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The 13th Compound: Co-operative Development of an Industrial Urban Village

by

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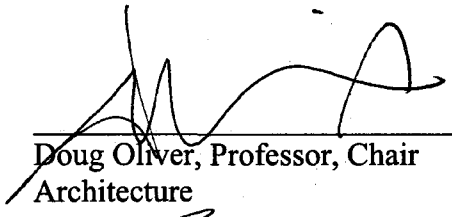

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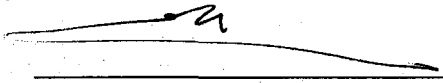

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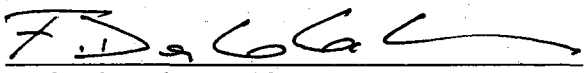

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ABSTRACT

The 13th Compound:

Co-operative Development of an Industrial Urban Village

by Kimberly Raborn

This thesis critiques the tabula rasa typology of 'slum' redevelopment which utilizes master planning to erase and rebuild slums. It proposes to enact a system based on smaller, contextual intervention within the 13th Compound in the Dharavi slum of Mumbai. Focusing on the creation of trade based workers' co-operatives; this thesis intends to reinforce the 13th Compound and its symbiotic relationship to Mumbai.

The proposal utilizes the context and resources of the neighborhood while focusing on the existing recycling industry as a continued means of livelihood. By enacting smaller scale interventions through erasure and addition, it inserts trade based workers' co-operatives as a means of organization, both spatially and politically.

These co-operatives will represent the recycling trades which thrive in the 13th Compound and will integrate infrastructural amenities such as rain-water harvesting and gray water filtration into the existing industrial fabric in order to facilitate continued development.

ACKNOWLEDGEMENTS

Special thanks to Doug Oliver, Farès el-Dadah, Eva Franch, John Casbarian and Albert Pope for their assistance and involvement.

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URBANIZATION - An Undeniable Force

"The growth of cities will be the single largest influence on development in the 21st century"
-State of the World Population 1996

For the first time in human history, more than half of the globe's population resides in urban areas (UN Population Fund 6). This is occurring overwhelmingly within the borders of developing countries. Our place in this history affords us an opportunity, as well as a responsibility, to alleviate the impending pressures of urbanization while attempting to capitalize on the positive changes this could affect.

3.3 billion people now inhabit the urban areas of the world (UN Population Fund 6). Throughout human history, the majority of individuals occupied rural environments, but a large scale process of urbanization has now swung the balance. Urbanization is, according to the United Nations Population Fund, the process of transition from a rural to a more urban society. While there are many potential opportunities for improved quality of life through this shift, the effects of such a rapid and large scale shift are also potentially catastrophic.

The impact of the massive force of urbanization on urban centers is apparent and rapidly expanding. The decided majority of this expansion is occurring in the developing world. Urban populations of Asia and Africa are projected to double between 2000 and 2030 (UN Population Fund 6). While the world's mega-cities are being impacted by peri-urban development and the increase of urban slums, recently transitioned rural towns feel an even greater effect. The infrastructural systems in these areas are not prepared to deal with the increasing populations they are almost sure to experience. Simply dealing with these population increases as they occur will not be enough to avoid serious ramifications from such a rapid population increase.

While the rate of growth cities has actually been declining in general, these growth rates still remain highest in Africa and Asia. Even with the decline of the rate of growth of cities, the scale of the growth is massive and unprecedented. From 1750 to 1950, America and Europe experienced an increase of urban population from 10% to 52% or from 15 million urban dwellers to 423 million. The same percentage shift experienced in these countries over the

course of two centuries will be experienced over a much shorter time frame and with much larger numbers in the developing world. It is projected that between 1950 and 2030, the urban population will increase from 18% to 56% in less developed regions. This percentage increase represents a population intensification from 309 million to 3.9 billion (UN Population Fund 7). This massive growth of the urban in the developing world will be composed primarily of poor people (UN Millennium Project 12). The disparity in the affluence of these new urban dwellers will lead to an unprecedented pressure on the urban infrastructures of these developing cities, which comprise more than two times the number of urban inhabitants than their more developed counterparts.

The World's Mega-Slums

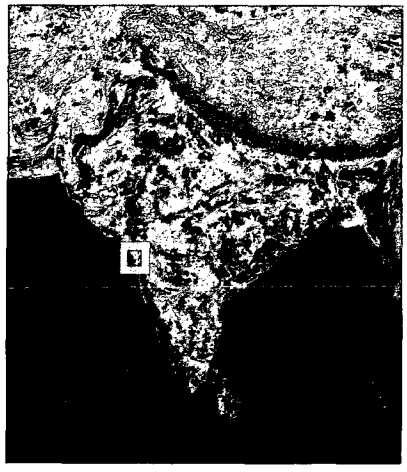
SLUMS and MEGA-SLUMS

The massive force of urbanization occurring in the world's poorer nations could easily become a process of slum building. The UN defines a slum as characterized by overcrowding, poor or informal housing, inadequate access to safe water and sanitation, and insecurity of tenure. It also estimates that by 2005, slum populations had grown to more than 1 billion people. This, of course, is disproportionately occurring in the developing world. While only 6% of urban dwellers in developed nations are considered slum dwellers, this label describes an overwhelming 78.2% of urbanites in poorer nations, or 1/3 of the global urban population (Mike Davis 24). When examining the total global population, the UN estimates that 1/6 of all humans live in slums.

While it is difficult to give an accurate count, there are probably some 200,000 slums in the world, ranging from a few hundred to more than a million people. In South Asia, 5 metropolises account for more than 20 million slum dwellers. However, Mexico City boasts the unfortunate honor of housing the world's largest mega-slum, home to more than 4 million

inhabitants (Keith Pezzoli 27). When squatter communities and shanty towns "merge in continuous belts of informal housing and poverty" a mega-slum is created (Mike Davis 26). At least 30 slums in the world contain more than half a million inhabitants each.

The "Challenge of Slums", as the report by UN-HABITAT is aptly named, is an obvious and growing issue within the developing world. The poor quality of life, lack of basic infrastructure and prevalence of health dangers create environments completely unsuitable for human habitation. However, these urban poor are pulled into slums and squatter communities by opportunity. Proximity to employment often supersedes secure tenure and inadequate housing. As stated by Kalpana Sharma in *Rediscovering Dharavi*, "Livelihood and shelter have to be seen as one rather than separate entities." The dire living situation in slums represents a opportunity for work and survival which trumps the hazards and extreme discomforts.



MUMBIA, INDIA

MUMBAI, INDIA

A country of over 1.1 billion people, India contains a great diversity of languages, religions and cultures. It is also home to a disproportionate number of impoverished slum dwellers. The slum population in India is estimated at 55.5% of the urban population, or 158 million people (UN-HABITAT). This number ranks India second only to China in sheer numbers of slum dwellers. Its two largest cities, Delhi and Mumbai, vie for the position of the densest and most populous city in the world, with Mumbai just surpassing Delhi in both accounts.

Mumbai is a city of extremes. From the colorful glitz of Bollywood to the squalor of slums, sharp contrasts remain in plain view. Mumbai, in the state of Maharashtra, is considered the fifth largest city in the world. Its metropolitan area carries a staggering population of 21.9 million inhabitants. According to the World Gazeteer, Mumbai proper has a population of 13,662,885. Considered the densest city in the world, Mumbai packs 23,000 people

into a square kilometer, almost three times the density of New York City. With almost 60% of its population being slum or pavement dwellers, Mumbai contains the greatest number of slum dwellers of any city (Mike Davis 16). UN-HABITAT estimates the number of squatters and tenement-dwellers at 10 to 12 million.

Mumbai, originally Bombay, was first inhabited by the Koli fishermen. The original seven islands, separated by shallow seas, were controlled thereafter by the Portuguese and later the British. During the 19th century, the British enacted massive engineering projects to connect the seven islands into one agglomeration. This project, as well as the opening of the Suez Canal, spurred growth northward. The new unified city occupied the southern part of the peninsula, where Bombay was experiencing a rapid growth as a port city. As populations increased, development continued up the peninsula to the newly inhabitable land. The swampy lands to the north began to be filled by refuse, slowly allowing for occupation by indigent populations and migrants from neighboring states.

Mumbai, once seven distinct islands, has now become a peninsula covering 223 square miles. It is considered the

financial capital of India, and its per capita income is roughly three times the national average. The technology industry has rapidly grown within the city since the 1980s. Famously home to India's film industry, Bollywood produces over 150 films per year. While Mumbai remains a city of massive growth and development, the disparities between rich and poor are staggering.

DHARAVI, MUMBAI

DHARAVI - Urban Village

Centrally located between two major rail lines and neighboring the posh suburban neighborhood of Bandra, the Dharavi slum sits upon increasingly valuable land. It has long been a destination for India's struggling village populations and urban poor. Within its labyrinthine sidewalks and alleyways, hundreds of thousands of individuals seek out the opportunities available to them in this teeming urban village. Composed of more than 85 individual *nagars* or neighborhoods, Dharavi's residents are as ethnically and culturally diverse as India itself. Densities range from 18,000 people per square kilometer to upwards of 300,000. Families of 15 often crowd into homes of no more than 300 square feet, leaving sleeping areas of 20 square feet for each individual. Water taps and toilets are scarce, with one toilet per couple hundred people. While Dharavi's informal development and lack of infrastructure is pointed, its unique status within Mumbai is due to its thriving industrial sector which employs a vast majority of its residents.

The human packed space of Dharavi is home to almost one million inhabitants. While official population counts place the number closer to 600,000, estimations from non-governmental organizations produce a number between 800,000 to one million. Accurate counts of residents are very difficult given the often illegal status of the residents and the dense and transient fabric of Dharavi itself. It is often called Asia's largest slum, a title now awarded to Orangi Town in Karachi, Pakistan (Mark Jacobsen May 2007). In fact, even in Mumbai, where 60% of the population is either a slum or pavement dweller, other slums rival Dharavi's size and density (Mike Davis 28).

Dharavi has grown into its slum status over the centuries. During Bombay's island existence, the land upon which Dharavi now rests was a fishing village. Koli fishermen were the original residents of what now is one of Asia's largest slums. Until the 1850's, Bombay remained a city limited to the southern tip of the peninsula. As this port city expanded, it grew northward. Even during this initial expansion, Dharavi, then Koliwada, was a separate entity from the city of Bombay. Its peripheral status

allowed for the independence of the Kolis, who continued their fishing until it was no longer possible.

The Kolis understand Dharavi as their land. They also represent one of only a few groups who have always been considered legal residents. They continued to survive by fishing until the late 19th century when the development of Bombay interfered with their livelihood. As Bombay expanded northward, Dharavi was used as a refuse dump. This activity eventually filled in its island status and contaminated the Mithi River to a point that fishing was no longer a viable option. At this point in their history, the Kolis turned to bootlegging, which has provided them with an alternate livelihood for a number of decades.

During the expansion of Bombay, populations that migrated from other states in India were displaced. The Kumbhars are potters that fled their drought ravaged home in Gujarat for Bombay in 1877. They originally settled in South Bombay, but the growth of the city forced them northward to Sion. This move also proved too central for the growing city, as the land was appropriated for a British Army camp. The Kumbhars and their kilns were forced to move once again. They were relocated to the swamplands of

Dharavi, where they have remained since and continue their pottery within the borders of the slum.

Kumbhar Potter

As Bombay continued to grow, it expanded northward up the peninsula. Each spurt of growth pulled the urban area closer and closer to Dharavi. Once completely peripheral to the city itself, Dharavi became interwoven with the urban fabric. Dharavi now is a diverse landscape of cultures and industries. It is a vibrant representation of the states of India as a whole, with distinct populations living in extreme proximity to one another. The draw to Dharavi has primarily been an economic one. One can find work in Dharavi. Tanneries created by Muslims from Tamil were a major draw for employment up until the 1980's. While a few smaller tanneries still exist, there has been a major shift to finished leather goods.

Leather goods exist as the face of Dharavi to the rest of Mumbai. Many wealthier inhabitants of Mumbai are familiar only with 90 Feet Road, the primary location of the sale of finished leather goods in Dharavi. But leather goods are far from the only thriving industry in Dharavi. In a slum where 80-90% of the population lives and works, a diverse and thriving economy exists. Dharavi's uniqueness in the urban environment is not its informal development,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but rather the vibrancy of its informal economy. Even using the word 'informal' to qualify the economy within Dharavi is misleading. An estimated $800,000,000 to $1,000,000,000 circulates through its borders annually (Elizabeth Eaves June 2007).

Home to thousands of small businesses, Dharavi displays a vast range of industries. From traditional crafts, such as pottery, to the increasingly necessary recycling industry, Dharavi offers residents a constant means of livelihood. Many of these businesses cater primarily to the local Dharavi population, but a number also serve greater Mumbai and even international clients. A Johnson and Johnson factory can be found within Dharavi's borders. A large proportion of small business owners own their own factories and employ several workers. Often these small factories are built into lofts of the owner's residence.

The Kumbhars' pottery represents one of the traditional trades, as do the few remaining Tamil tanneries. The garment industry is particularly active in Dharavi. Ranging from small loft workshops employing 2 or 3 workers, to much larger factories, workers produce, embroider and silk screen garments for consumer purchase. Often the workers in these

factories are day wage laborers who sleep where they are employed. Shifts of 10 - 12 hours are split between workers, who lie down and sleep on the floor of the workshop when their shift has finished. Often these workers are newly migrated poor who have yet to find housing.

Bakeries, hotels, and jewelers line the narrow streets. Many *nagars* are primarily residential or mixed-use residential and commercial. Here, small loft factories employ many of the residents. However, pockets of industrial activity also occur. These areas are usually found along the periphery of Dharavi, located in land mostly unsuitable for residential development. These areas along rail lines or the swampy shores of the Mithi River are even more prone to flooding during the rain-laden monsoon season. In these industrial zones, heavy metal work and recycling of all kinds employ tens of thousands. Polluted and dangerous conditions are prevalent, and it is rare to find residential blocks.

The recycling industry thrives in Dharavi, with at least 10,000 residents employed in plastic recycling alone. Dharavi is "becoming the green lung stopping Mumbai from choking to death on its own waste (Dan McDougal March

2007)." Almost everything is recycled in Dharavi. While plastic recycling represents the largest recycling industry, tin, paper, barrels, electronics, and household items are all recycled or refurbished. Rag pickers collect discarded materials from around the city and bring them to sorting stations in Dharavi where they collect a fee for their finds. Sorters sift through mounds of refuse, arranging everything according to size and quality. After sorting has occurred, materials are broken down or refurbished. The market for materials depends heavily on the type of item. Many household items are resold by street vendor to the local population. Plastics are often granulized and melted down. These products are either sold to corporations for reuse or distributed to local factories where they are reconstituted into usable goods. An estimated 80% of Mumbai's plastic waste is recycled within Dharavi (Shelley Seale January 2007).

Not only does the recycling industry employ tens of thousands of individuals, it also creates a symbiotic tie between Dharavi and Mumbai. In a city of over 13 million, the amount of refuse produced is quite unsustainable without recycling programs. The often impotent city and state

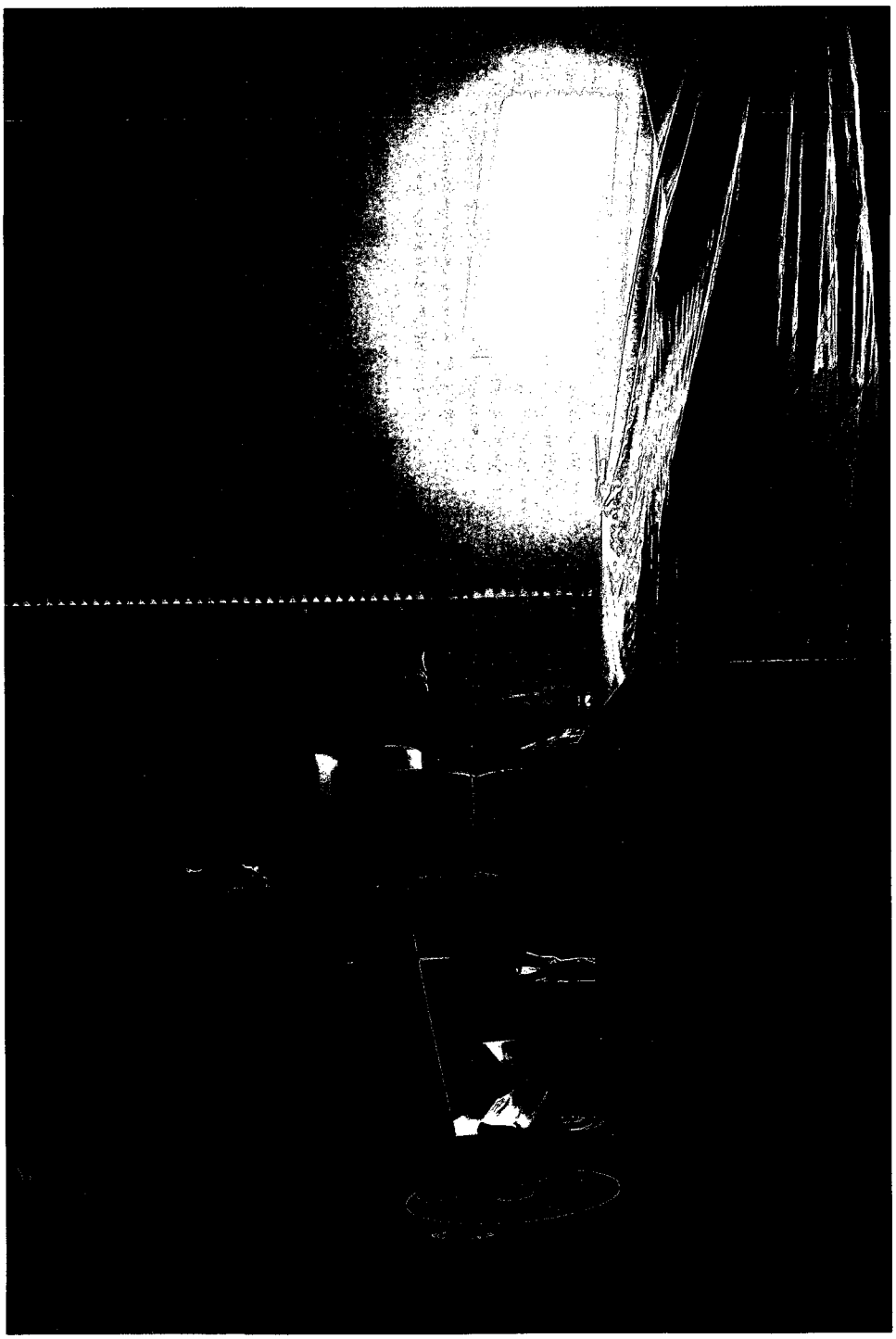
institutions cannot compensate for the work of thousands of impoverished residents. This symbiosis highlights the special value of Dharavi, which continues not only to supply livelihoods for nearly one million inhabitants, but also maintains the overall health of the city of Mumbai.

THE 13TH COMPOUND, DHARAVI

THE 13th COMPOUND - An Industrial Urban Village

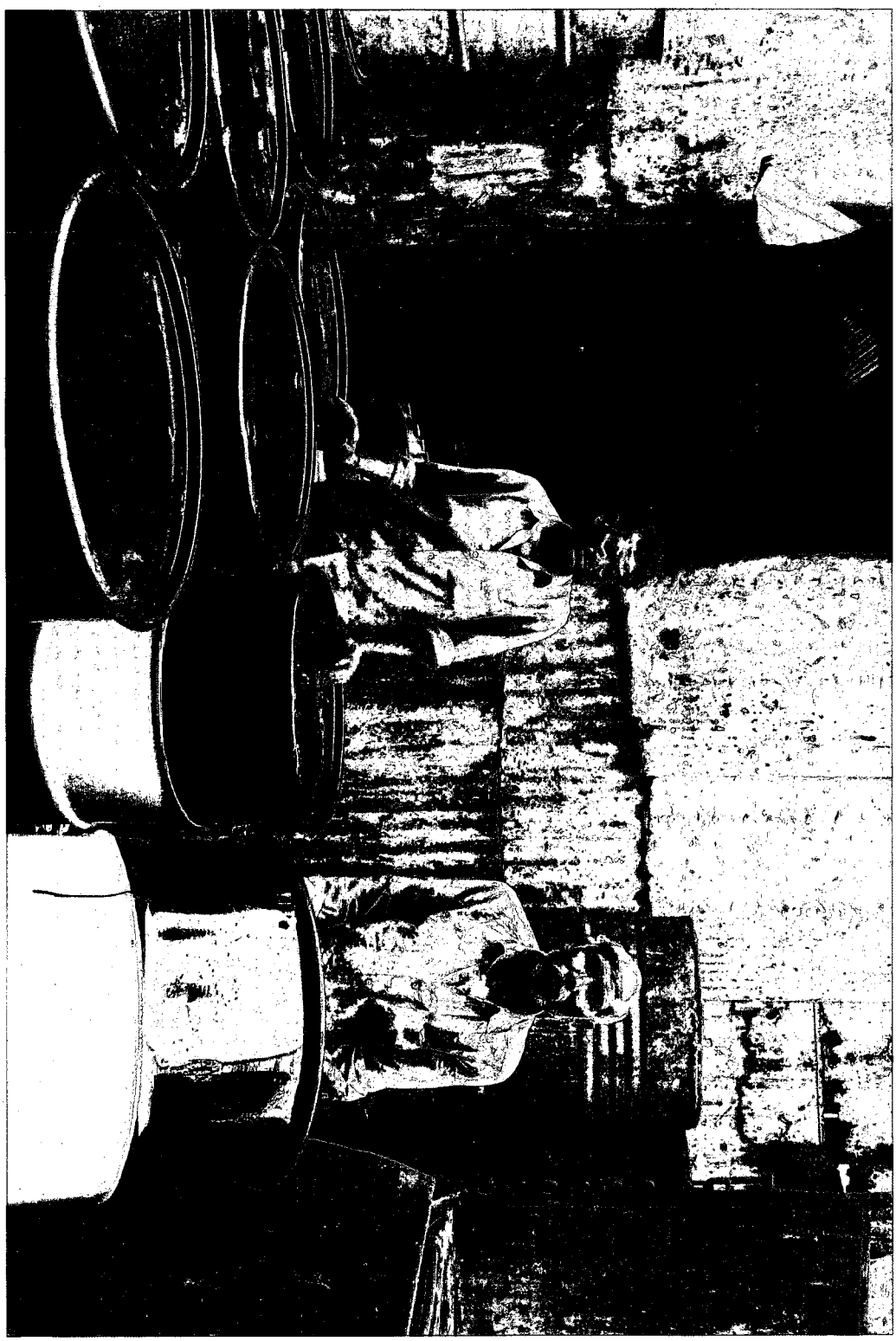
Not far from the vibrant urban streets of residential Dharavi, a teeming industrial zone houses thousands of factories and workshops. Heavy metal work and recycling make up the vast majority of the industries within this small neighborhood. In a rare area of open space, the color industry, or dye manufacturing, also thrives. The 13th Compound lies to the west within the borders of Dharavi. Flanked by a rail line, the Mithi River and 60 Feet Road, access to the 13th Compound is ideal for the industries housed there. The Center for Environmental Planning and Technology in India estimates that over 4,900 industrial units exist in the 13th Compound.

While external access is ideal, the dense network of winding alleyways and sidewalks that compose the internal throughways of the 13th Compound are narrow and extremely difficult to traverse. Most industrial units are not accessible by truck. Carts, bicycles and individuals transport loads through the labyrinth of sidewalks and ladders. Air and sunlight struggle to reach the interiors



of the densely packed factories. Fumes and smoke choke out what little light is provided by skylights in factory roofs. Similar to many neighborhoods in Dharavi, sewage and water access are scarce if available at all. Two large water pipes which enter Dharavi at the 13th Compound are punctured and leached to provide small amounts of water to the industrial units.

The environmental conditions are less than ideal, but the work continues and thrives. Although primarily industrial, the 13th Compound does provide residency for hundreds of individuals. Many of the residents of this neighborhood are day wage laborers, who sleep where they work. The 13th Compound often represents the first step in their residency in Dharavi. They work long hours and sleep in less than ideal conditions with the prospect of acquiring an improved home and perhaps a workshop of their own.



REDEVELOPMENT - Past and Future Policies

Over the last 60 years, the state of Maharashtra's policy on slums has shifted. From early slum clearance projects, the state evolved a policy of improvement and finally redevelopment. This relatively new stance of redevelopment now hangs a shadow of uncertainty over Dharavi. The $1.8 billion Dharavi Redevelopment Project, headed by Mukesh Mehta, threatens to change the face of Dharavi.

During British occupation, efforts were made to house the city's working poor. Initiatives such as the Bombay Development Department and the Bombay Improvement Trust built *chawls*, or workers' tenements, for the booming textile industry and even the police force. During these times, the British were afraid of disease being spread from the poor to the wealthy and made greater efforts to house the poor. However, after Independence, no such efforts were continued. The city continued to expand and develop, pushing workers out of their *chawls* and into informal housing. The city attempted to ignore the swelling population of the slums.

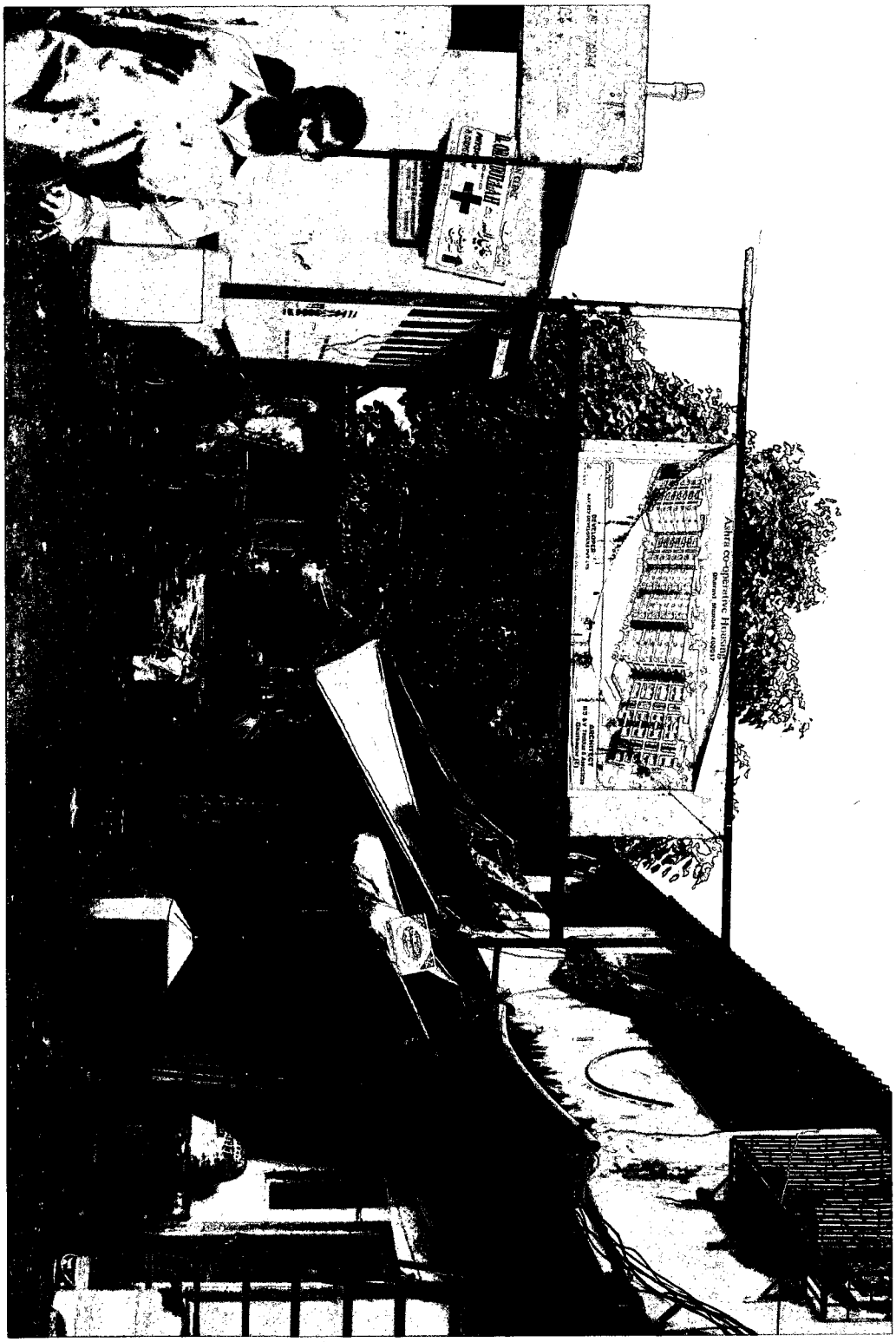
However, when that became impossible, the next step was one of erasure.

In the 1950's Bombay adopted the Slum Clearance Policy. This policy was pursued vigorously and to great destruction. The slums of South Bombay were bulldozed in the company of the police. Groups, such as the Kumbhars, were forced off the land and relocated in more peripheral areas. These peripheral areas were often newly reclaimed swampland or dumping grounds which were not suitable for habitation. However, the goal during these periods was to simply open up more desirable land and relocate anyone affected. That this policy simply created other more destitute slums with residents further from available work, was ignored.

The 70's yielded a more productive policy. The Maharasthra Slum Areas Improvement, Clearance and Redevelopment Act of 1971 attempted to provide basic infrastructural improvements to slum areas. The government was empowered to give these amenities to slums; however, the slum-dwellers still were given no legal right to live there. Also, in practice, the focus remained on slum clearance, not improvement. If a slum was declared unfit for habitation, it was written in the law that it could be demolished. 1981

marked a seeming complete return to the razing policies of the 60's. Shacks of thousands of pavement dwellers in the Janata Colony were destroyed during the height of the monsoon. The individuals were bussed to the edge of the city and told to 'go back' to the places where they came from.

These inhumane policies did lead to a shift in slum policy. The worldwide view of the poor continued to shift during the 80's. This change of view allowed the poor to be seen as essential players in the well-being of cities. Slum upgrading became the focus of Maharasthran policy. This policy allowed slum-dwellers to upgrade their houses *in situ*, allowing for a height increase so lofts could be built into existing structures. The policy also improved areas with added amenities such as water, sewage and paved roads. Facilitating continued improvements, by residents as well as the city, allows the slum-dwellers to remain in proximity to their work. Instead of removing the inhabitants, separating them from their livelihoods, and creating a more destitute slum in another location, the process of upgrading slums allows residents to remain where they work and improve their living conditions.


Alma co-operative Housing

Redevelopment now lingers over Dharavi itself. The Dharavi Redevelopment Plan (DRP) instituted by Mukesh Mehta, a non-resident Indian, plans to change the entire face of Dharavi. This project initially required the consent of 70% of the residents of Dharavi, which was later downgraded to 60%. When the project failed to gather the necessary consent, the clause was dropped altogether.

A controversial plan, the DRP is touted by developers as a way to improve the livelihoods of thousands of slum dwellers while taking advantage of the lucratively sited slum land. Dharavi would be divided into 12 parcels, which would be given to private developers. These developers would be responsible for housing, in total, 57,000 families that now reside in Dharavi. Once these premises are met, the developers can create higher income housing and commercial properties.

The families who stand to receive housing represent but a small percentage of the residents of Dharavi. In order to be considered for housing, residents have to have proof of residency since 1995, in the form of an identification card which is expensive and often hard to come by. After qualifying for new housing, residents would be given 225

square foot flats in 7 storey buildings. For some families, this provides an improvement in area, but for others it is a marked decrease in space as well as access to work. The Kumbhars, for example, live in clusters of houses that surround a shared kiln. Not only does a 225 square foot apartment represent a downgrade of space, it also removes the community's single means of livelihood.

The plan benefits a number of residents, upgrading their standard of living and affording them secure tenure. However, it completely disregards the livelihoods of the residents. Many women earn income by making *papads*, or flatbread, which they lay out in the sun on their balconies and roofs. A seven storey building not only impedes this process by forcing the women to lug materials up and down stairs, but it also restricts the open exterior space available for creating the *papads*. In addition to these women, many other residents create loft workshops in their residents. This is often the sole location for a workshop available to the resident. In the DRP, these workshops, many residents of Dharavi's sole livelihood, are ignored. Dharavi is a dense village of people working to survive. If any redevelopment plan ignores this aspect of life in

Dharavi, it is sure to succeed only in creating a more impoverished vertical slum, or moving its hundreds of thousands of residents further out to the periphery.

THE 13TH COMPOUND: CO-OPERATIVE DEVELOPMENT OF AN INDUSTRIAL URBAN VILLAGE

PROPOSAL - Co-operative Development of an Industrial Urban Village

As a critique to the *tabula rasa* typology of slum redevelopment, which utilizes master planning to remove and rebuild slums, this proposal seeks instead to enact a system based on smaller, contextual interventions in the 13th Compound of the Dharavi slum. Focusing on the creation of trade based workers' co-operatives; this thesis intends to reinforce the 13th Compound and its symbiotic relationship to Mumbai.

The 13th Compound is home to a vibrant recycling industry which not only employs tens of thousands of Dharavi residents but also serves as a "green lung" to the city of Mumbai. With redevelopment plans looming, the future of this neighborhood, as well as the rest of Dharavi, remains in question.

The *tabula rasa* typology of slum redevelopment enacted by the state of Maharashtra and the city of Mumbai represents a flawed policy. This proposal seeks to involve aspects unincorporated in previous and future redevelopment attempts by focusing on the livelihoods of the individuals

involved. People live where they work. Without employment, especially in extremely poor communities, survival becomes difficult, if not impossible.

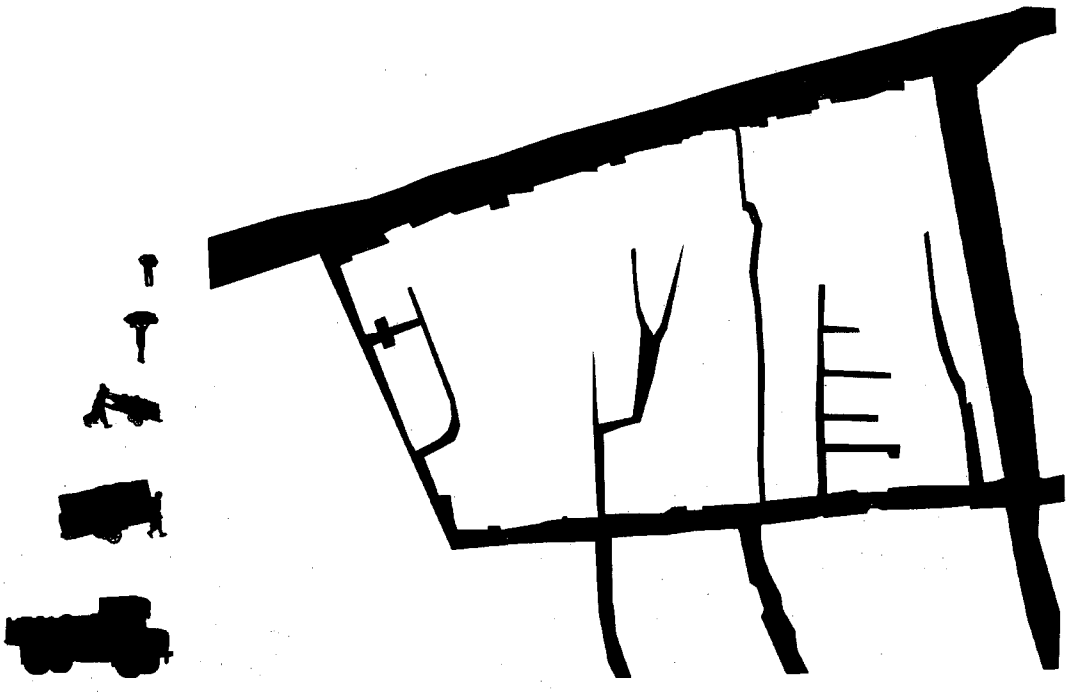
The informal developments which accrue into slums and shanty towns allow for an access to employment. They develop incrementally, as means become available. First a temporary structure of bamboo and cardboard which is washed away with each monsoon, a resident will develop his or her home into a concrete structure slowly, as funds and materials become available. This incremental form of development is suitable for those residing in slum situations, as it allows them to slowly improve their quality of life within their means.

While access to work and the ability to incrementally develop one's residence is a great benefit to slum-dwellers, the lack of basic infrastructure severely decreases quality of life. Little access to clean water, as well as lack of sewage, poses serious health risks for residents. The dearth of roads broad enough for cart and truck access also impedes industrial activity.

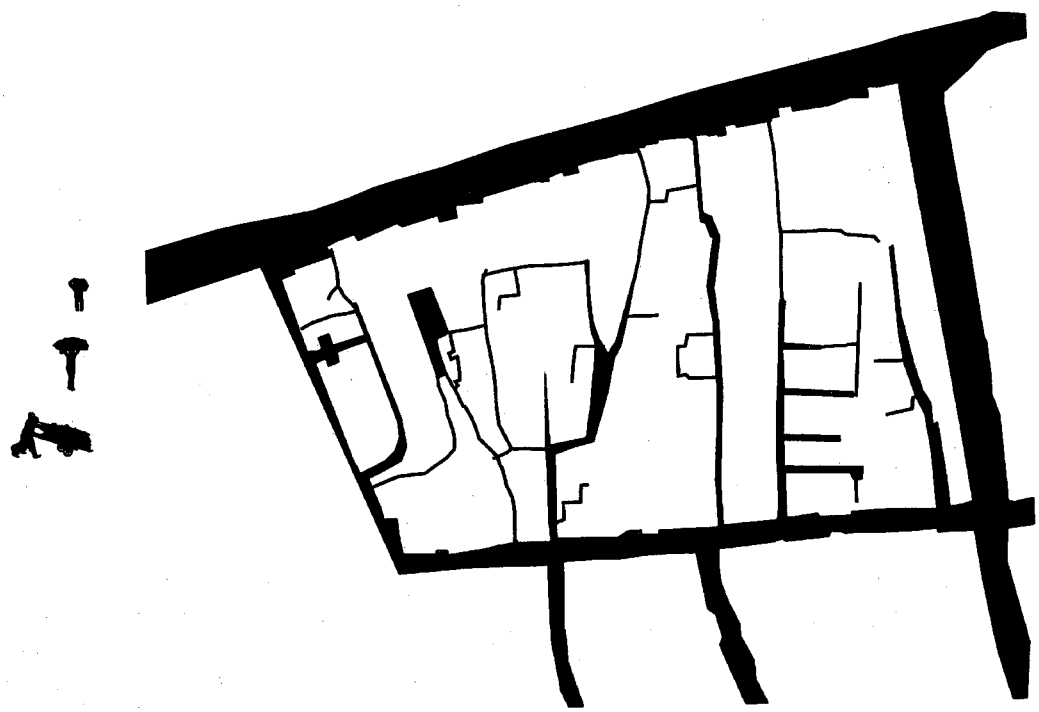
The 13th Compound is an extremely dense industrial neighborhood housing thousands of small industrial units.

Rail lines and major roadways allow for an ease of exterior access, but narrow alleyways plague interior traffic. Open space is rare, with open areas of more than 10 feet making up less than 5% of the total space. These open spaces include roads and throughways. Access by cart or truck is limited to 5 main thoroughfares, which slice the 13th Compound into 5 zones of activity. At a smaller scale, loads carried by humans, bikes and smaller carts have a much greater ease of communication through the labyrinth of sidewalks. A map of these smaller throughways reveals the permeability of the 13th Compound. These tight corridors, often in the form of ladders or sewage drains, provide access to the industrial units that fill this neighborhood.

open space



truck access

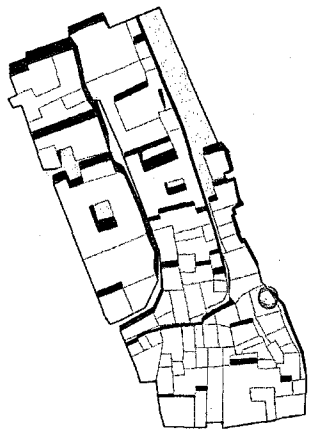


cart access

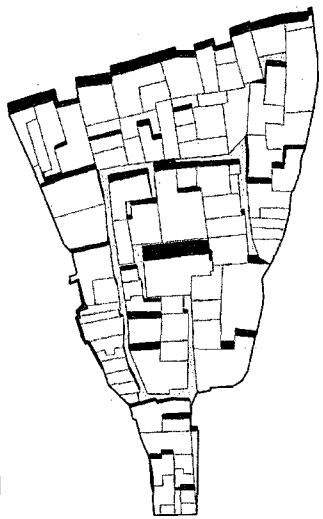
The 5 major throughways that split the 13th Compound also follow lines of industrial divide. While each node does not solely practice one industry, there are centralized industries which exist in each node. In order to follow a smaller scaled, contextual development, these 5 nodes were adopted as a spatial and industrial divide. Five major industries are represented spatially in these nodes: dye manufacturing, plastic recycling, goods recycling, tin recycling and paper recycling. The consolidation of industrial activity into specific nodes allows for a concentration of related activities and an ease of communication of services and materials. These nodes lay the foundation for the creation of trade-based workers' co-operatives, which will spatially and politically organize the workers involved.

The density of this urban fabric presents difficulties when attempting to integrate infrastructural improvements. The space is simply not available to improve roads, sewage, water and lack of fresh air and light. The extreme lack of open space also illustrates the complete lack of green space within the 13th Compound. All of these needs require a

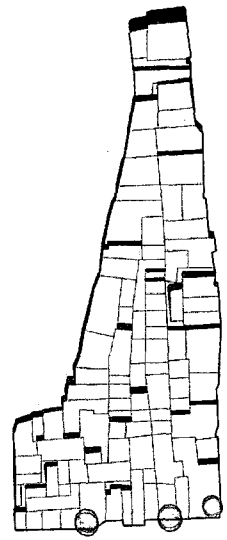
DYE MANUFACTURING



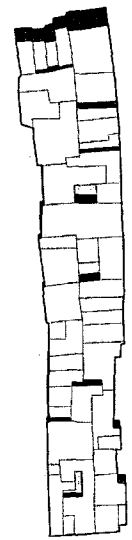
PLASTIC RECYCLING



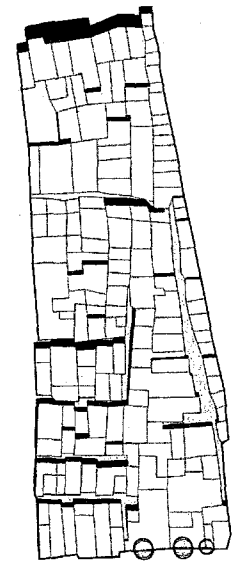
GOODS RECYCLING



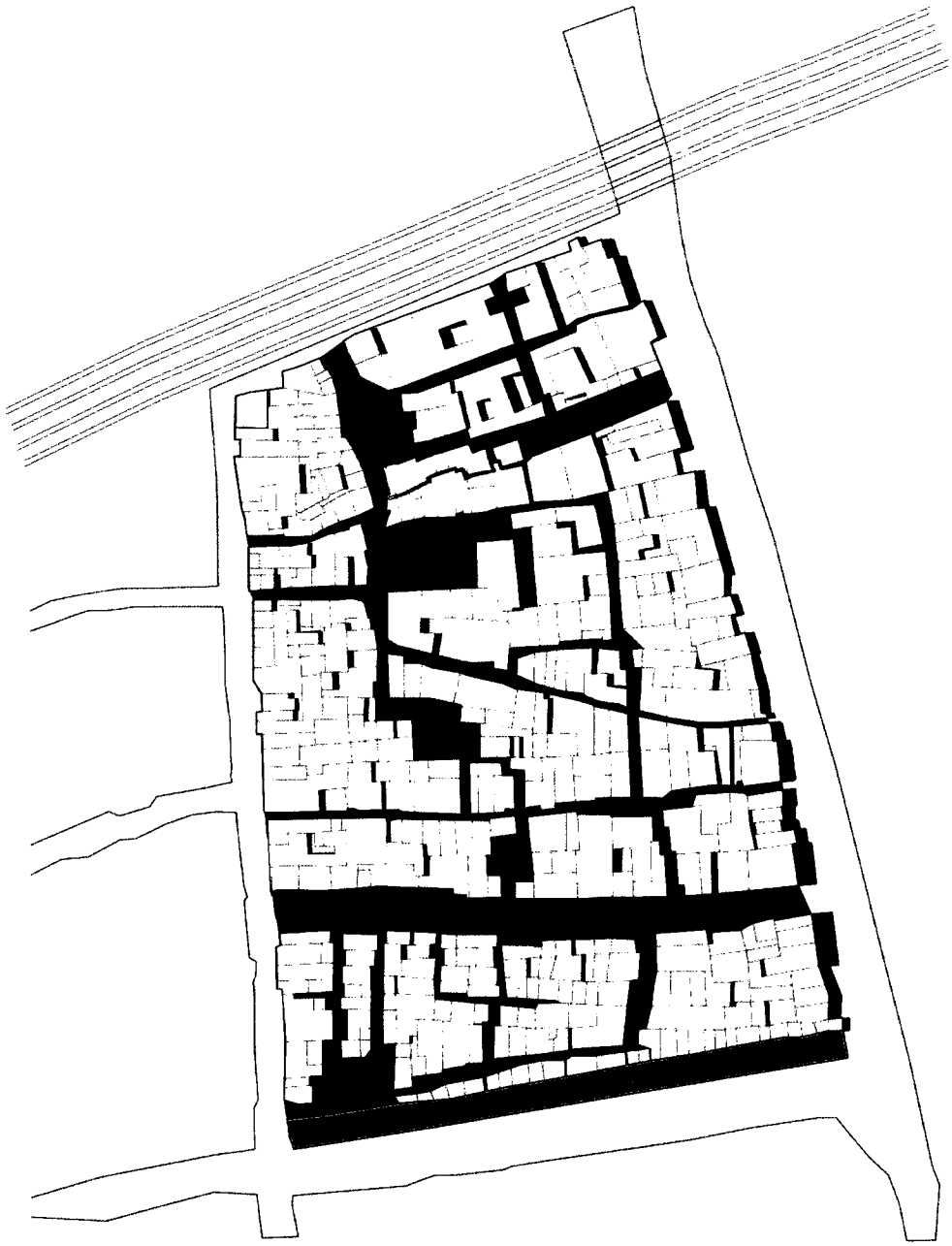
TIN RECYCLING



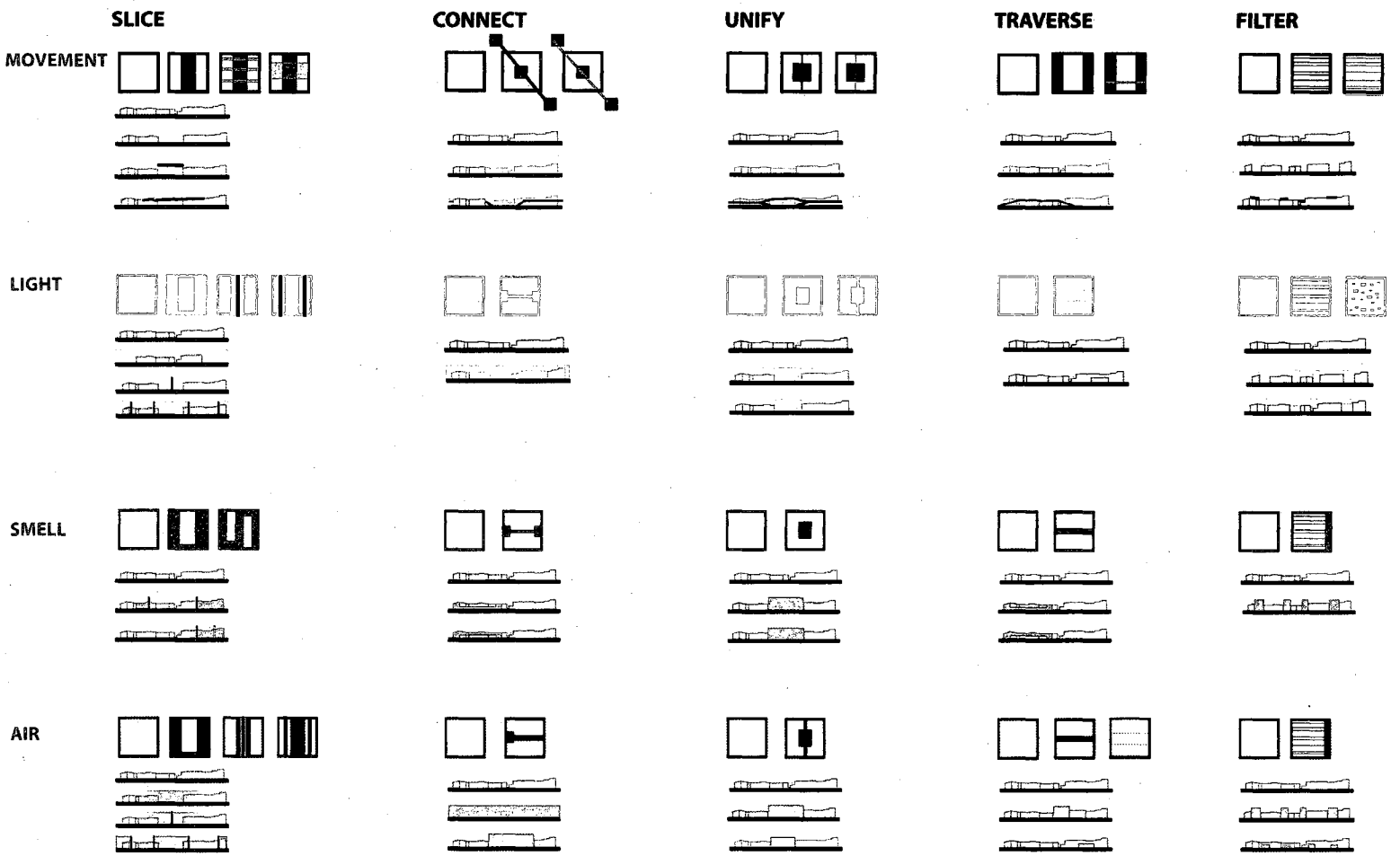
PAPER RECYCLING



certain amount of erasure in any improvement project. While mass erasure is not ideal, small scale erasures which drastically benefit the whole is justified. Once the necessary erasures have occurred, a process of addition can be initiated. These additions allow for the relocation of any industrial units or individuals who were displaced during the original erasure process. In addition, they will afford a realm open to future development, a densification which would not be possible in the current situation. The goal of the erasure and addition process is to improve access to industrial units, thus facilitating the industries, to improve access to water, ameliorate flooding, provide open green spaces and play spaces and increase air flow and natural lighting.

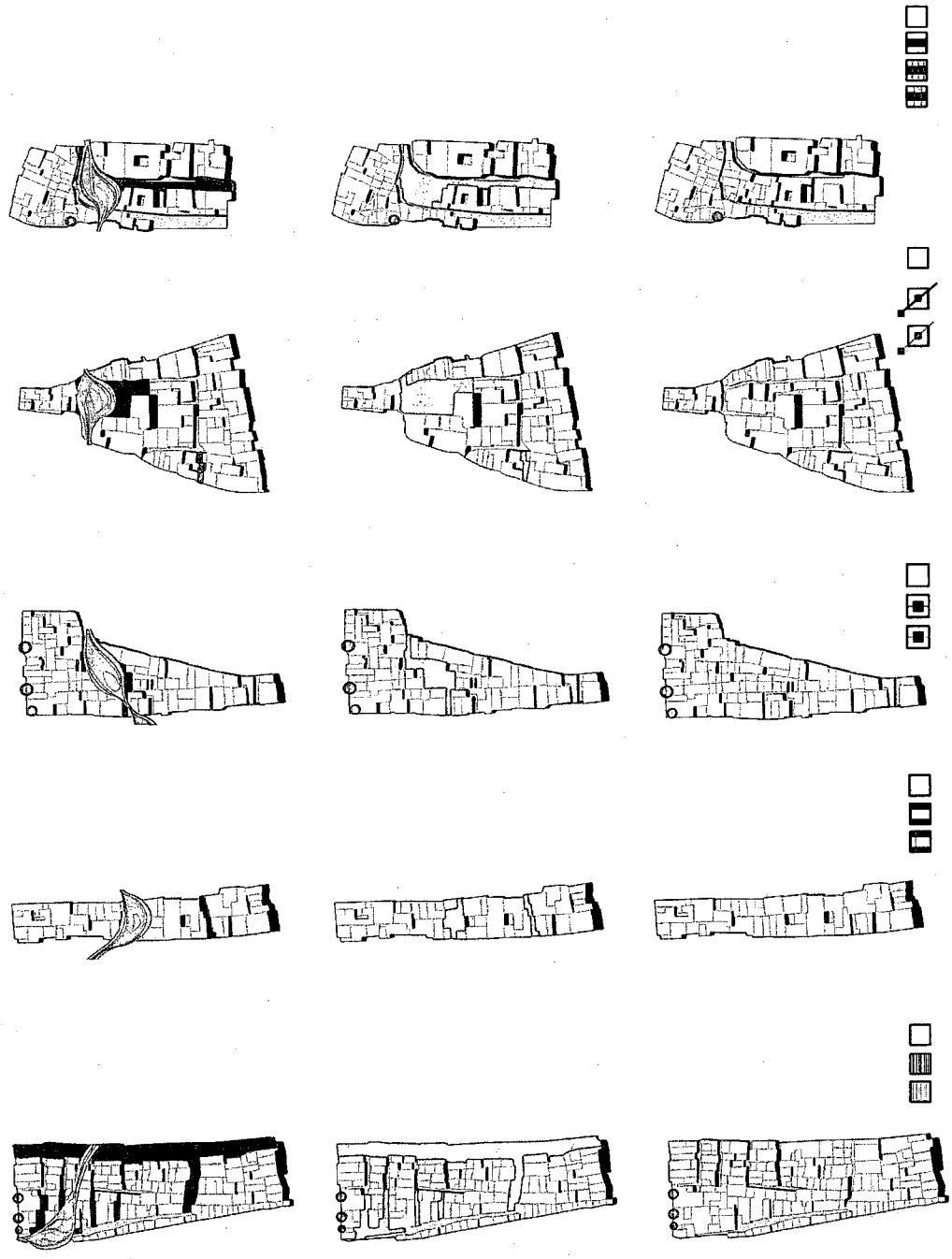


In each of the 5 blocks, a workers' co-operative will be installed which represents the trade centralized in that block. The programmatic elements of each workers' co-operative will be similar, with differentiations in size according to each trade's specific needs. The programmatic elements represent spaces which are extremely lacking or else non-existent currently in the neighborhood. Each co-operative will contain market space, offices, a communal kitchen, baths, sleep space for day wage laborers and open play/green space. Each of the program elements is impacted by a sensory element. For example, the market space is impacted by movement and the sleeping space is impacted by light. As a means of analyzing the elements related to the desired programs (movement, light, etc.), 5 modes of implementation are utilized: Slice, Connect, Unify, Traverse and Filter.


SLICE
CONNECT
UNIFY
TRAVERSE
FILTER
MOVEMENT
LIGHT
SMELL
AIR

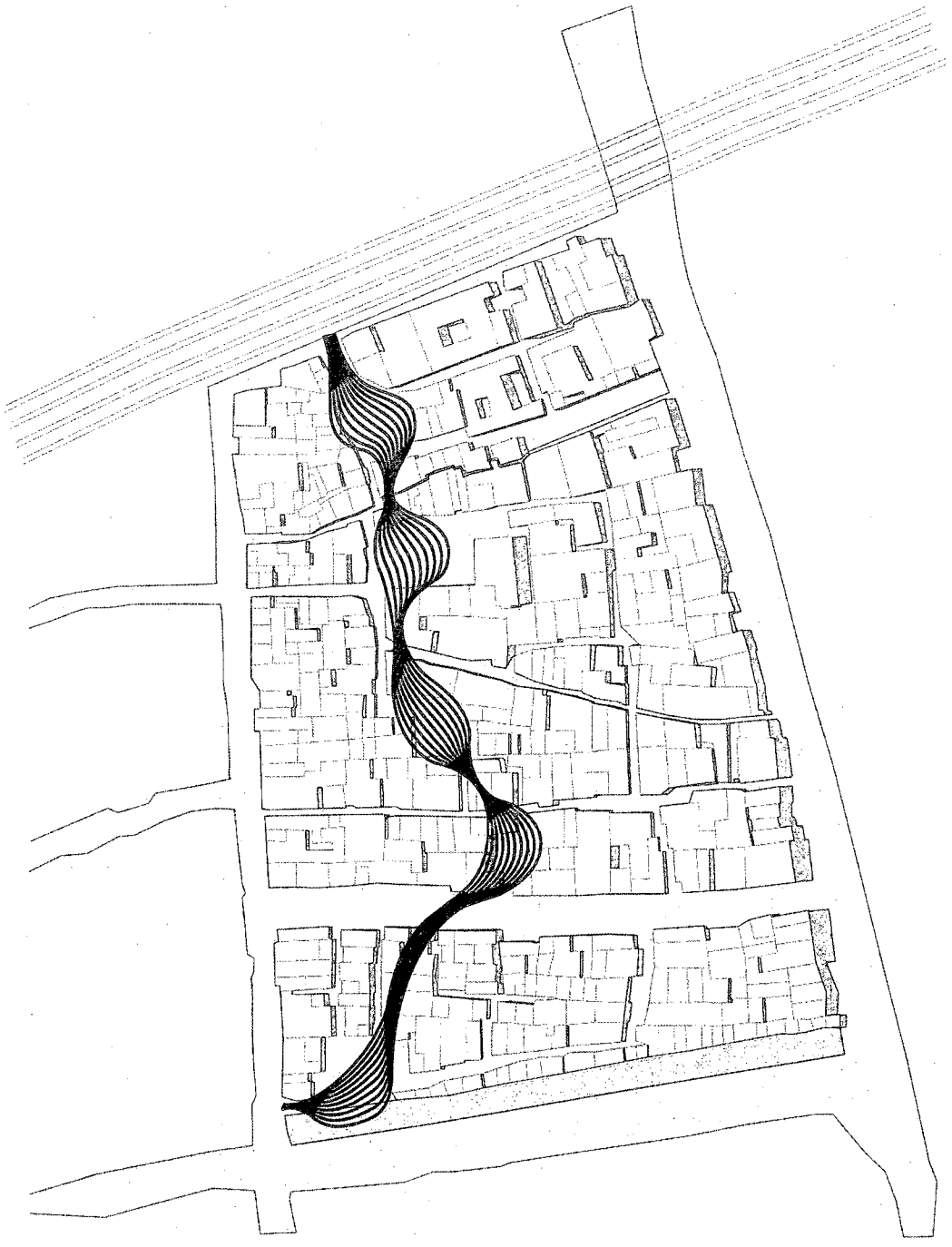
Each of the 5 nodes of the 13th Compound will undergo a unique process of erasure and addition utilizing the 5 modes of implementation. The 5 modes of implementation are based upon existing boundaries, throughways and typologies found within each of the 5 nodes. By utilizing 5 distinct modes of implementation, each node will maintain a unique individuality which will be furthered by the creation of workers' co-operatives. The node which manufactures dye will undergo a process of erasure and addition according to the Slice mode of implementation. The plastic recycling node will follow the mode of Connect. Goods recycling will implement the Unify mode. The Tin recycling node will utilize the Traverse mode. Finally, the node responsible for paper recycling will undergo the erasure and addition process through the mode of Filter.

While it is important to maintain the unique identities of each block of the 13th Compound in order to follow a process of contextual development, the need for interconnectivity of the neighborhood as a whole is also extremely important. By creating a connective tissue, which allows for a communication between blocks as well as across



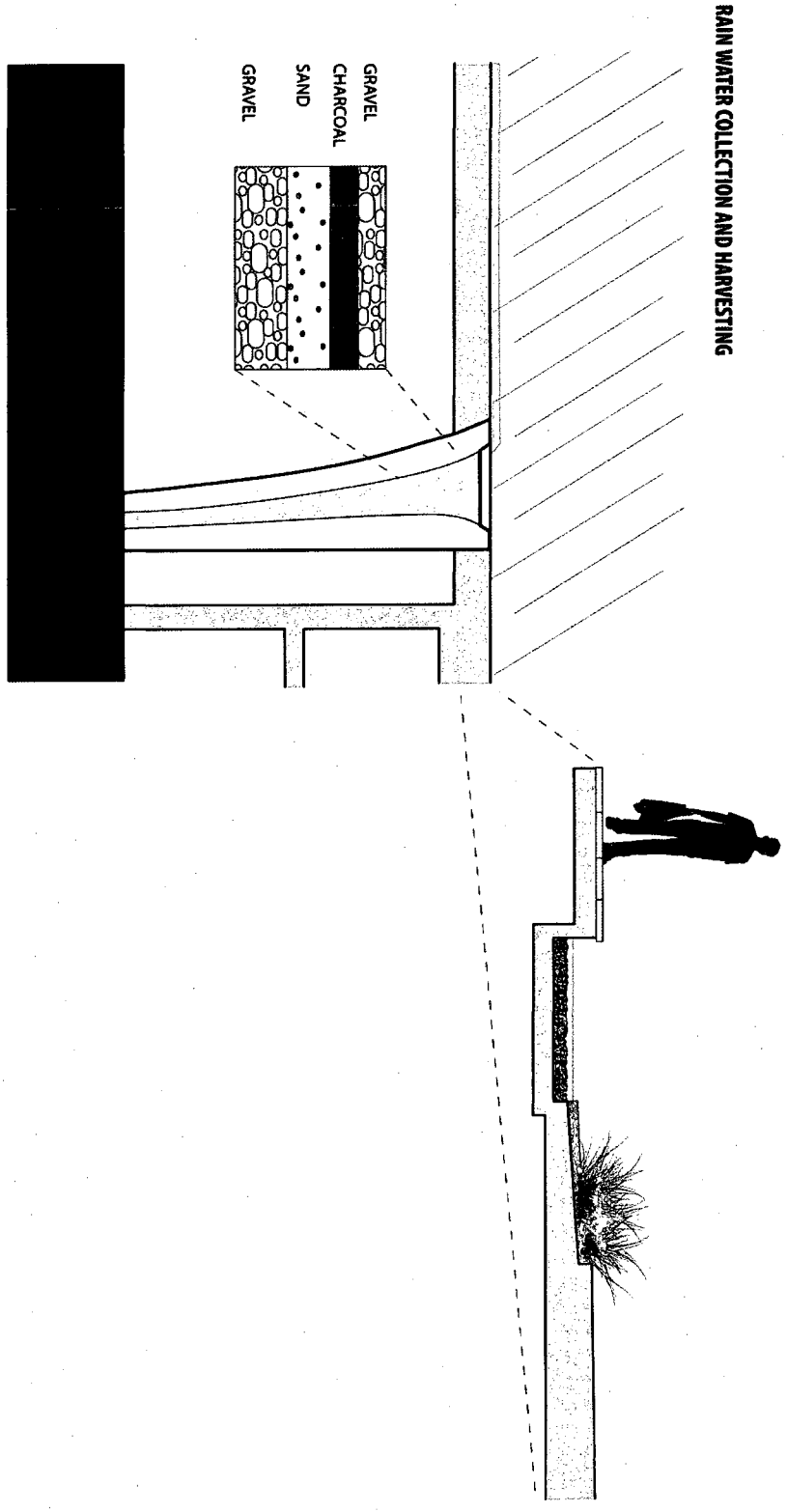
the neighborhood as a whole, industries and livelihoods are facilitated.

The process of erasure and addition follow according to the unique modes of implementation utilized in each block. However, the overall process of addition is a cohesive one that strives to connect the 5 blocks of the 13th Compound. The process of erasure itself allows for infrastructural improvements including, paved and enlarged roads, sewage and water access, open green space which can be utilized for play or for informal markets, and improved access to sunlight and air. The process of addition continues these infrastructural improvements through the creation of a duplicate ground plane. This duplicate ground plane will create a continuous surface above the original ground plane in each of the 5 blocks. Crossing the 13th Compound horizontally, it contracts and expands to form walkways and buildable space.



Each expanded node of the duplicate ground is imbedded with a workers' co-operative representative of the trade identity of that block. This co-operative functions to centralize the activities of each block, providing market space for each industry. In addition to providing much needed market spaces, each co-operative functions within the duplicate ground plane as a system for collection, filtration and re-distribution of rain water. Providing a centralized location for water collection and market space facilitates both residential and industrial activities.

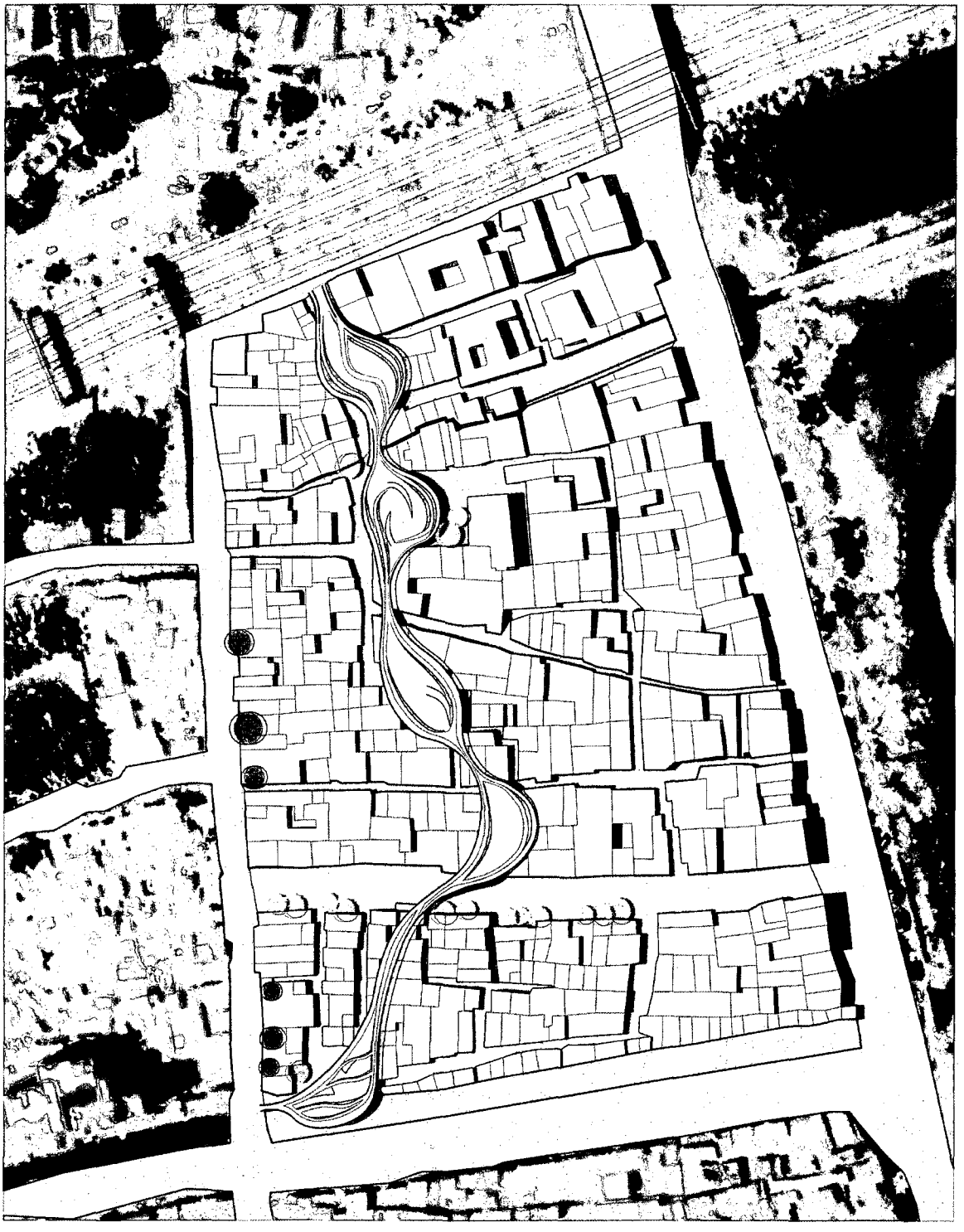
The duplicate ground plane contains several surface materials to direct human traffic, water flow, and facilitate water filtration. The severe lack of access to water, especially clean water, is one of the greatest issues within the 13th Compound. In this proposal, rain water travels through planted areas and drains towards filtration and re-distribution columns which are located in accord to the method of development appropriate for each block. These columns function as structural elements that support the duplicate ground plane as well as water storage and distribution points for the workers and residents of the neighborhood.

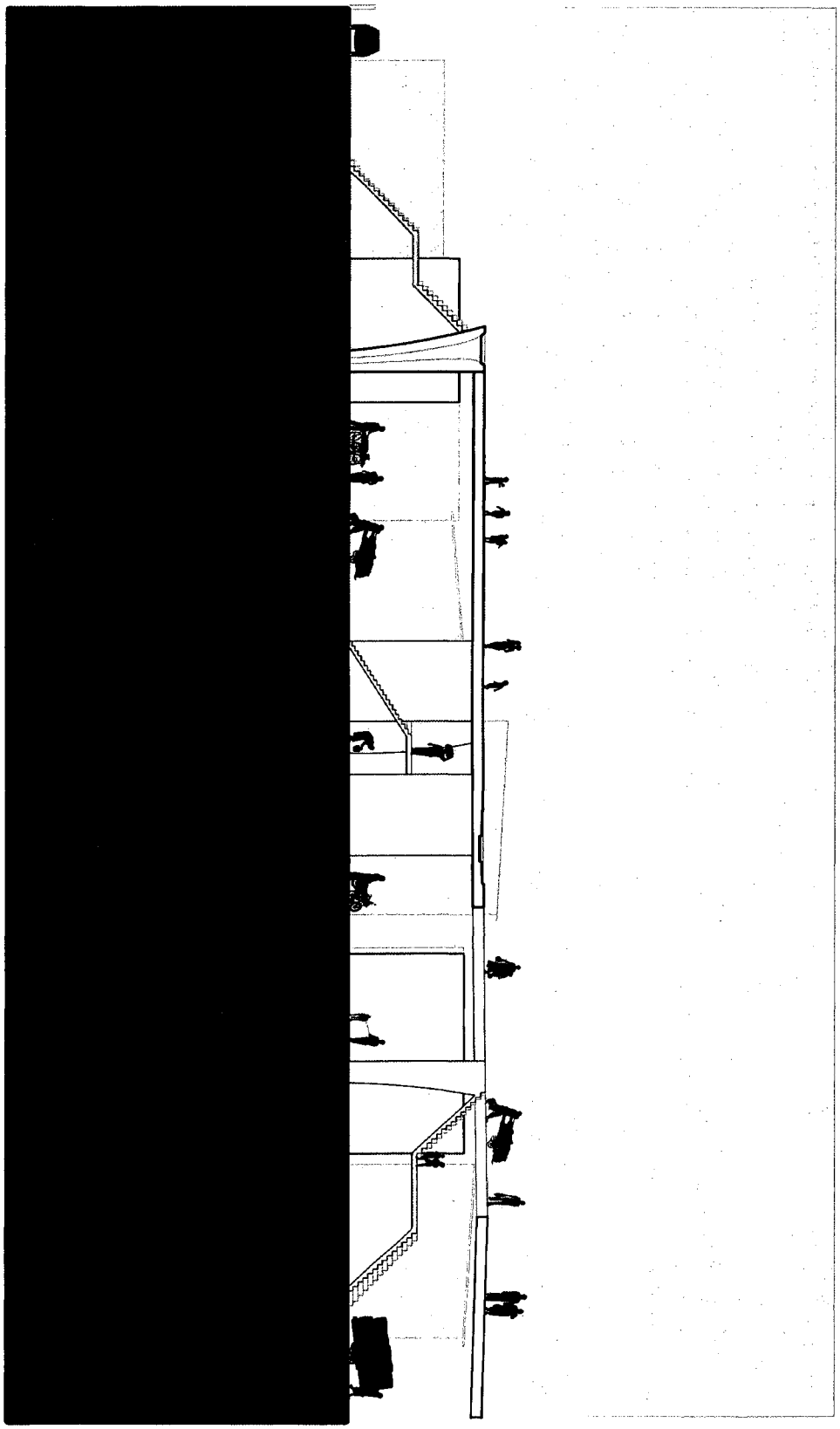

RAIN WATER COLLECTION AND HARVESTING
GRAVEL
CHARCOAL
SAND
GRAVEL

Where it reaches its greatest expanses, the duplicate ground plane also provides an open surface on which development can occur. While the initial process of erasure decreases the density within the 13th Compound, the following action of addition allows for a future re-densification. The open surface facilitates further development and can support a new layer of development. While this re-densification would limit certain initial improvements, such as the availability of open space, it would allow the individuals in the neighborhood to continue to develop residences and industrial units. The improved infrastructure would remain, but if future development was necessary or desired, the residents would be empowered to make those decisions.

The residents of Dharavi have long proven that they have the ability to develop and improve their own homes and businesses. The battles with legality and poor or non-existent infrastructure have been hurdles successfully surpassed by the almost 1 million inhabitants. The vibrancy and success, as well as the symbiotic nature, of the industries of the 13th Compound are a testament to these accomplishments. In order to support this growth and

development, infrastructural improvements are necessary. However, most slum redevelopment projects ignore the most important aspect of the slum, the livelihoods of its residents. This proposal seeks to supply access to improved infrastructure while facilitating the industrial activities which supply the livelihood for the residents of Dharavi.





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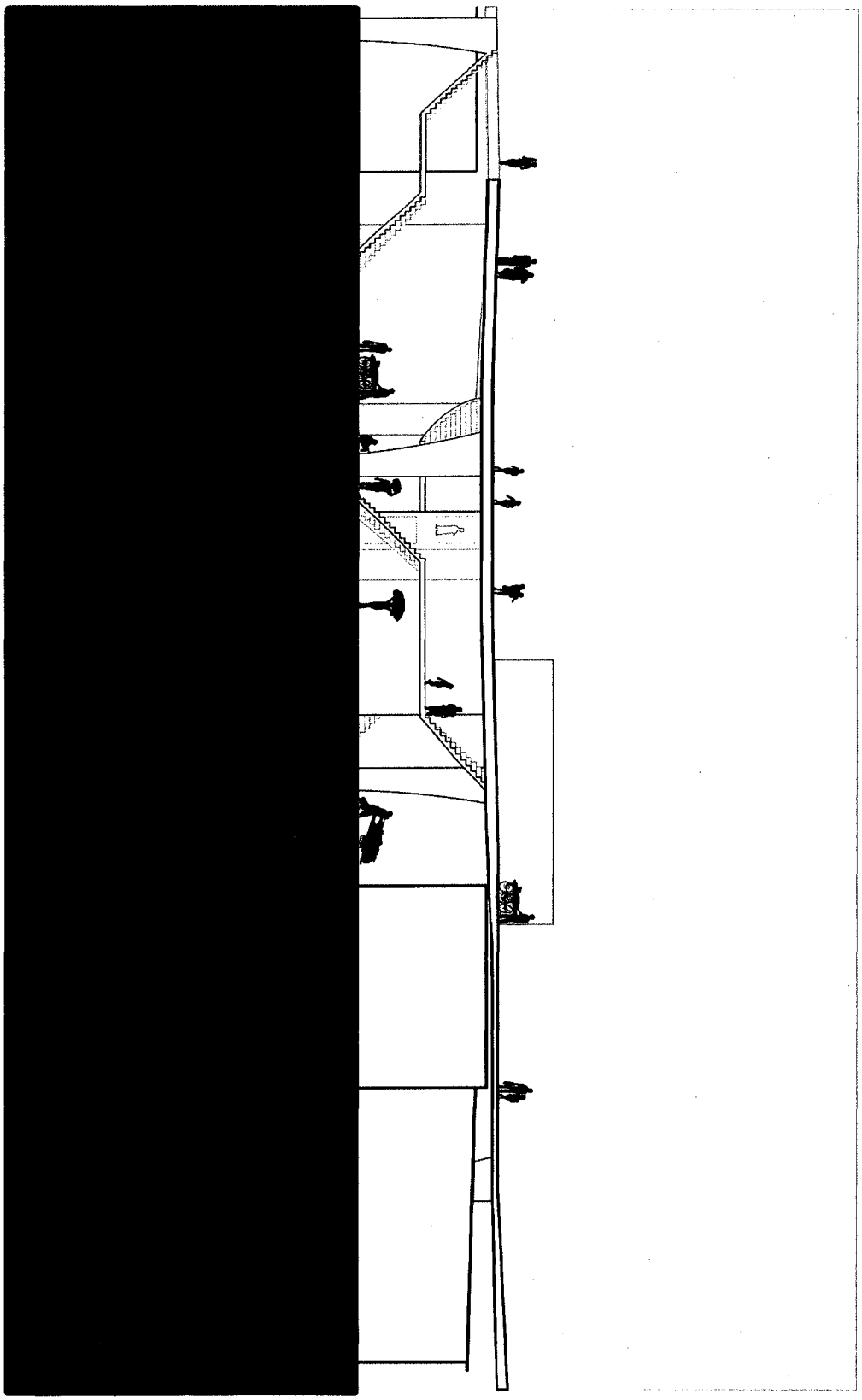
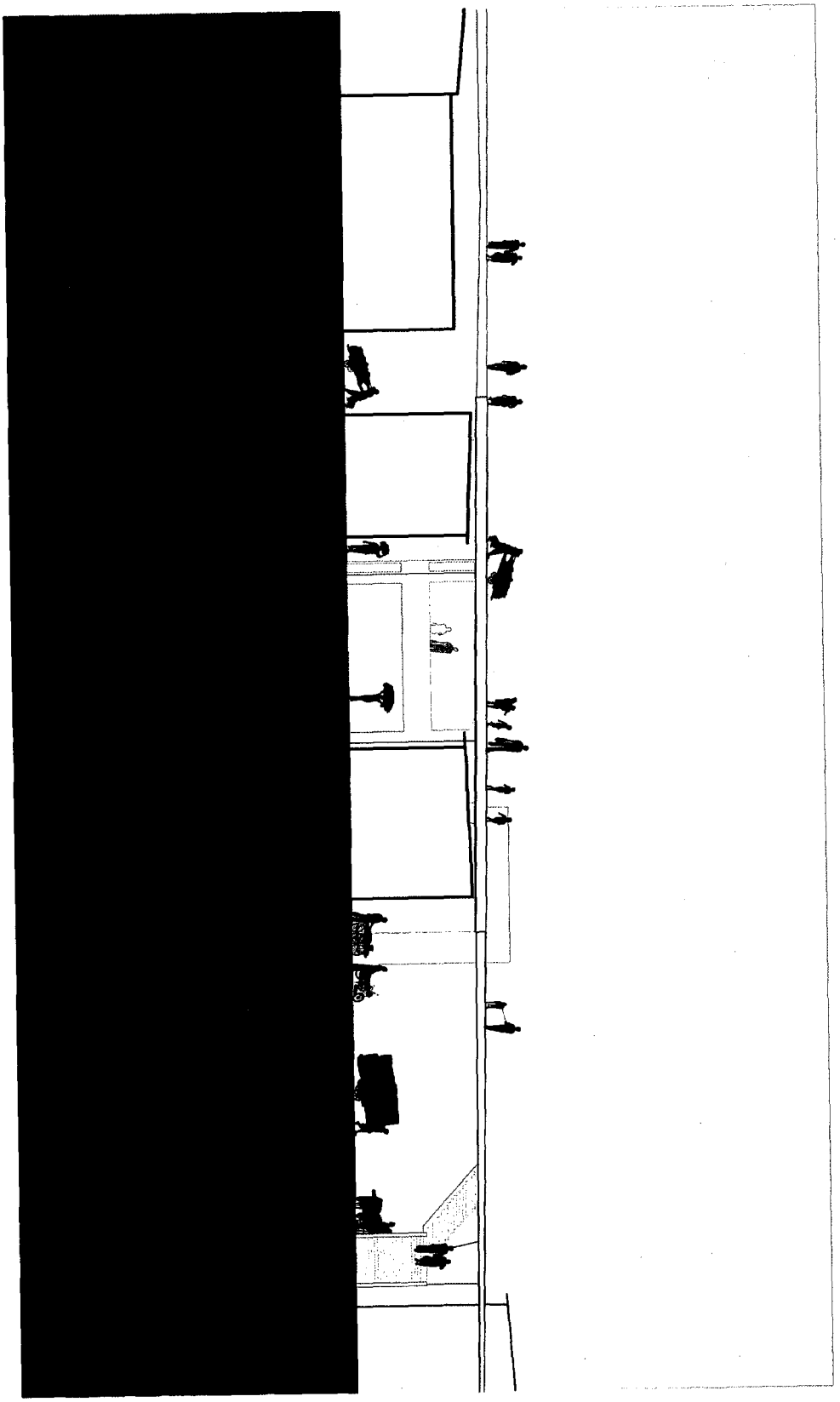
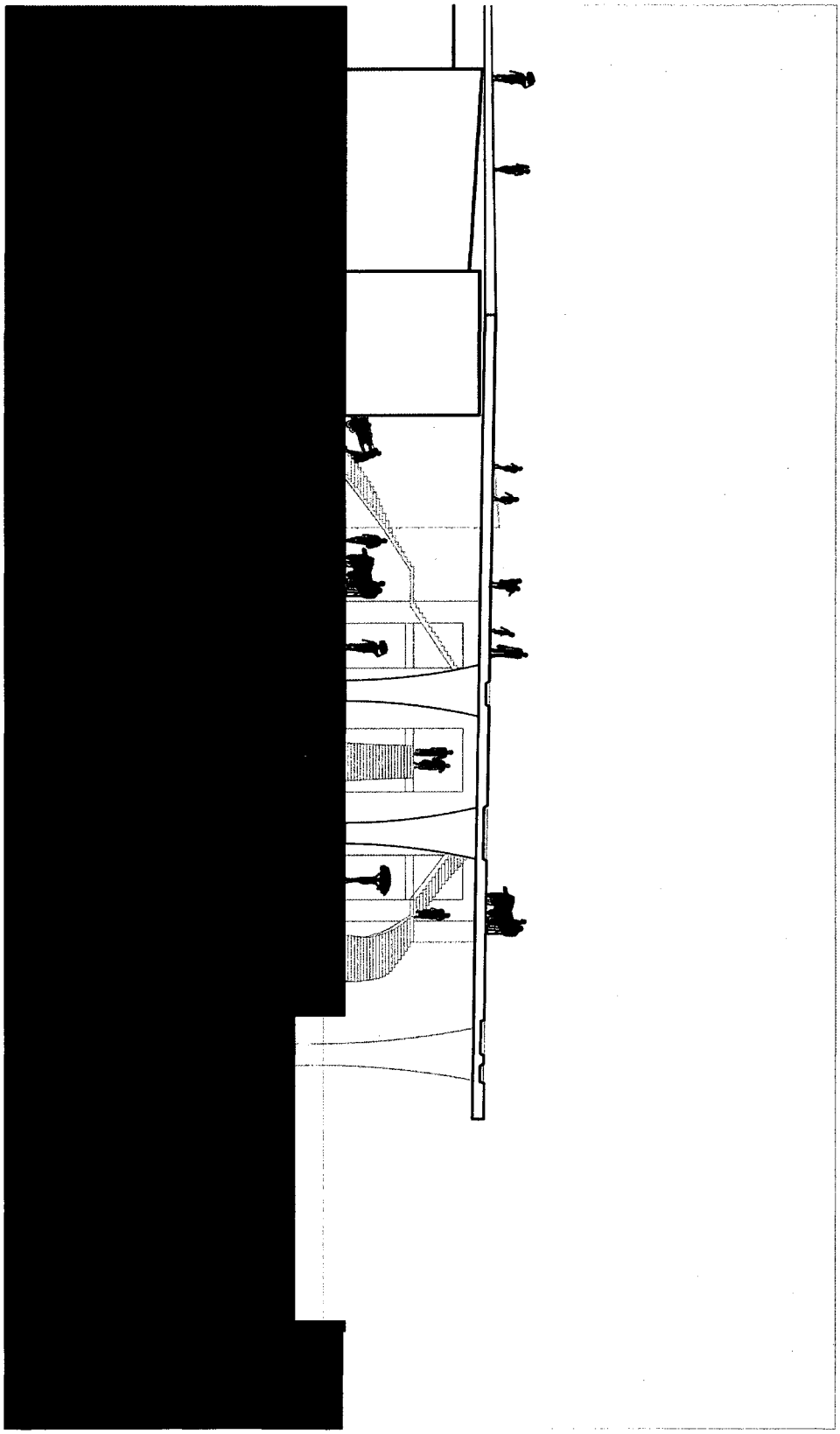


SECTION - CONNECT

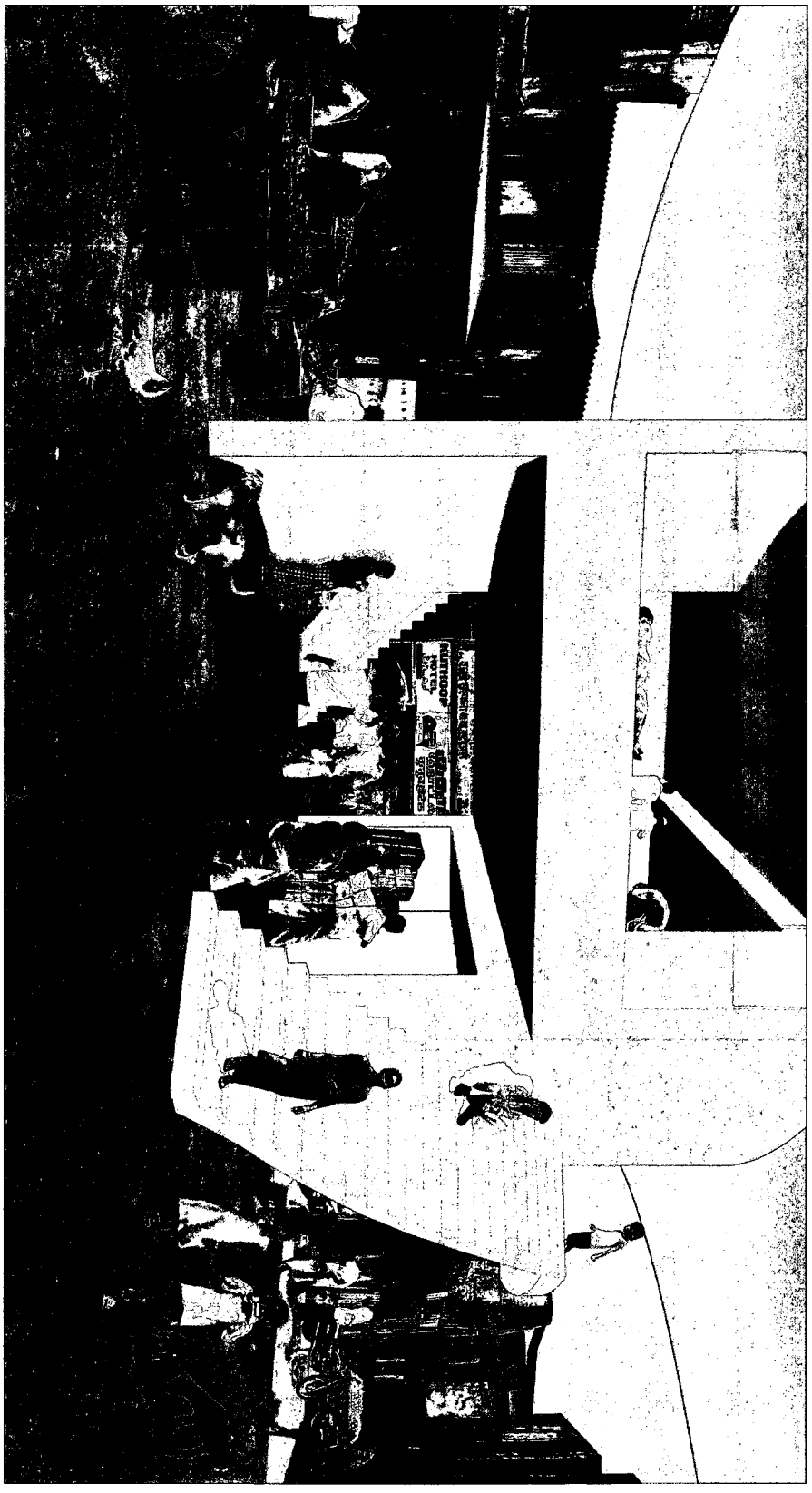
SECTION - UNIFY

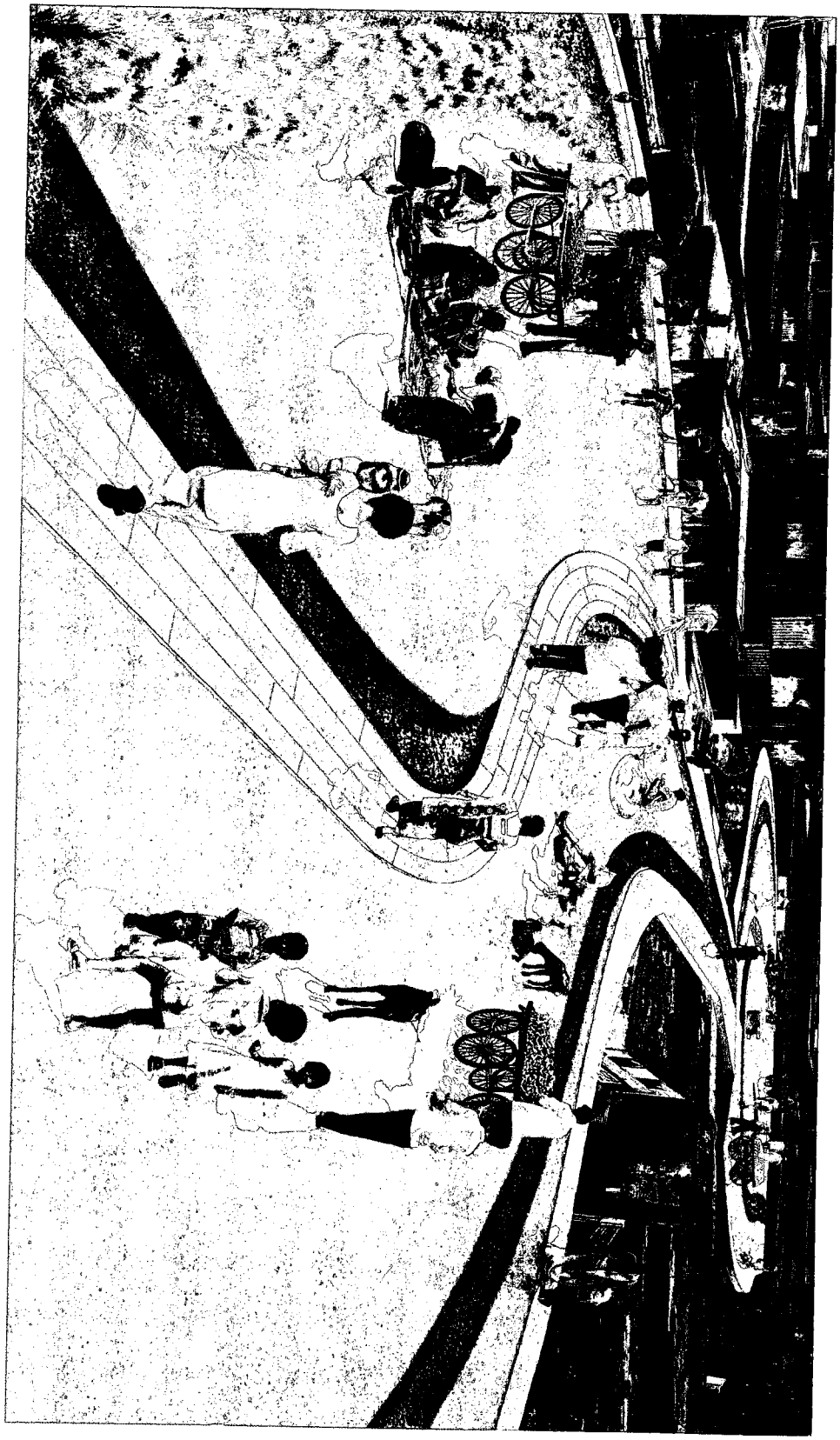


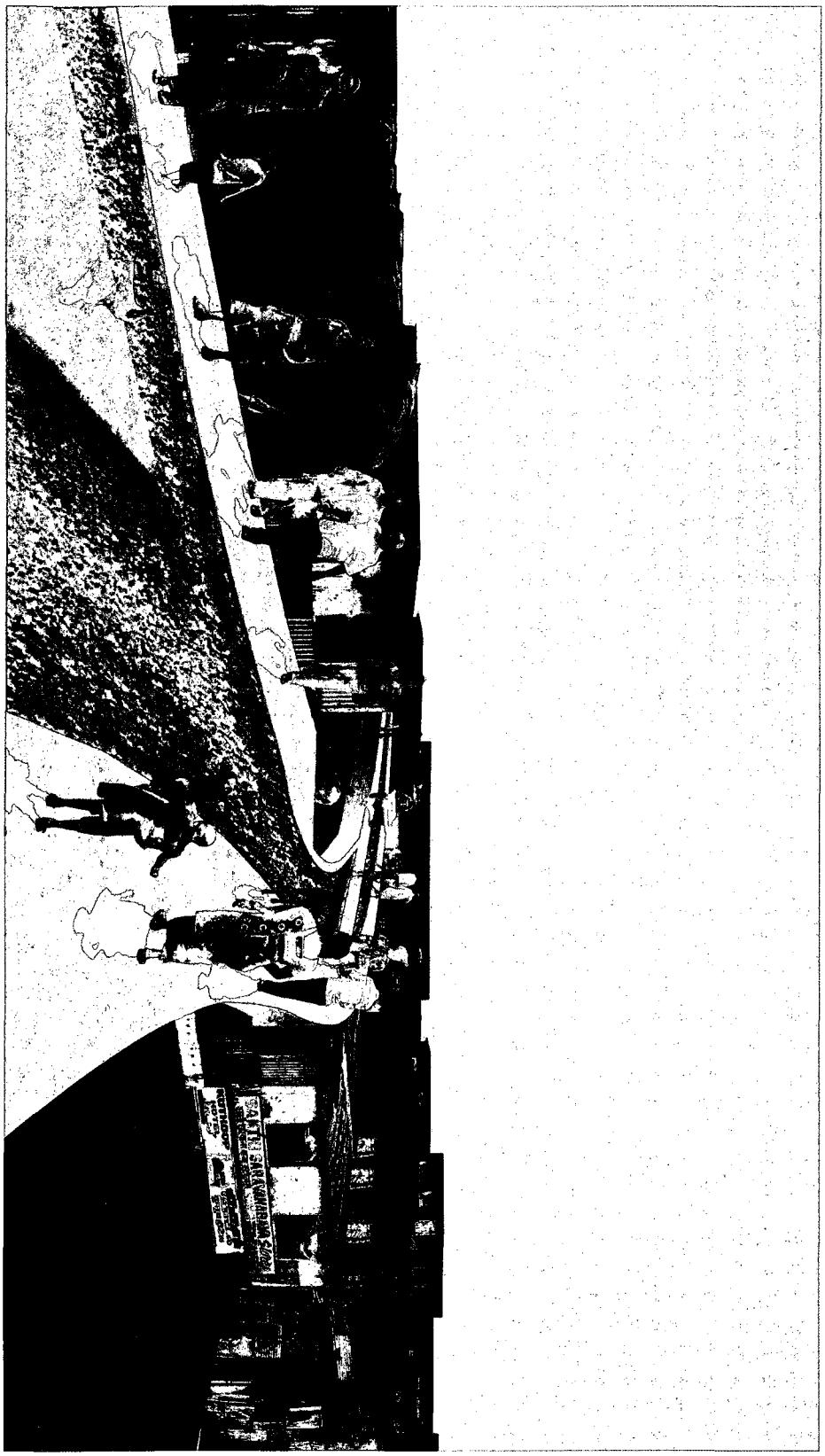
SECTION - TRAVERSE



SECTION - FILTER







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