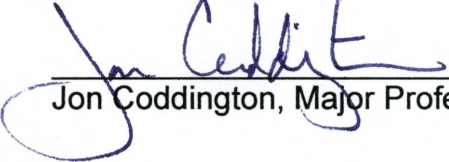


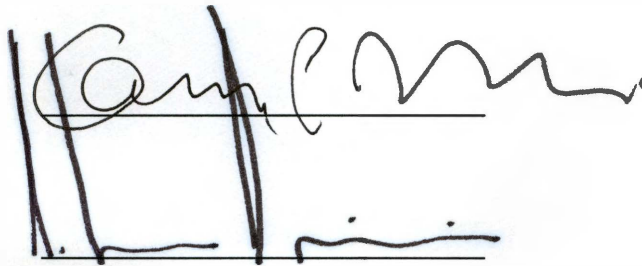
To the Graduate Council:

I am submitting herewith a thesis written by Claude Braxter Easterwood entitled "Infrastructure In-between: Reprogramming Urban Infrastructure." I have examined the final paper copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Architecture, with a major in Architecture.



Jon Coddington, Major Professor

We have read this thesis
and recommend its acceptance:



Accepted for the Council:



Vice Provost
and Dean of Graduate Studies

Thesis
2002
.E377



**INFRASTRUCTURE IN-BETWEEN:
Reprogramming Urban Infrastructure**

**A Thesis
Presented for the
Master of Architecture
Degree
The University of Tennessee, Knoxville**

**Claude Braxter Easterwood
August 2002**

DEDICATION:

This thesis is dedicated to Elizabeth Easterwood, who has endured hardship and frustration over my course of study, all the while offering encouragement and remaining inspirational.

ACKNOWLEDGMENTS:

Thank you to all of the professors that have helped me over the course of the last three years. Each studio professor has been effective in their own way, in exposing design as a process, experience as a product. Each brought individual design values, strategies and representation techniques to the studio. Thanks to these formative models cannot be overstated.

Also, I appreciate the stimulation, support and friendship of those who have endured through the process concurrently. The studio can be a place where ideas are tested, evaluated, criticized, rethought; and, I value the skills and opinions of my peers. The social comradery that developed has helped to value people, their work and, our time together. Each will be missed greatly in the coming years.

Finally, thank you to my family, for their continual support and encouragement. Without their help and commitment, the process would never have begun or become a success.

ABSTRACT:

This thesis proposes that highways and other infrastructure be looked at in a different manner. Though typically divisive in the urban context, it doesn't have to be so. Just as transportation systems connect across the country, so it can connect at a local level. The proposition is not anti-thetical place or community, but neither is it subjected and held hostage to them. It is both rooted and free, reflecting American culture itself.

The site is located under and adjacent to a short section of Interstate 40 in Knoxville, Tennessee, home of what has been the largest socio-infrastructure effort in the country's history, and 40 miles from Oak Ridge, where development of the Atomic bomb changed the perception, scale, and impact of our common arsenal.

The site also adjoins very real and valuable communities. The eclectic residential neighborhood of 4th & Gill borders to the north, and the entertainment and retail district known as the Old City to the south. Between the two districts the landscape is deteriorated, though some valuable manufacturing defines the zone, and provides some larger scale massing in an otherwise lower scale of context. Each community that occupies or engages the ground-plane of the site is local and particular to the history of the city of Knoxville.

Another, very different community uses the site in a very different way, and a different elevation. That is, the linear community of the highway. The infrastructure here has acted to the detriment of the city and those who pass through it. Recognizing the current, changed nature of the site requires that the modern place of the highway be recognized, designed for, and integrated. Essentially, the intent is not only to reconnect severed districts, but also connect them to the element that disconnects them.

The goal is to integrate the exclusive communities by providing for common

programmatic needs. The primary program is providing the city and Interstate with an intermodal transportation center; though, additional programs are integrated to engage both the visitor and resident.

Everyday needs of people who live the various lifestyles are surprisingly similar. Each need markets, restaurants, laundries, Post offices, places for recreation and exercise, etc. That given, there are other needs that are addressed in particular ways. Travelers are provided with places for rest and relief that are typical of travel centers. City residents are accommodated with event spaces, a learning center, clinic, etcetera. Though these programs are understood to be directive, they remain non-exclusive and would certainly allow for situations of contact and engagement across boundaries that are currently impassable.

Transforming boundaries into thresholds is the architectural and social directive explored here. It is achieved through simple observation, realization of overlapping opportunities and needs, and a design that recognizes scale, connectivity, identity, and experience.

<u>TABLE OF CONTENTS:</u>	<u>Page Number</u>
1 Thesis statement	1
2 Proposal for thesis	2
3 Architectural issue analysis	7
Materiality	7
Spatial definition	8
Vocabulary	10
4 Site location and analysis	13
Character	13
Selection and description	15
Site data	21
5 Program and vehicle	23
Program data	27
6 Precedent analysis	29
Interdisciplinary influence	29
Programmatic influence	32
Architectural influence	34
7 Design and resolution	43
8 Presentation of project	48
Bibliography	63
Vita	70

LIST OF FIGURES:	Page Number
2.1 Site photo: field condition	2
2.2 Site photo: I-40 condition	2
2.3 Site photo: Infrastructure 1	3
2.4 Site photo: Infrastructure 2	3
2.5 Central Park, New York City	4
2.6 Section of Appalachian Trail	4
3.1 Analysis drawing: Coordination / Integration	7
3.2 Site diagram: Boundaries	9
3.3 Site diagram: Thresholds	10
3.4 Site drawing: Parallax	11
3.5 Site drawing: Integration	11
3.6 Site drawing: Infrastructure	12
3.7 Site drawing: Context	12
4.1 Figure / Ground drawing (1896)	13
4.2 Figure / Ground drawing (1952)	13
4.3 Figure / Ground drawing (2001)	14
4.4 Figure / Ground drawing (2001), highway removed	14
4.5 Site data	22
4.6 Aerial photo of site	22
5.1 Program analysis collage 1	23
5.2 Program analysis collage 2	23
5.3 Program analysis collage 3	24
5.4 Program analysis collage 4	24
5.5 Temporal programming	25
6.1 <i>New Babylon</i> : Drawing	30
6.2 Vermont/Santa Monica Station	32
6.3 El Monte Station	32
6.4 Charlotte Transportation Center	33
6.5 Giant Travel Center	33
6.6 <i>West coast highway: The Steel Cloud</i>	34
6.7 <i>Screens for a Walkway</i>	35
6.8 Arnhem Station	36
6.9 <i>View from the Roof</i>	37

Figure	Page Number
6.10 <i>Highway Patrol</i>	38
6.11 Carrasco Square	39
6.12 Vall d'Hebron Park	40
6.13 <i>Return to the Fold</i>	41
6.14 <i>Water Tower</i>	42
7.1 Parti model 1	43
7.2 Parti model 2	43
7.3 Parti model 3	44
7.4 Parti model 4	44
7.5 Market systems axonometric	45
8.1 Site plan	48
8.2 Systems axonometric	49
8.3 Ground floor plan	50
8.4 Second level floor plan	51
8.5 Perspectives 1-2	52
8.6 Perspectives 3-4	53
8.7 Perspectives 5-6	54
8.8 Perspective montage	55
8.9 Isometric diagrams	55
8.10 Model photo	56
8.11 Axonometric	57
8.12 Partial section / elevation	57
8.13 Frontal axon / section	59
8.14 Sections	61

1. THESIS STATEMENT:

Modern physical infrastructure, such as highways, rail systems, etc. often act contrary to their role as elements of connection in the public realm. Yet, as the manifestation of public service, infrastructure supports and defines cities. It also has the ability to establish a sense of place; its important symbolic role can be found in history as monumental walls, gates, dams, bridges and parks. By integrating multiple uses and providing well designed, vibrant public spaces, infrastructure can help reconnect fragments in the city, build a high quality of life, support businesses and consolidate growth in the heterotopian spaces of our centers. The charge here, is to explore a situation in urban design and architecture where heterotopian space is created by infrastructure; and, to claim it with through proposal of an architectural project that synthesizes or blurs boundaries, connects local and interstate communities, and engages the visitor as well as the inhabitant.

*Movement is what connects
everything to everything else.*

Albert Einstein



Fig. 2.1 Site photo . Field condition
Source: Author



Fig. 2.2 Site photo. I-40 condition
Source: Author

2. PROPOSAL FOR THESIS:

This thesis explores the broad notions of connection, community, and threshold on a number of social and architectural levels. Boundary and threshold are most often presented as dialectical notions. The understanding of physical, visual and structural limitation as constrained by boundaries is often opposed to the interstitial, connective, revelatory threshold. At a formal level the two are obviously interdependent, if not tautological. Certainly, a physical threshold marks an opening, or crossing of physical boundaries; but, this is an investigation into spatial boundaries in the urban environment resulting from development of infrastructure.

Nearly all modern American infrastructure systems such as highways, rail systems, waterways , etc. act contrary to their role in the public realm. (Figs. 2.1 -2.4) They acquire a strategic and political importance as buffers and boundaries, severing cities and communities, and preventing people from interacting. The narrow focus of program in existing infrastructure has created visible barriers between cultural and economic groups, segregating urban dwellers. These places, and those adjacent, are most often treated as residual; and, their fragmentary nature makes it difficult to stitch things together. The concern here is not how infrastructure

the protocol of infrastructure design produces ugliness; but, that it is poorly programmed.

The next generation of infrastructure should not extend outwards, creating a third or fourth ring that transit around the city, but should refocus inward on systems already constructed. This is a topic that has been given more consideration in discussion of ethics and site. As a rule, infrastructure systems should strive to improve the sense of connection between our citizens living in introverted neighborhoods and the larger community to make a public landscape.

This notion of place, or *making public landscape* through infrastructure is highly complex in itself. These urban spaces and elements of the public realm do not fall under the immediate dominance of any subgroup, though they are continually occupied by an incredible variety of groups. Oddly, many don't even realize their occupation of the site, as its empty character renders it invisible.

Sites of this nature are generally located in areas that form borders between different communities, rather than within any particular one. Space emerges as the unprogrammed, left-over by-product of the design of major networks. Yet as a spatial quality heterotopias allow the general public to enter and reside on a uniquely equal basis. It is a quality of space that allows for "diversity and unity,



Fig. 2.3 Site photo . Infrastructure 1
Source: Author



Fig. 2.4 Site photo. Infrastructure 2
Source: Author

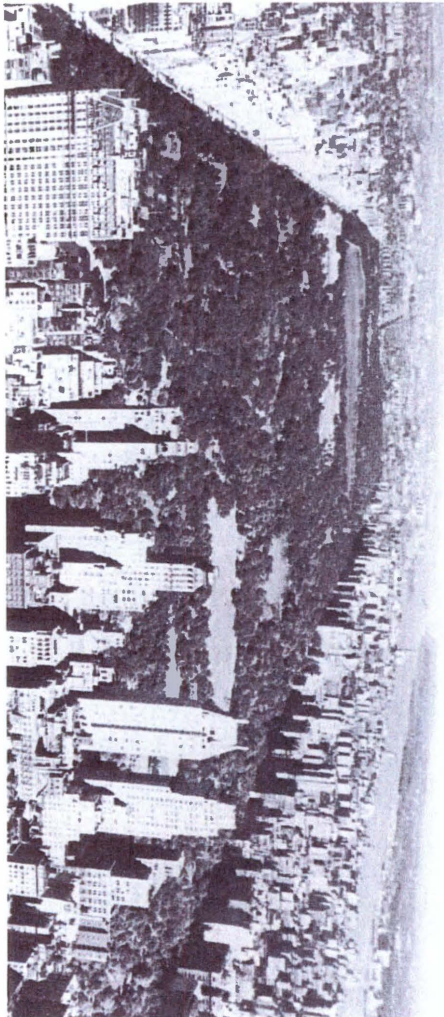


Fig. 2.5 Central Park NY
Source: Jellicoe

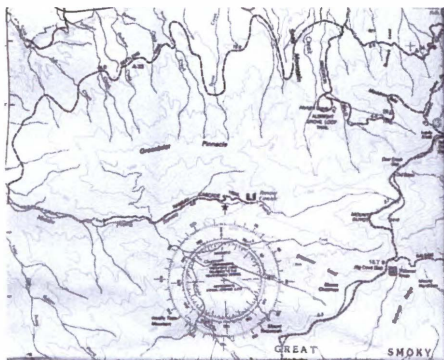


Fig. 2.6 Section of Appalachian Tr.
Source: Trails Illustrated

Intimacy and distance, and to allow groups to mix but not necessarily combine.” (Khalaf 60) On one hand they are a separator or buffer between districts, though at the same time they offer the potential of meeting places. They provide the opportunity to be used and abused, or claimed and appreciated equally, as all have access.

This should not imply that a purely public space ought to be generic as a result. William Morrish argued in *Putting the Place Back in Infrastructure* that, as an armature of culture, “infrastructure takes on three functions: to provide a repository for collective memory, to establish an orientation and pathfinding framework and to provide a curriculum of civic instruction on how to use and value this investment.” (Morrish 51)

When New York City built Central Park with its reservoir and new city streets in the 1860’s it sent a message to the public about reclaiming an abandoned dumping ground on the edge of the dense and grimy city would provide a sounder marketplace and improved quality of life for its citizens. (Fig. 2.5) A similar idea was the catalyst for Benton MacKaye’s original vision for the Appalachian trail (1921) as a public utility and reservoir of natural resources organizing transportation networks, locating industries and communities. (Fig. 2.6) It was to be “an infrastructure along which

which compact communities and industries would crystallize . . . to replace the suburbs.” (Easterling, *Organization Space* 32) In all, these and other proposals serve as models for designing infrastructure to contribute to urban development and identity opposed to the present system, a relatively undifferentiated arrangement of simple traffic corridors and interchanges. What we have, according to Keller Easterling, is a “frozen infrastructure . . . A dumb network of dumb switches.” (Easterling, *Organization Space* 31)

To build infrastructure that participates deeply in the imaginative life of its community requires a fundamental shift in our attitude toward landscape and its built environment. In *Discovering the Vernacular Landscape*, J.B. Jackson argues that “the most magnificent of city complexes recognized the need to integrate infrastructure, or civil engineering with landscape, or architecture.” (Jackson 48)

If the task at hand is the development of a transportation hub/travel center/community center, then it is this thesis' position that the expression of place should not exclude any participant, citizen or visitor. In fact, transitory and local layering add new dimensions to the design, and new opportunities for situations and connections. Drivers and riders get a glimpse of how the city is organized, what it symbolizes, how people



Site photo . To south
Source: Author



Site photo. To north
Source: Author

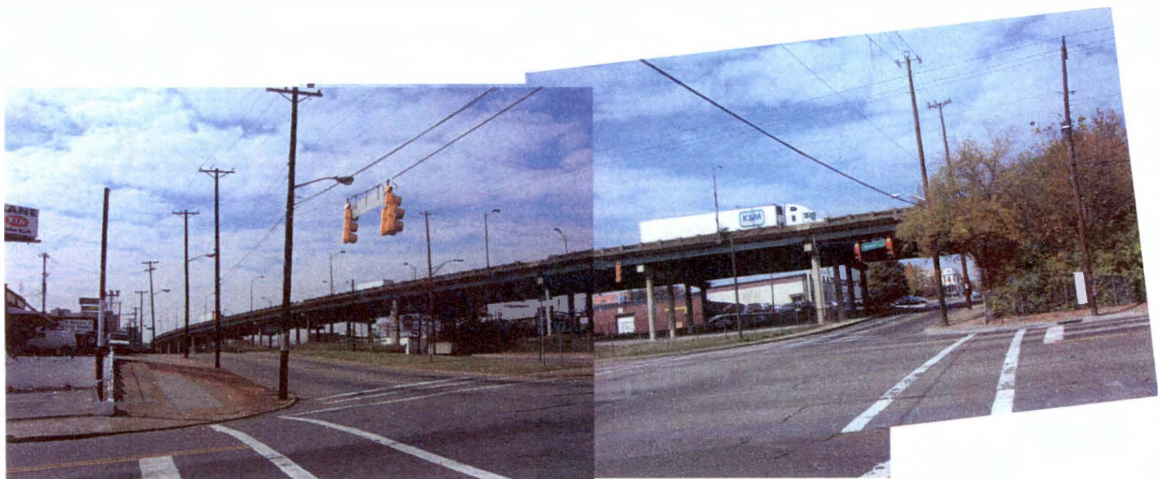
use it, and how it relates to them. This may seem unlikely, as transport is often described as disorganized, chaotic, facing collapse and so on; but, heightened awareness of culture and place in infrastructure is essential to the success of developing architecture of this type.

It's remarkable that all the towns in Iowa were named after their water tanks.

Garrison Keillor



Site photo . In-between
Source: Author



Site photo. In-between
Source: Author

3. ARCHITECTURAL ISSUES :

Materiality:

In addition to the broader social, albeit relevant concepts of connectivity and place that have been discussed in the proposal, the abstract and thesis statement itself, there are a multitude of issues and vocabulary that can work to make the solution an architectural one. The sculptural, though generic qualities of highway construction complement the transparent, translucent and reflective materials that embrace modern construction and concepts. Using the two means in coordination allows the project to blur or clarify spatial definition, making unique references and connections to the landscape, the context and the infrastructure. (Fig. 3.1)

In reporting the impact of the railroad on issues of coordination and spatial dislocation, Wolfgang Schivelbusch insisted that the building of the railroad instituted new levels of connectivity. Cross-country schedules necessitated increased coordination through the establishment of a universal time standard. More importantly, Schivelbusch drew parallels between train travel and an architecture of modern materials. *Evanescence* was the term he used to describe the similar effects of rail travel and glass architecture.

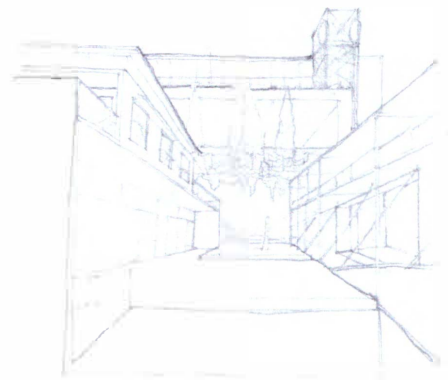
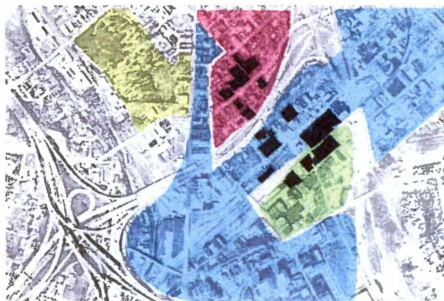


Fig. 3.1 Coordination
Source: Author

The uniform quality of light and the absence of light-shadow contrasts disoriented perceptual faculties, just as the railroad's increased speed disoriented the traditional perception of space. The motion of the railway, proceeding uniformly and in a straight line, was experienced as abstract, pure motion, disconnected from the space in which it occurred. Analogously, the space of glass architecture appears as pure and abstract light-space, skeletons for edifices that were once constructed in traditional massive materials.

(Schivelbusch 124)



Site diagram. Continuity
Source: Author



Site diagram. Circulation
Source: Author

Massive urban infrastructure offers material possibilities of another quality. Typically rational, functional and honest, they are often *plastic* as well. They are also very generic, and therefore predictable. This has allowed for an interesting integration into a modern architectural scheme, mitigating the heightened awareness of place apparent in contextual relationships. Dialogue has developed in the scheme that explores the perceptual limits of glass and steel skeletons that compliment a massive, earth-bound system.

Spatial definition and dividers:

As discussed in the proposal, the initiating of architectural situations in heterotopian urban spaces is essential to connecting communities severed by infrastructure. That is not to say that the perceptual qualities of the space be

Entirely lucid. In fact the conditions that make these spaces dynamic may be celebrated to maximize their potency and reinforce the nature of the site itself. Architectural conditions of phenomenal transparency, spatial overlap, simultaneity and layering are a few of many moves that can reinforce the transformation of an urban boundary to architectural threshold.

boundary: *n.* something that indicates bounds or limits; a limiting or bounding line. 2. Also called a frontier. *Math.* the collection of all points of a given set having the property that every neighborhood of each point contains points in the set and in the complement of the set. (Webster's Dictionary)

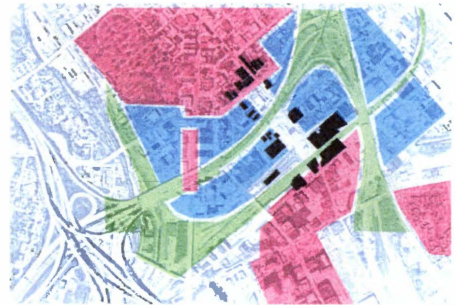
Boundaries are divisions based on something that is clearly marked by an element in the landscape, or construct; and, are therefore spatial. Rivers, mountain ranges, forests, fortified walls, highways, railways, high voltage lines, bayous, and fences are all recognizable spatial dividers. (Fig. 3.2)

At the same time, boundaries also connote a set of expected social guidelines, or protocol. Relating to design, these boundaries might be considered architectural givens like structural rationalism and craft, among others.

threshold: *n.* 1. The sill of a doorway. 3. Any place of entering or beginning. 4. also called limen. *Psychol., Physiol.* The point at which a stimulus is of sufficient intensity to produce an effect.



Fig. 3.2 Site diagram. Boundaries
Source: Author



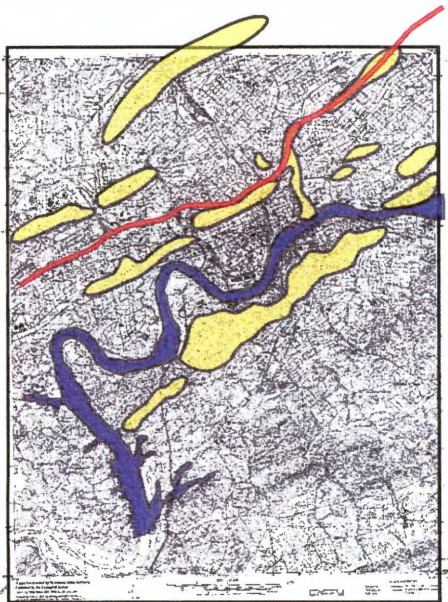
Site diagram. Zoning
Source: Author



Site diagram. Sound fields
Source: Author



Fig. 3.3 Site diagram. Thresholds
Source: Author



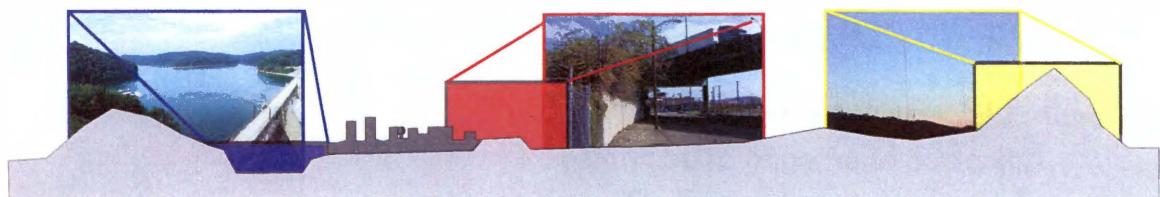
City diagram. Grain v. flow
Source: Author

Threshold, like boundary is something that is physically perceptible to the subject. It may be a clear visible marker, a natural occurrence (ie. strong winds in an urban setting), or a void. In this sense, it implies the necessity of transition across or between boundaries. This thesis limits exploration of threshold to the architectural realm. That is, how a threshold can impart a unique perspective of landscape or cityscape, and a heightened awareness of spatial connectivity and overlap. (Fig. 3.3)

At the same time it is recognized that thresholds can be understood in active and sensual terms. The reward for hard work, coming of age, independence or enlightenment are examples of experiential thresholds.

Vocabulary:

Parallax: The modern use of parallax allows an author to explore phenomenal transparency, simultaneity and movement. In turn, these moves may allow for perceptual blurring of spatial distinction. (Fig. 3.4)



City diagram. Infrastructure
Source: Author

Spatial overlap: Interstitial spaces that are common thresholds from architecture and gardens/landscape result from overlapping, interpenetrating volumes or slots of space. (Fig. 3.5)

Tectonics: Based on the character of the physical environment, tectonics can use an expression of structure to support the seamless integration of architecture, infrastructure and landscape. It is essential in this project that joinery expresses the notions of spatial and physical seams and knots. Creative detailing of joints help overriding notions of connectivity and in-between read at the scale of the assemblage.

Boulevard: The boulevard represents the 24 hour program of the city, and the wide veins that value the presence of pedestrians and vehicular traffic differently, though equally and at the plane.

Promenade: The promenade represents timed, particular programs and allows for the pulse of the boulevard to reach out into the contextual fabric of the city, and integrate the infrastructure. It offers pedestrians a particular procession, along which particular moments, or situations are framed.

Scale: Alternate understandings of context are critical to integrating infrastructure with the sites that surround it. The scale of the highway



Fig. 3.4 Site drawing. Parallax
Source: Author



Fig. 3.5 Site drawing. Integration
Source: Author

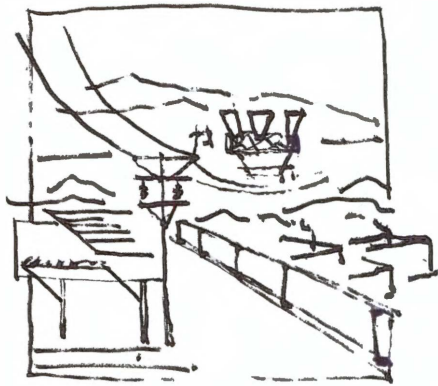


Fig. 3.6 Site drawing. Infrastructure
Source: Author

itself can read in different ways. The particular section has a scale of $\pm 40'$ creating a separation of surface elevation and visual connection with the city. At another level the scale of the highway is 2000 miles. Still another reading of highway surface and experience offers the scale of a 4" asphalt ribbon. The architectural scale of the surrounding fields is predominately 2-3 stories, though some larger manufacturing and storage facilities offer some variety. (Fig. 3.6)

Context: While the proposal directs some effort towards integration into the city that surrounds, it also regards the infrastructure of the site as context. Thus, the *contextual* approach used here allows for the creation of a new building type that addresses site influence, history, and experience in a unique way. (Fig. 3.7)

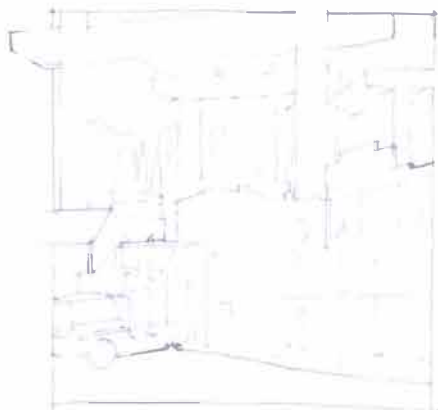


Fig. 3.7 Site drawing. Context
Source: Author

4. SITE ANALYSIS:

Character:

As a site adjacent to a national network of infrastructure, the site has a number of unusual qualities. It neighbors commercial, residential and public properties. Most recent advocacies surrounding the use of sites of this type resemble aesthetic proposals for scenic highways in the 1960's since they are often portrayed as an eco-style greenway preserve, free from commerce, offering exercise and extending non-vehicular connections to parks and larger preserves. But this is just one obvious tact by designers. The idea of a web of sites lying between waterways, rail lines and roadways, might sponsor and facilitate a diverse set of uses positioned to build parallelism and intelligence between several networks. Most critical is the perception of the roadside not as a vacancy, but as a site partially cleared of dominant programs and overlain with a topography of infrastructure, history, and commercial contours. (Figs 4.1 - 4.4)

In his essay *Reconnaissance in Wonderland*, Wilhem-Jan Neutlings recognizes that, with incredible speed the periphery of cities has developed into a galaxy of narrowly functional bedroom communities, park areas, and industrial zones. Like Henri LeFebvre before him, Neutlings recognizes that to support this



Fig. 4.1 Figure -ground (1896)
Source: Author

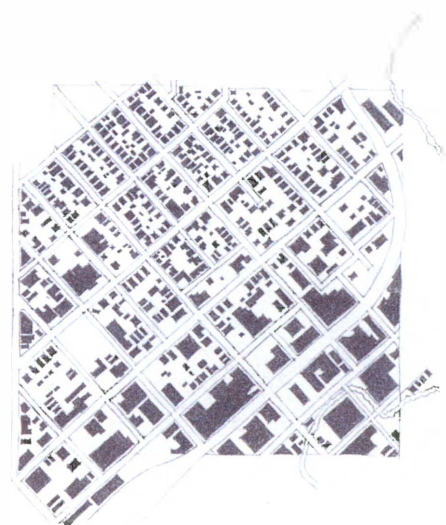


Fig. 4.2 Figure -ground (1952)
Source: Author



Fig. 4.3 Figure -ground (2001)
Source: Author



Fig. 4.4 Highway removed (2001)
Source: Author

system, incredible networks of infrastructure and architecture must occur between the center and the edge.

It is along the older highways that one finds the ideal areas to realize programs like the one presented here. New typologies, new styles and new structure can develop to serve the adjacent communities. By increasing densities in these voids, a section of raised highway becomes an event space, or recreation; while, the street itself, a black carpet with white stripes, becomes a stage for hundreds of thousands of interactions. A heightened kinetic awareness results from the time spent near the highway, where breathtaking detours and exciting scenes quickly shift with one another. Again, movement is the critical factor in the organization and composition of the site. This is exemplified by the flowing lines of viaducts, exit ramps, sound barrierwalls, and topography.

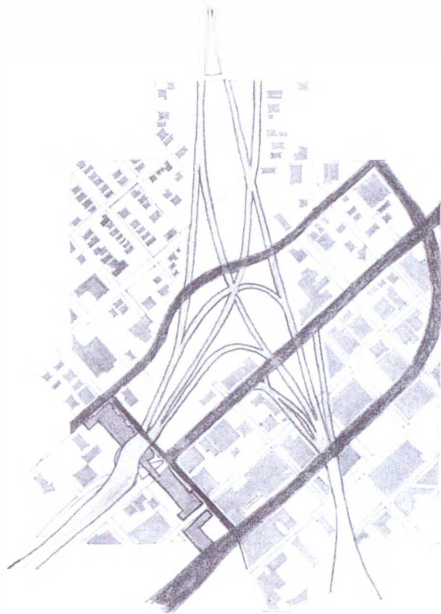
As expansive potential, the in-between zones contain the few large, open surfaces that remain available. They can provide a stage for activities like gardening, climbing, jogging, picnicing, exploring, etc. Such reserve becomes a way for the inhabitants of the metropolis to let off steam and escape to a primitivism that is self denied. (Neutlings) The earthworks to the east, and the interchanges of I-40 and I-275 to the west act as urban foyers to the site, where the concentration

of a variety of transit elements makes the proposal a vestibule to the city. It becomes an overnight spot for visitors, a connection point for commuters, a meeting place for locals; and first and foremost, a connection with the city.

A typical 20 minute walk for an urban citizen includes manufacturing facilities, gardens, cemeteries, eight - lane highways, high rise housing, a university campus, electrical plants, churches, greenhouses, etc. The patchwork metropolis reflects the reality of contemporary social conditions. We have not one society, one set of cultural values, but rather a mixture of varied lifestyles, cultures, images, market values, and spheres of influence. It is an order and complexity that offers a rich variety of intense experiences. As a result, simple expansion of the city must be rethought. Our goal should be to strategically place new, integrated projects, creating a dynamic balance that improves the quality of life of those who engage the site on a daily basis and those who experience it momentarily, within the context of and reflective of these new cultural and social realities.

Selection and Description:

Who is Knoxville? . . . We're headquarters of the Tennessee Valley authority, the engineering wonder that is America's most revolutionary socioeconomic experiment. We are within H-bomb range of Oak Ridge.



Design figure -ground
Source: Author



Design figure -ground
Source: Author

We once built the tallest structure in the world (WBIR tower) . . . In the early 80's a New York City daily dismissed us as" a scruffy little city on the Tennessee River," perhaps unaware that the venerable New York Times was built by Adolph Ochs, a Knoxville educated Tennessean who learned the newspaper trade on our downtown streets . . .

We were once the second most industrialized city in the South, with an elaborate Opera House, a German brewery, a local literary weekly, and a thriving and divers urban lifestyle of streetcars and coffee houses. In Knoxville church membership is unusually high - but so are pornography readership and pool halls per capita . . . The notion of Knoxville as homogenous is a lazy half-truth. Impressions from newcomers . . . 'There certainly are a lot of amputees in Knoxville.' . . . 'There are no black people in Knoxville.' . . . 'Knoxville men tend to be effeminate.' . . . 'Knoxville women all have big hair.' . . .

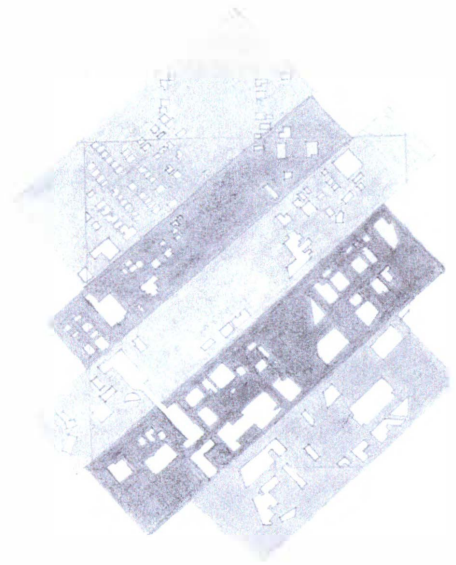
Preconceptions die hard; and if they want to believe Knoxvilleians tend to be unsophisticated or romantic or violent or obese or nude or Arabic or poetic or thrifty or predominately homosexual, they'll always be able to find plenty of evidence to support them. I say maybe its time to stop being embarrassed about that. It could be that's the way a great city should be.

Jack Neely 152

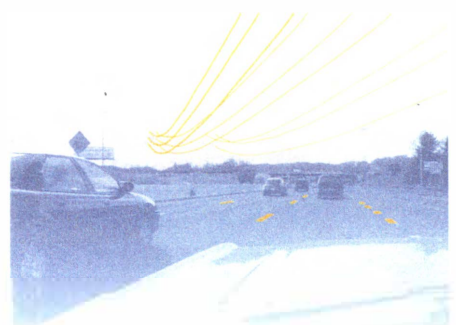
Without realizing how he might be referenced, journalist/historian Jack Neely makes the casethat Knoxville is heterogeneous. In short, he recognizes that the city's collective character is one of variety that is easily maligned or discounted by cosmopolitans outright; and, in the same way that this thesis hopes to highlight marginal spatial conditions, Neely urges all to embrace their differences.

While quaff and sexual disposition may seem irrelevant to an architectural proposal, it is essential to understanding the “ collective memory” of a place before designing with regard for context. (Boyer) In this case, the culture and the spatial condition of the city are in agreement. The heterogeneity of the population and culture is reflected in the poor spatial definition and dislocation that typifies the city. However, the correlation does not translate to causation. Rather, this may often be attributed to the unrealized programming of infrastructure and to the marginal sites that surrounds it.

Michael Foucault’s essay *Of Other Spaces* effectively describes the spatial conditions found in Knoxville and on the particular site. According to the author “there are real places - places that do exist and that are formed in the very founding of society - which are something like counter sites, a kind of effectively enacted utopia in which the real sites, all other real sites within the culture are simultaneously represented, contested, and inverted.” (Foucault 24) Principles of his description are that a culture can make an existing heterotopia function in a different manner; that a heterotopia, as a real place, is capable of balancing several sites that are typically incompatible; that heterotopias are most often linked to slices of time (akin to the Situationiste



Design figure -ground
Source: Author



Sight lines / Organization
Source: Author



Highway landscape
Source: Author



Program / Situation
Source: Author

Derive); and, that heterotopias presume a boundary that both isolates them and makes them penetrable. Wayside sites of this nature exist along nearly all American expressways. The infrastructure impacts the residual space around them for some distance outward. (Fig. 5.3) While other cities that place more value on real estate may ignore or enhance infrastructure to allow the city to thrive, Knoxville's spread to the suburbs has allowed for the presence, if not dominance, of heterotopias through downtown.

Another important trait of infrastructure and wayside sites (if not all sites) is that it is not a closed or finished product. Carol Burns recognizes the temporal dimension of site as a "human work that can never be completed or abandoned. Its meaning can never be determinable. The site, like the human condition is open. This is the surplus of the site, its indefinable excess." (Burns 165) Though its presence is immediate and obvious, infrastructure is under continuous improvement, expansion, or degradation. It happens with every fat highway contract, with every truck's radials.

The Central Avenue & Magnolia intersection at Interstate 40, in Knoxville is exemplary of the wayside and heterotopian space that both binds and divides districts of the city. In this case they are districts that were once

contiguous, but now split by a unique spatial quality and a soaring highway overpass. Transportation infrastructure has a long history on the site. The first surveyed plan of Knoxville (1835) shows the impact of the Norfolk Southern railroad on the surrounding fields - impressing a rotated grid and providing the strategy for developing communities. The communities grew, with Magnolia, Fifth Ave., and Central Ave, serving as connectors to other parts of the city and providing traffic for business development. In addition, the downtown trolley system of the early 1900's was centered on Depot St. (Neely 154)

The opening of Interstate 40 in 1967 effectively destroyed the fine grained fabric of this district, replacing it with impressive earthwork and massive roadways. The area had become somewhat more industrial, but many low income families were forced to move into East Knoxville. Though highway access was originally proposed to Magnolia, it was jettisoned with complete disregard for businesses and people in North and East Knoxville or the Old City. It is unlikely that a bomb could have weakened the city any more.

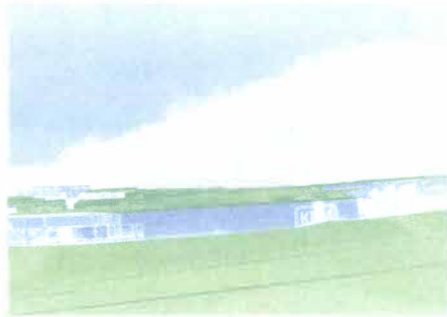
Other infrastructures have impacted the site as well. While there were countless variations on how to slice through downtown with this national artery, the final plan was again altered by a lack of cooperation by Bell Telephone,



Structure of communication
Source: Author



Sign and surface
Source: Author



Surface / landscape 1
Source: Author



Surface / landscape 2
Source: Author

in that they were unwilling to sell their important parcel of land. As a result, highway access was not realized, the route slightly shifted. The sculptural satellite tower atop the building still looms quietly over the stretch of highway. As obvious infrastructure, the tower is balanced by views of several radio towers on top of Sharps Ridge three miles to the North.

The highway dominating the site has an interesting history in its own right as well. When built, the clover leaf nearby gained a national reputation as “Malfunction Junction” because of the traffic congestion it caused for travelers and locals alike. It was an immediate disaster, seen as an idiotic engineering mistake. Though improvements in the early 80’s alleviated much of the congestion, Knoxville has retained a reputation for continual traffic inconvenience resulting from highway projects. One entertaining, opportunistic approach to the problem came from journalist Don Whitehead, whose view was to look at it as - “a jewel of engineering, a rare gem along a chain of concrete.” He argued that :

Malfunction Junction could not possibly have been an accident. Its location in the city is too diabolically clever to have been accidental. It doesn’t make sense to believe that experts of traffic engineering did not realize what they were doing.

We should not be apologetic to tourists about the delays in negotiating Malfunction Junction and we should not be angry about it. We should be proud of our

treasure. We should promote it as a tourist attraction and sell miniature replicas of it. Motorists who traverse it should be given a decal or bumper sticker reading 'I survived Malfunction Junction.' We can do no less for a masterpiece.

(Whitehead, A3)

The site is a typical heterotopia that is knit into the connective fibers of the city, winding between rail tracks, a bus station, the highway, a AAA office (among other commercial offices), and manufacturing sites. Active urban districts (residential, commercial, retail) exist beyond the blocks to be addressed. The intent is to provide a threshold from an interesting urban mescla north of the highway to the vibrancy of the Old City to the south, and engaging the interstate itself in the middle. Acting as a potential vestibule, the site enjoys a strategic location in the center of the city as the meeting place and interchange of goods and people coming from stations, rail lines and important avenues in the city.

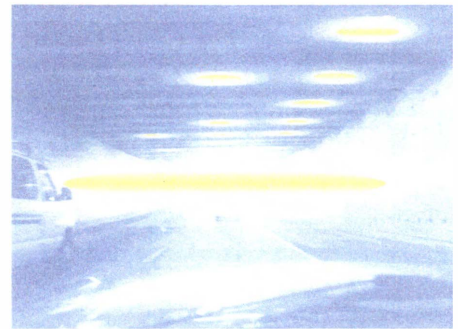


Fig. 5.15 Photo analysis
Source: Author

Site Data: (Fig. 4.5 - 4.6)

Location: Knoxville, Tennessee USA

Boundaries: Central Ave (East)
Norfolk Southern Rail (South)
King St (West)
Fifth Ave (North)

Crossings: Depot Ave (East-West)
Magnolia Ave (East-West)
I-40 (East-West @ 36' elev.)

Dimensions: 185' x 1200' (222,000 sqft.)

Elevation Change: +42' (South-North)

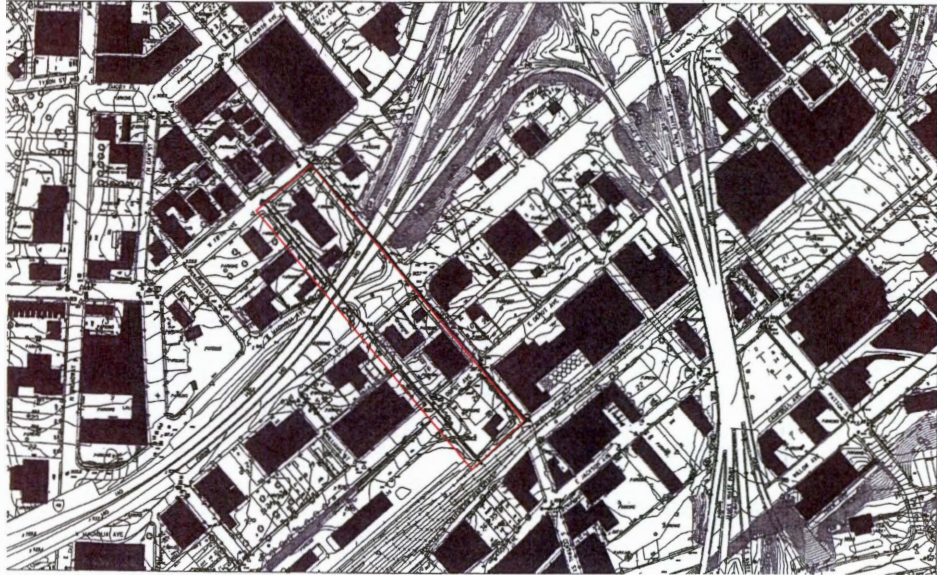


Fig. 4.5 Site data NTS
Source: Knoxville MPC

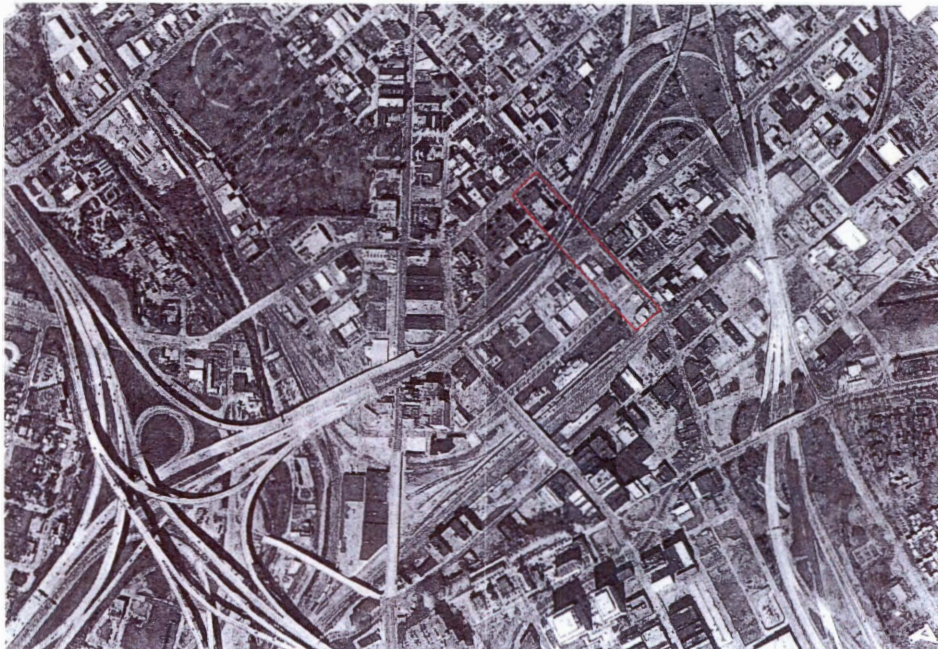


Fig. 4.6 Aerial photo
Source: Knoxville MPC

5. VEHICLE / PROGRAM:

When confronted with an urbanistic program, an architect may either:

A) Design a masterly construction, an inspired architectural gesture.

B) Take what exists, fill in the gaps, complete the text, scribble in the margins (a complement).

C) Deconstruct what exists by critically analyzing the historical layers that preceded it, even adding other layers derived from elsewhere - from other cities, other parks (a palimpsest).

D) search for an intermediary - an abstract system to mediate between the site (as well as given constraints) and some other concept beyond city or program (a mediation).

(Tschumi 124)

In referencing Bernard Tschumi's approach to programming, and the Internationale Situationistes before him it should be understood that movement - of sport, war, transport - is the intrusion of events into architectural space. At the extreme, these events become scenarios for programming, void of utility implications, independent but inseparable from the spaces that surround them. Determining events on the particular sight is with the basis of program in mind is straightforward. Movement and events of the highway, railway, bus station, and marginal spaces offer thousands of potential situations daily. (Fig. 5.1-5.4)

Referring to Michael Foucault again, we must accept that these sites have a function that relates to all the space that remains in the city. This function unfolds between two poles -

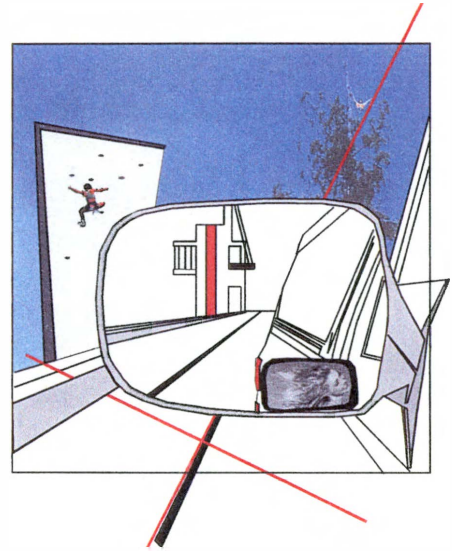


Fig. 5.1 Program analysis collage 1
Source: Author

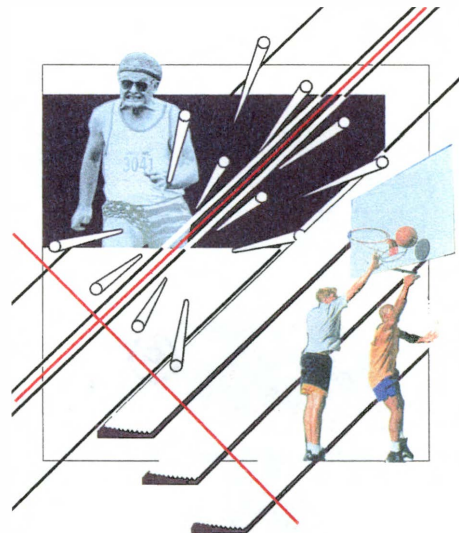


Fig. 5.2 Program analysis collage 2
Source: Author

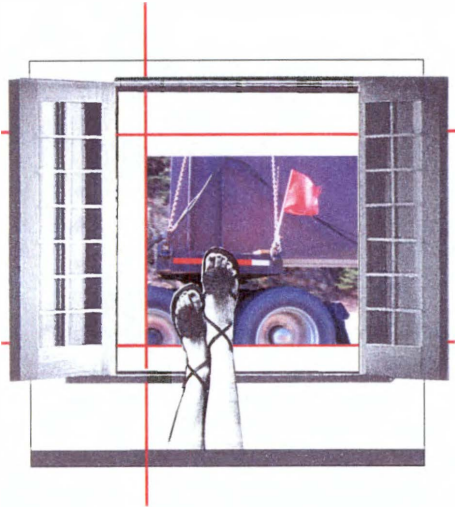


Fig. 5.3 Program analysis collage 3
Source: Author

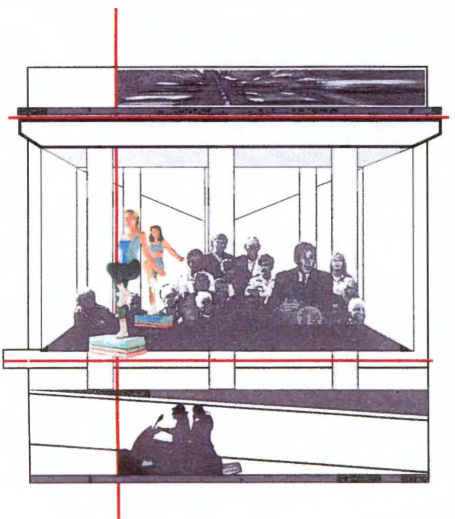


Fig. 5.4 Program analysis collage 4
Source: Author

Either their role is to create a space of illusion that exposes every real space, all the sites inside of which human life is partitioned, as still more illusory. Or else, on the contrary, their role is to create a space that is other, another real space, as perfect and meticulous, as well arranged as ours is messy, ill constructed, and jumbled. (Foucault 27)

It is essential that a program for this site should address its importance as a center for variety and movement as much as identity and context. The program proposed is heterotopic, pluralistic and capable of absorbing a number of different readings. An intermodal travel center in this location would accomplish the goals of the thesis in the urban center of Knoxville. Here people would have opportunities to mix through necessity, leisure, or incidence. In addition to providing infrastructure between active communities, a travel center with creative programming would include amenities for locals and transients alike. In fact a mixed-use center that responds to a variety of users might go through program changes over a given day. (Fig. 5.5)

The project cannot be a simple building, but rather an assemblage of elements which provide direct evidence of general composition, organizational and landscape problems. It attempts to unite this urban infrastructure and linear community to the urban field it occupies, energizing the surroundings and providing additional public

amenities. Infrastructure organizes connections to the city, offers a sequence of views to the city and landscape, and finally, gives local inhabitants an improved quality of life.

As a direct influence, time requires that the program be dynamic with regards to function. The elements of the landscape and buildings may be set initially, but it should be understood that permanence is antithetical to the proposition; and, that flexibility in strategy, composition and construction will allow for realizing the latent possibilities for the site. The program associated with this thesis should be thought of as Constant thought of *New Babylon*, as a “rhizome.” A rhizome is not rooted like a tree, but fluid and acentered, like crabgrass, “a process that ceaselessly extends itself, breaks off and starts again . . . It neither has a beginning or an end, but always a middle, through which it pushes and overflows.” (Borden 7)

Such programming not only benefits from insolent ideals, but from economic pragmatism as well. In December of 1991, then President Bush signed the *Intermodal Surface Transportation Efficiency Act*, that not only boosted sums authorized for transportation projects, but it also expanded the definition of the sorts of projects that could be financed by federal transportation dollars.

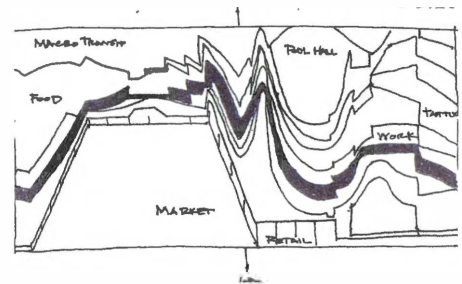
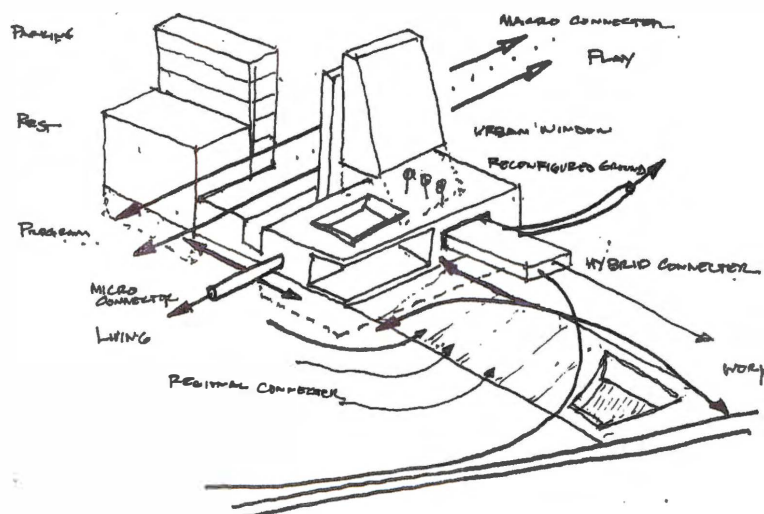


Fig. 5.5 Temporal programming
Source: Author

It allowed state officials more flexibility in using that money, particularly in shifting the aid from highway funding to mass transit uses. For the first time ISTEA allowed money to be spent in support of activities that counter the deleterious effects of highways; pedestrian and bike paths (rails for trails), rehabilitation of historic transportation buildings, etc. The planning bodies were instructed to consider at least 15 factors in their plans, including preserving existing roads, bridges, and transit lines; relieving congestion; considering a project's impact on land use ; and taking note of the *social, economic, energy, and environmental* effects of transportation decisions. (Ichniowski 47) Additionally, many projects have been encouraged to include mixed uses and higher densities located near transit lines.



Volumetrics & connections
Source: Author

1) A partial redesign of Interstate 40 to allow
for access to parking, proposal and
ground plane.

2) Transit hub for drivers, commuter trains,
and local and regional bus service.

- 8bus slips	20000 sq ft
- 2 pullout bus stops	02250
- 2 rail lines	28800
- Service areas	04000
- Train loading areas	02500

3) Travel Center / Community Center / Market

- Ticketing	00600 sq ft
- Travel information and Education center	04000
- Security / Police kiosks	00400
- Main lobbies / atriums	05000
- Marketplace	05000
- Post Office	00800
- Pool hall / Pub	02000
- Restaurant	12000
- Internet kiosks	00500
- Tattoo	00800
- Hairdresser / manicure	01200
- Tanning salon	00800
- Coin Laundry	01500
- Video Rental	01000
- Lockers / storage	04000
- Restrooms	04000
- Clinic and pharmacy	02000
- Moneywall	00800

4) Urban Park / Fitness

- Event spaces	10000
- Outdoor climbing wall	02500
- General fitness	12000
- Locker rooms / showers	03000
- Lap swimming pool	04000
- chapel	01200

5. Single room occupancy / Hostel

- Guest rooms	10000 sq ft
- Office / apartment	01000

Sub Total

144550 sq ft.

- Circulation (22%)	31820
---------------------	-------

176370 sq ft.

- Mechanical (5%)	8820
-------------------	------

185190

6. Parking

- 2000 cars	50000 sq ft.
- 85 trucks	100000

Total sq ft. 335190 sq ft.

6. PRECEDENT ANALYSIS :

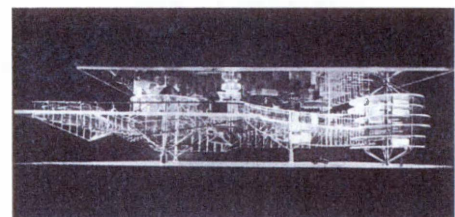
Interdisciplinary influence:

Though not typically recognized for aesthetic contribution William Morrish points out that beautiful and brilliant infrastructure schemes result when “they both recognize space for human needs, then both produce works of art in the truest sense.” (Morrish 52) In their 1964 book *The View from the Road*, city planners Kevin Lynch, David Appleyard and John Meyer point to infrastructure’s cultural potential: “The highway is - or at least might be a work of art. “ Certainly, this proposal uses sculptural architectural elements impacted by the highway to translate its formal character artistically. The creative design of structure (columnar system), landscape (ie. climbing wall), and infrastructure (ie. active street lamps) frames a dynamic work of countless compositions.

Indeed, it is difficult to separate any significant architectural trend or intent from a corollary or coincident inclination in other artistic disciplines. Designing architecture without regard for interdisciplinary considerations will not reach its potential depth or value. Land art has shown incredible potential in solving some of the problems of infrastructure, particularly in regards to waterways and solid waste treatment plants. The impressive earthworks



New Babylon, Constant
Source: Borden



New Babylon, Constant
Source: Andreotti



Fig. 6.1 *New Babylon*, Constant
Source: Borden

that replaced the urban fabric with the construction of the highway offer an opportunity for pulling it into the site. Its purpose though is in the service of people, rather than in the service of traffic. The intent is to reconceptualize the site as *a place to go to*, rather than *a place to pass through*.

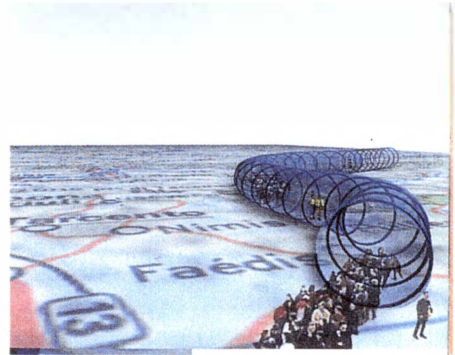
Regarding the character of liminal space and heterotopia, a quick reference to the Internationale Situationiste will show an influential intellectual and artistic approach to the systematic city. (Fig. 6.1) As an alternative form of unitary urbanism that was both systematic and playful in goals, they employed notions of the *derive*, *detournement* and *psychogeographie* in their engagement with the city, the street, and the colorless objects that saturate the space of everyday life. (Krens 35) The situations they constructed weakened the strict separation between interior/exterior and public/private in order to create in-between spaces. With reversals, or acts of *detournement*, these artists attempted to liberate the urban environment from the alienating effects of modern life. Co-founder of the movement, Guy Debord stated their goals as -

The invention of games of an essentially new type. The most general goal must be to extend the non-mediocre part of life, to reduce the empty moments of life as much as possible. One could thus speak of our action as an enterprise of quantitatively increasing human life...
(Jappe 18)

As part of the Situationiste vocabulary the *derive* was defined as “a technique of passage through changing ambiances.” (Andreotti, 50) It is the art of wandering through urban space whose special mood is well conveyed in the landscape’s darkly romantic meaning, and exploring forms of life with a radical emphasis on collective play.

The fabric that the Situationistes explored was influenced by philosopher Henri Lefebvre’s notion of *tissue urbain* - utopian descriptions of an urban civilization beyond the old distinction between city and countryside. Georg Lucak’s critique of reification turned the idealist aesthetics into a powerful critique of capitalist commodification and a way to dissolve the oppositions of form and content, subject and object, and theory and practice. (Lucaks) The same could be said for proposing to cross-program an urban site with a peripheral building type (ie. travel centers).

Part *derive* and part deTouqueville, the shocking association of travel center and community center is a proposal that draws from these intellectual precedents. It is a contemporary adaptation of *New Babylon*, acting as a framework for communities that present themselves as a wide-mesh network of connecting sectors, superimposed over a system of rapid transit routes. (Romito)



Untitled, Romito
Source: Romito



Found objects
Source: Author

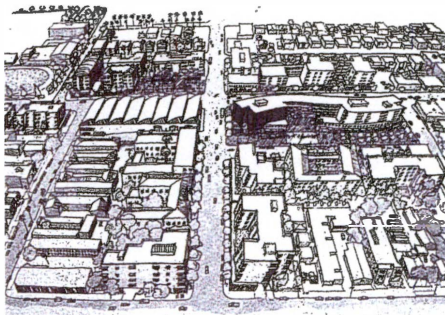


Fig. 6.2 Vermont/Santa Monica Sta.
Source: Kay

Programmatic influence:

The inclusion of these precedents is to understand the practical, proven elements of the program. They help to make a convincing argument for the plausibility of the proposal; and, are important urban theses in their own right. Some are also built with ISTEA funds. The core elements of this proposal have proven successful in these examples, while some other particular programs allow for this argument to be considered alternatively.

Vermont / Santa Monica Intermodal Station
Konig Eizenberg (Fig. 6.2)

- Clusters of neighborhood specific uses and forms around the station.
- Small market stalls in plaza.
- Single -room occupancy hotel over four floors of commercial space.
- Large mercado with underground parking.
(Kay 94)

El Monte Station
Frederick Fisher (Fig. 6.3)

- Low density housing and community oriented spaces.
- Gardens and soccer fields.
- Market space.
- Community halls and night school.
(Kay 96)

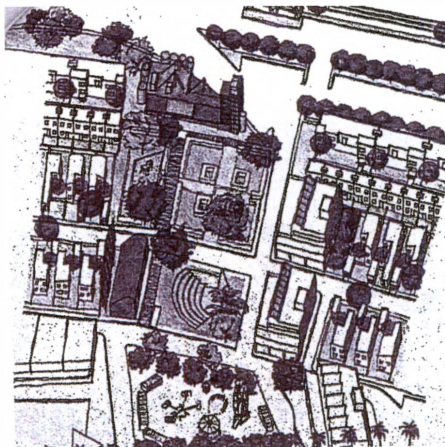


Fig.6.3 El Monte Sta.
Source: Kay

Charlotte Transportation Center
Gannt Huberman (Fig.6.4)

- 18 bay bus shed.
- "a transportation center ought to be more than a place to catch a bus and go to the bathroom. It ought to contribute to the life of the city."
- Mixed use with bank, medical clinic, retail and office space.

(Ichniowski)

Giant Travel Center
Giant Corporation Gallup, NM (Fig. 6.5)

- Full service restaurant and food court.
- General store offering small appliances, electronics, food and auto/truck parts.
- RV parking and dump.
- US Post Office.
- Game room and pool hall.
- 26 private showers.
- Barbershop, shoe shine, manicurist.
- 24 hour movie theater.
- Chapel for Sunday & Wednesday worship services.
- Paved and lighted parking for 300 trucks and with security and lot limosine.

(gianttravelcenter.com)

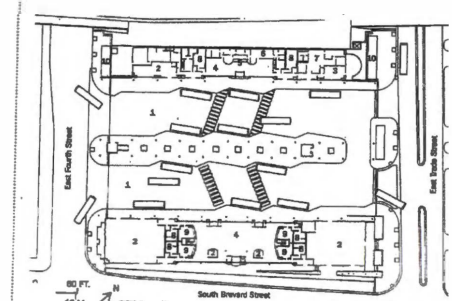


Fig. 6.4 Charlotte Transportation Ctr
Source: Ichniowski



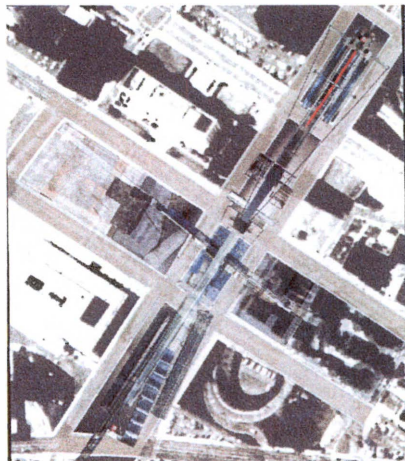
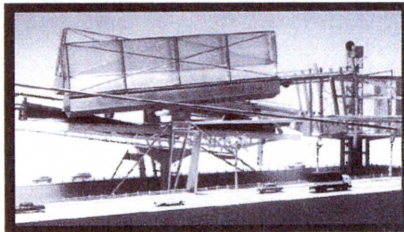
Fig. 6.5 Giant Travel Ctr.
Source: gianttravelcenter.com

Architectural influence:

West Coast Gateway ; The Steel Cloud .

Asymptote - Hani Rashid.and Lisa Couture

Los Angeles CA 1995. (Fig. 6.6)



As a monument to the late twentieth century, inspired by optical phenomena, telecommunications technology, computer simulation and the proliferation of information *The Steel Cloud* is located directly above the median strip of the Hollywood Freeway. It is “a prop that attempts to mend this bifurcated city.” The project makes scale and meaning disconcerting, with aquariums and suspended landscapes hovering above the skyline and “oscillating to its hidden rhythms.” (Rashid , Couture 52) The horizontality of the structure melds with the horizontality of Los Angeles.

Here galleries, libraries, theatres, cinemas, parks and plazas all intersect the fluid and transient space of the city. The Steel Cloud is architecture for the post- information age, devoid of perspective, depth, frames, or enclosure; it is a prop for a place where hallucination and fiction temper vivid reality.

(Rashid, Couture 58)

Figs. 6.6 *West Coast Highway*
Source: Rashid, Couture

*Screens for a walkway between buildings and
buses and cars*

Acconci Studio

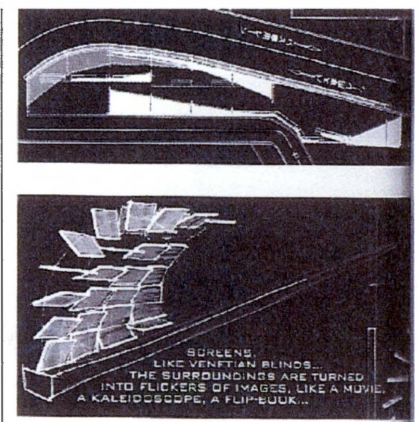
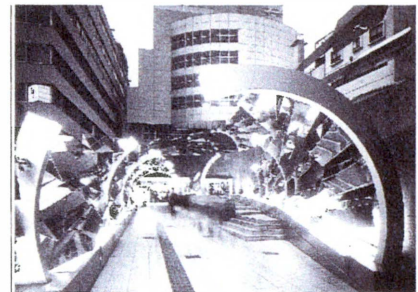
Tokyo JA 2000

(Fig. 6.7)

The screens rise up and curve around the walkway, like “shells” to become roofs. The surrounding ramps, the traffic on the ramps, and the nearby buildings are all transformed into momentary images. The project is like an occupiable kaliedescope, or flip book.

The mirrored screens are like Venetian blinds. The horizontal slats are suspended one above the other, able to be set at different angles. When they are vertical, the surrounding space disappears and the pedestrian sees themselves instead, rising up from mirrored slat to mirrored slat.

Public space, in an electronic age, is space on the run. Public space is not space in the city but the city itself. Not nodes but circulation routes; not buildings and plazas, but roads and bridges. Public space is leaving home, and giving up all the comforts of the cluster places that substitute for the home. Space on the run is life on the loose. Acconci (Andreotti 66)

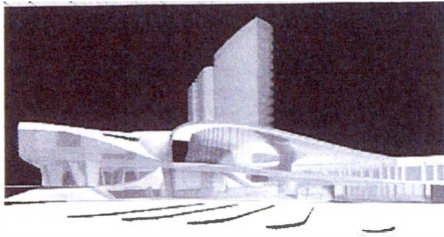


Figs. 6.7 Walkway between.
Source: Andreotti

Arnhem Station Area

UN Studio and Ove Arup & Partners

Arnhem NL 1996 – 2020 (Fig. 6.8)



As a masterplan for the station area, a existing complex of bus terminal and train station require drastic revision due to expansion of the town and the Dutch railway system. The design generates 80,000 sq.m of office space shops, 11,000 sq.m of shop floor, 150 housing units parking for 1,000 cars, storage for 5,000 bicycles and a rail underpass.

The site is organized as an enclosed plaza that interconnects and gives access to trains, taxis, buses, bikes, etc. The station emerges as a landscape of interrelated movements. Holes in the landscape create a system of pathways between programs.



The project works on *“the development of a 24-hour program fused in a continuous landscape.”* (Andreotti 79)

Figs. 6.8 *Arnhem Station*
Source: Andreotti

Penn Station Competition Entry

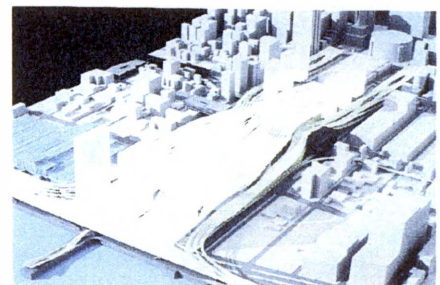
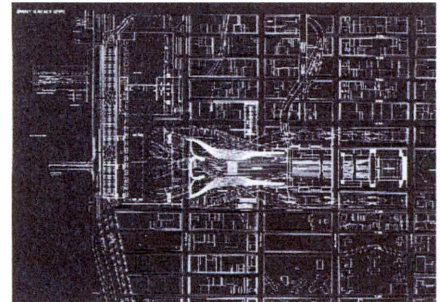
View from the Roof

Reiser + Umemoto

New York NY 1999 (Fig. 6.9)

The large scale, infrastructural elements which traverse the architecturally-scaled blocks and buildings of the site create an artificial geography to be harnessed for its organizational and sculptural potential.

Recreation and leisure activities are provided in a number of different park and landscape settings, and programs “piggy-back” onto existing infrastructure. Event space lies at the heart of this proposal, though underneath its artificial surface lie the tracks of the railyard, and overhead is a continuous blanket of a space frame. (Gregotti)



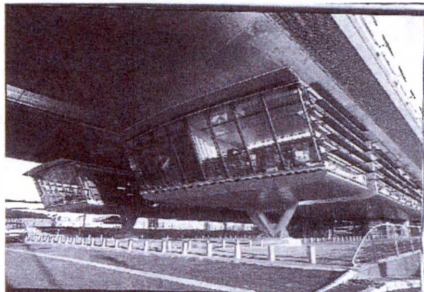
Figs. 6.9 *View from the Roof*
Source: Gregotti

Highway Patrol

Odile Decq and Benoit Cornette

Nanterre FR 1999 (Fig. 6.10)

The linear route of the Grande Axe links the suburbs and the city center of Paris, defining a strong east-west axis and gateway to the city. The architects were hired to design a new center for the highway patrol in the area.



The control center is located below the highway viaduct bordering Nanterre, “a featureless, melancholy landscape of tall apartment blocks and elevated railway tracks. The design strategy was to conceive of the building as an “integrated extension” of the infrastructure, rather than an isolated object. The viaduct was reconfigured to use curved steel arches for support, and the linear volumes appear to float weightlessly below the motorway. Freedom of the groundplane allows for civic improvements to follow (landscaping and an adjacent park reclaiming “wasteland”). (Pavia)



Figs. 6.10 *Highway Patrol*
Source: Pavia

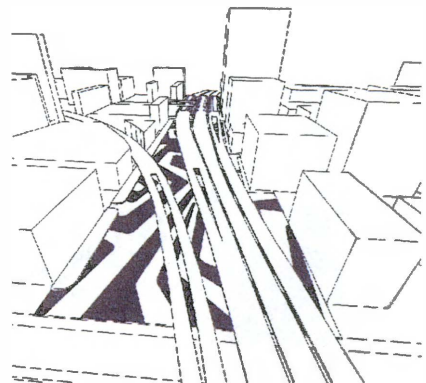
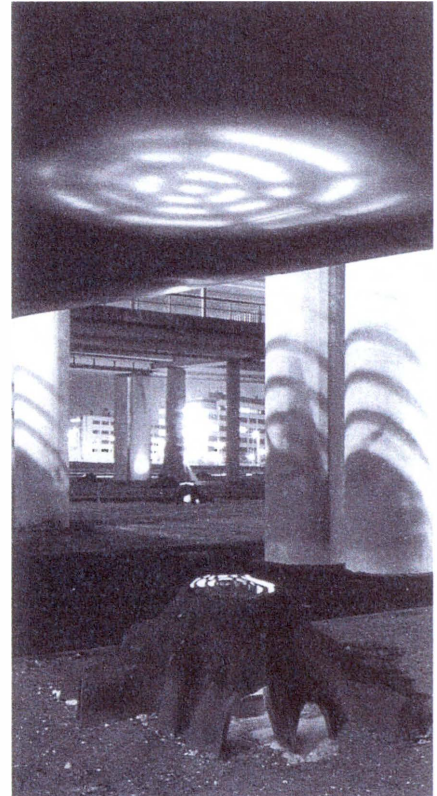
Carrasco Square

A. Geuze - West 8 Landscape Architects
Amsterdam NL 1997 (Fig. 6.11)

Although only a third of Geuze's plan was realized for Carrasco Square (aka Shadow Park) in Amsterdam, the intent to develop an ambiance out of the existing qualities of the site is clear. Though highly fragmented, the site is suited for assimilation of car, rail and pedestrian traffic.

The park proposal intertwines transportation modalities, in addition to the natural and man-made elements that appear to be an artificial wooded landscape. The area is transformed into an urban forest by allowing columns to be overgrown with ivy and placing casts of tree trunks in the grass planes.

There are no fences or other devices to mark the boundaries of the park, and its parameters are only read through the distance to which the rusting iron tree stumps can be seen to extend. (Chance 38)



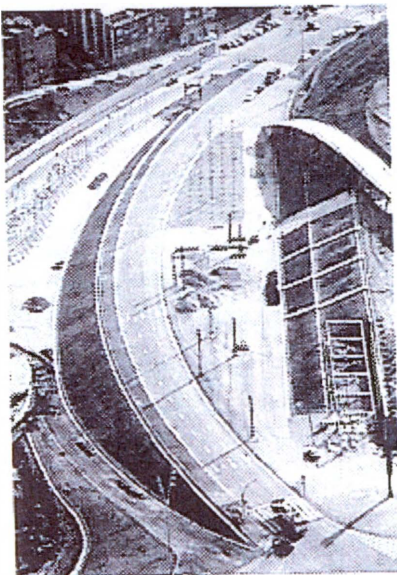
Figs. 6.11 *Carrasco Square*
Source: Chance

Vall d' Hebron Park

Eduard Bru

Barcelona ESP

1992 (Fig. 6.12)



Situated on a 26-hectare site in the inner suburbs just north of the Gothic center and its 19th century extension, the park come in direct contact with highway infrastructure. Bru holds that the beltway is the best location for leisure facilities that serve local users, in this case providing communities with a collage of sports surfaces, routes and parkland. Elaboration of routes creates a dynamic landscape able to intermediate between neighborhoods and provide flexibility in program.

"Driving to the super-market car park, and spending Sunday listening to the radio while the children play in the car park is a highly respectable custom. Here, users surround themselves with those objects most dear to them: the car, the children, the radio. And they spend their Sunday placidly." (Corner 241)

Figs. 6.12 Vall d'Hebron
Source: Corner

Return to the Fold: Federation Square

NL Architects

Melbourne AUS 2001 (Fig. 6.13)

Return to the Fold is a complex housing a variety of programs in the urban area of Melbourne. The functions range from parking garage to a gay bar, and from a fast food restaurant to a gymnasium. Plans also include shopping areas at different levels, cinemas, botanical gardens, butterfly garden, showrooms, studios, theatre, a rail station and bus station. The complex is dominated by a large elevated square with openings that offer views to green areas.

As a 'Swiss-cheese', it suggests a voyeuristic game based on a new relationship between nature and the city. [It] offers an urban landscape made of stratifications and projections of large scale naturalistic icons which look to the metropolis as a splinter of hypertextual cities (Paganelli 89)

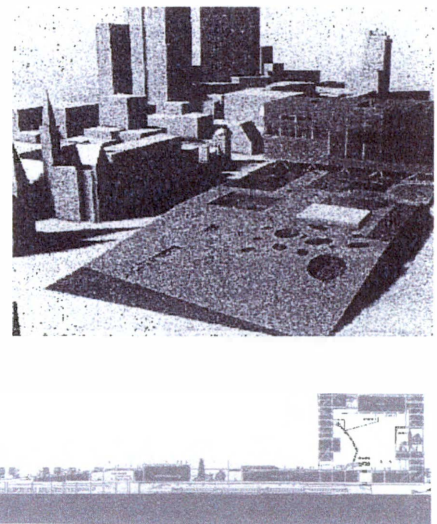


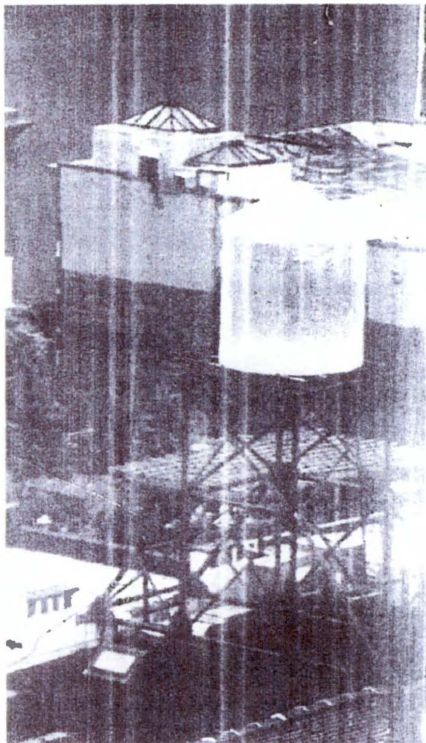
Fig. 6.13 *Return to the Fold*
Source: Paganelli

Water Tower

Rachel Whiteread

New York NY 1998 (Fig. 6.14)

The water tower is a very quiet fixture of New York's skyline; and, although it is an elegantly simple solution to a real problem, its function remains a mystery to many citizens and visitors alike.



In keeping with her design strategies Whiteread has created an object that materializes an everyday space hidden of function. The cast resin tank is unique and specific to its totally unremarkable position and history.

As it disappears against the sky, it speaks of countless infrastructural objects that produce play between their banality of function and the power of infrastructure's presence. (Cosper)

Fig. 6.14 *Water Tower*
Source: Cosper

7. DESIGN AND RESOLUTION:

The juxtaposition of community and interstate, local and universal is the driving force behind the project; though it is not an easy task to comprehend or offer solutions on. It can be assumed though, that the architectural solution presented here addresses both the condition of place and displacement. A project that simply connects 4th and Gill back to the Old City and downtown would deny the importance of larger cultural issues tied to the roadway; while a project that simply expands the highway would only further destroy the urban fabric that surrounds it.

A plan that reprograms and humanizes the highway infrastructure allows for the success of the proposition. Programming that is both travel center and community center offers multiple communities the opportunity to interact. In particular, the project provides unique conditions for those who are displaced to meet with a place, and those who are members of a revived community to appreciate the richness, diversity and latitude of those that pass through.

Though much of the imagery presented in previous sections has been instrumental in uncovering the latent possibilities of the site



Fig. 7.1 Parti model 1
Source: Author

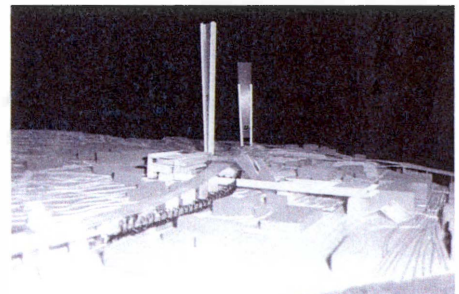


Fig. 7.2 Parti model 2
Source: Author

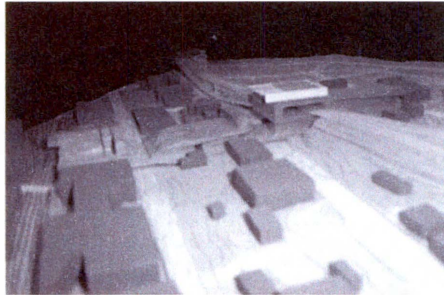


Fig. 7.3 Parti model
Source: Author

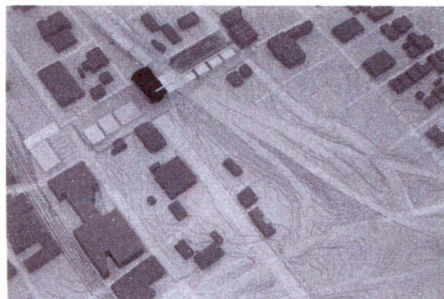


Fig. 7.4 Parti model
Source: Author

and informing the design process, much time was devoted to the generation of partis, spatial readings and landscape integration.

A great portion of the exploratory work was done with model. A site massing model was built early in the process and allowed for variations of schemes to be generated, tested and critiqued. (Figs. 7.1 - 7.4)

Each model explores the situation differently, though all engage the interstate in some way. One was developed through a subtractive method of carving, another folds landscape as an element that appears, disappears and then reappears at moments on the site. A programmatic approach was taken with another, while one used the formal qualities of context and infrastructure, reversing hierarchies and scales.

The importance of understanding how systems work on the site, with such a complex program, became clear early in the process. Particularly important was the integration of landscape, enclosure, spatial definition, and infrastructure. Exploded axonometric diagrams help to derive these systems. (Fig. 7.5)

Sectional designs determined the formal character of the project from the beginning. Using the varying scales of the commercial, residential, civic, and infrastructural zones

that contact the site. Each rendition has engaged the highway sectionally as well, either by moving over, sliding under or wrapping around. The final design preserves the character of the highway space by providing event spaces, and at other times reprograms it with gymnasiums and recreational systems. In addition, a tower element offers a sign to travelers, and an opportunity for pedestrians to view their city and their investment in infrastructure.

The presence of the highway allowed some elements of the design to take on figural characteristics. Lines of the interstate and the “impact” on some of the pieces nearby provide the variety that allows the project to address its context as it works across the four blocks. It reaches out into the city fabric through careful placement of recreation facilities, clinic, running track, train platforms, a chapel, bus pull-outs and a productive landscape.

Clarity and order are set by the structural system (a columnar grid of 25'x40') and in the continuity of surface. As the highway benefits from surface continuity, so does the *boulevard* that provides primary circulation and a galleria of 24-hour program. It connects portions of the site that are now severed through a bridge and

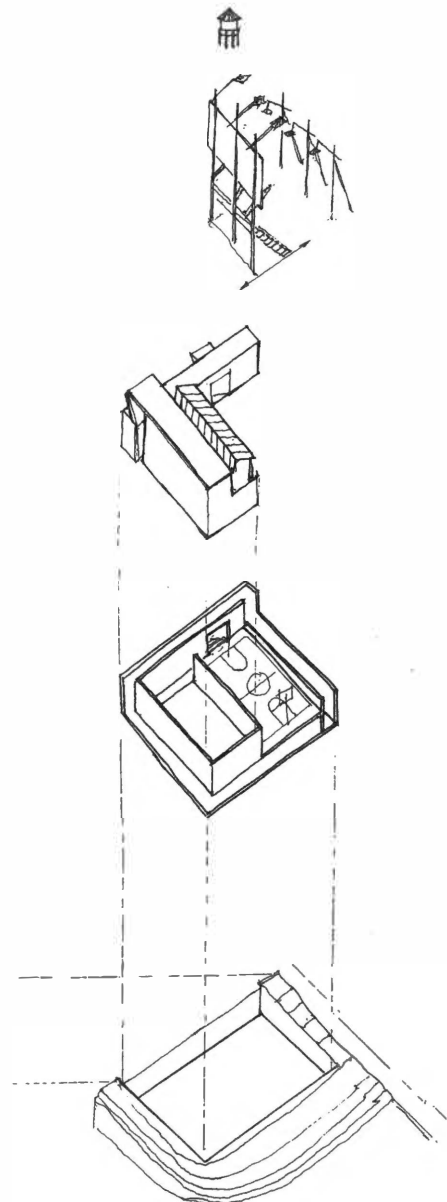
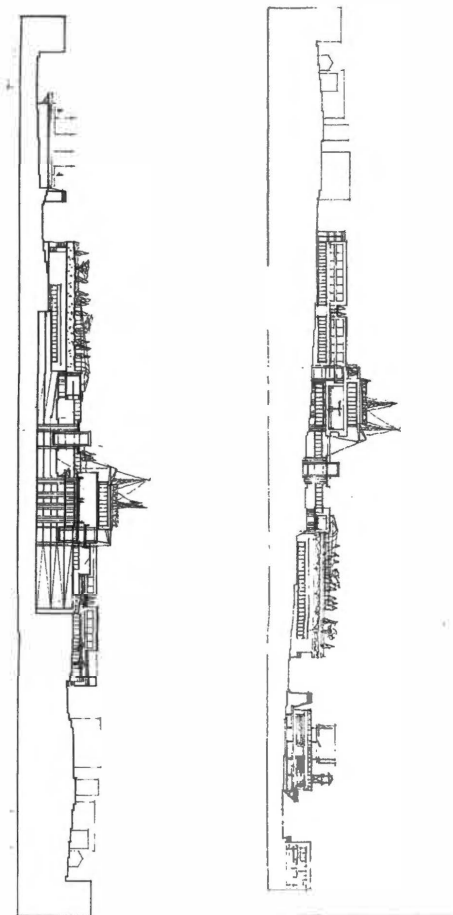


Fig. 7.5 Market systems
Source: Author



Process sections
Source: Author

with a carved, underground passage and parking.

The glass construction of the boulevard and the massive construction of the figural elements is accented by the tectonics of the repetitive tower elements that house circulation and other functional poche.

Infrastructure is integrated with architecture at a number of levels, most successfully in the marketplace at the South end. Here, a basketball court can be transformed into a Saturday market, with bleachers folding into a thick wall. A greenhouse and the productive landscape feed the market; and, a water tower provides for the greenhouse. Active lamp posts allow for the space to be activated by “players” at all hours. Their revolution provides a sign of activity for those on the highway (as search lights often do), though they can be secured for better visibility and less distraction during game times.

The product from this kind of adaptability and integration is something new. It is an infrastructure that meshes with the architecture around it, to benefit the disparate communities that engage it. Providing an infrastructure that is artfully designed and reprogrammed is manifest in moves that are made across the site.

Here, unique situations are provided for new associations. A driver may make a momentary

connection with a climber or runner; a local may engage in conversation with traveler staying in the hostel, while each do their laundry or have a manicure; or, a traveling salesman or truck driver may use a post box as a permanent address. In short, the project provides a systematic framework for the programmatic needs of the community, through infrastructure. This is not unlike the programmatic and social integration of Roman baths and aquaducts, recognizing the special social potential of systems that service a collective.

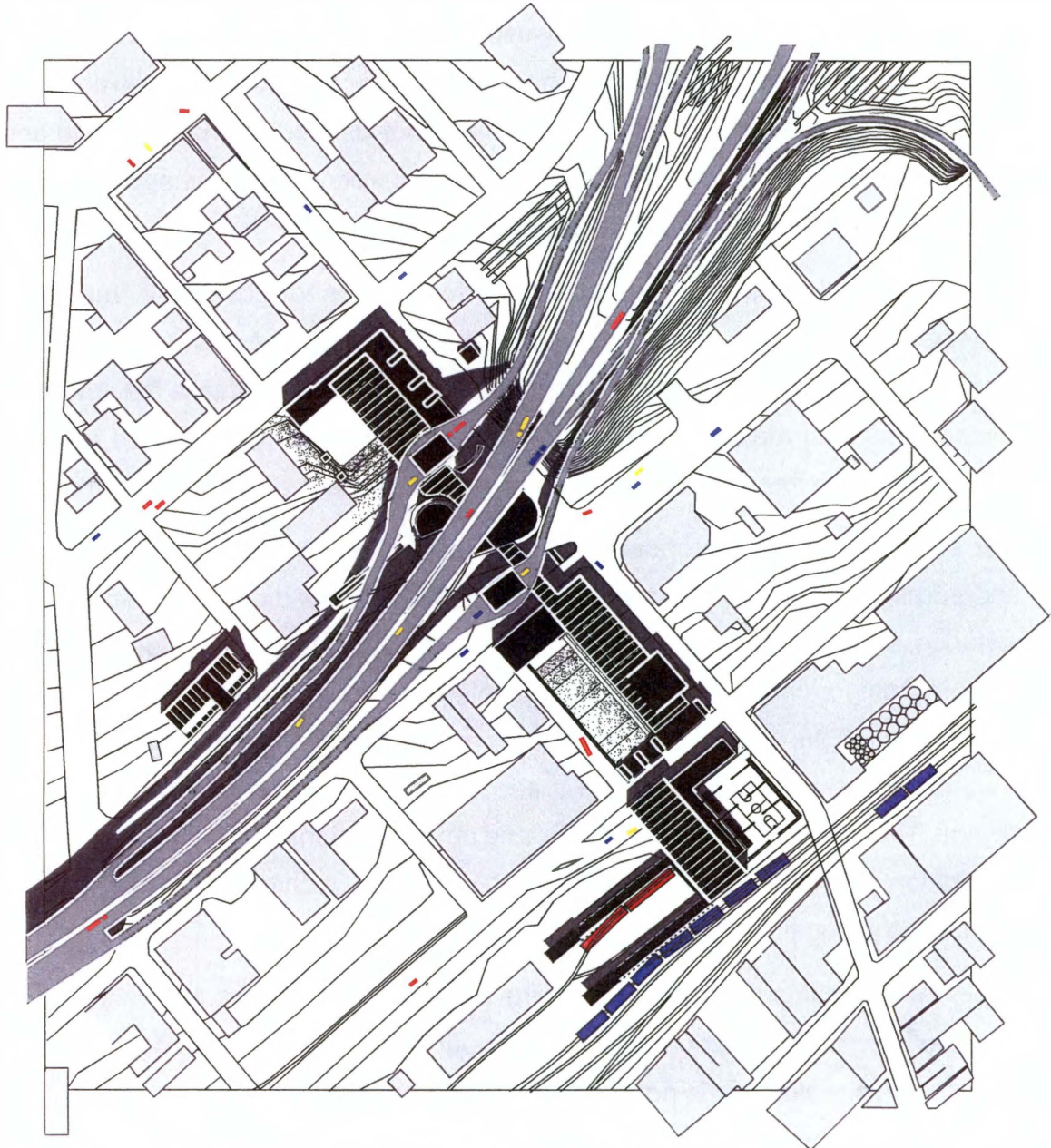
Just as the Situationiste's commentary and work was to reduce the "mediocre parts of life" with employment of the *derive* and *detournement*, this thesis works to counter the empty moments of life as much as possible and attacks the colorless systems that saturate everyday life. That is not to say that they are denied, ignored or boutique'd; but they are rethought in terms of design, social agenda, and effect.

The social goals of the proposal are reinforced particularly through architecture and infrastructure in combination. At times the intent is difficult to discern. For instance, a track for running and walking that wraps the highway provides a setting and program for citizens and travelers to interact. As an audience sits on a set of bleachers atop the clinic, it is unclear if their attention is directed at the action of the competitors or at the highway traffic set against the city and Smoky Mountain skyline. The *derive* is evidenced in this, and other situations in order to weaken the separation between interior/exterior, public/private, architecture/infrastructure, and transitory/local.

While the situations that are forced in the proposal may seem fantastic to some, they are imaginable and potentially real. Though the project is rooted in concepts and ideas, its realization is not precluded. Though not fully resolved or detailed, the design presented here could provide the architectural solution to the obvious problems identified with highway infrastructure, and how modern planning can benefit from investigating alternate possibilities for heterotopic spaces in our urban centers.

8. PRESENTATION OF PROJECT

Figures 8.1- 8.14 are presented below:



INFRASTRUCTURE IN-BETWEEN / GRADUATE THESIS PROJECT / BRAX EASTERWOOD
INTERSTATE - 40 INTERMODAL TRAVEL CENTER / KNOXVILLE TENNESSEE USA

UNIVERSITY OF TENNESSEE / COLLEGE OF ARCHITECTURE / SPRING 2002
PROF CODDINGTON / PROF DODDS / PROF DRISIN

Fig. 8.1 Site plan
Source: Author

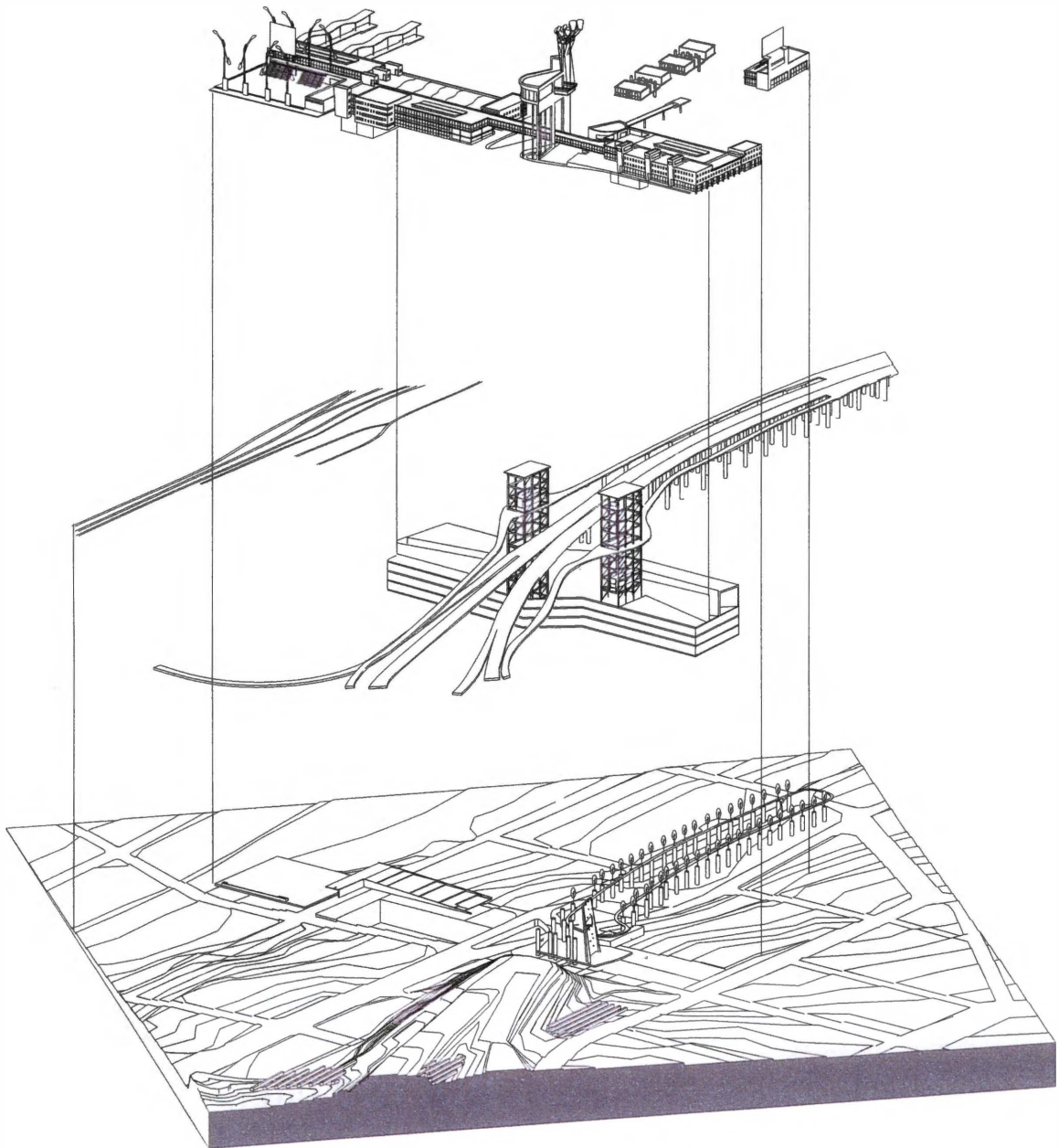


Fig. 8.2 Systems axon
Source: Author

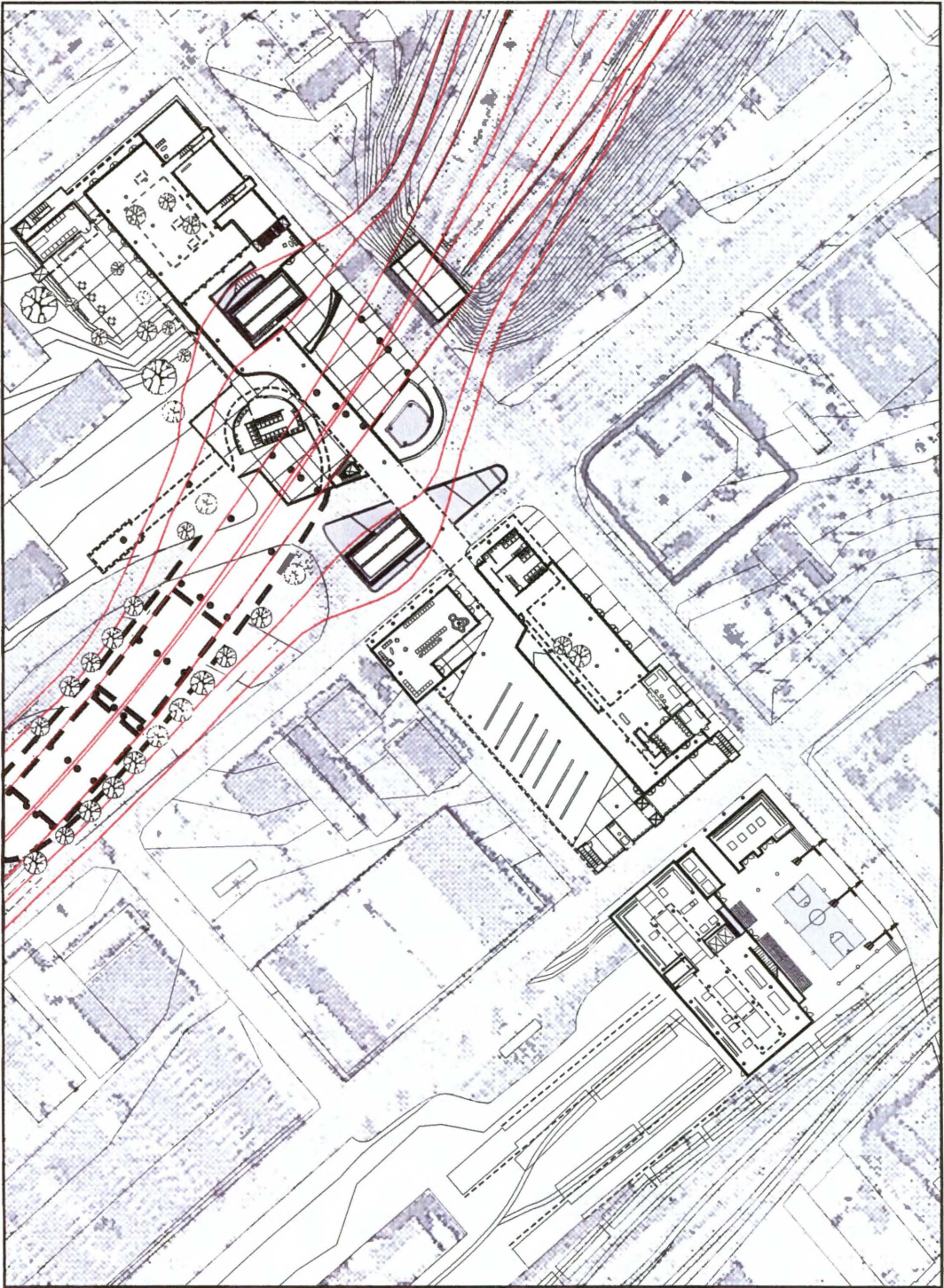


Fig. 8.3 Ground floor plan
Source: Author

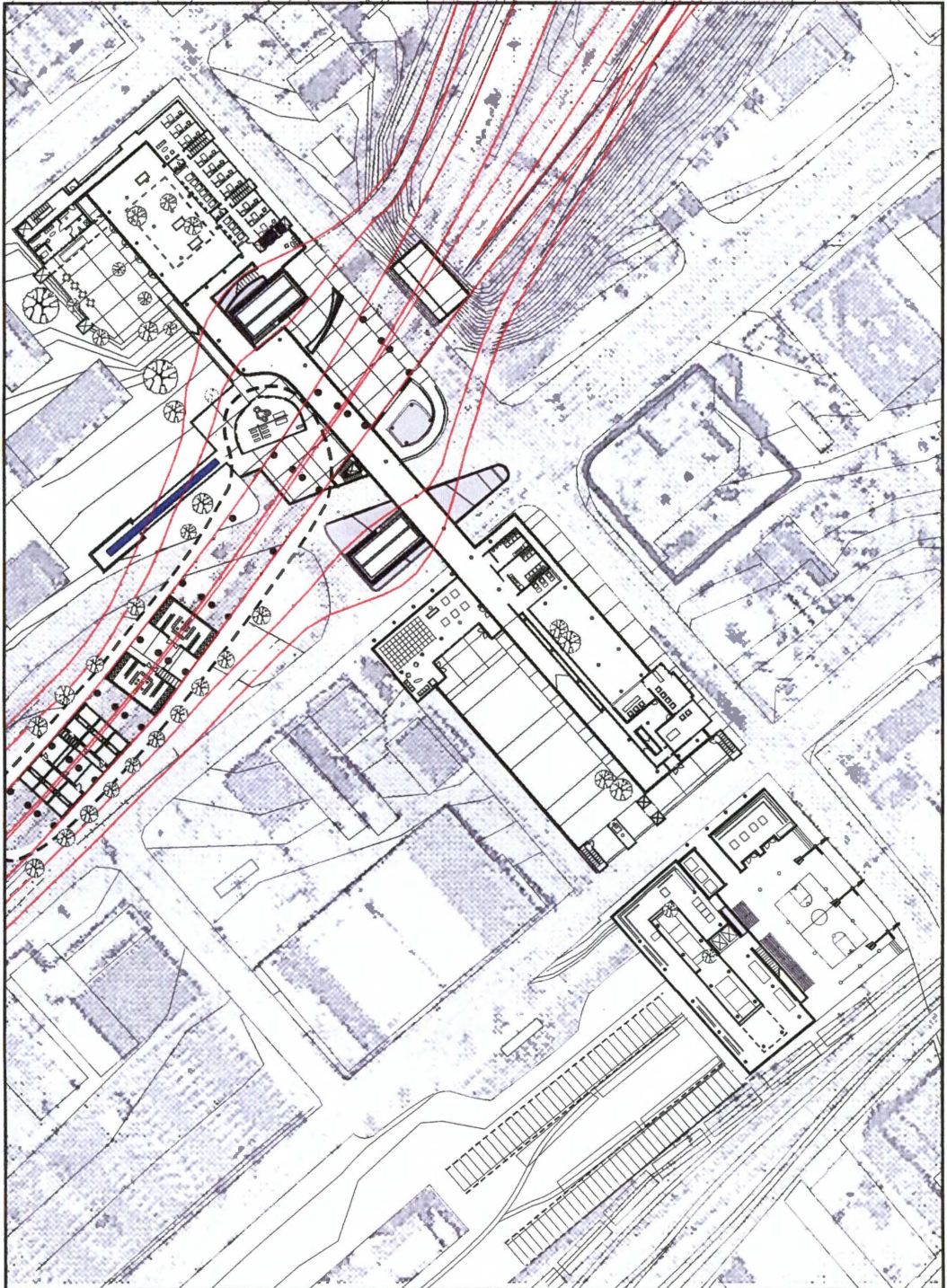
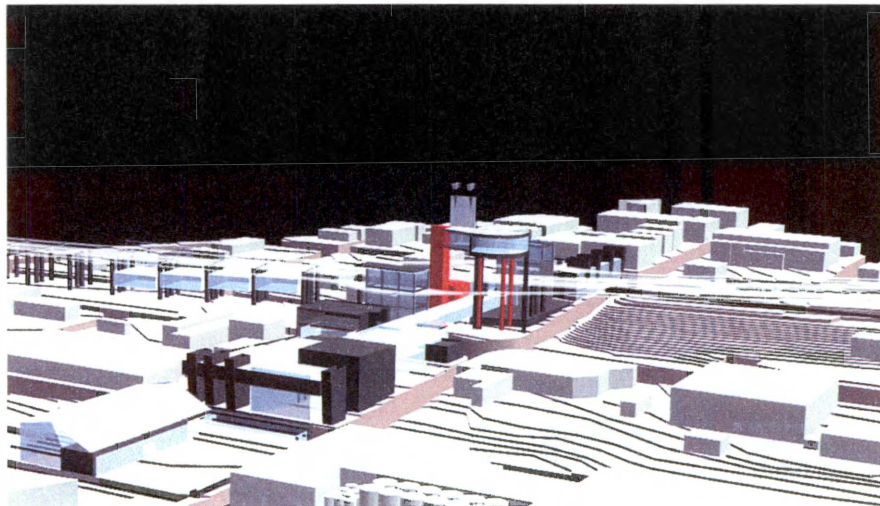
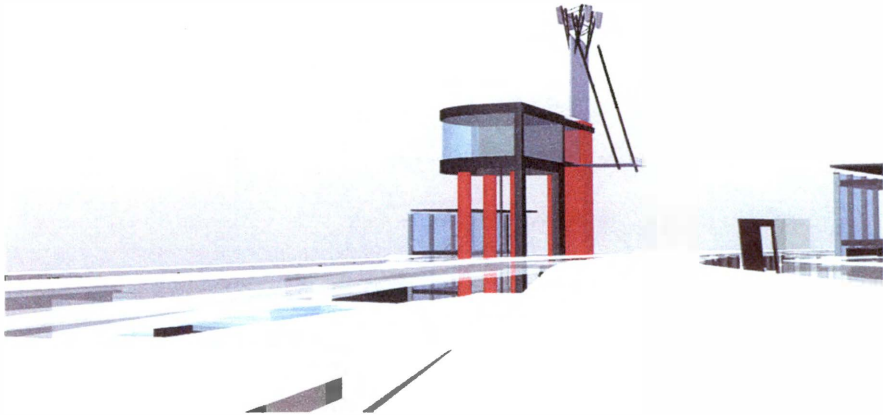
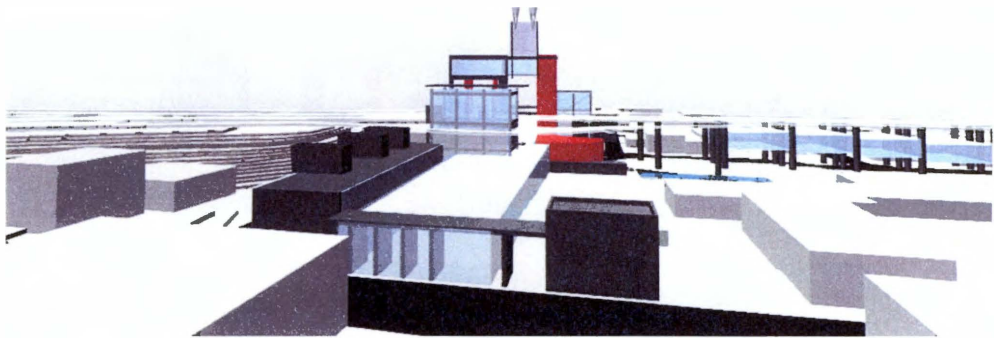


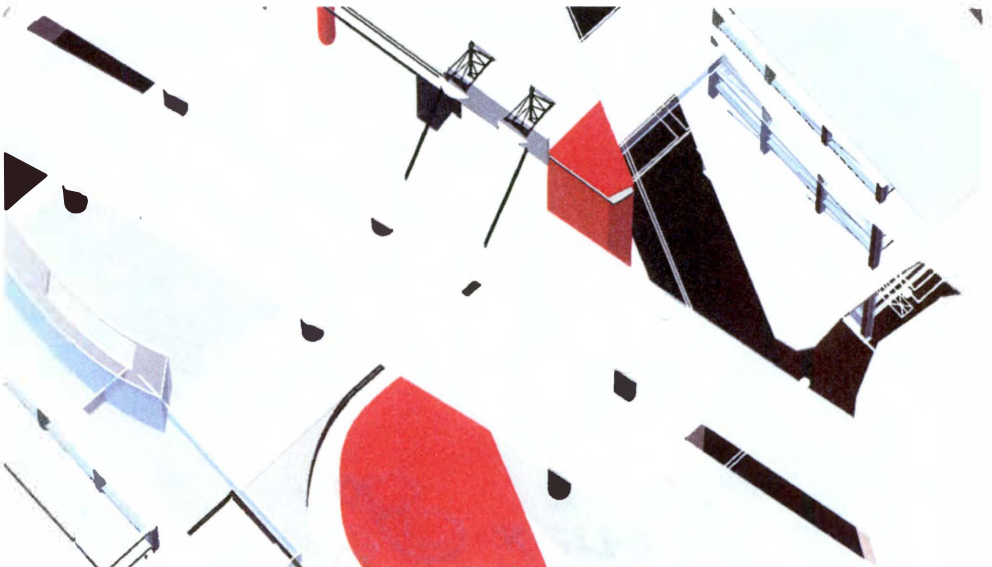
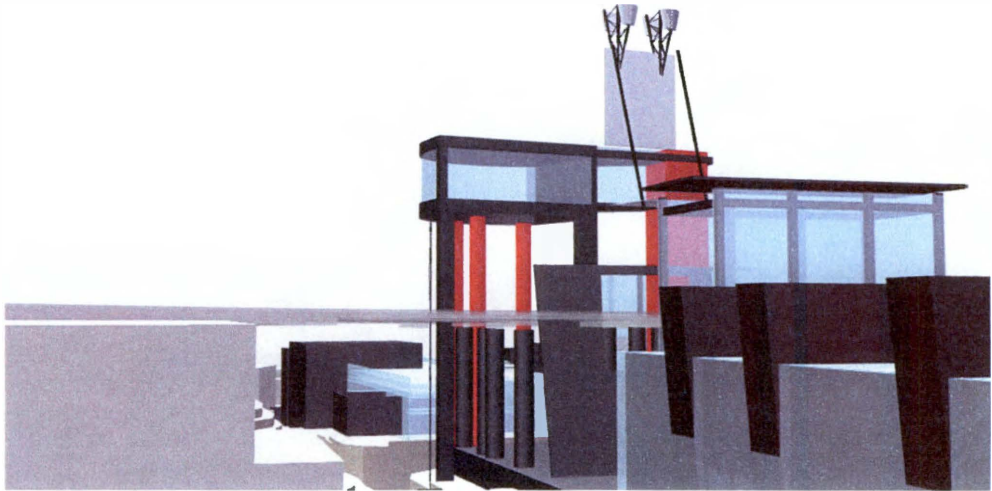
Fig. 8.4 Second level floor plan
Source: Author



Figs. 8.5 Perspectives 1-2
Source: Author



Figs. 8.6 Perspectives 3-4
Source: Author



Figs. 8.7 Perspectives 5-6
Source: Author

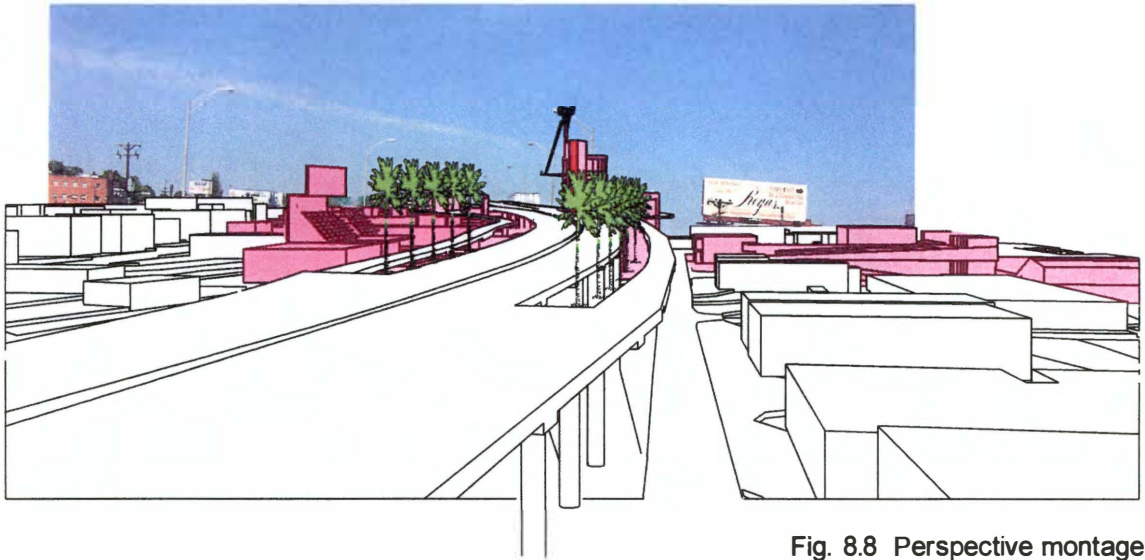
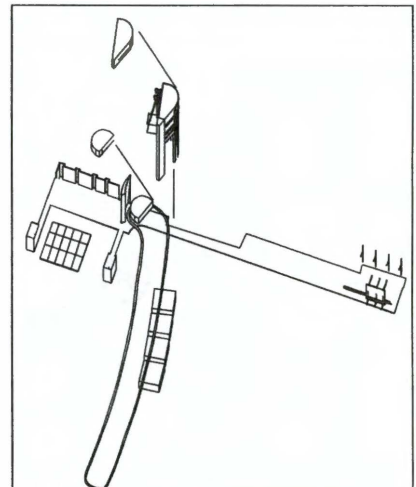
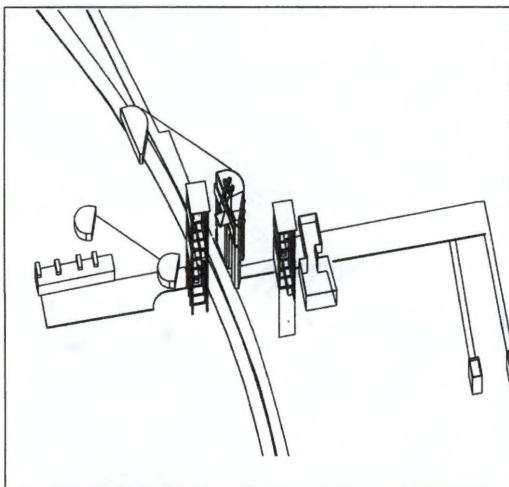


Fig. 8.8 Perspective montage
Source: Author



Figs. 8.9 Isometric diagrams
Source: Author

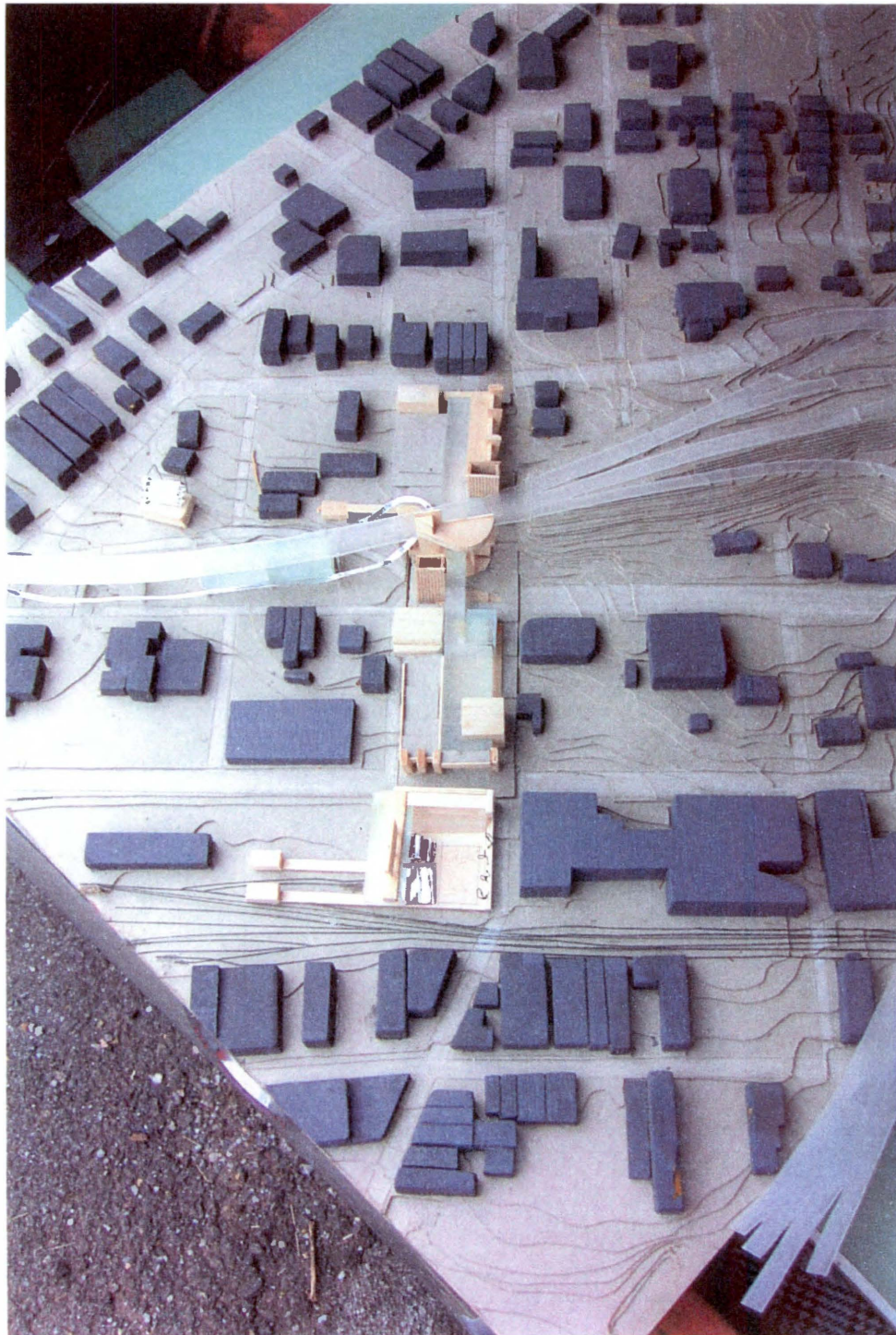


Fig. 8.10 Model photo
Source: Author

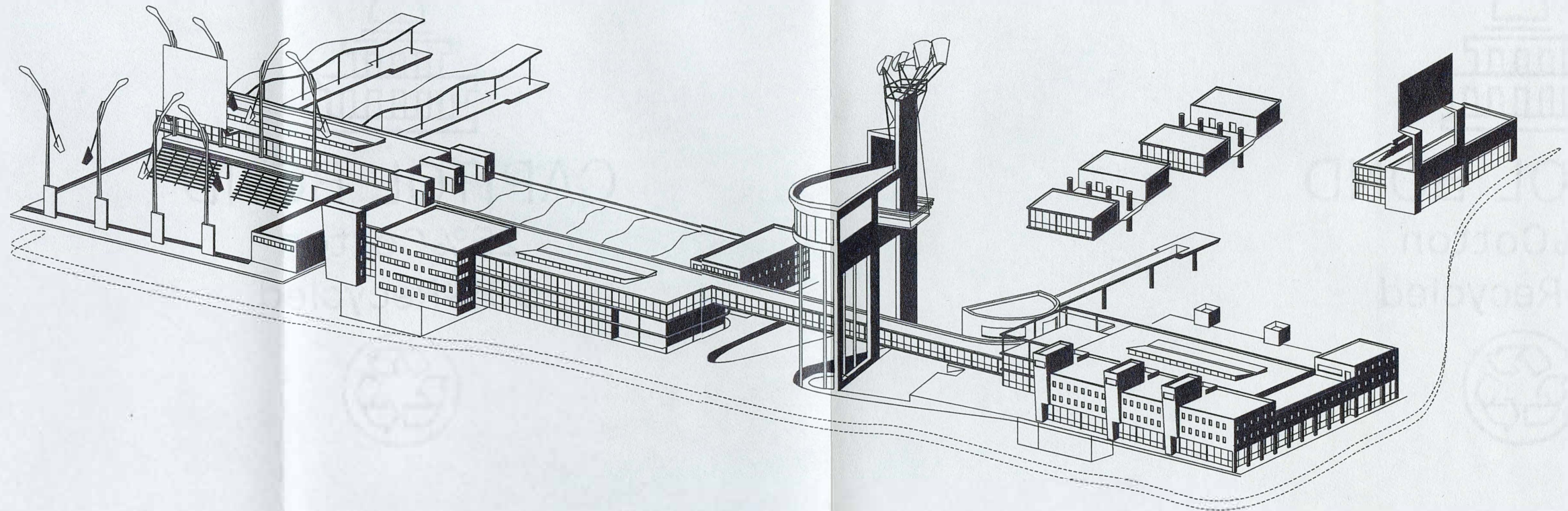


Fig. 8.11 Axonometric
Source: Author

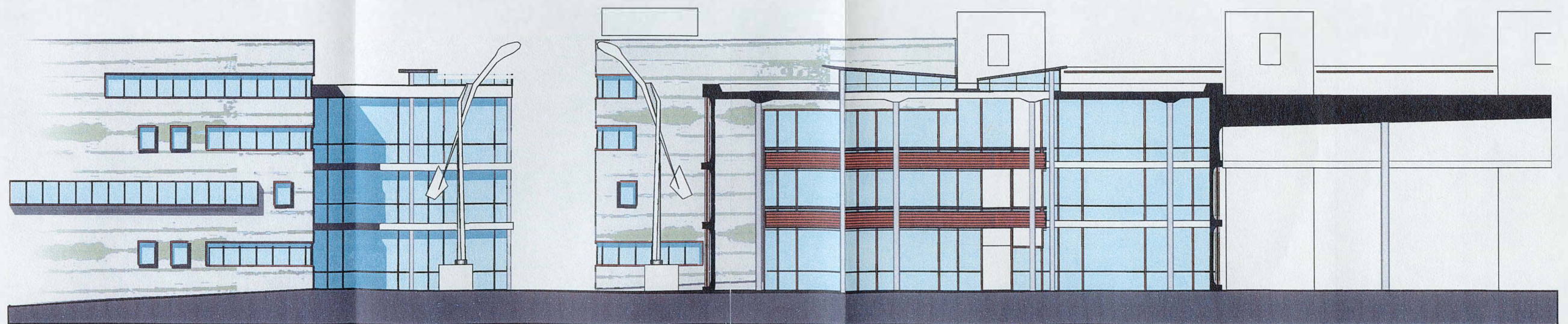


Fig. 8.12 Partial section / elevation
Source: Author

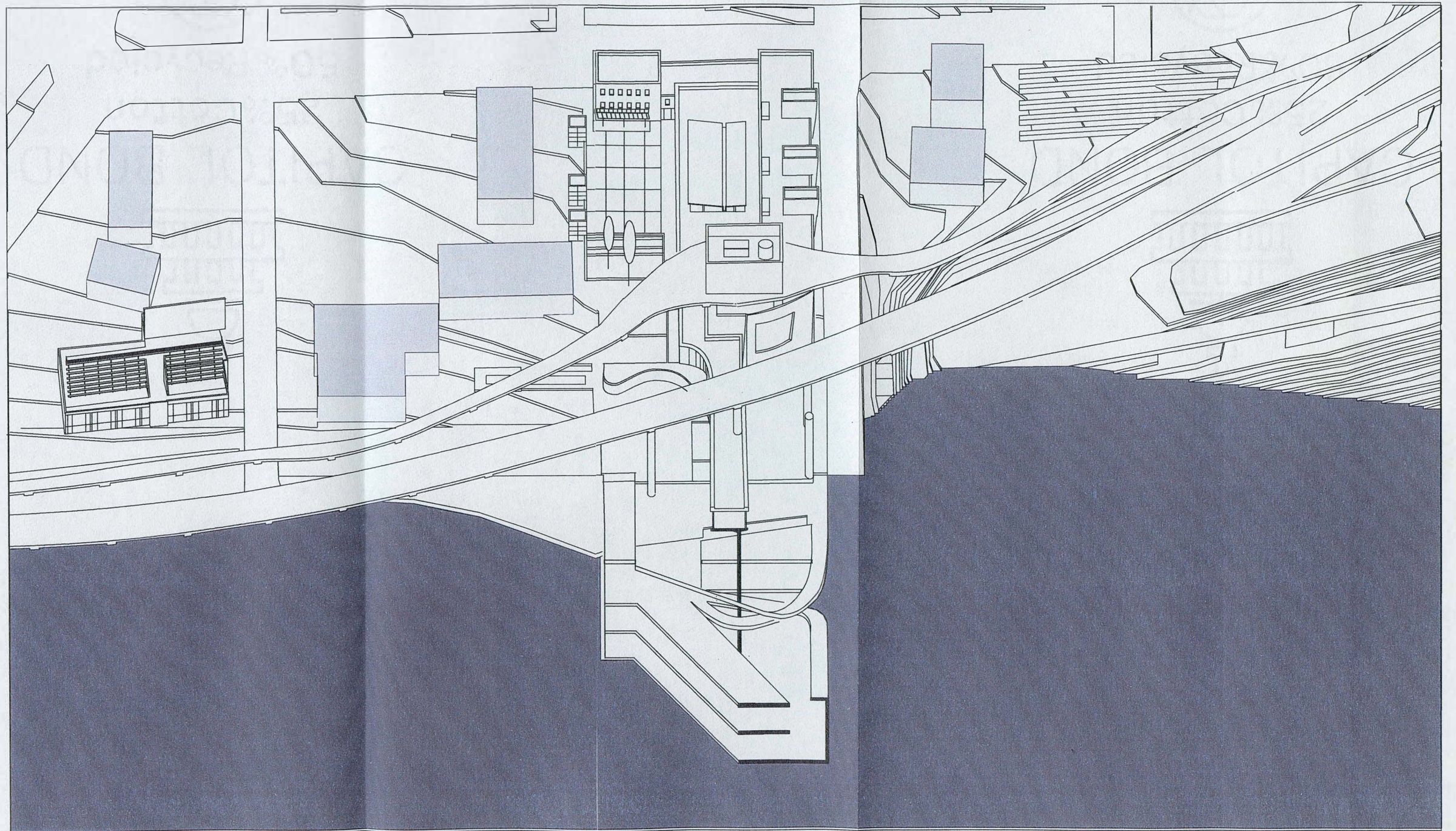
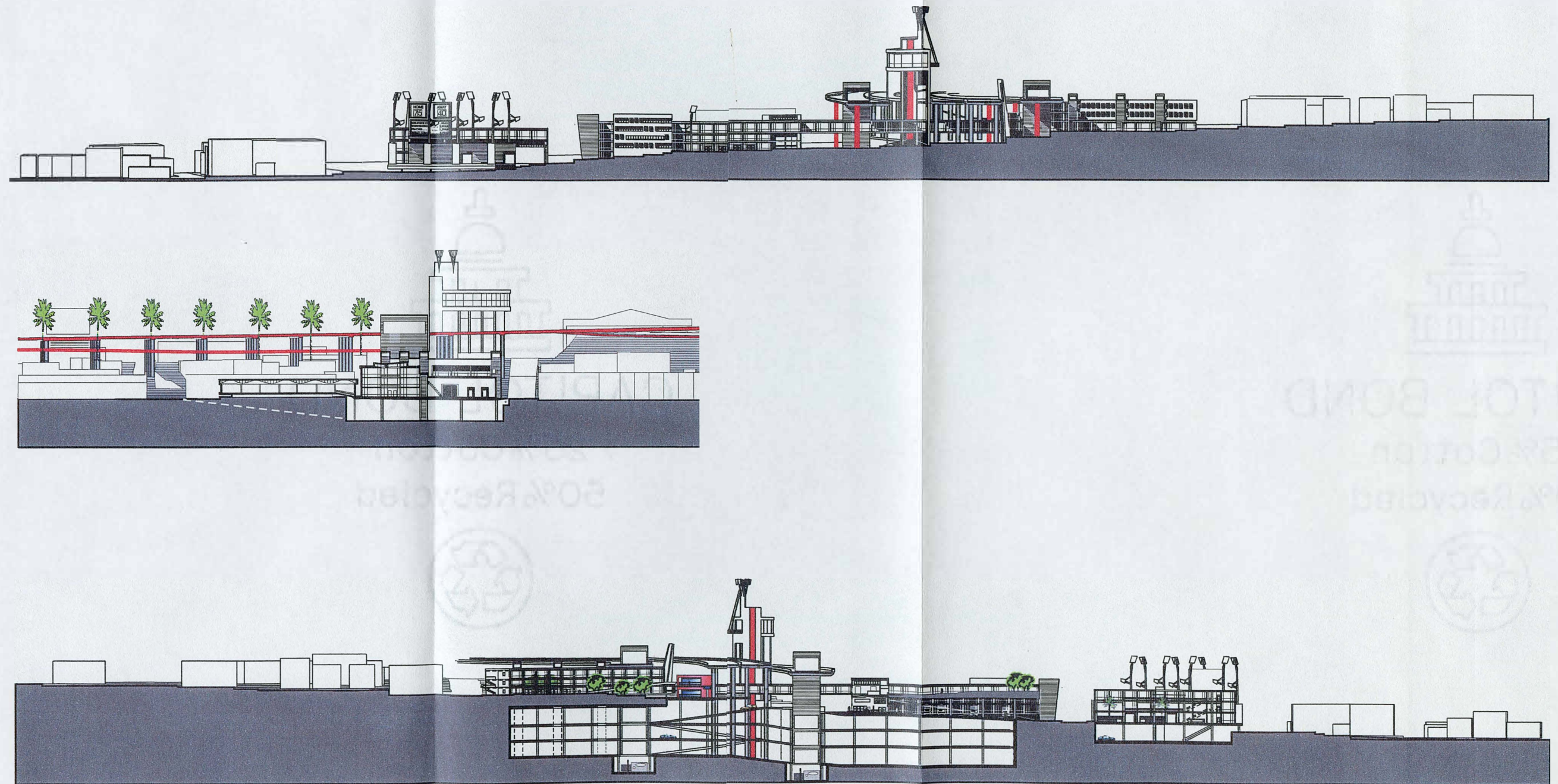


Fig. 8.13 Frontal axon / section
Source: Author



Figs. 8.14 Sections
Source: Author

BIBLIOGRAPHY

Andreotti, Libero. *Situacionistas arte, política, urbanismo*. Barcelona: Museu d'Art Contemporani de Barcelona. 1996.

"Art of infrastructure." *Arcade*. Sept. 1998. 4-34.

Borden, Ian. "Critique of Lines." *Architectural Design*. June 2001. 6-8.

Boyer, Christine. *The City of Collective Memory*. Cambridge: MIT Press. 1994.

Burns, Carol. *On Site: Architectural Preoccupations*. New York: Princeton Architectural Press. 1991.

Cairns, Robert. "Infrastructure Development." *Asian architect and contractor*. June 1998. p.68-74.

Chase, John, et al. *Everyday Urbanism*. New York: The Monacelli Press. 1999.

Chi, Lily. "Boundary Studies." *Journal of architectural education*. November 1999. 115-121.

Collins, Peter. *Changing Ideals in Modern Architecture*. Montreal: McGill-Queens University Press. 1965.

Corner, James. *Recovering Landscape*. New York: Princeton Architectural Press. 1999.

Cosper, Darcy. "Casting New York." *Metropolis*. June 1998. 48-50.

Davey, Peter. "Infrastructure Projects." *Architectural Review*. April 2000. 105.

"Die Oresundregion: Special Feature" *Bauwelt*. March 2001. 14-75.

Ducham, Steve. "Green infrastructure." *Urban Land*. March 2000. 112.

Easterling, Keller. "Interchange and Container." 30 *Perspecta*. 1999. 112-121.

Easterling, Keller. *Organization Space: Landscapes, Highways and Houses in America*. Cambridge: The MIT Press. 1999.

Foucault, Michel. "Of Other Spaces." *Diacritics*. Spring 1986. 22-27.

Hendrick, Daniel. "Over the Edge." *City Limits*. Sept./Oct. 2001. 6-7.

Jackson, J.B. *Discovering the Vernacular Landscape*. Cambridge: MIT Press: 1978.

Jappe, Anselm. *Guy Debord*. Berkeley: University of California Press. 1993.

Ichniowski, Tom. "Infrastructure: designing mitigation." *Architectural Record*. August 1997. 34-52.

Kay, Jane. "Los Angeles Builds on Transportation." *Architectural Record*. August 1993. 35-99.

Knoxville Metropolitan Planning Commission. *Site Data / Topographical Map*. October 2001.

Knoxville Metropolitan Planning Commission. *Aerial Photograph*. October 2001.

Krens, Thomas. *Premises*. New York: Guggenheim Museum Publications.
1998.

Kung, Moritz. "The Public Eye." *Archis*. May, 1993. 31-34.

Kunsthalle Basel. *Rachel Whiteread*. Basel: Schwabe & Co. . 1994.

Lui, Henry. "Infrastructure architecture." *Chien Chu*. May, 2000. 86-89.

Lukacs, George. *History and Class Consciousness*. Cambridge: The MIT Press.
1974.

Lynch, Kevin and David Appleyard. *The View from the Road*. 1964.

Morrish, William and Catherine Brown. "Putting Place Back in Architecture."
Landscape Architecture. June 1995. 50-53.

Neutelings, Wilhem-Jan. "Reconnaissance in Wonderland." 1986.

Paganelli, Carlo. "An Urban Machine." *ARCA*. December 1998. 89.

Pavia, Rosario. "Infrastrutture, urbanistica, architettura." 38 *Metamorphosis*.
1998. 59-62.

Pawley, Martin. "Transport is the answer." *World Architecture*. March 1995. 12.

Rashid, Hani and L.A. Couture. *Asymptote: Architecture at the Interval*. New York: Rizzoli International. 1995.

Richter, Dagmar. "Flow versus boundary: Zago's Kansai Library." *71 Daidalos*. 1999. 86-91.

Romito, Lorenzo. "The Surreal Foil." *Architectural Design*. June 2001. 20-23.

Rossi, Aldo. *The Architecture of the City*. Cambridge: MIT Press: 1982.

Rowe, Colin and Fred Koetter. *Collage City*. Cambridge: MIT Press: 1978.

Salvesen, David. "Resurrecting Dead Plats." *Urban Land*. December 1996. 17-18.

Schivelbusch, Wolfgang. *The Railway Journey*. Berkeley: University of California. 1977.

"The Station not the Airport." *Architectural Review*. June 2000. 44-45.

Struijjs, Maarten. "The body as a metaphor for urban infrastructure." *Via architectura*. July, 1999. 56-59.

Tschumi, Bernard. *Architecture and Disjunction*. Cambridge: MIT Press. 1994.

Van Dijk, Hans. "Architecture dissolved in infrastructure." *Archis*. November 2000. 10-21.

Whitehead, Don. "Malfunction Junction - Let's Call it a Treasure." *Knoxville Sentinel*. March 28 1978. A3.

www.gianttravelcenter.com. "Amenities." October 2001.

VITA :

After a graduating from the University of Denver in 1991 with a degree in Public Affairs and International Studies, Brax worked for the Santa Fe based think-tank North American Institute (NAMI). Interest in carpentry and area growth led to a career change, a technical degree, and relocation to Taos. After two more years of work in northern New Mexico and three more in eastern Tennessee he enrolled at the University of Tennessee. Brax graduated having displayed works in the Ewing Gallery, as well as earning merit scholarships and awards, including the Henry Adams Fund. His professional goals are undecided, but he is pursuing employment with offices in Houston TX and Washington DC.