

Tinus Van Der Merwe_ 29100233

Department of Architecture
University of Pretoria



the garden is us
in search of poetic dwelling

The Garden Is Us

In Search of the Poetic

Tinus van der Merwe

Study Leaders: Arthur Barker and Edna Peres

Course Co-ordinator: Arthur Barker

Submitted in fulfillment of part of the requirements of the degree MArch(Prof) in the Faculty of Engineering, Built Environment and Information Technology and the University of Pretoria

Pretoria, Republic of South Africa

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Herbal Clinic and Pottery Workshop

Old Rosema & Klaver Brick Quarry, Monument Park, Pretoria

Waterkloof 428 - JR

Pretoria, South Africa

S 25.48'24.58"

E 28.14'17.13"

Magister of Architecture [Professional]

Heritage and Cultural Landscapes

Regenerative Architecture/ Poetic Dwelling/ Healing Landscapes

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Thank you

Arthur Barker, Edna Peres, Chrisna Du Plessis, and fellow students for their inspiration and guidance,

My loving parents, for their unwavering support,

My Father in Heaven, for His unfailing love, and for making all of this possible.

God made a beauteous garden
With lovely flowers strown,
But one straight, narrow pathway
That was not overgrown.
And to this beauteous garden
He brought mankind to live,
And said "To you, my children,
These lovely flowers I give.
Prune ye my vines and fig trees,
With care my flowers tend,
But keep the pathway open
Your home is at the end."

God's Garden - Robert Frost

Abstract

Poetic dwelling, both as the perception of and engagement with the environment, has predominantly been lost in contemporary society. As a result, the earth had become an 'inexhaustible inventory' in the eyes of the dweller, resulting in a culture that merely consumes without giving anything of itself.

In response to a Regenerative approach to the making of architecture, the dissertation combines the theories of Robert. P. Harrison and Martin Heidegger, in that poetic dwelling finds its extension in the form of building, and its fulfillment in the garden.

The design aims to facilitate the healing of both people and environment on a site scarred by the consumer model of modern industry, and does so on a derelict brick quarry site in Monument Park, Pretoria.

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_chapter 1

introduction
the entering of gates

fig. 1.1 _Forest scene from Terrence Malick's 'The Tree of Life'

...Deserving, yet poetically,
we dwell
on this earth...

Friedrich Hölderlin - In Lovely Blue (in Leach, 1997:111)

fig. 1.2 _Drawing from concept development
[Author, 2013]



1.1 _Preface

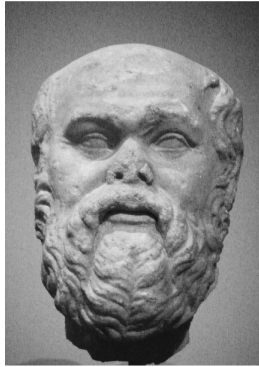
In the poem by Friedrich Hölderlin, Martin Heidegger investigates the human 'mode of Being' on the earth, and claims that humans dwell poetically, with the act of building as its inescapable extension (Leach, 1997:111). Robert P. Harrison (2008:36) takes it further by stating that poetic dwelling finds its fulfillment in the garden; the place where we were given life, and our original vocation as stewards of the earth. If the place for poetic dwelling is the garden, then resultantly the act of poetic dwelling is gardening.

But somewhere we lost the poetic, being separated from the garden and our purpose in it, and traded cultivation for consumption, protector for parasite, and though we desire the garden, we plunder the earth on our way to it.

The dissertation aims to show how architecture can form part of a regenerative¹ approach to how humans inhabit the biosphere, by viewing the earth as a garden (and therefore viewing humans as the gardeners). The acts of cultivation, fostering and stewardship unlock the soil's potential for giving life, and resultantly, human hands give back more than what they take out.

¹ Description of this term is provided at the end of Chapter 1, under Definitions of Terms and Concepts.

470 B.C.



[1]

SOCRATES

He would rather spend his hours in the streets and courts of men than in the countryside. The conversations and philosophical talks with his fellow citizens were far more important to him than the still contemplation found in 'nature'.

430 & 384 B.C.



[2]

PLATO

Experienced reality was for him a degraded one which was only based on another more "perfect" reality, and life was directed to entering the latter.

ARISTOTLE

He described the world as the 'first' reality, and everything within it should be understood in terms of their characteristics. His philosophy found great favour in later reductionist science.

354 A.D.

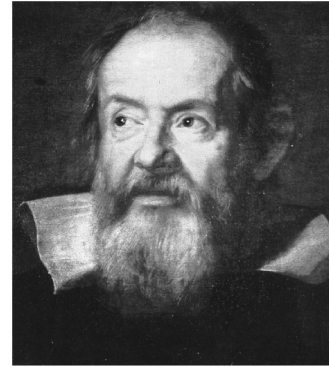


[3]

ST. AUGUSTINE

His writings insinuated the separation of religious practices and daily life; a division between the body and the spirit.

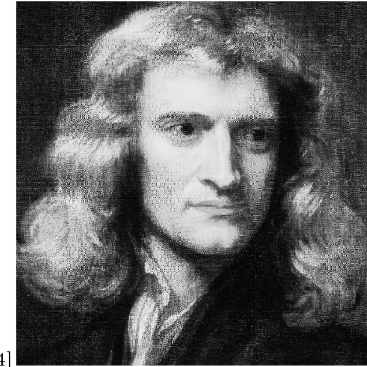
1564 & 1643 A.D.



[4]

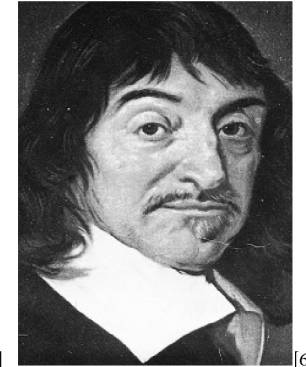
GALILEO & NEWTON

The cosmological discoveries of Galileo and the dimensions Newton brought to physics cemented science as a reliable way to describe physical reality. This objectification resulted in "a field of inanimate masses and forces which operate according to the laws of inertia and of quantitative distribution in space" (Jonas, 1966:10). The subjective experience of our world was reduced to and emotional contention reserved for the individual, not suited for the realm of science.



[5]

1596 A.D



[6]

DESCARTES

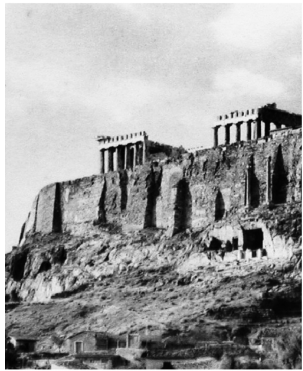
The 'self' found higher importance when Descartes promoted the values of the rational mind, which instigated the prevalence of Western individualism. The individual thus replaced the community, and society was no more seen as a collective mind, but as a collection of separate and independent minds.

1.2 Background information

In the reality of globalisation, this gradual loss of poetic dwelling had seeped into almost every part of the world, and the environmental danger posed to its gardens is thus widespread. Even though the Western canon is much more complex, and the thinkers touched upon here existed before the 20th century, our current age is still marked by the residue of their influence (figure 1.2).

fig. 1.3 _Development of the Western philosophical canon and related gardens
[Author, 2013]

500 B.C.

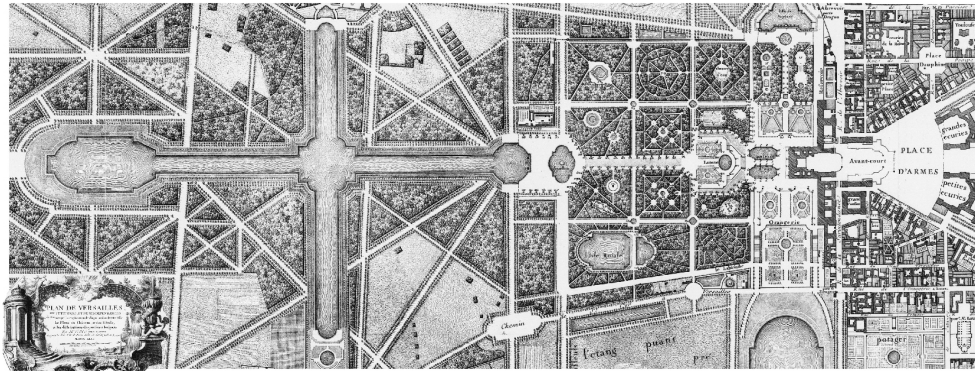


[7]

ACROPOLIS

The form of the land served as hierarchical guide for the most important buildings, with 'upper' resembling aristocracy, and 'lower' democracy. Place-making became a display of power and identity.

1624 A.D.



[8]

VERSAILLES

The former found higher precedence in the Renaissance. King Louis XIV's Palace of Versailles dominated the land to the extent that the control shifted predominantly to the designer, leaving the earth's surface as a mere obstacle, rather than an informant.

1760 A.D.



[9]

INDUSTRIAL REVOLUTION

The industrial revolution perpetuated this control over the biosphere. Mass agriculture and production required linear arrangements of both environmental and social structure. A separation of elements such as housing, commerce and agriculture made industries more manageable, for centralised authorities.

1920 A.D.



[10]

INTERNATIONAL STYLE

Apart from original intentions, Modern Movement models became rule-of-thumb solutions for a globalising world. Cities also became production lines, and mobility cause them to sprawl beyond previously imaginable distances.

1.3_Problem Statement

“The more we succeed in turning the earth into an inexhaustible inventory for human consumption, the more we abandon the postlapsarian vocation of care that turned human beings into cultivators of the mortal earth, as well as cultivators of our mortal modes of being on the earth.”

Harrison, 2008: 264

Robert P. Harrison (2008:264) states that world culture has a “blind drive” in which the “dominant impulse is to perpetuate its own dynamism rather than to fulfill an end.” We thus presently find ourselves in a paradox; to rebuild our own ‘Eden’ by plundering the garden itself - “the garden of the biosphere on the one hand and the garden of human culture on the other” (Harrison, 2008: 265). The continuous search for that seemingly unattainable place has resulted in a building industry that is centralised on particular (and now eroding) resources, and indifferent and disconnected to the aftermath of ‘blind’ actions on the garden of the environment. It has become one of the ways humans plunder the earth and then move on, leaving harmed land to heal itself or to be plundered further by the markets.

Also, in a phenomenological sense, this blinding is directly related to human perception, which, in the current culture, is fixed on the fruits of the garden, and not on the soil of their origin (Harrison, 2008:47). Herein therefore lies an opportunity to tackle human perception of nature and resource, by changing perceptions about what it can mean to dwell poetically on a thriving earth.

1.4_Urban Issue

This growing rate of resource extraction has enabled humans to increase their mark on the earth’s surface. On the one hand, a kind of ‘void’ is created at the site of extraction, leaving desolate places usually on the fringes of city development. And on the other, vast blankets of urban development that engulf the remaining stretches of open space. The issue is therefore urban sprawl, together with the resource extraction that is needed for its implementation.

The site of the dissertation, located in Monument Park, Pretoria, is a very unique case. An old brick quarry, decommissioned two decades ago, is located in the middle of a suburban residential area. Both aftermaths of resource extraction are displayed here. As a result of the quarrying process, a dolomitic water source was struck, and a dam was created. Although Black Wattle trees, planted during operation of the quarry, spread throughout the site, many indigenous bird and insect species settled, and new ecosystems were formed. Being located so close to reserves like that of Groenkloof (to the north-west) (figure 1.4) and Rietvlei (to the south-east), the site has the potential of having a significant contribution to the biodiversity and open space network of the Tshwane Metropolitan area.

At the present stage, however, the post-industrial site itself offers little to no value to the surrounding community (it is also seen as a crime risk), and plans for further residential development (continued sprawl) has already been proposed for the site². If these prospects for development come to fruition, the latent potentials present in the site will be lost, and the monotonous nature of current suburban sprawl will merely continue. This will become more of a pressing issue in the face of rapid urbanisation. The need therefore arises to harness the latent potential of the various systems on site in order to mitigate further sprawl, and to support new forms of production as alternatives to the current plundering industry.

3

The development proposal for the site is discussed in the Context Chapter.



fig. 1.4 _Photograph of the Rosema & Klaver brick quarry in Monument Park, 1930's
[Rosema & Klavers Pty Ltd]



fig. 1.5 _Map showing site in relation to Groenkloof Nature Reserve
[Author, 2013]

1.5 _Architectural Issue

“Building and thinking are each in its own way, inescapable for dwelling.”

Leach, 1997: 109

In the search for poetic dwelling, the dissertation looks at two theoretical aspects: that of ‘building’, or *bauen*, as defined by Heidegger, and the ‘garden’, as defined by Harrison. Architects are expected to ‘think’ and be continually critical about how to build, which in turn requires critical thought about what it means to dwell, and how that dwelling happens spatially in the garden of the environment.

In the eyes of suburban dwellers, post-industrial sites are largely unfavourable entities in the urban fabric, and like the old brick quarry in Monument Park, they are seen as threats to the safety of suburban living. Their contribution to the needed regeneration of the surrounding context seems very little, as they usually become inaccessible to the general public. The architectural meaning and use of these sites, of both their histories and futures, is thus problematic (figure 1.5).

Finally, the phenomenological experience of the environment (or the garden) is, according to Harrison (2008:264), veiled by the drive of consumption. The present built environment is thus not seen as what it mostly is: a landscape merely produced for human habitation and consumption, instead of a garden for poetic dwelling. People are currently disconnected from their direct environment, and part of the architectural question is whether architecture can act as a tool to reconnect human experience with environment.



fig. 1.6 _Photograph of the ruins of the drying kilns at the Monument Park site
[Author]

1.6 _The Question

How can architecture, in viewing the earth as garden, help to heal and regenerate a suburban industrial heritage context, as well as experientially reconnect its communities with their direct environment?

1.7 _Sub-questions

What can be done about the sterile nature of the suburban landscapes, and what could their role be in a regenerative city?

What relationship can building, as extension of poetic dwelling, have with garden, as place for poetic dwelling, for people to, through biophilic experience, reconnect phenomenologically with their direct environment?

Is it possible for the inhabitants of these environments to tap into the resources at their disposal, within respectable limits, and contribute to the 'gardening' of their immediate area?

Can the spatial and experiential attributes of a garden, as described by Harrison (2008: 62), act as mechanisms in the making of architecture that has spatial hierarchies, tangible discovery, relevant function and material composition?

Can architecture, while expressing sensitivity in the use of extracted resources and products, accommodate new forms of production and cultivation in a context that resulted from an industry that is no longer sustainable?

1.8_Hypothesis

It is proposed that the disconnect between us as humans and our environment can be alleviated through an architectural solution; one that achieves a synergy with the environment it sits in, and allows users to experience it concretely and poetically. Even more, by recognising our biophilic³ functions, the architecture can accommodate not only a real appreciation for life, but an engagement that can physically heal and prevent ailments of our many different ‘modes of being’.

By facilitating small-scale production that is safe and accessible, the architecture can aid in the process of decentralising industry in the context of Tshwane, while enabling the local community to contribute in the regeneration of a suburban area. This will be done with a form of production that is dependent on resources mainly accessed on site, resulting in a new form of industry that is true to the place. The architecture will also achieve this with strategic placing of the building and material selection.

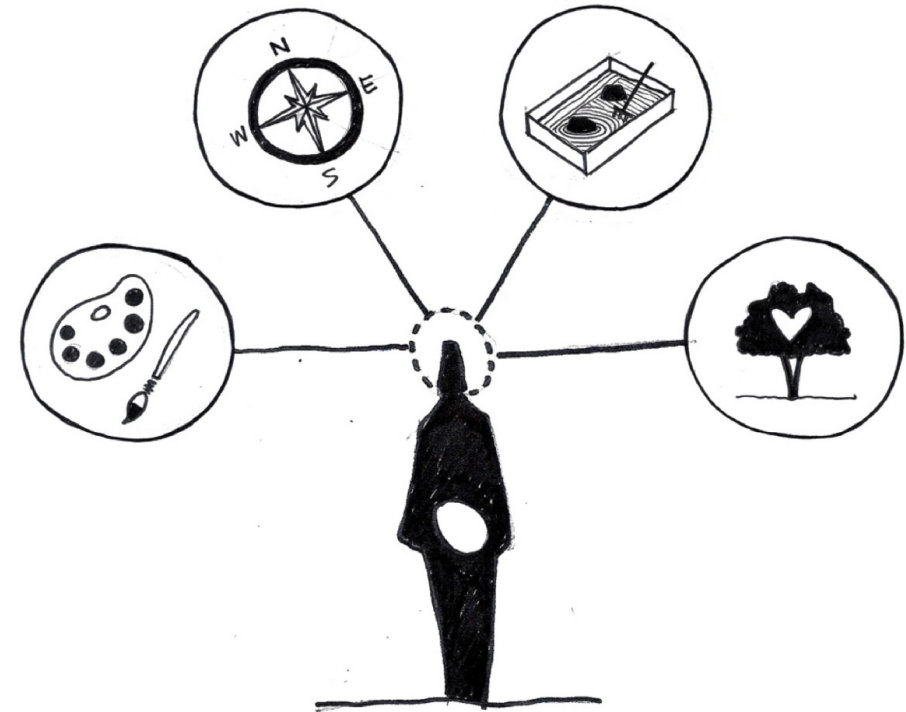


fig. 1.7 _Illustration of the different aspects of the *garden* as defined by Harrison
 [Author, 2013]

It is proposed that the essential attributes of Harrison’s garden, that being contextual orientation, creative expression, a place of sanctuary, and biophilic experience (figure 1.6), can be expressed, captured and celebrated in an architectural work. The life that gardens generally accommodate, including people, can have concurrent presence in designed and thoughtful space, and this can be achieved within a piece of architecture. With the garden as metaphor and over-arching program, gardening becomes the primary role of both the designer and the end user; the earth’s surface is thus seen as a dwelling place that is sustaining, life-giving and fruitful.

3 The term ‘biophilic’ is described in the Theory Chapter



fig. 1.8 _Site within surrounding context
[Author]

1.9 _Objective

The site that had been identified for the dissertation is located in Monument Park, which is located South-East of the CBD of Pretoria (figure 1.7). It is the old brick quarry and factory of the previous owners of brick-making firm Rosema & Klaver. The suburb of Monument Park developed all around the edges of the site, while the site itself was left open. The objective of the dissertation is to unlock the regenerative potentials that lie on the site and in the surrounding area in order to not only give life to the now derelict piece of land, but to also contribute to the resilience of city as a whole.

The dissertation aims to introduce a new form of production that is small-scale, humane, nurturing and cultivating. Where industry previously dominated the natural landscape and its processes, the new proposal will make use of on-site resources in such a way that gives back more than what is taken out.

The main objective of the dissertation is to investigate the possible healing of Heidegger's 'modes of Being', of both the site itself and the people in the community. It will do so by means of an architectural intervention that, as a surgical mechanism, improves the soil fertility, plant diversity and social significance of the site. The chosen programme for the dissertation is the production of herbal medicine, extracted and produced from these plants. Additional programmes will also form part of the proposal to accommodate the large size of the site, but all these will depend on the medicine production. For the community, the architecture will aim to provide tangible experience, of biological life and its importance for human existence, reconnecting people to place in a phenomenological and biophilic sense.

Principles of Regenerative Design⁴ will be used throughout the scheme as a driver for decision-making. The story of place associated with the site is a crucial component in facilitating an experience that is authentic to the context and its history. Systems thinking views all elements as an interdependent whole, and takes into account that the origin, flow and use of resources have various affects even beyond the borders of the scheme. The thesis will also take an ecological view, as the design regards humans and the built environment as part of the natural world and its processes. But above all, the design will aim to have regenerative value, giving back more than it takes away. This principle will be the main decision-driver and intention in making the architecture.

4 These principles will be discussed in the Theory chapter.

1.10 _Delimitations

It is not the aim of the dissertation to propose a new way of thinking about sustainability, but to explore the use of principles of regenerative design.

The nature of the entire programme causes the scheme to become too large for a single thesis to design. A certain part of the site/programme will be selected to design to a detail level, and the remaining part will be designed to an 'urban' level; that is, one satisfactory for the response and explanation of the urban vision for the entire site.

Also, the selection of plants for the dissertation will not be a detailed proposal for the entire size of the scheme, but will focus on the building that is to be designed to a detailed level.

Material choice for the construction of the building will take cognisance of the original brick-making process, but will not be restricted to the use of bricks as the main building material, if other materials are deemed more suitable.

1.11 _Assumptions

It is assumed that the soil conditions on the south eastern corner of the site (close to the where the clay was extracted) are suitable for construction. The soil is predominantly clay of decomposed shale that is not too expansive (figure 1.9), and of good quality for building material (rammed earth).

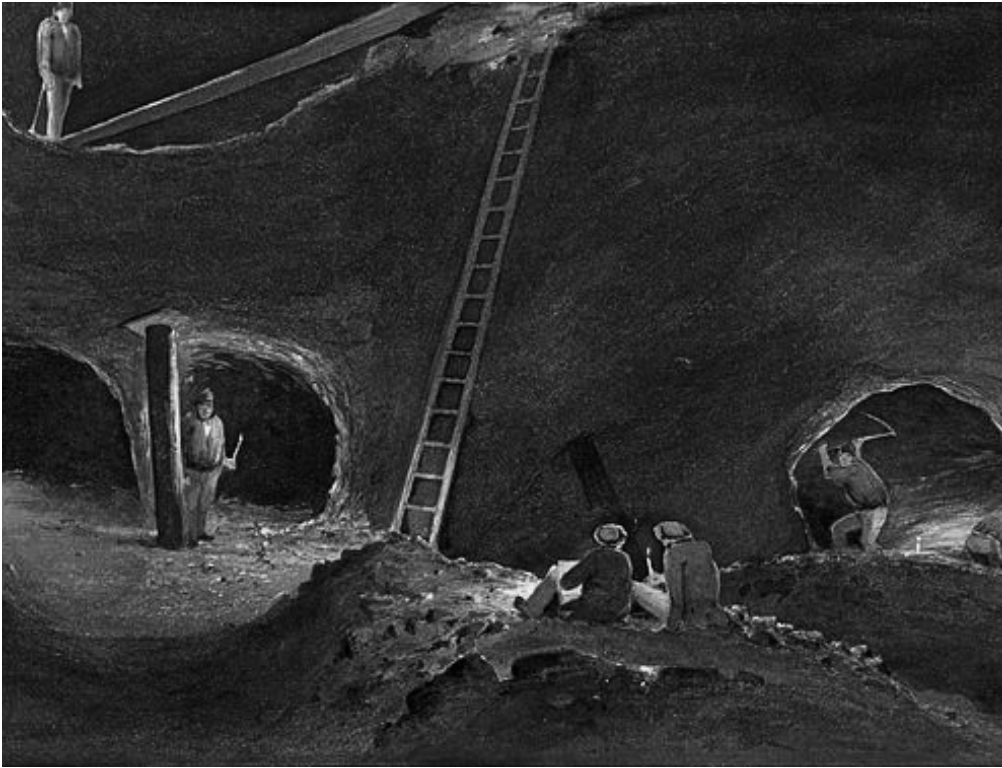


fig. 1.9 _Sketch painting of miners stoping at the Burra Mine, Burra, Australia, 1847
[[http://www.quickwiki.com/en/Stopping_\(mining\),_miners_in_the_burra_mine,_australia](http://www.quickwiki.com/en/Stopping_(mining),_miners_in_the_burra_mine,_australia)]



fig. 1.10 _Clay on eastern part of the site
[Author, 2013]

1.12 _Definition of terms and concepts

REGENERATIVE DESIGN

It is distinguished from the term 'sustainability' in that it does more than merely meet the minimum standard of ecological, social and economic responsibility, but, like in medicine, where new cells can be activated to regenerate dead tissue, it seeks to add more value, significance and life than whatever is removed.

RESILIENCE

As an acknowledgement that the social-ecological systems of our world are constantly changing, resilience thinking assumes these systems to be adaptive and complex, and loaded with different "meanings, interpretations and value positions" (Wilkinson, Porter and Colding, 2010:36). Resilience in these systems is therefore the amount of change and adaptation that the system can sustain, without collapsing or losing its functional identity. For the dissertation, resilience is deemed to be achieved through the decentralisation of industry.

BIOPHILIA

As coined by the Harvard biologist, Edward O. Wilson, it is "the genetic basis for the human predilection towards the natural world" (Stairs, 2010:339). Although, according to Arnold Berleant, human needs include those of spiritual (aesthetic) character and are not limited to the physical environment (Stairs, 2010:344).

DWELLING

As defined by Heidegger as the act of dwelling poetically, in direct relationship with building and thinking (Leach, 1997: 109).

LIFE

As defined by Hans Jonas, the view of the primordial human, life as a phenomenon that permeates all things, even the inanimate, as it is "so intimately intertwined with the dynamics of life that it seems to share its nature" (Jonas, 1966: 7).

GARDEN

As defined by Robert P. Harrison, "first and foremost places where appearances draw attention to themselves, presenting themselves to us as freely given." (Harrison, 2008: 82). It: "courts the presence of the surrounding context"; exists to "re-enchant the present"; is to agriculture what poetry is to prose; is ritualistic, ludic, magical and aesthetic; facilitates human needs and not just animal needs.

SUBURB

An outlying district of a city, especially a residential one.

[Oxford Dictionary of English]

CONSUME

eat, drink, ingest;
b) (resource) use up.

[Oxford Dictionary of English]

CULTIVATE

- prepare and use for crops or gardening
- break up (soil) in preparation for sowing or planting
raise or grow (plants)
- [Biology] grow/maintain (living cells or tissue) in culture
- try to acquire/develop (a quality or skill)
- try to win favour/friendship from someone
- try to improve/develop (one's mind)

[Oxford Dictionary of English]

INDUSTRY

[mass noun] Economic activity concerned with the processing of raw materials and manufacture of goods in factories.

[Oxford Dictionary of English]

PRODUCTION

[mass noun] The action of making or manufacturing from components or raw materials, or the process of being so manufactured.

[Oxford Dictionary of English]



_chapter 2

t h e o r e t i c a l
the gaping of eyes

fig. 2.1 _Waterfall scene from Terrence Malick's 'The Tree of Life'

Fair Quiet, have I found thee here,
And Innocence, thy sister dear!
Mistaken long, I sought you then
In busy companies of men;
Your sacred plants, if here below,
Only among the plants will grow.
Society is all but rude,
To this delicious solitude.

Andrew Marvell, The Garden (1681)

2.1_Preface

The dissertation investigates the phenomenological 'regenerative' potential of architecture in an urbanising world by proposing a return to the poetics of human existence. Biophilia and Spirit of Place, as two relevant aspects of regenerative theory, will be discussed as starting points, followed by Martin Heidegger's phenomenology of dwelling and Robert P. Harrison's critique on the human condition through emphasis on the philosophical attributes of the 'garden'.

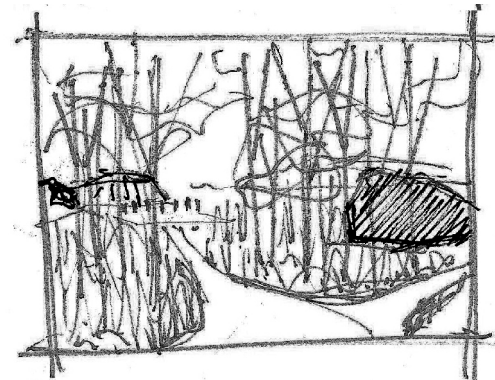


fig. 2.2 Vignette of route exploration
[Author, 2013]

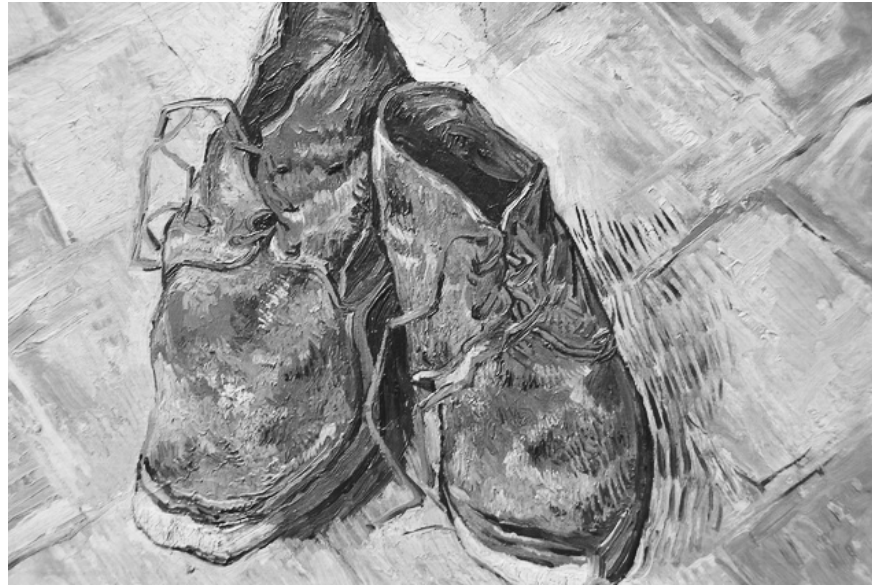


fig. 2.3 _Shoes, Vincent van Gogh, 1888



fig. 2.4 _Botanical sketch of Cestrum

2.2 _The Biophilic

Biophilia was coined by the Harvard biologist, Edward O. Wilson, who proposed it as “the genetic basis for the human predilection towards the natural world” (Stairs, 2010:339). David Stairs (2010:339) discusses the term’s development in the field of design, saying that although it was an unproved theory at the time, it was taken further by the intellectual community in the debate around climate change. Many of the writers he mentions bring their theories from a mathematic reductionist point of view, and Stairs claims that this merely draws a “constant parallel of dichotomies”, in which a split between ‘material’ and ‘spiritual’ is created (2010:342). The dissertation supports his argument in that although the human mind might have developed an ‘instinctive’ affiliation for the natural environment, which could serve as a mechanism for survival, the “unity of experience” is lost as soon as the human soul is taken out of the equation (2010:344).

Stairs (2010:343) cites Arnold Berleant (a phenomenologist), who saw the environment as “a dynamic perceptual/cultural system that assimilates person and place”. Berleant endorsed what he termed the ‘aesthetic community’, which “recognises the social dimension of environment and the aesthetic conditions of human fulfillment.” (Stairs, 2010:344). Human needs include those of *spiritual* (aesthetic) character and are not limited to the physical environment.

In his essay *The World of Perception*, Merleau-Ponty (2004:45) describes how this spiritual aspect of human nature can be experienced in our bodily relationship with objects (figure 2.3). When considered from an objective, scientific point of view, a lemon, for instance, can be described with various independent qualities, such as a round, bulging oval shape *plus* a yellow colour *plus* an acidic taste, etc. (Merleau-Ponty, 2004: 45). But this intellectual analysis is not satisfactory, as the lemon is in fact a unified entity of which the qualities are just different manifestations. The qualities, in other words, are in intimate dependence, and cannot be described separate from the reactions they provoke in our bodies (Merleau-Ponty, 2004: 46). He describes this as being ‘honeyed’:

“Honey is a slow-moving liquid, while it undoubtedly has a certain consistency and allows itself to be grasped, it soon creeps slyly from the fingers and returns to where it started from. It comes apart as soon as it has been given a particular shape and, what is more, it reverses the roles by grasping the hands of whoever would take hold of it.”

Merleau-Ponty, 2004: 46

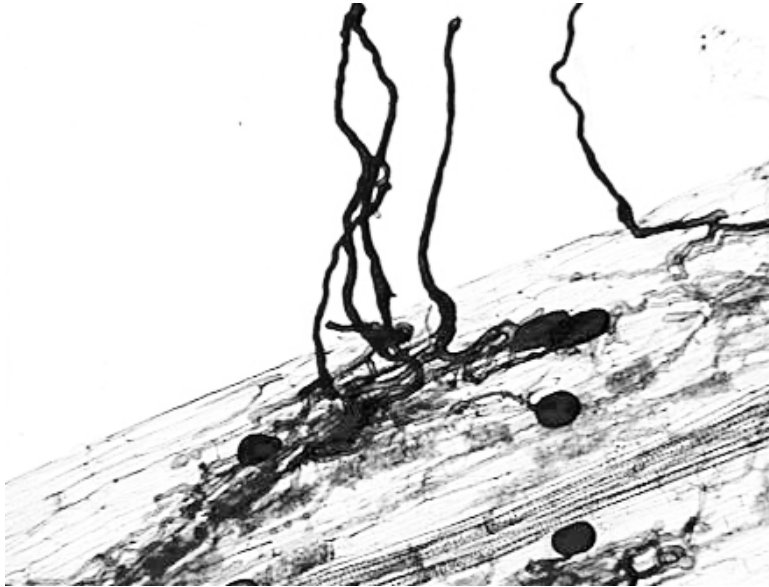


fig. 2.5 _Microscopical view of plant fibre

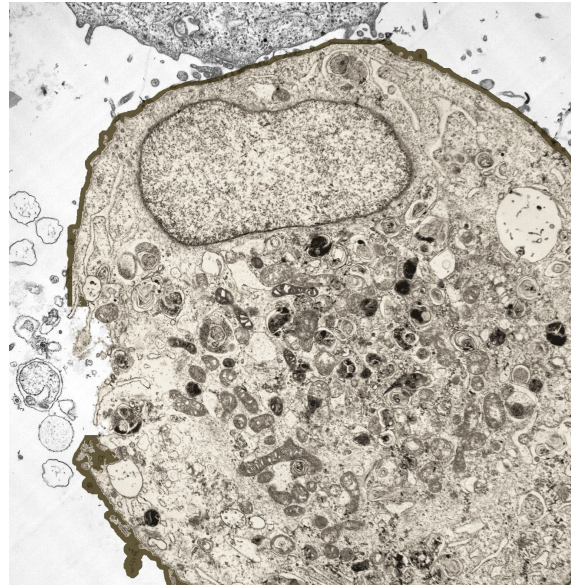


fig. 2.6 _Plant cell

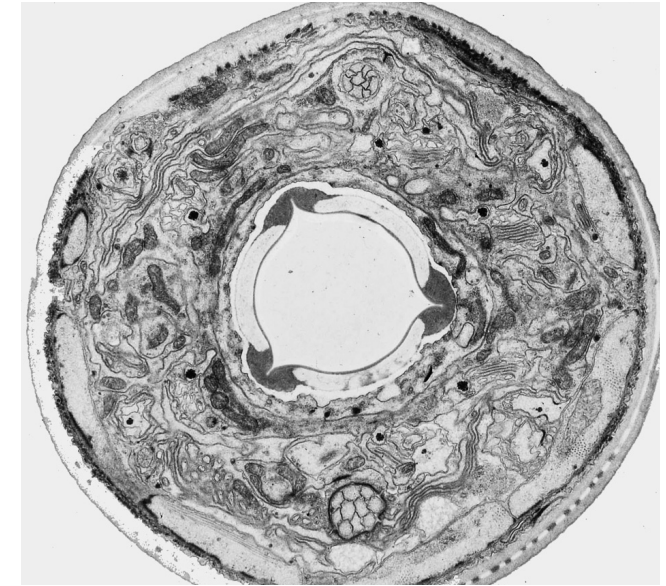


fig. 2.7 _Plant cell

This intimate unification of human perception is also upheld by the biological dependencies that our bodies share with our environment. Ian McHarg (1992: 44), in his book *Design With Nature*, speaks of an experiment that was done to try and understand what a human would fundamentally need to sustain his life in outer space. “The experiment design required a plywood capsule with a fluorescent tube representing the sun, a quantity of air, some water, some algae growing in water, some bacteria and a man.” The details of the experiment is not relevant here, but what was essentially created was a closed loop in every element that the human body would consume to survive: air, water and food. The loops were between the man and the algae, essentially, and the only import was light from the fluorescent tube, and the only export heat (1992: 45). A short description of the system is provided:

“The system depends first upon the sun, the net production of photosynthesis after respiration, upon the water and upon the cycling and recycling of the materials in the system by the decomposers.”

McHarg, 1992: 45

Plants are pre-human, describes McHarg, and their role is indispensable to our survival and vitality (McHarg, 1992: 46). “Indeed, all food, all fossil fuels, fibres, all atmospheric oxygen, the stabilisation of the earth’s surface and its terrestrial water systems, the amelioration of climate and micro-climate have been accomplished by the plant.” Plants, then, not only supply our bodies with what we need to live, but also create the conditions for all *life* to take place, in all its forms and processes (figures 2.5-2.7). It is thus not only in our perception that the plants in our environment find terrestrial meaning and irreplaceability, but also in the biological relationships that sustain our existence. We are in fact not so disconnected from life as the Western condition would like us to believe.

2.3_The Oikophilic

The 'Spirit of Place' can be traced back to the British Romantic painters of the 18th century, who reacted, with artistic media, against the scientific reductionism promoted by Newton, Descartes, Locke, Hume and Galileo (Yorke, 1988: 15). Galileo indeed claimed the "language of nature" to be "mathematics," as it was for him "no longer necessary to interpret its messages through poetry or myth". Yorke (1988:15) describes how these painters aimed to "smash the clock-work mock-up of the heavens, to put magic and mystery back into things." He continues with Neo-Romanticism, a return of Romanticism in the late 1800's and 20th century, in citing Peter Fuller, who noted that the artistic movement stands as an image of "man's reconciliation to himself, of reconciliation between man and man, and indeed, between man and nature" (1988:334). Most notably is the work done by these artists in the time of WWII, whose responses to Nazi invasion captured the 'spirit of place' in a most profound way (<http://www.vam.ac.uk>) (figure 2.9).

Fuller also called the values of the movement "conservationist, even conservative" (Yorke, 1988:344), endorsing its potential relevance in the Post-Modern world. *Conservatism*, although more 'modern' in its approach, shares this sentimental attachment to place. Roger Scruton expands on conservatism's interest in local solutions as aid to "maintain an inherited equilibrium that is both social and ecological" (2012:23). He describes this as 'oikophilia' (2012:26), which is "the love of the *oikos*, or household." In Latin form, this Greek word appears in 'economy' and 'ecology', which relates it with the interconnected character of Berleant's aesthetic community (Stairs, 2010:343), as a "unity of individual and social in which neither dimension dominates but each enhances the possibilities of the other."

Human beings have thus not only an individual affiliation for life, and this on a universal scale, but also a love for the regional environment, which is made *household* by the presence of other individuals (figures 2.10 & 2.11).



fig. 2.8 A Recess near the Eye Where Little or No Part of the Sky Is Seen, John Constable, 1823



fig. 2.9 A Ruined Cottage, John Piper, 1941



fig. 2.10 Photograph of vegetation on eastern part of the site [Author, 2013]



fig. 2.11 Photograph of ruins on site [Author, 2013]

2.4_The Poetic Returns

...Deserving, yet poetically,
 we dwell
 on this earth...

Friedrich Hölderlin - In *Lovely Blue* (in Leach, 1997:111)

In the quest of understanding the human condition, this excerpt from Hölderlin's poem *In Lovely Blue* serves as an illuminating lens. For the purposes of the dissertation, Martin Heidegger's phenomenological analysis of this poem proves sufficient (figure 2.12).

As poetry is essentially, according to Barfield (1928:35), quoting Coleridge, "the best words in the best order", and consequently "the best language", Heidegger's understanding of *dwelling* is embedded in his notion of *language*. He calls language the 'House of Being' (Norberg-Schulz, 1976: 432) and says that "man dwells in language". Norberg-Schulz (1980:22) notes dwelling "to be at peace in a protected place", and he relates it to that which is 'known' or 'habitual', thus the close similarity of the words 'habit' and 'habitat'. As man dwells in language, language itself can become 'equipmental' (Heidegger, 2002:14), and merely taken for granted, as the fish not noticing the water.



fig. 2.12 _Martin Heidegger at his well



fig. 2.13 _Martin Heidegger's hut



fig. 2.14 _Green Romanticism

The earth is where dwelling takes place, and as in language, it is possible for humans to dwell ‘unpoetically’¹. But the poet does not merely use words up, but in such a way that words “become and remain truly” words (Heidegger, 2002: 25). Poetry, according to Heidegger, essentially lets us dwell, as “poetry first causes dwelling to be dwelling” (Leach, 1997: 111).

Furthermore, in his essay *Building, Dwelling, Thinking* (Leach, 1997: 104), Heidegger identifies dwelling with the German word for building, *bauen*, which linguistically relates to the words for ‘to dwell’ or ‘to be’ (figure 2.13). Building, in its very nature, is a ‘letting dwell’ (Leach, 1997: 108), but it is in turn firstly being capable of dwelling that enables the capability of building. How we build, in other words, is the reflection of how we dwell, and how we dwell the enablement of how we build. Architecture, notes Norberg-Schulz (1980: 23), “belongs to poetry, and its purposes is to help man to dwell.” (figure 2.14). It can therefore be seen as *poetic building*.

1 It must be noted that Heidegger claims language in its own nature to be poetical (Norberg-Schulz, 1976: 434). Does the poet, then, base his thesis on a lie? Heidegger answers ‘no’, in stating that dwelling can only be unpoetic if it is in its essence poetic. “For a man to be blind, he must remain a being by nature endowed with sight” (Leach, 1997: 118)

2.5_The Unpoetic Present

Hans Jonas (1966: 7) describes the pre-historic perception of the direct environment, where “on the terrestrial scene, in which experience is reared and contained, *life* abounds and occupies the whole foreground exposed to man’s immediate view” (emphasis added). Lifeless matter was scarcely perceived, as even those elements that we now see as inanimate were “so intimately intertwined with the dynamics of life” that it seemed “to share its nature.” The development of rational thought in the Western canon, however, brought to our modes of perception a tremendously enlarged universe, which resultantly became “a field of inanimate masses and forces which operate according to the laws of inertia and of quantitative distribution in space.” (1966: 10). Stairs (2010:343) states that nature and culture, body and mind, material and spiritual, were misleadingly “dichotomised”, and humans are now viewed as separate from their environment.

The continued obsession with mathematical, scientific analysis required objectivism, and a forced removal of our human experience from the perceptual field (Jonas, 1966: 10): “What remained is the residue of the *reduction* toward the properties of mere extension which submit to measurement and hence to mathematics”. (figure 2.15). The lifeless became what is knowable; the true and basic foundation of reality. ‘Life’ thus became the mystery, the puzzling phenomenon that somehow entered our lifeless world.

In the current human condition, this reductionist view had engulfed our perceptual lens. The prevailing culture in the globalising world is, according to Robert P. Harrison (2008: 261), one of *consumerism* (figures 2.16 & 2.17). Harrison (2008: 264) claims that cultural existence has become a “blind drive” in which consumption’s “dominant impulse is to perpetuate its own dynamism rather than to fulfill an end”. He says that Heidegger’s ‘emptiness of being’ is unacknowledged and resultantly “escaped” (2008: 263). Human dwelling has thus become, in a social sense, habitual and ‘equipmental’, and life (as defined by Jonas), like language, is merely used up:

“The more we succeed in turning the earth into an inexhaustible inventory for human consumption, the more we abandon the postlapsarian vocation of care that turned human beings in cultivators of the mortal earth, as well as cultivators our mortal modes of being on the earth.”

Harrison, 2008:264 (emphasis added)

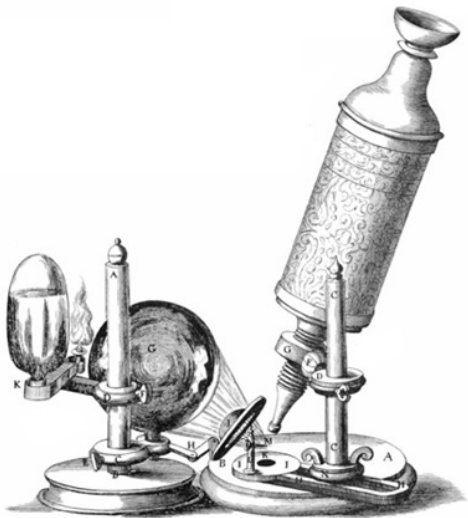


fig. 2.15 _Robert Hooke, first microscope



fig. 2.16 _Illustration of consumer culture



fig. 2.17 _Spoons and cables, Hassan Sharif

consumption

- a) eat, drink, ingest
- b) [fire] completely destroy
- c) (resource) use up

cultivation

- a) prepare & use for crops/gardening
 - break up [soil] in preparation for sowing or planting
 - raise or grow [plants]
- b) [Biology] grow/maintain (living cells/tissue) in culture
- c) try to acquire/develop [a quality or skill]
 - try to win favour/friendship from someone
 - try to improve/develop one's mind

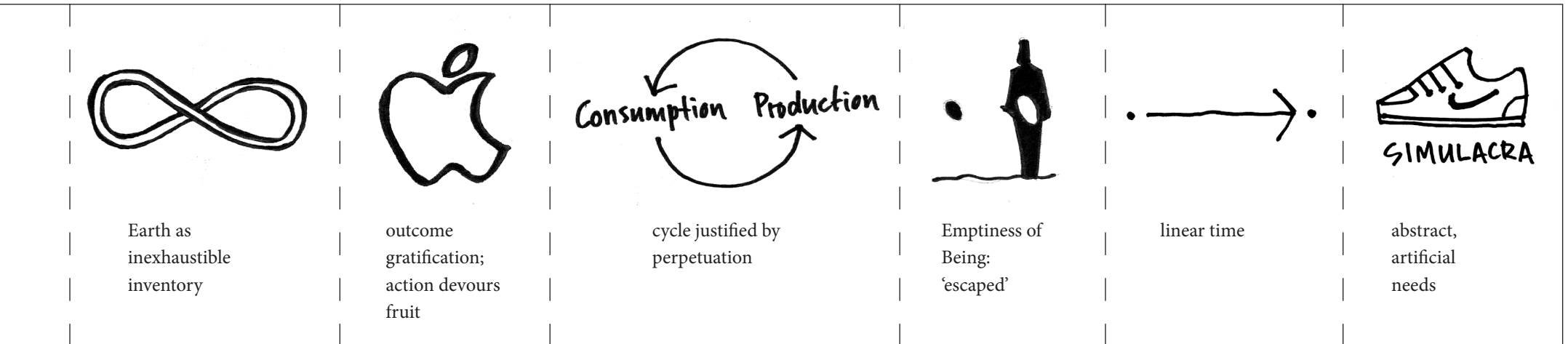


fig. 2.18 _Illustrations of consumption
[Author]

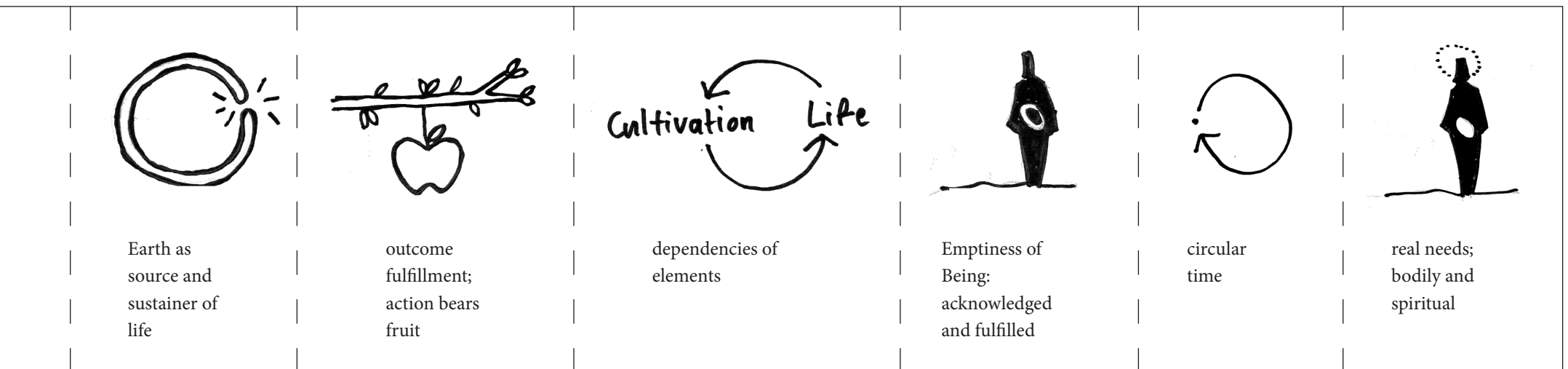


fig. 2.19 _Illustrations of cultivation
[Author]

2.6_Contemplating the Garden

It is precisely thus *cultivation* that Harrison advocates as not only the original province of human beings, but the remedial undertaking that can and should replace that of consumption² (2008:36). In his book *Gardens: An Essay on the Human Condition*, he claims that cultivation finds its fullness in the ‘garden’ (2008:264), and the restlessness in current culture testifies of the yearning to that original state and ‘gardening’ as the fulfilling occupation (2008:207) (figure 2.20). The Garden is, in other words, an artifact that points to the authentic purpose of humans in the arena of life.

It cannot be historically proven, but it is assumed that what gardening is to agriculture is what poetry is to prose, in the sense that gardening came before agriculture (Harrison, 2008: 61). The gardens of pre-historic people did not merely serve productive and economical purposes, but were ritualistic, ludic, magical and aesthetic (2008: 62). They were used for the procurement of “opiates, spices, hallucinogens or healing agents” to ultimately serve an “inert craving for humans to transfigure reality.” Gardens offer what the uninhabited environment does not: they make room for us, but also respond to “a set of human needs not reducible to animal needs” (2008: 63). Such needs are for creative expression; a sanctuary of repose; human, not just spatial expression; and our biophilia (2008: 65). The garden, together with its associated cultivation, thus fulfills those needs that consumerism only reduces to abstractions (2008:191).

² The parallel drawn between these two opposites do overlap, as one condition cannot completely replace the other. But the question is merely this: which condition is primary to our design? Are we ‘consumer’ or ‘cultivator’? ‘Scrounger’ or ‘steward’? ‘Parasite’ or ‘protector’?

GARDEN AS LINGUISTIC MARGIN

“Almost all the words for ‘garden’ in world languages have etymons linked to the idea of fence or boundary (figure 2.21). A garden is literally defined by its boundaries” (Harrison, 2008:86). Although the boundary keeps them “intrinsically related to the world” outside, human-made gardens are specific places in that they are experientially different from their exteriors. Owen Barfield (1928: 20) calls his experience with poetry ‘aesthetic imagination’, which he defines as a “felt change in consciousness”: ‘consciousness’ meaning an embracing of all awareness of one’s “surroundings at any given moment”, with ‘surroundings’ including “all feelings”; and ‘felt’ in that the “change itself is noticed, or attended to” (1928:21). Poetry in dwelling is similarly experienced. “Everlasting day can no more freshen the earth with dew than everlasting night, but the change from night to day and from day back again to night.” (Barfield, 1928: 25)

Barfield (1928: 25) quotes Santayana in saying that “men are habitually insensible to beauty.” The poetic, like in Heidegger’s habitual dwelling, is unfelt, ‘insensible’. But the poetic mood can be kindled by “the passage from one plane of consciousness to another” (1928:25). It is thus this change, and its associated *feeling*, that makes poetic experience possible. This is enforced by the garden.

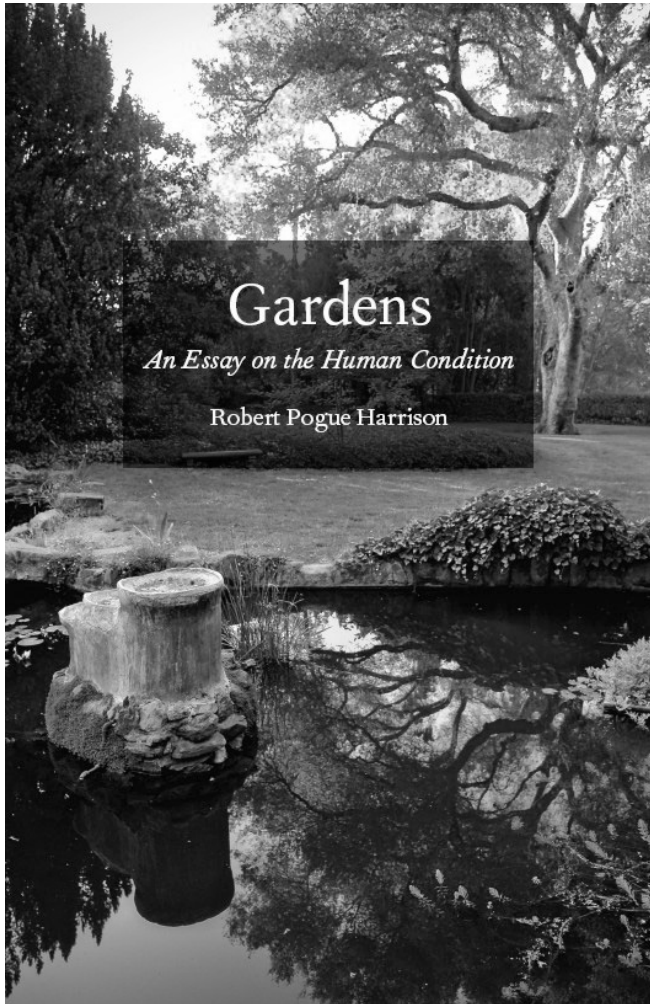


fig. 2.20 _Front cover of Robert P. Harrison's book, 'Gardens: An Essay on the Human Condition'



fig. 2.21 _Garden boundary



fig. 2.22 _Cultivating hands

THE VOCATION OF CARE

Gardens do, however, require a kind of cultivation loftier than that required by farm lands. Harrison (2008: 42) simply names this *gardening*. His description of the garden of Eden carries valuable relevance here (2008:14): As a gift, Eden could not be appreciated and enjoyed before the expulsion as it did not, in Adam and Eve's perception, require *work*³ (cultivation, protection, stewardship). The curse of the exile brought about mortal "limits", and this, according to Harrison, is what made us 'human' (mortality). Life suddenly mattered.

"Through Adam and Eve we lost a gift but earned a heart, and in many ways we are still earning our heart, just as we are still learning that most of what the earth offers - despite its claims on our labour - has the character of something freely given rather than aggressively acquired."

Harrison, 2008:15

3 It should be noted that it was Adam and Eve's perception of their responsibility toward the Garden that was misplaced, and not the vocation itself: "And the Lord God took the man, and put him into the garden of Eden to dress it and keep it" - Genesis 2:15 (KJV); and "every plant of the field before it was in the earth, and every herb of the field before it grew: for the Lord God had not caused it to rain upon the earth, and there was not a man to till the ground" - Genesis 2:5 (KJV)

There is, therefore, a paradox in current consumer culture: all practices are based on the will to recreate an Eden where "all desires are gratified", where no more work is required and human beings can be "unfettered consumers of goods, entertainment, information, and pleasures" (Harrison, 2008:261), while at the same time this very pursuit is "littered with ruins, corpses, and destruction", and "our attempts to recreate Eden amount to an assault on creation" (2008:262). Gardening, as embodiment of the joys of care-taking (2008:42), is what projects the human soul beyond mere gratification toward true fulfillment (2008:264), and it is therefore a pertinent endeavor in our current age.

In his description of the 'gardener', Harrison first refers to Eve: "Her hands... do the primordial work of shaping, sowing and fecundating. These same hands touch the doors between life and death, through which 'swirl the seeds' of what grows both in the soil and in the soul." (2008:36) (figure 2.22).



fig. 2.23 _Justin from Fernando Meirelles' 'The Constant Gardener'



fig. 2.24 _Holiness of dirty hands

Heidegger's opening of worlds within worlds, which is according to Harrison's theory the appearances of phenomena, needs to begin with the world at one's feet (2008: 47); a re-engagement with the substance humans originated from (2008:44), for "out of [the ground] wast thou taken" (Genesis 3:19) (figure 2.24). Our focus now shifts away from the fruits of life we've come to love so obsessively to the soil in which they find their birth (2008: 45), and for it to realise its "potential for fostering life", the soil needs an external agent to "undertake the labour of domestication and fertilisation" (2008:47).

The gardener is a year-round presence within the garden and a cultivator during all seasons (Harrison, 2008: 16) (figure 2.23). Enough duration should be given for the garden to seasonally grow into its cultivated form (2008: 11), and when it eventually achieves this, it has the ability to also (almost ironically) slow time down (2008: 61) as part of its power of 'enchantment' rather than 'endurance'.

Another important reason for ample time to be given is for *appearances* to be experienced. Harrison calls this the "temporal horizon" (2008: 191), where time allows the beholder to see phenomena become apparent. A space is provided for by the boundary, but time allows the soul to behold the life articulated in the garden (2008:85). When soul and garden are both present, a phenomenological conversion takes place: "the penumbral depths in question belong as much to the garden as to the mind or soul of the beholder. Where these two dimensions of depth encounter and flow in one another, the phenomenon makes its appearance" (2008: 188). Both time and space allow appearances to be felt, and this experience substantially depends on one's position in the garden, and also the time of day and year (2008: 80), and the appearances can thus embody various guises. The 'poetic mood' referred to by Barfield (1928:25) is thus not only felt in the change from outside-garden to inside-garden, but also within the boundaries of the garden itself.

Appearances_ the phenomenological conversion that takes place when both soul and garden are present (Harrison, 2008: 83). The eye moves beyond the surface of living forms to the depths in which they find their origins and from which they grow into “the realm of presence and appearance” (2008: 46). ‘Life’ essentially finds articulation, and things are seen as what they truly are (2008: 83).

Boundary_ is essentially the mechanism with which we ‘make room’ for ourselves in the world (Harrison, 2008: 63), and it speaks of *human* modes order (2008: 73). However, the garden itself does not “bring order to nature”, but to our relation to it (2008: 75). It is defined by its boundaries (2008: 86).

THE GARDEN/BUILDING RELATION

In the quest to answer the dissertation questions, of what relationship building should have with garden, and how biophilic experience can be enabled spatially, these different concepts of ‘space’ of both Harrison and Heidegger will be investigated in the architecture. For the latter, space as a ‘making room’ for ourselves in the world is done through *building* (Leach, 1997:102) , and for the former through the act of *gardening* (Harrison, 2008:63). Both enable humans, through phenomenological experience, to become poetic dwellers.

From this, the dissertation argues that the making of the architecture can be viewed as an act of gardening; that building, as a verb, forms part of the gardening process. Therefore, as a set of theoretical guidelines, four elements were extrapolated from Harrison’s investigation of the garden, with the aim to later translate these into conceptual scenarios that aid in making the architecture (figure 2.25). They are:

Time_ now that a space for appearances is provided by the boundary, ample time is still required. Harrison calls it the “temporal horizon” (2008: 191), where time allows the beholder to see phenomena become apparent. Time also needs enough duration for the garden to seasonally grow into its cultivated form (2008: 11).

Soil_ The notion of soil is Harrison’s (2008: 44) attempt to let man re-engage with the substance he originated from, for “out of [the ground] wast thou taken” (Genesis 3:19). The focus now shifts away from the fruits of life to the soil in which they find their birth (2008: 45). Heidegger’s opening of worlds within worlds needs to begin with the world at one’s feet (2008: 47). For the soil to realise its potential, it needs an external agent to “undertake the labour of domestication and fertilisation.”

The architectural significance of these will be expanded on in the Concept chapter.

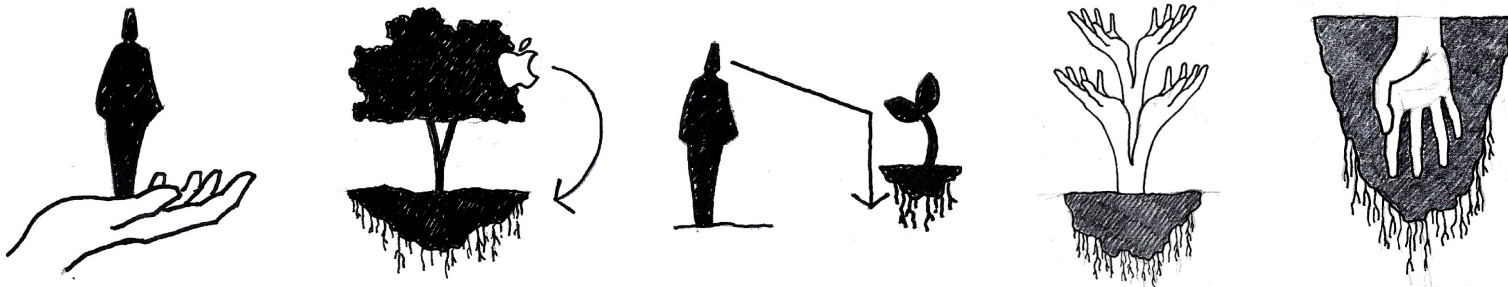
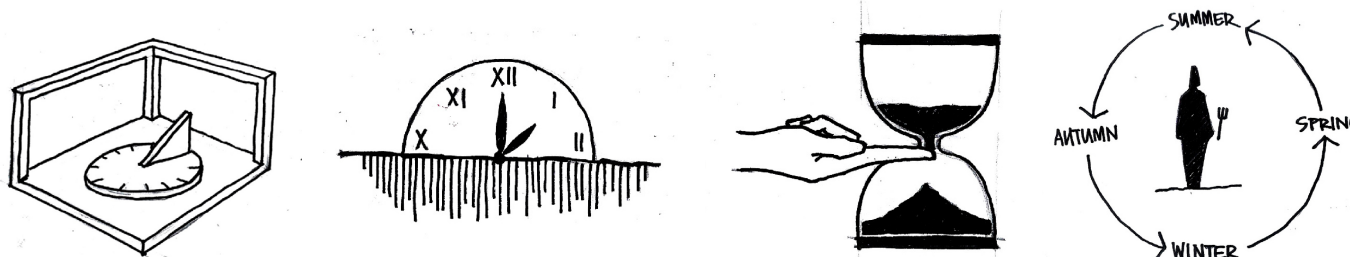
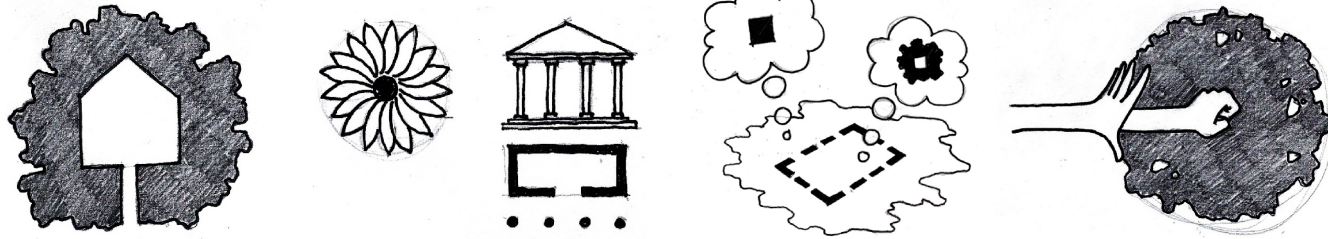
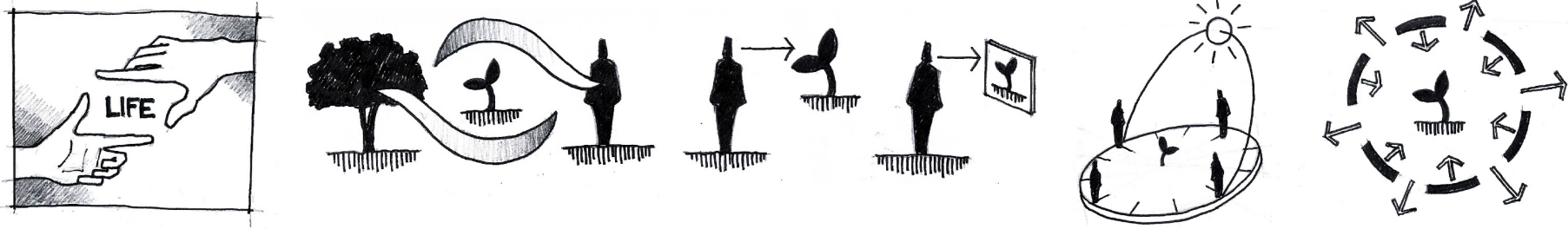


fig. 2.25 _Diagrams of Harrison's aspects of the garden [Author, 2013]



_chapter 3

c o n t e x t
the marking of bounds

fig. 3.1 *_Shadow scene from Terrence Malick's 'The Tree of Life'*

Beasts did leap and birds did sing,
Trees did grow and plants did spring.

Shakespeare, "The Passionate Pilgrim"

3.1_Preface

For the intentions of the scheme to have effect, the best kind of site to select is one blighted by the actions of consumer culture; a piece of earthly garden in dire need of care. In the suburbs of Monument Park lies a deserted brick quarry and factory, a historical artifact hidden by private ownership and 20 years of undisrupted spreading of invasive plant species. This chapter will highlight the importance of the place by telling its story, describing its current condition and accentuating its potentials.

This dissertation also forms part of a group of three architecture students and one landscape architecture student working on the site. A collective vision had been conceptualised and designed, and it will be presented in this chapter as a response to the issues identified in the context.

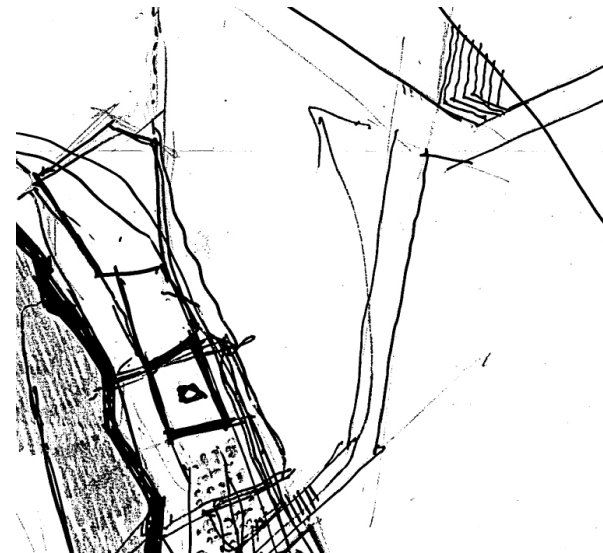


fig. 3.2 drawing from design investigation
[Author, 2013]

3.2_A story of place

Although no record was found regarding land use before industrial development, it is assumed that the site used to be part of one of the various farms around Pretoria. It did, however, provide a source for neighbourhoods to flourish. Clay was discovered here, and in 1930 Rosema & Klaver, a brick-making company, bought the land, which stretched from Waterkloof ridge (north) to just a few kilometres South of where the site is located today (van Dijkhorst, 2013). Mining started in 1933, and the company built a brick factory on-site around the same time (figure 3.3).

According to Hans van Dijkhorst (van Dijkhorst, 2013), a foreman who worked for the company for more than 25 years, the bricks produced at the quarry helped build many of the traditional face-brick buildings in and around Pretoria. The company grew, and because of Waterkloof becoming a desirable residential neighbourhood, Rosema & Klaver developed what is today known as Monument Park, which would essentially become an extension of the urban sprawl of Pretoria. Although the development was seen as an asset to the company (and to the city), the people who settled in Monument Park complained about the dust and noise caused by the quarrying process, and Black Wattle trees were planted on the edges as an attempt to solve the problem. The pressure from the community did however not cease, and a court notice was given in the 1980's that the quarry had 10 years to close down production.

Mining at the Monument Park quarry came to an end when an underground water source was struck, presumably located in a dolomitic chamber that sits under the shale layer (Dippenaar, 2013). This clean water had to be pumped out daily as the clay needed to be dry in the initial steps of the brick-making process. Mining thus became extremely uneconomical, and whatever good clay was left had to be forfeited to the soil's faithful reservoir.

In 1993 a labour strike caused the final closure of the quarry (van Dijkhorst, 2013). Most of the structures were demolished in the following years during the 1990's because of legal reasons regarding safety, but some parts of the structures are still in tact. These are now occupied by vagrants who manage to sneak past the security appointed by the current owner. The vegetation has, during the past 20 years, enveloped every piece of man-made structure.

Just as the story started with the site providing a resource that would enable the flourishing of neighbourhoods, so now the water provides a source for nature to thrive. Therefore, the story of this site is one of giving valuable resources. The question now is how humans can change their perception of resources so that it is not only taken from, but also how a partnership can be established between people and the resource of open space in order to foster a healing of the disconnect, while still acknowledging the history of the site.

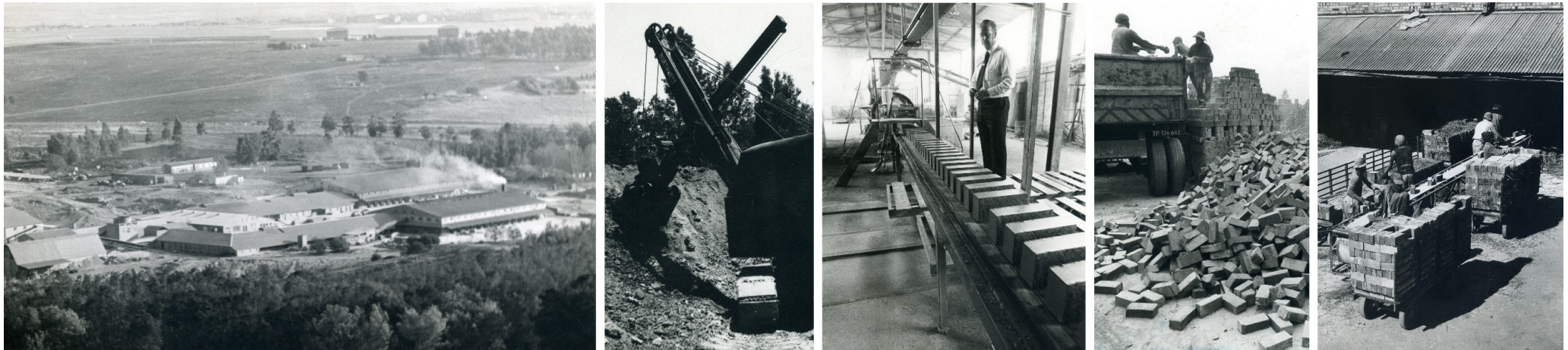


fig. 3.3_Photos of brick-making on site
[Rosema & Klaver (Pty) Ltd]

(a) quarry



The quarry itself was the first stage, where the clay was mined and piled into heaps.

(b) conveyor



From these heaps, the clay was transported via conveyor belt to a hammer mill.

(c) pugmill & filter



In the hammer mill the larger pieces of clay were fined, and then filtered to a powder.

(d) dust shed



The powder was sent to the dust shed, where it was sorted and then funneled onto a conveyor belt that lead to the wetting stage.

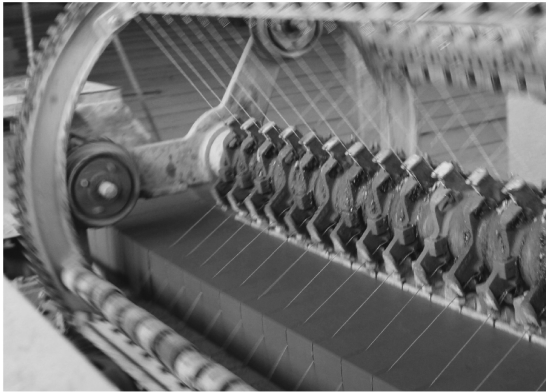
3.3_A story of making bricks

Rosema & Klaver had opened another brick quarry and factory in Pretoria in 1950, and built it as an improvement on the Monument Park model. It is located in Eersterust, and is still active today, at least partially. A visit to the quarry helped in understanding how production took place on site, and what the ruins that are now left over used to be, both functionally and materially (figure 3.4). Hans van Dijkhorst (van Dijkhorst, 2013) provided the information.

This process is a dying one. Contemporary brick factories use gas rather than charcoal, and machinery rather than manual labour. Van Dijkhorst (van Dijkhorst, 2013) claimed that in about ten years, the quarry at Eersterust will close down, and the process will be lost forever. It is therefore important to tell the story of what happened on site with whatever new intervention is proposed.

fig. 3.4_Illustration of brick-making process, compared to Eersterust factory [Author, 2013]

e) wetting & cutting



It here the clay was mixed with water to a consistency suitable for compaction and moulding. After moulding it is cut into the standard size brick, and then packed onto trays.

f) drying kilns



The wet bricks were sent into the drying kilns, which had hot air pumped from the baking kilns

g) drying kilns

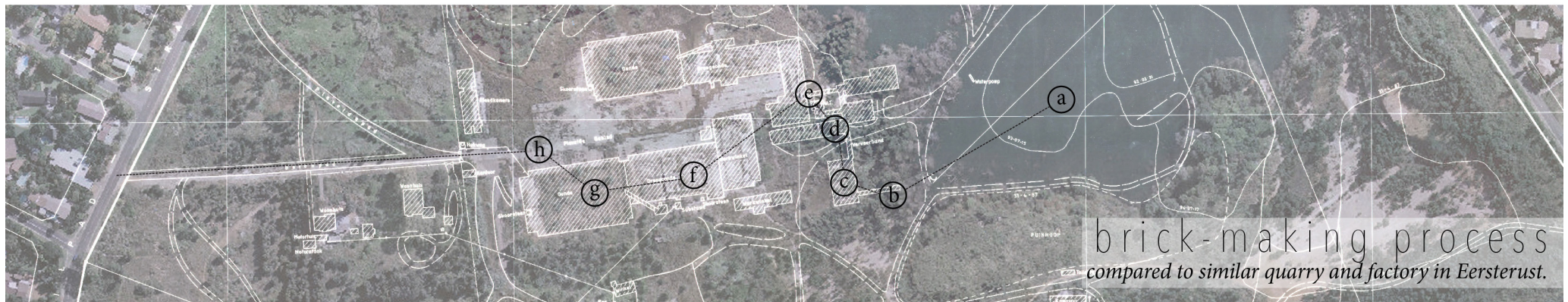


The bricks were then fired in the firing kilns, fed with charcoal.

h) loading



Finally, the baked bricks were stacked and ready to be delivered.



brick-making process compared to similar quarry and factory in Eersterust.

3.4_A story of value: Statement of Heritage Significance

According to the Burra Charter (1999: 1), “places¹ of cultural significance enrich people’s lives, often providing a deep and inspirational sense of connection to community and landscape, to the past and to lived experiences.” These places become “historical records” that act as tangible expressions of identity and experience. They tell us about who we are, and how our past informed us and the landscape we inhabit. Brick-making forms an integral part of the history of Pretorian architecture (Fisher, le Roux & Maré, 1998:123), and the industrial methods that existed informed not only the buildings in our city fabric, but also the processes that exist today, as well as the new ones of the future. Our industrial heritage is therefore a part of our cultural identity, and the places where industry took place give us tangible experience of that identity. The site at Monument Park can be viewed as a ‘cultural landscape’: A Pretoria industry of brick-making formed and altered what had been before, and the landscape in its current form depicts that phenomenon.

Article 5.1 (Burra Charter, 1999:4) indicates that the “conservation² of a place should identify and take into account all aspects of cultural and natural significance without unwarranted emphasis on any one value at the expense of others.” The site has cultural value, but it carries great natural value as well, bearing in mind the rich and valuable water source discovered during the quarrying process. The presence of the water has enabled the rapid spread of vegetation across the site, albeit mostly invasive, but this regenerative quality is of indispensable significance. In the case of this site, it is the cultural *fabric*³ that needs to be conserved, together with the *potential* of the natural system.

In the conservation of the existing ruins, two relevant methods have been identified. Firstly, *preservation*, “where the existing fabric or its condition constitutes evidence of cultural significance” (Burra Charter, Article 17, 1999:7). Secondly, *new work*, where new functions will be brought to the site, with the assurance that it does not distort or obscure the cultural significance of the place, or detract from its *interpretation* and appreciation” (Burra Charter, Article 22.1, 1999:7). The new work should also be identifiable as such (Burra Charter, Article 22.2, 1999:7). Another tool that the Charter grants in the approach to intervention is that of interpretation (Burra Charter, Article 25, 1999:8), as the cultural significance of the brick-making process is not readily apparent, and should therefore be explained by interpretation. This needs to “enhance understanding and enjoyment, and be culturally appropriate.”

1 The Burra Charter, Article 1.1 - Place means site, area, land, landscape, building or other work, group of buildings or other works, and may include components, contents, spaces and views.

2 The Burra Charter, Article 1.4 - Conservation means all the processes of looking after a place so as to retain its cultural significance.

3 The Burra Charter, Article 1.3 - Fabric means all the physical material of the place including components, fixtures, contents, and objects.

3.5_Physical attributes: beyond the bounds

The built fabric that surrounds the old quarry site in Monument Park is predominantly suburban, with residences of one to two storeys (figure 3.5). Within this fabric, some small-scale businesses have opened, especially along more active roads and closer to where the shopping centres are located. One of these was developed and opened by Rosema & Klaver, and it is located just north-west of the site. Skilpad Road connects it to the site, and functions as one of the main access roads from the north. It crosses with Olifant Road on the site's north-west corner, and the latter is the closest access to the R21 highway. Both of these roads currently accommodate buses and taxi's, with regular stops as indicated on the map (see figure 1).

A gated community is located directly South of the site. What used to be integrated with the rest of the Monument Park suburban community has been physically closed off, with a singular entrance for the control of vehicular activity. It is speculated that this area was closed off because of being physically neighboured by the old quarry site, seeing that vagrants regularly stay there. But the site has become a security risk for the local community, and most surrounding residences have put up high walls or fences as measures to prevent crime. The site is also fenced off, and inaccessible to the general public.



fig. 3.5_Analysis beyond the site (refer to group vision booklet)
[Élita van Graan, 2013]

3.6_Physical attributes: within the bounds

RUINS

Many of the structures were constructed of steel frames and corrugated sheeting, but these had been removed completely. The remaining structures are of brick and concrete, most of which are not suitable for re-use (figure 3.6). They do, however, have enough integrity to be preserved, where it is relevant to do so.

The brick-making process was very similar as what was seen at Eersterust, but different in layout and sizing of structures. The remaining fabric, being the only evidence of the past brick-making activity on this site specifically, carries significant value in telling the story of Monument Park's cultural past. The new intervention will have to facilitate these processes in becoming legible, accessible and subsequently celebrated.

Most of the fabric that still remains consists of ground floor slabs, foundations, basement structures and excavations. Most of these will need to be replaced where new functions are introduced, but the physical evidence on site together with the historical knowledge of the structures will need to be respected, as outlined by the Statement of Heritage Significance, by any new intervention.



fig. 3.6 _Photographs of
ruins on site
[Author, 2013]



fig. 3.7 _Comparison of inner city with site, church square highlighted
 [Author, 2013]

TOPOGRAPHY

Due to the quarrying conducted on site, the topographical features have been altered drastically. Where the surface of the site had a steady fall sloping to the west (figure 3.8), the quarrying leveled and deepened as operations carried on, and created a 30m level difference on the east of the site (figure 3.9). It is because of this that the water source was uncovered and the character of the site developed to its current state.

These topographical alterations are also interpreted as culturally significant, together with the structural ruins on site, as they contribute to the narrative of the industrial activity. The new topographical dynamic will be embraced as an opportunity for the new intervention, rather than an obstacle, and will also be viewed through the lens of the Statement of Heritage significance.

BIOLOGICAL LIFE

The site has been taken over by invasive species of trees and grasses (figure 3.10). This has had an influence on the PH balance of the soil, which hinders the growth and flourishing of many other plant species. The trees do, however, become homes for many different bird species, although they might favour some above others. Plant growth on site is very dense, and this strengthens the safety concerns of the surrounding community, as visibility is low. Most of the vegetation on site, therefore, will have to be removed and replaced by plants that will contribute to the biodiversity of both fauna and flora.

The ruins themselves have been enveloped and sometimes penetrated by the vegetation. This layer adds to the character of the place significantly, and also becomes an integral part of the story. Cognisance of this needs to be taken, especially when employing new planting strategies where the ruins will be affected.

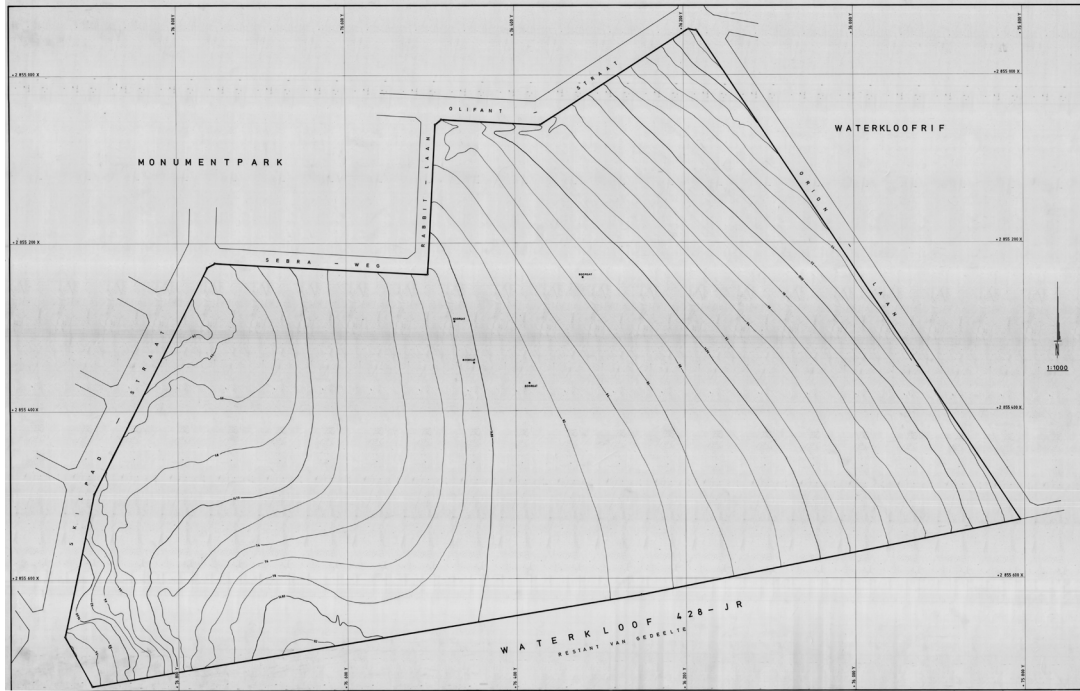


fig. 3.8 Original topography of the site
[Rosema & Klaver (Pty) Ltd]

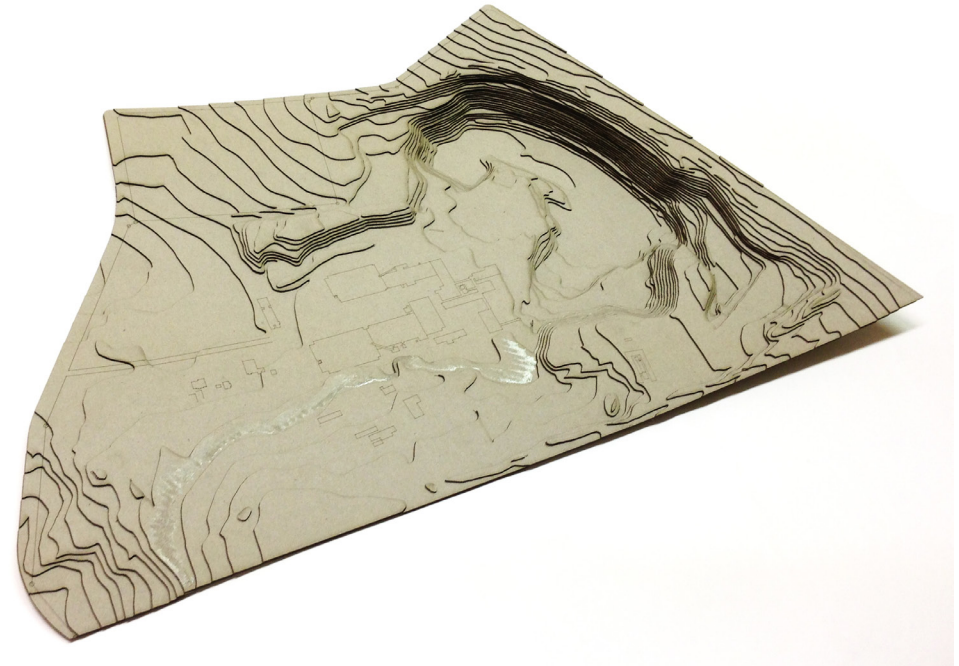


fig. 3.9 Current topography of the site
[Author and Silent Industry group, 2013]



fig. 3.10 Invasive plant species on site
[Ilze Labuschagne, 2013]

3.7_Silent Industry: Productive Park as Alternative Typology

CRITIQUE OF THE MARKET-DRIVEN DEVELOPMENT PROPOSAL AND REGIONAL SPATIAL DEVELOPMENT FRAMEWORK (RSDF) OF 2013:

A development proposal and an EIA report by Seaton Thompson and Associates was prepared for the site by Arcia Consortium in 2003. Architecture proposals were prepared by Nico van der Meulen Architects.

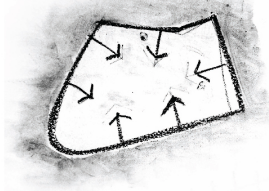
Also, the City of Tshwane proposed a new Regional Spatial Development Framework (RSDF), in which the site falls under Region 3. Three maps were identified as relevant to the site, namely the 'Open Space Framework', 'Nodal Development Plan' and 'Density Development Plan'.

In a collective effort by a group of three architecture students and one landscape architecture student, a critique was formulated for both the development plan and the RSDF. This is expanded on in a separate document compiled by the group, and more detail can be referenced there (Van Graan, *et al.*, 2013). Some issues originating from both these proposals and the current conditions of the area have been highlighted, and the goals of the collective vision were formulated as responses (figure 3.11).

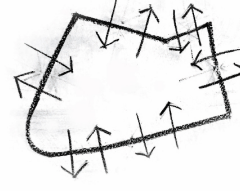
ISSUES

VISION

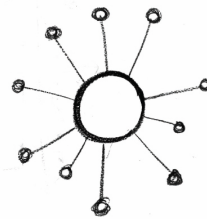
a developmental encroachment
There are currently proposals that the site be developed into a residential estate. The historical narrative of the site is not taken into consideration in this proposal, and if it is implemented, the homogenous nature of suburban sprawl will spill over cover the entire site.



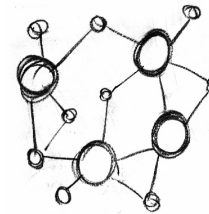
a establishment of amenity rich in use
New interventions will establish the site as a local amenity, as it provides necessary facilities and goods, as well as a place specific to its history and context. As a primary function, the site will become a place for recreation.



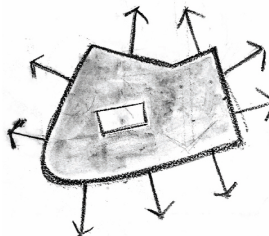
b centralisation of power & industry
Industry at present is primarily owned by singular organisations, and their models are focused on singular resources and processes. Because these models are expected to provide for the whole of the local society, the scale of production is immense, as well as the extraction of resources.



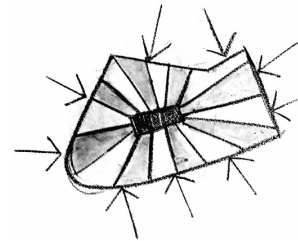
b decentralisation of industry
Programmes are selected to make use, within respected limits, of resources on site, while putting back more than taking out. Production will be small-scale and decentralised, and the surrounding businesses and community will be invited to contribute to the programmes. The collective programmes form a component integrated into a larger urban network of similar developments.



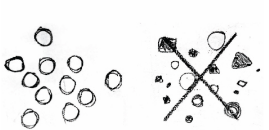
c no acknowledgement of industrial heritage & consequences
The abovementioned development schemes and the local community do not recognise the previous activities on the site, and how these have contributed to consumer culture. The current age is very different, and requires that things be done differently. An awareness of past mistakes is imperative for their consequences to be exposed.



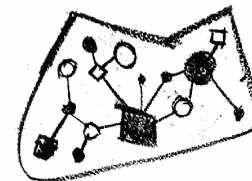
c acknowledgement/celebration of industrial heritage
New schemes will take the history and the existing ruins into account in the design of the new buildings. Past activity will also inform new processes, and will be reinterpreted into functions that offer a regenerative transformation on the site and the well-being of the surrounding community.



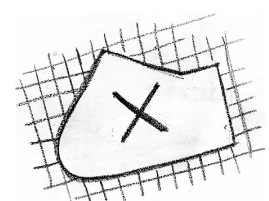
d conditions not optimal for bio-diversity
Because of the dominance of clay and Black Wattle trees, only certain types of plant species are currently flourishing. In return, this affects the biodiversity of fauna, including humans. Diversity in use and activity is also not enabled by the current state.



d introduce new industry connected to living systems
New processes will take cognisance of the lack of biodiversity, and will aim to establish a richer variety of both fauna and flora, and will base systems and processes on the enablement and support for these new eco-systems.



e alienation of community & terrain
The community is currently turning its back on the site. Visibility is minimal, and residents see the site as a safety risk, as it provides shelter for presumable criminals in the area. Also, the ownership is still in dispute, and contributive action as therefore prohibited.



e interventions enable integrated relationships
Contributions from the local community will be embraced, and some needs will also be provided for. The processes can be supported by micro-processes in the surrounding area, like in people's backyards, and be linked to these in a concrete and interactive manner. Connections with the site and the community are resultantly established.

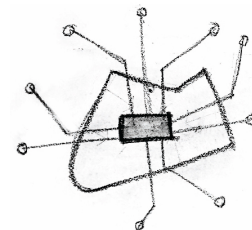


fig. 3.11_Issues identified and visions proposed
 [Author and Silent Industry group, 2013]

COLLECTIVE VISION_ GREEN NETWORK PROPOSAL

The site falls among a collection of recreational and ecological support parks, such as Groenkloof Nature Reserve and Rietvlei Nature Reserve, together with other large pieces of unoccupied ground with similar strengths as the Monument Park Quarry site (figures 3.12 & 3.13). It is proposed that the City of Tshwane embraces the opportunity to create an ecological support network, linking all relevant parks and reserves. This is an effort to protect the biodiversity of the Pretoria region, as well as establish a recreational amenity that all people of the region can enjoy.

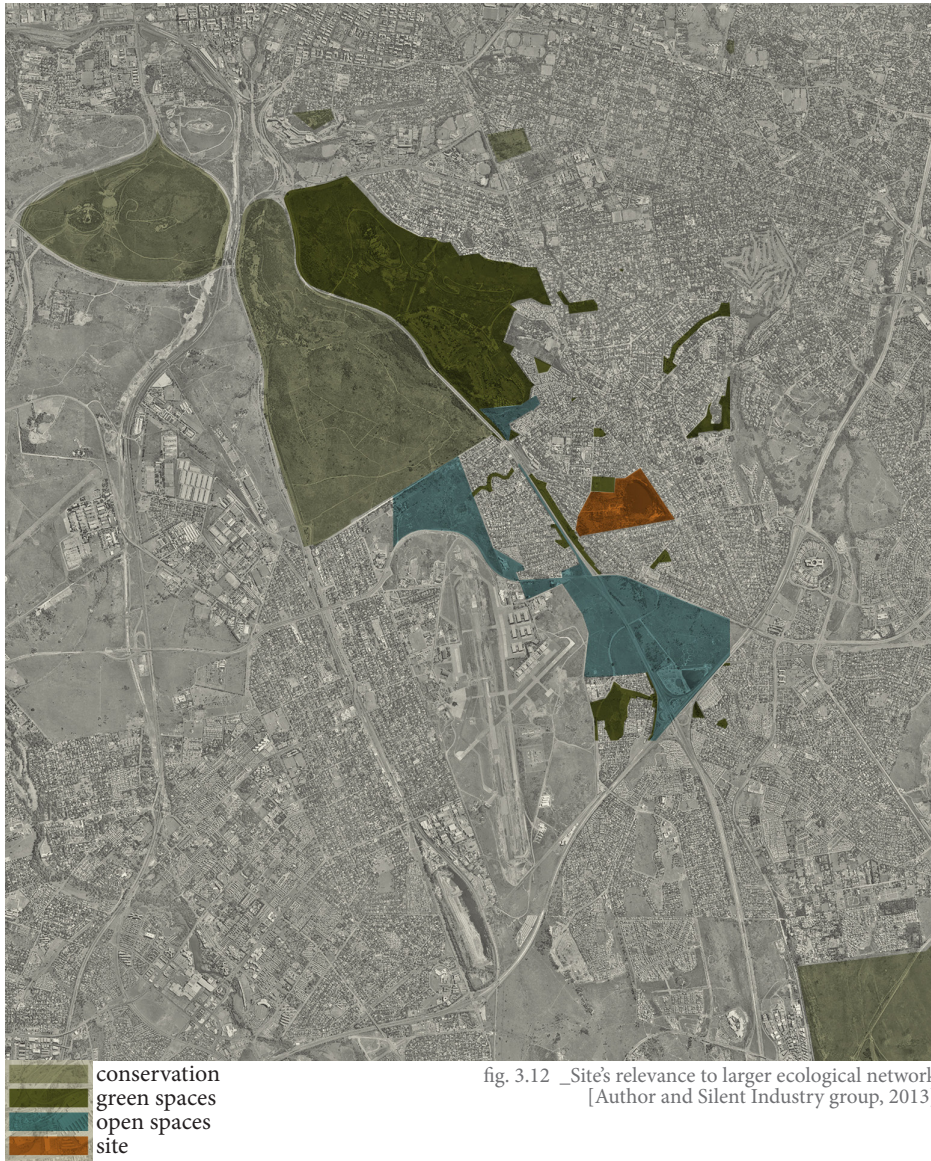


fig. 3.12 _Site's relevance to larger ecological network
[Author and Silent Industry group, 2013]

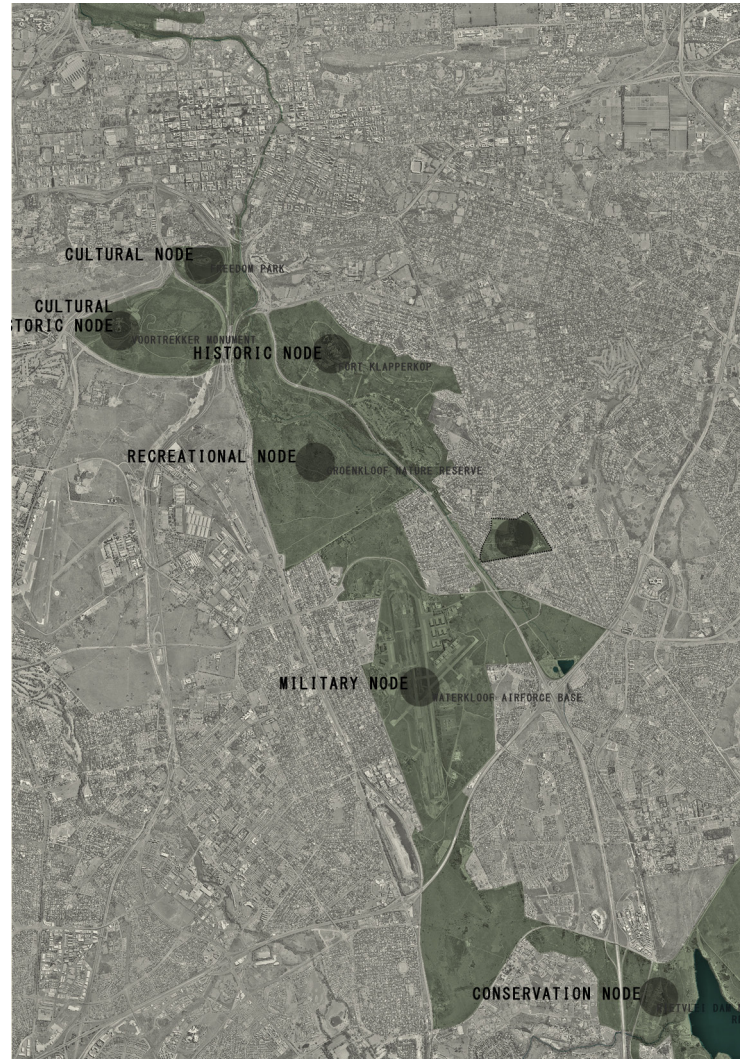


fig. 3.13_Larger ecological green network
[Author and Silent Industry group, 2013]

COLLECTIVE VISION_ PRODUCTIVE PARK PROPOSAL:

The following aspects were addressed in the design of the vision proposal as responses to the issues described above, together with the five points of the vision (figure 3.14):

- a) To establish the site as a park that the local community can use for recreation (informal) and leisure. This park will be rich in plant, bird and insect biodiversity, and people will be able to interact and enjoy the life on site in an engaging way .
- b) Establishing a core, or heart, for the site, where most of the activity will be concentrated. The purpose of this core is to give life to the site, and maintain an influx of users. Here, the production on site will be made accessible to visitors, as well the historical importance of the site.
- c) Introduce sensitive and passive water treatment systems to ensure that rainwater is not wasted.
- d) Physical and visual accessibility from all around the site, to help improve the safety of the surrounding area, and for the valuable aspects of the site, like the water source, to be accessed by the local community. Cycling and pedestrian routes will also be provided, to add to the recreational aspect mentioned above.
- e) A relevant response to the vehicular and pedestrian activity at the north-western corner of the site, which can include retail and office space, as well as a library and IT lab for the local area.



fig. 3.14 Vision for the site
[Author and Silent Industry group, 2013]



_chapter 4

p r o g r a m m e
the mandate of care

fig. 4.1 *_Ocean scene from Terrence Malick's 'The Tree of Life'*

“What is this quintessence of dust?”

Hamlet, in Shakespeare's Hamlet

4.1_Preface

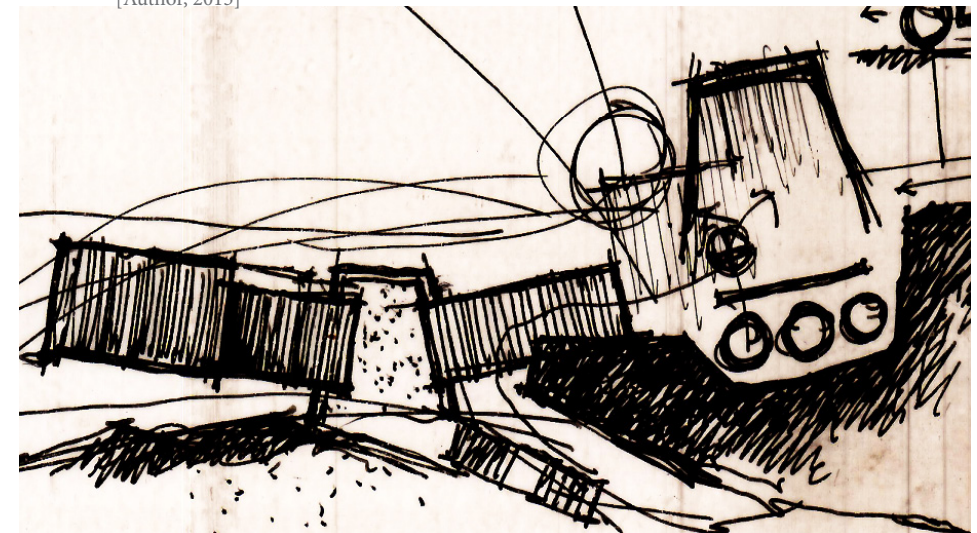
In light of the theoretical approach taken by the dissertation and its influences, the programme aims to synthesize the research objectives into a unified whole: The site is in dire need of healing¹, together with our perceptual 'modes of being' (Harrison, 2008:264) in the local environment, which includes the human return to the poetic and acknowledgement of our biophilia, and also the reconnection with community and place. The coalescing element is, borrowing from McHarg (1992), plants; particularly *medicinal plants*.

It is proposed that plants with medicinal properties relevant to the South African (and specifically Tshwane) context be introduced to the site - where these can be grown and cultivated - together with a facility that can accommodate the production of medicinal/herbal products.

As a model, the medicine production centre and garden of Margaret Roberts (<http://www.margaretroberts.co.za>) in Hartbeespoort served as guide for understanding the various facilities needed. The site is however very large, and in a context that requires a variety of functions. A clinic (for non-acute treatment), a plant nursery, a restaurant, and a research facility will support the herb production.. In addition, the scheme proposes a pottery workshop that will use the remaining clay on site to make pots for the nursery, and wherever else necessary on site.

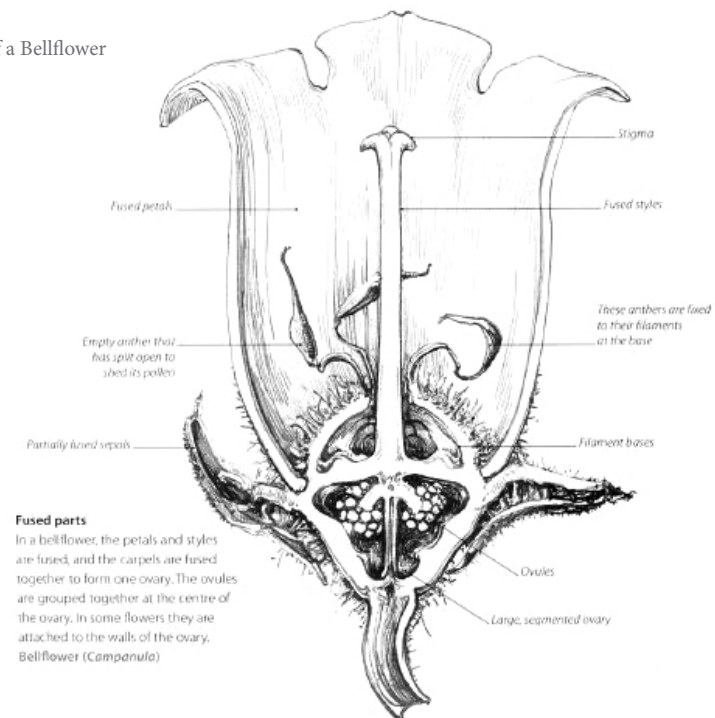
Considering the size of the overall scheme , it had been decided, for the purposes of the dissertation, that only the clinic and pottery workshop will be designed to a detailed level, with all other facilities proposed in terms of location and relationship to the rest of the site.

fig. 4.2 Drawing from plan development
[Author, 2013]



¹ This 'healing' should be viewed differently from 'restoration', which would mean, in the most extreme sense, that the dam on the quarry site be filled up to its original condition, or that before the beginning of clay-mining.

fig. 4.3_Botanical drawing of a Bellflower



4.2_The Medicinal Plant

“Southern Africa is exceptionally rich in plant diversity with some 30 000 species of flowering plants, accounting for almost 10% of the world’s higher plants.” (Van Wyk & Gericke, 2000:7). There is also great cultural diversity, with plants still as a part of the daily lives of many people, for “food, water, shelter, fuel, medicine and other necessities of life.” Van Wyk & Gericke claim (2000:119) that Southern Africa holds a range of around 4000 plant species that are used as medicines.

These remedies predominantly find their origins in traditional knowledge, and thus cannot be explained “from the reductionist perspective of Western science,” as they embody various “energetic, spiritual, ritual and symbolic aspects.” In the context of South Africa, a country that has experienced many changes in access to healthcare (Van Wyk & Gericke, 2000:7), as well as perceptions of what healthcare entails (Mander et al., n.d.:190), many stigmas around traditional indigenous practice are still prevalent. The dissertation proposes to facilitate a field of medical research and practice that acts as mediator between Western medicine and that of traditional cultures.



fig. 4.4 _Melianthus comosus



fig.4.5 _Echinacea purpurea



fig. 4.6 _Salvia Africana-caerulea



fig. 4.7 _Agathosma betulina



fig. 4.8 _Sutherlandia frutescens



fig. 4.9 _Scilla Natalensis



fig. 4.10 _Leonotis leonurus



fig. 4.11 _catophractes alexandri



fig. 4.12 _Aloe vera



fig. 4.13 _Chironia baccifera

examples of indigenous medicinal herbs

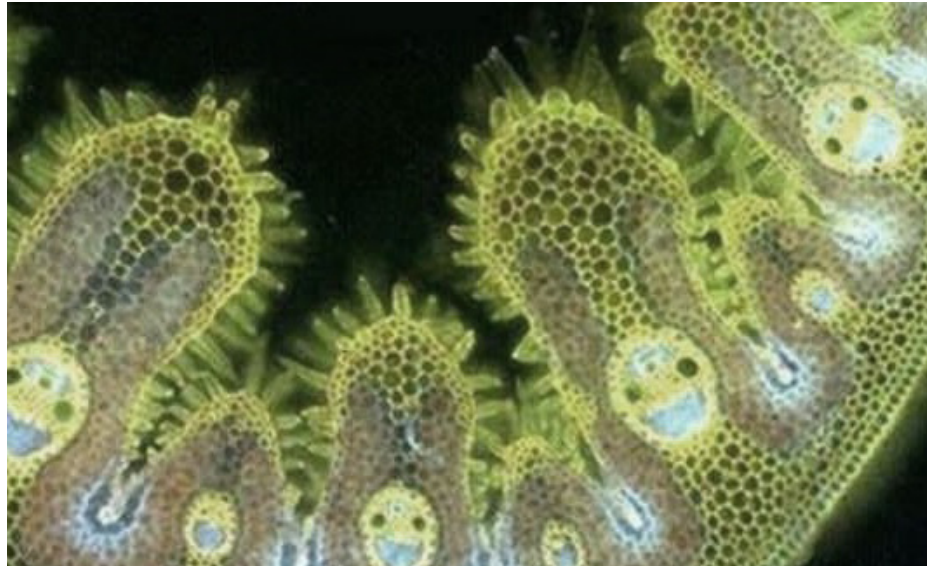


fig. 4.14 _Microscopic view of grass cells

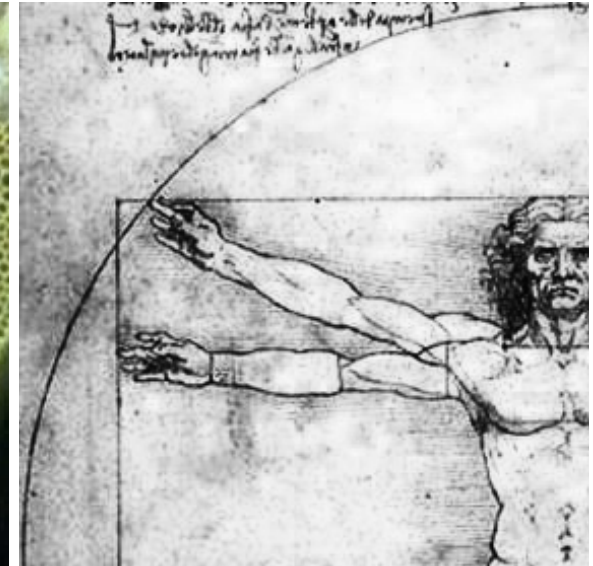


fig. 4.15 Leonardo Da Vinci's Vitruvian Man

4.3_Biophilia: the clinic

In a case study prepared by John M. Ochora (n.d.), he describes the implementation of a herbal clinic in Nairobi, Kenya:

“Patients suffering from such common diseases as those listed above plus diabetes, hypertension, ulcers and others were provided with herbal remedies and checks were made of their progress. Initially, some 100 people were treated, many of whom were referred to the clinic by modern health practitioners. Since then, the clinic has treated thousands of individuals.”

Ochora, J.M., n.d.:120

The purpose here is not to draw a comparison between the healthcare conditions of South Africa and Kenya, but to merely illustrate the plausibility of such a clinic in the area of Monument park. In the case study by Ochora (n.d.:125), it had been reported that “the herbal medicines have been effective and... free of side effects.” The number of visits by patients resultantly grew to an average between 8 and 10 per week.

The clinic will accommodate the treatment of , in addition to the common and easily treatable diseases, more serious conditions as well. Herbalism is known to treat a large diversity of diseases very effectively, namely those related to digestive, cardiovascular, musculo-skeletal, and otolaryngeal (ear nose and throat) diseases, to name only a few (<http://www.hydesherbalclinic.co.uk>). But the dissertation argues for a holistic view of human health and well-being, and because elements such as walking/jogging routes, sports facilities, and restaurants serving fresh, locally sourced food are included in the larger vision for the site², the clinic will be viewed as a supplementary function within the site as local amenity (figure 4.16):

“Physiologically we are nothing but the foods which we ingest, and the air which we breathe. It is to faulty eating (on both quantitative and qualitative sides), and the lack of proper air, including adequate exercise in it, plus enervating habits of all kinds, to which most of the diseases of to-day may be ascribed.”

(Ward, 1936:12)

²

Refer to ‘Context’ chapter for a more detailed description.

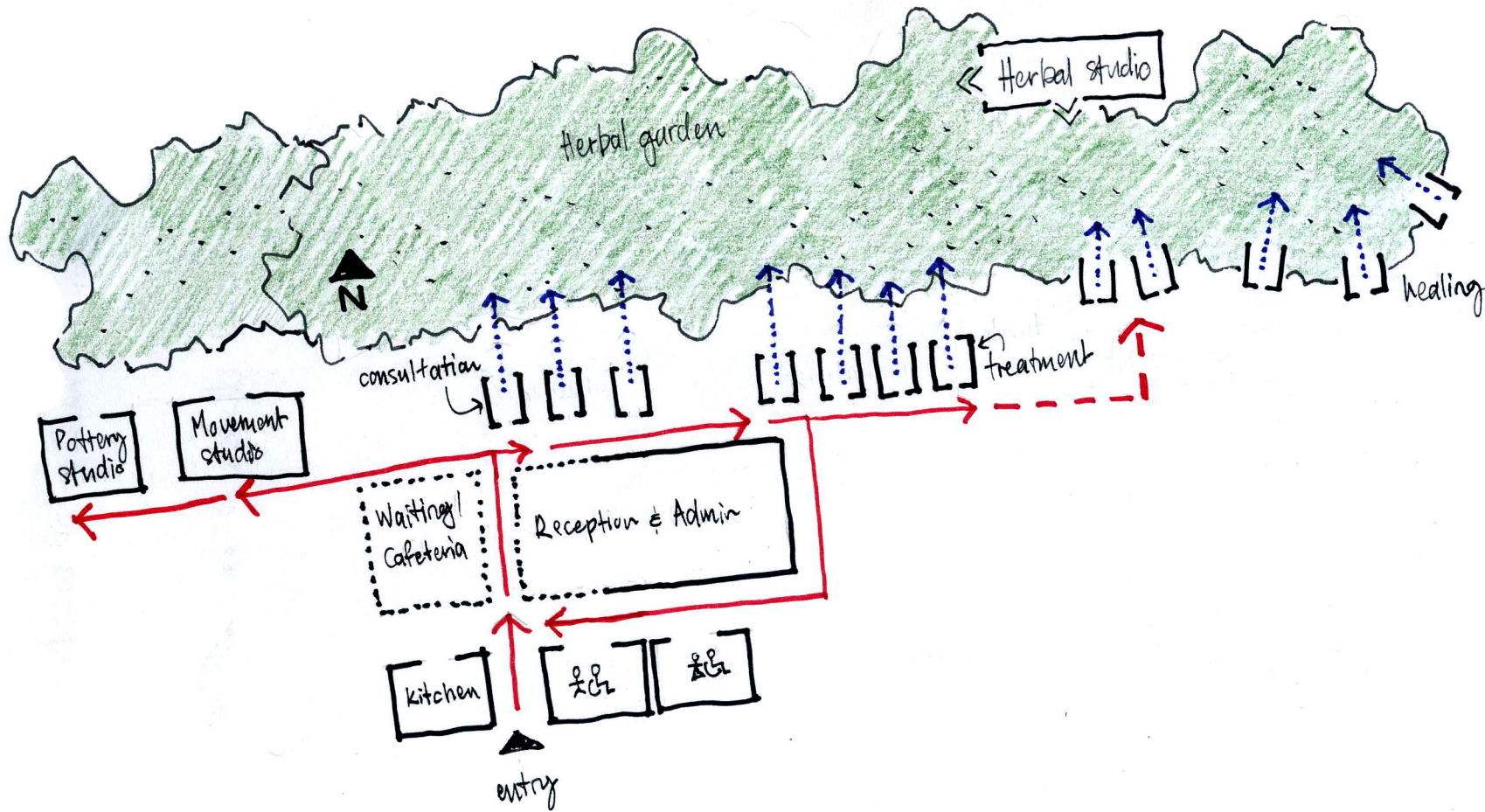


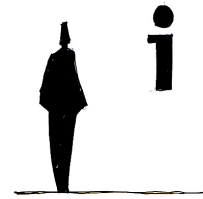
fig. 4.16 Spatial organisation of the clinic programme
[Author, 2013]

CLINIC USERS: STAFF AND PUBLIC

The clinic will accommodate 3 medical herbalists. They will be assisted by 3-4 assisting nurses, a secretary, 5 administration staff, 3 kitchen staff and 3 cleaning staff. The public that will use the clinic will be from the surrounding area, being people of all ages, but the elderly will probably be the most frequent visitors. Accommodation for wheelchair access is imperative. Because of the building's location and projected construction cost, overnight facilities do become more exclusive to people who can afford it. But most of the facilities will be available to the public.

CLINIC FUNCTION: SPACES AND REQUIREMENTS

All spaces are to be passively lit and ventilated as effectively as possible. Climate control should also be passive where applicable, and preferably controllable by the users of the building. Specific rooms requirements are as follows (figure 4.17):



Reception desk & Cafeteria_ upon arrival, the visitor should be introduced to the reception desk to be orientated from there, but have limited visual access to the garden. Seating options will include chairs with tables and couches. The reception should accommodate a maximum of ten people at a time, excluding the cafeteria, which in itself should accommodate 15 people.

Reception & Administration_ should be accessed by staff only, and provided with a desk for appointments and enquiries, record storage, medicine storage, point of collection of prescriptions, and secretary and manager desk space. At least two entrances should be provided, as well as access to the treatment rooms. A minimum floor area of 180m² will be sufficient.

Consultation/examination rooms_ no smaller than 14m² (Adler, 1969:16-5), and each provided with an examination couch with closable curtain, chairs for visitors and staff, a wash hand basin, counters and storage space. These rooms should be given views to the garden outside, and wheelchair access from inside the building.

Treatment rooms_ no smaller than 17m² (Adler, 1969:16-5), and each provided with an examination couch, chairs, shelving and storage, counter surfaces, a writing surface for notes, a sink and drainer, and instrument and equipment trolley. These rooms should also have views to the garden (predominantly from the perspective of the patient), a small balcony to provide more than mere visual access, and wheelchair access from inside the building. Types of treatment include massaging with topical products, nutrition, and aromatherapy.

Healing rooms_ these will have a single bed, cupboard, book shelving, a reading chair, and on-suite ablutions, and are to accommodate one person at a time. They should be viewed as exclusive, allowing patients to enjoy the space uninterrupted, but be given physical access to the herbal garden, where patients can interact with plants and other people. The purpose of these rooms are for patients to stay over if the medicine needs time to work in the body, and the duration of stay thus depends on the type of medicine that is taken.

Herbal studio_ provided with a brainstorming space with a table and blackboard/projection screen, a kitchen to make tinctures, and ablution facilities. Physical access to the garden should be provided, and the studio should accommodate 3 medical herbalists.

Movement studio_ where patients will be able to do Pilates or other relevant movement exercises. A warm floor should be provided that can absorb impact. The space should be well-ventilated and kept at a comfortable temperature, and be provided with visual access to the garden.

Pottery studio_ here patients will be able to participate in the making of pots as a therapeutic exercise. It must be provided with 5-6 wheel-throwing stations, a service lift to transport pots to the firing kilns, and good lighting. Materials used in the space should reflect the character of the clay on site.

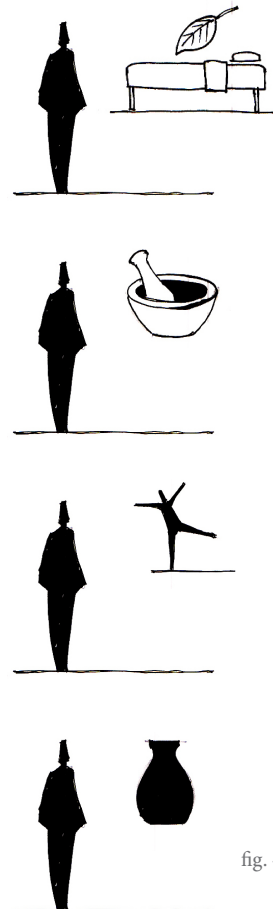


fig. 4.17 _Diagrammatic sketches illustrating different function in the building [Author, 2013]



fig. 4.18 _Wheel throwing

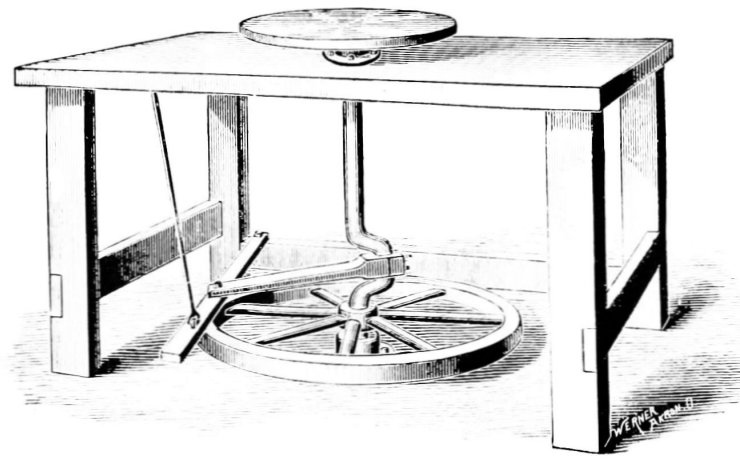


fig. 4.19 _Early pottery wheel



fig. 4.20 _Small-scale pottery firing kiln

4.4_'From the dust you came': the pottery workshop

As an attempt to heal the landscape, a strategy was conceptualised that includes the transitional fertilisation of the soil on site, as described in the concept/design development chapter. The excess clay will be removed, and used to make pots that will house the plants for the nursery, the medicine production, etc. The building will make pottery lessons available to the public (figure 4.18), but also to the patients of the clinic, as an activity that can aid in the healing process.

The building will accommodate the preparation of the clay from the raw material to one suitable for pottery. Very specific climatic requirements will then have to be taken into account. The process and spatial and climatic requirements are shown in figure 4.21. Also, adequate storage shelves for tools and pots should be provided, together with three to four water points in the wheel throwing area.

As in the clinic, ramps will also be necessary for trolleys to transport raw material and pots throughout the building. Materials used should reflect the character of the clay on site, wherever internal functions allow it.

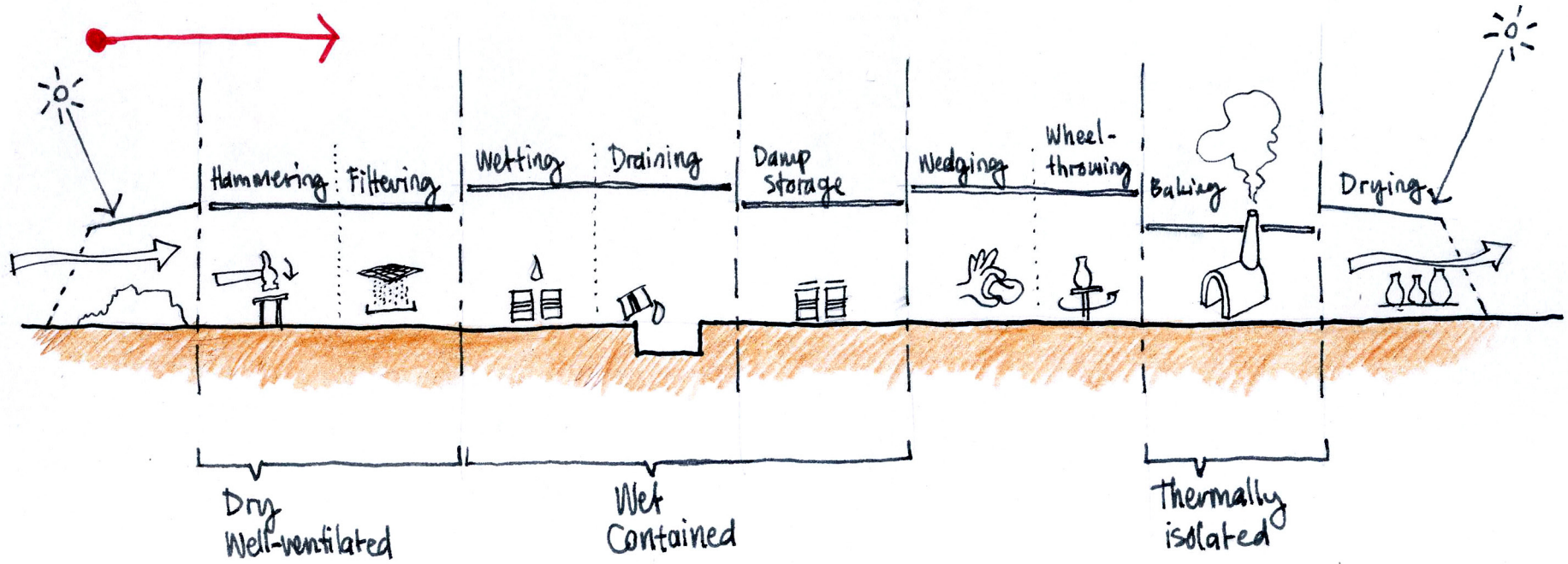


fig. 4.21 _Pot-making process with dry/wet characteristics [Author, 2013]

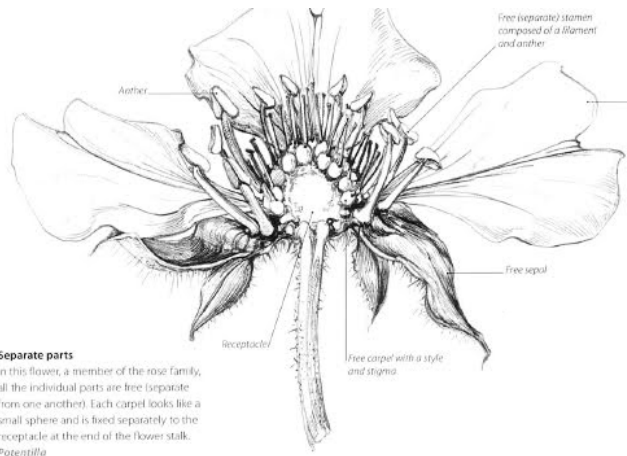


fig. 4.22 _Botanical drawing of a Potentilla



fig. 4.23 _Botanical drawing of a herb



fig. 4.24 _Herbal medicine packaging



fig. 4.25 _Various kinds of herbs

4.5_Medical Herbalism: the production centre and research facility

“Herbal remedies, having themselves assimilated these necessary mineral substances from the earth, can pass them on to us in organised form, that is, the form in which iron, calcium, sulphur, phosphorus and so on are organically present in our tissues, and the only form in which the cells are able properly to assimilate anything introduced into our bodies, whether we call it food or medicine.”

Ward, 1936:12

Medicine production is the primary programme for the scheme, and will thus be located centrally for all supporting programmes to be in close relationship. External activity will include sowing, harvesting and tending the main herbal garden, washing and air drying of harvested plants. Internally, the plants will be stored, and made into tinctures, salves, and other remedies, from where it will be stored once more before being taken to relevant facilities like the clinic (figure 4.24).

As a supplementary programme, a research facility is proposed, and will be located close to where the other schemes are on site. It will have the most public function, and will have to provide opportunity for people to interact with the building and its related garden. Internally, the functions are more private. Laboratories, a library, offices, a conference room, administration facilities, a herbarium and seed room will be provided. Researchers will be able to experiment with plants in an attempt to improve the knowledge of their medicinal uses, as well as their suitability on site (figure 4.22).

These two buildings, however, will only be designed to where they can be suitably positioned in relation to the collective programme, the other schemes on site, and the site conditions. They will not be developed further.

4.6 _Supporting functions: the nursery and restaurant

The site area and vision of 'Silent Industry' require programmatic functions that accommodate the users at a more public level. The different components of the larger programme (as proposed by the theory and later by the concept) are located accordingly in the 'garden', with its specific spatial characters that dictate the placing of specific functions.

A restaurant is proposed next to the 'herb garden'. It will make use of the herbs and plants for the menu, and will utilize the garden itself as an outdoor eating area. Because of its public nature, a shop, that can sell herbal products made on site, will be connected to the restaurant.

A plant nursery will be located next to the road for easy access by the surrounding community. This facility will make herbal plants available to the public, so that these can be grown and cultivated in the private gardens around Pretoria. Because the herbal medicine can, to a large extent, be made in household kitchens, the nursery will facilitate and support this process.

4.7 _Summary

The overall programme proposed for the scheme is large, and multifaceted, but each part has a specific purpose in the healing of the site, as they contribute to each other's functions as well. For the design development of the scheme, only one of the buildings proposed will be focussed on, which will accommodate the programmes of the herbal clinic and pottery workshop.



_chapter 5

p r e c e d e n t s
the seeds of wisdom

fig. 5.1 _Cathedral scene from Terrence Malick's 'The Tree of Life'

“Gardens are poems
Where you stroll with your hands in your pockets.”

Pierre Albert-Birot, The Cubist Poets in Paris: An Anthology

5.1 _Preface

The precedents discussed here were selected in light of aspects such as the character of the site, the nature of the programme, and appropriate response to landscape. From each precedent the regenerative effects were identified, as well as the relevance to the intentions of the dissertation.

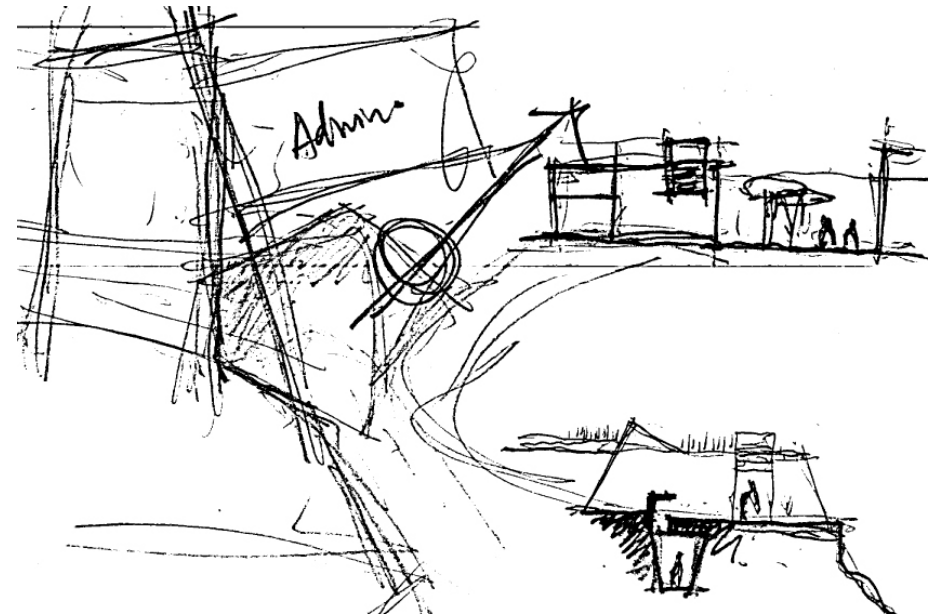


fig. 5.2 _Conceptual investigation [Author, 2013]

5.2_Igualada Cemetery

Architects: Enric Miralles & Carme Pinós

Location: Barcelona, Catalonia, Spain

Commissioned: 1984

Completed: 1994

The project was part of a architectural competition as an attempt to replace an older cemetery (<http://www.archdaily.com>). It was won by Enric Miralles and Carme Pinós, who aimed to challenge the traditional notions of what a cemetery is. They did so by considering both those who are laid to rest and the families who remain in letting the living dwell in what the architects called “a city of the dead”, bringing them closer in spirit. The concept was essentially a ‘river of life’ that, as described by Peter Buchanan, a “swirly stream that eroded the smooth curves of the banks of burial niches” (Mecking, n.d.)

Embedded in the hills created by the quarrying process, the cemetery becomes a ‘site-specific sculpture’ (Mecking, n.d.), blending with the landscape to such a degree that the built work seems like an organic extension. The cemetery was designed as a series of tiers which are formed by ‘mausoleum burial plots’; walls niched with tombs that wrap around the main burial area, while at the same time carving out a processional pathway that leads visitors from the main entrance to this depressed space (<http://www.archdaily.com>). The main burial area (figure 5.3) is surrounded by gabion walls and the mausoleum burial plots (figure 5.6) to seclude the visitor from the surrounding context, accentuate the view to the sky. The organisation of the burial plots and the related spaces does not attempt to draw attention to these specifically, but to rather create a processional movement through the site that enhances the experience.

Materially, the cemetery ties itself seamlessly with its context. Gabion walls, aged concrete and wooden railroad ties embedded in stone relate very effectively with the hard surrounding landscape, with the tones and textures creating the impression that the cemetery has been part of the landscape for longer than its actual age (<http://www.archdaily.com>). The stark and dynamic character of the architecture, which is achieved by the inherent qualities of the materials and the sculpted walls and pathways, act as expression of life’s fugacity (Mecking, n.d.), and relates well to the original intention of the architects; that of poetic experience to let visitors “begin to understand and accept the cycle of life as a link between the past, present, and future” (<http://www.archdaily.com>).

REGENERATIVE EFFECT

In terms of the ‘Spirit of Place’, the project achieves a strong harmony with its surrounding context, while bringing new life to a site that otherwise would have remained desolate. The local community of Catalonia is provided with access to a place that forms part of their past and, in a disconcerting manner, their future. Resultantly, the phenomenological aspect of time is powerfully experienced. What is lacking in a regenerative sense is that large-scale replacements of vegetation was not introduced by the scheme¹, and although the project does present the opportunity to phase in appropriate flora, the intension of the architects to retain the intangible quality of death might be compromised if it were implemented without the needed sensitivity.

RELEVANCE

The relevances that the Igualada Cemetery has for the dissertation are numerous. Firstly, it is located in a barren quarry site deserted after the limits of extraction were reached (although in Monument Park it was economic limits) and the scheme attempts to revive the life of the site, but in a new and unique form. Secondly, the design is focused on experience, and accentuates the phenomenological aspects of both place and time. Thirdly, because of the affects of quarrying, the land form is very dynamic, and terraces are used to form routes that carry users through the different spaces. Finally, the architecture is tied to its landscape in the use of materials, spatial layout and form, and resultantly seems to have emerged from the landscape itself. The project achieves these aspects by identifying the underlying and sometimes invisible potentials inherent in the site, and letting them rise to the experiential horizon.

1 Soil conditions of abandoned quarries are predominantly of sterile quality and do not allow the adequate number of plant species to flourish, which in turn also influences the biodiversity of fauna.



fig. 5.3 _Main burial area



fig. 5.4 _Tiers formed by gabion walls



fig. 5.5 _Pre-cast concrete elements



fig. 5.6 _Route alongside mausoleum burial plots

5.3_ASU Health Services Building

Architects: Lake Flato Architects
Location: Tempe, Arizona, USA
Completed: 2012

For the design of the building, the architects sought to “clearly define a healthful, non-clinical, welcoming identity” (<http://www.archdaily.com>). The original identity of the Arizona State University (ASU) Health Services was to be transformed, and the project consisted of some demolition of existing structures, renovation of the original facility, and the construction of a new wing.

REGENERATIVE EFFECT

Descriptions of the building’s regenerative effect on its surrounding context is limited. However, the facade facing ASU’s historic Palm Walk (figure 5.10), the campus’ primary pedestrian spine, welcomes users into the building through well-vegetated courtyards and shady porches, while also articulating the pedestrian street edge, and adding to the human scale of the street itself. The scale of the additions achieves that, as it is in harmony with that of neighbouring buildings and the original facility. But overall, the regeneration created by the building seems very low.

RELEVANCE

The new additions are situated next to a walkway, which is the same scenario in the thesis, at both the clinic and the research facility. In the case of the ASU Health Service Building, the structure punctuates the linear circulation spine, creating intimate waiting areas that alternate interior and exterior. In relation to the garden-building concept that the thesis aims to explore, together with the incorporation of biophilic attributes, this engagement between structure and plants serves as a tangible example.



fig. 5.7 _Health Services building's scale compared to surroundings



fig. 5.8 _Plant diversity in front of the building



fig. 5.9 _Outside waiting areas



fig. 5.10 _Building's relationship with the street

5.4_Farmacy

Architect: Samantha Lee
 Location: London
 Student Project at the AA
 Date: 2008

In a vertical studio at the Architectural Association, co-ordinated by Nannette Jackowski and Ricardo de Ostos, the central question asked was: “Can extremes of programmatic effectiveness blend with the fragility of human habitat?” (<http://pruned.blogspot.com>). Samantha Lee proposed a ‘farm’ that “grows, manufactures and sells medicinal herbs”, and her scheme answered the question by making the farm part of civic infrastructure, as its function is similar to hospitals or local clinics (figure 5.11).

In the article cited, the critic on the project is that it belongs in ‘Middle Earth’, and not in a contemporary urban setting. However, the student did aim to let the building ‘blend’ with its spatial context by mitigating riotous reaction from users, letting “urban farms...mine the mythical rural idyll for nostalgia and vernacular forms, reinterpreted” (<http://pruned.blogspot.com>).

REGENERATIVE EFFECT

Located in an area notorious for its past with drugs, the design attempts to form part of its “journey of healing” (<http://pruned.blogspot.com>). The process of regeneration is not only focused on the environment, but even more so on the people who live there. Specific ailments in the area were identified and herbs were selected accordingly. Integrating it into its context even further, the project also provides a public walkway with pharmacies located throughout, allowing users to experience the fragrances of the herbs used, as well as buy herbal products produced on site.

RELEVANCE

This project also gives a potent clue for the experiential aspects that the dissertation aims to explore. Time, as described in the Theory Chapter, is related to the change of seasons, and Appearance related to the the temporality and time-specific occurrences of phenomenon. It would therefore be appropriate to have users experience the herbs in a sensory way, as the Farmacy does, with plants flowering in different seasons, and smells and textures changing throughout the year.

Another strong relevance is the intention that the programme aims to address is to heal the context. Although the dynamic landscape of the Monument Park quarry is very different from the urban context of London, both of these environments have been affected by human activity, and both can be treated with the use of plants. It becomes even more relevant in Monument Park as the vegetation will have to be replaced.

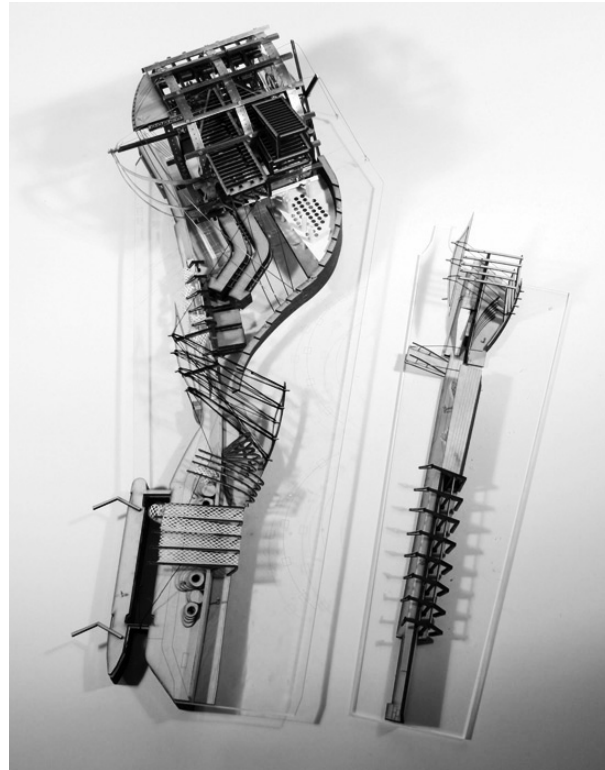


fig. 5.11 _Model showing route that the building creates



fig. 5.12 _Internal spatial experience



fig. 5.13 _External view of the Farmacy

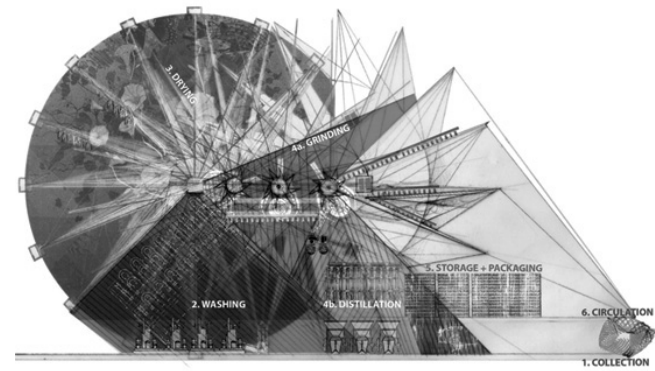


fig. 5.14 _Programmatic arrangement

5.5 _Summary

As the most relevant precedent, the Iqualada Cemetery gives various clues in how to respond to a landscape scarred by industrial development, and one that is very similar to the site in Monument Park. The ASU Health Services Building displays a possible manner in which a clinic can respond to a pedestrian route, and Farmacy, though rather 'otherworldly' in its design, shows the feasibility of herbal medicine production in a city context (in the case of the dissertation, a suburban context).



_chapter 6

c o n c e p t + d e s i g n
d e v e l o p m e n t

*the tilling of soil &
telling of time*

fig. 6.1 _Canyon scene from Terrence Malick's film 'The Tree of Life'

“For you little gardener and lover of trees, I have only a small gift. Here is set G for Galadriel, but it may stand for garden in your tongue. In this box there is earth from my orchard, and such blessing as Galadriel has still to bestow is upon it. It will not keep you on your road, nor defend you against any peril; but if you keep it and see your home again at last, then perhaps it may reward you. Though you should find all barren and laid waste, there will be few gardens in Middle-earth that will bloom like your garden, if you sprinkle this earth there.”

J.R.R. Tolkien, The Fellowship of the Ring

6.1_Preface

The design process of the scheme was marked by exploration and bold changes in decision-making. It comprised of many exercises to try and establish a concept that would be a uniting element between theory, site and programme, as well as a strong decision-making mechanism in producing the architecture.

In an attempt to clearly communicate how the process unfolded, it is divided into 3 sections. These are represented by conceptual drawings describing the overall strategy for the site, in terms of programmatic function, the garden, and the route that is the binding element.

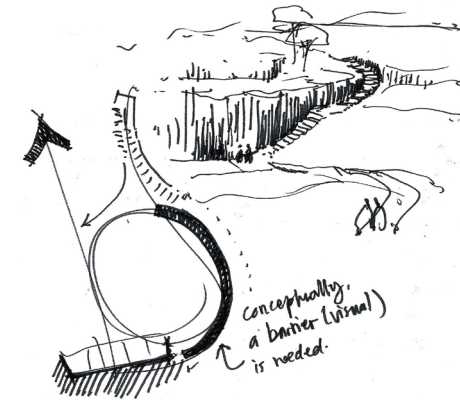


fig. 6.2 _Investigation of a response to site [Author, 2013]

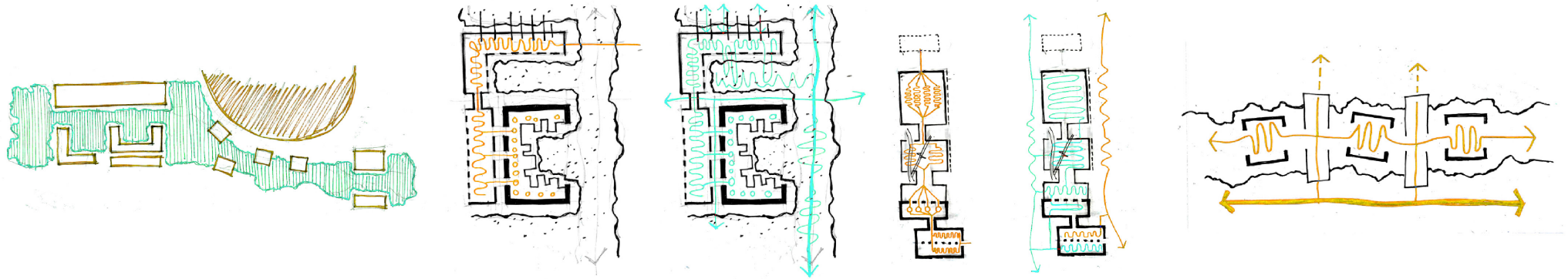


fig. 6.3 _Initial concept drawing of the relationship between building and garden [Author, 2013]

6.2_Part 1



Initially, it was conceptualised that the functions would be split in two groups and placed on opposite ends of the site, to then be connected by a garden avenue. The avenue would house the route, with the intention that visitors would experience the medicinal plants in a very direct way.

The research facility, clinic and medicine production was located to the west, and to the east the pottery workshop and nursery (fig. 6.3). A conceptual exploration was done to see what the movement of plants would be related to the movement of people, and how the building could accommodate the presence of both (fig. 6.3).

Different building functions flowed into one another, as the plants moved from production to testing, and then finally to the clinic. The idea was to accommodate these in a single structure. Also, at this time of the design process, the landscape became a determining factor, and because of its experiential function, the design of the route was considered.



fig. 6.4 _Drawings made to investigate the layout of the medicinal garden, with the route running through it [Author, 2013]

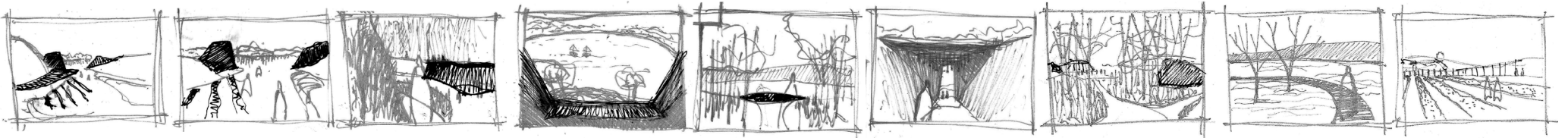
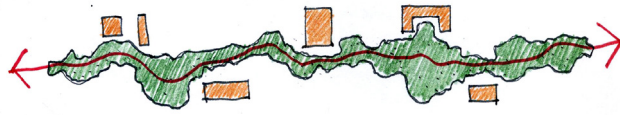


fig. 6.5 _Vignettes drawn as an investigation of a possible route through the site [Author, 2013]

6.3_Part 2



CONCEPT

It was later considered a more feasible idea to spread the programme across the site, to enrich the visitor's experience along the route, but to also have more activity throughout the site. Separate buildings would then house the different functions. The route itself was still seen as the garden, but more structures were placed along its length. The placing of buildings became a challenge (fig. 6.10), and various options were considered.

A conceptual investigation of the site was done, in which the soil and vegetation were separated to express the stereotomic and tectonic qualities of the site (fig. 6.12). From this point, the conceptual thinking started to become more true to the theory used in the scheme. Two aspects of the garden, as described by Harrison, were applied to the site for the first time: soil became stereotomic, and time tectonic. Appearance was to be experienced by the route, and boundary was the resultant structure (fig. 6.8).

DESIGN

The clinic was moved to the east, and the research facility remained to the west. At this time, the aim was to design both of these two polar ends of the site, and attention was given to developing both buildings. The clinic was placed on a location looking out onto the water (fig. ?), but the connection of the building with the garden was lost, and soil conditions were not suitable, as the location was the heap created by the dumping of old bricks and clay during quarrying. Another more suitable location was later found. On the western side, the research facility started to develop a more rigid architectural language (fig. 6.9), which was a response to its location. But the design reached only a certain point before it was decided that all design attention would be focused on the clinic and pottery workshop.

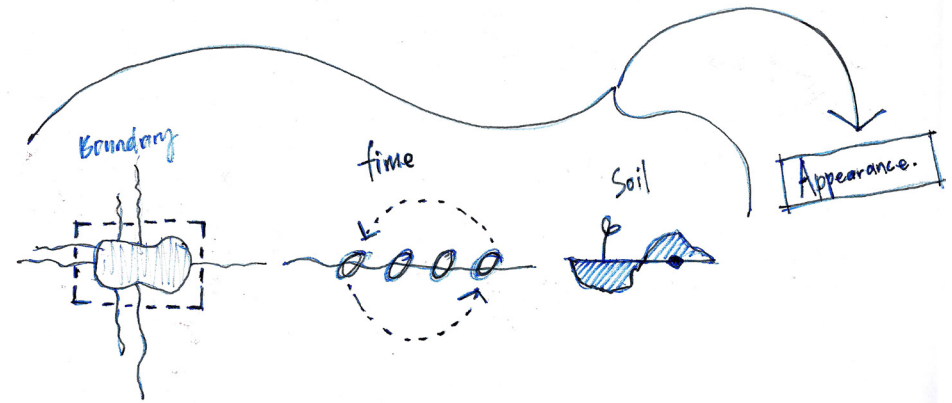


fig. 6.6 _Boundary, time and soil make appearance possible [Author, 2013]

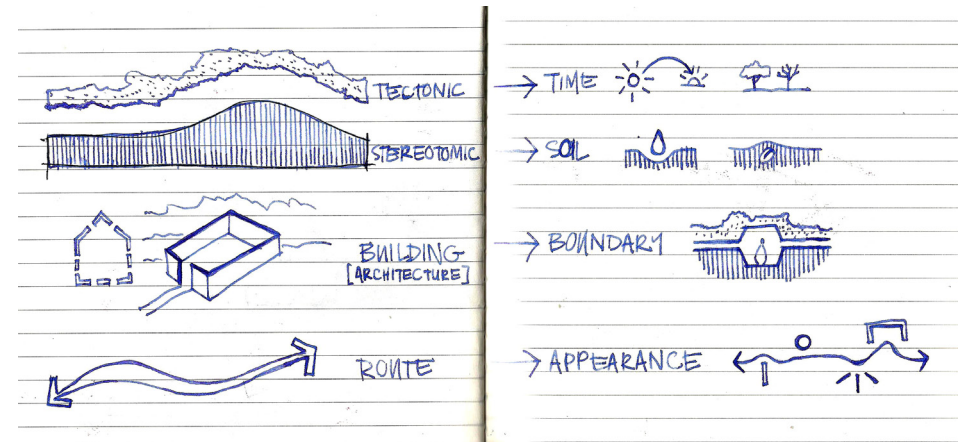


fig. 6.7 _All four elements as independent [Author, 2013]

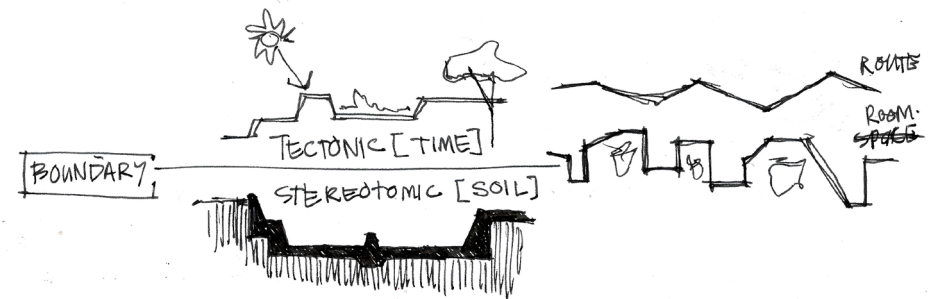


fig. 6.8 _Time and soil working to form boundary and accommodate the route [Author, 2013]

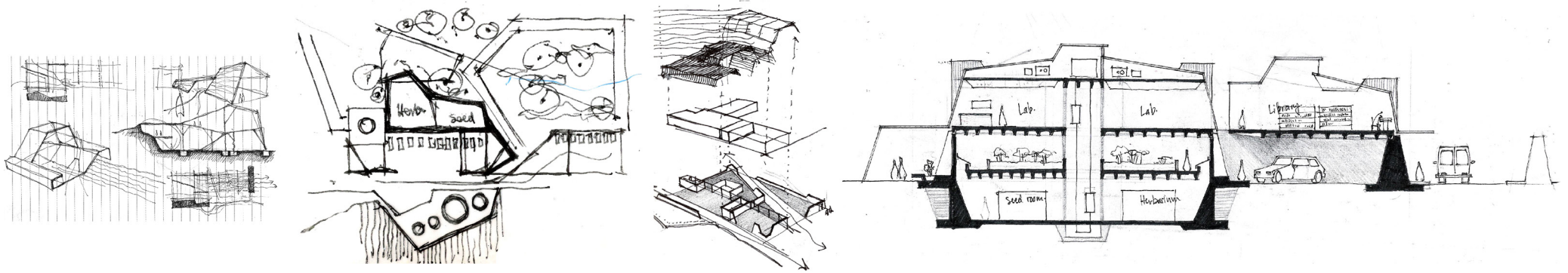


fig. 6.9 _Early design investigations of the research facility [Author, 2013]

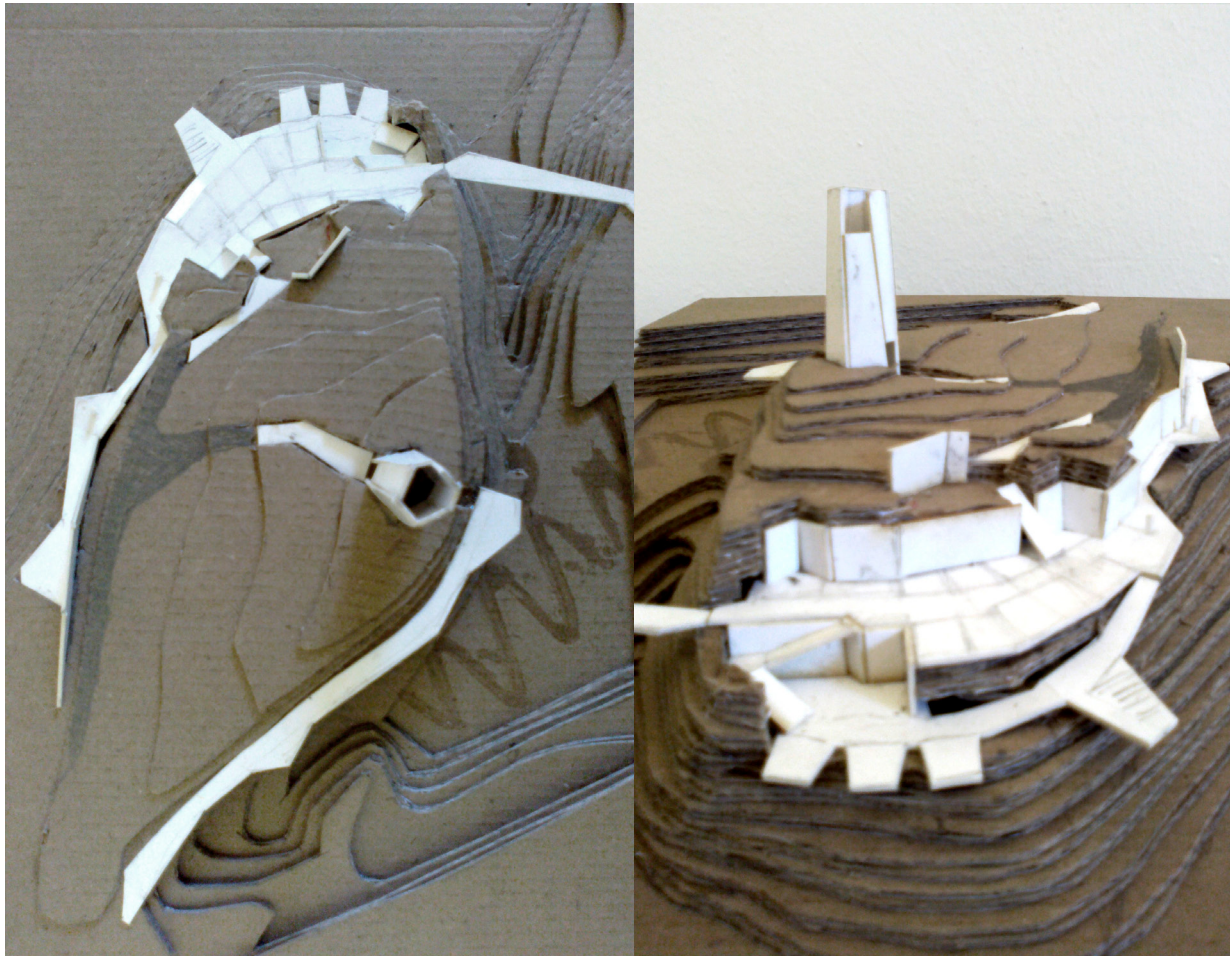


fig. 6.10 _Initial position of the clinic [Author, 2013]

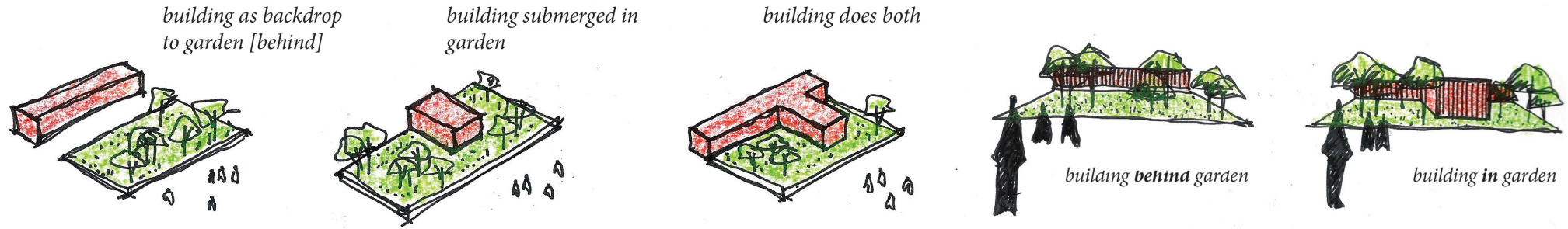
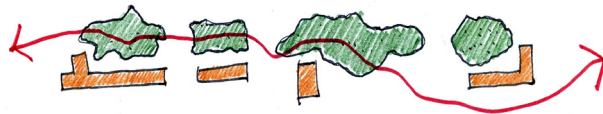


fig. 6.11 _Garden/building relationships [Author, 2013]

6.4_Part 3



CONCEPT

The conceptual thinking, up to this point, had not yet searched for a suitable relationship between building and garden. But it did lead to a better understanding of how to articulate that question to give rise to a conceptual solution. It was at this time that the theory was revisited, as an attempt to make the concept more truthful to the theoretical intentions.

Barfield's (1928:20) description of the poetic moment as a "felt change in consciousness"¹ served as a strong informant for the building/garden relationship. For this change to be effective, difference is needed in the experience of one's environment; the movement from one mode of consciousness to another. Also is Harrison's (2008:264) notion that the garden is the place in which poetic dwelling finds its fullness, and Heidegger's (Leach, 1997: 104) 'building' as the extension or result of dwelling. Therefore, it is essentially the garden that should be determined first, followed by the building.

The continuous garden as the route was replaced by a series of different gardens connected by the route. In this way the visitor can experience the change noted by Barfield (1928: 20) in the movement from one type of space to a different one, as they move through the site. Then, associated with each of these is a building with a particular programme; one that is related to its allocated garden (fig. 6.11).

1 Refer to Theory chapter, p.?

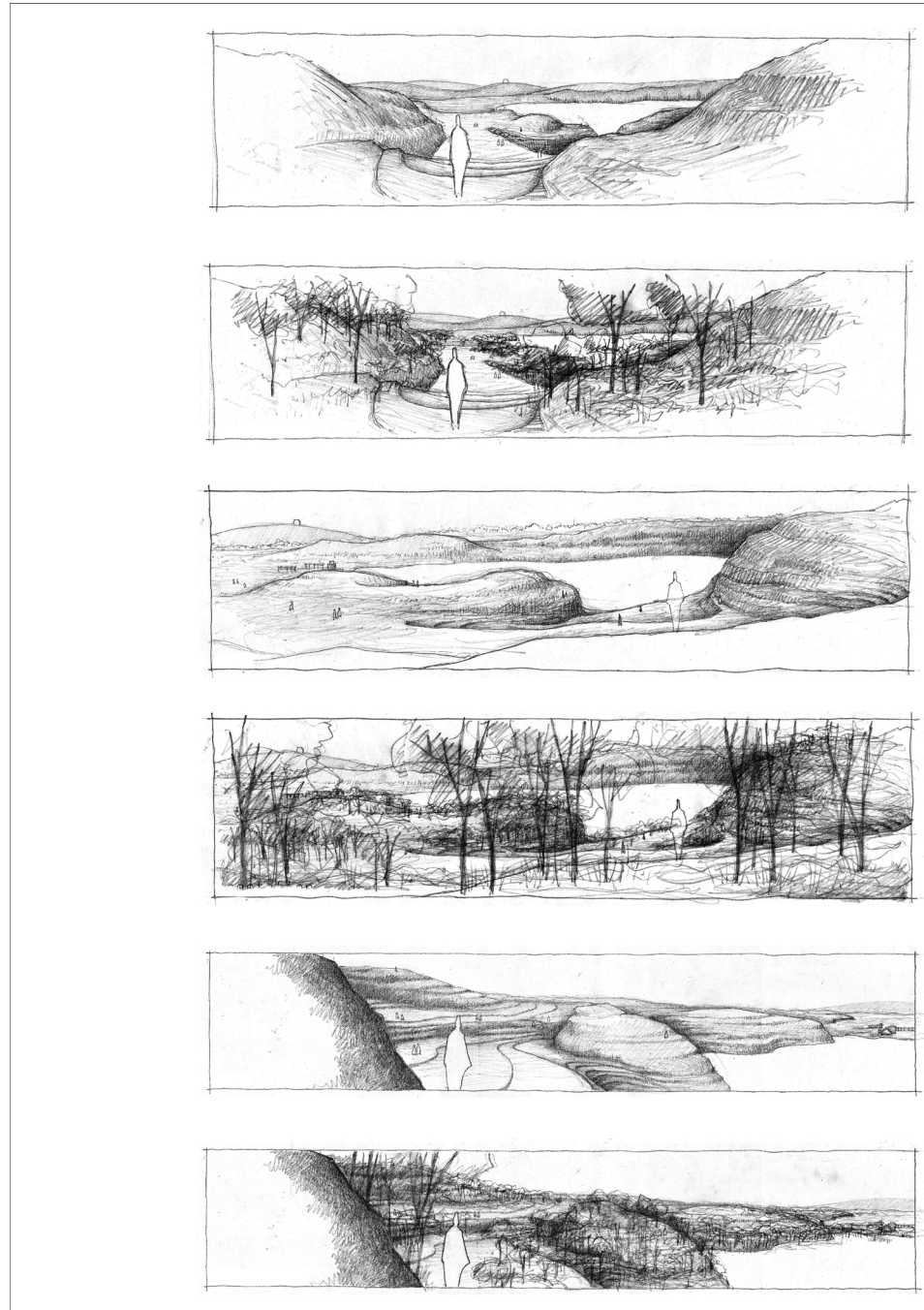


fig. 6.12 _Investigation of the stereotomic and tectonic characteristics of the site [Author, 2013]

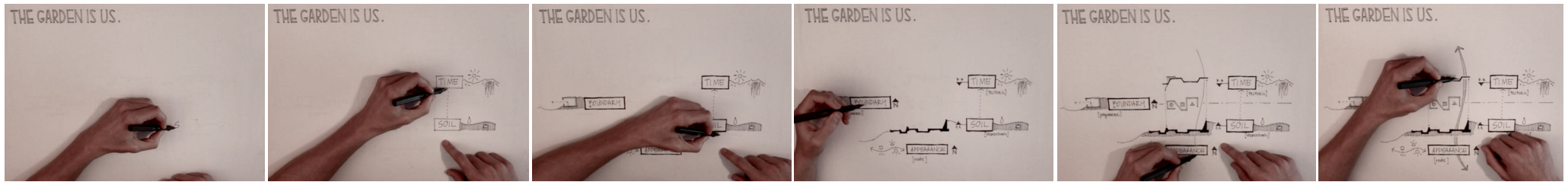


fig. 6.13 _Conceptual video [Author, 2013]

6.5_Part 3 [continued]

FINAL CONCEPTUAL RESOLUTION

The final concept is a synthesis of the four aspects extracted from Harrison's (2008: 44) theory of the garden (fig. 6.14). Soil as earthy substance is continuously shaped and formed both by humans and natural processes, yet at the same time it is the platform on which dwelling takes place. It holds the potential for life, which is unlocked by an external agent; the dweller. This unlocking facilitates the life of plants, which tell of Time by their changes during seasons, photosynthesis, as well as cycles between birth and death, which return to and is enabled by the soil. Boundary, then, is how humans make their home between these two elements; the mechanism with which 'space in the world' is made. And as a result of the perceptual awareness of the above-mentioned, Appearance takes place phenomenologically between the soul and the garden.

To make these architecturally useful the following was proposed: The first two, soil and time, happen in section, and become the stereotomic and tectonic, holding and accommodating the programme (boundary), which takes place on plan, together with appearance that is enabled by a route that transports dwellers through different spaces. and dependent on its garden (figure of site with programme).

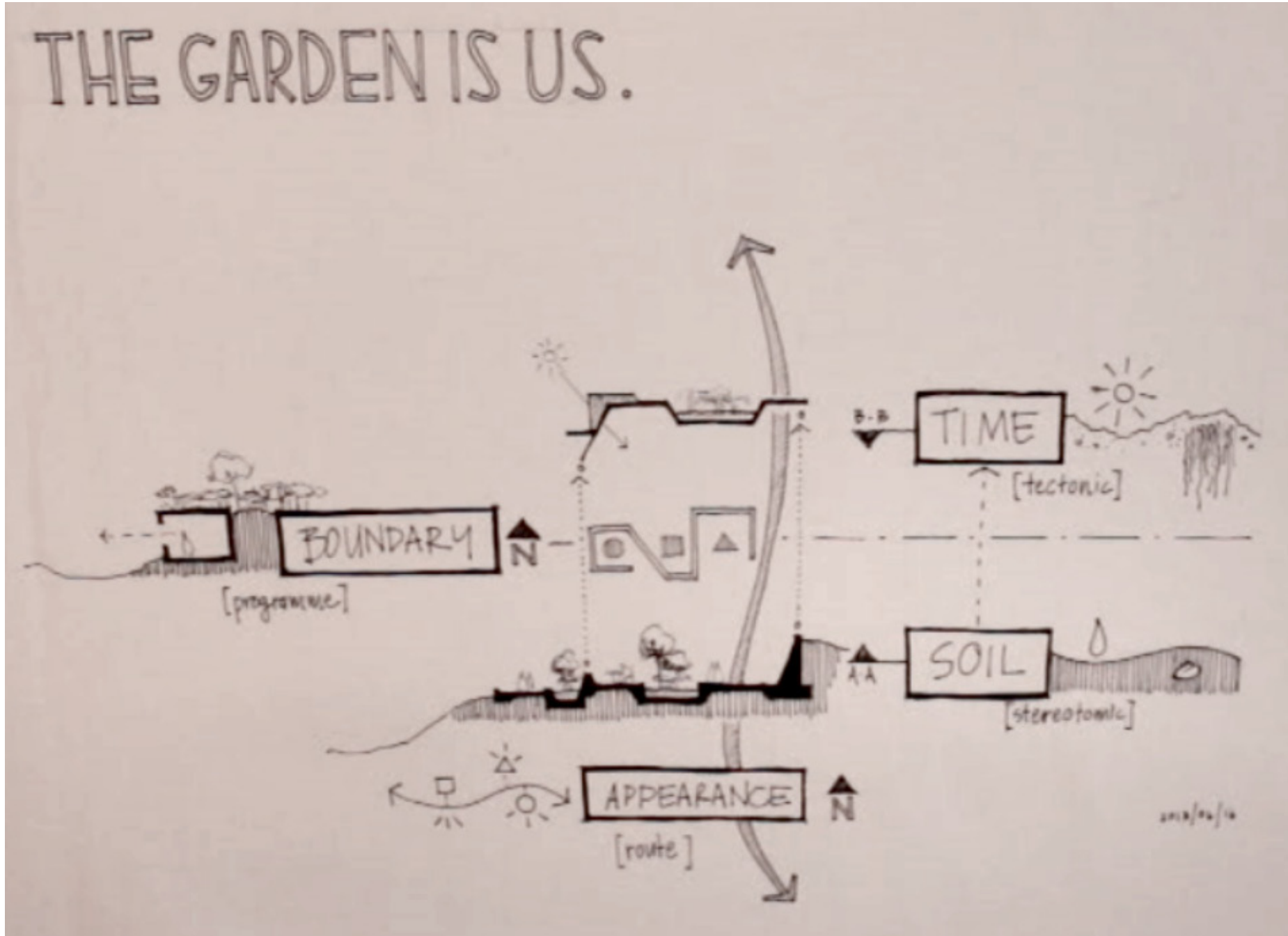


fig. 6.14_Final concept [Author, 2013]

6.6_Part 3 [continued]

DESIGN

Because the aim of the dissertation is to investigate the making of architecture, and not necessarily landscape, the new garden interventions on site are only proposed by type and character (figure 6.15). The design development as described above refined these programmes to what they are, and they are therefore mentioned here, and not in the programme chapter. Table 1 describes the different gardens and their related activities, specific purposes, and qualitative characteristics.

All of these will be connected by an experiential route that runs through the whole length of the section of the site covered by the scheme (fig. 6.15). Visitors will be guided from one garden to another, from one 'state of consciousness' to another, thus enabling the poetic moment via experience through movement. Appearances can be seen as what they are in a tangible way, and the next distinguished from the former.

In relationship with each garden a building is proposed with a programme that relates to that of its own. The relationship is specific in each case so to respond to the programme of each, and the characteristics of the site, and in each case the building is differentiated from the garden.

Table 1

garden	purpose	activities	character
<i>Medicine garden</i>	To house plants for medicine production. Additionally, for cultivation to make composted/fertile soil.	Planting, harvesting and tending of plants. Carts transporting plant material. Washing and drying of plant material. Visitors walking & observing, stopping to enjoy lookout points.	fragrance of plants, hard texture of route materials vs. soft texture of plants. Experiential in nature, route allows discovery and enables mystery.
<i>Herbal garden</i>	To house herbs for infusions in teas and use in food.	Tending of herbs. Visitors enjoying food or tea in presence of herbs. Visitors walking through as part of route, and having a direct experience of the plants.	Strong fragrant presence of herbs. Rested character. contrast of new vs. old life; plants vs. ruins.
<i>Experimental garden</i>	To allow experimentation of different plant species in different conditions.	Planting, harvesting and tending of plants. Researchers studying plant <u>behaviour</u> , and public moving through while enjoying different spatial qualities created by plants.	Unpredicted yet controlled planting environment. Also contrast of new vs. old life, but less tangible than the Herbal garden. Densely vegetated. More public and activated character than Herbal garden.
<i>Clay garden</i>	To have remaining clay in topsoil be worked/replaced with soil created by Medicine garden (and supplementary sources if needed). This garden will transitionally be turned into a completely cultivated garden that the clinic can live our onto.	Firstly, machinery and workers extracting clay to be used in the building and for making of pots. Topsoil is worked and made more fertile. Secondly, new plants are introduced, and public and clinic users enjoy tangible closeness to the plants, experiencing spaces and views.	Firstly, activated at times of extraction. Transition to more empty and exposed state as vegetation and topsoil is removed. Secondly, initial activated state as new soil and plants are introduced, then transition to a denser vegetation, and rested, solitary spaces. More silent than rest of the site.

Table 2

building	relationship	garden
<i>Medicine production</i>	<i>opposite/ apart from</i>	Medicine garden
<i>Herbal Restaurant & product shop</i>	<i>behind/next to</i>	Herbal garden
<i>Research facility</i>	<i>behind/next to</i>	Experimental garden
<i>Herbal Clinic and Pottery Workshop</i>	<i>within/ surrounded by</i>	Clay garden

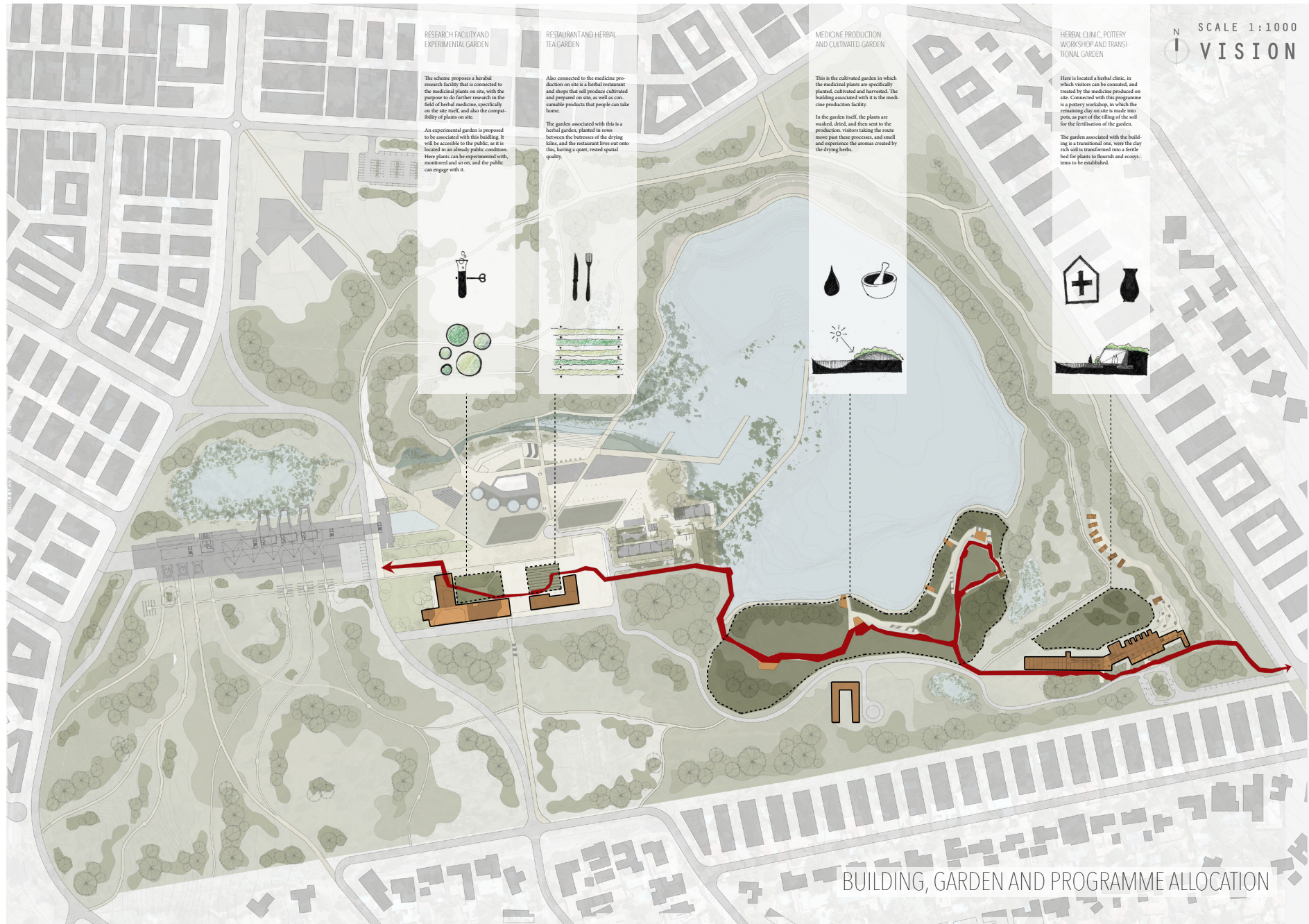


fig. 6.15 _Placement of buildings and gardens , with route linking [Author, 2013]

6.7 _Ends of the route

RESEARCH FACILITY

To the far west of the site, the research facility is located next to the experimental garden, and it is perceived as behind the garden from the public space north of it (fig. 6.16). The main reason for setting the building back was to retain the lack of built structure, the void of building, and to rather fill it with vegetation (the garden). Most of what remained of the ruins is visible on the ground, and the idea is to draw the user's attention to it with the contrast of stark old and gentle new.

The new gardens occupy the spatial bounds created by the ruins, and sit within it, defining their presence as something specific and distinct, yet part of their surroundings. Where lines were created by the drying kilns, the 'herbal garden' is planted in rows that run within these, to retain and enhance the quality already existent. New interventions soften the rigid form of the ruins, but without working against it. The 'experimental garden' sits within the boundaries of the old baking kilns, and leaves the surrounding ground surfaces as they are, creating another contrast between old and new.

Both the research facility and the restaurant, are located south of the gardens. They have long forms orientated north, and make up the backdrops of the vegetation when experienced from the northern side. Their height is determined by the programmes, which do not require more than 3 storeys. The interior of these buildings live out directly onto the gardens in front of them, and most rooms are thus directed north.

CLINIC AND POTTERY

On the other end of the route, the landscape is much more dynamic (fig. 6.16). The undulating topography created by the quarrying process provide potent opportunity for investigating the relationship between garden and building. Here, the 'clay garden' serves the purpose of providing the pottery workshop with clay material for making pots, and subsequently transforming itself into a fertile and flourishing garden. The garden, therefore, takes up the part with the most remaining clay, and the building is placed in close relationship to it.

Directly south of the garden is a man-made hill, one of the highest points of the site, and it is proposed that the clinic and pottery workshop sit in it, giving the structure a linear form and a north orientation, but also a wide view of the affiliated garden. The soil of the hill is surgically prepared for the building, creating stereotomic levels and platforms onto which a tectonic structure will later be placed. Resultantly, the building sits within the garden, strengthening the biophilic argument made in the theory chapter.

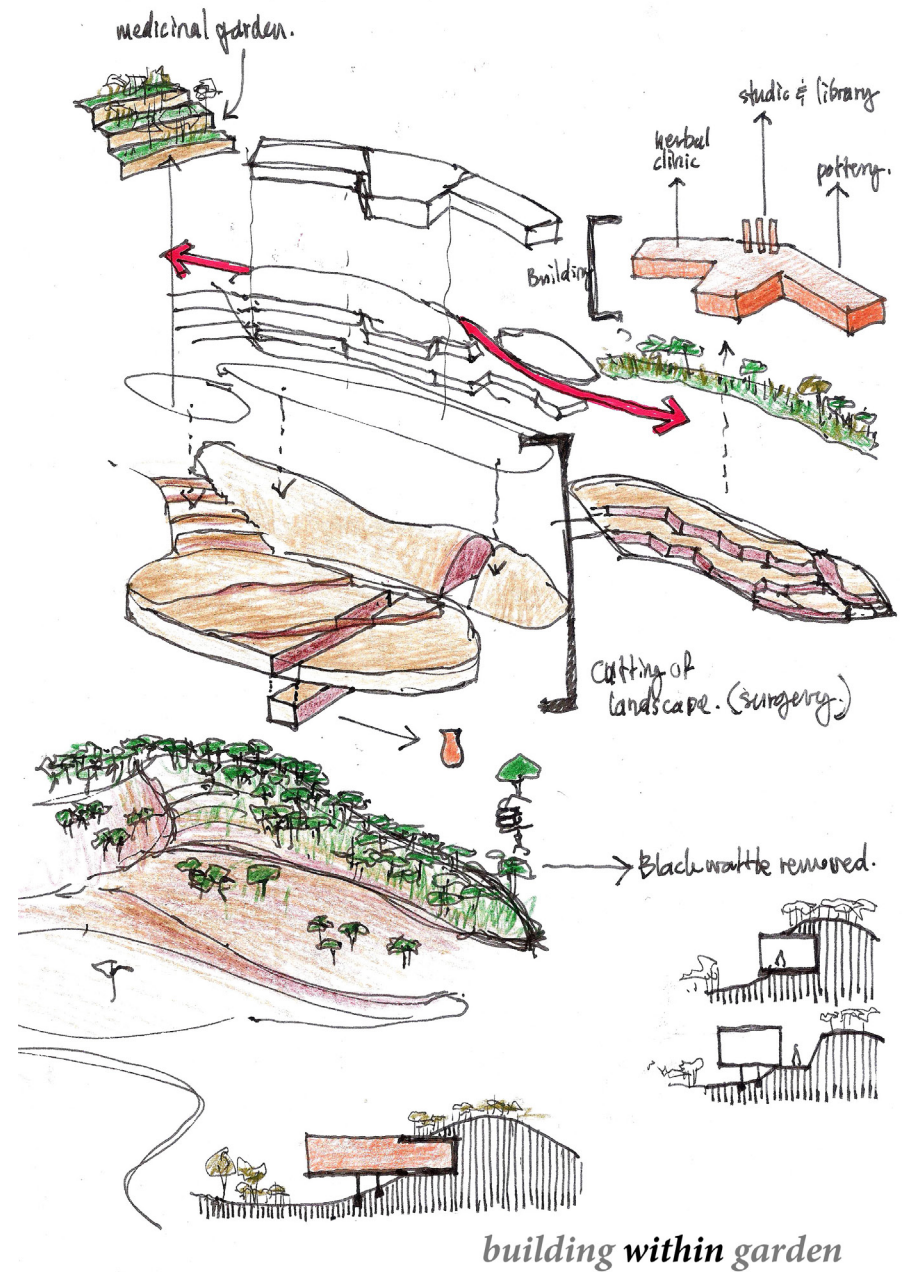
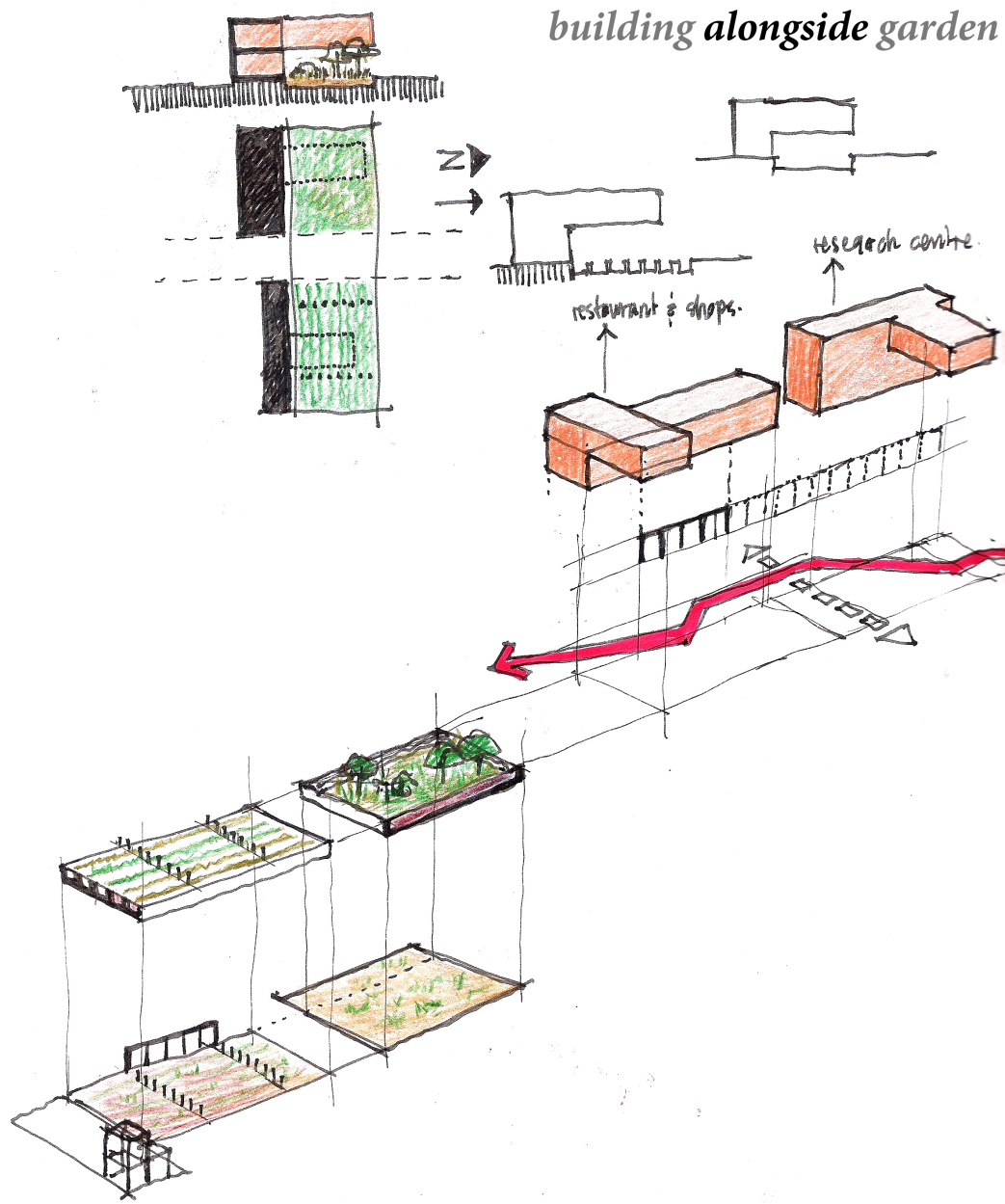


fig. 6.16 _Placement of garden and its relation to the site, and how the buildings respond to the garden [Author, 2013]

6.8_To heal the land: landscape strategy

The site is prepared for the building, and this also instigates the healing process to support the theory of gardening, the site is prepared for the building, and this also instigates the healing process. Firstly, different topographical elements are identified, namely 'heaped', 'compacted', 'sunken' and 'sloped' (fig.6.17). The heaped sections were created by the quarrying process, either by cutting away, or dumping excess material. These are viewed as alterable, but with the intent to retain their memory, as they tell of the past activities on site. The compacted sections were caused by trucks and possible equipment storage, which made the soil hard and mostly infertile, making this section the highest priority for healing. Water movement due to rainfall had hollowed out a collection point close to the dam, and another one with a similar function, namely a swale, is proposed close to it. To the eastern face a steep slope is identified, approximately 30m high, forming a stark division between the site and its context.

A strategy to mitigate erosion and possible damage to the building is proposed (fig. 6.18). Water flowing from the highest point will be diverted and directed to the swales mentioned above. This water can be collected seasonally and be either stored or use for irrigation. To slow water down even further, the slope to the east is terraced and vegetated, creating levels that can be accessed from the building. Furthermore, the compacted portion is initially cleared of vegetation until enough clay is extracted, and it is therefore not vegetated yet. The rainwater strategy aids in retaining as much clay as possible.

Finally, it is proposed that the terraces be formed by retaining walls (of which the most suitable material will be explored in the technical chapter) (fig. 6.19). These will be permeable to let water through and allow plant growth. When seen from the lowest point looking up, the walls will be a continuation of the sloping face, but now filled with new life and possibility for life. A drain is also to be installed that will divert the rainwater as explained above. This element can easily be made out of used brick, as a concave paved surface that transports excess water, but allows seepage.

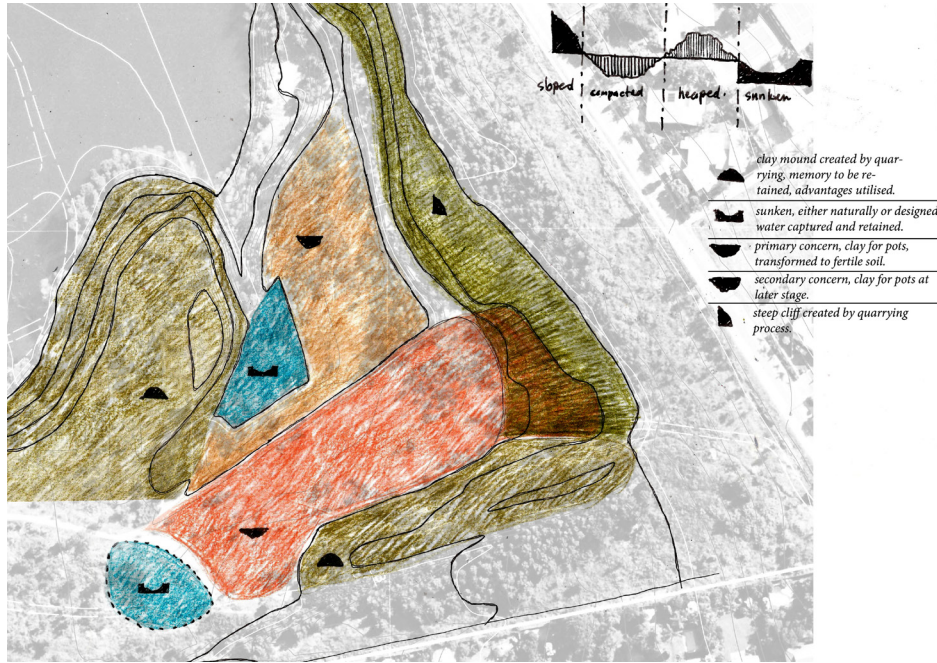


fig. 6.17 _Identifying different topographical aspects [Author, 2013]

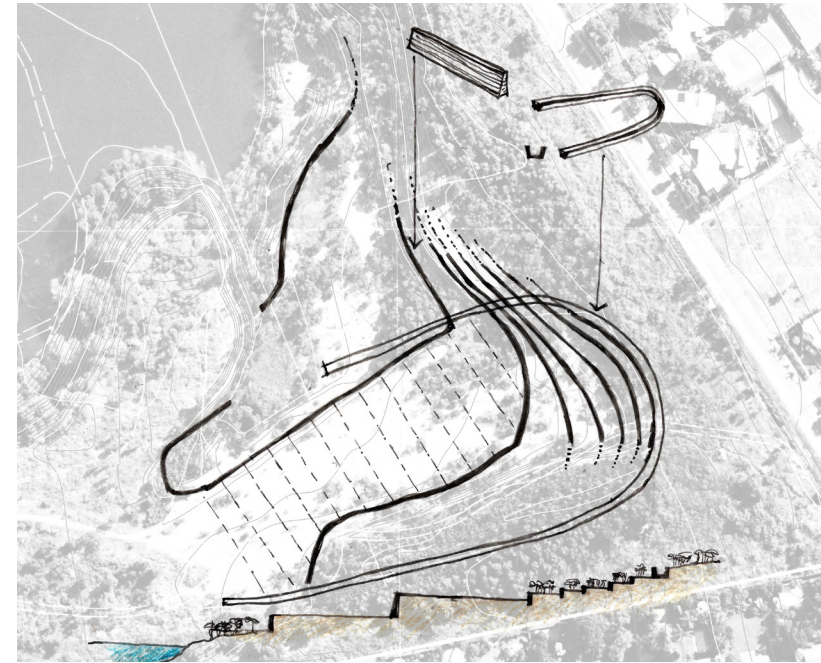


fig. 6.19 _Ways of implementation [Author, 2013]



fig. 6.18 _Rain water management plan [Author, 2013]

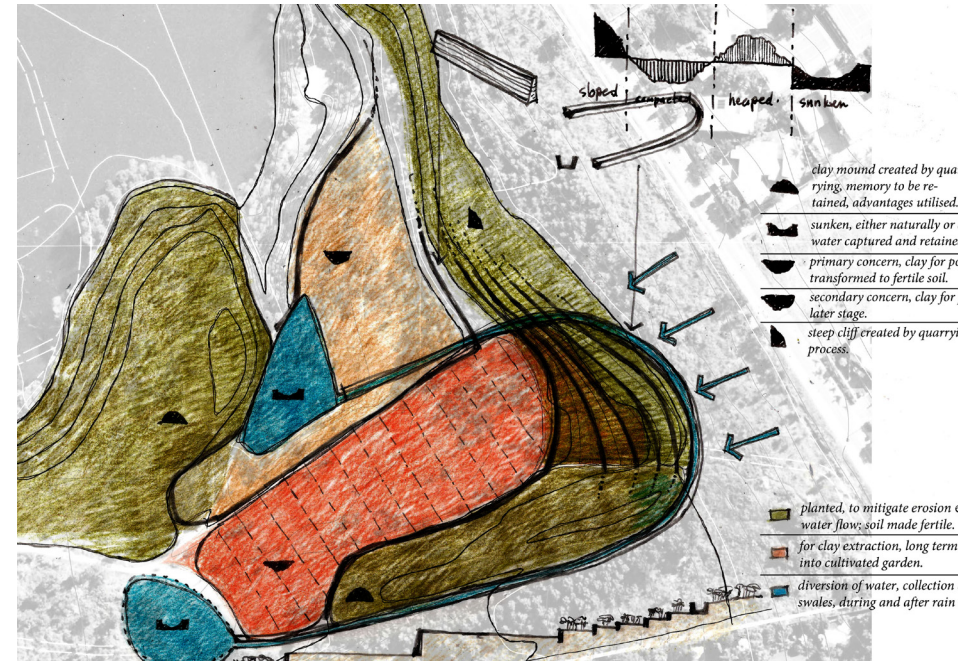
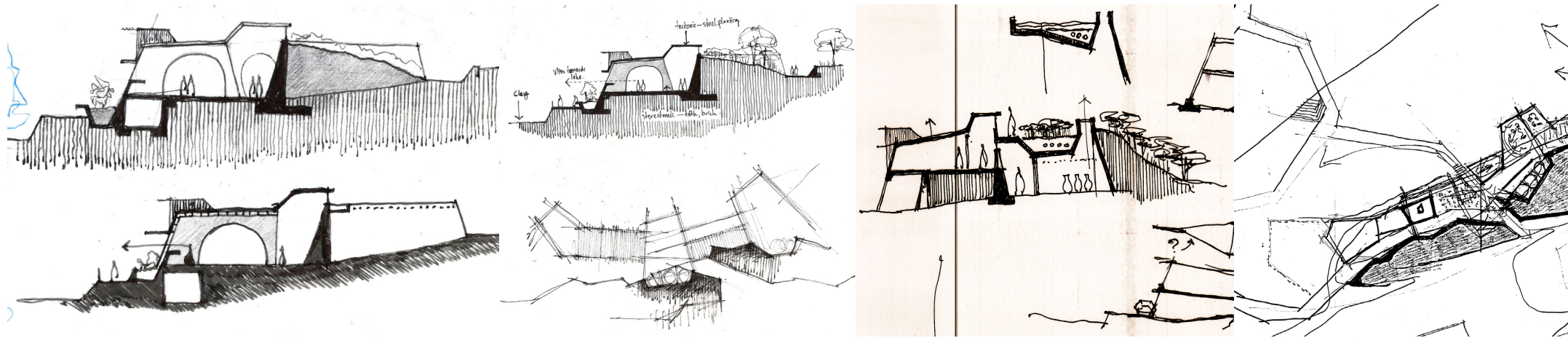


fig. 6.20 _Compiled landscape strategy [Author, 2013]



6.9 _To heal the people: the clinic and pottery workshop

It was mainly in the design exploration of the clinic and pottery workshop that the concept and design moulded each other to a final conceptual scenario, as illustrated in figure 6.21. Some important notes on the design of the building and how it relates to the concept will be discussed here.

The initial conceptual thinking behind the building was that three of the elements, namely soil, time and boundary would be used to make the structure. But it later became apparent that boundary is a contrived element when viewed as an entity on its own, i.e. a wall that continuously runs through the building. For it to have more meaning, it had to be an uninterrupted element, but the complexity of the programme unfortunately did not allow it. Rather, the coming together of the stereotomic and tectonic, that is soil and time, would create walls, or boundaries, and subsequently separate spaces that are linked by a route.

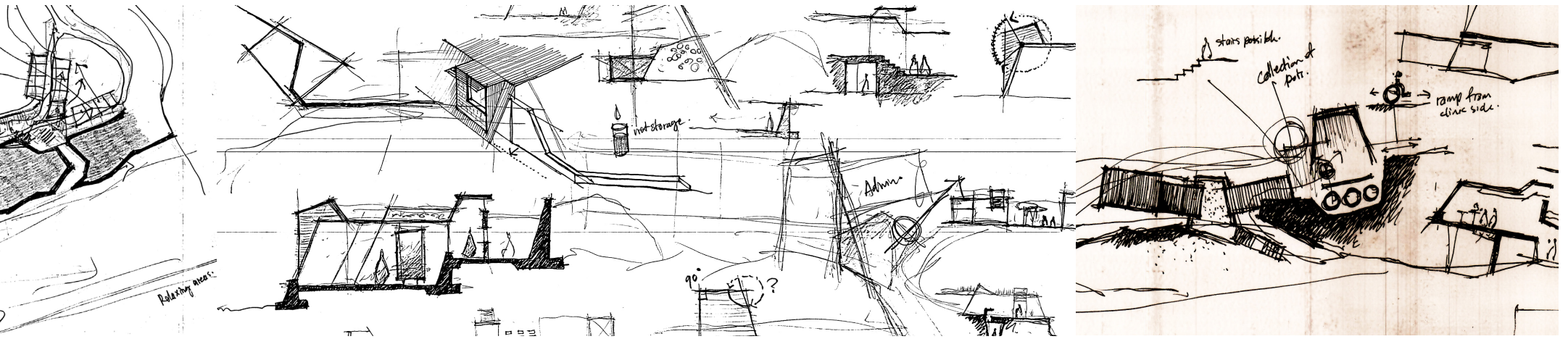


fig. 6.21 _Design exploration [Author, 2013]

MERGING WITH THE SITE

The building attempts to create harmony with the site in various ways:

Firstly, by its position. To the west, the structure separates itself from the mound to create a juxtaposition, letting the more organic mound read as distinct from the linear building. Moving more towards the east, the structure changes direction to follow the contours of the site, and gradually merges into the mound (fig. 6.22).

The second way that harmony is created is with the shape the building's roof. The tectonic structure, comprising of structural steel and Corten IBR sheeting, leans back into the mound, as an attempt to mimic the original slope, but also for the form of the building to be less imposing.

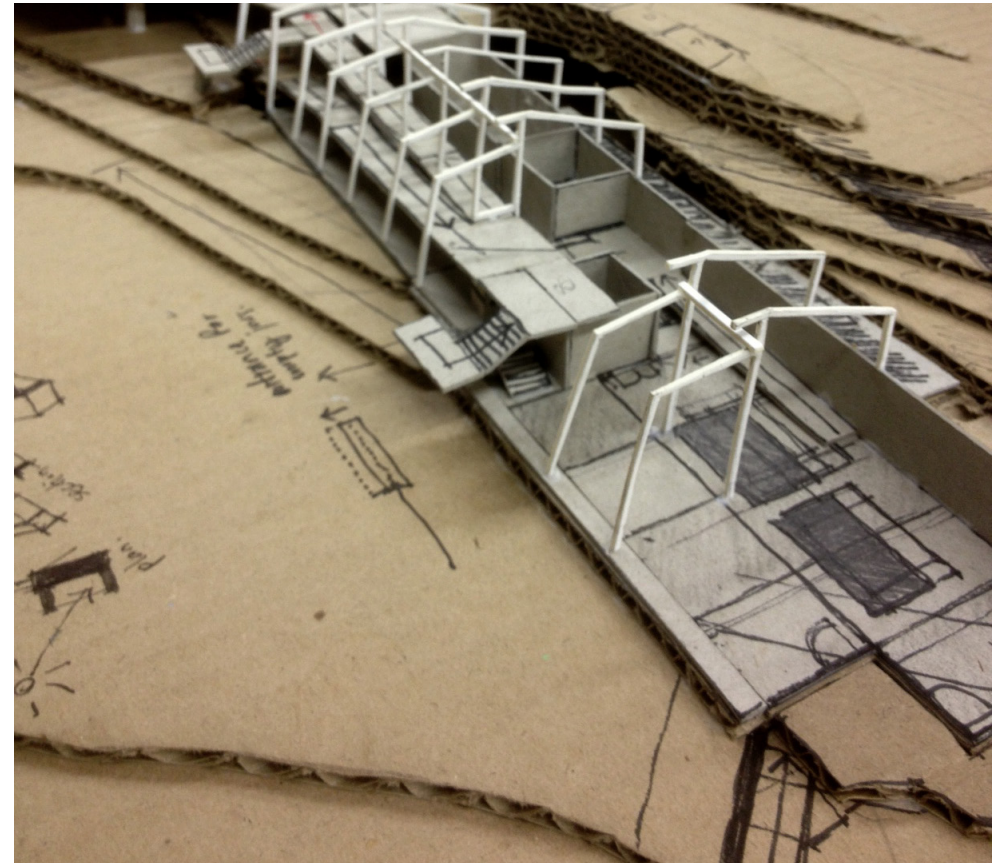


fig. 6.22 _Exploration model 1 [Author, 2013]

Thirdly, by the choice of material. Seen from the garden north of the building, the roof with Corten sheeting extends down to form the facade, and the colour attempts to gradually, over time, blend more into the landscape. Clay from the site is used for making walls of rammed earth, letting the interior reflect the material quality of the exterior, and old used bricks are used as paving around the building.

Shown in figure 6.23 is an exploration model that illustrates how the building sits in the landscape, and how portal-like steel structures sit on a prepared 'soil' made of concrete, brick and rammed earth.

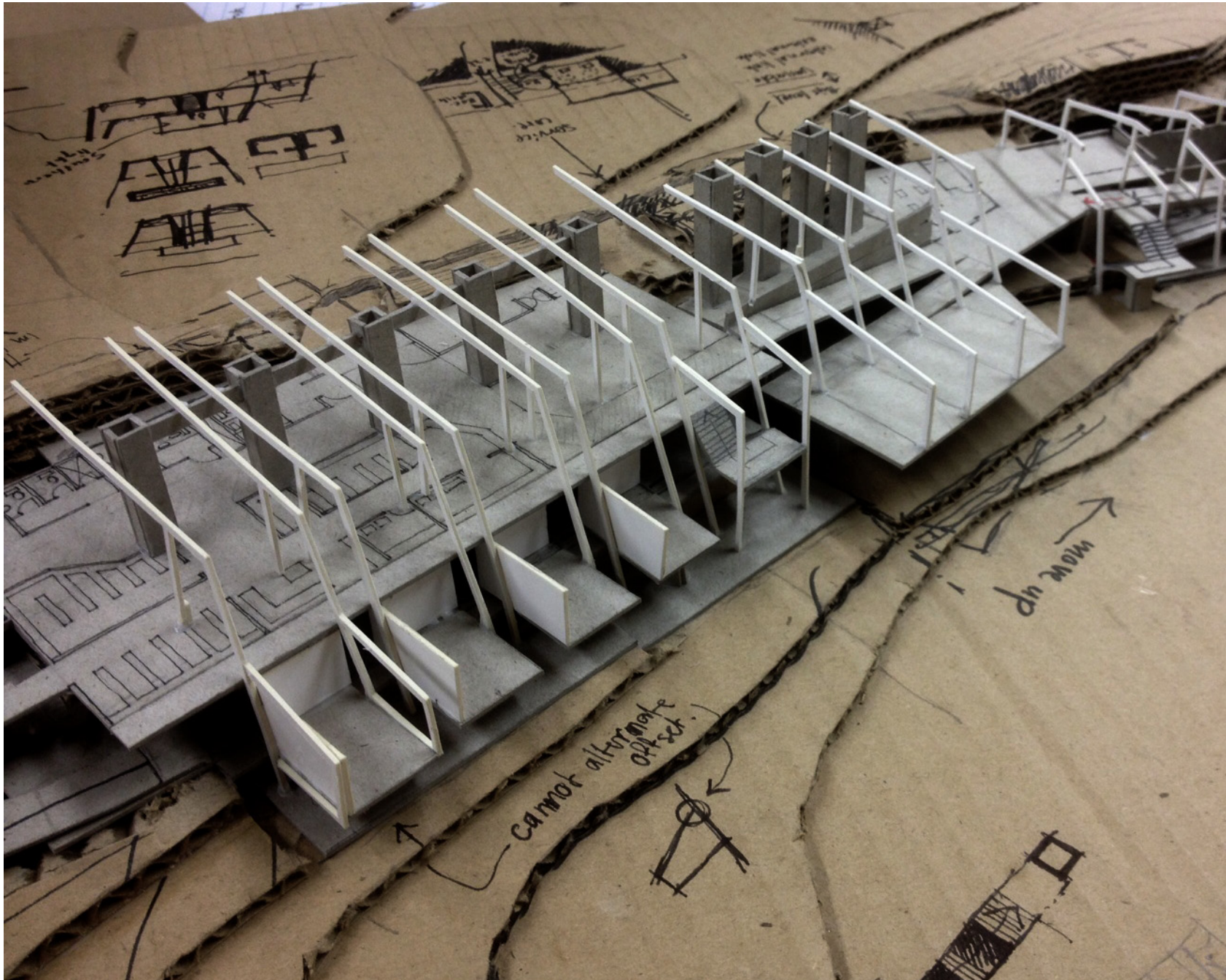


fig. 6.23 _Exploration model 2 [Author, 2013]

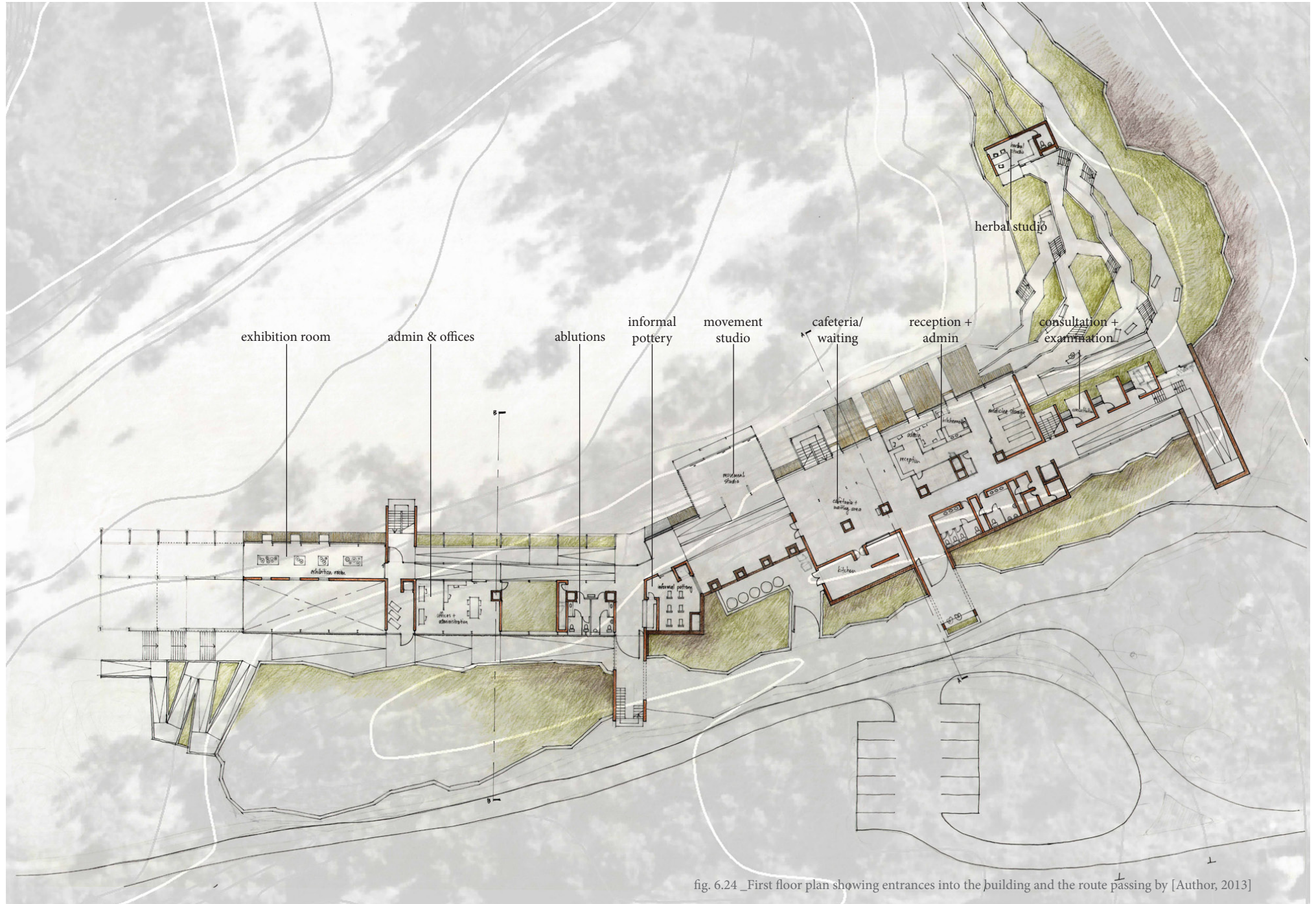
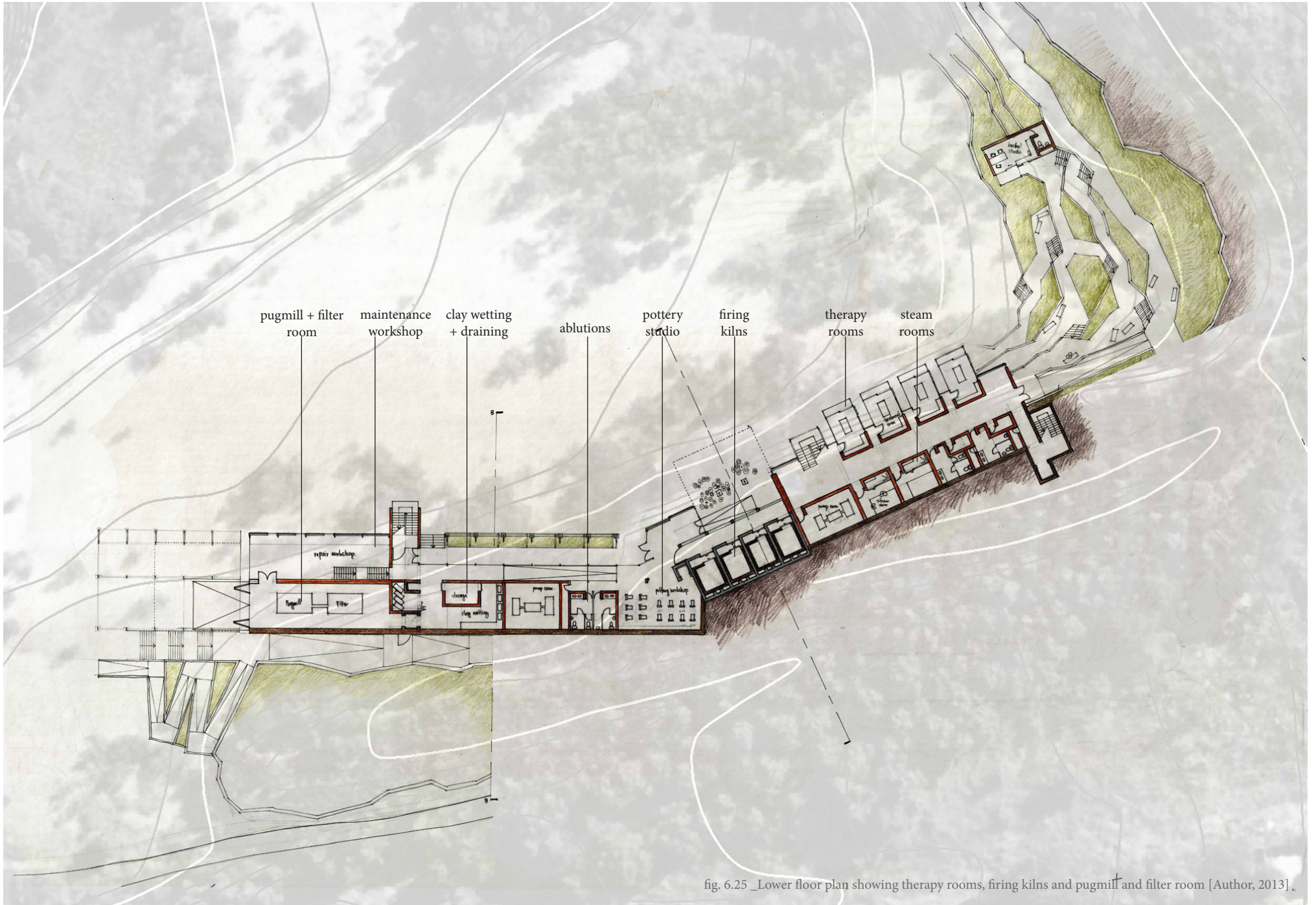


fig. 6.24 First floor plan showing entrances into the building and the route passing by [Author, 2013]



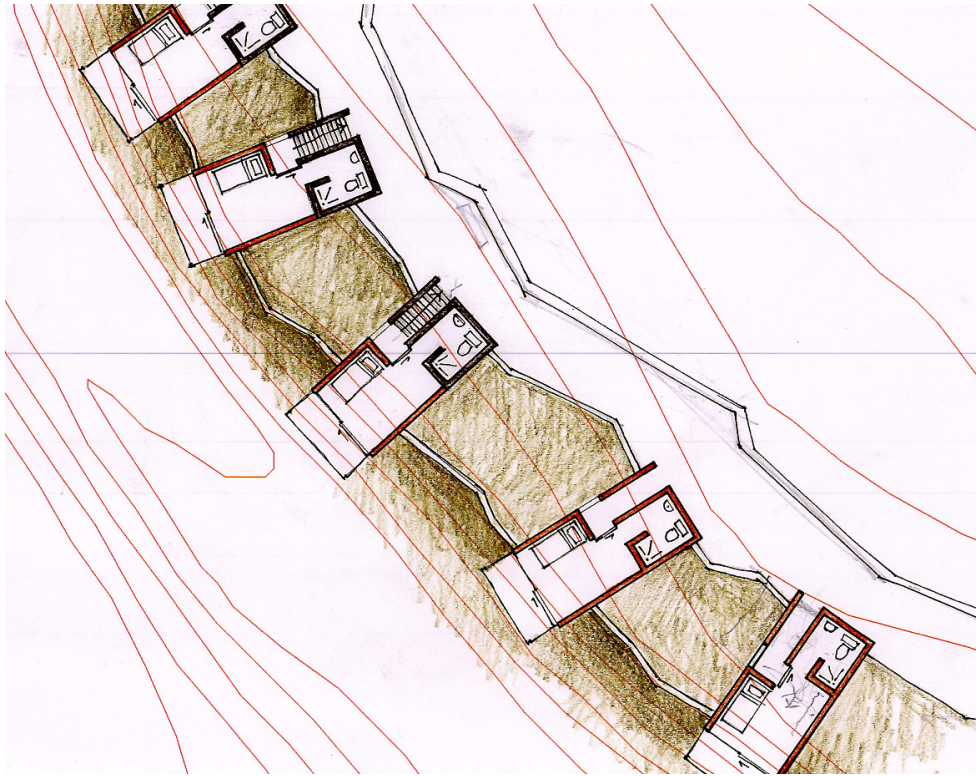


fig. 6.26 _Healing rooms placed against slop with a view to the garden [Author, 2013]

THE INTERIOR ROUTE

Both of the programmes require continuous walkways, and therefore ramps, that give access the different levels of the building (fig. 6.27 and 6.28). Potters need to transport pots and raw clay material via trolleys, and patients in wheelchairs needs to move from reception to the treatment- and healing rooms. This programmatic requirement fits well into the conceptual idea of the route. Resultantly, the building was designed to accommodate the different levels with ramps, and a route was created that not only allows access to all the spaces, but also connects the two programmes in an effective manner.

WET VS. DRY SPACES

In the process of preparing the clay, specific spatial requirements caused dry spaces to be separated from wet ones along the length of the building, as the process runs that direction. At the clinic, wet was separated from dry in the perpendicular direction, across the length of the building (fig. 6.29). Wet spaces like ablutions, kitchen and the steam rooms were placed in the mound and part of the stereotomic, while dry spaces like offices, consulting rooms, treatment rooms etc. were placed on the northern side, belonging to the tectonic, looking out onto the garden.

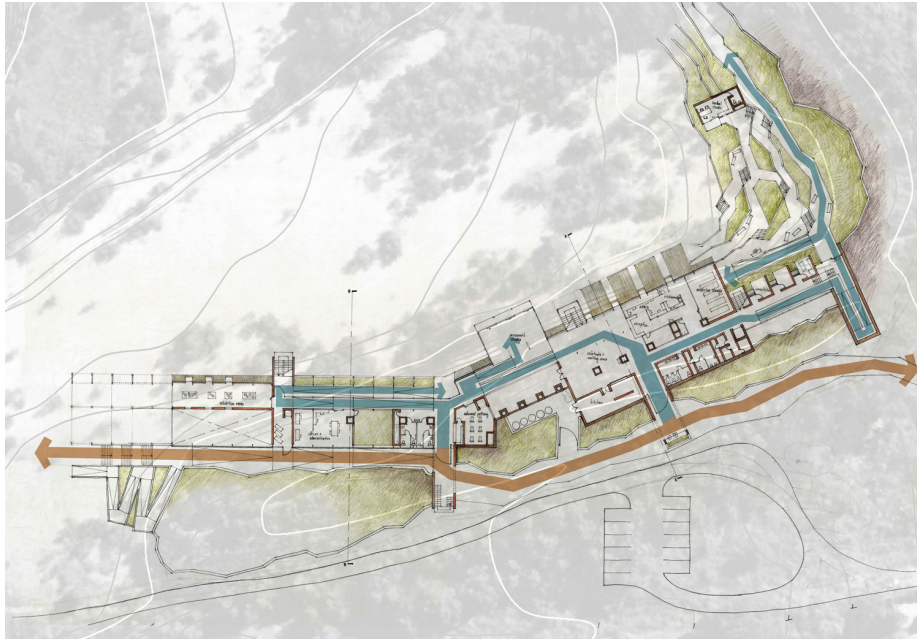


fig. 6.27 _Interior route of top floor with relationship with exterior route [Author, 2013]

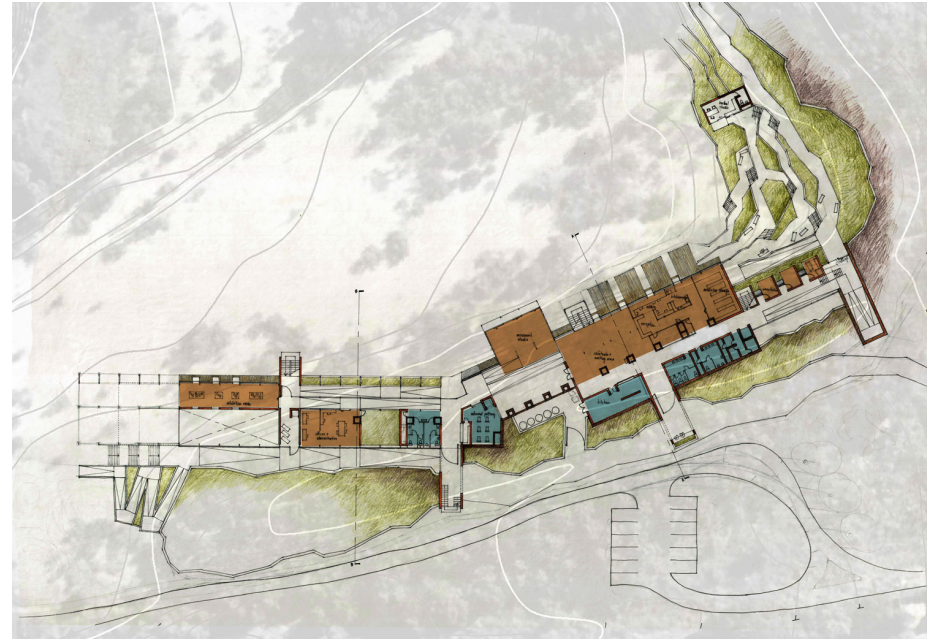


fig. 6.29 _Wet spaces (blue) vs dry spaces (orange) [Author, 2013]

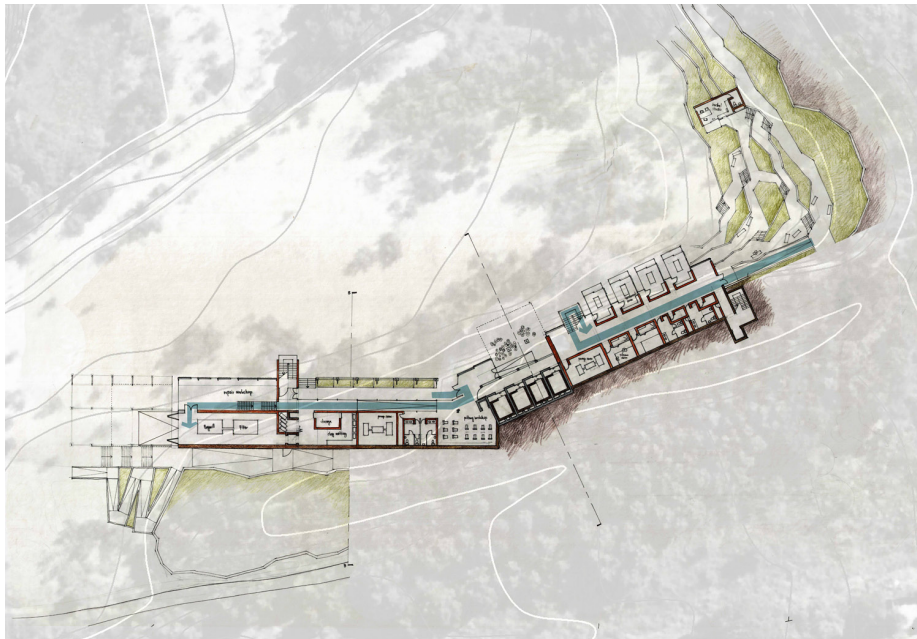


fig. 6.28 _Interior route of bottom floor [Author, 2013]

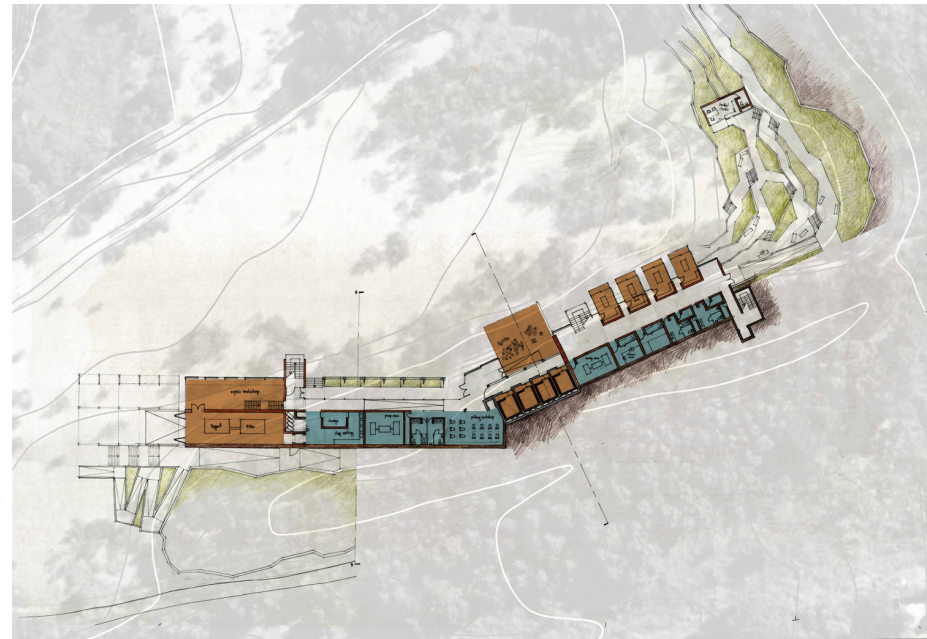


fig. 6.30 _Wet spaces (blue) vs dry spaces (orange) [Author, 2013]

BUILDING AND GARDEN

The design of the building explores the building-garden relationship in various ways. The building as an entirety is seen as something distinct from the garden, yet placed within it (fig. 6.31). When approaching the building from the south, very little of it can be seen, as the mound extends over and forms part of the roof. An opening in the mound gives access to the clinic's reception area, and when entering, the interior gives limited visual access to the garden outside. As one walks down the passage to the lower level, the rammed earth wall tells the story of the original state of the garden, with depressions occupied by planted pots telling of its current function and character. Where the wall meets the roof, a clerestory grants glimpses of vegetation. When reaching the treatment room, the narrow passage is contrasted by the room's interior, which opens a large view to the garden, and also allows some extent of physical access with a small balcony, adding to the experience of appearance from within the building. Patients using the healing rooms have the experience of moving through a smaller herbal garden (used by the herbalists) to where the rooms are located, thus moving from interior to exterior and back to interior once more. This experience strengthens the connect- edness to environment that the scheme aims to achieve.



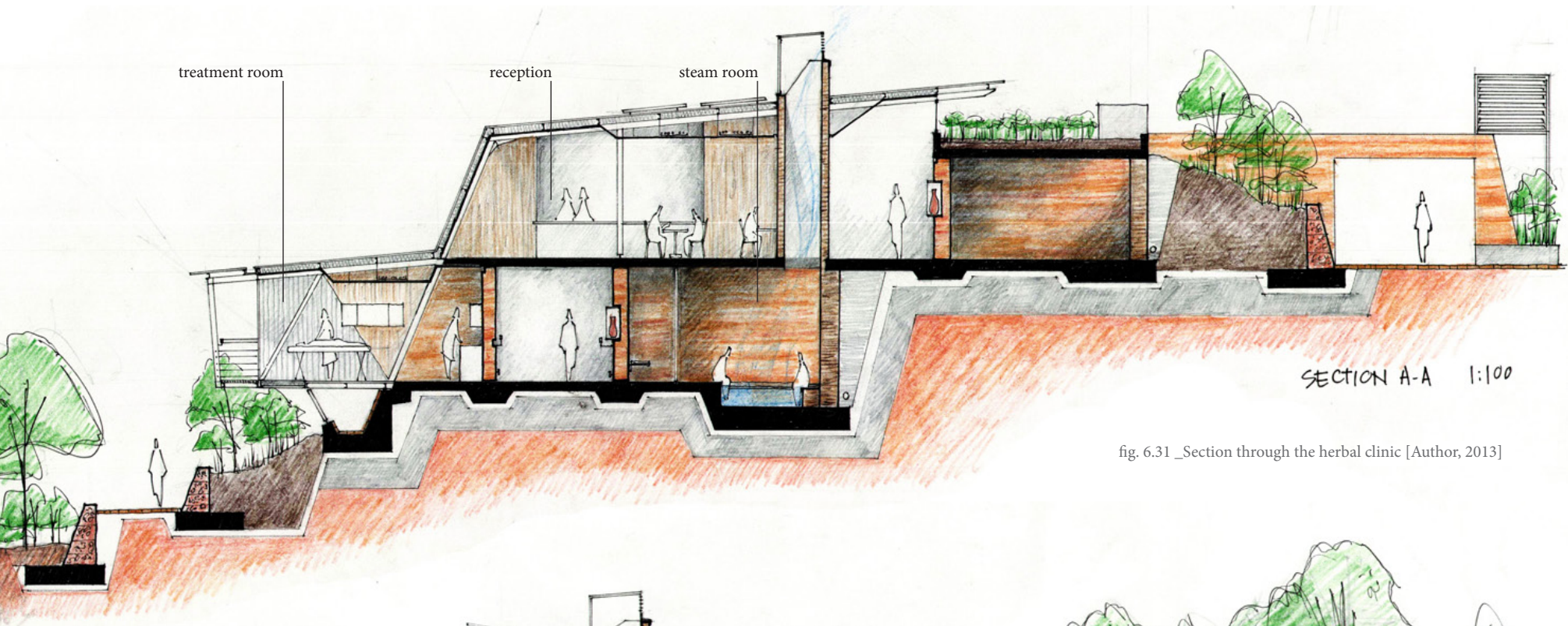


fig. 6.31 _Section through the herbal clinic [Author, 2013]

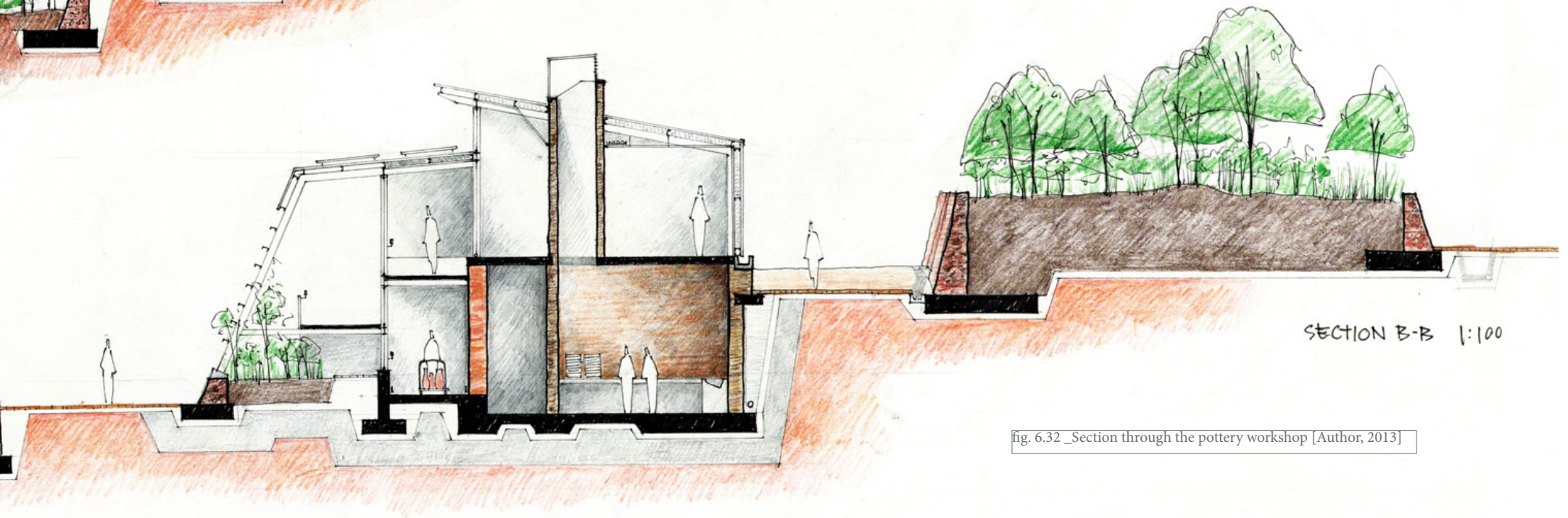
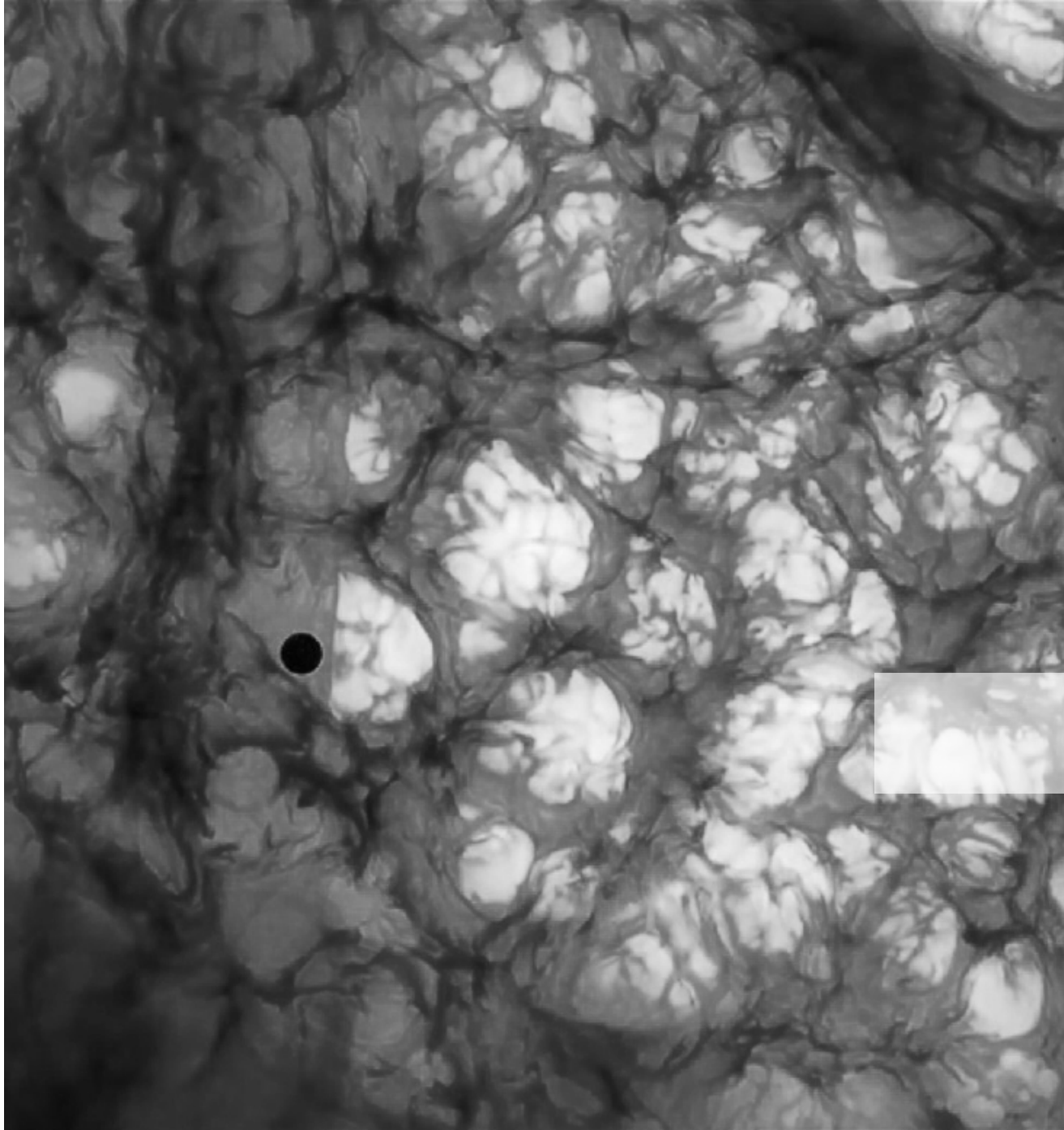


fig. 6.32 _Section through the pottery workshop [Author, 2013]



_chapter 7

t e c h n i c a l
the dirt of hands

fig 7.1 _Sun scene from Terrence Malick's film 'The Tree of Life'

How vainly men themselves amaze
To win the palm, the oak, or bays,
And their uncessant labours see
Crown'd from some single herb or tree,
Whose short and narrow verged shade
Does prudently their toils upbraid;
While all flow'rs and all trees do close
To weave the garlands of repose.

Andrew Marvell, The Garden (1681)

7.1_Preface

The making of the building has become not merely the final stage of the overall scheme, but a continuous reinterpretation of the concept and design intentions. The chapter will expand on this by discussing the technical concept, material palette, primary and secondary structure, and how Soil and Time come together in the aesthetics of joining. Also discussed here are the firing kilns and the water system, together with how the building's interior climate is passively controlled.

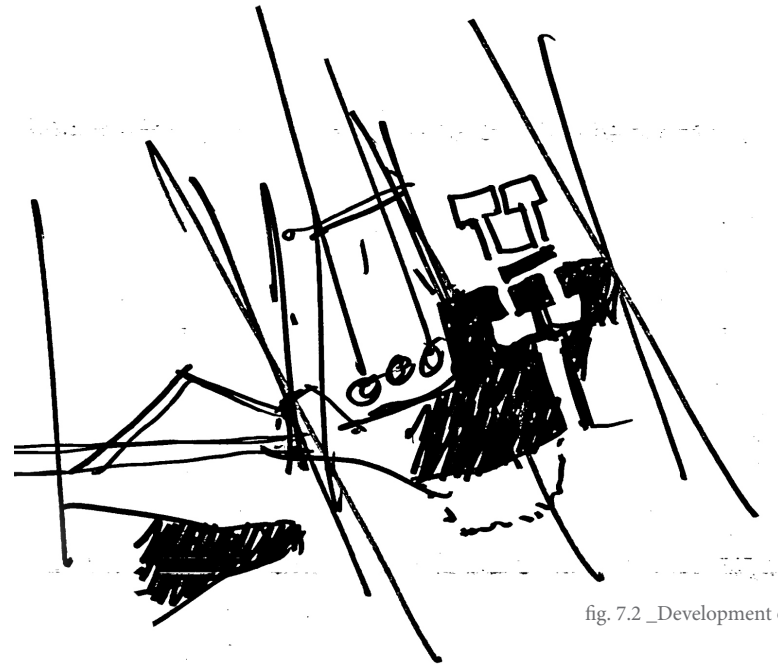


fig. 7.2_Development of plan [Author, 2013]

7.2 _The technical concept

The technical concept is a refinement of the design concept as an attempt to bring the conceptual intentions to a technical resolution. Stereotomic, soil, and tectonic, time, was explored further in section (fig. 7.3), and a rationale was developed that can apply to every condition present in the building. In detailing the section, it becomes important to express the definition of stereotomic and tectonic as separate entities, and this is most tangible where the two meet.

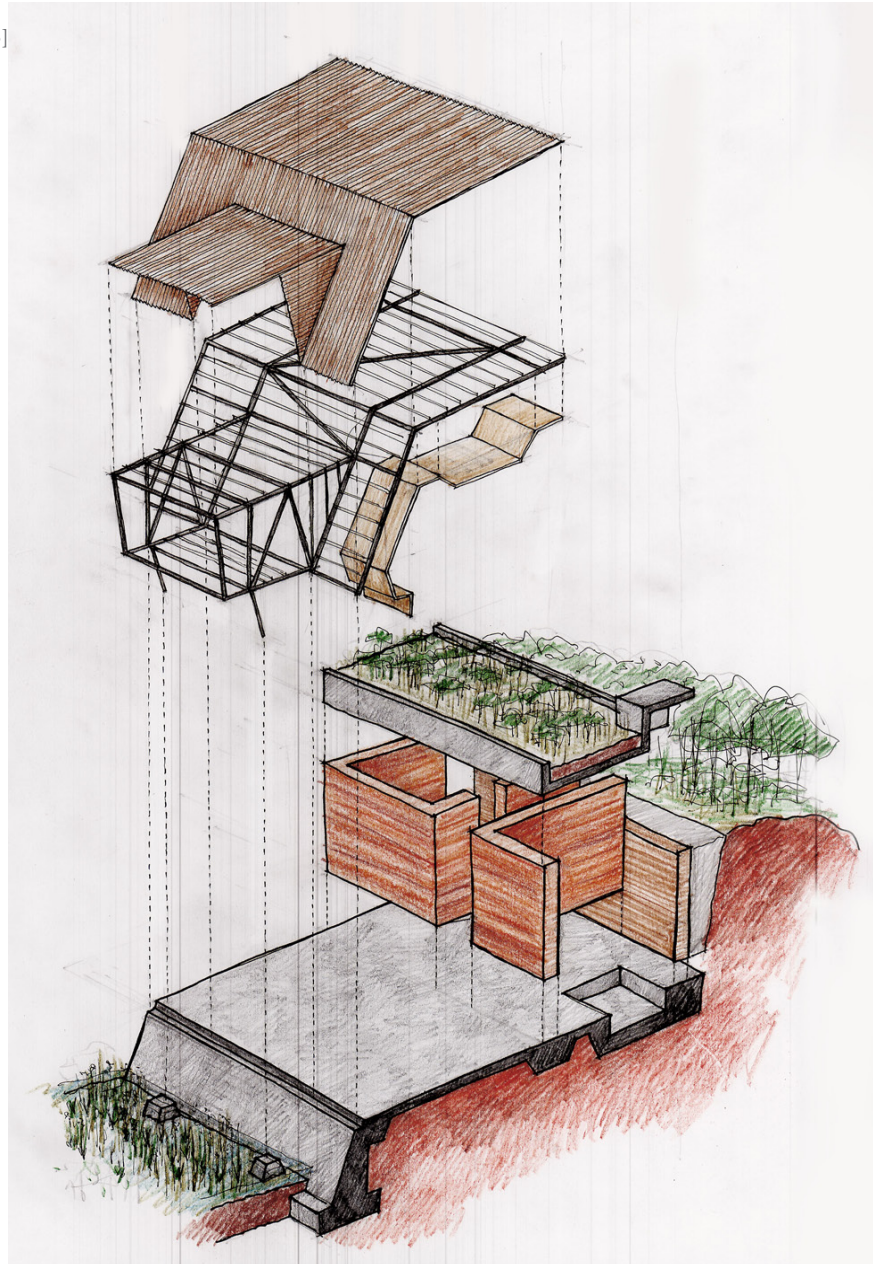
VERTICAL AXIS

Soil enables time, in that the stereotomic is prepared for and anticipates the tectonic. Heavy, dense materials sit on the site and rise from it, enclosing the wet spaces and creating floors to most interior rooms (fig. 7.3). These are viewed as permanent. Lighter materials sit on top of the prepared base. The resultant roof allows light into the interior and views to vegetation outside, giving an awareness of time and seasons.

HORIZONTAL AXIS

Soil and time also have relevance on the horizontal axis. The stereotomic first creates a condition that is completely soil, sitting within the mound, and holding the wet function. From there it moves to a condition that has both the presence of soil and time, heavy and light materials working together to hold a space, and finally, to a condition that is purely time, where the healing of the herbs and views to the garden can be enjoyed.

fig. 7.3 _Technical concept [Author, 2013]



TIME

TIME

SOIL

SOIL
[STEREOTOMIC]

REMAINING CLAY

The soil present on site is of decomposed shale, and has a prominent reddish colour. This clay is the reason the quarry was opened here in the first place.



BRICK RUBBLE

As an aftermath of the brick-making process, many bricks lay around in heaps. They are a tangible reminder of what happened on site.



CONCRETE SLABS

Most remaining of the ruins are the concrete slabs, indicating where structures were situated and functions occurred.



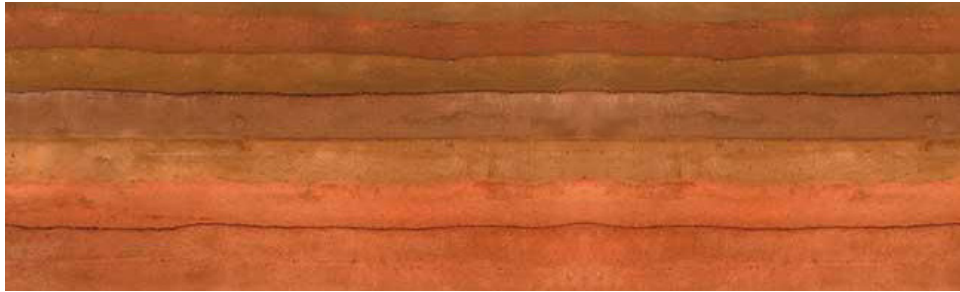
7.3_The material palette

The definition of the material palette has been determined by the material qualities of the site, spatial requirements, and conceptual intentions. For stereotomic, concrete, brick and rammed earth was chosen. And for tectonic, Cor-ten IBR sheeting, structural steel and plywood¹ was selected.

¹ Initially, the idea was to use Black Wattle planks for interior finishes, with the intention to strengthen the conceptual notion of time, but no sources could be found to justify it as a reliable material.

STEREOTOMIC {SOIL}: MATERIAL QUALITIES ON SITE

The predominant stereotomic material is clay, especially where the clinic and pottery workshop are located. Another prominent material on site is used clay bricks, present in the paved access roads and rubble heaps. These two materials most effectively tell the story of the brick production that used to take place on site. The final material is concrete, used in most ground floor slab surfaces where the factory was located, and also as post and beam structures now recognisable in the ruins.



RAMMED EARTH

The most potent material to embody and express the concept of soil, as it will have the colour and content of the clay on site. It also has very good air regulating abilities.



BRICK

Bricks will be used as a paving material, as well as where retaining walls are needed. It relates to the soil in that it tells the story of the place purely as a material.



CONCRETE

This will be used as floor slabs, foundations, and plinths for exterior earth walls.

fig. 7.4 _Material palette, soil [Author, 2013]

STEREOTOMIC {SOIL}: SPATIAL REQUIREMENTS

In the herbal clinic, a comfortable temperature needs to be maintained throughout the year. The rammed earth can aid in controlling the interior temperature by regulating humidity levels to between 40 and 60% (Walker, et al., 2005: 12). It also improves indoor air quality, “removing asthma triggers and reducing respiratory diseases”. The thermal mass of all three materials also help in controlling the interior temperature. A concrete floor that receives sunlight in winter can act as a thermal battery, building heat in the day and gradually releasing it throughout the night. Qualitatively, the earthen texture gives a very tactile quality to the interior, reminding one of the clay on site, and relating well to the making of pots.

STEREOTOMIC {SOIL}: CONCEPTUAL INTENTIONS

It is intended that the materials of soil seem to rise from the site itself. Rammed earth, brick and concrete do that, as they relate to the materials found on site, but rammed earth does it most effectively because of the actual soil of the site being formed and used in the building. This relates well to the re-engagement with the substance humans are made of that Harrison (2008:44) refers to. In relation to the notion of gardening, i.e. preparing the soil, the material selection provides an effortless realisation, as all of them already belong to the soil of the site. Their presence in the building speaks of a working engagement with soil.

TIME
[TECTONIC]

ORIGINAL STEEL STRUCTURES

Relating to the concept of 'time' is the memory of the old steel sheds that used to occupy the site.



VEGETATION

Plants give the awareness of time in that they change over seasons, and live in a continuum of birth and death. On site are mostly invasive Black Wattle trees.



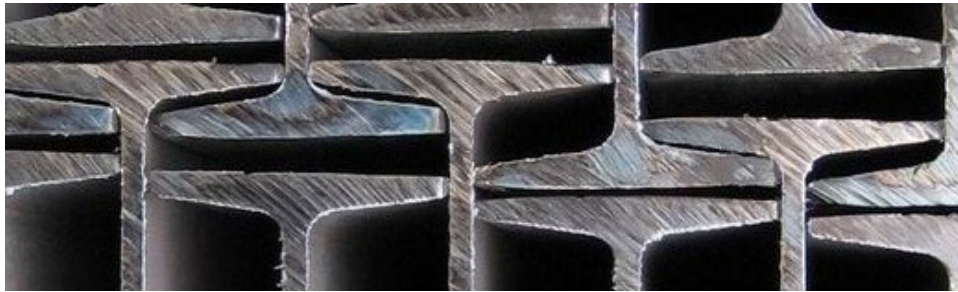
TECTONIC {TIME}: MATERIAL QUALITIES ON SITE

Australian Black Wattle trees occupy most of the site, and are especially prevalent where the clinic and pottery workshop are located. Vegetation speaks of time not only because it is fleeting and temporary, but also constantly changing with time and seasons. Also, a more intangible aspect of the site relating more to its memory (and thus to time), are the steel structures that used to occupy the site. They fall under tectonic {time} because of their ability to be disassembled and re-used fairly easily, and their light aesthetic quality.



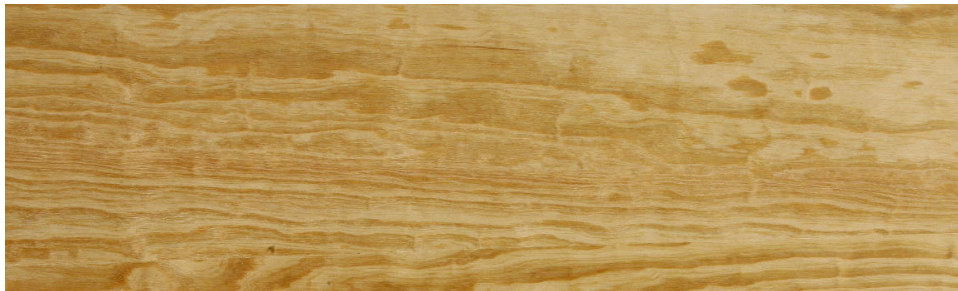
CORTEN

As a roof sheeting material, Corten IBR sheeting not only relates to the sheeting of the original structures, but also changes with colour and eventually blends with the site, binding it to the concept of time.



STRUCTURAL STEEL

A steel structure also relates to the original sheds, but also gives a tectonic quality and adds to the concept of time.



PINE PLYWOOD

To resemble the vegetation on site and its memory, a wooden finish will be provided in the interiors.

fig. 7.5 _Material palette, time [Author, 2013]

TECTONIC {TIME}: SPATIAL REQUIREMENTS

Internal spaces need to be well lit, especially where examination of patients needs to take place. The steel structure will therefore need to have adequate openings, and strategically so, to allow natural light into the spaces. Qualitatively, the tectonic materials contrast well with that of the stereotomic, and help to create a light, breathable interior environment.

TECTONIC {TIME}: CONCEPTUAL INTENTIONS

An awareness of time can be achieved by materials selected in the following ways. Firstly, by the steel creating openings that allow light into the interior and giving views to the plants outside. Secondly, by the Cor-ten sheeting's ability to age and change character over time. And thirdly, by the plywood panels resembling the memory of the vegetation that used to occupy the site.

7.4_Primary and secondary structure

The technical concept, together with the material selection, gives rise to how the structure will be put together. As part of the soil, concrete, brick and rammed earth make up the primary structure. With the building sitting in the mound, and thus becoming part of it, the soil of this mound is worked and prepared to subsequently give support for the secondary structure.

PRIMARY {SOIL}

Because of the presence of clay, and thus the possibility of expansiveness, soil preparation will need to be done (Von Geyso, 2013), where suitable soil is brought in and laid at a depth of about one metre, onto which layers are compacted at 150 mm with a float foundation on top of that. In-situ reinforced concrete is used for this foundation. Wherever retaining walls are required, brick is proposed to be used, a better option than rammed earth, as earth walls are too susceptible to weathering in the constant presence of moisture (Walker, et al., 2005: 18). Rammed earth will be used for interior walls, and exposure of rammed earth walls to the environment is minimised. Where moisture is high, like in the steam rooms, and where walls have exterior exposure, a Crommelin Rammed Earth Sealer sealant is proposed to be applied (Crommelin.com).

Another component is the green roof over the southern spaces of the herbal clinic. It belongs to the primary structure in its material (concrete), and also as part of the soil, as the mound comes 'over' and 'onto' the roof of this part of the building.

SECONDARY {TIME}

A steel skeleton structure will then be placed on the prepared soil, or primary structure. The steel frame is portal-like, made up of 203 x 102 x 25 taper flange I-section steel rafters that meet the same size columns with a portal apex connection (The Southern African Institute of Steel Construction, 2000: 38). In the clinic, these rafters are spaced according to spatial requirement, dictated by the width and spacing of the treatment room boxes. They are laterally supported by 89 x 152 hot rolled steel I-sections, and cross braced with steel rods. Fixed to the top of the steel frame, as the roof covering, will be IBR Cor-ten sheeting, fixed to 50 x 100 x 20 x 2 cold formed lipped channel steel purlins. And in the interior, to the bottom of the steel frame, 18mm plywood panels are fixed to the bottom of the purlins, and suspended at relevant places to create plenums for electrical services.

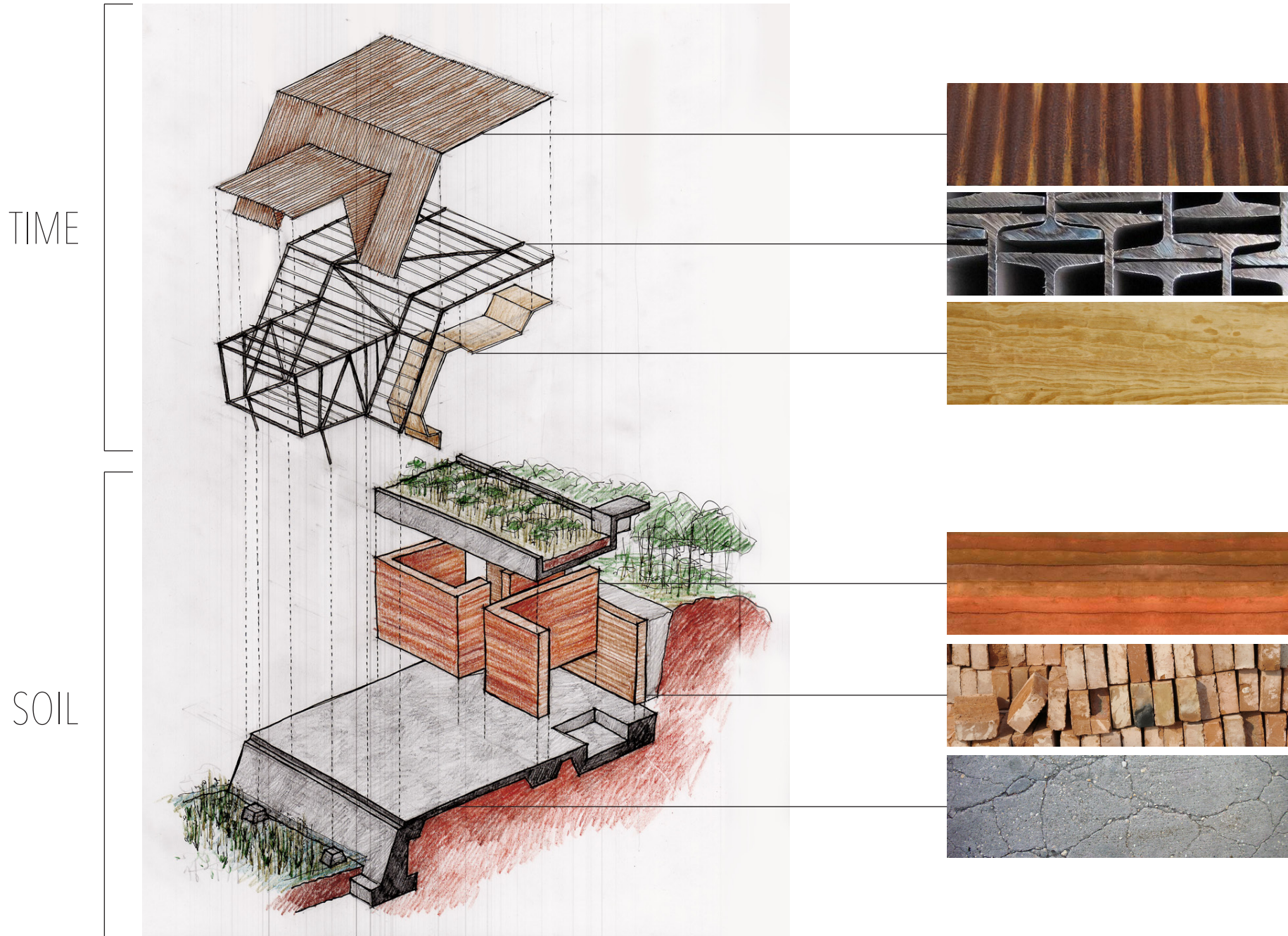


fig. 7.6 _technical concept explosion showing primary and secondary structure [Author, 2013]

7.5_The aesthetic of joining: where Soil and Time converge

Considering the material choices that relate to the conceptual intentions, the detailing of how these materials are joined should express Soil and Time as distinct entities. The characteristics of these entities are also to be expressed, that of Time being temporary and changing (i.e. time-bound) and Soil more permanent and grounded. Details from the herbal clinic will be used to explain how this is executed.

TIME

The aesthetic intention was for the composition to have a light character, yet also a temporality in how materials are joined. For the main structural elements, that is the steel rafters, an adequate depth was selected that could support a portal-like structure with the span and incline proposed for both the members, and bolted fixings were decided on to give the sense of temporality. For this to be perceived from the interior, the plywood ceiling is set in line with the top flange of the I-beam to expose the steel detailing. On the exterior, the intention with using Cor-ten IBR sheeting is for the character of the material to change over time, and to keep this surface as uninterrupted as possible, it was decided against putting a gutter here, and rather let water run directly down to the artificial wetland below.

TIME + SOIL

Wherever the two conceptual elements are present, the detailing lets these remain distinct in their structural roles, even if it will not be visible from the interior. On the first floor (the cafeteria/waiting area), the plywood ceiling meets an unequal leg steel angle that, together with a steel plate, forms a footing for Time to rest on the in-situ cast concrete slab of Soil. In the bottom space (the treatment room), the I-beam comes down and is exposed where it is met by the rammed earth wall. The plywood ceiling lets 'roof' be Time and 'wall' be Soil, as the concrete floor slab gives way for the plywood to be tucked in under it, meeting the rammed earth wall with a lighting fixture as separation.

SOIL

It is in the wet spaces, like the steam rooms, where Soil is in its purest form. Because the rammed earth walls are mostly internal, they are already protected from damage by rain. They are predominantly sandwiched by concrete slabs, and because of different movement rates, the two materials meet with movement joints. To express this even further, a shadow line is made in the rammed earth wall wherever it meets the concrete. Where the skylight shafts meet with the lower spaces which they provide natural light for, a continuous brick surface is achieved by setting the concrete slab one brick course back, and letting the brickwork run uninterrupted.

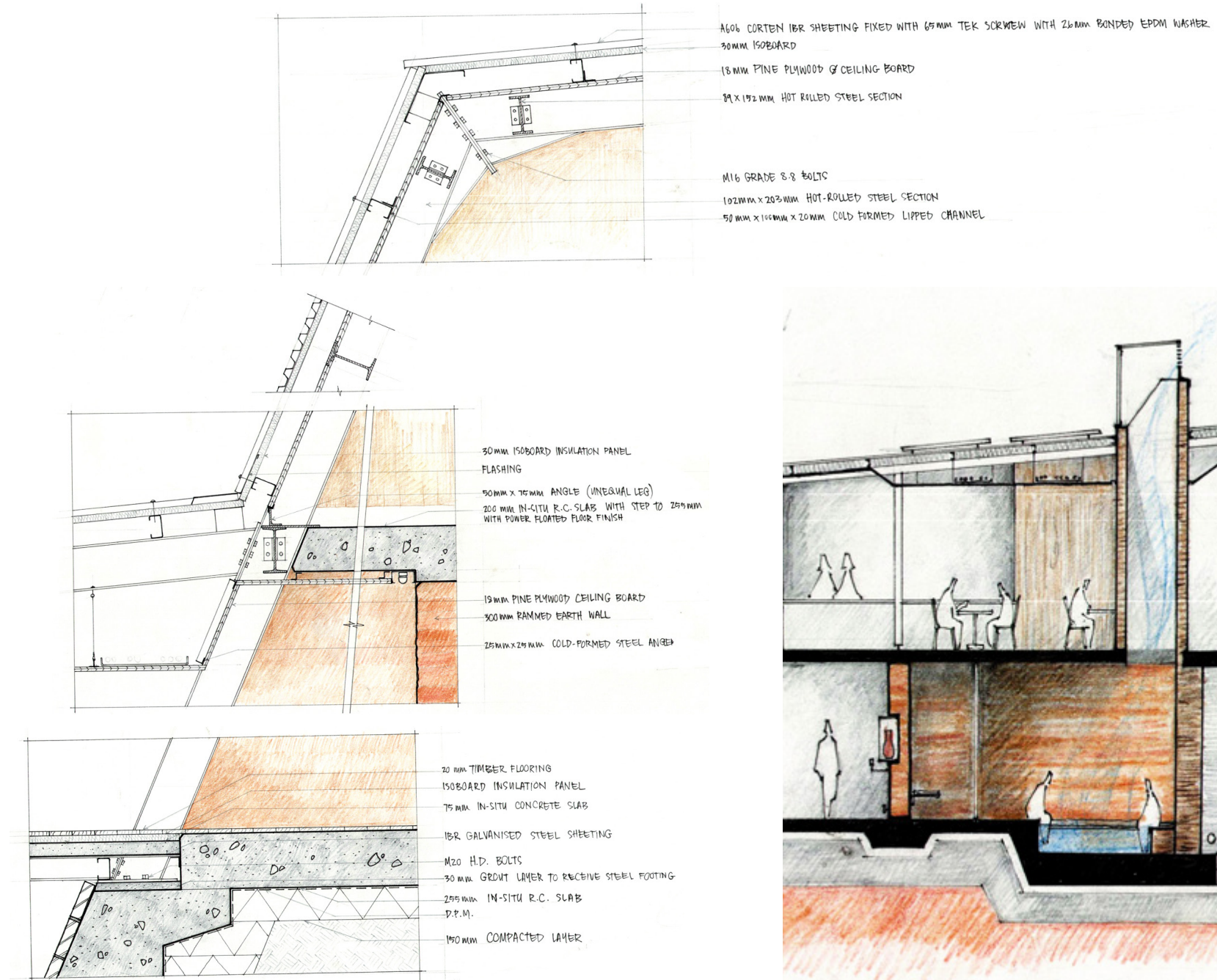


fig. 7.7 _Details showing how the concept influences the aesthetics of joining [Author, 2013]

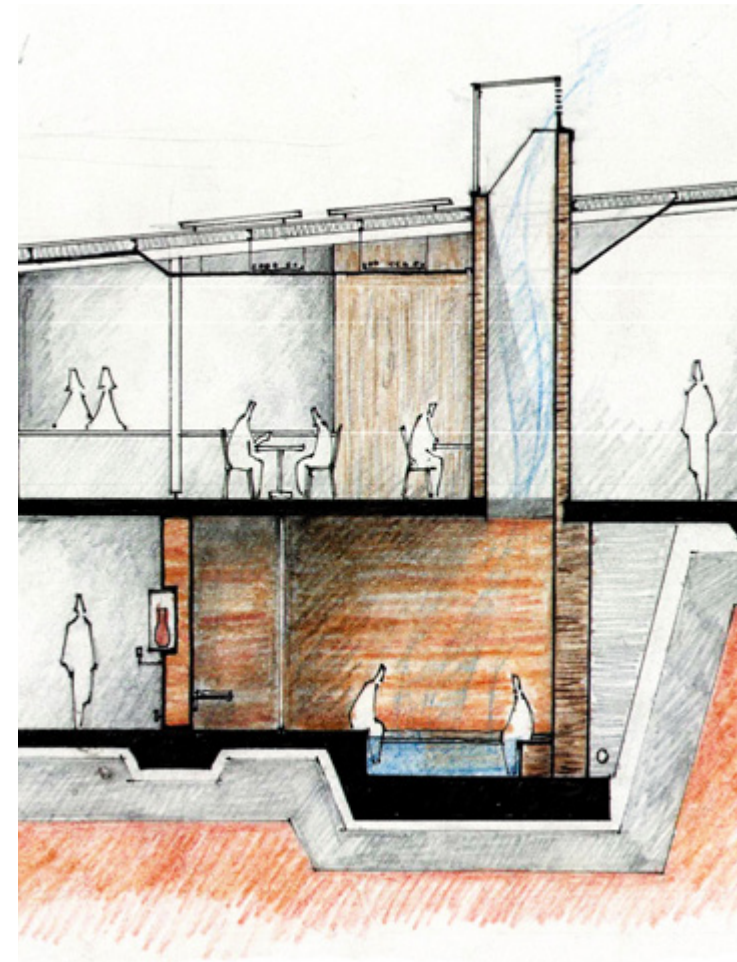
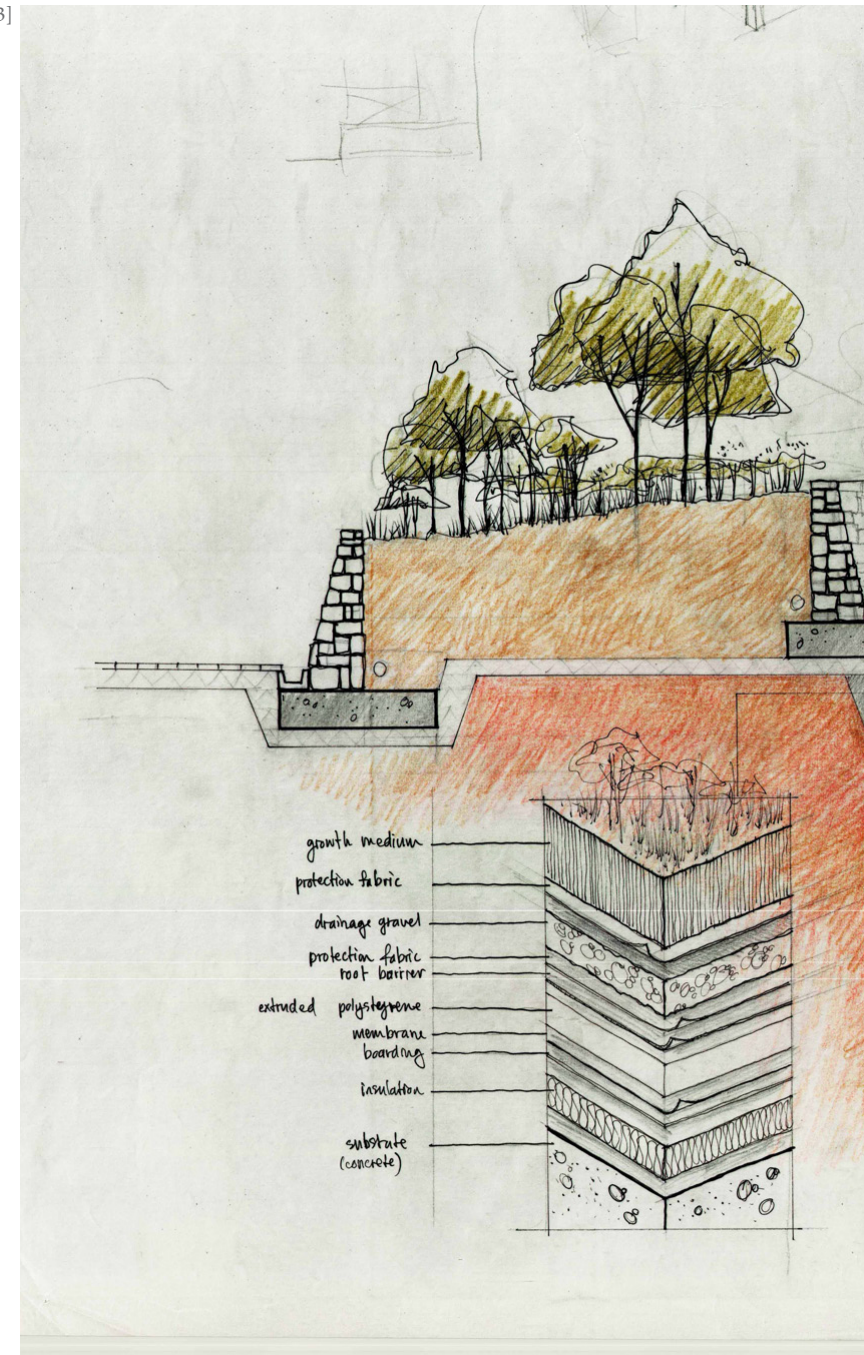
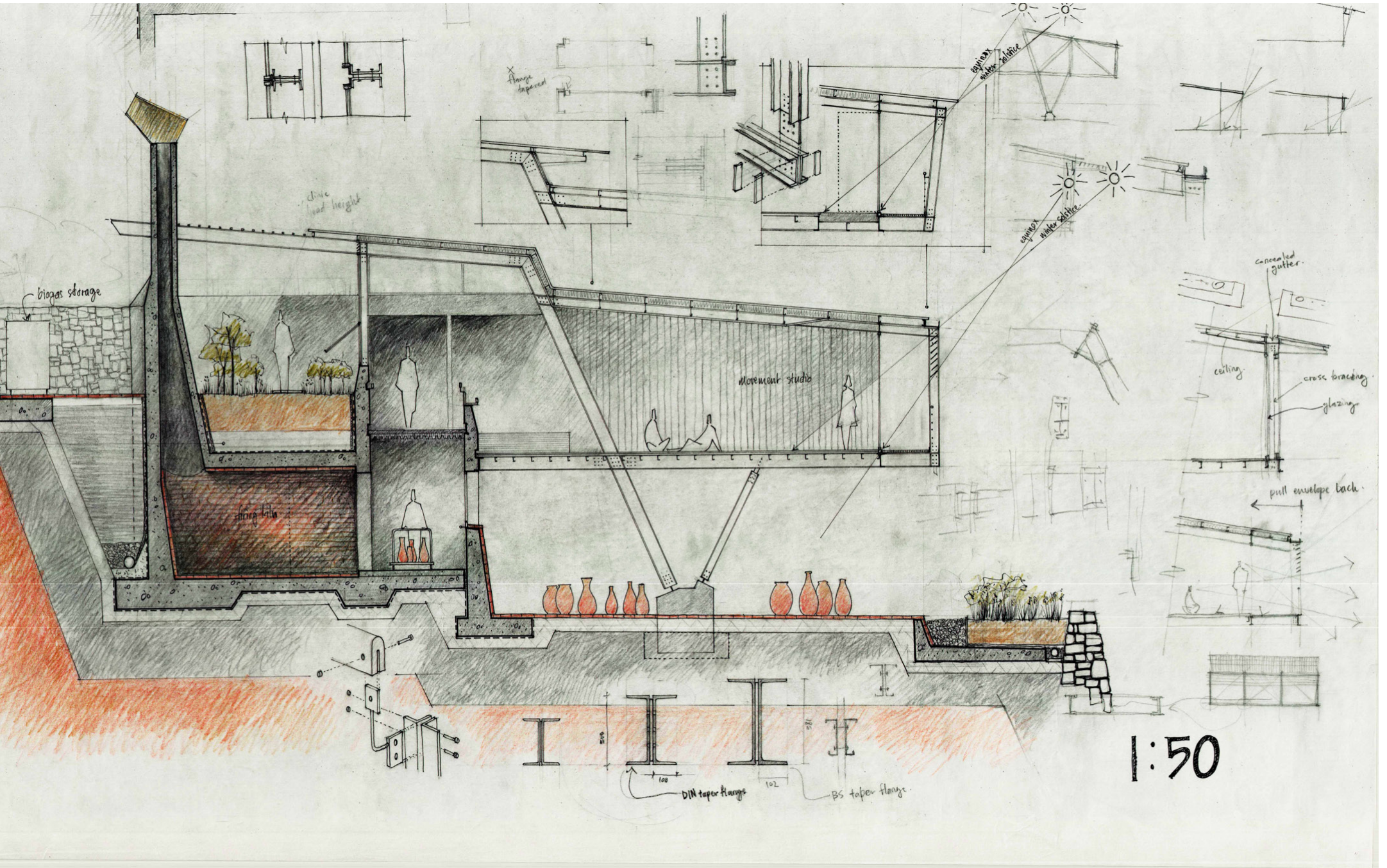


fig. 7.8 _Section through steam room [Author, 2013]

fig. 7.9 _Section through the movement studio and firing kilns [Author, 2013]

7.6 _The section: technical exploration





7.7 _The firing kilns

As one of the final stages of the pot-making process, the kilns become an integral part of the pottery workshop. But they also function as an element that systematically links the pottery workshop to the herbal clinic. For the steam rooms in the clinic, water needs to be heated to generate steam, and the kilns already provide that kind of energy. It is thus proposed that the kilns and steams room be located in close proximity to each other, and the water pump and purification system in between these.

Some complications were discovered in the process of resolving the kilns. Initially, it was conceptualised that the kilns would be constructed first, with the intention to make bricks from the clay extracted for use in the construction of the rest of the building. Once the building was finished, the kilns would be used to bake the pots. The problem with this, however, is that brick kilns function differently from pottery kilns, in their rates of cooling down and heating, etc., and the former uses a much higher temperature than the latter. This had implications in the material selection and detailing.

FINAL RESOLUTION

The initial resolution had concrete as the main structural material for the kilns, with the internal surface lined with fire bricks. The problem with this is that the severe thermal expansion and contraction experienced by the concrete would cause it to crack and eventually fail. To mitigate this, the kilns are made of fire bricks, in arched cylindrical forms, and placed within a concrete shell. The two materials are isolated as far a possible in order to allow for thermal expansion and contraction. This also allows for the structure to be more flexible, that if the building would not need the kilns any longer, the fire bricks could simply be removed without affecting the structure, and the space be used for something else.

This isolation also grants opportunity for the water pipes, those for heating water for the steam rooms, to be placed in between the two materials. However, the temperature of the kilns, which can go up to about 1000°C, can be excessive for the amount of energy needed to heat the water. The time lapses in between firing and cooling down would be sufficient for boiling the water, which can then be stored in thermally insulated containers.

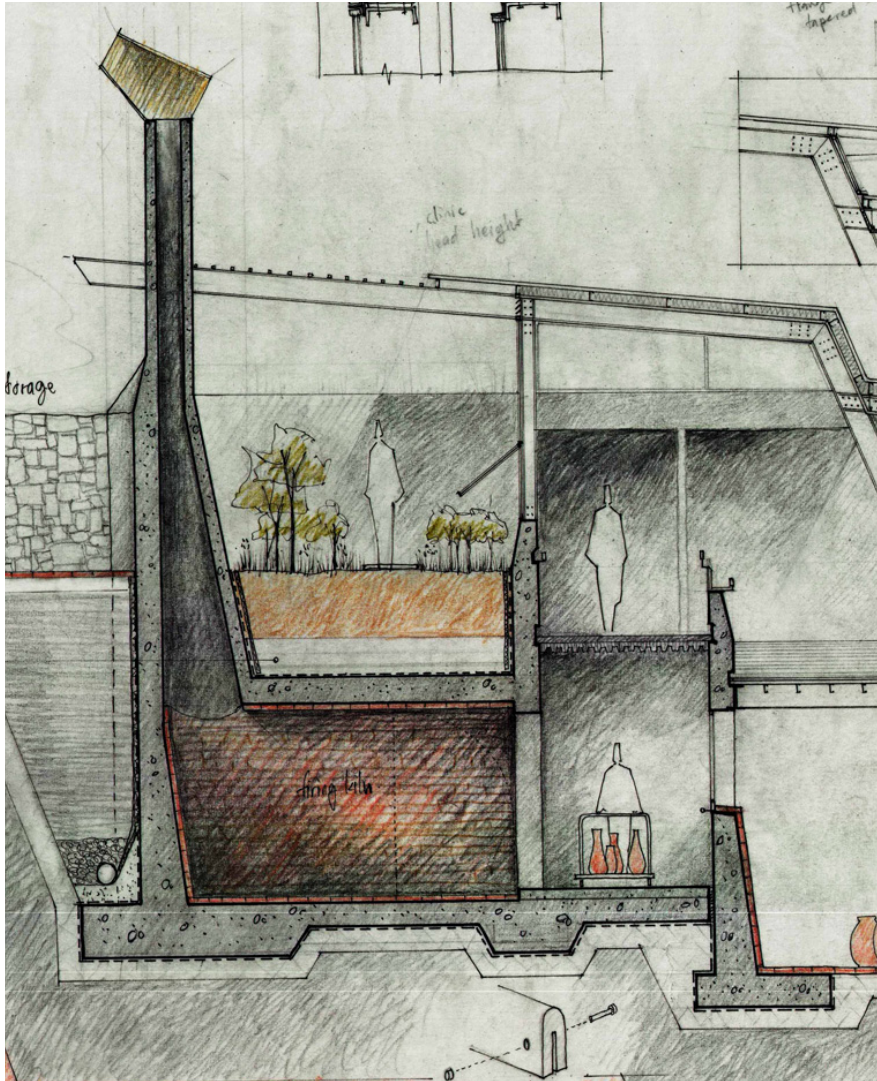


fig. 7.10 _Initial kiln resolution [Author, 2013]

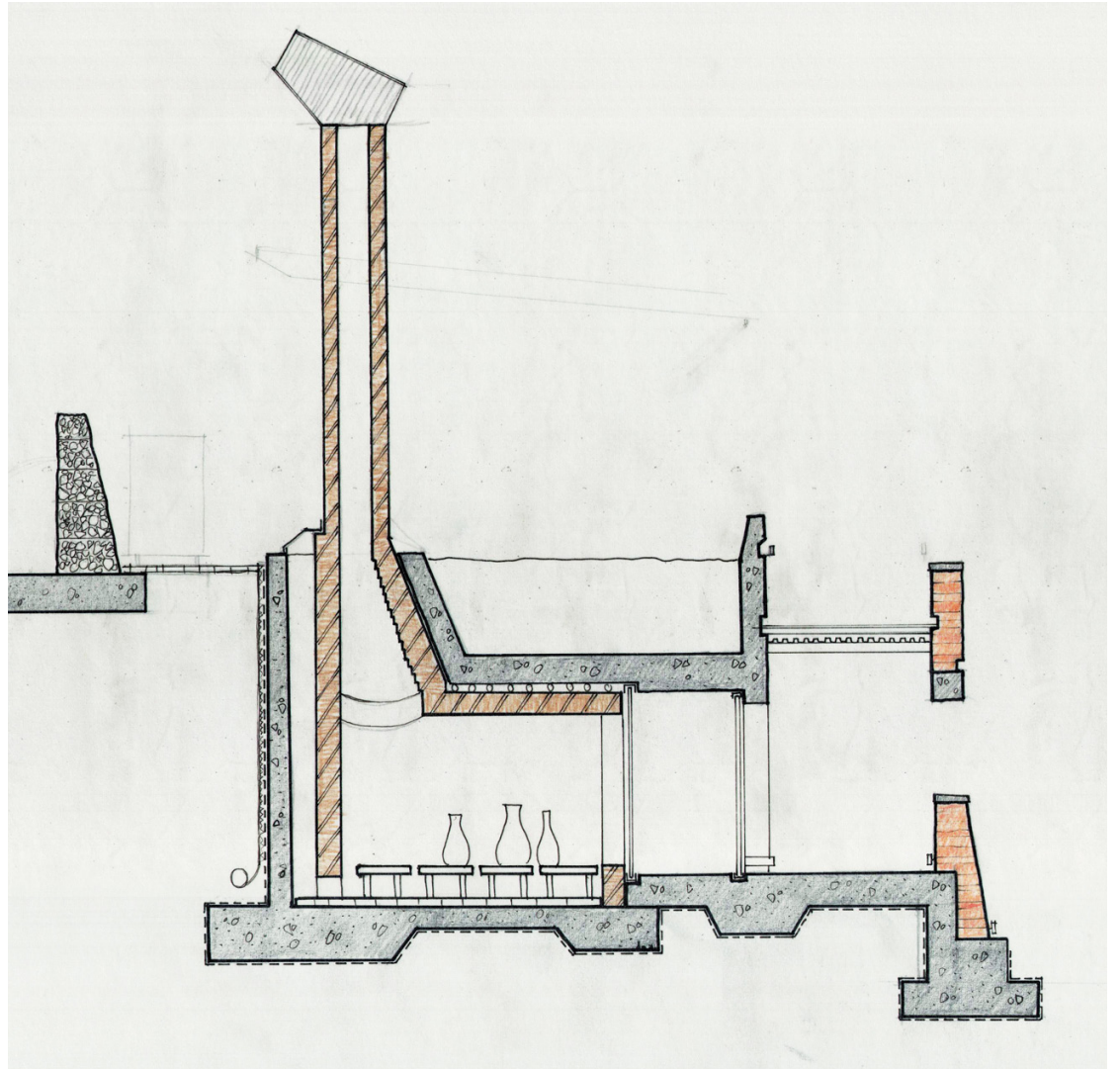


fig. 7.11 _Later kiln resolution [Author, 2013]

7.8_The water system

The programmatic functions within the building require specific uses of water, and a water reticulation system is therefore proposed. In the clinic, two of the therapy rooms use herbal infusions with steam, requiring heated water. It is proposed that the rainwater collected be heated with the firing kilns, and then pumped to the rooms.

WATER BUDGET

A water budget has been calculated to establish the amount of water that can be collected via rooftop, which then determines how much tank space will be required. Furthermore, the water use in the building needs to be compared to the amount that can be stored. In the clinic, primarily, recycled water will be used in the WCs, and after receiving UV radiation, in the steam rooms. In the pottery workshop, recycled water will also be used in the WCs, but also in the sprinkler system in the dust filtering room, to help dust settle to decrease health risks for the occupants.

Since the amount of water that can be collected by the roof far exceeds the amount required for use in the clinic, it will be better to only collect a certain amount and let the rest either flow into a french drain and into the soil, or into additional storage tanks for irrigation. This amount is determined by the maximum amount of 5000 litre tanks that can be housed in by the allocated area, that is 60m³, or 60 000 litres. Twelve 5000 litre storage tanks will then be accommodated under the building.

ROOF CATCHMENTS:

Clinic:

$$195 + 398 + (22,4 \times 5) \\ = 696 \text{ m}^2$$

Pottery:

$$185,5 + (12,8 \times 4) \\ = 236,7 \text{ m}^2$$

TOILETS:

20 visitors per day, with a probability of each person flushing once. That gives 20 flushes per day. For the 15 staff members there is an average of 25 flushes per day.

$$45 \text{ flushes} \times 6 \text{ litres} = 270 \text{ litres per day}$$

$$7 \text{ weekdays, } 28 \text{ days per month: } 28 \times 270 = 7560 \text{ litres (7,56 m}^3\text{) per month.}$$

WHBS:

Calculated with the assumption that 2 litres is used for a single hand wash. After each toilet flush, 45 hand washes come to 90 litres.
 $90 \times 28 = 2520 \text{ litres (2,52 m}^3\text{) per month}$

SHOWERS:

One shower takes 190 litres (for 10 minutes).
 15 showers per week, meaning 60 per month. That gives 11400 litres (11,4 m³) of water use per month.

STEAM ROOMS:

1 litre = 1kg
 1000 litres = 1m³
 1kg of steam = 1,673 m³ (atmospheric pressure)
 Each steam room is 74,2 m³

$$74,2 \div 1,673 = 44,35 \text{ kg (44,35 litres)} \\ 44,35 \div 1000 = 0,04435 \text{ m}^3 \\ 0,04435 \times 60 \text{ hours (3 hours, 5 per week, 60 hours per month)} = 2,661 \text{ m}^3 \\ 2,661 \text{ m}^3 \text{ (2661 litres) needed per month}$$

The building is provided with two steam rooms, thus 5,322 m³ will be needed per month

Total estimated use of harvested water = 26,802 m³

month	average monthly rainfall (m)	Yield = PAC (m ²) [clinic]	Yield = PAC (m ²) [pottery]
January	0,136	85,2	77,5
February	0,075	47	42,73
March	0,082	51,4	46,72
April	0,051	31,34	29,1
May	0,013	8,14	7,41
June	0,007	4,4	3,99
July	0,003	1,88	1,71
August	0,006	3,76	3,42
September	0,022	13,78	12,53
October	0,071	44,5	40,41
November	0,098	61,39	55,83
December	0,11	62,9	62,67

month	yield (PAC)	in (m ³) [new/left over]	used	remaining in tank
January	85,2	60 / 0	26,802	33,198
February	45	33,198 / 78,198	26,802	51,396
March	51,4	51,396 / 105,796	26,802	78,994
April	31,34	78,994 / 110,334	26,802	83,532
May	8,14	83,532 / 91,672	26,802	64,87
June	4,4	64,87 / 69,27	26,802	42,468
July	1,88	42,468 / 44,348	26,802	17,546
August	3,76	17,546 / 21,306	26,802	-5,496
September	13,78	-5,496 / 8,284	26,802	35,086
October	44,5	35,082 / 79,586	26,802	52,784
November	61,39	52,784 / 114,174	26,802	87,372
December	62,9	87,372 / 150,272	26,802	123,47

month	yield (PAC)	in (m ³) [new/left over]	used	remaining in tank
January	85,2	40 / 0	26,802	13,198
February	45	13,198 / 58,198	26,802	31,396
March	51,4	31,396 / 85,796	26,802	58,994
April	31,34	58,994 / 90,334	26,802	63,532
May	8,14	63,532 / 91,672	26,802	44,87
June	4,4	44,87 / 49,27	26,802	22,468
July	1,88	22,468 / 24,348	26,802	-2,454
August	3,76	-2,454 / 1,306	26,802	-25,496
September	13,78	-25,496 / -11,716	26,802	-38,518
October	44,5	-38,518 / 5,982	26,802	-20,82
November	61,39	-20,82 / 40,57	26,802	13,768
December	62,9	13,768 / 76,668	26,802	49,866

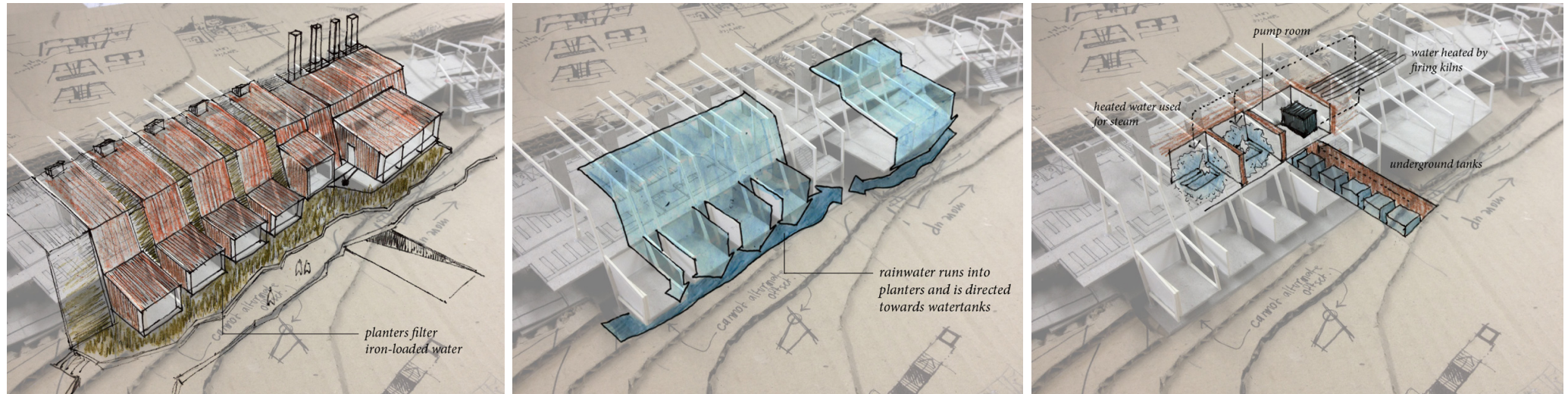


fig. 7.12 _Water system: relation of water related services with the building [Author, 2013]

THE SYSTEM

Rainwater is collected by the roof and directed to an artificial wetland that sits at the base of the building. For the first six months of the building, the 'bleeding' of the Cor-ten rust will be too high in metal content for the wetland to filter (Nippon Steel & Sumitomo Metal Corporation, 2012: 5). After those six months, however, the rust on the sheeting starts to stabilise, and the metal content of the water running from it is low enough for the wetland to absorb. The wetland naturally treats the water, from where it moves to an 'organic solids trap', separating organic solid matter from the water. It then flows into underground storage tanks.

From these tanks, the water is split. It is either pumped directly into the WCs of the clinic, or through a UV treatment chamber into a thermally insulated tank, where it is temporarily stored. Another pump takes the water from this tank and pumps it through the piping that sits in the firing kilns. The water is heated, and returns to the insulated tank, and when at the right temperature, it is sent to the steam rooms.

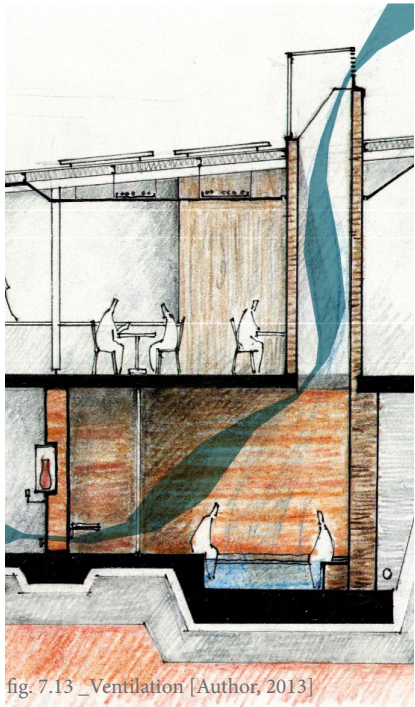


fig. 7.13 _Ventilation [Author, 2013]

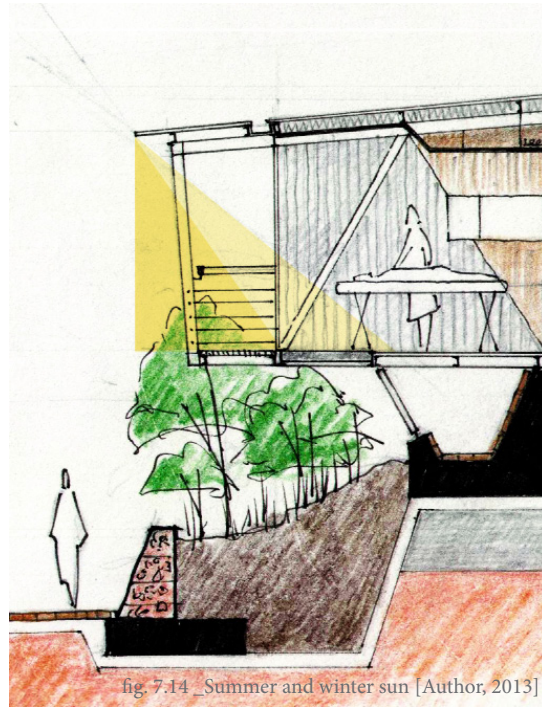


fig. 7.14 _Summer and winter sun [Author, 2013]

7.9 _Passive climate control

Because of the building's orientation, and most rooms being located on the northern side, passive heating in winter is easily achievable. The treatment rooms and movement studio all have fully glazed northern faces, to optimise the views to the garden outside. Solar gain in summer is mitigated by a one metre deep balcony that sets the glazed envelope back enough to keep the interior shaded. The presence of the wetland also helps to cool the air that moves into the space. In winter, however, sun is allowed into the space, where a concrete slab acts like a thermal battery, absorbing the heat and constantly releasing it into the interior.

The building also has a long narrow form, making it easier to passively ventilate. Spaces on the first floor are mostly open through the width of the building, and air moves from a smaller, low opening on the northern side to a higher, larger opening on the southern side. Some rooms, like the ablutions and steam rooms, are more difficult to ventilate. The skylight shafts, therefore function as ventilation shafts as well. In the steam rooms, hot air rises up these shafts and escape at an opening at the top, and then gets replaced by dry air through openings that sit low in the wall that separates the room from the hallway.

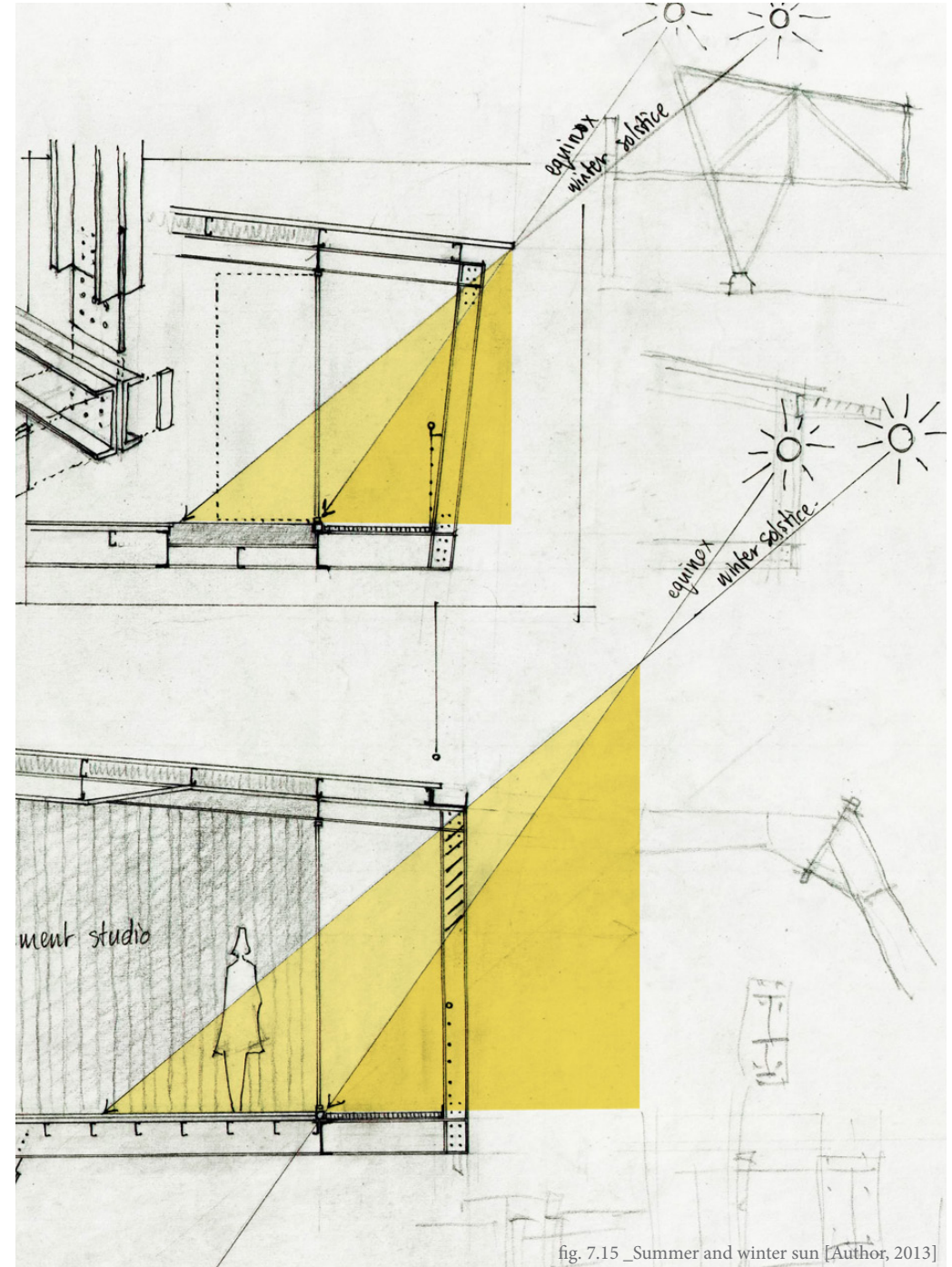


fig. 7.15 _Summer and winter sun [Author, 2013]



_chapter 8

c o n c l u s i o n
the healing of harms

fig. 8.1 _Tree climbing scene in Terrence Malick's film 'The tree of Life [Author, 2013] <http://brianwelk.com/2012/01/15/the-tree-of-life-revisited/>

8.1 _Healing the disconnect

In the aim to address the experiential and physical disconnect between humans and environment, the dissertation investigation came to the following solutions:

GARDEN

By taking the theoretical approach of Robert P. Harrison on the garden, the site is viewed as a garden scarred by past industrial practice as part of a dominant culture of consumption, and currently in need of cultivation. This view links well with the collective vision of transforming the site into a 'Productive Park': Productive, as gardens are used for the procurement of goods, such as medicine, and park, as they are places of enjoyment and solitude. Also, the garden is a place where life, as defined by Hans Jonas, can flourish and, more importantly, be experienced.

PROGRAMME

The introduction of medicinal plants to the site contributes in the healing of both the site and its surrounding community. New plant life enriches the biodiversity of the site, and the making of medicine from these plants creates a direct and tangible relationship between people's needs and what the environment can offer. Furthermore, the clinic forms the link in this relationship, where herbal medicine can be consumed in the place it is produced. Additionally, the making of pots aids in slowly transforming its related part of the site into a cultivated garden, by tilling the soil through the extraction of clay and allowing new plants to subsequently be housed.

BUILDING

The question of whether the spatial and experiential attributes of Harrison's garden can act as mechanisms for making the architecture is answered by the concept, which in itself is a mechanism that allows the architecture to be true to the theoretical intentions. The concept is taken even further into the level of detailing, allowing users to access it by viewing the articulated composition of the building.

RELATIONSHIP

Poetic dwelling is accomplished by placing the extension of dwelling, the building, within the place where dwelling happens poetically, which is the garden. The relationship between building and garden is deepened by the concept described above, where the making of the building is guided by the attributes of the garden. Also, the material palette binds the building to the garden in that it relates to the character of the site, and it allows the building to age and sit harmoniously within the landscape.

ROUTE

The reconnection of people with the environment is mostly achieved by the route, where different spaces and their functions are experienced in a continuous walk, either across the larger scheme or in the interior of the building. The route acts as the binding element, allowing the dweller to experience the building, both exterior and interior, from different places and at different times.

8.2 _Regeneration

The dissertation addresses the idea of Spirit of Place in that the herbal clinic and pottery workshop aids in establishing a place that is accessible by the public, and through the above-mentioned considerations of experience, create a building that is true to the genius loci of the site, and accommodate visitors to experience the place for what it is.

In response to the principles of Biophilia discussed in the theory, the programme of the clinic directly connects the visitors with the plants on site through the use of herbal medicine. The building itself provides strong views to the garden, allowing patients to enjoy looking out onto the plants that aid in their healing.

The overall scheme provides buildings for activities to be housed on site, giving the site new life and meaning for the surrounding community, while sensitively placing them in relationship with specific gardens that allows for cultivation and nurturing. The industrial heritage on site is acknowledged as part of the area's history, and the potential unleashed by it is harnessed by the new intervention, as it cultivates the site into a rich, life-giving garden.

Other aspects of Regenerative thinking, such as systems thinking (social and ecological networks, interconnectedness) and resilience thinking (adaptability, redundancies, positive change) can still be explored further in the design. These are acknowledged as far as possible, but the aspects of Biophilia and Spirit of Place served as the main informants for the dissertation.

“In the midst of the street of it,
and on either side of the river,
was there the tree of life,
which bare twelve manner of fruits,
and yielded her fruit every month:
and the leaves of the tree were for the healing of the nations.”

Revelation 22:2 - King James Version

_chapter 9

a p p e n d i x

Fair Quiet, have I found thee here,
And Innocence, thy sister dear!
Mistaken long, I sought you then
In busy companies of men;
Your sacred plants, if here below,
Only among the plants will grow.
Society is all but rude,
To this delicious solitude.

Andrew Marvell, The Garden (1681)



fig 9.1 _Perspective of herb garden in front of restaurant
[Author, 2013]

Beasts did leap and birds did sing,
Trees did grow and plants did spring.

Shakespeare, "The Passionate Pilgrim"



fig 9.2 _Perspective of route towards medicinal garden
[Author, 2013]

“What is this quintessence of dust?”

Hamlet, in Shakespeare's Hamlet

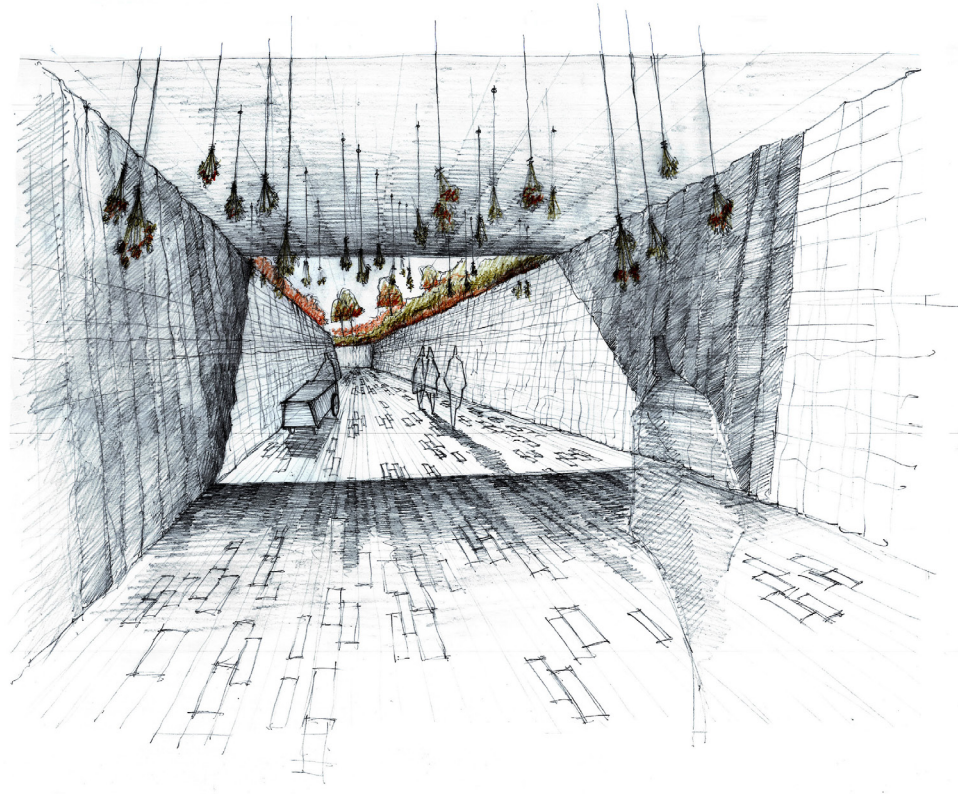


fig 9.3 _Perspective of herbs drying [Author, 2013]

“Gardens are poems
Where you stroll with your hands in your
pockets.”

Pierre Albert-Birot, The Cubist Poets in Paris: An Anthology

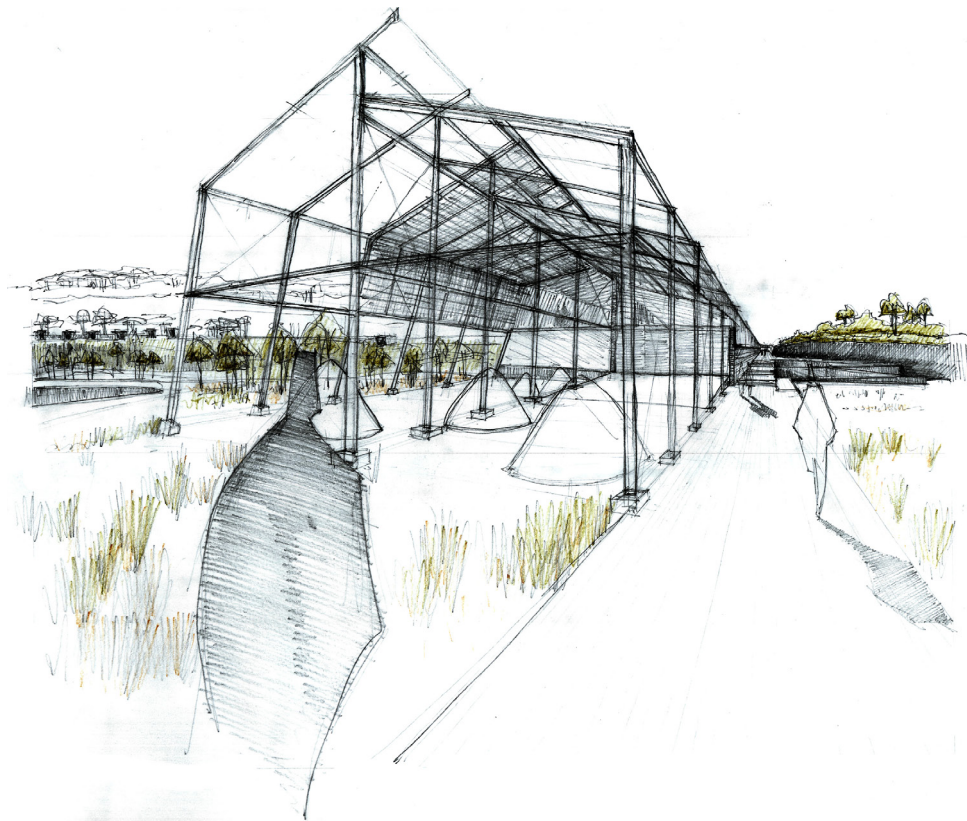


fig 9.4 _Perspective of herbs drying [Author, 2013]



fig 9.5 _Plan of lower level, scale 1:200 [Author, 2013]

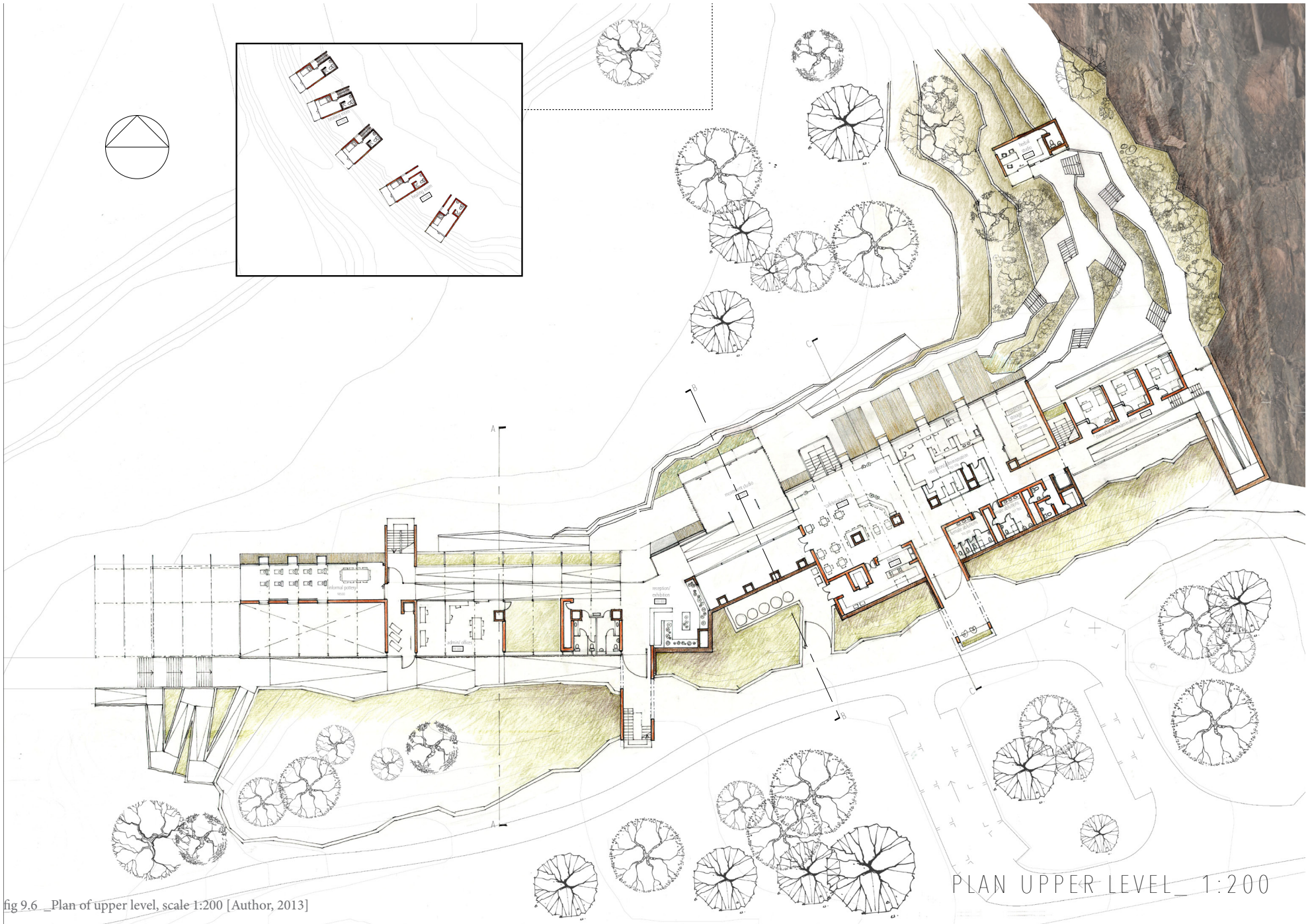


fig 9.6 _Plan of upper level, scale 1:200 [Author, 2013]

fig 9.7 _Section through pottery workshop [Author, 2013]

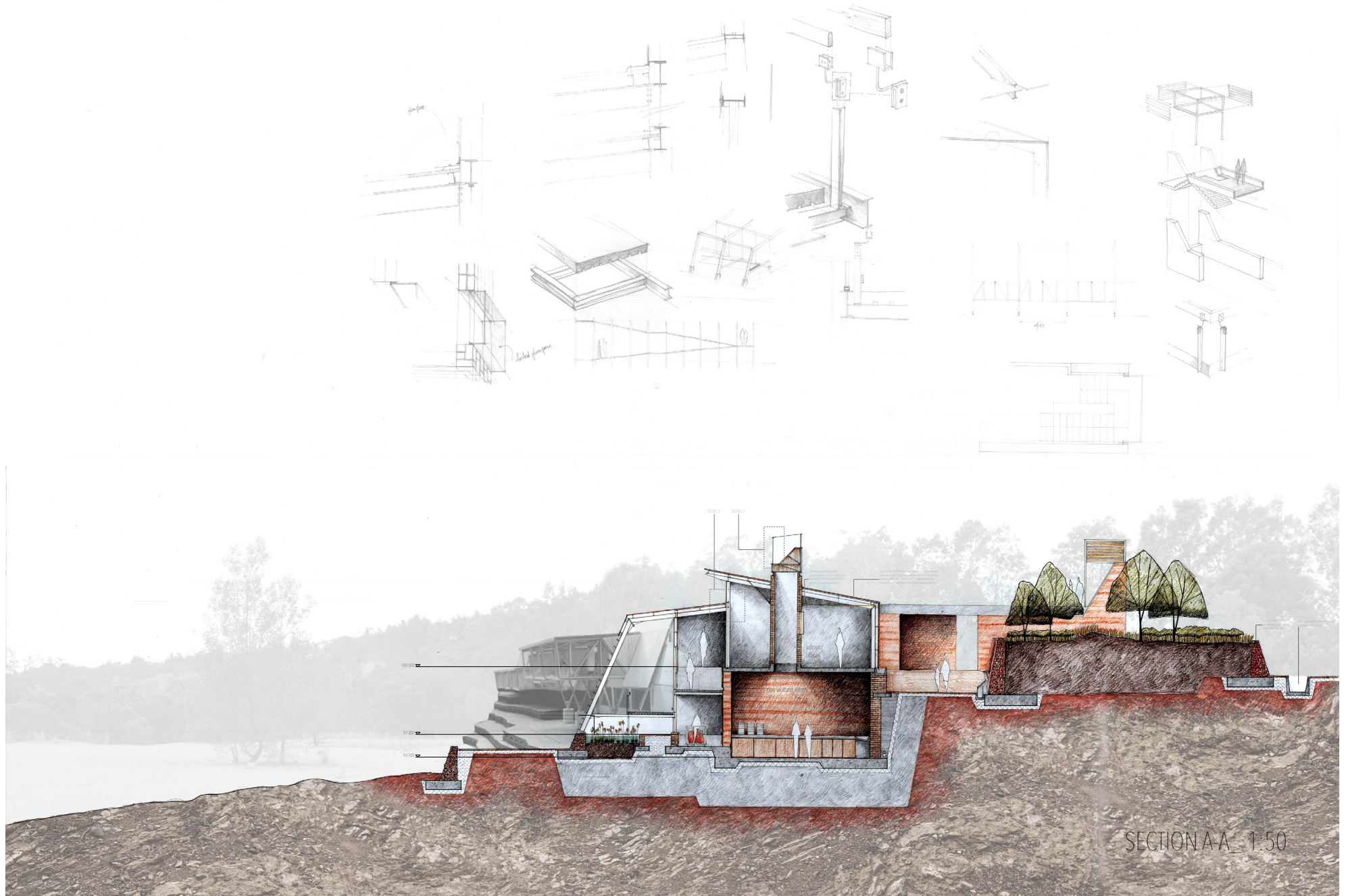
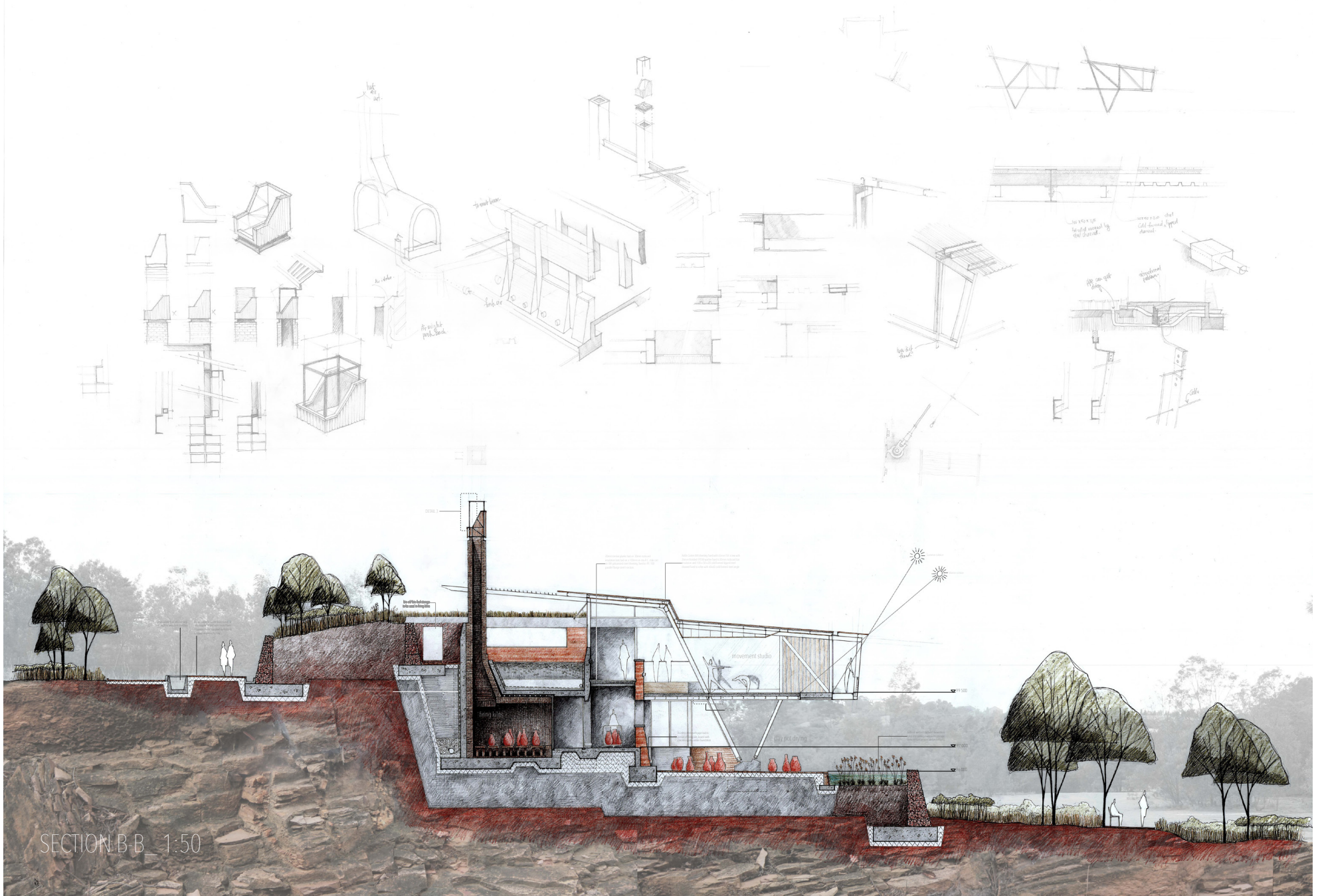


fig 9.8 _Section through movement studio and kilns [Author, 2013]



"For you little gardener and lover of trees, I have only a small gift.
Here is set G for Galadriel, but it may stand for garden in your tongue.
In this box there is earth from my orchard,
and such blessing as Galadriel has still to bestow is upon it.
It will not keep you on your road, nor defend you against any peril;
but if you keep it and see your home again at last, then perhaps it may reward you.
Though you should find all barren and laid waste,
there will be few gardens in Middle-earth that will bloom like your garden,
if you sprinkle this earth there."

J.R.R. Tolkien, The Fellowship of the Ring

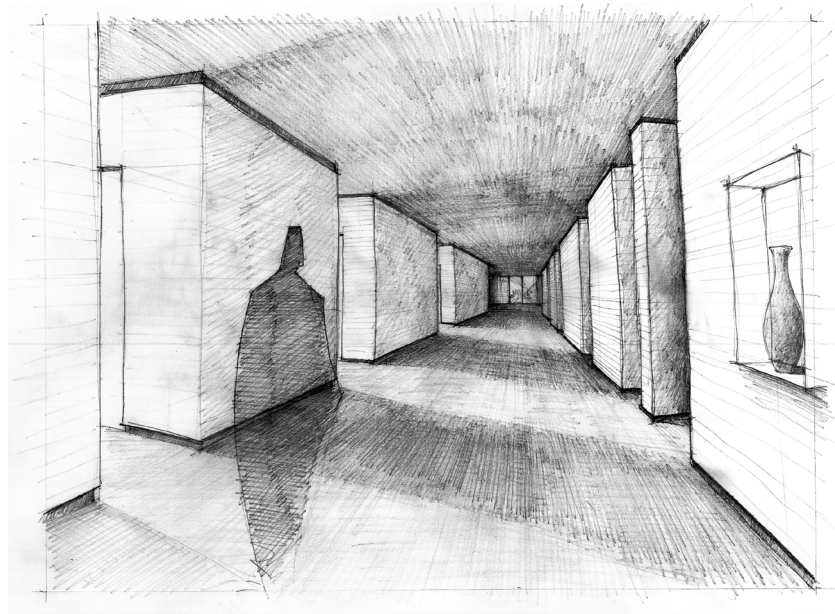
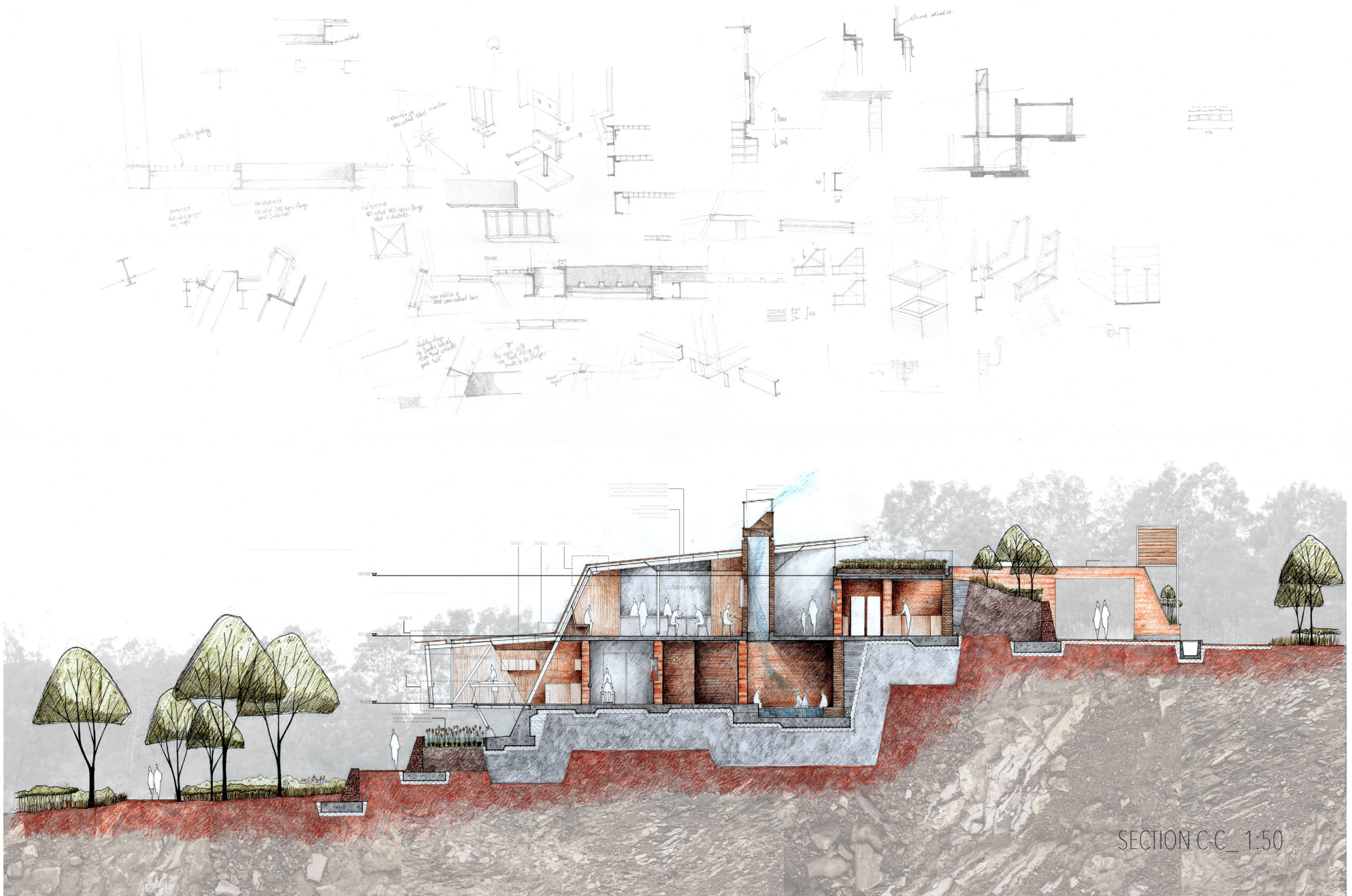


fig 9.9 _Perspective of hallway between treatment rooms and steam rooms [Author, 2013]

fig 9.10 _Section through treatment room, steam room and waiting/cafe/teria [Author, 2013]

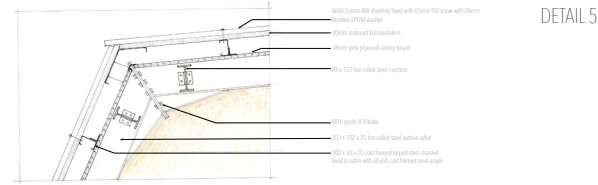


How vainly men themselves amaze
To win the palm, the oak, or bays,
And their incessant labours see
Crown'd from some single herb or tree,
Whose short and narrow verged shade
Does prudently their toils upbraid;
While all flow'rs and all trees do close
To weave the garlands of repose.

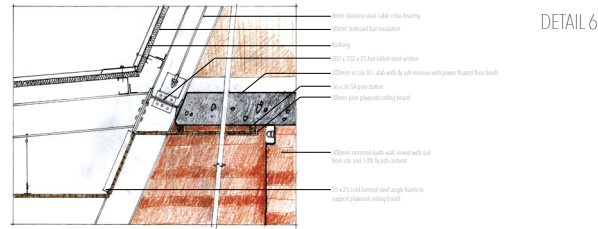
Andrew Marvell, The Garden (1681)



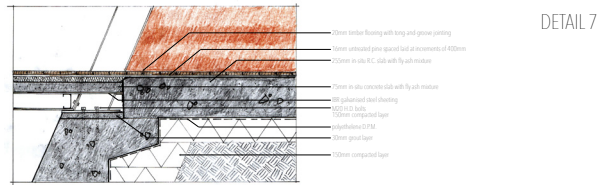
fig 9.11 _Perspective of herbal/medicinal garden [Author, 2013]



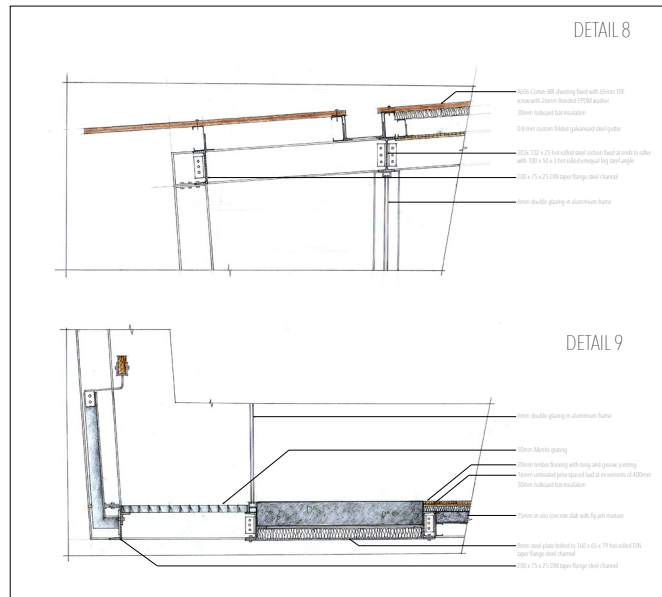
DETAIL 5



DETAIL 6



DETAIL 7



DETAIL 8

DETAIL 9

fig 9.13 _Related details [Author, 2013]

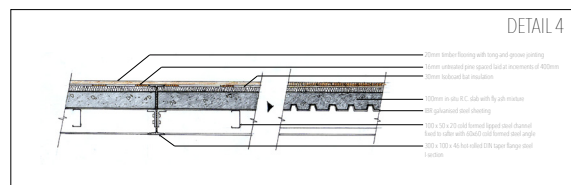
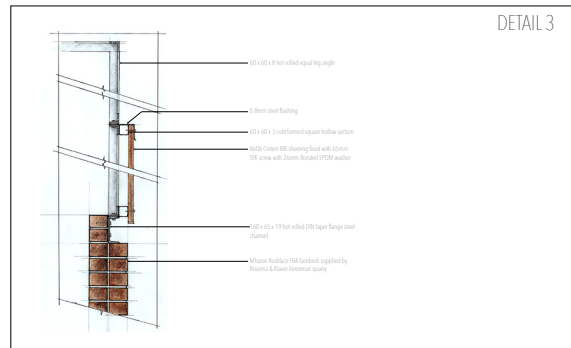
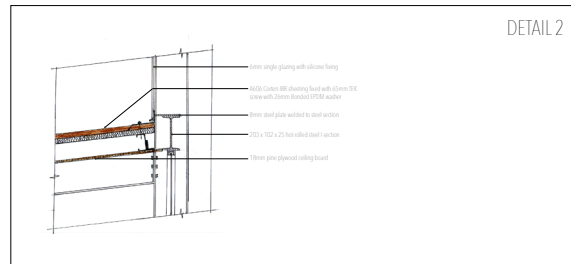
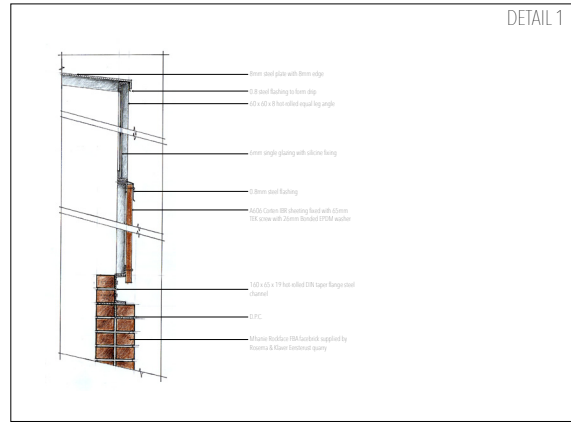


fig 9.14 _Related details continued [Author, 2013]



fig 9.15 _Final model showing clay storage and drying area [Author, 2013]



fig 9.16 _Final model showing northern facade of clay storage and drying area [Author, 2013]



fig 9.17 _Final model showing exterior of movement studio and treatment rooms [Author, 2013]



fig 9.18 _Final model showing bird's eye view of entire building [Author, 2013]



fig 9.19 _Final model showing healing rooms in context
[Author, 2013]



fig 9.19 _Final model showing southern ramps
[Author, 2013]



fig 9.20 Group model showing entire site and relevant schemes
[Author & group, 2013]



fig 9.21 Group model showing building done in this dissertation
[Author & group, 2013]

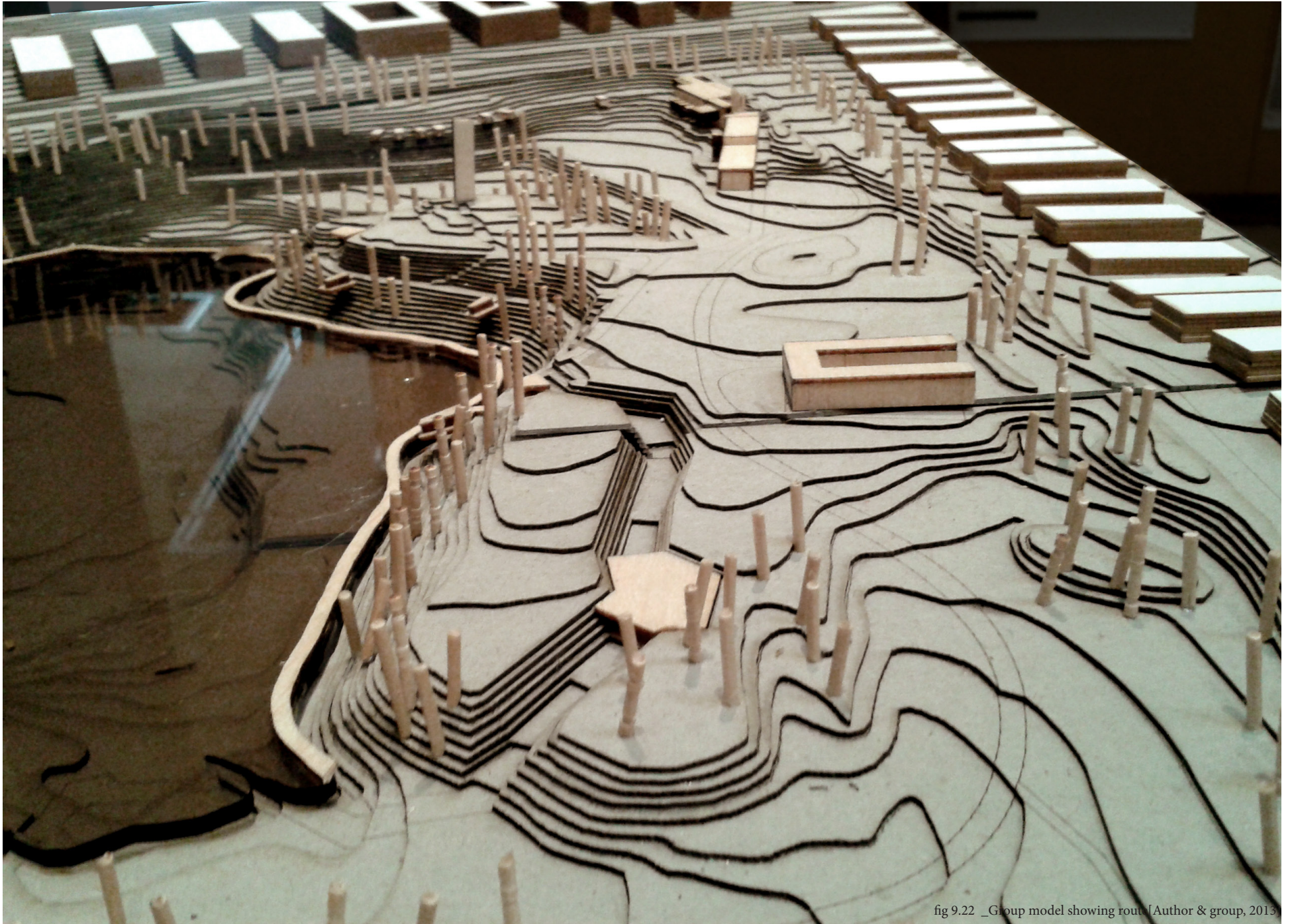


fig 9.22 _Group model showing route [Author & group, 2013]

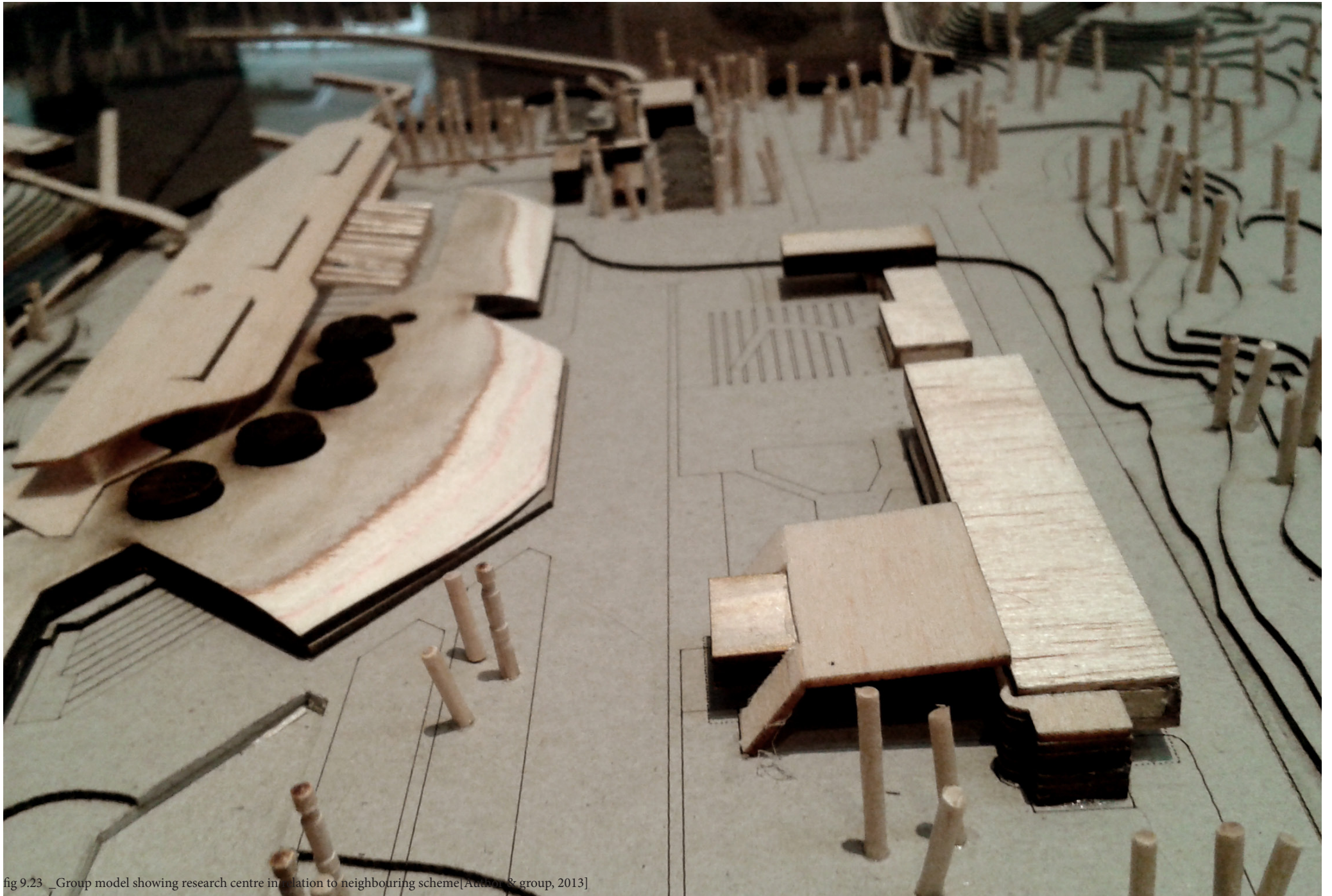


fig 9.23 _Group model showing research centre in relation to neighbouring scheme [Auld & group, 2013]

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l i s t o f f i g u r e s

CHAPTER 1

- fig. 1.1 [_http---blackboxblue.wordpress.com-2012-05-24-the-tree-of-life-22](http://blackboxblue.wordpress.com/2012-05-24-the-tree-of-life-22)
- fig. 1.2 [_Drawing from concept development \[Author, 2013\]](#)
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- fig. 1.10 [_Clay on eastern part of the site \[Author, 2013\]](#)
- fig. 2.9 [_http://anthonyhepworth.com/html/art_john_piper](http://anthonyhepworth.com/html/art_john_piper)
- fig. 2.10 [_Photograph of vegetation on eastern part of the site \[Author, 2013\]](#)
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- fig. 2.13 [_http://www.zukunftsmusik.com/zm/mh](http://www.zukunftsmusik.com/zm/mh)
- fig. 2.14 [_http://english.unl.edu/sbehrendt/courses/965GreenRomanticism/SylF2012](http://english.unl.edu/sbehrendt/courses/965GreenRomanticism/SylF2012)
- fig. 2.15 [_http://www.history-of-the-microscope.org/robert-hooke-microscope-history-micrographia](http://www.history-of-the-microscope.org/robert-hooke-microscope-history-micrographia)
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- fig. 2.17 [_http://english.al-akhbar.com/node/8463](http://english.al-akhbar.com/node/8463)
- fig. 2.18 [_Illustrations of consumption \[Author\]](#)
- fig. 2.19 [_Illustrations of cultivation \[Author\]](#)
- fig. 2.20 [_http://www.bibliovault.org/BV.book.epl?ISBN=9780226317892](http://www.bibliovault.org/BV.book.epl?ISBN=9780226317892)
- fig. 2.21 [_http://seattletimes.com/html/pacificnw/2008923696_pacificpnwl29](http://seattletimes.com/html/pacificnw/2008923696_pacificpnwl29)
- fig. 2.22 [_http://www.deviantart.com/morelikethis/277505315?view_mode=2#skins](http://www.deviantart.com/morelikethis/277505315?view_mode=2#skins)
- fig. 2.23 [_http://whiggles.landofwhimsy.com/archives/2009/02/the_constant_gardener_bluray_i](http://whiggles.landofwhimsy.com/archives/2009/02/the_constant_gardener_bluray_i)
- fig. 2.24 [_http://monsignormonk.blogspot.com/2011/08/holiness-of-dirty-hands](http://monsignormonk.blogspot.com/2011/08/holiness-of-dirty-hands)
- fig. 2.25 [_Diagrams of Harrison's aspects of the garden \[Author, 2013\]](#)

CHAPTER 2

- fig. 2.1 [_http://www.flickr.com/photos/mbell1975/4960476350/](http://www.flickr.com/photos/mbell1975/4960476350/)
- fig. 2.2 [_Vignette of route exploration \[Author, 2013\]](#)
- fig. 2.3 [_http://www.flickr.com/photos/mbell1975/4960476350/](http://www.flickr.com/photos/mbell1975/4960476350/)
- fig. 2.4 [_http://dreamwall1.wordpress.com/2011/05/26/beautiful-botanical-walls/](http://dreamwall1.wordpress.com/2011/05/26/beautiful-botanical-walls/)
- fig. 2.5 [_http://archive.bio.ed.ac.uk/jdeacon/mrhizas/ecbmycor](http://archive.bio.ed.ac.uk/jdeacon/mrhizas/ecbmycor)
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- fig. 2.7 [_http://www.wormbook.org/chapters/www_intromethodscellbiology/intromethodscellbiology](http://www.wormbook.org/chapters/www_intromethodscellbiology/intromethodscellbiology)
- fig. 2.8 [_http://www.tate.org.uk/art/artworks/constable-14-a-recess-near-the-eye-where-little-or-no-part-of-the-sky-is-seen-t08108](http://www.tate.org.uk/art/artworks/constable-14-a-recess-near-the-eye-where-little-or-no-part-of-the-sky-is-seen-t08108)

CHAPTER 3

- fig. 3.1 [_http://www.reddit.com/r/movies/comments/13u4bs/i_made_an_album_of_some_of_my_favorite/2](http://www.reddit.com/r/movies/comments/13u4bs/i_made_an_album_of_some_of_my_favorite/2)
- fig. 3.2 [_drawing from design investigation \[Author, 2013\]](#)

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