of the author. The technical investigation preceded the development of the plan where the details and systems directed the design. Although the end product of the details and sketchplan may seem simple, it followed a rather complex investigation.

8.1 PLANTING STRATEGY

The planting strategy in Wupperthal stems from the mapping of the vegetation done in Chapter 6. The different vegetation types in the area allowed for an interesting use of plants within Wupperthal. Strict measures should be taken to ensure that only plants endemic to the Cederberg is used within the cultural landscape unless argued by historic importance. It is an important consideration that all plants are chosen from of the same drainage basin, ensuring that the Cederberg as a centre for specific endemism is maintained. The following strategies are applied to the historic town of Wupperthal; planting as restorative, place-making, and educational device.

A PLANTING AS RESTORATIVE DEVICE

The historic unit of Wupperthal is characterised by the large *Eucalyptus* trees and dusty voids. The restoration of this tree rich unit includes the substitution *Eucalyptus* with indigenous trees over a period of time. Although the Cederberg area with its various vegetation types does not include a wide range of larger trees, care was taken to select trees that does grow in the Cederberg. Species were selected on their growth form and character to ensure the continuation of the historic character of Wupperthal. Ten percent of the *Eucalyptus* trees will be replaced with these two species and they will in turn create a habitat for other indigenous species to establish themselves, some of the plants in Plant Palette A will be among these species. The *Rapanea* as well as the *Olinia* are found in the wetter kloof of the Cederberg. The edge of Wupperthal is framed by water. A part of the *Eucalyptus* forest will be maintained for the informal use of wood in the area.

The stream that runs on the edge of Wupperthal will be restored by mimicking the habitat of streams in the area. A variety of species will be tested to increase the biodiversity and formation of a habitat within the area and ensure that a reasonable success rate is obtained for the cultivation and commercial use of some of these species.



Fig. 8.3 Entrance to Wupperthal (Franklin 2015)



Olinia ventosa
(PlantZAfrica 2015)



Rapanea melanophloes
(PlantZAfrica 2015)



Zanthedescia aethiopica
(Franklin 2015)



Crassula dejecta
(PlantZAfrica 2015)



Metalasia densa
(PlantZAfrica 2015)



Stoebe plumose
(Franklin 2015)



Juncus species
(Franklin 2015)



Restio filliformis
(Franklin 2015)



Calopsis paniculata
(PlantZAfrica 2015)



Elegia capensis
(PlantZAfrica 2015)



Restio festuciformis
(PlantZAfrica 2015)



Hymenolepis parviflora
(Franklin 2015)



Brachyleana neriiflora
(PlantZAfrica 2015)



Erica caffra
(PlantZAfrica 2015)



Watsonia stokoei
(PlantZAfrica 2015)



Diosma hirsuta
(Franklin 2015)



Fig. 8.4 Perennial stream border of Wupperthal (Franklin 2015)



Fig. 8.5 Restored stream habitat (Franklin 2015)

PLANT PALETTE A
Water habitat mix



Bulbine sp.
(Franklin 2015)



Othonna coronopifolia
(Franklin 2015)



Euphorbia mauritanica
(Franklin 2015)



Rhus undulata
(Franklin 2015)



Carpobrotus edulis
(Franklin 2015)



Cotyledon orbiculata
(PlantZAfrica 2015)



Pelargonium magneteum
(Franklin 2015)



Felicia fruticosa
(Franklin 2015)



Ficus cordata
(Franklin 2015)



Aristea africana
(PlantZAfrica 2015)



Honeybush cyclopia
(PlantZAfrica 2015)



Euryops spesiosissimus
(PlantZAfrica 2015)



Euclea tomentosa
(PlantZAfrica 2015)



Dodonaea viscosa
(PlantZAfrica 2015)



Fig. 8.6 Backyard link between church and shoe factory (Franklin 2015)



Fig. 8.7 Use of plants in change of awareness and scale (Franklin 2015)

PLANT PALETTE B
Agter Sederberg shrubland mix

B PLANTS AS PLACE-MAKING DEVICE

A great appreciation for flowering plants exists in the cultural landscape of Wuppertal (Informal discussion with more than one resident, April 2015). Most of these plants are exotic species that were commonly used in traditional gardening. Plastic flower plants can be found on the graves. Although a number of indigenous flowering species exist within the area, few have been adopted in the creation of space. In the areas of absence, these plants will be used to contrast the large trees and voids with the indigenous shrub typology (Figure 8.8- 8.9) enhancing the experience of the historic nodes. Plants can be used as a privacy device, where it could be used as a low screen for workspaces. The distribution of stormwater in the creation of habitat will be tested (Figure 8.11).

C PLANTS AS EDUCATIONAL

It is proposed that medicinal plants be incorporated at the interpretation centre for educational purposes. The medicinal value of plants is well-known in the area and still assists the people of Wuppertal in some of their needs. The inclusion of these plants will need to be developed in conjunction with the community of Wuppertal in order to understand the value of each of the plants and the representation thereof in the landscape. The same applies for the development of the seedbank where plants fulfil an educational role within the landscape. This knowledge base is however limited to oral traditions and use of the agricultural fields. It was not possible during the time frame of this project to get a complete understanding of this system; a more integrated process will be needed to develop this part of the seedbase. Where the author could play an important role was in the layout of the proposed facilities to enable the trading of seeds including the germination and seedling stations (see sketchplan development).

8.2 OLIVE INDUSTRY

The olive industry was analysed for its spatial impact for the placement of trees within the landscape and the production of table olives and oil. The Mission Olive (*Olea Europaea*) was selected for this purpose and also for its ability to withstand cold. The three different styles of planting were investigated and the high density olive tree planting system proved to be the most appropriate. This system is commonly used for planting in this area. The graph to the right shows the time when olives should be harvested in order to produce the highest quality or most oil. The benefit of this industry is the amount of work created with the pruning of the trees and the harvesting of the olives by hand. The pressing of oil and processing of olives will also create employment opportunities. The production of olives enable the private individual to become a producer of the raw product and in such a way generate income from a single tree. Trees produce their first olives three years after planting.

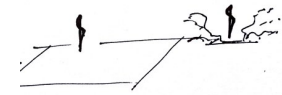


Fig. 8.8 Contrast in scale (Franklin 2015)

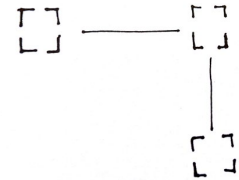


Fig. 8.9 Historic nodes (absences) in-between (presence) (Franklin 2015)

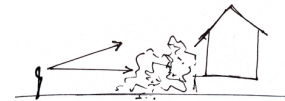


Fig. 8.10 Planting as privacy device (Franklin 2015)

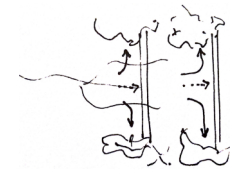


Fig. 8.11 Stormwater dispersal (Franklin 2015)



Olea europea
Mission Olive

Table + Oil
Can withstand cold



Super-High-Density (SHD) planting system

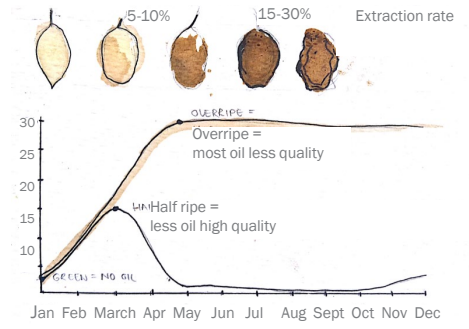


Traditional dry-farmed Olive tree planting system (commonly used on other farms in the area)



High-Density (SHD) planting system

OIL QUALITY vs RIPENESS



Harvest: April - June
(produce olives 3 years after planting, full bearing after 7 years)

Yield: 10t/ha
(1ton = 170l @ 18% extraction rate)

Cooled to 14°C before pressed

Do not plant close to water

100kg nitrogen/ha + potassium + barum (legume, cover crop and manure)

- PROCESS
1. Pressed
 2. Separated (Olives + oil)
 3. Filtered
 4. Bottled



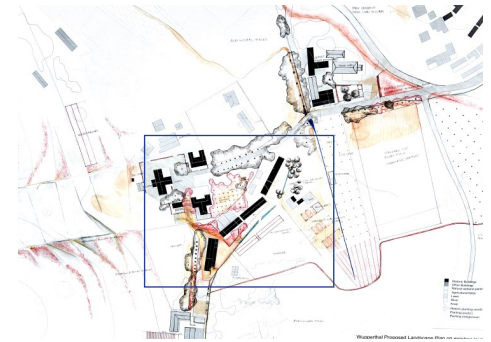
Fig. 8.12 Sketchplan (Franklin 2015)

8.3 SKETCHPLAN

The sketchplan is included here after the discussion of the planting strategy and olive industry which applies to the masterplan and the sketchplan. All items indicated in black is existing, while the red includes the proposed elements.

The majority of the buildings are currently dedicated to functions related to with the hostels. It is proposed that these functions area is consolidated to the three main hostel buildings. Two proposed buildings are in need of an upgrade. These facilities will include extra rooms, kitchen facility and study room that takes place in the other buildings. These buildings will provide space for an olive shed, the production of clay, a seedbase and a restaurant as part of the proposal.

Here one can easily see the different application of the design to the historic nodes 'absences' and the areas of 'presence' or in-between nodes (discussed in Chapter 3 concept development). The in-between areas show a reduction in scale with the use of planting in order to enhance the experience of the historic nodes, with minimal intervention. A transition can be found between the public space in front of the hostel and the agricultural fields. Even as one walks here you would be confronted with open views and bordered (trees) walkways. The development of the timeline directs the placement of the trees and the direction of the paving (to be discussed in more detail in the November crit).



Reference masterplan

Low white washed werf-wall

Clay tile production facility

Olive orchard

Restaurant

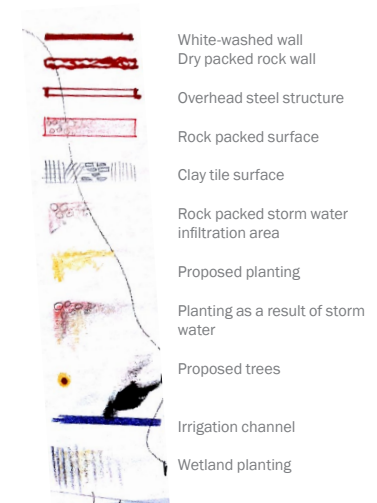
Seedbase

Interpretation centre
with proposed ablution
structure

Public space and time line
development

Olive shed

Rieldancing platform



LEGEND

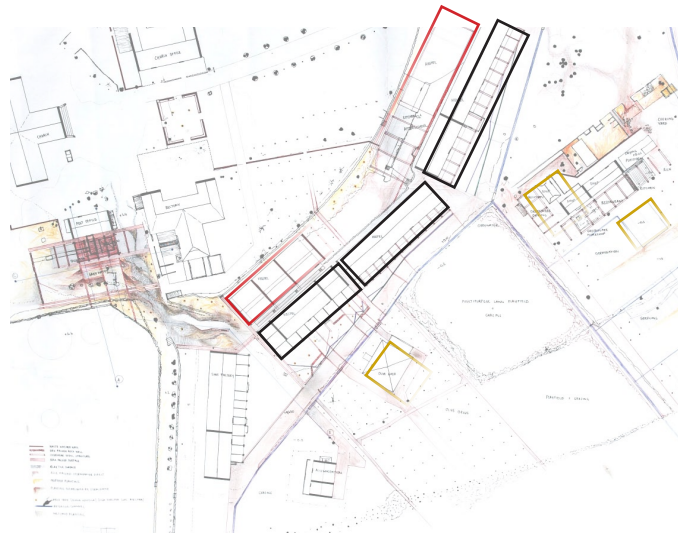


Fig. 8.13 Appropriation of hostel buildings (Franklin 2015)

- Main hostel buildings
- Proposed (additional) hostel buildings
- Buildings for proposed industries



Fig. 8.14 Absences and presences development (Franklin 2015)



- 'Absences', historic nodes
- 'Presences' functional



Reference sketchplan



Fig. 8.15 Open views and closed orchards (Franklin 2015)

-  Olive orchard
-  Open views to landscape

1. Church werf
(Absence)

2. Interpretation centre
(Presence)

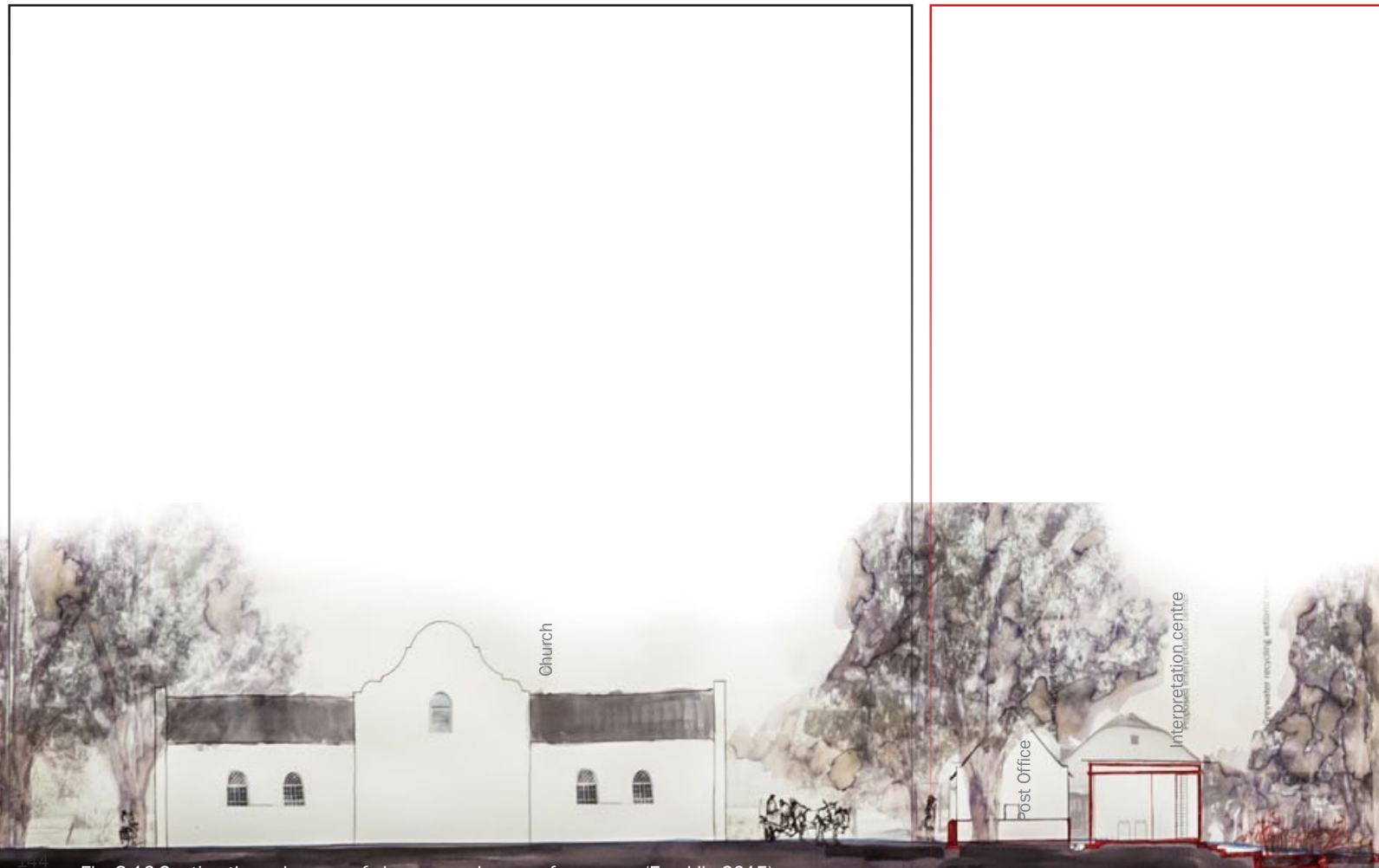


Fig. 8.16 Section through areas of absence and areas of presence (Franklin 2015)

3. Shoe factory
(Absence)

Plants as place-making device. Creating more intimate nodes between historic dusty voids and eucalyptus trees.

Existing temporary hostel structure to fit into new building proposal for

Existing hostel building

Rethinking platform in front of shoe factory

Olive grove

1. Church werf
(Absence)

2. Interpretation centre
(Presence)

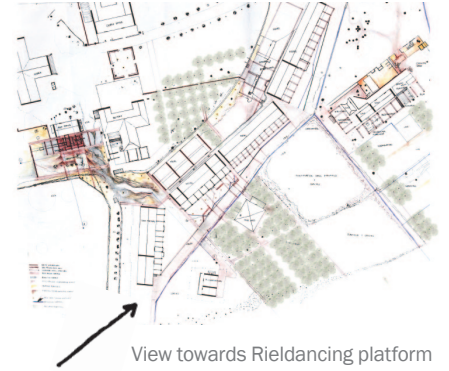
3. Shoe factory
(Absence)



Section line



Fig. 8.17 Perspective of Riedancing platform (Franklin 2015)



Full perspective image

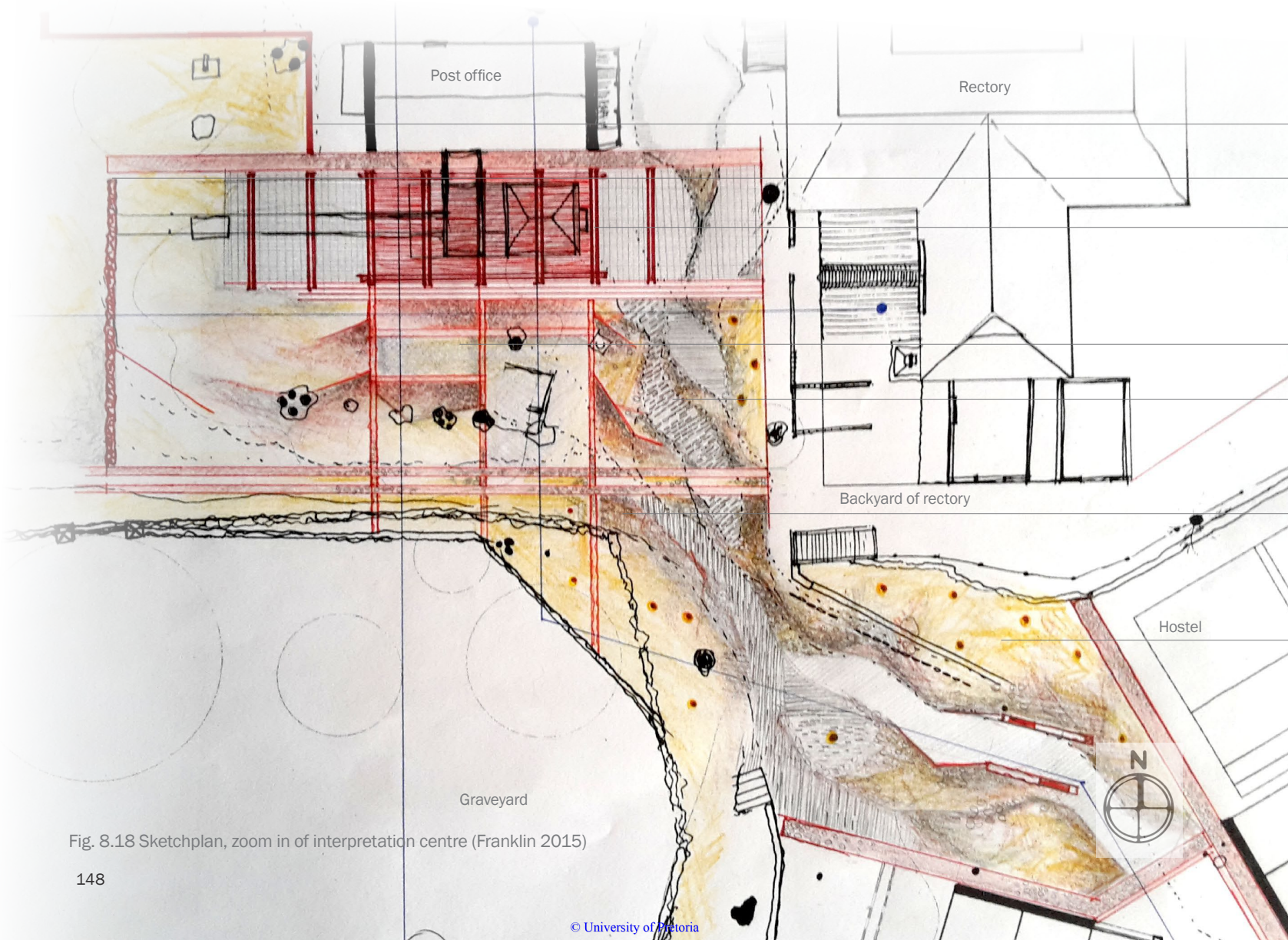


Fig. 8.18 Sketchplan, zoom in of interpretation centre (Franklin 2015)

8.4 INTERPRETATION CENTRE

The proposed interpretation centre is located next to the post office. The interpretation centre stems out of a need for ablation facilities to be added to historic buildings. This shows the effect of development on the historic town. A new typology is proposed in Section 8.6 for the development of these added structures. Here it forms part of the functional requirements of Wuppertal, located in an in-between area and should therefore contrast the existing building in mass and material, showing it as an added building while being designed to fit into the landscape and enhance the historic features (see guidelines for new build in Chapter 6 page 69).



Reference sketchplan

Low white washed werf-wall

Low dry-packed rock wall

Proposed ablation structure
(Existing in black)

Greywater (from handwash basin) recycling system

Paving pattern with locally manufactured clay tiles

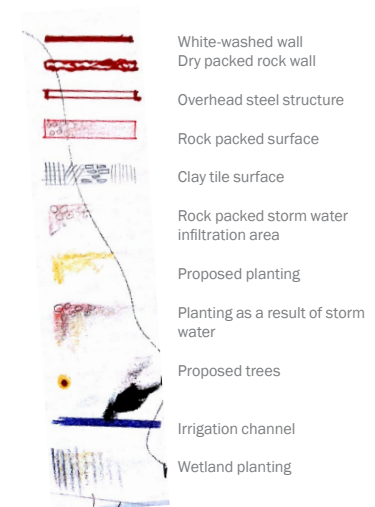
Planting established as part of habitat formation through packing of rocks

Proposed planting edge as privacy device

The greywater and blackwater from the ablation facility is separated and recycled through a series of wetlands discussed in Section 8.7.

The interpretation centre include a series of signage panels that tells the story of Wuppertal. These signs should be developed in close association with the residents. They will be developed on clay tiles manufactured in Wuppertal (proposal on page 152). The manufacturing of clay pavers is also proposed for outdoor use. This paving pattern will be developed further for the November exam.

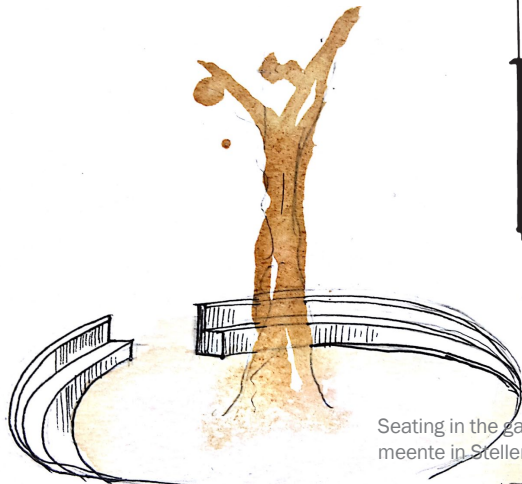
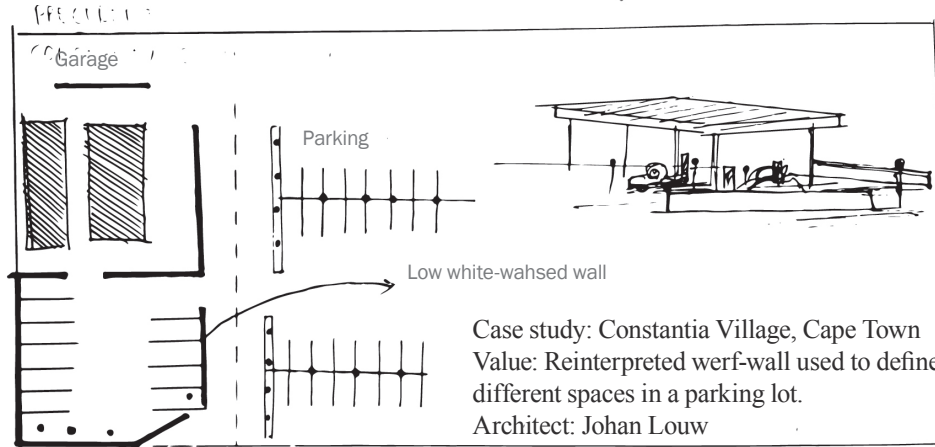
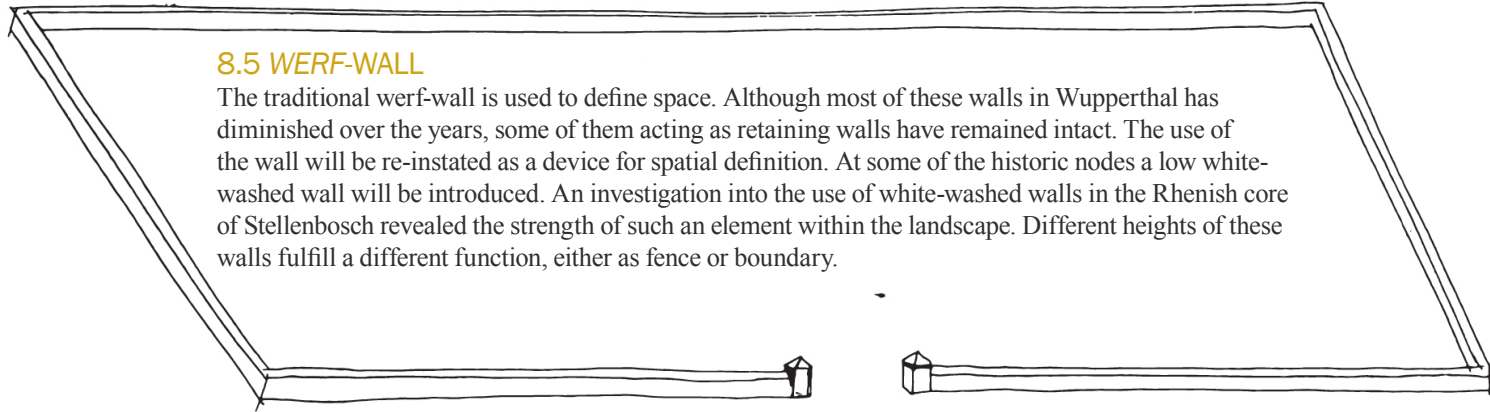
The werf-wall is interpreted within the landscape and clearly defines the edges while at other times it acts as storm water distributors within the landscape. Planting decreases the scale for better appreciation of the historic nodes.



LEGEND

8.5 WERF-WALL

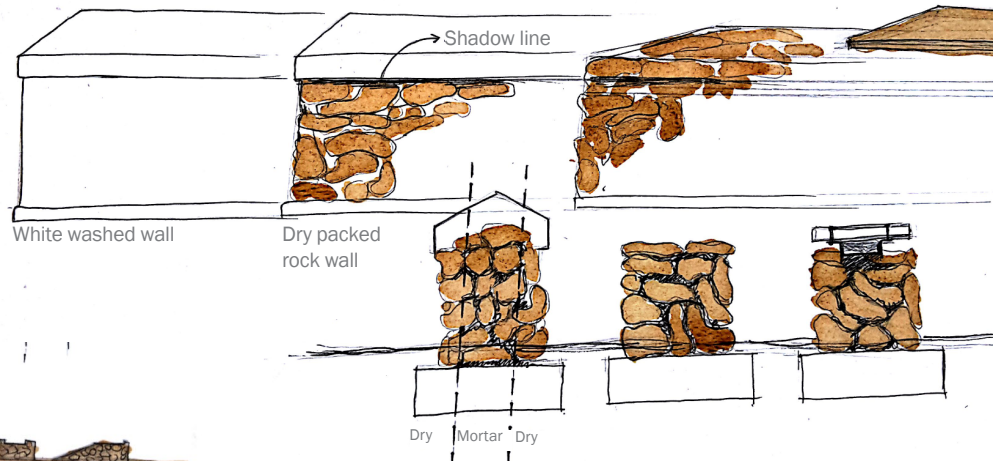
The traditional werf-wall is used to define space. Although most of these walls in Wuppertal has diminished over the years, some of them acting as retaining walls have remained intact. The use of the wall will be re-instated as a device for spatial definition. At some of the historic nodes a low white-washed wall will be introduced. An investigation into the use of white-washed walls in the Rhenish core of Stellenbosch revealed the strength of such an element within the landscape. Different heights of these walls fulfill a different function, either as fence or boundary.



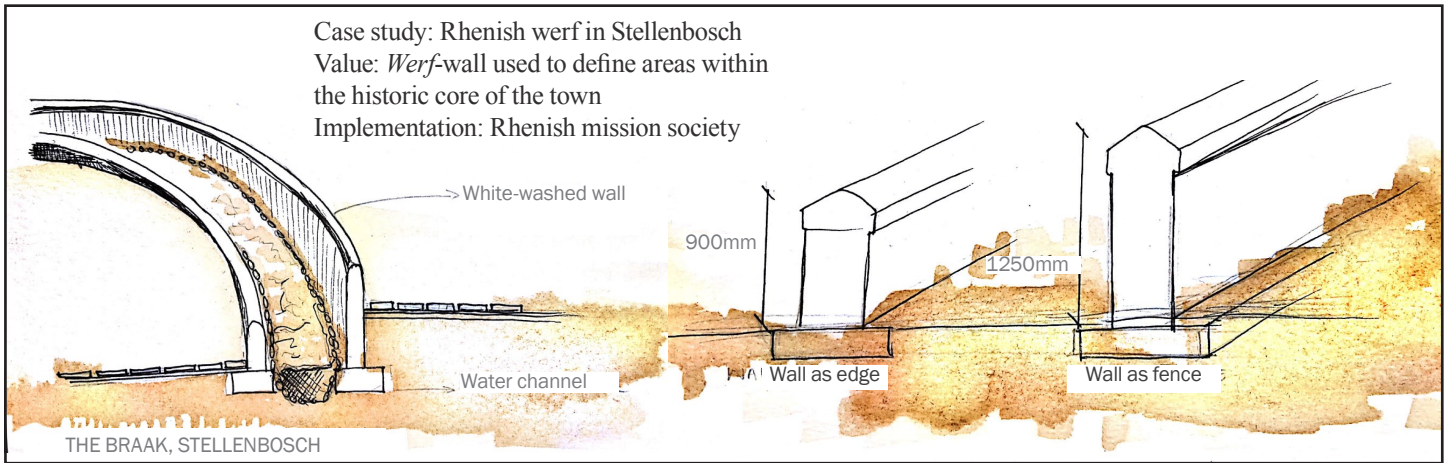
Seating in the garden of the NG-Moederge-
meente in Stellenbosch



Fig. 8.19 Traditional boundary wall in Wupperthal (Franklin 2015)



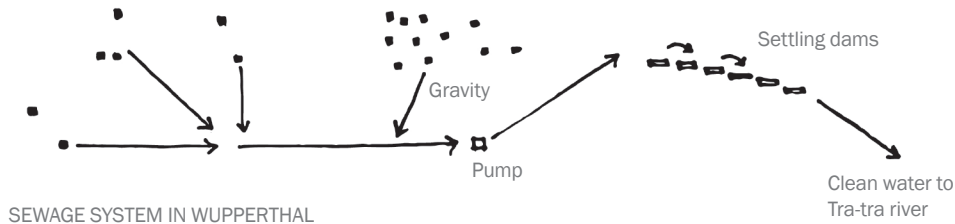
VARIATIONS OF THE WALL



8.6 ABLUTION STRUCTURE

Ablution facilities in Wuppertal form part of infrastructural development that came with an advancement in technology (see Chapter 5 for mapped ablution facilities). The sewage in Wuppertal is gathered by means of gravitation from where it is pumped to a series of settling dams before being released back into the Tra-tra river. A new architectural typology is proposed for these structures and that area added to the existing historic building. The architectural guidelines propose that it follows the stoep typology in contrast to the mass of the solid white-washed wall facade.

These guidelines are informed by the Burra and HUL charter discussed in Chapter 6, page 69. Any new building should follow the traditional mass of the building in Wuppertal. The proposed ablution facility of the post office will be a pergola type structure clad with thatch panels, that can open and close. Signage will be included on these panels that tells the story of Wuppertal for individual interpretation. Greywater will be treated in a series of wetlands next to the facility, thereby lessening the load on the sewage system.



ABLUTION FACILITIES ADDED IN WUP-



Stoep typology



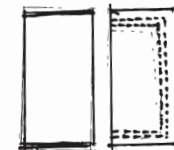
Temporality

separated from building



shadow line

Side view



Light structure
in contrast to
solid white-washed
walls

Wall line offset in structure

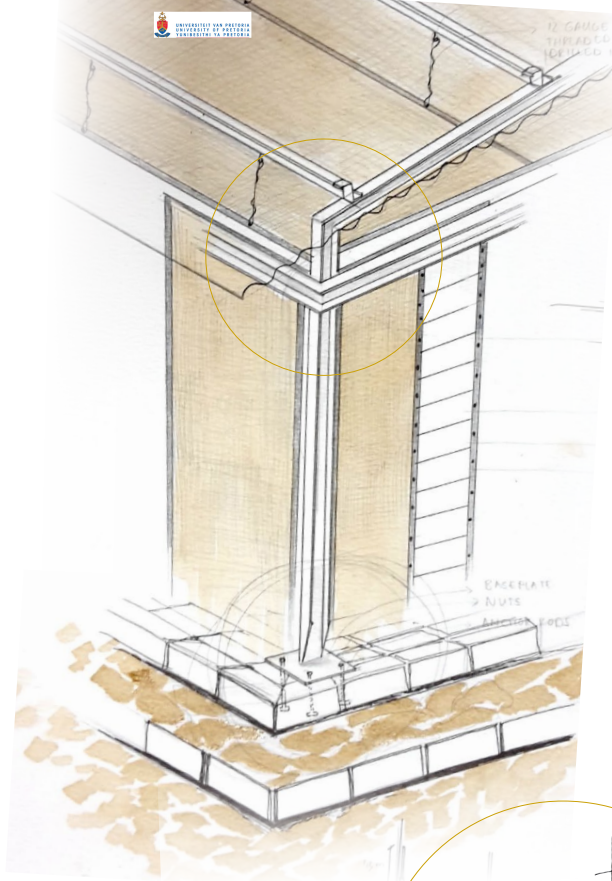
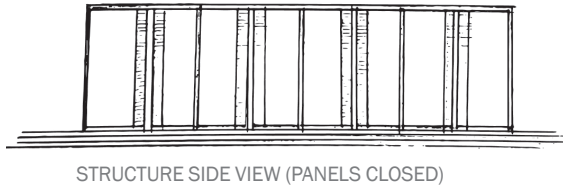
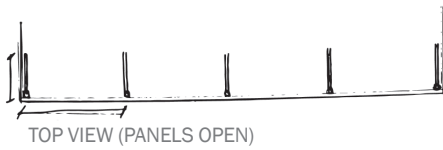
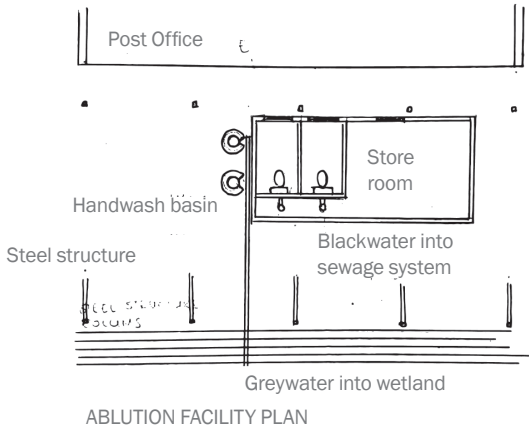


Side view



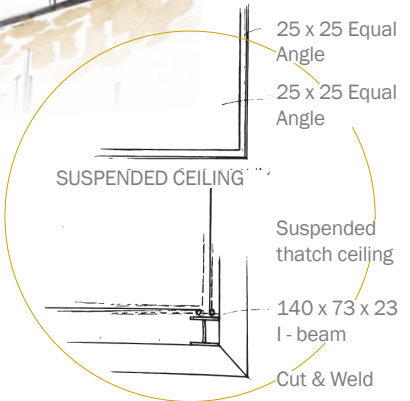
Side view

PROPOSED ARCHITECTURAL TYPOLOGY
FOR ABLUTION FACILITY



100 x 50 x 20 Z-Lipped purlin fixed at 1.5m
Screw eye
12 Gauge hanger wire threaded through pre-drilled holes

Interpretive tiles
Collapsible signage panel
Thatch cladding



I BEAM JOINT FROM TOP

Greywater produced						
ABLUTION A & B						
Application	water	unit	Amount	people served	Total (L)	Size of pond
Handbasin A	8 to 15	L/person served/day	2	3	90	
Handbasin B	8 to 15	L/person served/day	4	12	720	
					810 L/day	0.81 m ³
						1.62 m ³
						6.48 m ³ 4 day lag time

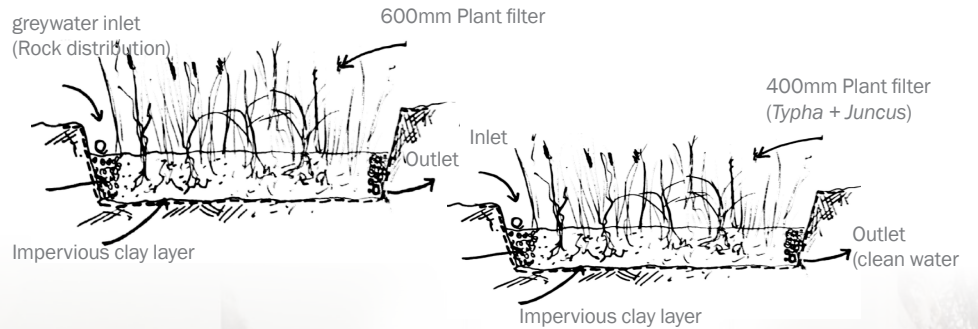


Fig. 8.20 Section through wetland and ablation structure (Franklin 2015)



Calopsis paniculata
(PlantZAfrica 2015)



Elegia capensis
(PlantZAfrica 2015)



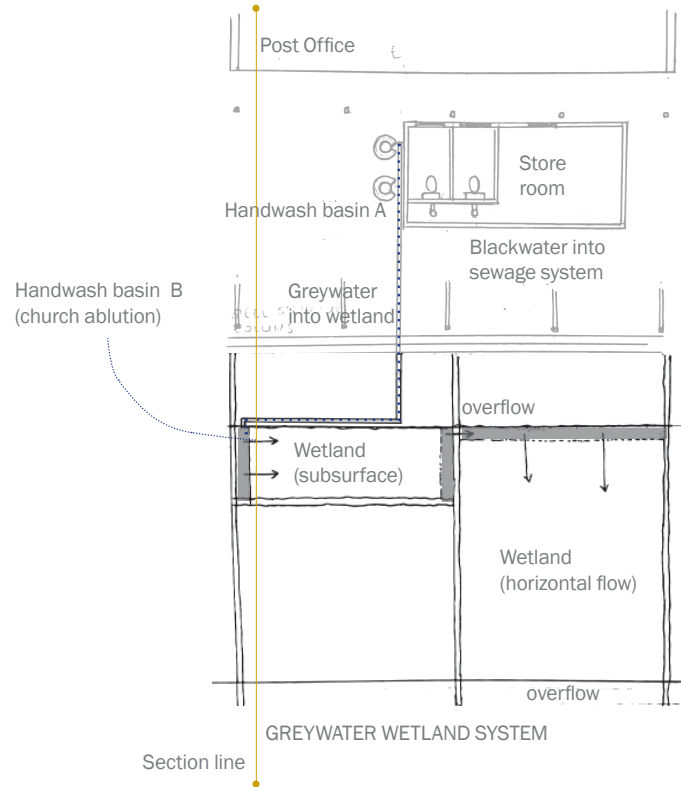
Typha capensis
(PlanZAfrica 2015)



Juncus species
(Franklin 2015)



Restio filliformis
(Franklin 2015)



8.7 GREYWATER SYSTEM

Greywater is all water generated from a household without faecal contamination. Greywater is easier to clean as it contains fewer pathogens and can be used for irrigation after treatment. Water in Wuppertal will be treated with a series of wetlands, the first a subsurface flow wetland to ensure contact with the root area, its overflow to a horizontal flow wetland system. The traditional use of *Phragmites* in the first wetland will be tested with the *Elegia capensis* that grows in the area in its ability to extract nitrates from the water. The second wetland will include the typical use of *Typha* and *Juncus*. The species selected are done to be able to continue growing should the system not receive any greywater to recycle.

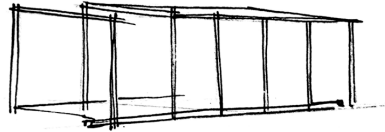




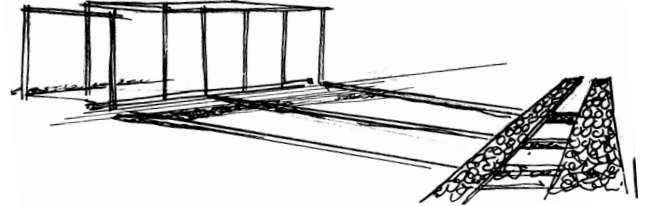
Components applied to site



1. Werf-wall



2. Steel structure



3. Dry-pack wall variation



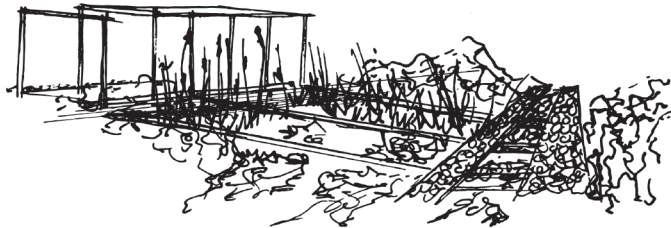
8.8 ABLUTION STRUCTURE COMPONENTS (INTERPRETATION CENTRE)

The images and sections below shows the different components that make up this part of the design and the kind of form it can take on when applied to a site. Each site will have a different interpretation of the technical investigation and the proposed components.

8.9 LIGHTING

Lighting in Wuppertal: Three existing light posts in the historic town (purely functional); on the main square, in front of the hostel and in front of the church. These single lights has the same effect at night as a tree representing a gathering place during the day.

Proposed use of lighting to remain functional, but in a different form. Uplighters under a tree or building provide the necessary light, while providing spaces for gathering at night.



4. Greywater recycling system and planting applied to site



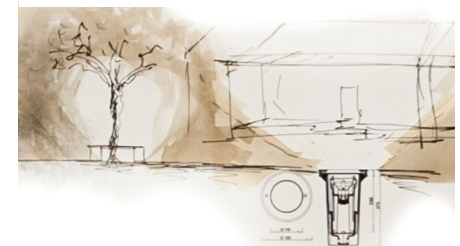
Existing use of lights in Wuppertal



Proposed use of lights in Wuppertal



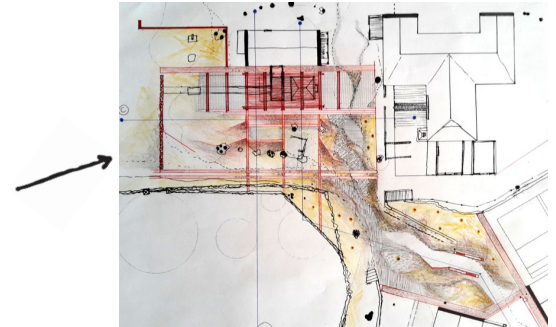
Existing lights in Wuppertal (functional)



Proposed use of lighting in Wuppertal (functional)



Fig. 8.21 Perspective of Interpretation centre (Franklin 2015)



View towards Interpretation centre



Full perspective image



Fig. 8.22 Sketchplan zoom in Clay tile workshop and Seedbase (Franklin 2015)

8.10 SEEDBASE

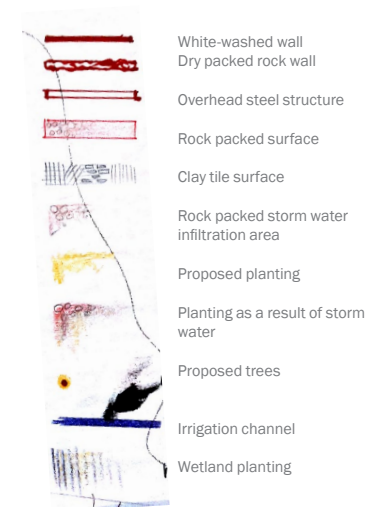
The seedbase and clay tile manufacturing area is located in the same area the tannery used to be (now only the foundations of the tannery left). The clay tile manufacturing adds the same spirit to the place that the tannery added to the space.

Clay from the outposts will be supplied to Wuppertal for the processing into the various clay tile products.

The processing of the clay is in need of the following facilities indicated on the plan:

- Storage room (raw clay)
- Greenware workshop
- Greenware drying facility (no wind)
- Kiln firing facility
- Cooling platform
- Painting and glazing workshop

The seedbase is discussed on page 154. The seedbase functions as an educational facility that expose some of the intangible processes that shape the land within the Greater Wuppertal Area. The seedbase consist of three main areas. The germination, seedling and planting area each with their different requirements. The components of the seedbase will be discussed in more detail for the november exam.



LEGEND

Proposed hostel kitchen, abluion and additional rooms needed

Proposed abluion structure (Existing in black)

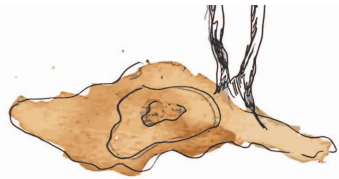
Play area behind hostel building

Seedbase

Public space

Wetland (irrigation overflow)

Olive trees



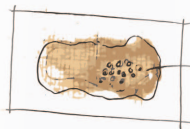
1. Dig out natural clay



2. Add water to double amount of clay



3. Mix to smooth creamy consistence



Discard gravel

4. Screen through a fine sieve



Clear water

5. Settle for 24h, remove clear water



6. Dry plaster container to drain extra water



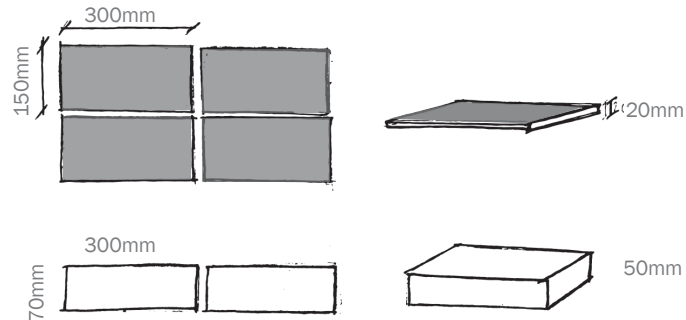
7. Clay bagged in plastic



8. Plasticity test

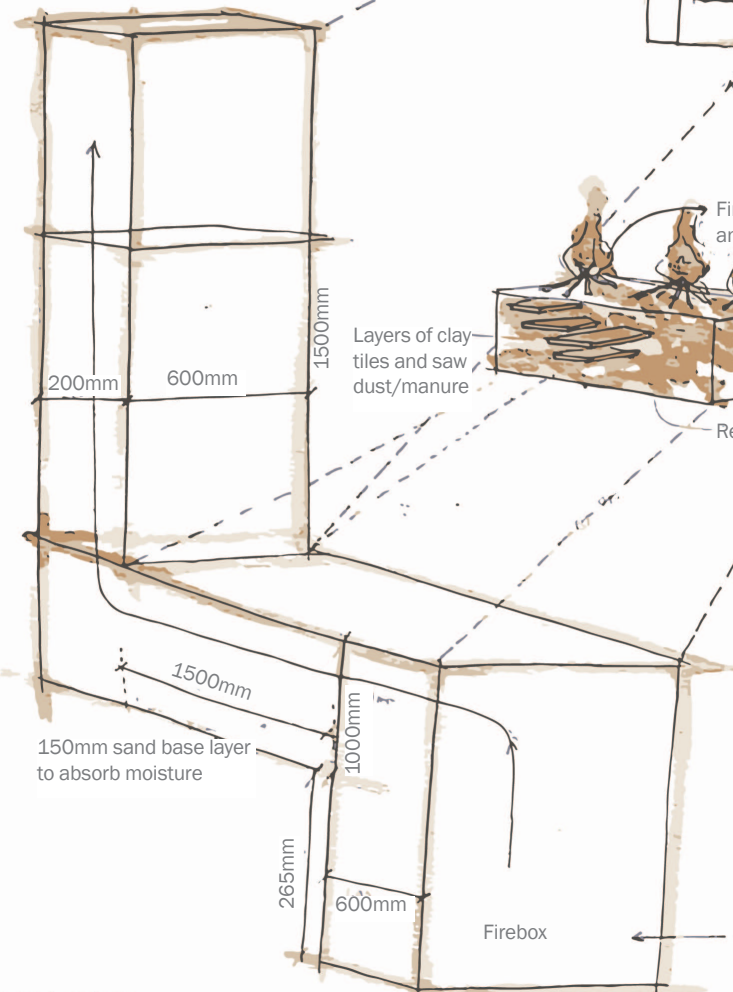
8.11 CLAY TILE MANUFACTURING

Wupperthal has a rich clay deposit in the larger landscape, as discussed in Chapter 6 and again as part of the Greater Wupperthal Area Framework in Chapter 7. It is proposed that this form part of an economic initiative in the historic core. A simple clay tile (red clay) with a black finish is to be used as surface under the steel structures. The black will complement the thatch of the roofs of the historic buildings and contrast against the white walls. The black finish is obtained from a process of a low-firing process and a reduction in air contact. The proposed kiln is built to be adaptable to different firing functions indicated in the diagram to the right. Once a year the area adjacent to the tannery is used for cooking for the church bazaar or festival. During these times the kilns will be used as the traditional oven with the removal of a few clay bricks. Clay tile pavers (yellow clay) with a thickness of 50mm will be used for outdoor paving, blending in with the dust surfaces. Clay is bagged and transported to Wupperthal for product development. Other products to consider include plates, and bottles for olive oil etc. An integrated process needs to be followed to involve the development of the products in close association with the community of Wupperthal.

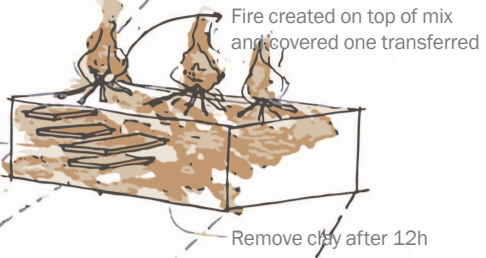


CLAY PAVER AND TILE SIZES

CLAY PRODUCTION PROCESS

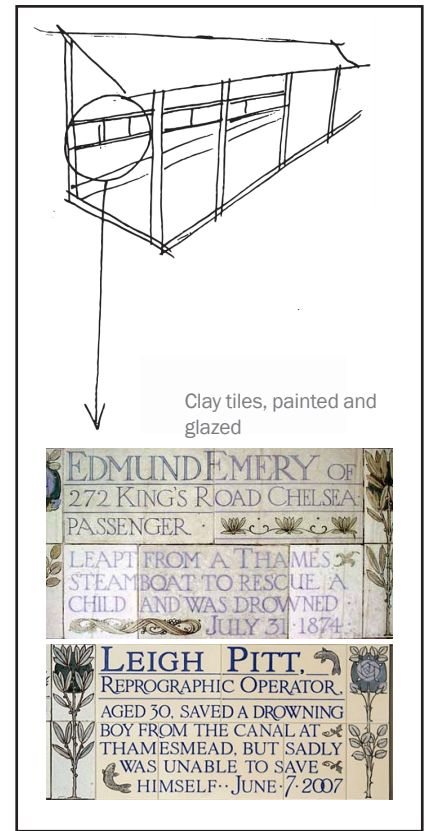


1. Traditional oven in Wuppertal (Preparation of food)



2. Low-firing pottery box for black tile finish (reduction in air contact turns red clay into black tiles, polished with river rocks afterward. No glazing needed.)

3. Glazing and wood fired Groundhog kiln (Traditional baking and glazing of clay)

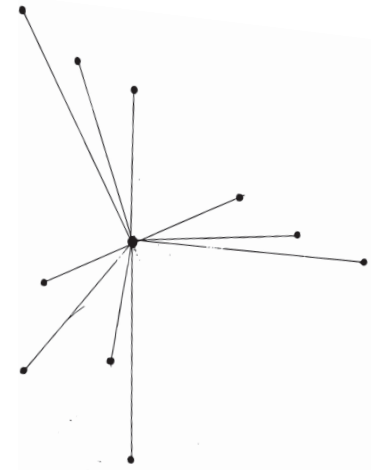


Case study: Postman's Park London Memorial to heroic sacrifice.
Value: Use of clay tiles for memorial plates
Architect: Ernst George
Ceramicist: William de Morgan

8.12 SEEDBASE DEVELOPMENT

The seedbase is a proposal that follows the isolation of Wupperthal and the use of their seed in the agricultural gardens in the larger cultural landscape. The seedbase is developed for the trade of Heirloom seeds building up a larger seedbase free from genetic manipulation. Heirloom means to pass onto next generations. Wupperthal will form the centre for trade of these seeds. Although seeds can be kept for long periods of time the best growth vigour is obtained for planting within a few months of storing. Different seed types need to be stored under different conditions. These conditions differ from seed to seed. Two categories exist, dessication-tolerant and dessication-intolerant seeds. Dessication-tolerant seeds can be prepared for long term dry storage, while dessication-intolerant seeds prefer moist cool places. Most of the seeds fall within the first category.

The seedbase forms part of the planting strategy for the educational use of plants. Part of the seedbase is also to show the germination of seeds and the development through to seedlings before they are transplanted for growing vegetables and the production of seed. The germination and seedling production both have different requirements for the conditions they need. The designing of the structure forms part of the technical investigation. The complete set of technical details will be presented as part of the final crit.



Stimulate seed production and use of agricultural fields in fourteen outposts

Case study: Oranjezicht Community Farm
Value: Integration of active farm into the urban fabric and surrounding community
Landscape Architect: Tanya de Villiers

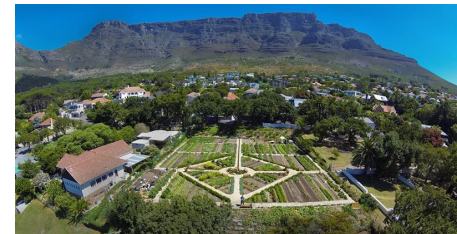


Fig. 8.23 Oranjezicht Community Farm (Franklin 2015)

1. Germination

- Soak overnight
- Light
- Bottom heat
- Cool conditions

DESIGN CONSIDERATIONS
Heat from kilns

2. Seedling

Hardening (increased expose to sunlight):

- 1-3 day (3 hours sunlight)
- 4-7 days (5 hours sunlight)
- 8-10 days (full day sunlight)

DESIGN CONSIDERATIONS
Structure that allows sun exposure to plants with different requirements

Draw people in to move through the plants (hardening of plant structure by simulating movement of animals though plants)

3. Vegetable plants

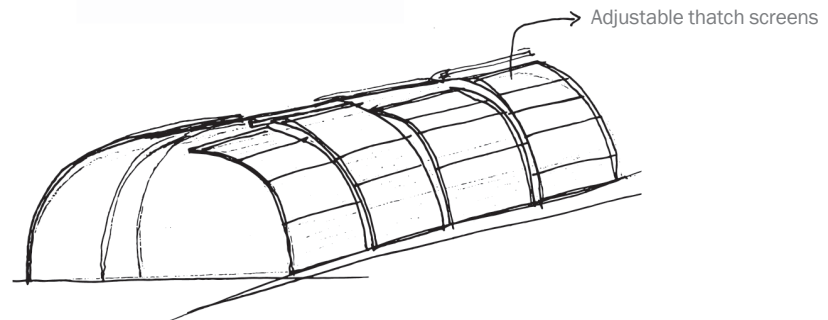
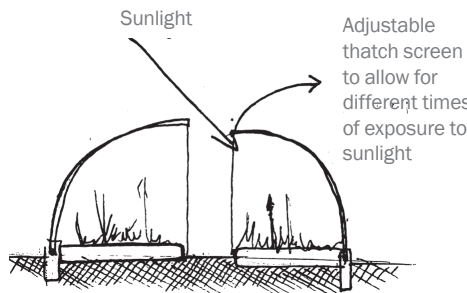
Hardening (increased expose to sunlight):

- 1-3 day (3 hours sunlight)
- 4-7 days (5 hours sunlight)
- 8-10 days (full day sunlight)

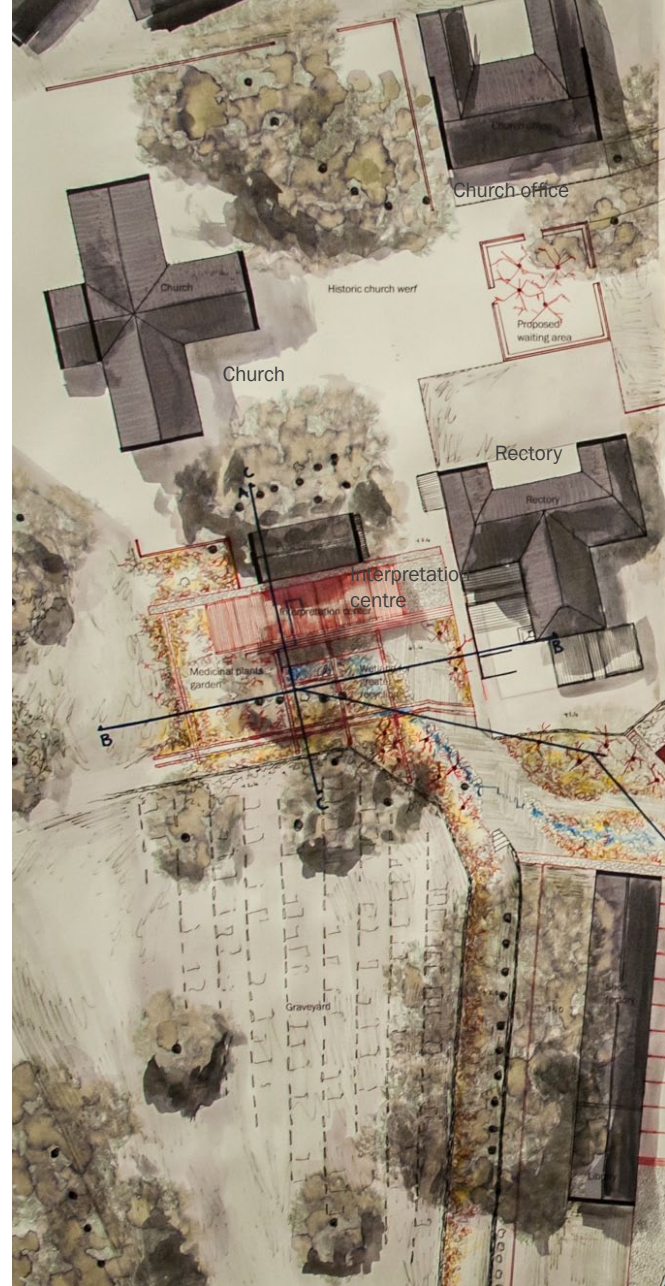
DESIGN CONSIDERATIONS
Educate visitor on traditional ways of agriculture management in Wuppertal:
E.g. Use of manure:

- Onions- pig manure
- Potatoes - Cow manure




To be developed in close relation to the people of Wuppertal and their traditional ways



8.13 FINAL SKETCHPLAN





-  Existing
-  Proposed
-  Re-appropriated

LEGEND



8.14 FINAL PRESENTATION



