

**TRADITIONAL** *revolution*

Formalizing the informal

A proposal for the "periphery urbanite"

Lagos, Abuja & Port- Harcourt.

by

**Patrick Rhodes-Vivour**

Bachelor of Architecture

University of Nottingham, UK, 2004

Submitted to the Department of Architecture  
in partial fulfillment of the requirements for the degree of

Master of Architecture  
at the Massachusetts Institute of Technology

February 2008

[June 2008]

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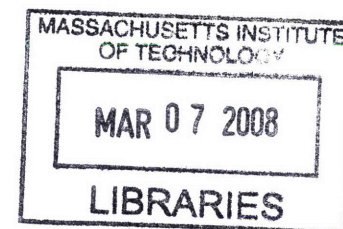
Thesis Supervisor

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01

ARCHIVES

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## **Abstract**

The inherited modernist principles of urban design and development policy have left Social exclusion in its wake. The cities founded during colonial times and there-after continue the legacy of colonial urban development. Within these formal networks of roads and infrastructure, there exist a dynamic relationship between the excluded and the included. An informal network permeates the system with an aim to constantly push against barriers and force their way further in amidst the included. At the bottom of this network exist the Waste pickers also known as scavengers. Perceived as the poorest of the poor and marginal to mainstream economy and society. The individualistic nature of their activities makes them vulnerable to exploitation , but with people migrating to the city everyday from rural areas, The job as a waste picker is where they start their climb up the social ladder. This thesis investigation explores the part played by these individual waste pickers in the collection of refuse and proposes a system that formalizes the informal, A system in which Instead of being a problem, waste pickers can be part of the solution to the seemingly intractable problem of collection and disposal of solid wastes in Nigeria.

Thesis Supervisor : **Adèle Naudé Santos**

Title: Dean of the School of Architecture and Planning, MIT

Patrick Rhodes-Vivour

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Lagos, Abuja & Port- Harcourt.



# TRADITIONAL revolution

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Distance is a fundamental indicator between two groups especially when there is an imbalance of power. If separation is desired by both groups, they would each maintain the barriers between them, On the other hand when separation is not desired, one individual seeks to narrow the social distance while the other seeks to maintain it.

David Kaplan

# Introduction

## The City

In 1914 the British colonialist, Lord Frederick Lugard, conquered and amalgamated more than 250 independent ethnic groups and indigenous empires into the nation state currently known as Nigeria. The colonization of Nigeria led to the formation of colonial port cities Lagos and Port-Harcourt. Abuja was created later on with modernist principles of urban design and development policies as a result of Lagos and Port-Harcourt.

Lagos is a city grounded in colonial ideals focused on social control, domination and subordination. Pre-independence, through the design and management of the city, Europeans were able to segregate themselves from Nigerians. At the time, many Nigerians lived in high density satellite towns that embodied the characteristics of slums. After Nigeria's independence in 1960; the areas previously developed for the Europeans were taken over by the Nigerian elite.

This New elite thus inherited an existing system and network of infrastructure that fostered social exclusion, unequal development and physical barriers to access. These systems and residential areas achieved exclusion of those of low income by the use of physical separations such as major highways, canals and high walls. This was very different from traditional palaces in the different parts of the country. Walls that surrounded palaces were not to protect the king from the people as the gates were always opened to the public to bring their complaints to him.

In today's Nigeria, what was formerly an exclusion based on race has become an exclusion that is economically driven. This has led to the creation of a new urban dweller "The periphery urbanite".

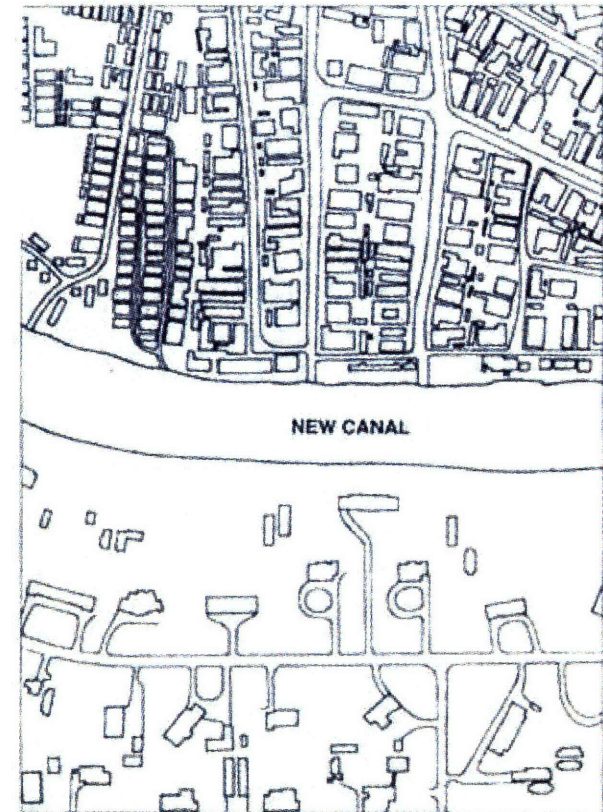


Figure 1: Ajengule and Apapa: the canal separates the poor high density housing development above from the more affluent low density area- Apapa estates

<sup>1</sup>Peil, Magaret, Lagos –the city is the people (pg 8)



## The Cities People

The Peripheral urbanites can be divided into four main economic groups. The entrepreneurial poor, the self-employed poor, the laboring poor and the vulnerable poor<sup>2</sup>.

The large amount of Peripheral urbanites in Metropolitan cities in Nigeria, is a direct result of large migration from the rural areas to the city as well as rapid urbanization brought about by a large population growth. In Lagos for instance, the population increased from 1.14 million in 1963 to currently 11.3million<sup>3</sup>. Some of these poor immigrants from rural areas go on to enter the informal recycling business as waste pickers.

Urbanization often takes place in the form of an expansion or creation of new slum areas and squatter settlements. Typically, these settlements grow organically without holistic planning, resulting in twisting and narrow streets, as well as occupation of environmentally sensitive and disaster-prone areas, such as, river beds, land fills, flooding plains, and underneath express ways.

Recycling of municipal solid wastes in Lagos relies largely on the informal recovery of materials from waste dumps. The most widely available commodity in Lagos is garbage. It is an engine of growth in the underworld of the city's informal economy, a vast sector with an astonishing volume of supply. Waste pickers recover materials to sell for reuse or recycling, as well as diverse items for their own consumption. These individuals are also known as 'scavengers'. The process of recycling waste material for the production of new goods can be done by processing waste into new materials as well as recycling objects that were left intact (bottles). Recycling usually takes place in industries that waste materials can be used as a raw material. Other than the industries, a number of big and small enterprises are involved. These production-units together form the recycling network or business and it comprises all the people who occupy themselves with collecting, dealing and processing materials to be recycled.

The link between them is that everyone, either as a scavenger, intermediate trader or industry, is involved in the same process of recycling waste material, which makes them (in various degrees) dependent on each other<sup>4</sup>.

<sup>2</sup>Babatunde A. Ahoisi,, Under siege: Four African cities, Popular shaping of metropolitan forms and processes in Nigeria (pg 140)

<sup>3</sup><http://www.citypopulation.de/World.html>

<sup>4</sup>Henk Gilhuis, Scavengers between Self-Employment and wage work (pg 34)

## The Problem

The cities Lagos, Port Harcourt & Abuja, have very different characters mainly due to the predominant tribe in each city, Yoruba in Lagos, Igbo in Port Harcourt and a diverse mix in Abuja, but one thing they all have in common is an **ENORMOUS** refuse problem.

In this problem also lies a dynamic set of social, spatial and economic networks that govern waste collection and its stakeholders. From recycling, processing, the disposal chain as well as the opportunity for wealth creation and environmental protection, the network is immense and as everyone / institution produces waste, this network is connected to everything<sup>5</sup>.

As Rem koolhaas remarked based on his view of Lagos from a helicopter, “on closer inspection the apparent randomness of the garbage revealed heaps of similar materials and colors. The activity taking place was actually not a process of dumping but more a process of sorting, dismantling, reassembling, and potentially recycling<sup>6</sup> . This is a common occurrence most especially under viaducts in metropolitan areas. Unfortunately these massive dumpsites are located in the peripheral urbanites peripheral existence.

<sup>5</sup>Babatunde A.Ahosi, Under siege: Four African cities, Popular shaping of metropolitan forms and processes in Nigeria (pg 140)

<sup>6</sup>Rem koolhaas, Fragment of a lecture in Lagos, Under siege four African cities (pg 177)

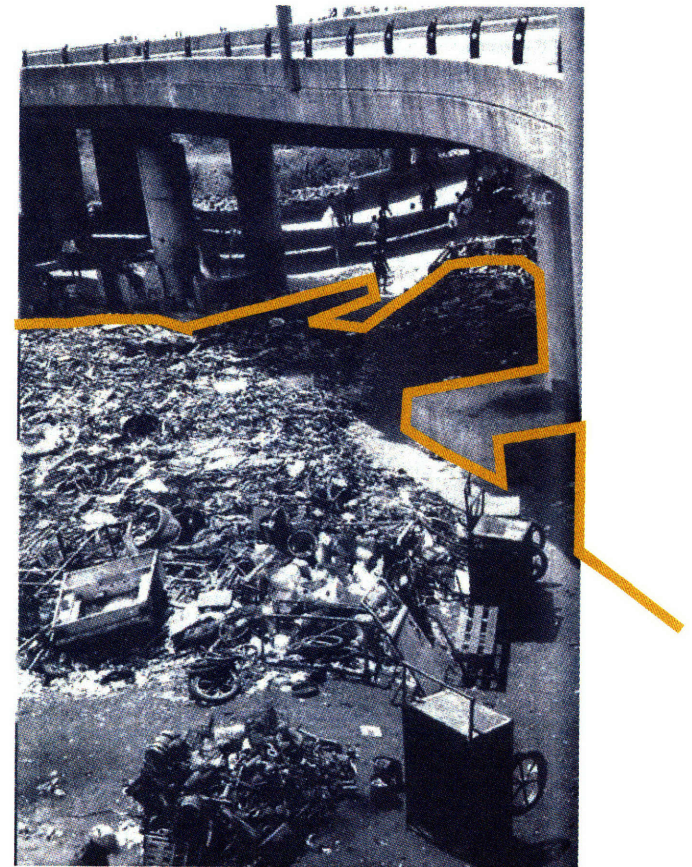


Figure 2: Inorganic informal sorting, Lagos Nigeria



BREAKING NEWS - SUMMER 2007





There are at least seven groups of actors that make a living out of the dump site – centered waste management chain:

Scavengers,  
Cart pushers, waste sorters/cleaners/packers,

Suppliers of recyclable materials,  
Waste converters,

Buyers,  
Waste product exporters,

Dumpsite service providers  
Food sellers and office waste manager

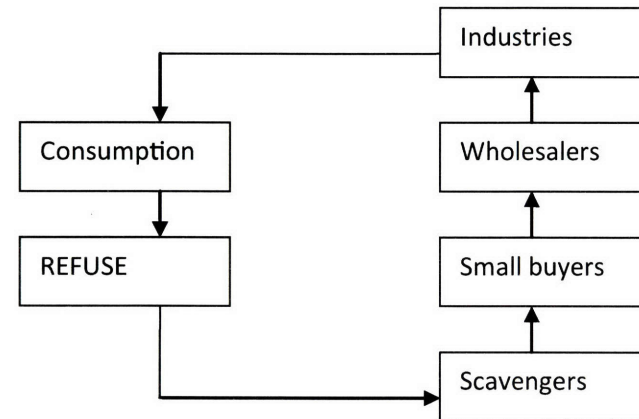


Figure 3: The recycling network in Lagos

#### OWNERSHIP /MOBILITY /VULNERABILITY

The Peripheral urbanites due to their economic circumstances and their numbers , make them vulnerable to exploitation by the monopolistic markets (markets where there is only one buyer, as opposed to a monopoly, where there is only one seller) set up by the middle men (Small buyers and wholesalers). This situation exists because the most important means of production for the scavenger is mobility which is facilitated by the use of a cart. The assemblage of the cart requires some know-how and the wheels (usually used bicycle wheels with pneumatic tires) are expensive, a cart is a costly investment.

The buyer on the other hand owns several of these carts and loans them out as a means of tying the waste picker to him, thus creating a dependant relationship were the scavenger who borrows a cart from a buyer consequently has an obligation to deliver the recycling material he collects to him.



There are two kinds of scavengers; mobile and stationary. The mobile scavenger utilizes the cart while the stationary scavenger(s) forms large waste picker communities around the dumps. By settling around the dumps, waste pickers minimize their transportation costs and thus save on housing costs. The relative isolation of dumps makes it nearly impossible for waste pickers to transport materials to the nearest town. In both situations, the scavengers are vulnerable to exploitation by the middlemen in terms of low prices paid in exchange for sorted refuse.

Middlemen perform useful services to industry, by doing further sorting and processing of materials, accumulating and selling them in the amounts that industry demands. Middlemen can achieve high profits due to the fact that they often operate in a monopolistic market.

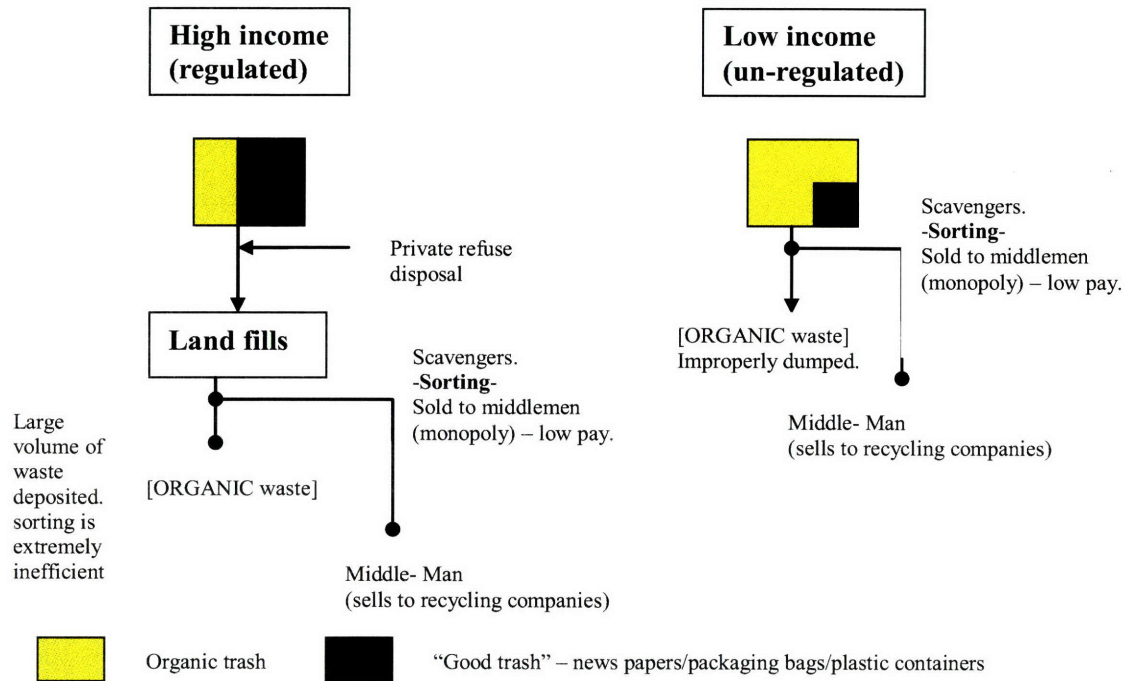


Figure 4: The Dilemma

### Getting the trash

Different income levels treat waste in different ways; Low-income neighborhoods, slums, and squatter settlements constitute the areas where municipal collection of wastes often does not exist. This is due to the inaccessible nature of the settlements as well as economic handicap of the city to provide waste collection systems.

Residents of areas without refuse collection may resort to dumping their garbage in the nearest vacant lot, river, or simply burn it in their backyards. Informal collectors who work in these low income settlements also dump the collected garbage in vacant lots, river banks or ravines, posing risks to human health and the environment. Given that dumps or landfills tend to be at a considerable distance from residential areas, and that animal-drawn and man-pushed vehicles have the disadvantage of a limited range, it is convenient for those informal collectors to dump the collected refuse as soon as they can after collecting the recyclables<sup>7</sup>.

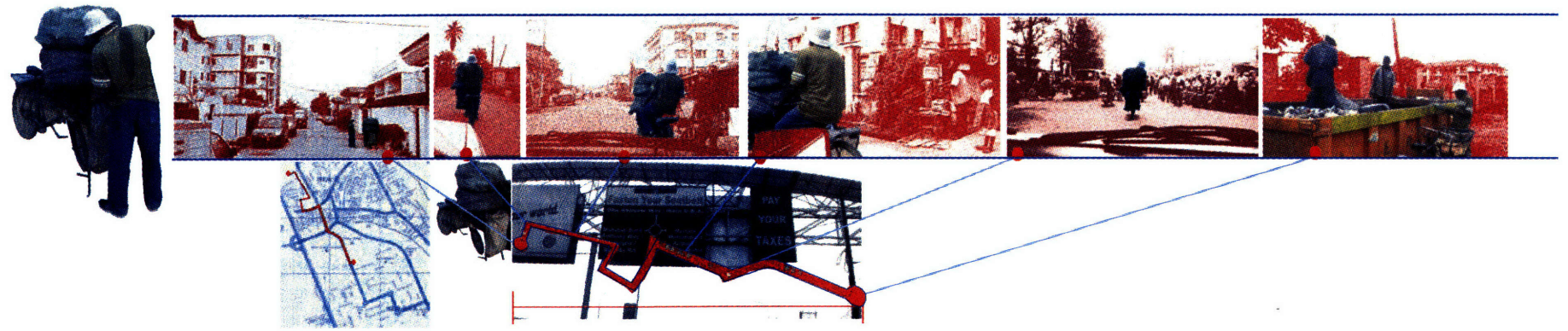
The improper disposal of solid wastes constitutes a source of land, air and water pollution, and poses risks to human health and the environment. Higher income neighborhoods on the other hand have arrangements with private waste collectors. The scavenger is usually welcome in the Low- income neighborhoods but is considered a nuisance in higher income neighborhoods, where they go in search of 'good trash'. Waste from high-income residential areas, hotels and stores are particularly valuable, since wealthy individuals tend to discard more recyclables and items that can be repaired or reused. Furthermore, the banning of cart pushers has adversely affected the operations of scavengers as it limits the range and size of waste they can collect and transfer. And with the ban has come more harassment by local government officials<sup>8</sup>. This ban has led to the accumulation of waste in slum areas as well as the build up of large Landfills.

<sup>7</sup> Medina, M. Informal Recycling and Collection of Solid Waste in Developing Countries: Issues and Opportunities

<sup>8</sup> Babatunde A. Ahoisi, Under siege: Four African cities, Popular shaping of metropolitan forms and processes in Nigeria (pg 145)



The Scavanger way



Time taken -15mins- Paid 1500 naira/month. Serves 5 Households in relatively affluent neighbourhood.  
Refuse collected on Tuesday, Thursday & Saturday.

GOVERNMENT



VS

PRIVATE SECTOR/ INFORMAL



Given the multiplicity of stakeholders, a holistic approach is required to better handle the problem of waste management. Opportunities exist via partnership between the government, the private sector, scrap collectors, waste processing, and recycling groups for the scaling up of waste to wealth business via capital injection, skills training, and simple machine procurement to process more waste while creating more wealth and energy as by-products.

## PROPOSAL

A Localized sorting and organic waste recycling center. Located around peripheral dividers e.g. underneath express ways, it would be a prototype that serves the refuse needs of its locality. In its design, it would serve to act as a mediator and an interface between different income groups. The creation of a center like this would change the individualized scavenger system to something more collective. This would be a means of achieving a better standard of living for its workers, dignify their occupations, and strengthen their bargaining power with industry and authorities.

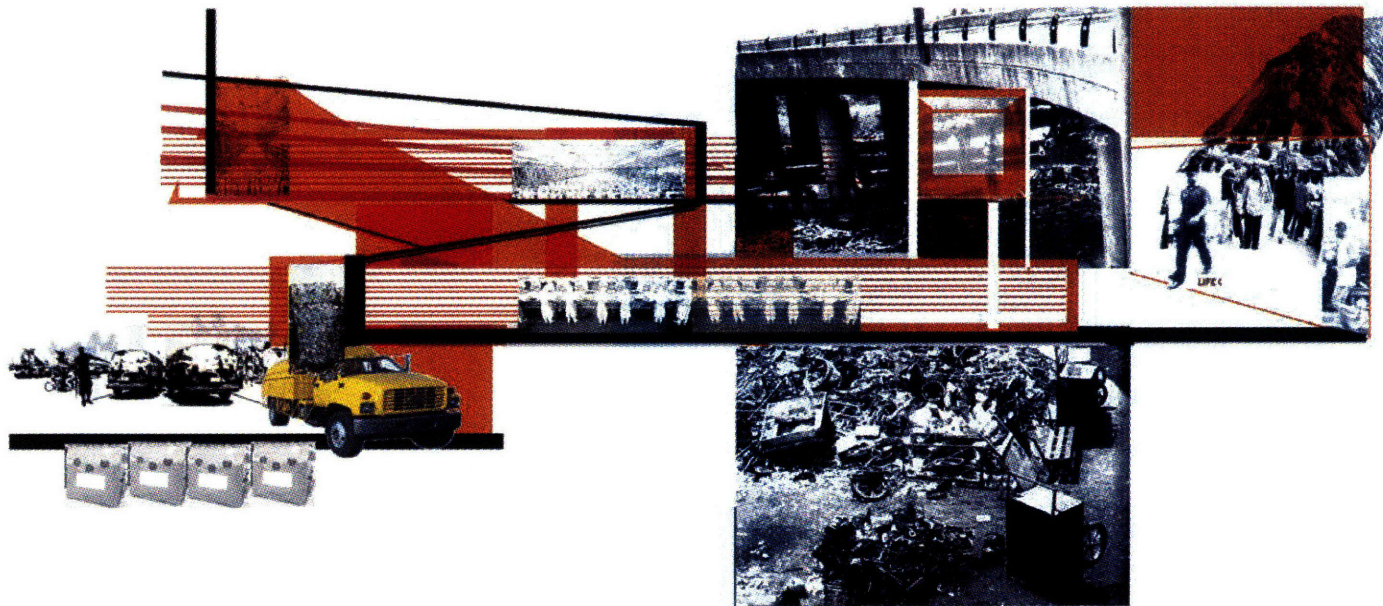
Waste would be sorted based on quality and sold in bulk to recycling companies. The organic waste would be used to generate electricity to power the center as well as supply to the electric grid and the by-product of creating biogas (compost) would be sold as fertilizer to farmers at subsidized prices.

To facilitate this process and to ensure that these centers are not overwhelmed, centers would be distributed in several localities, waste would be pre-sorted and delivered to the Center or a specified point for collection at a certain time everyday.

Programmatically, the design would be comprised of;

- A sorting area, class and conference rooms,
- A recreation area
- A museum area that has a route for visitors and contains a collection for art and objects .
- Organic fertilizer plant.
- Loading Docks for the collection of quality sorted waste by buyers as well as a dock to receive Pre-sorted waste.
- Offices
- Showers & Bathrooms
- Open air Bar





A network of sorting cooperatives would then be established, refuse collection could be extended at a low cost, creating jobs and benefiting low-income communities. Instead of being a problem, waste pickers can be part of the solution to the seemingly intractable problem of collection and disposal of solid wastes in Nigeria.



## SITE

Site selection for the Head quarters of the center was dependent upon several factors.

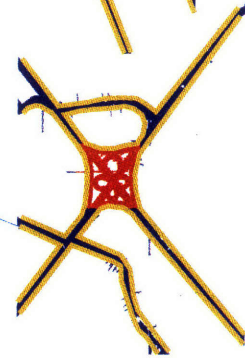
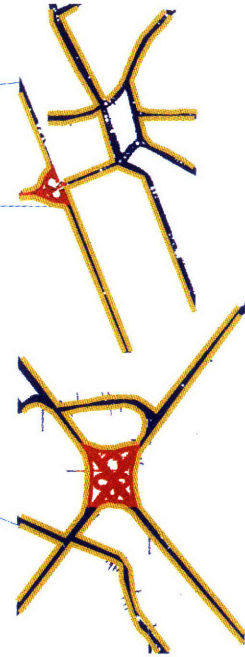
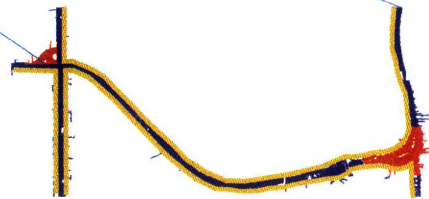
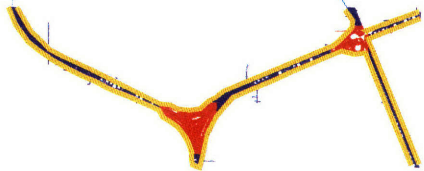
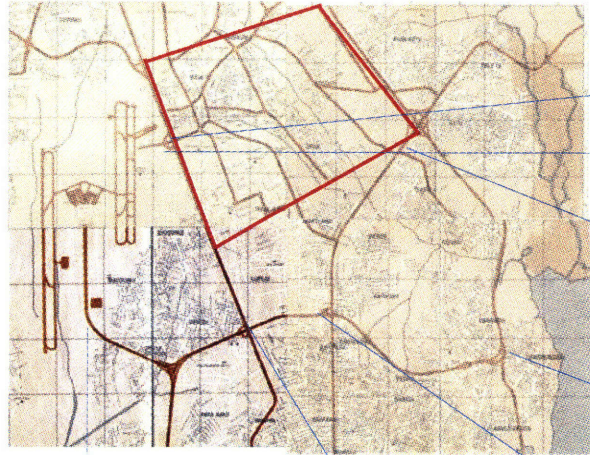
The building is suppose to be articulated and designed to show of the process of sorting and recycling.

In so doing act as a billboard for recycling.

Given the patnership with the government in terms of the contribution of land, The site should be located in a prominent area with a large amount of traffic passing it as well as very good linkage to the major roads in the city.

The site chosen was a traffic island in Ikeja. Ikeja is the capital of Lagos State and is the home of the International and local airport as well as the Local government Head-quarters for Lagos state.

POTENTIAL SITES \_TRAFFIC ISLANDS \_IKEJA



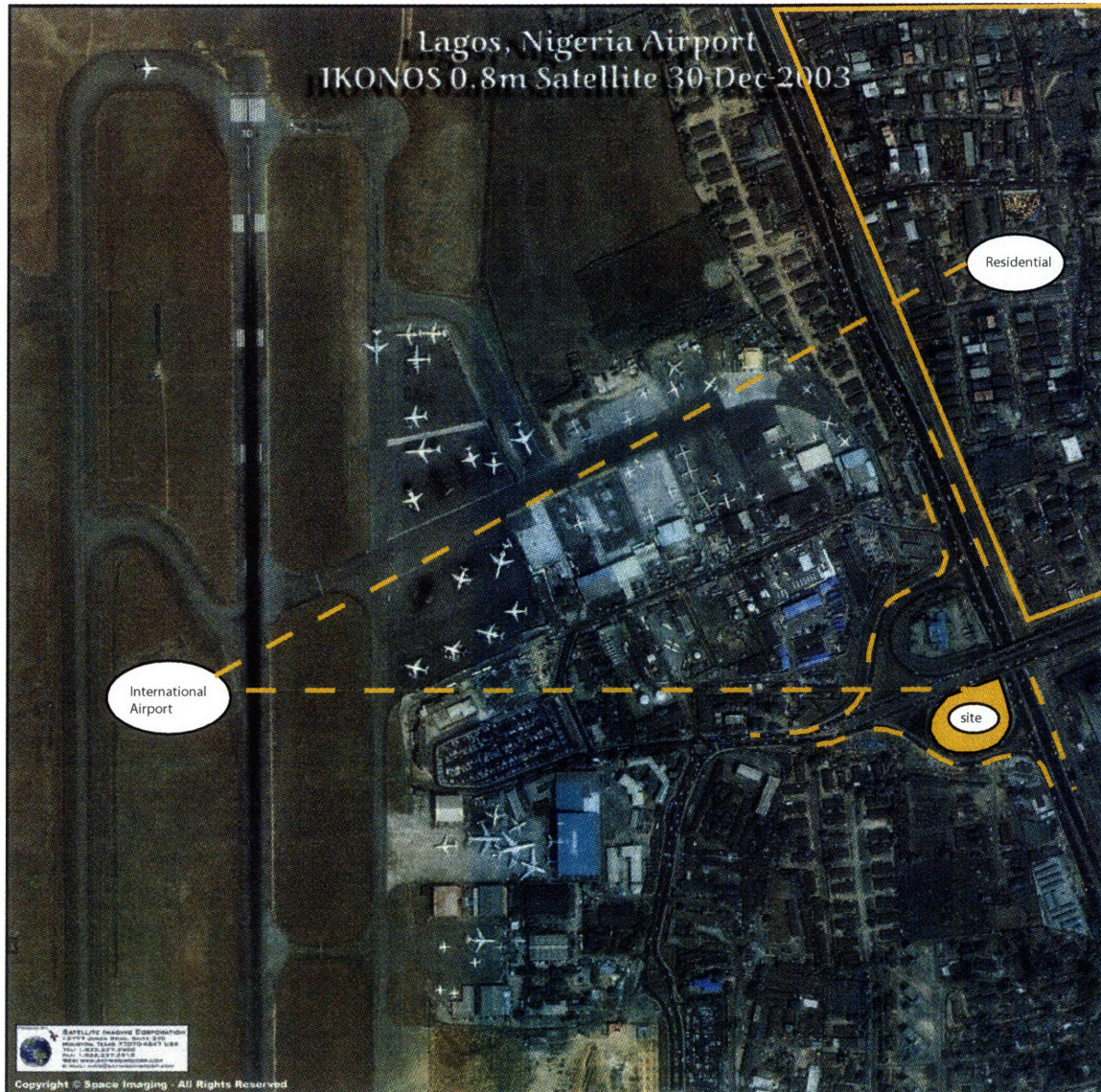
POTENTIAL SITES\_ Ojota



POTENTIAL SITES\_ Lagos island

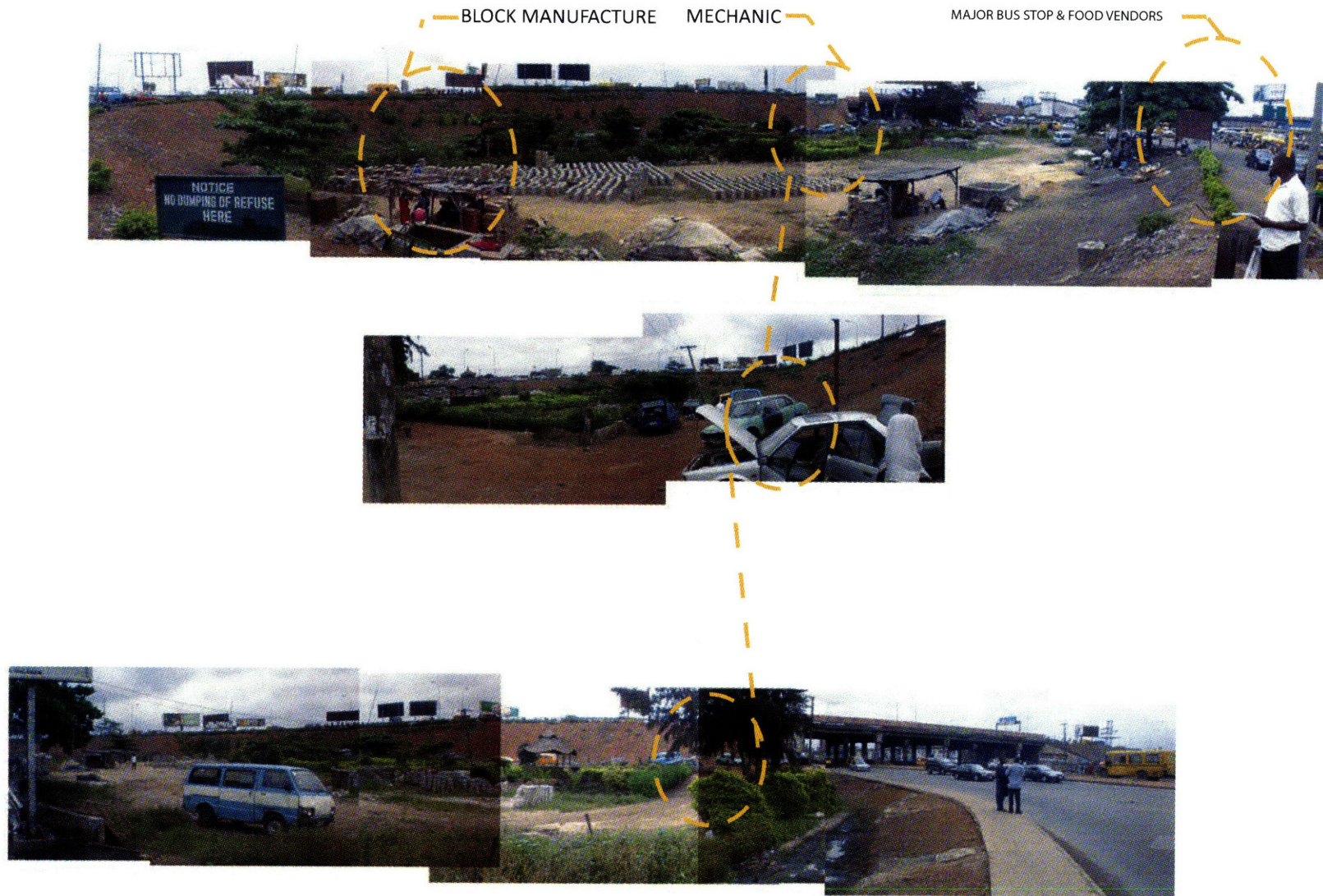








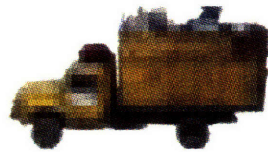
Site selected for head quarters of sorting Co-operative



## WASTE COMPOSITION IN LAGOS STATE

- vegetable - 68%
- plastics- 7%
- glass- 5%
- textiles- 4%
- grits- 4%
- metals- 3%

### ELEMENTS OF NETWORK



=

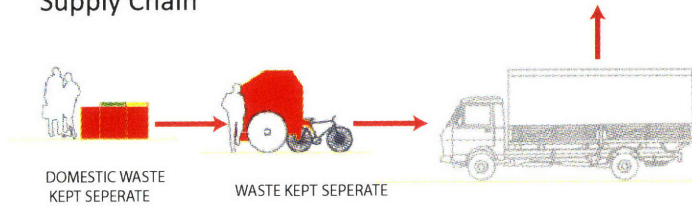


Capacity:  
Weight- 32.5 tonnes  
Volume - 17m

Capacity:  
Weight- 32.5 tonnes  
Volume - 17m

Waste produced by Ikeja per day = 381.29 tonnes/day  
capacity 25% = 95 tonnes/day

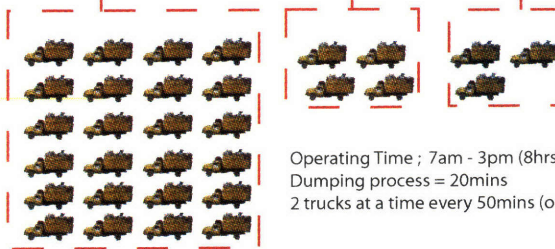
### Supply Chain



Vegetable  
68%  
65 tonnes  
24 trucks

Paper  
9%  
8 tonnes  
4 trucks

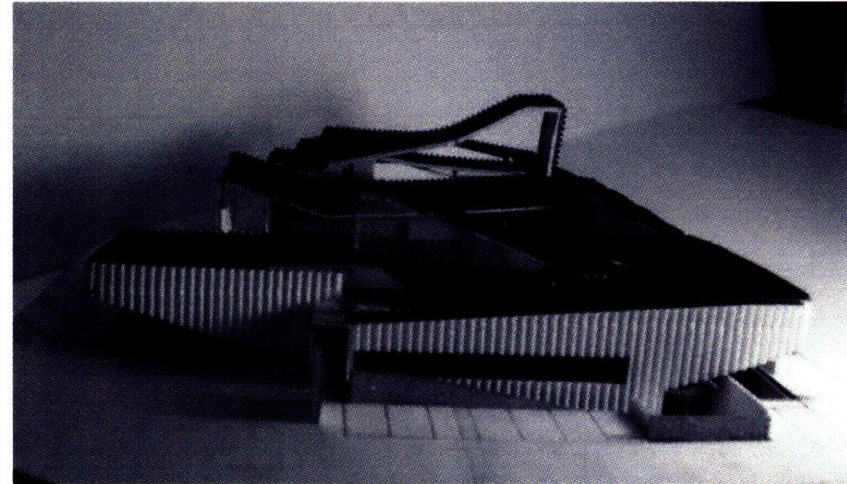
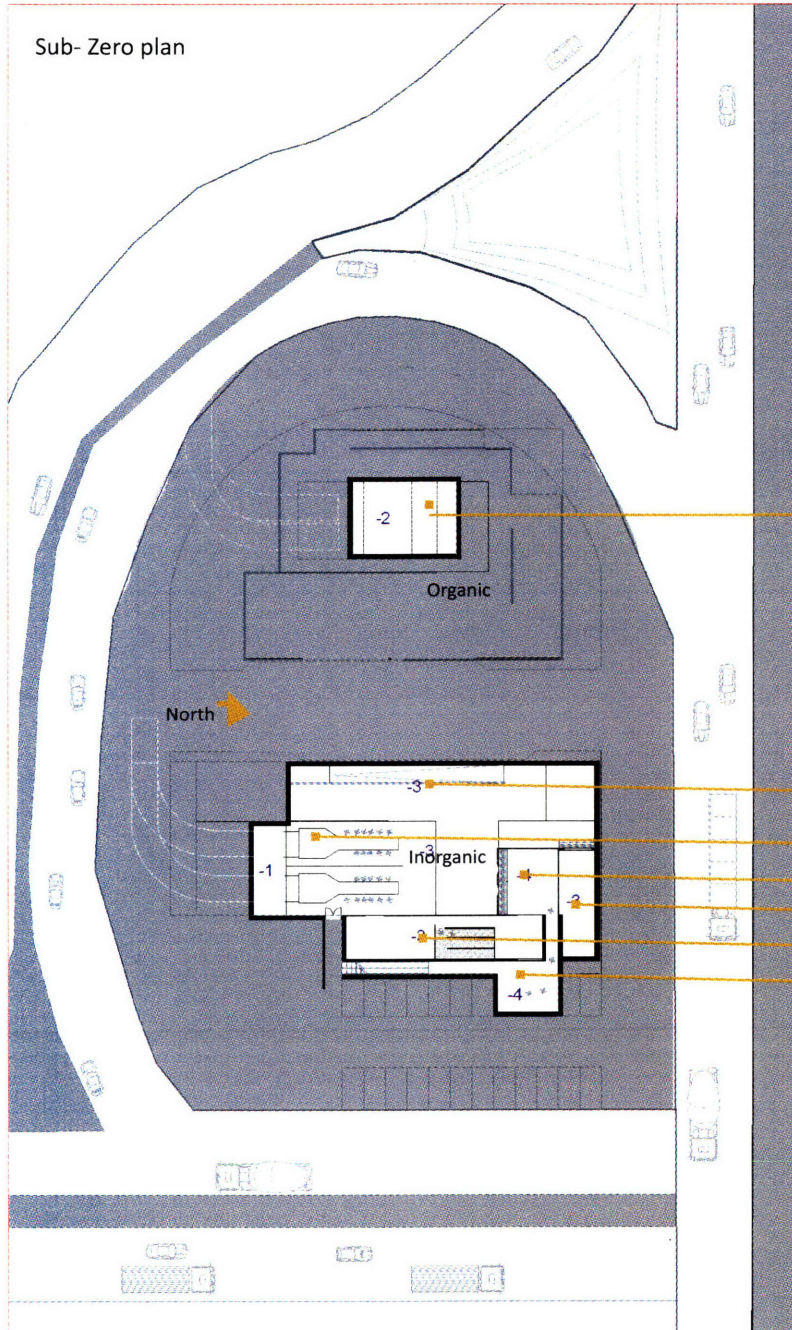
Plastic  
7%  
6 tonnes  
3 trucks



Operating Time ; 7am - 3pm (8hrs)  
Dumping process = 20mins  
2 trucks at a time every 50mins (organic)



Sub- Zero plan



Compost Machine

Storage

Inorganic Sorting

Internal Courtyard

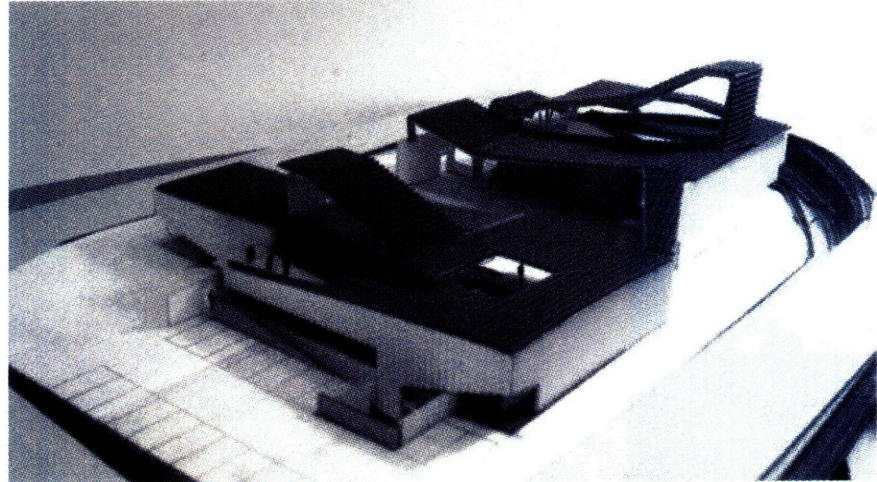
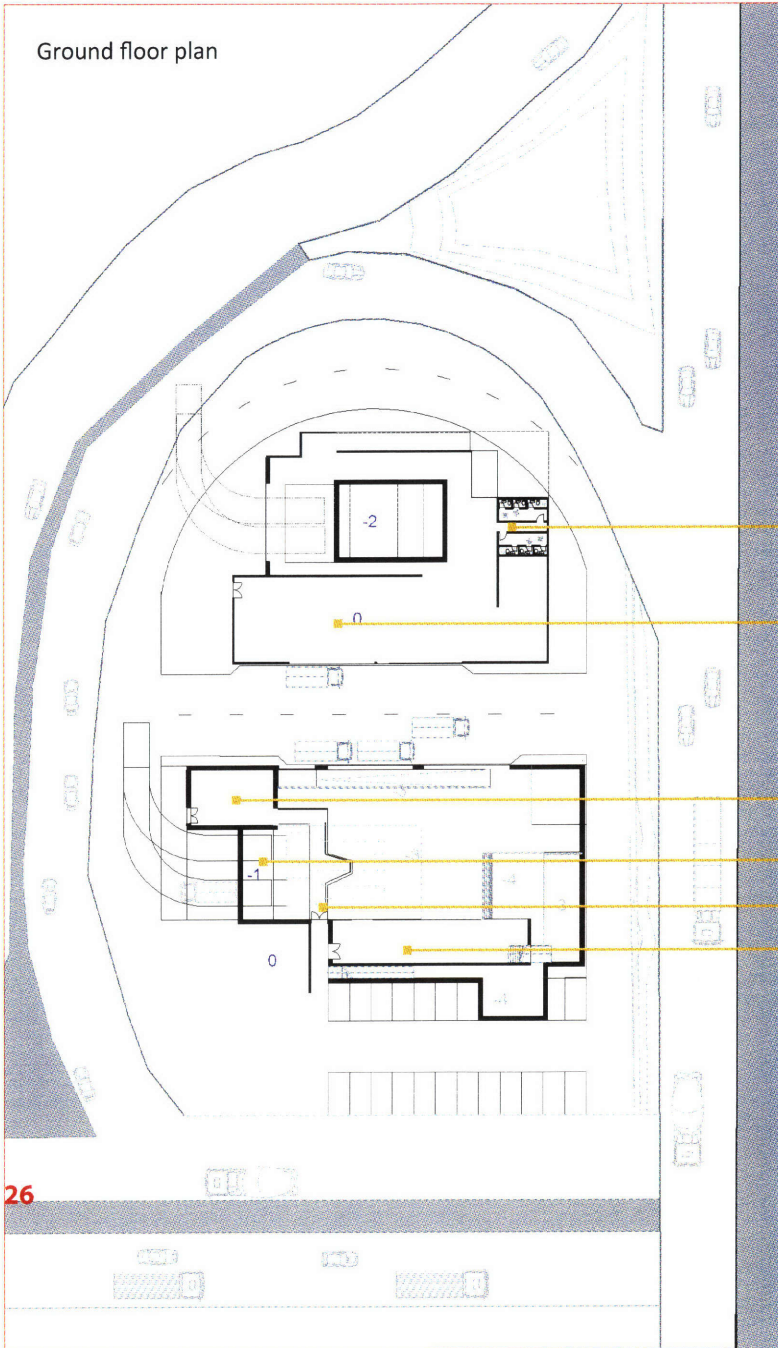
Conference room

Storage/ Lockers / Shower

external Courtyard



Ground floor plan



Toilets

Organic compost Storage

Reception

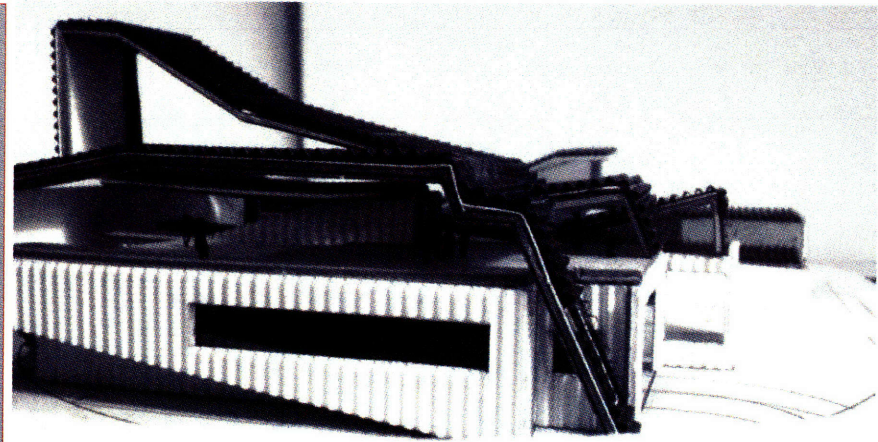
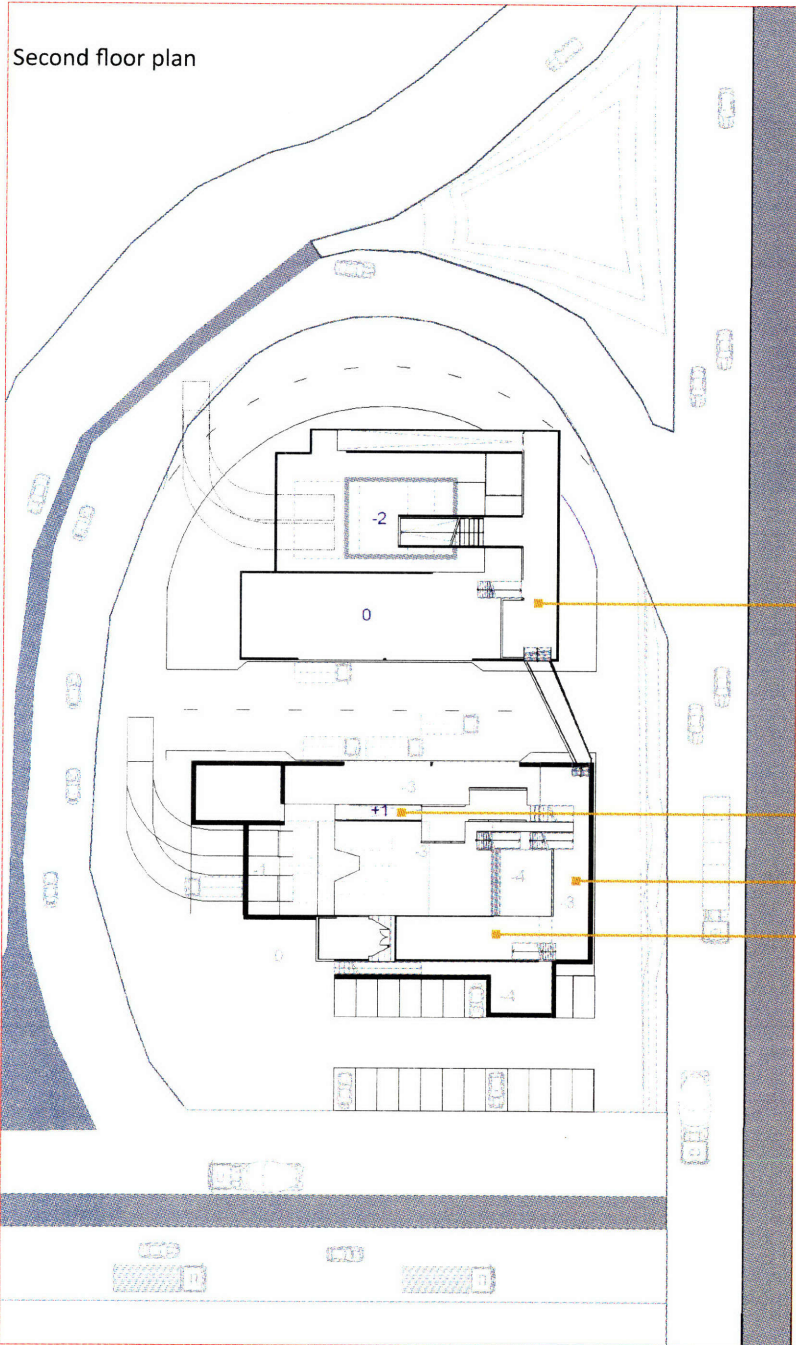
Inorganic (paper & Plastic)

Entrance and walkway

Office



Second floor plan



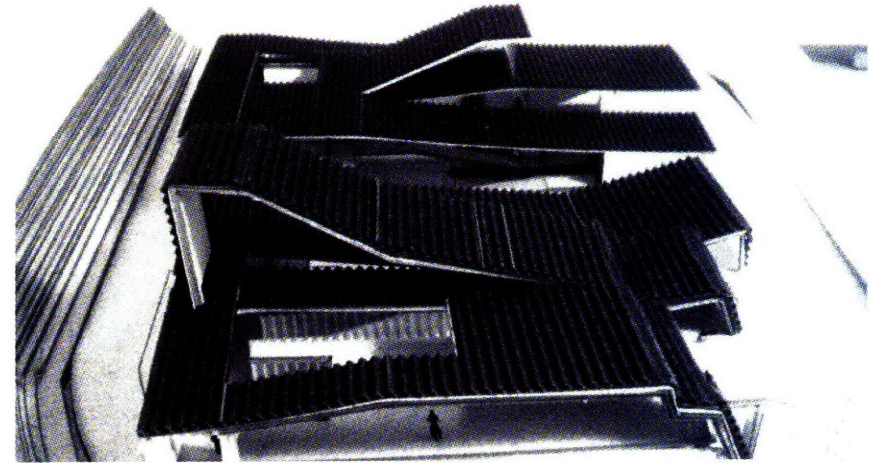
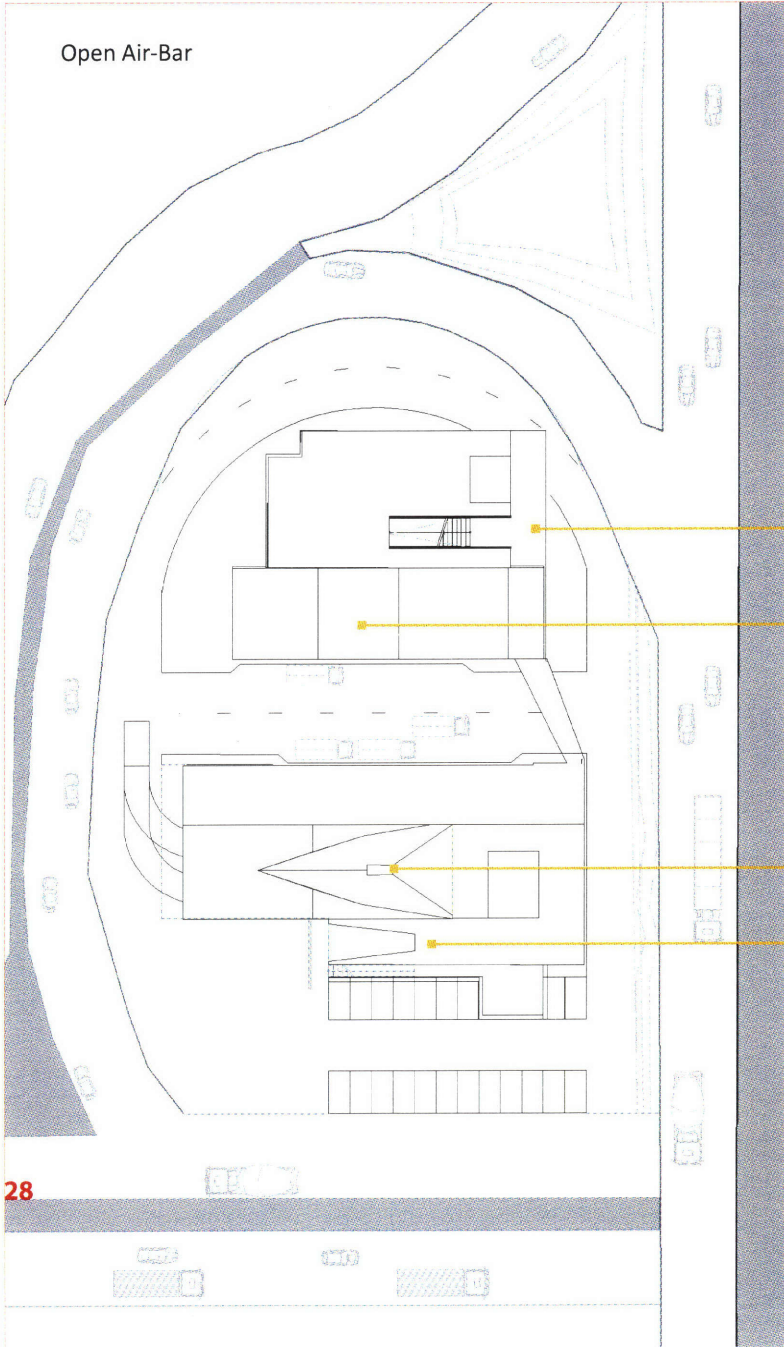
Compost Machine

Gallery

Gallery

Gallery

Open Air-Bar



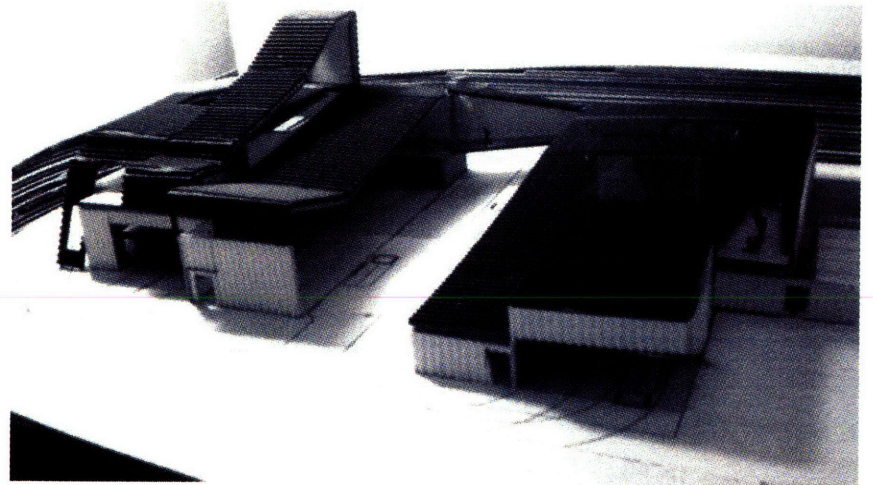
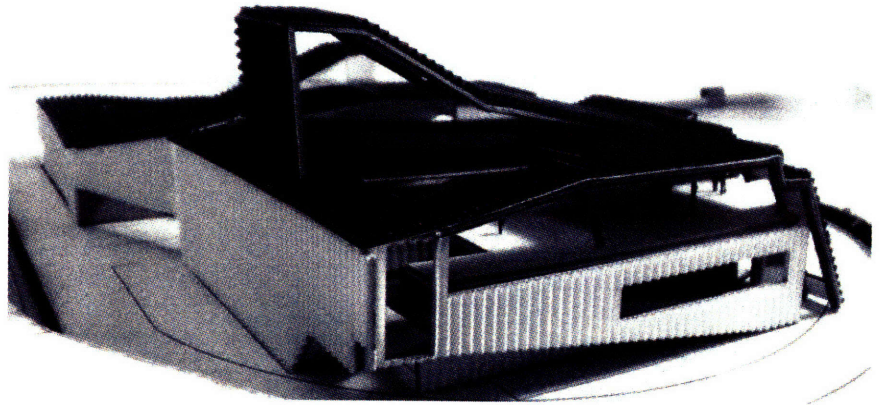
Entrance to Bar

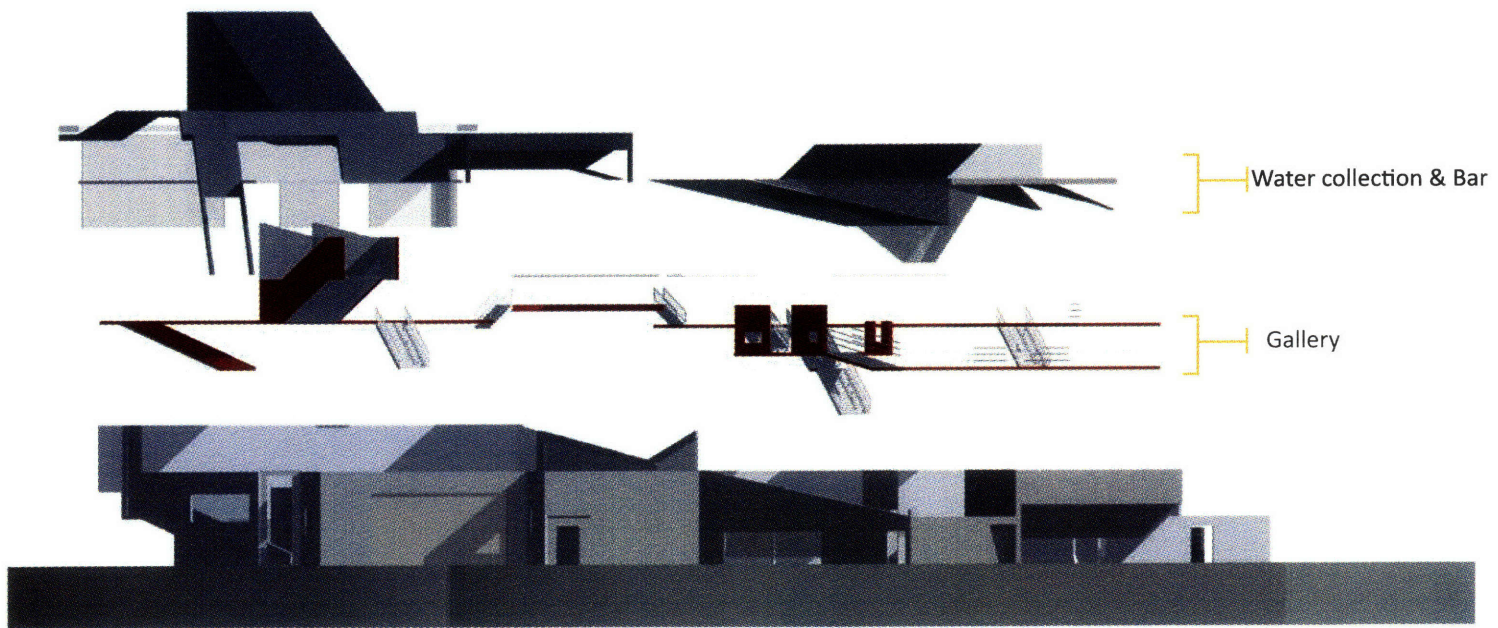
Open air-Bar

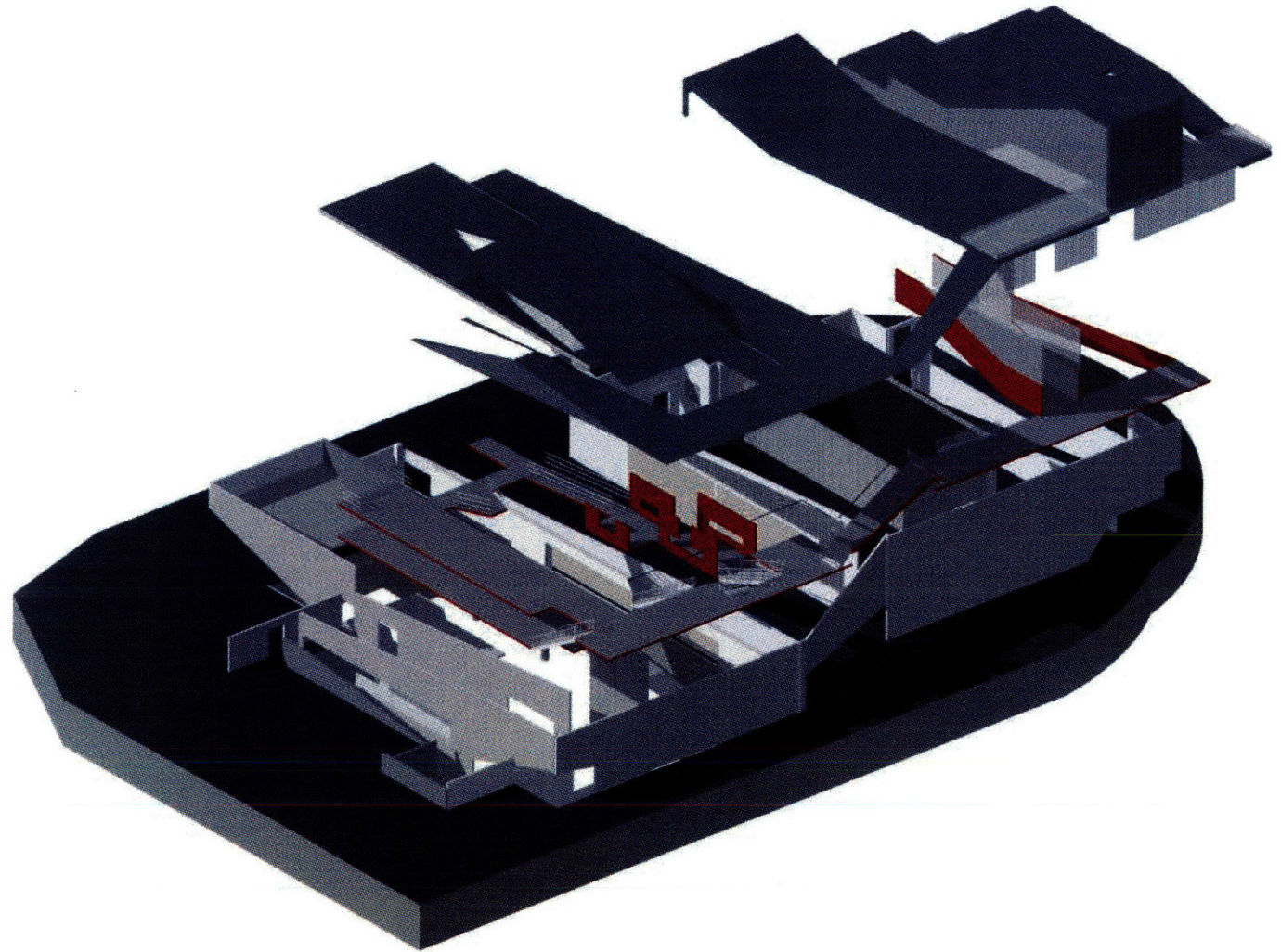
Water collection

Gallery



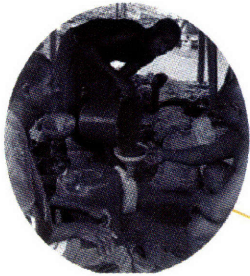




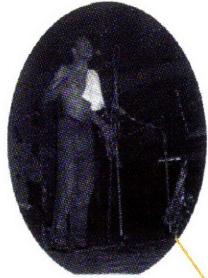




POTENTIAL USERS



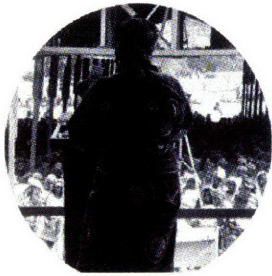
FUN SEEKING INDIVIDUALS



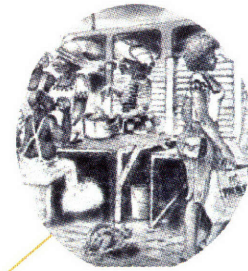
MUSICIANS\_FELA



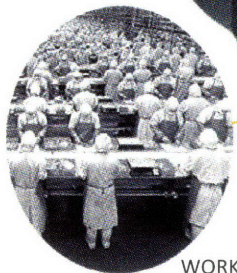
STUDENTS



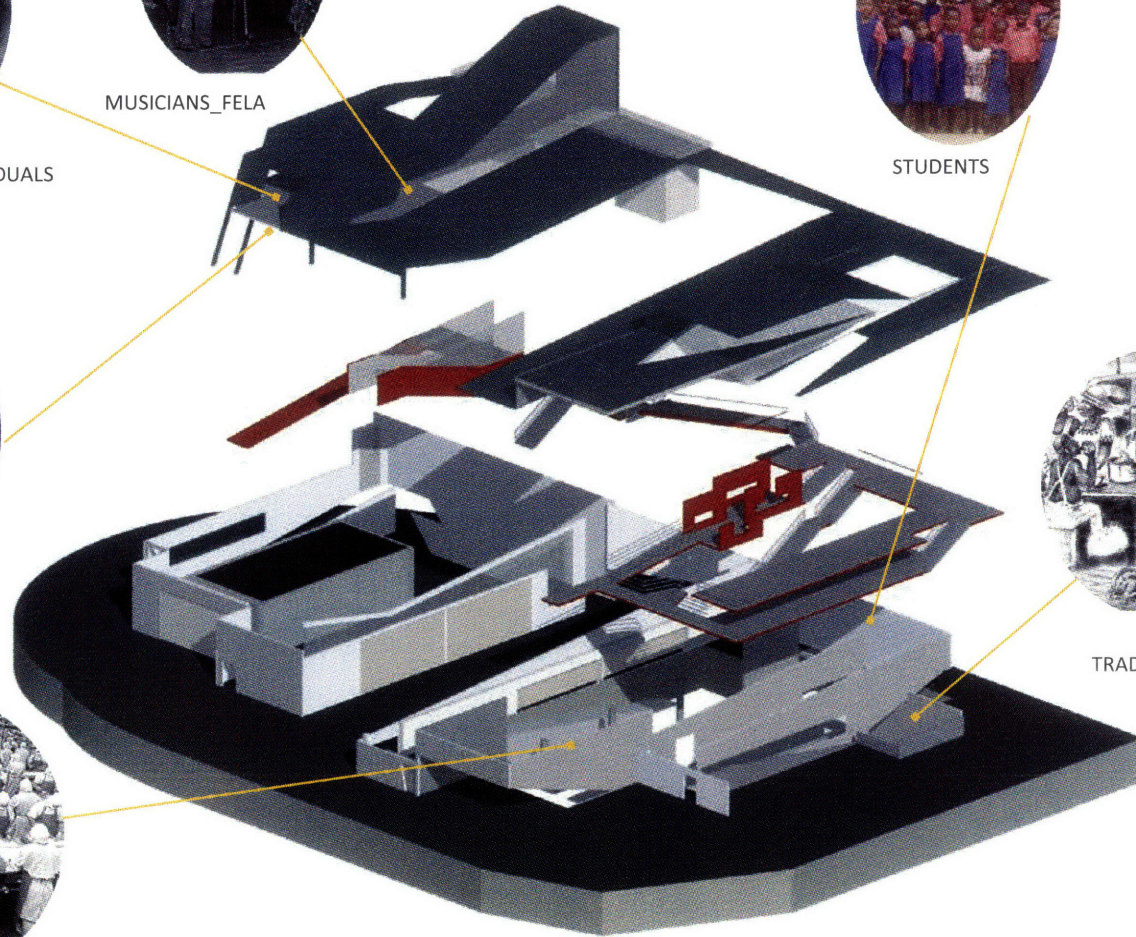
SPEAKERS

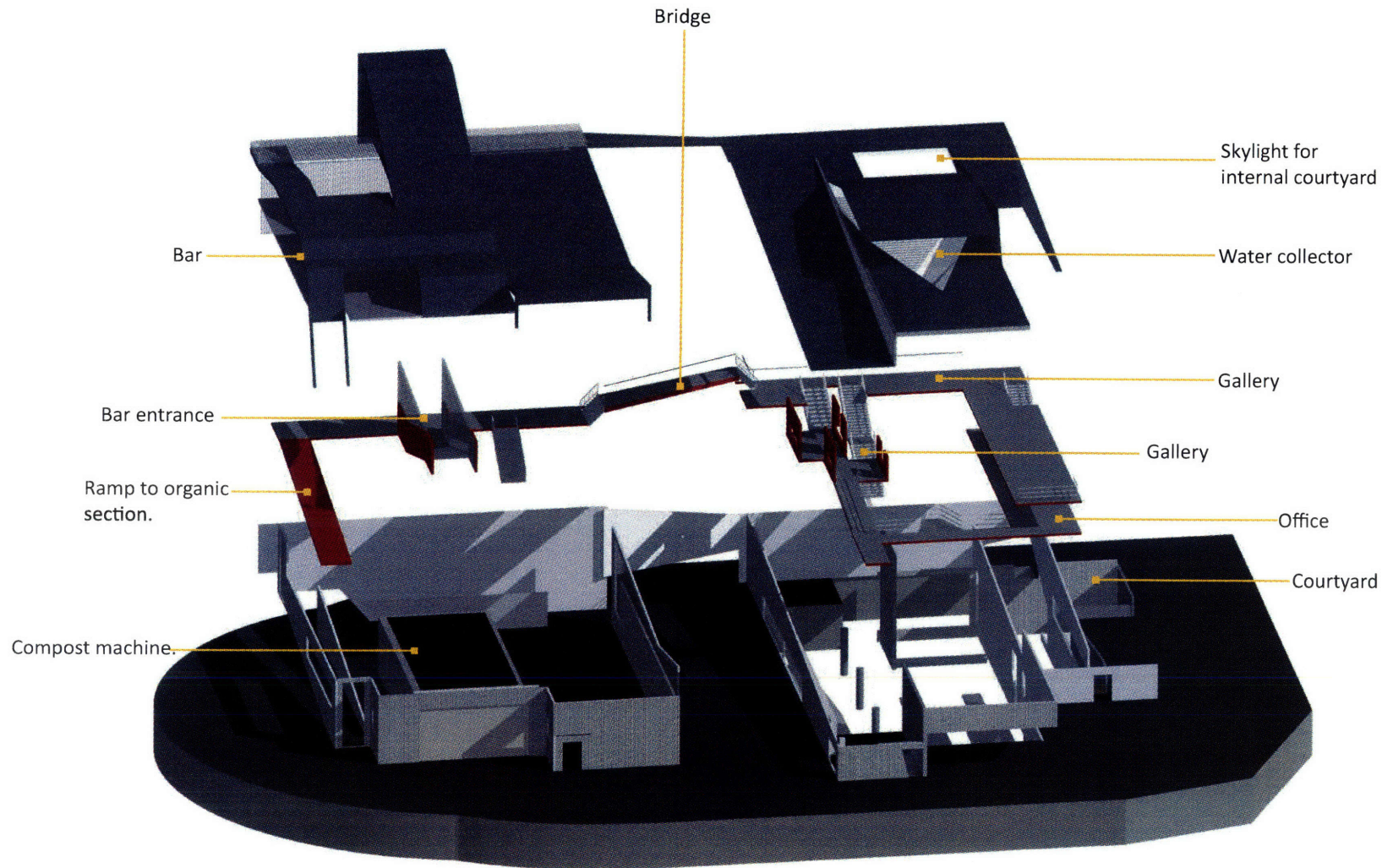


TRADERS

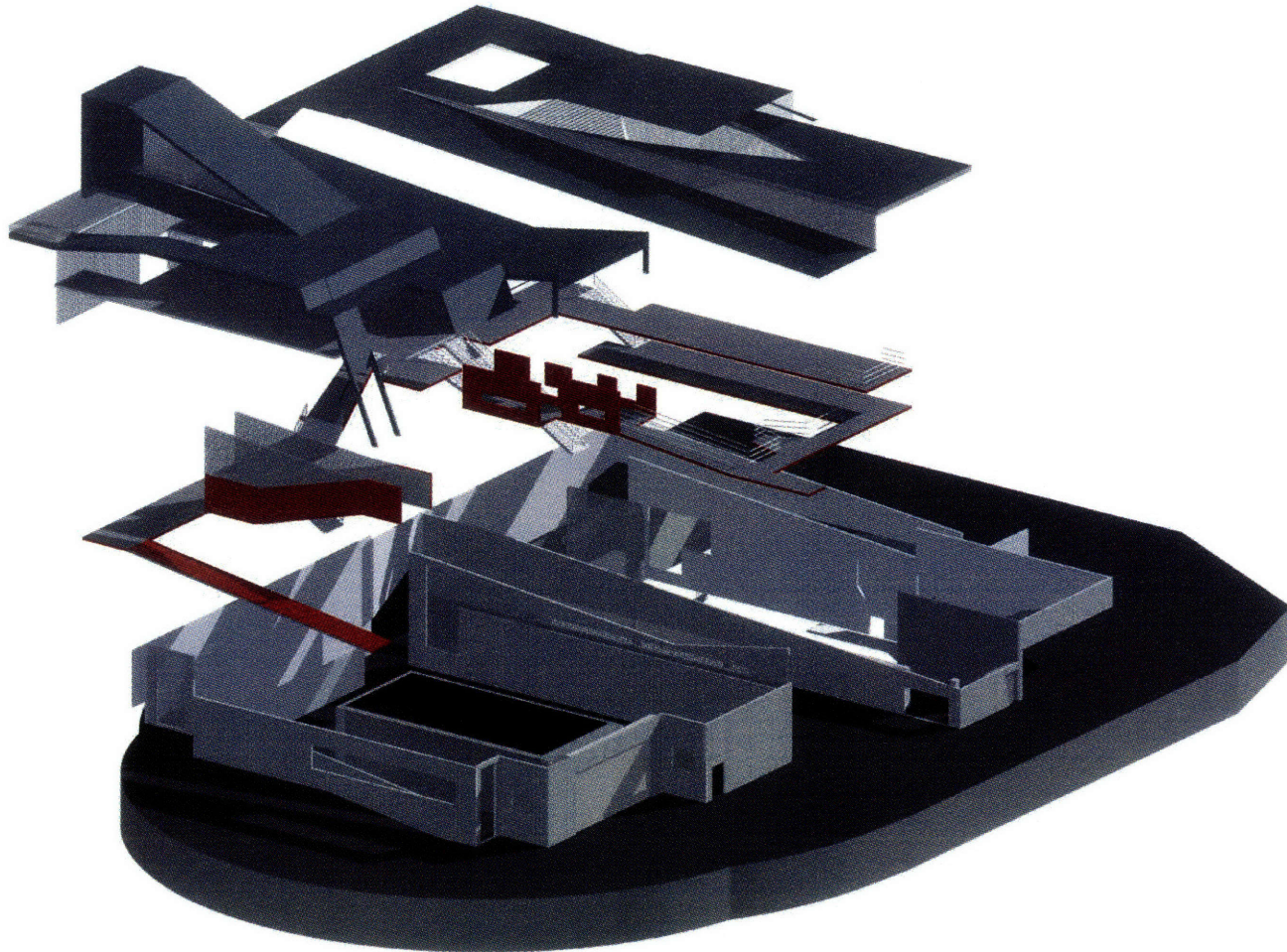


WORKERS



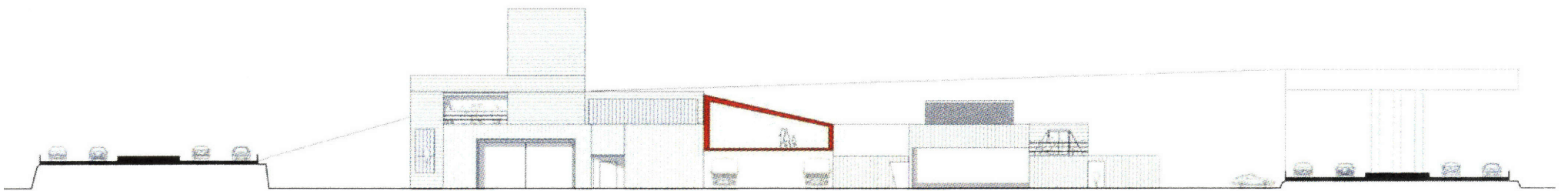


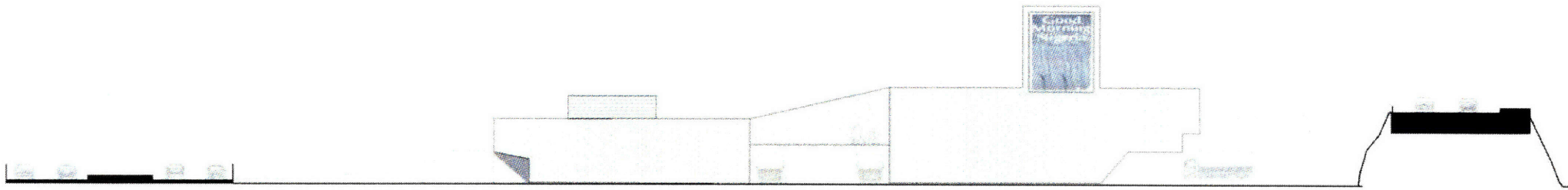


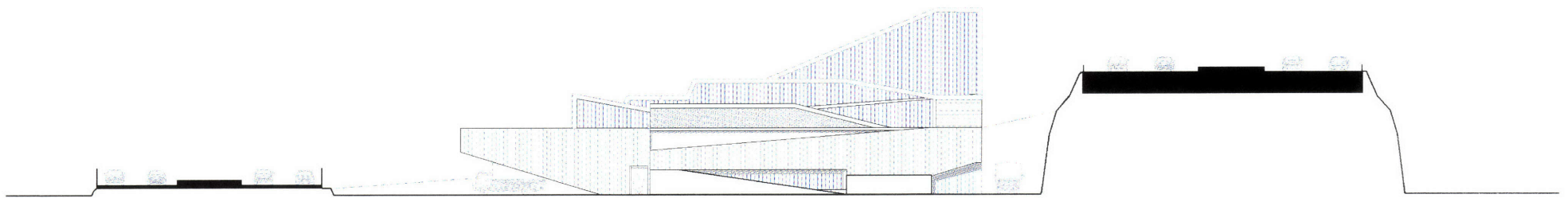




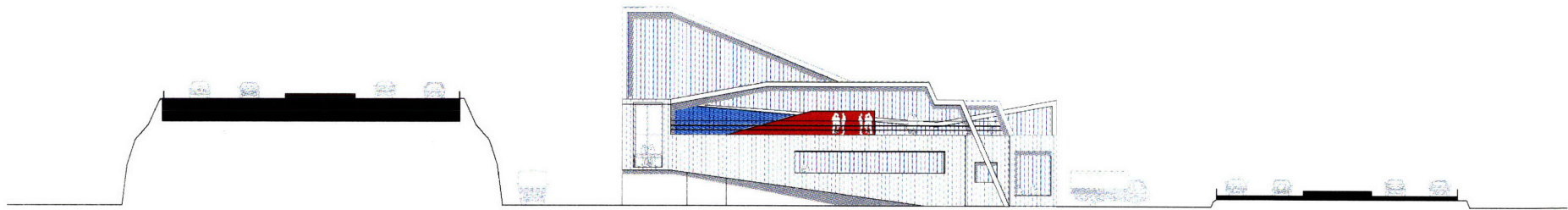
ELEVATION & SECTION DRAWINGS

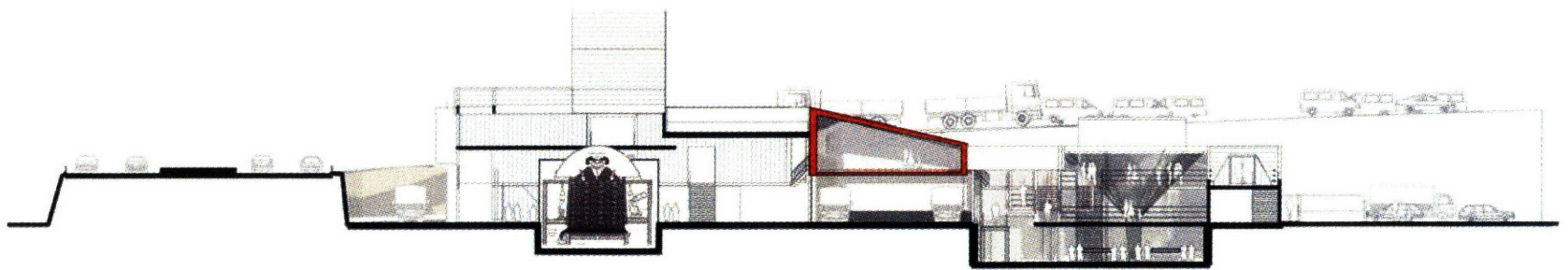


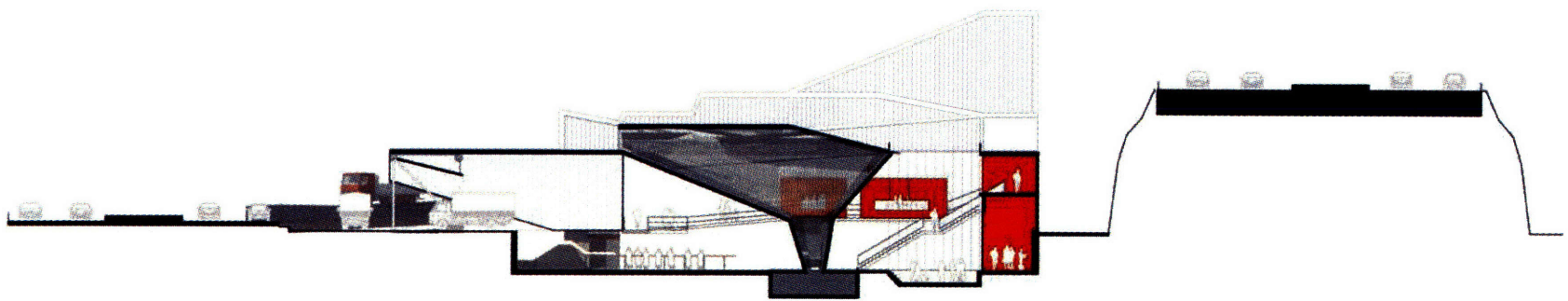










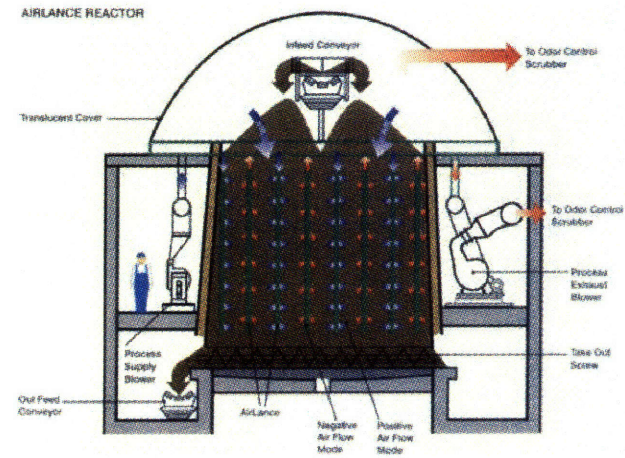
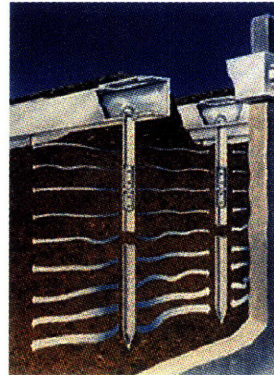


## Compost Technology

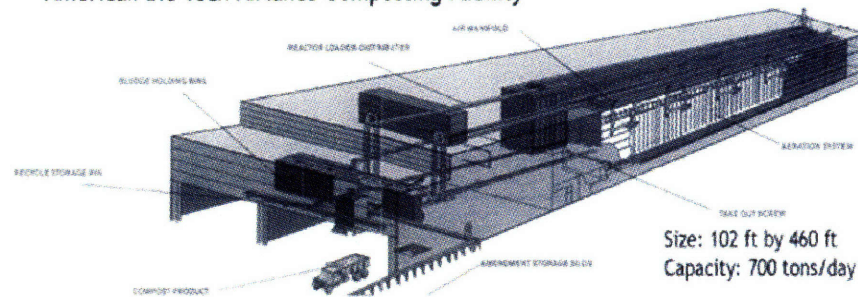
This system produces a high quality compost through invessel technology that eliminates the need for large mobile loading/mixing equipment as well as the large amounts of land required. It also allows for processing reduced particle size, which allows large surface area and rapid single storage processing. The system can be made as a highly automated system or small package plant for small operations.

Other benefits include :

- Accelerated composting processing
- Effective Odor Control
- Lowest material handling time
- Lowest energy and manpower cost
- Minimal space required
- Total cost per ton of compost is lower than any commercial process.

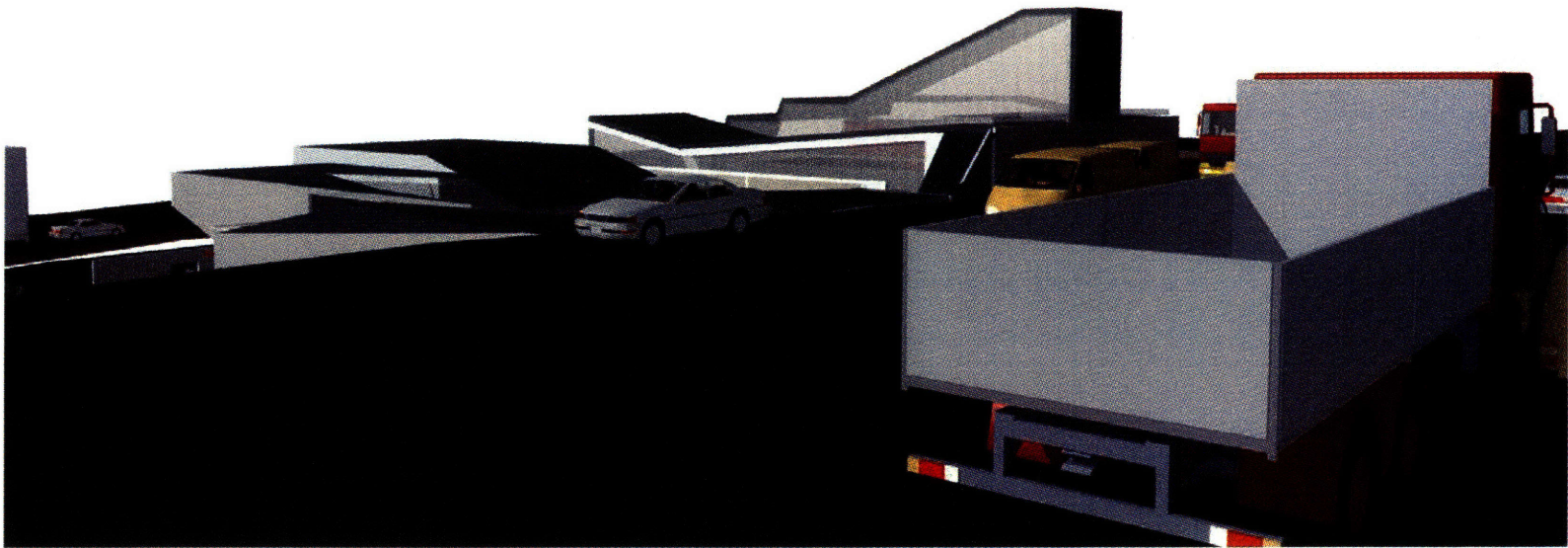


### American Bio Tech AirLance Composting Facility

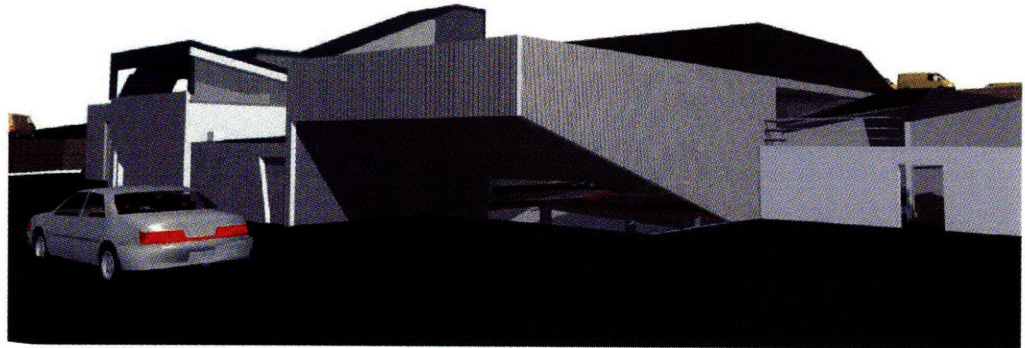




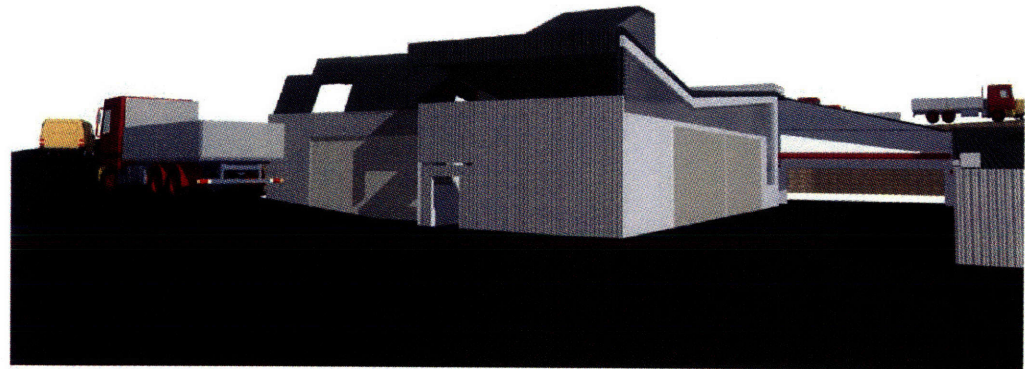
EXPERIENCE



View from Road

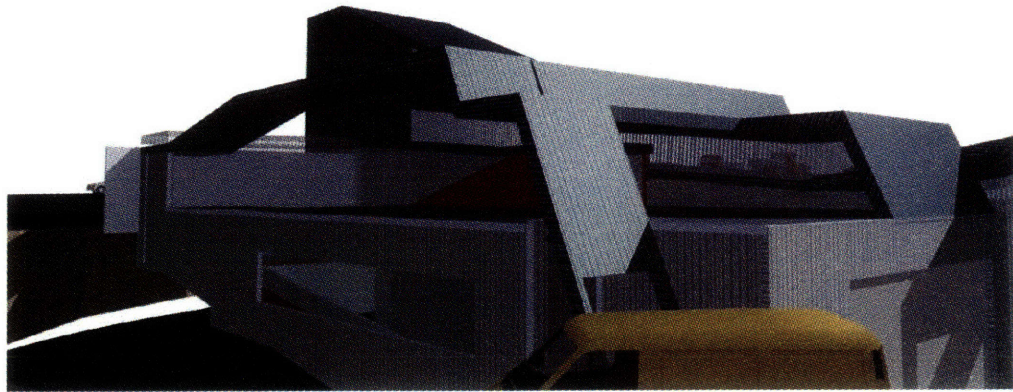
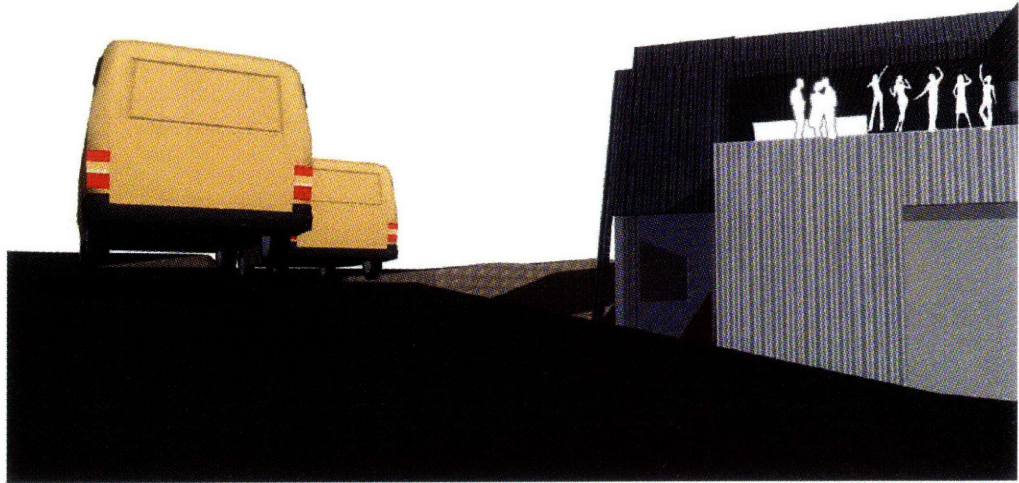


Pedestrian

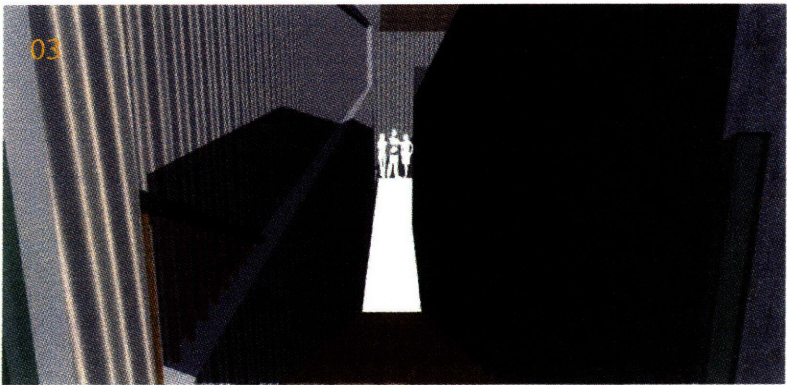
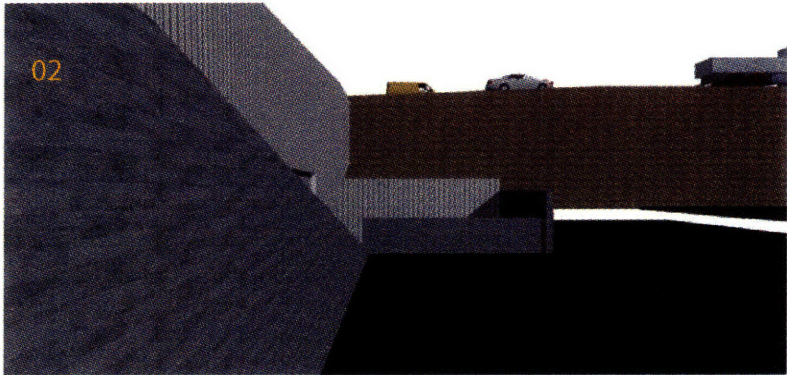
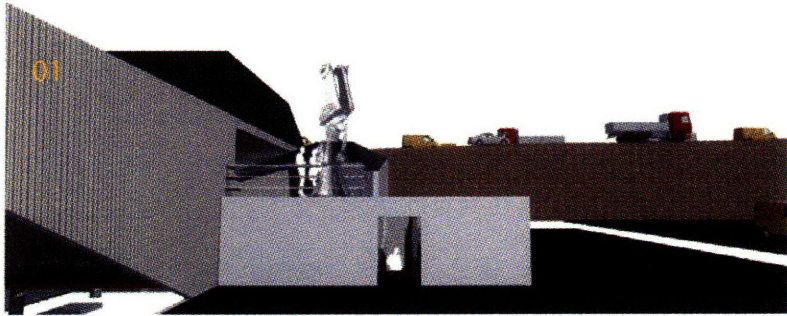


Motorist



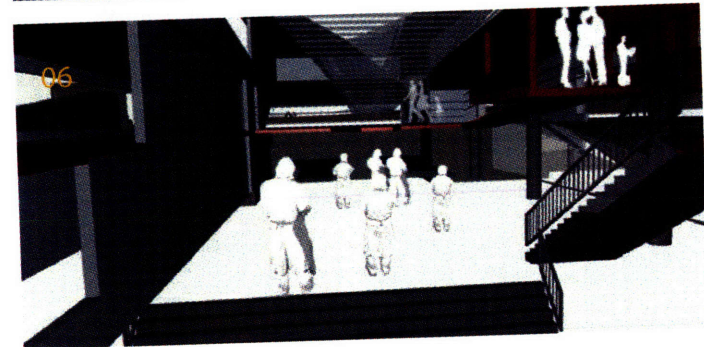
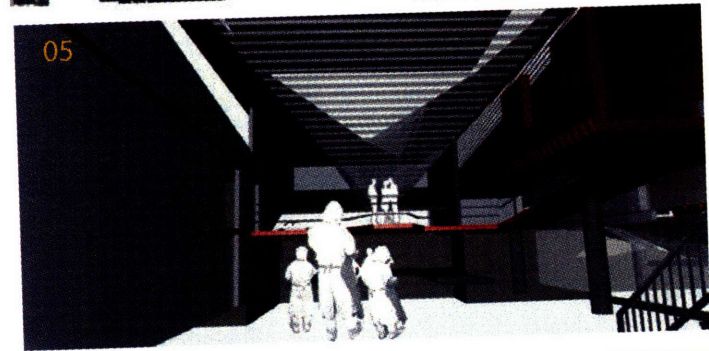
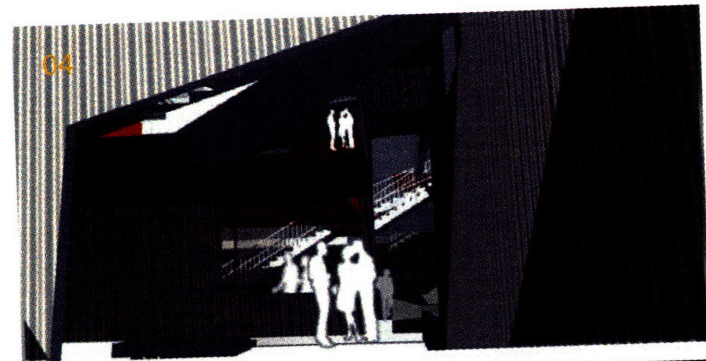


The building is organised to show process almost like a performance,  
creating a dynamic background for  
static art pieces made from recycled material.

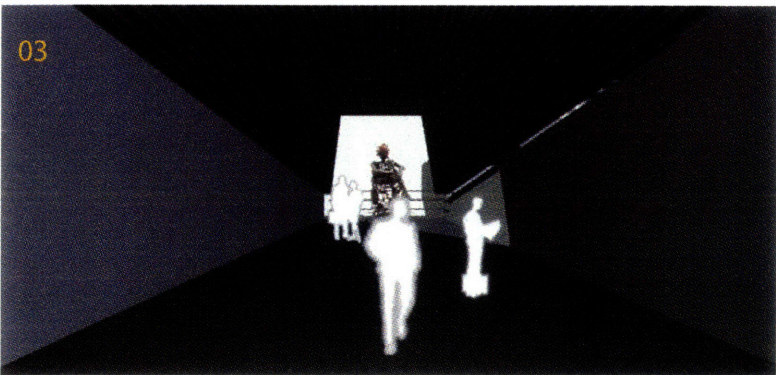
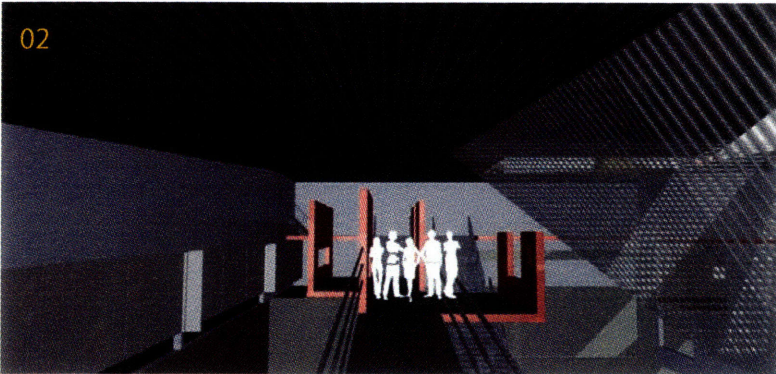
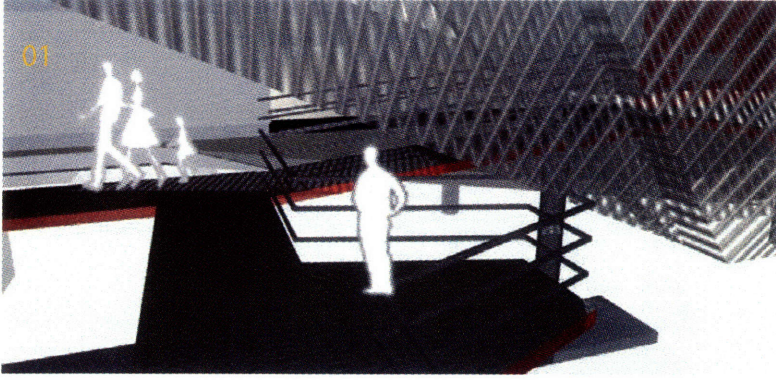


Worker entry sequence

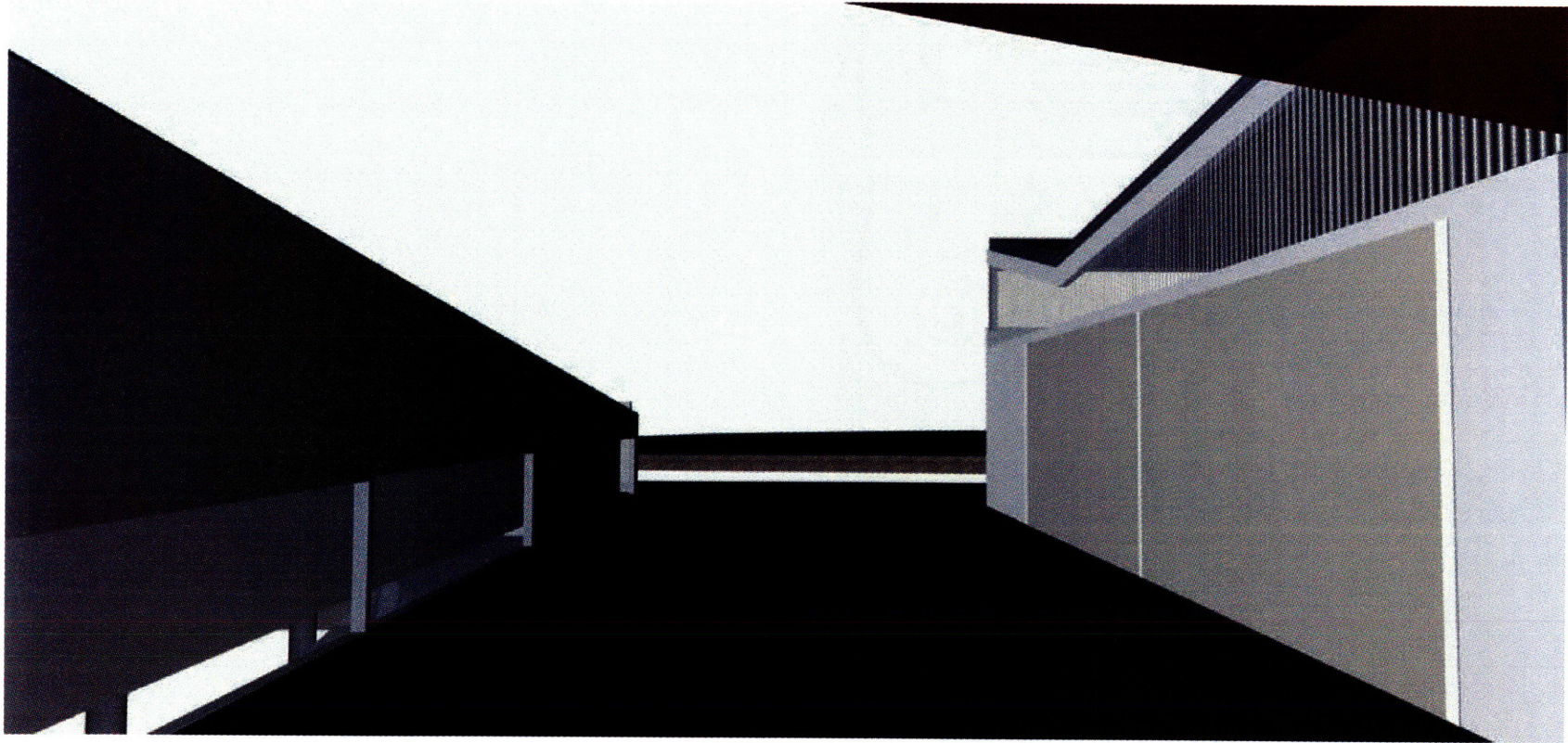




Worker entry sequence

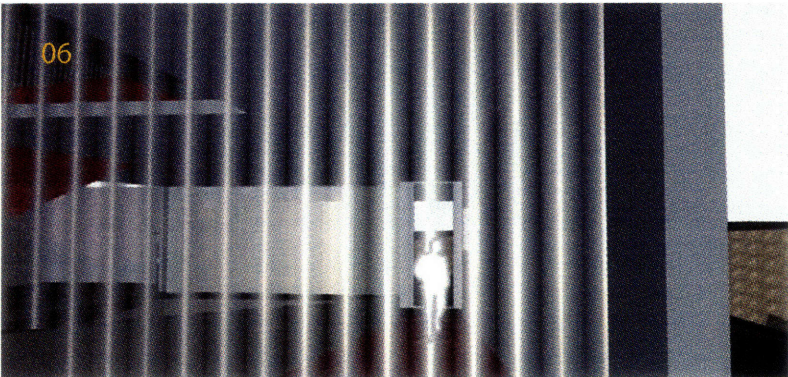
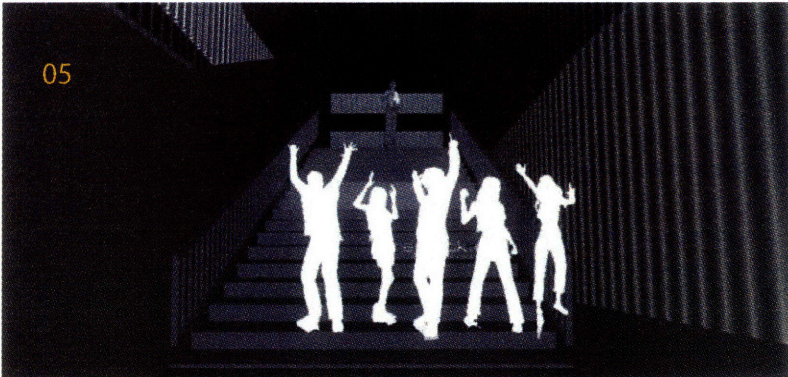
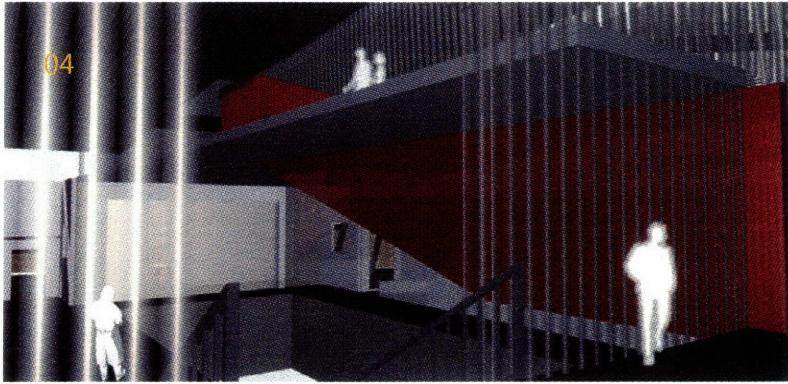




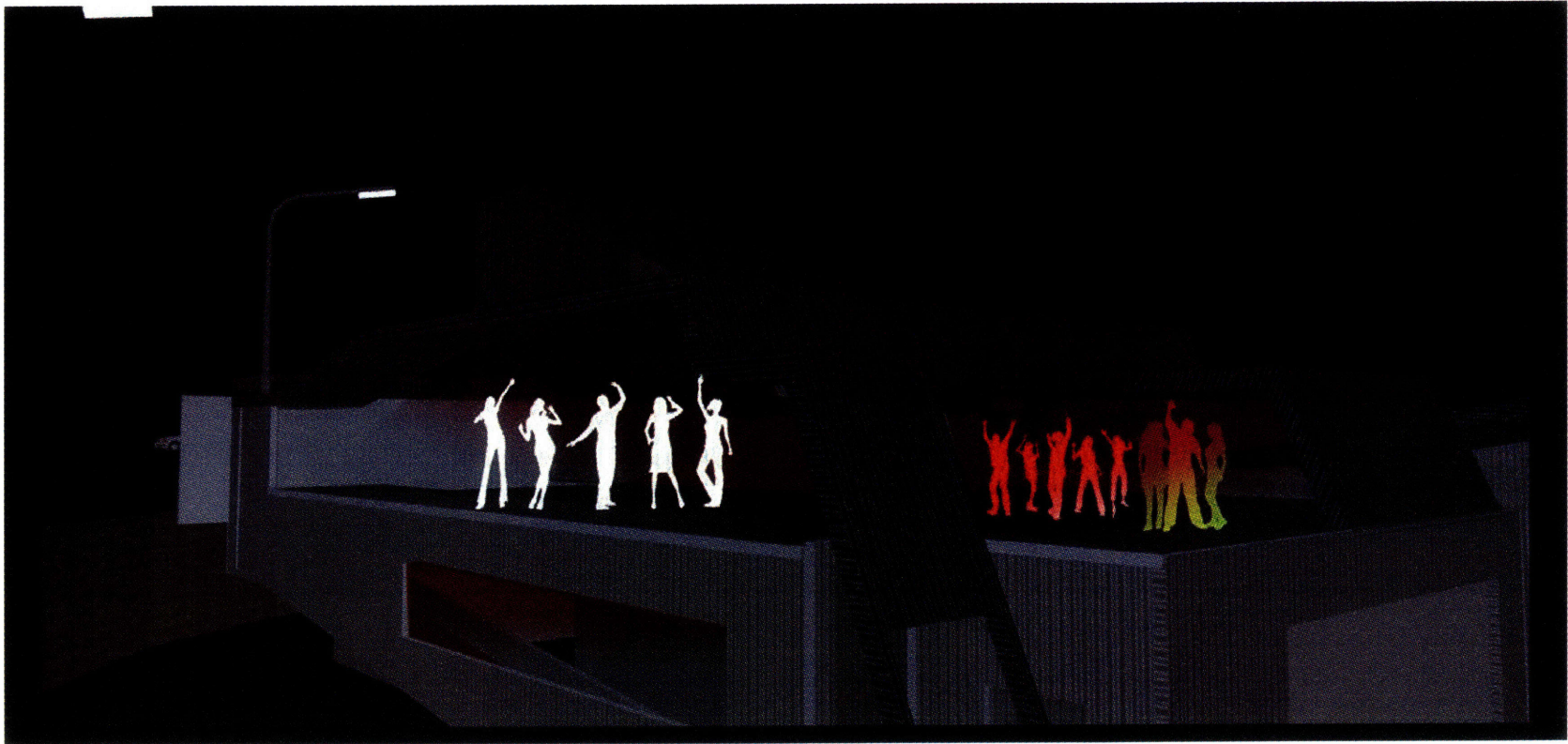


View from Bridge

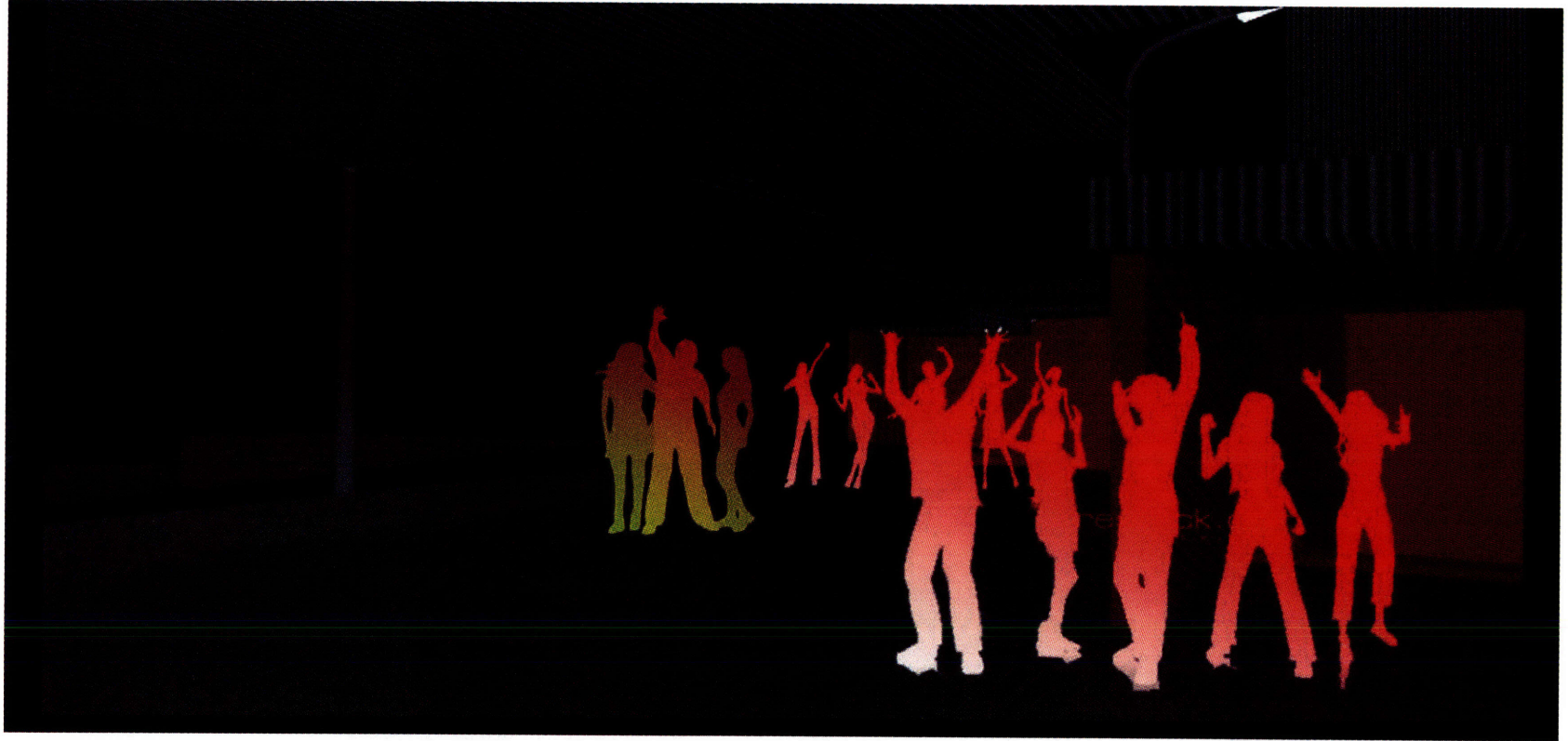


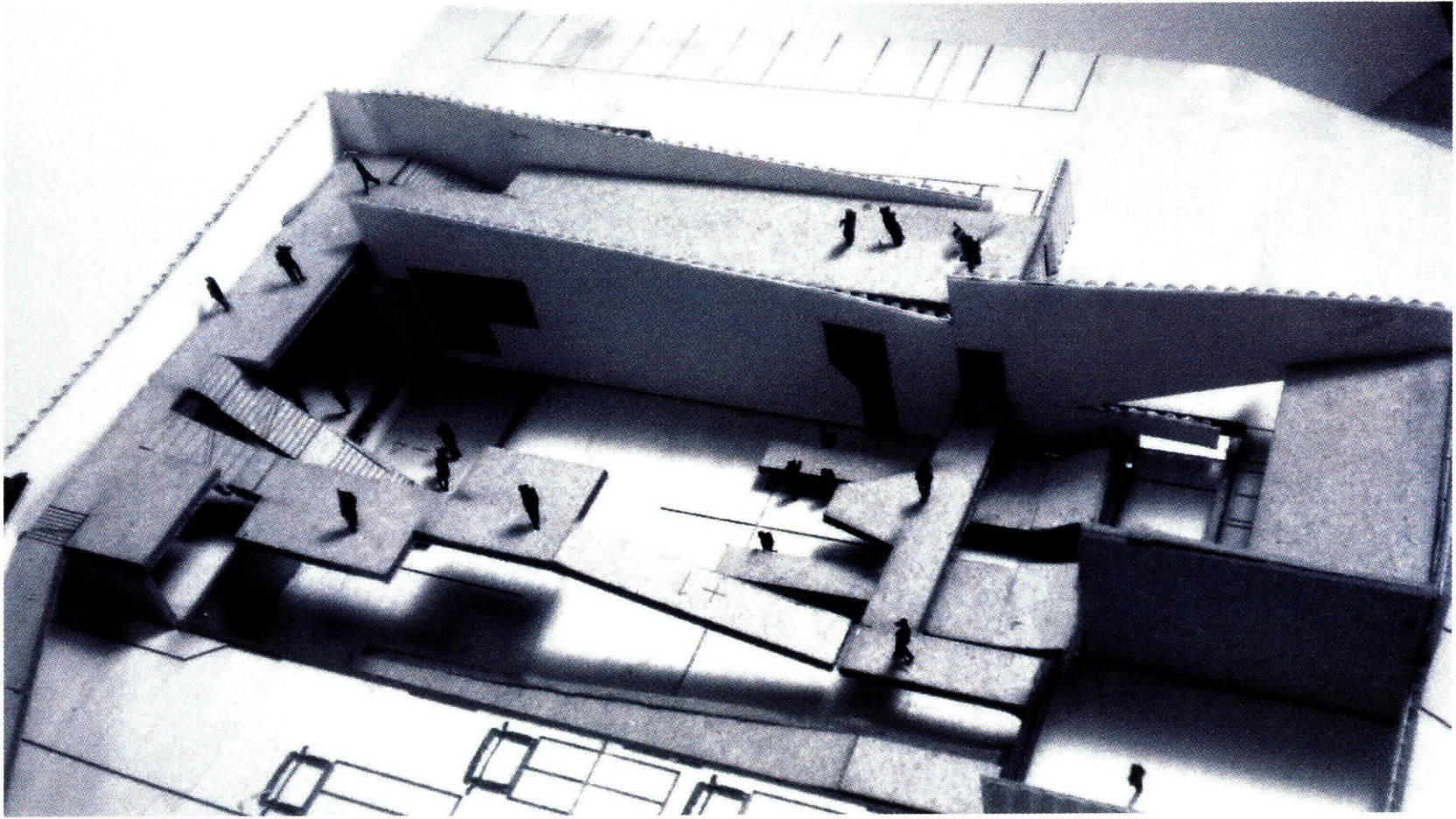


AT NIGHT, The show goes on

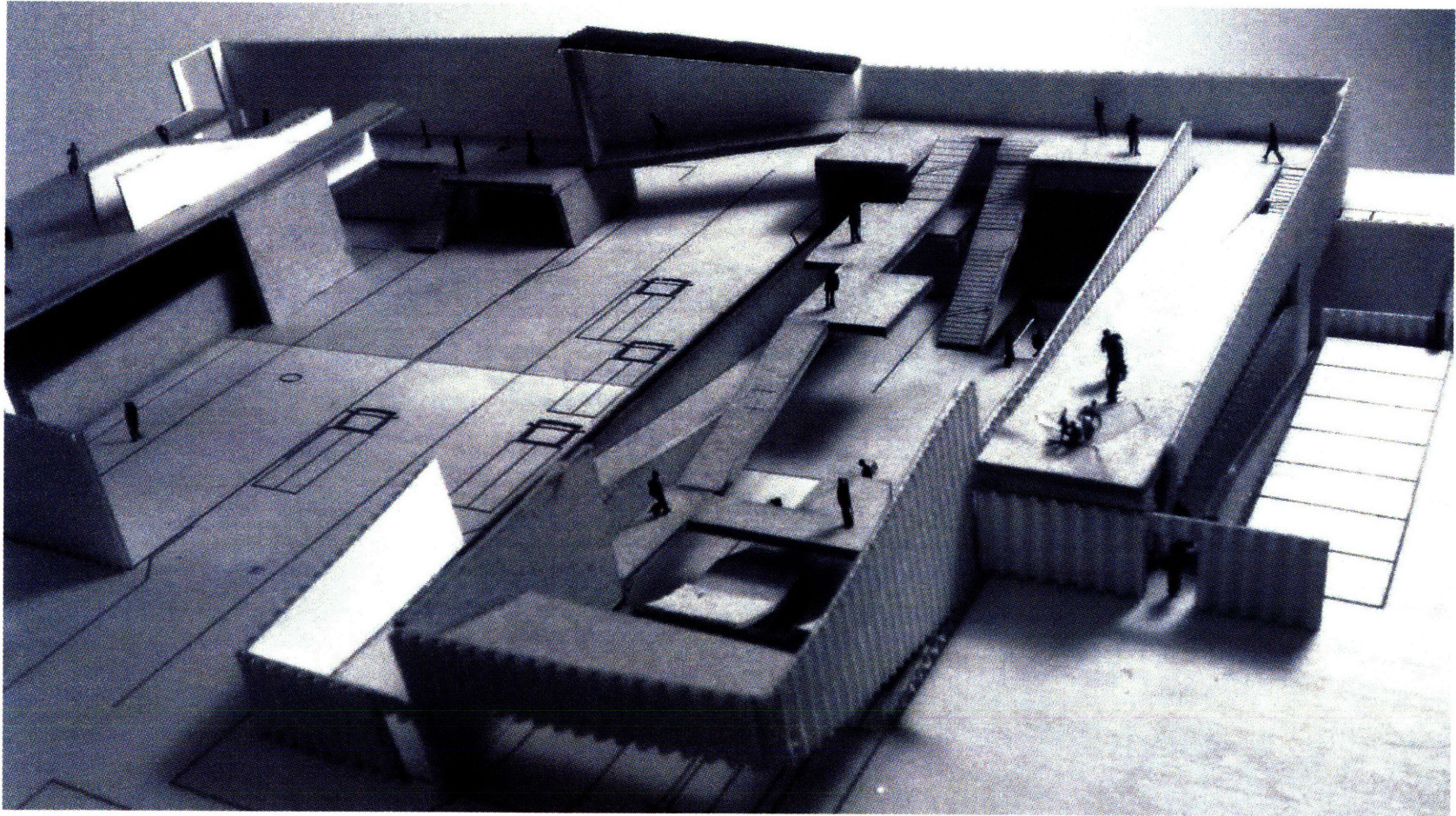




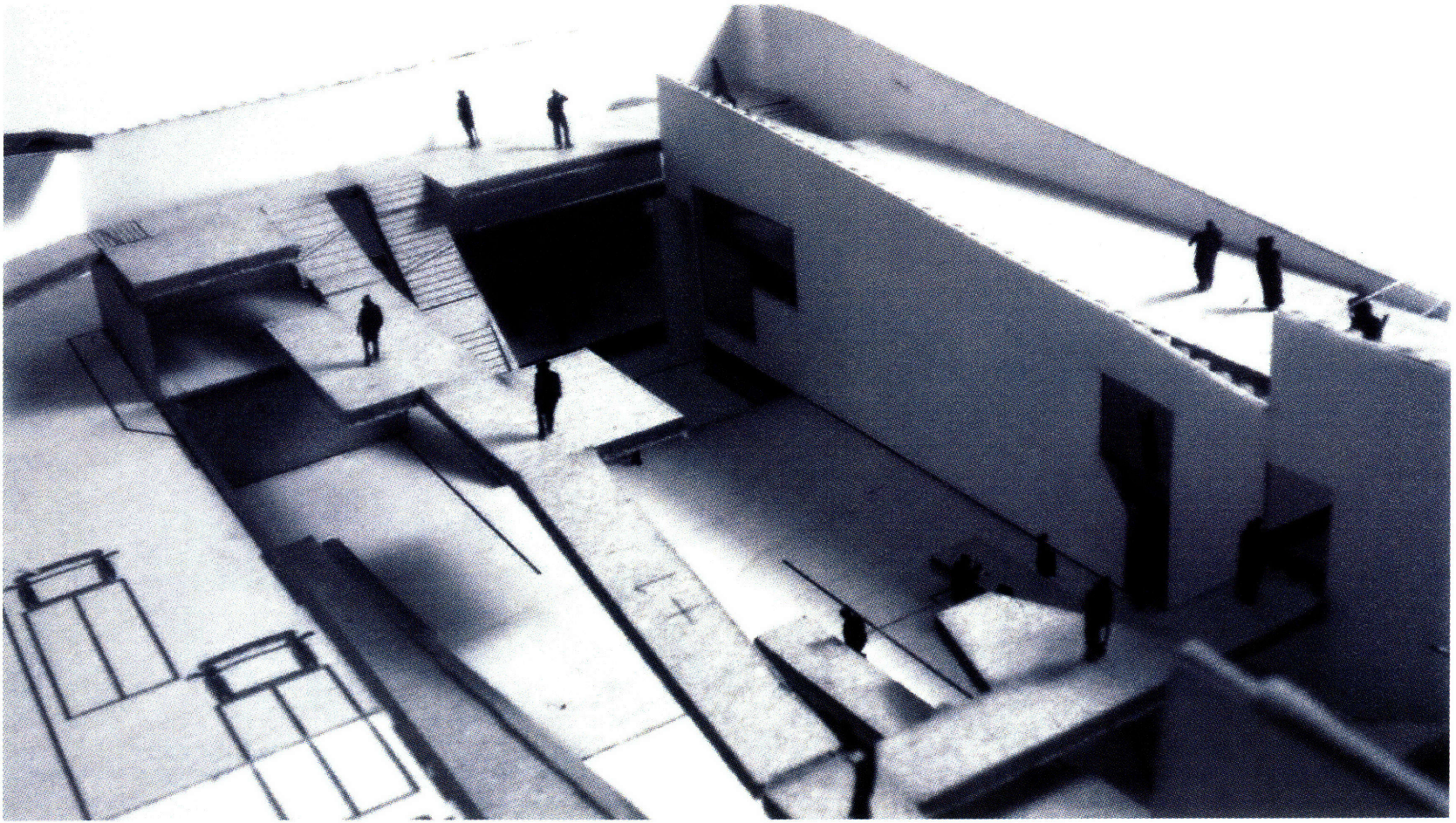








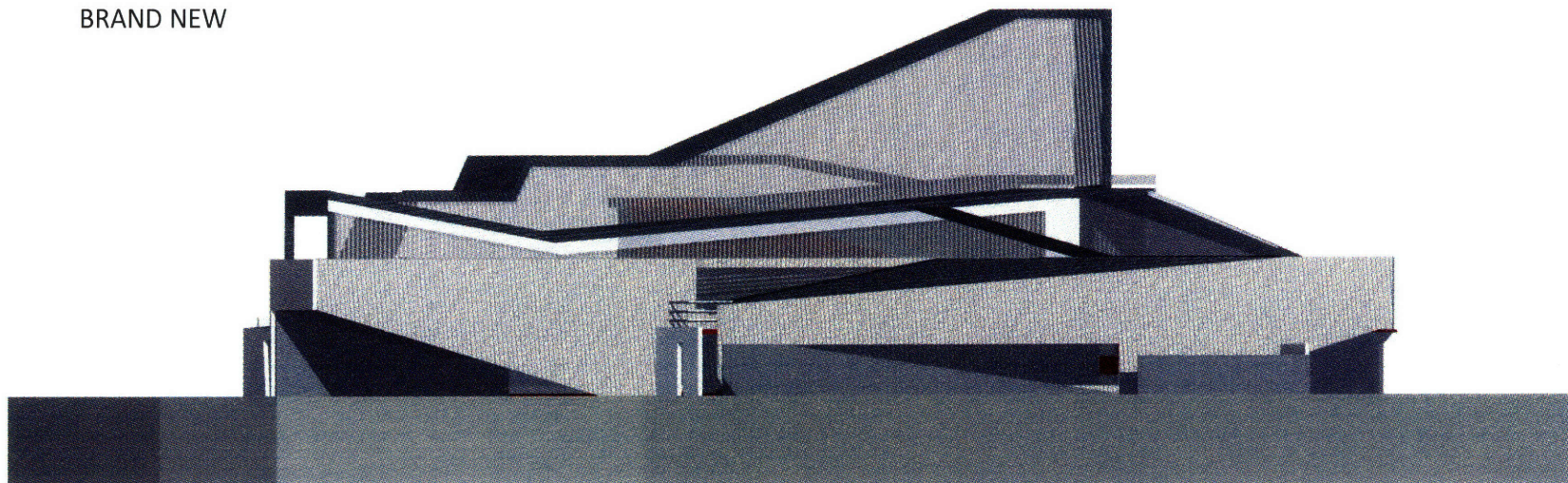




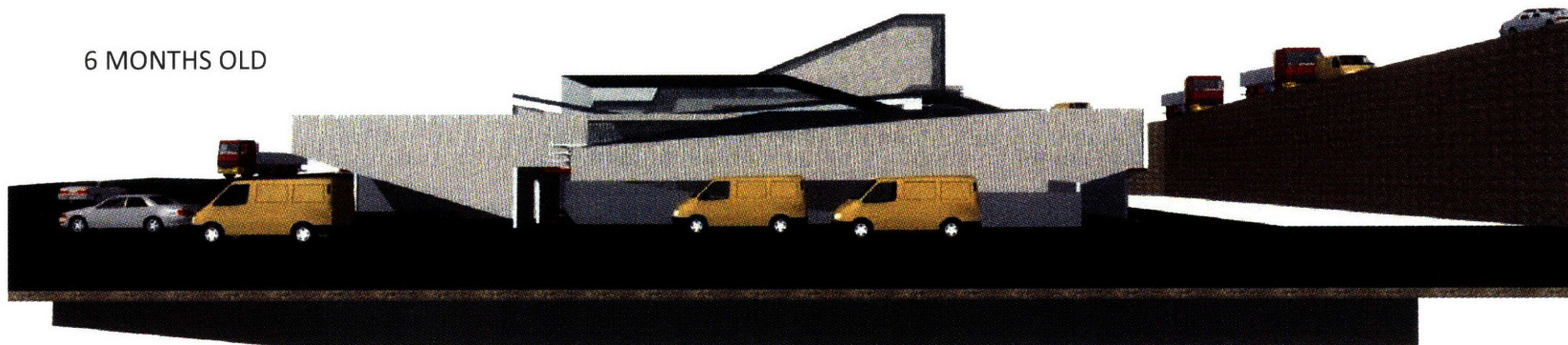
A BUILDING FOR THE PEOPLE  
APPROPRIATION



BRAND NEW



6 MONTHS OLD



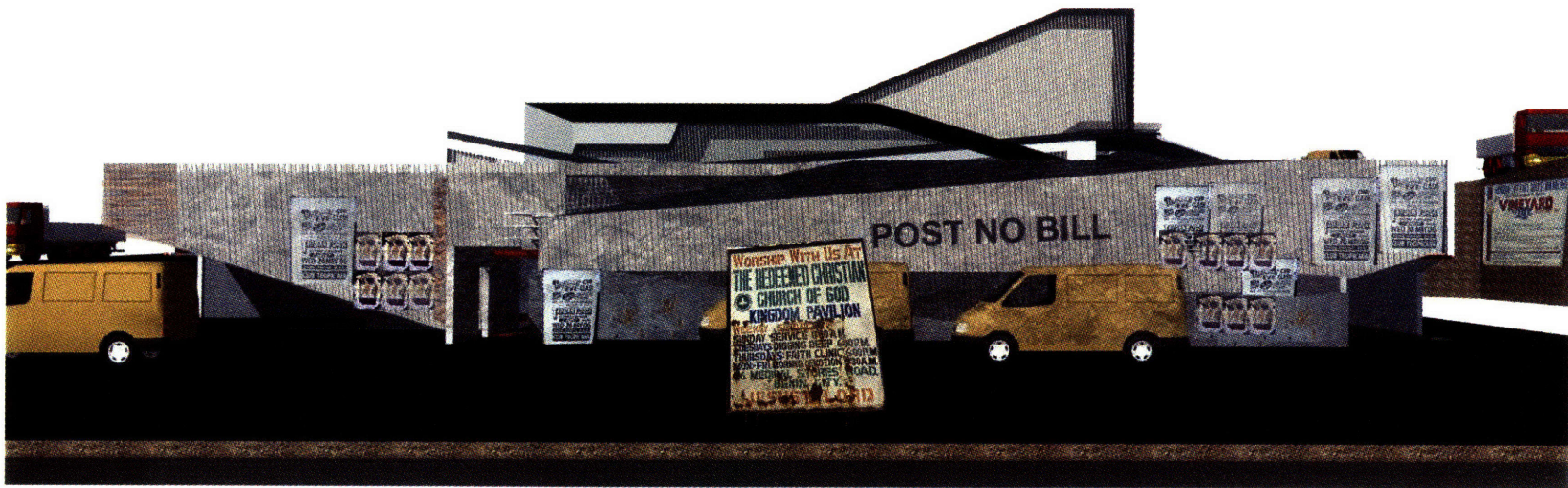


APPROPRIATION



Figure 6

APPROPRIATED



The building is made out of common materials used in an innovative way. This is to create a sense of familiarity and facilitate appropriation.







CONCLUSION

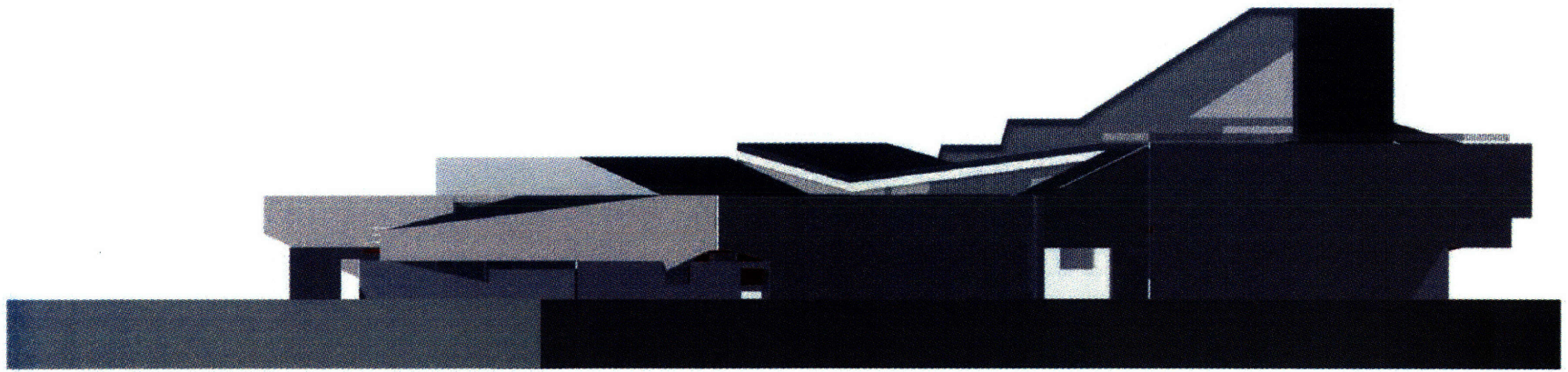
The premise of my thesis was the notion that a bottom up approach could be implemented as a solution to the refuse problem in Nigeria. This Premise was informed by the already existing informal network of waste collection, sorting and ultimately recycling. The thesis then took on a social agenda of dignifying the perception of the scavenger by creating a network of sorting co-operatives. This increases the efficiency of the process by improving mobility and access of the supply chain. It also increases the bargaining power of the scavengers and allows them to partake in the proceeds of the conversion of waste to wealth.

An urbanistic as well as an architectural intervention was then proposed. The urbanistic intervention is the Concept of a supply chain as well as a network of sorting co-operatives located in traffic islands in Several localities and local governments.

Architecturally each center is to be designed to allow a display of the process of sorting and recycling. The building is made out of common materials used in an innovative way. This is to create a sense of familiarity and facilitate appropriation. The buildings are designed to be iconic and memorable thus acting as a billboard for recycling.

In achieving these goals, refuse collection would be extended at a low cost, creating jobs and benefiting low-income communities. Instead of being a problem, waste pickers can be part of the solution to the seemingly intractable problem of collection and disposal of solid wastes in Nigeria.





## Acknowledgement

Adèle Santos,

Thank you for your belief in the project. Thank you for your guidance and encouragement throughout the semester. Thank you also for making time to see me regularly and taking time to understand what I was actually trying to achieve.

Jan Wampler,

Thank you for your interest in my project. Thank you for inspiring me to have a social agenda, a process that has spanned two studios and culminated in this work. Most importantly thank you for your smile... (you are our sunshine\_N.O studio)

Julian Beinart,

Thank you for your amazing insight in to my culture. Thank you for pushing me to incorporate the rich culture of Nigeria in to my design. Thank you for sharing your experiences in Nigeria with me, it really did make the process that much more fun.

Arindam Dutta,

Thank you for your guidance towards my eventual thesis topic, Thank you for your books and criticism.

Ute Meta Bauer,

Thank you for your interest in my work .Thank you for your suggestions which enabled me achieve the social agenda I strived for with my thesis.

Thanks to my family, whose invaluable support helped me get this far.... Thank you

Reilly and Isabelle thank you.

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