Chapter 5

Design development & Detailed design

This site is investigated on a conceptual and detailed design level.

50 Figure_5.1. Site A design development process work (Author,2015)

Site A

Spaghetti junction gateway

1.1.1 The city gateway

Cities used to have walls , not only for defence but to divide the urban from the non urban domain. The entrance to a city was a gate left open during day time hours and closed at night. Like all thresholds the gate became an important node for activities other than functions of arrival and departure. Although the industrial revolution changed the form of cities the concept of wall and gate resides rooted in our subconscious. In the late 19th century the gate was the railway station, which usually featured as monumental urban reception. (Raggat, 2012) Contemporary cities have no walls or gates. Boundaries are blurred and points of entry are often unclear. This is the case at the freeway intersection of O.R Tambo International Airport. The spaghetti junction throws the user into a whirlwind of concrete and asphalt. The author proposes a clear defining entry way that signifies the arrival to the country. Points of arrival and departure should posses a certain hierarchy. And elements of the urban industrial area should be acknowledged. Although passing beneath the Gautrain rail line creates somewhat of a threshold on route to the capital, the author suggests a bolder approach may be more suitable when travelling at high speeds. The air plane and metro rail uses should also be considered when passing by.
The Melbourne gateway is an example of a powerful contemporary gateway. The monumental scale and bold use of colour are elements that contrast the monotonous city tones.

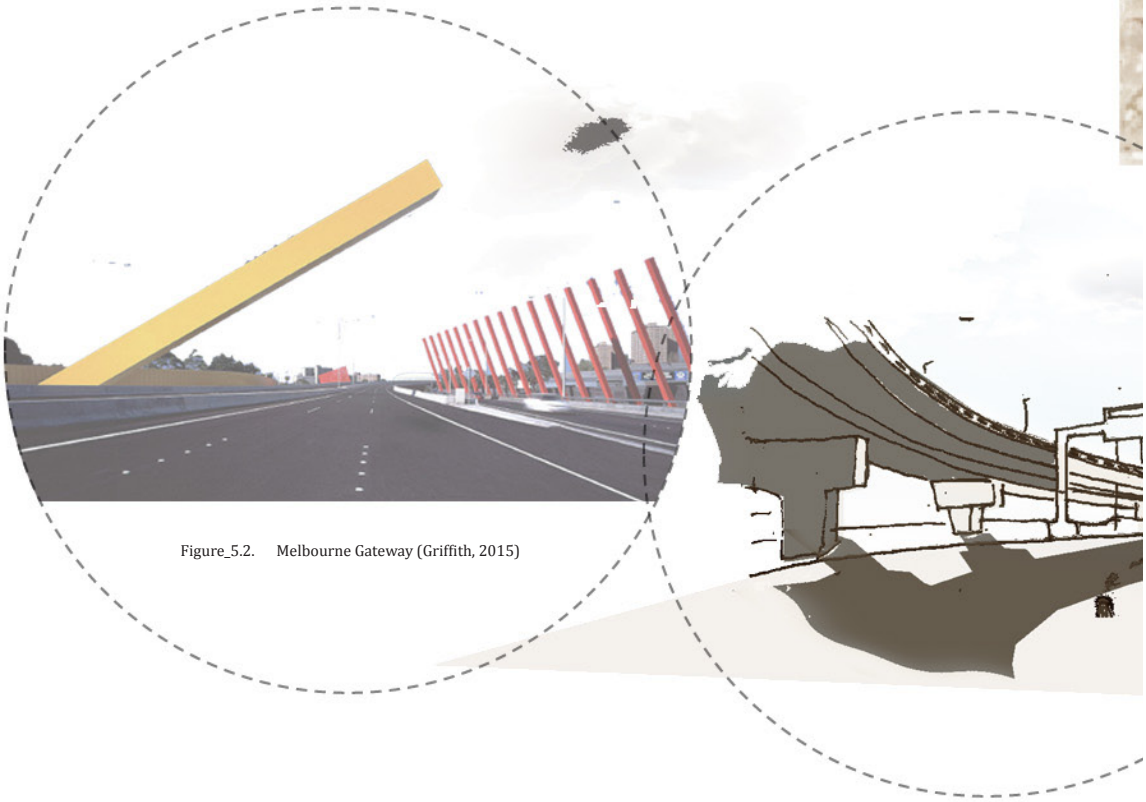


Figure_5.2. Melbourne Gateway (Griffith, 2015)

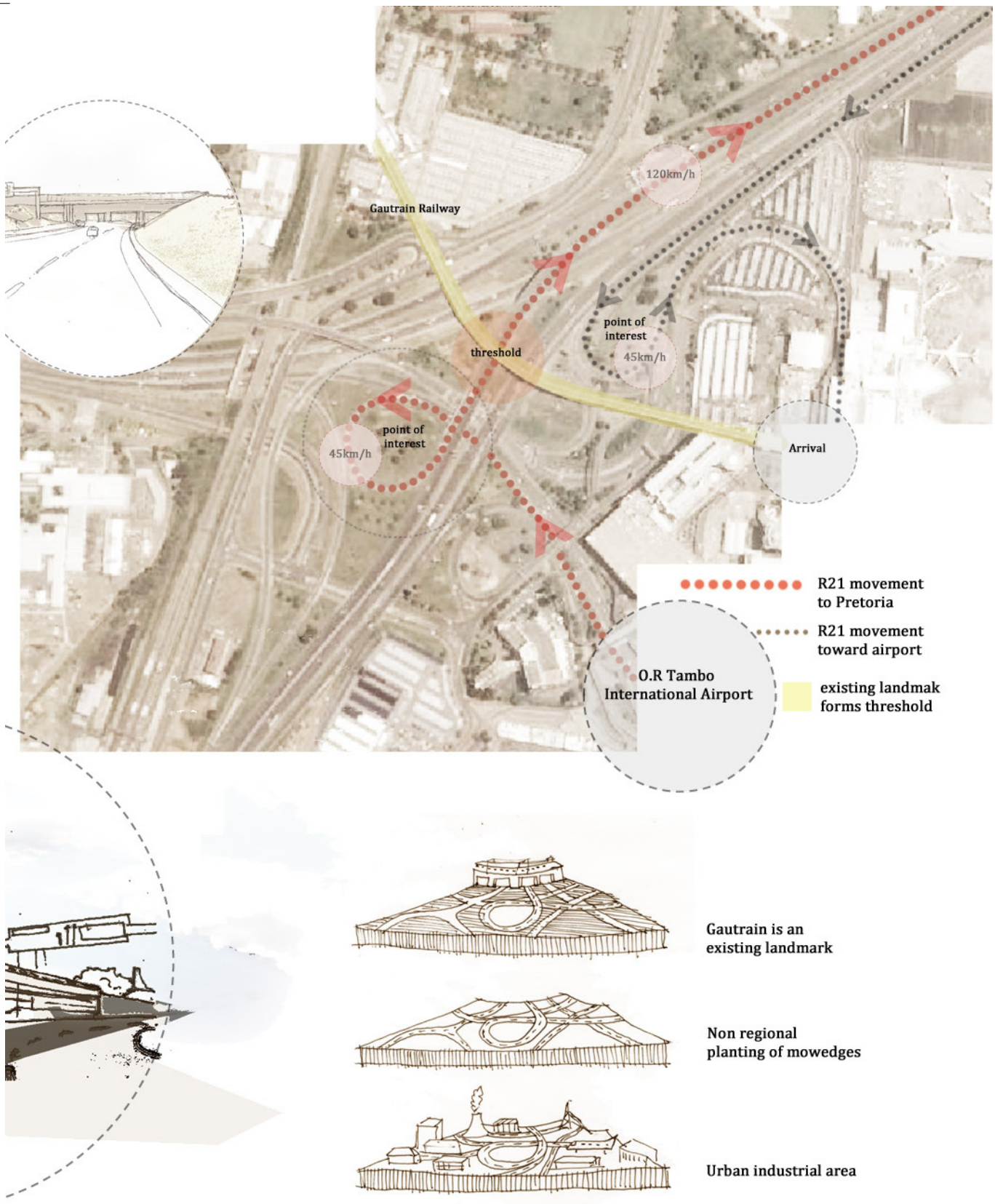
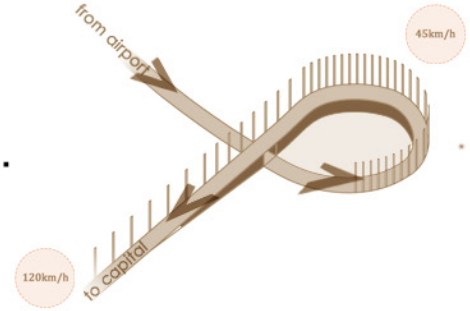


Figure_5.3. Site A site analysis (Author,2015)

5.

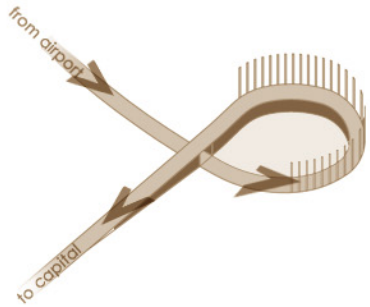


spatial elements extended

slower speed requires more frequent elements
45km/h around bend

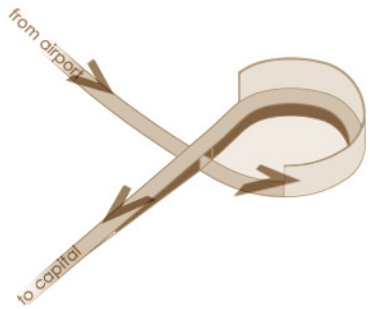
increased speed requires elements to be spaced furthur apart
120km/h on the straight

4.



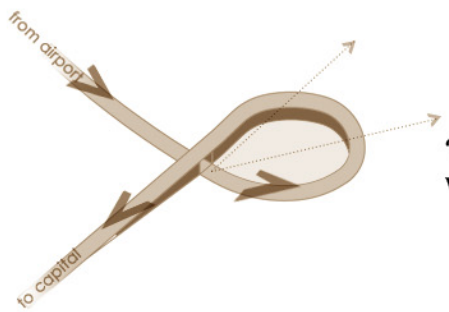
barrier resembles urban industial structures

3.



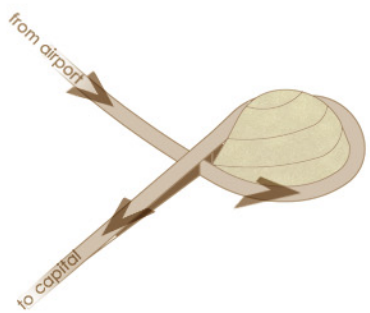
Space motion application of 'push' barrier
vertical elements create strong sense of threshold

2.



'Cut' to open space up for visual reference

1.



Existing

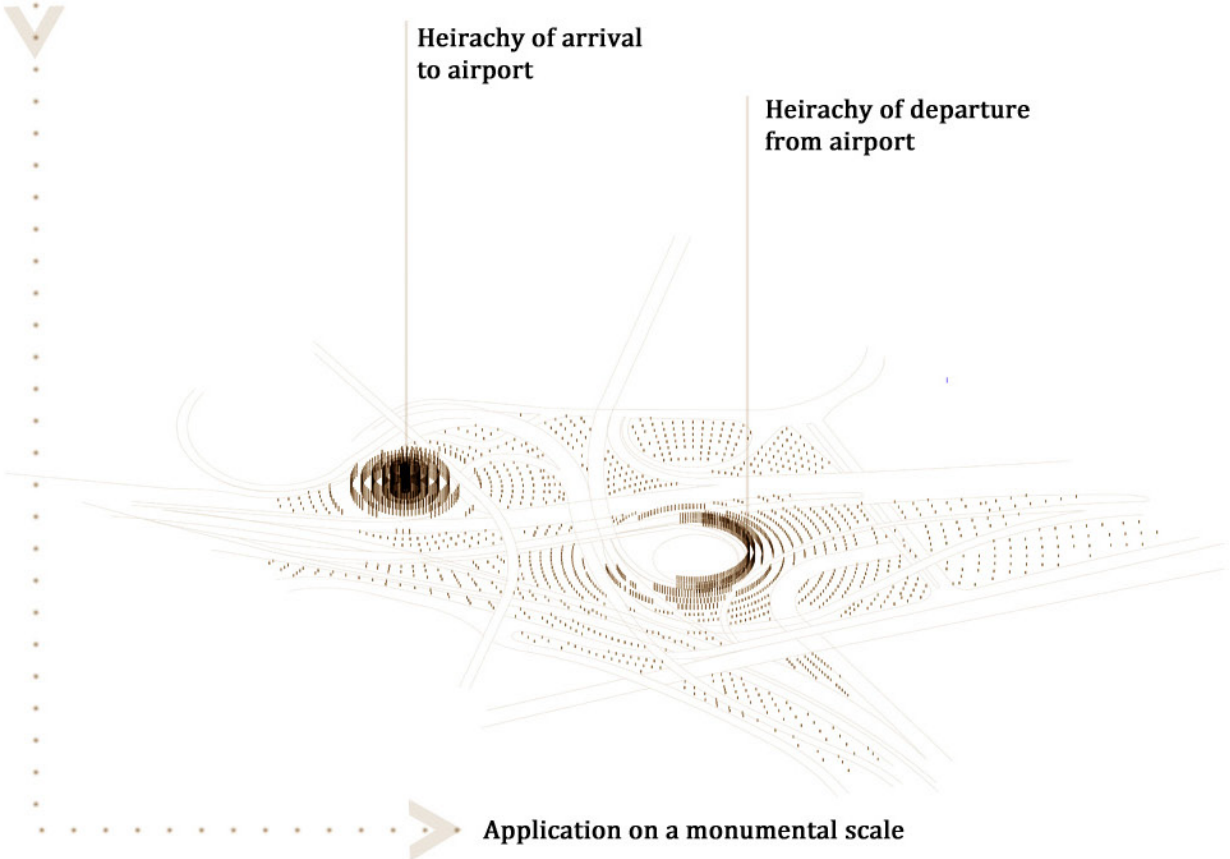


Figure_5.4. Site A design process (Author,2015)

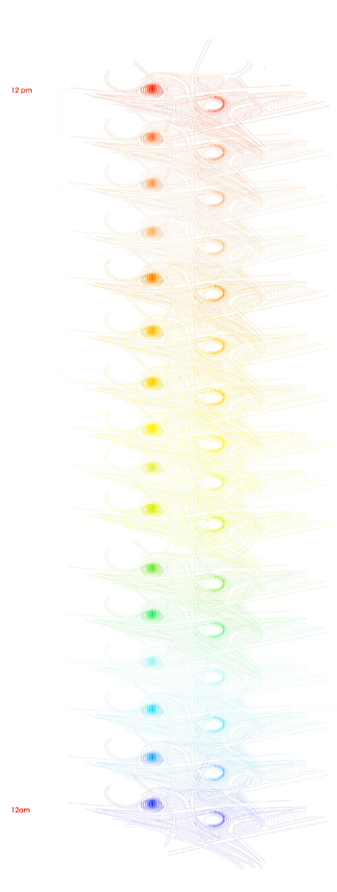
1.1.2 Preliminary design

Critique:

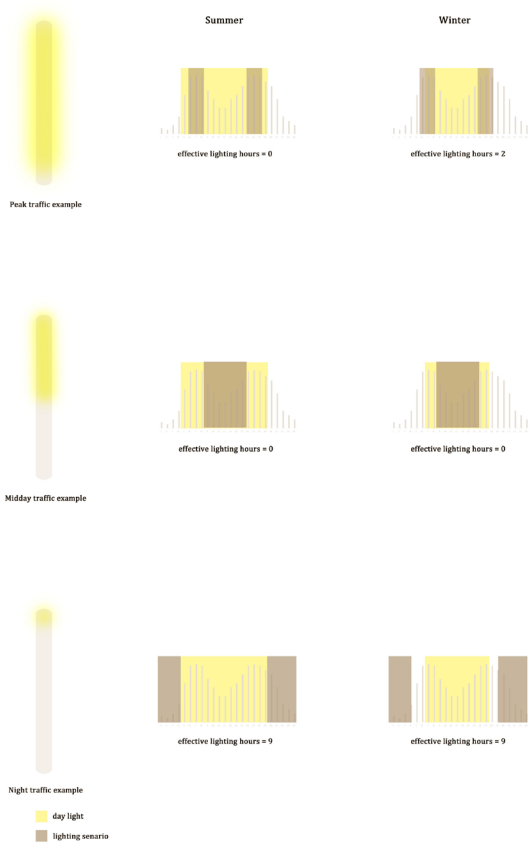
The preliminary design is some what responsive to spatial movement, with rhythm of trees fanning out as speed increases. Trees however do no celebrate the urban industrial environment. Junctions of the barrier wall are abrupt, a more subtle approach should be considered. The arrival portal is not considered. The grid layout of the trees do not embrace the chaotic nature of the junction. The water collection pool is not viable.

56 Figure_5.5. Site A preliminary design (Author,2015)

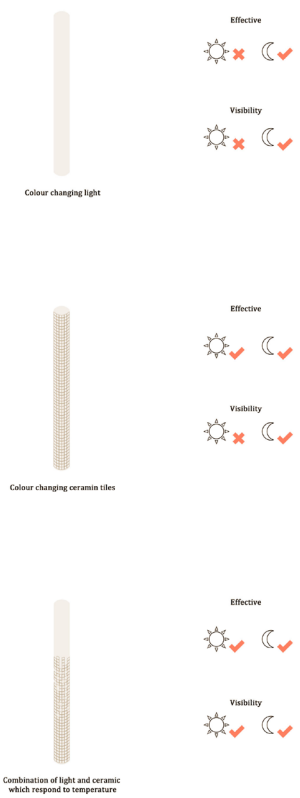
Environmental psychology and seasonal change



Dinural Temperature change

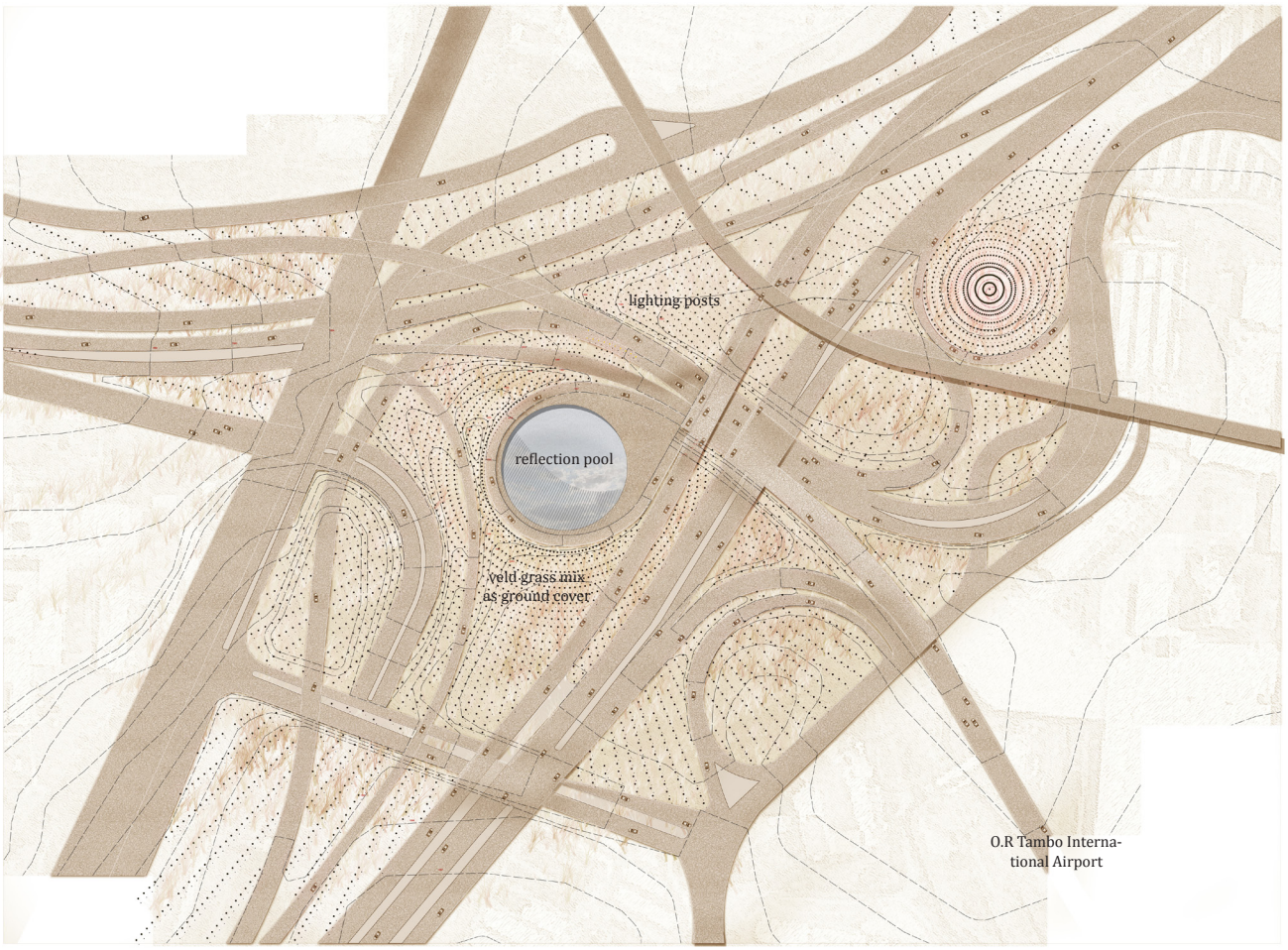


Traffic energy lighting response



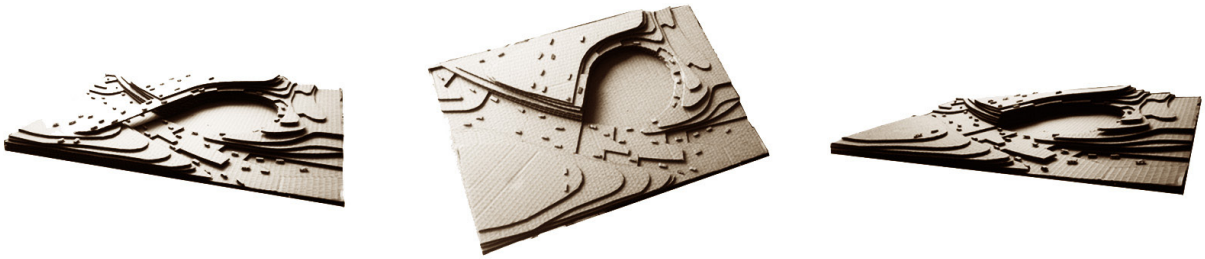
Communiction materials

Figure_5.6. Site A lighting investigation (Author,2015)

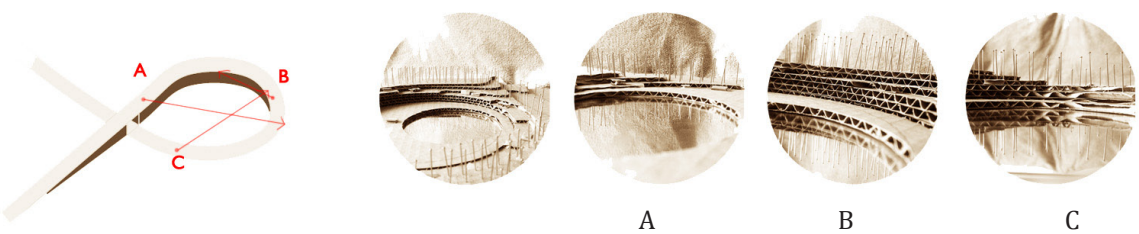


Sketch plan

58 Figure_5.7. Site A sketch plan (Author,2015)

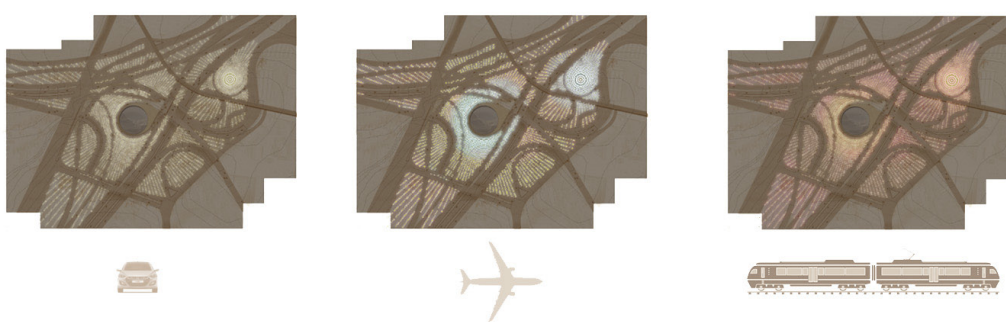


Contour manipulation model
illustration of void creating gateway



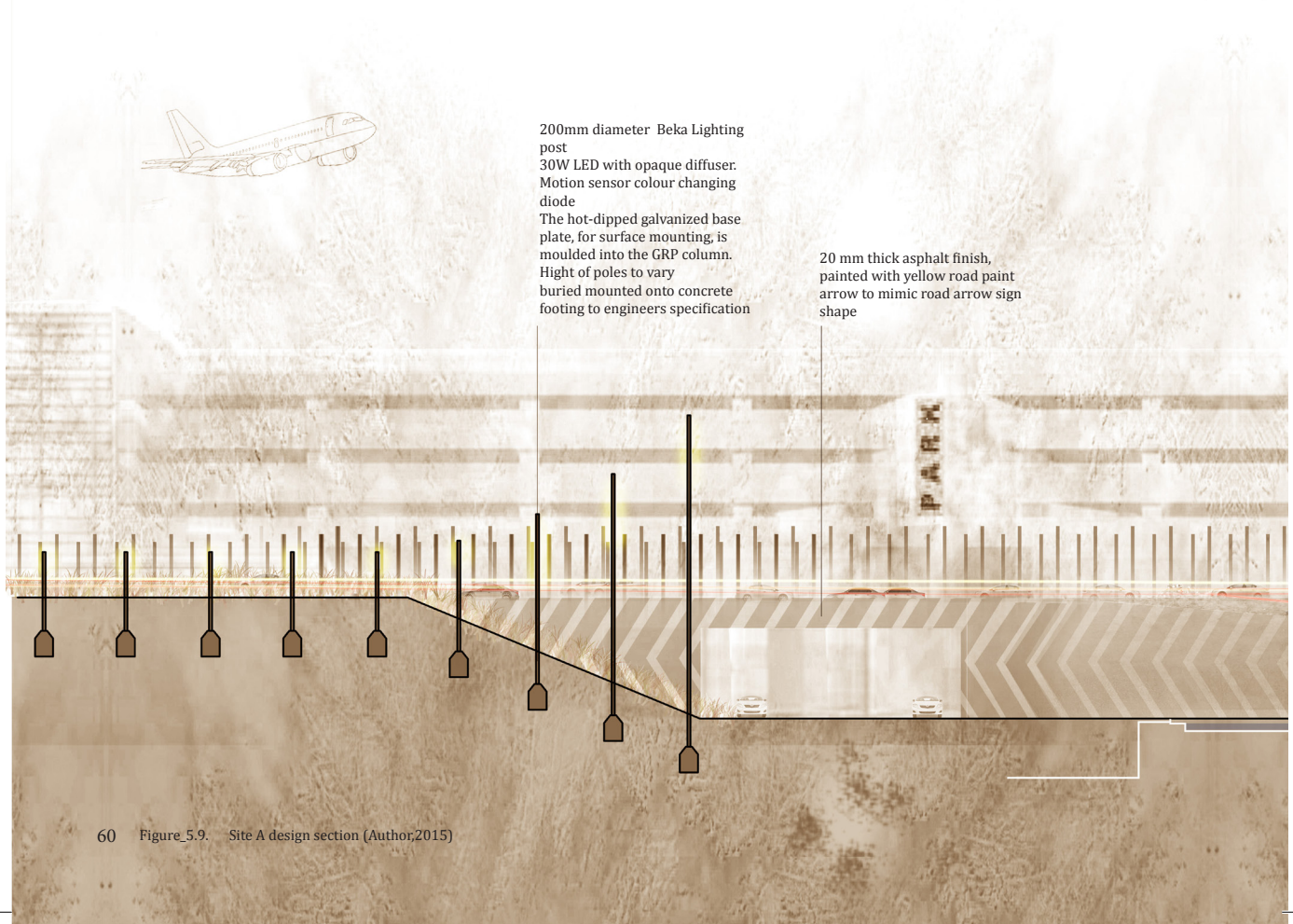
A B C

Investigation into visual effect of
reflection pool

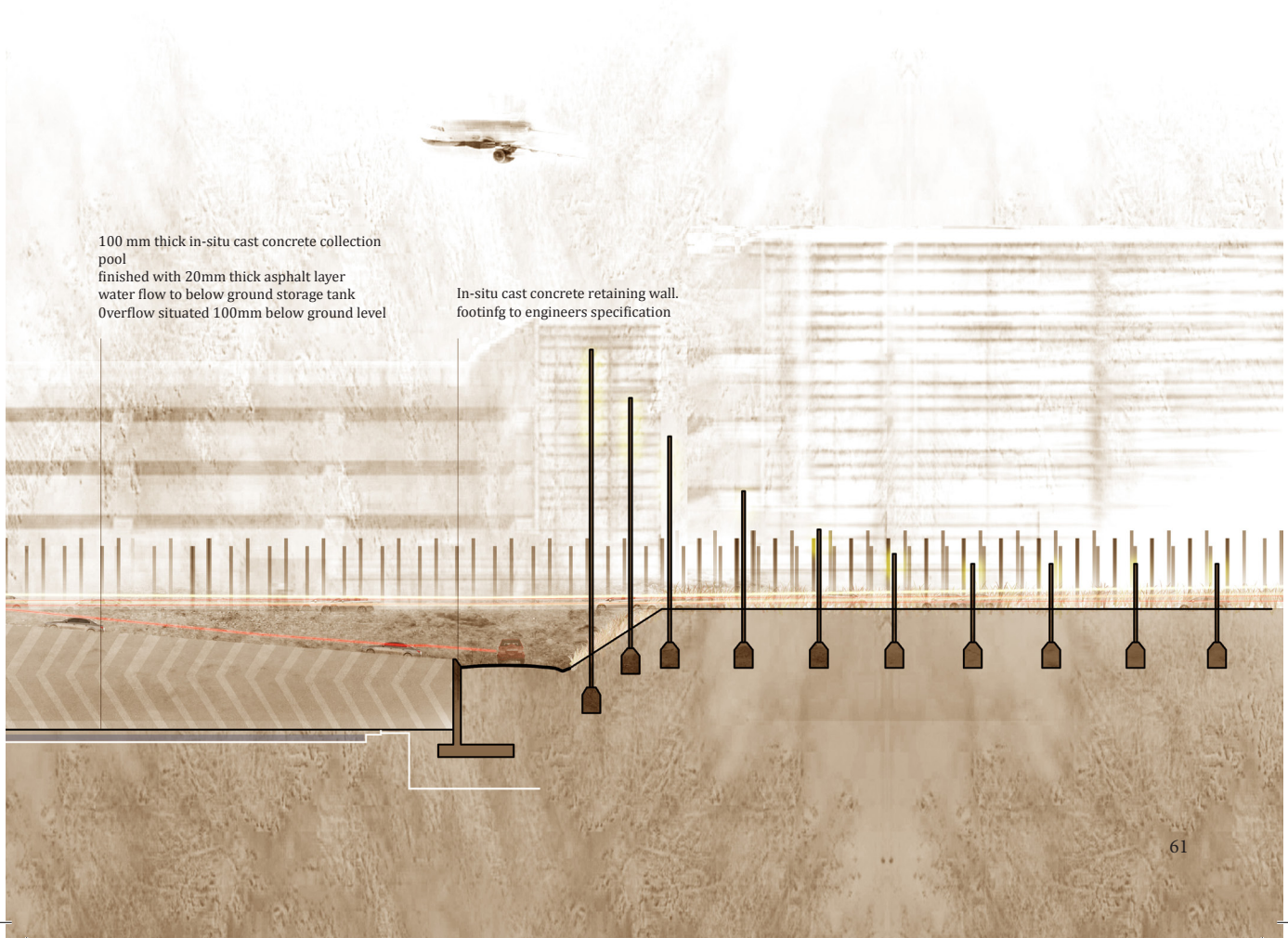


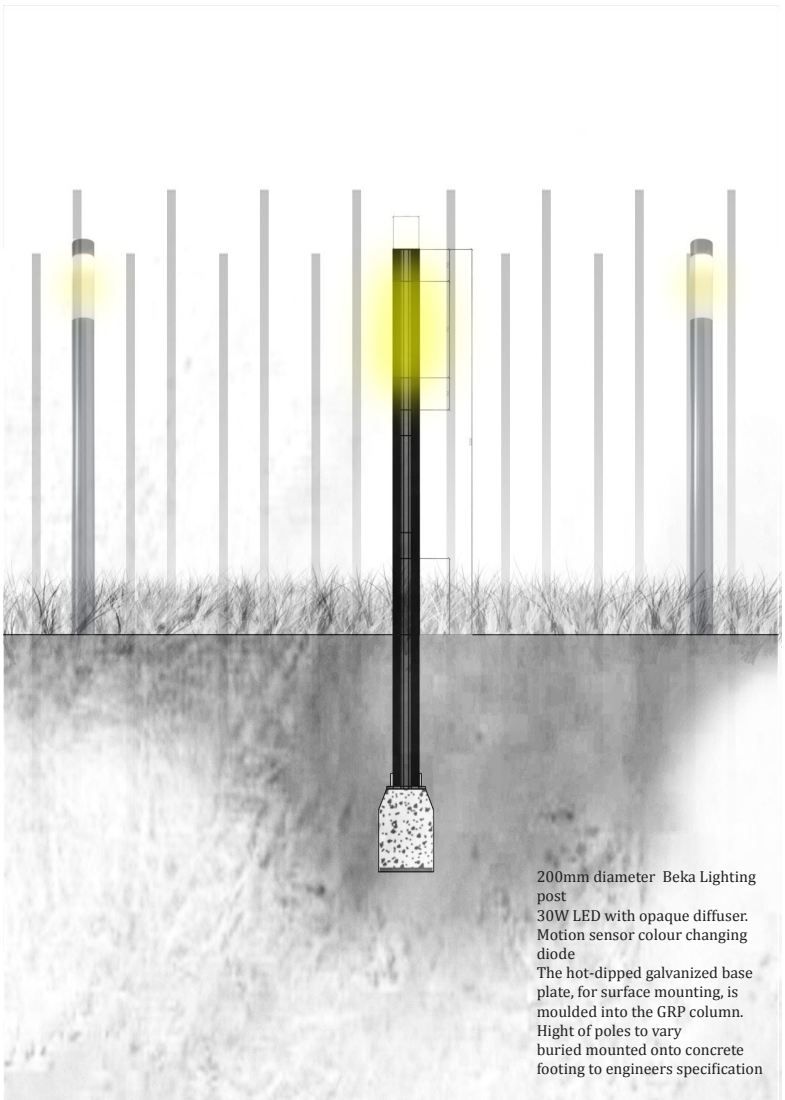
Lighting strategy responding to various transportation
motion sensored lighting allows for a variation of light displays

Figure_5.8. Site A contour manipulation, refelection investigation and lighting strategy (Author,2015)



60 Figure_5.9. Site A design section (Author,2015)





62 Figure_5.10. Site A light detail (Author,2015)

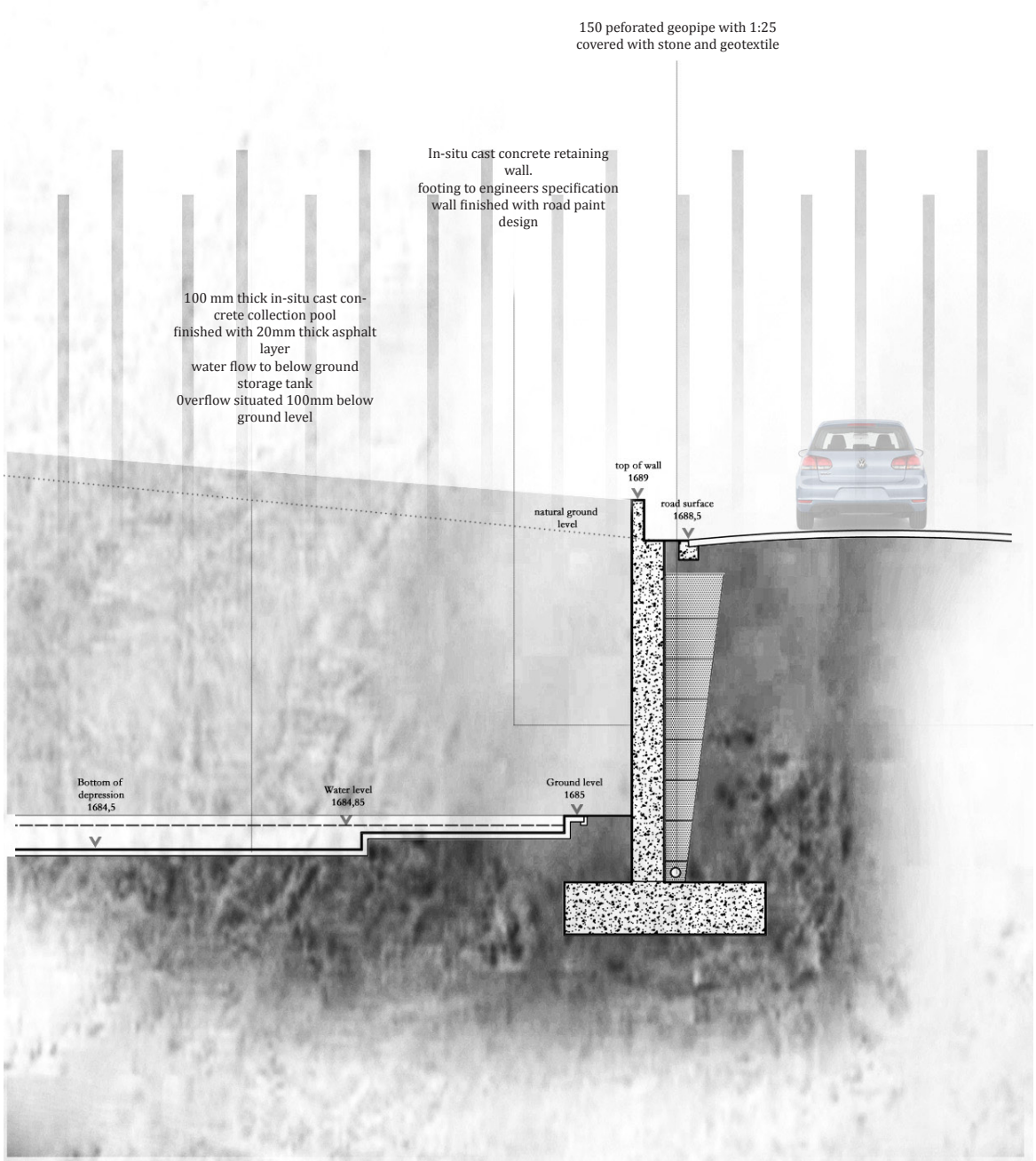


Figure_5.11. Site A detail (Author,2015)

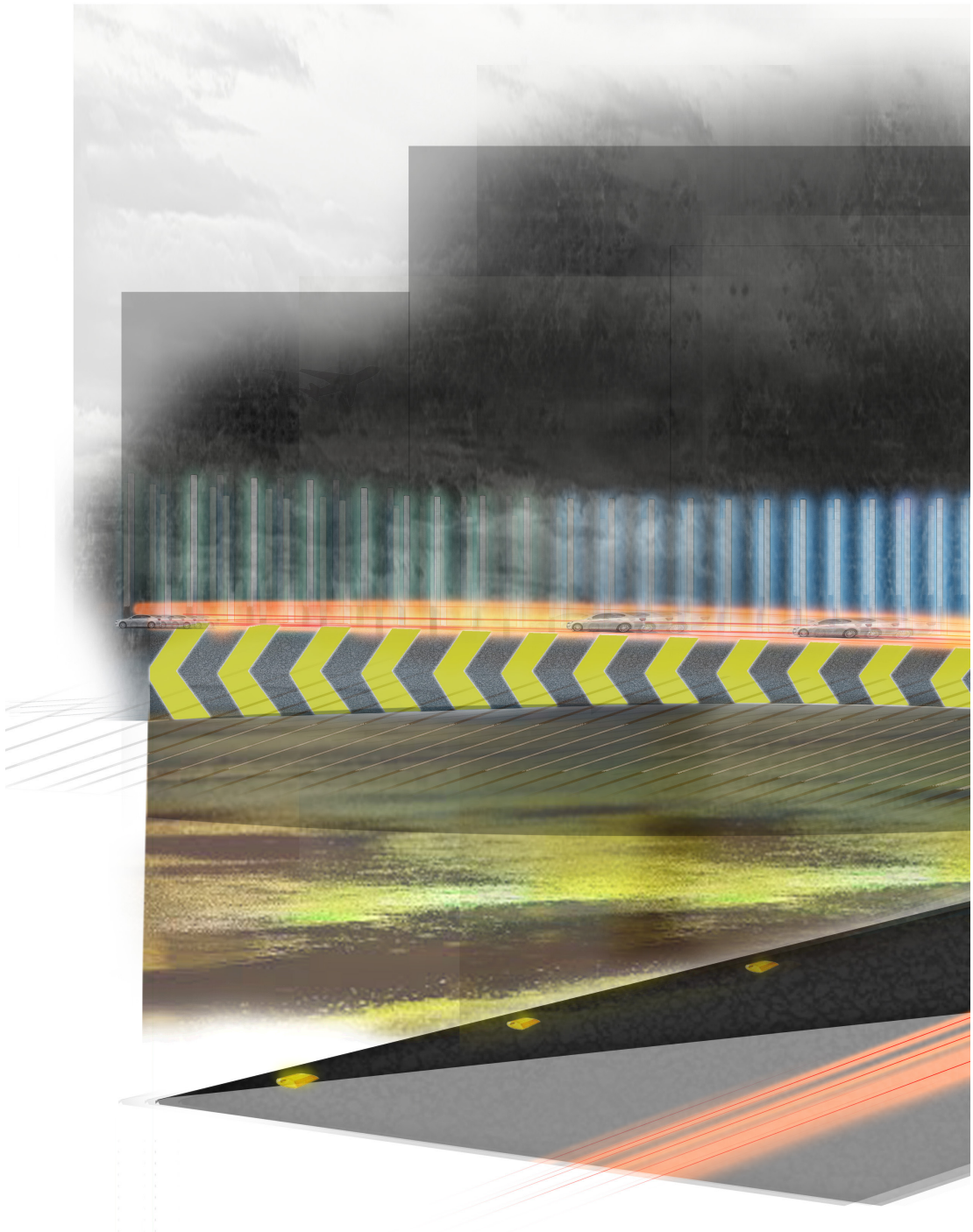
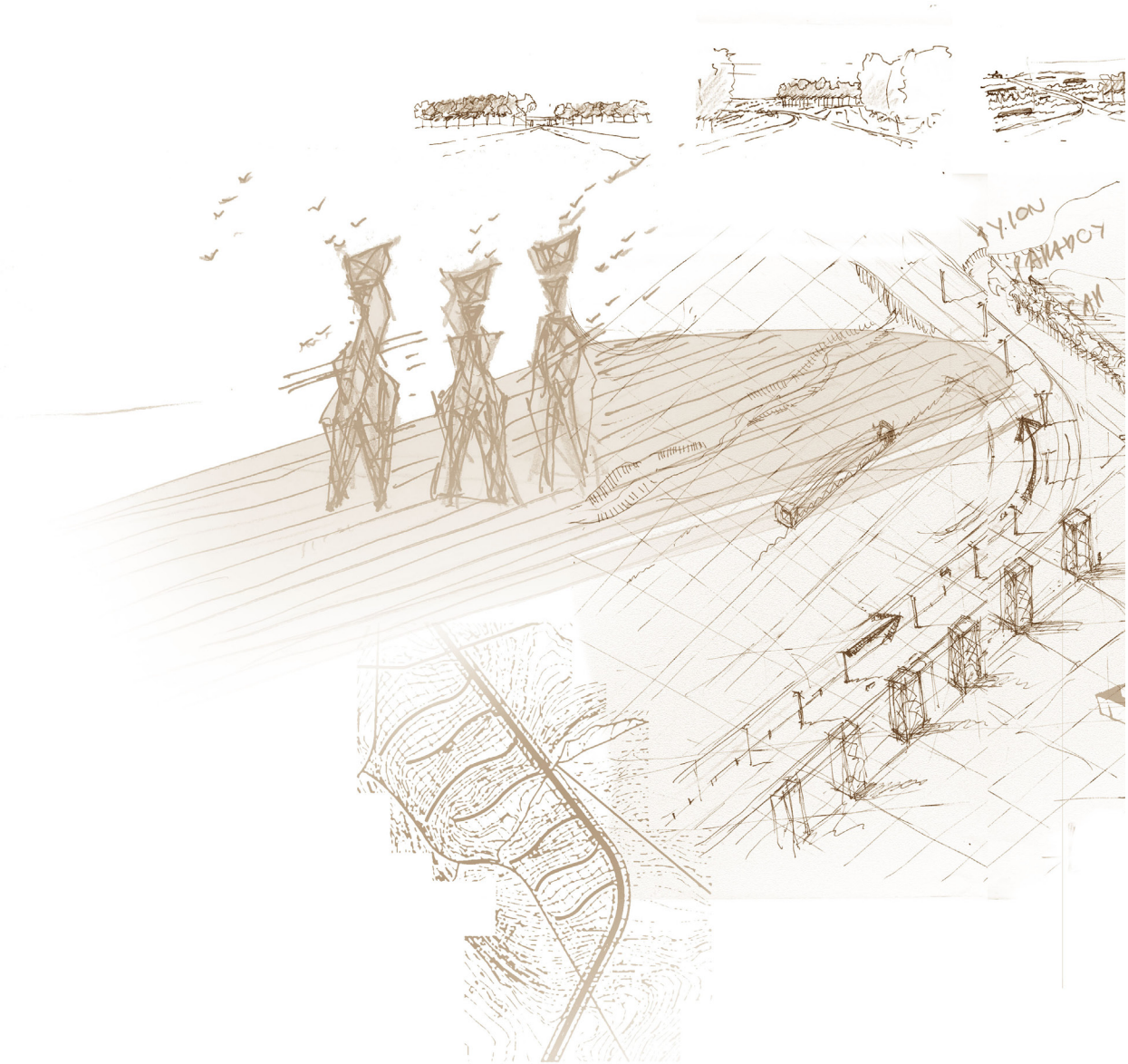
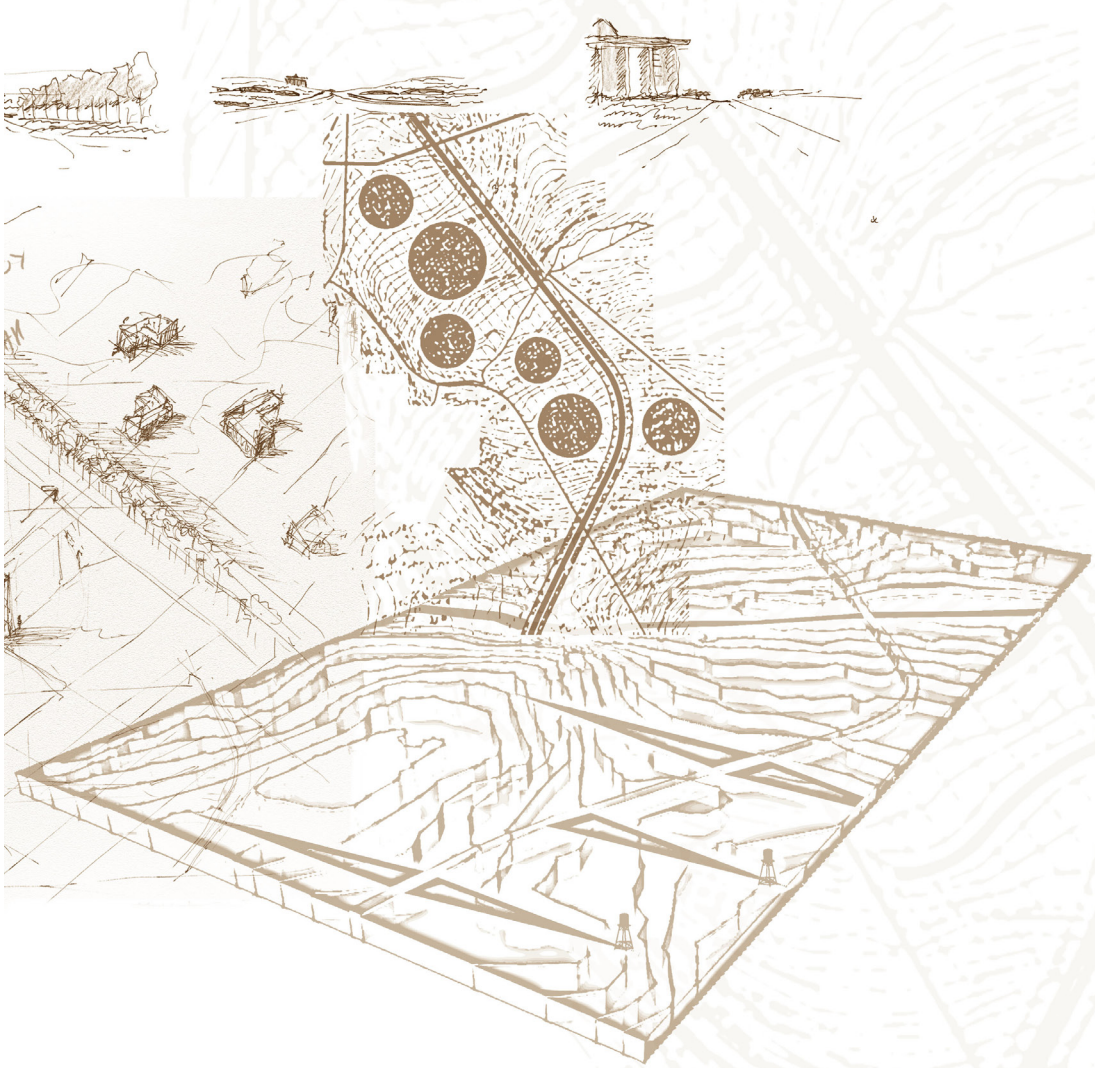


Figure_5.12. Site A perspective (Author,2015)

This site is investigated on a conceptual level only.



66 Figure_5.13. Site B design development process work (Author,2015)



Site B

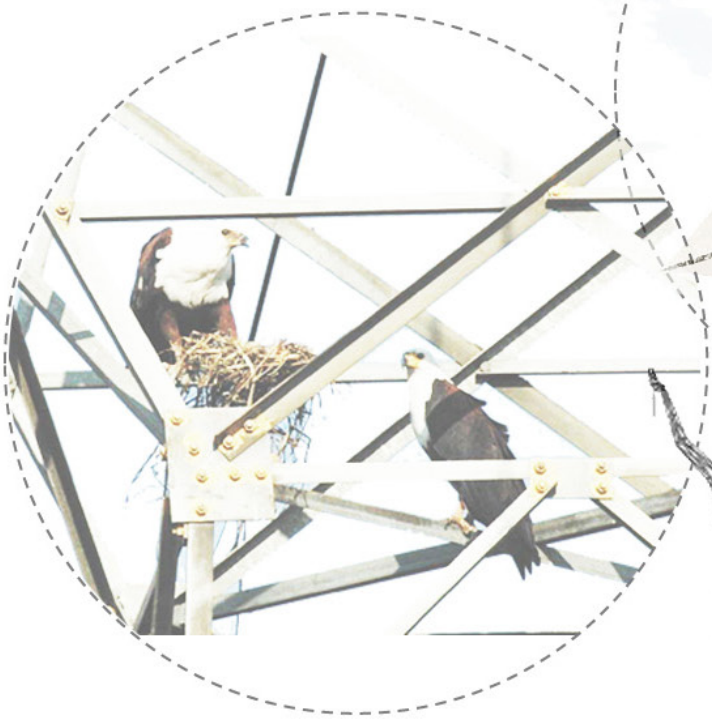
Nesting units

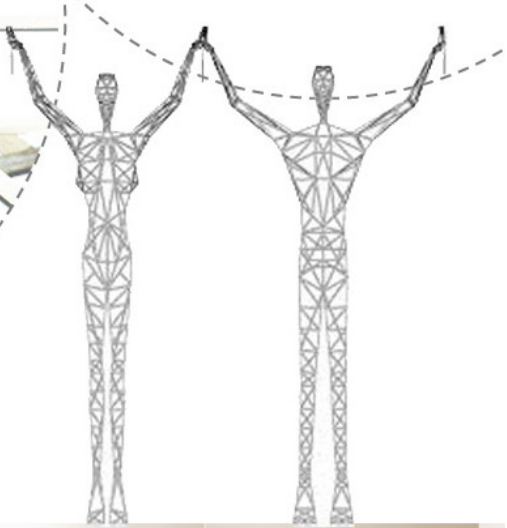
1.2.1 The pylon paradox

Over the past century, electricity power lines have been a conspicuous part of the landscape. These structures are generally known to cause fatalities to birds. However, some bird species use electricity poles as nesting structures, song posts, or for perching. Other, but not-acknowledged, benefits probably include the marginal habitats around the base of pylons. Differences were tested in breeding bird communities under pylons, under electricity high-voltage power lines, and in adjacent open fields. Birds were counted twice during the 2011 breeding season in a total of 91 study plots located in the intensive farmland of western Poland. Both species number and bird abundance were significantly higher under pylons and under power lines at control points than in open fields, especially where there were shrubs under the pylons. Pylons and power lines locally may play a positive role for the avian community in intensive farmland. (Tryjanowski,2012:34)

The pylon is an inherent part of the road environment. A loss of habitat in agricultural areas presents the challenge of introducing wildlife back into the landscape. The design intention is to introduce vertical perching and nesting structures into the vast horizontal landscape which resembles the pylon structure. The aim is to rethink the pylon.

An investigation into placement of vertical structures for an animation effect is investigated.





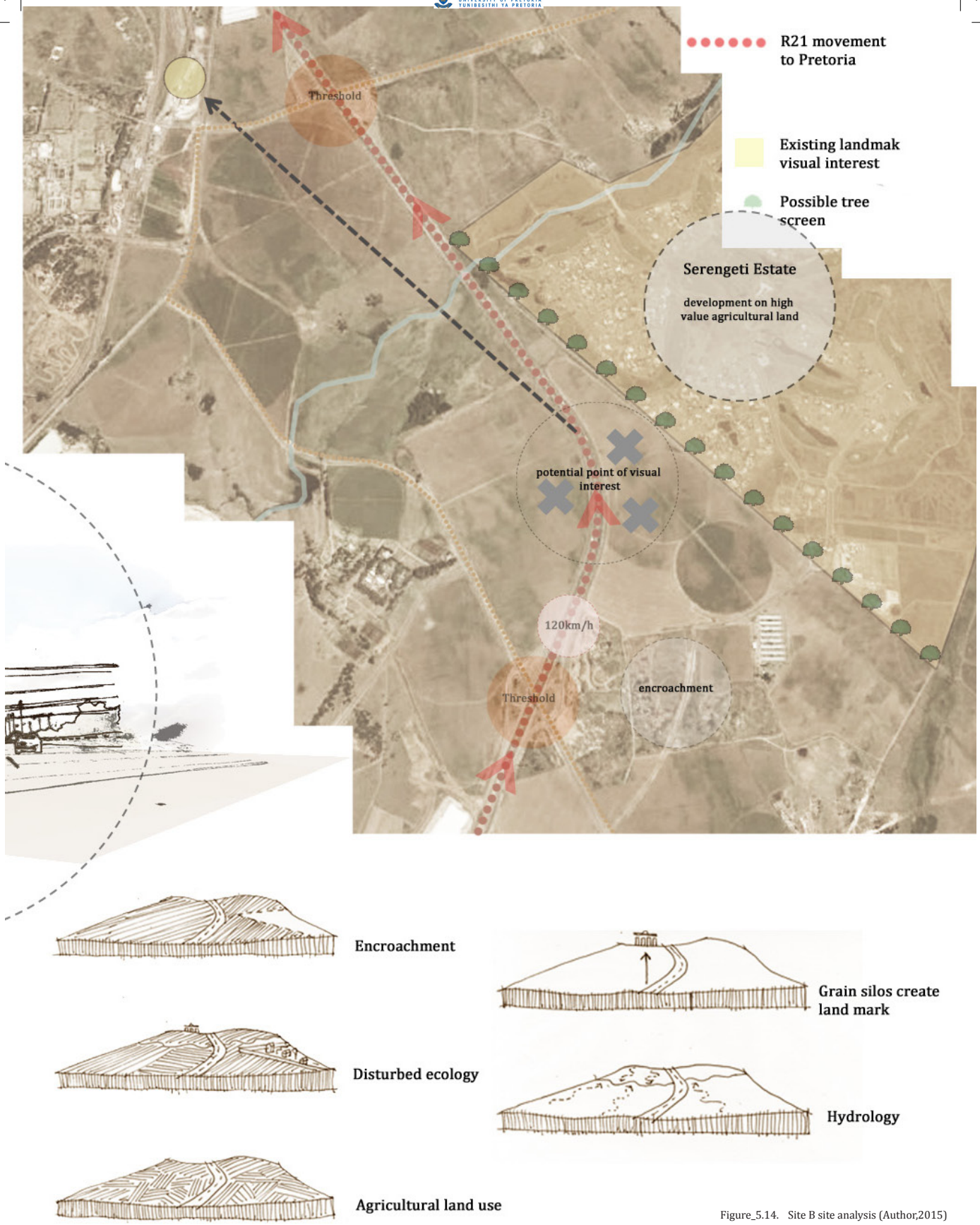
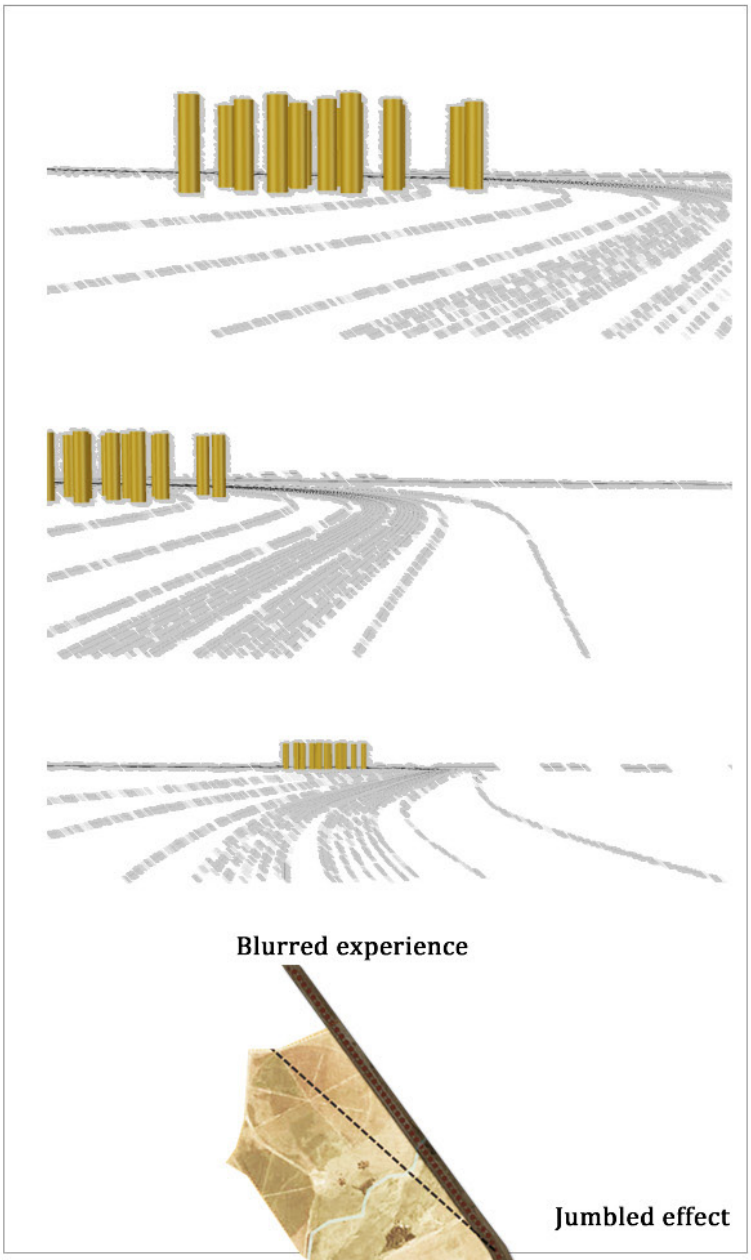
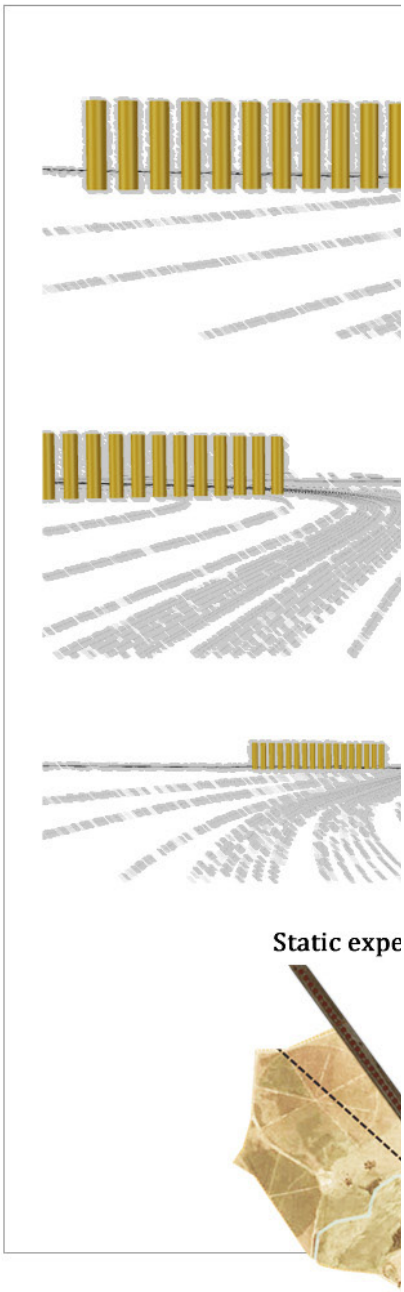


Figure_5.14. Site B site analysis (Author,2015)





Investigating how placement of objects in the landscape may be animated when passing around a bend Vertical pylon-inspired nesting structures will be introduced as dancing objects in the landscape

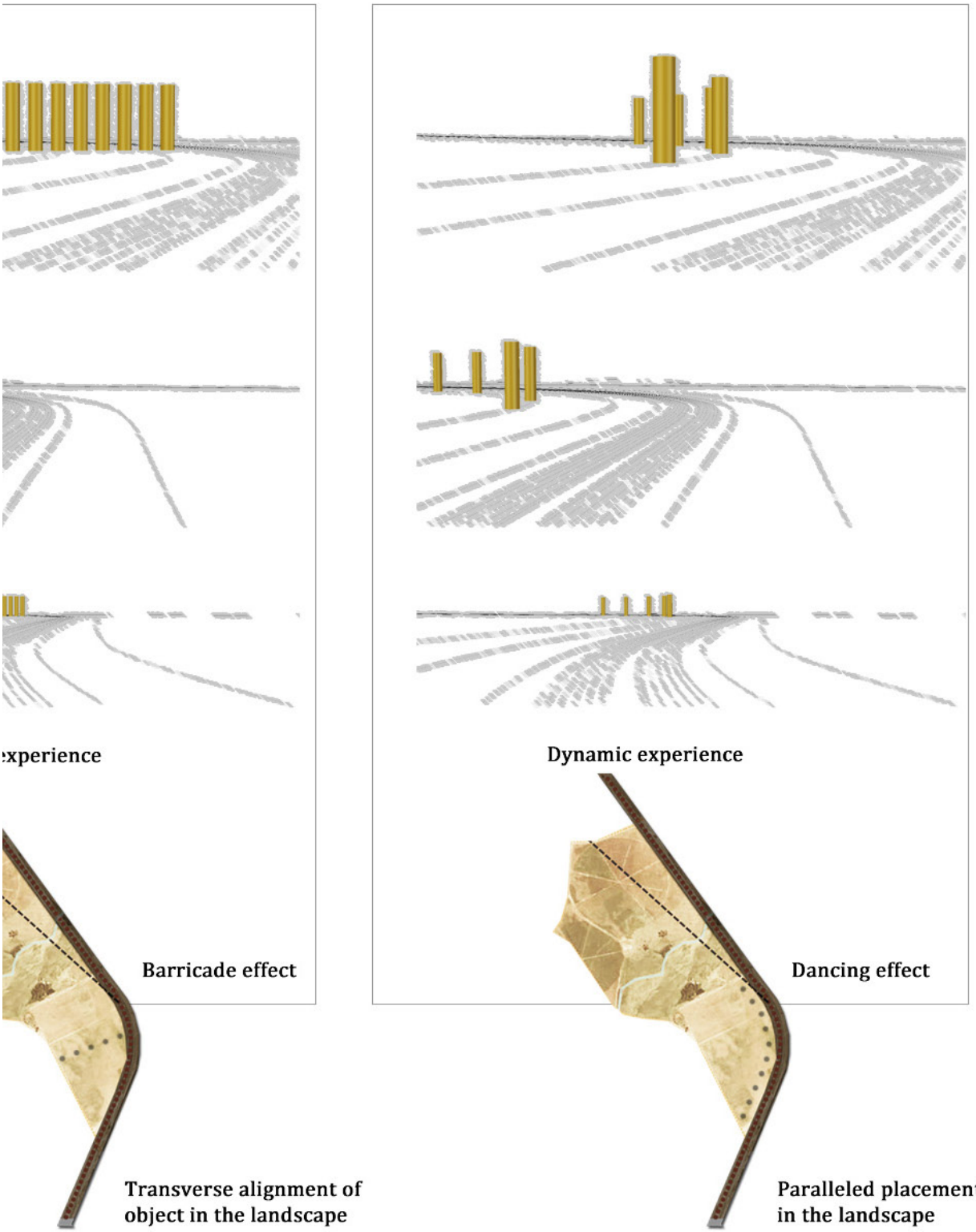
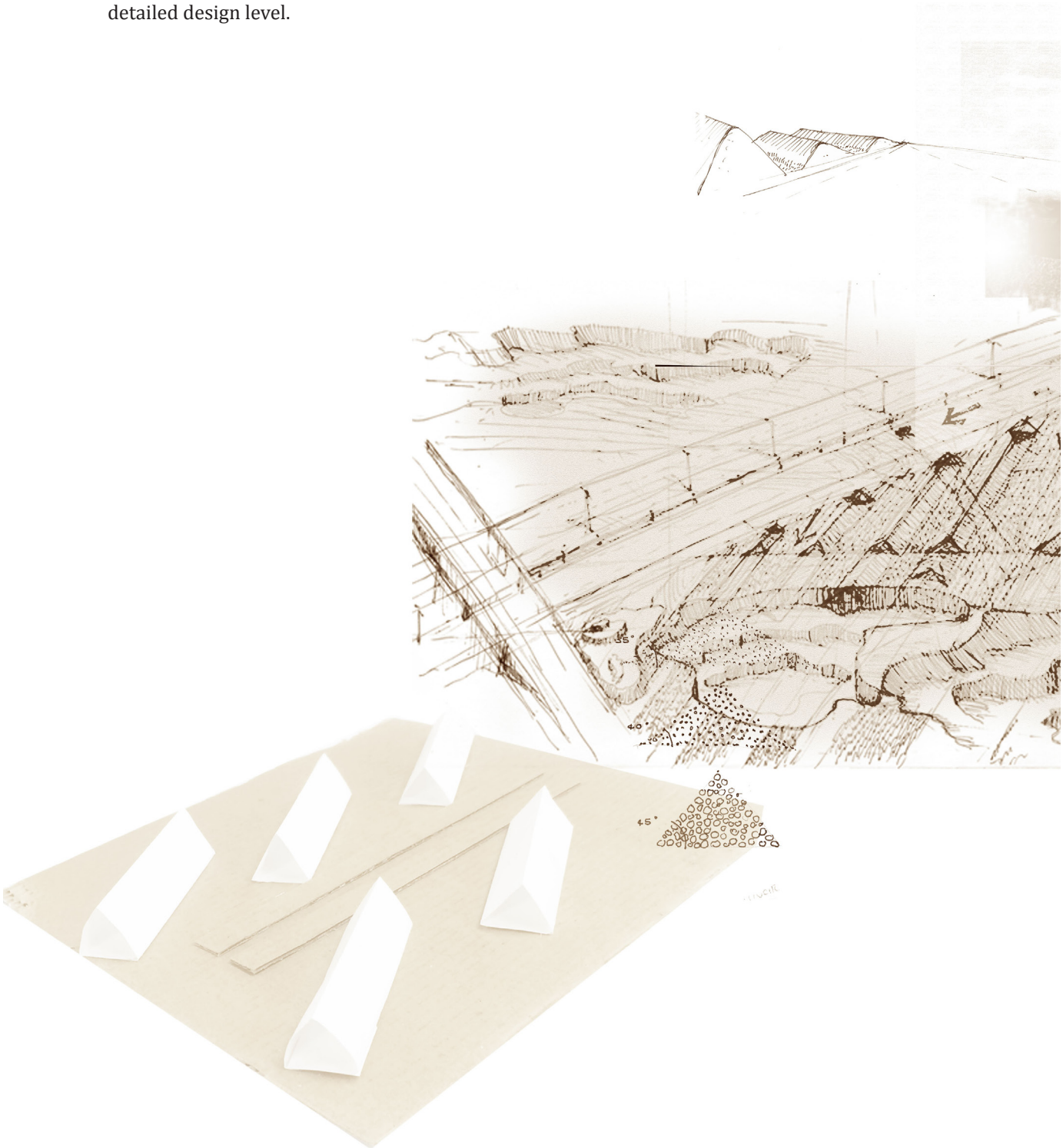
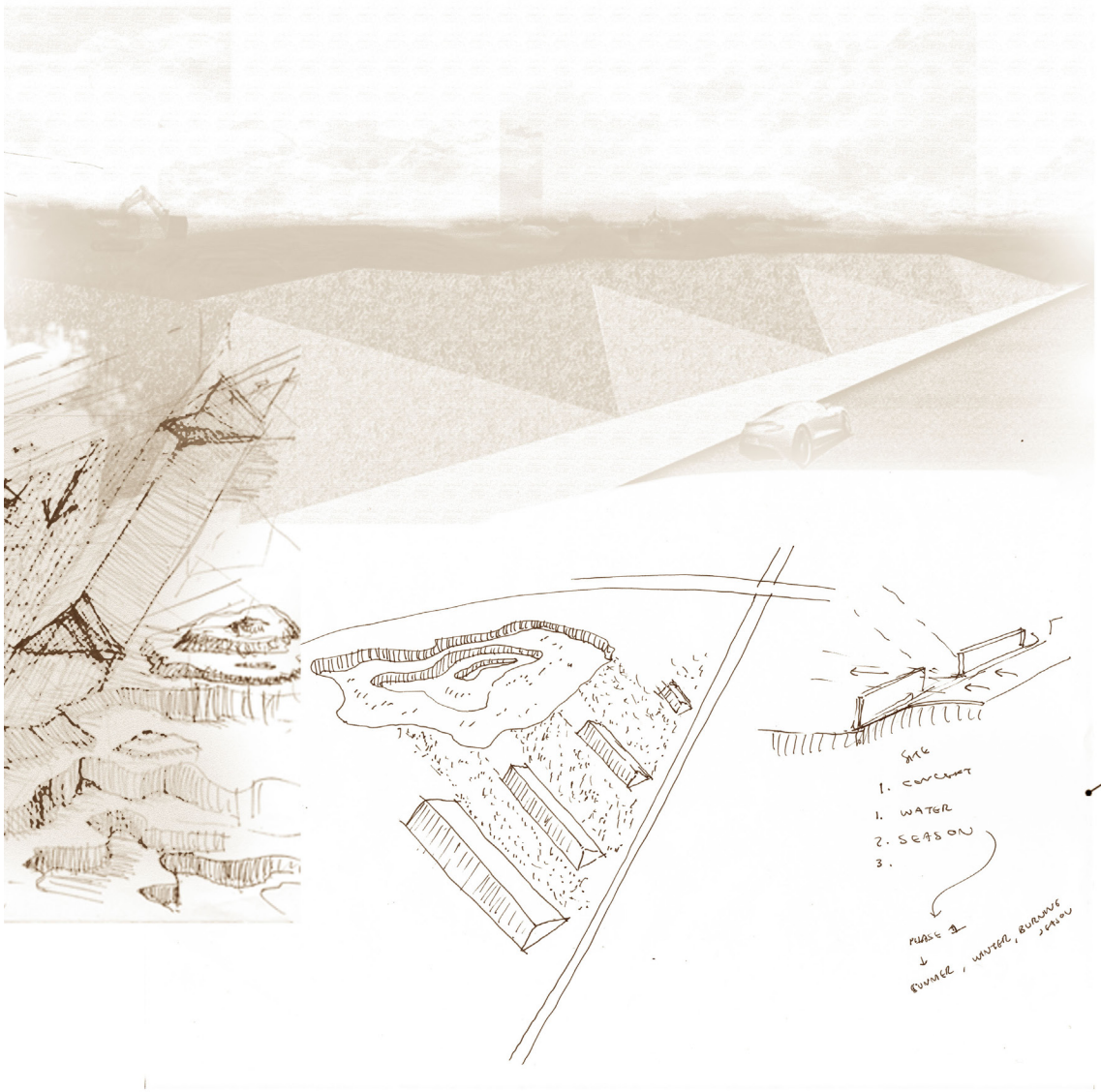


Figure_5.15. Site B investigation into animation of objects in the landscape (Author,2015)

This site is investigated on a conceptual and detailed design level.



72 Figure_5.16. Site C design development process (Author,2015)



Site C
Quarry rehabilitation

1.3.1 Post industrial beauty

Contemporary landscape projects have had the ability to change perceptions about disregarded sites. Theses sites include the Highline, a once abandoned railway and Landschaftspark Duisburg-Nord a former coal and steel plant. Both projects are examples of how perceptions have bee changed through landscape design. The projects are successful attempts at celebrating the industrial qualities attached to the sites. A good example of post-industrial rehabilitation, is MacLeod Tailings, by Martha Schwartz. The design embraces the cultural landscape by sculpting 'golden' soil bars which communicate the once industrial nature of the site. The sculptural landscape forms an interesting perspective from the freeway which appears to cut through the sculptures. The project did not try to return the site to a pre-mine condition but sought the means of rehabilitation by working with the existing fabric.
Along the R21 freeway lies a series of clay brick quarries. The Strekfontein brick quarry's life span is coming to an end. The opportunity arises to rehabilitate the land as per environmental law, but in a manner that will reveal the beauty of the industrial landscape.

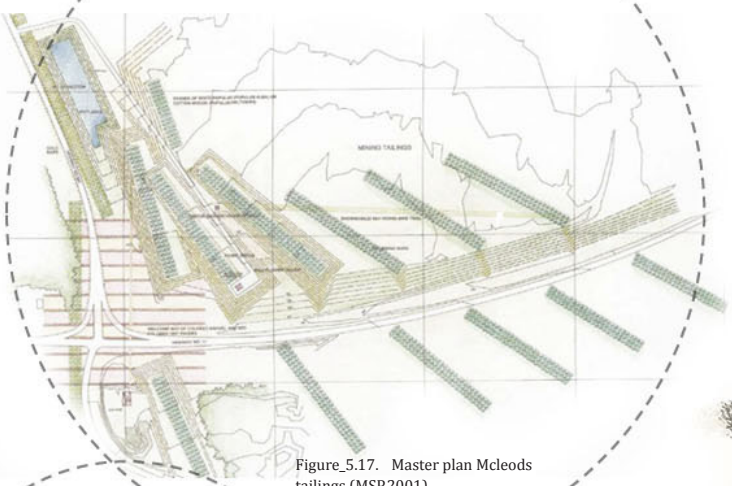


Figure_5.17. Master plan Mcleods tailings (MSP,2001)

Figure_5.18. Mine reclamation at Mcleods tailings(MSP,2001)

Site feature

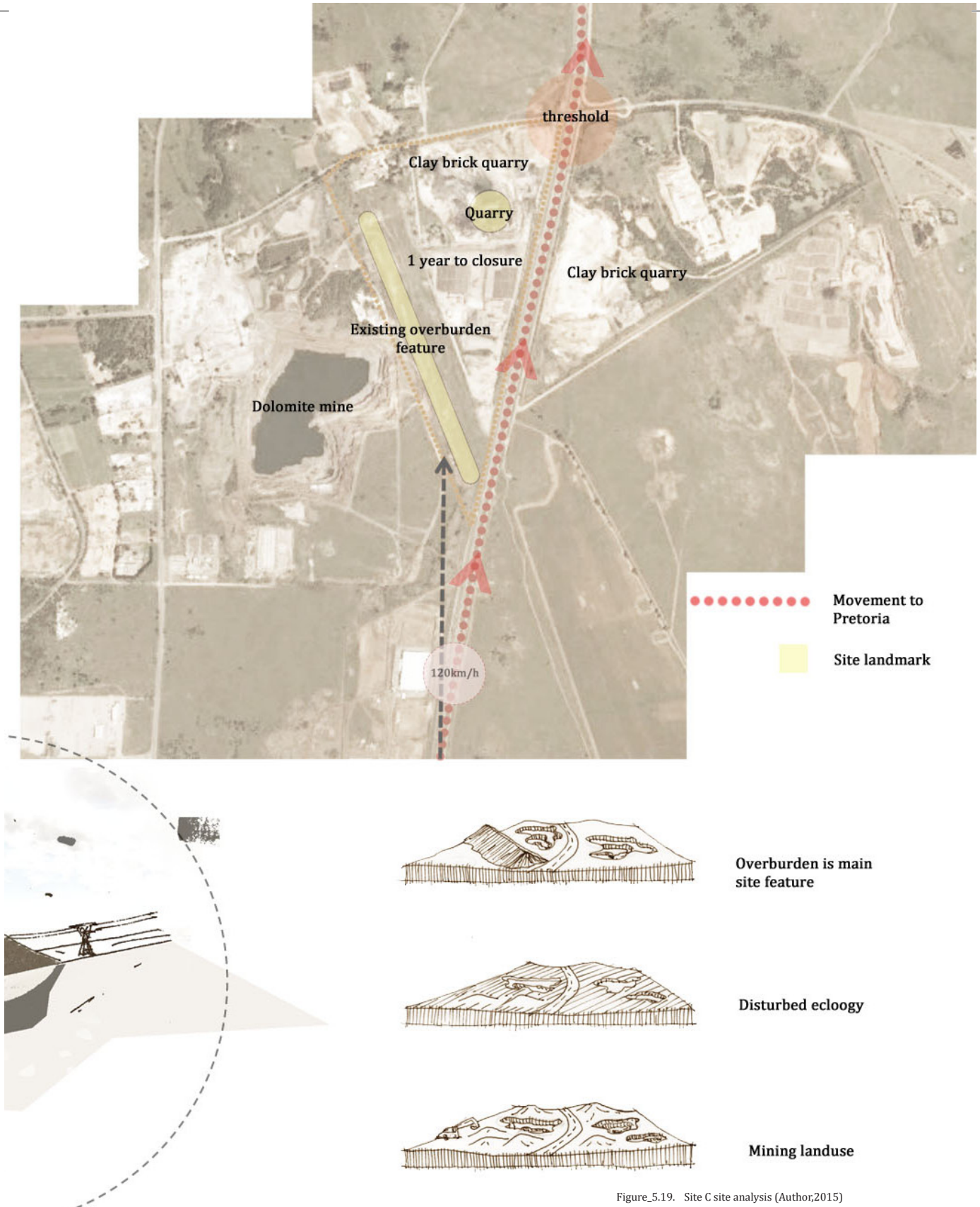
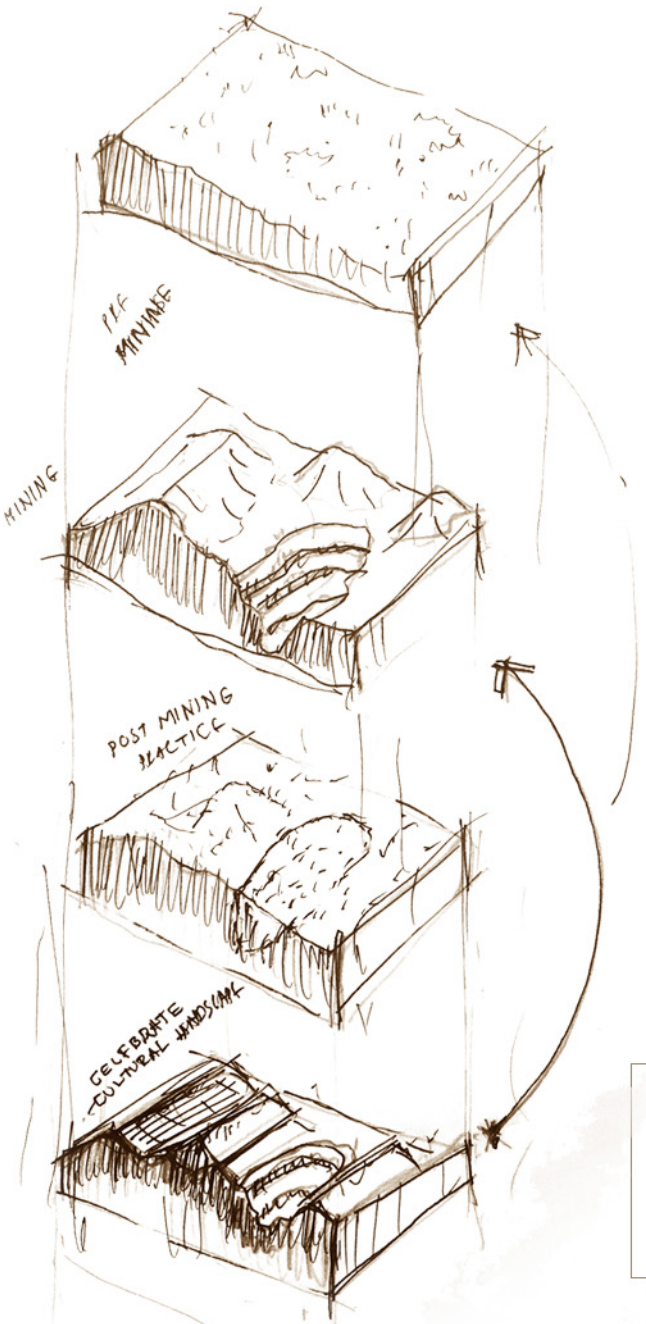


Figure_5.19. Site C site analysis (Author,2015)

Aim: The design intention is to celebrate the cultural mining aspect of the region by creating a feature along the route. When one thinks of a scenic environment, a mine dump is not necessarily the first thing that comes to mind. The design is based on the use of existing overburden material to form a sculptural landscape while still preforming the role of rehabilitating the land. Instead of returning the land to its pre-mine condition, where memory of the land use is forgotten, the author embraces the previous mining land use, this is achieved through sculpting the overburden pile in to a geometric shape which resembles a stock pile. Through repetition of this geometric form, the driver is reminded of the cultural land which has a major contribution to the regional landscape.

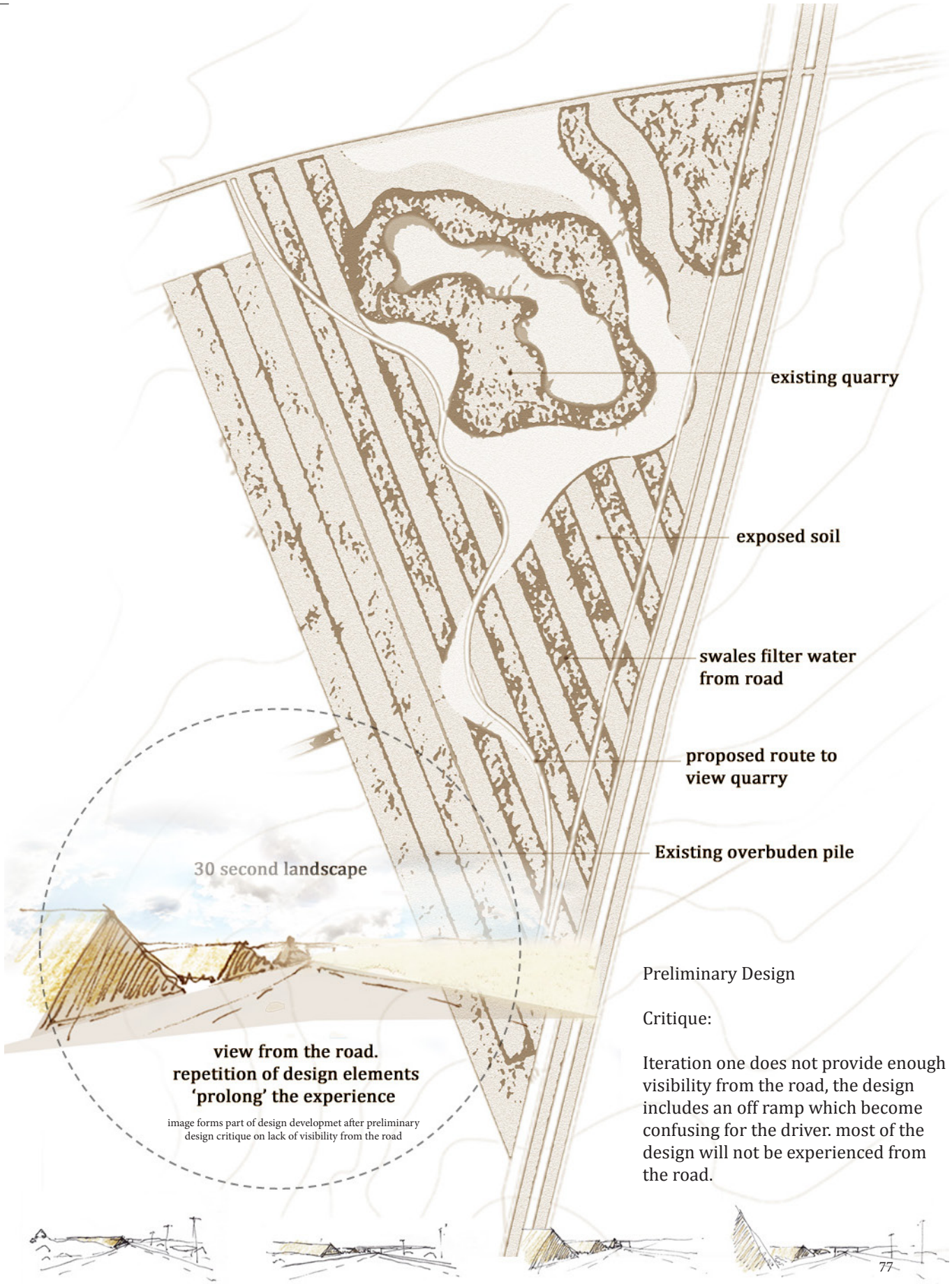


Pre-mine condition

Mine operational condition

General post mine rehabilitation attempts to return mine to pre-mine state by disguising mine operation. This leads to loss of memory of regional landscape.

Landscape design intention to rehabilitate yet retain qualities of quarry's operational state.



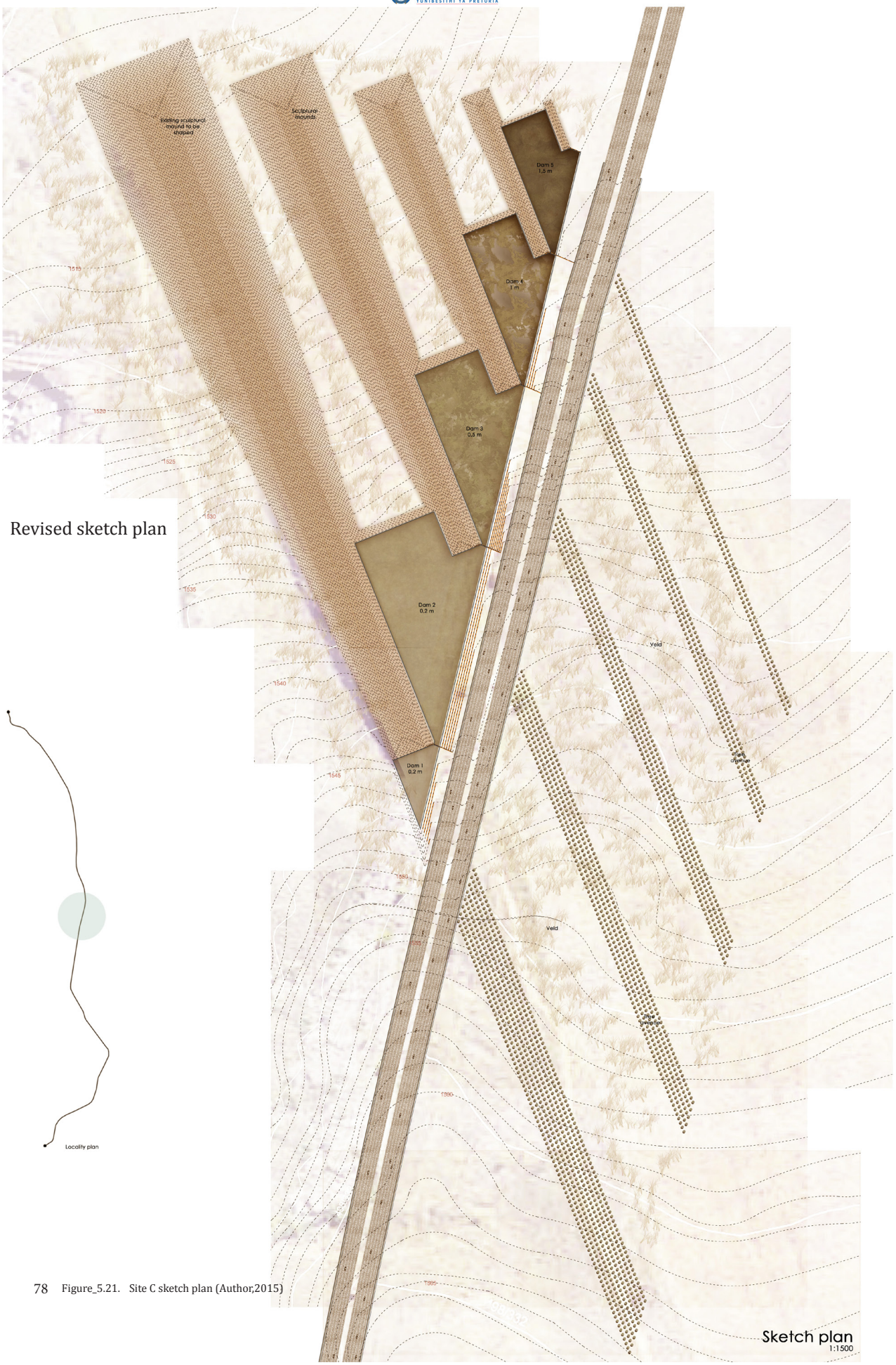
Preliminary Design

Critique:

Iteration one does not provide enough visibility from the road, the design includes an off ramp which become confusing for the driver. most of the design will not be experienced from the road.

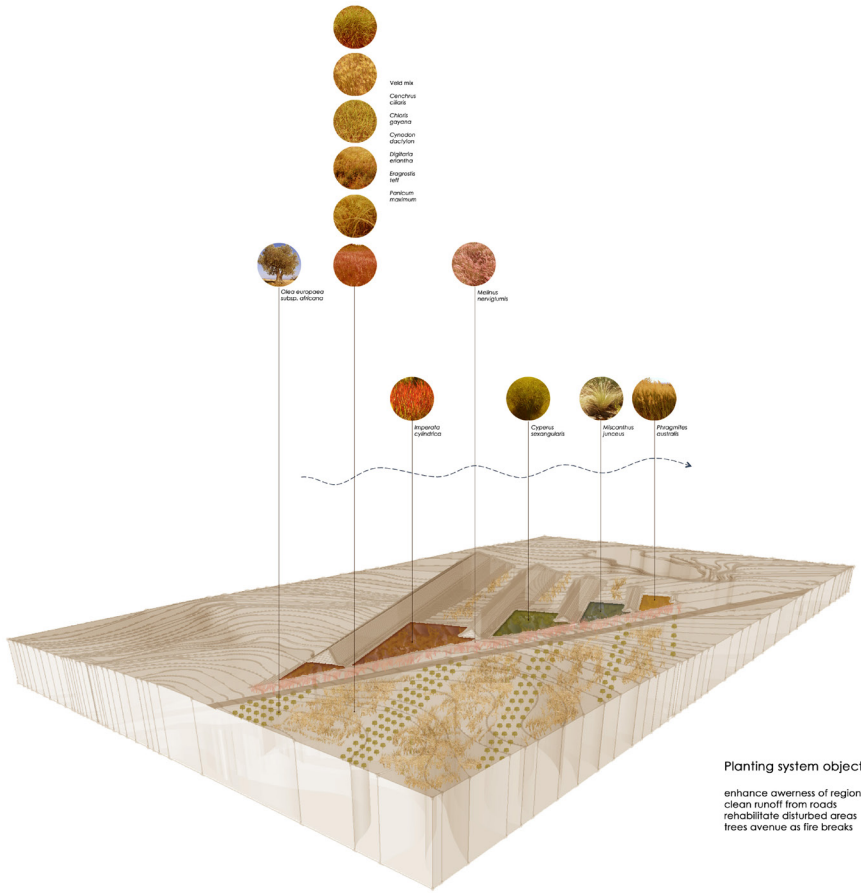
Figure_5.20. Site C design concept and process(Author,2015)

Revised sketch plan



78 Figure_5.21. Site C sketch plan (Author,2015)

Planting



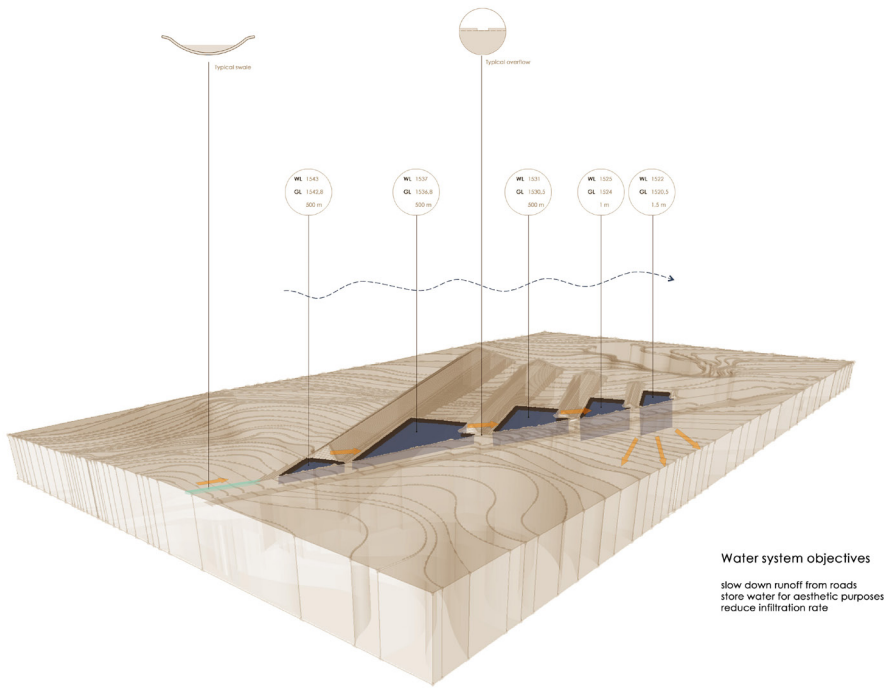
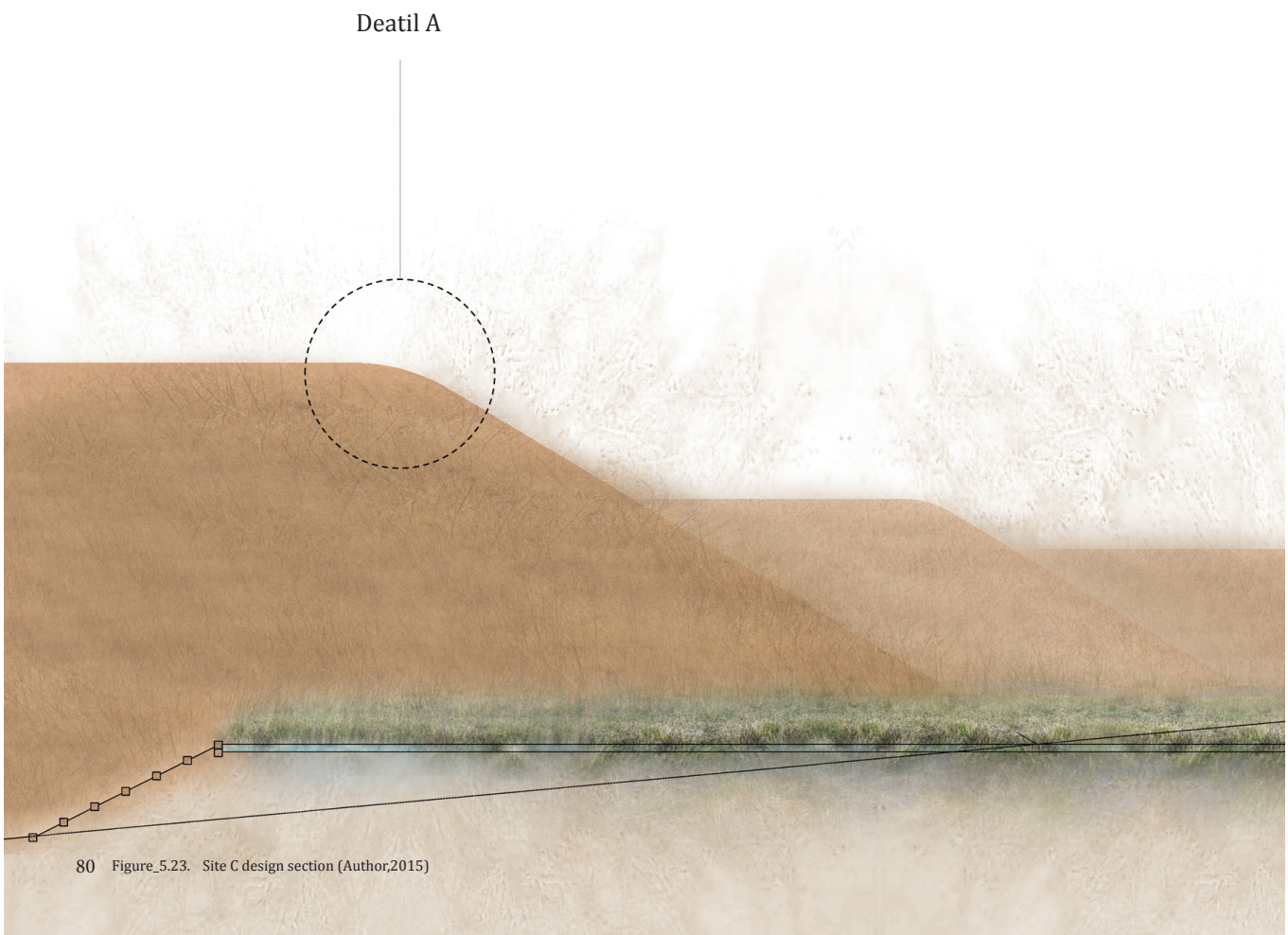
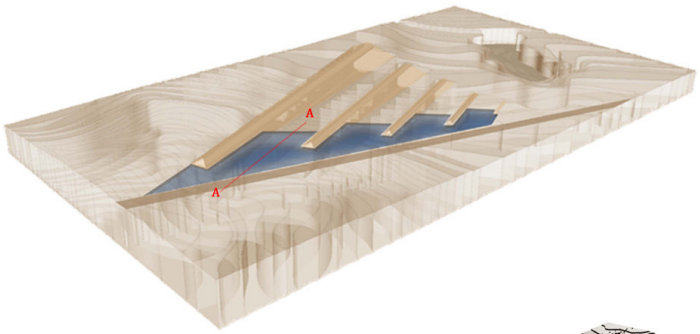
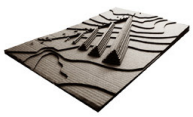


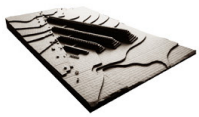
Figure_5.22. Site C planting and water strategy (Author,2015)

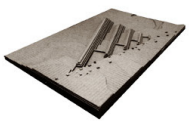


80 Figure_5.23. Site C design section (Author,2015)



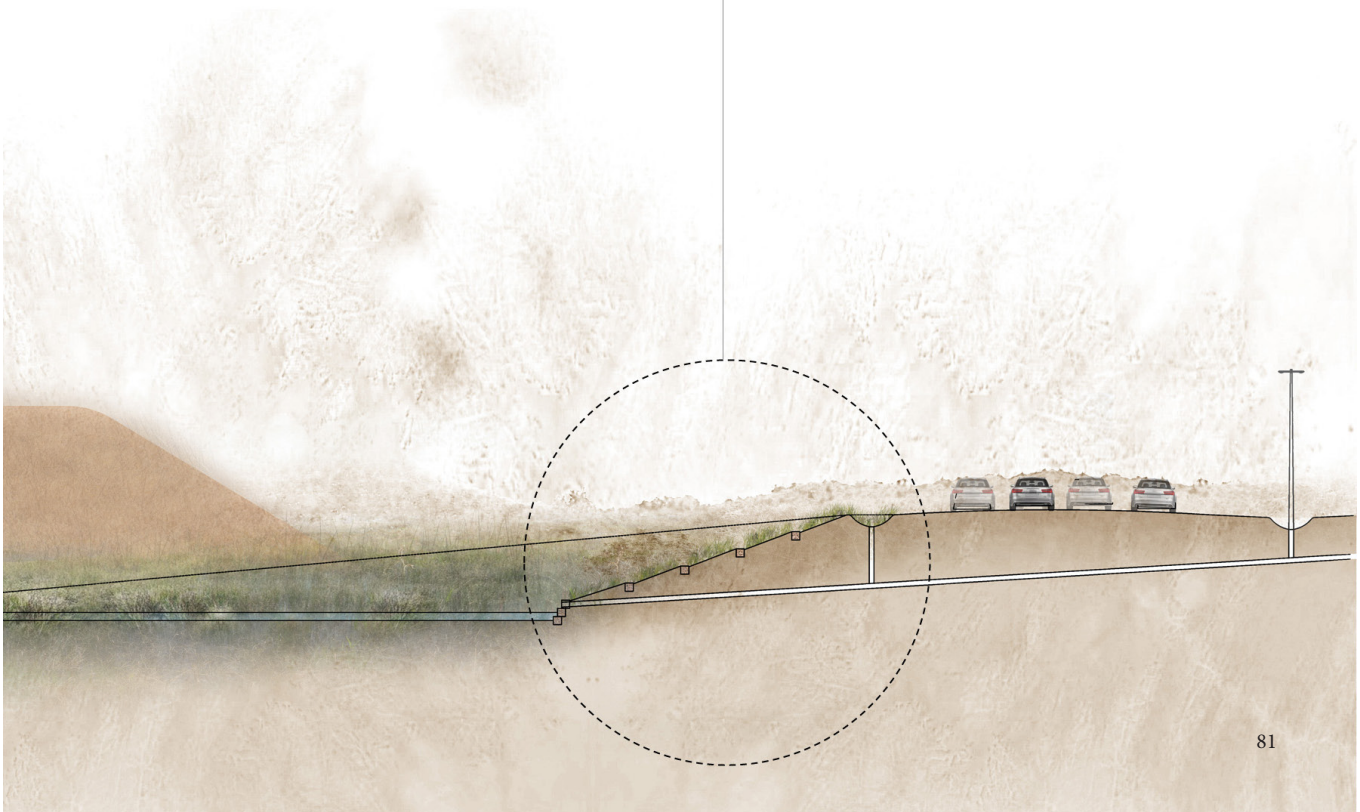


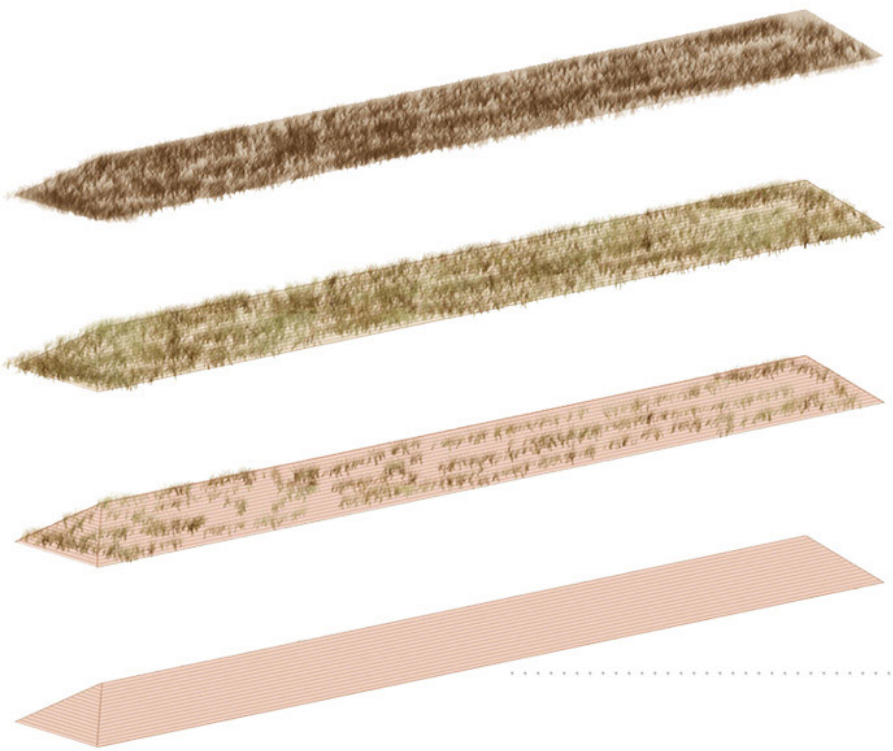




Contour manipulation model

Deatil B





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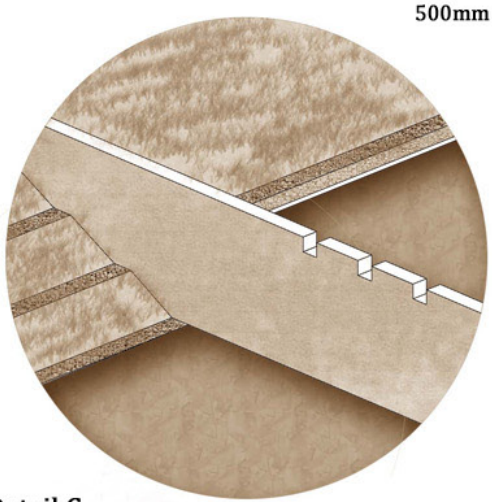
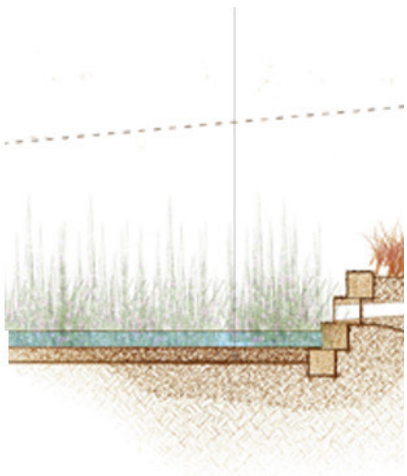
500mm thick 25mpa insitu cast
concrete retaining dam wall with
500mm wide overflow



Detail C
Dam weir

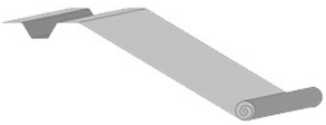
300mm soil growth
medium on bidum liner



Pre-sowed bio textile

Application process

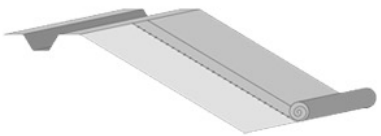
Remove rocks and the pre-existing grass or vegetation by the roots, turn up 100 mm stopsoil. Crush the ground solids and prep soil to 60 degree slope.



On slopes, dig a trench 600 mm over the crest, 300 mm wide and 300 mm deep.

Unroll bio- textile and install into the trench, making sure that the pre-sowed bio-textile remains attached to the ground.

Secure to the centre of the trench using
U-shaped staples, 20 cm in length and 6 mm in diameter.

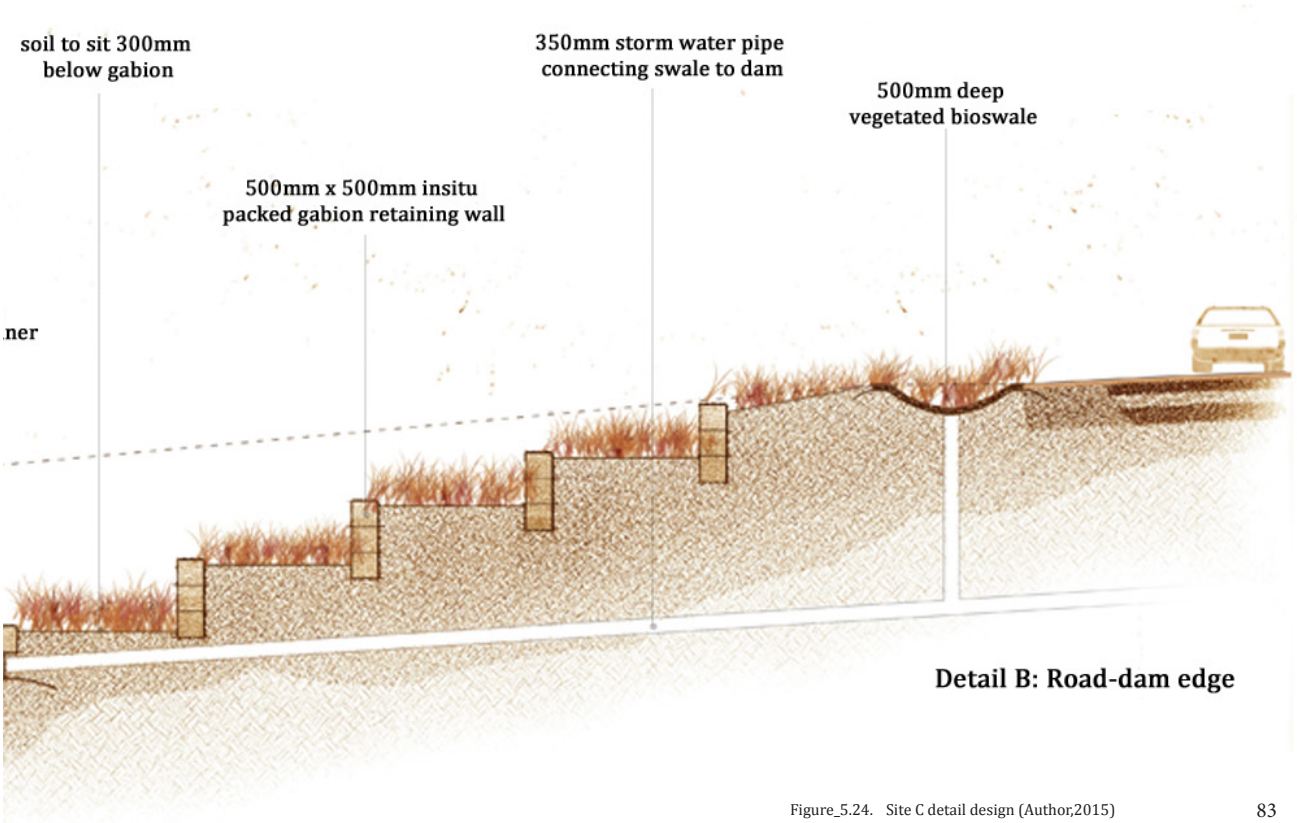


Unroll from top to bottom making sure that it remains attached to the ground and secure it to the roll edges, slightly overlapped, using U-shaped pegs, placed at a variable distance, depending on the inclination and on the location and terrain features.

On average, 1 peg every 1-2 square metres of geo-mat. ou might notice it does not perfectly adhere
to the soil. cover and consolidate the trench.

Another consideration was the use of stacked recycled tyres

Detail A: Soil mound stabalization



Detail B: Road-dam edge

Figure_5.24. Site C detail design (Author,2015)

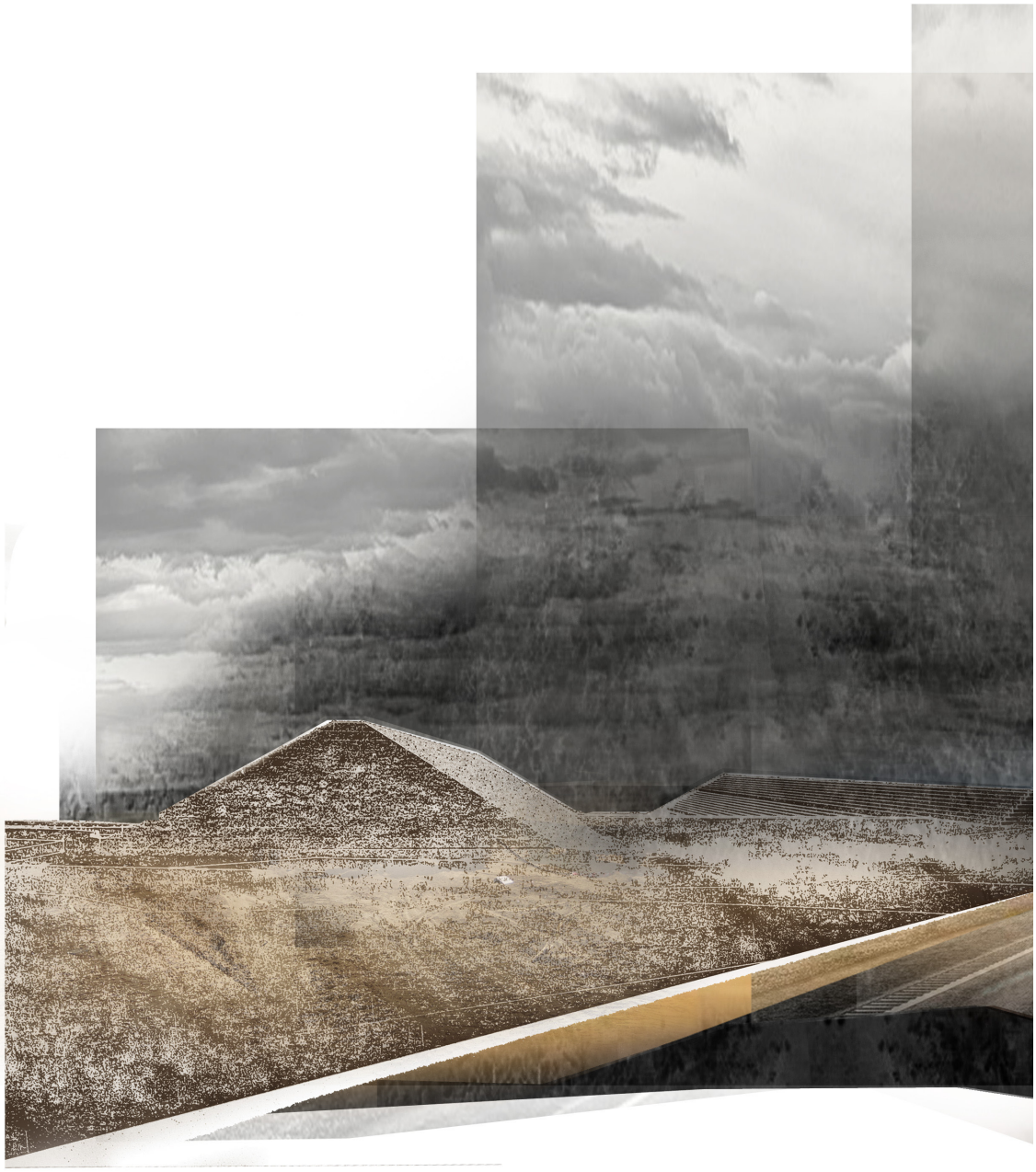
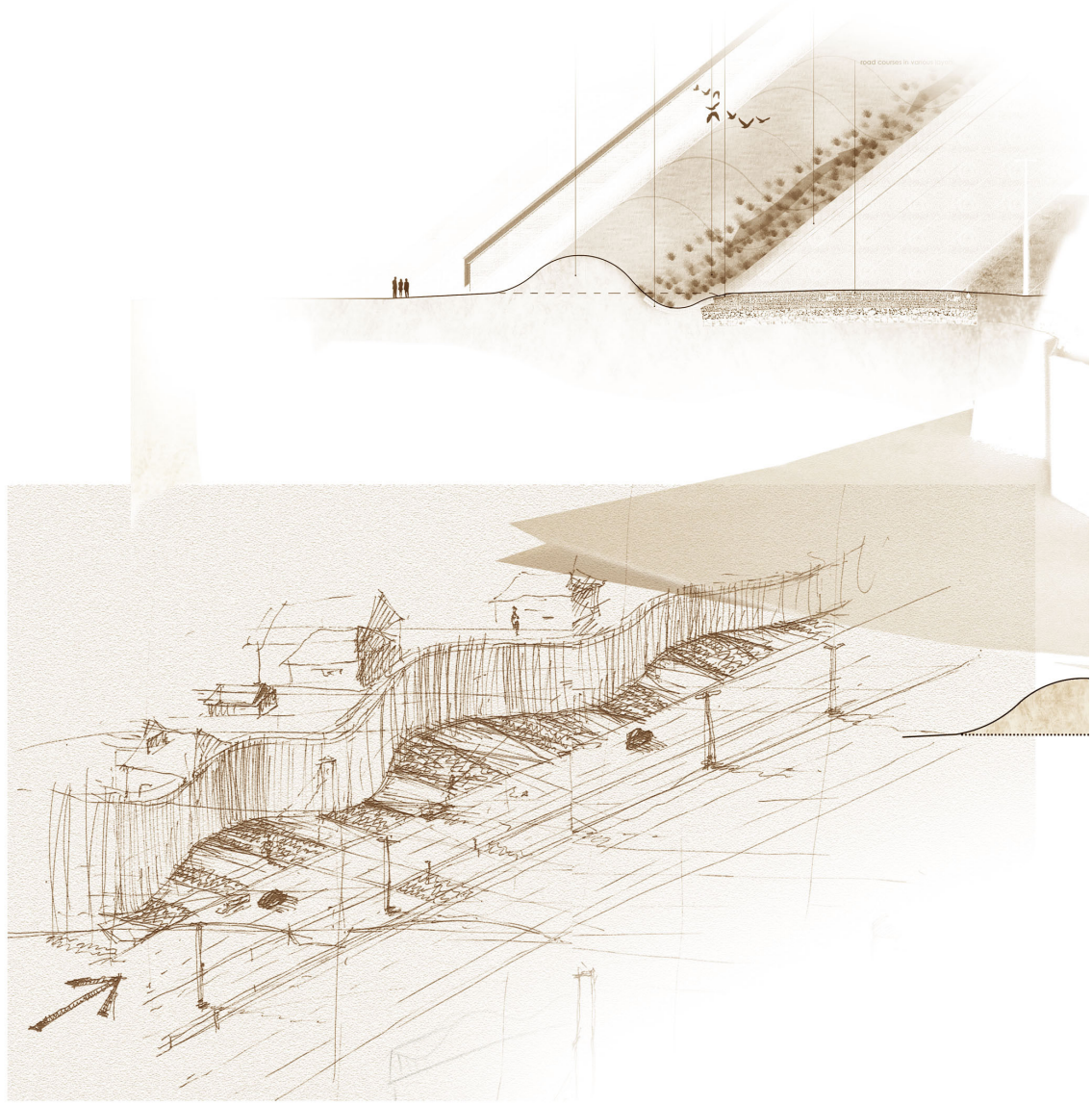


Figure_5.25. Site C perspective (Author,2015)

This site is investigated on a conceptual level only.



86 Figure_5.26. Site D design development process (Author,2015)

Site D
Sound barrier

1.4 Acoustic barrier

As part of a new freeway construction project connection to northern Melbourne, the Federal Government, undertook a competition for the design of a gateway aspect and noise attenuation features.
The design competition was awarded to Taylor Cullity Lethlean, Tonkin Zulaikha Greer and Robert Owen in 2003. The winning design, comprising walls, bridges and landscapes, was informed by a poetic reading of the site and a freeway environment largely experienced at speed.(Tonkin) In particular the design explores how otherwise static objects begin to exhibit dynamism or are activated by the travelling motorist. Two wall types were developed each distinctive and responding to their adjacent condition.
The 'Curtain Wall' a long sinuous steel ribbon is fluid in its form, dynamic and experiential. The 'Scrim Wall' by contrast is located alongside a residential interface and is composed of patterned acrylic panels and repeated louvres.
The project is not a problem-solving-based solution, but rather a creative response to concepts of movement, arrival and reference. The design was born out of the need to re-route the Hume Highway and the tension along the selected bypass route between the basalt plain grasslands to the west and the city's expanding urban fringe to the east.

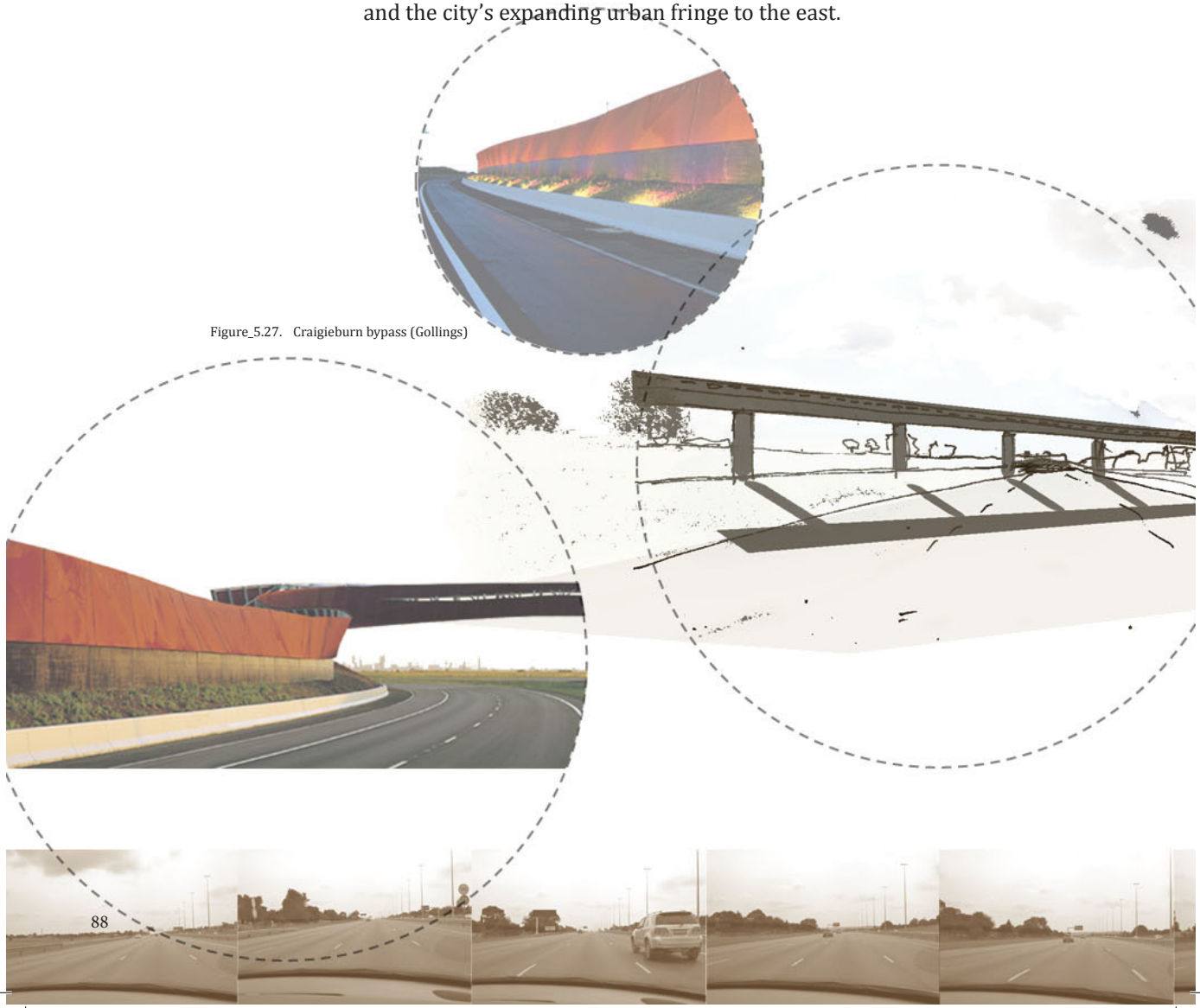
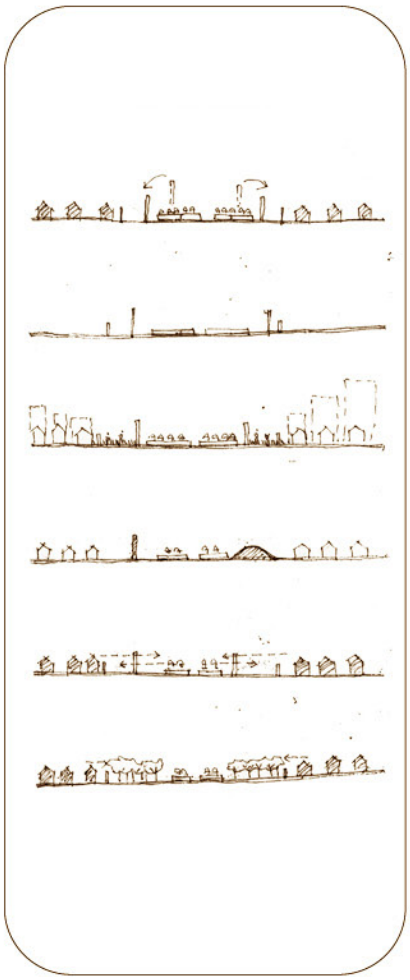


Figure_5.27. Craigieburn bypass (Gollings)

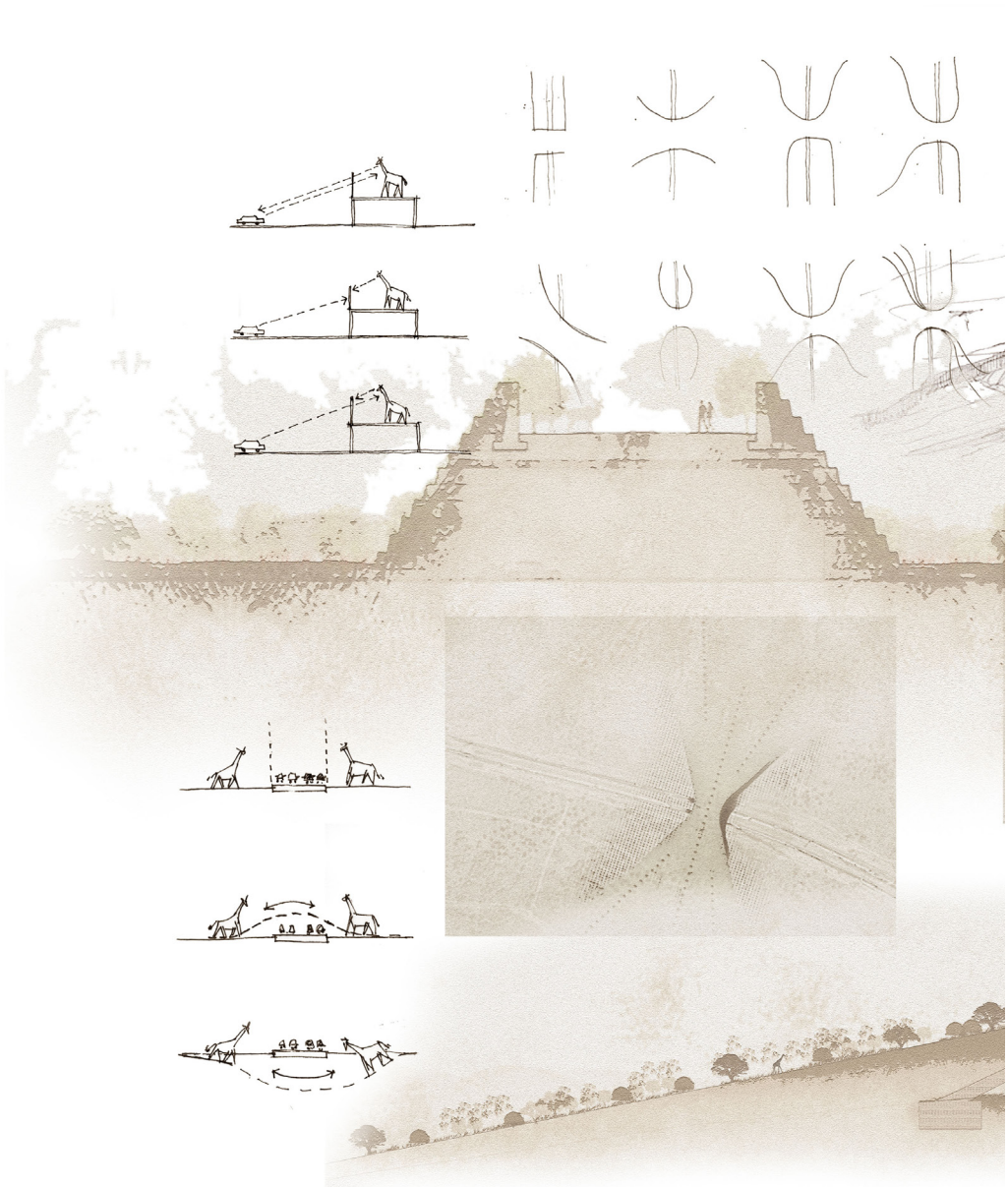
Figure_5.28. Site D site analysis (Author, 2015)



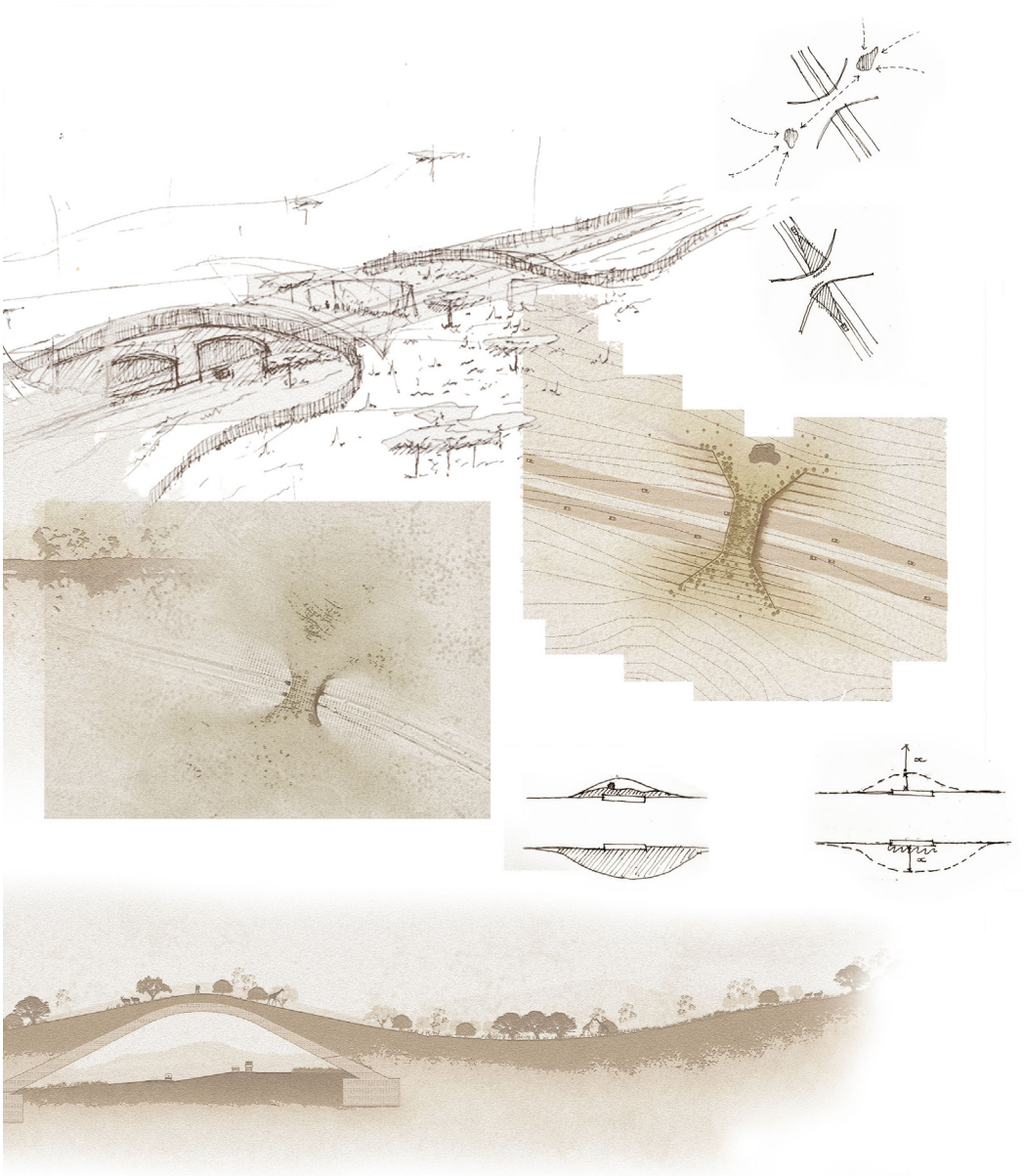
exploring possibilities of sound barriers
in context

Figure_5.29. Site D site analysis (Author, 2015)

This site is investigated on a conceptual and detailed design level.



92 Figure_5.30. Site e design development process work (Author, 2015)



Site E

Animal bridge

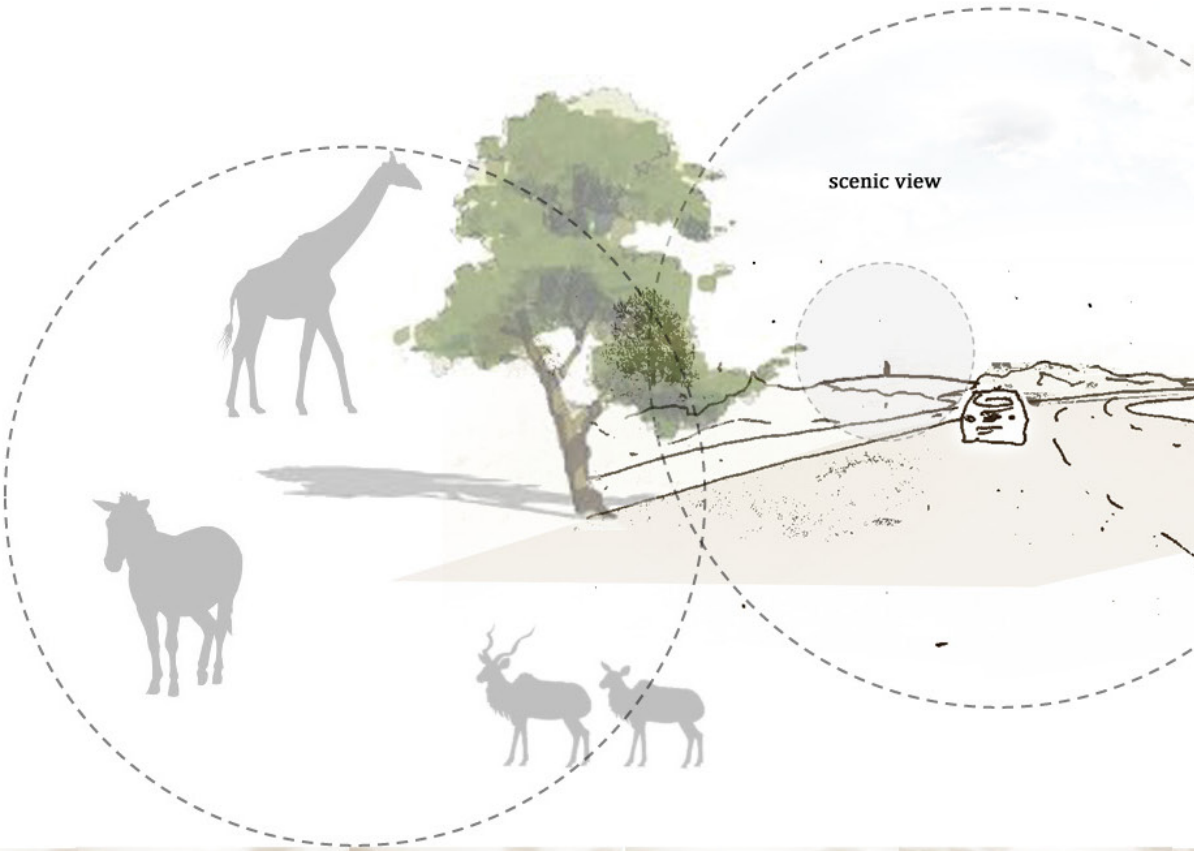
1.5 The ecological link

Spatial considerations in landscape typology suggest that areas connected by corridors are better than isolated areas for increasing the potential range of species. Larger areas are preferred over smaller areas which have greater population capacity, which makes them more resilient. (Oberholzer, 2014:63)

The R21 freeway acts as a divide between two protected nature reserves in the Tshwane municipality district. The landscape design intention is to connect these ecological units.

The parks provide other recreational activities such as mountain biking and trail running, a restaurant and picnic areas. The proposed connection may serve as more than an animal passage way, but a recreational facility too.

The proposal will aim to reflect the conservation area by housing a series of threatened grass aloes. Shale geology also forms an important aspect of the area and is considered as structural material which may be made visible to the driver.



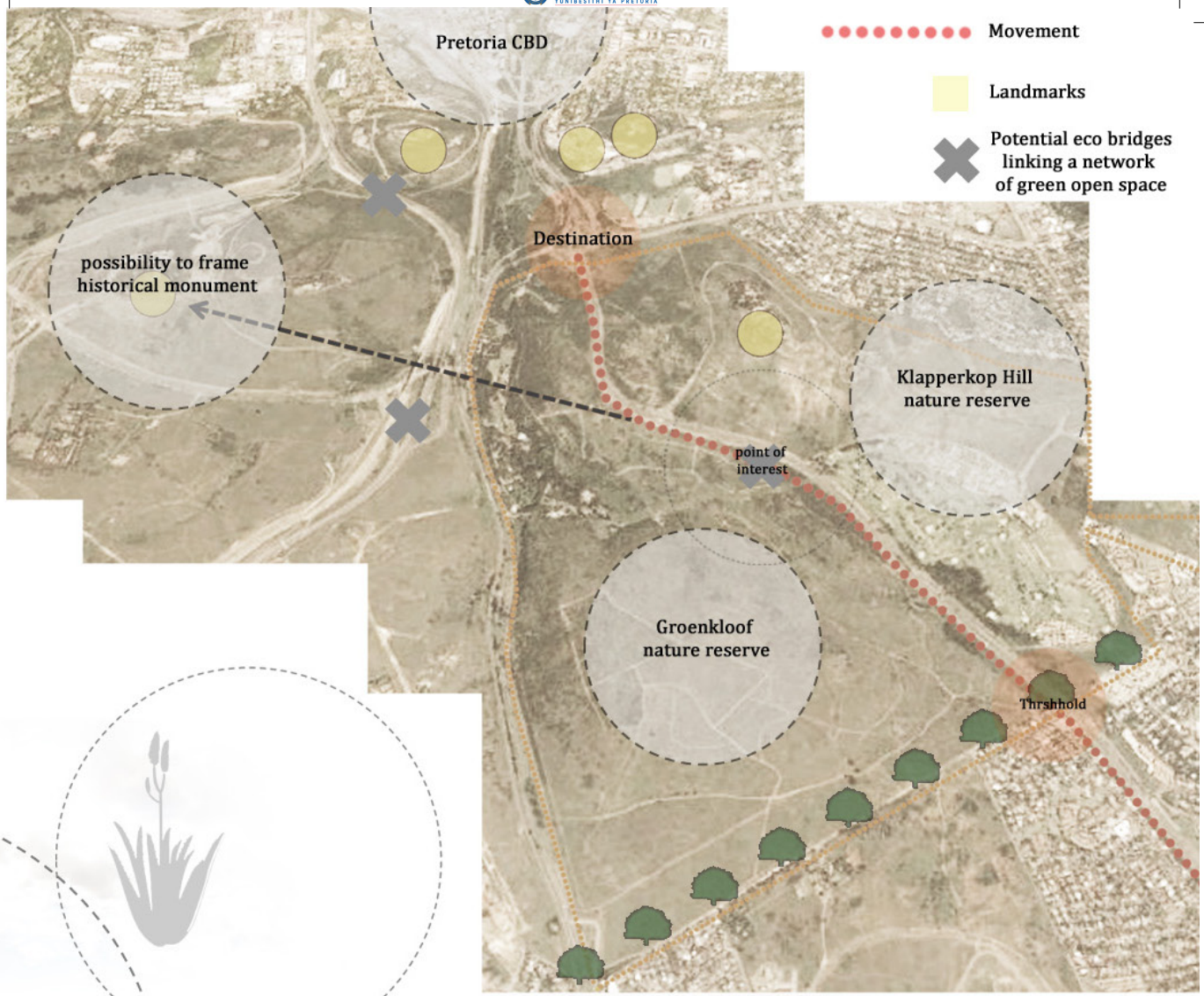


Figure_5.31. De Borkeld animal crossing (Freeman, 2012)

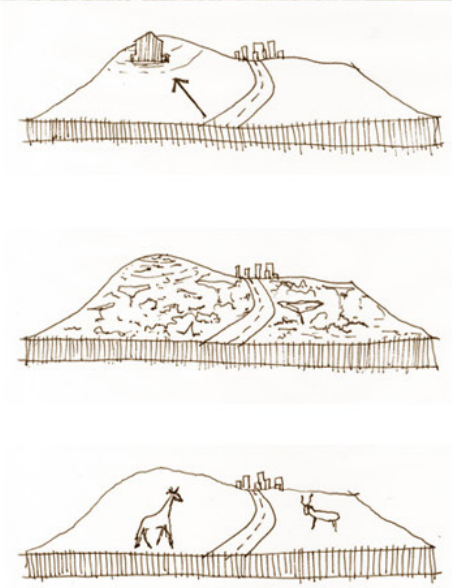
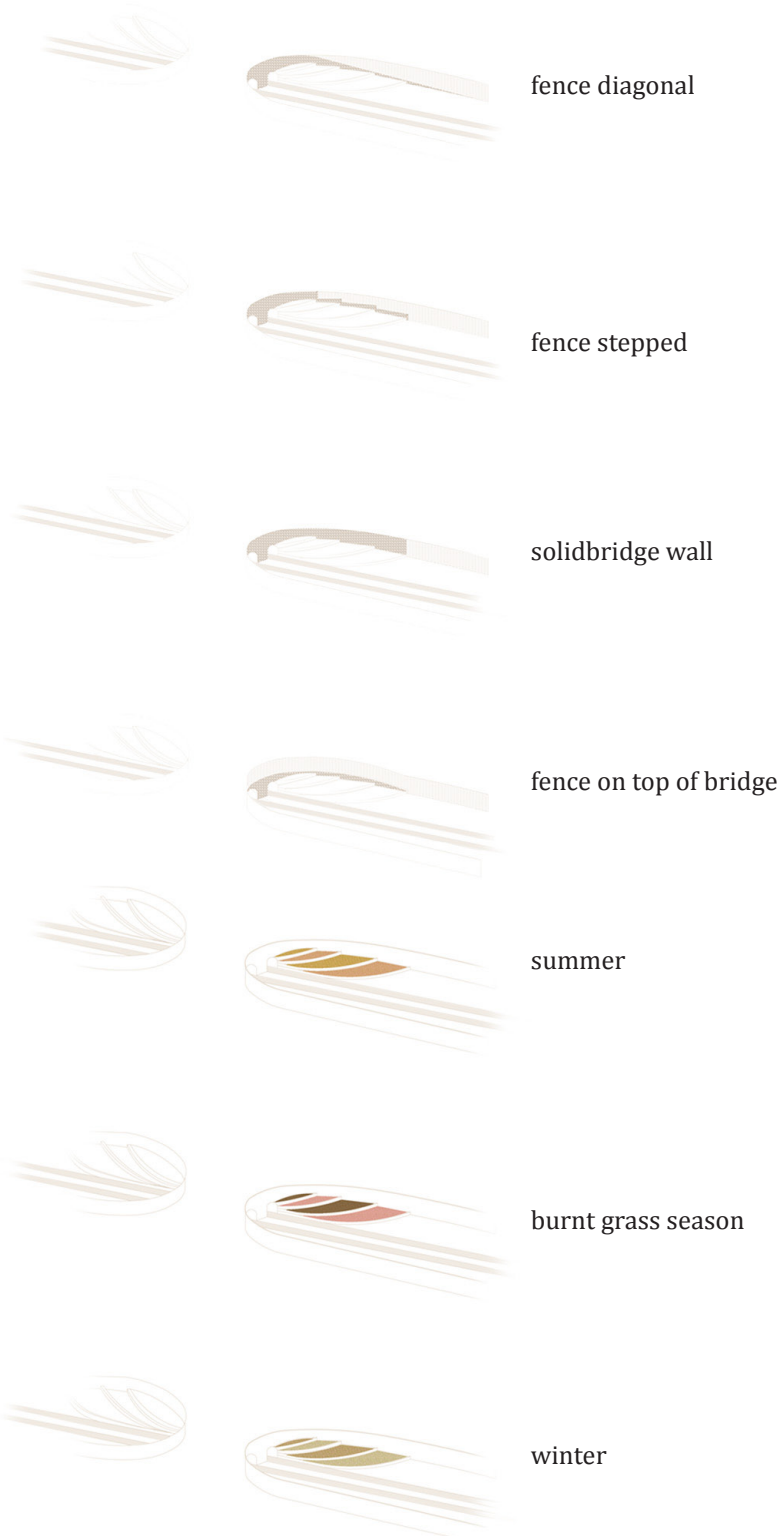
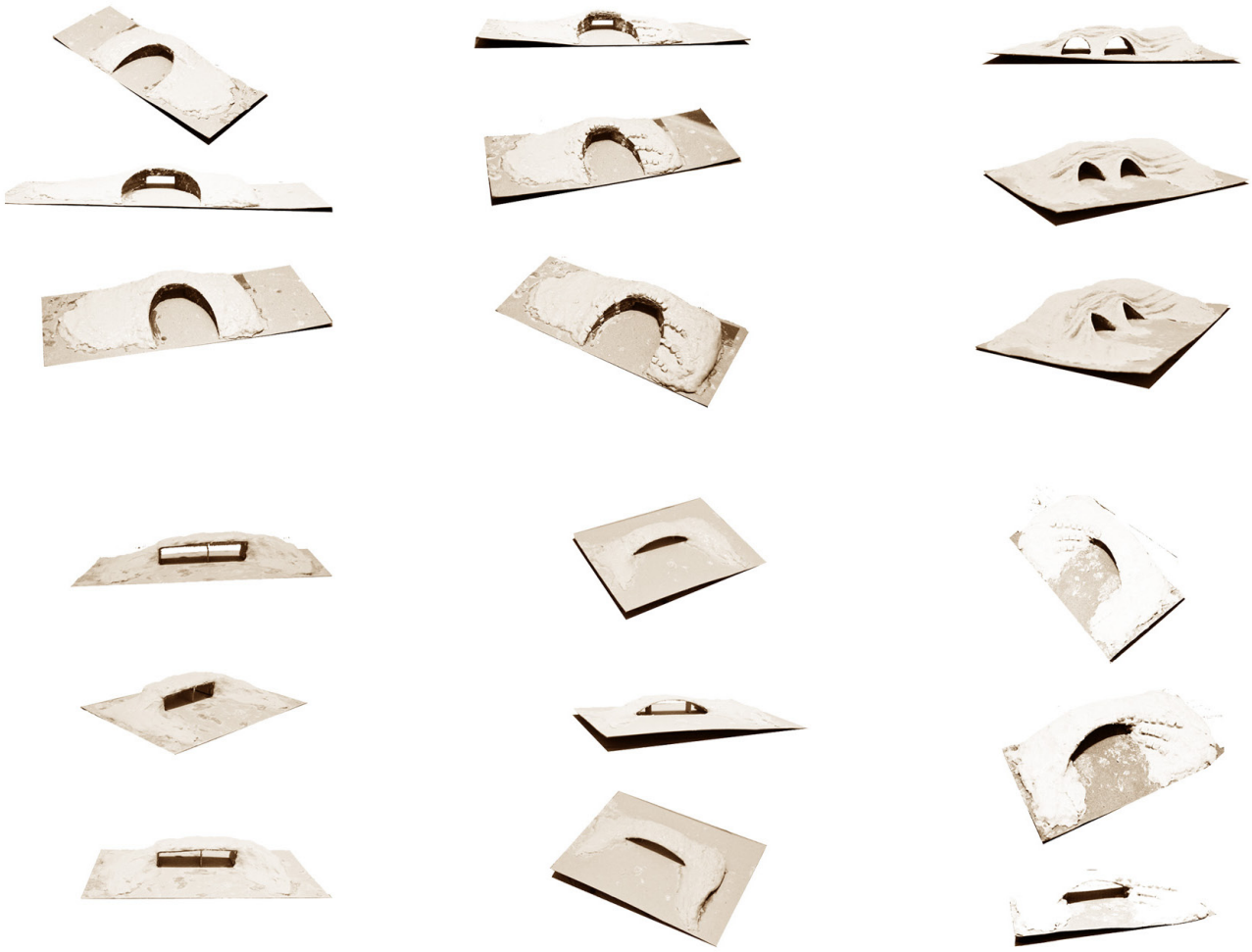


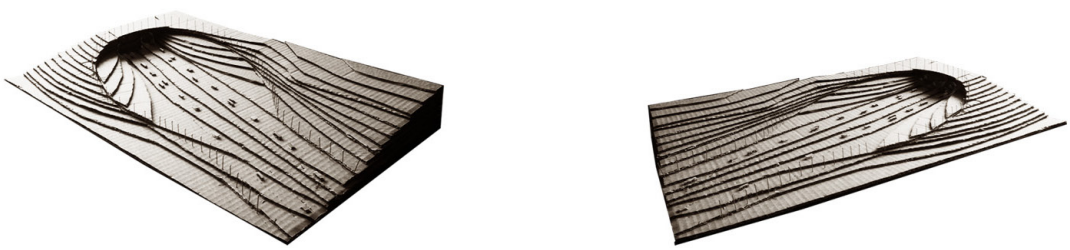
Figure_5.32. Site E site analysis (Author, 2015)



96 Figure_5.33. Site E fence and planting investigation (Author, 2015)

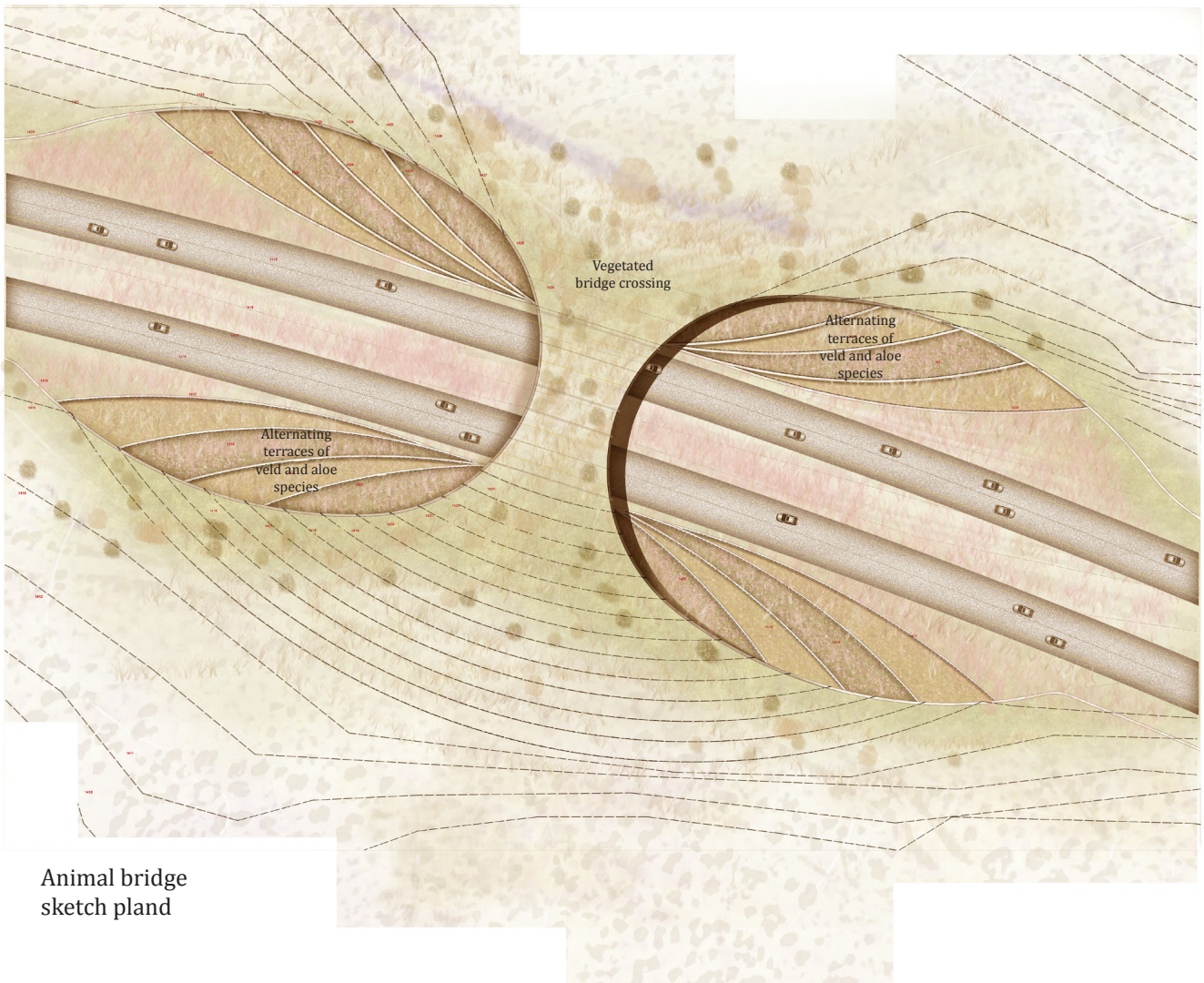


series of clay models by author investigating animal crossing options



Contour manipulation model

Figure_5.34. Site E clay model investigation and contour manipulation (Author, 2015)



Animal bridge
sketch pland

98 Figure_5.35. Site E sketch plan(Author, 2015)

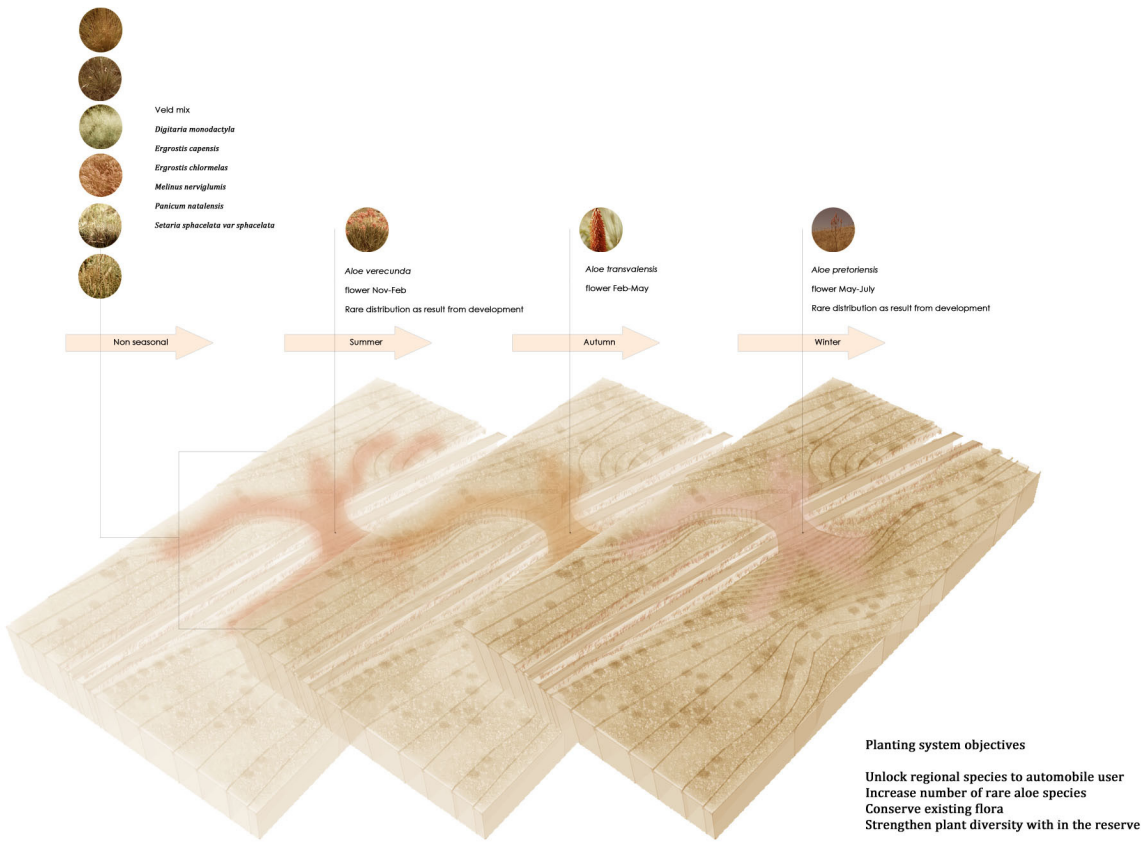
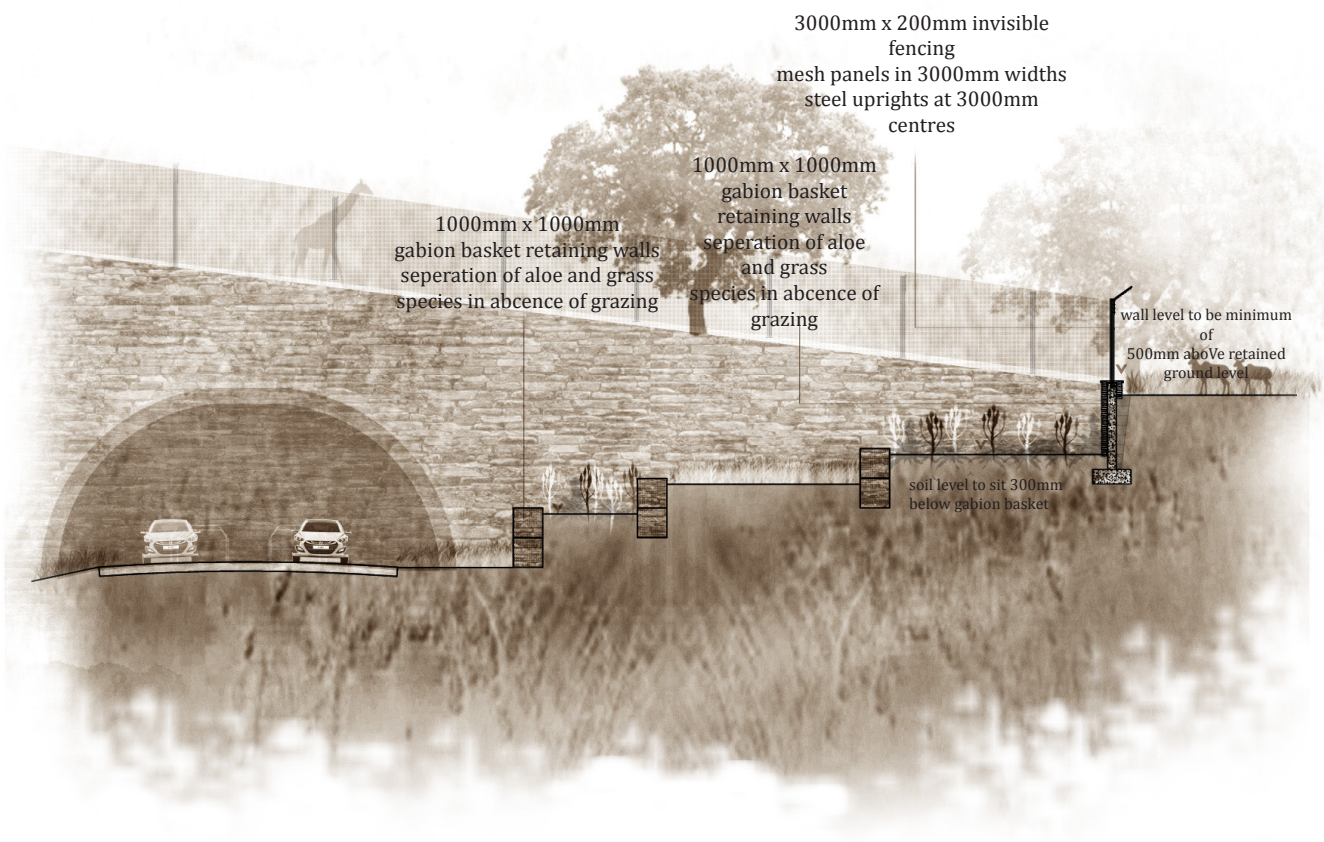
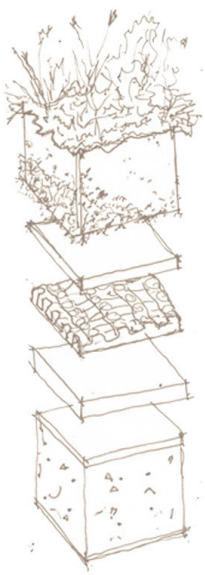


Figure_5.36. Site E planting strategy (Author, 2015)





Layers throug bridge

Specific veld mix and aloe species(see planting)

Imported lightweight soil from road swale overburden

Filter fabric

Drainage layer

Filter fabric

Root barrier mat

Torch on waterproof membrane

cast insitue concrete bridge arch

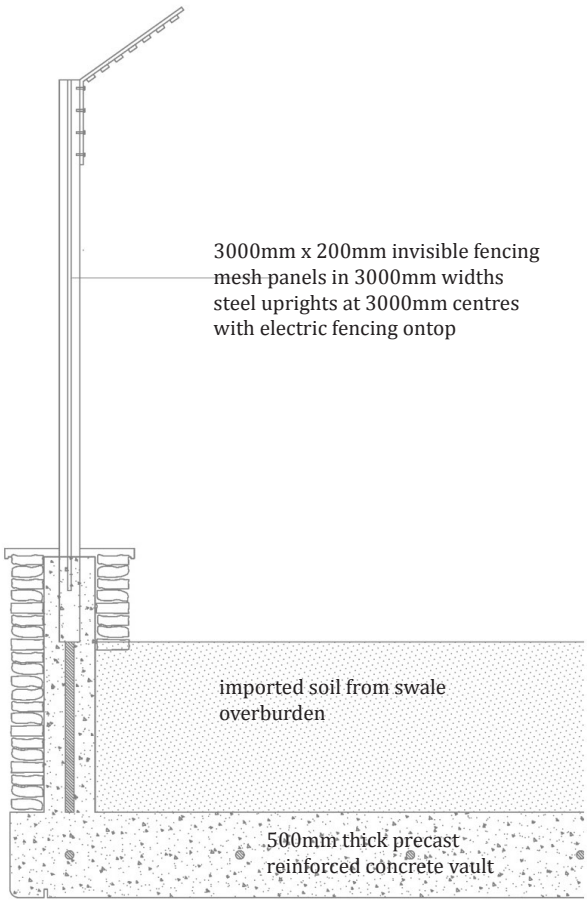


Figure_5.37. Site E detail design images (Author, 2015)

Figure_5.38. Site E perspective (Author, 2015)