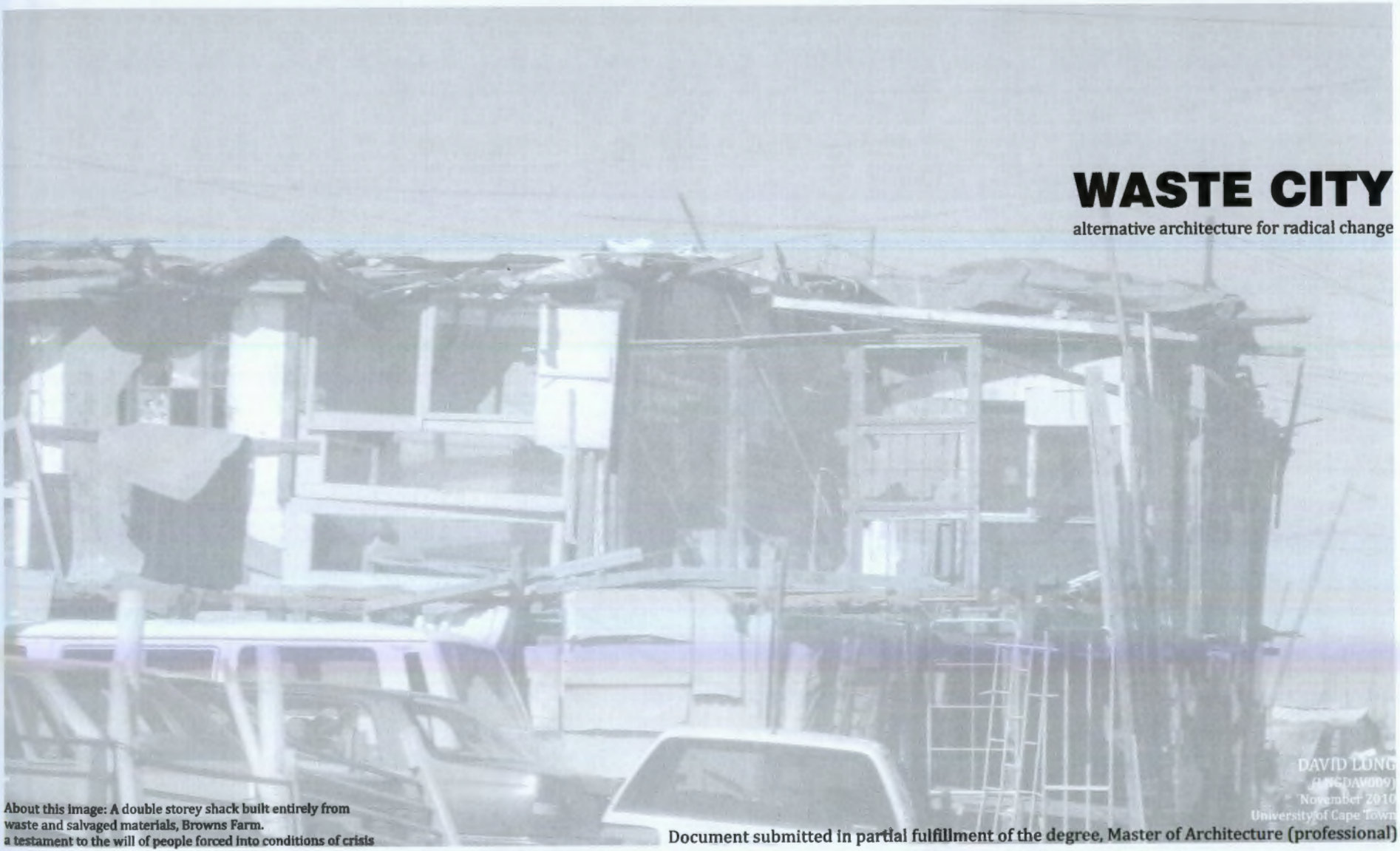

WASTE CITY

alternative architecture for radical change

About this image: A double storey shack built entirely from waste and salvaged materials, Browns Farm.
a testament to the will of people forced into conditions of crisis

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WASTE CITY
alternative architecture for radical change

Abstract

This thesis is an exploration into the possible creation of radically alternative ways of dwelling within the city, whereby inhabitants would construct their own environments through the use of waste as a building resource. The project challenges and contests the status quo of architectural production, market driven planning and a societal structure which is governed by the continuous consumption of 'stuff', while simultaneously attempting to address the ever-increasing social inequality experienced within Cape Town.

Given our present conditions of crisis born out of modernity and the processes of modernization, the research brings foreword the utopian debate, questioning how we might begin to envision a better future.

To this end the research begins with an exploration into the conditions of modernity and the implications these conditions have had on human existence. The modern social project of architecture forms the basis of this study, unpacking the complexities it faced when confronting the social conditions of modernity and its attempts to bring about social transformation. The conclusions drawn from this study formed the development of a personal philosophical position and the development of a series of propositions presented in the form of cartoons. The study thus formed the basis and genesis of ideas for the design project.

This ideological response comes in the form of self-sufficiency support structures, whereby inhabitants would construct their own environment to meet their own desires. Free from the constraints of capital labour, people could engage in free play, creativity and celebrate collective life, thus potentially overcoming the alienating and fragmenting forces associated with the conditions of modernity.

However, prior to the development of the design, the problem of materialization and the huge amount of capital required to realize any utopian proposal such as this is confronted. New opportunities are found within the detritus of capitalist consumption-Waste.

A speculative theoretical position is then taken up, exploring the potential opportunities, implications and limitations associated with building with waste. This discovery reinforces the ideologies embedded within the theoretical design propositions and gives further definition to the design project.

The sheer quantity of waste produced shifted the design project into a large scale speculative proposal for the growth of a new 'waste city' within the existing metropolitan area. It was through this shift in scale that the design project finds fruition and begins to respond, to some degree of entirety, to the conditions of crisis we face in modernity today.

Intention

Through a re-engaging of the utopian thought and ideas, I believe architecture can be empowered by the virtue 'imagining' of what might be possible. It is through this process of imaging and envisioning that architecture is able to engage fully with the notion of social transformation and radical change, albeit on a theoretical design level.

> *"It is only by revitalizing the utopian tradition that we will be able to fuel a critical reflection that will help us to act as conscious architects of our fates rather than as helpless puppets of the institutions and imaginative worlds we inhabit."*

In light of this statement it is the intention of this thesis to evoke ideas and possibilities around the possibility of change and how it might architecturally unfold. In this sense the research does not conclude with design, but rather uses design to unpack and test the ideas which were born out of the theoretical and technical investigations.

A Note on the Structure of this Document

This document is divided into three sections. **Section I** deals with the philosophical and social issues of the thesis, which forms the background to the project and the theoretical context from which the project emerged. **Section II**, responds to issues raised in the first section, looking at material technological opportunities and begins to give the design specific direction. This section serves as an informant to the technical and spatial design response. While section I and II originated as stand alone papers in the first semester of this year, **Section III** deals with the spatial response to the ideas, issues and opportunities conceptualized in both of these papers, and hence their inclusion, albeit slightly edited, within this document. The bulk of these ideas are brought to light in the conclusion to Section I and then explored further in Section II. A synthesis of the two sections is then outlined in *Part 3.0. Description of the Design Project*, which forms the introduction to the design project.

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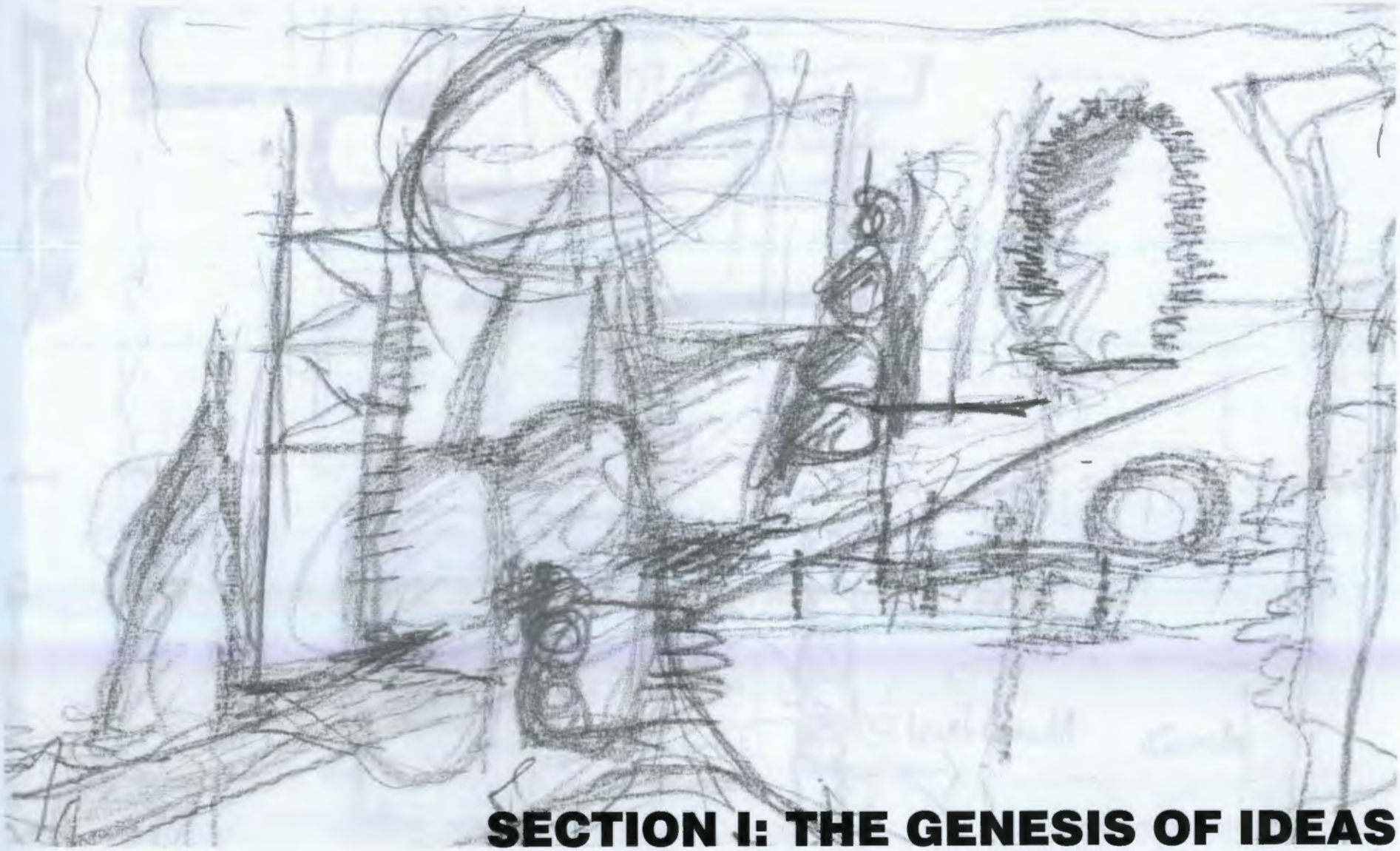


SECTION I: THE GENESIS OF IDEAS

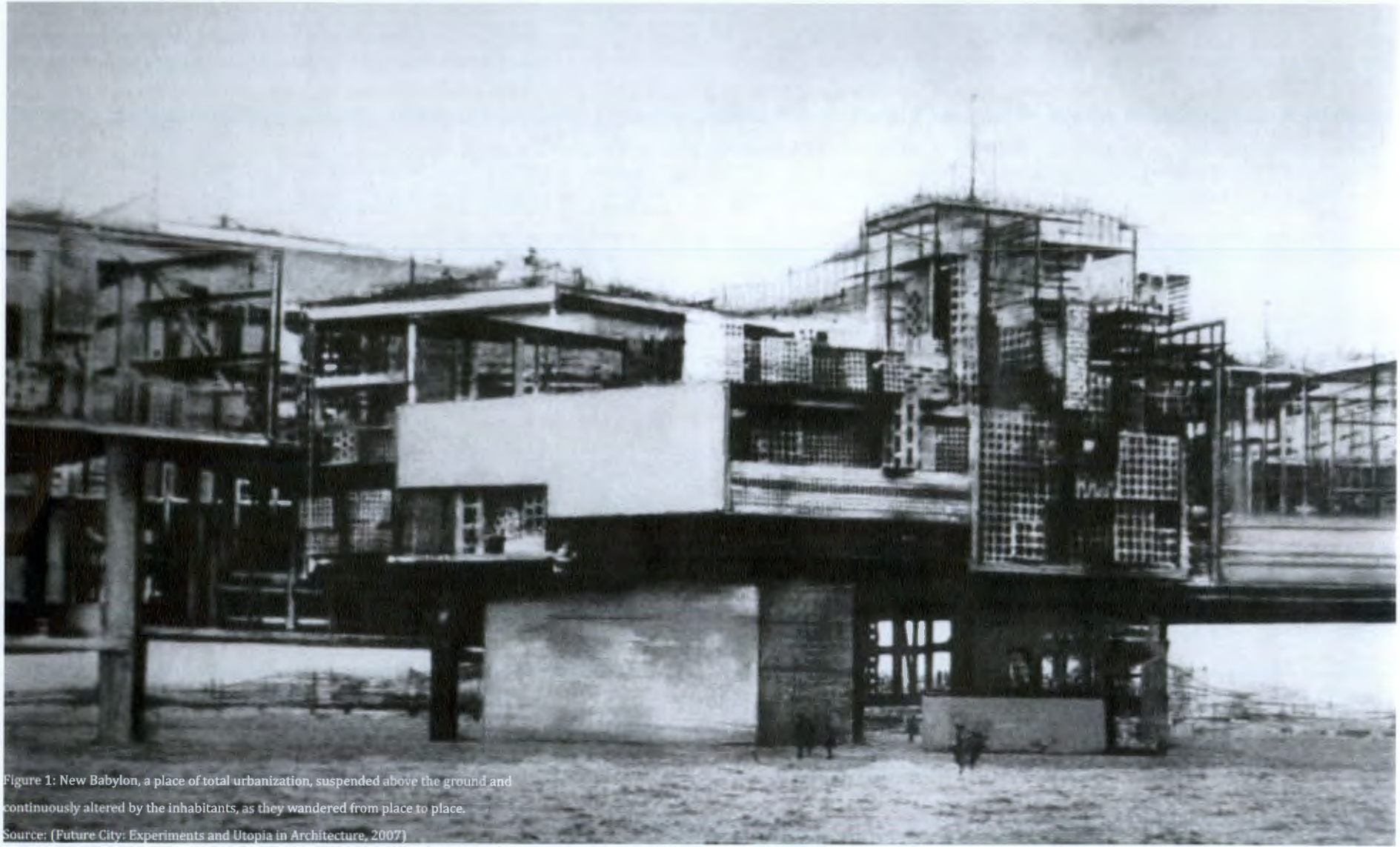


Figure 1: New Babylon, a place of total urbanization, suspended above the ground and continuously altered by the inhabitants, as they wandered from place to place.
Source: (Future City: Experiments and Utopia in Architecture, 2007)

1.0. REVISITING UTOPIA: INTRODUCTION

This paper evolves out of a fascination with the visionary work of Constant Nieuwenhuys' New Babylon and its attempt to portray an alternative way of living within the conditions of modernity. Given the state of crisis we are confronted with both globally and locally I feel that the notion of utopia and how we begin to imagine a better future to be of utmost importance. The pretext to the paper highlights the, the *poverty of experience* one is confronted with under the conditions of modernity and the consequent complexities this brings to ideas surrounding dwelling, meaning, architecture and the processes of modernization itself.

These issues are then contextualized within the crises which face society at large and the local South African population, ultimately begging the question of how we can begin to imagine and design alternative ways of living which challenge the prevailing status quo and address the state of crisis with which we are faced.

The complexities of modernity and modern architecture are brought to light by establishing, the architectural position of Ernst May, as one of the major contributors of embodying the principles of modern architecture within built form, with a distinct pastoral utopian program. Through juxtaposition with the work of May and the critical positions of Ernst Bloch, Manfredo Tafuri and Theodore W. Adorno the problematization of modern architecture and its utopian attempts to bring about social transformation is brought into fruition.

The critique ultimately concludes with the notion that modern architecture failed to acknowledge the inherent contradictions and tensions embedded with the different attitudes towards dwelling, the processes of modernization and the developments of capitalism, thus seeing the decline of utopian hope.

Despite the apparent tragic state within which the work results Constant's New Babylon and the work of the Situationists brings new opportunities for exploration to the utopian debate, in their attempts to confront the functionality of modern architecture and the tensions associated with utopian projects.

From here a new framing for utopia and a redefinition of dwelling is proposed under the guidance of David Harvey's spatio-temporal utopianism. It is here which we begin establish an appropriate response with respect to the questions

and issues raised around the complexities of modernity and current conditions of crisis. It is here which we can begin to formulate a design premise, by utilizing the latent possibilities embedded within the crisis itself.

These latent possibilities, and indeed the hallmark of a capitalist consumer driven society, come in the form of wastes. Out of these wastes we can begin to establish a realizable, alternative way of living which transcends the dominant order and has the potential to fuel critical reflection on the status quo by the possibility of creating new spatial praxis and new ways of producing architecture.

1.1.PREMISE AND ISSUE

a. Emancipation and Liberation? The Double Edged Sword of the Modernity

Emancipation and liberation are no doubt the catch words of modernity which have been etched into the minds of society ever since the mid 18th century-Mobility, communication, mass production, housing, urbanity and the metropolis. Alienation, fragmentation, isolation, homelessness, loss of meaning, passivity and illusion-The attractive promise of emancipation and liberation offered by modernity has been a double edged sword. Upon reading Hilde Heynen's seminal book *Architecture and Modernity: a Critique*, I was for the first time, consciously confronted with the difficulties humans face in dwelling in a meaningful way within modern society. These notions of fragmentation, isolation, homelessness and a loss of meaning in daily life which she describes, as put forward by Walter Benjamin et al. were ideas which were at once both foreign and resonant within in me; foreign because I did not fully understand the extent of their meaning, and resonant because I have partially felt in a way or another these feelings in my own life.

Benjamin's ambivalent attitude towards the promises of modernity and the prospects of modern architecture, aptly describe the notion of the double edged sword. While on the one hand he saw great opportunity for the prospect of modern architecture, particularly in the glass and steel boxes which he saw as an authentic expression of the beginnings of creating a classless society, at the same time he saw the same glass boxes as a representation of the 'poverty of experience' of modern life(Heynen, 1999). The statement 'poverty of experience' was by no means optimistic, and represented a nostalgic yearning for the past and a more traditional way of life.

b. Dwelling, Modernity and Utopia

Heynen brings to light the dilemma between the pastoral (nostalgic-utopian) and counter-pastoral (radical-critical) responses of architecture relative to modern society. The pastoral view best represented by Heidegger and Norberg-Shulz, who abandon the liberal and emancipatory aspects of modernism and define dwelling as that of a traditional life, a sense of rootedness and a mythical connection to the divine. They view architecture as that which should strive to overcome the fragmenting and alienating qualities of modern life. On the other hand Massimo Cacciari refuted this claim to dwelling, he argued that due to the disconnection between man and nature, as brought about by modernity, that poetical dwelling as defined by the former was no longer possible. Cacciari saw the glass boxes as described by Benjamin as a concrete negation of dwelling and thus a better representation of the conditions of society relative to modernity.

The tension between the pastoral and counter-pastoral attitudes towards dwelling has been a recurrent trend throughout modernity, and in many cases it becomes difficult to separate the two. Benjamin's ambivalent attitude illustrates the difficulty architecture faces in confronting these complex conditions of modernity, dwelling and its relationship to society and social structures at large.

The notion of dwelling as I understand it could, today, be re-interpreted as the meaning or lack thereof humans develop through their personal existence and presence on earth and in turn within modern society, a relationship which is in some way mediated and sometimes challenged by architecture.

Given the feelings of isolation, fragmentation, alienation, homelessness, and loss of meaning, one could say that the modern condition is defined by a situation of crisis. This state of crisis is the condition which the social project of modern architecture sought to confront as a continuous search for the total emancipation, liberation and freedom of society which, paradoxically, it was always hoped modernity and modernization would bring.

This search within the context of this document is defined as a search for utopia. As I understand it, reaching this idealized version of a utopian state would reconcile the loss of meaning and poverty of experience which Benjamin spoke of.

In this sense utopia is understood as a project which aims to affect social change through a projective alternative vision of the future which challenges the status quo. However in dealing with real world conditions of crisis, utopian thought attempts to address not only the philosophical underpinnings of human existence but must also deal directly with the very real day to day problems faced by society. As I will illustrate, the two conditions are inherently intertwined.

c. Passivity of the Masses

Figure 2: The society of the Spectacle.
source:(Society of the Spectacle, 1983)

While it is clear from the previous section that the conditions of modernity bring with them a state of crisis within society. The notions of alienation and fragmentation as defined by Benjamin are no doubt still present with us today. While I don't claim to have experienced a loss of meaning or a nostalgic yearning for a more traditional way of life, I do believe that we have just about lost all meaning in our daily lives. What I find so intriguing about Benjamin's view is that it pre-empts the present societal condition of advanced capitalism and mass consumption. That because of the poverty of experience which society was faced with, and the loss of meaning, and inability to fulfill our own desires we were required to find meaning elsewhere. This meaning came in the various forms of representation found within capitalist consumer culture.

Our current societal condition can be defined by the consumption of novelty as we continually reach out for more products, more fashion, more TV, more food, more information, more images, more branding, more shopping, more houses and more everything of anything. Life has been reduced to what Guy Debord called the society of spectacle, where all life's experiences are reduced to different forms of representation. We no longer live direct lived experience but experience life through representation and reproduction(Heynen, 1999) . Debord's view is reflected in the writings of Lefebvre where he states that modern life is characterized by a feeling of alienation. The production of individual lives, whether it is in the workplace or the home and even individual desires are all controlled by the capitalist driven society within which we exist. (Heynen, 1999)

This control of capitalism has lead us into a state of passivity where we are unable to question the meaning of our existence but rather prefer the 'amnesia of sleep' created by false feelings of cultural unity and identity through the meaning and attachments we develop with the illusory qualities of consumer 'stuff'. As Lebbeus Woods points out in making reference to Aldous Huxley, that the way to control people is not with pain, but rather through pleasure, '*the consumer waits to be pleased and in this way is continuously pacified.*' (Woods, p. 15)

The capitalist promise of freedom and liberation appears to have all but diminished as we are now reduced to passive consumers. Rather than being free to do what we want, our actions are reduced to a series of likely probabilities within the given constraints which govern our lives.

d. Local Crisis

This state of pacification would not be of much concern were it not for our present condition in South Africa and indeed much of the global south. While the pacification of the masses resides in the global discourse of modern society, its effects are far worse within the South African post-apartheid context. There is no doubt that the lure of capitalism and the free-market economy is not doing much to assist the majority of South Africa's urban poor as the margin between rich and poor continues to grow.

People experiencing conditions of homelessness, poverty, hunger and major inequality is common place and the numbers continue to grow at a rapid pace. The process of rapid urbanization compounds this issue further as poor people move into cities from impoverished rural areas at a rate that the market simply cannot keep up with housing demand or employment opportunities. I believe that if we continue with the status quo of a typical developmentalist approach towards these issues that the future cities of the global south will be characterized by slums and poverty.

Further to this is the current ecological/environmental crisis within which we find ourselves. Indeed it is the poor who will suffer the effects of this the most. As resources diminish and demand increases, the poor are faced with increased costs of services such as electricity, water and sanitation. The devastating effects of climate change and disaster can be relatively easily adjusted to by countries and people in a position of power and money, while the urban poor would prove to be less resilient. The effect of droughts, flooding, and other natural disasters has a far more devastating effect on the urban poor than on the wealthy, both due to the instability of built infrastructure and institutions as well as the inability to repair and rebuild due to lack of access to money and in turn resources.

The urban poor are affected in much the same way by the global economic downturn, as companies downscale, budgets are reduced and infrastructural projects are postponed or cancelled in order to meet profit margins and keep their businesses afloat. As Edgar Pieterse points out, we are presently facing both of these issues, recognizing that the '*grim future is born out of confluence of the globalised economic and ecological collapse that is fast becoming the defining feature of the 21st century*'. (Pieterse, 2010, p. 13)

In the darkness of this current crisis, I believe it to be more relevant than ever to raise the utopian debate and begin to imagine and explore alternative ways of living and modes of spatial production which challenge the prevailing status quo and address fully the state of crisis within which this status quo has positioned us.

Recognizing the failure on the behalf of modernization and modern architecture to bring about utopia, while taking into consideration the issues of crisis with which we are currently faced, the questions we should be attempting to answer are as follows:

How did modern architecture fail to deal with the complexities and contradictions associated with the modernity and modern society?

Taking these failings into account, how can we redefine the notion of dwelling and utopia within the context of modernity today?

How can this reformulation be utilized in order to put forward alternative propositions around the notions of utopia which begins to address the conditions of crisis with which we are faced?

How can architecture bring about/support/propagate/materialize these reformulations of a utopian ideology?

1.2. LESSONS FROM HISTORY

a. Capitalism Reigns Supreme: The Disintegration of Utopian Hope

This section aims to highlight the different but interrelated trajectories around the issues raised earlier, namely that of dwelling, modernity, architecture and utopia. It must be noted that the foregrounding for the following positions is based on the notion that the process of modernization is largely associated with the development of the metropolis (urbanization), and as we will see, the progression of capitalist society.

Drawing on Sarah Williams Goldhagen and Hilde Heynan there appears to have been two dominant responses towards the project of modern architecture, both of which aimed for new beginnings but differed fundamentally on their intended outcomes. Firstly, and what has been termed a programmatic response, proposes that the new architecture is first and foremost a project, a project which has the inherent ability to bring about social change, and in turn define new traditions and new cultural and political practices. (Heynen, 2003)

The second approach which was aligned with the processes of the avant-garde, understood the idea of a new architecture which would form a constant destruction of the present and a negation of the past paving the way for a new, ever-changing environment which would call for continuous innovation and redefinition of the modern condition. Hilde Heynan defines this as the transitory qualities of modernism dealing with the changing aspect modern phenomena as opposed to aiming for a new tradition . If there was to be a new tradition (Heynen, 1999) within this transient frame it would be defined by a process of continual change and re-invention.

While both responses challenge and attempt to destroy the status quo of political and cultural practices of society, they are also paradoxically entwined with these practices since they utilize the then current phenomena as grounds for developing new praxis. This relationship as I will indicate later has important consequences. While it may be that the transitory does not attempt to give definition to the future but only seeks to destroy the present and that the programmatic response attempts give a definitive order, I understand both approaches to have utopian intentions, since they are both seeking the new in order to transcend the prevailing order.

Figure 3: Orderly, sober façade. Blocks in Westhausen by Ferdinand Kramer. Source: (Architecture and Modernity: A Critique, 1999)

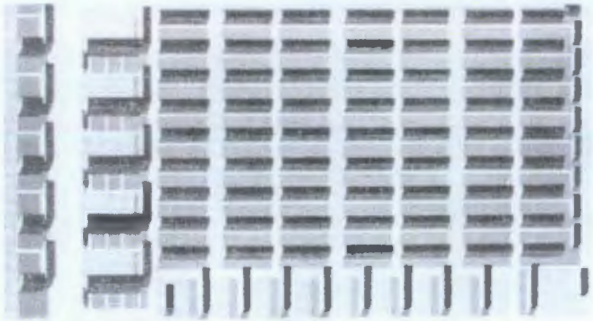


Figure 4: Abstract and rational. Axo of Siedlung Westhausen. Source: (Architecture and Modernity: A Critique, 1999)

The built works of Ernst May and his associates, during his term as the Head of the Department of Housing in Frankfurt in 1925 and the few years following could be described as one of the most significant, programmatically utopian attempts for societal reformation within the practice of modern architecture. It is true that the built work in Frankfurt was not as radical as the likes of Le Corbusier, in that they did not undertake a complete avante-garde stance of complete destruction of present values. The work nonetheless illustrates a relevant example of built architecture which, despite its best social utopian intentions for the needs of the collective, failed in its attempt at countering the social structures of capitalist production and bourgeois culture.

Clearly taking a pastoralist position, May understood the culture of the 19th century to have become corrupted and chaotic and that the people were under the threat to become slaves to technology and industry(Heynen, 1999). He did however see the war as an opportunity to bring about a new homogenous culture, which would destroy the class separation between the bourgeoisie and the working classes. In a clear attempt to fight back against the developments of capitalism, he aimed for a culture which was to be orderly and conflict free. Rationality and functionality were to be grounding principles of this vision. He rejected ideas of ostentation and excess and rather adopted an attitude of soberness, purity and truth, ideologically believing that if one's environment was to be built in such a way, that one would respond accordingly and thus create an environment of social order. This order would allow one to feel less alienated within society and thus create a more inclusive environment. By creating uniformity and homogeneity May hoped that it would translate into a society of equality and thus allowing for an equal amount of personal freedom (Heynen, 1999).

However it was the homogeneity of the projects which lead to their undoing. In the creation of an environment of uniformity one makes the assumption that all people are the same and therefore denies individuals the right to choose and in turn denying them their freedom. (This being a typical difficulty facing utopian projects)

There is also an underlying paradox in the work of May and its relationship with capitalism and his use of technology through standardization and industrial building products. The use of technology is a direct response to the logic of capitalism as the two are directly intertwined.

Further to this, Juan Rodriguez-Lores and G. Uhlig argue, that the result of May's attempt at reformation resulted in the working classes simply to become integrated into bourgeois capitalist society, by giving them living spaces which were associated with bourgeois fashion and values. Through the provision of a house one is empowered with the ability to acquire commodities as the house becomes an envelope for their storage, a process which Martin Pawley describes as embourgeoisment (Pawley, 1975).

The project ultimately failed in its attempt for societal reform because it was considered to be anti-urban attempting to embody the values associated with traditional village settlements. It did not acknowledge the real problem of the city, that being the '*increasing commercialization of the city centre.*' (Heynen, 1999 pg. 69)

Further to this criticism but directed more widely at modern architecture in general, or what had been termed the *New Objectivity*, is the opinion of Ernst Bloch. What is revealing about Bloch is the fundamental connection he makes between capitalism and the *New Objectivity*. He argues that all modernist architecture did, was glorify capitalism, through the progression of bourgeois culture and the constant use of new technology and new industrial products. The cool, sober, unadorned buildings he saw as mere fashion, which simply projected the emptiness and 'hollowness' of the present. Functionalism he argued was simply that which supported capitalist culture and thus upheld the status quo. (Heynen, 1999)

Reflecting values propagated by Adolf Loos, Bloch favored values of warmth and security over transparency and openness. Bloch believed that the current fascist world of the outside had nothing to offer the interiors. The only way to imagine a utopian future for Bloch, was to deny any direct reference to it, thereby creating a void, a void within which all hope could be filled. In acknowledging the void, he argued, the vision for utopia takes on a critical function. This criticality was found in expressionism and montage. Aligning himself with artists such as Franz Marc and Wassilly Kandinsky, he promoted an architecture which would ignite the emotions. Rather than covering up the old with the new, one would combine fragments of the past together with the present, thus bringing new meaning to the past while simultaneously critiquing the present (Heynen, 1999).

> *This method has all the negative features of the void, but indirectly it also potentially contains something positive: the fragments can be used in another context to create something that works contrary to the normal order.* (Heynen, 1999)

Despite his disdain towards the hope of the *New Objectivity* creating a new society, Bloch's thinking was fundamentally utopian. He believed this utopia would be found in what he called the *Heimat* or the Homeland. This homeland he argued had not yet been found, but was suspended in the future. He combines this utopian image of the *Heimat* with references to the past through ornament. Bloch describes this reference as less of a reference to the past than that of the 'other', the other that we cannot or do not know fully.

From this it becomes clear that Bloch views utopia as something which is momentary and fleeting, suspended in emotion of the present and memory of the past one can make a connection to the other and thus reveal hope for a utopian future (Heynen, 1999). Bloch's view on modernity and dwelling can be defined as both pastoral and counter-pastoral. While on the one hand he clearly aims to critique the poverty of the present conditions by 'exposing the cracks' and 'revealing the void', his references to the past and his notion of homeland can only be defined as pastoral. While he claims that the homeland is something which is yet to be found, he would have to utilize his own memory or vision of what this might be like through his emotional connection to the utopian moments he has experienced in the past. Through the understanding of Bloch's fleeting and momentary view of a possible utopian condition we can see that Bloch takes on a transitory view of modernity.

What is important here though is the difference in thinking between Bloch and Benjamin. While both acknowledged the poverty of current experience, Benjamin believed that the *New Objectivity* or 'new barbarism' had the potential to bring about change and thus emancipation and liberation. Bloch had no such hope. I believe the central tenet to this, is the issue of functionality and rationality. Bloch argued that the spaces of the New Objectivity were so abstract that people did not know how to inhabit them, but because of their functionality and rationality, the existing patterns of behavior were simply able to continue, as the spaces did nothing to challenge current spatial behavior and social orders.

Thus we see modern architecture become a watered down version of its original intentions, becoming subsumed into style and fashion. Modern architecture viewed in this sense, merely became a new vehicle which could be utilized for the perpetuation of the existing capitalist values. Lebbeus Woods, many years later, shares a similar view:

> *I've come to believe, from that experience and a lot of reflection, that modernism was a failed movement because it did not deliver on its promises of facilitating social change through a new architecture. Instead, it was classicism dressed-up in new clothes.* (Woods, As it is, Interview with LW: 2010)

Tafuri shares similar sentiments to Bloch with respect to the complicit relationship between modern architecture and capitalism, except Tafuri goes beyond criticism of functionality and rationality and takes a critical stance towards the artistic movements of the historical avant-garde relative to the former two.

Tafuri understood that the task of the avant-garde was the negation and destruction of present values in order to seek out the new. He describes the dialectical relationship between the avant-garde and capitalist production, by revealing their operative and structural similarities. Hilde Heynen describes the task of the avant-garde to 'extol the chaos of the present and seek new order', and in so doing 'trivializing the shock experience that is typical of the new, rapid tempo of urban life.' But this existing chaos is a result of the ever- increasing 'rationality' of the system which the avant-garde was attempting to destroy.

Thus in destruction of the present and the creation of the new order, it simultaneously reproduces a new chaos which perpetuates out of the intended new order which is inherently connected to the existing rationality. The avant-garde thus paves the way for the progression of capitalist society. Progression and the new are essential elements for the development of technology and modern capitalist society and in turn modern architecture. This is because capitalism functions on the depreciation of existing values which must then be replaced by new values. The avant-garde Tafuri argues was necessary and essential to the development of capital society (Heynen, 1999). The destruction of the present

has always been understood as the way of creating something new and in turn creating the conditions for progress.

Thus capitalism can be defined as state of crisis succeeded by crisis. It is required that it destroys itself in order to continue its own progressive existence.

> *Far from undermining capitalist development and the power of the bourgeouisie, the avante-gardes in both their constructive and destructive guises presented by Tafuri as collectively functioning as a means of educating and energising those dominant interests, naturalising the conditions of the industrial city and enabling the ever more effective modernisation of capitalist society.* (Pinder, 2005)

What we can conclude from this is that Tafuri saw no hope in fabricating any kind of improved future, since any critique or destruction of the present would continuously allow for its progression. For as long as utopian projects continued their search for a new order and new rationality over the prevailing chaos, it was clear that they would merely contribute to the existence of the capitalist status quo.

One need only look at the rise to fame of the supposed 'avante-garde' now branded architects of the last decade to see the adaptiveness of capitalism. Or more recently the way it has adopted the 'green movement' for its own purposes. While it initially appeared as though it presented the ability to dislodge capitalism, it has now become a clever marketing strategy, to promote just about anything under the title of *green*.

From the discussions of May, Bloch and Tafuri it becomes clear that the continuous attempts to restore a semblance of order and rationality in attempts to embody the essence of the era, were what lead to the continuous perpetuation of chaos and crisis.

Adorno's Dialectic of Enlightenment clarifies this issue further and is somewhat similar to Tafuri's dialectic of the avant-garde. The *Age of Enlightenment*, defined by a shift within the basis of thinking, moving from a mythical standpoint to a position of rationality and reason, in order to justify and legitimate thought and action and create an order within the

world as opposed to mythical chaos. Hence the other name given to it as the *Age of Reason*.

However Adorno claims that in attempting to define the world by rationality and reason, a system was setup which ended up at its own opposite, that of myth and chaos, the very conditions which it was attempting to overcome. Thus proving that the system of rational thought in itself is actually irrational. But in order for the system to continue to legitimate itself, rationality and reason had to prevail in order to continually attempt to justify and understand itself. Adorno refers to this condition as instrumental rationality. The process of modernisation and in turn capitalism shares many of the same qualities as instrumental rationality and it is for this reason which we are lead to believe there is no alternative to today's crisis.

So while the pastoral-programmatic response of Ernst May simply allowed for the existing order to continue, we see too that the counter pastoral-transitory approach of the avante-garde simply destructed present values only to pave the way for the perpetuation of a system which requires this destruction in the first place. On the one hand this reveals the adaptability of capitalism and the process of modernization to appropriate new values in the face of its own destruction, a notion which has crippled utopian thought. On the other we see the failure of modern architects and artists for that matter, to take into account the ambivalent attitude of Benjamin, who I believe recognised that it was not simply a case of pastoral or counter-pastoral, but that their was an inherent tension between the two conceptions which could not be resolved by simply choosing one and not the other.

It is obvious that this critique applies a rather monolithic character to the failings of modern architecture to bring about social change and omits many other reasons for its shortcomings and in some instances its successes. This is done in order to highlight the intention of demonstrating the way in which modern architecture and utopian intentions faced repeated difficulty, whose hoped intentions were often at odds with the progressive conditions of modernization, the development of cities, technological advancements and the power of capitalism.

b.The Situationists and Constants New Babylon

Figure 5: Inhabitants of New Babylon engaged in free play.

Source: (Future City: Experiments and Utopia in Architecture, 2007)

Well aware of the way in which rationality and functionalism was ending up at its own opposite, were the members of the Situationists International. Clearly operating from within a socialist Marxist perspective, the Situationsists reacted almost anarchically against the totalatarianism and the abstract functionalism of the prevailing system. The Situationists deemed the rational and functional urban planning and architecture of Postwar Europe to be both a banal and abstract concept which did not relate to individual human needs, but rather merely functioned as a means of providing efficient circulation of people and cars (Sadler, 1999).

In recognising the way in which the system of instrumental rationality leads to a state of pacification and the *society of spectacle*, as discussed earlier, the Situationists advocated an urbanism of irrationality, expressed individuality and indeterminacy. Opposing the dogmas of the capitalist system dominated by the task of labour, they proposed an urbanism of freedom, creativity and play. They proposed a revolutionary urban movement which was intended to:

> *...promote a participatory environment that would dislodge the passivity of the capitalist economic spectacle through a permanent transformation of urban locales.* (Lebas and Kofman in Non-plan, Sadler:2000)

In his project for New Babylon, Constant Nieuwenhuys (known more widely simply as Constant) presented the concretization of the Situationists alternatives to the passive society of spectacle. Constant presented a world in which the technological means of production had become so advanced that all humans would be free from the constraints of tiresome labor, and could therefore dwell in a constant state of creativity, play and freedom.

New Babylon was the epitome of the hope associated with modernity. It was a situation of absolute emancipation and liberation where human beings were able to 'fulfill their destiny as creative beings in accordance with their deepest longings'(Heynen, 1999).

Inhabitants would alter their own environment on a daily basis and drift from place to place in a constant state of play. It was through the creative act of participation and play in the production of space which gives the Situationists work and New Babylon its power. Recognizing that people were no longer able to dwell in a traditional pastoral sense, but had

subsequently lost all sense of meaning through the culture of capitalist consumption, they sought to bring new meaning by offering new spatial alternatives. This meaning was to come from the ability to engage in creative and playful activities both collectively and individually which were not produced by the illusions of capitalism, but were self fulfilling entities of existence in their own right. In other words they were constructed out of individual and collective desire as opposed to meeting the requirements of a system.

New Babylon was in essence a visual version of Walter Benjamin's vision for a classless society. I believe Constant to have had a similar attitude of ambivalence towards modernity as that of Benjamin in that he embraces the transitory aspects of modernity (change, destruction of tradition and norms etc.) in order to meet programmatic ends (utopia). The project is also both pastoral in its intended outcome, that of a mythic connection of fulfilling our deepest yearnings, but in reaching this outcome it reveals its counter-pastoral nature (it becomes a critique of its own conditions). It is here that the tragedy of New Babylon is revealed and Benjamin's cautionary attitude of ambivalence towards the emancipation and liberation offered by modernity should be given recognition.

In achieving what was envisioned as a classless society, where people were able to wander from place to place in a state of complete mobility, free play and creativity, Constant recognized that this sense of rootlessness and constant state of disorientation and indeterminacy, due to the constantly changing surrounding environment would not be a desirable condition. And in fact would become a place of total isolation and alienation-the very conditions which he was attempting to overcome.

Further to this as Hilde Heynen points out that a great deal of force would be required in order to coerce people into to the conditions which Constant was proposing. If Utopia is understood as a condition of total emancipation, liberation and freedom then it would appear that New Babylon ends up at the opposite of its intentions.

While the Situationists and Constants New Babylon could be understood as the polar opposite and indeed a critique of modern architecture and planning and its complicit relationship to the destructive forces of capitalism, we can also see

Figure6: New Babylons, tragic character is visible in the drawings by Constant. A place of isolation and disorientation. Source: http://boiteaoutils.blogspot.com/

operative similarities between the two visions. Both New Babylon and modernism in general shared a totalizing vision for the future, the complete destruction of present values in the search for new values, a total urbanization of the planet and the constant faith in the opportunities afforded by technology. But despite this similarity in operative language the Situationists and New Babylon painted an entirely different picture to that of their utopian predecessors, and this is something which should not be overlooked.

New Babylon should not be seen as a failing similar to that of modernist utopias as the projects tends to open the debate of an alternative rather than close it down. One can draw on many points from New Babylon which attempted to address the failures of previous modernist utopias and the issues raised by Bloch, Tafuri and Adorno. Most notably was the way in which both the Situationists and Constant illustrated visions for a world which was free from the constraints of labor and capitalism, thus precluding any opportunity for the continuation of the status quo and the production of bourgeois capitalist culture. They did not merely offer a new spatial alternative of purist abstract forms, but envisioned an entire restructuring of society through both social and spatial processes which were embedded within the practices of modernity itself. It was not either-or but both-and. They did not advocate fixed forms but opted for a state of indeterminacy within which participants or inhabitants would be active in the making of space. In doing so people would be actively engaged with each other as they negotiated this process of space making.

Thus naturally this utopia would not be without its own problems but would rather be a place of contestation, through which conflicts can be resolved. As David Pinder points out, it was the incompleteness, indeterminacy, and the participation of the inhabitants within the production of space which allows the opening up of the difficulties facing utopian thought (Pinder, 2005).

Debord illustrated in his book *memoirs* that '*It is not enough to want to create new cities so that as a result all problems are resolved.*' (Pinder, 2005, p. 257). Through this spatial openness New Babylon attempted to imagine spaces which would not reproduce the current orders and notions of control it sought to overcome while simultaneously attempting to embody new values and desires, a world of free play and creativity.

1.3. PERSONAL POSITION

a. Reframing Utopia

With a global culture of passive consumers, a local situation of inequality and crisis, the destruction of the natural environment, the illusory qualities of modern consummative living and the resultant loss or lack of meaning we develop through the unified identity we form with these illusions, it is evident that we are in a rather desperate position. Our continued utopian faith in the processes of modernization has not brought emancipation and liberation to everybody everywhere. As I have illustrated this faith in modernization and the development of technology and processes associated with urbanization appears to be the very thing which has been continuously worsening our plight.

The recent decline of utopian thinking, that of the potential of architecture to bring about social change, and bring forth the notion of emancipation and liberation is not without reason. The failings of the modern project of architecture, and its inherent relationship to capitalist production and the difficulty utopias face with their inherent notions of authoritarianism, totalitarianism and control, seems to be reason enough to shelve the utopian debate.

But then where does this leave us? Are we not then left in a permanent state of crisis and despair, continually responding like puppets to the dominant order of the current system? By continuing the status quo do we not deny the very essence of what has led us into the state of crisis in the first place?

Or can we not imagine alternatives which begin to establish a spatial practice which transcends this dominant order and begins to address the situation of crisis we are faced with? Given the difficulties facing utopian thought it is necessary to reframe the utopian process in order to better position ourselves in imagining realizable alternatives.

The fact that the utopian projects of modern architecture ended up paving the way for the continuation of capitalist culture is not unique. David Harvey, in his book *Spaces of Hope*, brings our attention to more recent examples of materialized utopias and the reason why they end up being subsumed into the prevailing order. To illustrate this he brings our attention to the utopian vision of new urbanism.

Typically new urbanism attempts to bring about social change through good principles of urban design that of collective memory, a sense of belonging, a good sense of community, quality public place-making, mixed-use activity, civic pride,

lively streets and ecological design principles.

The problem Harvey argues with this is that it brings about change for all the people who do not require it. The development of new urbanism is almost always upon Greenfield sites and requires large amounts of capital to build it. Thus the process of social change is short-circuited by the social processes which are required to build the development, that of capital, which then perpetuates the status quo of capitalist production. It does little to bring about social change for the masses but rather creates a series of interlinked happy enclaves which merely paints a picture of an improved suburbia(Harvey, 2000).

Thus the means (capital) which are required to mobilize the utopian vision are that which the vision sought to transcend in the first place. This is a fundamental problem in any attempt to build utopias, since they are almost always built within the limiting parameters of the prevailing order and thus always bares a complicit relationship to that which it attempts to overcome. This could be understood as an extension of the critique of modern architecture put forward by Tafuri and Adorno. David Harvey describes the scenario below:

> *The failure of realized Utopias of spatial form, can just as reasonably be attributed to the processes mobilized to materialize them as to failures of spatial form per se.*

But he continues to conclude that:

> *There is a fundamental contradiction at work here. Utopias of spatial form are typically meant to stabilize and control the very processes that must be mobilized to build them. In the very act of realization, therefore, the historical process takes control of the spatial form that is supposed to control it.* (Harvey, 2000, p. 190)

This then brings to the discussion the notion which Harvey refers to as Utopias of process as opposed to those of spatial form. Traditionally utopias give the spatial form onto which a particular order is intended to adhere. Harvey argues that the converse requires consideration if we are to formulate a proper conception for utopia today.

Social processes are typically understood to be temporary in that they constantly witness changing fluctuating conditions within a given social construct and are specified outside of any spatial construct. Capitalism is a utopian ideology within which in a perfected free-market system all social ills of the world would be saved through the trickle-down effect. This is obviously not the case as I have discussed earlier. This inequality is clearly reflected in the built landscape, seen most clearly in the contrast between informal settlements and elitist suburbs. Thus in the materialization of a utopianism of social process we see that it manifests itself in a spatial form.

What we can conclude from this, and this is seen as a positive for utopian thought, is that while it may be that the difficulties faced by spatial utopias can be attributed to the mobilization of the social processes which are required to materialize them, so too do utopias of process face the same difficulty through their process of spatialisation and the resultant inequalities reflected in their materialization(Harvey, 2000).

> *The utopianism of the free market necessarily produces a social order akin to free-market stalinism coupled with a world of accelerating income inequalities instanciated in the physical landscape as massively uneven geographical development of both life chances and human potentialities.* (Harvey,2000)

This then puts any spatial utopianism on equal grounds for consideration and critical comment as any utopianism of process. It does not become a case of either-or but rather both-and. Any utopian vision should thus attempt to embody both social processes and spatial form if it is to break free from this constraining contradiction. Harvey describes this as a spatio-temporal utopianism.

So while modern architecture, such as the work of Ernst May in Frankfurt, merely gave the spatial form and not the social process and expected inhabitants to respond to this form in order to bring about social change, New Babylon appeared to have given both. Thus the project talks in some way to Harvey's notion of spatio-temporal utopianism. As previously mentioned it ignited the transitory aspects of modernity in order to reach its spatial utopian ideal. The social processes which were in play at the time were embedded within the process of the materialization of the spatial form, while the

spatial form is simultaneously what guided and enabled by this utopian vision and new social processes to be imagined, that of a space of complete mobility, free play and creativity.

However as we have clearly seen in the processes of advanced capitalism, the development of advanced technologies to reduce labor capacities does not bring about a situation of increased freedom, as people are forced into unemployment, while the owners of the means of production continue to benefit and the margin of inequality increases. Thus it is unlikely to imagine that New Babylon would bring about any such freedom if the system of private ownership of land and the means to production was is left untouched(Heynen, 1999).

This is perhaps because Constant presented a totalizing vision of the future and does not leave clues as to how this utopian vision may have grown incrementally as a process out of the existing spatial configurations. He merely gives the end result of his envisioned process. Nonetheless the project gives valuable insights into imagining alternatives which attempt to embed both social and spatial practices within the materialization of the utopian vision.

b. Redefining Dwelling

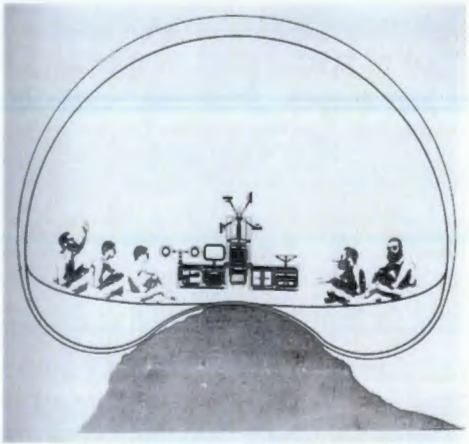


Figure 7: Banham and Dallegret's transparent inflatable dome, filled with media devices and inflated by the pressure of its air-conditioning, represented the rational organization of commodity consumption and the dwelling as a storage place for such commodities.
Source: (Garbage Housing, 1975)

While I do not think we experience a nostalgia as Benjamin describes, the notion of looking for something else within present day, something which *transcends the norm*, I believe to be ineluctable.

The notion of dwelling within a modern world is inherently bound up with forming one's own identity and thus defining one's own place within the world and creating a personal sense of belonging. Under the conditions of modernity however this has become impossible in the traditional sense as Hiedigger would have it. We are thus faced with what I described earlier as a poverty of experience, and the inability to fulfill our own desires. Hence we are forced to find meaning elsewhere. This meaning comes in the various forms of representation found within capitalist consumer culture. Given the illusory qualities of these forms of representation and the alienating affects they have on our lives, the way in which we dwell is characterized by corresponding illusions of meaning.

It is no coincidence that the notion of private ownership of land or the idea of the home is also defined as a dwelling, as it is in the home which one can claim one's own stake within the world and create security and seclusion. The house becomes the boundary between the self and the rest of the world. Ironically it is also the system of private ownership of land which has so easily allowed for such abundance of commodity consumption, as not only does the house take on the role of a storage envelope but it is also through the purchasing and the subsequent display of these commodities that the homeowner further establishes his/her own identity within this envelope.

While I don't deny the notion of making oneself a home as being important, in whatever potential form, I believe this incessant private ownership of land and the continuous expansion of the private home simply exacerbates our conditions of isolation and alienation. Can we not re-interpret this notion of making oneself at home, by finding the way in which difference is recognized between the self and the rest of the world?

While it may be a pastoral conception, the idea of creating one's own identity and the consequent formation of meaning, I believe to be fundamental to human existence and even more so under the conditions of modernity despite the contradictions and complexities it brings with it. It is this utopianism which we cannot deny. Yet the tension between the

nostalgic-pastoral and that of a counter-pastoral critical notion of dwelling must be reconciled if we are to make any progress in a utopian vision for the future.
But how can we reformulate this utopian notion of dwelling in order to transcend the current order which has, as I have clearly illustrated, repeatedly brought us into a situation of crisis upon crisis?

Referring again to Constant's New Babylon and the work of the Situationists, I believe a thematic undercurrent of their work lies in the ideas of collective life. Though more evident in his writings Constant placed particular emphasis on public space being the only place within which culture can develop. Culture of course is inherently bound up with identity and in turn meaning. The collective participation of people in the production of space and creative acts of play was, I believe central, to how Constant had hoped people would form meaning within their lives. As Raoul Veneigem a member of the SI stated in his book titled *The Revolution of Everyday Life* that:

> *In its chaotic underground development, the new society tends to find practical expression in the transparency in human relationships, which promotes the participation of everyone in the self-realization of everyone else. Creativity, love and play are to life, what nourishment and shelter are to survival.* (Veneigem, 1979)

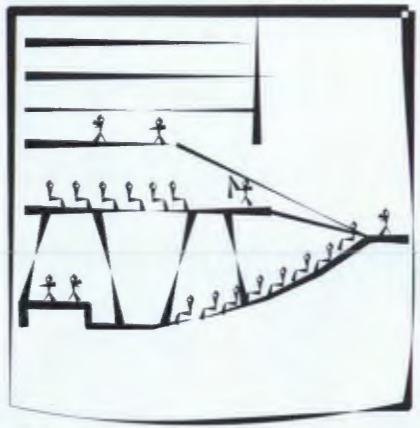
If we redefine the notion of dwelling to the idea of establishing difference between oneself and the rest of the world as being the primary way of forming identity, we can begin to begin to unpack a notion of dwelling which corresponds to the changing transitory phenomena of modern life, rather than being at odds with them. Hilde Heynen describes this notion as 'enclosing oneself'. Similar to the way in which we find security, comfort and identity within the home, the notion of enclosing oneself, is a self referential act within which by the recognition of the difference and similarities between the self and the rest of the world, we can begin to form personal identity and a sense of belonging within a collective. Dwelling viewed in this sense corresponds to both pastoral and counter-pastoral modern conceptions of the term.

Thus we can interpret dwelling as something which is not fixed or rooted to specific place and time but is something which is transitory and changing. Something which we can we can continue to develop and renew as we set out to establish our

place within the world. This renewal is not to come from forms of representation and the continuous consumption of commodities as it does now, but rather through the interactions, relationships, conflicts, associations, participation, play and creativity which are associated with collective life. These activities have the potential for occurrence outside and separate from the prevailing order and thus momentarily suspend the order in both space and time and immediately connect one to something else. It is here that we can begin to see a notion of dwelling and meaning which begins to transcend the dominant order of today.

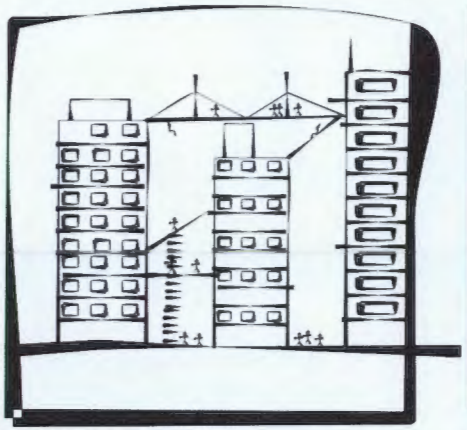
It is through the recognition of difference and similarity between self and others that we can begin to form this continuous renewal of identity, dwelling and a sense of belonging.

The cartoons presented on the following pages give a diagrammatic illustration of architectural possibilities, in the form of interventions, which begin to address some of the ideas raised in this section and the previous sections, within a city context. They are intended to address the notion of how we begin to utilize these new notions of dwelling to contest the status quo and serve evocations around the ideas of creativity, play and new forms of meaning arising from collective life and new spatial relationships and programs. Please note that I use the terms free-play and creativity quite loosely and could be interpreted to mean any number of activities associated with the desires of people who are free enough to take part in just such activities.



what if performance, space and public creatives could form part of the urban public domain?

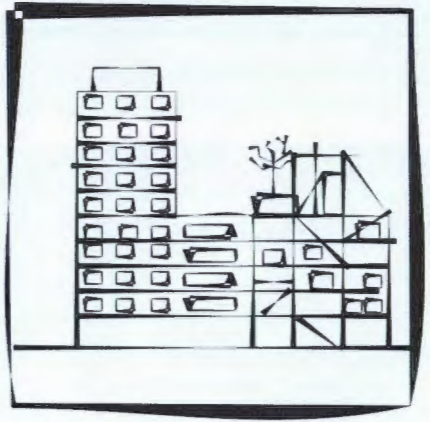
what if buildings were unfamiliar and non-sensical,to the visual registration of program.



what if additional 'planes' could create public/event/play/creative space in the sky?

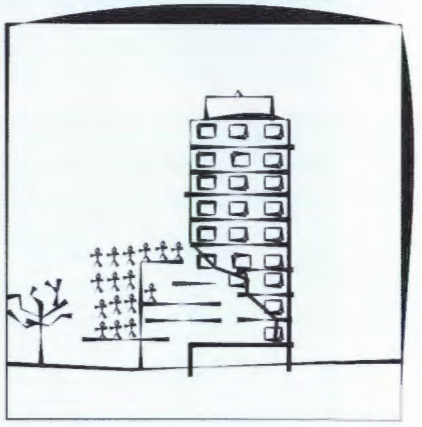
what if we programmed all buildings towards the collective?

what if we explore the absolute minimum of privatespace, allowing space for collective creativity and play?



what if building could be left partially incomplete for future unknown uses and for the formulation of new spatial praxis?

what if buildings created spaces which we do not yet know how to inhabit?



what if an intervention could begin to erode capitalist values within the perceived spaces of the city?

c. Utopian Alternative Found in Waste

How then can we imagine a utopian vision which embodies a notion of dwelling which encompasses both the transitory aspect of modern phenomena while still maintaining the pastoral appeal of dwelling and forming one's own identity and meaning through collective life? How can this be done without reverting into some form of nostalgic appeal for harmony, order and unity-aspects which are clearly at odds with modern society? How can it maintain a critical notion towards existing society and capitalist consumer culture? How do we build spaces which we do not yet know the activities which might occur? How can it embody both social temporal processes, while giving at the same time a spatial form? How can this spatio-temporal form begin to address the inequalities and conditions of crisis we are faced with in South Africa?

I believe the answers to these questions should come from within the conditions of our existence and should not be external to it. We cannot destroy existing values only to allow for the perpetuation and continuation of the dominant order as seen with modern architecture and the avante-garde. (The current RDP housing model reflects to a notion of creating the new, this is typical of a western developmental approach.) To destroy and begin anew means only to deny the very conditions which brought us into this state of crisis. For it is our existence which has created these issues and therefore we must find ways of addressing these questions from within latent possibilities and resources embedded within our society.

By extracting, subverting and inverting existing praxis we can perhaps begin to turn situations of crisis into situations of opportunity. For without the crisis there would be no need for intervention. Indeed architecture in its materiality should embody the very essence of this crisis.

> *The seeds of revolutionary transformation must be found in the present; no society can launch upon a task of radical reorganization for which it is not at least partially prepared. On this basis we can hope to "grow" an alternative spatio-temporal utopianism out of existing spatio-temporal processes and their internal contradictions.* (Harvey, 2000)

Taking a look at the operative processes of modernity, development, technology, capitalism and consumption and the way in which they unfold, they can be defined simplistically as continuous destruction of the present to make way for the new. This process of continuous change, as I have illustrated, is one of the hallmarks of the processes of modernization. But this process of relentless destruction of the present and its materiality, brings with it formidable quantities of waste. This waste comes in a multitude of forms, such as wasted time, wasted money, wasted natural resources, wasted education, wasted energy sources, wasted human resources, wasted technology and solid waste. While all of these wastes could be discussed in detail the two which hold the potential to address the issues raised in this document are those of solid waste and wasted human resources.

South Africa has an unemployment rate of 41.6% . This statistic should be read as 41.6% who are not economically active within the money economy. The Cape Town Metropolitan area produces just over 4 million cubic meters of solid waste every year (Engledow, 2007). These wastes are derived almost entirely from processes associated with production and consumption of products, consumer goods and services.

While solid wastes, pile up at landfill sites all around the world, releasing toxic chemicals into our ecosystems, taking up vast amounts of valuable land and leaving scars of human's inability to live in harmony with nature wherever we choose to settle, unemployment leaves masses of people homeless, starving and in a continuous struggle to make ends meet each day by whatever means possible.

While I don't intend to make light of dire situation of poverty I do think a reframing of these conditions is important. If we begin to see the 41.6% representative of a latent (wasted) potential within the population which is not involved in the all consuming act of economic labor, we can thus see the potential for these people to engage in other activities. Activities which may not contribute to the capital economy but could perhaps contribute towards another emergent form of economy, an economy which is not based in money. Similarly, can we not see the 4 million cubic metres of solid waste as a

potential building resource?

These waste outputs are intrinsic to the social process of modernization, development and capitalism. Is this not a possibility of creating a spatio-temporal utopia which Harvey speaks of? It is not merely a spatial form which is given, onto which these new activities and emergent economies are to adhere to, neither is it simply the social process. The two would undoubtedly have a tightly knit relationship. By inverting these social processes of crisis we can begin to imagine a future which begins to address the issues raised in this paper.
To refer to the previous quote from Harvey, I believe South Africa is uniquely positioned to take on such challenges. Considering that over 10% of the country's economically active population has been able to construct a livelihood within the informal economy, is testament to this latent potential. Harrison describes this latent potential quite aptly:

> *Rather than seeing Africa as an incomplete or deteriorated example of modernity, we might focus on how Africa, and its many different parts, is-through the resourceful responses of its residents to conditions of vulnerability-in a process of becoming something new that is both part of and separate from western modernity....the success of Africans in constructing productive lives at a micro-scale, and economies and societies at a macro-scale, that work despite major structural constraints.* (Harrison 2006: in Pieterse, 2009)

Through the mobilization of these potentials we can begin to imagine alternative ideals and values, those which transcend the dominance of the current order. We can begin to imagine a utopian alternative which would begin to address the crisis of inequality which we face. I believe architecture is to pay a critical role in mobilizing these processes and creating the spatial stimulus for such changes to come about.

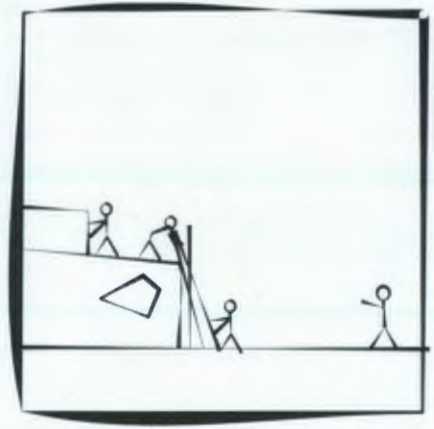
The cartoons on the following pages explore this process of mobilization and the potentiality for architecture to play a key role in this process. The cartoons are inspired by the work of Yona Friedman and his guides to *Survival.* (Friedman, 2006)

Figure 8: Ingenuity and Will, Khayalitsha
Source: By Author

d. Architectural Conclusions

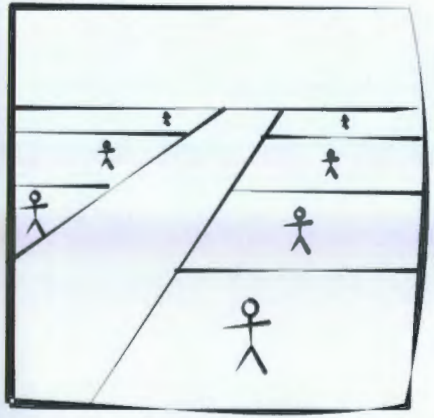
What if this architecture was first and foremost an entirely a social project?

What if unused space was appropriated for new use?

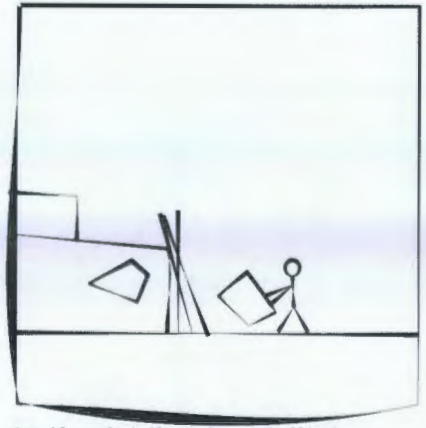


or they utilised the help of their friends who had building skills? What if this was built using waste?

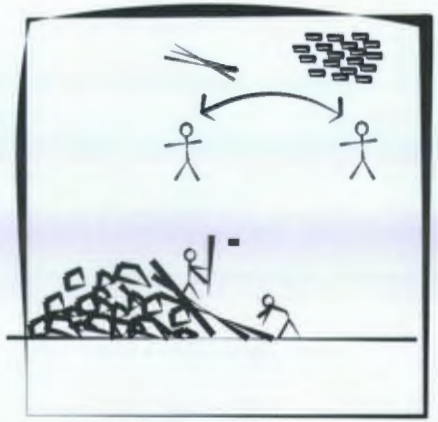
What if we could built this within the existing urban fabric and footprint of cape town?



what if was no individual private ownership of land?



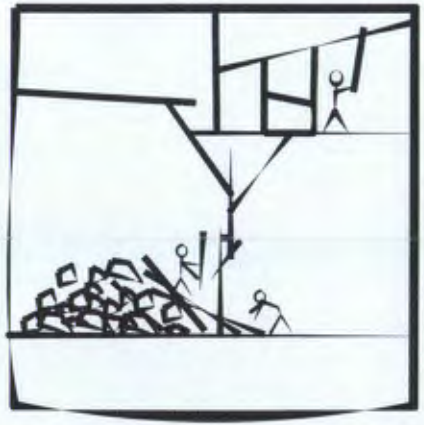
what if people built their own dwelling?



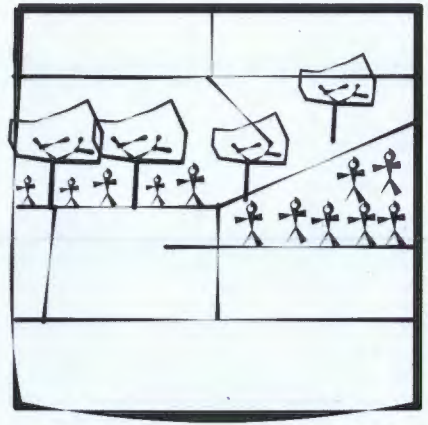
What if waste materials were found on landfill sites, industrial yards and traded between inhabitants as building resources?

But the problem is that most land in Cape Town is already owned, occupied or highly contested.

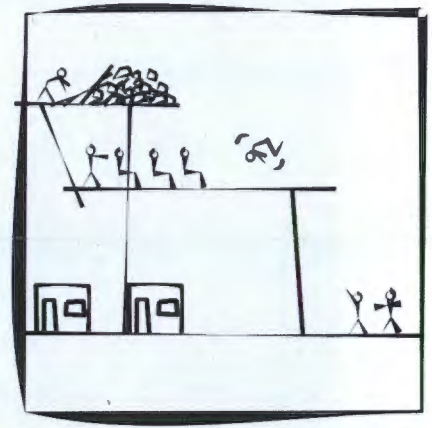
But what if we could build a new LAYER in the air?



What if all of this could be built from waste? Could the building itself operate like a landfill?



what if public spaces could be both indoor and outdoor and could be built by the inhabitants? These spaces could be continually altered and extended since waste materials are constantly supplied at no monetary cost.



What if new contingent economies could emerge from this vision? How might the architecture support these economies?

This new architecture in the air could contest and compliment the existng urban fabric?

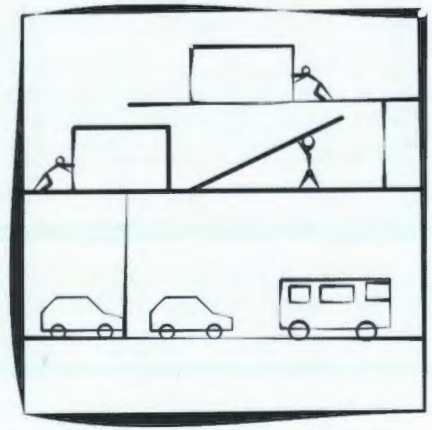
What if the friction between public and private worlds could be dissolved? What if only differentiated space was necessary, since traditional spatial relationships reflected in the current order would be no more?

What if private space was kept to a minimum since there would be no need for the accumulation of commodities and consumer goods associated with status?

What if urban agriculture, water harvesting and water purification were used as survival resources?

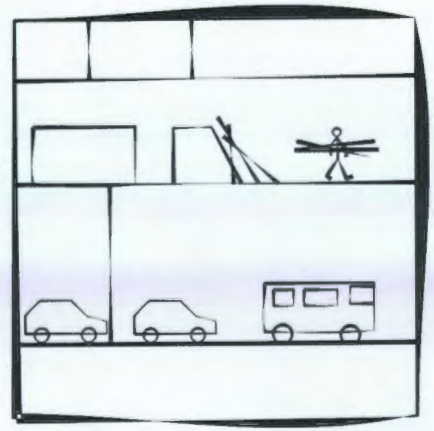
It becomes evident from the 2nd set of cartoons that this potential alternative and the building with waste would inevitably involve some kind of spatial framework onto which all activities could adhere. A framework which could be both at once separate or part of the existing built fabric. John Habraken in his book *Supports* describes a framework for support as something which is '*built in the knowledge that we cannot predict what is going to happen.*' This description becomes important in order to differentiate a support framework from that of the skeletal of say a concrete framed building. For the unprecedented nature of a proposal of this kind, creating new emergent economies, unknown activities and building with waste, mean that it is entirely unpredictable and must therefore embody notions of indeterminacy and change. These notions are of particular importance for the design project, as I will illustrate in sections II and III of this document.

Typically architecture is conceived of as an investment which offers some form of economic return, but architecture built with waste by people who do not require remuneration for their labor task is not bound by this constraint. This opens up the possibilities for architectural experimentation in many forms: Construction techniques, new spatial relationships, new forms and experiment with different waste materials and their respective opportunities and limitations.



What if people could continually modify their environment?

What if this architecture of waste developed new structural relationships with industrial cycles of input and output?



What if inhabitants decided to relocate they could simply dismantle their dwelling and take the materials with them? Or leave them for someone else to utilize.

What if existing and future proposed public urban infrastructure could form a mutually beneficial relationship with the infrastructure of this new architectural vision?

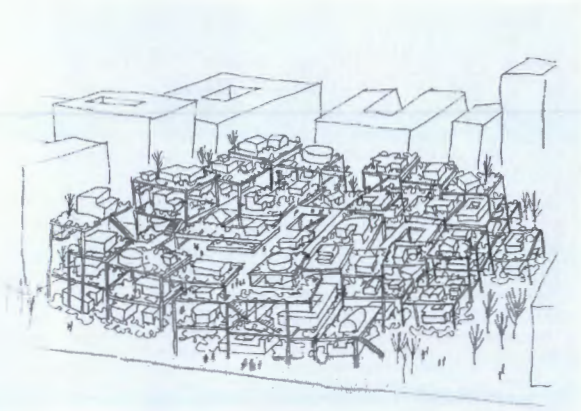
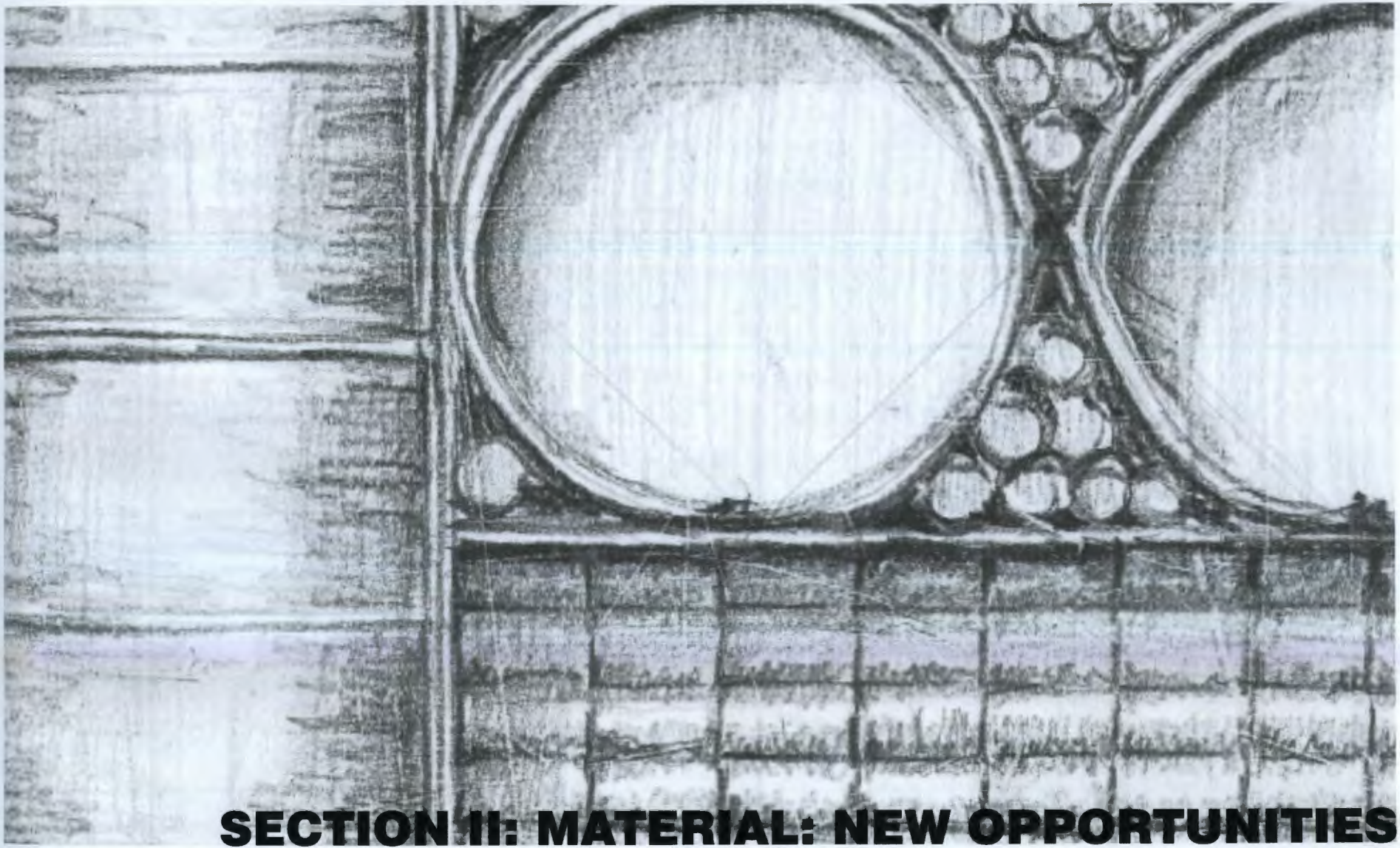


Figure 9: An alternative way of living. Yona Friedman, survival architecture.
Source: (Pro Domo, 2006)

With waste we can create architecture which is not derived from the prevailing order but appropriated entirely for the activities associated with free play, creativity and various others associated with collective life. Architecture could thus become a framework for everyday life for the activities which are intrinsic to it. The production of daily life and the production of space could happen simultaneously. While this begins to give a similar image of the constantly changing environment, as put forward by Constant, it is doubtful whether the built habitat envisioned here, would actually change as much as he had intended. The relative permanence of architecture is always a hindrance within this notion of change. However the use of waste in buildings, would potentially free up this constraint considerably.
The architect/s involved in a project of this kind would form that of continuous guiding consultant . It would be the role of the architect to conceive of the beginnings of a project of this kind, to locate the project within appropriate sites, to envision how it might unfold, what it might look like, to overcome problems such as disorientation within a potentially unordered environment, to gain an understanding of the limits of a utopian vision of this kind, to research the capacities and limits of building with waste and their appropriate technologies and understanding what these wastes are.

The architect is to imagine how the supporting framework can become an enabling infrastructure, to ensure that this infrastructure remains sufficiently open to change, to develop new technologies for an infrastructure of this kind and to understand the potential population these frameworks might begin to support. And lastly to understand and research how the new forms of inhabitation might begin to form a structural relationship with the existing urban fabric and urban structures.

These ideas form the basis of exploration within the next section of this document, and give considerable shape to the design project itself.



SECTION II: MATERIAL: NEW OPPORTUNITIES

2.0. WASTE BUILDING: INTRODUCTION

Waste could be defined as one of the many hallmarks of the process of modernization and capitalist consumption. Destroying the old and making way for the new has been the operative means of modern processes since the very beginnings of the industrial revolution. Having its roots in technological advancements and later on the mass production of products and consumer goods, it is safe to say that modernization and mass production has created within us an obsession with the *new*-new technologies, new products, new brands, new appliances, new fashions, new furniture, new gadgets, new foods and new buildings.

In the wake of the consumption of new stuff, we see a linear material cycle, which ultimately leads to an end state of masses upon masses of waste. However, by shortcutting the linear flow of materials and reusing waste and unused/unwanted objects in the production of architecture, we can begin to imagine a process of turning waste into valuable resources.

This paper explores the potentialities, opportunities and freedoms arising from the reuse of solid waste and underutilized objects and products which could potentially challenge the status quo of a capitalist driven market driven society, through possible creation of new spatial production techniques.

In recognizing the constant accumulation of waste materials and unused objects and products and the inherent unpredictably of their specificity, the dominant intention of the paper is to explore the ways in which the production of architecture utilizing waste, could becomes a cyclical process of continuous growth, change, indeterminacy and experimentation, where both architect and inhabitants could play equal but different roles in the making of new built environments and the production of space. The paper thus plays a critical role in the establishment of various critieria to be explored in the design project.

2.1. THE ARGUMENT FOR WASTE

a. Environment

The commonplace pattern of continuous production and consumption of new stuff as described previously, has allowed us to have very little trouble discarding the old things we have, quite happily not worrying too much about where they go or what they become. We have become dependent on the ability to simply obtain new goods, allowing the status quo of continual extraction of the earth's resources to continue unchecked.

While it may be merely speculative that the earth's resources are running out, I feel it is an issue which should not be overlooked. Whether they are running out or not, we cannot continue take from the earth in the way that we do.

The general flow of materials for just about any product, consumer good, food stuff or building material, could be described as extraction, processing, manufacture, assembly, distribution, consumption, use and finally when the user has decided the material has done its job it is discarded as waste. The final step in the process, that of waste is the obvious problem. It is clear that the quantities of these waste are reaching a situation of crisis, as I will illustrate later on.

Despite the actual waste of money associated with the discarding of used objects, the main problem lies in the fact that the processes used in manufacturing all these things does not take into account their actual end state; that of attempting to return back to earth, the very place the material was extracted from. While it may be true that industries are slowly changing production processes in order to address issues associated with the global environmental crisis and looking at ways of incorporating closed loop cycles, this process of change is slow and will not eliminate waste entirely.

Thus by utilizing waste as a potential resource within architecture by the creation of secondary use, we could potentially reduce the amount of waste going to landfill, as well as reduce the raw materials which are extracted from the earth, by mitigating the need for the production of new building products and materials.

While the recycling of materials certainly reduces waste going to landfill and reduces the resources which are extracted from the earth, there is still an large amount of energy which goes into the reprocessing of materials such as steel, plastic and paper. There is also a limited amount of times in which products can be recycled until their end state does not allow for any reuse.

b. Potential Livelihoods

While the environmental concerns could be considered reason enough for the utilization of waste in architecture and building, one is further pressed for critical action given the population demographics of South Africa. With 38% of the population living below the poverty line(Counter Currents, 2009) , it is ironic to see such vast quantities of waste produced, given the associated cost implications. These costs reflected in both the handling and management of wastes as well as the money lost when the respective product is considered to no longer have value.

Through the use of waste as a building resource, we can begin to imagine a way of ascribing secondary value to wastes which would begin to address in a small way the huge inequalities experienced with the South African population. The creation of secondary value may create economic opportunities for the urban poor, which has become evident through the various recycling programs initiated around the major cities of the country, a more significant potential is the value gained within the potential building material itself and in turn the ability to construct and build environments at a fraction traditional costs. Informal settlements, despite the obvious technical and performance difficulties associated with them, are a reflection of this kind of practice.

This is not to say that building out of waste should be limited to those in situations of poverty, but should be an encouraging option to all people. While there are obvious problems associated with status and the image of waste in architecture particularly when it comes to a society so fixated on the consumption of new products, is it not this very same problem which we need to begin to address, if we are to see any closing margin between rich and poor?

Should we not begin to challenge the status quo of a consumer fixated society in order to begin to properly rebuild the South African built landscape? Given the means and knowledge to do so, could the utilization of waste in architecture, not empower people in some way to begin to address these inequalities themselves? Would the subversion of the capitalist output of waste into something positive, not be a better reflection of the violent past experienced within our country? As Lebbeus Woods describes in reference to war damaged cities:

> *The damaged city without building loans or bank credits, without government (or its aid), without the importation or manufacture of new materials, is the city of recycled materials and means.* (Woods, 1997. p29)

But how then do we begin to do this? Woods goes on to describe:

> *But the same city, if it wants to re-construct itself, cannot simply re-assemble the wasted and ruined into an urban collage of things and events....Rather, the architect must find ways to transform, to metamorphose the material and intellectual detritus of destruction into the genuinely new. The technique most essential to this process is a conceptual one: see the old as if never been seen. From this all technological means will follow.* (Woods, 1997. p. 30)

The situation Lebbeus Woods describes is not unlike that faced by many South Africans living in poverty.

What is revealing about the above quote is the responsibility Woods places upon the architect in order to invert the process of destruction and its resultant wastes into the genuinely new. What I believe Woods to be referring to here, is not the creation of new architecture as a product or object for consumption, but rather new kinds of buildings and new ways of producing architecture, arising from the opportunities associated with the waste materials themselves.

Perhaps it is here we can begin to address the problems of status and image associated with building from waste. Could the utilization of waste in this way not begin to challenge the status quo of capitalist consumer society by extrapolating the unique opportunities embedded within the process of utilizing waste in order to create the genuinely new which Woods speaks of?

2.2. WHAT WASTES?

a. image essay

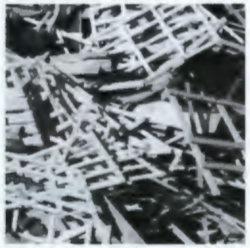
Figure 10: Landfill
Source: www.econurse.org

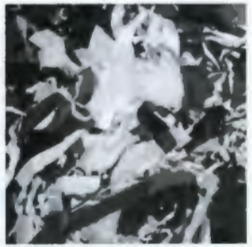
The wastes to be discussed which form the foundation for this paper can be divided into two categories. Firstly solid waste which is in great abundance, which can be relatively easily accessed and is collected and handled by Cape Town solid waste management whereby it is transported on a daily basis to landfill sites. The statistics and figures of these wastes are known and are given some attention the under the section *Cape Town solid waste audit.*

The second category is formulated by taking up a speculative position on what kind of other wastes there might be available which are not reflected in the statistics and not seen at landfill sites but rather, lie within industrial areas and scrap yards waiting to be utilized. These wastes, defined as 'dead stock' arise from defective products, inability to sell, overruns of manufacture or have simply become redundant. This category takes into account both current wastes of this kind which might be available as well as those which might come available in the future, recognizing that at some stage most products reach the end of their lifespan for their intended purpose. These wastes could cover a broad range of scales and could potentially include objects such as crates, pallets, oil drums and water pipes ranging up to shipping containers, airplane fuselages, and perhaps abandoned buildings. Within the context of this paper this category is referred to simply as *unused objects or materials.*

While it is obvious that not all of these could be considered to be wastes could in many cases be reused by the owners of such materials, I believe their inclusion to be important in order to give a holistic view of the potentialities for material reuse in architecture.


Pick n Pay
inspired by you

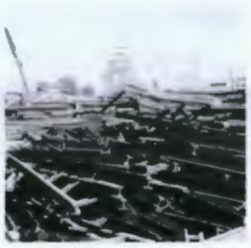



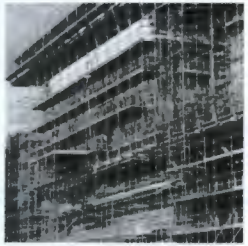
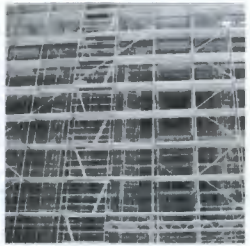
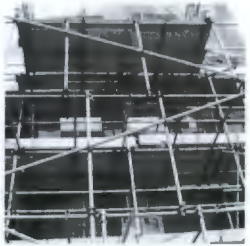



















Freeimg.com




b. Cape Town Solid Waste Audit

Figure 11: Cape Town Metroploitan area Source: Author

Cape Town currently produces roughly 2.7 million tons of solid waste per year, with figures continually on the increase. While Cape Town's population has increased by a quarter since 1996, the waste output has more than doubled (Engledow, 2007).

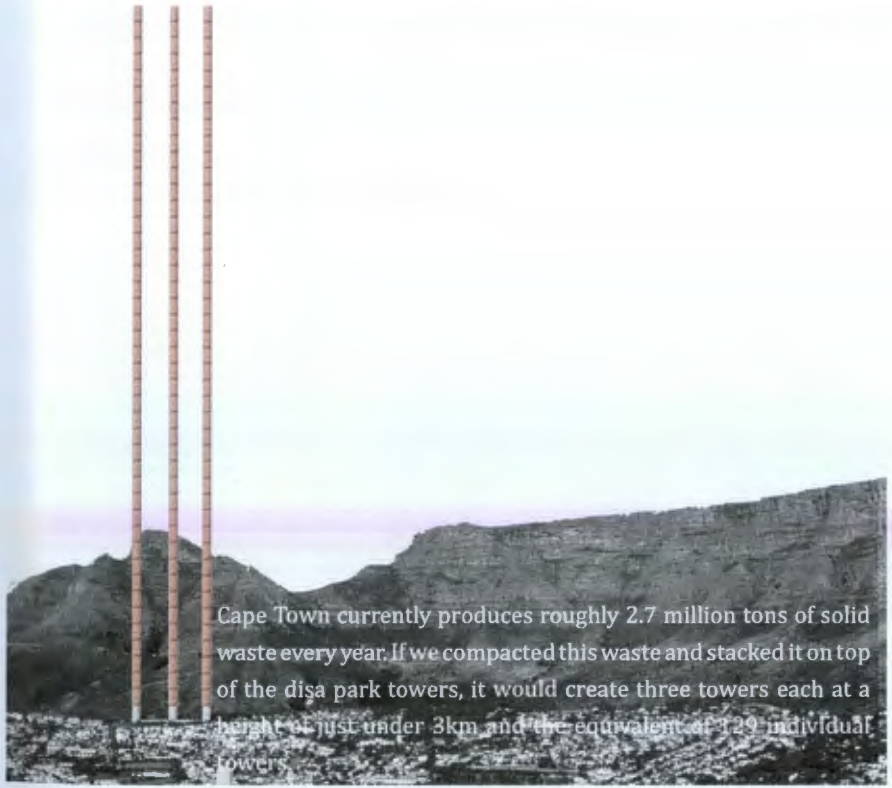
The following pages give a visual indication of the volumetric implications of 2.7 million tonnes of waste. This has been done in order to effectively convey the material potential of such massive quantities of waste.

The figures represent the total amount of waste going to landfill and does not include waste which has been recycled. It must be noted that while the overall quantities which are reflected in each sector are taken from the Solid Waste Baseline report completed by the Sustainability Institute of Stellenbosch and are thus relatively accurate, the respective breakdowns within each sector are speculative due to lack of information. Only the breakdown for the household waste has been taken from the report as this information was available and can thus be considered to be accurate.

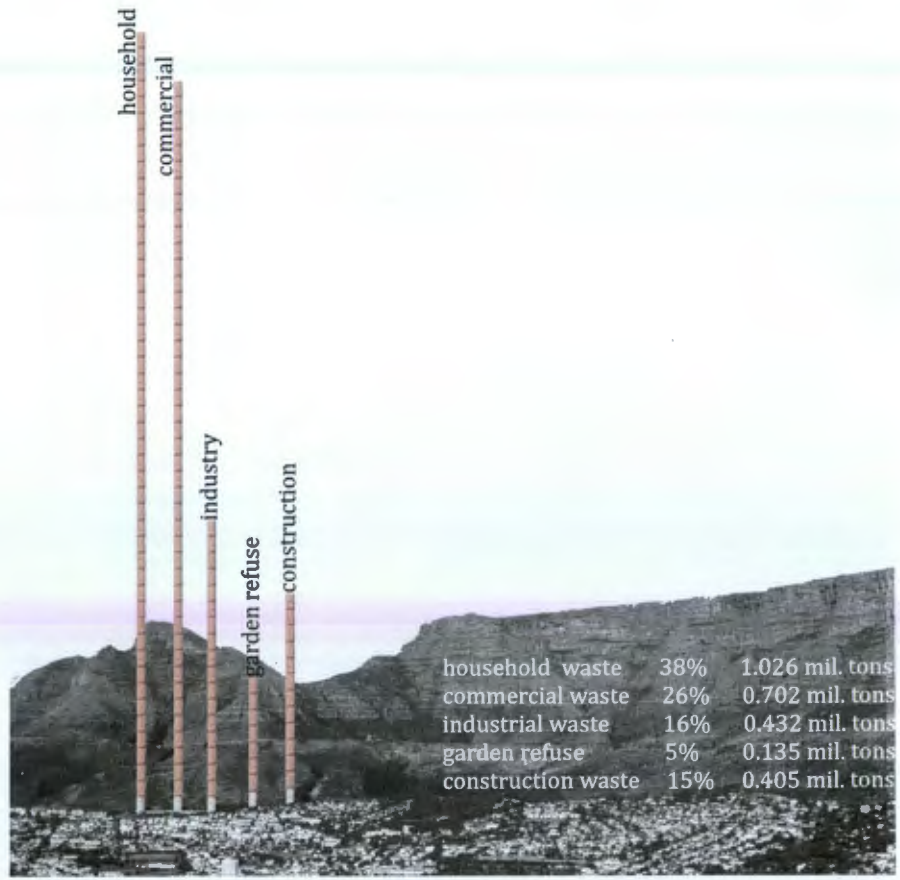
The following pages effectively convey that the notion of building with waste is by no means unrealistic and should be a matter of urgency.

(Note : All images by Author)

Disa Park towers at the foot of devils peak in cape town, are each 24m in diameter, 61m high and each have a floor area of 452m^2. The volume of each tower is 27662m^3. With table mountain as a backdrop, the towers become a useful tool for comparative graphic representation of the volume of waste produced in cape town in one year. The volumes were calculated using individual material densities and the given total mass of each material.

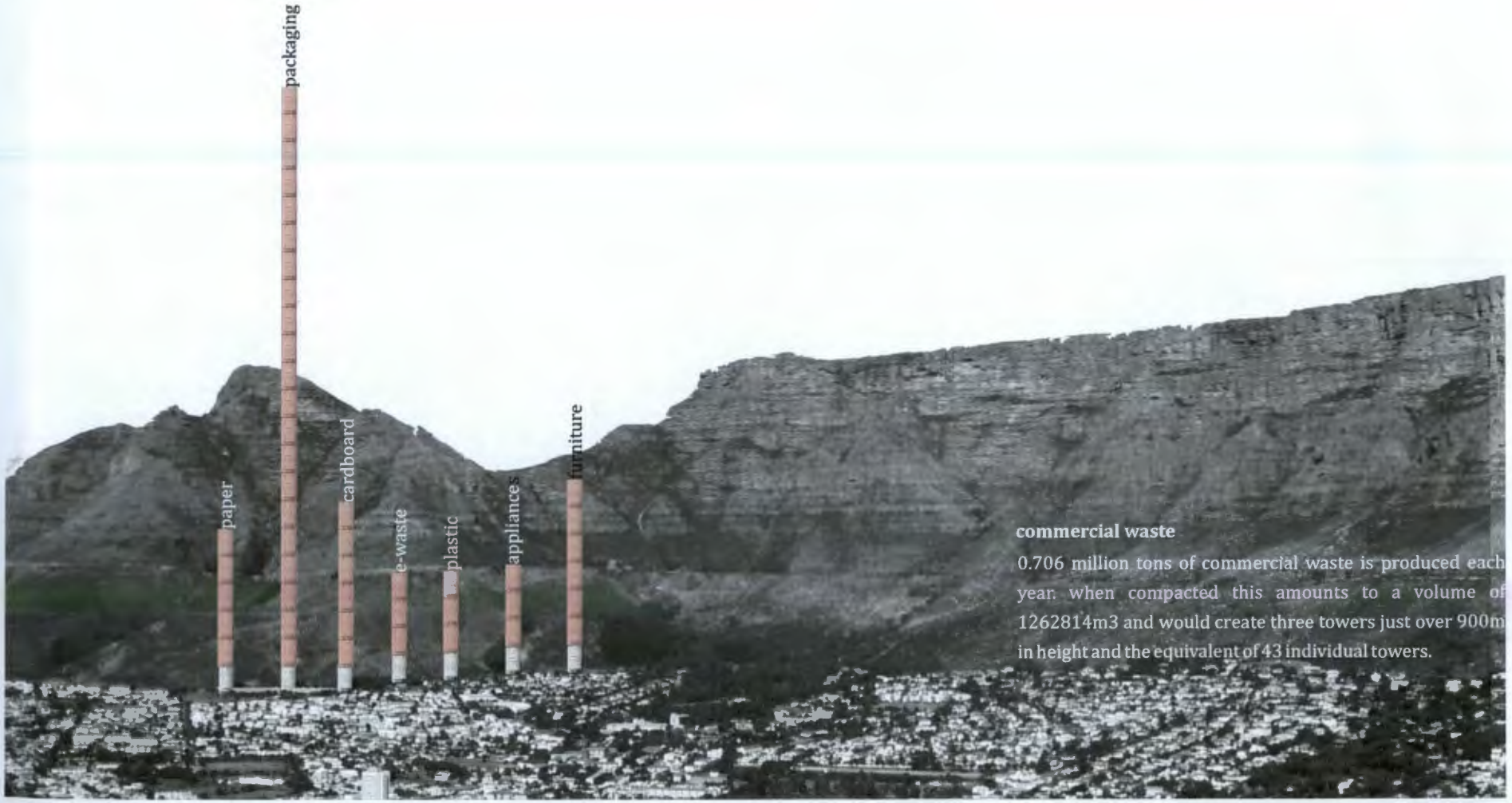


Cape Town currently produces roughly 2.7 million tons of solid waste every year. If we compacted this waste and stacked it on top of the disa park towers, it would create three towers each at a height of just under 3km and the equivalent of 129 individual towers.



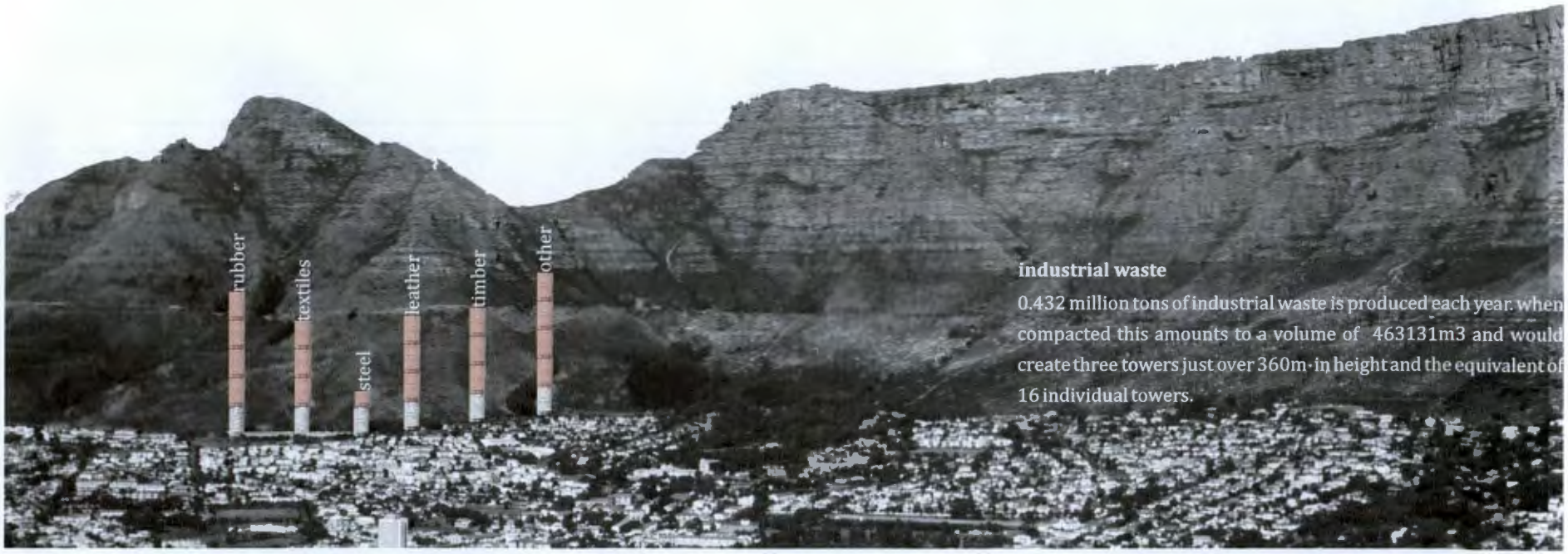
household waste

1.026 million tons of domestic household waste is produced each year. when compacted this amounts to a volume of 1327464m3 and would create three towers just under 1km in height and the equivalent of 48 individual towers.



commercial waste

0.706 million tons of commercial waste is produced each year. when compacted this amounts to a volume of 1262814m3 and would create three towers just over 900m in height and the equivalent of 43 individual towers.



industrial waste

0.432 million tons of industrial waste is produced each year. when compacted this amounts to a volume of 463131m3 and would create three towers just over 360m in height and the equivalent of 16 individual towers.

construction waste

0.405 million tons of construction waste is produced each year. when compacted this amounts to a volume of 330525m3 and would create three towers just over 240m in height and the equivalent of 12 individual towers. It is interesting to note the difference in volume between industrial and constrition wastes despite their similar mass contributions. This is due to the difference in material densities. (see table of figures)

2.3. WASTE BUILDING ANALYZED

a. Design and the Production of Architecture

Figure 13: Tin can sculpture. The can transcends its intended purpose and takes on a new meaning in the form and upon the surface of the bull.
Source: http://housewife.splinder.com/post/965716

Figure 14: Wikado 2012 Architects Source: www.2012architecten.nl
The reuse of an old wind turbine to create a playground for children, creates new a new space and environment allowing for the potential emergence of new kinds of play.

"Draw architecture as though it were already built. Build architecture as though it had never been drawn."
(Woods, 1997, p. 31)

The constant inflow of unspecified materials is possibly the defining characteristic of the process associated with the reuse of waste and unused objects in architecture with profound implications.

Traditionally architects design buildings knowing full well the palette of materials available for the construction process, and thus the materiality of the building is very much subservient to the designer. If we consider the process of gaining access to waste materials and unused objects, equivalent to a process of finding, there is a large degree of indeterminacy brought into the process, as the act of finding involves that which is unknown. Thus the traditional process is reversed, starting with a found object or series of material conditions which then begin guide, invert and subvert the original intended outcome of the design into something new and unknown.

Through this process not only does the design of the building transcend the ordinary but, so too does the original object or waste material. Through its appropriation into the functional program/form of architecture, it takes on a new secondary value and purpose and in doing so transcends its original purpose (van Hinte, Peeran, & Jongert, 2009). We see this process as an operative means of creating something of value in the various arts and crafts sold around the markets and streets of South Africa.

Similarly the implications of a non-standard materiality into the design process allows for a new kind of spatial coding. Lebbeus Woods talks extensively about the coding of space and the way in which we behave in a specific way due to the way in which spaces are governed by types and have, in turn, a given pre-coded meaning. In other words we behave in a certain way because we have become accustomed to these space types from previous use, since each space tends to be a mirror of its predecessor.

By inversing the design process, by utilizing a given non-standard materiality prior to the design of the building, we might be able to shed this notion of pre-coding thus challenging the status quo of spatial production in the hope of

Figure 15: Miele Space Station, 2012 Architects
Source: www.2012architechten.nl
The reuse of discarded washing machines creates a new spatial type which is then appropriated in a variety of new ways, ranging from coffee bar, office and exhibition space.

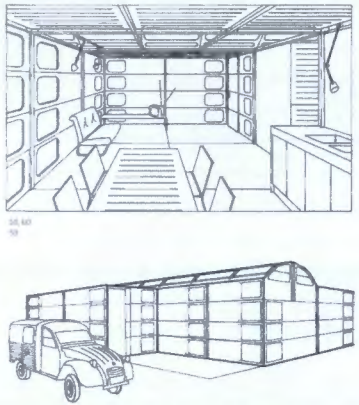


Figure 16: Citroen Project, Jeffrey Skorneck. Source: Gargabe Housing, 1975.
'Dead stock' of citroen car bodies designed for use in the creation of housing. Here we see the creation of a housing with a new materiality. The space of the house, however remains conventional.

eliciting new spatial praxis or in the very least new ways of producing architecture.

This notion of indeterminacy is taken one step further when one considers the impossibility of sourcing all materials prior to the process of construction, as new materials or objects become available throughout the phase of design and construction. Thus the process of design itself would have to move away from that of designing finished product and more towards the creation of a set of guidelines and frameworks. Just as we see an emergent process of finding and making, so too do we see a process of finding and re-making as new material conditions must be absorbed into the design and or construction process.

It is obvious that this is scale dependant and it may be quite likely to source all building materials prior to construction for relatively small projects. Nonetheless the outcome remains determined by the starting point of a given materiality, to which the design must be subverted.

The idea of designing a set of guidelines or frameworks in order to readily accommodate notions of change and adaptation throughout the design process brings about the possibility of user participation in the construction process of the building which will be explored in a later section.

However with the understanding that the design process is centered on absorbing a number of potential changes and the possibility of user participation, coupled with the continuous inflow of waste, the design and making of architecture moves distinctly away from the building as final product and rather towards a cyclical process of building. This process of cyclical building is clearly reflected the making of informal settlements as inhabitants perpetually alter and extend their homes and environments as soon as they gain access to the materials to do so. Thus we see that with a continuous supply of materials comes the opportunity for a cyclical building process.

This de-emphasis of the building as a final product speaks directly to the notion of challenging the status quo of consumer driven society. More and more we are seeing buildings become commodities themselves becoming subservient to the demands of the market and not necessarily the needs of the people.

Figure 17: Quake City,Lebbeus Woods
Source: Radical Reconstruction, 1997.
Created for and continuously altered by the destruction from earthquakes, the work appears to be in a continuous state of growth and change as inhabitants attempt to find occupancy within the structure, simultaneously embracing the conditions of change brought on by the layers of built fabric as they responsd to the earthquake itself.

The notion of shifting towards a more cyclical process, creates the opportunity for architecture to become a more effective framework for everyday life, as built environments could be continuously modified to meet the changing demands of life. As John Habraken describes in reference to people constructing their own homes, that it is through the act of dwelling which people can evolve their own potential and in turn through the act of dwelling comes the possibility of developing meaning.

Further to this, the very idea that one is not aiming for an end state of product allows the process of design and building to become experimental. Typically architecture is conceived of as an investment which offers some form of economic return, but architecture built with waste by people who do not require remuneration for their labor task (since they are potentially building for themselves) is not bound by this constraint. This opens up the possibilities for architectural experimentation in many forms: Construction techniques, new spatial relationships, new forms and experiments with different waste materials and their respective material strengths and weaknesses. Not only could this process of experimentation afford the opportunity to create the genuinely new, but it would be essential in order to create successful living environments through overcoming the technical difficulties and unknowns faced when confronting the use of waste in the production of architecture. These difficulties are discussed in further detail later on.

The relative scarcity of practice in utilizing waste in architecture is testament to the technical difficulties one might be faced with, as well as the resistance to change of current construction techniques. How then can we begin to analyze the potentials, limitations and weaknesses of waste materials and unused objects in order to actively and readily engage in the process of cyclical, indeterminate building? How might we begin to imagine a support framework in order to overcome the technical difficulties of materials and increase in scale without compromising the opportunities associated with this process? Is it possible for the extension of this said support framework to become and extension of this process?

b. Oppurtunities and Limitations Facing the Use of Waste

Figure 18: Lucy House, Rural studio. Source: www.ruralstudio.com
Unused carpet tiles are dry stacked to make up load bearing walls. The tiles were held in compression by a ring beam to overcome horizontal instability.

Figure 19: Yancey Chapel, Rural studio. Source: www.ruralstudio.com
900 tyres were stacked and filled with compacted earth to form walls. Vertical rebar bound the walls and provided horizontal stability.

In undertaking an analysis of the opportunities and limitations afforded by the secondary use of waste materials, one is inclined to make comparisons between the waste materials and the more traditional counterparts reflected in normal building practice. This may be necessary in terms of thermal performance, shelter and structural stability, as building with waste and unused objects should not mean a compromise on these aspects. However in making these comparisons, one should be weary of simply attempting to simulate or emulate the properties and form of traditional building materials and components, thereby potentially precluding the opportunity for the objects themselves to begin to inform the technique and in turn stunting the possibility of creating new ways of building.

In order to unpack the limitations, opportunities and various potential construction techniques of the various wastes and unused objects, it would be useful to assess them according to size and rigidity of form (i.e. a bottle would be categorized differently to paper). This stratification becomes useful as a tool in dealing collectively with the limitations and opportunities associated with the objects and could potentially be utilized as the beginnings of a guide in the process of assessing materials.

Without entering into discussion around the limitation and opportunities of each individual waste objects I will rather discuss broadly what is immediately apparent. This discussion is not intended to be decisive or conclusive but rather speculative and exploratory, opening up ideas which are explored in the process of design.

The smaller sized wastes and objects such as, bottles, paper and plastic, have little structural integrity in their own right (except for glass perhaps) and thus present themselves for use dominantly as infill which could be achieved through, stacking, compaction into blocks, bailing or gabion type structures.

While wasted timber and steel could be utilized to form frames and support for these infill materials and other structural purposes, as well as potential freestanding infill. Unused objects such as pallets, crates and oil drums could be utilized, as secondary structural entities, as well as potential built in and movable furniture such as storage, seating and stairs.

Figure 20: Het Blauwe Huis, 2012 architects. Source: www.2012architecten.nl
Steel sinks are used to form the skin of a rooftop apartment. The structural integrity of the sinks is capitalized by the use of a very thin lightweight framing system into which the sinks are fixed.

Figure 21: Wikado 2012 architects. Source: www.2012architecten.nl
The form of an old wind turbine is re- interpreted into a children's playground. The retention of the form of the original object is what creates the dynamism of the new playspace.

Figure 22: 40 % BTW, 2012 architects. Source: www.2012architecten.nl
An entire building is to be de-constructed for reuse in the creation of a new building. The new building is governed by this materiality and as a result reveals unique spatial outcomes.

The larger objects such as water tanks, water pipes and shipping containers have the potential to become functional forms in their own right and could be utilized as a starting point for the production of architecture from waste. Indeed these objects have the potential to begin to inform the making of a framework or support. It is at this scale where we see the most potential for the creation of new types of space emerging from a given materiality and form of the object itself. As illustrated in the Wikado project by 2012 architects and the LOTEK speed train project.

It should not be overlooked that all of these material have the ability not only to form components typically associated with the making of buildings but could also present an opportunity for the making of unique public open spaces, landscaping, play spaces, artworks , street furniture and other elements of an urban design nature.

Some of the technical and physical difficulties facing the use of waste in the construction of buildings would include aspects such as mobility of materials, horizontal stability, the limited spanning potential, limited load bearing capabilities, the creation of operable openings, water-proofing, thermal performance, longevity and quite simply the possible inability to find use for certain wastes.

However, possibly the overarching technical difficulties one would be faced with, would be that of the joint. The difficulty of joint would be implicated across all scales, ranging from the joint between individual small scale items to make up larger components, the joint between these components to make up infill, through to the joint between infill material and structure, and finally the joint between all of these elements fixed coherently into a larger scale support framework.

The inherent incongruity of all of the various components and waste objects with their varying physical properties, different shapes and sizes means that no one uniform joint could be developed, but would require a series of different kinds of connectors, framing, **welding, bindings, bolting, clippings, nailing and tying**. Though a far more complex issue, there is of course the possibility of developing these joints from the waste objects themselves.

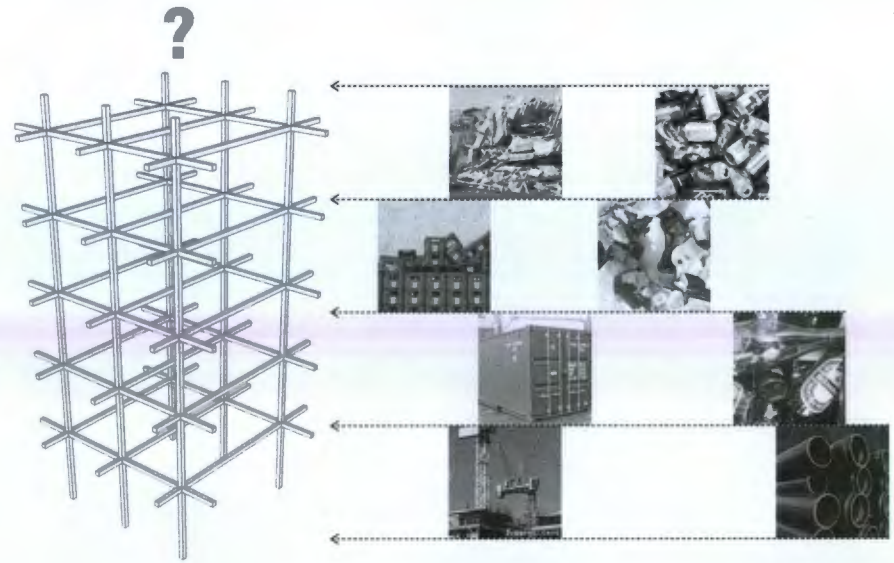
The specific joint however which requires further exploration in the context of this paper is that between the smaller

Figure 23: This technique of stacking would naturally require a framework and a binding of some sort. Source:

Figure 24: A combination of compacting and framing could be used. Pallets here have the potential to deal with the difficulty of the joint. Source:http://www.stockphotopro.com/photo_of/crushed/A31DFM/Stacked_pallets_of_crushed

scale spaces created through the use of waste and unused objects and the framework which could potentially support these spaces. Not unlike traditional building materials, the use of waste objects in the production of architecture, particularly as infill, is limited in scale due to limited load bearing capacities and thus requires some form of frame in order to achieve larger scaled buildings.

How should this notion of joint and connection between frame and material address some of the technical difficulties as indicated previously? How could this connection amplify and extend the ideas around building with waste and unused objects raised within the broader context of this paper?



c. Limitations of Scale: Exploration of the Support Framework

Figure 25: High Rise of Homes, James Wines, 1981. Source: http://www.caroun.com/Architecture/Architects/J-Wines/JamesWines.html

John Habraken aptly captures the idea of support structures as that which performs those functions which other components of the building cannot perform (Habraken, 1972). This is a useful description in recognizing the limits of building with waste, and hence need for something else to come into play. To this end Habraken describes the simplest possible form of the support as a series of equally spaced planes in the air which are supported on columns (Habraken,1972) . The work of James Wines in the project titled High Rise of Homes, gives a visual picture of this notion of support.

While Habraken's description is fitting in this context, I feel as mentioned previously, that by simply laying down horizontal planes stacked repetitively on top of each other may stifle the opportunities and freedoms associated with building with waste. While it may be that the creation of a flat plane suspended in the air creates the same opportunities as the ability to build on the ground, I feel the use of a support structure should become an extension of the processes associated with building with waste, thus forming a reciprocal relationship with the materials found and the frame itself, as each adapt, grow and change through the cyclical process of time and the production of architecture.

The support framework should be able to form a symbiotic relationship with waste materials and unused objects found of all scales. It should just as easily accommodate small scale infill materials as it could large scale shipping containers. These larger scaled items could potentially perform a similar purpose of the framework, creating spaces within which smaller scale wastes can be used as infill. The framework should also be able adapt and grow from the reuse of unused structural steel which may be obtained from abandoned buildings or other similar disused structures.

After spending the day wandering the informal settlement of Nkanini on the outer limits of Cape Town, I realized that the two most significant technical problems faced by this housing type (and this was confirmed by a few residents) is that of roof and floor and the respective junction of the vertical walls between these two elements. In an attempt to overcome these issues, many residents pushed sand up around the base of the walls in order to create a seal between wall and floor. While the issue of the roof was attended to by fixing a tarp or sheet of shade-clothover the entire roof

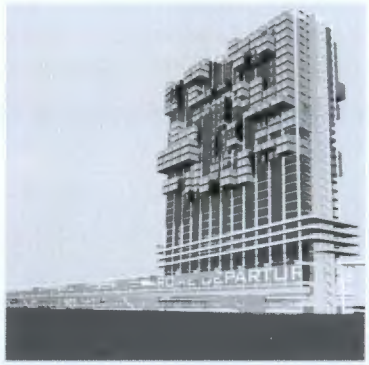


Figure 26: Fast Train Terminal, Lot-ek Architects. Source: www.lot-ek.com
A tower made up of a neutral structural frame is conceived as an incomplete building to be plugged and pulled as the needs of program evolve and change. The containers become an extension of the frame, as both container and frame allow for infill and activity between them.

and onto the top of the walls.

While the making of an informal settlement in many ways captures similar ideas embodied in the notion of building with waste, the idea of creating a supporting framework makes all the more sense, when one considers the potential of overcoming the difficulties as described. The support framework could thus begin to overcome the problems associated with the joint between infill, objects and frame structure. It is for this reason and the criteria mentioned previously that the support framework creates the opportunity for connections of all different kinds.

These ideas begin to paint a picture not dissimilar to that of any framed multiple story building, which is essentially made up of a super-structure, a secondary structure and tertairy structure into which fittings and onto which finishes are applied. In other words the free plan. While this is a useful comparison, this vision also implies the fixity of the varying scales of structure which I believe should be able to change and adapt. Here we see the opportunity for the inhabitants to adjust the framework, even if only on the scale of secondary structure, in order to accommodate their own needs. These adjustments could happen independently, without necessarily altering the overall structure of the system.

The framework should not constrain the possibility of vertical spaces and vertical growth, which would be the case in the typical example of a framed building as well as in Habraken's description of a support.

To this end one might begin to conceive a support framework constructed from a possible combination of both steel and concrete, with multiple points of connection and varying degrees of adjustability. It would be imperative that the structural design and the sizing of the main support members is kept uniform throughout the support framework, in order to avoid the creation of a pre determined hierarchy prior to its appropriation by inhabitants.

Moreover the notion of a support framework should not be viewed as an isolated entity similar to that of a freestanding multi-storey building, but rather be seen as having the potential to stretch out across the landscape, incorporating all aspects associated with the development of city. At this scale we can begin to see the potential for the

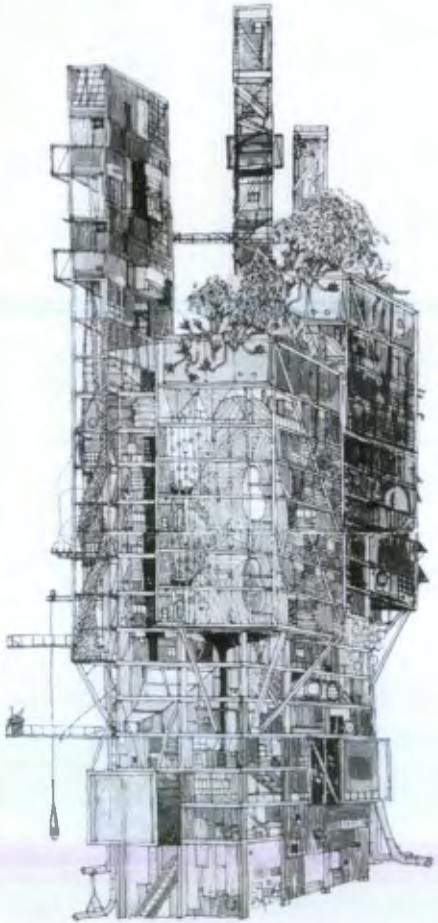


Figure 27: ShackRise, Daniel Maggs.
A support framework for the use of waste in multi storey buildings. The image is suggestive of many of the notions of change, flexibility and accommodating multiple sclaes of infill. The building appears to be in a continuous state of growth as inhabitants alter and change their own environment, enabled by the supporting framework.

development of a new spatial praxis and a potentially new way of living. For as David Harvey describes in reference to a quote by Robert Unger that if society is imagined and made then it can be re-imagined and re-made. (Harvey, 2000)

If we can successfully translate the use of waste and found unused objects in architecture into larger scale multi-storey buildings, the opportunities for building in thus way would appear to have no bounds. Given the sheer quantities of waste, as reflected in the *solid waste audit* of this paper, an exploration into an alternative of this nature appears to be a logical step in the processes of building construction and architecture.

The logistical implications a process such as this would no doubt, have its challenges. While we see the opportunity for both large scale and smaller scale adjustments, changes and developments, we must ask who would be responsible for large scale changes and how might they be orchestrated? How might smaller scale changes be negotiated between inhabitants? Questions around the sourcing and transport of materials would require attention? How might the role of the architect change from top down designer, into more of an integrated role as facilitator of change and design guide? And lastly what might the role of the state be in the creation and support of these new kinds of settlement frameworks.

While some of these issues I believe could be addressed to some degree by the generic make up of the multi-scalar adaptable support frame, others could only be attended through the process of site and program to be explored in the design enquiry.

SECTION III: SPATIAL: DEVELOPMENT AND APPLICATION

3.0. DESCRIPTION OF THE DESIGN PROJECT

Creating the Pre-conditions for the Visionary

Through the development of the papers presented in Sections I and II of this document, the design proposition had been framed quite succinctly. Collectively they both asked: What might the architecture of a support framework look like which would bring about social transformation and address the conditions of crisis and inequality experienced within Cape Town? How can this Support the use of waste as a building resource? Where should this locate? Who would build there? How can it support a self-build process? How would it be inhabited? How can this can this create an environment which would challenge the status quo of the prevailing order and bring about new spatial praxis, through new spatial production techniques? And finally, how can this support structure bring about a condition where free play, creativity and collective life form the basis of producing meaning through the consequent identity formation inherent to these acts?

In order to begin to answer these questions the focus of the project shifted towards the design of the actual support structure itself, as opposed to the resulting environment, recognizing that it was now the task of design to make these ideas possible, rather than to only imagine what they might look like. (Although this would no doubt be part of the process)

From this point I began to question ways in which people could literally live outside of the governing constraints of a social system driven entirely by the need for money and thus the root of inequality. The natural response was that the support structures must first and foremost produce energy, collect and clean water and produce food, thus alleviating the need to work in order to gain access to these requirements for survival. While these aspects were not responded to in a technical manner they were recognized to have significant spatial implications.

Given the sheer quantity of continuously produced waste, as illustrated in the solid waste audit, coupled with the idea of a support structure which would involve a self build process and could grow continuously, it became evident that the scale of the project could expand significantly. What was initially imagined as a series of buildings, evolved into a city-wide proposal for the Cape Town Metropolitan area, which would actively address fully the conditions of crisis and inequality within the city. The potential growth of this new *waste city* within the existing city would radically

increase the density of the city and could potentially have a restructuring effect on society at large.

The focus of the design of the support structures was largely driven by the use of waste as a building material and the potential it had for inhabitants to build and change their own environment to meet their new daily needs and requirements. Recognizing that the act of building itself would form the very basis upon which new ways of living within the city and new kind of spatial orders might evolve.

The design project is thus an attempt to create the pre-conditions for this to unfold, and consequently to imagine what it might ultimately look like.

The process of rapid urbanization requires a radical response to cater for future densities

EXISTING

Figure 28
source: google earth

THE LIKELY FUTURE

Figure 29
source: montage by author

3.1. GROWING WASTE CITY

a. Mapping

The following series of mappings were executed in order to establish likely growth points for the inhabitable support structure. Recognizing that the most likely people to initially inhabit a place such as this, would be those most entrenched in conditions of crisis, the mapping of poverty became an obvious starting point and the key generator of site and growth.

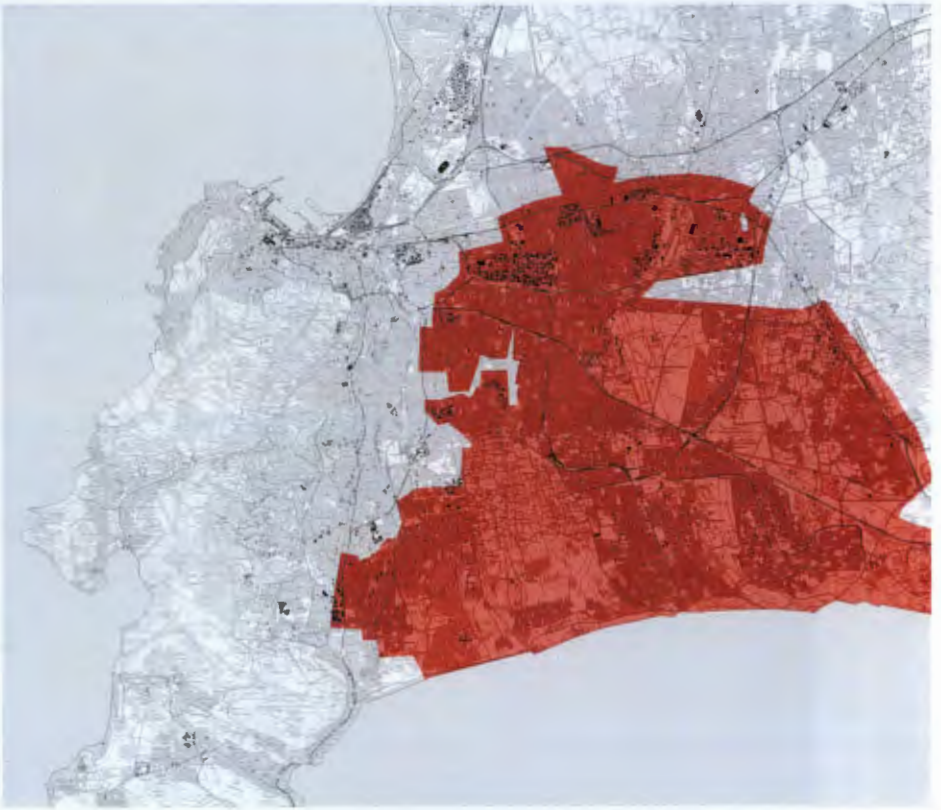
While simultaneously the generation of waste and existing waste infrastructure provided further points of anchorage as it was imagined that the inhabitants of the new support structure would salvage locally produced waste, from houses, commercial and industrial areas, transfer stations and landfills. Or conversely the support structure would act as a landfill site or drop-off facility for local residents and the City of Cape Town Municipality, thus opportunistically taking advantage of the location of the source of waste production as well as existing municipal waste movement routes within the city.

The mappings concluded with a composite diagram which indicated the likely growth points and future lines along which the new *city* would grow within Cape Town.(All mappings produced by Author)

1. Capital Geography

The physical manifestation of inequality. Cape Town shows definitive distinction between the wealthy and the poor. Generally higher ground is occupied by the wealthy while the poor covers the entire Cape Flats. The two slightly darkened areas which stretch out into the Cape Flats is Cape Towns working class. The Cape Flats thus becomes the focus area of study.

(Map adapted from Map: Residential Class Structure in Cape Town, *Counter Currents, 2010*)

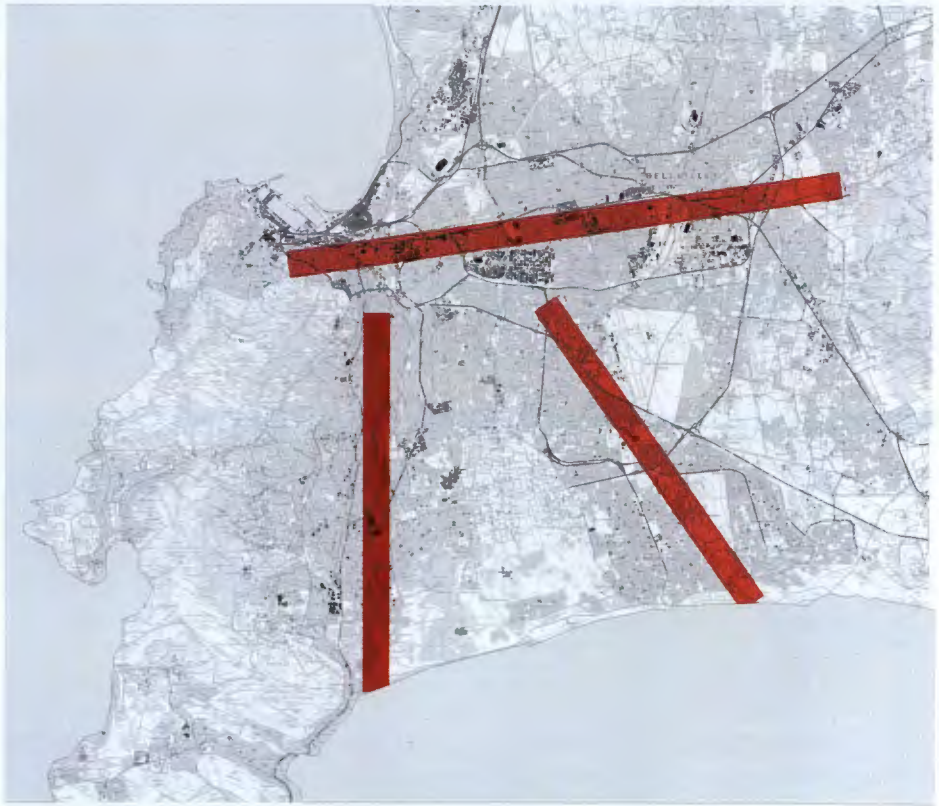


2. Areas Worst Affected by Poverty

An indication of the areas, with collapsing or no services, highest unemployment, towering density, and generally places of day to day struggle for survival.

3. Areas of Highest Waste Generation

The amount of waste produced is directly proportional to income and density. Generally the wealthy produce more waste because they consume more. It is interesting to note that similar waste quantities are produced in the impoverished South East of the city, which is indicative of the towering density.



4. Informal Settlements

The informal settlements indicate by far the specific places which experience the highest degree of desperation and need. It is in these places where, people would be most likely take inhabit the new support structure.

5. Commercial and Industrial Areas

The commercial and industrial areas of the city would no doubt be high generators of waste. Industrial areas would also be likely places of waste salvaging, as well as the places from which unused items and 'dead stock' could be sourced.

6. Existing Waste Infrastructure

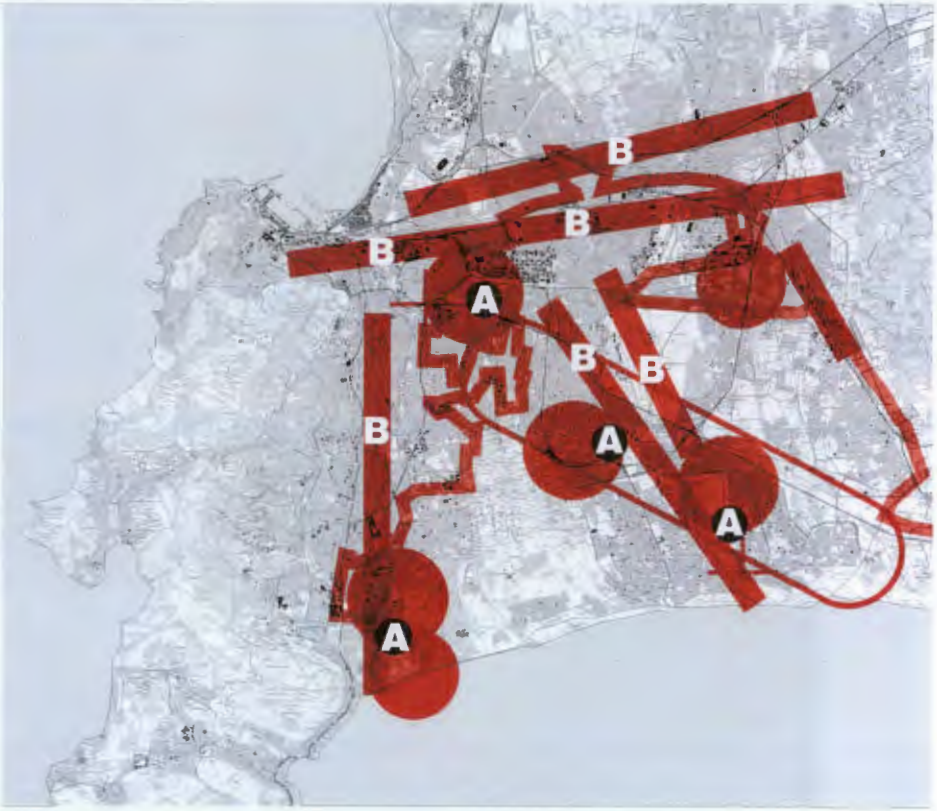
The location of landfill sites and transfer stations would be of particular significance, as not only do these indicate places of waste salvage (an existing practice) but also show their strategic location within the city as key places for citywide waste handling. If the new support structure was to act like a landfill, these become key points of emergence and growth. It is noted of course that the original location of the landfill sites, was setup to have minimal environmental impact and a minimum effect on local residents. However the continuous growth of the city of Cape Town has just about rendered these original intentions obsolete.

7. Open Space

The places left to be occupied within the Cape Town Metropolitan area. It is likely that the a large portion of these open plots will be occupied by informal settlements. These open places give an indication of where specifically the new support structure can grow, relative to the other criteria laid out in the previous maps.

8. Composite Diagram

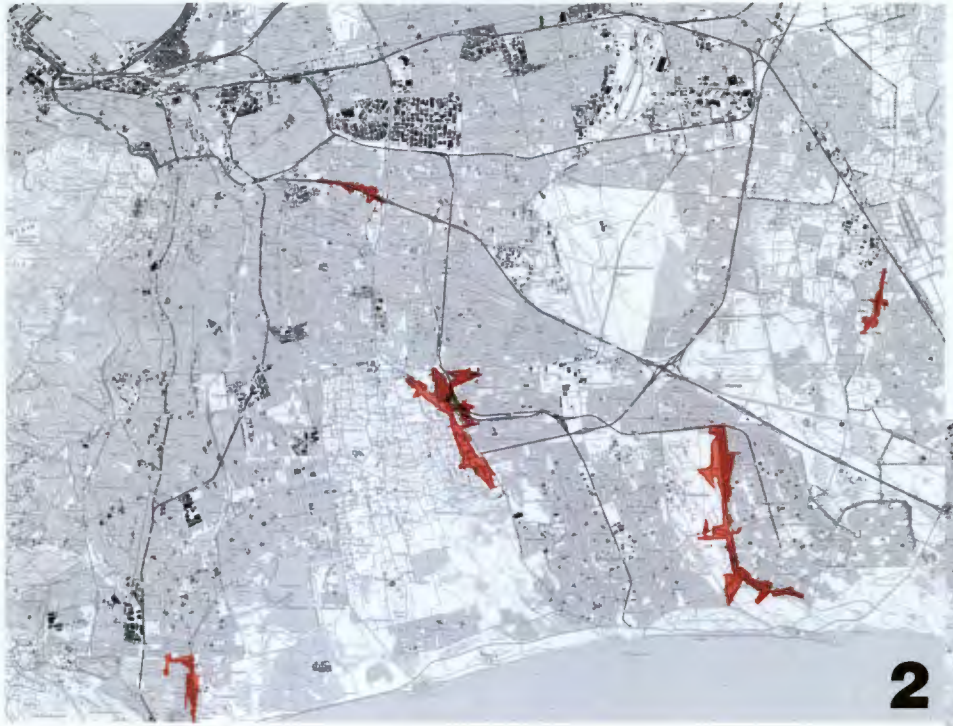
The A's indicate the likely points where the support structure would initially strategically locate, while the B's indicate the paths along which the new *city* would grow, relative to the open space map indicated above.



b. Growth

Drawing on the previous series of maps and the composite diagram, the following series of drawings were developed. The drawings propose a horizontal city-wide proposal for the growth and development of the new form of settlement. Ultimately forming a high density networked matrix out of waste within the existing Metropolitan area. The proposal would radically increase the density of Cape Town, while simultaneously addressing the conditions of poverty and inequality across the entire city.

Since the new *city* would not be contributing to the value of land in terms of a money economy, it would be impossible for it to locate on valuable spaces within the city. As such the development takes up a realistic position and locates itself on the unwanted spaces within the city- along highways, train, tracks, adjacent to industrial areas and in flood prone spaces-the spaces which are not considered to have much value within a the land market. This however would inadvertently bring about double transformation, both to the land upon which it locates as well as to the adjacent land, bringing a new kind of value to the previously desolate parts of the city.



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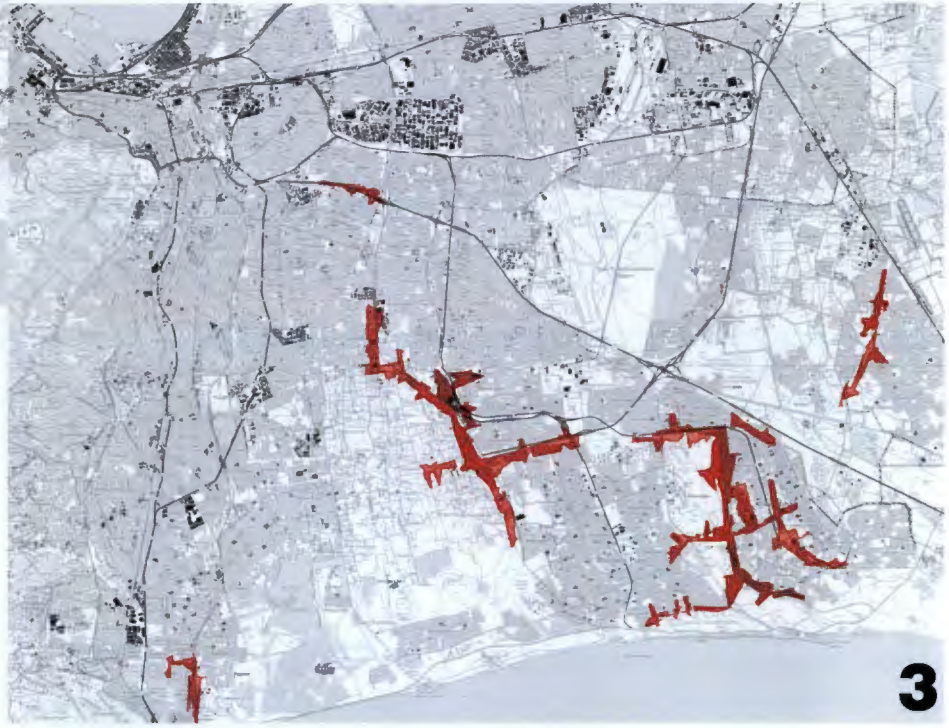


3

4

5

6

7

c. Critical Sketch

This drawing was made as a response to the series of mappings and the consequent drawings of a growing city. It can be considered as a conceptual leap as I attempted to imagine what this new *waste city* might look like.

The series of inclined planes would allow services to run to specific points by the force of gravity and also created an expansive urban space for use on the underside, while simultaneously raising up the inhabitation spaces possible flood levels. The oblique terrace also allowed for improved light and ventilation.

For me personally this image captured the ideas of a networked horizontal, growing city, which is built by the inhabitants and continuously altered on a day to day basis

3.2. FINDING SITE

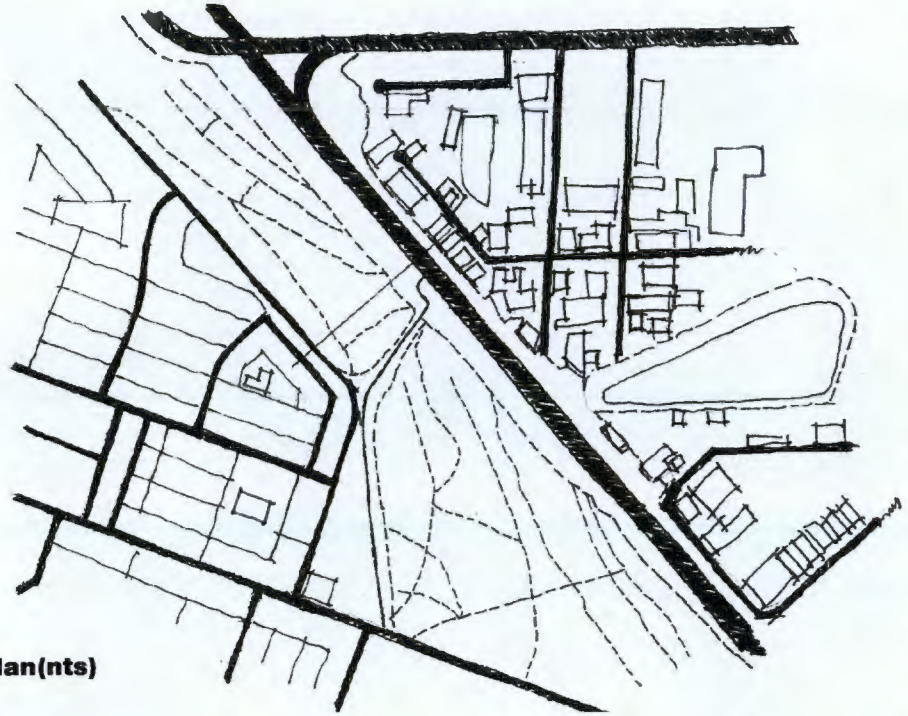
a. Wasted Left-over Space: Five Sites

In order to further develop the design, the next step in the process was to test the proposition on a particular site, with real informants and constraints. In order to select a site, five different site types were chosen within the city-wide proposal, which each reflected varying surrounding conditions.

This was done in order to unpack similarities and differences between the various site types, so that a set of guidelines and a generic site strategy could be developed for the city-wide proposal as a whole. This in essence would define the rules of the game. These rules would answer the questions around what structures the new form of inhabitation?

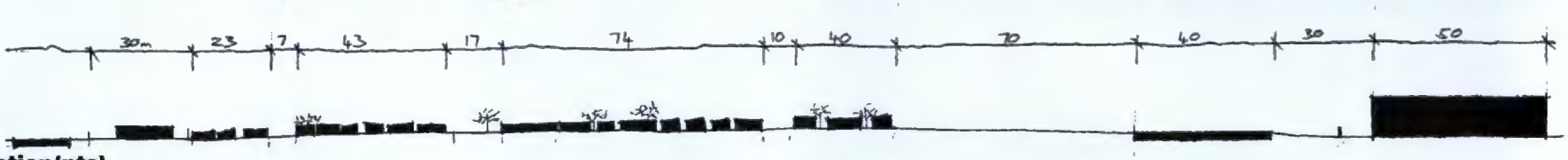
A

Industrial Periphery
Gugulethu- Kanana



plan(nts)

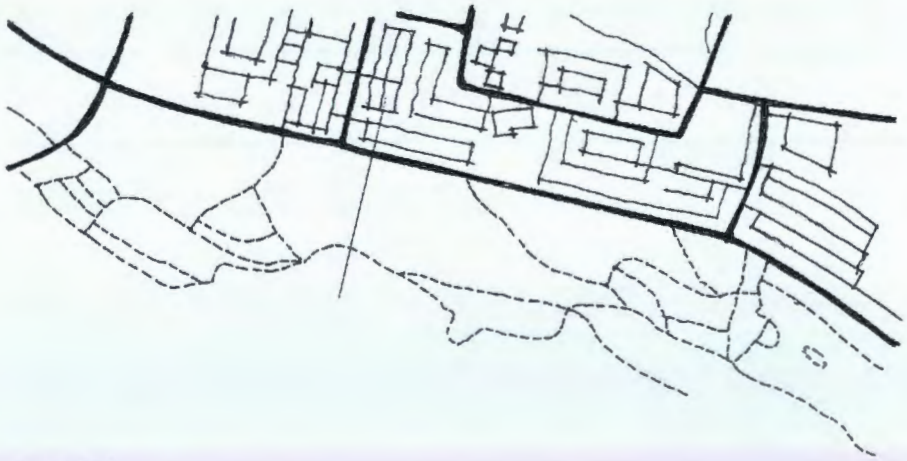
Figure 30
Source: Google Earth



section(nts)

B

Settlement Edge
Khayalitsha-Monwabisi



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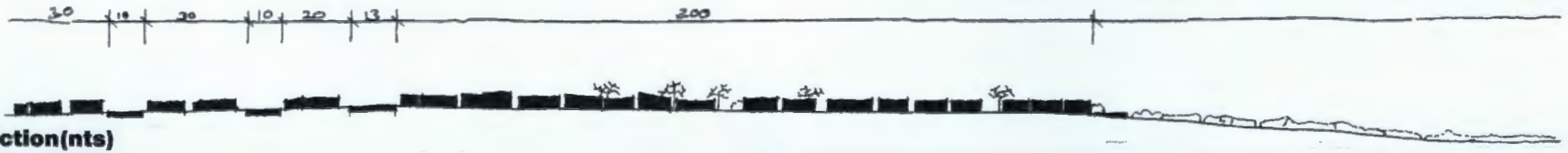

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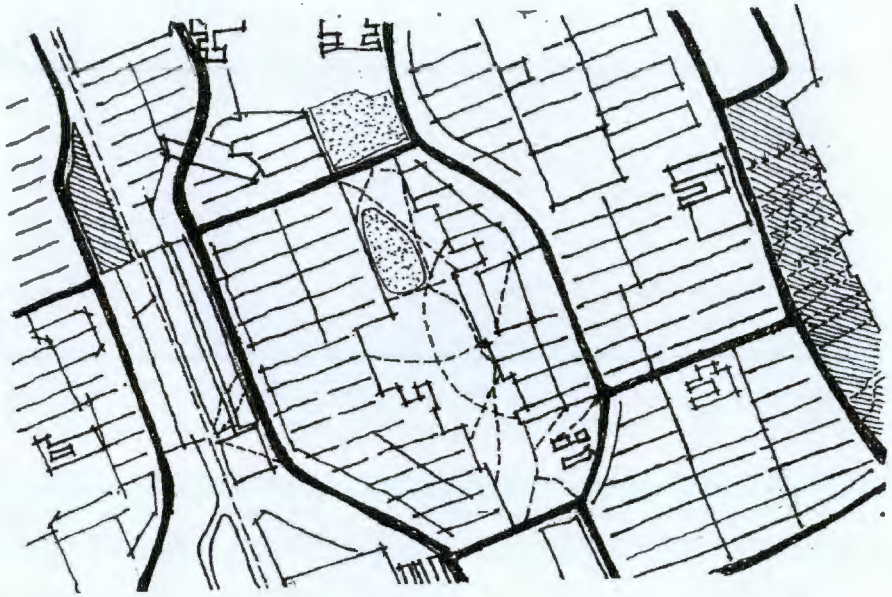
C

Left-over Suburban
Khayalitsha-Eyethu



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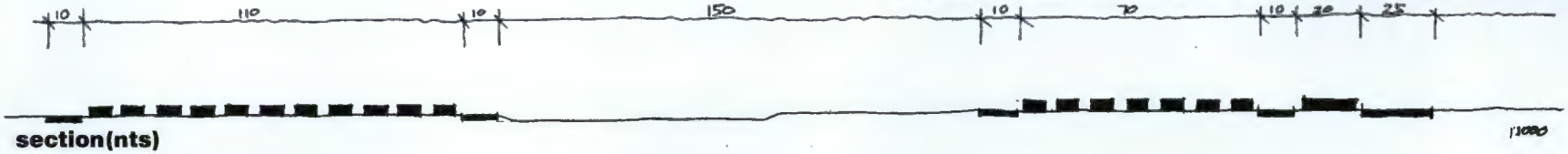


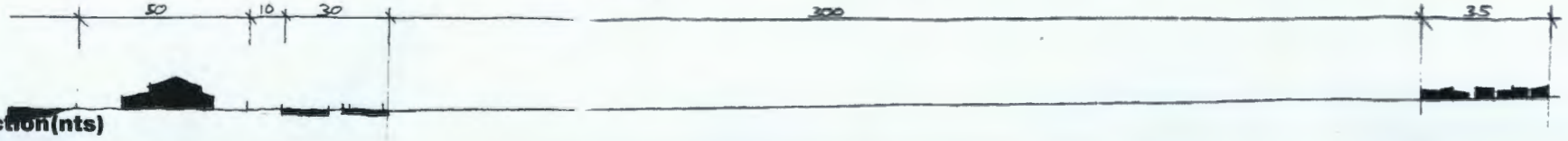
section(nts)

D

Dividing Periphery
Marina Da Gama
Blue Haven

plan(nts)

Figure 53
Source: Google Earth

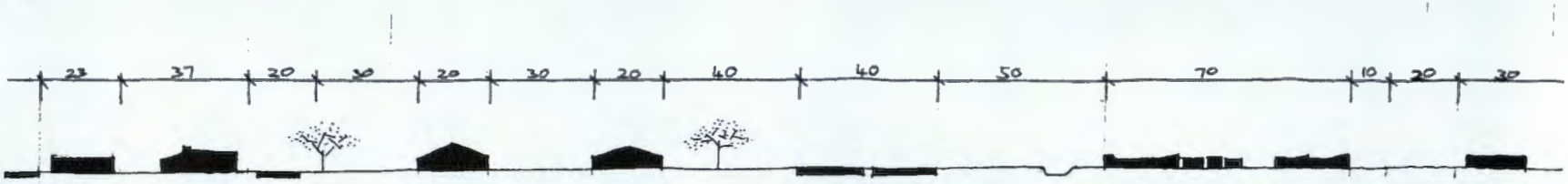


section(nts)

E

Highway Edge
Langa-Joe Slovo N2

plan(nts)



section(nts)

b. Conditions of the Sites

While the drawings on the previous pages give an indication of the urban scale and context of the selected sites, the images to the right typify the main qualities which were extracted in order to formulate a set of guidelines.

These are intentionally limited for two specific reasons. Firstly given the projective futuristic nature of the project, it would be futile to draw out all existing site complexities, thus the conditions which are shown are those which I believe would still remain in the future, not necessarily in their same position but the condition would still be present. And secondly by limiting the site qualities the guideline developed out of these qualities not to become too complex. This would naturally allow for more freedom within site specific responses as the settlement grew throughout the city over time.

These conditions are thus seen as initiators for the design response both towards the process of site making as well as the design of the support structure itself.

d. Site Selection

Site E: Langa-Joe Slovo N2

Although any of the five sites could have been chosen as potential location upon which to test the proposition, the decision to choose Site E was based upon a number of factors. Firstly it emerged out of the City-wide proposal as one of the growth starting points. Secondly the near proximity of the Municipal Waste transfer station meant that it would be strategically located to receive vast quantities of waste from the broader area.

Figure 3
Source: Google Earth

The public nature of the site positioned as a gateway into the city of Cape Town, rendered the site as a strategic position to fuel critical reflection and provide a political statement towards the current state of affairs. It would also serve as a clear alternative to the current norm of housing development referred to as the Joe Slovo N2 Gateway Housing Project.

Lastly it presented a series of difficulties which would thus be the true acid test for the project. These difficulties were highlighted by the existing presence of water and the narrow size of the site.

Figure 3
Source: Google Earth

d. Site Locality Plan

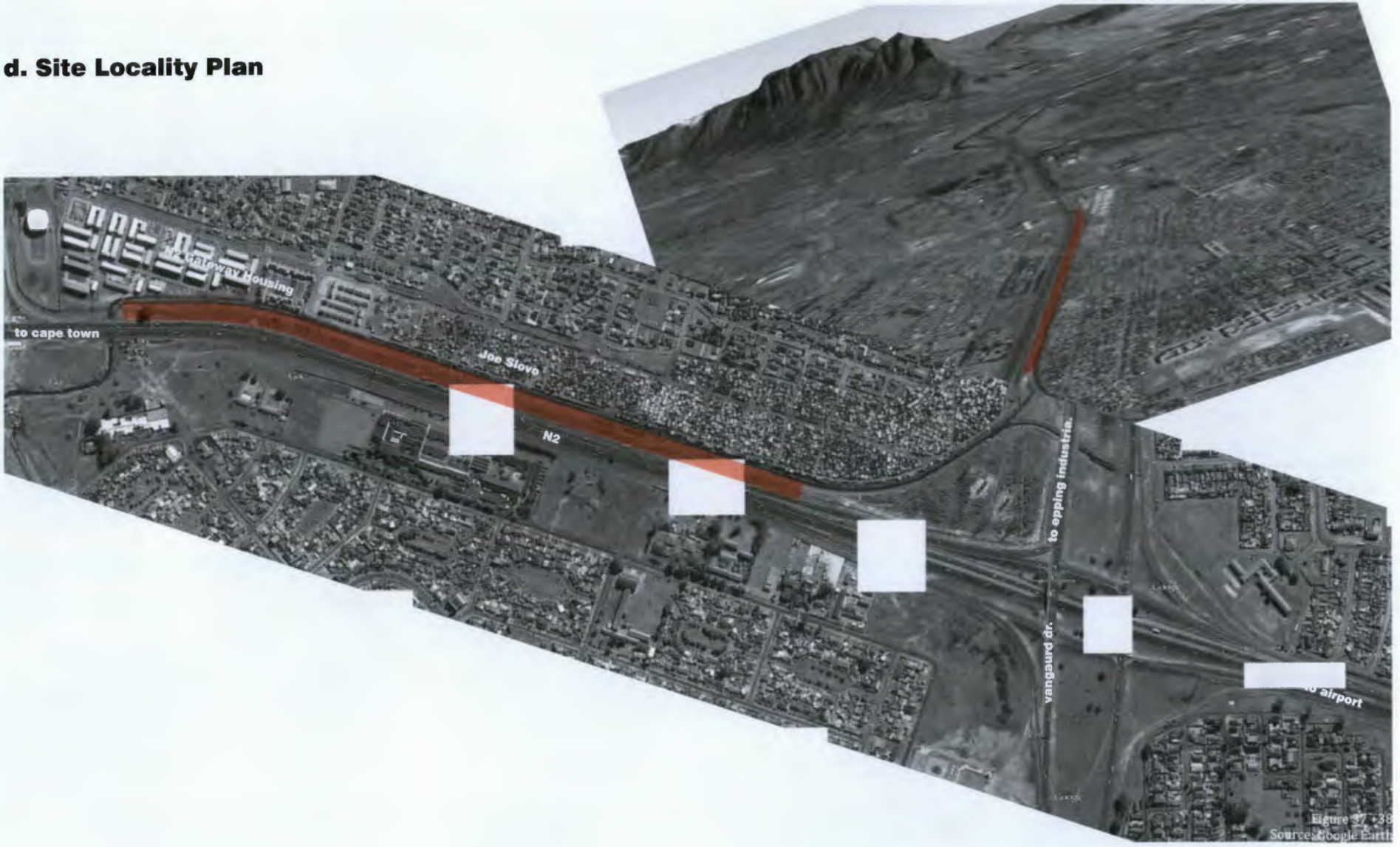


Figure 37 : 38
Source: Google Earth

e. Site Data

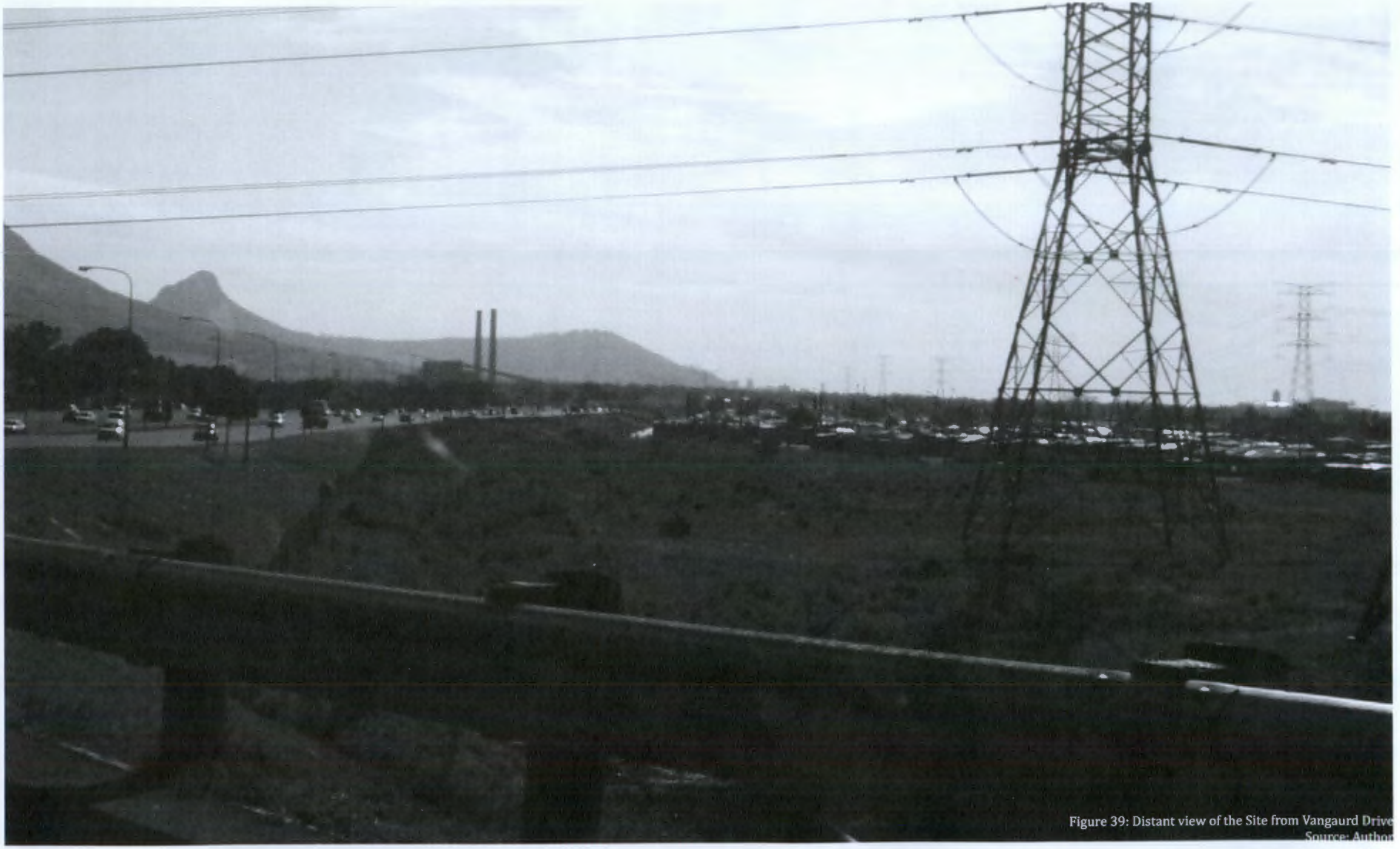
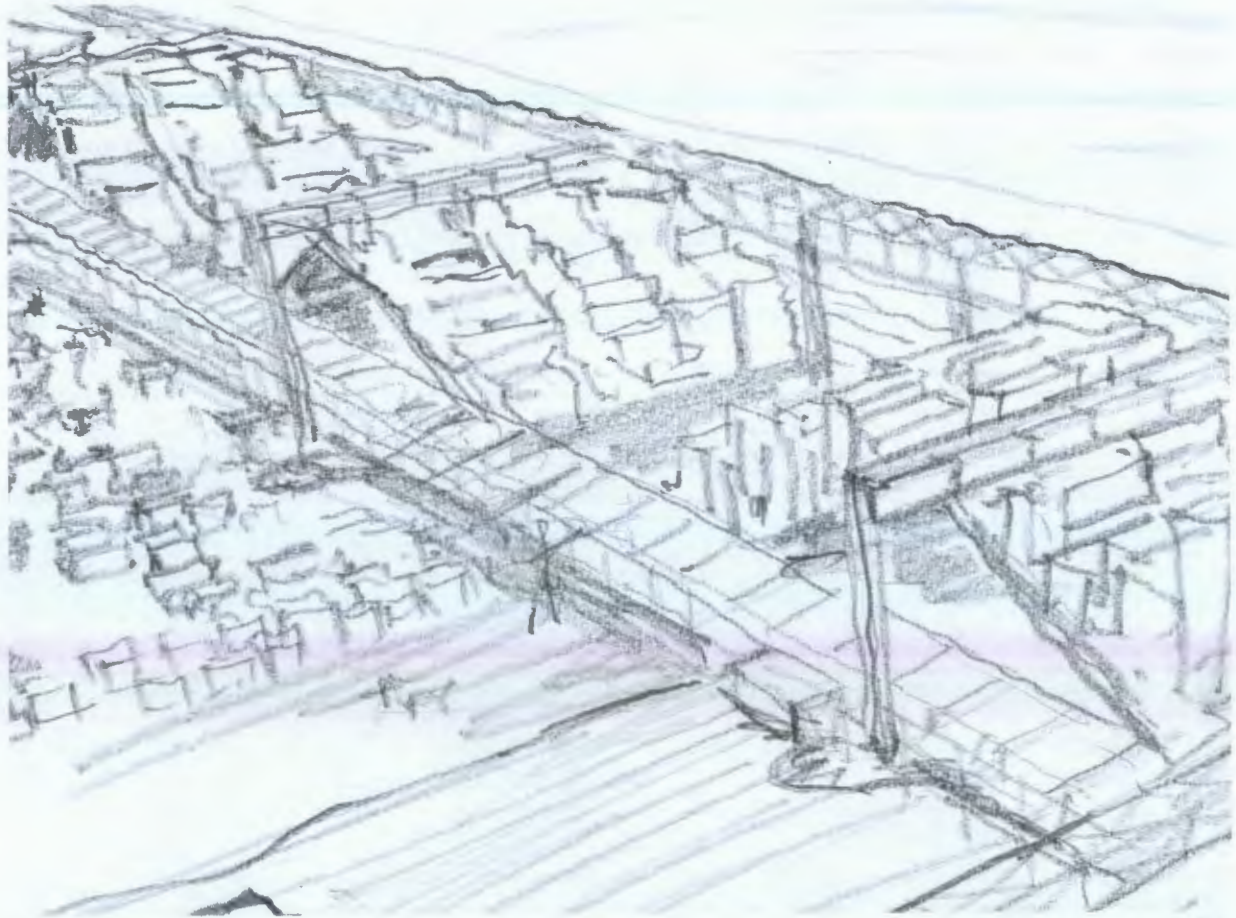


Figure 39: Distant view of the Site from Vangaurd Drive
Source: Author

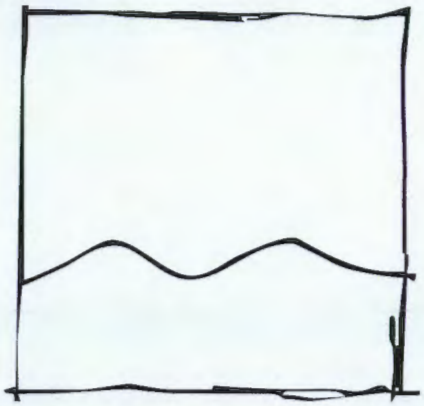
3.3.INHABITABLE SUPPORT STRUCTURE

a. Cartoon Guidelines: Defining the 'rules of the game'

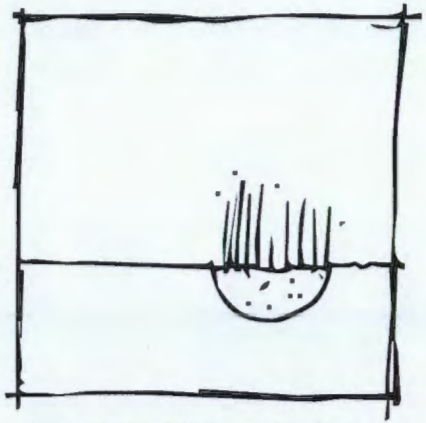
The cartoons presented on the following pages present a series of generic guidelines towards the making of the inhabitable support structure as previously described. They have been alongside the process of design and are in part seen as one of the conclusions to the design process. They are however presented here to give a deeper understanding of the design project. (All cartoons by Author)



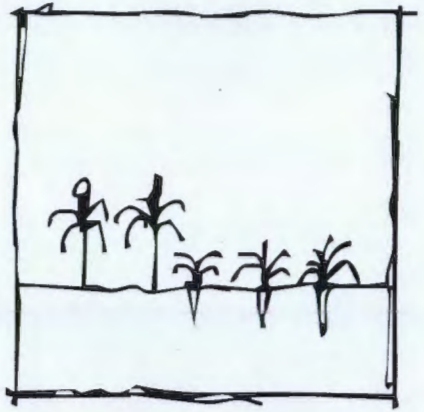
How do we build on these unwanted left over spaces, which flood all the time and are very noisy?



First the land is manipulated, to direct and control water. This easy because most of the sites are just sand.

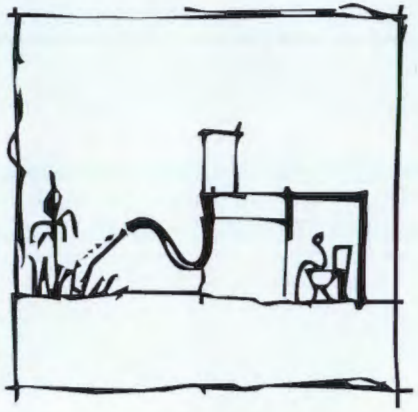


Then a water filtration system of read beds, and wetlands is setup. This can be new, but where possible should tie into the existing natural water structure.



Vegetable gardens are then setup for intensive self-help agriculture. This could be divided into allotments. However a permaculture model is best for this.

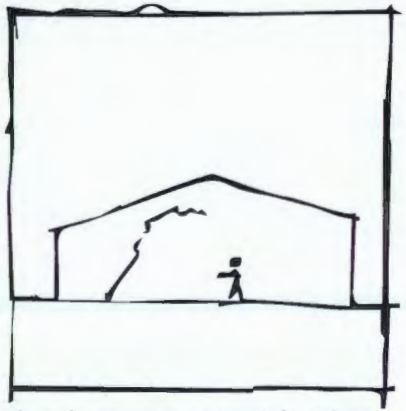
A road network is setup, which connects into existing movement patterns and allows for the servicing of the site by car and truck. (deliveries of waste.



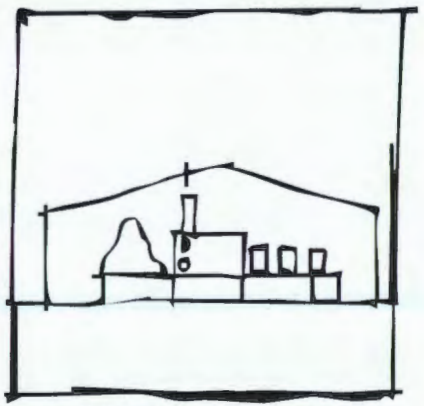
Basic infrastructure is established, so that the site can be utilised by people. This infrastructure should be aimed to be used first and foremost by existing adjacent inhabitants, whose services are more than likely collapsing.

Areas for the delivery of waste should be designated.

A buffer can be created between the source of the noise and the site, in order to make future living conditions more pleasurable.

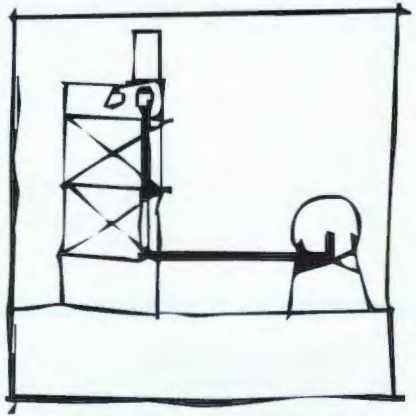


A warehouse type space is created in order to process, sort and clean waste. This can also used as a building warehouse.



A waste building factory is setup, within the warehouse. The first real step towards creating buildings from waste. This would be supplied by government or the state.

But now that there is water and a factory, how can we begin to make buildings and inhabitable spaces.

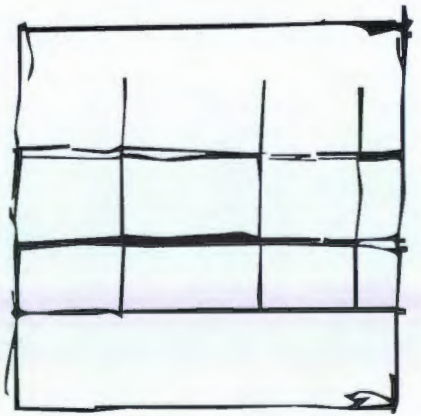


Bulk infrastructure, such as potable water and methane digestors for energy must then be setup. These are created above ground to allow easy access and connections.

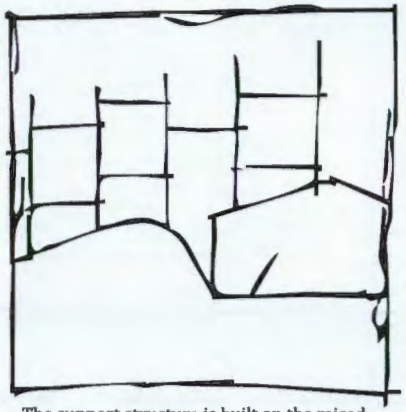
They are setup in such a way as to allow for constant extension and growth and change. They form part of the urban structure.

Closed loop cycles of energy and water inputs and outputs are always ensured.

Ok, now that there is all the basic infrastructure how do we create spaces to live and celebrate our new freedoms within? This must also allow for great density, so we cannot just build on one level.

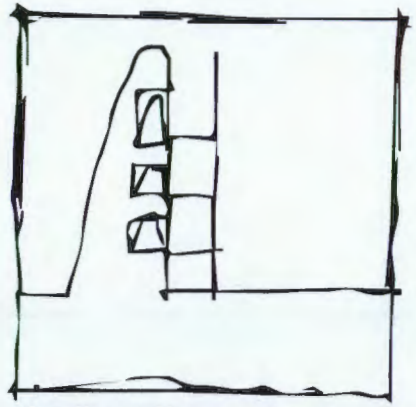


A support framework of columns, beams and infill floors is created.

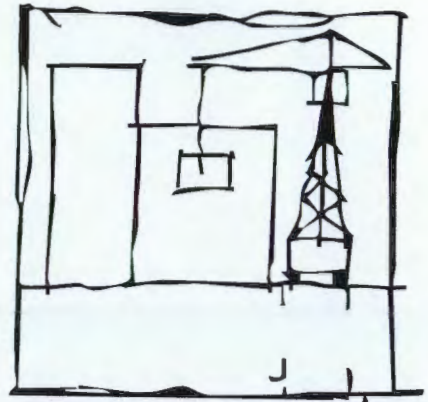


The support structure is built on the raised ground and on top of the warehouse to create to avoid the ground floors to be flooded, while still mainting a connection to the ground. This creates and inclined plane living environment.

Ramps are required in order to move the heavy wastes (the building material) up to the various floors within the framework.

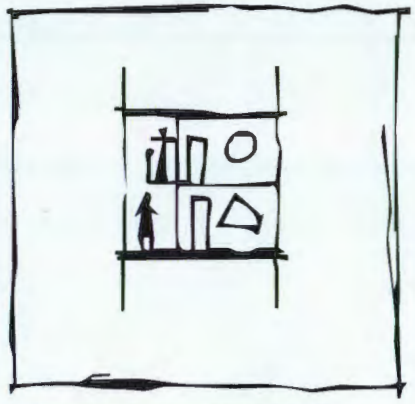


The buffer is used for storage of waste materials once it is sorted and ordered. Since the accumulation of waste would be far greater than the speed at which people could build with it.

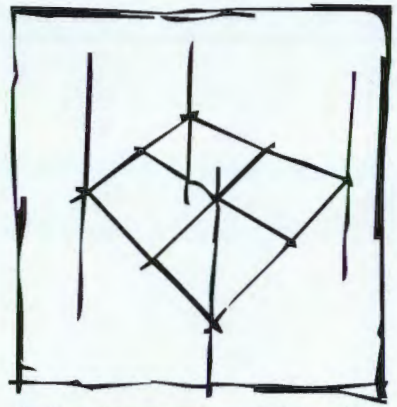


A service road which is clear to the sky is kept open to allow for building assistance by a mobile crane which would

In the informal settlements we see a practice of people building up to two floors using timber and scrap metal sheets. This would be much easier with the help of the building factory below.

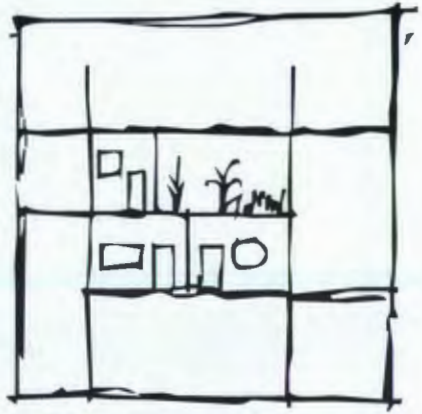


The support framework creates a double volume space into which two floors can be built utilizing waste, entirely by choice by the needs of the individuals. A floor and a roof is thus provided.

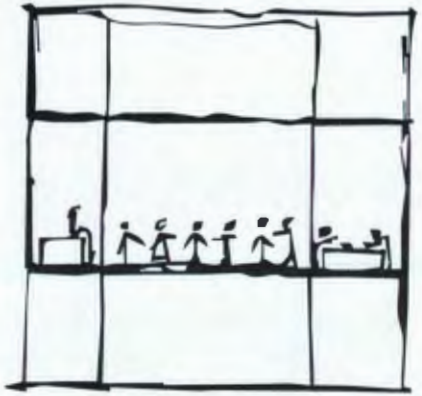


The floor plates are made up of a lattice of beams allowing for further vertical flexibility. The floors could be built using either timber or a rib and block concrete system.

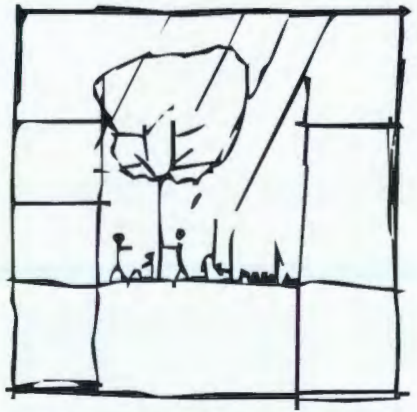
The floor plates are able to be fixed at different levels allowing for maximum flexibility. This happens as the settlement grows over time and is not be pre-determined.



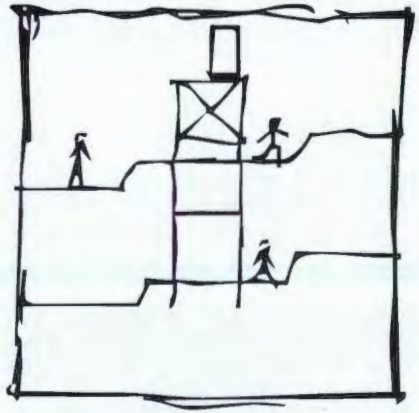
These flexible spaces can divided into small individual dwellings and gardens.



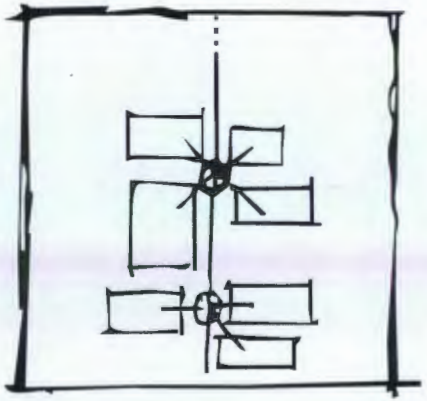
Or they can be combined to create large collective spaces.



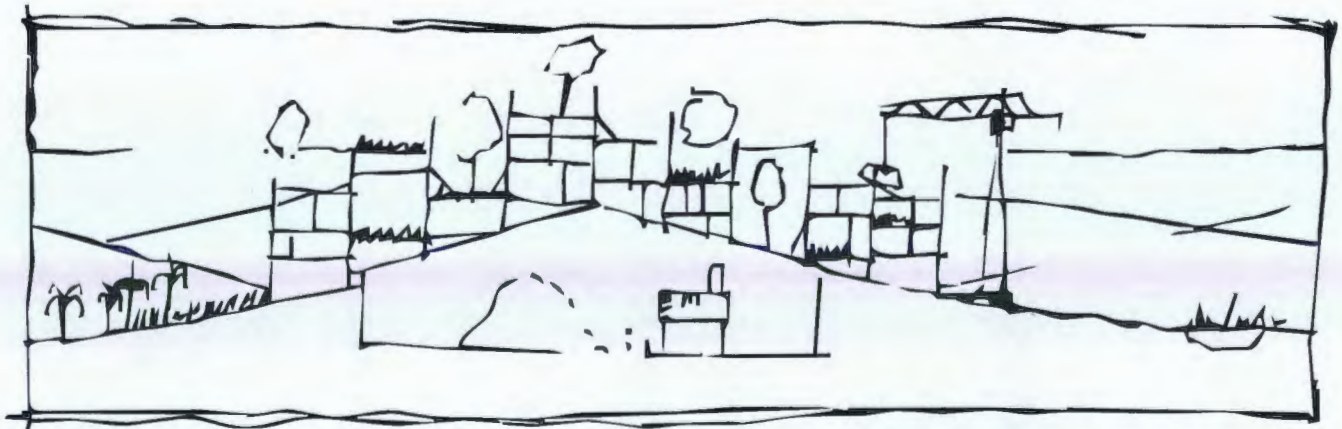
But some must be left open to create gardens and allow light and ventilation into adjacent units.



In order to create some form of order, walkways are created at every second level. Sub-cores are established into which the surrounding units and collective spaces, plug into.



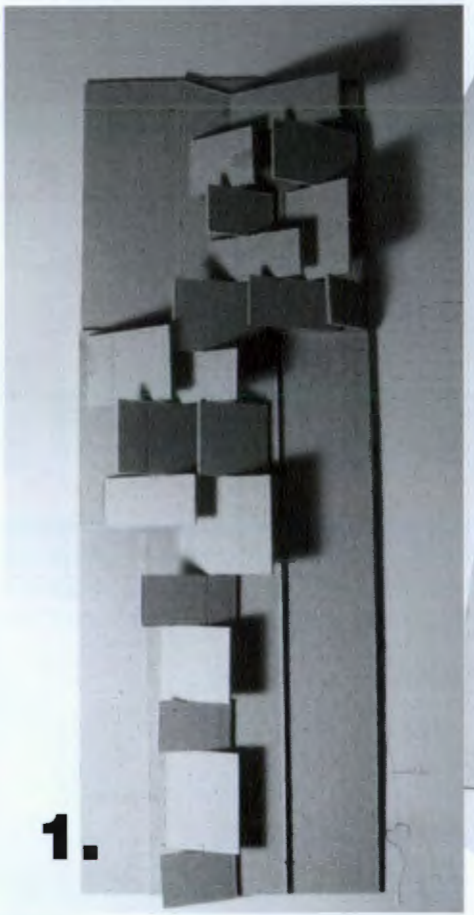
These walkways and sub-cores, act streets and define an urban structure.



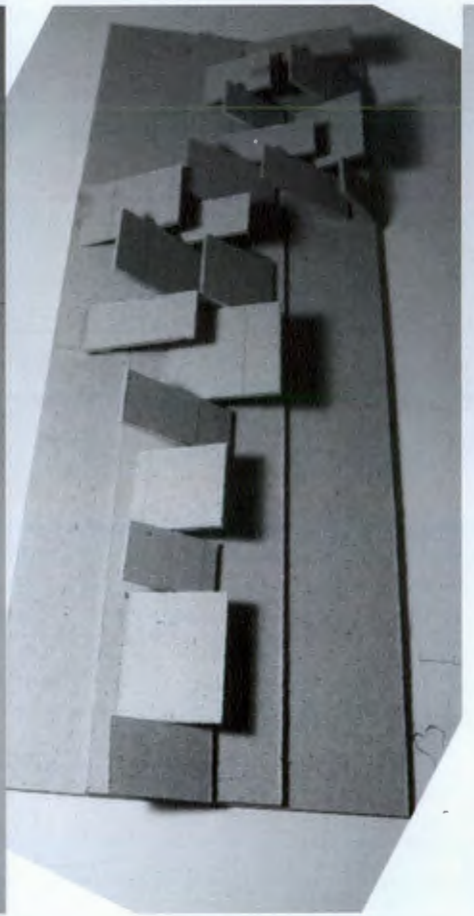
An inhabitable self-sufficiency framework, supporting the use of waste as accummulative building materials. Always changing, adapting and growing.

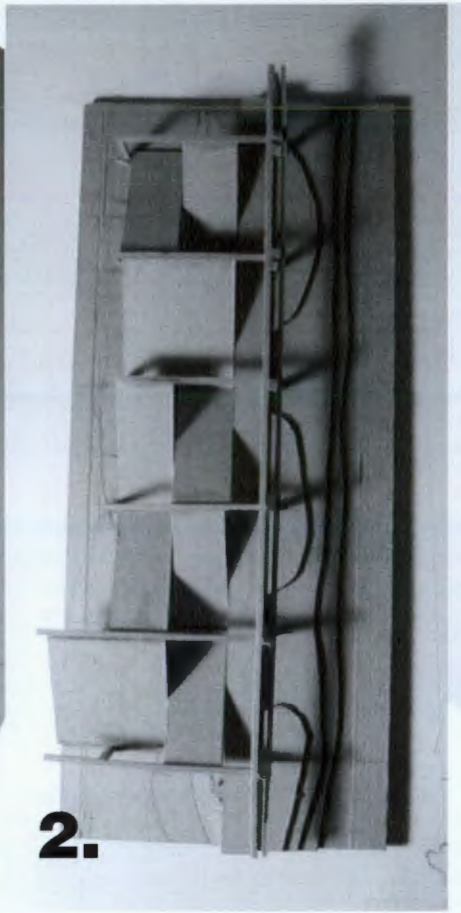
b. Experimenting with Models

The two models presented here, illustrate two different responses to the way in which the inclined planes, upon which building the building occurs, relate both to eachother and the surrounding context. They also illustrate the way in which the settlement might begin to grow. The first model indicates a form which stitches and connects into its surroundings, while the second model gives a more linear response. The second model shows the integration of service lines and structure.

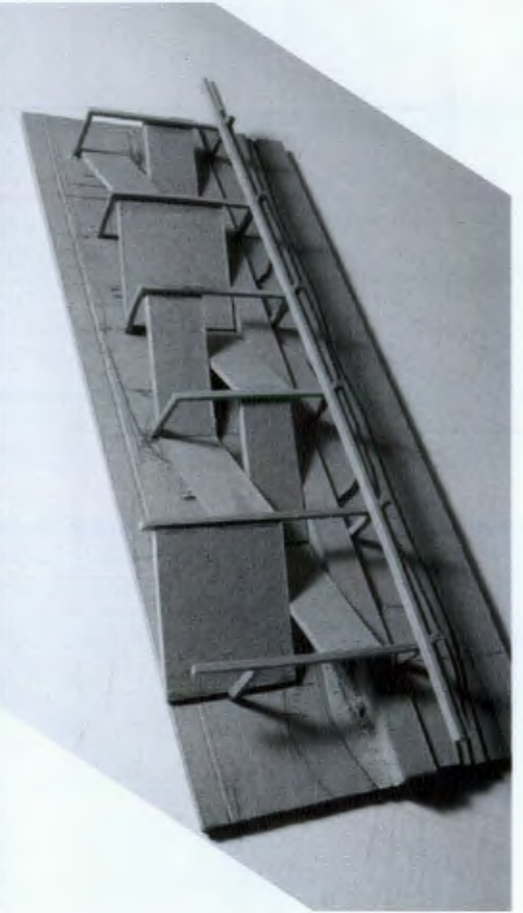


1.

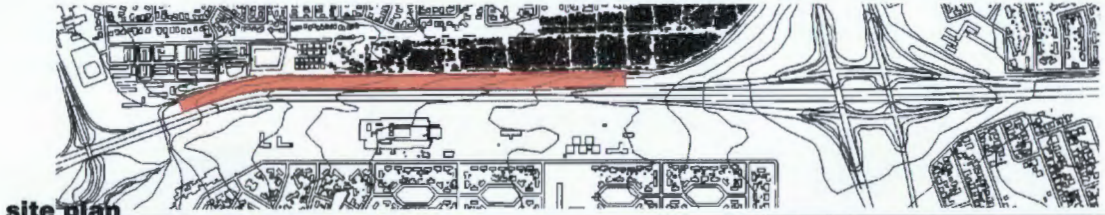




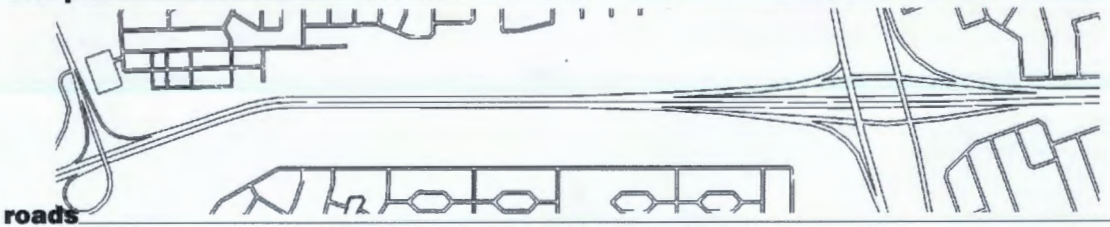
2.



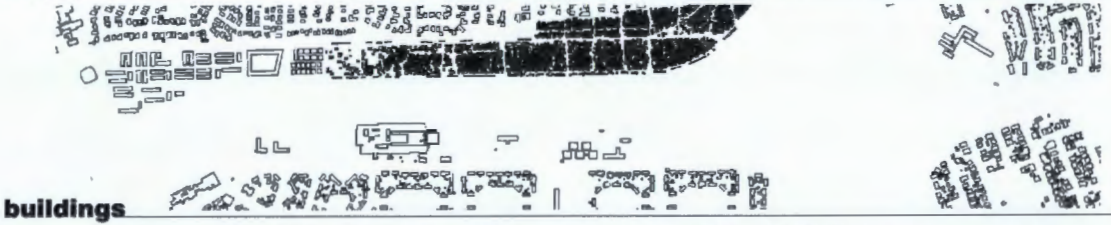
e Data



site plan



roads



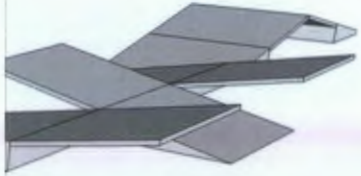
buildings

1m contours

man-made canal

4. rotation

5. difference



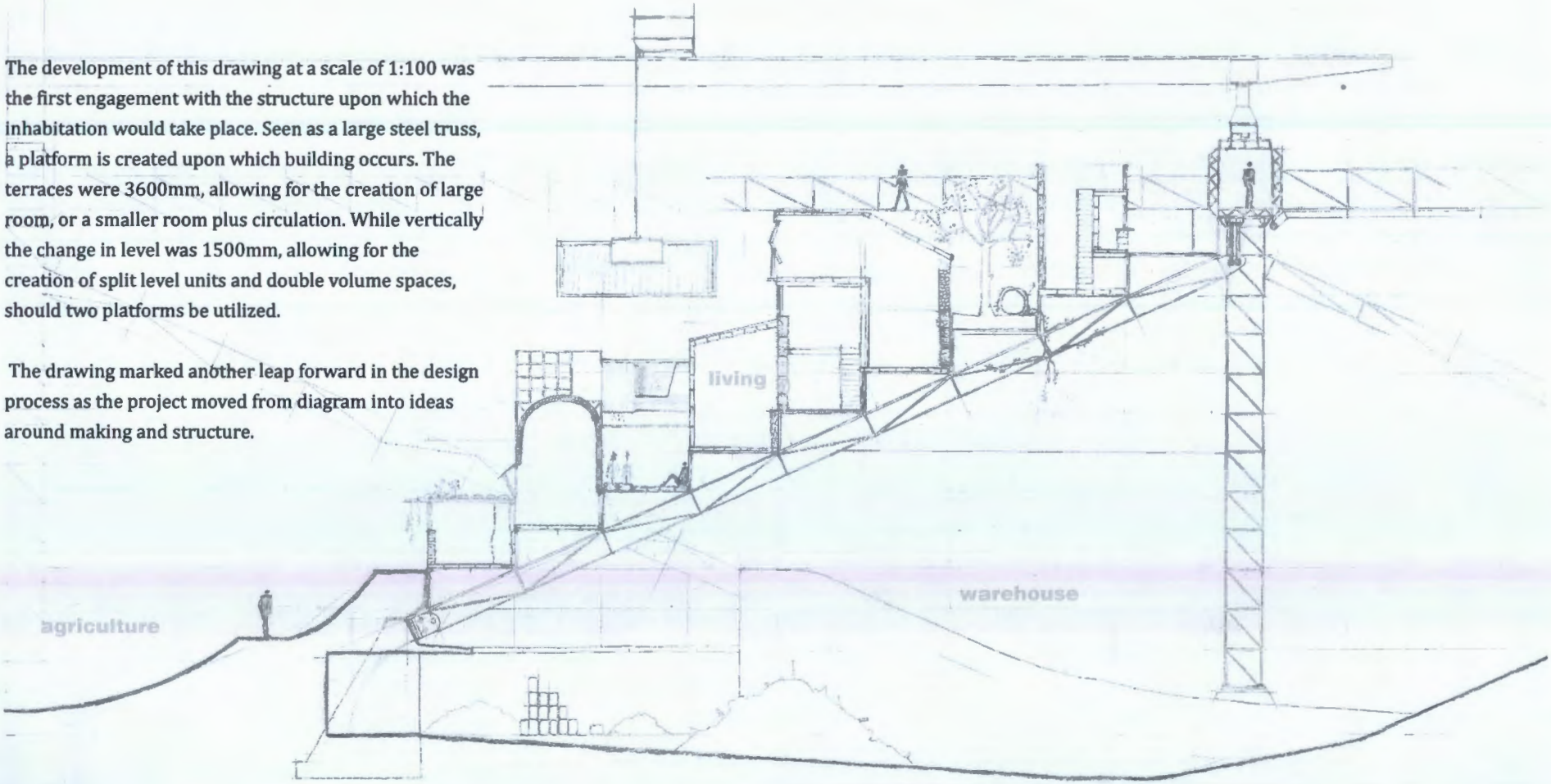
6. collective form

t view of the Site from Van
So

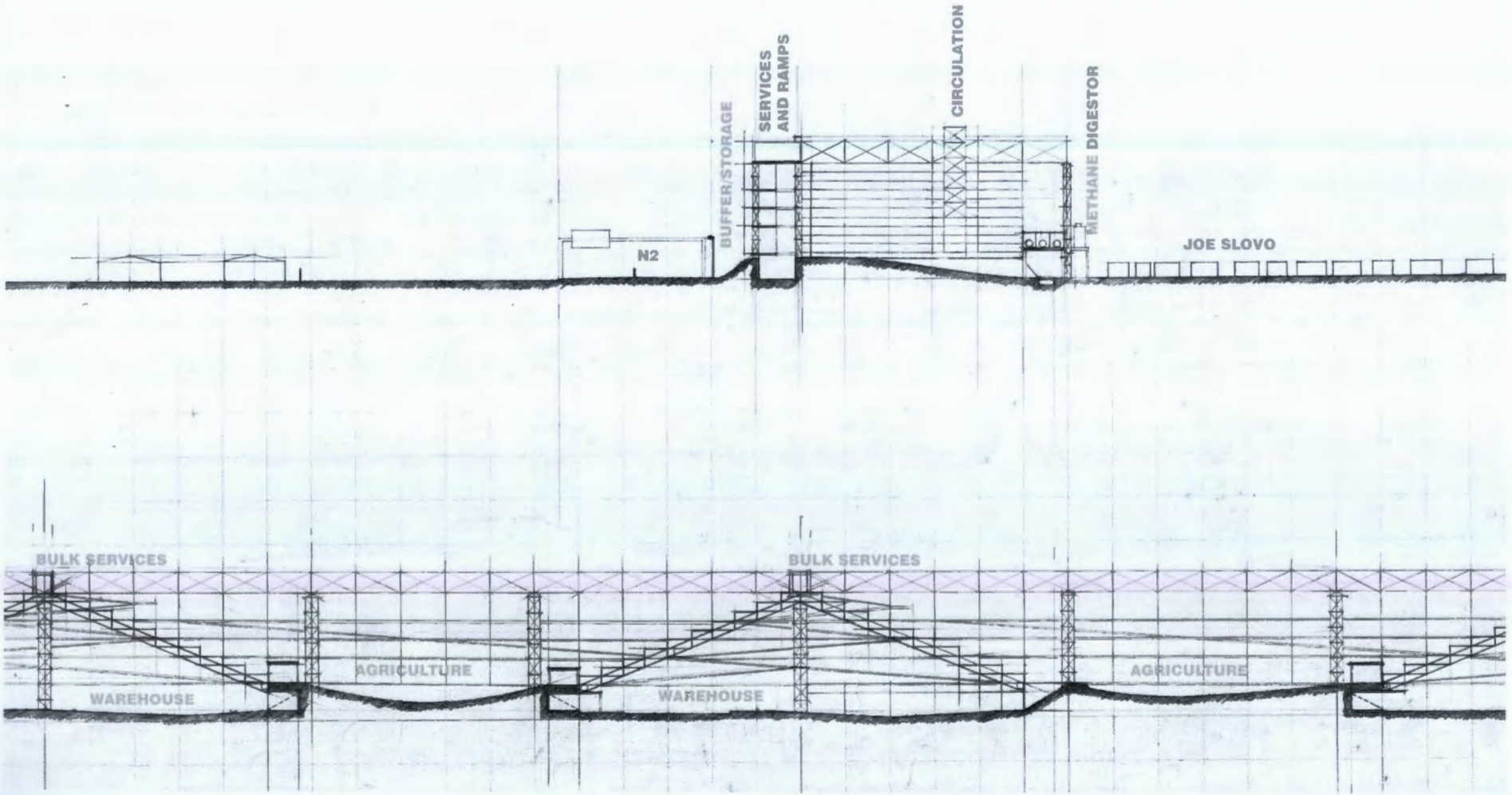
d. Critical Drawing

The development of this drawing at a scale of 1:100 was the first engagement with the structure upon which the inhabitation would take place. Seen as a large steel truss, a platform is created upon which building occurs. The terraces were 3600mm, allowing for the creation of large room, or a smaller room plus circulation. While vertically the change in level was 1500mm, allowing for the creation of split level units and double volume spaces, should two platforms be utilized.

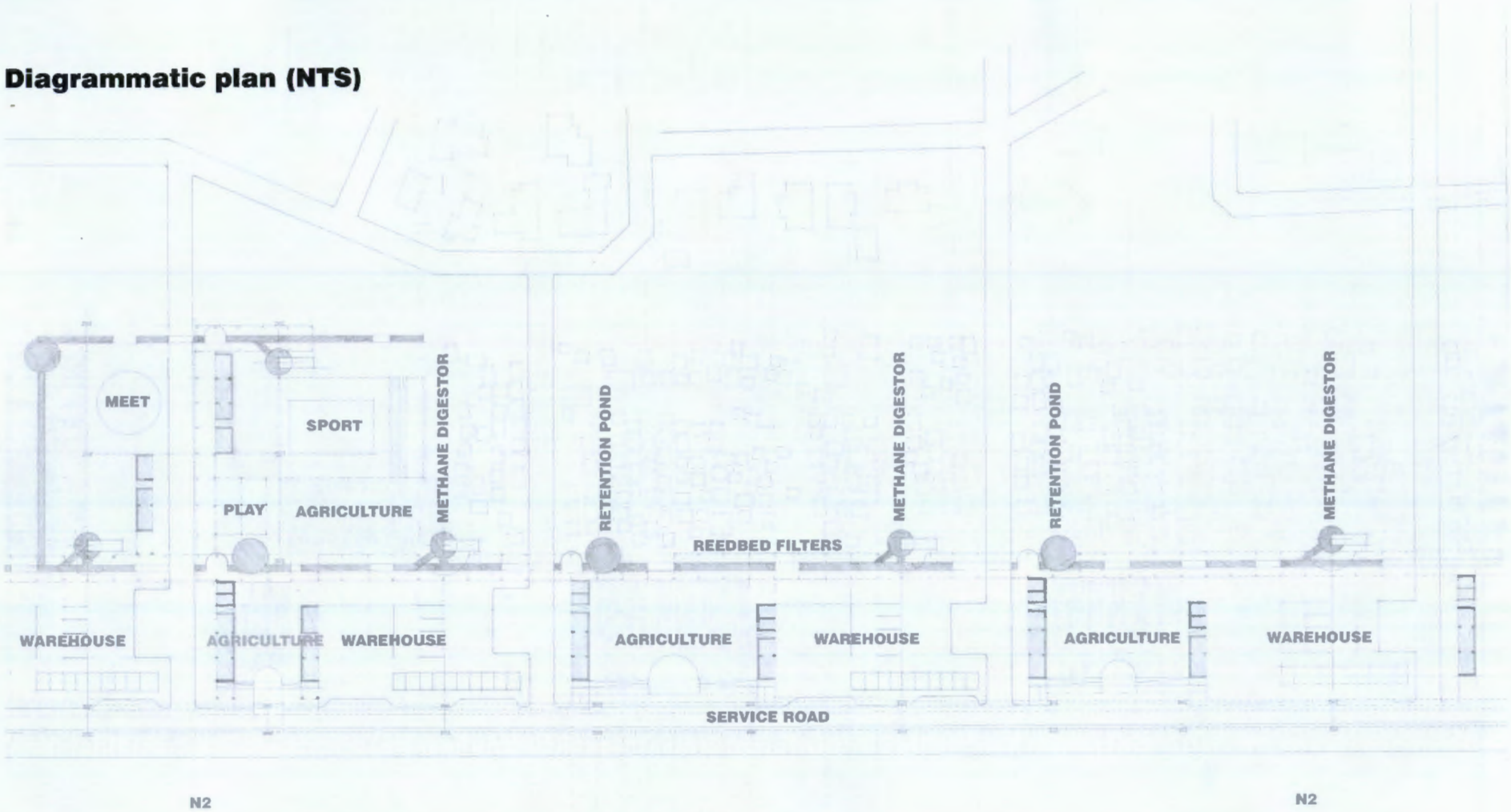
The drawing marked another leap forward in the design process as the project moved from diagram into ideas around making and structure.

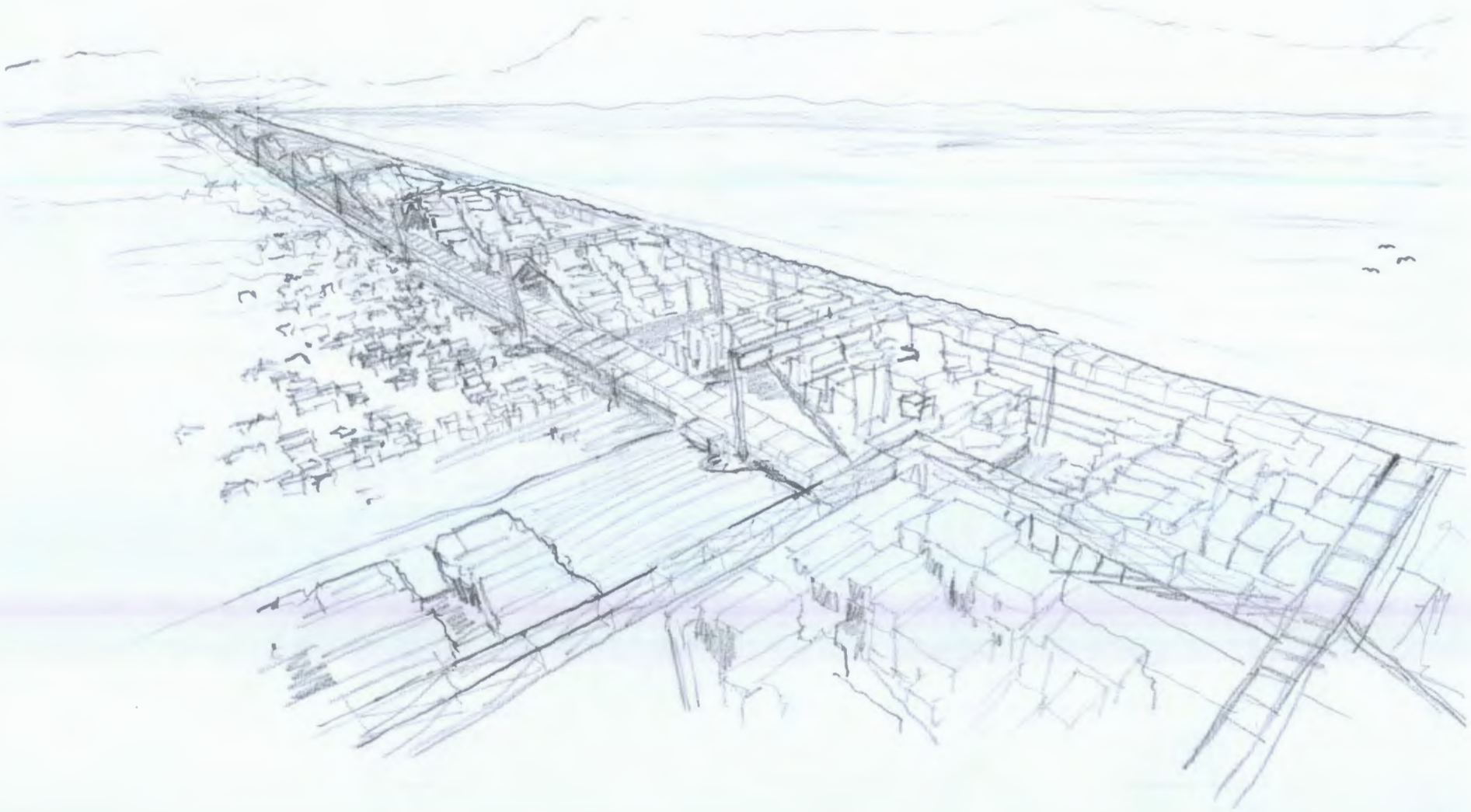


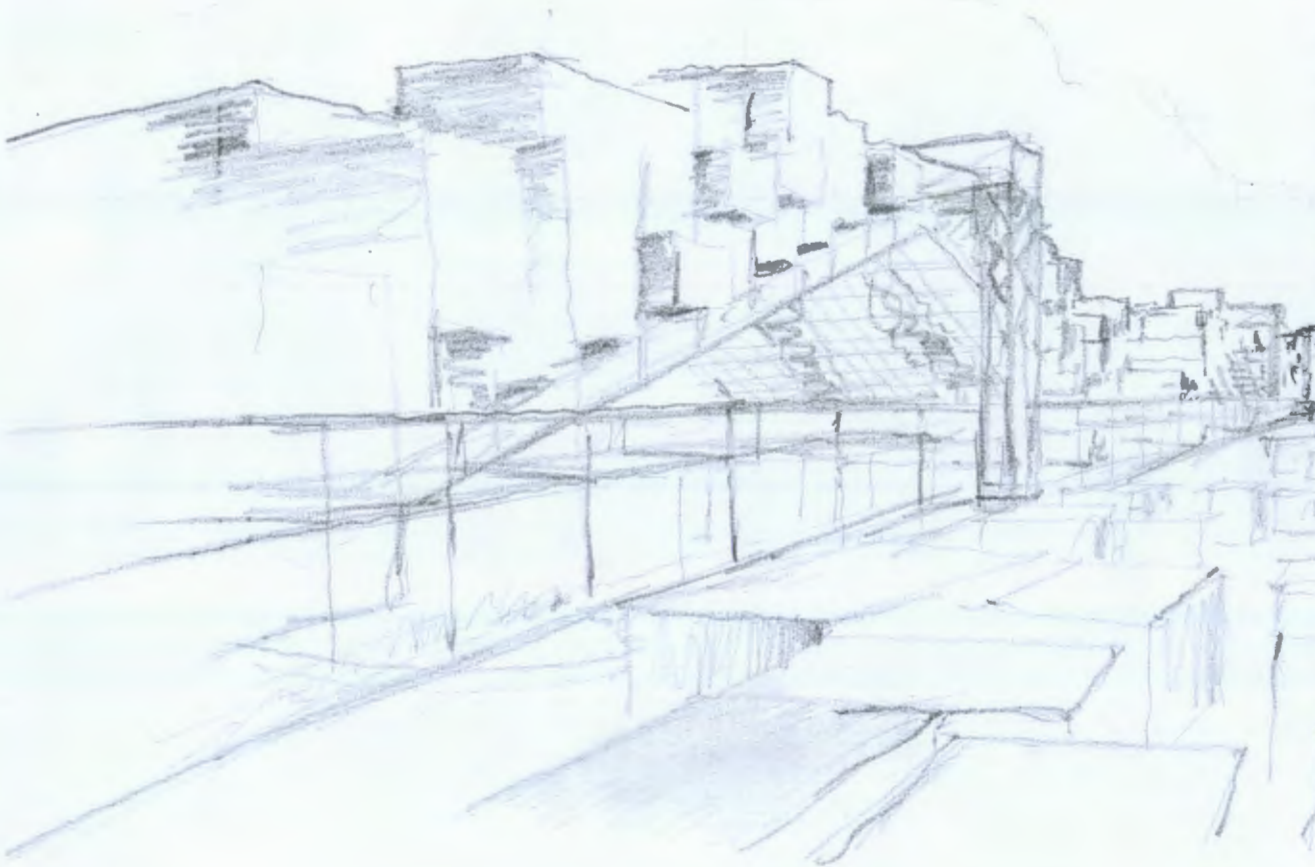
e. First Sketch Design Proposal (Uninhabited): Part Sections (NTS)



Diagrammatic plan (NTS)







Reflections: Ultimately it was felt that the use of steel contradicted the argument for the use of waste and that a more energy efficient should be sought. However the need to densify and the consequent need to have multiple levels meant that a support structure of some sort had to be provided. This could not be built entirely out of waste. Unfortunately timber was not an option in South Africa, except for gum-poles, which leaves concrete and steel.

Since building with waste would entail, a combination of both lightweight and mass construction techniques it was decided that a combination of structural solutions could be used. In light of the fluctuations of prices and availability of materials in the building industry this would create a robust system for the development of the support structure as the support structure could adapt and change along with these fluctuations as well as to the variability of waste building techniques.

The modular grid of the support structure was also adjusted to a larger module to allow more freedom, recognizing that secondary structural framing could be achieved through the use of wasted timber and scrap metal.

Development of the Module

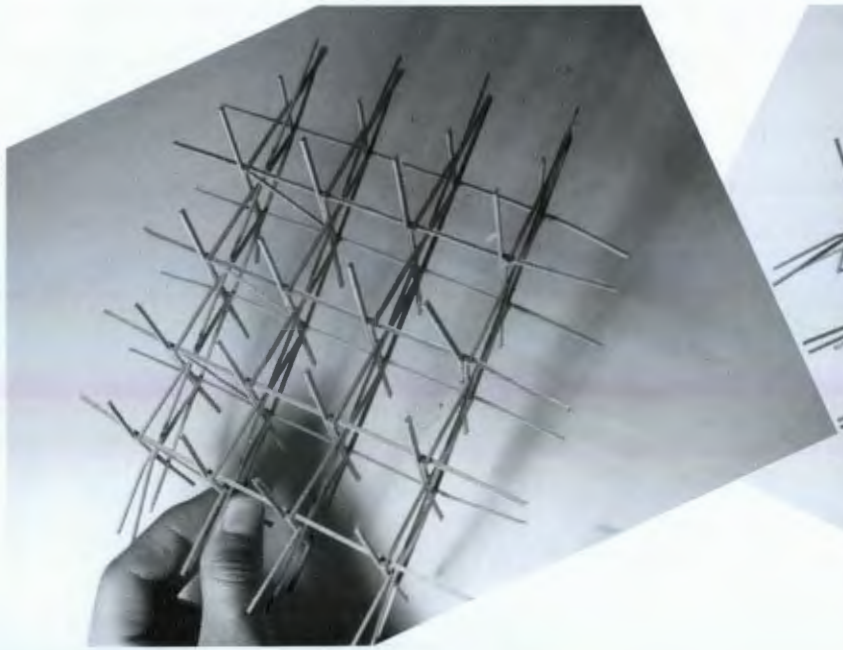
individual

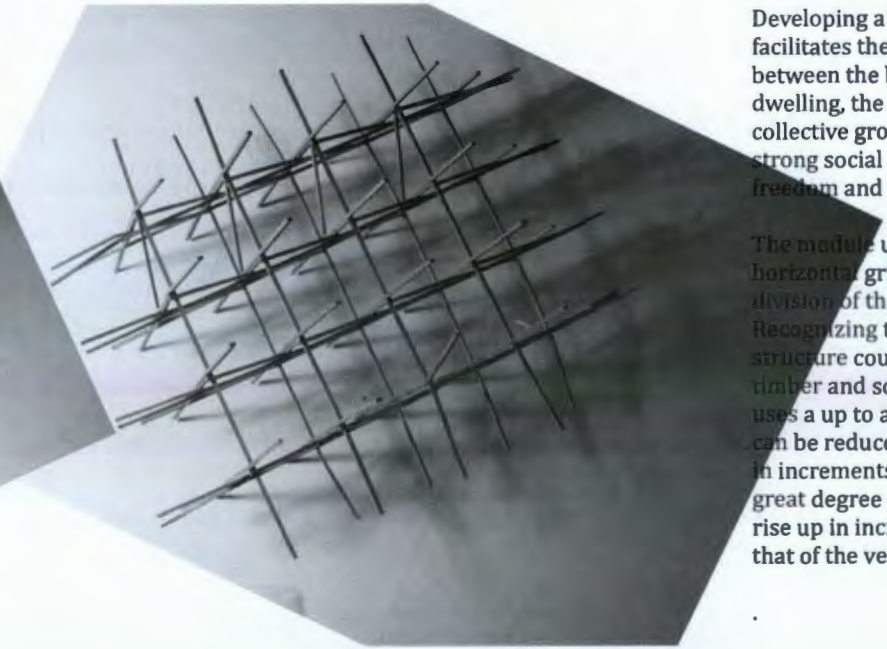
neighbour

support frame

variability- adapt, grow, change

collective spaces

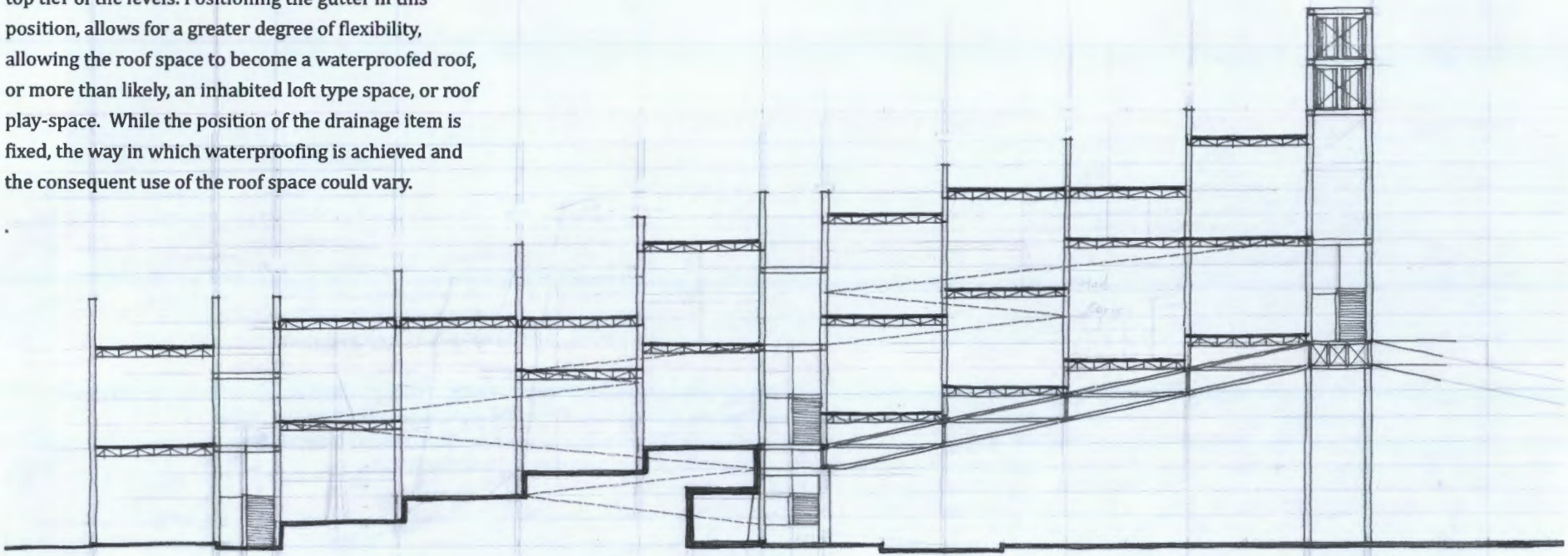




Developing a support structure which facilitates the fine scale negotiation between the building of the individual dwelling, the neighbor and the collective group, thereby creating strong social networks and allowing a freedom and variability of spaces.

The module uses a 7.2mx7.2m horizontal grid, which allows for sub division of the individual bays. Recognizing that a secondary framing structure could come from wasted timber and scrap metal. The module uses a up to a 6m vertical module, but can be reduced to 3m and can be fixed in increments of 1.5m allowing for a great degree of variability. The terraces rise up in increments of 1.5m to match that of the vertical increments.

The section indicates the 7.2m horizontal module and the variability of the levels creating a multitude of spaces, which could result in both indoor and outdoor spaces. A box gutter would be fixed at floor level of the top tier of the levels. Positioning the gutter in this position, allows for a greater degree of flexibility, allowing the roof space to become a waterproofed roof, or more than likely, an inhabited loft type space, or roof play-space. While the position of the drainage item is fixed, the way in which waterproofing is achieved and the consequent use of the roof space could vary.



Section through a portion of the the revised Framework

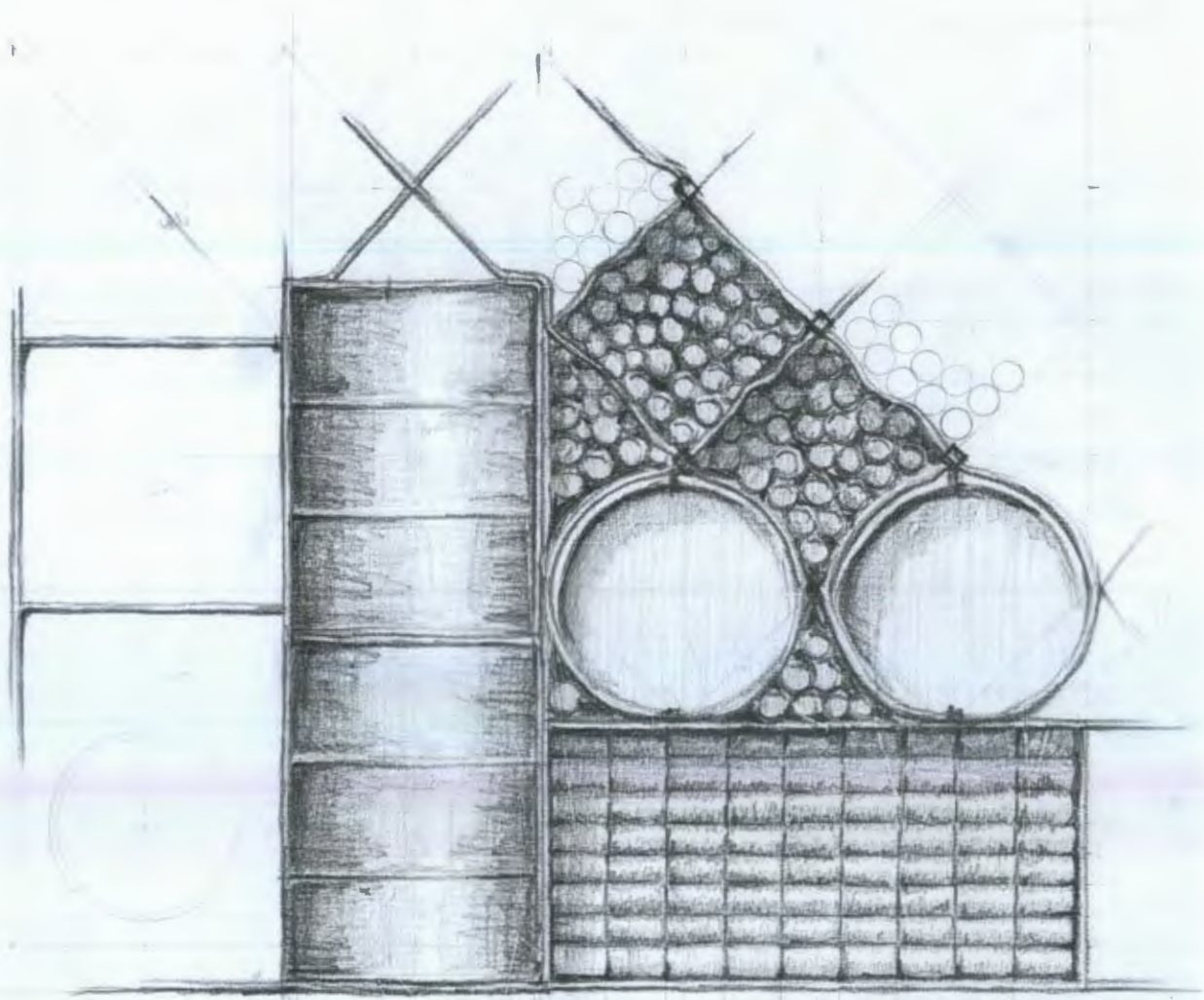
5.4. MAKING

a. Stratification and Techniques

As stated in section II the primary means of assessing waste for use in building, would be by stratification of size and rigidity of form. In this way one can determine Potential uses, processing techniques and possible joinery. This is indicated on the next page.

While initially I had hoped to keep the original form of all materials, thus allowing the materiality to speak directly to the tectonic solution, it made more sense that the small non-rigid items would be processed. I felt however these processing techniques should be limited. As such the two techniques suggested are that of Shredding and Compacting or Baling of wastes such as packaging, paper, cardboard, and plastic. These would then form mass blocks which could be dry-packed and staked for re-inforcing.

The image to the right illustrates the use of tyres as a hybrid joining/framing technique which could be utilized extensively. Since the tyre is not completely rigid, it offers a form of tolerance, thus taking up small incongruencies and differences between various waste material. The tyre also offers ease of fixing, as one could fix anywhere upon its length. The image merely shows how different objects could come together and is not indicative of any aesthetic.



Processing Technique: None
Use: Stand Alone space to shape use
Joinery: Fixed into Primary structural Frame

Processing Technique: None
Use: Used as secondary structure, Spatial entities, Play equipment
Permanent Formwork
Joinery: Smaller wastes used to take up
tolerance, Hex Frame, or tyre Fin

Processing Technique: De-constructed to form Panels
Use: Wall Panels, Cladding, Stairs, Storage
Joinery: Tyre Fins

Processing Technique: Laminated, Ecobeam
Use: Secondary Structure, Wall Panels, Trusses,
Tyres used as Tolerance Frame
Joinery: Glued, nailed, Screwed, Bolted

Processing Technique: Cut to form shingles for cladding
or None
Uses: External light emitting walls,
Internal walls
Joinery: Strung together and held in tension,
Packed into Hex tyre Frame
Wire- Bindind

Processing Technique: Shredding,
Compressed Blocks,
Bales
Uses: Internal or External Walls,
Insulation,
Stairs or used as filler between objects, i.e bottles
Joinery: Dry Packed, Vertical reinforcing

b. Tyres as a Tolerance Joint- The Hex Frame

As mentioned previously the use of tyres as a framing/jointing technique would be valuable. Illustrated here is the tyres are cut and then bolted together to form a hexagonal framework into which waste objects would be packed. The tyres around the perimeter would form a jam-liner to fit into a larger framework. Since tyres can be easily cut the size of the Tyre frame can be infinitely variable and can also vary in shaping, filling up incongruencies other objects.

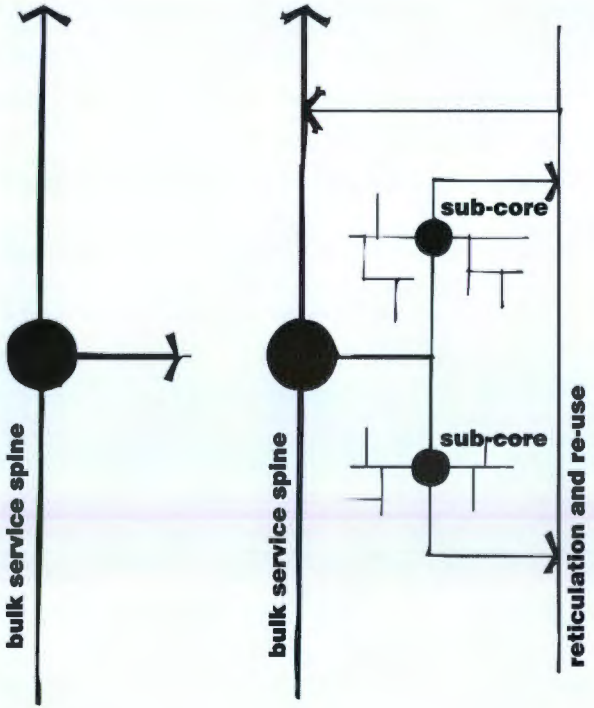
Panel packed with plastic bottles

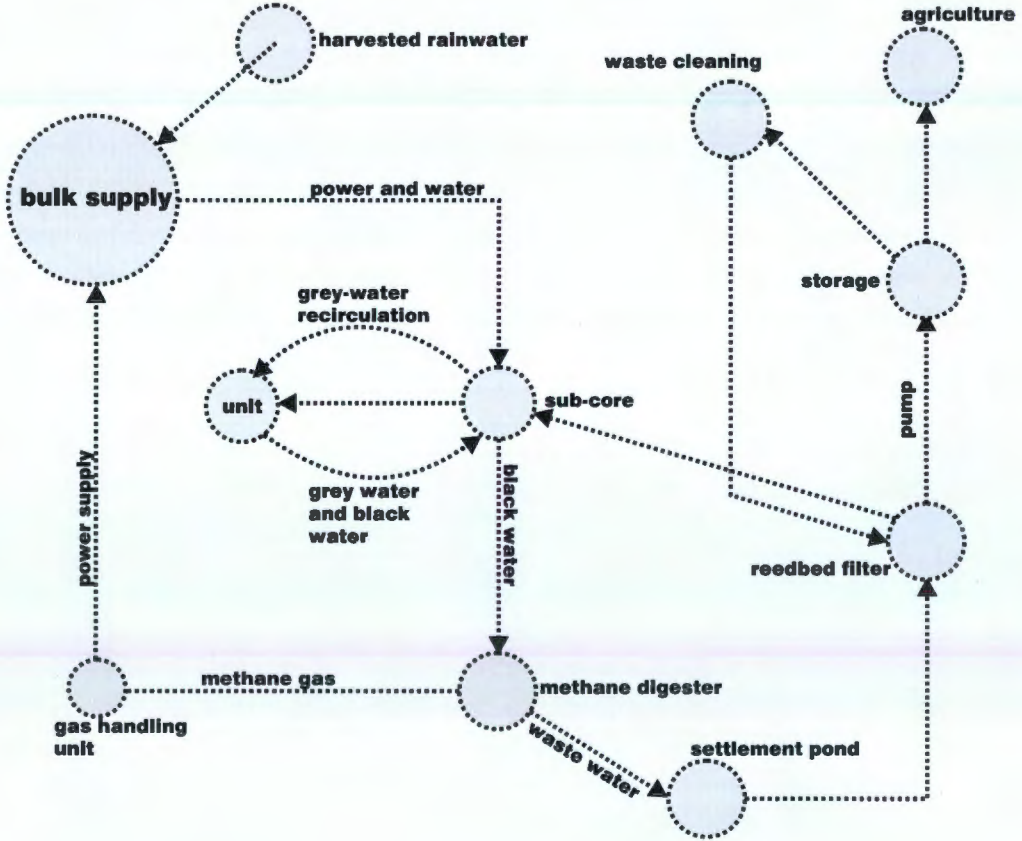
Empty Frame

Simple Bolted Fixing

3.5. SYSTEMS

infrastructure diagrams





3.4. CONCLUSION

Reflections

In retrospect the design project could have developed in two different ways. The traditional visionary approach which would have developed the ideas as set out in Sections I and II in more graphic detail, or a combination approach, which looks at the physical ways and means of making such ideas possible, and then engaging in how these ideas would unfold within such conditions. I chose the latter. This approach shifted the project from an imaginative notional qualitative position into a somewhat rational pragmatic quantitative position, as issues of material performance, material structure, urban structure, existing urban conditions and an ordering system within the settlement had to be confronted.

This shift in focus was necessary due to the conditions of crisis we face in South Africa. These conditions I believe have a welcome grounding effect on architectural visionaries. By engaging only with the notional, a real opportunity to affect the potential for change is lost. By engaging with the pragmatic challenges of the project as opposed to simply resorting to the visionary image, I feel the project has met with the proposition of imaging what is possible, rather than the impossible. Too often, I believe Utopian visionary projects leave too many questions unanswered and rely on the eternal belief in the power of new and exciting technologies which might solve the worlds' problems. This is especially true of present day futuristic projects. The project presented here takes a distinct position on this, and contextualizes the project within the limitations of a present day a South African context. Issues such as material performance, orientation and human comfort, have kept the project within grasping distance of the real.

To this end the design of the self-build support structure, the spatial ordering implications of service infrastructure, sub-cores and circulation (both vertical and horizontal) and the actual process of utilizing waste as a building material has been the focus of the design process at the site scale. While many of the evocative ideas brought forward in the previous sections may have been toned down by the pragmatic shift, the intention is not lost. The process of design has been constantly driven by three overarching principles drawn from the previous sections: growth, the ability to change and adapt one's environment and collective living. Consequently it would be through the process of inhabitation of the support structure that the production of the genuinely new and the possible creation of new

spatial praxis might evolve.

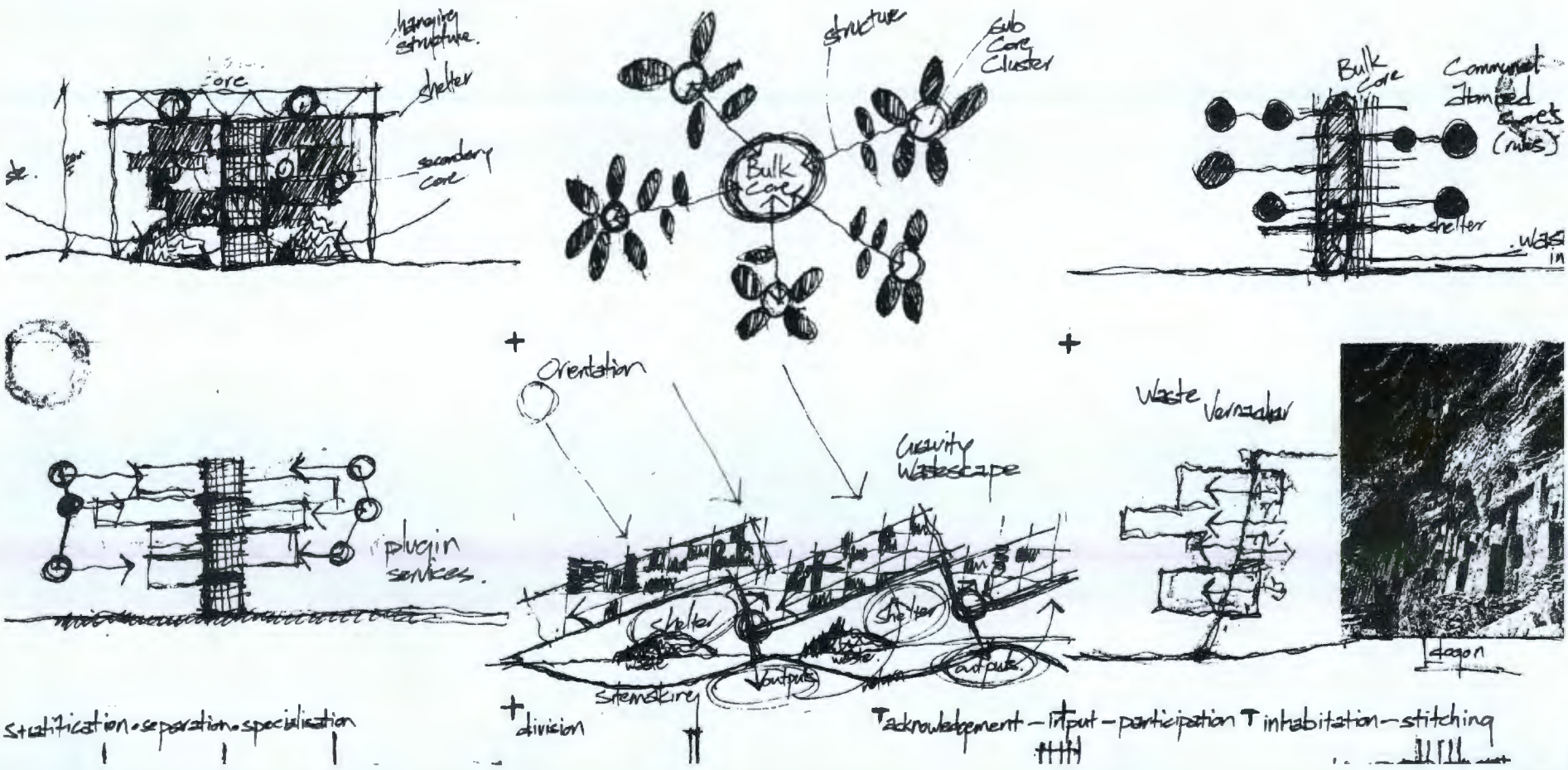
Further to this, while still being driven by inherently modern conditions such as urbanization, high density, technology, change and crisis, the project attempts to reconcile pastoral yearnings of identity formation and meaning as discussed previously. It is by making the process of inhabitation possible, by creating the pre-conditions for people to be able to construct their environment and engage in the act of dwelling, both individually and collectively that the project begins to respond to these issues and ideas raised in the first section.

Thus the process of drawing support structure fully inhabited, the imagining of what *waste city* would ultimately look like, would form the next step in the process of imagining a utopian vision such as this. While this has been done to some degree, it has not been fully realized as yet. It is imagined that the support structure would shift and alter with the process of inhabitation and so too with the process of drawing this situation. In this sense it is not the intention of the project to represent a completed project, but something which is always changing and evolving, through the process of design, which might reflect more accurately the actual process of inhabitation.

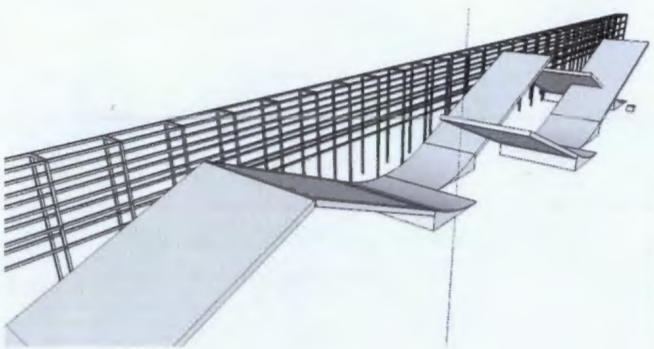
In closing I would like to add that the complexity and multiplicity of cities today means that no single monolithic system can take precedence. It thus becomes important to acknowledge utopian visions as alternatives. For as alternatives they have more power than a system which is intended to restructure and transform society at large. People who live in cities, or perhaps more appropriately urban areas, choose to do so for the opportunities, conveniences and variety choices associated with all aspects of urban life. While the current order of capitalism appears to stifle this freedom of choice, it becomes further limited under the conditions of poverty. Utopian alternatives then fill the role of reinstating the opportunity for choice. This choice of an alternative way of living should not however, be limited to those under conditions of poverty but should be extended to all. In the recognition of the potential for a more meaningful way of dwelling within the world, I do not believe this to be an unattainable objective.

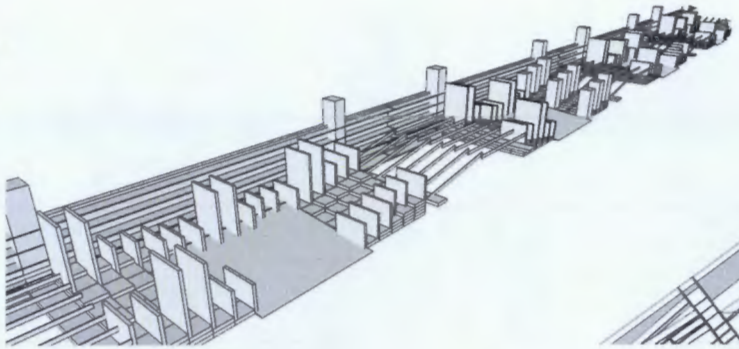
3.6. ADDENDUM

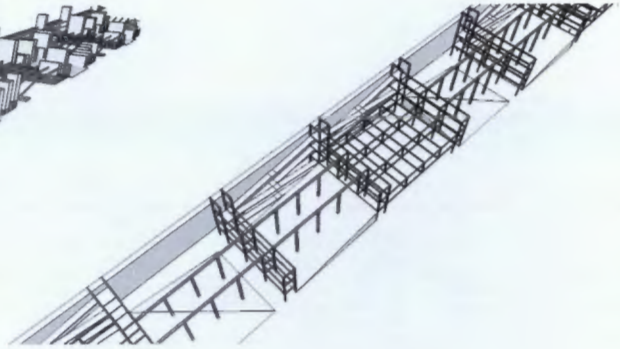
early sketches and other things

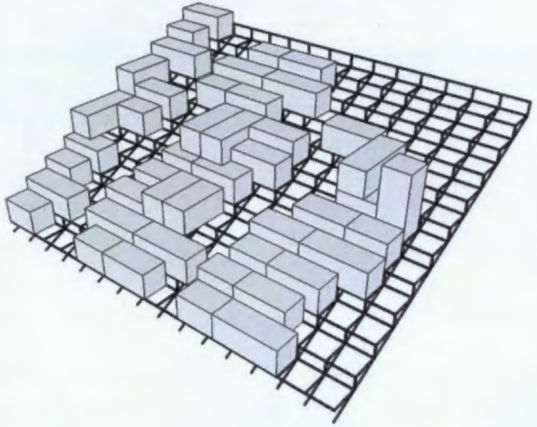


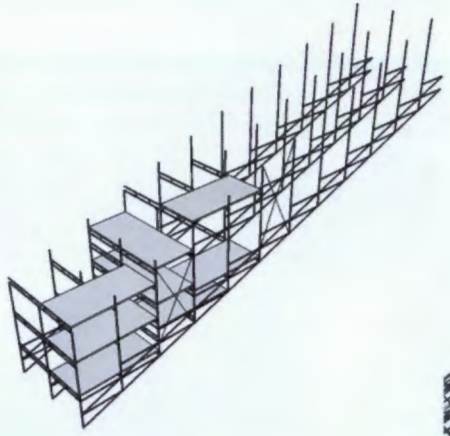
Digital Model Experiments

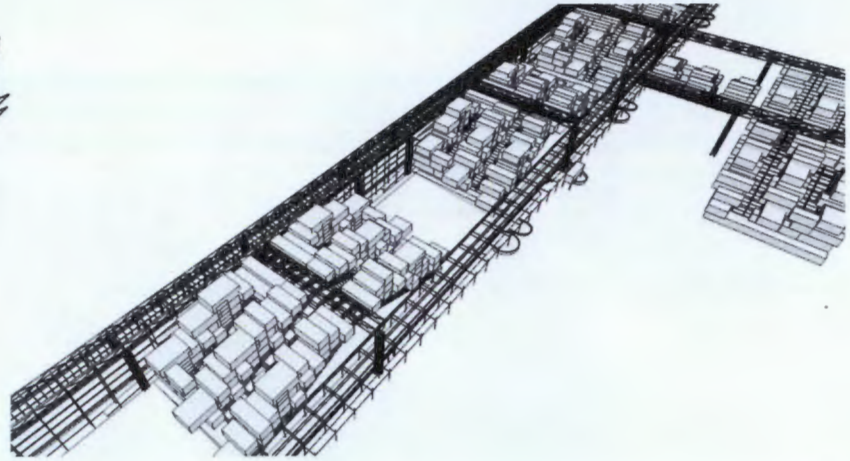


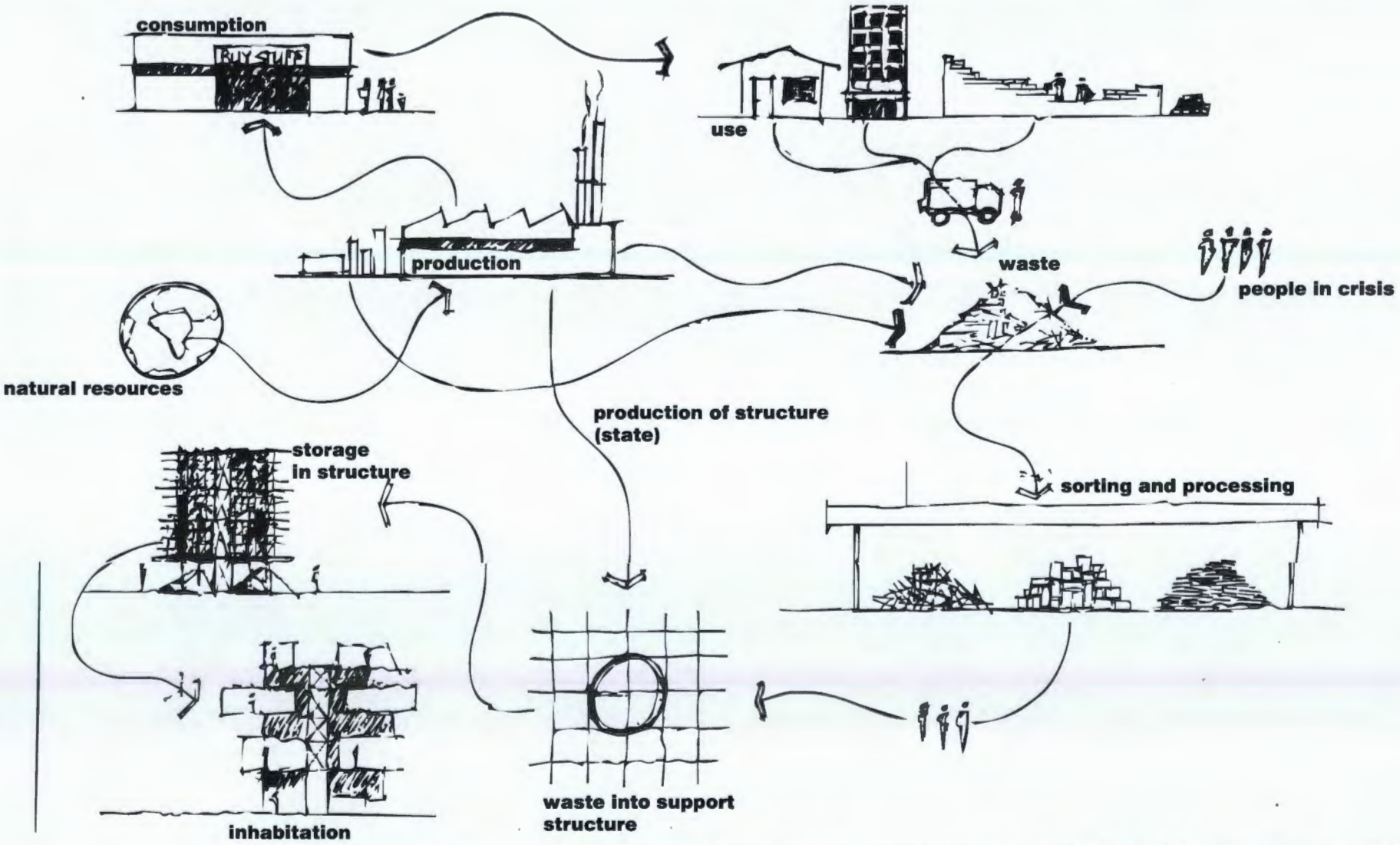












an early diagram of material flows in the process of creating buildings from waste

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