

9.1. MATERIALS

Materials was selected to complement and enhance existing materials, respecting the heritage of Weskoppies. The ability of the material to stimulate the senses was also considered when materials were selected. Flowers have the ability to lift the spirit and therefore the selected vegetation mostly consists out of flowering plants. Mosaic work done by Weskoppies patients on planters and retaining walls encourage community participation and give the people at Weskoppies a sense of ownership and pride.

Fig. 9.2: *Planting and paving plan*
(Author, 2009).



LEGEND:

SOFT LANDSCAPING (refer to 9.1)



Tree species:
(refer to the codes for tree species in 9.1.1).



Flowering shrubs: refer to the shrubs palet as illustrated in (9.1.2)



Fragrant groundcovers planted between pavers to release fragrance when crushed (refer to 9.1.3. for species)



Climbing plants at pergolas (refer to 9.1.4 for species).



Herbs and vegetables as selected by patients in horticultural therapy program (refer to 9.1.5).



Red cut flowers (refer to 9.1.6 for species)



Purple/ blue cut flowers (refer to 9.1.6 for species)



Yellow cut flowers (refer to 9.1.6 for species)



Mixed colours cut flowers (refer to 9.1.6. for species)



Cynodon dactylon

PAVING MATERIALS



In situ concrete: a comfortable surface for wheelchair users



Gravel: provides texture, sound and a permeable surface for infiltration



Concrete pavers interplanted with fragrant groundcovers: releases fragrance when leaves are crushed.



Semi-glazed ceramic tile inserts: bright colours that lead the pedestrian to colour pockets.



9.1.1. TREES

Indigenous trees were selected based on their colours and their ability to change with the season. This creates a sense of anticipation and makes patients more aware of the time and seasons while the colours contribute to creating a uplifting, positive outdoor environment. The proposed trees also fit in with the existing trees at Weskoppies as well as the existing natural bushveld.

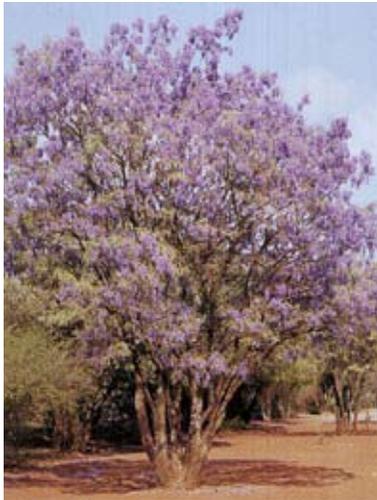


Fig. 9.3: *Bolusanthus speciosus* (BS)
(Venter, 1998)



Fig. 9.4: *Pterocarpus rotundifolius* (PR)
(Venter, 1998)

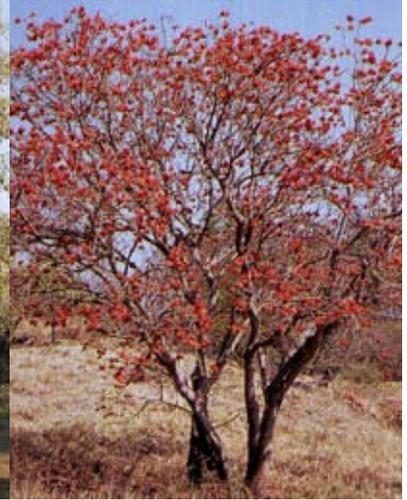


Fig. 9.5: *Erythrina lysistemon* (EL)
(Venter, 1998)

***Bolusanthus speciosus* (Tree witseria):** The tree witseria was selected based on its purple flower display during spring that attracts insects. It has a non-aggressive root system ,grows quickly and can survive with little water. (VENTER. 1998:242)

***Pterocarpus rotundifolius* (Round-leaved kiaat):** Selected for its yellow flower display in spring, creating a cheerful environment and attracting insects. It has a is non-aggressive root system and grows quickly. (VENTER. 1998:58)

***Erythrina lysistemon* (Common coral tree):** Selected for its vibrant red flower display in spring attracting insects. Its root system is aggressive and it should not be planted close to paving. It grows fast. (VENTER. 1998:78)

***Combretum erythrophyllum* (River bushwillow):** The root system is non aggressive and the foliage provides autumn colours. It is a fast grower and can survive with little water. (VENTER. 1998:240)

***Celtis africana* (White stinkwood):** Selected because it is reflective of the seasons which is important in the context of Weskoppies. The tree also provides dense shade during the summer and sun during the winter when it loses all its leaves. It grows extremely fast. (VENTER. 1998:278)

***Acacia xanthophloea* (Fever tree):** Selected for its contrasting green trunk and foliage and fast growing nature



Fig. 9.6: *Combretum erythrophyllum* (CE)
(Venter, 1998)



Fig. 9.7: *Celtis africana* (CA)
(Venter, 1998)



Fig 9.8: *Acacia xanthophloea* (AX)
(Venter, 1998)

9.1.2. SHRUBS

Indigenous shrubs was also selected to give a vibrant, uplifting colour display with flowers that accentuates the seasons. These shrubs doesn't require a lot of maintenance and fit in with the natural bushveld vegetation at Weskoppies. The flowers also attracts insects and birds.



Fig. 9.9: *Barleria obtusa*
(Joffe, 2003)

Fig. 9.10: *Hypoestes aristata* (Joffe, 2003)

Fig. 9.11: *Plectranthus fruticosus* (Joffe, 2003)

Fig. 9.12: *Plectranthus neochilus* (Joffe, 2003)

Fig. 9.13: *Plumbago auriculata* (Joffe, 2003)



Fig. 9.14: *Dietes grandiflora* (Joffe, 2003)

Fig. 9.15: *Euryops pectinatus* (Joffe, 2003)

Fig. 9.16: *Tecomaria capensis* (Joffe, 2003)

Fig. 9.17: *Strelizia reginae* (Joffe, 2003)

Fig. 9.18: *Bauhinia galpinii* (Joffe, 2003)

Barleria obtusa (BO): This bushy shrub is ideal for reflecting the natural bushveld architecture at Weskoppies. The shrub was also selected for its masses of blue mauve, pink or white flowers in autumn. (Joffe, 2003:37)

Hypoestes aristata (HA): The Ribbon bush was selected for its mauve and pink flower display just before winter. It can be planted as a ground cover in the shady positions around the buildings. (Joffe, 2003:49)

Plectranthus fruticosus (PF): The Pink Fly Bush was selected for its pink or bluish mauve flower display in summer. It is ideal for a ground cover at shady positions underneath trees and close to buildings (Joffe, 2003:60).

Plectranthus neochilus (PN): This is a good low growing ground cover plant with deep blue and purple flowers in autumn and a strong garlic smell. (Joffe, 2003:61)

Plumbago auriculata (PA): This fast growing, drought resistant shrub will be planted in sunny areas where it will give a powder-blue flower display throughout summer. (Joffe, 2003:87)

Dietes grandiflora (DG): The white-orange-and-mauve flowers could be mass planted under trees and other partial shade areas. (Joffe, 2003:43)

Euryops pectinatus (EP): This shrub was selected because it is covered with bright yellow flowers from June to October. It will be planted in sunny positions. (Joffe, 2003:46)

Tecomaria capensis (TC): The cape honeysuckle is fast growing and drought resistant, it forms an informal hedge. It produces yellow flowers in Spring and summer. (Joffe, 2003:92)

Strelitzia reginae (SR): This striking perennial is unique to the South African context. It produces flowers from March until October. (Joffe, 2003:66)

Bauhinia galpinii: This higher growing shrub was selected because it fits in well with the bushveld context and produces red flowers in summer. (Joffe, 2003:71)

9.1.3. FRAGRANT GROUNDCOVERS

The fragrant ground covers will be planted between precast concrete pavers. When crushed the leaves will release a fragrance and stimulate the sense of smell. The author proposes the following species:

Full sun

Thymus praecox (thyme)
Achillea tomentosa (Woolly yarrow)



Fig. 9.19. Thyme



Fig. 9.20. Woolly yarrow



Fig. 9.21. Pennyroyal

Sun to partial shade

Mentha pulegium (pennyroyal)
Mentha requienii (Corsican mint)
Laurentia flavuliatilis (Blue star creeper)



Fig. 9.22. Corsican mint



Fig. 9.23. Blue star creeper



Fig. 9.24. Sweet woodruff

Shade

Galium odoratum (Sweet woodruff)

9.1.4. CLIMBING PLANTS

The following climbing plants can be used at the pergolas :

Jasminum multipartitum (Starry wild jasmine)
Thunderbergia alata (Black-eyed susan)
Pyrostegia venusta (Golden shower)
Wisteria sinensis



Fig. 9.25. Jasmine



Fig. 9.26. Black-eyed susan



Fig. 9.27. Golden shower



Fig. 9.28. Wisteria

9.1.5. HERBS & VEGETABLES (HORTICULTURAL THERAPY)

The herbs and vegetable species will not be specified by the author. The selection of plant species will be part of the horticultural therapy program. Patients will decide what they want to plant in this area based on what they have learned.

9.1.6. CUT FLOWERS

The cut flower species is categorized in four different groups based on their colour. These include a yellow, red/ orange, purple/blue and mixed colours.

Yellow cut flowers



Fig. 9.29. *Graspedia globosa*



Fig. 9.30. *Helianthus annuus*



Fig. 9.31. *Bupleurum griffithii*



Fig. 9.32. *Euryops pectinatus*



Fig. 9.33. *Delphinium belladonna*



Fig. 9.34. *Cynoglossum amabile*

Blue & purple cut flowers

Red/ orange cut flowers



Fig. 9.35. *Calendula officinalis*



Fig. 9.36. *Crocosmia paniculata*



Fig. 9.37. *Watsonia*



Fig. 9.38. *Sparaxis elegans*

Mixed cut flowers



Fig. 9.39. *Antrirrinum majeus*



Fig. 9.40. *Lathyrus odorata*



Fig. 9.41. *Freesia*



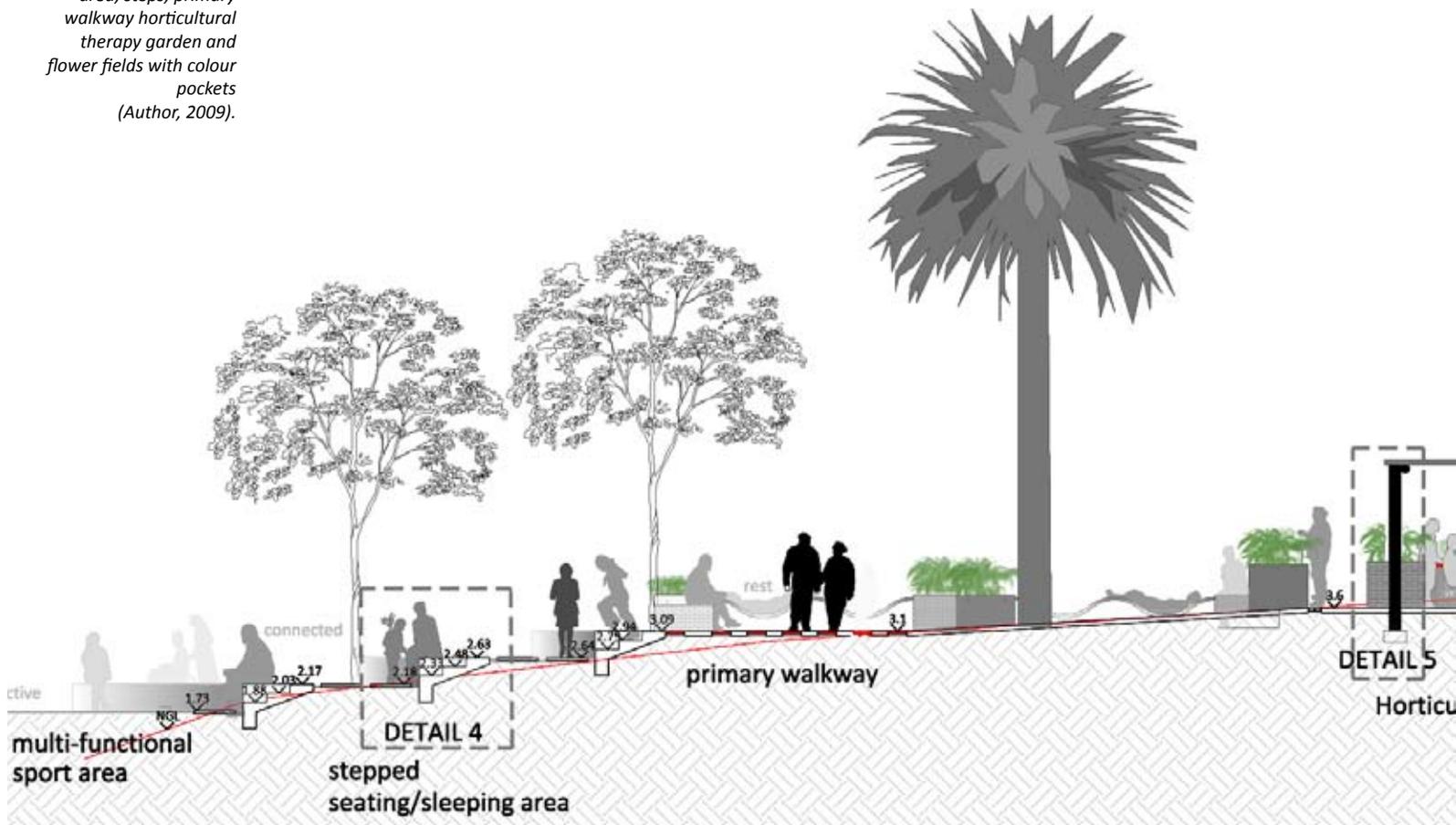
Fig. 9.42. *Gypsophila elegans*

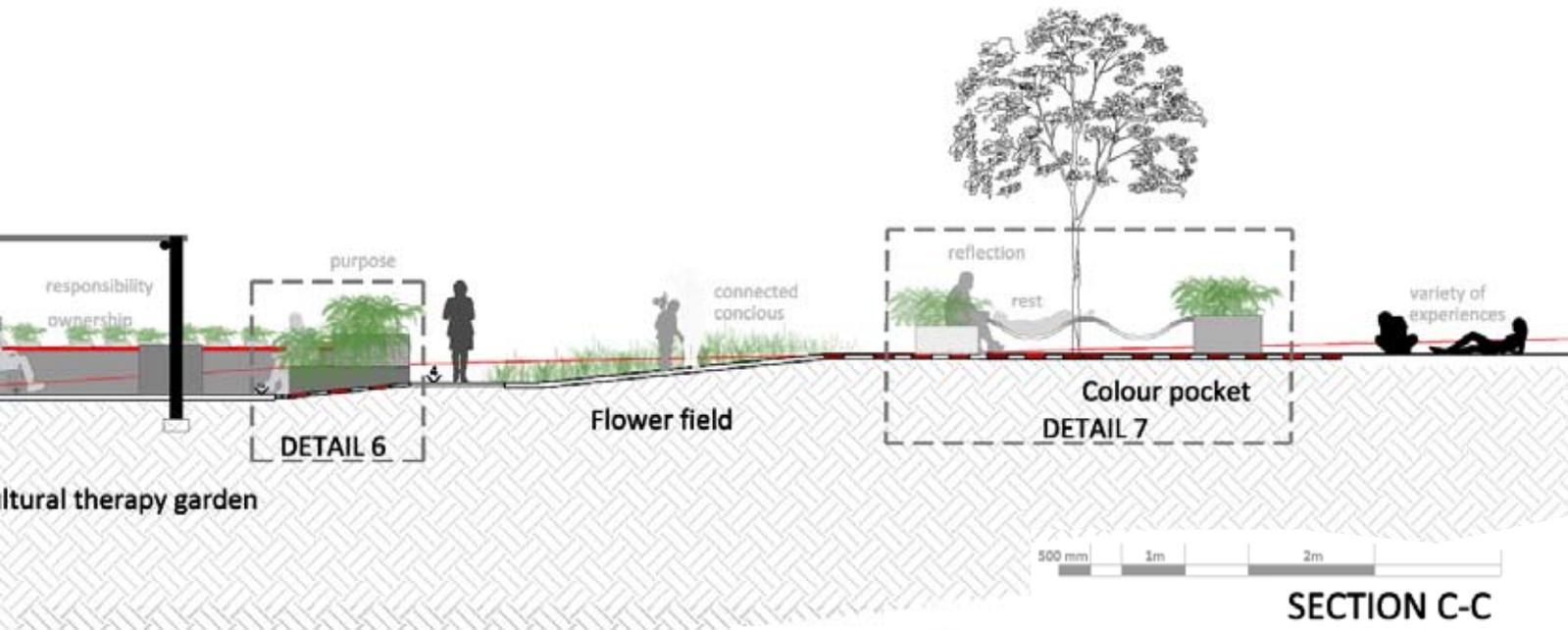
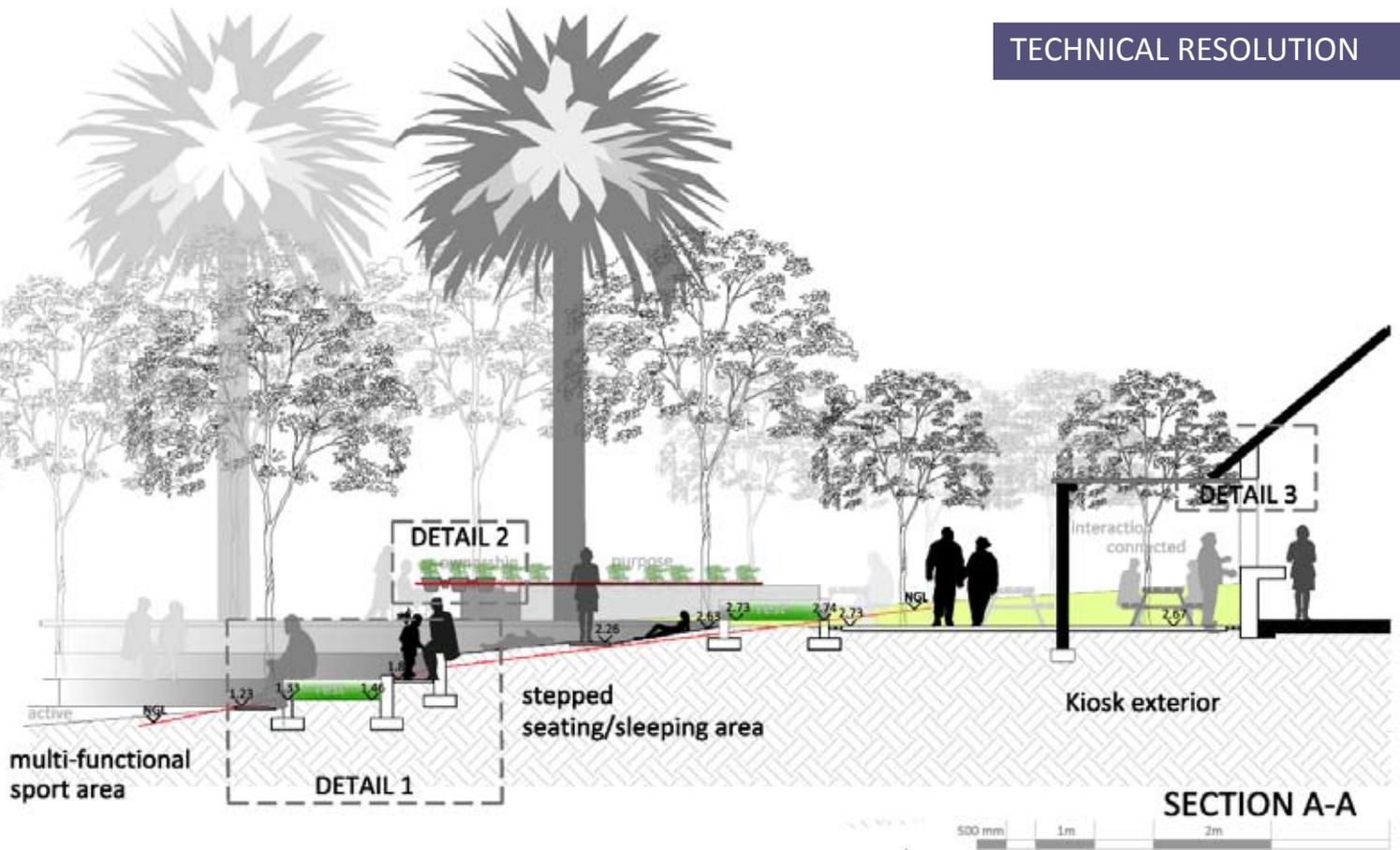
9.2. TECHNICAL DETAILS

Section A-A and B-B cuts through the most prominent landscape structures as proposed in the sketch plan. The numbered details will be explained on a bigger scale in 9.3.1 to 9.3.7. and includes; the sculpted sleeping and seating terraces, retaining walls, various planters, step details, pergola details and the waved seating benches. These details will show dimensions, material use, subsoil layers and fastening methods.

*Fig. 9.43
(opposite page): Section A-A includes the multifunctional sport area with the stepped sleeping and seating area, primary walkway and kiosk exterior (Author, 2009).*

*Fig. 9.44
(below): Section C-C includes the multifunctional sport area, steps, primary walkway horticultural therapy garden and flower fields with colour pockets (Author, 2009).*



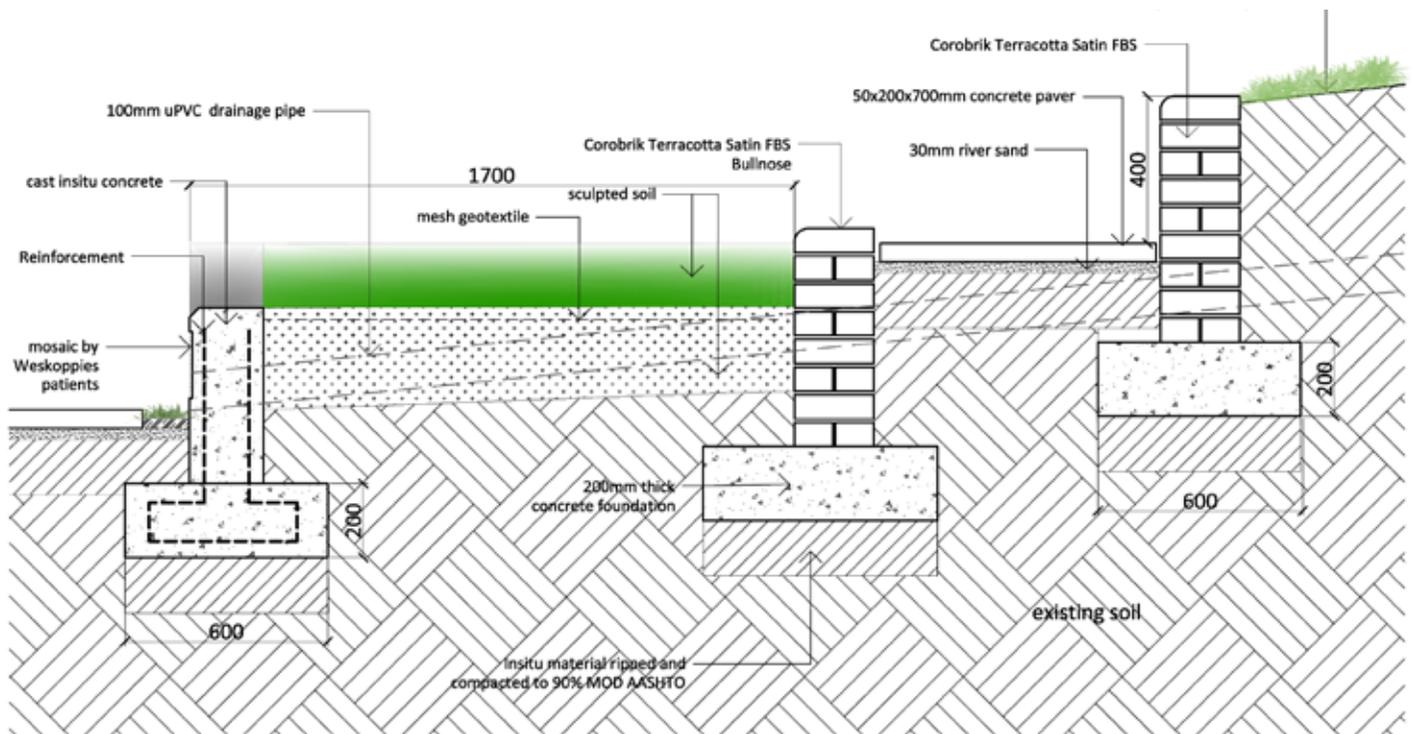


9.2.1. DETAIL 1: SCULPTED SLEEPING AND SEATING AREA

The Sculpted lawn is a comfortable sleeping area for patients that needs rest during the day. Seating walls and terraced lawns are also accommodated in this area. It is situated around the multifunctional sport area to allow people to observe sport activities.

A reinforced waved cast in situ retaining wall with mosaic work by Weskoppies patients retains the waved lawn area, while flat terraced lawn areas will be retained with stone clad retaining walls. A 50 x 299 x 700 concrete paver inter planted with fragrant ground covers will provide a walkway between terraces .

Fig. 9.45
(below): Detail 1-
stepped seating and
sleeping area
(Author, 2009).



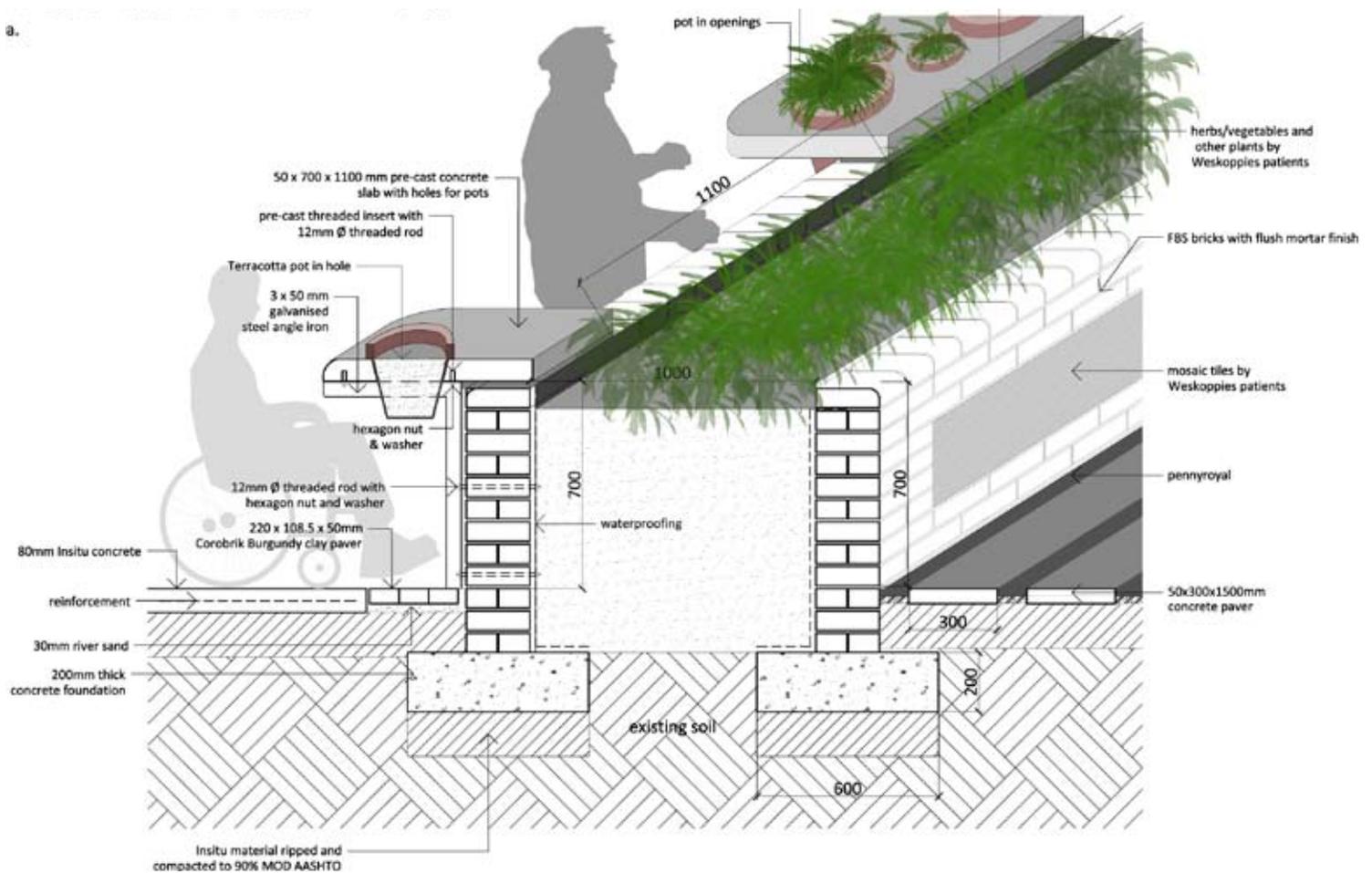
9.2.2. DETAIL 2: PLANTER WITH POT OPENINGS

Detail 2 shows a 700mm high horticultural planter with a 700mm wide pre-cast concrete slab attached to the inner edge. The concrete slabs have pre-cast holes in them to function as pot holders. As part of the horticultural therapy program patients will start out with small manageable size pot plants which they can place in these holes. The height of the concrete slabs makes it possible for wheelchair users to put their legs underneath the slab while working with the plants.

The planters are built with FBS bricks with a flush mortar finish. At certain places as indicated on the detail, mosaic work by Weskoppies patients will be accommodated. The detail also indicate the concrete pavers, inter planted with fragrant ground covers.

This planter in conjunction with the planter described in detail 6 encloses the horticultural therapy garden.

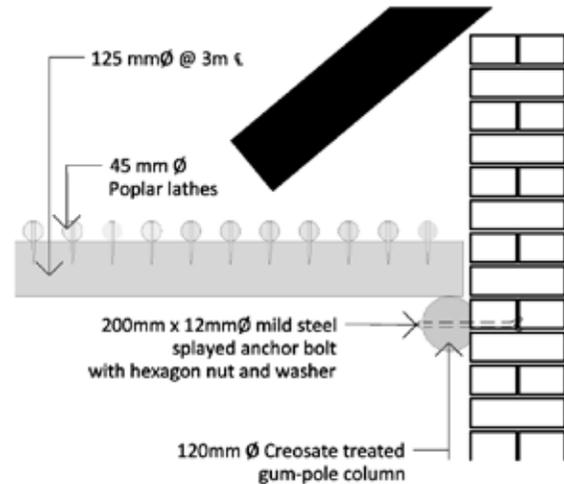
Fig. 9.46 (below): Horticultural planter with pre-cast concrete slab with holes for pots (Author, 2009).



9.2.3. DETAIL 3: PERGOLA FIXED TO WALL

Fig. 9.47 : Detail 3- Detail of proposed pergola fixed to existing kiosk structure (Author, 2009).

A pergola fixed to the existing kiosk structure is proposed for shading at the area where people can buy food from the outside. Fragrant climbing plants like *Jasminum multipartitum* will cover the pergola to stimulate sense of smell and provide denser shade.

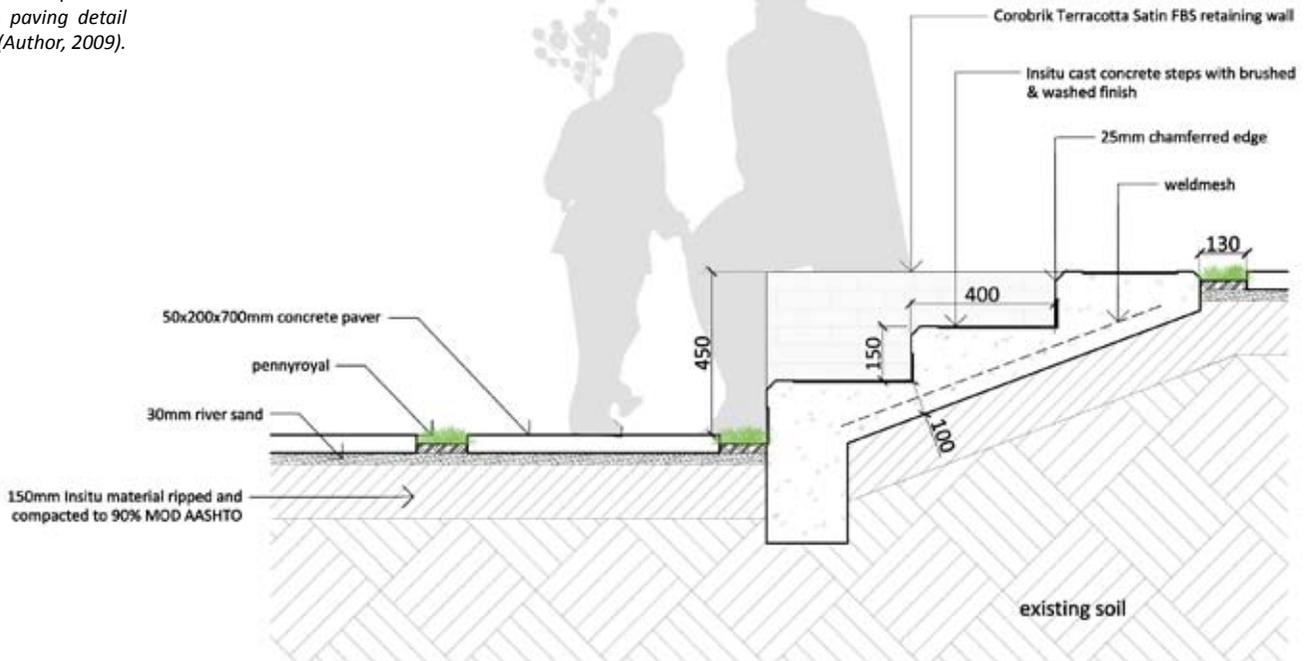


9.2.4. DETAIL 4: STEP AND INTER PLANTED CONCRETE PAVING DETAIL

The steps at the stepped seating and sleeping area will be cast insitu with a brushed and washed finish.

A walkway will be accommodated to allow movement between terraces. This walkway will consist out of 50 x 200 x 700mm concrete pavers inter planted with fragrant ground covers in 100mm openings.

Fig. 9.48 : Detail 4- Step and inter planted concrete paving detail (Author, 2009).



9.2.5. DETAIL 5 A & B: PERGOLA DETAILS

The pergola, situated central to the horticultural therapy garden will provide shading for the working tables. Fragrant climbing plants will cover the pergola stimulating the sense of smell while softening the structure and providing denser shading.

Materials used for the pergola includes; 125mm diameter creosote treated gum pole column, 250 x 50mm Eucalyptus laminated beams, and 45mm diameter poplar lathes

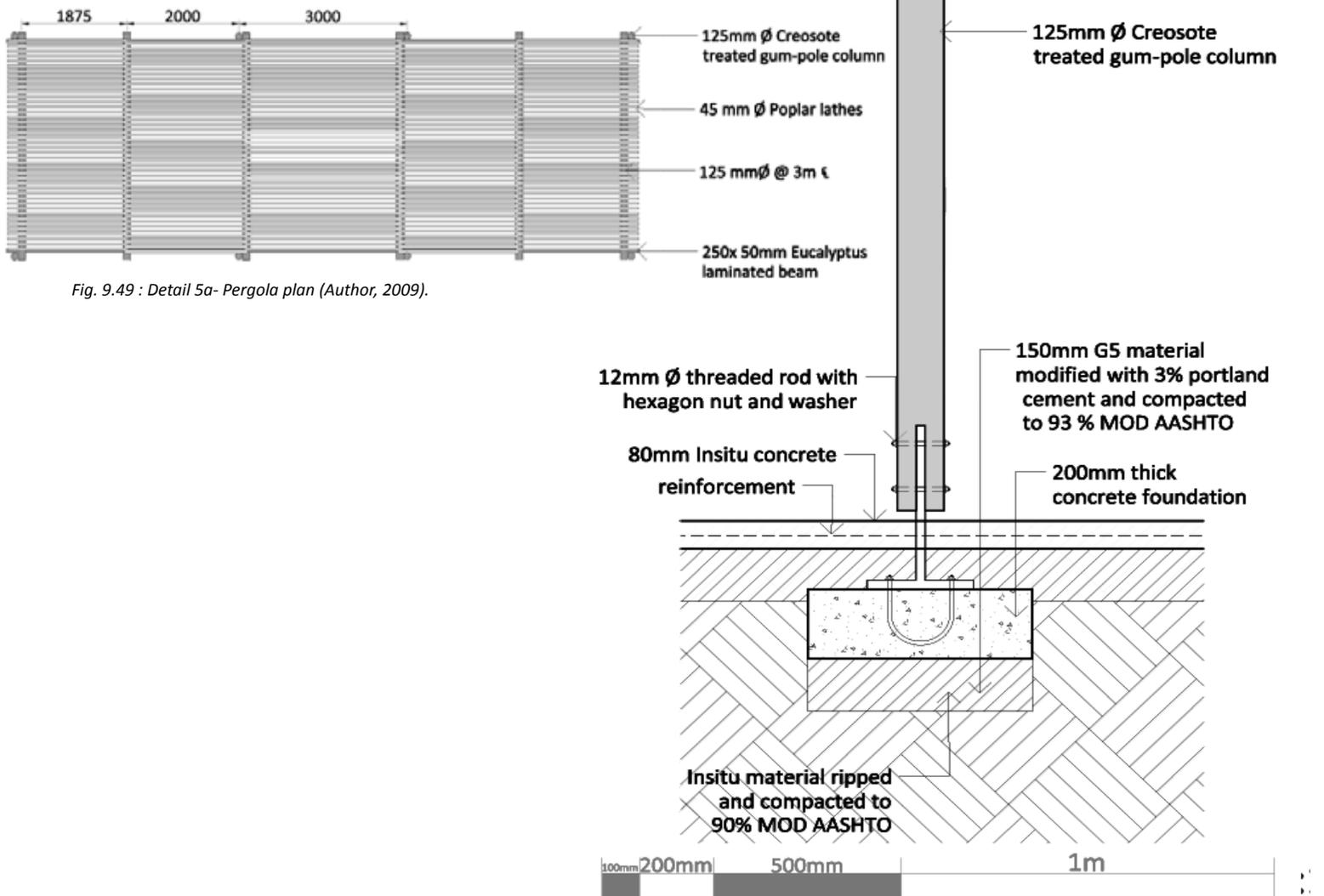


Fig. 9.49 : Detail 5a- Pergola plan (Author, 2009).

Fig. 9.50 : Detail 5b- Section trough pergola column (Author, 2009).

9.2.7. DETAIL 7 A & B: WAVED BENCH ATTACHED TO PLANTER

Wavy wooden benches between square face brick planters becomes a comfortable outdoor sleeping area for patients that need rest during the day.

Fig. 9.52 (right): Detail 7A- The fastening of the waved sleeping bench to planter the planter(Author, 2009).

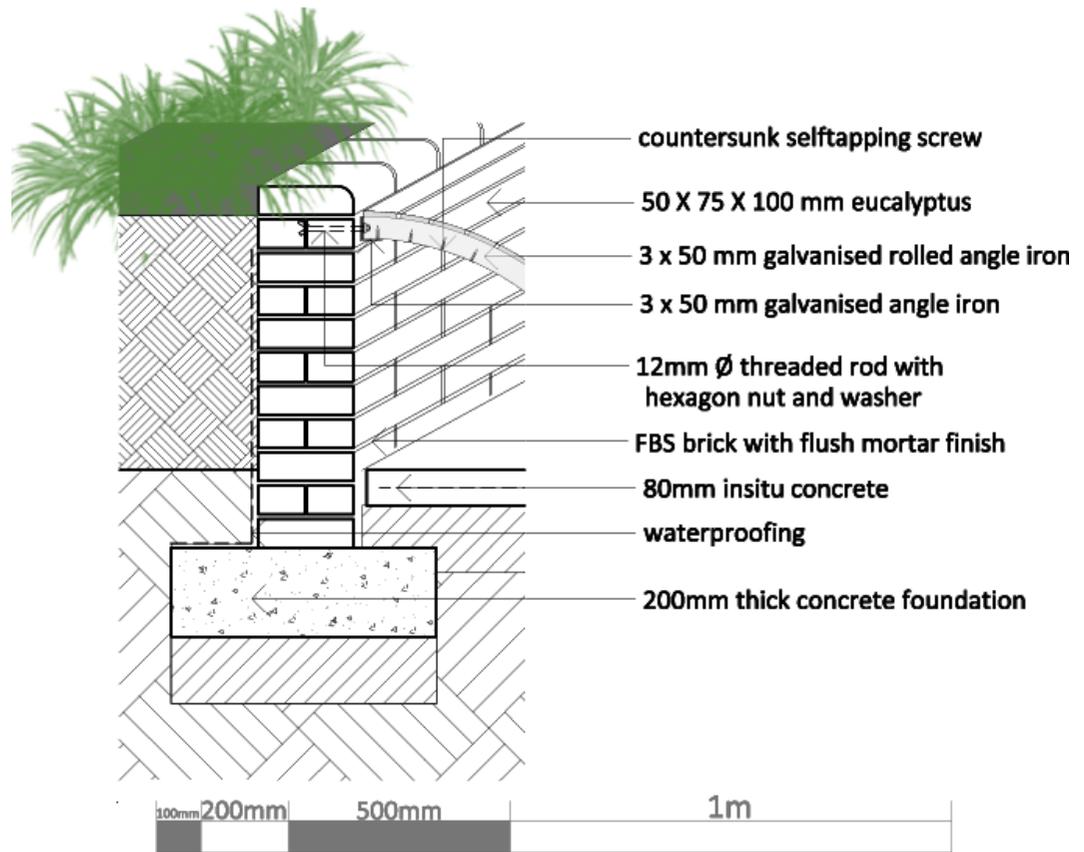
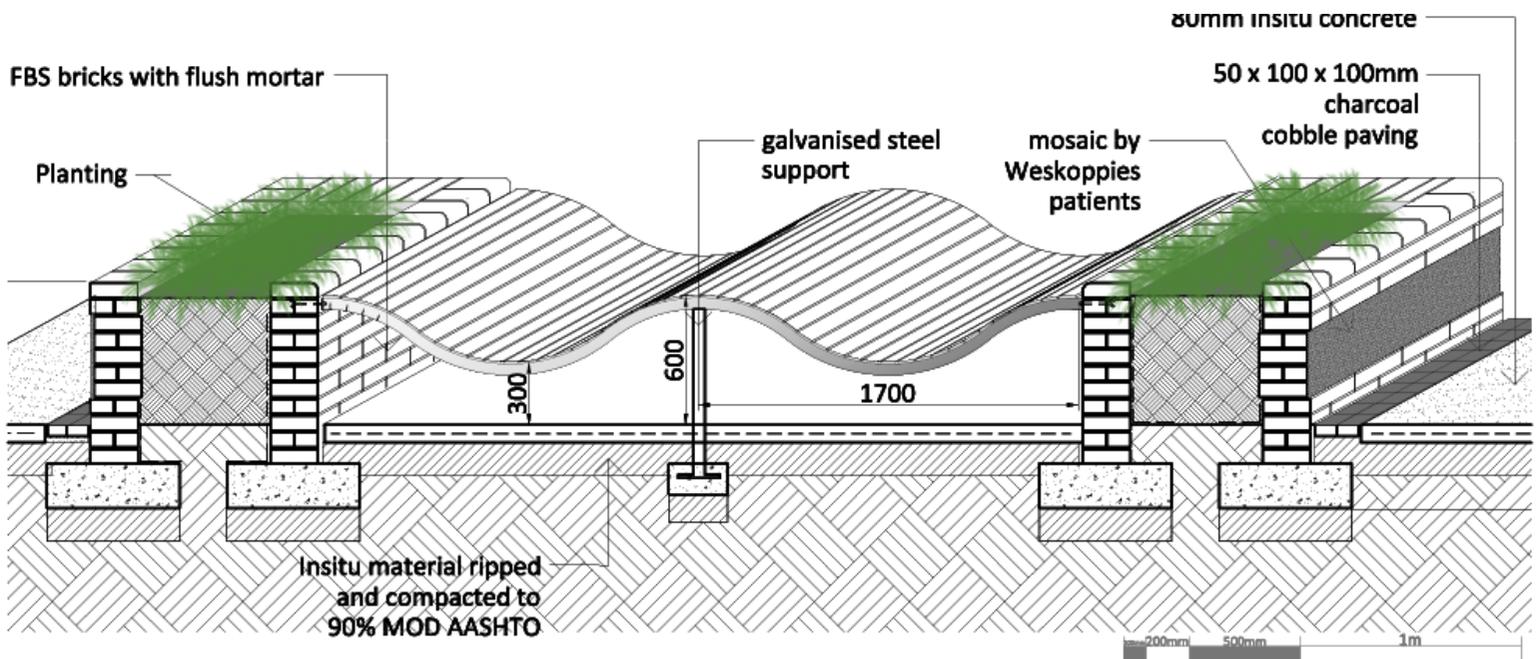


Fig. 9.53 (below): Detail 7B- Detail of a wooden sleeping bench attached to a facebrick planter (Author, 2009).

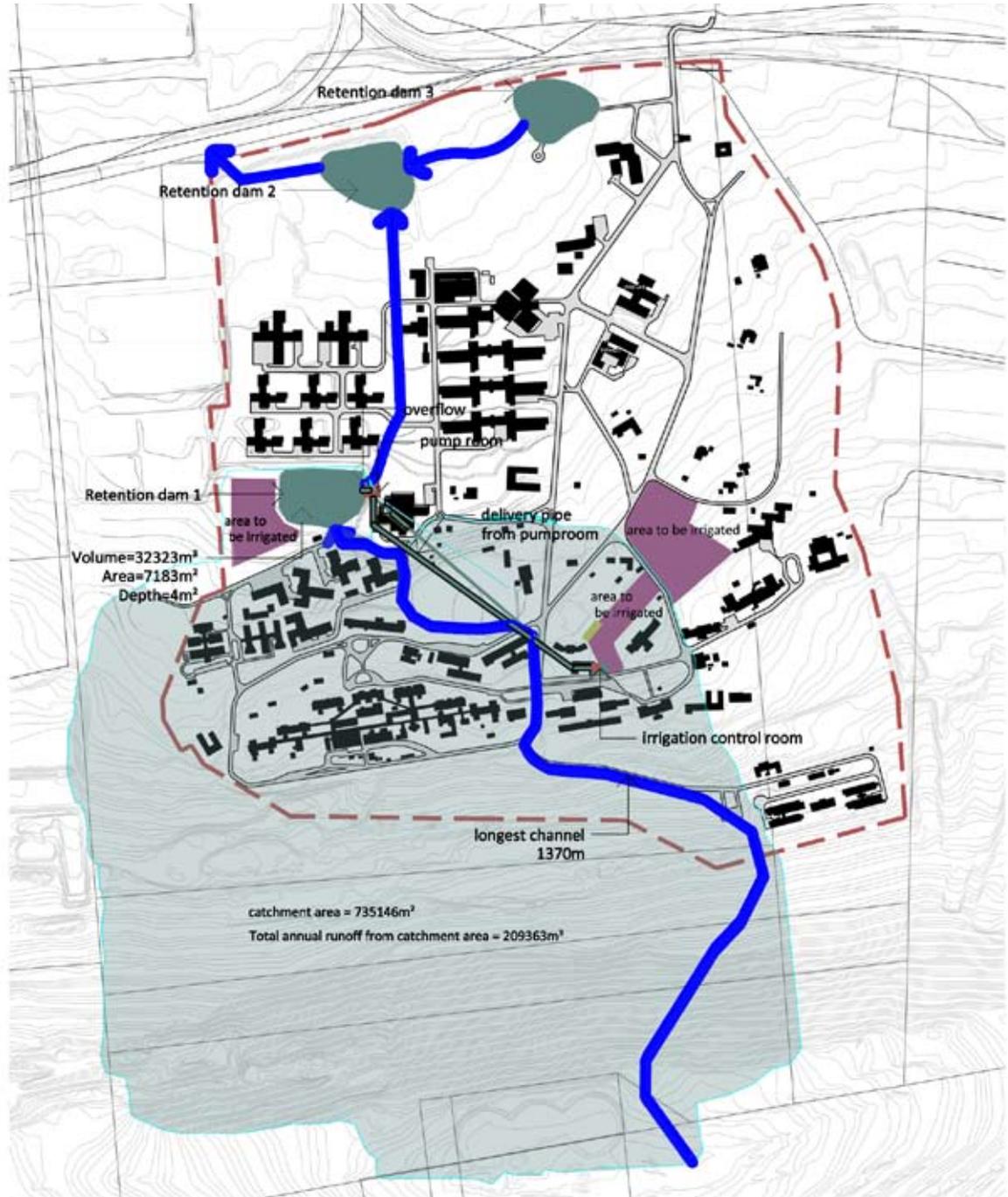


9.3. STORM WATER MANAGEMENT

Storm water will be captured in three retention dams and used for irrigating the landscape and flower fields. As part of the catalytic sketch plan only 2 Ha of land will be developed as flower fields initially. Retention dam 1 will be used for irrigating the first 2 Ha of flower fields. The rational method was used for determining peak flow and the catchment area and longest channel is indicated on figure 9.55.,

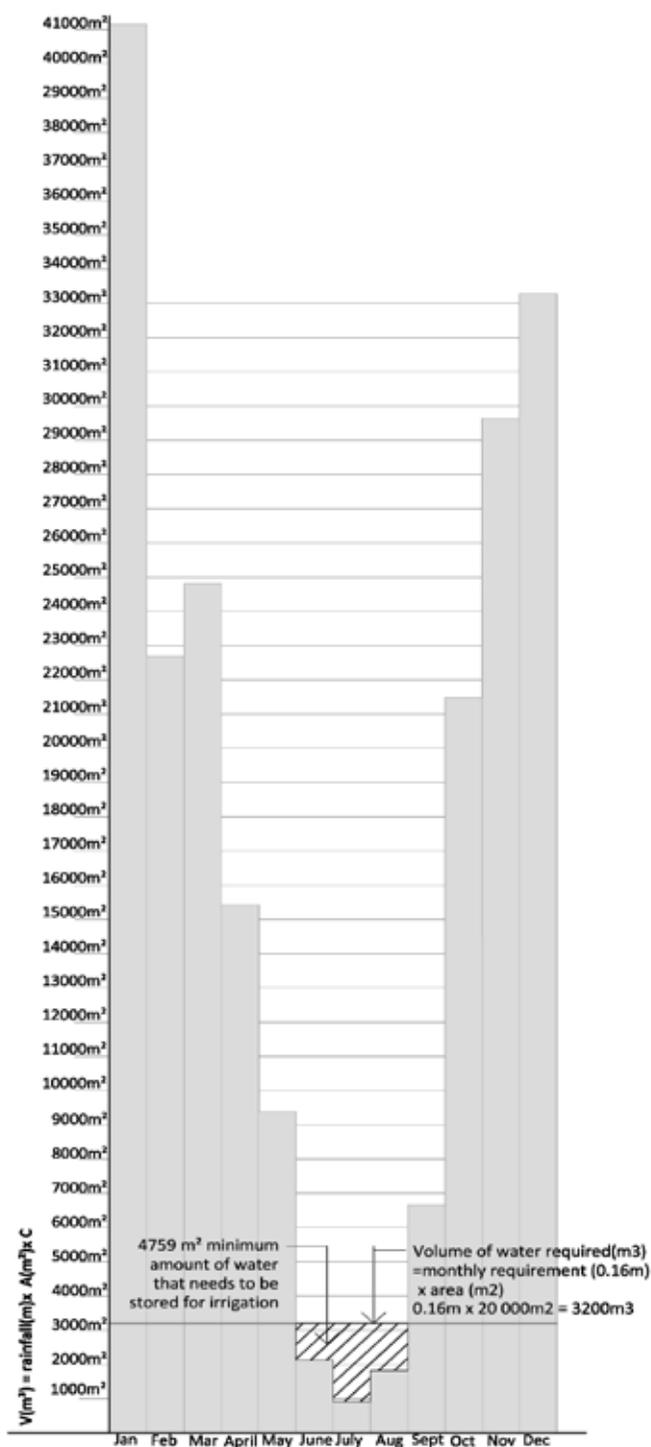
Fig. 9.54: Storm water management plan with catchment area and retention dams (Author, 2009).

Fig. 9.55 (opposite page): Table illustrating the rational method of determining peak flow and determining the capacity of Retention dam 1 (Author, 2009).



The Rational method to determine peak discharge					
		Q=C.It.A			
Catchment area (m ²)		735146			
Length of the longest channel (m)		1370			
Elevation difference (m)		154			
Time of concentration (hours) from table		0.175			
Time of concentration (seconds) Tc		630			
Rainfall region		summer			
Average annual rainfall for pretoria(mm)		673			
Area to be irrigated (m ²)		20000			
Irrigation needed for cut flowers (m)		0.16			
	Rainfall intensity m/sec (I) I=Depth of precipitation/Tc	Depth of precipitation(m)from table			
2 year	4.7619E-06	0.003			
5 year	3.1746E-05	0.02			
10 year	3.80952E-05	0.024			
20 year	4.4444E-05	0.028			
50 year	5.5556E-05	0.035			
100 year	6.34921E-05	0.04			
Runoff coefficient (C)					
	Area m	% of total	Coefficient (C)	% x Coefficient	
Grassland (steep)	510324	0.694180476	0.45	0.312381214	
Lawn	131494	0.178867871	0.08	0.01430943	
Cultivated land	20000	0.02720548	0.5	0.01360274	
streets and pavements tennis netball	30366	0.041306081	0.8	0.033044865	
Roofs	30065	0.040896638	0.9	0.036806974	
lawn sport fields	12897	0.017543454	0.08	0.001403476	
Total				0.411548699	
	Peak discharge Q=C.A.I (m ³ /sec)				
2jaar	1.440706571				
5jaar	9.604710476				
10jaar	11.52565257				
20jaar	13.44659467				
50jaar	16.80824333				
100jaar	19.20942095				
Budget for retention dam (refer to graph)					
Month	Monthly rainfall (m)	In V(m ³) = rainfall(m)x A(m ²)x C	Out Flowers need 0.16m/month V(m ³)=0.16(m)xA irrigated(m ²)	Total	
January	0.136	41146.57968	3200	37946.57968	
February	0.075	22691.1285	3200	19491.1285	
March	0.082	24808.96716	3200	21608.96716	
April	0.051	15429.96738	3200	12229.96738	
May	0.031	9378.99978	3200	6178.99978	
June	0.007	2117.83866	3200	-1082.16134	
July	0.003	907.64514	3200	-2292.35486	
August	0.006	1815.29028	3200	-1384.70972	
September	0.022	6656.06436	3200	3456.06436	
October	0.071	21480.93498	3200	18280.93498	
November	0.098	29649.74124	3200	26449.74124	
December	0.11	33280.3218	3200	30080.3218	
Total		209363.479	38400		
Minimum amount to be stored for irrigation (m ³) from graph	4759				
Total runoff from site	209363.479				
Depth of proposed retention dam (m)	4.5				
Area of proposed dam(m ²)	7183				
Volume of water in proposed dam (m ³)	32323.5				

Fig. 9.56: Graph indicating the volume of run-off per month from the catchment area and the required volume of water needed for irrigating 2Ha (Author, 2009).



Graph indicating the volume of runoff per month from the catchment area and the required volume of water needed for irrigation

The graph shows that far more water will be captured from the catchment area than needed for irrigation purposes. The dam will therefore be designed to accommodate more water than needed for irrigation purposes and will be full throughout the year, adding aesthetic value.

Water will be extracted from the retention dam to the pump room (Fig. 9.59) where it will be filtered and pumped to the irrigation control room (Fig. 9.58) closer to the flower fields.

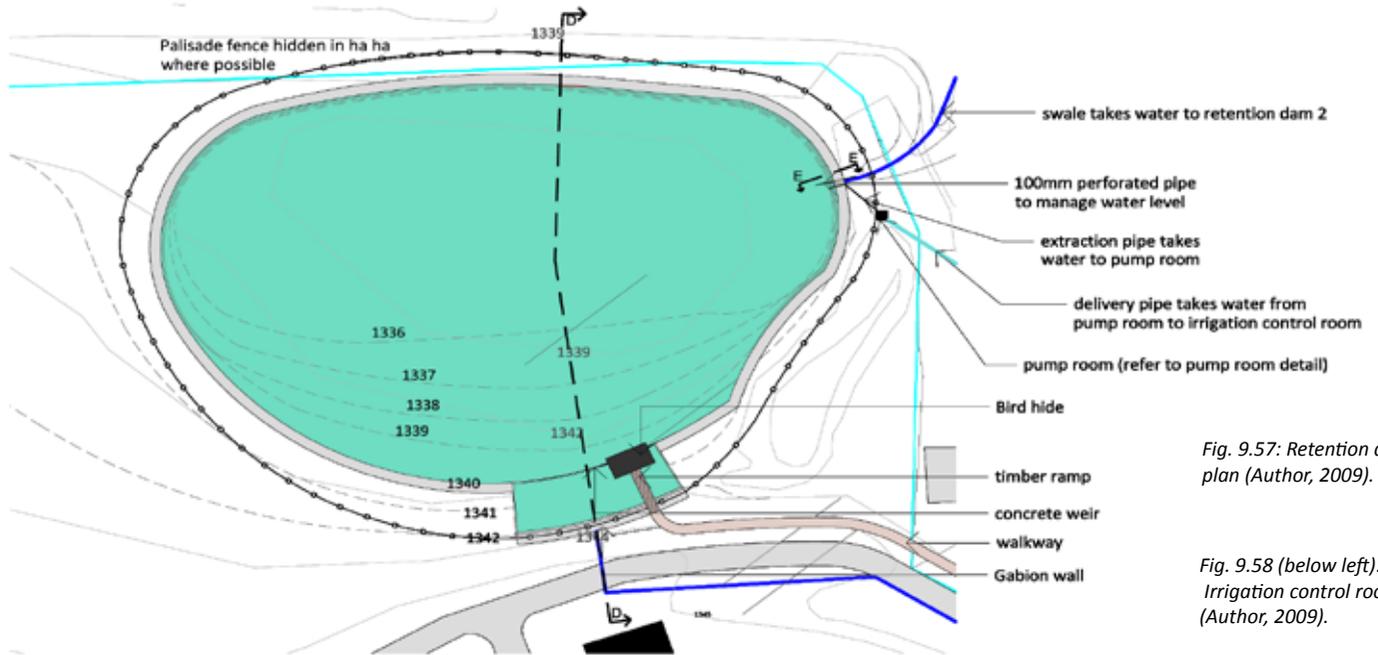


Fig. 9.57: Retention dam 1 plan (Author, 2009).

Fig. 9.58 (below left): Irrigation control room plan (Author, 2009).

Fig. 9.59 (below right): Section through pump room (Author, 2009).

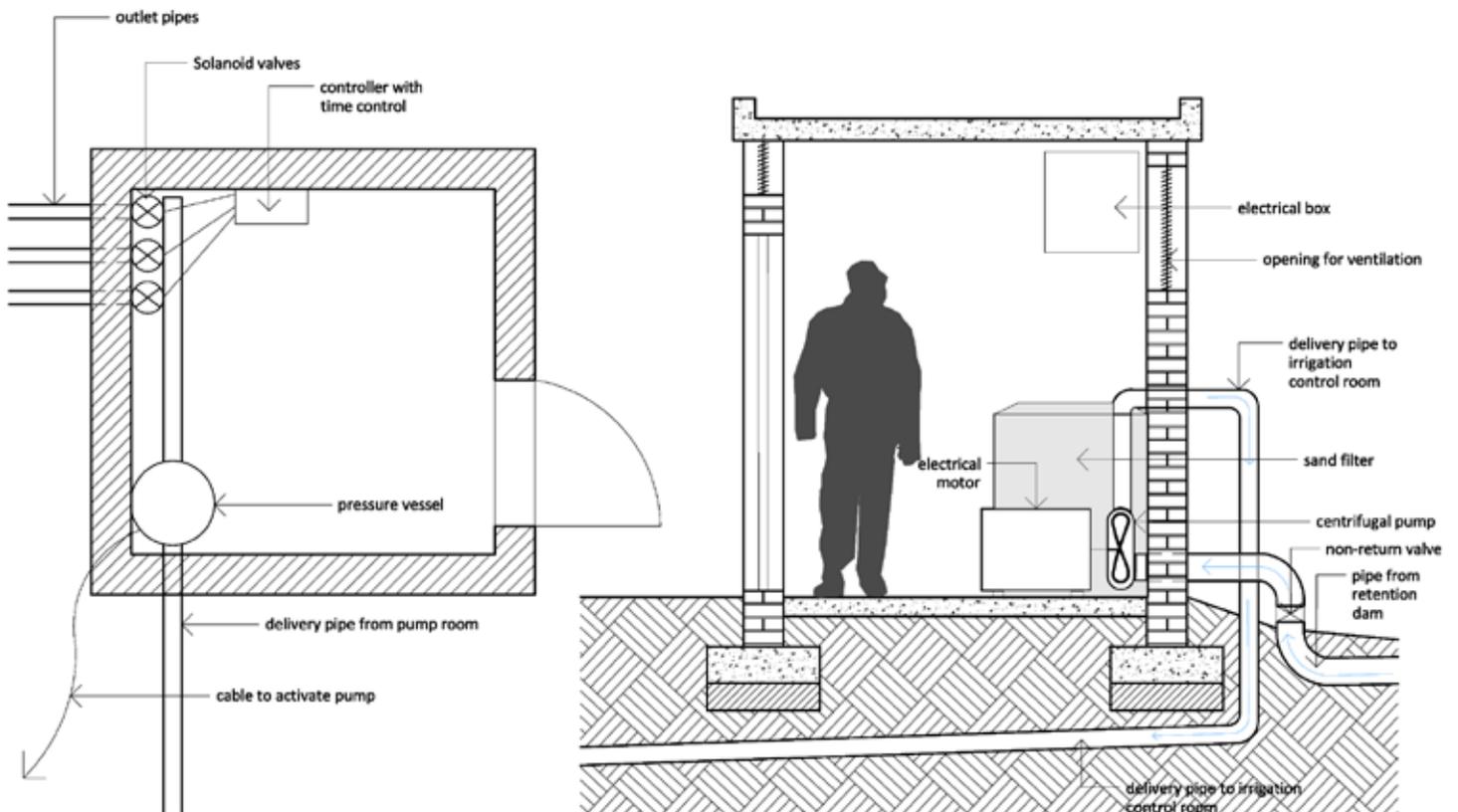
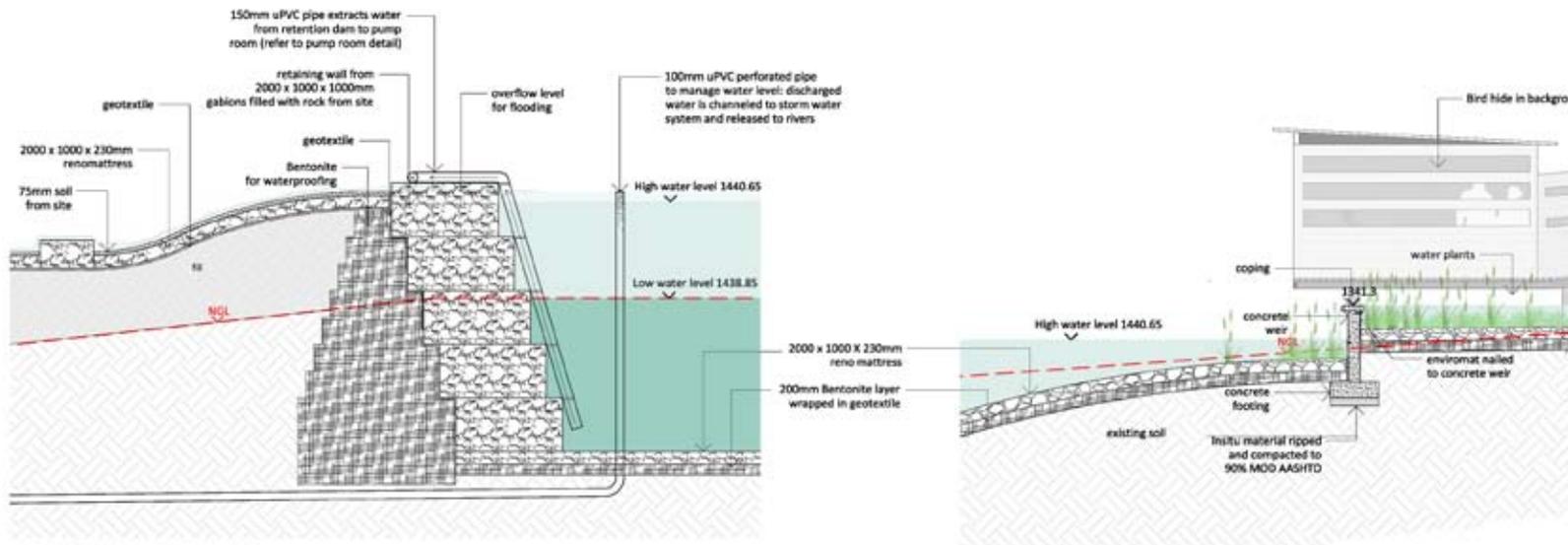


Fig. 9.60: Retention dam outlets and retaining wall
(Author, 2009).



SECTION E-E 1:50 retention dam outlets at retaining wall

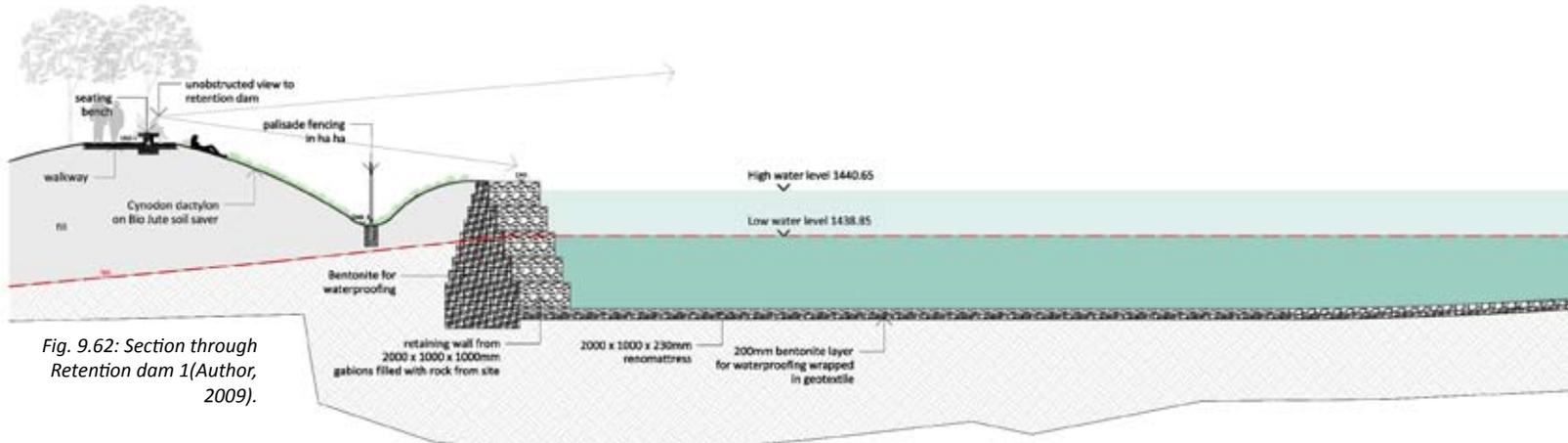
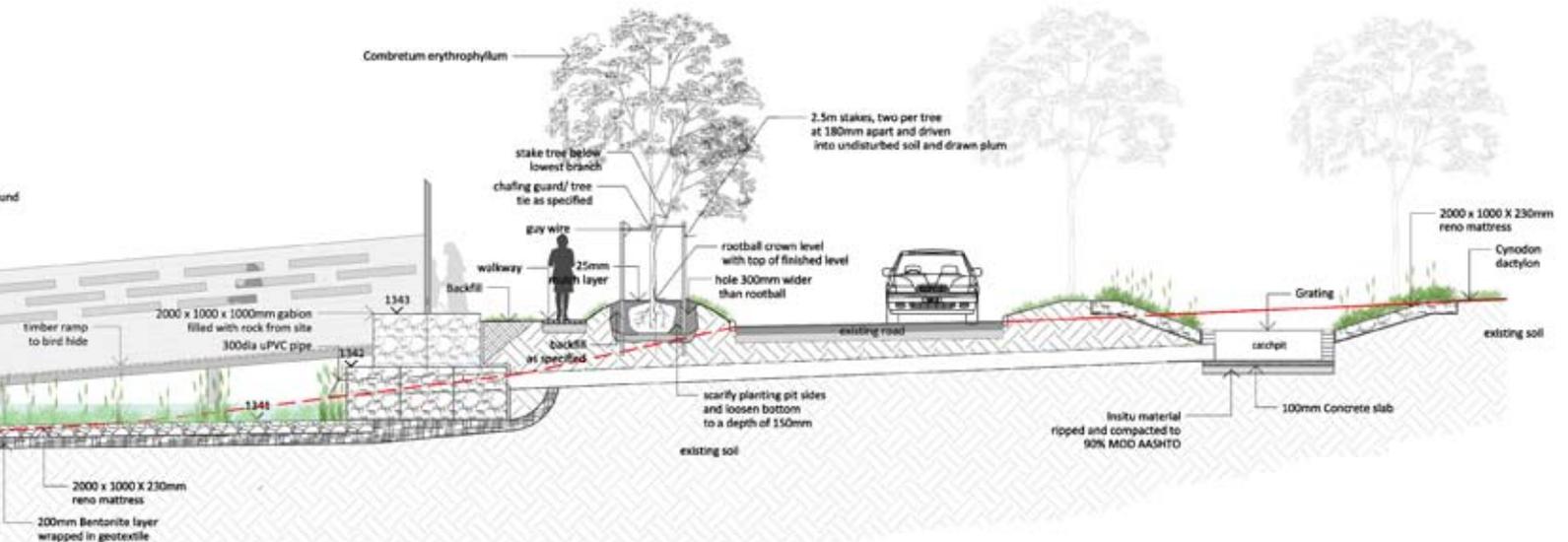
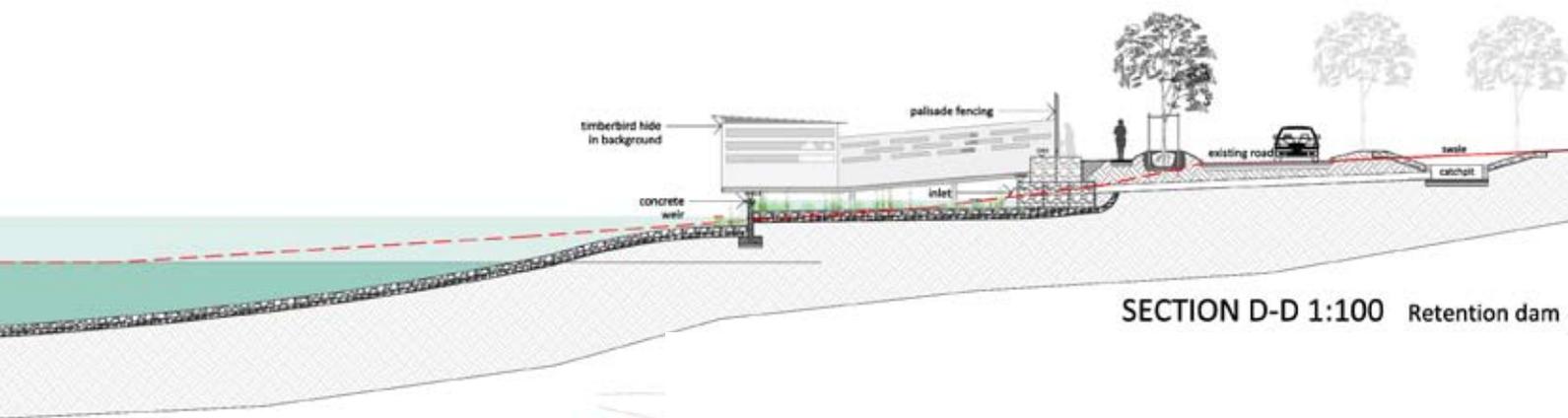


Fig. 9.62: Section through Retention dam 1 (Author, 2009).

Fig. 9.61: Retention dam inlet with bird hide in background (Author, 2009).



SECTION D-Da 1:50 retention dam inlet with bird hide



SECTION D-D 1:100 Retention dam