THE DESIGN OF A
WASTE RECYCLING FACILITY FOR THE WASTE PICKERS OF ARLINGTON LANDFILL, PORT ELIZABETH

RECOGNISING THE NEEDS OF UNACKNOWLEDGED STAKEHOLDERS IN THE CIRCULAR WASTE ECONOMY

BLAKE SEAN SMIT 216009944

Figure i: Waste Picker portrait
Source: Buthelezi, M. (2018)

PRECURSORS

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Firstly, I'd like to thank the Lord for the strength he has given me throughout the year. I'd like to thank my parents for their patience, belief and unending support as well as blessing me with this wonderful privileged of completing my treatise.

Thank you to my classmates who have taught and guided me throughout the years, giving me strength in the most challenging of times.

Finally, thank you to my course master Andrew Palframan who has provided both a truly great example and an invaluable environment for growth. I regard this as a privileged and a once in a lifetime opportunity.

At this very moment, this very second, in the backstreets and upon high, vast wastelands, something is in motion. Often on the periphery of our daily thoughts, or not at all, this very motion never ceases to exist- it simply cannot afford to.

Waste, our modern day global issue, has reached a critical point, causing us to now venture into uncharted territories. We produce unspeakable amounts of waste per annum creating compounding social and environmental problems, and in the process we create a particular physical object, an altered landscape known as a landfill. The landfill environment is where this treatise chooses to position itself, but looks further into the existing community of individuals who perform the task of recycling. Waste pickers, an unmatched motion and dynamic within our broad waste landscape, remain largely unacknowledged in the role they play in the circular waste economy, subsequently creating the core concern for this treatise. Hence, the building type responsible, a waste recycling facility, that looks to identify and address the needs that these individuals require to safely carry out their pivotal role within the setting of Arlington Landfill in Port Elizabeth. Therefore, this treatise looks to uncover and bring to light a day in the life of a waste picker, through an architectural intervention seeking to become more than an object on the landscape. The treatise looks to break away from a static architectural object by applying the overall lens guided by 'Anti-Object' written by Kengo Kuma, therefore concerning itself with an overarching process of creating an emerging anti-object architecture, embodying the subtitles and characteristics of the waste pickers of Arlington Landfill.

Figure ii: Waste Picker within synthetic landscape
Source: Swingler, S. (2019)

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Figure iii: Waste Picker on Uitenhage landfill
Source: Preiser, W. (2020)

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Part 00

INTRODUCTION
00

Standing on a mountain which seemed to be as much part of the natural phenomena as the near untouched landscape knitted and unbound far below, could only reveal itself to be the by-product of our diseased consuming nature.

Our global village, seemingly growing smaller by the day, is a testament to our productivity over the past few decades. Productivity that has seen revolutionary leaps in connectivity, technology, transportation, and infrastructure, all of which seek no end in progression and continue to push the thresholds once thought to be insurmountable or having reached a peak. However, this progression defining us as forward thinking and relentless, through a different lens, can begin to reveal an ulterior consequence, known as discontentment. Cracks begin to appear when that ulterior consequence is revealed, as this means there is a fault in our unrelenting productivity and progression, one of which comes in the form of a by-product cast aside as an undesirable or useless matter.

Waste, our undesired matter which, in our recent past, was reserved a place completely retracted from our minds and placed accordingly within our physical contexts. Slowly over the decades waste has become less of a castaway and has become a whole industry of its own, through recycling and management processes, yet something still lurks on the fringes. Ultimately there is an end for every start, and some ends are not defined moments, but rather ongoing insidious ends. There is a particular method we have developed to deal with the time relative to waste's pernicious end and it comes in the form of an altered landscape - a landfill.

Landfills, the entities responsible for the containment of matter which will outlive millennia, are in fact, constructed and planned landscapes and dynamic in nature. These overwhelmingly large areas traditionally demarcated on the outskirts of cities are continuously reinventing themselves and moving in direct response to global trends. Seen in this light, the problem of waste and its unending influx onto our landscapes can seem to be manipulatable and manageable. This by no means is referring to the idea of this method of waste management being sustainable, but it now addresses the integral roles played around this managing aspect. The scale of operations around landfills is of industrial scale and nature, and processes are put in place by the state to carry out responsible and lawful methods of waste management. However, within these large-scale operations, a certain finer sub-system begins to emerge.

A group of individuals by foot, cart or a sudden leap onto a passing landfill truck make their way up to the plateau of waste where new waste is about to arrive at an already agreed upon zone. This is where waste meets hands that will ultimately give it new life. These are the people, the waste pickers that adorn the plateau of the landfill and perform the extremely important role of gathering and separating waste in an attempt to resell to companies or private individuals, who then use their respective types of waste to fabricate new products.

Such a role in a global dilemma can be seen as admirable, but this is not quite the case. The waste pickers who spend a great portion of the day out in the open on a synthetic landscape do not often have more to show for their act than the filled bag or cart alongside them. The role of the waste pickers is not being held in the same light as the ultimate effect they have on a sustainable future. This is where the treatise interest lies.

The aim in an architectural sense, is to design a waste recycling facility at Arlington Landfill, Port Elizabeth, that seeks to match the dynamic and embody the character displayed by these individuals. However, attempting to successfully understand this dynamic, or any dynamic for that matter, comes from a process that is defined by a particular set of objectives.

Therefore, a theoretical lens will be constructed through which to view the treatise. The lens will be constructed through a core set of principles and ideas with 'Anti-Object', by Kengo Kuma, as the overarching piece of literature. 'Anti-Object', refers to a concern with self-proclaimed and self-centred architectures, conceived through processes that result in conspicuous objects separated from their contexts. While an additional set of theories, 'Field Conditions' by Stan Allen and Opposite Integration' by Sou Fujimoto, will look to create a type of methodology to execute notions of an anti-object architecture.

Subsequently, understanding an anti-object architecture will frame the investigation of the conventional building type that this treatise will deal with - a waste recycling facility. Establishing an understanding of the type will be achieved through a precedent investigation, revealing the nature of the spatial and physical attributes associated with a waste recycling facility.

A site will be selected, based on a mapping process conducted across scales to understand the general systems involved as well as the relevant informative layers at each scale, further defining a set of constraints and informants for the design response to embody, within the geographic and social context of Arlington Landfill.

Furthermore, a principle exploration will be conducted, framing core principles, giving a greater, more in-depth understanding of the possible role they will play through the spatial and physical aspects of the treatise building itself.

Therefore, understanding the pressing issue on a global front gives context to the sheer scale of the conversation around waste, as well as the scale of certain processes that attempt to manage it. The treatise positions itself amidst the global conversation within a pocket which, in comparison, can at times seem to have no voice. The individuals that the treatise brings to the forefront will lead the process from start to end, informing decisions and pushing the architecture further away from preconceived abducting notions, drawing nearer to the realm of an anti-object.

Figure iv: Agbogbloshie
Source: Kevin McElvaney (2013)

The purpose of this treatise is, firstly, outline the severity of our wasteful nature, as well as define a solution to the issues that face the group of hard-working individuals who, through largely unacknowledged efforts, have used this global issue as an opportunity. Therefore, the following will outline the methodologies employed in the construction of the treatise providing a response to the relative research questions.

PURE AND APPLIED RESEARCH

The treatise deals with a current global issue where, through research and a contextualised understanding, a well-positioned argument may be put forward. To construct a rounded argument that addresses the issue itself as well as introduce informative parallels, pure research was conducted. Grouped with the pure research, applied research was conducted to acquire specific knowledge in terms of the particulars and practicalities related to the treatise topic. This understanding is reflected in the completed product.

PARTICIPANT OBSERVATION METHOD

This method refers to the nature of the obtainment of information, for the development of the treatise. Observations were made of both the systems involved in the circular waste economy, as well as an observation of individuals who perform specific categorised tasks, within the broad productive waste landscape. Qualitative research was conducted through observation of multiple waste-centric sites, site tours and conversations with the individuals involved. Subsequently, a set of issues and concerns were outlined, informing an appropriate qualitative collection of literature, which was then placed accordingly through relating parallels, pin-pointing the position of the chosen theoretical lens.

Quantitative research looked to acquire information comprising of specific sets of data and statistics, informing the treatise of particular trends and benchmarks. This was conducted through the collection of data relating to waste tonnages within Port Elizabeth, municipally related figures and spreadsheets (equipment, shortages, expenses, budgets), climatic data and data related to absolutes within the waste recycling facility type itself. All of which create the context for the treatise to position itself accordingly.

DATA COLLECTION TECHNIQUES

Primary Sources
The primary sources include qualitative interviews, observations of site and existing dynamics as well as a progressive development of an understanding of the inherent characteristics of waste-centric facilities.

Secondary sources
The secondary sources include literature gathered from relevant theoretical backgrounds, databases, case studies and precedents. The secondary sources helped contextualise the discussion within the existing larger discourse, through which the treatise could apply a selected lens.

Part 01

CHAPTER **1** - PATHWAY TO THE THEORETICAL POSITION

An argument is put forward creating the departure point for the chapter. The response to this argument is then constructed through a set of ideas and principles, ultimately creating the theoretical position and the overarching lens through which to view this treatise.

CHAPTER **2**- NATURE OF BUILDING TYPE

The chapter looks to understand the nature of the type of building that the treatise deals with, through an investigation of a series of precedents. The investigation uncovers the physical and spatial attributes of each precedent, subsequently informing the design phase.

CHAPTER **3**- SITE

The project site is selected through a multi-scaled and multi-layered mapping process. The process looks to understand the relevant systems involved at each scale, building up a set of constraints and informants.

CHAPTER **4** - PRINCIPLE EXPLORATIONS

Ending off part one is a further exploration of a set of principles within the previous chapters. This creates depth and a more developed understanding of those particular principles.

Part 02

CHAPTER **5** - DESIGN PHASE

This chapter includes the project brief and programme, followed by the project concept and the design development process. The design development will be shown through the iterations produced.

CHAPTER **6** - FINAL DESIGN AND TECHNICAL STRATEGY

Chapter 6 will convey the final design through a set of drawings and depictions along with the nature of the technical strategy employed to achieve the overall design.

PART 01- *RESEARCH*

Figure 1.1: Agbogbloshie
Source: Kevin McElvaney (2013)

CHAPTER **1** - PATHWAY TO THE THEORETICAL POSITION
01

This chapter constructs the pathway to the theoretical position. The chapter puts forward an argument that is then fulfilled with principles and ideas, ultimately creating the lens from which to view the treatise. The principles and ideas that fulfill the argument are in the form of "Anti-Object' by Kengo Kuma, 'Opposite Integration' by Sou Fujimoto and 'Field Conditions' by Stan Allen.

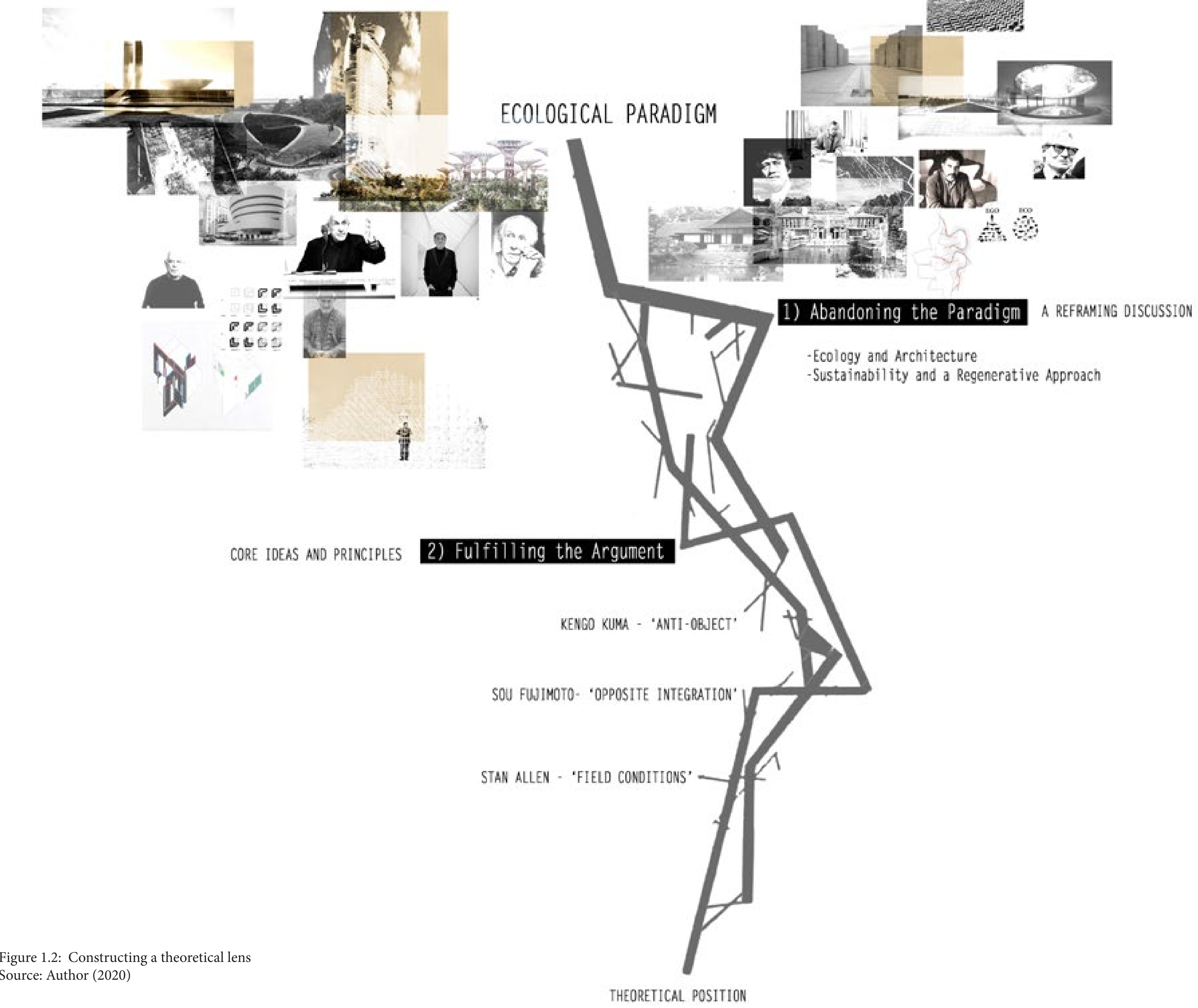


Figure 1.2: Constructing a theoretical lens
Source: Author (2020)

ARCHITECTURE AND THE ECOLOGICAL PARADIGM

What is Ecological Architecture?

Ecology - *Ecology is the study or concern for the relationships between an organism and its environment* (Reed/Lister:2014).

Therefore, 'ecological architecture' seeks to become the medium whereby these relationships can exist. The architecture thus becomes an organism itself by using principles adopted from nature or employs actual natural systems to create the environment. As a result, the architecture attempts to become less impactful on both its immediate and extended environment and in some cases plays a regenerative role for the site and the relationships within that specific environment.

The paradigm of architecture that is now referred to as the ecological paradigm, reveals architecture that concerns itself with the ecological issues of our time. These buildings identify ecological problems and attempt to respond positively via ecological principles and methods. This is the architectural paradigm that is not only conscious of the issues within its environment, but is set on a pursuit to find a solution for those very issues. Or is it?

We, for thousands of years, have positively understood the relationship between the natural environment and the one we construct, harnessing natural elements to create a self sustaining environment. There has always been a unseparated matrix between that which was built and that which remained in its natural form, subsequently making architecture part of the natural context and not an object conspicuously separated from it.

However, in recent years, certain architectural interventions that claim to embody an ecological outlook have somewhat veered off the path of true ecological efforts and have become the self-proclaimed objects 'on' the landscape. So much so, that the criticism of certain ecological buildings has led to the rejection and dismissal of this very paradigm of architecture.

Shown (right) are ancient Persian windmills. Harnessing the capabilities of wind, the windmills were able to extract water from the ground and grind grain (Kumar:2015). The built complex rises up from its context, revealing its unseparated relationship between the architecture and the landscape.


Figure 1.5: Asbads of Iran
Source: Surfiran (no date)


Figure 1.6: Nashtifan Windmills
Source: Welcome to Iran (2017)


Figure 1.3: One Central Park
Source: Archdaily (2014)

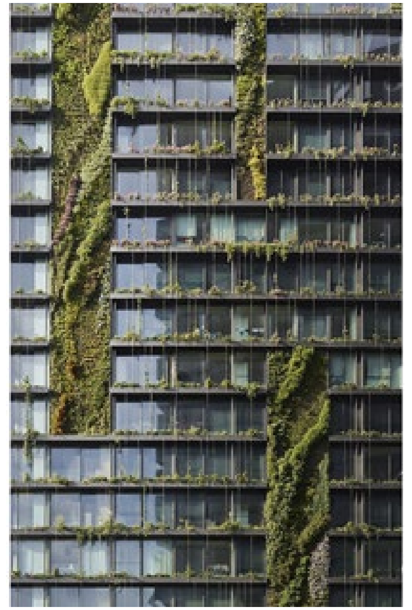


Figure 1.4: One Central Park Facade
Source: Archdaily (2014)

Shown (left) is a mixed-use building in Sydney, Australia. The building comprises of living and working spaces, centred around an ecological motif, but to what degree? Are a core set of issues being addressed by the building and is the building, truly, emerging and unfolding in response to those core issues? i.e. The building without its vertical planting may reveal its thin idea of an ecological embodiment through architecture.

ABANDONING THE PARADIGM

From the understanding of what ecological architecture is and what it aims to achieve, one can now question and challenge the concept itself. Ecological architecture has, of late, led down a convoluted path, losing its clarity in its motif and losing sight of its roots. The following discussion will attempt to establish a new departure point outside of the preconceptions of the 'ecological architecture paradigm'.

The reason for separating the two terms is to show the possible or blatant result of our need to devise new means to engender function and meaning through the making of space. How has something born of the same become delaminated or separate of itself ? Architecture is not an occupation withdrawn from its immediate environment, it is quite clearly within and around it.

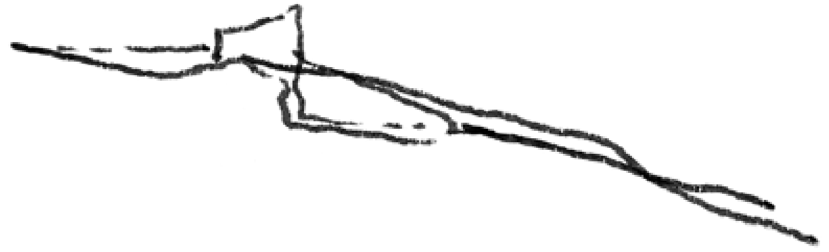
The idea that there is now a particular paradigm of architecture that we refer to as ecological architecture, indicates that it is a mindset that can be visited or occasionally tapped into, if necessary. This can lead to a possible contradiction of its very own cause. We have framed a particular way of making architecture through a discriminated class which may largely be a series of branches disconnected from its very own roots. An inherent matrix within us and our connection to the natural has been displaced and reformed as a subject only revisited and employed as an optional practice within our built environment. The question? Should we even create a defined paradigm?

It seems that default decisions begin to emerge when an over-explained idea or approach is realised. A re-hash or interpretation obscurely shoots off from the previous iteration and then leaves confusion as to why something appears to be in a particular way. Some architectural interventions are more cynical or conscious in their approach through the forceful implementation of architectures that resemble new orders, political stances or economic conditions (Kuma:2008). This leaves a stumbling block for the way a building comes to fruition as a result of preconceived ideologies leading the process, rather than a process that listens more than it dominates a conversation.

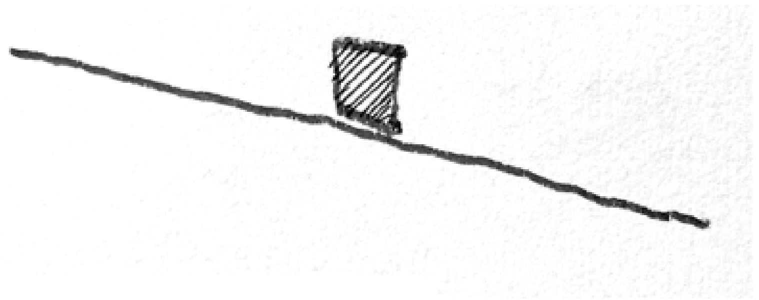
Fractures begin to occur when attempts are made to reintroduce the fragments to their whole. Examples of categorised or superficial architectural interventions emerge as objectified entities completely or partially within their own isolating agendas. In some cases, we see at the forefront of the ecological movement towards a better architecture, a criteria-based pursuit that strives to check the boxes. These attempts become detached efforts of reconciliation and begin to resemble an architecture always out of reach of its own element.

To conclude the questioning of the identity of ecological architecture, Sou Fujimoto, who will be expanded on later in the chapter, refers to the forest and the city as much the same; that they serve a range of functions that protect and expose, thus form a collage of different identifying spaces (Fujimoto:2014). This observation shows that there may be a constant overriding principle that binds together our built and the natural environment. However this is not an observation that lies in the conventional or falls victim to categorisation, which therefore shows that the principle of our intertwined relationship to the natural is not fully understood.

The ability to create architecture that embodies our relationship to the complex natural lies not in a process of acquiring, but rather in the realisation that it is inherent. It has never left; only by our doing have we forgotten.



Integration between architecture and environment - Anti-Object



Delamination between architecture and environment - Object

Figure 1.7: Architecture and the environment: the anti-object vs the object
Source: Author (2020)

In delving into a realm such as ecological architecture, we begin to see the areas which this movement has started to exploit. These exploitations, some of great value to the larger conversations and some not so, are mostly in a unified pursuit of 'sustainability'. Continuing from the re-framed idea of this separated paradigm, a significant connection can be made by this very search for sustainability. The idea that architecture needs to perform a task in halting or retarding the process that has been put in motion by the initiations of significant realisations in history (i.e. Industrial Revolution), reveals that architecture can turn to the natural as an elemental right. Sustainability is a conscious effort made through a kind of unification between the two very antiquated orders, architecture and nature. Thus, there is true authenticity in the merging, or rather 're-merging', between the two orders.

However, the skepticism of the categorised realm is validated through the 'bad' examples created out of the plasticised idea of what architecture is trying to re-establish through sustainable actions. Furthermore, there is skepticism in the reasoning behind the effort to create sustainable architecture, as it has become an attractive idea to represent ecological efforts, but falls short of being truly invested in finding the embodiment or 'environmental pump'. Subsequently, the word 'sustainability' may have reached a point where it, too, has lost its intrinsic meaning.

Meaning may be restored by understanding that sustainability may vary in degree from place to place. Some architectural interventions or, describing the more successful interventions, 'environmental pumps', may be situated on sites that perform numerous tasks of a type of remediation or rehabilitation, yet some stand as self-proclaimed solutions that do very little. If we use precedents that are integral and conscious in their efforts ,they all begin to reveal, at varying degrees, an approach linked to 'regeneration'.

A regenerative approach seeks more for a solution which keeps its positive influence in motion. Consequently, seeking to become an additional component in an ecological system that performs not as a redundant object, but rather as that of an integrated medium in which natural ecological processes flow unobstructed.

FULFILLING THE ARGUMENT

In response to the argument put forward, a particular lens has been chosen to establish a theoretical position. The chosen lens draws parallels to questions asked in the argument that has unfolded through the abandonment of the paradigm. The following core principles and ideas are put forward to fulfill the argument and to ultimately create the overriding notion of the treatise.

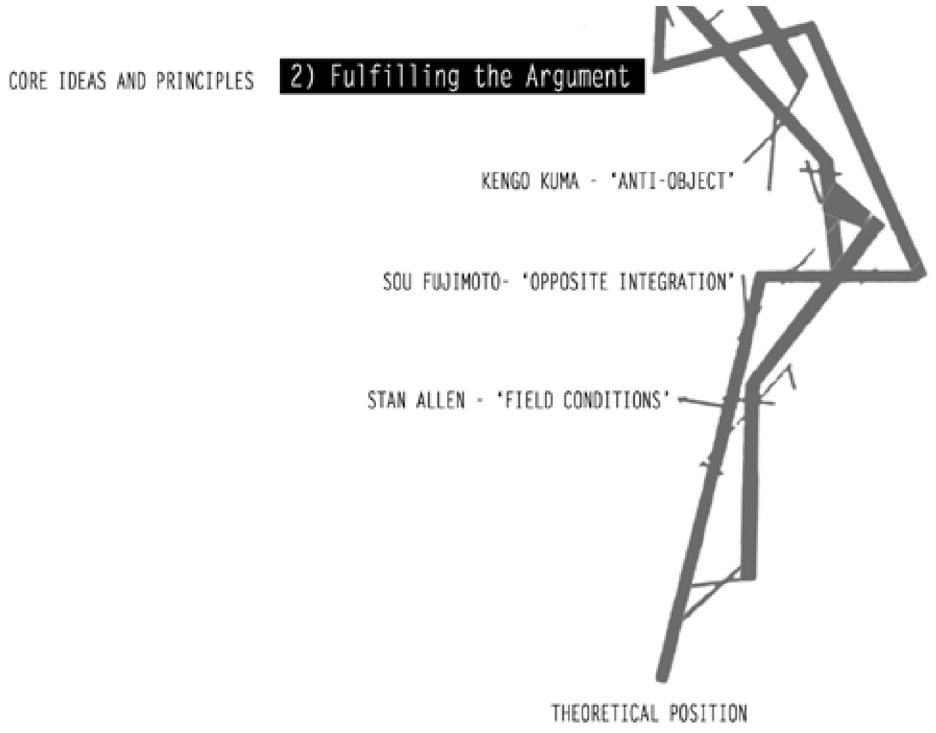


Figure 1.8: Fulfilling the Argument
Source: Author (2020)

by Kengo Kuma

"No particular skill or effort is required to turn something into an object. Preventing a thing from becoming an object is a far more difficult task." - Kengo Kuma

'Anti-Object', a book written by Kengo Kuma, has provided both a framework and the lens from which to view the treatise. The book creates the parallels needed to address the issues discussed in the argument put forward. The inclusion of the book 'Anti-Object' is firstly a significant turning point within a personal outlook, as well as being the piece of literature from where the following discussion will emanate. The words spoken by Kuma within 'Anti-Object' highlight core principles that will ultimately manifest in the treatise itself and will be linked to the supporting principles and ideas of 'Opposite Integration' by Fujimoto and 'Field Conditions' by Stan Allen.

'Anti-Object' at first glance seems to allude to the obvious concerns in the trends of architecture shown throughout the ages. Opposing architecture as 'objects' may be drawn as a final conclusion, but far more is embedded in this compounded term. Yes, the questioning of objects in place is a central theme, but the explanation of why and how they exist creates the space for investigation and reflection. It is also noted that the book sets its premise on the issue of the relationship between the subject (people) and the object (architecture), pin-pointing at the forefront, the possible starting point of where something falls into an act of objectification. Therefore, the following will discuss the tension created around the subject and object through examples that show the issues embedded in objects, as well as the process involved in creating the anti-object.

A dichotomy was revealed in the early stages of 'Anti-Object'. This was shown through the explanation of perceptions of controlling matter within place during the Renaissance period. The manner in which buildings were presented and perceived were made possible by the tool of perspective drawings. A building would reveal an atmosphere completely devoid of the actual perception that the subject would encounter, creating a building completely detached from its true atmosphere. Following this, came the period which Baroque ideologies began to emphasise the importance of the subjects perception within a space. Therefore, between the two movements, we see the dilemma being created around the idea of how materialisation occurs around the subject, subsequently creating the object. This dilemma has manifested through the centuries in the same manner and becomes the premise of the anti-object.

This dilemma is further discussed through the 20th century works of Bruno Taut, Mies and Le Corbusier. This is revealed through their differing intents of bringing the subject to its object and vice versa. Their tension, within modernism, rested on their efforts to navigate the unrelenting space of consciousness and matter. It is at this point in 'Anti-Object' that the momentous shift unbeknown to the majority at the time, takes place. The shift unveils the discontentment Taut had in the twentieth century notion of reducing consciousness to existence and matter to products (Kuma:2013), which is perceivable in the works of Mies and Le Corbusier. Simply, Taut was in pursuit of something that can be seen as an early venture into the anti-object realm.

Kuma then begins to elaborate on his pursuit in the same vein as Bruno Taut, but with the intent of dismissing the notion of objectification by realising that 'medium' performs a crucial role, thus reordering and reestablishing the role of the object. Kuma refers to the relationship between 'subject and nature', making the matter in and around this relationship, the 'medium'. "Our objective should not be to renounce matter, but rather to search for a form of matter other than objects" (Kuma:2013).

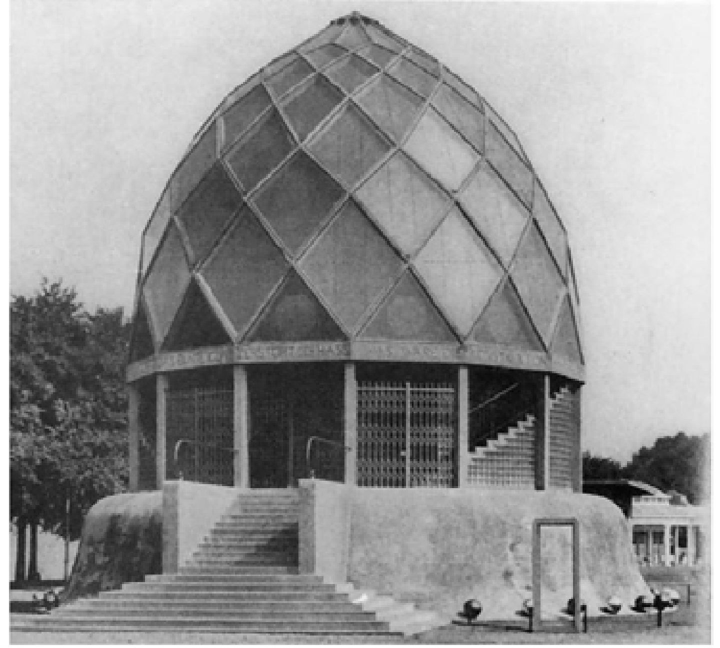


Figure 1.9: The Glass Pavilion
Source: IDesign Wiki (2017)

This is a building by Taut. Once inside, the subject would encounter a connection between matter and time, achieved by the result of the relationship between light and coloured glass. This, however, can never be captured in a black and white photograph (the extent of media at the time), therefore it was rejected by the public. The building was not a product, but rather a bridge between that which may be invisible and the perceivable.

In Kuma's explanation of the different projects, there is constant self-scrutiny around using the natural to expound the importance it carries in creating the architecture. When he refers to 'Water/Glass', a house on a steep slope overlooking the ocean, he refers to the medium used to 'frame the world' (Kuma:2013). He realises that by simply employing a conventional window to mediate between subject and nature, that it is immediately tainted by the whims of perspective. He, therefore, uses the floor and ceiling to create the frame, subsequently creating the medium, and lets the shallow pool of water create relationships to the natural that only water can achieve. This is the stepping back of matter and allowing time to take its place through natural phenomena.

Through this observation, a particularly special principle is brought to light. The idea that the diminishing of material may be handed to time, which, as a phenomenon, can create unprecedented connections between subject and nature within an environment of tangible matter.

Kuma's projects, throughout 'Anti-Object', maintain a constant: the idea that the buildings must realise that they have an obligation to serve the subject and natural phenomena, and to understand their role in mediating. The point at which an object is inexorably set on a path is the moment it loses sight of the consequences of its meaning through materiality, form and composition. Thus, harsh scrutiny must be placed on any agenda which does not elicit mediation through matter. This is how an object removes itself from objectification. "Making architecture into an object means distinguishing between inside and outside and erecting a mass called 'inside' in the midst of the 'outside' (of which nature is one verion)" (Kuma:2013).

Figure 1.10: Dining room surrounded by the ever-changing environment created by the relationship between water, light and air. Water/Glass by Kengo Kuma.
Source: Anti-Object (2016)

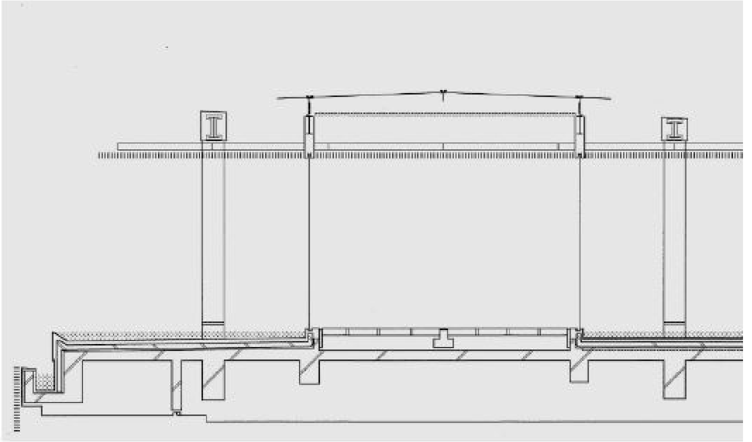


Figure 1.11: Section through Water/Glass which shows the floor and ceiling creating the 'frame', in which the subject will be enveloped in and around an ever-changing environment.
Source: Anti-Object (2016)

Kuma elaborates on this scrutiny when he speaks of the Japanese Pavilion for the Venice Bienalle. If we speak of harsh scrutiny in the (paradoxically speaking) making of an anti-object, this project may well embody the lack thereof. Takamasa Yoshizaka, a Japanese architect, designed what can be seen, within the context of the discussion, an object. Once a student of Le Corbusier, Yoshizaka was influenced by Corbusian notions and produced a white box that stood elevated above the ground; familiar to what we might perceive in Le Corbusier's buildings (i.e. Villa Savoye), yet there was an indication in Yoshizaka's intention of bringing an element to capture time in an unbound state. Unlike Le Corbusier who compressed and framed time by placing emphasis on architectural elements of movement (staircases and ramps) within a particularly centralised space, Yoshizaka placed a circular puncture in the ceiling to 'mediate' between heaven and earth. This was vastly different in principle to Le Corbusier's notion, as time was allowed to flow unbound by matter.

Unfortunately, the attempt to elevate the possibilities of unbound time through space fell short within the building. The very specific and controlled placement of the puncture in the ceiling in fact only strengthened the "centralised character" (Kuma:2013) of the building, thus identifying as an object. Kuma associates this to the Oculus in the Pantheon which reveals a relating comparison.

It is at this point in 'Anti-Object' where Kuma introduces the profound example of Katsura Imperial Villa and speaks of Taut's experience of bridging the gap between consciousness and matter, which plays a crucial role in the making of an anti-object. The notion of time, matter and space is given its utmost importance when the example of Katsura is unveiled. The 'building' and garden in Japan have been marked as one of the most important references to architecture. It was revealed to Taut some 80 years ago what has been revealed to this particular thesis now. Katsura possesses the connection between consciousness and matter. Taut, who had been searching for this connection for years, was finally in the midst of it in Katsura. "Taut describes, not just the spaces of Katsura, but the time flowing through it" (Kuma:2013). Nothing could be referred to, in definite terms, as a room or a conventional space, as the process of creating the spaces did not revolve around the preoccupation of compressing time and creating products out of matter. Rather, matter was the mediator between subject and nature.

By allowing time to appear unbound in space, the role of matter and the way it is organised may provide the mediation between subject and nature, allowing for architecture to become an unbound place of connections, furthering itself from the notions of an object and reversing the conspicuous process of delamination between the architecture and its context.

Figure 1.12: Katsura Imperial Villa interior spaces flowing out
Source: Ishimoto, Y. (1982)

'OPPOSITE INTEGRATION'- SOU FUJIMOTO

After acquiring the set of tools provided by 'Anti-Object', a furthering of the discussion can now turn to the explorations, relative to mediation, of architecture and nature. This will be guided by the ideas of Sou Fujimoto and his perception of 'Opposite Integration'.

A talk given by Fujimoto titled 'Between Nature and Architecture' where the city and forest were described as the same, revealed at its core, a search for a connection to the subject via natural environment. There was an idea that an alternative order be uncovered and implemented within the design process. This initiated the interest within Fujimoto's philosophy, as this idea placed the making of architecture around the concern for the possible connections the subject would encounter in and around a particular natural environment. This indicated strong parallels to the notion of the anti-object, as a type of mediation is evident.

The notion of the city, in this case Tokyo, being quite similar to that of the forest was particularly provocative through its paradoxical idea. The paradox, however, is the reason for its lucid explanation. Fujimoto explains by saying the forest has its own structure and order that creates openness and moments of intimacy, sheltering that which needs shelter and exposing to the elements the areas which need exposure to survive (Fujimoto:2014). He continues by saying the city possesses the same principles through its own form of ordering, through its collage of colours, cables that create a canopy as they swing from building to building, tight protected streets that open up into public zones, and of course the tall structures that dominate spatial awareness. These two vastly different environments are completely opposite through material and visual perception, but the fundamental realisation of them being quite the same, comes when the underlying principles naturally do not distinguish them apart. They both envelope the subject within their environment.

An 'opposite integration' is uncovered (Fujimoto:2014). This integration can help sysnthesise new means of creating space. There is a bridge between architecture and nature through principles. This realisation brings about a consciousness that is always questioning the human default that is categorisation, exposing the fragility of mere perception and pushing more for an understanding of principle. The task, making decisions based on an idea that something far more profound is at work and understanding that an order needs to be uncovered to make mediation possible.

Opposites seen through their inherent principles may no longer identify as opposites, but rather as parts separated from their whole. The opposites may exhibit their own segregated materiality, yet are timelessly bound by the potential of their overriding principles. This is where architecture can be made to become the mediation between subject and nature and where it can step back from preconceived ideals that may obstruct its very potential. Mediation is created so that subject and nature fall into dialogue whilst the architecture merely becomes a means for the dialogue to take place.

Figure 1.13: A Narrow Street in Tokyo
Source: Pinterest (no date)

'FIELD CONDITIONS' - STAN ALLEN

If 'Anti-object' seeks the architecture of embodiment, then 'Field Conditions' seeks the process of extracting the information, for the anti-object, from the surrounding conditions.

Stan Allen's 'Field Conditions' addresses the idea that natural order can be found in a 'field', devoid of preconceptions, through a process of extrapolation. Understanding the nature of that particular field, in this case a landscape, can inform a process of making, allowing architecture to be part of that order. A new way of realising an architecture through a 'process of emergence' (Allen:1985) sparked a sense of excitement, as the idea of creating something devoid of preconceived forms meant that there was a sense of reconciliation and 're-lamination' between architecture and context.

The pursuit to capture the sense of emerging principles resulted in an investigation through a series of models. These models stemmed off the quote from Allen's book that challenged the idea of how an object can be re-framed as a series of events causing form to rise. "The shift from the idea of the 'discrete object' to 'a record of the process of its making'" (Allen:1985). Therefore, the models set out to achieve some sort of comprehension of this idea which would start the process of achieving the greater goal, allowing for an emerging process to inform an architecture. These models will be uncovered and shown through the design process later on in part two.

Allen provides an extraordinary view point and describes the idea of the emerging process in a manner which brings to light its unpretentious truth. He highlights that something that is emergent is part of a process that involves several imposing conditions (Allen:1985). The idea that something has the potential to become, should only wait for time to reveal its perceivable form; whether that translates into consciousness or matter depends on the nature of the emerging process.

Allen speaks of one example created by artificial intelligence theorist, Craig Reynolds, through the investigation of the nature of a flock of birds. Reynolds creates an experiment conducted via computer program that sets up a series of commands to a singular bird ('boids' as he referred to them). He specifically points out that none of the commands mentioned creating a flock. However, the birds being individually programmed through three elementary commands relating to velocity, minimum distance and identifying an apparent mass of birds, formed a flock as a result of a series of local conditions. Likewise, in the case of Barry La Va's investigation (right) which shows bearings creating emerging forms as a result of several local conditions placed on each singular bearing (Allen:1985).

If an architecture can be uncovered from a field, where unique local conditions inform the design process, then the architecture can begin to release itself from the notions of an object. Understanding the conditions allows for the emergence of an integrated architecture, or an anti-object.

Therefore, the significant connection is then made. The idea that a ground up process needs to be uncovered, rather than fabricated, speaks fluently to the idea that architecture needs to reveal its role in mediating, rather than objectifying. Both attempt to avoid object on landscape.

Figure 1.14: Barry Le Va: Bearings Rolled (six specific instants: no particular order) 1966-1967
Source: Field Conditions (1996)

Through these principles, the theoretical lens has been created. 'Anti-Object' brings to light the issues architecture faces in certain design processes that ultimately result in objects that do very little for the spatial economy, people and the environment. The chosen lens opens up the space for a process of making a 'building' that understands its context or 'field' and embodies its prevailing informants. Therefore, the waste pickers of Arlington landfill are part of the field of informants and play a pivotal role in creating an anti-object architecture.

The theoretical position challenges the idea of the separated 'ecological paradigm' and suggests a regenerative approach, by allowing for an emerging architecture to materialise as an anti-object that serves as a selfless architecture and provides the environment for an architecture of embodiment, rather than that of monument.

Figure 1.15: Agbogbloshie
Source: Kevin McElvaney (2013)

CHAPTER **2**- NATURE OF BUILDING TYPE

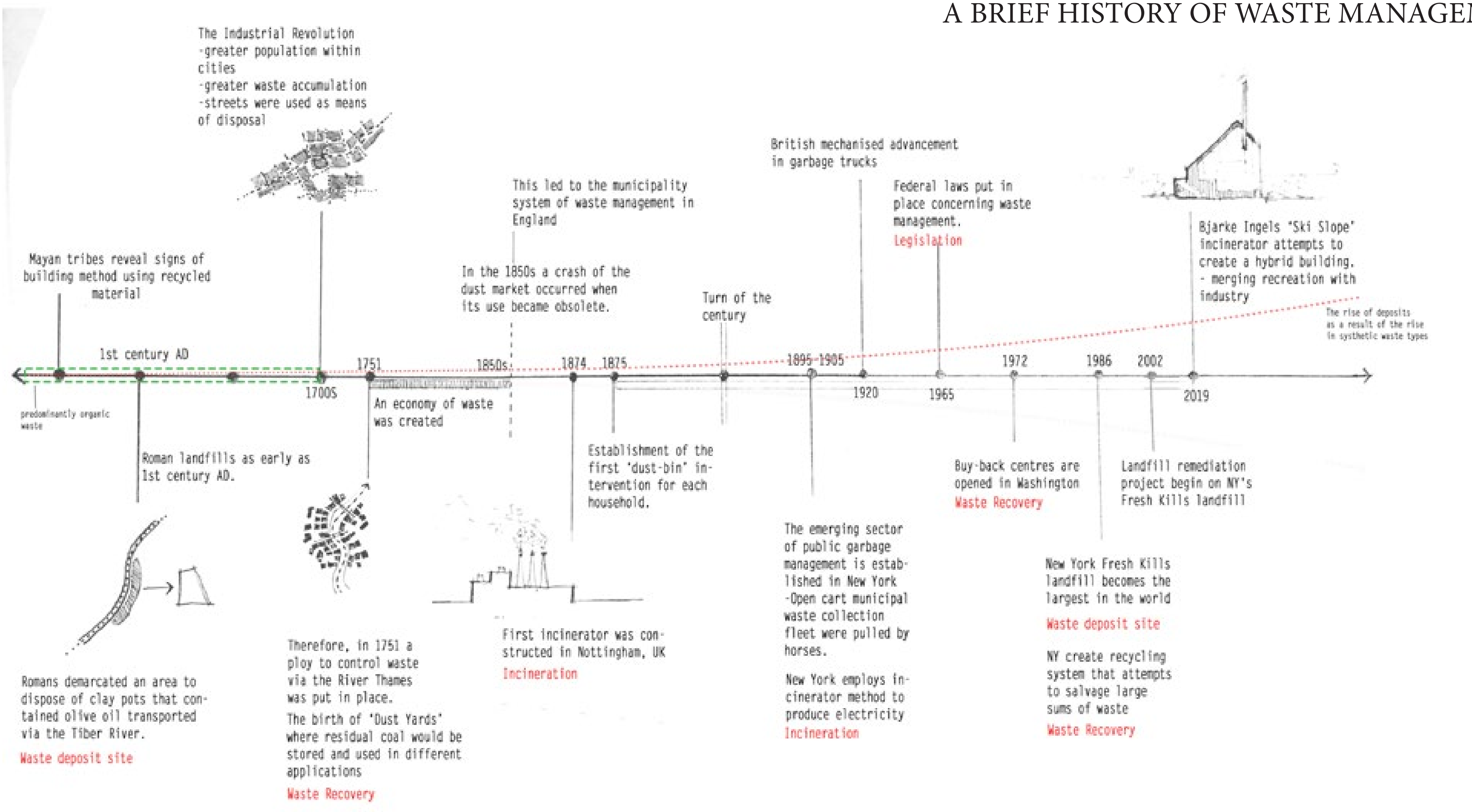
01

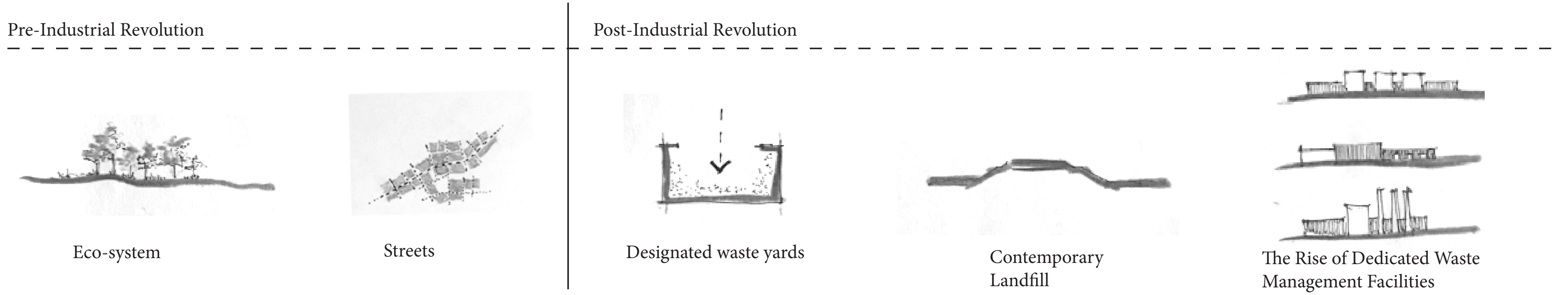
The following will provide an insight into what a recycling facility is and how it functions. A precursor discussion will be included in the chapter to help define the basics of a recycling facility in order to provide the foundation on which to discuss the chosen precedents. The precedents have been carefully selected and will unfold from large to small scale and then finally a concluding precedent will be discussed through its anti-object traits.

To commence the chapter, a holistic history of waste is provided to uncover how waste management originated and has since evolved through the progression of technology, leading to a specific type under investigation within this chapter: a waste recycling facility.

Figure 2.1: Illustrating the history of waste management
Source: Author (2020)

A BRIEF HISTORY OF WASTE MANAGEMENT





A waste recycling facility is a facility that is able to take in waste, sort and separate the waste into categories and as an output, produce new products or raw material ready to be used for manufacturing once again.

PRECURSOR

The images alongside, are two examples of forefront recycling facilities. Their spatial and physical aspects will be discussed to build up an understanding of an inherent set of criteria and basics within the building type itself, to then interrogate a series of precedents within this chapter. The overview of the forefront facilities will begin with the nature of their spatial positioning then identifying their particular parts and finally the nature of their expression.

Figure 2.2 & 2.3: Madrid Recycling Plant
Source: Waste Architecture Platform (no date)

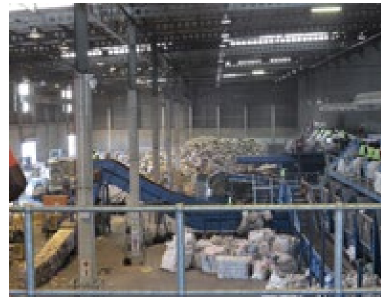
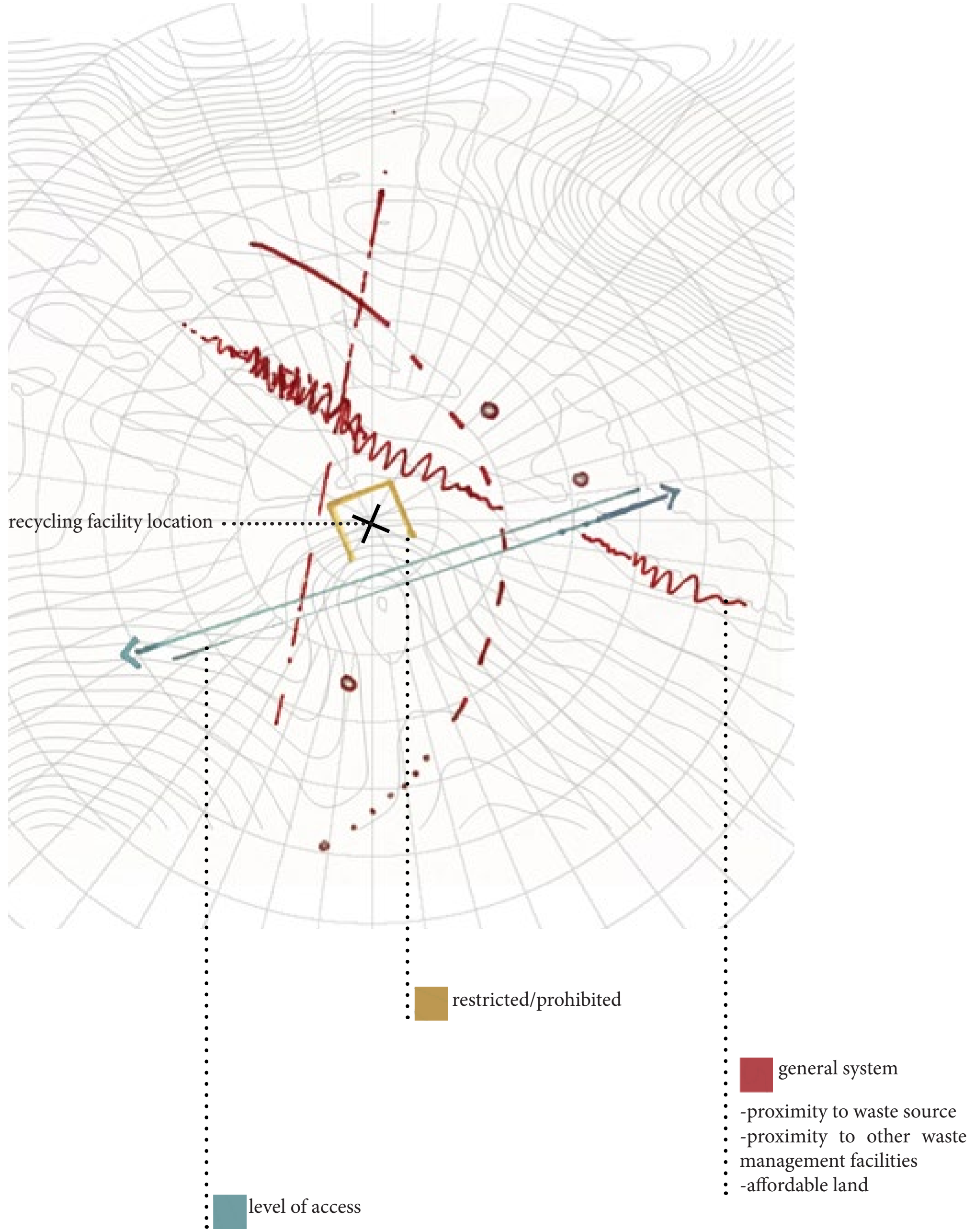


Figure 2.4: Kraaifontein Waste Management Facility Exterior
Source: JG Afrika (2012)

Figure 2.5: Kraaifontein Waste Management Facility
Source: SNU Footprints (2016)

Figure 2.6: Spatial diagram of building type within the greater system
Source: Author (2020)



The diagram (left) shows a conceptual explanation of the spatial concerns this building type has, within a greater system, and how it positions itself to carry out its role and function.

Firstly, waste processing facilities are found at specific points related to their general system. The general system can include some factors such as physical context, proximity to waste sources and other waste management facilities, affordable land and a general understanding of its social responsibility. These facilities vary in size according to their role within the general system, subsequently dictating the level of access to the facility and the boundary itself. The level of access, which allows different scaled flows of waste into the facilities, comes with an inherent degree of restriction. This restriction or prohibition is set in place by the type of activity the facility chooses to carry out therefore, a level of protection for property and persons forms part of its spatial concerns.

TYPICAL RECYCLING FACILITY COMPONENTS

Incoming Waste

Pre-treatment and Volume Reduction
- -crushing
- -shredding

Sorting Methods
- -NIR optics sorting
- -air-drum
- -inert separator
- -eddy current
- -manual sorting
- -flip-flop screen
- -balistics separator
- -overband magnet

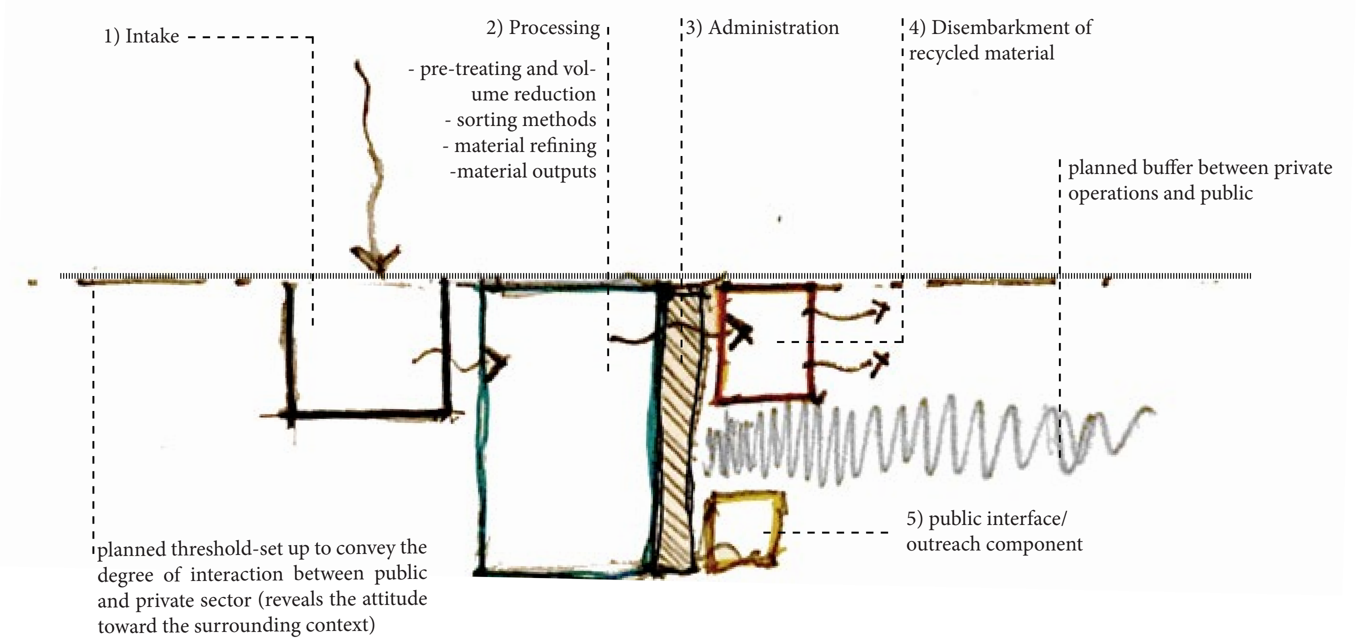
Material Refining
- -computer based optical sorting
- -manual sorting

Outputs
- -plastic
- -metal
- -wood
- -textiles
- -paper
- -cans
- -cardboard
- -glass
- -compost
- -rubble

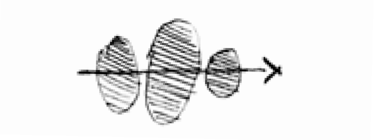
Preparing Material for Market
- -baling
- -compacting

Outgoing Product

Figure 2.7: Typical building type plan and relationship between its parts
Source: Author (2020)



predominantly mechanised process



predominantly manual process

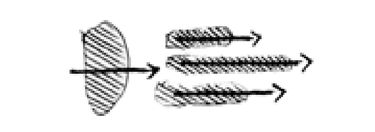


Figure 2.8: Typical characteristics of the organisation around differing processing types
Source: Author (2020)

Within the plan of these recycling facilities, similar or the same parts can be identified throughout. These parts are what make up the building type as a whole and are the parts that define its role and function. Furthermore, each part has a relationship to the next which also reveals the nature of the organisation around how these facilities take on incoming waste.

The diagram (left) reveals the particular parts that make up the whole which vary in scale depending on how specialised the facility is and what its looks to achieve in terms of waste quantities. Furthermore, the plans all have a degree of organisation around the relationship between private operations and the public realm.

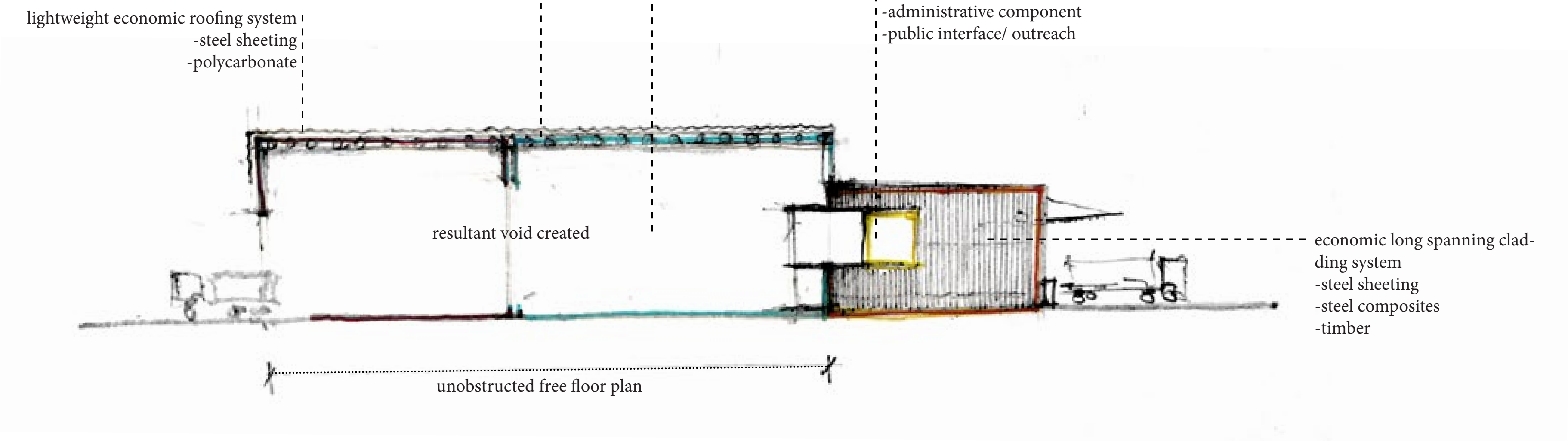
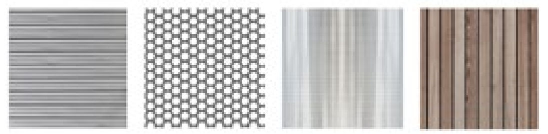


Figure 2.9: Typical building type expression and materiality
Source: Author (2020)

The diagram sketch shown (above) deals with the expression of the recycling facility type. These buildings, as mentioned, differ in scale according to their function and context, but all bear the same principles when referring to their reasoning behind their expression or appearance. These building need to accommodate specific processes with specific equipment and flow, therefore they look to create a free or open floor plan without structural obstructions. No matter the scale of the recycling facility, they all attempt to use a construction technique that can achieve this very function and still provide the adequate environment for the auxiliary functions within and around the building. This method is often executed through long-spanning material (relative to the scale) as the super structure, and cladded with a long- spanning economic lightweight material. As a result, through the simplest observation, a type of industrial shed takes form.

TYPICAL MATERIAL PALETTE ASSOCIATED WITH THE RECYCLING FACILITY TYPE
- CREATING THE EXPRESSION



steel sheeting
expanded steel
polycarbonate
timber cladding

The following discussion will outline the physical and spatial attributes of each precedent. The precedents will be discussed in terms of their placement within their general system and what that entails in terms of their size, level of access and their restricted and prohibited protocols. The facilities will also be discussed in terms of the nature of their plan and physical expression.

MRFs (Material Recovery Facility)

-Large Scale Operations

SUNSET PARK MRF, NEW YORK

This recycling facility in New York is a large, highly mechanised piece of infrastructure that is able to take in and recycle large sums of waste.

The following precedent represents the largest type of waste recycling facility. This facility is placed strategically within its general system as it is an expensive piece of infrastructure relying on efficient industrial scaled logistics and operations in order to function. The size of the facility is in relation to the high percentage of waste it manages within its system, therefore the facility requires a high, but specialised, level of access for multiple codes of transport. As a result of its importance within the circular waste economy within New York, the facility is highly restricted and only accessible by authorised persons. This is maintained by the industrial zone it rests in as well as the defined edges of the existing wharf.

Therefore, the following diagrams will discuss this particular recycling facility's spatial and physical attributes.

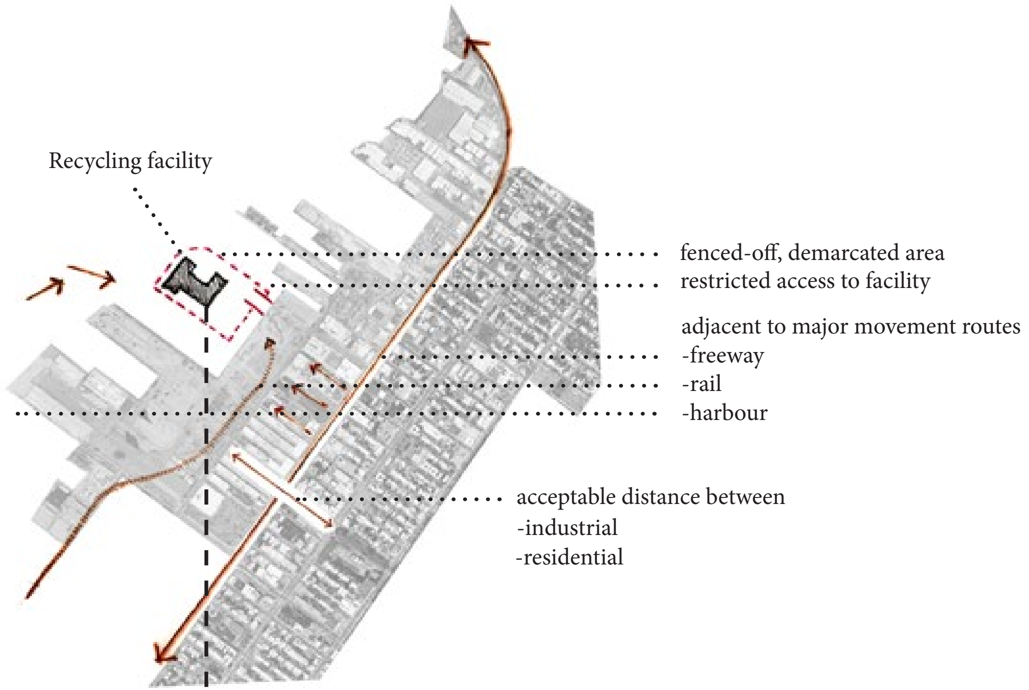


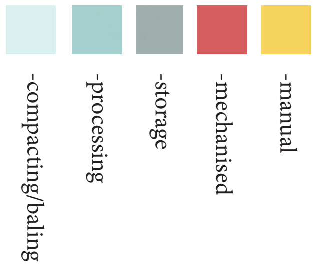
Figure 2.10 (left): General System
Source: Author (2020)

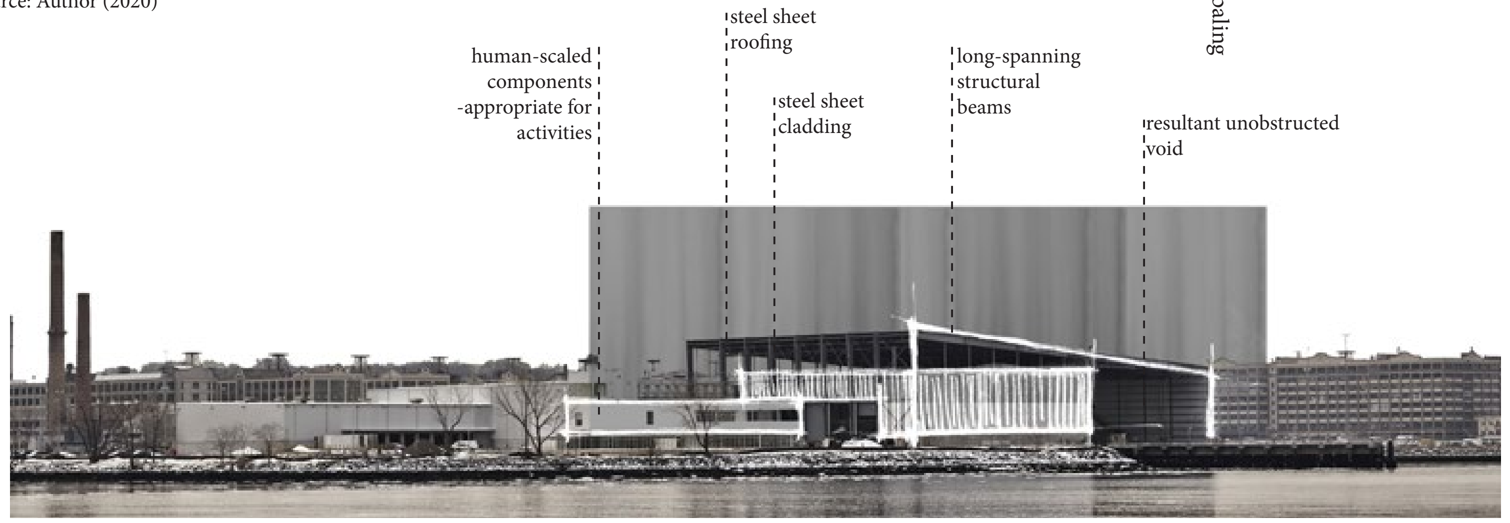
Figure 2.11 (bottom middle): Plan/Parts
Source: Author (2020)

Figure 2.12 (bottom right): Process Diagram
Source: Author (2020)

Figure 2.13 (left): Sunset Park Material Recovery Facility's structural expression
Source: Archdaily (2014)

Figure 2.14 (right): Sunset Park Material Recovery expression and materiality
Source: Author (2020)

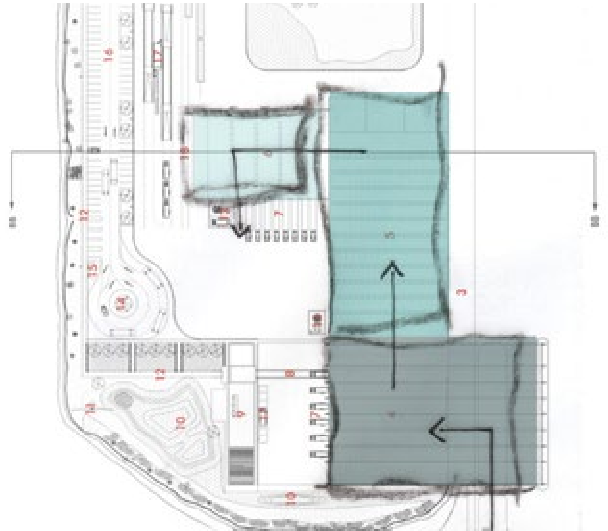




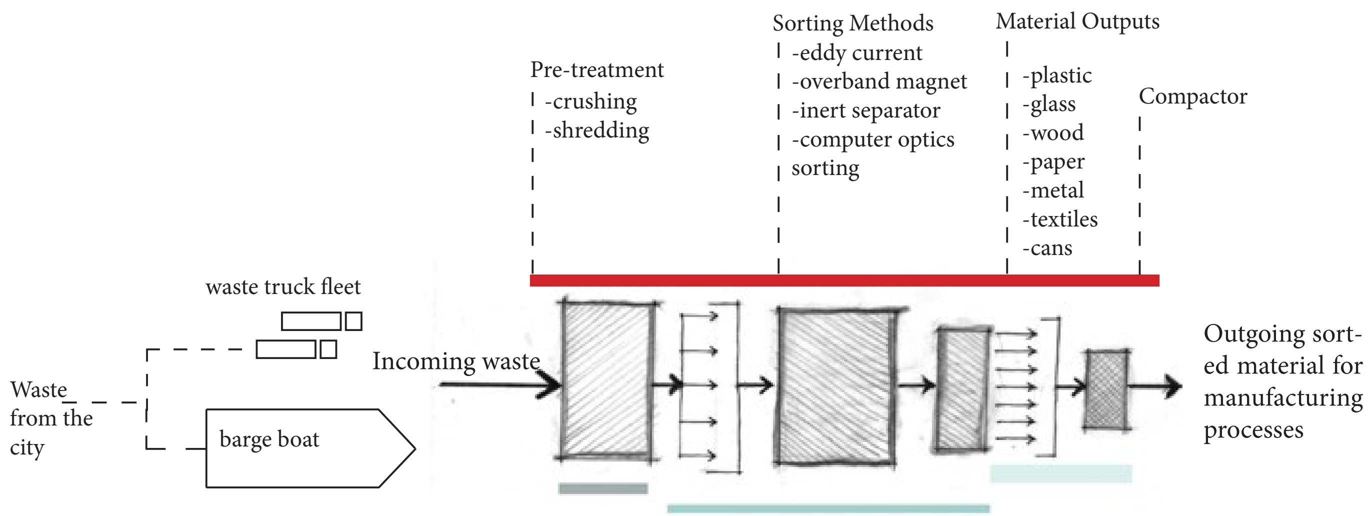
ELEVATION

This image (above) reveals the high level of mechanisation within this facility. A large unobstructed space is required for the facility to function efficiently, therefore the type of construction (long-spanning steel beams) implemented creates the large unobstructed volume inside.

The flow of activities and nature of the mechanised process is shown in the plan and process diagram below.



PLAN



Hybridised Facility

-Medium Scale Operations

SMESTAD RECYCLING CENTRE, OSLO

This recycling facility in Oslo is a hybrid facility, looking to become an effective, integrated tool within a community, rather than a large piece of infrastructure. The facility relies on public participation to feed the waste in, yet still maintains a degree of mechanised processing to effectively deal with the incoming waste stream.

The facility's size and location within its general system is a response to the existing circular waste economy. It reflects its understanding of the existing waste sources and waste management activity and maintains a high level of accessibility to those utilising the facility through the use of major movement routes. The facility also maintains a degree of restriction by using both manmade and natural elements to create the controlled environment necessary for these particular buildings.

Therefore, the following diagrams will discuss this particular recycling facility's spatial and physical attributes.

Figure 2.15: Nature of structure
Source: Archdaily (2015)

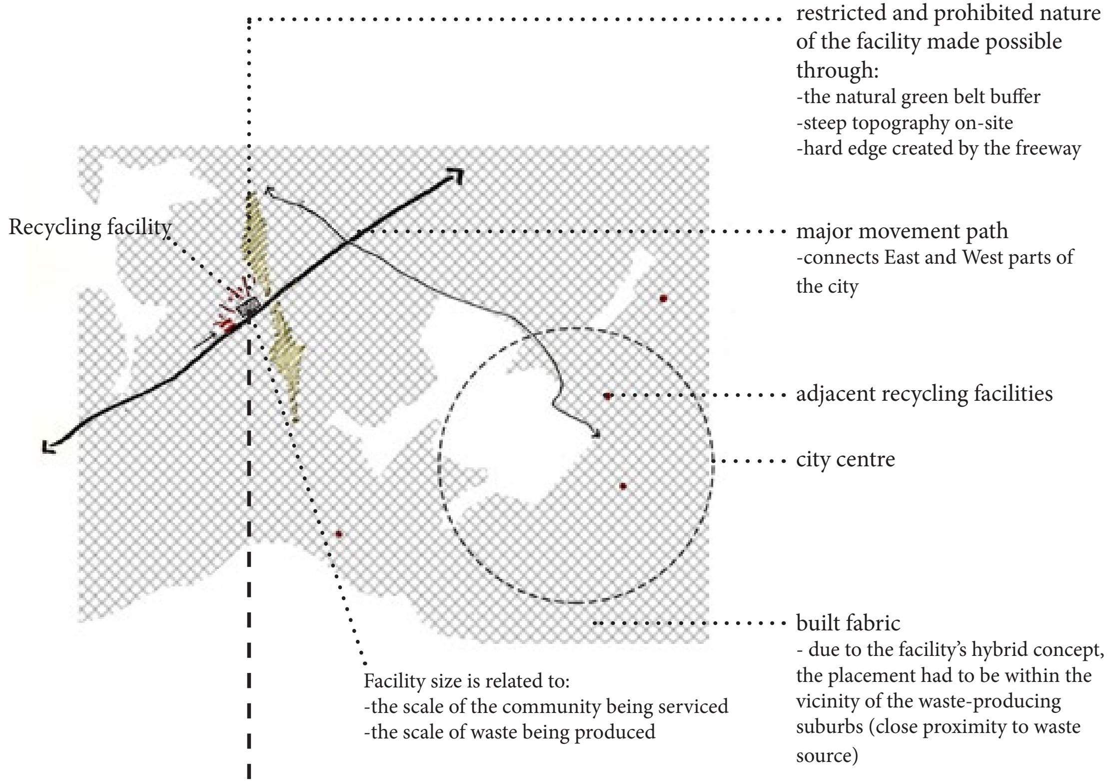


Figure 2.16 (left): General System
Source: Author (2020)

Figure 2.17 (bottom middle): Plan/Parts
Source: Author (2020)

Figure 2.18 (bottom right): Process Diagram
Source: Author (2020)

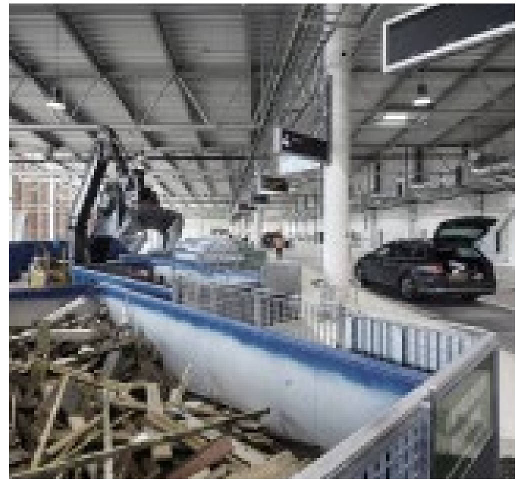
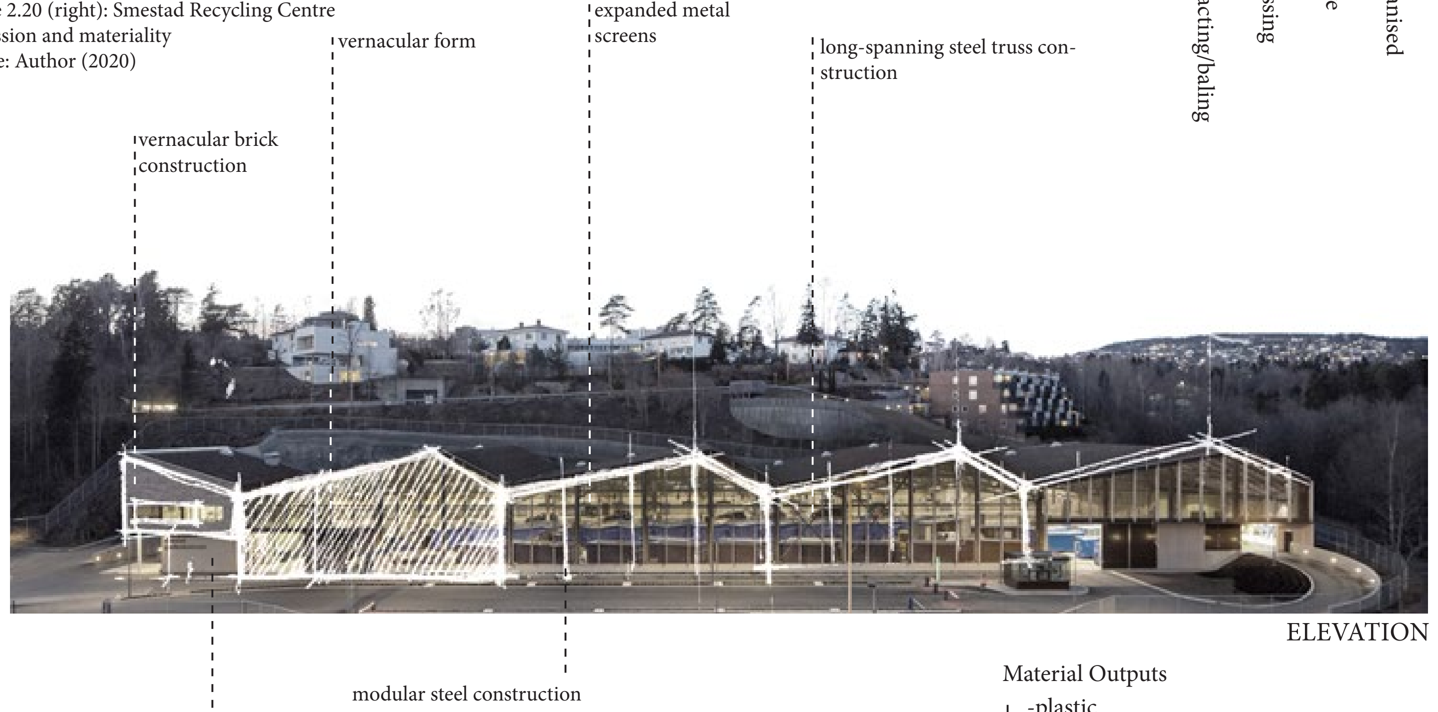


Figure 2.19 (left): Smestad Recycling Centre's structural expression
Source: Archdaily (2015)

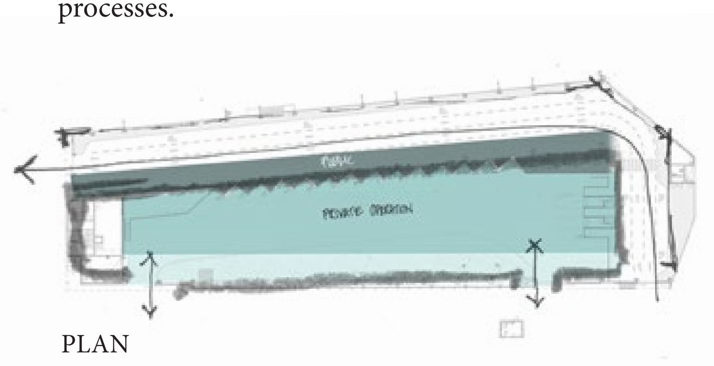
Figure 2.20 (right): Smestad Recycling Centre expression and materiality
Source: Author (2020)

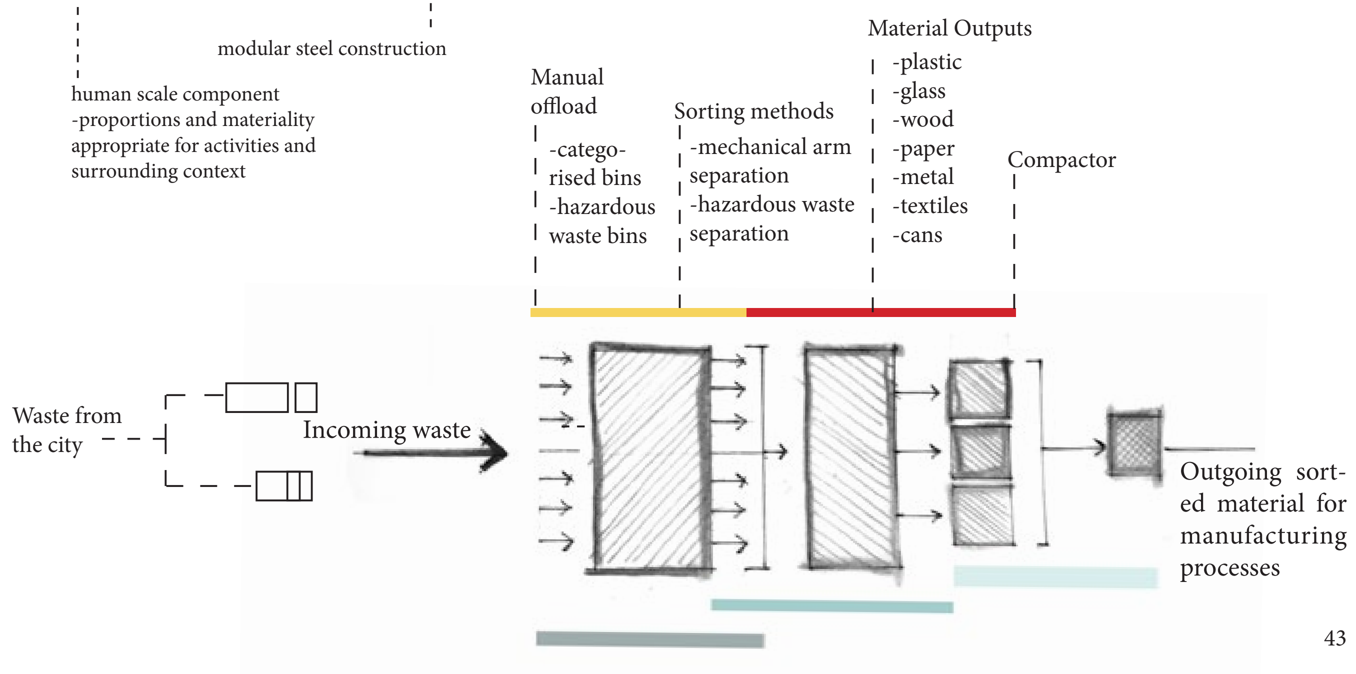
-compacting/baling
-processing
-storage
-mechanised
-manual



The image (above) reveals the nature of the space achieved inside. The bridge between the public and private operations is fluid and unobstructed. This is made possible through the use of steel trusses and modular planning.

The plan below shows the flow of activities as well as the thinning boundary between the public and private operations. The process diagram (right) begins to show the relationship between mechanised and manual processes.





Community Recycling Facility

-Small Scale Operations

NOSARA RECYCLING FACILITY, NOSARA COSTA-RICA

The community recycling centre aims at diverting and salvaging waste from the unregulated dump sites and the general waste scattered around areas of Nosara. The waste is put through a process largely controlled by manual work with the aid of small scale processing equipment.

The understanding of the general system of this particular facility is reflected through the precise location of the facility itself. The facility, as a result of the severity of waste pollution within Nosara, is placed proportionally on an existing dump site. Therefore, the facility makes use of the existing infrastructure that the dump had been operating on in the past years. Consequently, the facility has inherited the level of access and the nature of the restrictiveness in and around the site.

The following diagrams will discuss this particular recycling facility's spatial and physical attributes.

Figure 2.21: Nature of processing
Source: Archdaily (2011)

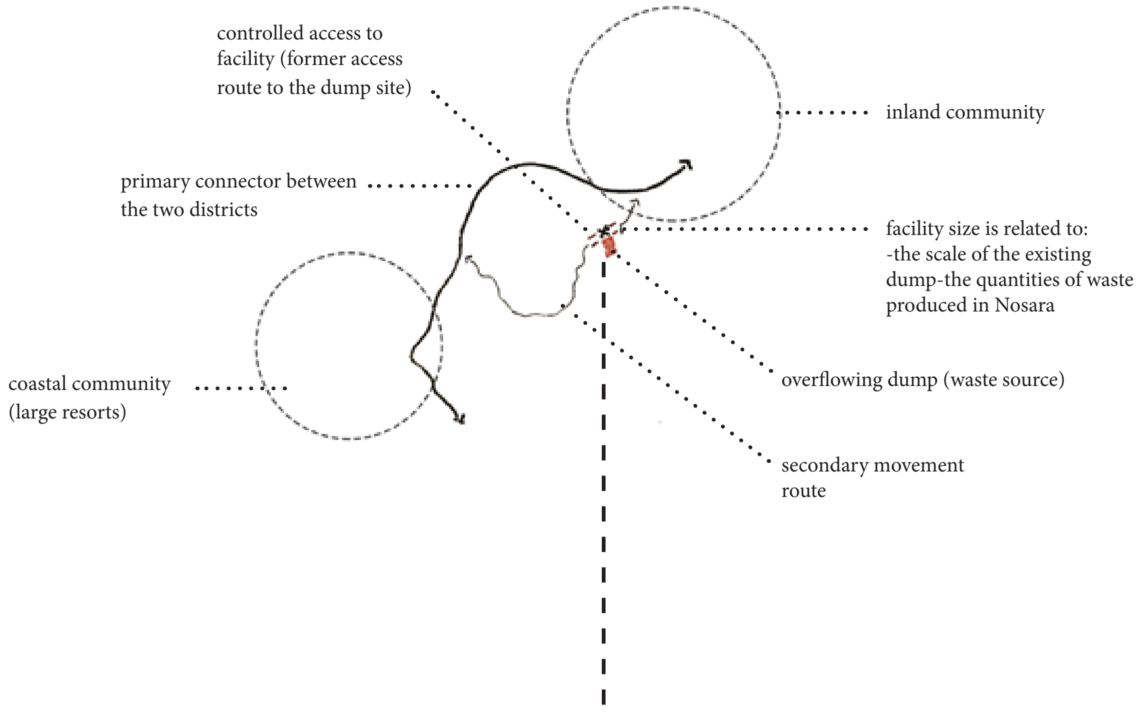


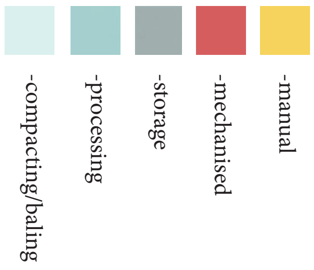
Figure 2.22 (left): General System
Source: Author (2020)

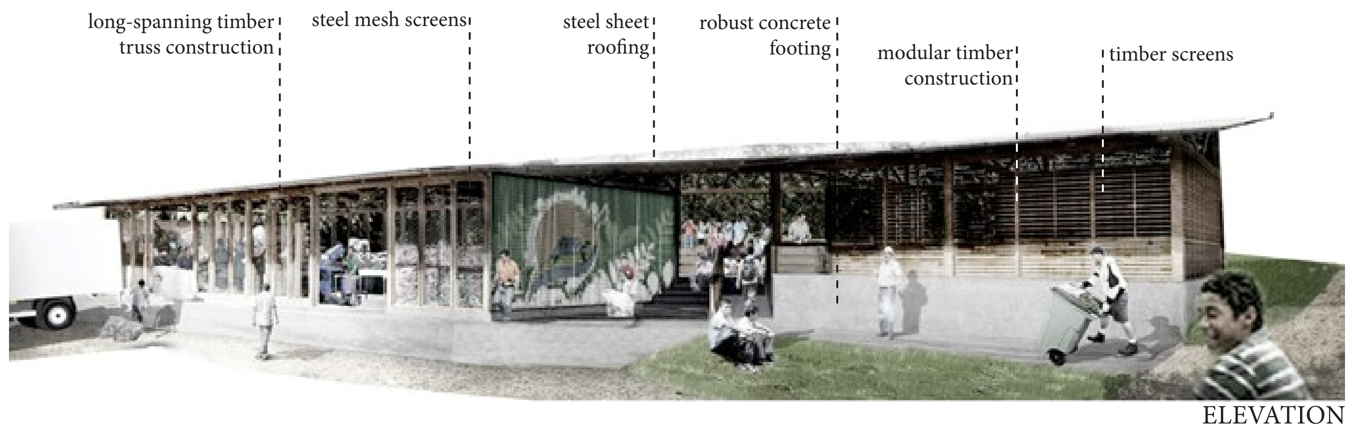
Figure 2.23 (bottom middle): Plan/Parts
Source: Author (2020)

Figure 2.24 (bottom right): Process Diagram
Source: Author (2020)

Figure 2.25 (left): Nosara Recycling Plant's structural expression
Source: Archdaily (2011)

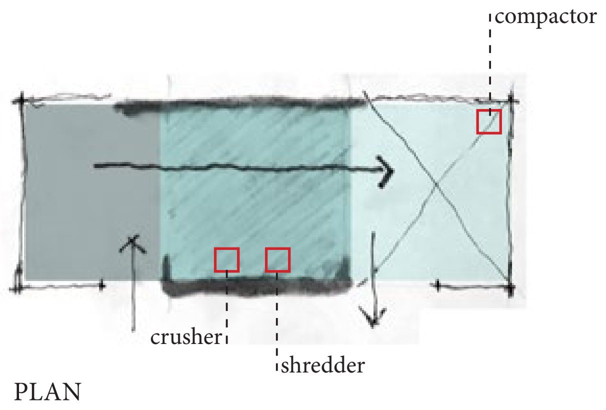
Figure 2.26 (right): Nosara Recycling Plant expression and materiality
Source: Author (2020)

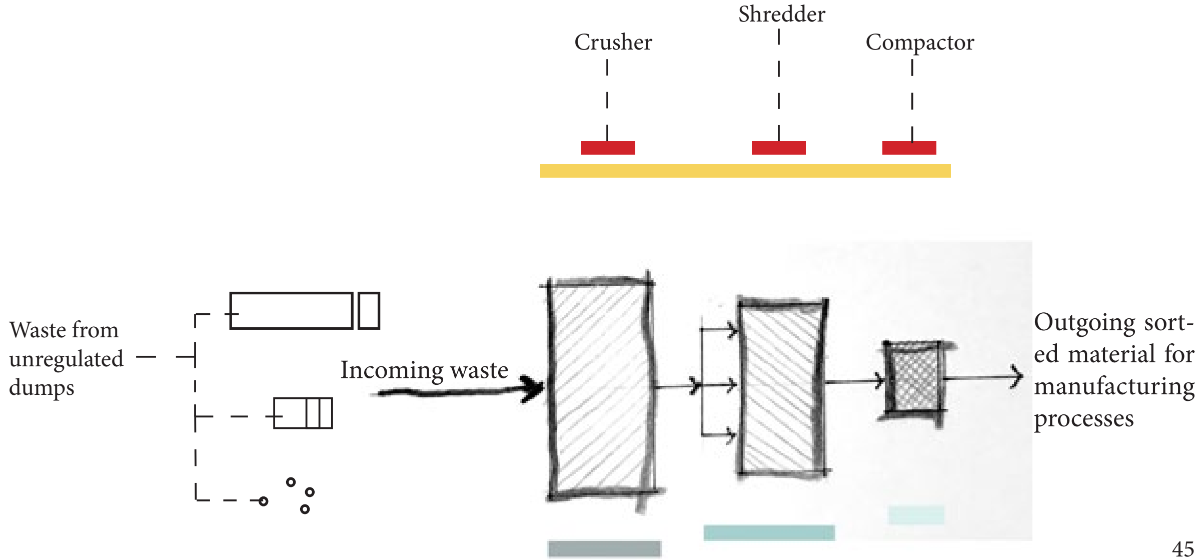


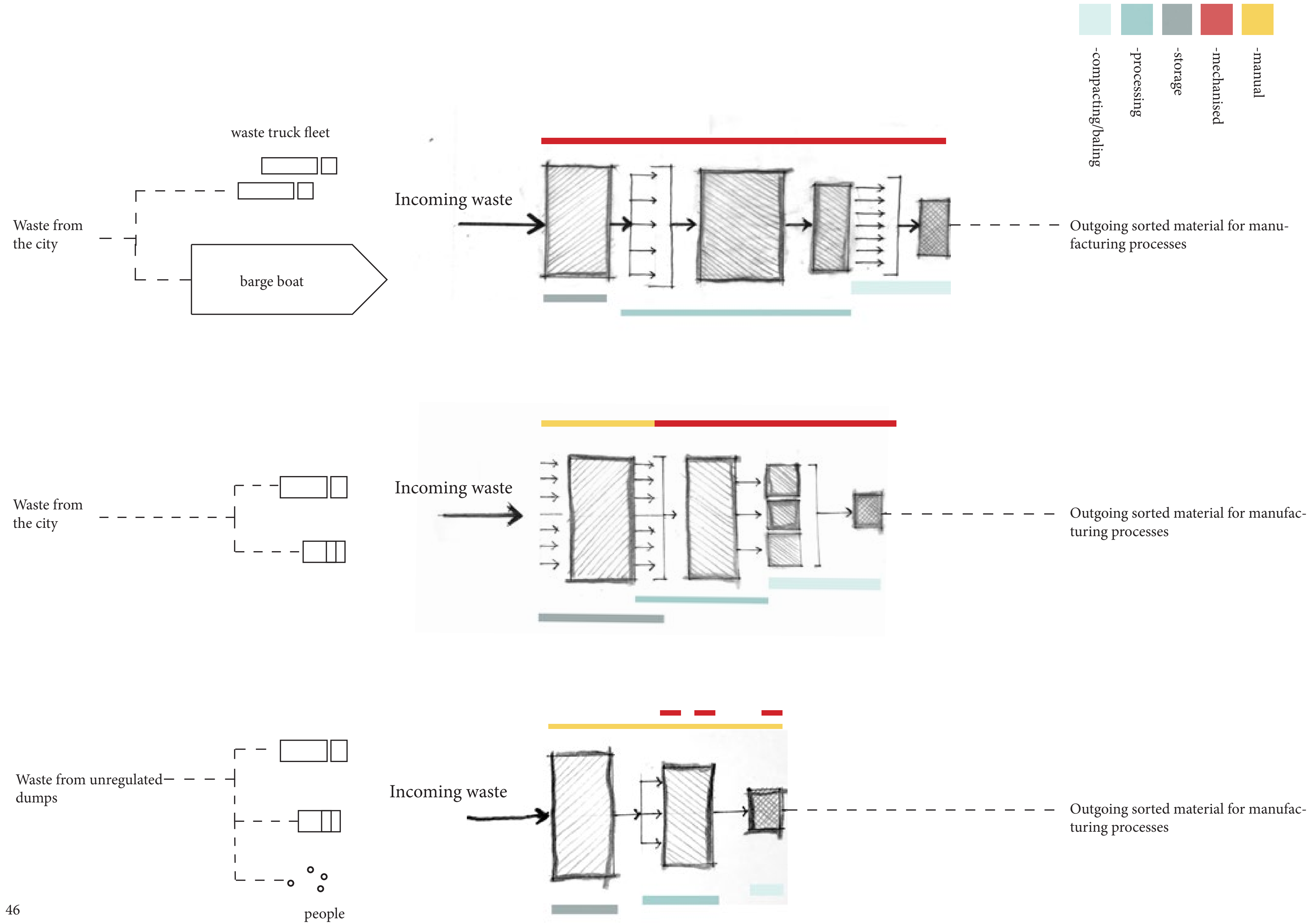


The image (above) shows the nature of the extent of manual activities within the facility. As a result, the facility demands a more dynamic space than that of a static mechanised process. This is achieved through the same principles employed by the previous precedents, through a modular beam and column construction to create the unobstructed interior. Timber was used as a more affordable material, along with recycled mesh (lightweight spanning material), timber cladding and corrugated sheeting.

The flow of activities and nature of the manual process is shown in the plan (below) and process diagram (right).







By understanding the fundamental components, across scales, the precedents have created clarity around both the extent of operations involved as well as the degree of manual interventions involved. These buildings all share similar components, thus giving definition to the type of building they fall under. The collective processes shown (left) all suggest that the buildings are involved in a centralised linear process, consequently placing them, within this argument, in the realm of objects. They perform a specific task and provide a product in the end; therefore the contrasting notion and the antithesis of this centralised linear process will be discussed in the following precedent.

Figure 2.27: Process Diagrams of each scale of building type
Source: Author (2020)

OLUSOSUN LANDFILL, NIGERIA

Olusosun landfill is the largest dump site in Nigeria, receiving up to 10 000 tonnes of waste per day. The demarcated space for the city's waste was some distance from the city in its earlier years, but since has seen the explosion of the city around its boundaries. Large, active and hazardous are some terms that could describe this chasm within the city, but 'home' doesn't seem to be a conventional term used.

Olusosun dump site is home to thousands, living on and off the waste brought in by the heavy vehicles every day. Waste is not seen as inconvenient or useless here, but rather seen as a product waiting to be rummaged through, sorted and sold. Livelihoods are created and sustained in this inhospitable place. Even the word inhospitable does not spring to mind when observing the individuals at work, play, worship and even within the grasp of locally formed law. Olusosun possesses a lively spirit that speaks through the individuals that seem to have perfected the art of recycling. Long days in the harsh tropical sun to these individuals is taken up by side-by-side conversations with the comrades beside them. This spirit keeps the people of Olusosun landfill moving.

This can be seen as an intensely integrated system, reaching past function and stepping into the realm of the human spirit. Collectively, these individuals perform the task otherwise handed over to large infrastructural objects that are dedicated to a specific process. A way of life has infiltrated and materialised into a built fabric, built to be around the waste, but not enslaved to its negative and toxic connotations.

Figure 2.28: Google Earth image of Olusosun landfill, Nigeria's largest landfill
Source: Google Earth (2020)

Figure 2.29: Olusosun landfill figure ground diagram
Source: Author (2020)

OLUSOSUN BUILT FABRIC - AN ANTI-OBJECT AT WORK

Figure 2.30: Olusosun landfill figure ground diagram shown through the lens of the anti-object
Source: Author (2020)

Watercolour was used to capture the flow of waste within this 'anti-object' recycling facility. Water colour was a medium that best depicted the subtle change in the different phases of the recycling process on Olusosun landfill. The colours seem to overlap and transform into different phases, replicating the motion on the landfill. Unlike the rigid and centralised processes of the previous precedents, this integrated waste recycling system flows naturally over the contours of the landfill, and in between conversations had by those passing by or sorting alongside. Time flows through the landfill, relative to the components that make up the whole and is not bound by a formalistic and stringent processing structure, which would otherwise give rise to a very specifically ordered building.

Figure 2.31: Olusosun landfill figure ground diagram callout
Source: Author (2020)

THE MEETING PLACE BETWEEN WASTE TRUCK AND WASTE PICKER

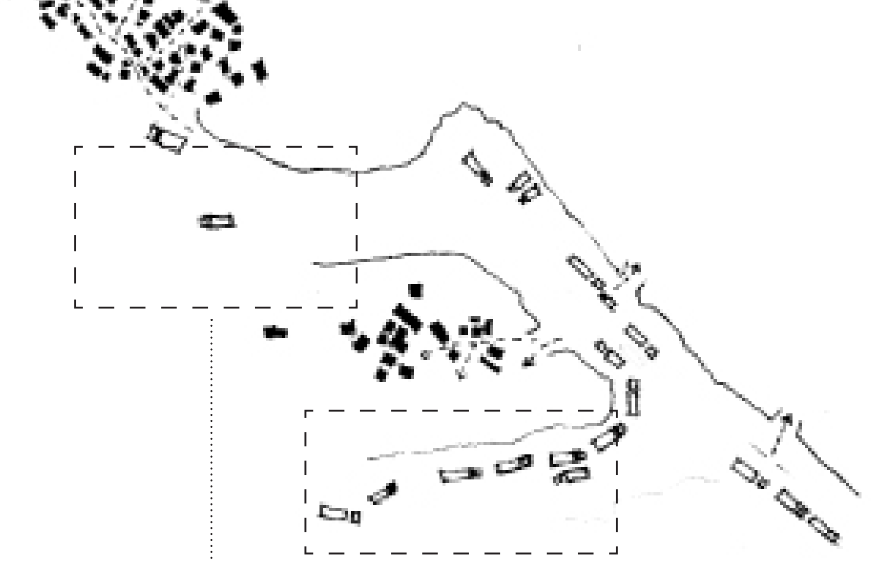


Figure 2.32: Waste pickers meet trucks
Source: Getty Images (2007)

The anticipation around the trucks arriving begins to reveal the spirit in which these individuals carry out their work. The moment the waste truck releases the waste is the moment the waste escalates in value. The waste is ripped, nurtured, sorted and extracted by the pickers and strategically taken elsewhere. Though frantic it may seem, the 'elsewhere' is exactly why this decentralised system works. Waste is immediately taken to a point where a valued exchange will take place.

The intensity around these waste trucks ultimately means that a large sum of the waste will not fall victim to the landfill and will be recycled or reused accordingly. The intensity may also allude to the fact that the landfill has the tendency to burst into flames, fueled by the gas collecting under the layers of decomposing waste, therefore waste must be quickly turned into profit.

Figure 2.33: Waste pickers meet trucks
Source: The Washington Post (2017)

Figure 2.37: Olusosun landfill figure ground diagram callout
Source: Author (2020)

-manual
-mechanised
-storage
-processing
-compacting/baling

THE EVENT OF SORTING AND SEPARATING

Figure 2.36: Aerial view as waste pickers meet trucks
Source: The Washington Post (2017)

Figure 2.34: Olusosum Landfill
Source: Guardian (2017)

Figure 2.35: Waste picker carries bag full of collected waste
Source: BBC (2010)

The process then continues through to a sorting and separation phase. While trucks may still be streaming in from the city, bulldozers are constantly relocating waste heaps around the landfill. This gives opportunity for the waste pickers to sort through other areas of waste. The manual task of filling the bag, cart or bin commences and ultimately gives rise to the fluid formality seen in the image above.

These seemingly isolated events of separating and sorting, under closer inspection, are quite the opposite. Trading of specific material types or even lending happens within this phase of recycling. A constant awareness of waste type and waste value maintains a concept of a type of stock market. A supposed 'Wall Street' on a landfill.

PREPARING THE 'BALES' FOR MARKET

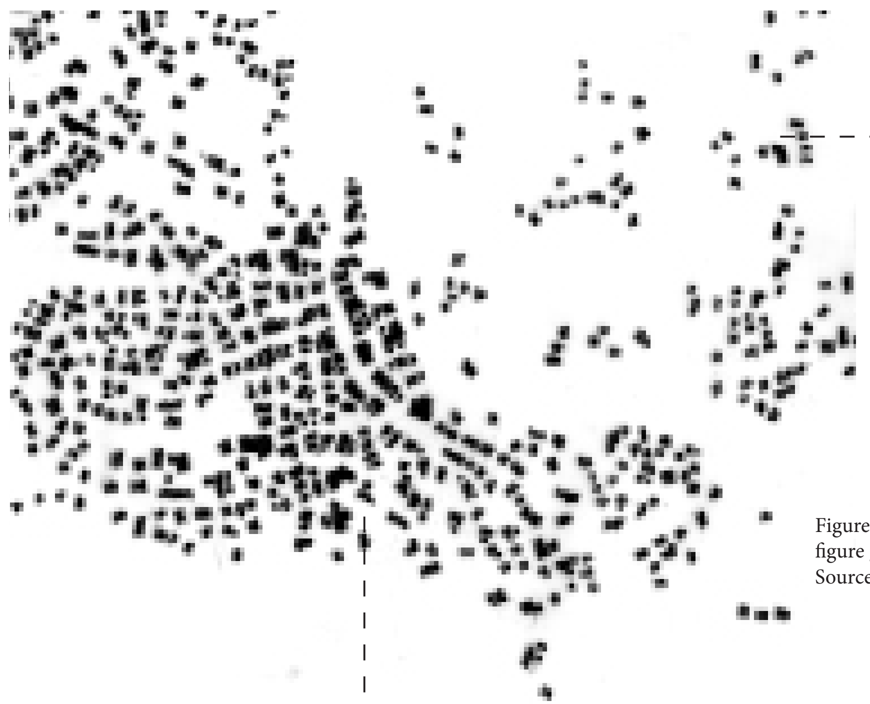


Figure 2.38: Olusosun landfill
figure ground diagram callout
Source: Author (2020)

Figure 2.41: Waste picker processes his waste
Source: BBC (2010)

Once sorted, separated and hauled back to a specific station or homestead, the individuals can start to refine their marketable load. The large stacks of already sorted waste are placed in 'bale-like' manner before taken off to a waste broker or to an area of interest. Either way, the waste that is piled and ready for market will provide a return based on the market values and trends at that point in time. Once sold, the bags are emptied the process starts again.

Figure 2.39: Olusosum Landfill
Source: Guardian (2017)

Figure 2.40: Life within the world of waste found in the 'space between'.
Source: BBC (2010)

Figure 2.42: Dump Fury
Source: Kalu, B. (2018)

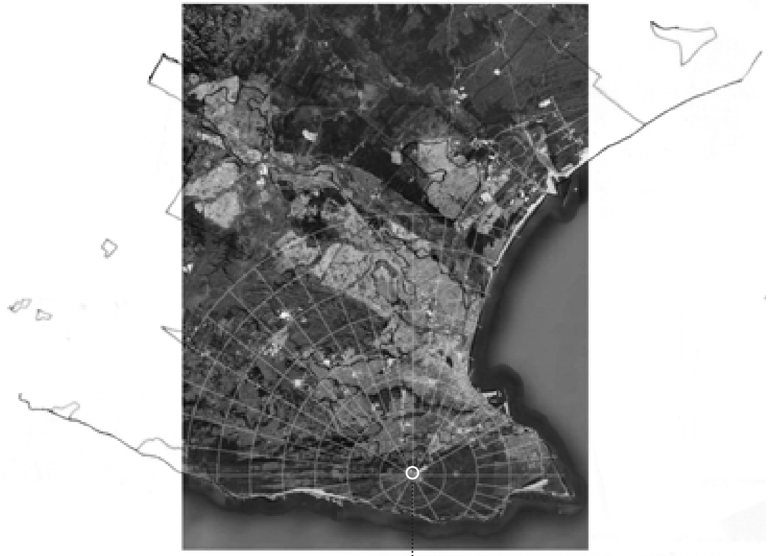
This chapter has been structured around the overview of the theoretical lens, the 'Anti-Object'. The precedents were analysed under their own obligations and objectives as buildings, yet scrutiny was maintained through the aforementioned theoretical lens. Although not explicitly categorised into objects and anti-objects, a particular navigation around principles within the precedents allowed for the contrast between the two to emerge. This contrast was ultimately made clear through the uncovering Olusosun landfill. A sense of time flowing through the spaces created in the built fabric of Olusosun is not bound by compression or stringent planning, but rather ordered around the influx and movement of another type of matter, which in this case is waste. This observation, along with the particular linear processes identified in the recycling facilities will give rise to an approach at Arlington landfill. Along with the inherent processes involved in a recycling facility, the notion of unbound time flowing through spaces, mediating between picker and place, will become the aim of the design process.

Figure 2.43: Trash Land
Source: Ferreira, J (2011)

CHAPTER **3** - SITE: MAPPING THE PRODUCTIVE WASTE LANDSCAPE
01

This chapter aims at defining a framework that is informed by a multi-layered investigation, with a specific intent on understanding the context of Port Elizabeth's circular waste economy as well as the people involved. The investigation will combine informants, extracted from each layer, and provide the appropriate location for the project site. The city structure, as well as the natural context, will be mapped in order to synthesis what the structure reveals itself to be. The following has been mapped with specific intent in mind in quickly understanding what is important, especially at each scale, and what informs the design process at each stage. Furthermore, this mapping process is not performed in a linear fashion, but rather as a back and forth dialogue between design ideas and mapping.

Figure 3.1: Diagram depicting the scales of analysis
Source: Author (2020)

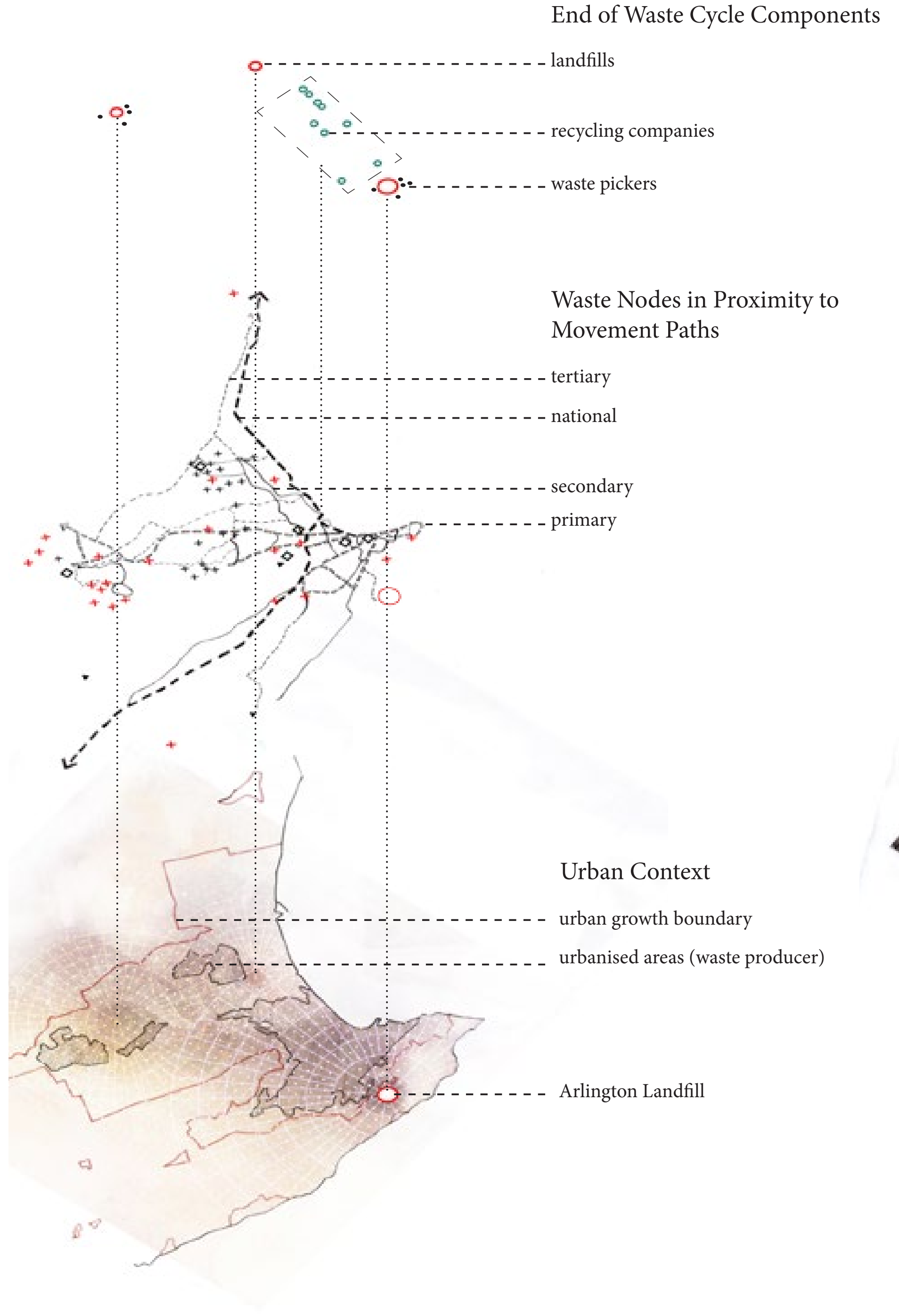


METRO SCALE

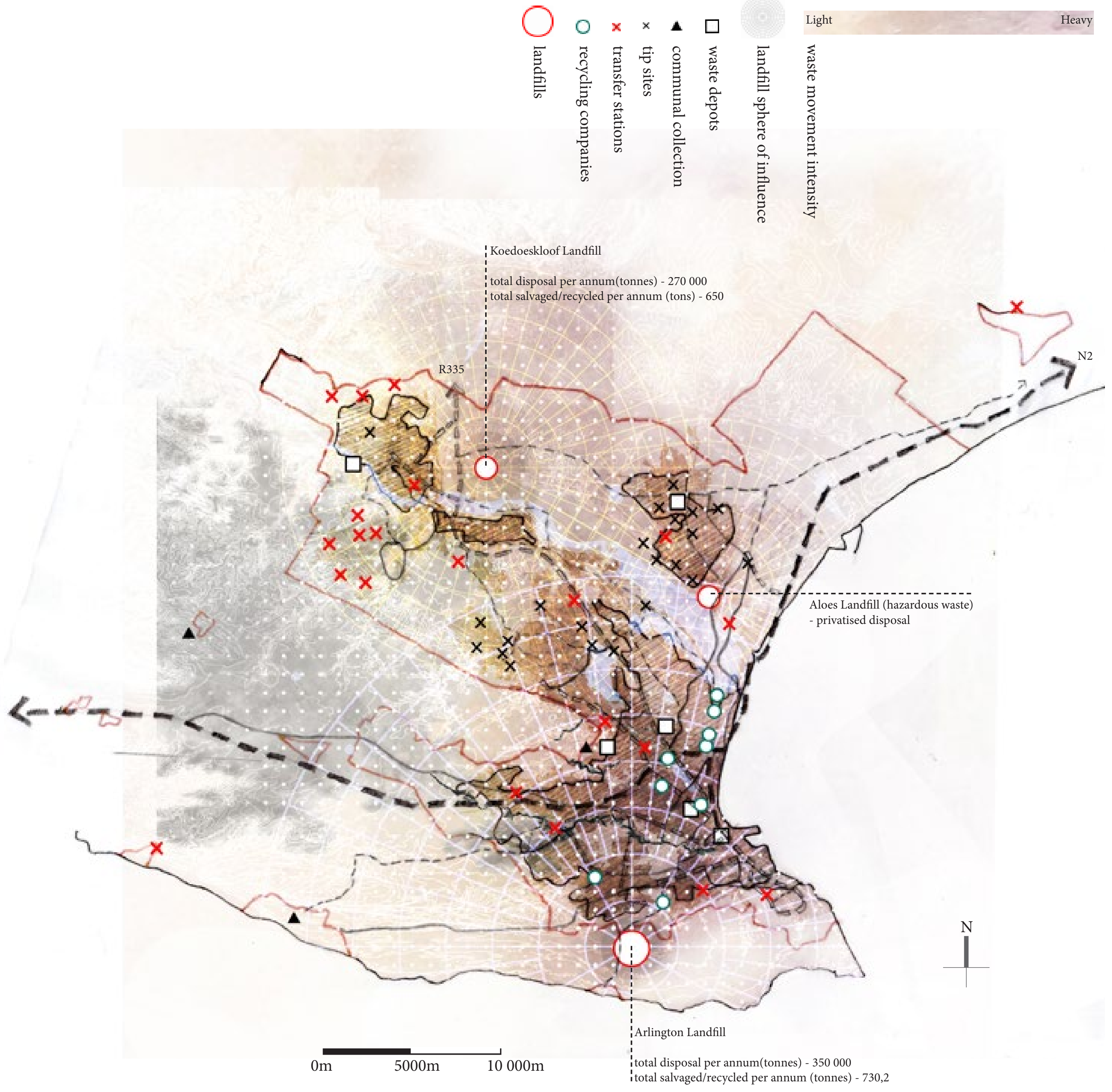
The following mapping takes place within the metro scale. The aim of mapping at this particular scale is to reveal the structure of the waste flow within the natural and built environment of the Nelson Mandela Bay Metro.

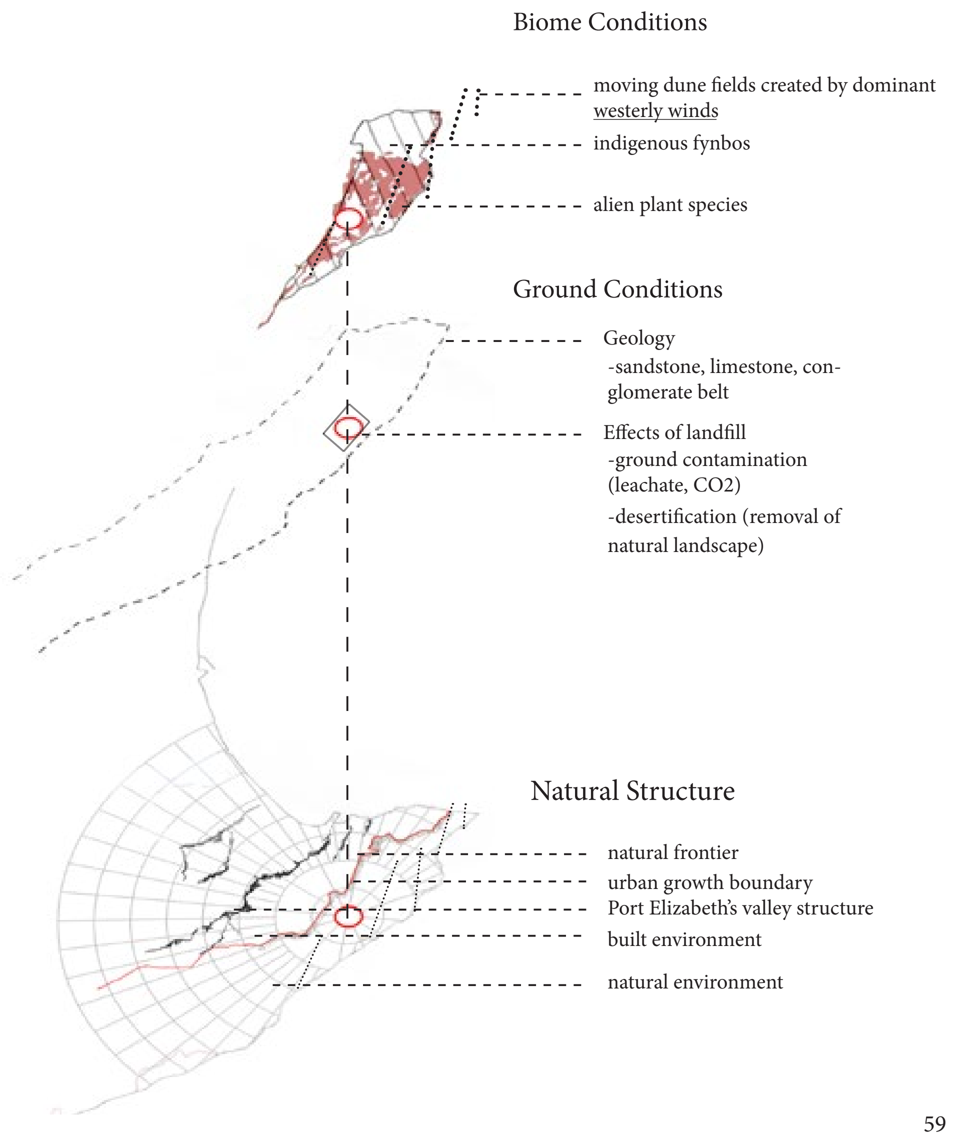
The structure of the city is uncovered to understand where waste is produced, transported and collected. Furthermore, the natural structure is uncovered to understand the effects the waste production and flow have on the environment.

Figure 3.2: Metro Scale Analysis (all maps)
Source: Author (2020)



COMPOSITE MAP





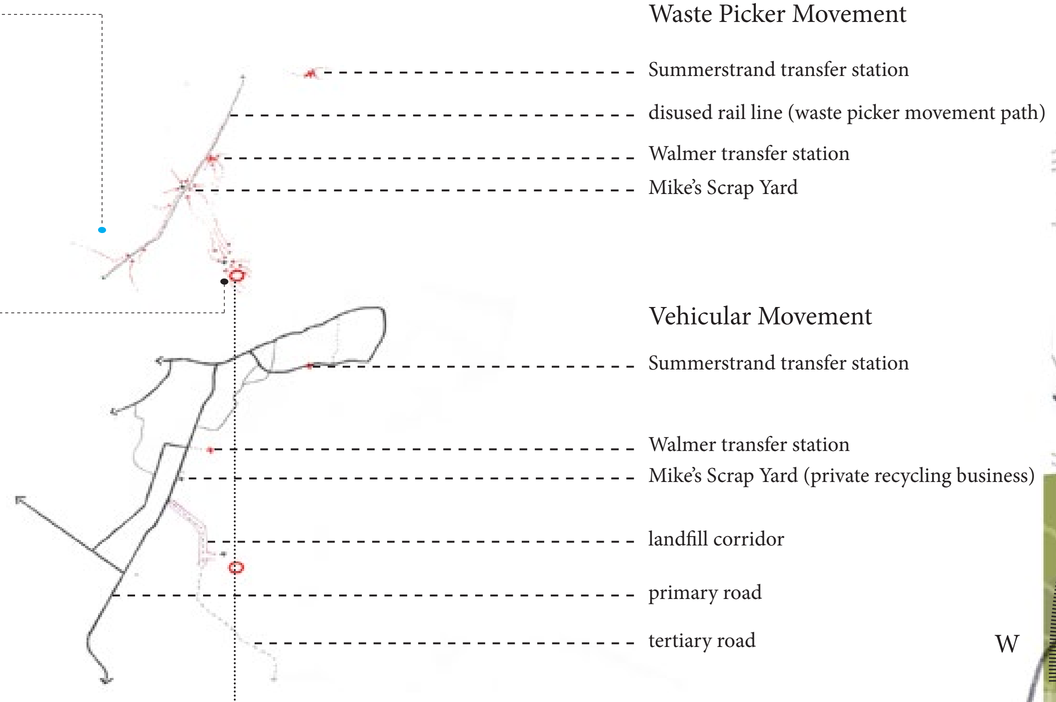
PRECINCT SCALE

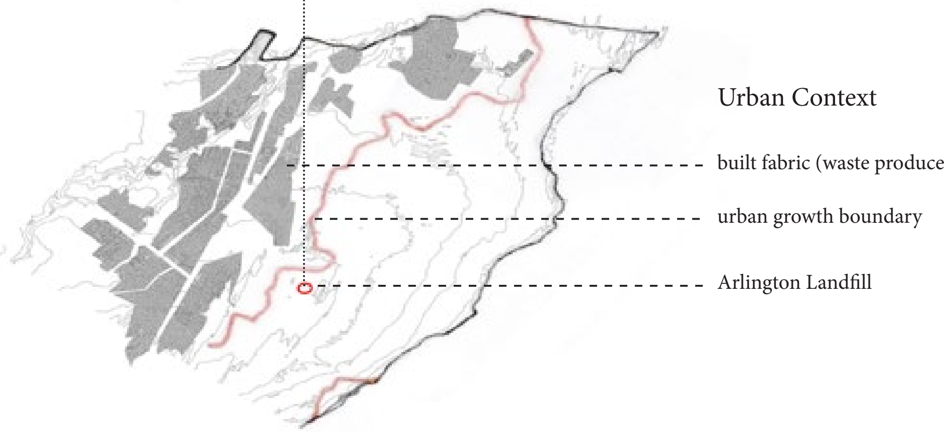
The following begins to uncover specific constraints and informants at a precinct scale. The precinct scale looks to magnify the concerns found within the metro scale and to begin the process of building up a set of core issues and concerns for the project to embody. The following layers that have been extrapolated begin to reveal an attitude towards general concerns as well as a specific intent within the project scope.

Figure 3.3: Precinct Scale Analysis (all maps)
Source: Author (2020)

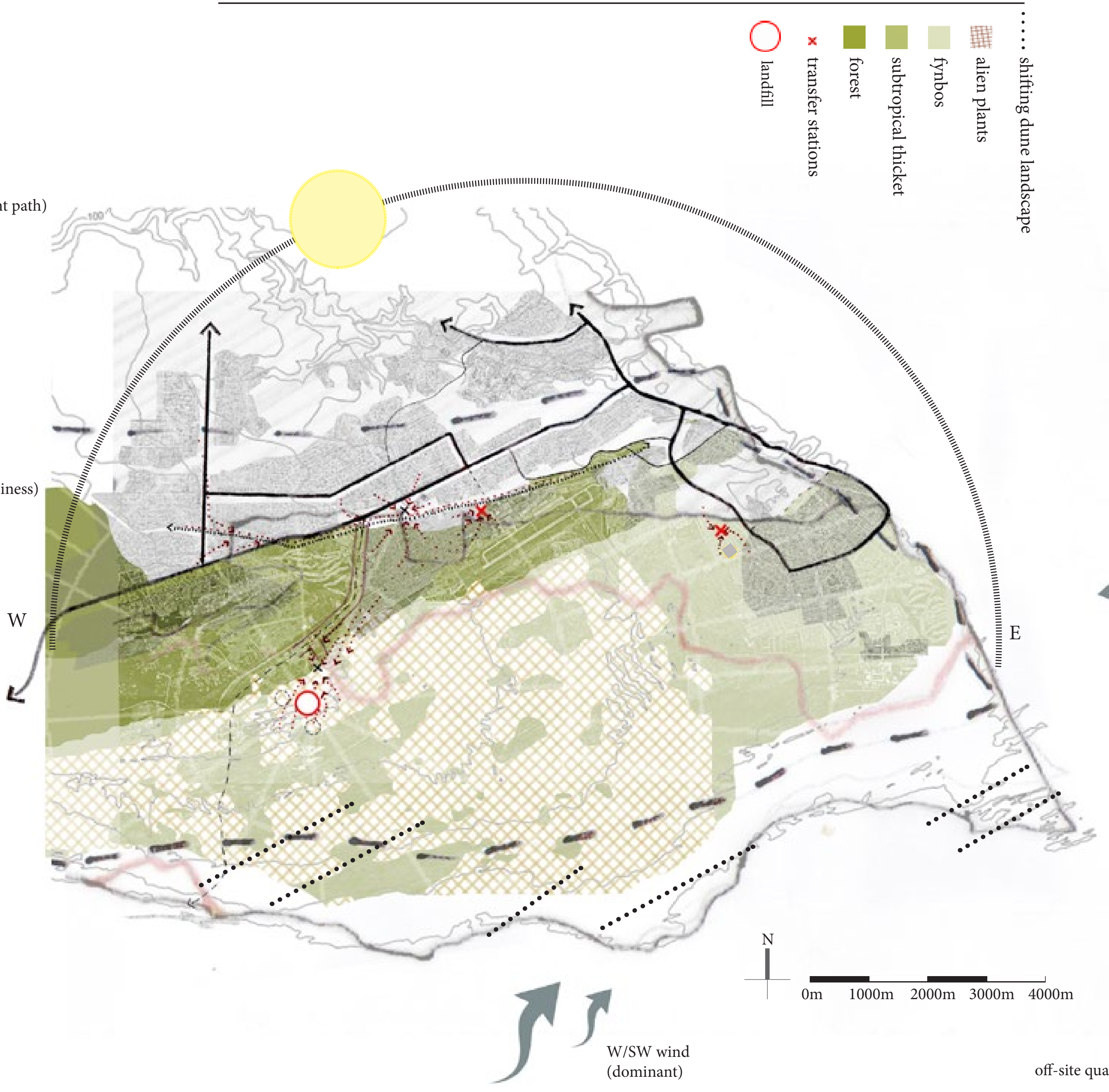
Figure 3.4: Picker 1
Source: Rosebank Gazette (2017)

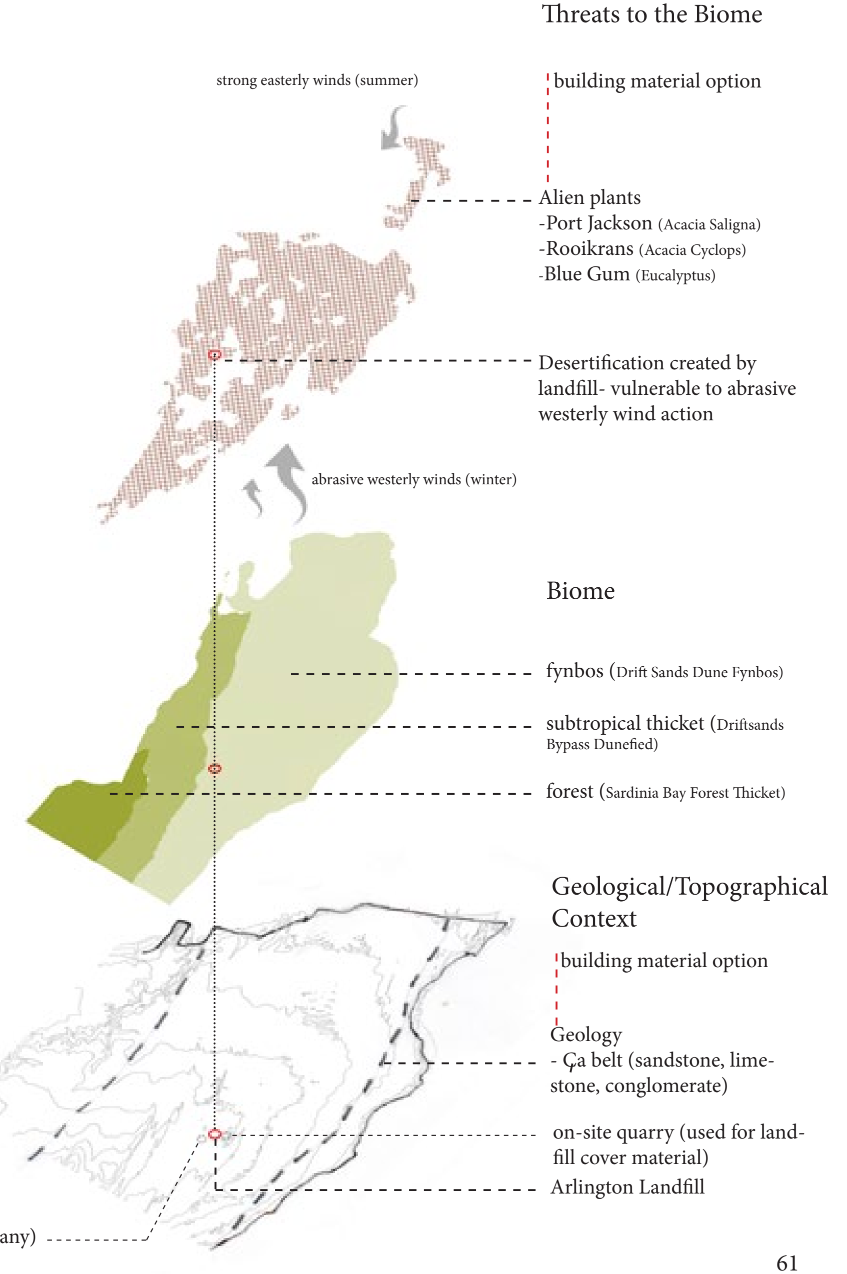
Figure 3.5: Picker 2
Source: News 24 (2020)





COMPOSITE MAP

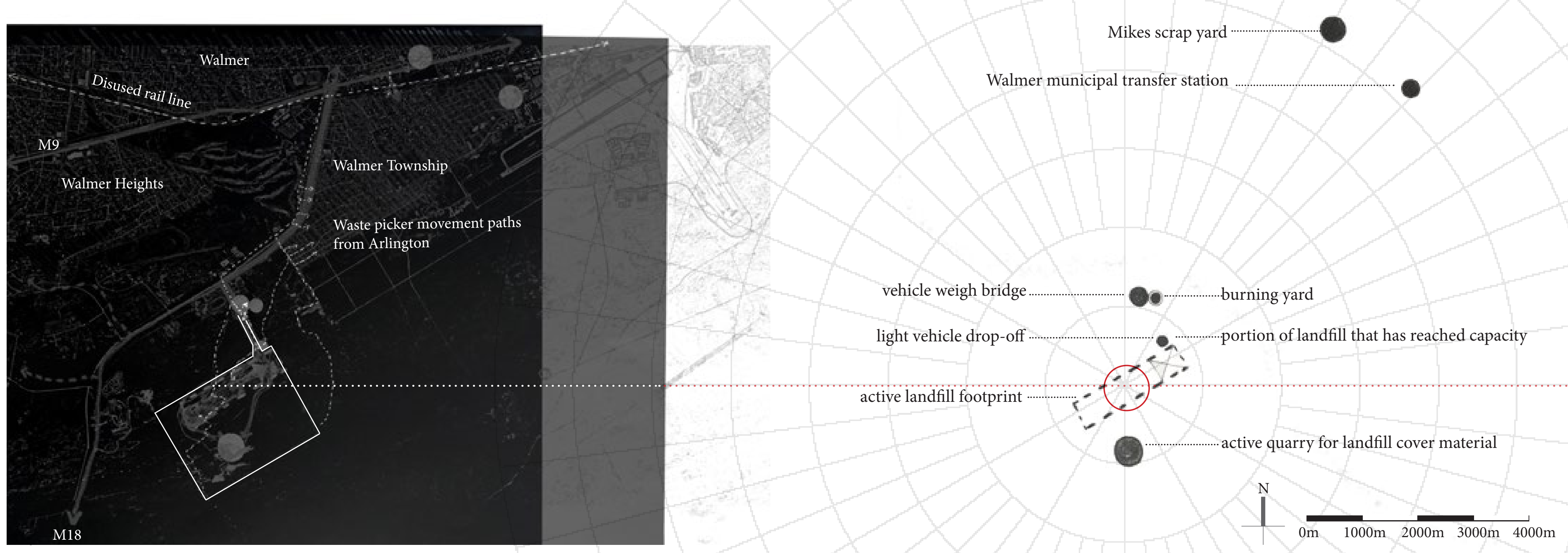




Precinct Scale Nodes of Activity

The following diagrams deal with the active nodes within the precinct scale. These nodes are a representation of where the critical points are within both the informal and municipal waste system. Each node is a point where an action meets its end or begins the next reaction within the long circular chain of waste. If we begin to dissect the nodes and what their interchanging roles may be, we can begin to see how waste becomes a sub-economy.

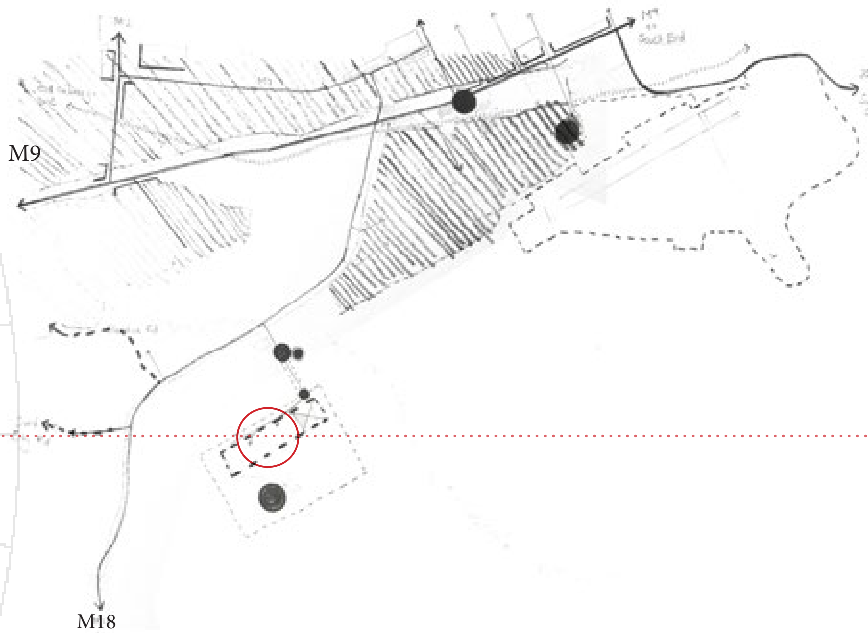
The collective substance suddenly starts to acquire value once it lands at the bottom of the bin. The opportunities seem endless as do the quantities that spill out of every household, business and street bin. As a result of this strange value within something that may seem spent, comes the capitalisation of the system. Each node is a point of interest in this system and each operates uniquely.



Vehicular movement

The diagram below shows how tertiary, secondary and primary routes, in close proximity to Arlington landfill, are able to link suburbs. In this case, the precinct scale, shows how the main artery bisects the M9. The M9 connects major suburbs of the city in an east to west direction and thus the bisecting route to Arlington landfill becomes a major movement path in the act of waste disposal. Both municipal and private vehicles use the main routes in order to penetrate the finer grained streets of the surrounding suburbs.

The activity nodes further convey the intensity of the waste system as heavy and light vehicles navigate through the suburbs in an attempt to harvest waste and deposit at desired points. These points are the nodes of disposal, exchange and/or waste departure. Each nodes gives waste new status and therefore new value, allowing the waste to become a substance which creates an economic activity.



Waste collector movement paths

This diagram shows a simplified map of the paths and routes used by different types of individuals within the informal waste collection system. These routes were put together by aerial map observation and by personal ground work within and around the precinct area. In this investigation two distinct types of collectors were determined, the individuals operating in the suburbs and business districts and those operating on Arlington landfill.

Thus, sense is made of the resultant paths within the diagram. A main route appears in a similar form to the M9 used by vehicles. This main route is a disused railway line which is the waste collectors equivalent of the M9 . This is a main artery which leads to the hub of informal waste collection at Mikes scrap yard.

The Arlington landfill waste pickers operate for most of the day on the plateau, yet there are signs of possible extractions of material from the Walmer township and vice versa. The paths on the landfill converge at particular nodes, therefore revealing a particular function. The weigh bridge, burn yard and light vehicle drop-off are fundamental points for waste to be collected, sorted, transformed and hopefully sold. These paths are also the desire lines for the waste pickers who live in the township or in an informal structure in the surrounding fynbos.

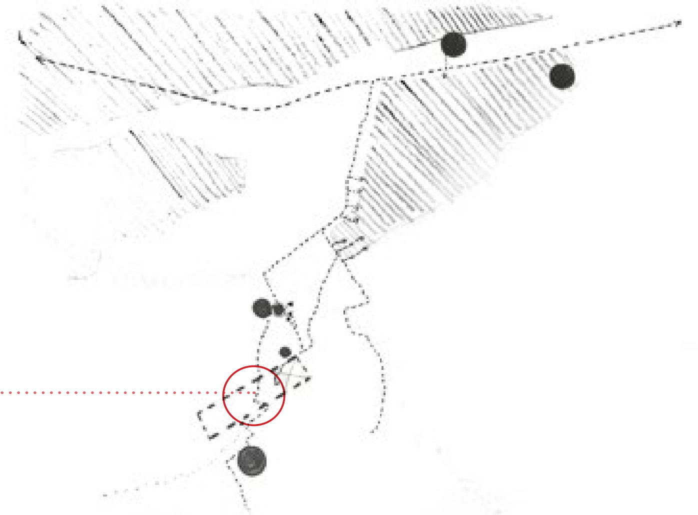


Figure 3.6: Precinct Vehicle and Picker Movement (all maps)
Source: Author (2020)

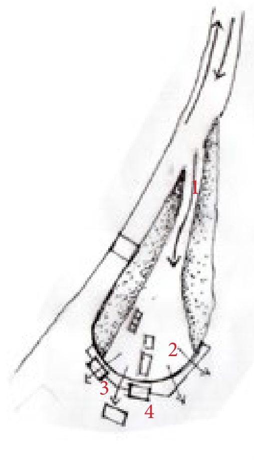
LOCAL SCALE

The local scale mapping process looks to find a particular order at Arlington Landfill: both the dynamics on-site and the natural context. The order comes from an understanding of what components are present on-site and what degree of influence each possesses. It is at this scale that the waste pickers become a crucial informant and ultimately help guide the process of selecting appropriate sites.

Therefore, the information extracted at a local scale can begin to inform an architecture.

On-site Transfer Station

1) ramp
2) off-loading dock
3) waste tips
4) tip collection point



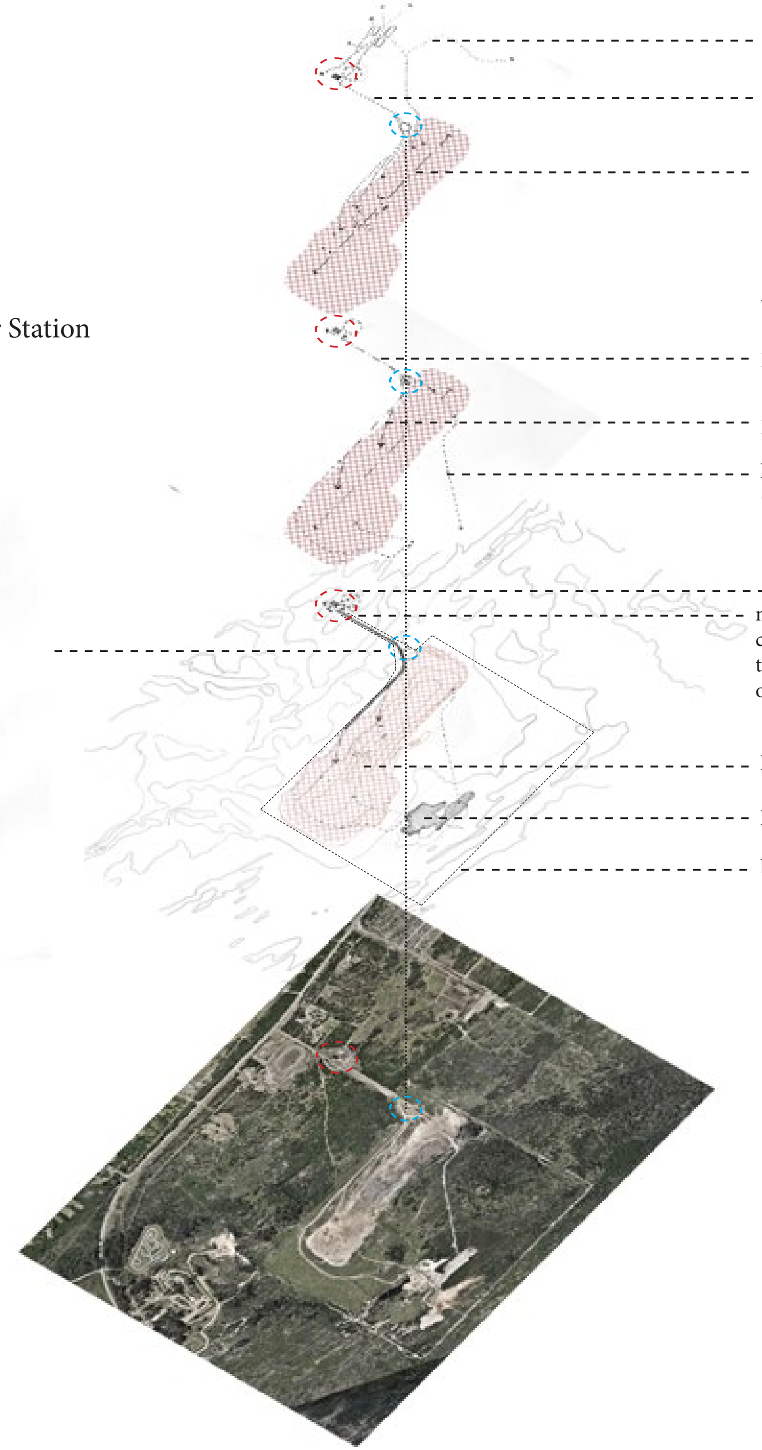
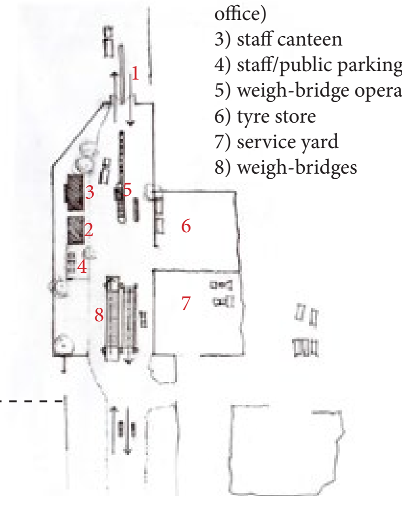


Figure 3.7: Local Scale Analysis (all maps)
Source: Author (2020)

Weigh-bridge and Admin Office Plan

1) entrance/exit
2) admin office (landfill operator office)
3) staff canteen
4) staff/public parking
5) weigh-bridge operating room
6) tyre store
7) service yard
8) weigh-bridges



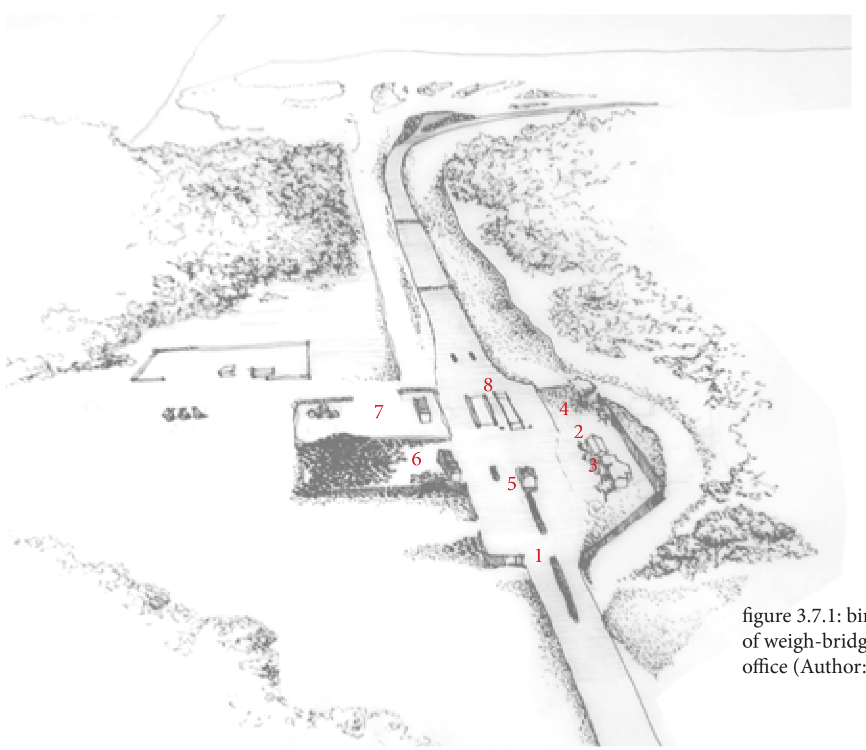
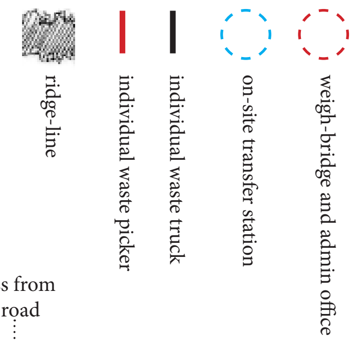
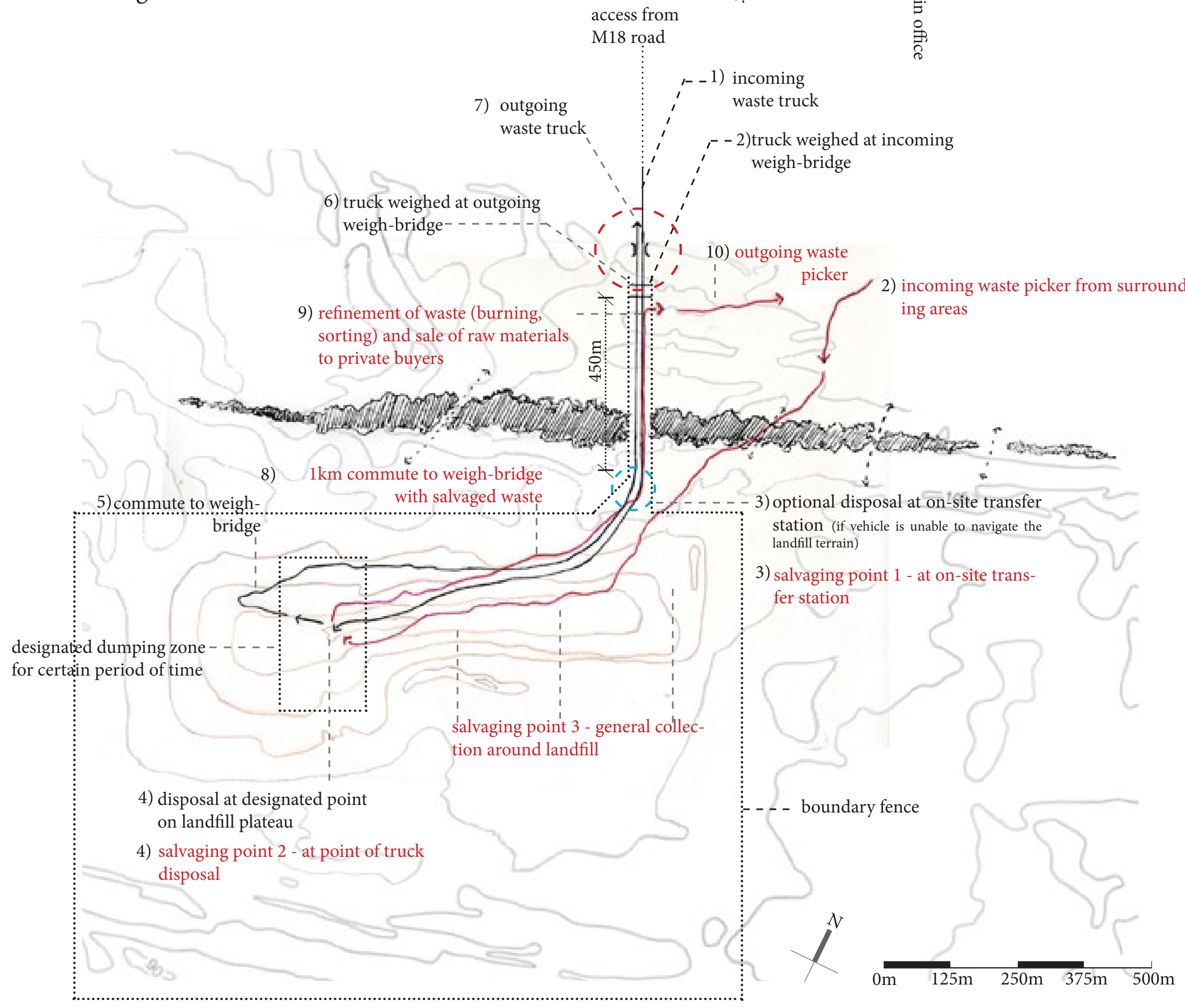


figure 3.7.1: bird's-eye view of weigh-bridge and admin office (Author:2020)

COMPOSITE MAP

To give context to the dynamics on site, the following composite map reveals the movement of a single waste truck as well as a waste picking individual. A sequence of events attempts to convey the particular dynamic present at Arlington Landfill.





After understanding the flow of events of a single waste truck and a single waste picker, the greater system of movement on-site will now be discussed.

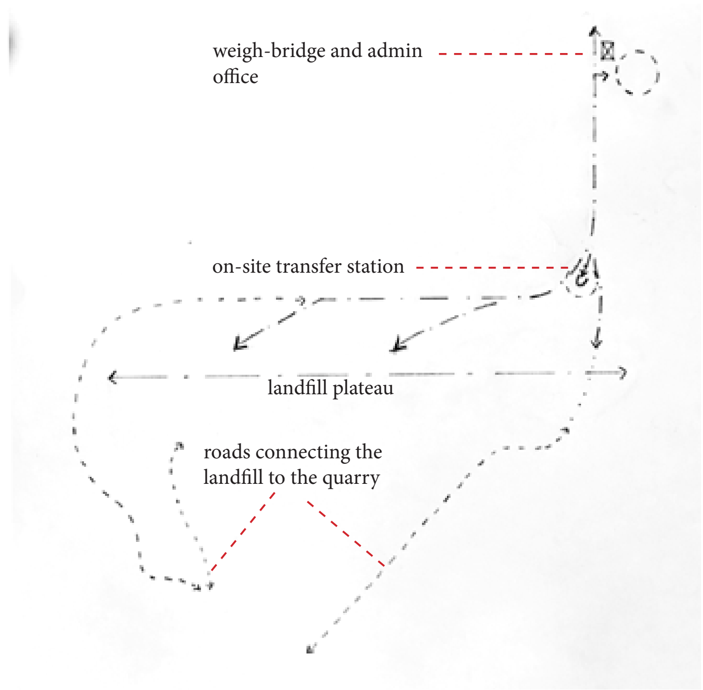
Figure 3.8: Waste Picker on Uitenhage landfill
Source: Preiser, W. (2020)

Vehicular Movement

The on-site vehicular movement is represented in the diagram below. While there are numerous access routes and optional detours that both municipal and private vehicles may take, there is a systematic 'conveyor belt' that has formed around the landfill. As the landfill grows in size, continuous planning, by the landfill manager, must be conducted to allow for constant movement. The routes are organised much like any hierarchical movement system with the presence of transitions from 'main' roads to 'secondary' and possibly 'tertiary' if needed. These routes change rapidly and represent the pace of transformation of the unnatural landscape.

Waste Pickers Movement Paths

The local scale gives relatively good insight into what the human scale movement is in and around the landfill. Whether these paths represent a coming or going, we can begin to see what nodes on site have the strongest influence and what the nature of desire lines are. Furthermore, as the landfill is a constantly transforming object a pattern begins to form through the movement of the pickers. The act of identifying specific waste, sorting and then storing shows as evidence of the system the waste pickers have adopted on the plateau of the landfill. Google earth images can show both subtle and dramatic changes throughout the years in terms of the points where the pickers have chosen to station themselves. This of course is due to a directly affected procedure that occurs on the landfill. The procedure of demarcating certain deposit areas every week, month and/or year. Thus we see a process of adaption being taken on by the waste pickers.



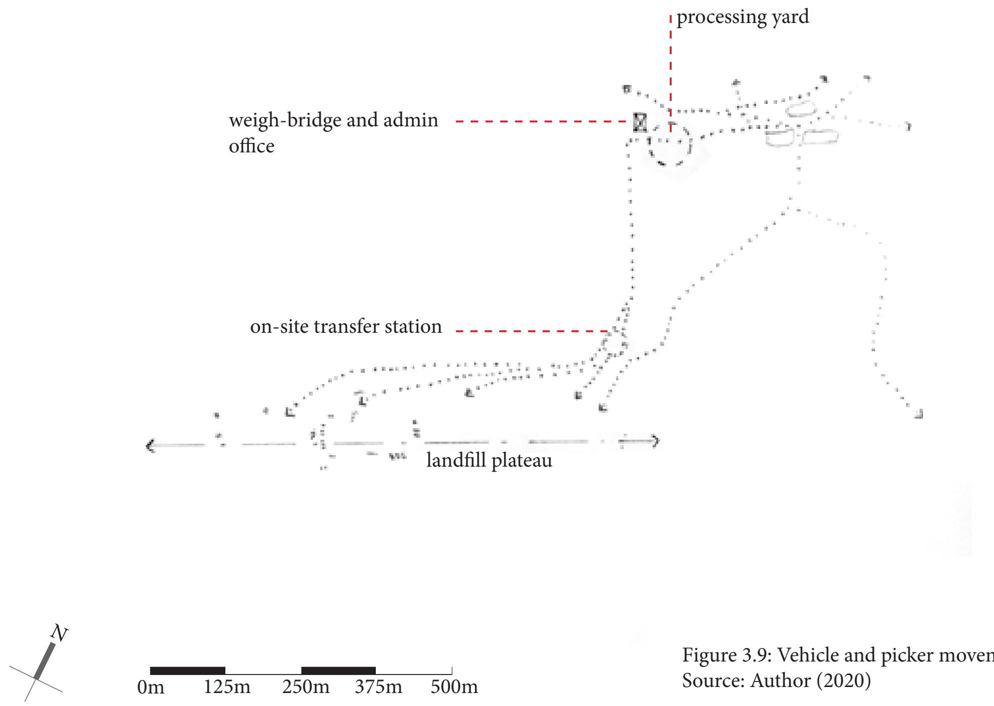
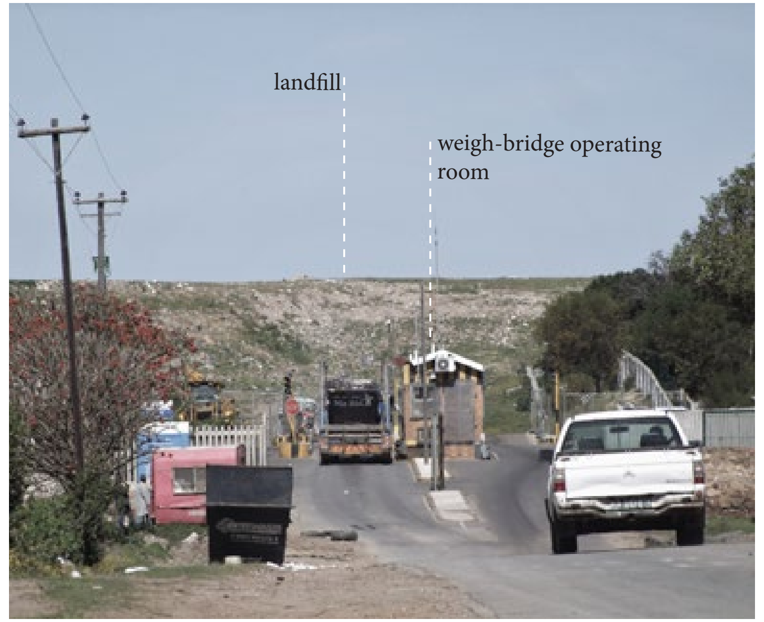


Figure 3.9: Vehicle and picker movement diagrams
Source: Author (2020)

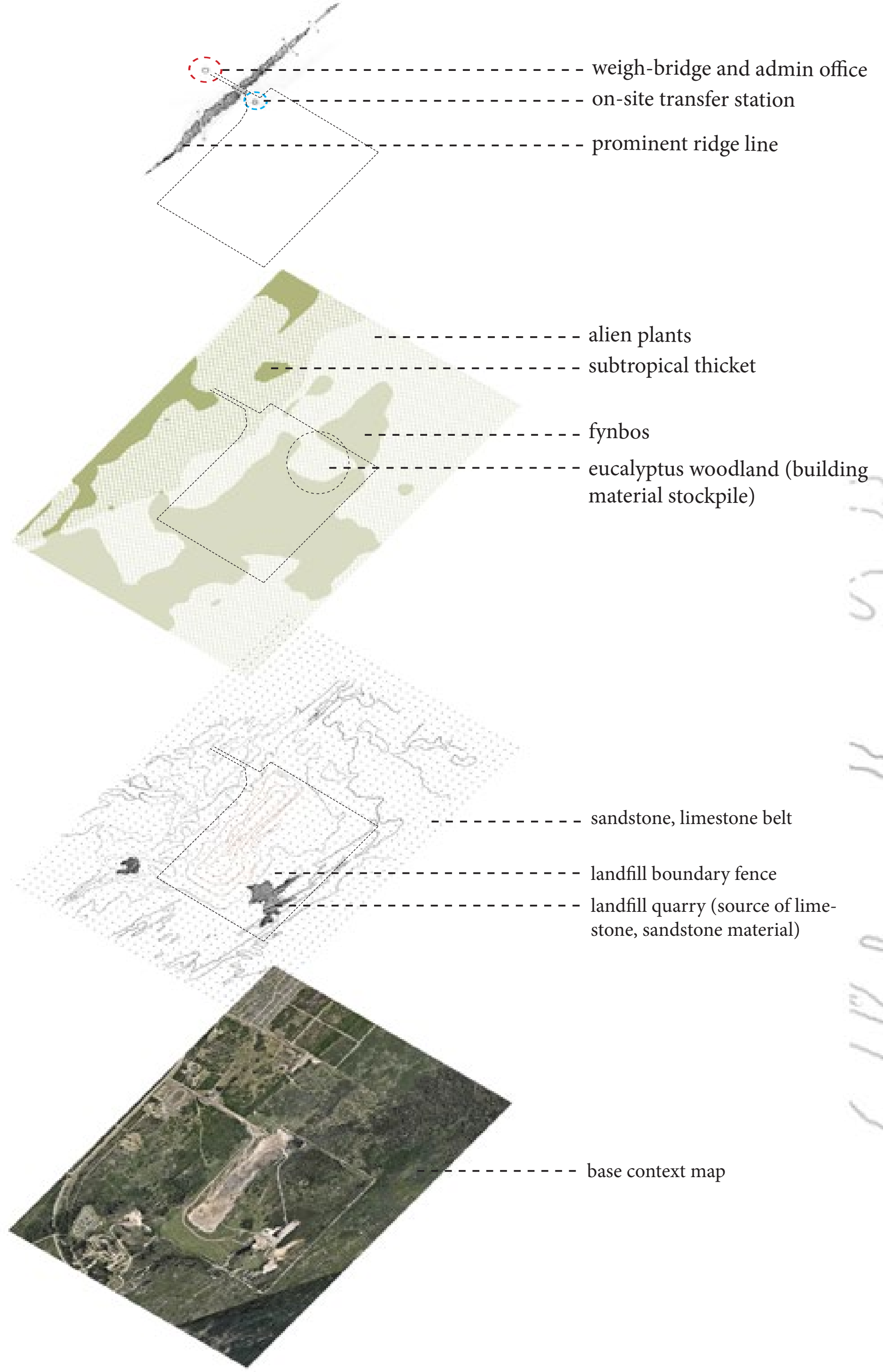
Local Scale



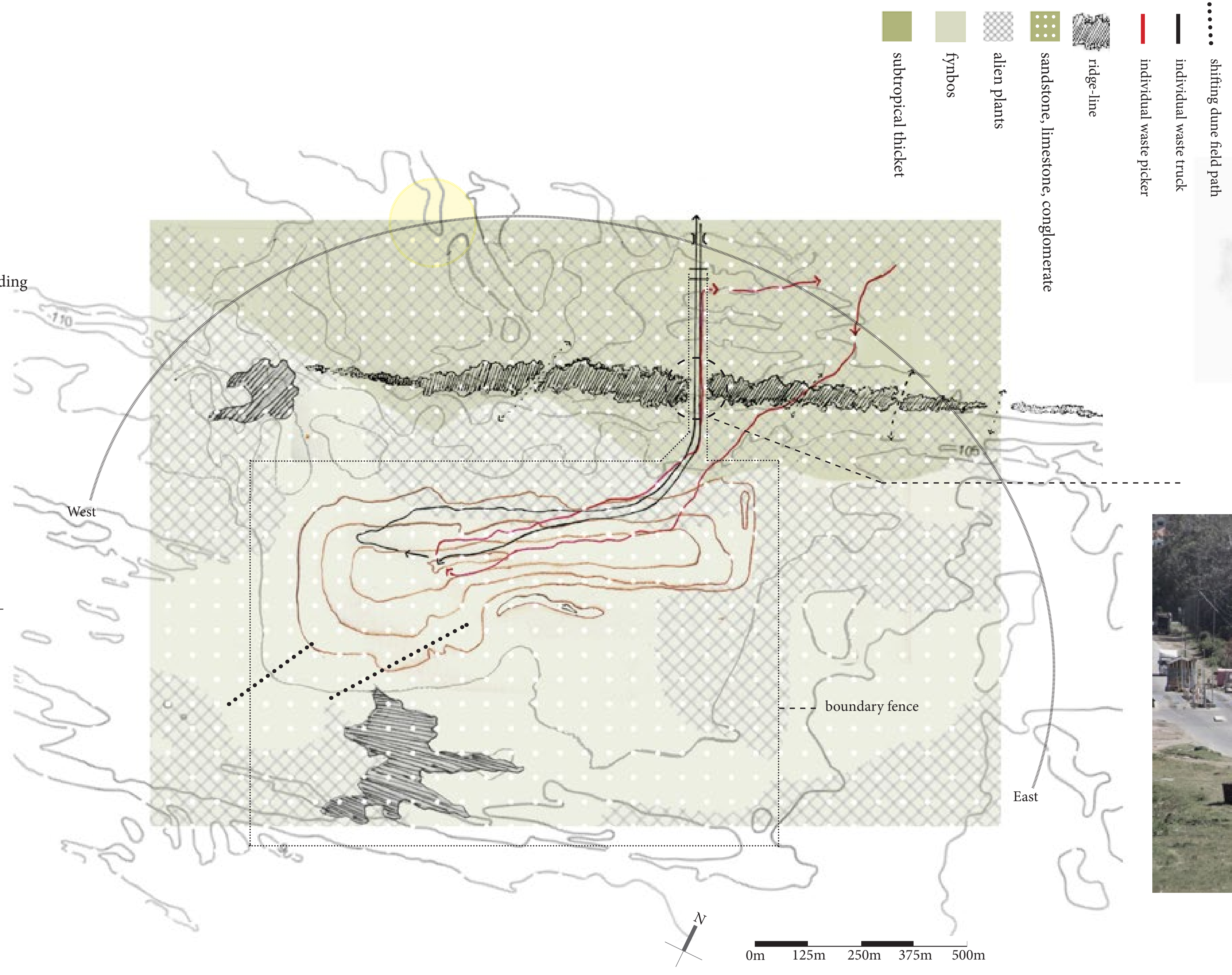
3.10.1

Figure 3.10: Local Scale Analysis Continued (all maps)
Source: Author (2020)

Figure 3.10.1: Entrance to the landfill (landfill in background)
Source: Author (2020)



COMPOSITE MAP



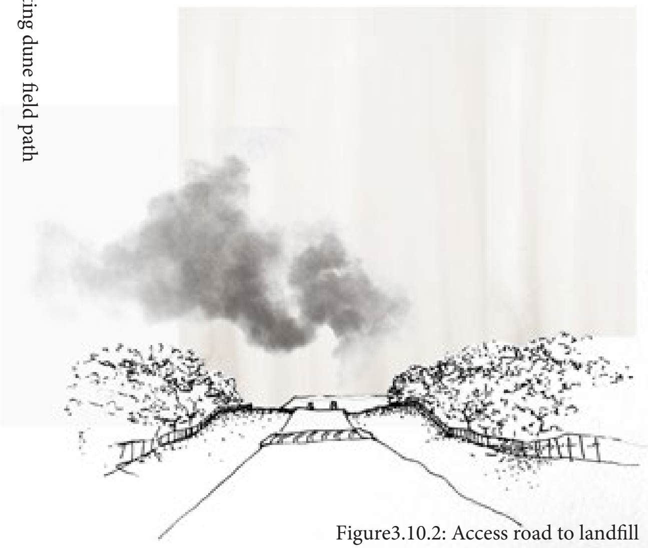


Figure3.10.2: Access road to landfill bisecting the prominent ridge line (Author:2020)

Figure 3.10.3 Pickers walking on access road to landfill bisecting the prominent ridge line (Author:2020)

Figure 3.11: Landfill Morphology
Source: Google Earth (2020)

ARLINGTON LANDFILL MORPHOLOGY

Arlington Landfill has been in operation for over 30 years and has been Port Elizabeth's more dominant refuse disposal site. The landfill accepts all types and quantities of waste except that which is hazardous, resulting in a synthetic landscape that is in constant motion and flux. Landfills, though static, demarcated confined areas of land, require extensive amounts of planning and strategy to keep the on-site waste under control, causing them to become dynamic moving entities. Arlington Landfill is no different.

The images shown (above) give a brief idea of how the landfill changes as society and trends change. Landfills reflect our position in time and become physical records of society within our urban and rural settlements, revealing our technological advancements, economic growths and progressive consuming nature. Arlington Landfill reflects this notion of a physical record for Port Elizabeth as it continues to evolve as a dynamic time-capturing landscape.

Figure 3.12: Typical Landfill Construction
Source: Author (2020)

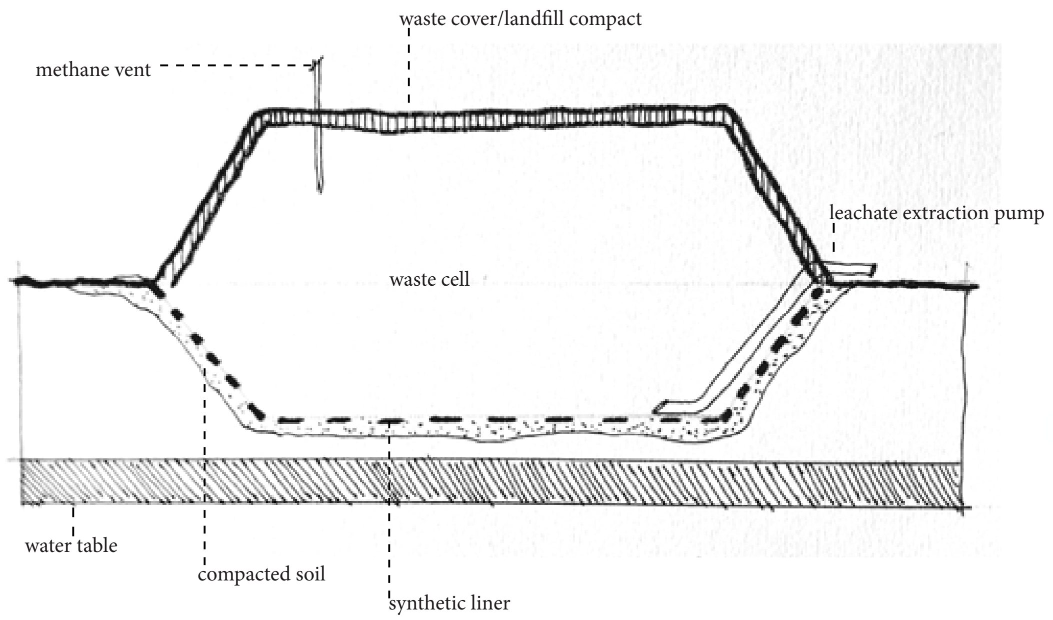
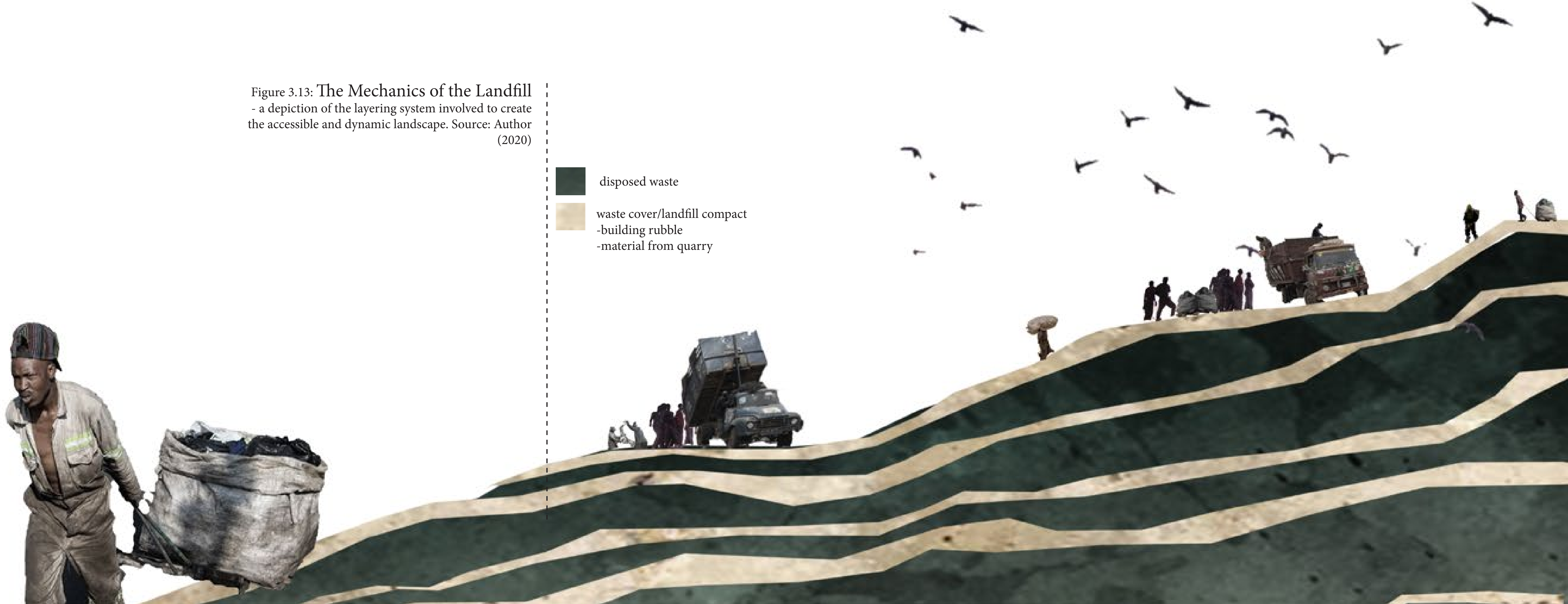


Figure 3.13: The Mechanics of the Landfill
- a depiction of the layering system involved to create the accessible and dynamic landscape. Source: Author (2020)



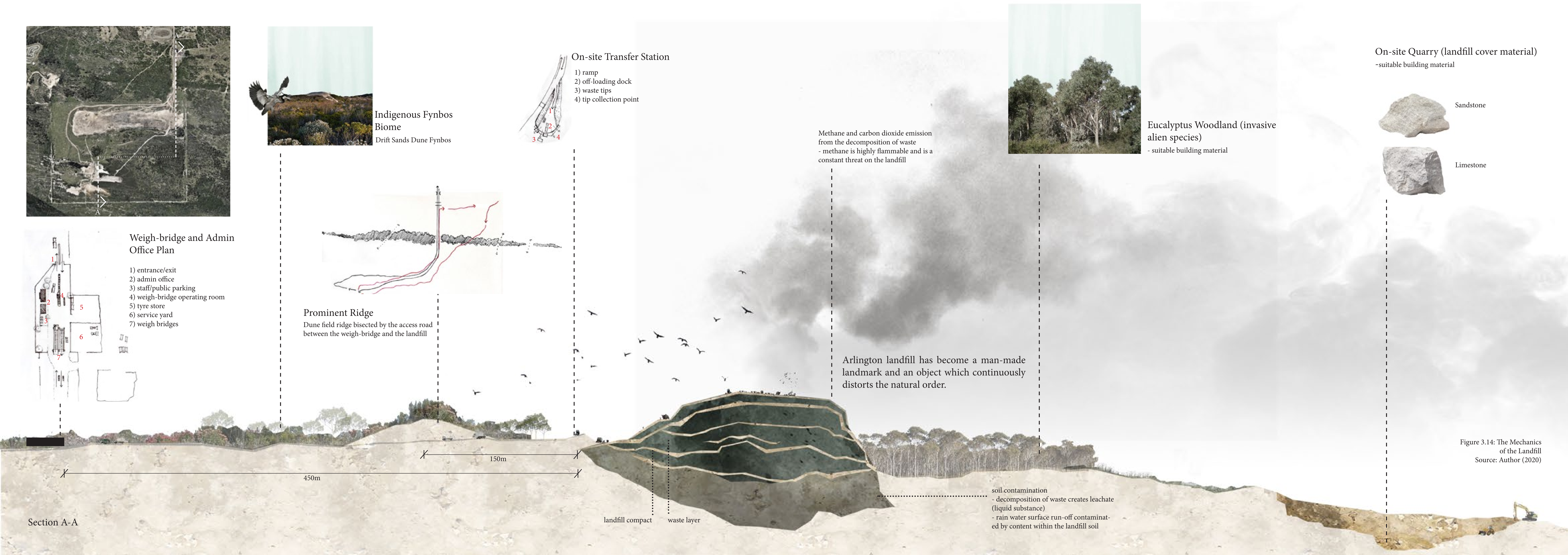
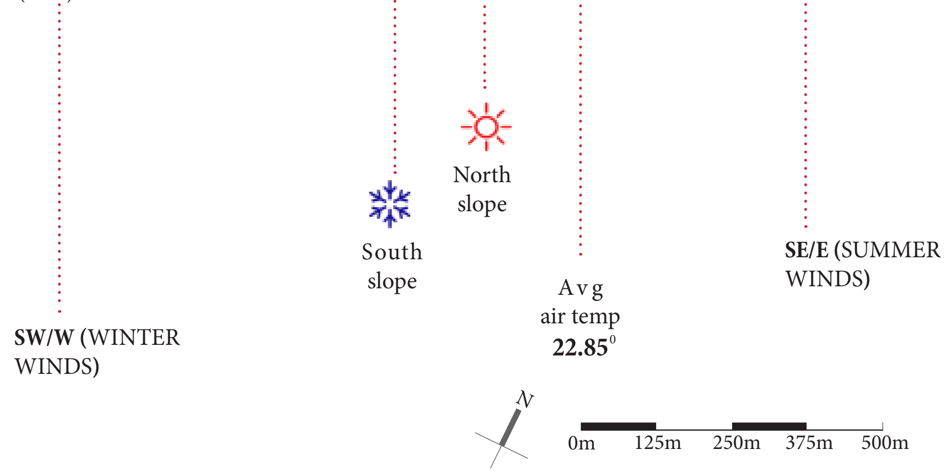


Figure 3.14: The Mechanics of the Landfill
Source: Author (2020)

CLIMATIC CONDITIONS

Figure 3.15: Climatic Conditions
Source: Author (2020)



Port Elizabeth lies in the **'temperate oceanic'** climatic region that does not experience a definite dry season. This therefore means that climatic variations appear smaller in comparison to areas that experience continental climates. Climatic patterns vary and uncharacteristic changes may occur in the far or near future. The following data will give reason to why the area experiences the aforementioned climatic conditions. The previous scales created a contextualised image of the climatic conditions in order to show the effects the climate has on the site itself. Rainfall, temperature, orientation and wind play a major role in any situation, but it appears to play an even more profound role in this particular case. The nature of the site and its locality make the 'man-made' landmark very vulnerable to the elements of this climatic region, and subsequently so too are the people who work on the landfill. These conditions are given definition by the movement and conditions of the ocean. The site finds itself not only in close proximity to the ocean, but also finds itself on the windward side of the metro when the winter cold front systems begin to arrive.

The climatic conditions of the landfill will inform part of the selection of the sites, and will ultimately effect the design strategy.

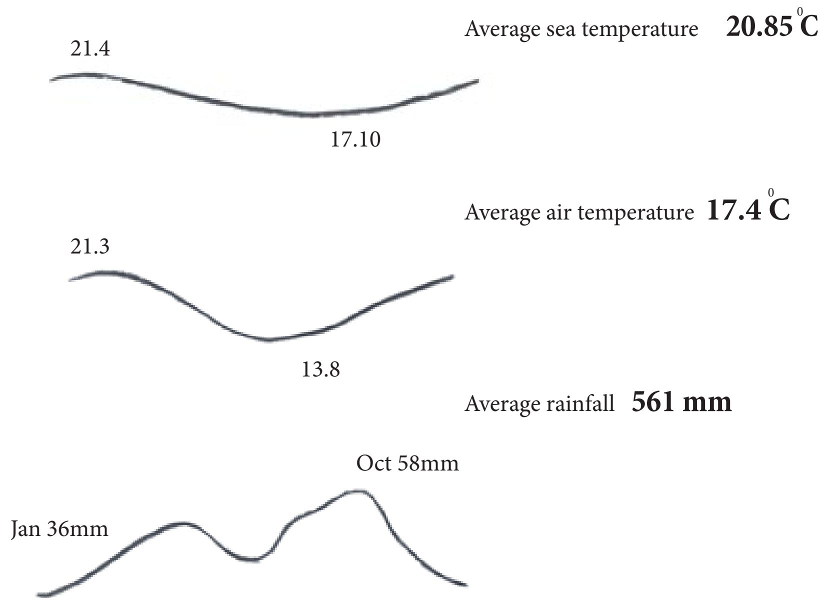


Figure 3.16.1 Fynbos Dunefield below the Landfill
Source: Author (2020)

Figure 3.16.2 Landfill Proximity to the Ocean
Source: Author (2020)

NATURAL VEGETATION STRUCTURE

0m 125m 250m 375m 500m

Figure 3.16: Existing Vegetation Conditions
Source: Author (2020)

Figure 3.16.3 Eucalyptus -Invasive Plant
Source: Author (2020)

Figure 3.16.4 Port Jackson -Invasive Plant
Source: Author (2020)

ADDRESSING A CORE SET OF ISSUES

Identifying sites that respond to the issues faced by the waste pickers and municipal workers

The project site has been selected based on the mapping process conducted over the various scales. The site selection reflects the understanding and acknowledgment of a set of constraints and informants and looks to become involved in a process that is not merely a reactive response, but one that reflects an embodiment of those very constraints and informants. The diagram shown provides a consolidated reasoning for the selected sites.

The process of mapping and understanding the dynamics of the waste pickers on site has led to the decision of selecting two components for the project going forward. These two components are in the form of the 1) Waste Pickers Recycling Facility and the 2) Waste Pickers Toolkit Station.

1) Selected Site for the Pickers' Waste Recycling Facility

-A facility that will enable the waste pickers to recycle collected waste

2) Selected Site for the Pickers' 'Toolkit' Stations

-A small scale facility that will provide specific services for the waste pickers whilst collecting on the landfill

COMPOSITE OF CONSTRAINTS AND INFORMANTS

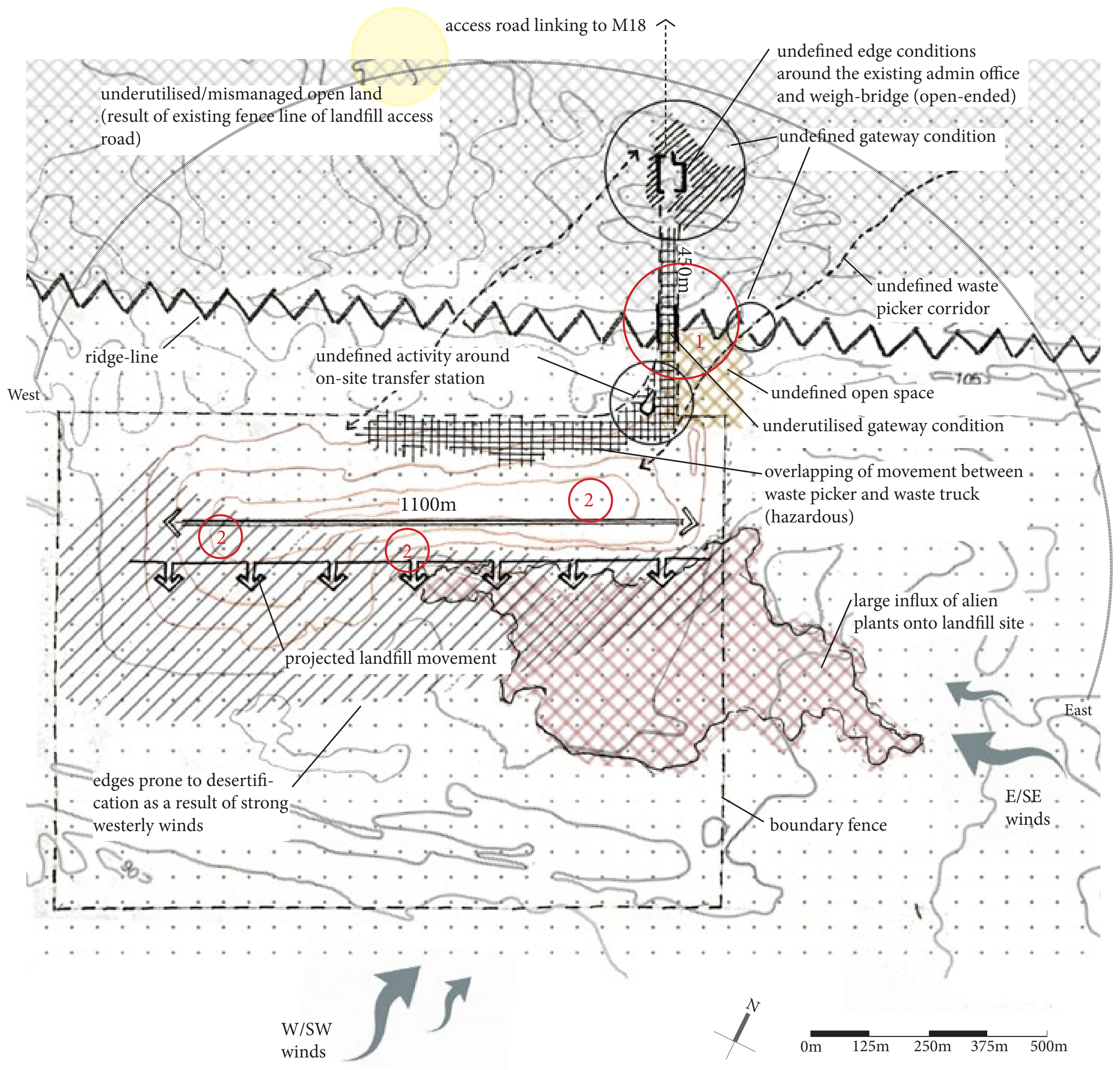


Figure 3.17: Composite of Constraints and Informants
Source: Author (2020)

Figure 3.18: Trash Land
Source: Ferreira, J (2011)

CHAPTER **4** - PRINCIPLE EXPLORATIONS

01

The following aims to further the discussion of the previous chapters. The discussion pulls out the principle of each chapter and defines its role for the forthcoming design process.

An anti-object concerns itself with a process of understanding the subject, as well as a particular focus on a sensitive materialisation of a mediating environment. This then outlines the intended explorations within the chapter. The subject, being the waste picker, needs to be fully understood and acknowledged through their dynamics and ergonomics.

Then, an exploration of an environment capable of mediating through the use of recycled materials, found on-site, as a building method. As a result, an anti-object will emerge at Arlington landfill.

Figure 4.1: Ergonomics of a waste picker
Source: Author (2020)

EXPLORING THE DYNAMICS AND ERGONOMICS OF THE WASTE PICKER

After understanding the waste pickers broad movement patterns over the site, an exploration can now look into the particular dynamic movements and actions that a waste pickers performs, ultimately informing the nature of the space required within the project.

Waste pickers perform specific tasks that require a certain level of physicality and flexibility. These movements occur when collecting, transporting and sorting. The sketches shown (right) give an idea of these particular movements.

There is a unique relationship between the waste picker and the bag/storage component which needs a particular dimension of space. This is the productive space a picker uses when collecting from a waste truck, collecting at a waste heap and when taking time to sort and separate a mixed collection. This is particularly important to understand as the space intended for a waste picker must include his or her one or many bags alongside as well as the movement between those bags.

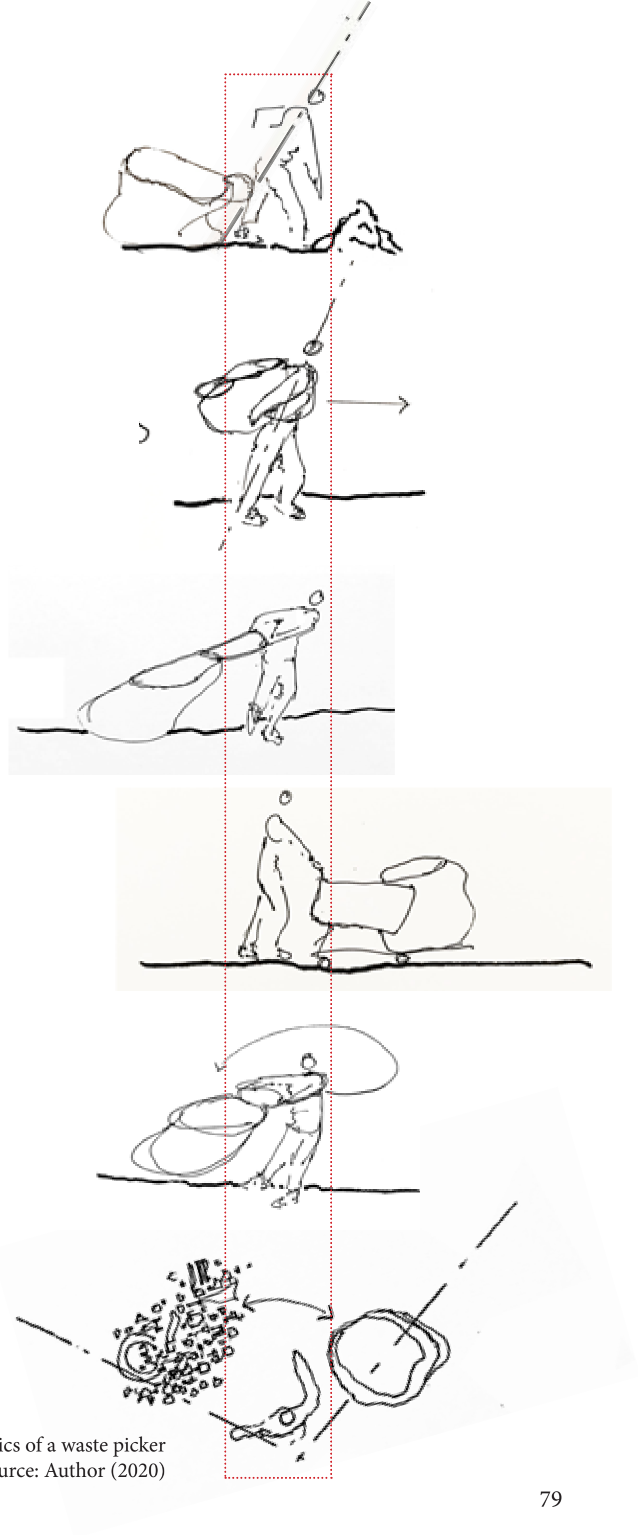


Figure 4.2: Diagramatic ergonomics of a waste picker
Source: Author (2020)

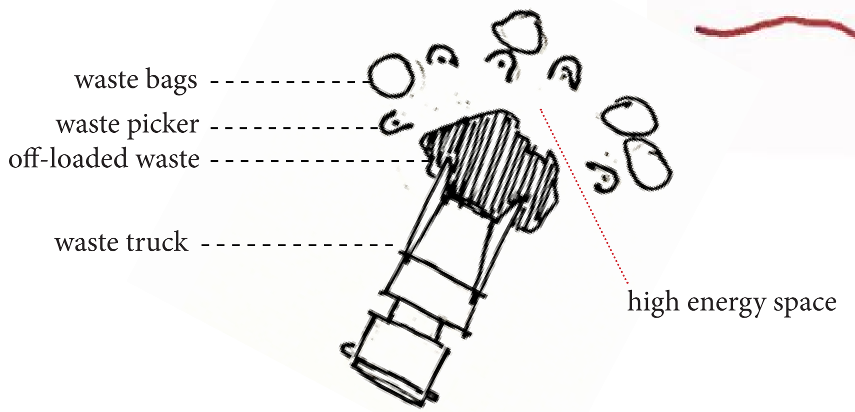
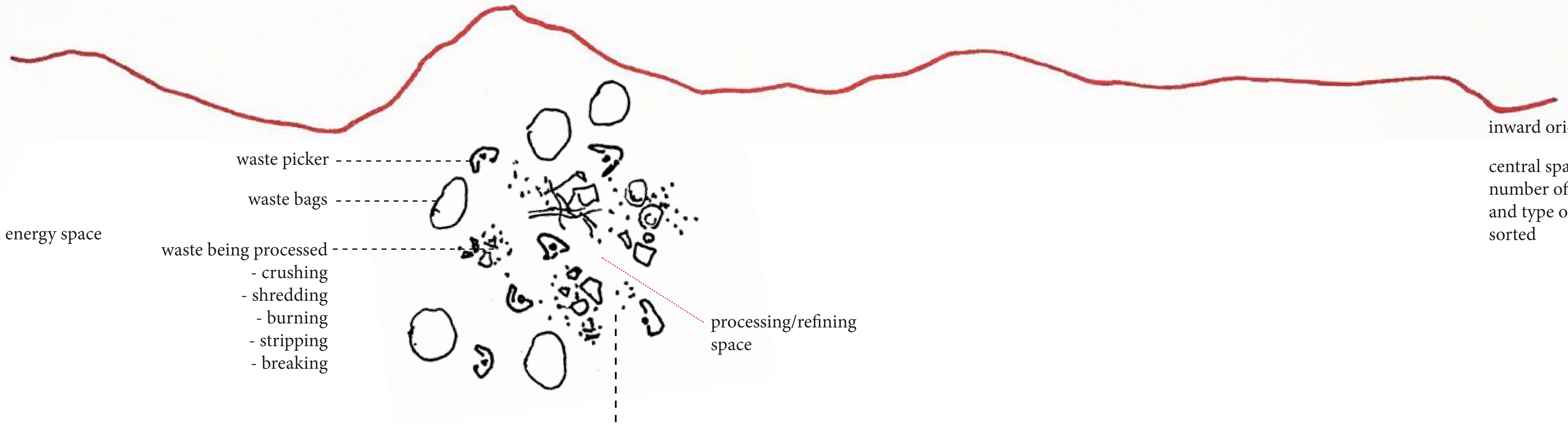
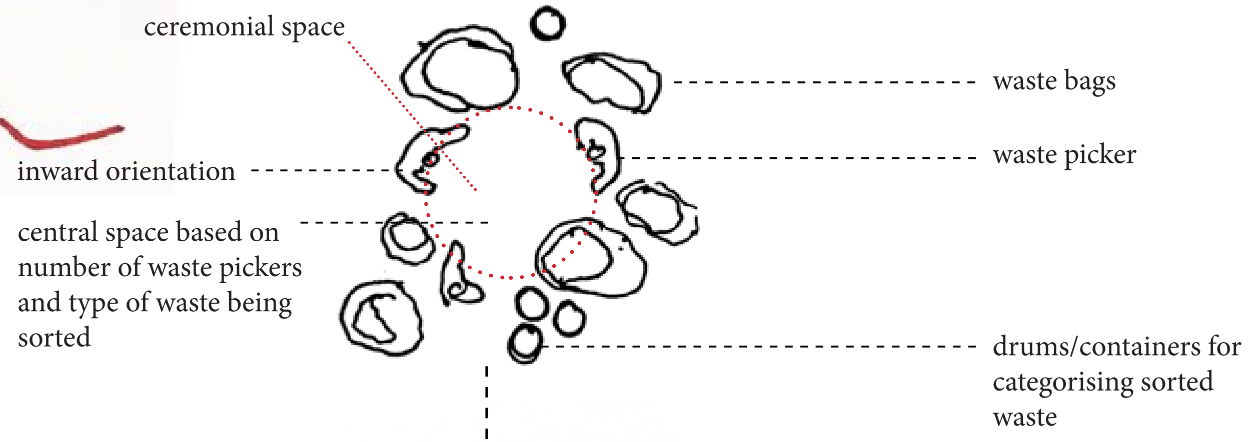


Figure 4.3: Diagrammatic group dynamics
Source: Author (2020)





EXPLORING THE NATURE OF A GROUP DYNAMIC

There are certain identifiable moments on a landfill that make up the recycling process as a whole. These moments refer to the particular acts around an off-lading waste truck, the processing or refinement of collected waste and the act of calmly sorting and separating collected waste into their respective categories.

Therefore, the following explores the nature of the group dynamic, at prominent points of the recycling process, to better understand the energy and subtleties within those spaces, informing a particular design approach.

Figure 4.4: Trash Land
Source: Ferreira, J (2011)

The image shown (right) is a particularly important dynamic to understand. This ceremonial space, which displays a degree of intimacy amongst a vast open landfill, changes function throughout the day. The space can become a kitchen, a conversation crescent and often the point where waste is categorised and readied for market.

This particular space can give rise to an enriching environment within a 'building' as it creates ambiguity and freedom to overlap with different spaces. This is a trait of an anti-object.

Original site sketch at Arlington Landfill showing the end of day ritual of organising and sorting and readying for market.

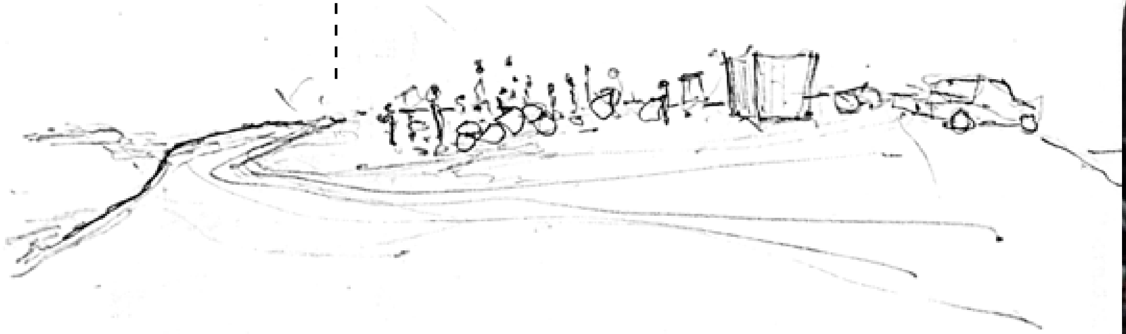


Figure 4.5: Group dynamics
Source: Spatari, M. (no date)

EXPLORING THE POSSIBILITIES OF RECYCLED WASTE AS BUILDING MATERIAL

Following on from the waste picker as a major design informant from a spatial point of view, attention can now be placed on the equally important physical aspect.

The physical aspect can be attributed to the nature or concern of expression through the inherent properties of certain materials. This is then heightened by the way materials are put together, creating the tactility and tectonic within that specific environment.

Therefore, the following will explore the properties and capabilities of specific recycled materials to further understand the possibilities of the project at Arlington Landfill.

- structural eco brick (plastic bottle compact filled with various recycled materials)- partition walls
- facade screens

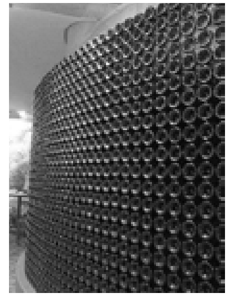
Plastic

- polyethylene terephthalate (PETE)
- high density polyethylene (HDPI
- polyvinyl chloride (PVC)
- low-density polyethylene (LDPI
- polypropylene (PP)
- polystyrene (PS)
- acrylic, polycarbonate, polyactic fibres, fibreglass (OTHER

- lightweight roof tiles
- shingles
- shredded tin as reinforcing fibre in concrete

Metal

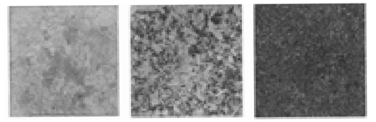
-aluminium cans
- tin-coated steel (tinplate) cans
- electrolytic chromium coated steel (ECCS) cans
- corrugated sheeting
- expanded metal



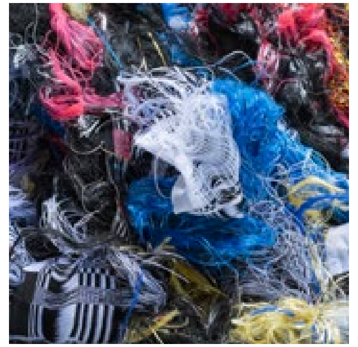
- glass walls (non-load-bearing)
- gabion basket fill
- flooring

Glass

- clear bottles
- green tint bottles
- amber tint bottles
- off-cuts
- windows
- dish-ware



- wall panels
- counter surfaces
- insulation
- pollution absorber
- rain/wind screen



Textiles

- clothes
- carpets
- curtains
- table cloths
- towels
- upholstery

- wall panels
- acoustic boards
- insulation

Cardboard/Paper

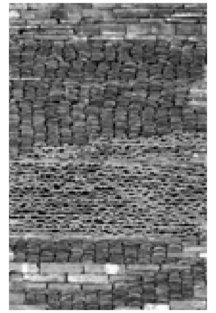
- corrugated fiberboard
- office paper
- magazines
- newspaper

- wall cladding
- flooring
- structural elements
- bulk heads

Wood/Composite Panels

untreated (clean)
- pallets
- dimensioned timber
- lumber
- raw off-cuts

treated
- flooring
- fibre boards
- laminated timber
- plywood



- hardcore fill
- structural foundation aggregate
- structural wall
- gabion basket fill
- retaining wall

Building Rubble/Construction Waste

- concrete
- bricks
- aggregate
- tiles
- glass
- insulation

- retaining wall
- planters
- seating
- storage
- wall panel

Rubber

- heavy vehicle tyres (large)
- vehicle tyres
- motorcycle tyres
- rubber mats

Figure 4.6: Material Properties and Capabilities
Source: Author (2020)

Figure 4.7: Exterior View
Source: Facebook (2018)

Figure 4.8: Interior view showing light
shining through glass bottle wall
Source: Facebook (2018)

SILINDOKUHLE COMMUNITY HALL
by COLLECTIF SAGA
- Port Elizabeth

The inclusion of this project helps create a sense of how far simple materials can be pushed to create depth and meaning through a building.

This building makes use of standard building materials as well as reclaimed and recycled material.

Therefore, the following will covey the buildings spatial and physical attributes through the high level of detailing and understanding of these particular simple materials.

Figure 4.9: Exterior View
Source: Facebook (2018)

Glass Bottle Wall
- Detail

Standard Timber Member Wall
- Detail

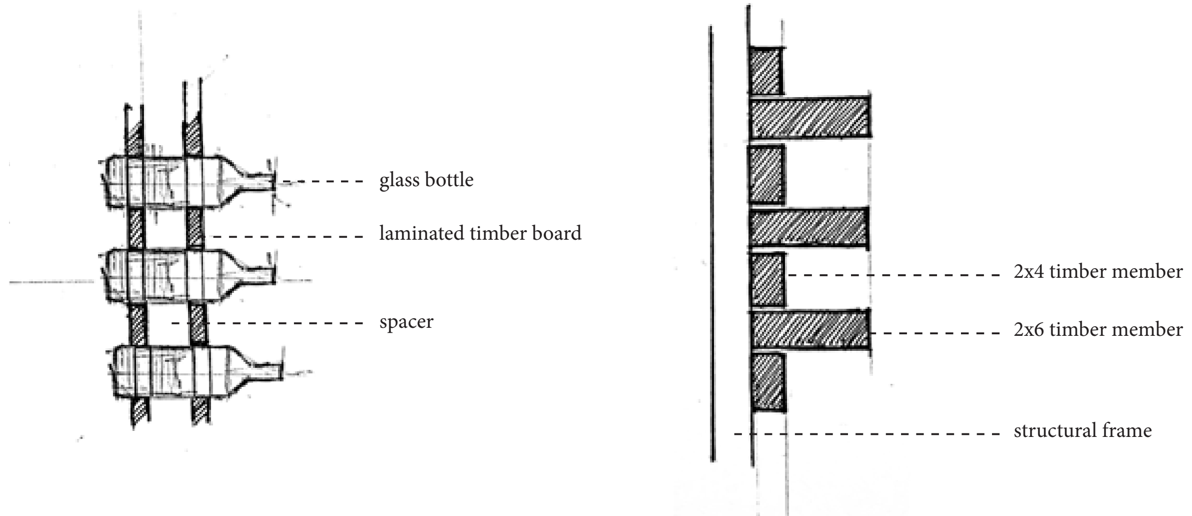


Figure 4.10: Recycled Material Joinery and Details
Source: Author (2020)

EXPRESSION THROUGH SIMPLE MATERIAL DETAILING

The following images give an idea of the level of thought out detailing that ultimately gives the building a great sense of tactility, uniquely connecting the subject to the environment. These details go further than conventional functionality, as they convey a strong understanding of the user (subject) and the type of space required.

Furthermore, the simple materials of glass bottles, wooden pallets and skateboard trucks are pushed further than a probable default use, therefore revealing the result of their effortless capabilities.

The detail sketches (below) show an understanding of the inherent characteristics of the simple materials and their relationships to one another, allowing for those characteristics to be intensified and highlighted to create extraordinary results.

Figure 4.11: Recycled Material Joinery and Details
Source: Urban Next (2017)

Therefore, the chapters of part one have created a structured lens through which part two can be developed. The overarching principle of 'Anti-Object' and an in depth understanding of both the site and the nature of the building type, can now materialise through the design process, seeking to embody the subtitles and characteristics of the waste picker.

Figure 4.12: Agbogbloshie
Source: Kevin McElvaney (2013)

CHAPTER **5** - DESIGN PHASE
-5.1 Proposed Urban Intervention
-5.2 Developing the Brief
-5.3 Design Development

CHAPTER **6** - FINAL DESIGN AND TECHNICAL STRATEGY

PART 02- *DESIGN*

Figure iii: Trash Land
Source: Ferreira, J (2011)

CHAPTER **5.1**
02

The following sub-heading 5.1 deals with the construction of an urban framework. The construction of an appropriate urban framework is a result of a dialogue between the unfolding ideas of a framework and the treatise building design process itself, both influence one another to create the final product.

Highlighted and outlined in the site chapter in part one, a series of concerns relating to the general system of Port Elizabeth as well as the specifics of the existing waste systems, revealed a particular structure that allows for the current waste system to function and exist. However, the system, through the lens of the treatise, is fragmented and lacks cohesion.

Therefore, the axo shown (right) firstly identifies the existing fabric and existing networks, then follows on by extracting the major points of interest and structuring elements that need to be addressed within the proposed framework.

The highlighted elements are marked as crucial informants as they will ultimately have an impact on the building design itself.

Furthermore, the framework is further influenced by the current state of the natural systems in and around Arlington landfill. The placement of the landfill on the existing urban growth boundary means that it is apart of one of Port Elizabeth's natural frontiers. The landfill sits on the line between the natural and built context and as a result of its toxic nature, it posses an additional threat to the natural systems found within that frontier. Therefore, the framework looks to include a strategy to confront these pressing issues.

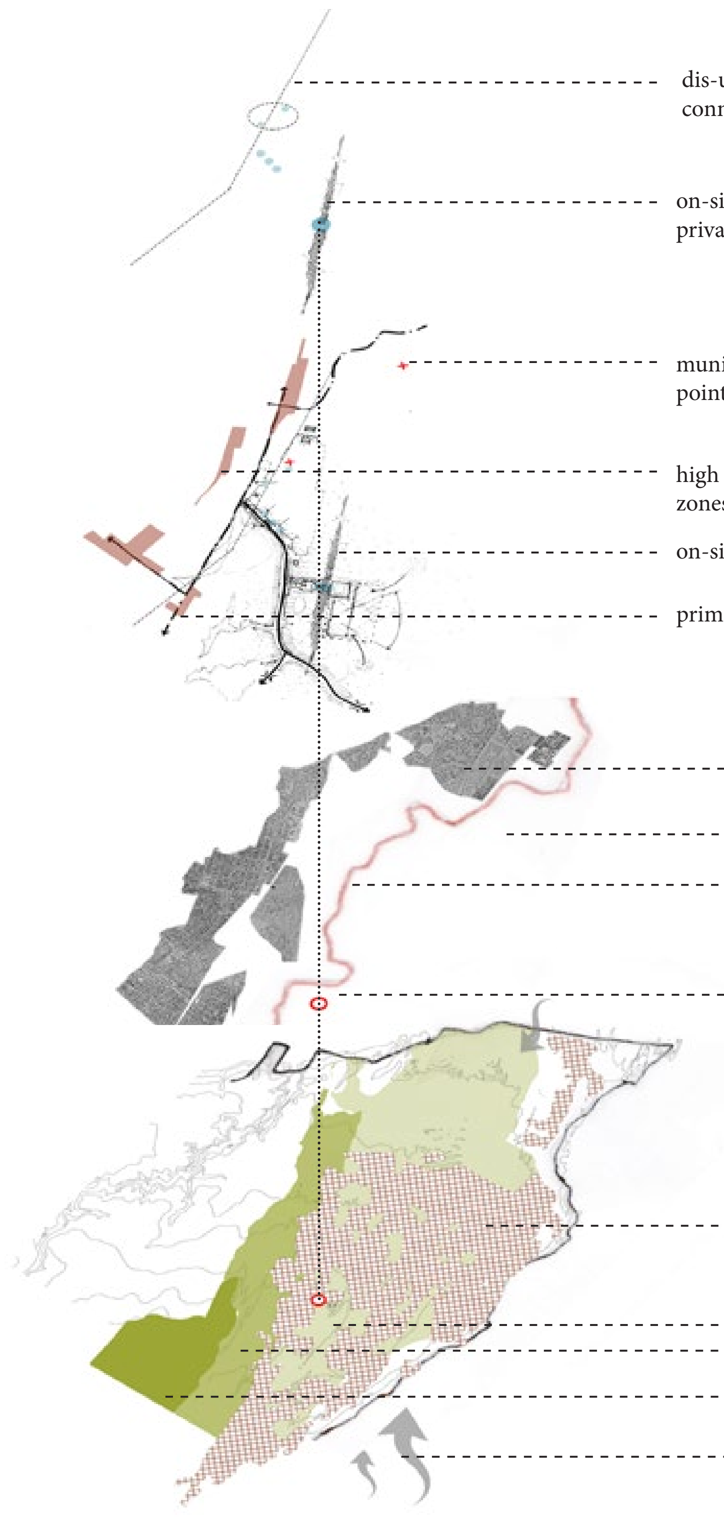


Figure 5.1: Structures informing the framework
Source: Author (2020)

URBAN FRAMEWORK AXO

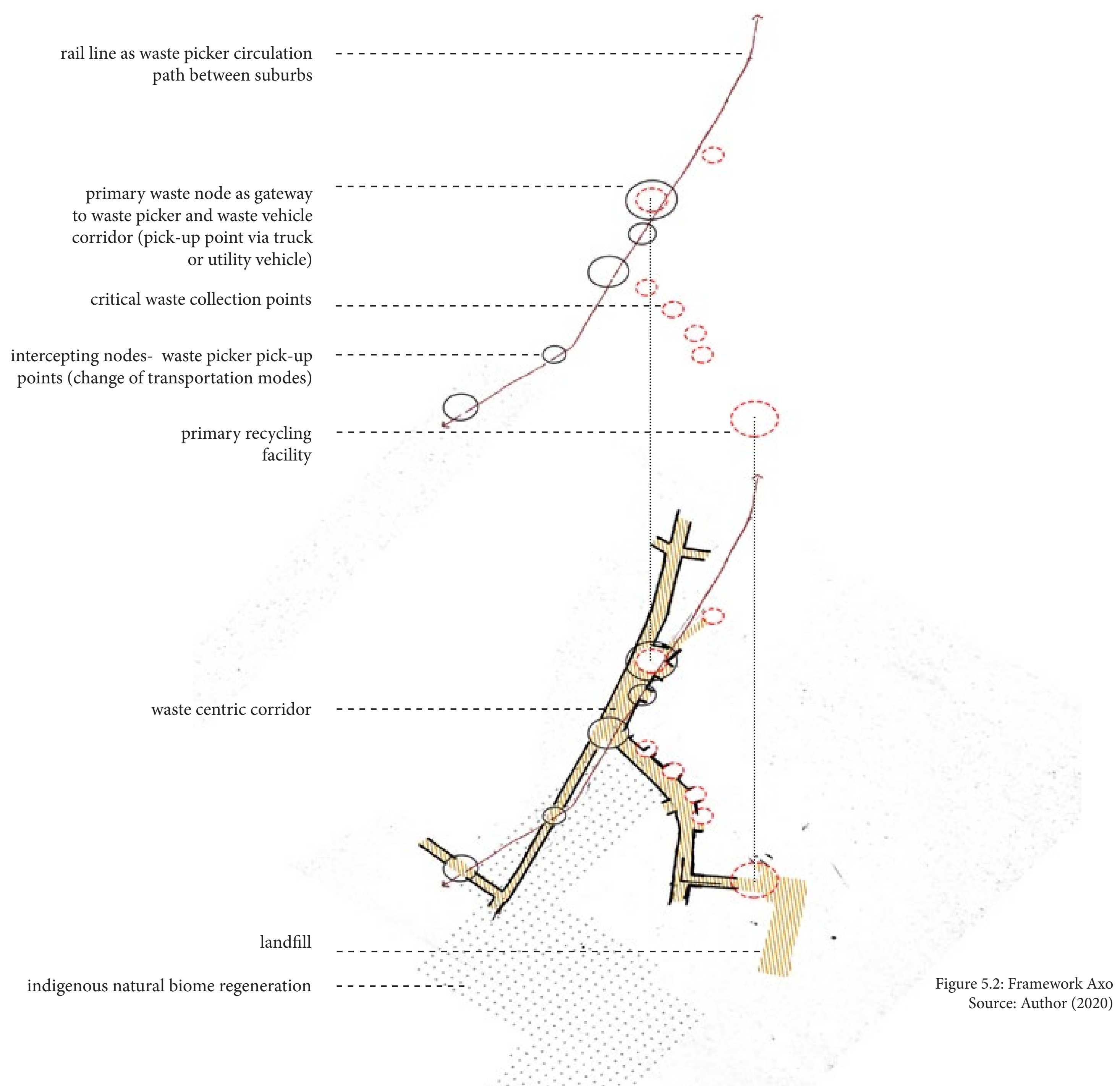


Figure 5.2: Framework Axo
Source: Author (2020)

COMPOSITE URBAN FRAMEWORK

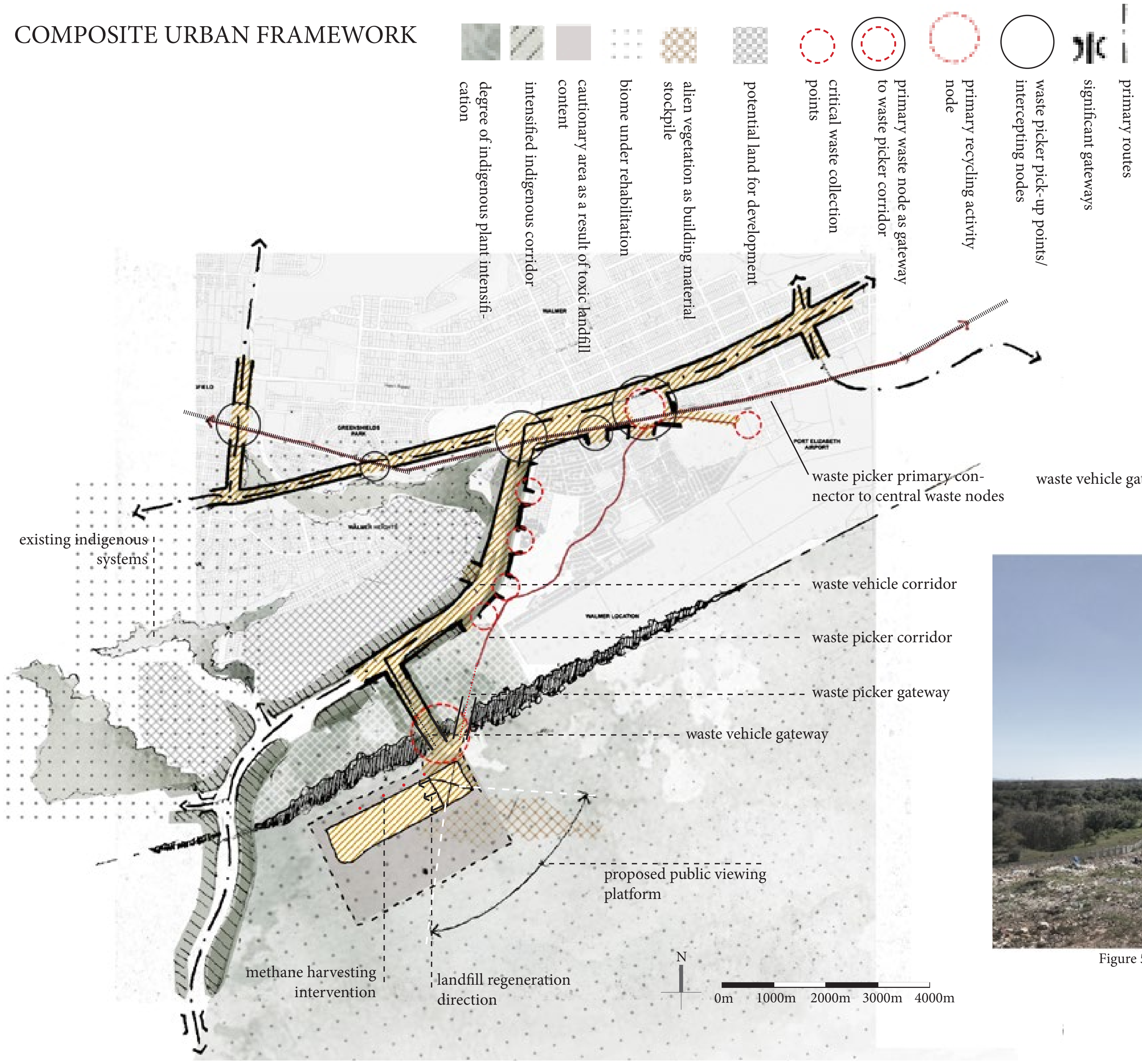


Figure 5.3: Composite Urban Framework
Source: Author (2020)

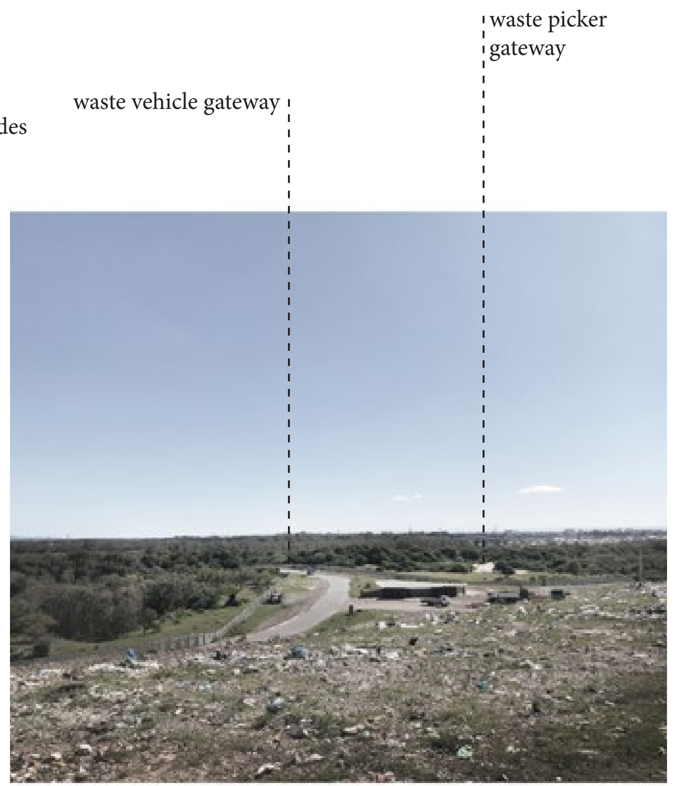
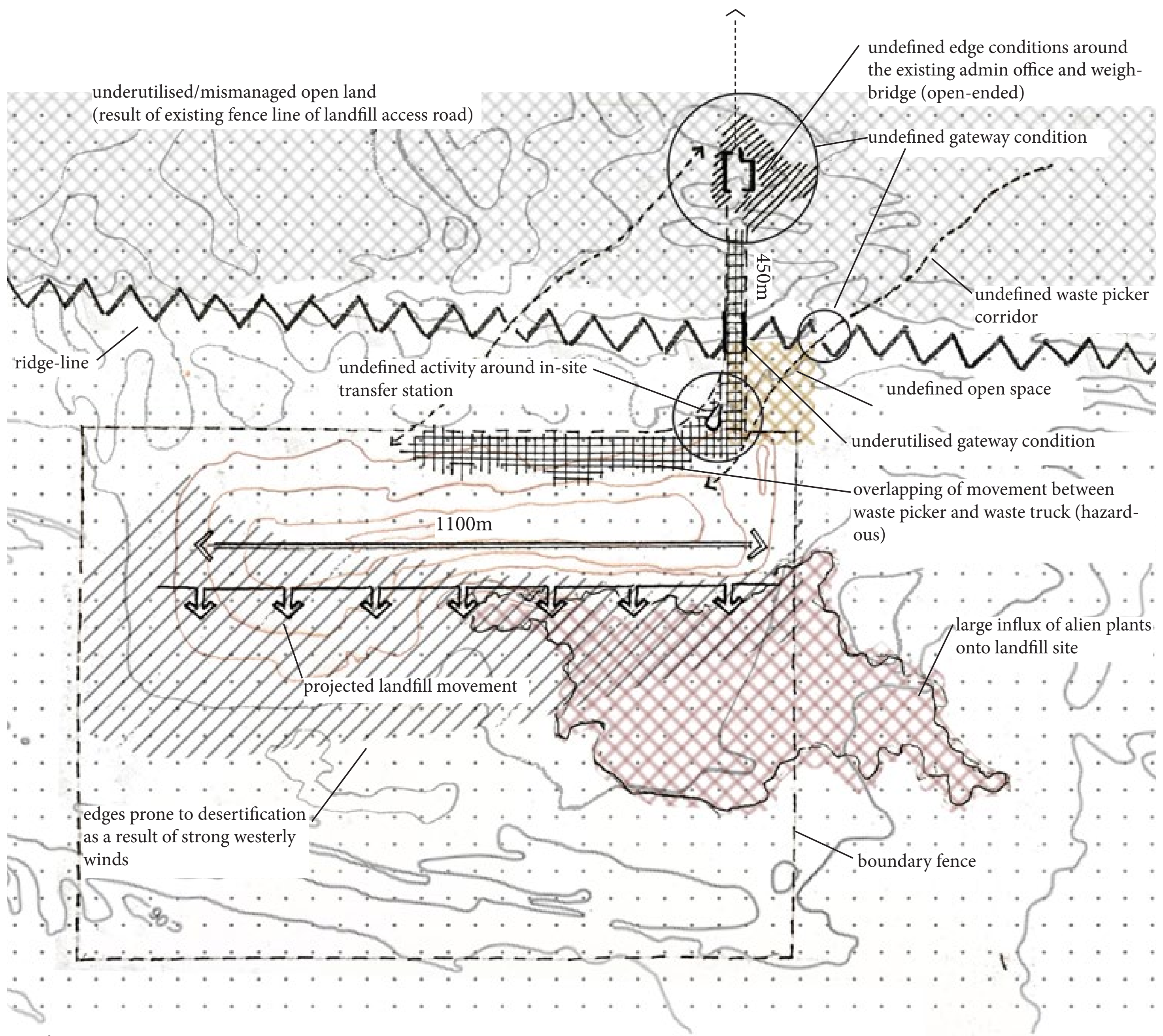


Figure 5.2.1: view of the bisecting access routes to the landfill by vehicles and pickers. Source: Author (2020)



N

0m 125m 250m 375m 500m

contours spaced at 5m intervals

Figure 5.3.1: Dominant Spatial Issues
Source: Author (2020)

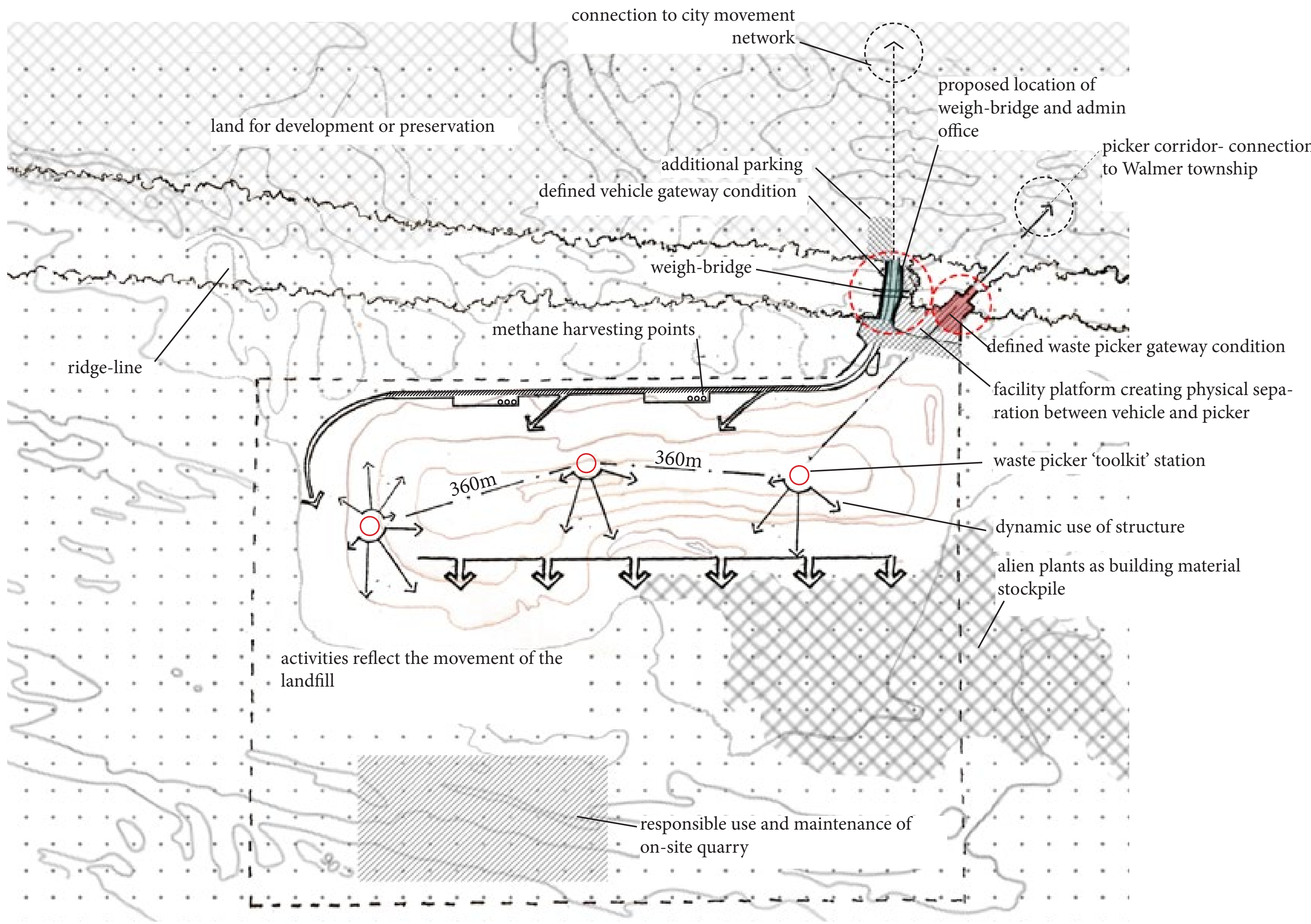


Figure 5.3.2: Composite Local Scale Urban Framework
Source: Author (2020)

N

0m 125m 250m 375m 500m

contours spaced at 5m intervals

5.2 DEVELOPING THE BRIEF

The following sub-heading 5.2 defines a brief, which includes the programme of the building as well as a detailed accommodation schedule.

The selected programmme reveals an understanding of the requirements described throughout part one, reflecting the movement away from overly rationalised spaces that, are susceptible to objectification, rather drawing nearer to principles of an anti-object.

Furthermore, Arlington Landfill has an existing set of operations that are performed by the municipality, private companies and of course the waste pickers. Therefore, the programme inherits a responsibility to adjust to the existing systems, yet maintaining a stance to better those very systems.

The brief combines the existing weigh-bridge activities as well as the waste pickers' recycling facility, therefore outlining the specific users of the building.

-Municipal staff
-Waste pickers
-Selected medical staff
-Incoming/Outgoing waste vehicles
-Private companies

PROGRAMME

The following programme is put together with the knowledge of the type of facility, scale of operations and the intended design objectives.

Municipal:

-Weigh-bridge (incoming and outgoing)
-Administrative Office
-Weigh-bridge Control Office
-Security Office
-Waste Recycling Facility
-Waste Picker Accommodation

Private:

-Small-scale clinic

Public:

-workshops
-recycled material pick-up point

ACCOMMODATION SCHEDULE

ACTIVITY	ROOM TYPE/NAME	NUMBER OF PEOPLE	SIZE
Municipal Management	-Weigh-bridge		
	-incoming	-	36 m^2
	-outgoing	-	
	-Weigh-bridge Control office	1	6 m^2
	-Administrative Office		
	-landfill operations manager office	1	12 m^2
	-landfill operations supervisor office	1	12 m^2
	-heavy vehicle maintenance manager office	1	12 m^2
	-conference room	15	30 m^2
	-staff ablutions		
	-visitor ablutions		
	-staff canteen		
	-Security Management Office	2	12 m^2

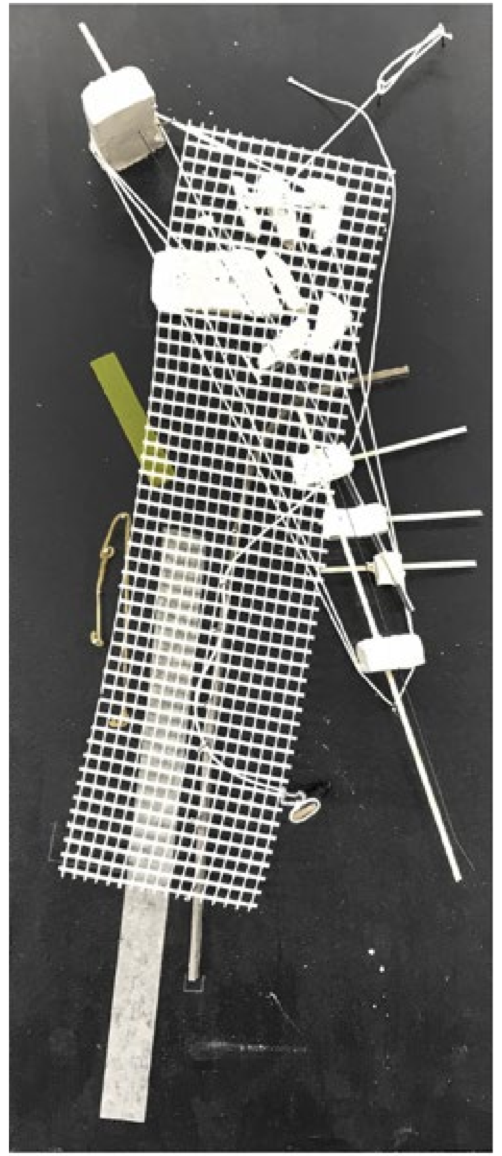
ACTIVITY	ROOM TYPE/NAME	NUMBER OF PEOPLE	SIZE
Recycling	-wash area(wet)	200	1000 m^2
	-communal sorting		
	-storage units		
	-plastics processing		
	-metal processing		
	-glass processing		
	-timber processing		
	-textile processing		
	-paper/cardboard processing		
	-loading dock		
	-ablutions		
Waste Picker Accommodation (night shelter)	-mattress store		20m^2
	-sleeping area		400 m^2
Small-scale Clinic	-medical staff rooms -on-duty doctor room with storage space -on-duty nurse room with storage space	2	20 m^2
	-medical staff ablutions		
	-patient waiting area		3 m^2

5.3 DESIGN DEVELOPMENT
THE CONCEPT

The sub-heading 5.3 introduces the design concept, outlining the design drivers and reflecting an acknowledgment of the recorded constraints and informants.

The design concept represents an embedded understanding of the issues and concerns taken on-board thus far. The concept resembles an intent on creating an architecture through the use of recycled and natural locally sources materials, through a spatial organisation that remains dynamic and ambiguous, constantly. This is attributed to the pursuit in creating an anti-object architecture, seeking to maintain a mediation between subject and environment, through matter, unbound by controlled and compressed form.

The following will commence with a series of investigative models, interrogating both order and principles, within the context of Arlington Landfill. This is then followed by the development of the concept through a series of design iterations.



Investigative Model 1

The investigative model 1 was part of a 'play' investigation. It looked to understand order through composition, materiality and the inherent relationship between mass and void. The model took on a sculptural expression, yet was not created out of a formal preoccupation. This particular model began the endeavour of understanding the process of emergence.

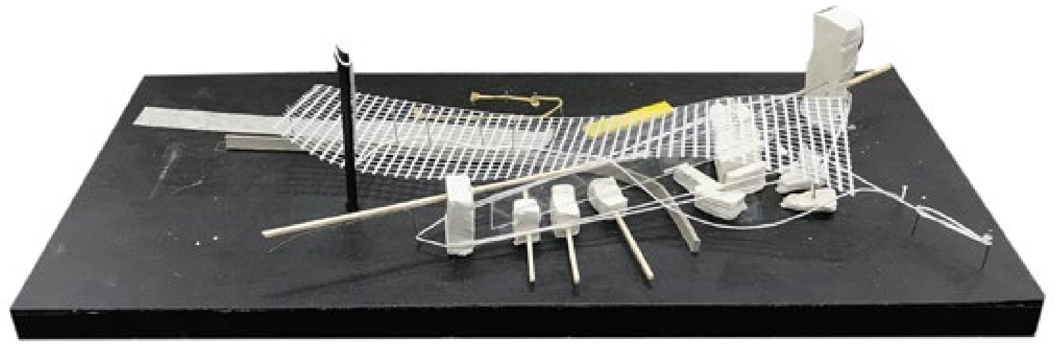
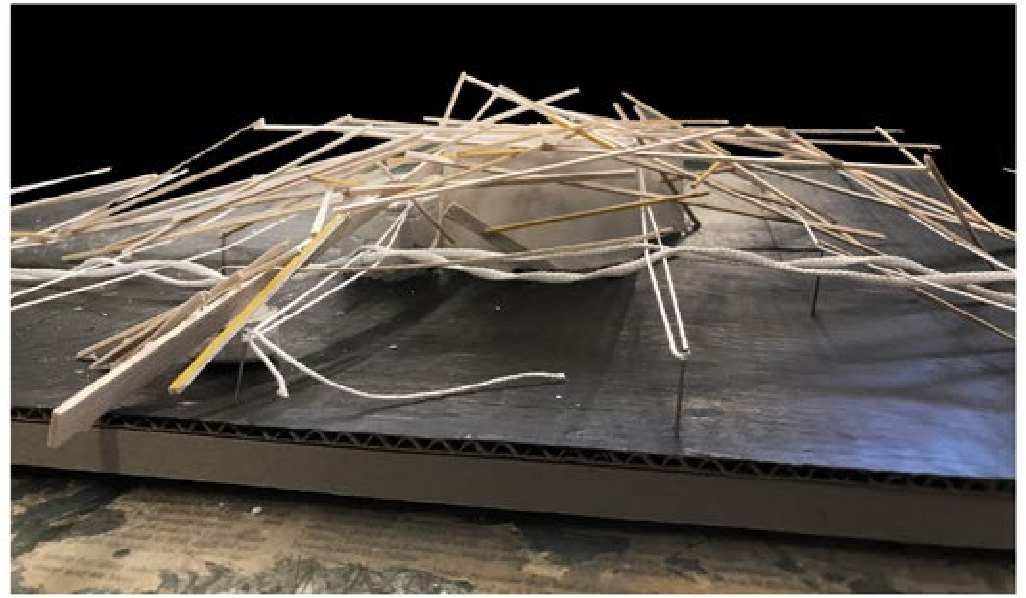


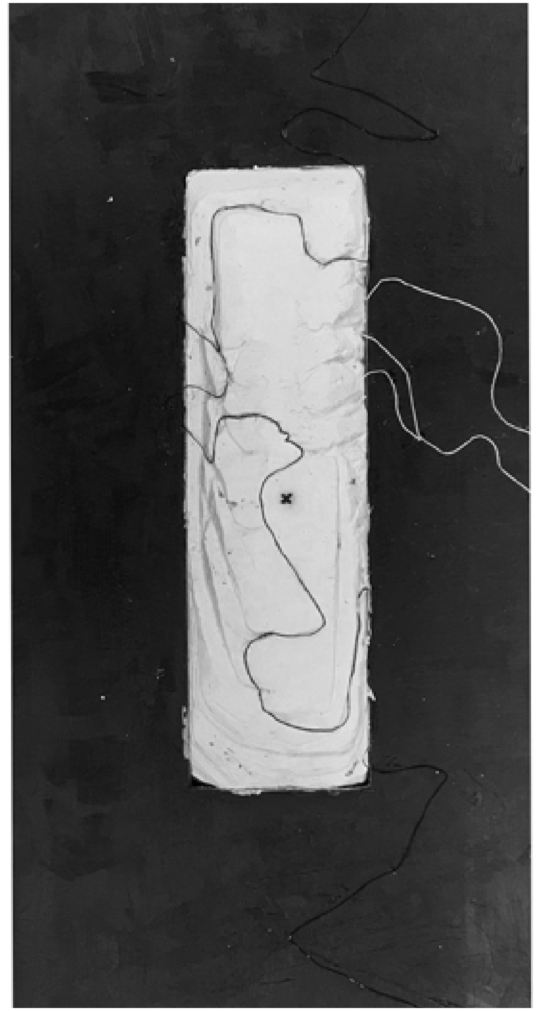
Figure 5.4: Investigative model 1
Source: Author (2020)

Figure 5.5: Investigative model 2
Source: Author (2020)

Investigative Model 2

The investigative model 2 begins to reflect the principles of the text 'Field Conditions' by Stan Allen. The model seeks to find the order around the landfill by understand the forces and objects that create a resultant form. In this case the white string and balsa sticks represent a natural order. It is only at the point when the circular forms (landfill matter) are pushed upwards (from the base) that they distort the order, creating an alternative landscape.





Investigative Model 3

The investigative model 3 looks to explore the slow resurgence of the natural order on the ever-expanding and dynamic landfill landscape. There is an element of decay and breaking down of both natural matter as well as synthetic, causing a constant interchange of that which is creating mass and that which is involved in a process of breaking down. Ultimately, the landscape may become mass within the natural order, yet will remain a consolidated mass that is not of the natural order.

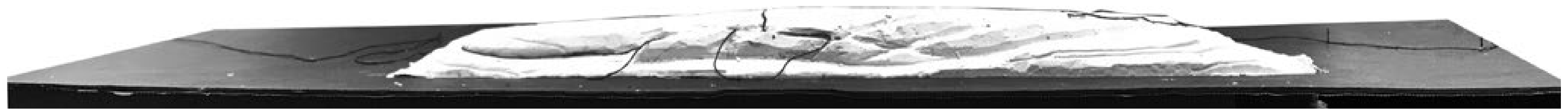


Figure 5.6: Investigative model 3
Source: Author (2020)

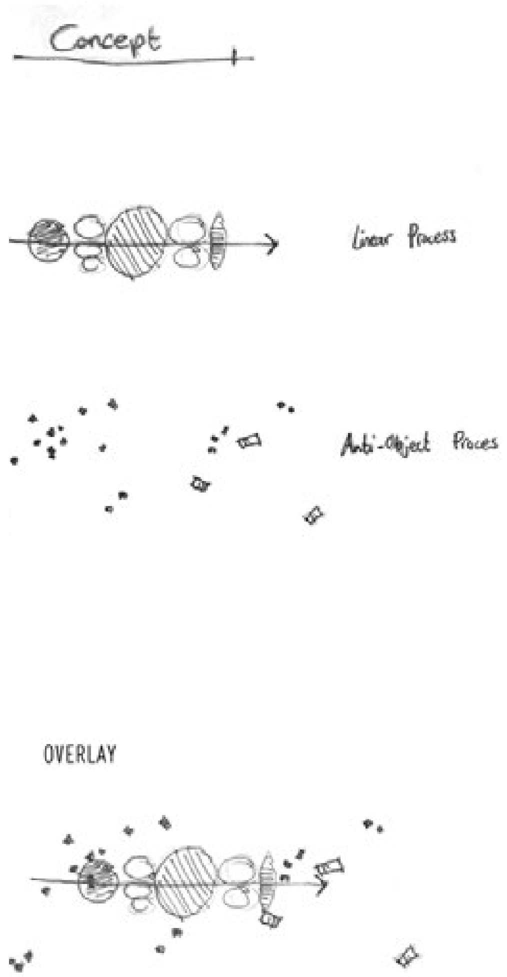
The investigative models reveal a process that seeks to look past preconceived design motifs and attempts to uncover order from the respective 'field'. Arlington Landfill has provided the physical landscape for interpretation and investigation where an order begins to emerge, not through an observation of the discrete abject, but rather through an interrogation and understanding of the layers that are involved in the object's process of making.

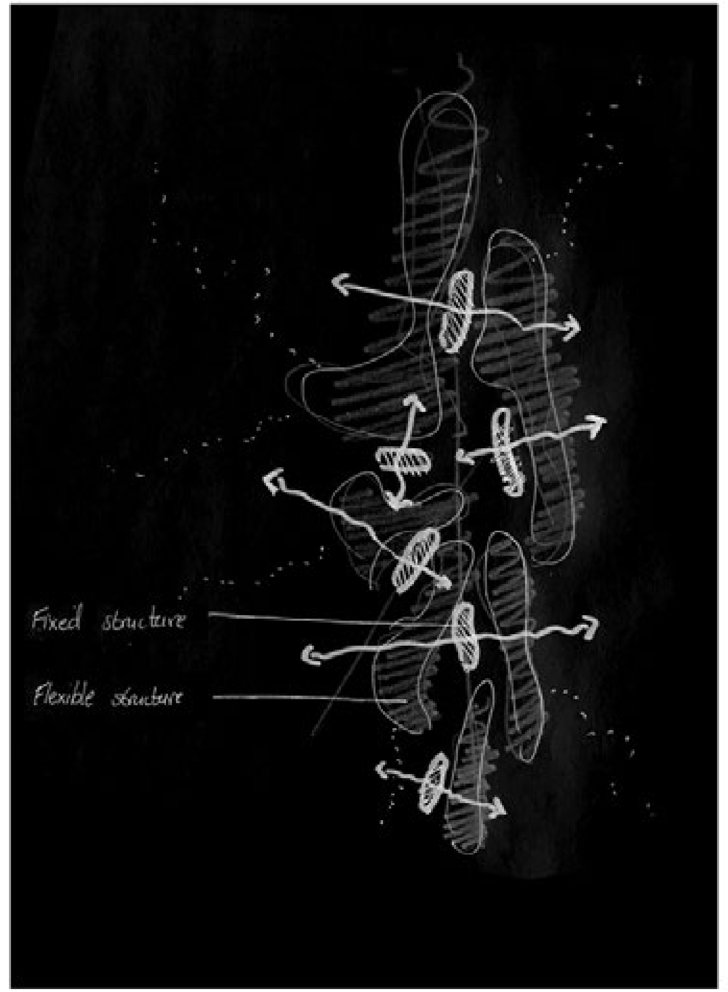
Therefore, the process that uncovers an emerging anti-object architecture, within the environment of Arlington Landfill, which looks to abandon 'object' on landscape and mediate between subject and environment, must understand and interpret the conditions within the given field. The following iterations will covey this particular endeavour, ultimately arriving at the final design.

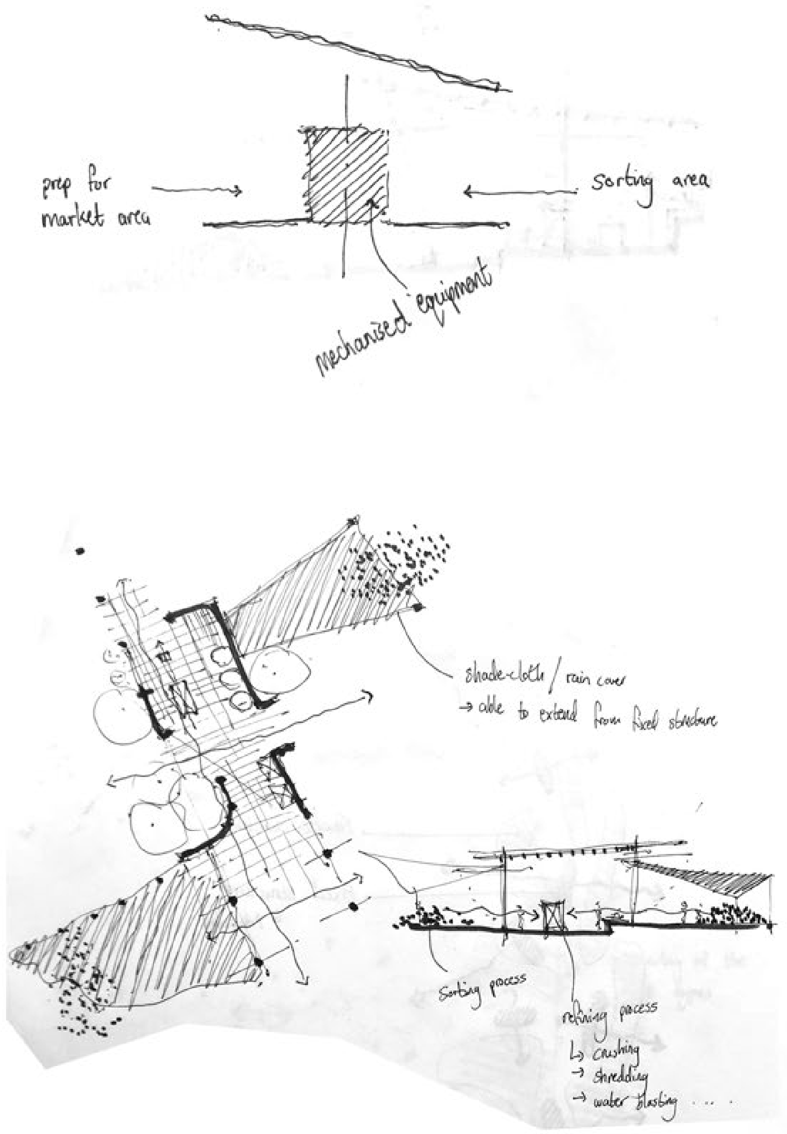
ITERATION 1

The first iteration looked to develop the concept of the recycling process on the landfill plateau. The concept overlays the principles of the linear process and the anti-object process, discussed and outlined in the type chapter.

The design organised itself around service core, containing the services needed by the pickers, and allowed a free-flowing membrane structure to span outwards, protecting the pickers from the elements.







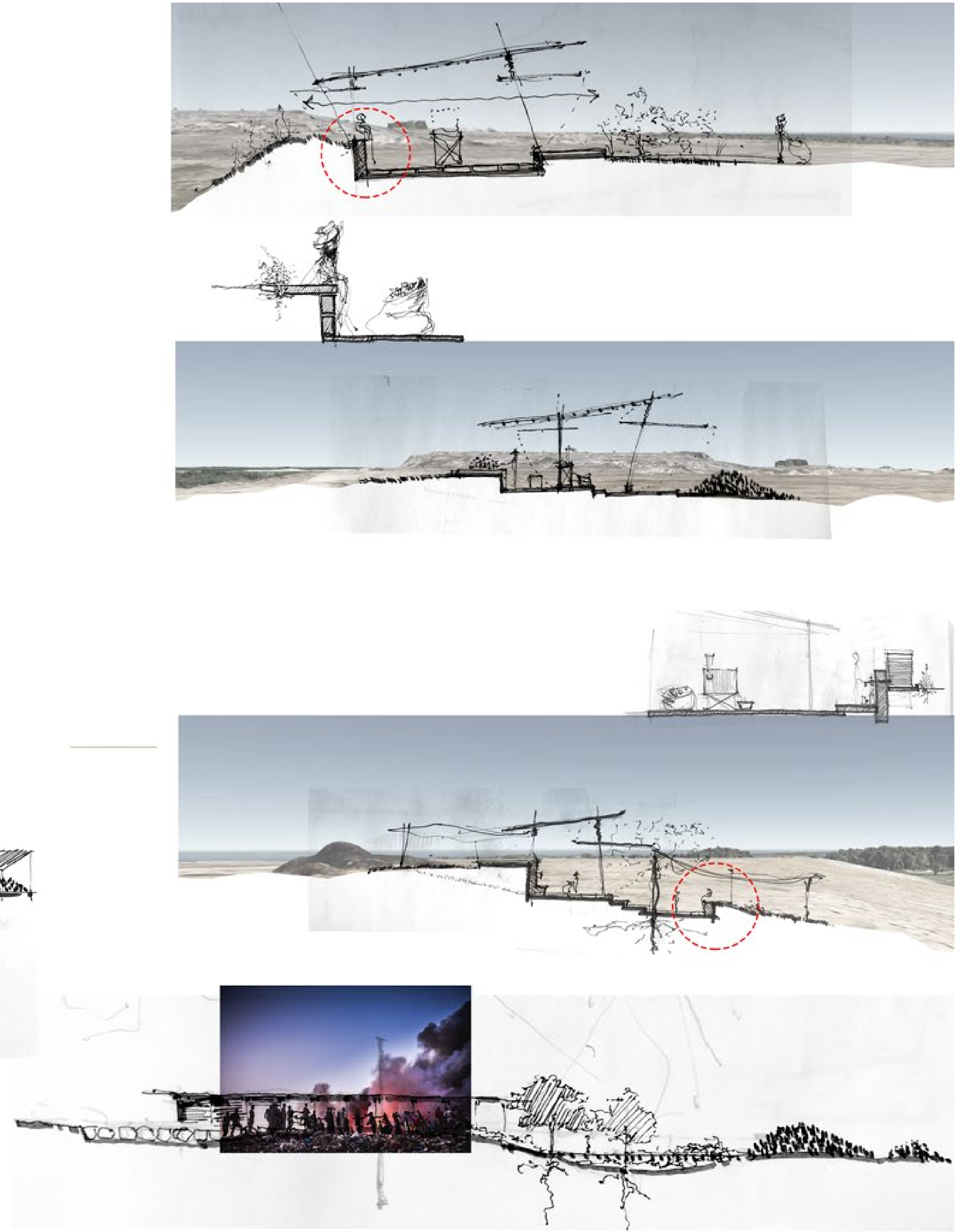


Figure 5.7: Iteration 1 Concept Sketches
Source: Author (2020)

ITERATION 2

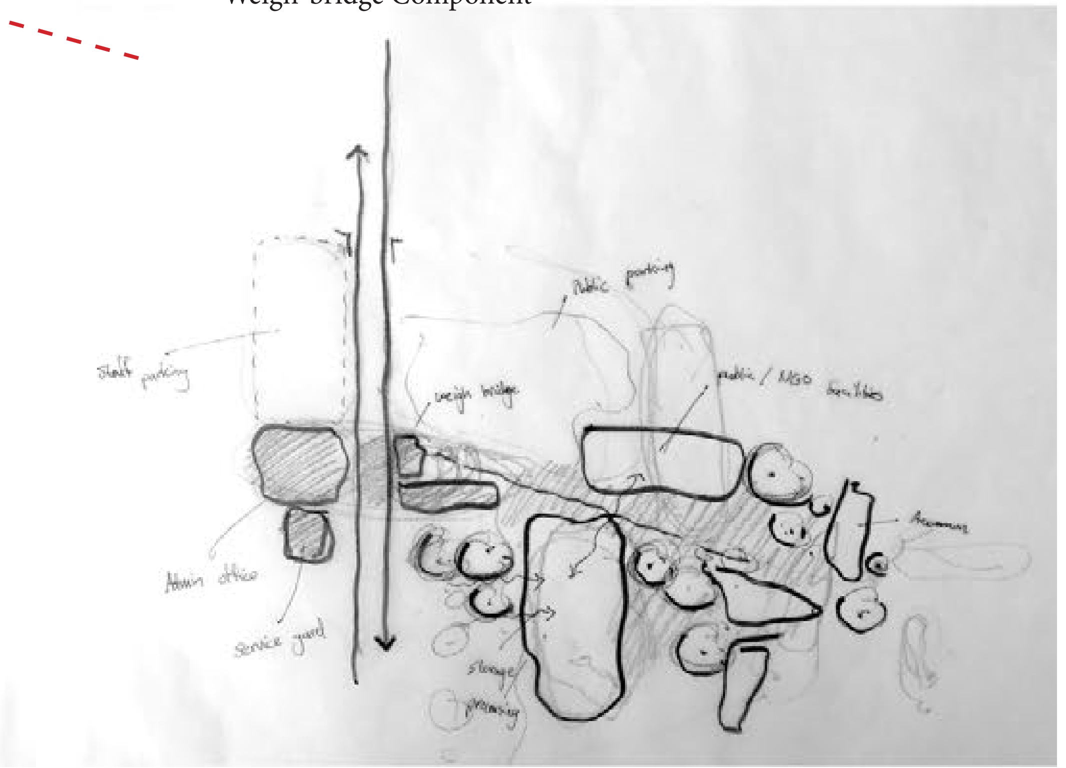
The second iteration dealt with the change of location of the recycling facility, placing it at the base of the landfill at a point where an elongated ridge-line had been bisected by the access route, connecting the landfill to the weigh-bridge. This then gave rise to the idea of having two design components.

A toolkit station on the landfill plateau that would provide as a service station for the waste pickers during their collection phase, and the waste recycling facility combined with a newly positioned weigh-bride and admin office.

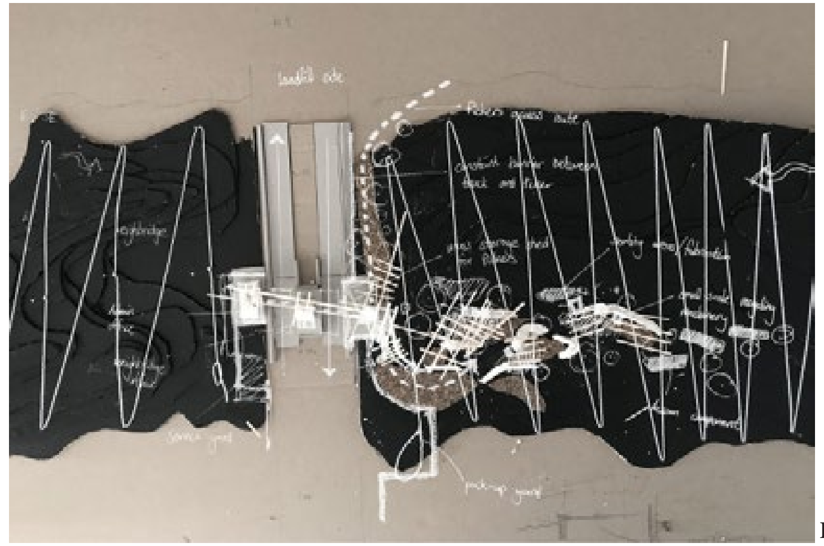
SITE

Existing Weigh-bridge and Admin Office

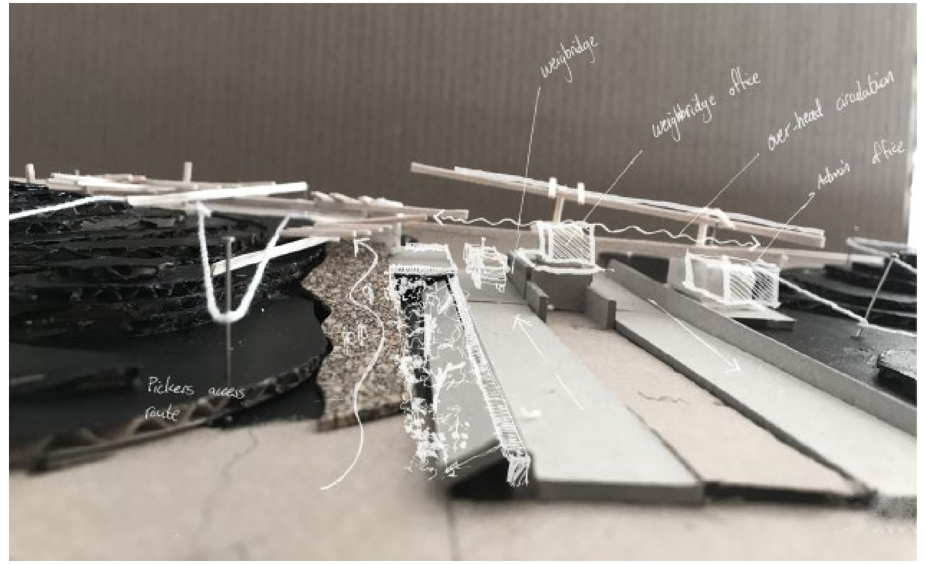
Proposed Waste Picker Recycling Facility with Weigh-bridge Component



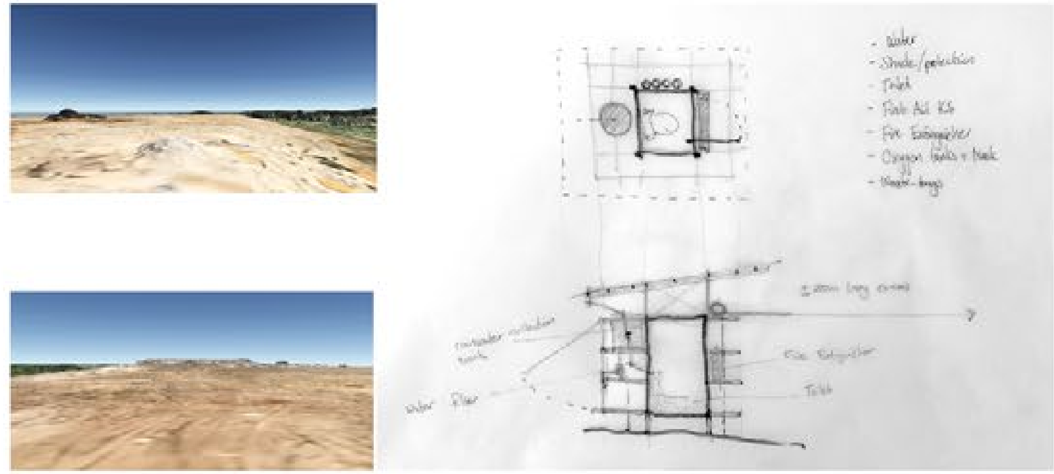
CONCEPT DIAGRAM



PLAN



PERSPECTIVE OF WEIGH-BRIDGE AND ENTRY INTO THE RECYCLING FACILITY



TOOLKIT CONCEPT

Figure 5.8: Iteration 2 Concept Sketches
Source: Author (2020)

ITERATION 3

The third iteration started to explore the nature of the space, informed by the characteristics and dynamics of the user, and the nature of the materiality.

The design concept looks to further itself from pre-conceived rational forms, seen in the previous iterations, and rather follow a process that looks for natural order. The concept begins to explore the capabilities of certain recycled materials as building materials, and the relationship those materials have with one another in creating the architecture.

This iterations starts to understand how the notions of an anti-object, as a result of the shift in creating an environment that mediates between subject and environment.

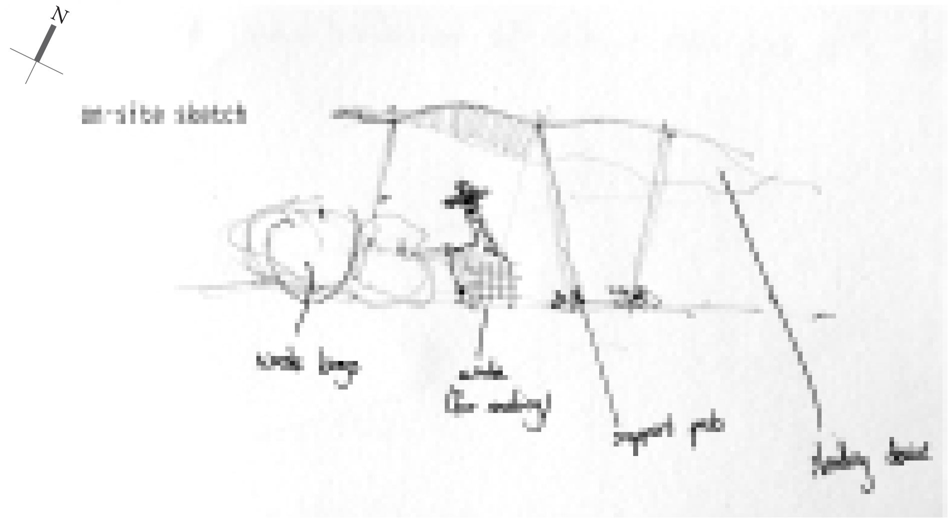
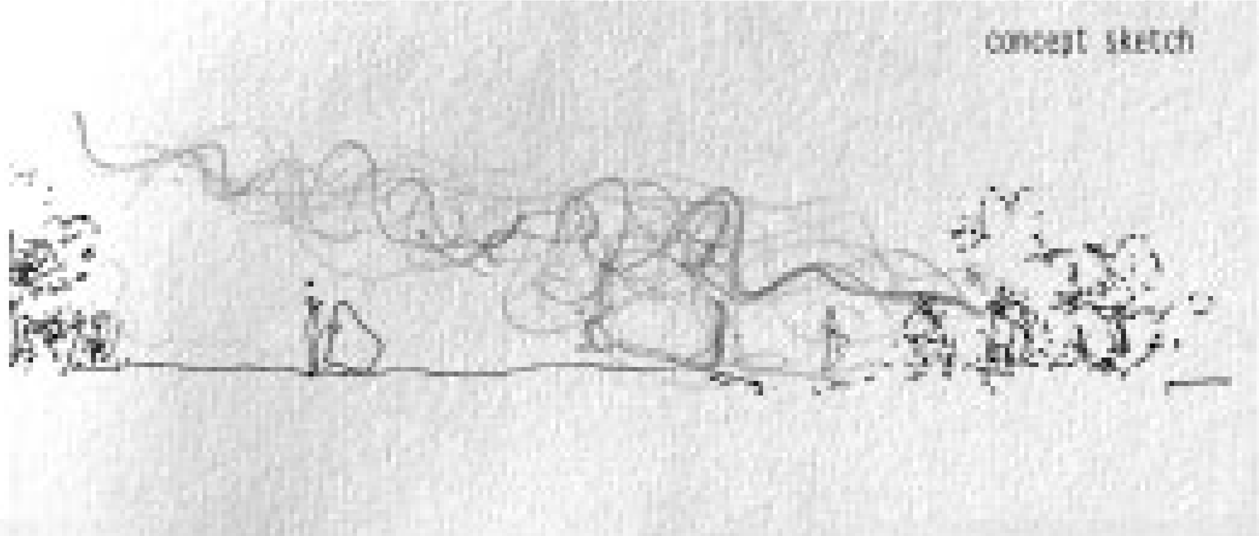
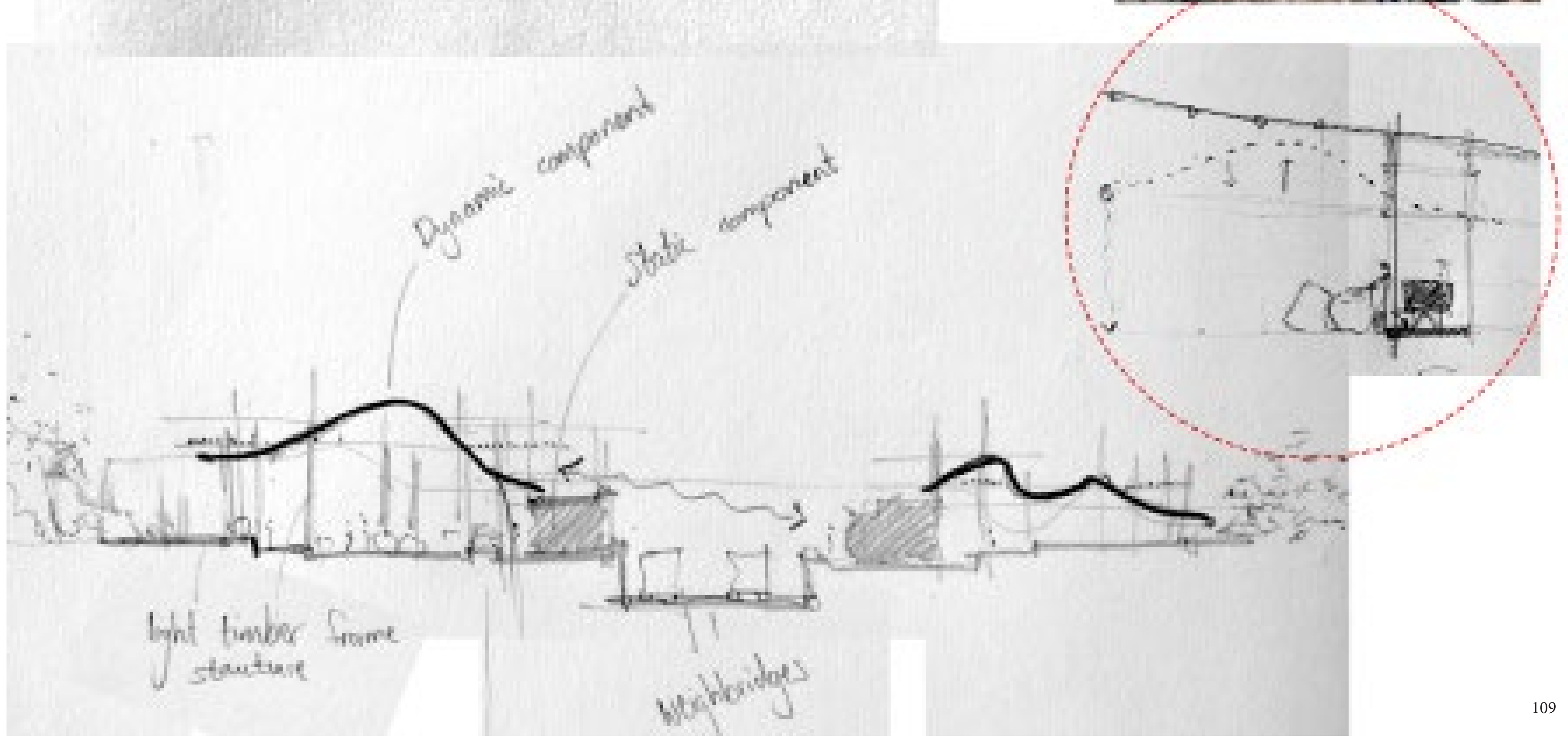


Figure 5.9: Iteration 3 Concept Sketches
Source: Author (2020)





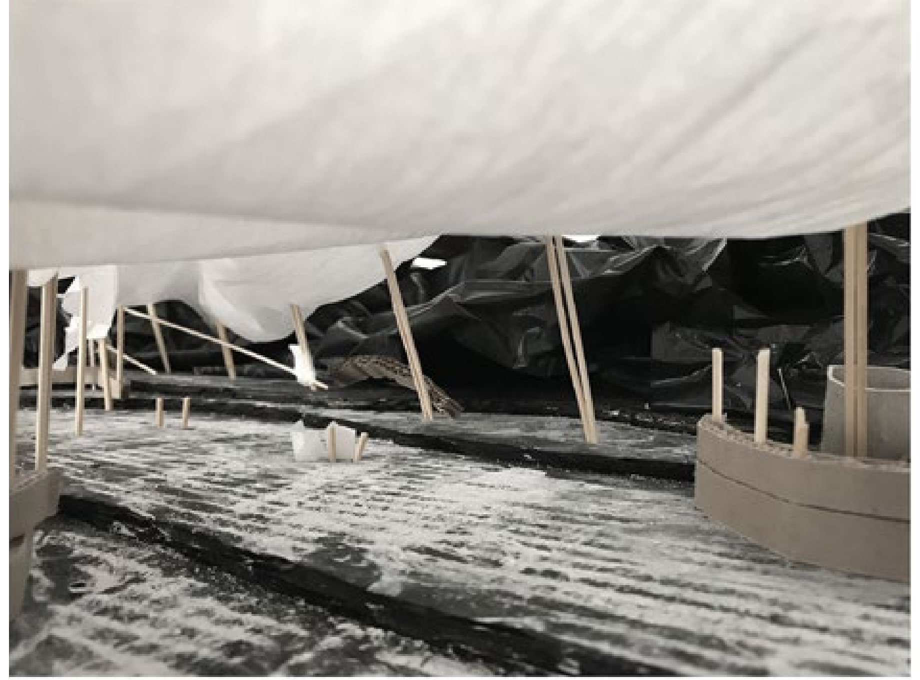
ITERATION 3- PHYSICAL MODEL

The physical model was generated out of an understanding of the current dynamic and spirit of the types of spaces that the waste pickers have created on the landfill plateau. The process of collecting, sorting /separating and readying for market is performed in specific ways that at times become ceremonial and quite subtle. Thus, the layer that captures the spirit of this particular dynamic has resulted in a courtyard space at the centre of the facility that will allow the waste pickers to perform the task of sorting and separating, while preserving much of what is to be found on the landfill itself.

The supporting spaces alongside the waste picker courtyard consist of a volume reduction area, creative fabrication area, workshops, soup kitchen, night shelter and washing area.

Figure 5.10: Iteration 3 Physical Model
Source: Author (2020)

1- The sensitive edge between the ridge and the facility. The internal workshop spaces are able to open up onto the ridge, providing provocative and interactive outdoor spaces.



2- The waste picker courtyard will create the spirit of the building, stepping back to mold around the subtleties and characteristics of the waste pickers. The courtyard will provide a membrane structure that can be easily pushed and pulled to provide protection from the elements, as well as create differing privacy gradients.

CHAPTER **6** - FINAL DESIGN AND TECHNICAL STRATEGY
02

Figure 6.1: Final Design Bird's Eye View
Source: Author (2020)

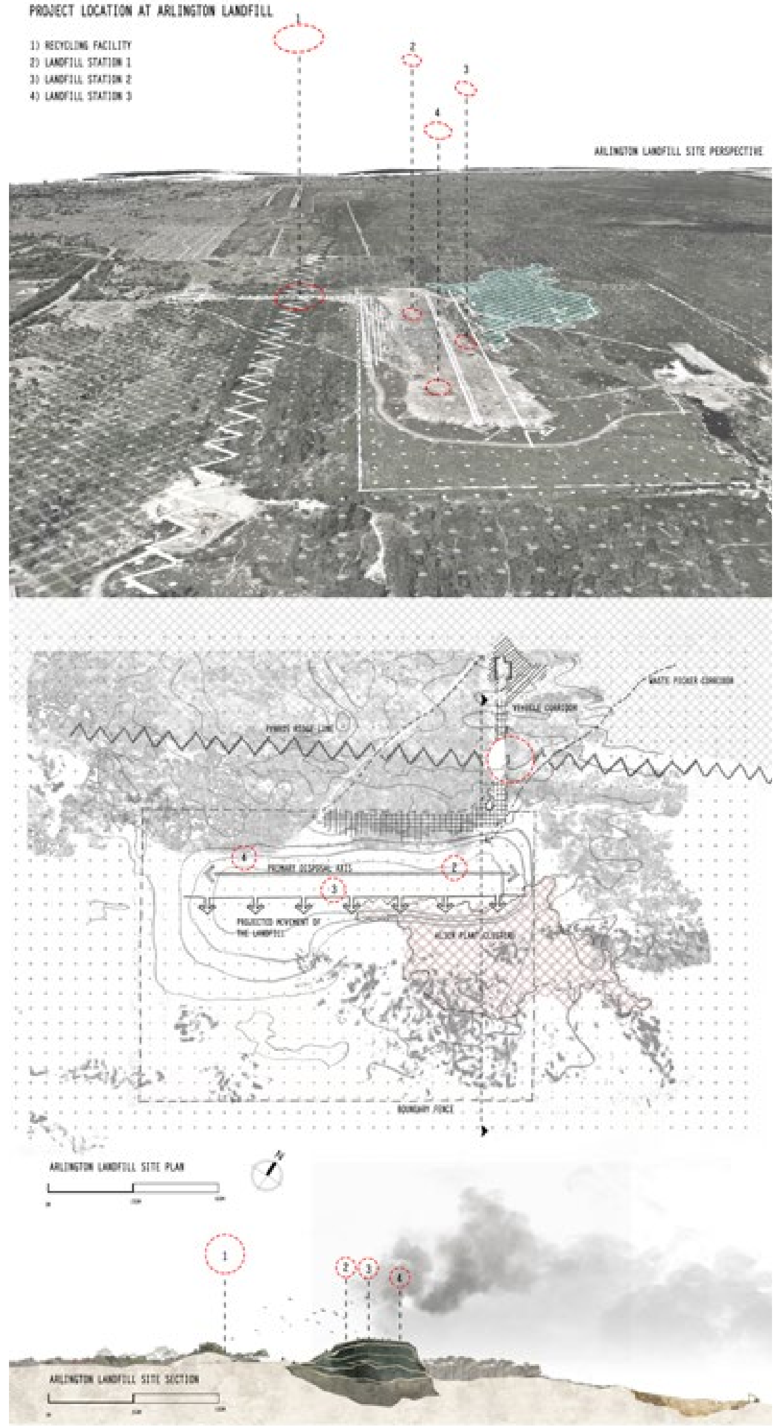


Figure 6.2: Project Locations
Source: Author (2020)

The final design comprises of two components, the recycling facility at the base of the landfill and the equidistant landfill stations on the landfill plateau itself. The image (left) conveys their exact locations within the greater Arlington Landfill site.

Figure 6.3: Entrance to the Recycling Facility
Source: Author (2020)

Figure 6.4: Roof Plan of the Recycling Facility
Source: Author (2020)

1) THE RECYCLING FACILITY

- A dignified space that is given order by the subtleties and characteristics shown by the waste pickers. The spaces created are an embodiment of the spirit you'll find around these individuals who adorn the landfill plateau.

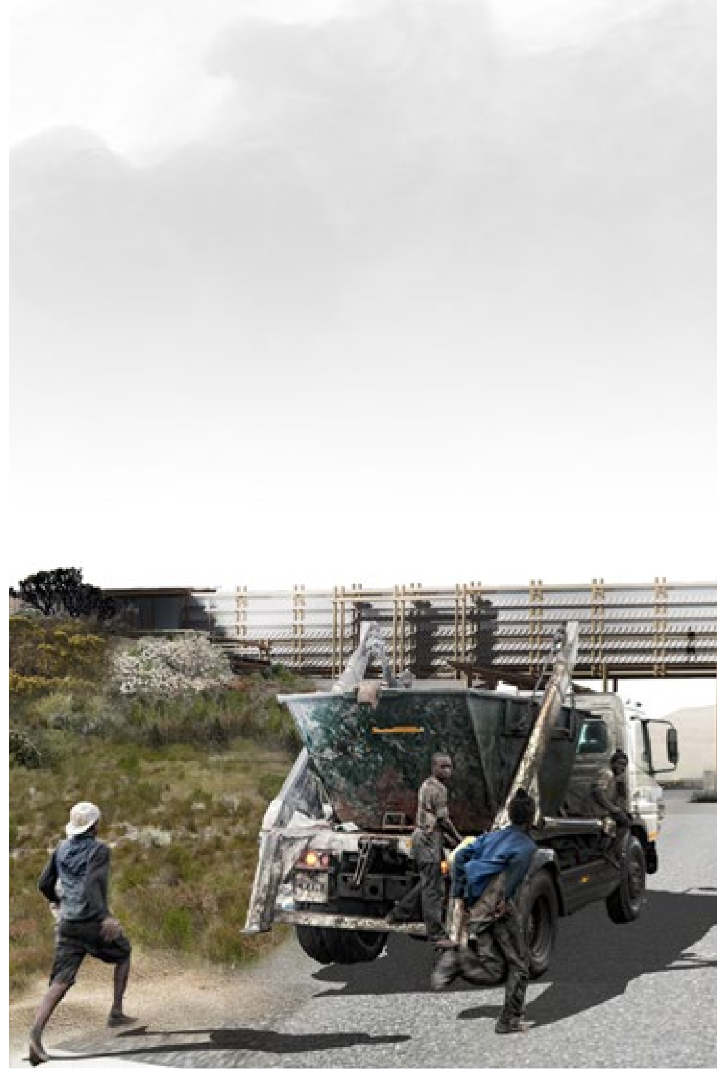


Figure 6.2

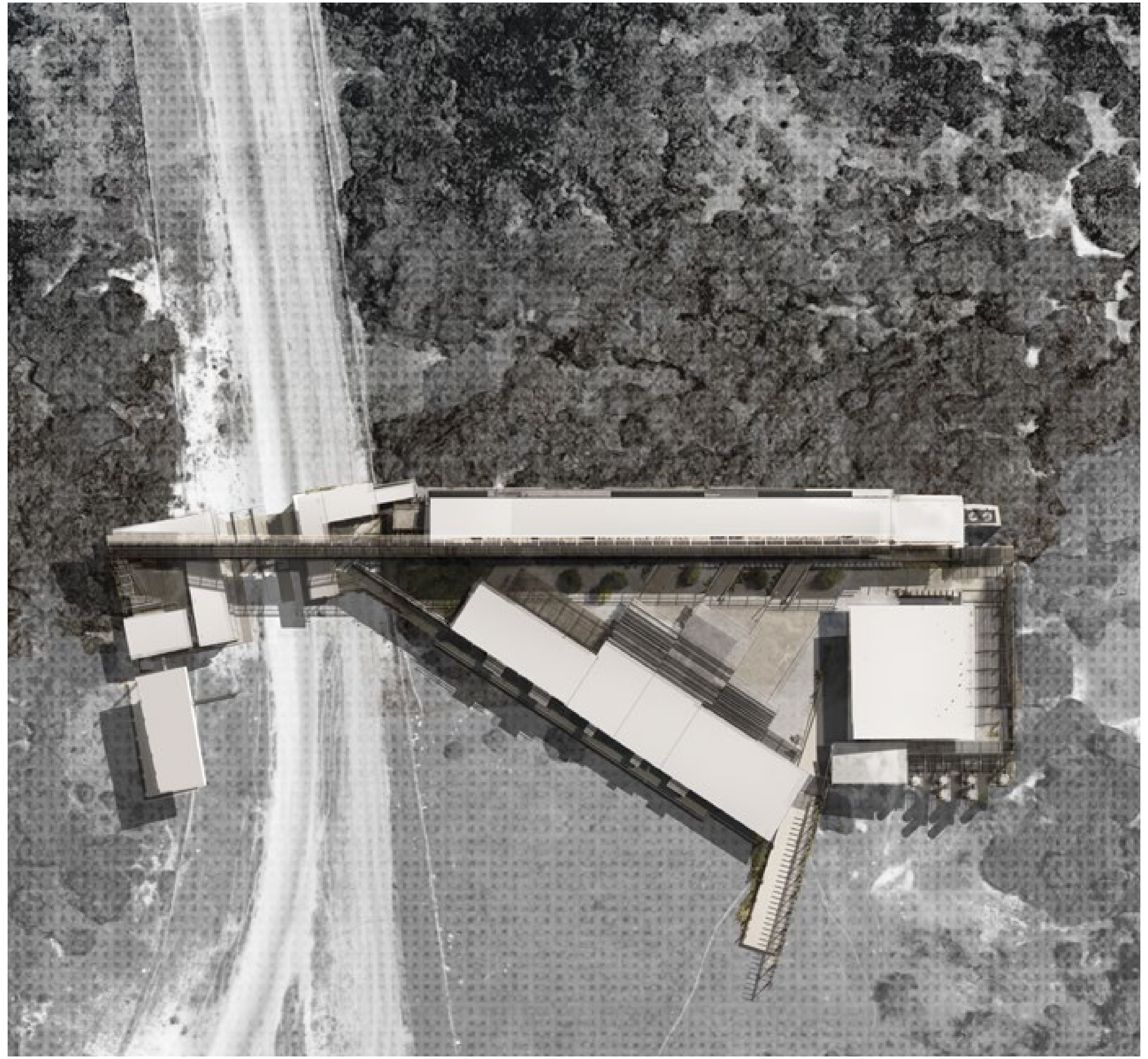


Figure 6.3

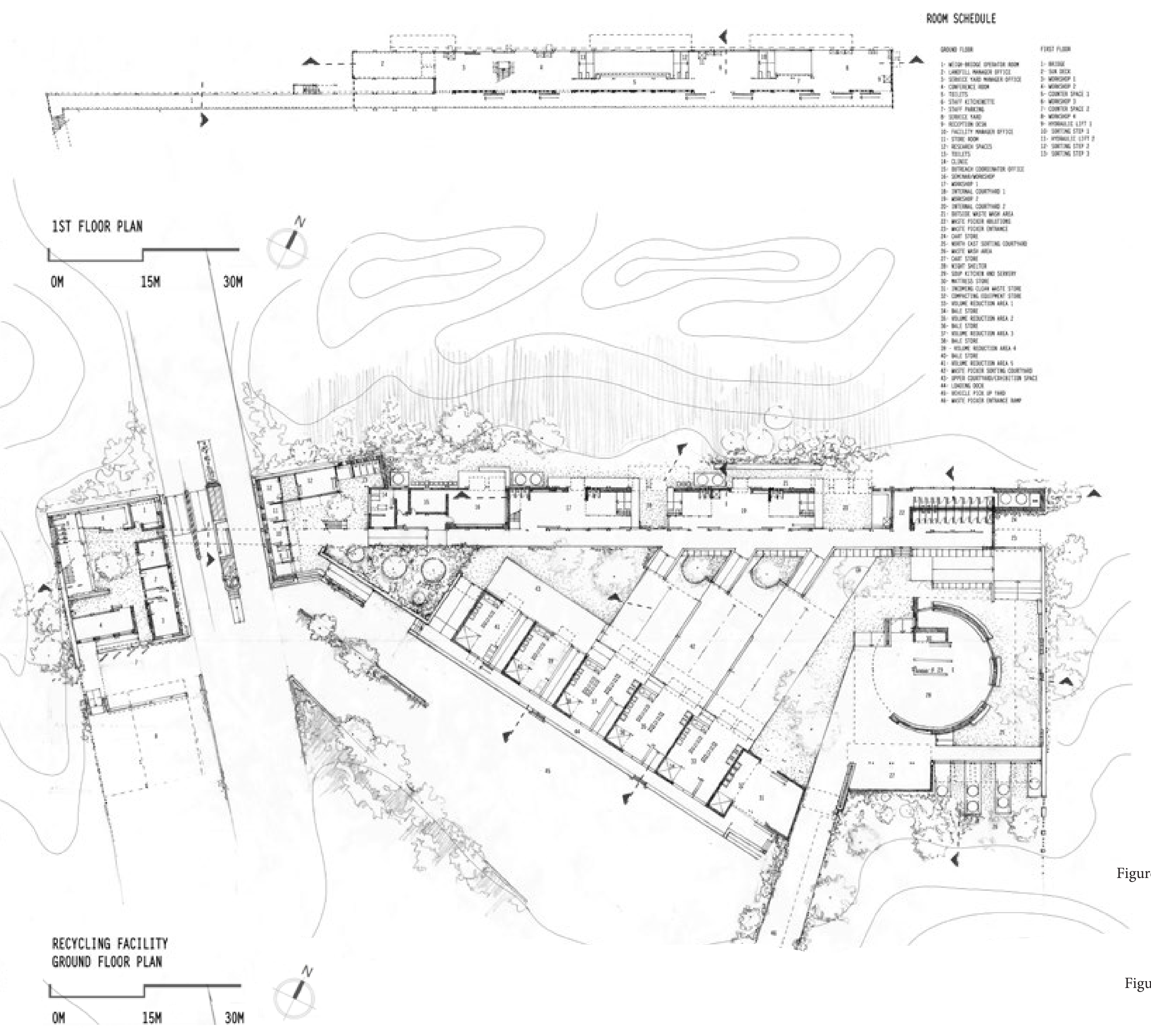


Figure 6.5: Ground and First Floor Plan of the Recycling Facility
Source: Author (2020)

Figure 6.6: Waste Picker Courtyard Sail Depiction
Source: Author (2020)

Figure 6.7: Section from Creative Spaces to the Volume Reduction Spaces
Source: Author (2020)

The waste picker courtyard forms the primary space within the facility which informs the nature and scale of the surrounding spaces. Being the heart of the building, the courtyard becomes a multi-functional space throughout the day, reflecting the way in which the waste pickers work.

The courtyard is stepped, cascading down towards the night shelter, while the deployable sail makes use of the waste picker PVC collection bag as a resourceful fabric.

The image (below) shows the facility cut through from the creative spaces (spaces that allow the waste pickers to create something new from their collected waste in multi-functional workshops) through the protected courtyard and into the volume reduction spaces (spaces with small-scale machines that allow the waste pickers to neatly reduce and compact waste for market).

Figure 6.6

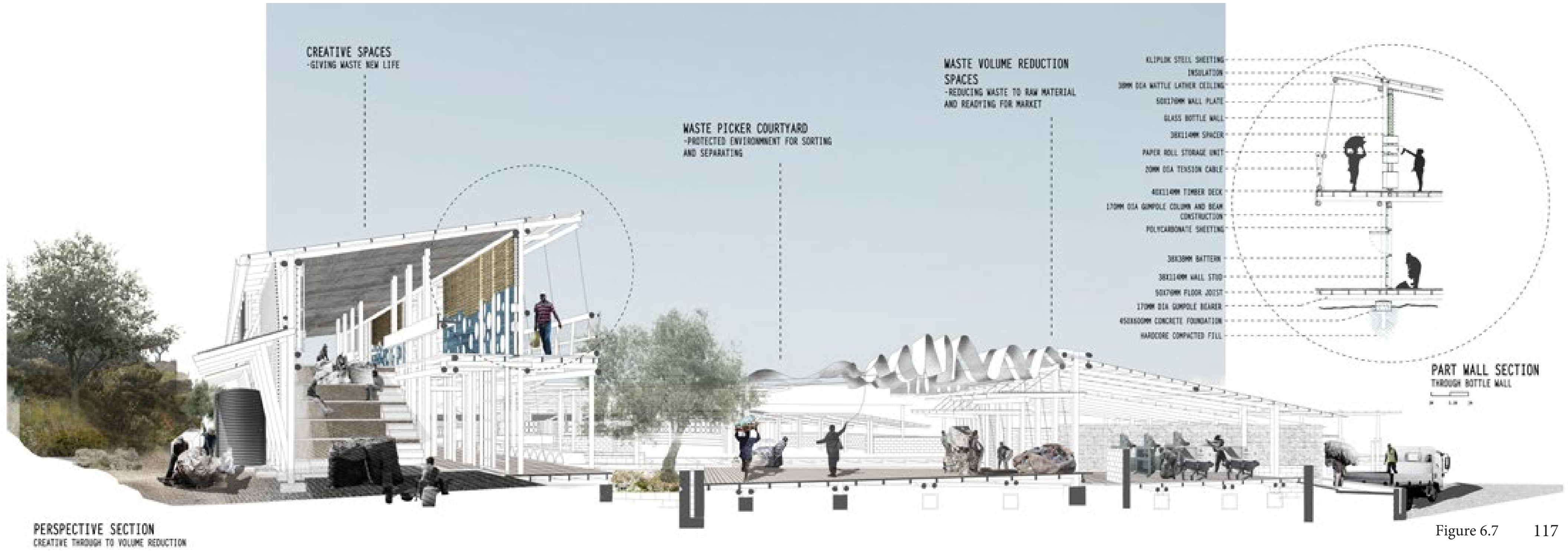


Figure 6.7

The spatial attribute of the facility turned to the nature in which the waste pickers work as well as their inherent scale, while the physical attributes turned towards the argument put forward through the theoretical lens.

Arlington Landfill rests within a rare fynbos landscape which at the same time possesses an influx of eucalyptus trees. This gave the project an opportunity to regenerate the landscape by allowing the building to extract both the alien timber as well as waste from the incoming waste stream, resulting in a building which resembles a product of its environment and its over-arching outlook.

(Below) is a section cutting through the length of the building, from the administrative offices through the stepped waste picker courtyard and down into the night shelter. This reveals the unique tectonic of the structure that, when combined with waste building material, creates a unique unified composite .

Figure 6.8: Section from Administrative Office to the Night Shelter. Source: Author (2020)

Figure 6.9: Axonometric. Source: Author (2020)

Figure 6.10: Composite Facade Details. Source: Author (2020)

Figure 6.11: Composite Facade. Source: Author (2020)

Figure 6.12: Section through Creative Spaces. Source: Author (2020)

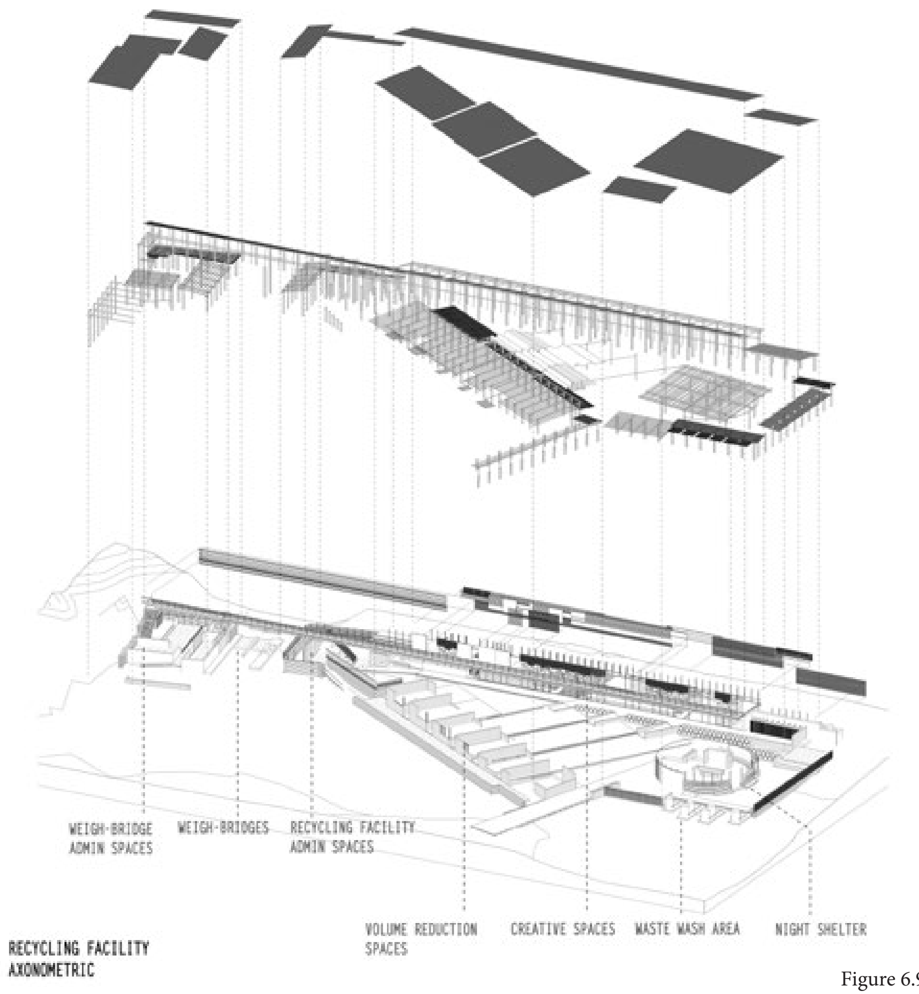


Figure 6.9

Figure 6.10

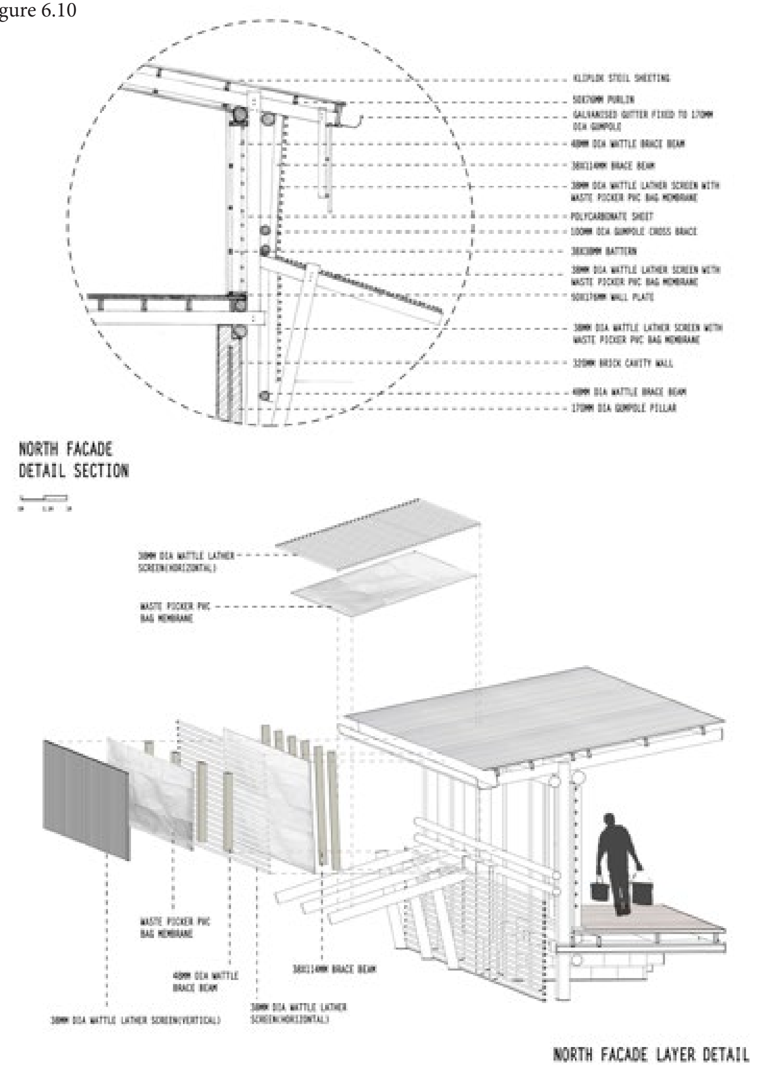



Figure 6.11

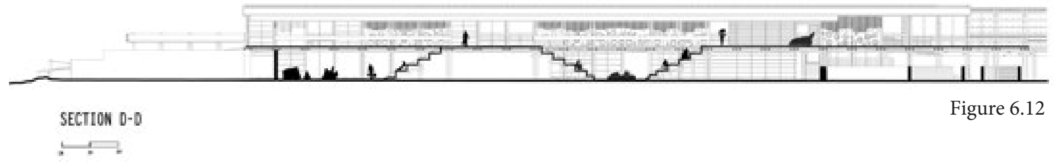


Figure 6.12

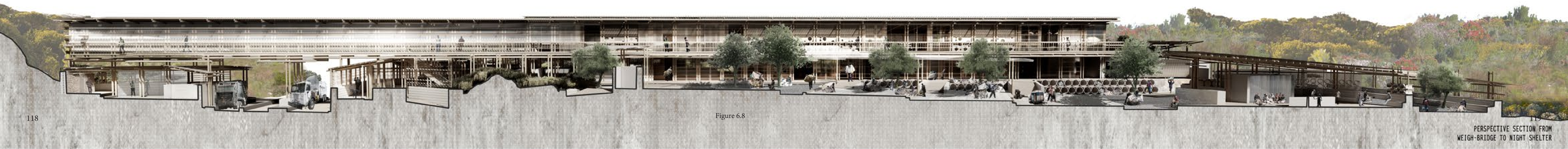


Figure 6.8

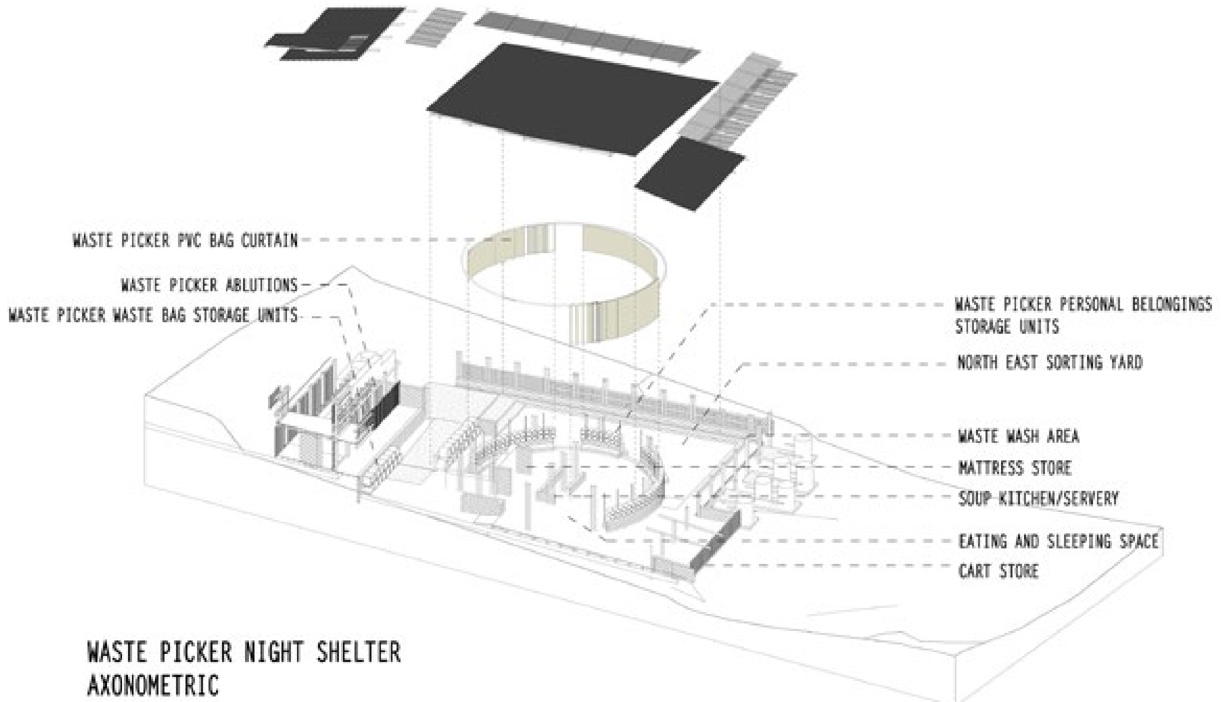
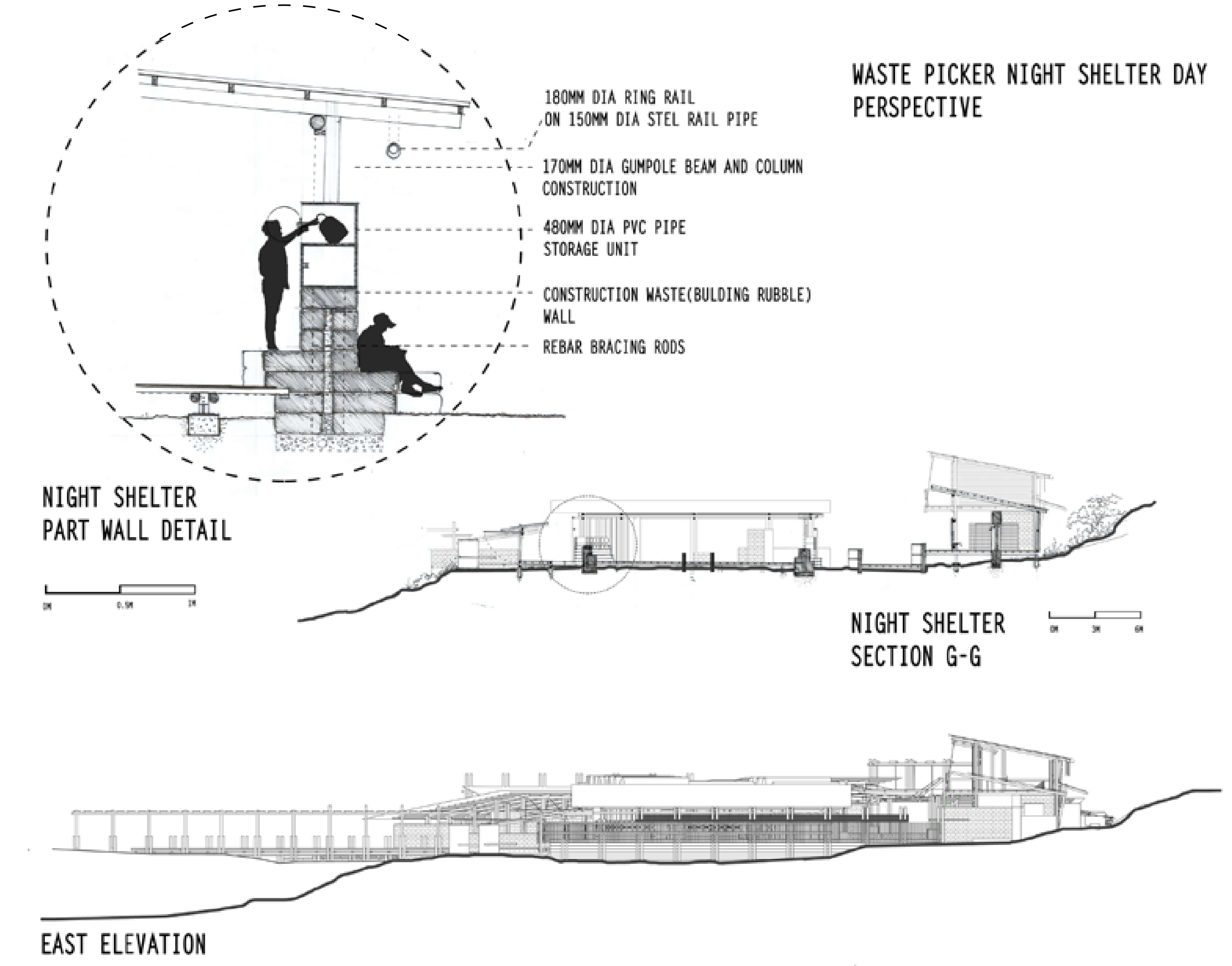


Figure 6.13: Night Shelter Axo. Source: Author (2020)

The waste picker night shelter defines itself as a consequential part within the whole by becoming a multi-functional space within the courtyard itself. This space, at different times of the day can be used as a kitchen, storage facility, protected sitting area and at night becomes a sleeping shelter for those who need a place to rest. The axo (above) explains the components that make up the night shelter and its flanking supporting spaces.

Figure 6.14: Night Shelter Daytime Depiction. Source: Author (2020)

Figure 6.15: Night Shelter Night-time Depiction. Source: Author (2020)



WASTE PICKER NIGHT SHELTER DAY PERSPECTIVE

Figure 6.16: Sections and Wall Detail Source: Author (2020)

WASTE PICKER NIGHT SHELTER NIGHT PERSPECTIVE

2) THE LANDFILL STATIONS

-The stations rest on top of the landfill itself, serving as conveniently placed resourceful tools that provide for the waste pickers needs throughout the day. Like the recycling facility at the base of the landfill, the stations make use of the gum poles and wattle to create the structure, while the waste building material creates the delicate mediations between the waste picker and the immediate harsh environment.

Figure 6.17: Landfill Station in Context. Source: Author (2020)

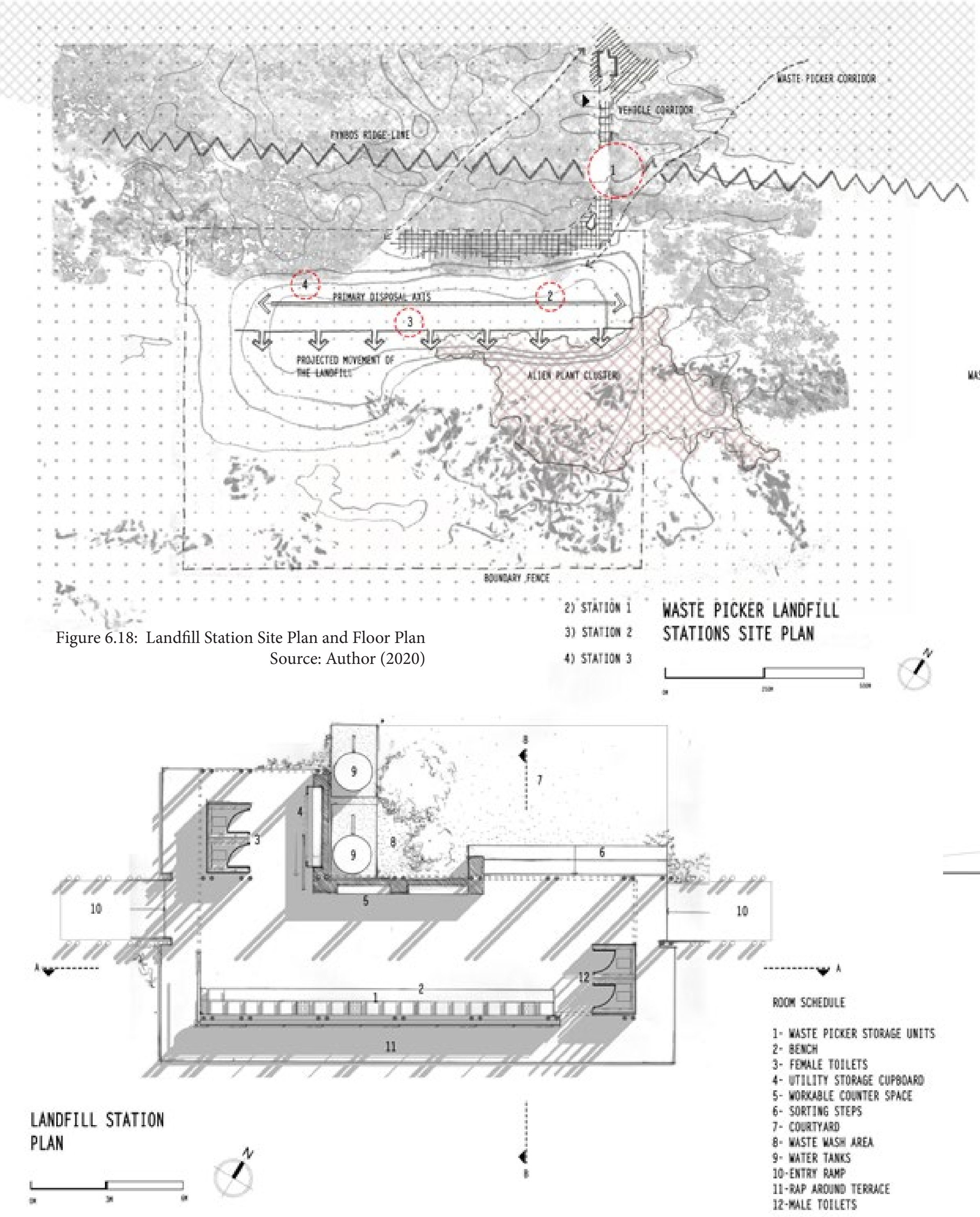


Figure 6.18: Landfill Station Site Plan and Floor Plan
Source: Author (2020)

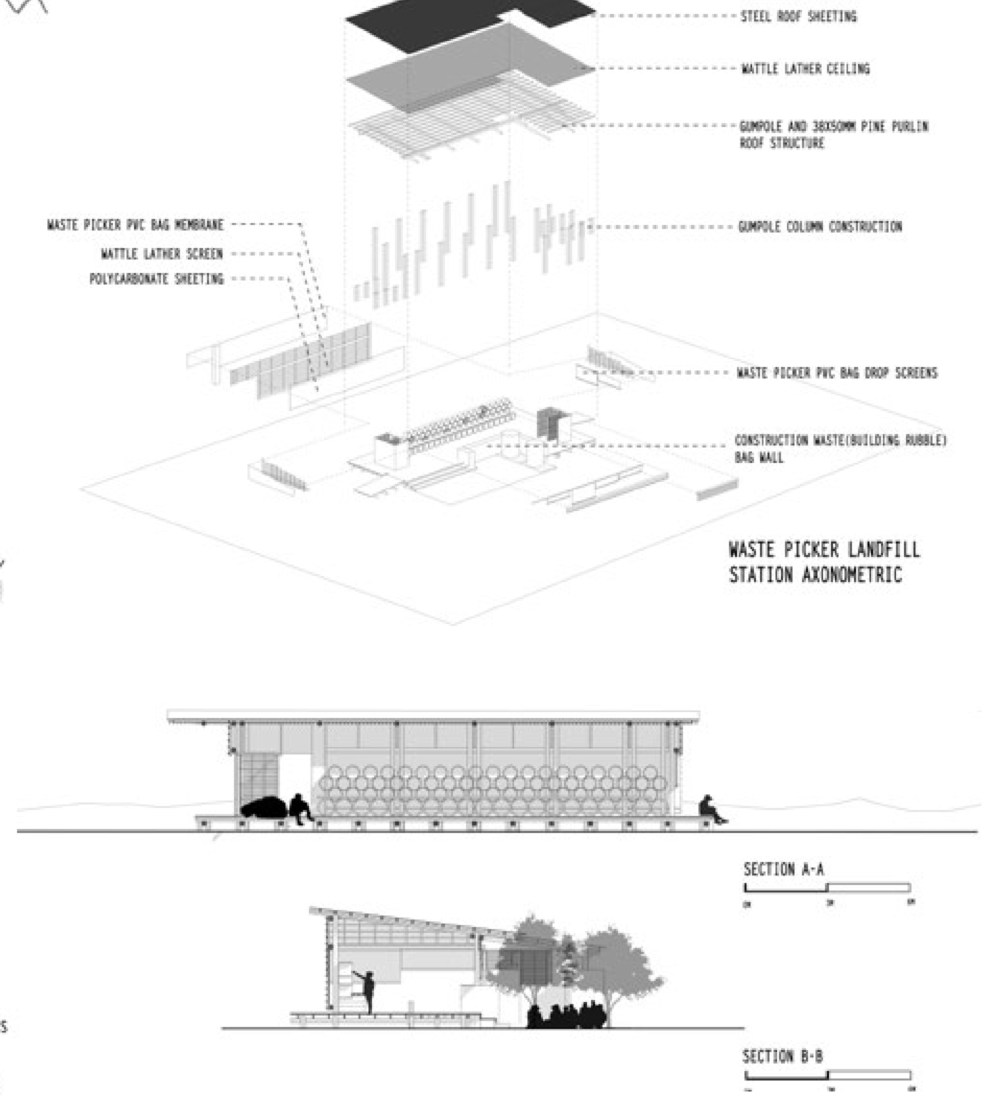


Figure 6.19: Landfill Station Axo and Section
Source: Author (2020)

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CHAPTER 01

Figure 1.1: Agbogbloshie
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Figure 1.2: Constructing a theoretical lens
Source: Author (2020)

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Figure 1.8: Fulfilling the Argument
Source: Author (2020)

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CHAPTER 02

Figure 2.1: Illustrating the history of waste management
Source: Author (2020)

Figure 2.2: Spatial diagram of building type within the greater system
Source: Author (2020)

Figure 2.3 & 2.4: Waste Architecture Platform. (no date). *Madrid Recycling Plant*. Available online at: https://wastearchitecture.com/en/database-progetti/recycling-plant/ (Accessed 14 July 2020)

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Figure 2.7: Typical building type plan and relationship between its parts
Source: Author (2020)

Figure 2.8: Typical characteristics of the organisation around differing processing types
Source: Author (2020)
Figure 2.9: Typical building type expression and materiality
Source: Author (2020)

Figure 2.10: General System
Source: Author (2020)

Figure 2.11: Plan/Parts
Source: Author (2020)

Figure 2.12: Process Diagram
Source: Author (2020)

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Figure 2.24: Process Diagram
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Figure 2.26 (right): Nosara Recycling Plant expression and materiality
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Figure 2.31: Olusosun landfill figure ground diagram callout
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