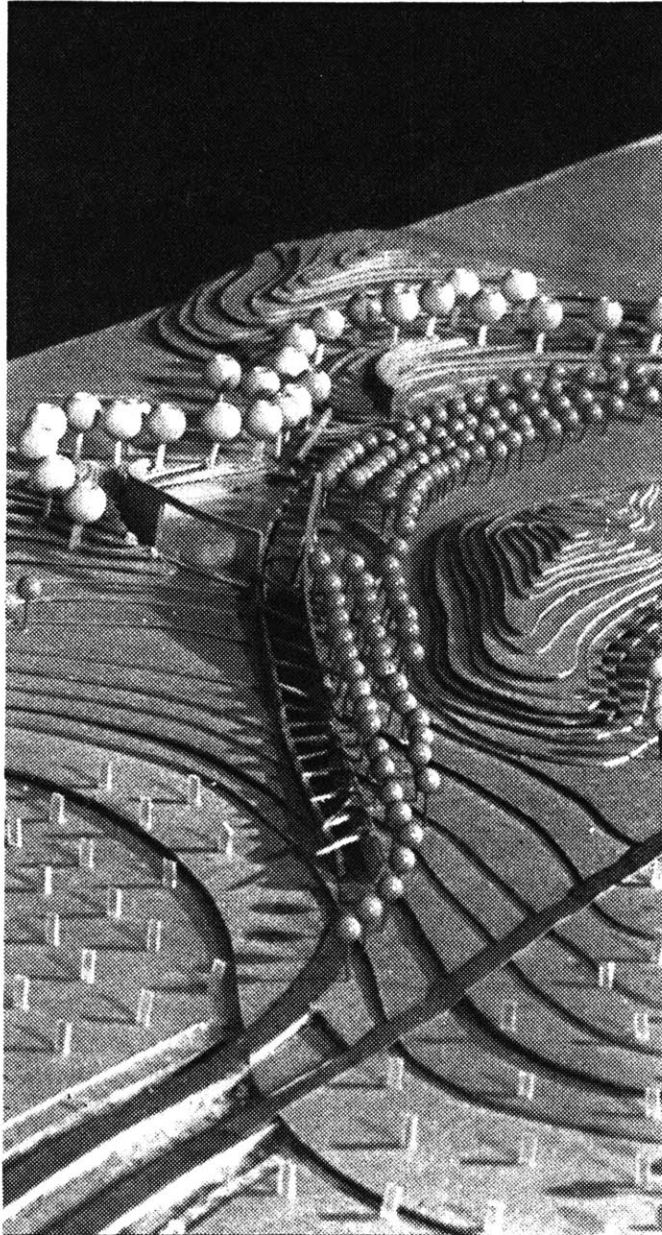


1



HIGHWAY FUSION

by
Wael Abu-Adas
 B. of Design in Architecture
 University of Florida - May, 1988

SUBMITTED TO THE DEPARTMENT OF ARCHITECTURE
 IN PARTIAL FULFILLMENT OF THE REQUIREMENTS OF THE DEGREE
 MASTER OF ARCHITECTURE
 AT THE
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY
 JUNE 1991

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HIGHWAY FUSION

by

Wael Abu-Adas

Submitted to the Department of Architecture on 10 May,
1991

In partial fulfillment of the requirements for the degree of
Master of Architecture

ABSTRACT

The objective of this thesis is to investigate a design methodology that utilizes both visual perception and movement as determinants to design. We perceive and understand architecture and its context by moving around it and walking through it, therefore our experience of architecture is contingent on a sequence of visual and spatial events over a given time frame. Yet when we design, we seem to be primarily concerned with the relationship of static things and places to each other, with little consideration as to how we will perceive those relationships through movement.

The context with which I have chosen to work is the highway, where speed and time play important roles, and where movement as a basis for design thinking would be most appropriate. This thesis looks at the highway as movement through space and as an experience involving an enigmatic relationship among things and places as the driver moves through them. What is sought is a sequential visual experience consisting of landscape areas, scenic views, orientational landmarks and visual events all of which work together to present us with a full and meaningful image and experience of the context we are traversing. The three primary elements of the design are the perception of spatial organization, the sequencing of events, and a scale based on time.

The project is a welcoming center to Florida that acts as a "gateway" and an initiating procession into the Sunshine State. This "gateway" is an intense experiential journey that lasts just over three minutes. Its form derives from an exploration of landscape as an imagery for highway architecture, and of the relationships between landscape and the road. It is my attempt to incorporate the highway

into the landscape, rather than imposing the highway on the landscape.

This highway project is intended as a metaphor or model for further exploration into visual perception and movement that may be applied in other architectural designs. I am presently also working on computer animation, to simulate the driving experience through the design. Please check with my advisor for a copy of the video.

Thesis Advisor: Jan Wampler

Title: Associate Professor of Architecture

Thesis Critics and Readers: Edward Levine and Hashim Sarkis

Titles: Professor of Visual Arts and Lecturer of Architecture respectively.

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1. A chaotic architectural strip greets motorists to Fresno, CA.

BACKGROUND

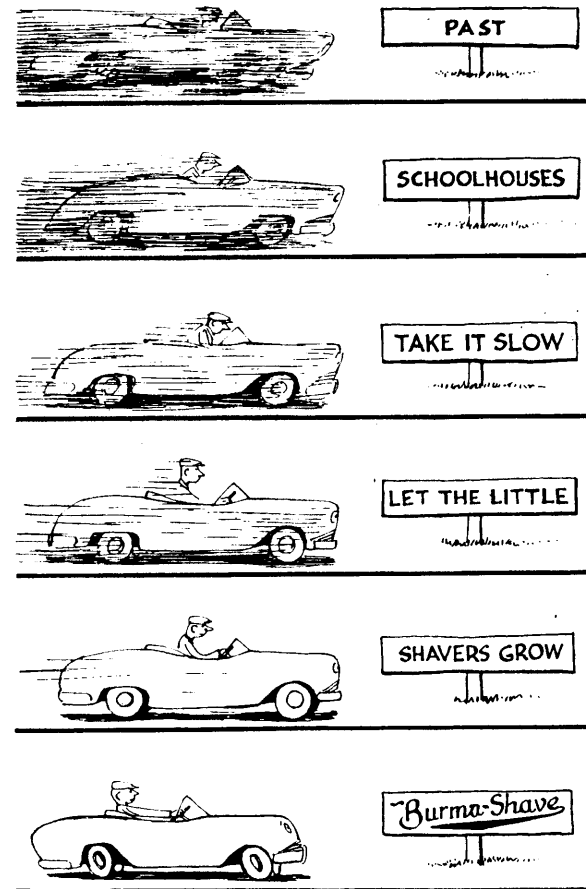
I was asked many times about my thesis topic and why it interested me, and every time my response was different. This reflects the way the thesis evolved, in a very non-linear fashion: In fact, it has continued to evolve till the very end. The complexity and richness of the subject amazed me as I searched deeper and deeper into it, and I wish I were able to address all the issues that arose.

I began by looking at the present confused state of highway architecture and the context in which it sits. The highway environment has become a very familiar terrain to many of us as we spend more and more of our time traversing it, yet despite its centrality in our lives, I felt this environment has frequently been allowed to run its own course unchecked, leaving us with a brutal automobile landscape of great distances, high speed, and an architectural experience that lacks order and meaning. It seemed strange to me that we invest very little design input into this medium, compared to other built environments, despite its important role in our daily activities.

An intense research cycle led me from looking at the history of the highway, to the development of roadside architecture and commercial signage, to regional and vernacular differences between states as one drives through them, to perception of the road through motion, and to a detailed look at the differences between the driver's and the front passenger's perception, and between theirs and the rear passengers'. There were many issues that arose throughout this cycle, but because of the short time frame of a semester, I have focused on the highway architectural imagery that this design could take on, and how the spatial and experiential sequences will be perceived by the front driver.

The thesis is organized into four parts:

- 1- A discussion of the relationship between man, car and the highway.
- 2- The development of various imageries of roadside architecture.
- 3- The process and design.
- 4- Design findings and notes on perception of movement and space on the highway.



2. A Burma Shave sign sequence that employed a sequential visual experience to relay information to the motorist.

Acknowledgment

Thanks to:

Jan Wampler, my advisor, for his direction, and for sharing his personal stories of highway driving with me.

Ed Levine, my critic, for his support and guidance in generating the computer studies and for introducing me to a new design thinking through the visual art classes.

Hashim Sarkis, my critic, for his direct criticism and for introducing me to the exciting field of Visual perception.

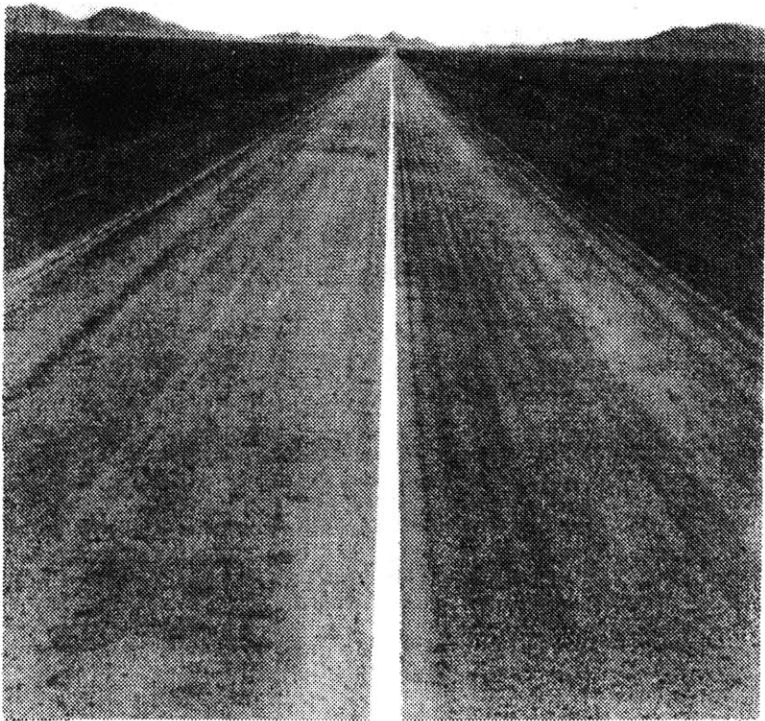
Elizabeth Reed, for her support and help in making this thesis more coherent.

"Thesis Row" for their friendship and support.

Tomasz Nagler, my roommate for his valuable help and patience.

Emily Huang, my officemate and long-time friend for making this semester an unforgettable one. We did it!

Dedicated to my family for their infinite and loving support.

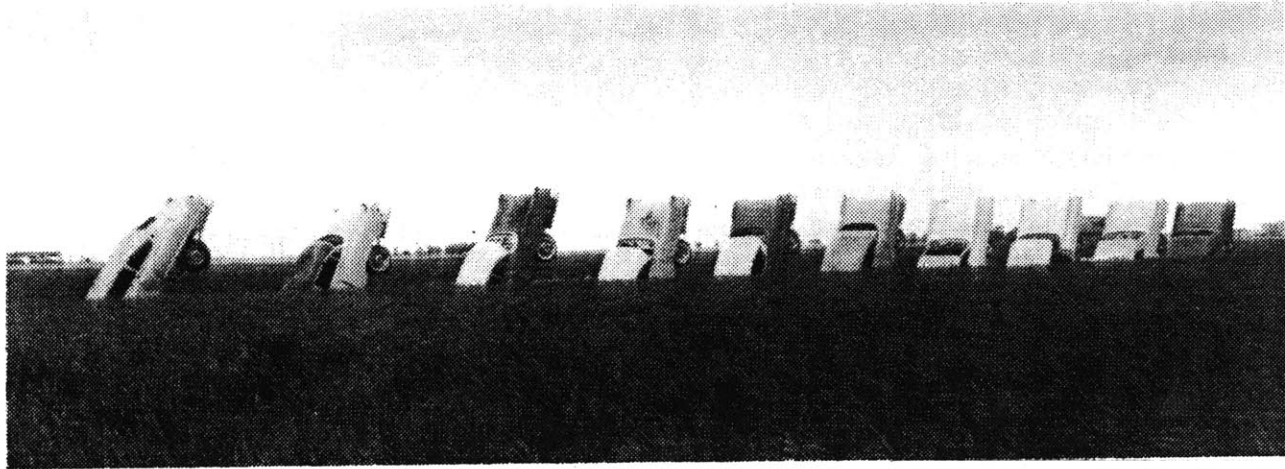


3.

MAN, CAR, AND THE OPEN ROAD
An American Phenomenon

"The road runs straight across the open plains, toward a bright horizon where mountains rise, squeezing the white stitching of its centerline together in a caricature of perspective. The sun is setting but heat still shimmers from the grey asphalt, warping the horizon, and the sky which nearly fills the windshield is already waxing rosy beneath a higher blue. A telephone pole, crossed with four or five arms stands out against the sky like a musical staff marking the bare sound of rushing wheels."¹

This description immediately conjures up images of the simplest and straightest open country road; a road with which we are all familiar, either having experienced it personally, or having read about it and seen it in movies. It is an image extracted from the heart of America's pages, a road that all men and women journeyed either physically, vicariously, or metaphysically. The automobile



4. *The infamous Cadillac Ranch,
A tribute to Interstate 40.*

and the open road, provide a unique medium through which man may discover the country and, in turn, himself. Highway boosters argued that the only place to find real Americans is on the road. In 1939, F.D. Roosevelt advised a young man to learn about the country by driving cross-country:

"Take a second-hand car, put on a flannel shirt, drive out to the coast by the northern route and come back by the southern route... Don't talk to your banking friends or your chamber of commerce friends, but specialize on the gasoline station men, the small restaurant keeper, and farmers you meet by the wayside, and your fellow automobile travellers".

The road quenched man's desire for mobility and change as it opened the whole frontier to his will. In 1934, James Agee, a young staffer of Fortune magazine became captured by the American restiveness shown in the roadside culture, as he was preparing an article on "The Great American Roadside":

"... a restiveness unlike any that any race before has known... we are restive entirely for the sake of restiveness. Whatever we may think, we move for no better reason than for the plain unvarnished hell of it.

"... so God made the American restive. The America in turn and in due time got the automobile and found it good. The War exasperated his restiveness and the Twenties made

him rich and more restive still, and he found the automobile not merely good but better and better. It was good because continuously it satisfied and at the same time greatly sharpened his hunger for movement: which is very probably the profoundest and most compelling of American racial hungers. The automobile became a hypnosis..."

These open country roads, like all American roads, offered a literally concrete expression of the central American drives - freedom of movement and change. Our highways are more than a means of transportation. They are as close as anything to a national public space. The Romans for example had their roads proudly displayed on gold hammered maps in the Forum. For Americans, our roads themselves, are the Forum; they are a national promenade. They are America's *Main Street*.

The roads, as public spaces of the American landscape, became places for us to own and conquer. Driving across the open frontiers, where the receding horizon becomes our most steadfast goal, we remember the day's events

and then forget, as we are released into a state of buoyancy, building and constructing our dreams as we traverse the highway landscape. The vast open spaces, monotonous landscape and the uninterrupted driving cycle allow for the breeding of imaginative visions, and lead us into a state of daydreaming. Because we are relatively physically inactive while driving, beyond looking at the road, and we are unable to change our stationary seated position, we are more likely to lapse into our mind and wander subconsciously. The thesis considers this issue and tries to build upon it, by creating an almost surreal environment that can stimulate and intensify our imagination. A metaphor for the design project for example is the "birth" and "initiation" into Florida, and the design itself attempts to create and deliver that sensation to the motorist. This will be fully illustrated in the chapter on design.

The road and automobile have provided us with an atmosphere conducive to the expression of our feelings, hopes and desires. They also provide a place where we seek to relieve ourselves, for when we are depressed and

frustrated, the open road becomes our escape route, and subsequently a source of comfort. We pack up and go, driving into the wilderness of the night with no specific location in mind. The sound of the engine humming, the wheels turning, the cold breezes blowing, and the tape deck playing all conspire to soothe our souls. In this venture where we seem to leave everything behind and drive into the unknown, away from our stagnant problems; we search for solitude within ourselves and our machine, soaring through the highway landscape so that no place or time can hold us back. This notion of driving aimlessly in search of comfort can be tapped even further and exploited in design, to create an almost dream world which we can seek out and lose ourselves in.

We see the automobile as an extension of ourselves: and it has been termed our "castle on wheels" because of the high value we attach to it. It has become a status symbol and an indicator of style, and we even tend to identify people's character with the type of car they drive: eg. we consider a person with a Cadillac to be classy, while the owner of a jeep as macho and tough). The significance of

the automobile goes far beyond its practical functions as a transportation vehicle.

With the gas tank full and the sun deck pulled down, we cruise the roads as if we own them. This sense of ownership is understandable, logical even, because of the nature of the highway as a public domain. Many of us take full advantage of the public character of our highways and treat driving on them as a recreational activity, as we do being in public places like parks and playing fields. Therefore it is not surprising that many American families spend many of their vacations on the highway traveling the country from coast to coast and state to state. Driving on the highway is undoubtedly an integral part of the American lifestyle.

¹ Phil Patton - "Open Road" Simon and Shuster, (1986) pp.11



5.

ARCHITECTURAL IMAGERY ALONG THE HIGHWAY

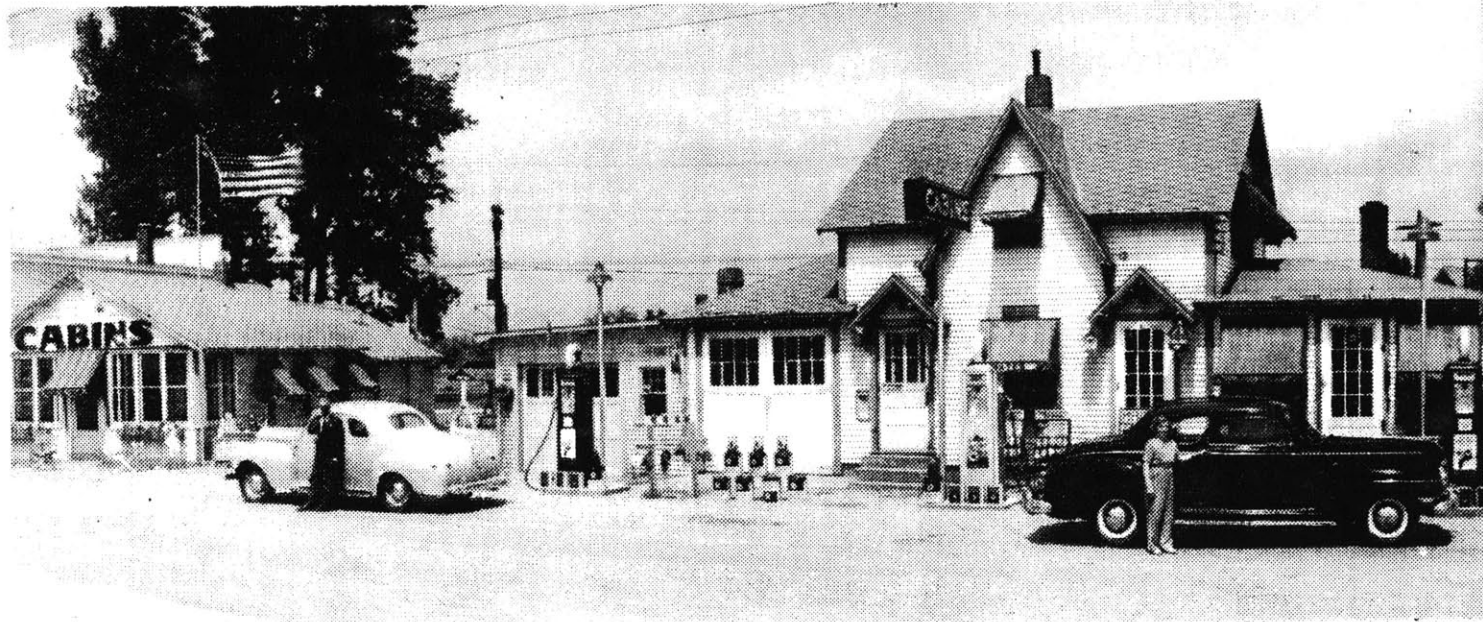
Shortly after World War 1, entrepreneurs saw an opportunity to capitalize on a new aspect of the American lifestyle - the prevalence of the automobile. The movement and autonomy which cars provided enabled businessmen to reach out and lure motorists with their services and products all over the country, on the new road network, instead of confining their advertising to the top of city-buildings that housed the actual products. The ornament and imagery of roadside buildings that sprung up, as will be discussed in greater detail later, were very much a product of the values and priorities of the age in which they were built.

A common element throughout the various imageries in the designs which developed was an intense level of commercialism. Because of the speed at which the viewer passed by, the buildings had to visually shout for attention - "Slow down, Pull in and Buy!"

The automobile had prompted a marriage of architecture and advertising, and with the opening of vast expanses of the roadside, it provided the impetus for this commercialization, that we still see today. It had stimulated a commercial architectural revolution and a new kind of landscape. J. B. Jackson, a landscape theorist commented on the development of the highway: "*Never before had there been so total and dramatic a transformation of a*

portion of the American landscape, so sudden an evolution in habits, nor such flowering of popular architecture."²

The response to the proliferation of American roads was the creation, along the roadside, of a crazy, funny carnival of culture - temporary architecture, architecture of fantasy, abbreviations and puns, art combining surrealism, pop and cuteness. What follows is a description of the various imageries that developed.

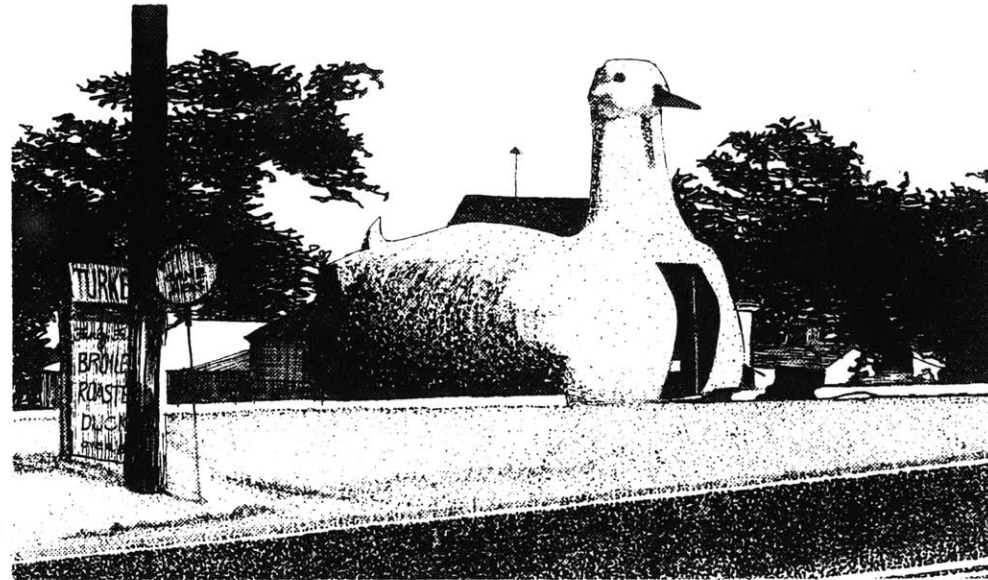


Domestic Imagery

During the interwar years, the most prevalent form along the road was that of a home or a cottage. The concept of home held deep-rooted symbolic connotations of security and stability. This was very important given the turbulent atmosphere engendered by the First World War, and feelings of uprootedness and instability created by the Great Depression. This was also the wacky era of the Roaring Twenties, of cigarettes, flappers and speakeasies, which prompted a strong societal longing for tradition - a

return to normalcy. In the decade following WW1 "normalcy" and "home" were virtually synonymous, and therefore the image of home was ideally suited for exploitation by the roadside merchant. Places like "Kozy Kottage" and "Bungalow Tea Room" were erected everywhere. In some cases the architecture was overdone with the use of oversized roofs, non-functional shutters and dormers and extra large chimneys. The entire composition was usually done on a diminutive scale, to cut costs and to

6. Gas stations and restaurants adopt the Domestic Look, thus creating a comfortable and inviting atmosphere.



7. The Big Duck, probably the most publicized Mimetic building in the country.

Mimetic Imagery

make it look charming and quaint. (This technique has been exploited to its fullest by Walt Disney in his theme parks). The architecture was intended to be inviting, like a ginger bread house in a fairy tale.

By the late 1920's the roadside merchants developed another strategic method for selling their products, the lure of the bizarre. Motorists found themselves mesmerized by the sight of large watermelons, cactuses, dogs, and ducks. Buildings began to reflect and even take the form of the product that they sold, or were otherwise so outrageous that drivers could not help but slow down to marvel at the structures. This type of imagery was labeled "mimetic architecture" and in French "architecture parlante"

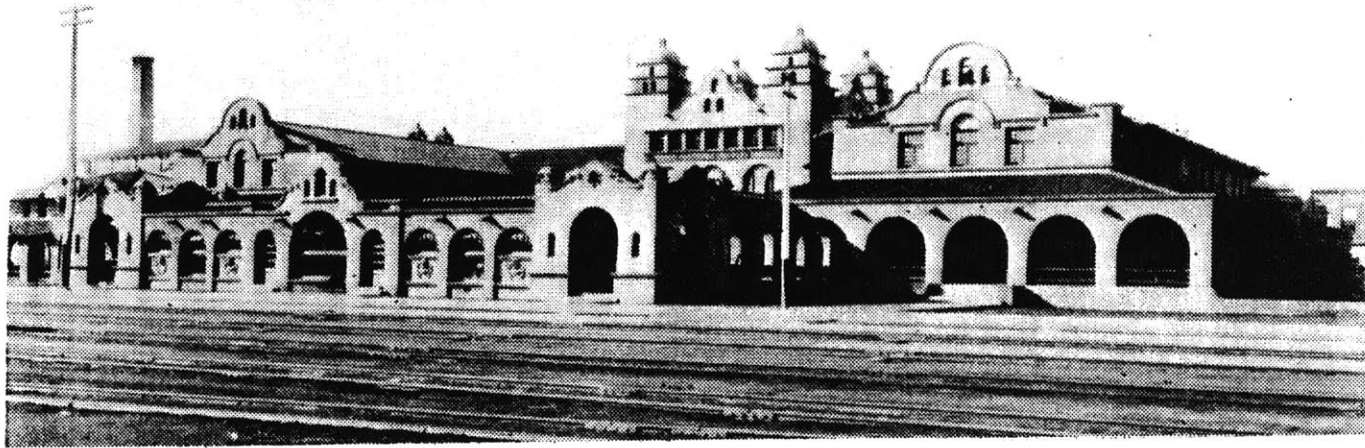


8. A Dog refreshment stand of the 1930's along Route 99.

(speaking architecture), or simply “duck” architecture after the famous roadside duck built in Long Island in 1931. This was not a new form of expression however. It has its roots in the 14th Century Main Streets of the Middle Ages, where the tooth puller was represented by a large tooth the size of a jug, and a glover advertised his services by hanging a huge glove outside, with each finger big enough to hold a baby.³

These structures were used in amusement parks and later on the road as promotional lure, and were associated with recreation and spending money. Another example of this

association is Miniature Golf, with its eclectic array of dinosaurs, godzillas and Eiffel Towers adorning the side of the road. What was created was basically a unified commercial package of architecture and advertising. There was now a total synthesis of building and sign that was compelling and effective in the quest to attract, hold attention and sell.



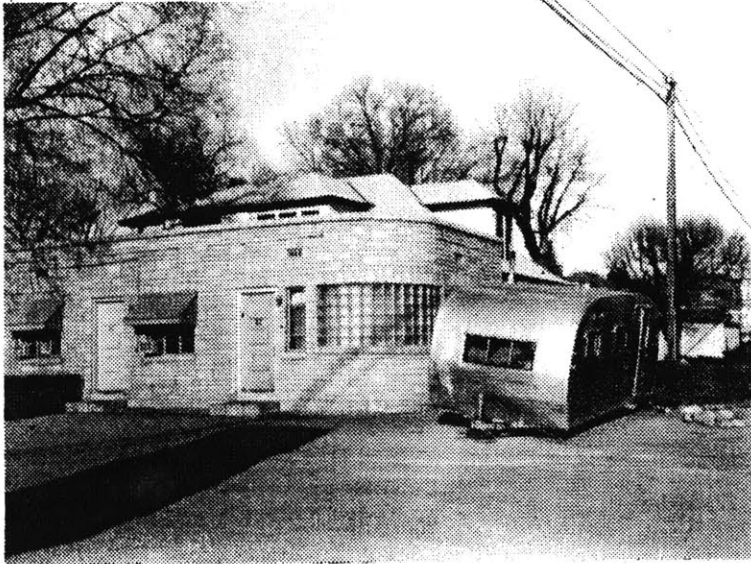
9. A Mission Revival-style hotel in Albuquerque.

Regional and Historical Imagery

Simulating associations with and capitalizing on places or geographic regions was yet another commercial technique sought by entrepreneurs. The objective was to play up or romanticize ideas or notions that travelers held of a certain place, and thus to tempt them through the use of stereotypes. The tourist usually had strong notions of what to expect in certain parts of the country, such as cactus in Arizona, seafood in New England and oil rigs in Texas. Businesses anticipated these pre-conceptions and

sought to reinforce them with an appropriate image. Thus were created places like "South of the Border" (an enormous rest stop in South Carolina), Colonial Motels in Williamsburg, and pagoda-like McDonalds in Chinatown.

Like all other types of imagery, they were literal rather than abstract in concept, and came to be certified within society as acceptable visual triggers for expected emotions.



10. Streamlined motel and trailer

Moderne Imagery

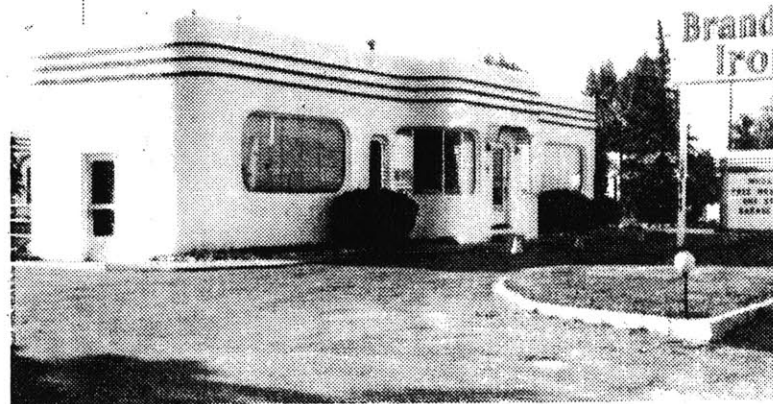
Beginning in the 1920's, and all the way through the 1950's and early 1960's there was a search for a style that was not rooted in antiquity or in interpretations of the Beaux Arts and Neoclassical etc., but rather an imagery that would express the fast-paced technological excitement of the times. From that search evolved several systems of design and decoration which were labeled Art Deco, Zig Zag Moderne, Streamline Moderne and "Cosmic" Architecture (which coincided with man's discovery and exploration of outer space).

Art Deco evolved from a desire to replace classical details with machine-like ornaments, and to implement them in repeated fashion, analogous to the assembly line production of a factory. The Art Deco imagery on the roadside was limited, however, to a few gas stations and car showrooms. A more prevalent style manifested in a greater share of building types was the Streamline Moderne. This style of imagery differed from Art Deco in that the latter was an application of machine-like aesthetics, while the former developed from the process of designing and selling the machines themselves. The

11. Curvilinear motifs of the Streamline Moderne is added to the vocabulary of the motor court.

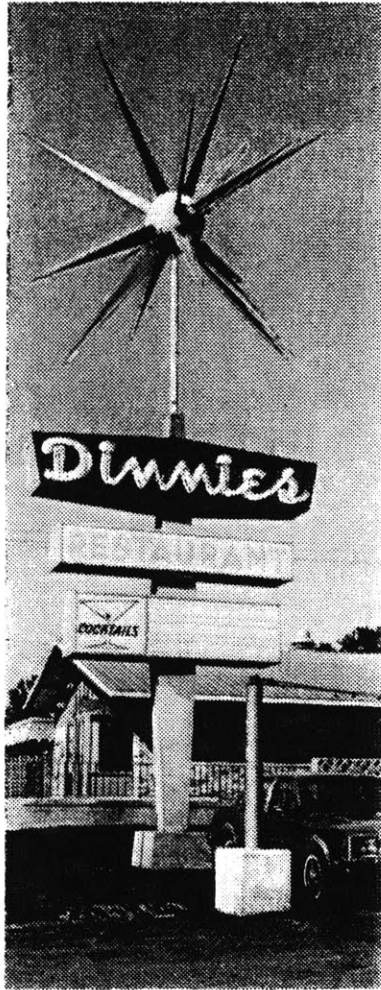
aesthetic appearance of the object was treated as equally important as how well it worked, in order to lure more customers to buy it. This was a very important commercial approach especially during the Great Depression when demand decreased and sales plummeted.

Industrial designers of the Streamline Moderne style were fascinated with an essential characteristic of machines; motion through the reduction of friction. They were influenced by forms that expressed movement, from the rounded corners and undulating facades of the European Modernists such as Eric Mendelsohn, to the tear-drop cross section of airplane wings. The Streamline Moderne style conjured up the hope of future economic prosperity, and even the term "streamlined" became a synonym for modernity. (The bright, curving, smooth shapes may have subconsciously appealed to a society in the throes of economic turmoil, and many businesses played up that association to sell their products). Merchants for example, were told to streamline operations, and travelers were welcomed aboard "Streamliners", the new sleek trains



zooming along the railroads. Although the Streamline Moderne originated as a futuristic wrapper for products, it soon found its place as a prominent form of architectural expression. Buildings designed with rounded corners, built with shiny, new materials and decorated with flowing lines suggestive of movement, started to appear everywhere. By the late 1930's, the streamline imagery began to permeate the roadside, as corporations sought industrial designers and architects to design prototypes for their outlets.

In the 50's and early 60's when man ventured into outer

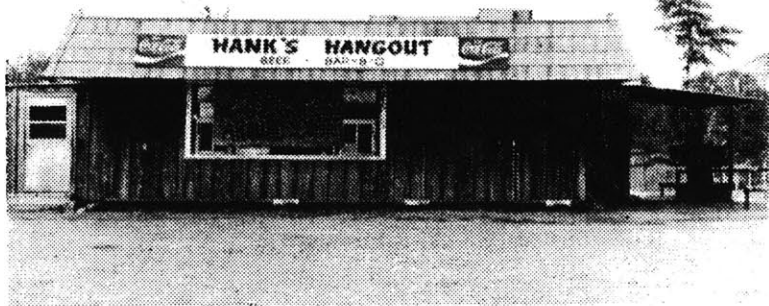


12. Satellite forms became a common roadside motif after the launching of Sputnik in 1957.

space and landed on the moon, the frenzy caught the rest of the nation and a new genre of popular imagery, inspired by science and technology was born. Shortly after the launching of Sputnik in 1957, shining globes bristling with antennae, an attempt to resemble satellites, began to

adorn diners and motels.

However after three decades of bombardment with advertisements and with architecture declaring "new is better", the public was losing faith in newness for its own sake. There was a disenchantment with the "world of tomorrow" that had been played up during the Great Depression and manifested after World War II. Books that revealed the darker sides of progress were beginning to influence our evaluations of our environment. In The Death and Life of Great American Cities (1961) for example, Jane Jacobs, a planning critic, decried the levelling of large portions of American cities to make way for superhighways and high-rises sitting in a sea of rubble-strewn grass.⁴ Architect Peter Blake in his book God's Own Junkyard (1964) lamented that the outskirts of the nation's cities had become "interminable wastelands dotted with millions of monotonous little houses or monotonous little dots and crisscrossed by highways lined with billboards, jazzed up diners, used-car lots, drive-in-movies, beflagged gas stations and garish motels."³



13. Unpainted board-and-batten siding, and mansard roofs are hallmarks of the Environmental Look.

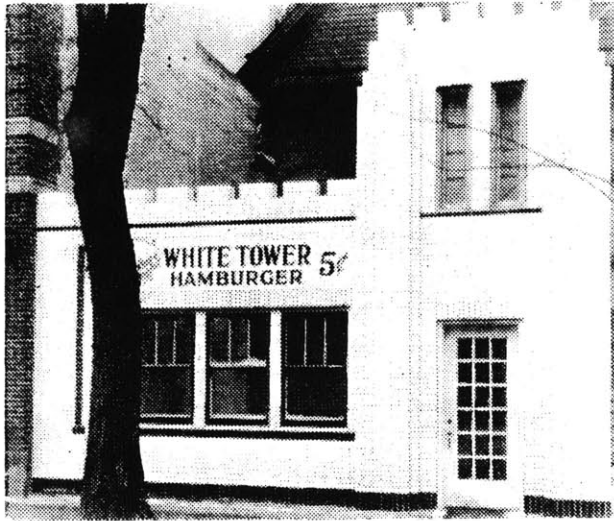


14. Kentucky Fried Chicken changed their Modern striped roofs of the 50's, to a more environmentally pleasing earth-tone metal mansards.

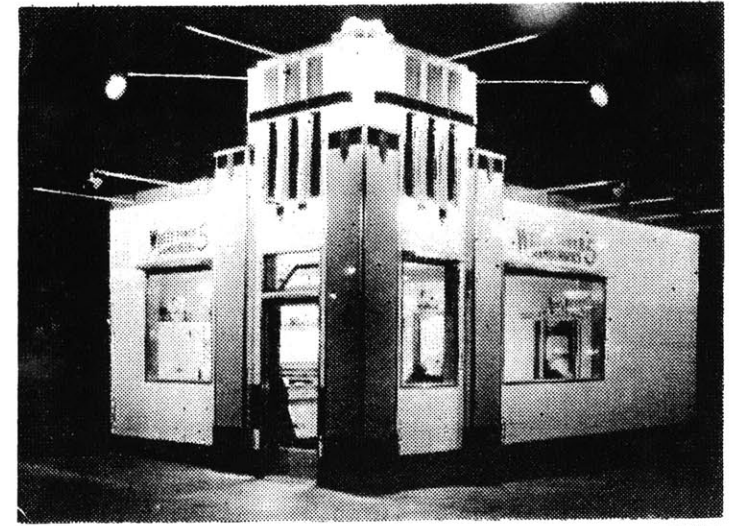
Beginnings of the Environmental Look

Because of this disenchantment with the “world of tomorrow” and with all the destruction it had wrought on our cities and towns, several measures were taken to rectify the problems. Public policies gradually began to address the complex issues of environmental pollution and urban preservation, through measures, such as the passing of the Environmental Protection Act of 1969. Programs were set up for cleaning the country’s rivers and streams, and combatting air and noise pollution. At times, however, the solutions seemed too simple and even ugly, as civil

engineers resorted to building walls alongside the highway to insulate adjoining neighborhoods from the noise of traffic. Communities may have been better protected from noise, but in its place they got a brutal landscape alongside the road. Other interventions included installing utility cables underground and banning billboards from interstate highways. At a White House Conference on National Beauty held in 1965, Lady Bird Johnson, the chief organizer of the conference, called for “creating pleasing vistas and attractive roadside scenes” to replace “endless corridors walled in by neon, junk, and ruined landscape”.⁶



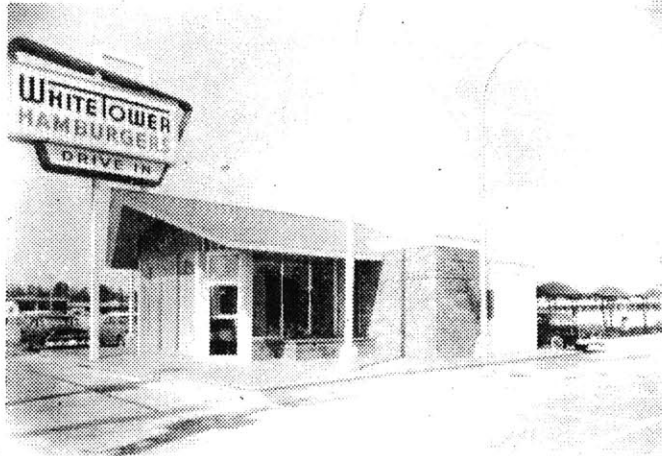
15a)



16b)

Public discontent with the highway strip went beyond criticism of its chaotic, confusing and dilapidated state, to the underlying values of the postwar era. From the beginning, roadside commercial architecture had mirrored the longings and preferences of the population at large. The last manifestation of this in the Moderne style seemed to encourage the nation to "hot-rod" over the landscape, pollute the environment and exhaust valuable resources. The public had now turned against this vocabulary for wayside vending, rejecting, criticizing and denouncing it.

Once again, entrepreneurs who had helped create this mess with their gas stations, motels and fast food outlets, picked up on the shift in public opinion and aesthetic preference. The time had come for them to develop a new vocabulary that could convey a softened presence, and mute the blaring visual signs of the 50's and 60's; one that would be perceived as compatible with the environment rather than confrontational, or at its worst, destructive. The most common feature of this visually "quieter" style was the mansard roof, which to this day continues to be a popular element of architectural vocabulary. The new mansards proved extremely versatile



17c)

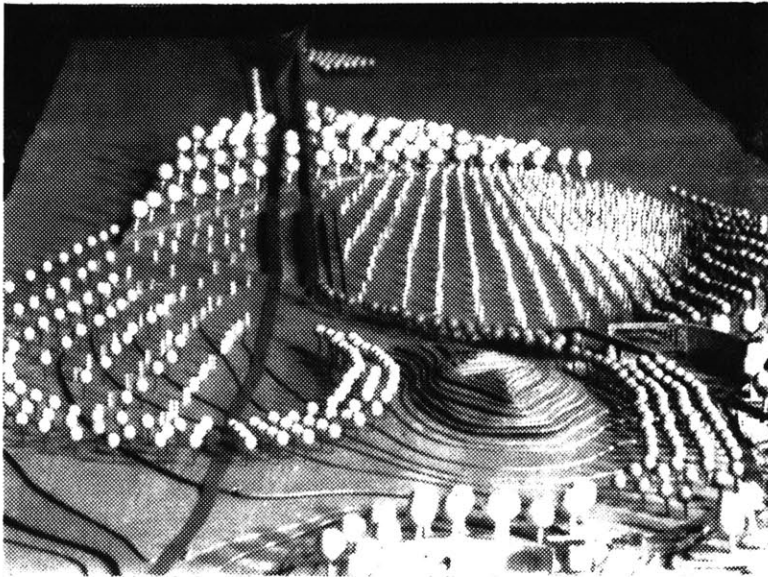
disguises for loud visual statements of roadside vending. They were included in all types of building design, from restaurants to banks, gas stations to supermarkets; and were also applied as instantaneous visual cosmetics to existing roadside buildings. Other techniques which developed alongside the mansard roof included the rustic look, which utilized as its elements brick walls, wood side boards, less neon and low maintenance landscaping.



18d)

The development of the White Tower chain through the different imageries:

- a) The diminutive scaled brick building has a domestic look.*
- b) Art Deco motif of 1935.*
- c) Exaggerated Moderne in 1957, with trapezoidal signs and undulating rear canopies.*
- d) White Tower featuring the bare-wood Environmental Look in 1984.*



Landscape Imagery

What this thesis is proposing is a landscape imagery that better reflects our current awareness of nature. Now that the Reagan era is over and the pursuit of a materialistic lifestyle has fallen out of favor for many, peoples' attitudes about their environment and lifestyle are gradually changing, and many of us are becoming more conscious of the need to preserve our planet. The Yuppie syndrome for example no longer dominates as it did in the 80's, when the accumulation of wealth and the search for a

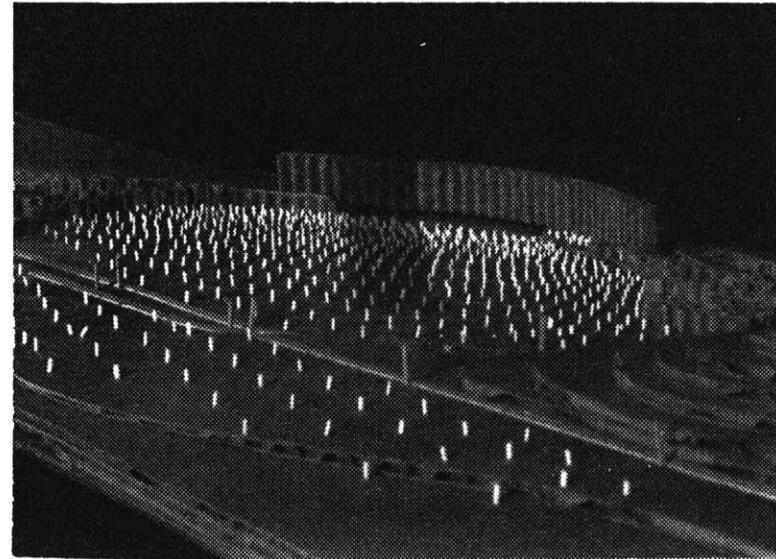
materialistic lifestyle seemed the ideal route to pursue for many young adults. Now the trend is a return to traditional values of family, stability and mother nature (which takes the form of consuming healthier food, and a search for a cleaner, healthier environment in which to bring up our children). Littering our environment, whether physically or visually, is no longer tolerated, and many measures have been taken to combat this problem. Conservation of our natural resources and recycling of materials are two examples of the relatively widespread new commitment incorporated as part of our lifestyle.

We are still a long way from achieving that goal, as we remain a consumer-based society. However more and more individuals and organizations are making different and more environmentally committed choices than at any time since the 50's. The Massachusetts Department of Public Works for example has initiated a Scenic Highways Program in an effort to counteract the rampant strip development that has turned many New England highways into eyesores. Through this program, they are buying up land through which highways run, and

embellishing it in ways that preserve and enhance the natural environment, such as planting a variety of plants that will inform us of the changing seasons as they blossom over time.

It is unlikely that we will ever abandon the road as a primary means of transportation, so there will always be issues regarding its negative impact on our environment. One positive response we can make, is to develop more friendly attitudes and take careful measures towards the environment as it relates to the road. My design begins to incorporate this approach and tries to create a meaningful experiential journey for those entering Florida, through the introduction and manipulation of landscape.

The design investigates a new relationship of the highway to earth and the landscape, and goes beyond simply imposing the road onto the terrain. Through this new relationship, there evolves a different reading of the landscape ; an environment that we have often taken for granted. My intention is to create a new role for the landscape in informing us of the context, by its



arrangement and configuration with the road. By sculpting the hillside alongside a meandering road for example, and setting up a rhythm of curving hills, the sensation of flowing water is simulated to motorists as they move through it. The highway is treated as an art form that weaves its way through a variety of "landscape events" interspersed with "transitional phases". The objective of this landscape imagery is to create a phenomenological experience through the use of sequences of space and motion, to create and convey a meaningful experiential journey that we can assimilate and recall later as we continue to drive on.

The design is intended to augment the change of heart that is now finally underway in our culture in relation to the natural world. An underlying assumption is that as people really experience and become more conscious of place, of nature, of environment, they will value it more and will want to work harder to preserve it. The design is an attempt to design an environmental "role model", to juxtapose to strip developments; one that reflects a strong respect for natural elements. The design is also a model for further exploration into designing architecture with visual perception and movement in mind. Hopefully the private

sector (ie. developers, retailers etc.) will now be forced to respond with a new style of design.

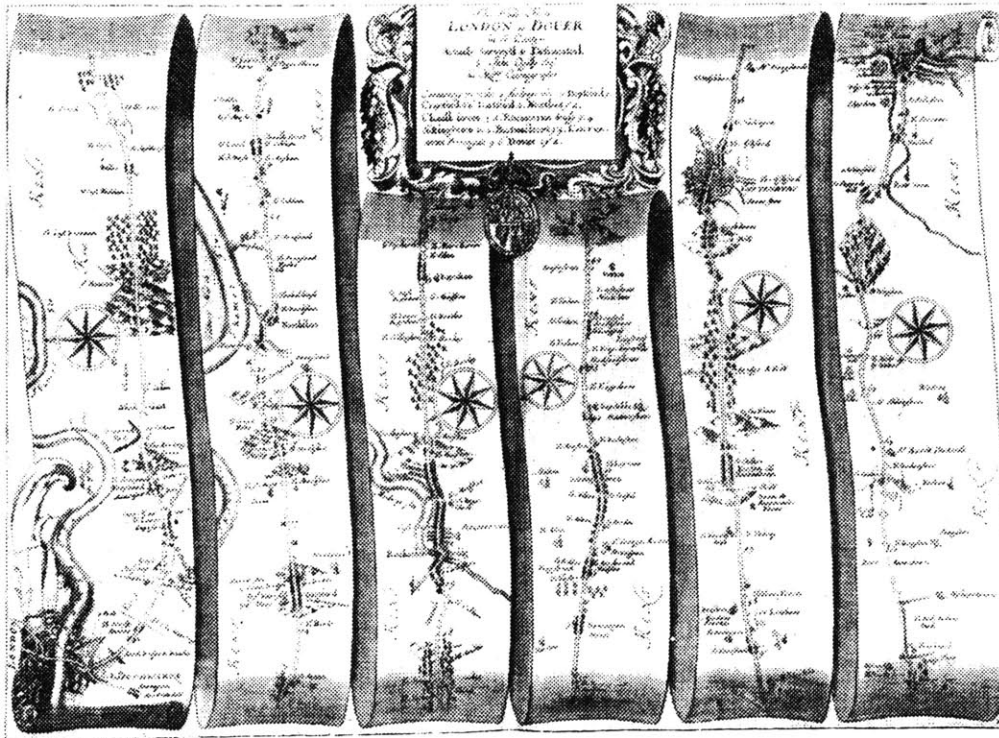
² J.B.Jackson, "Other Directed Houses" in *Landscape Magazine* and later in "Landscapes. Selected Writings of J.B. Jackson" by Ervin Zube (Univ. of Mass. Press 1970) pp. 65

³ Barbara W. Tuchman, "A Distant Mirror" (New York, Balantine Books, 1979) pp.158

⁴ Jane Jacobs, "The Death and Life of Great American Cities", (N. Y. Random House Vintage Books 1961) pp. 7

⁵ Peter Blake, "God's Own Junkyard: The Planned Deterioration of America's Landscape" - (N.Y. Holt, Reinhart & Winston 1979) pp. 24

⁶ Lady Bird Johnson as quoted in "Beauty for America, proceedings of the White House Conference on Natural Beauty" (Washington D.C.: GPO, 1965) pp.22



19. An early road map which provided indications of the visual experience along a given sequence. (Published in 1698)

THE DESIGN

Program

The project is a "Welcoming Center" to Florida which, like most welcoming centers, greets motorists to the new region and relays information, which tells them what to expect in Florida. It differs slightly from others however in that it is not a building, but is an entire stretch of the highway through which one journeys, and by traveling along it, one is "initiated" into Florida and prepared and informed of its context, as I interpret the characteristics of Florida to be. The project can be likened to an extended "gateway" or zone that receives and inducts motorists. Of course the highway could also be perceived as a departure area for those leaving Florida and entering Georgia. Due to time constraints however, my focus has been invested mainly on the issues of arrival. (Georgia can handle the departure!)

The fact that this design is conjured up through a continuous driving experience rather than through an interruption that requires stopping, makes the design more compatible with the nature of the highway as a continuous

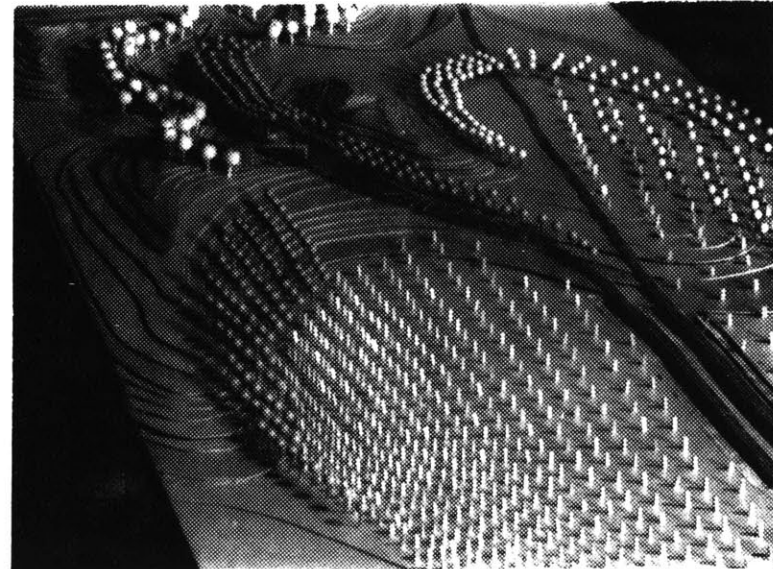
network that does not end, but is a linkage of one road to another. The highway differs from the old country road, in that it froze values of the frontier by making movement a permanent state of mind, and replaced the notion of migration with circulation.

The site is a hypothetical one intended to serve as a paradigm for what could be done on a stretch of the highway. The site's characteristics are typical of North Florida however, and incorporate both flat and hilly terrain, and straight and winding roads. The design may never pass the Department of Transportation's guidelines, but that is not really the issue here. The thesis is trying to push the limits of highway design; to start us thinking about possible relationships between the highway, the surrounding landscape, and drivers' perception of these; and hopefully, to move from this thinking to designs that enhance the driving experience.

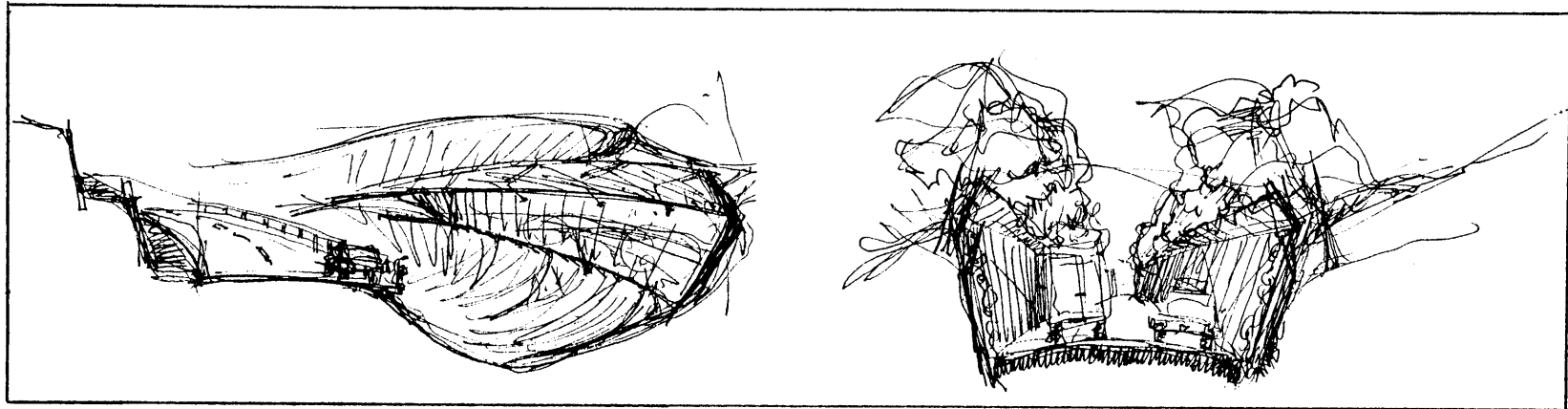
Design Structure

The design is structured in several parts, each exploring a certain sensation that is unique to the driving experience. These parts are broken up into "visual and experiential events" such as the field of lights, and "transitional phases" that link one event to another, such as the narrow gorge which precedes the field of lights. These events and transitions add up to reinforce an experiential journey whose metaphor is "arrival" to Florida.

There is a repetitive organizing element to the design that facilitates a smoother transition and a more coherent relationship between one event and another. In each event I offer a glimpse of the subsequent phase, as a form of foresight into what happens next. For example one sees the field of lights briefly from atop the hill, but then is swooped down through a narrow shaded ravine before being released again into the wide open field, thereby intensifying the feeling of open field versus narrow tight spaces. I feel this kind of transition is presently missing on our



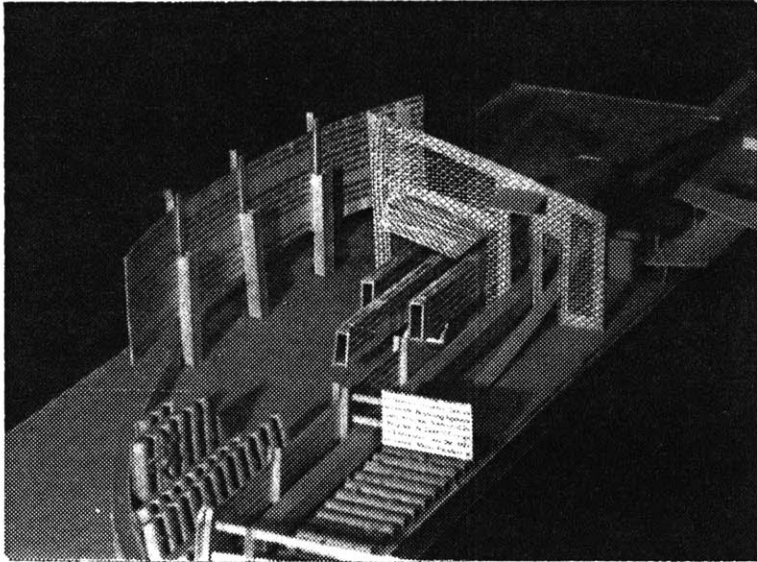
highways. For example we are prepared for a rest area, only by posted signs along the road informing us that it is coming up. So we pull into the side road, slow down to a complete stop, and find ourselves in front of the building. This sort of transition seems too abrupt and does not inform us of what type of rest area we are about to pull into.



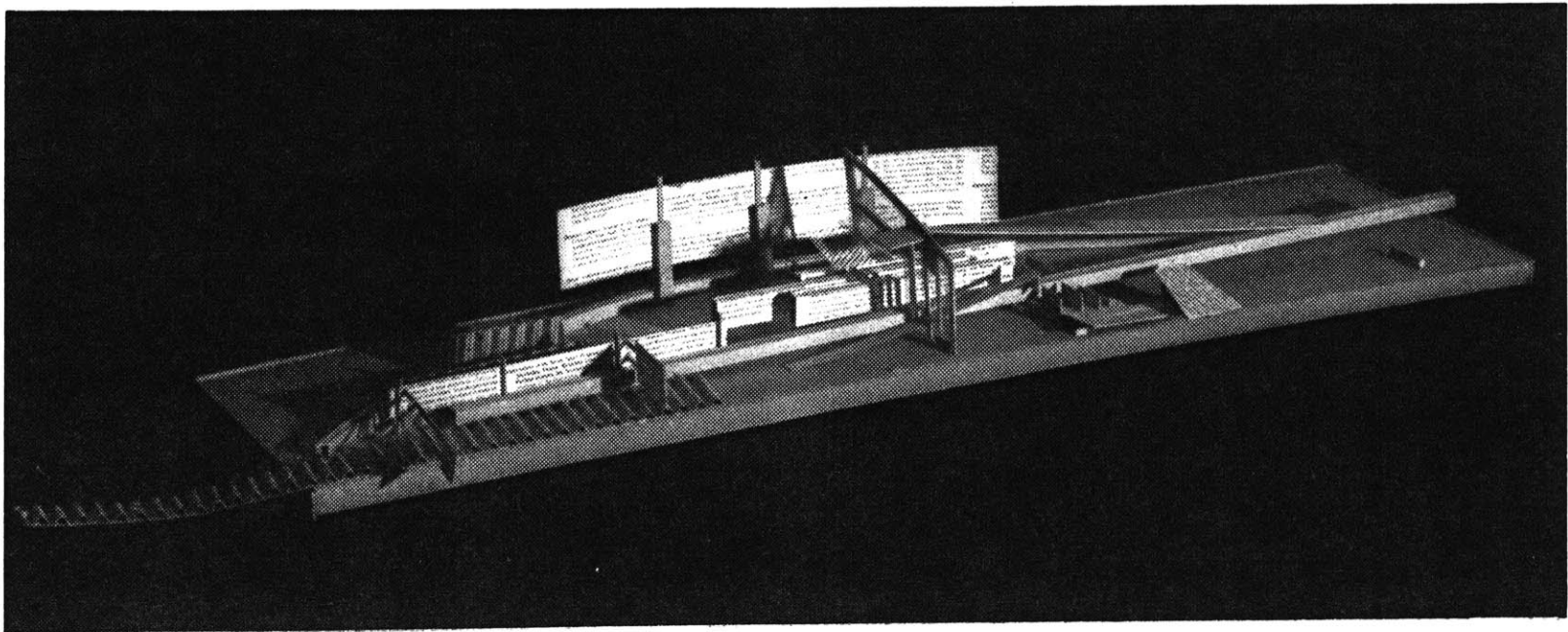
Process

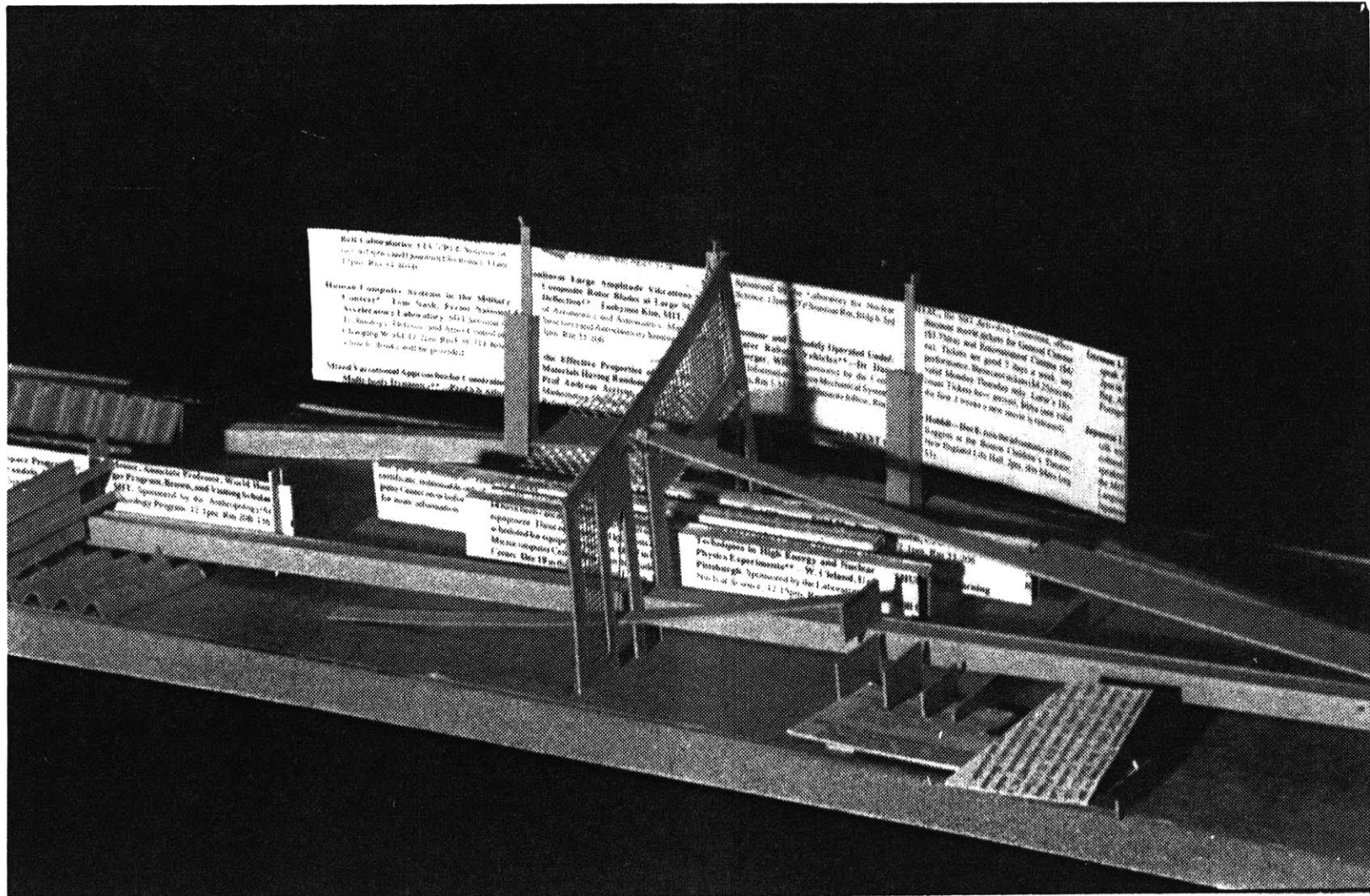
The process investigated several methods of design representation, and of using movement in architecture as a determinant to design. The media ranged from drawings, to models (both representative and conceptual) to computer animation that stimulated the sequential visual experience of the design.

The initial design incorporated a building along the highway that acted as the Welcoming Center. The architectural configuration of the building itself attempted to convey movement, and was meant to be read spatially, both at 60 mph and at a pedestrian speed.



The first conceptual model illustrates the building configuration as a series of "information blocks" alongside and over the highway. There is an attempt to integrate the idea of billboards and the architecture into one entity. The road is elevated from its normal course as it approaches the welcoming center, and partakes in the spatial zone set up by the building.





MIT Laboratory for the Study of
Composite Structures
1960-1961

Human Computer Systems in the Aircraft
Industry - Tom Nash, Frank Sturges
Aircraft Laboratory, MIT, Cambridge
1. Study, Design, and Test Control
2. Design of Aircraft Control Systems
3. Study of Human-Computer Interaction

MIT's Operational Approach to Control
Systems - Fred C. Yeh

Nonlinear Large Amplitude Vibrations
Composite Rotor Shafts at Large
Deflections - Joseph Koo, MIT,
Department of Aeronautics and Astronautics, MIT,
Cambridge, Massachusetts
1960-1961

The Effective Properties of
Materials Having Random
Microstructure - Paul
Andreas, MIT,
Department of Aeronautics and Astronautics,
Cambridge, Massachusetts
1960-1961

Nonlinear Vibration of the Laboratory for the Study
of Composite Structures - Joseph Koo, MIT,
Department of Aeronautics and Astronautics,
Cambridge, Massachusetts
1960-1961

Computer and Manually Operated Control
Systems - Dr. H. G.
Morgan, MIT,
Department of Aeronautics and Astronautics,
Cambridge, Massachusetts
1960-1961

MIT's 50th Anniversary Commemorative
Exhibit - MIT, Cambridge, Massachusetts
1960-1961

MIT's 50th Anniversary Commemorative
Exhibit - MIT, Cambridge, Massachusetts
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MIT's 50th Anniversary Commemorative
Exhibit - MIT, Cambridge, Massachusetts
1960-1961

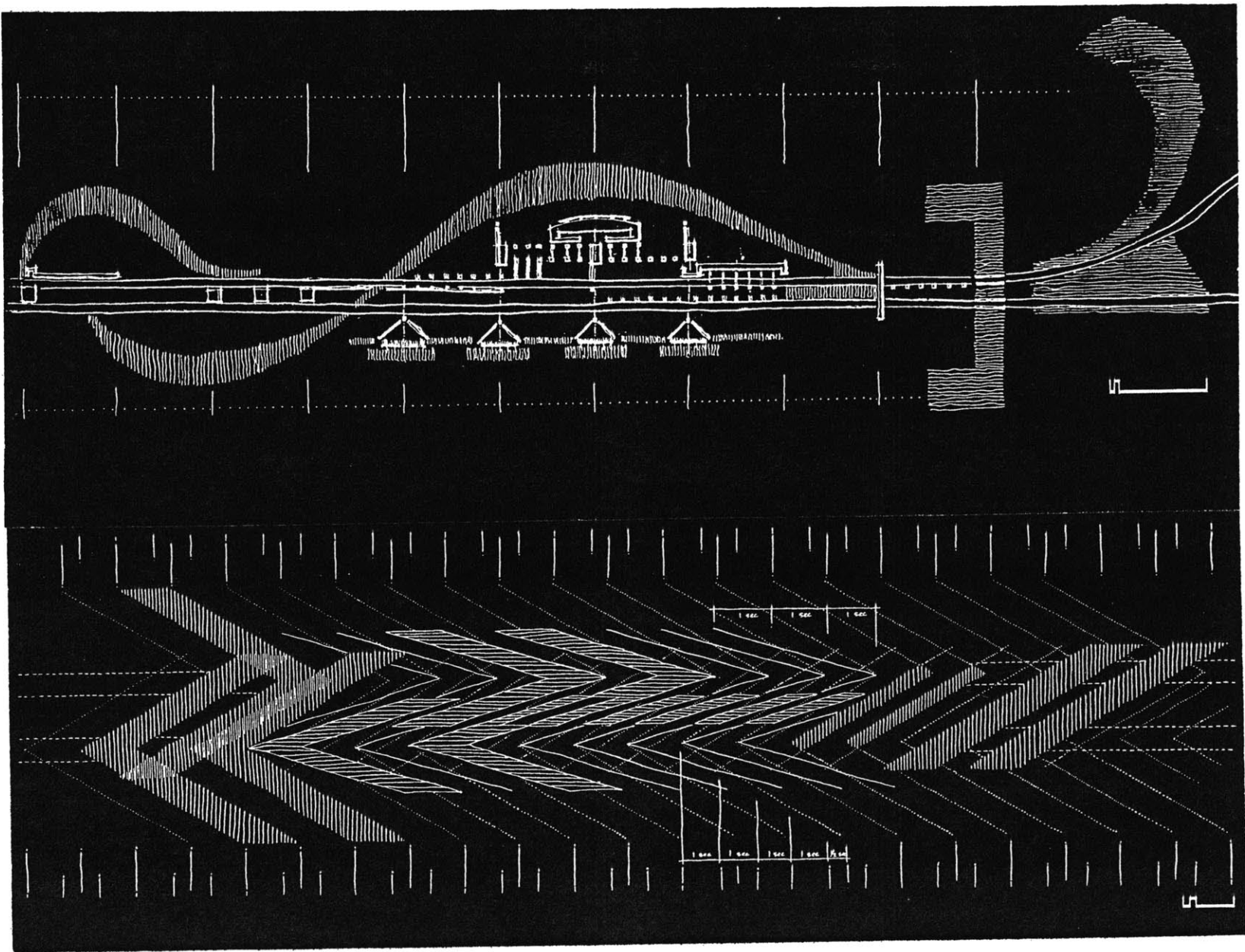
MIT's 50th Anniversary Commemorative
Exhibit - MIT, Cambridge, Massachusetts
1960-1961

To measure, conceptualize and communicate the experience of movement in time has not been fully developed in architecture. The musician has a scale, the dancer has a labanotation, and the film editor has a "storyboard", but the architect has only a series of perspectives/sketches or orthographic projections. But even successive images may still seem discontinuous and would require too many to be of any significance. As part of the final presentation, I did drawings that incorporates plans, perspectives and diagrammatic "scores", all overlaid together to give a better reading of the space as perceived through motion. The best method though, which hopefully will accompany this thesis, is the computer animation. This media is the closest to relaying the real experience of movement in time and space.

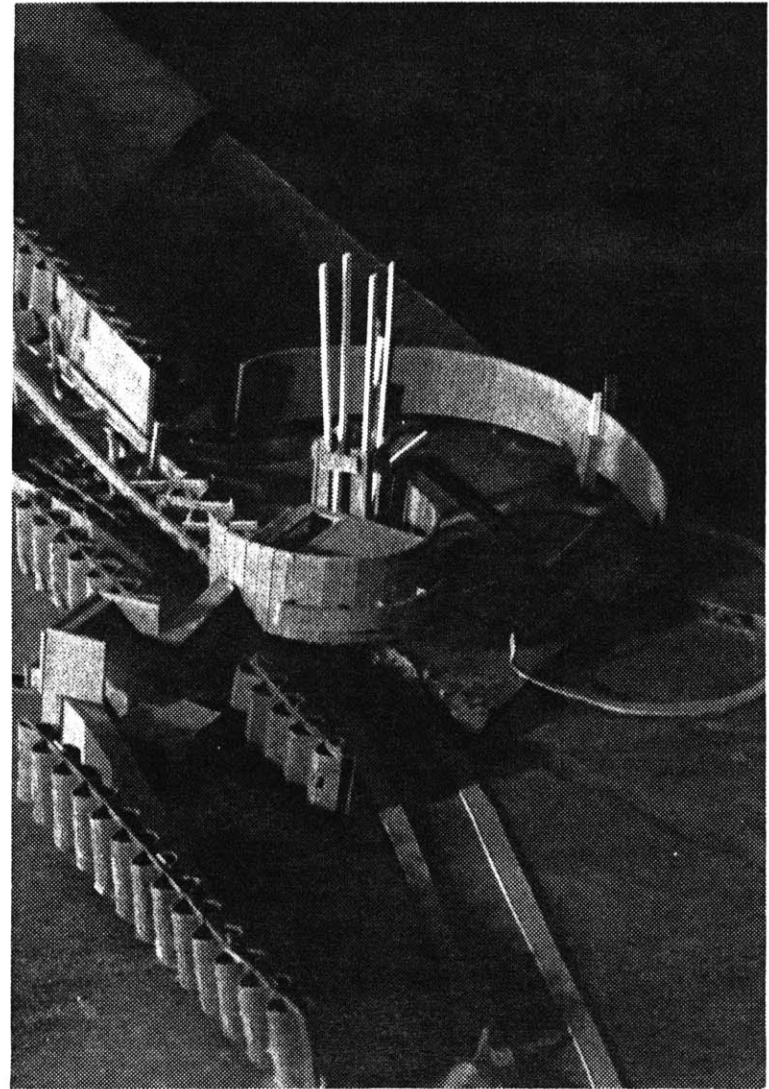
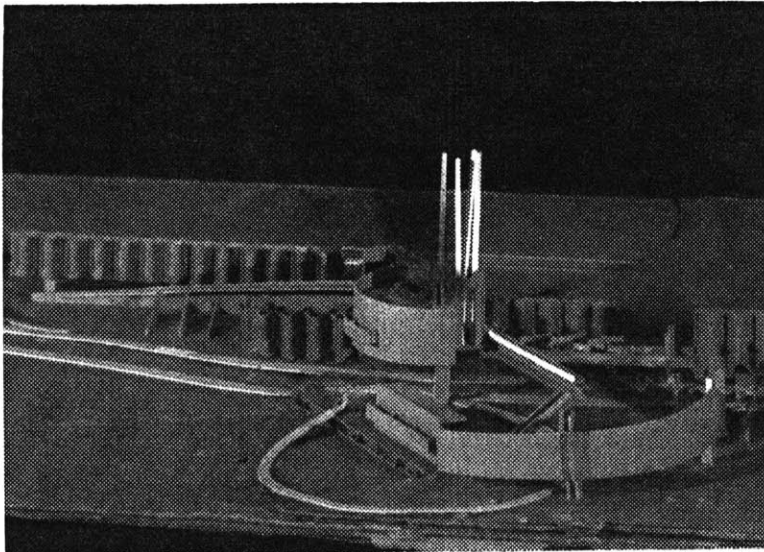
I attempted several plan studies by imposing a musical and visual grid as a guideline to the design. The upper right drawing encompasses architectural and landscape elements as notes on a sheet of music. The landscape plays a background rhythmic role that accompanies the

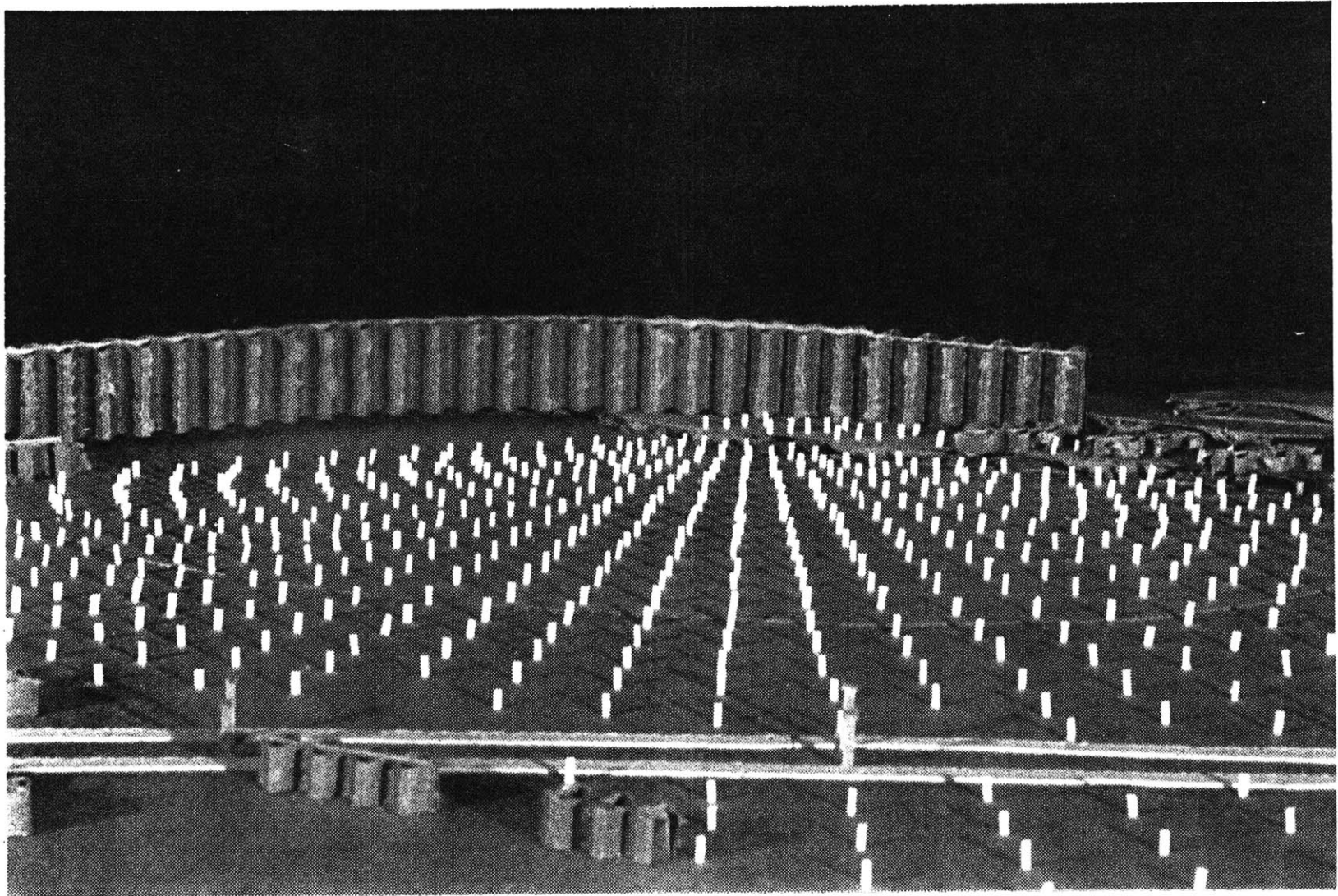
more pronounced and visually distinct architectural elements. The plan is set up on a temporal scale.

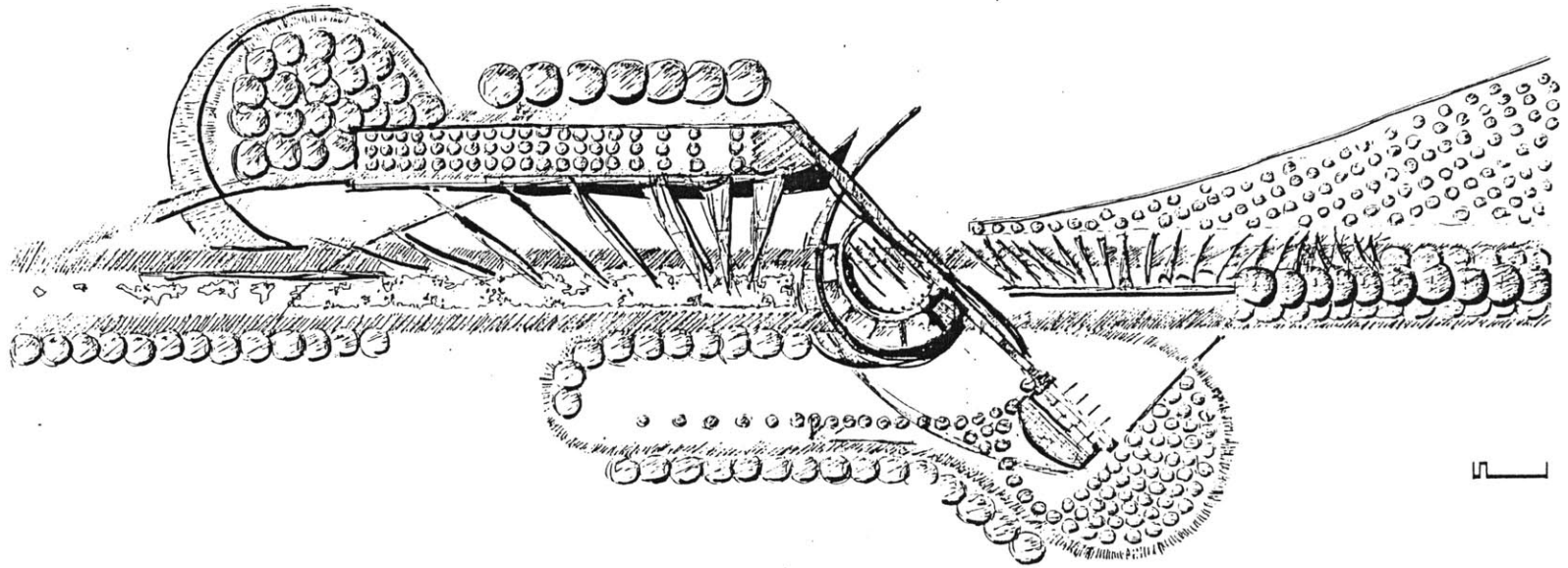
The lower right drawing is a diagram of visual perception from the road at two different speeds: 40 mph and 60 mph. It sets up a framework of visual fields and angles of both speeds, superimposed over each other, as perceived from both sides of the road, every second. By this arrangement, one can determine the placement of objects for optimum visibility and for setting up a temporal rhythm. This plan is also set up on a temporal scale composed of one second units.



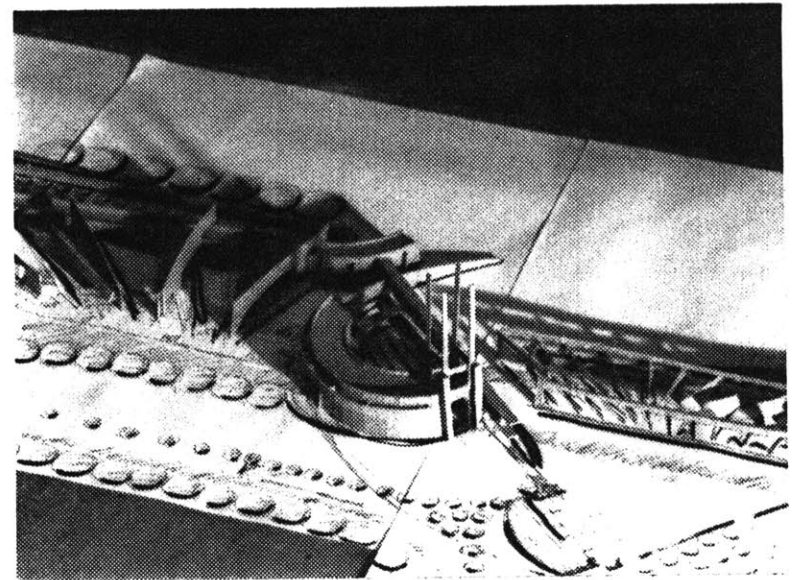
This is an early study of the building, that initially greets the motorists at the horizon as they enter Florida, as would a beacon in the harbor. While all the other elements and events occur on the side of the road as one journeys through the design, the actual building sits over the road as the final connector that brings everything together, and welcomes the driver into Florida officially.

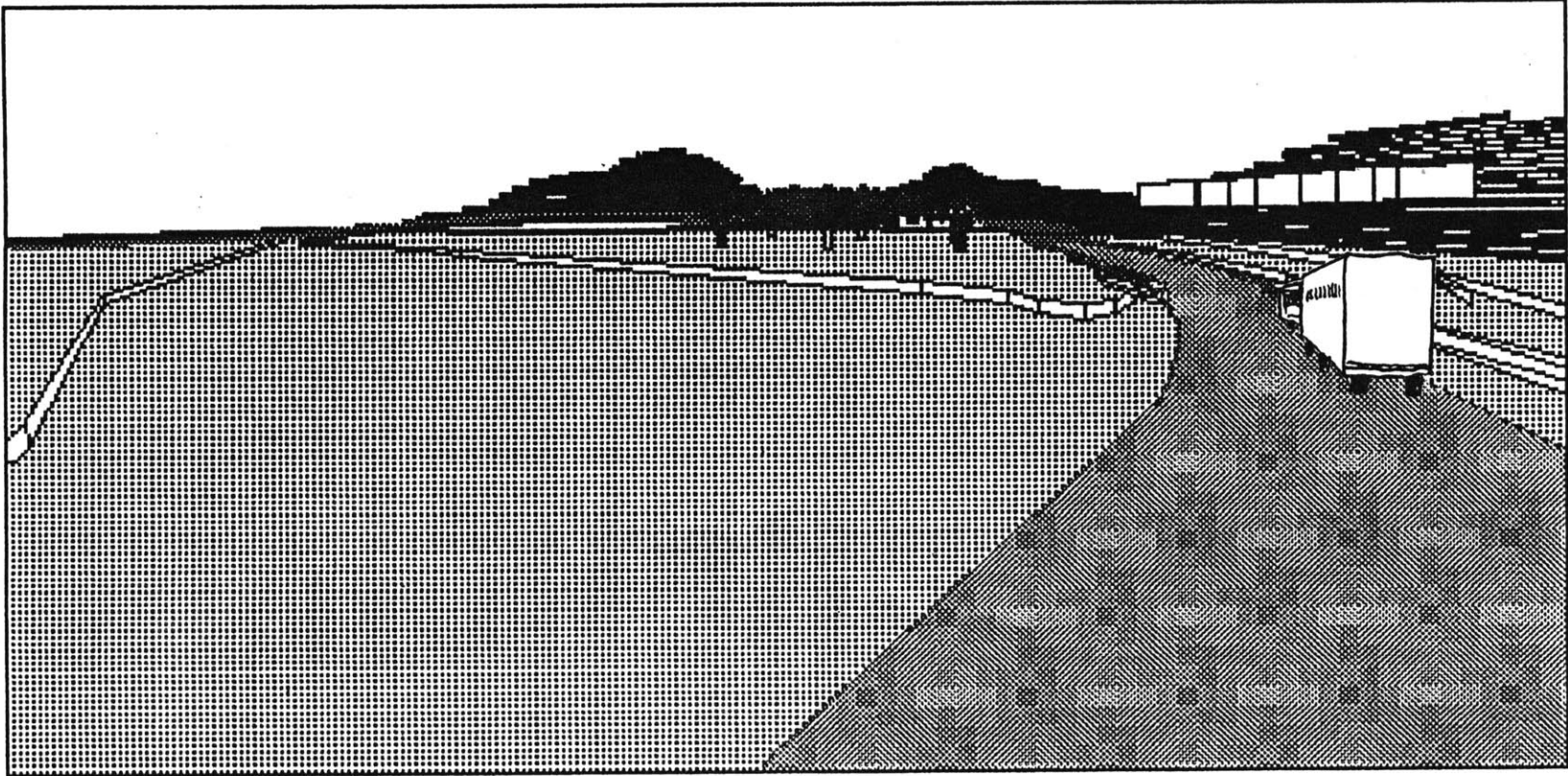




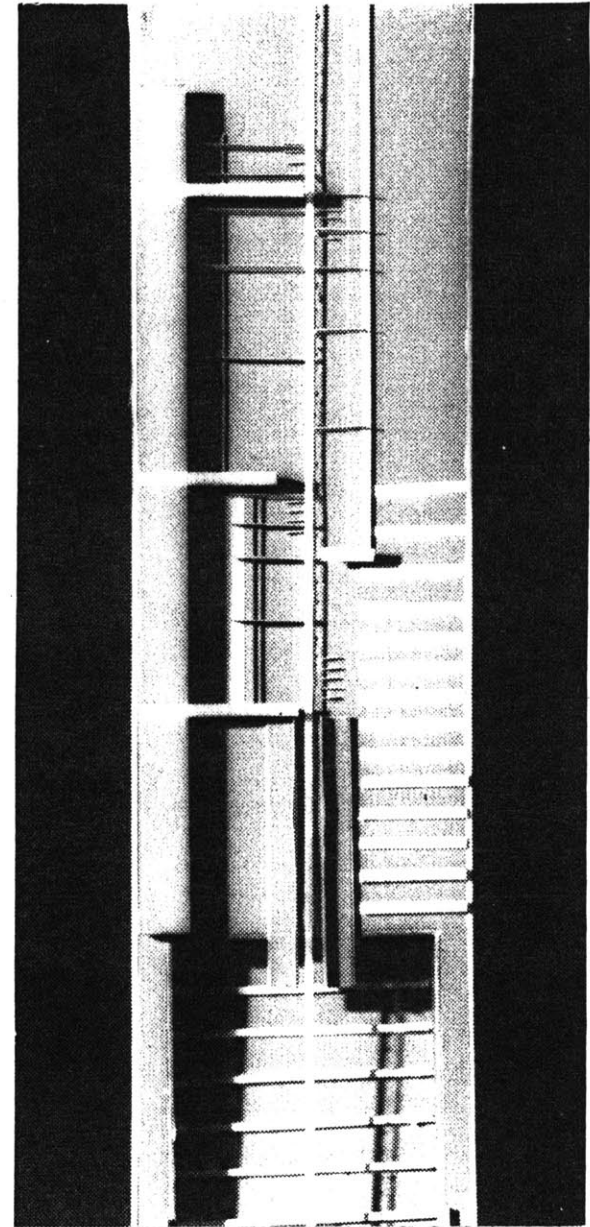
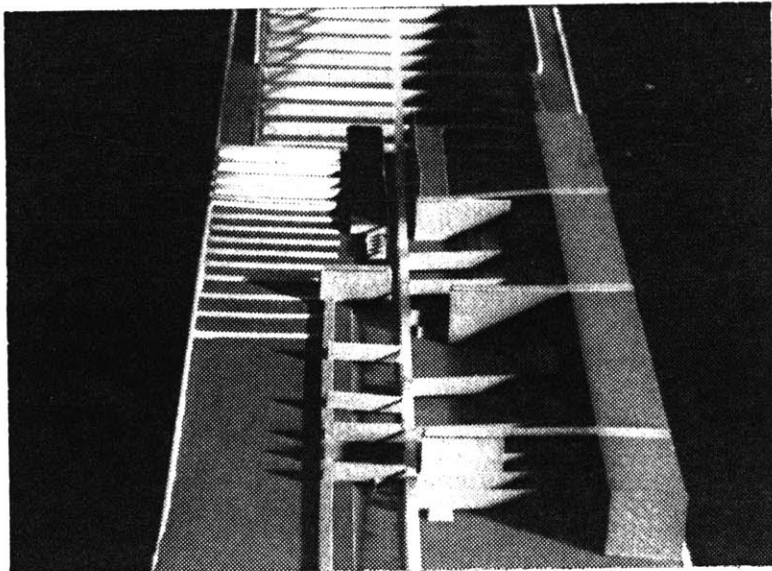


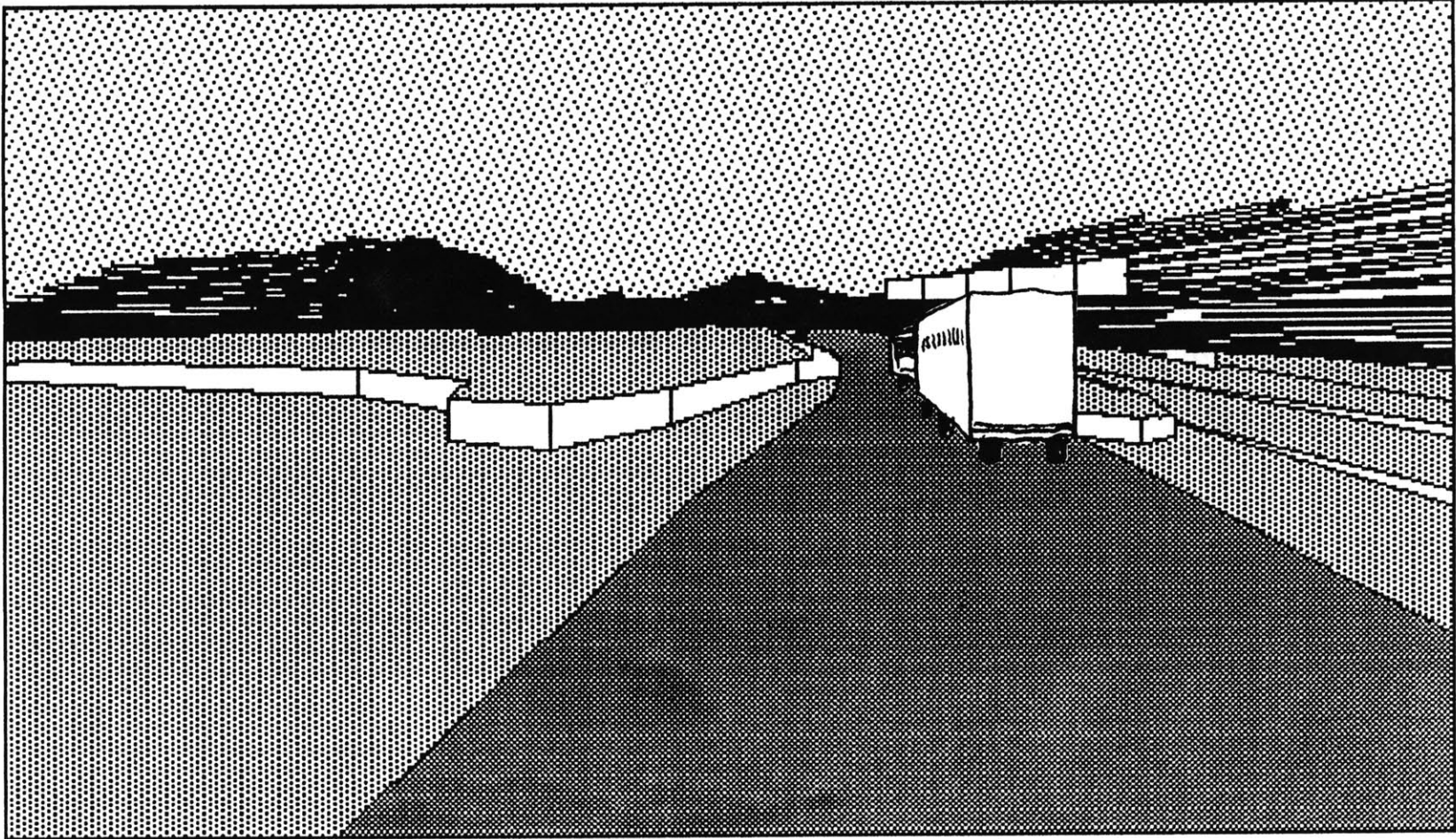
A later study of the building as it straddles the road, and then unfurls out as the motorist drives by. There is a transformation of scale in the transitions; from the tree canopies, to the overhead sail-like fins, to passing underneath the semicircular building, and back to the larger scaled sail-like structures that unfurl out and become parallel with the road.

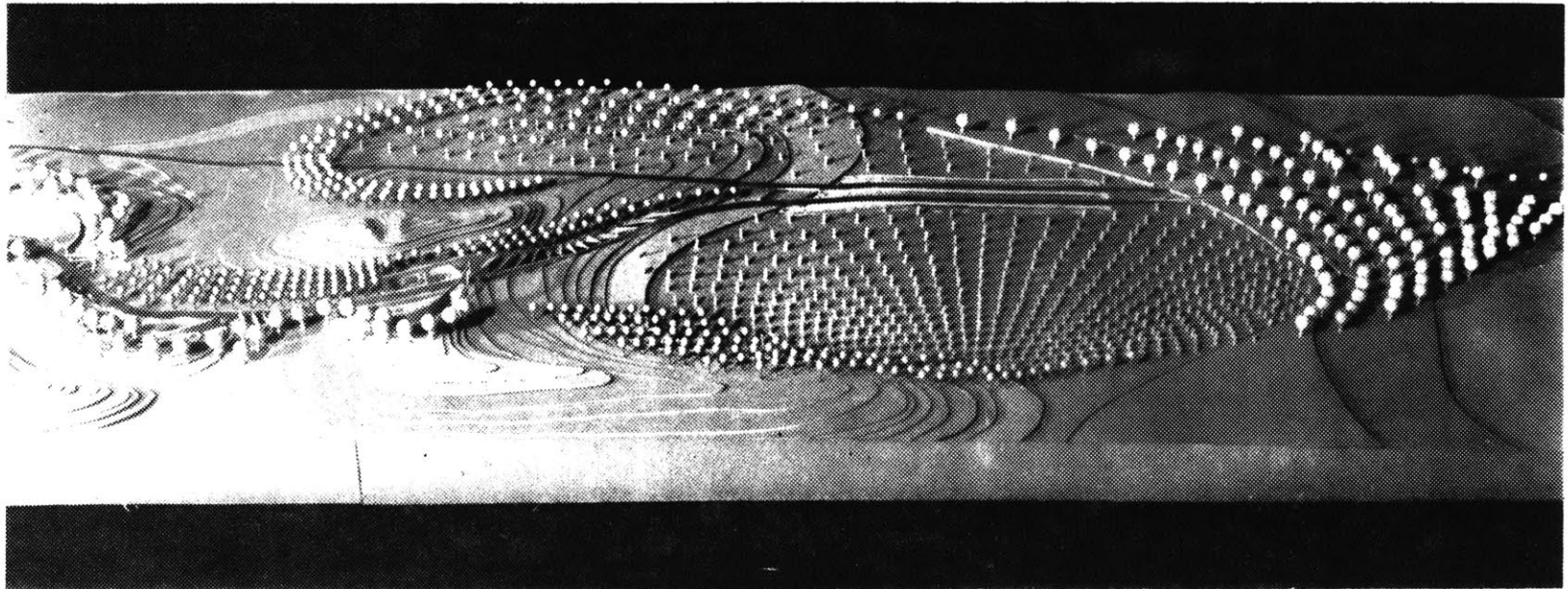
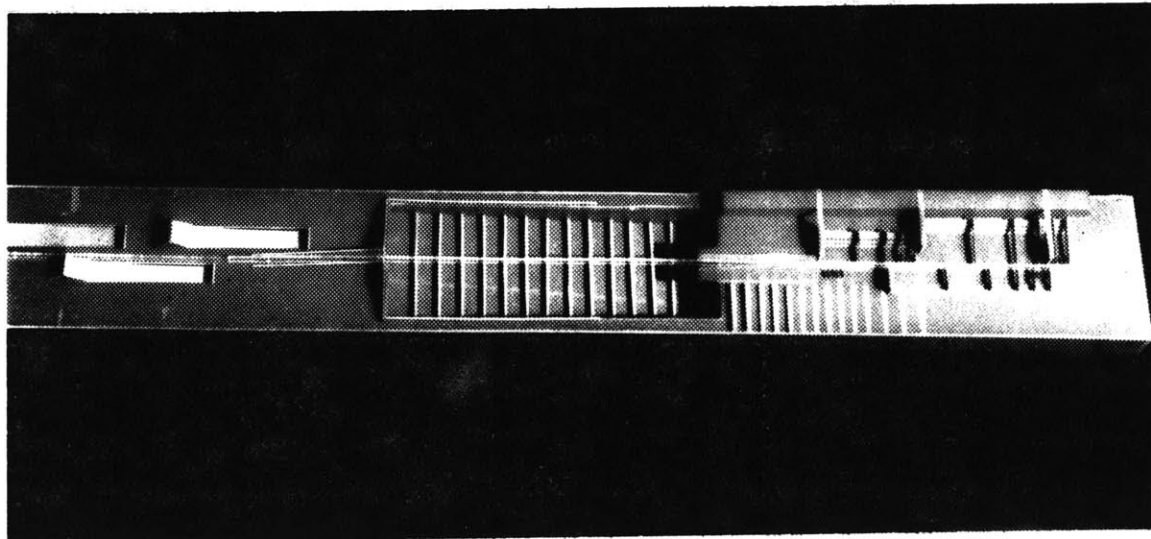


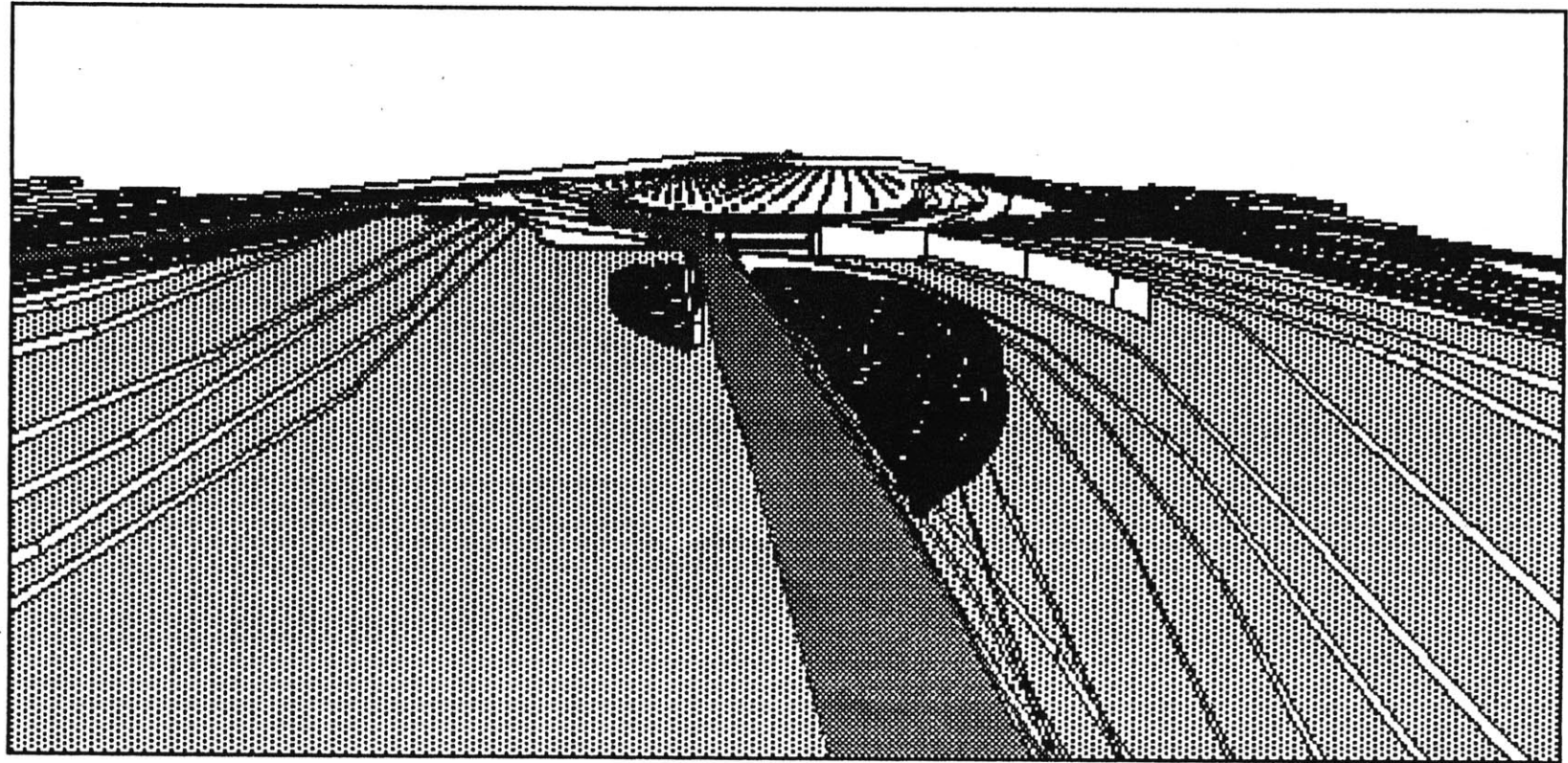


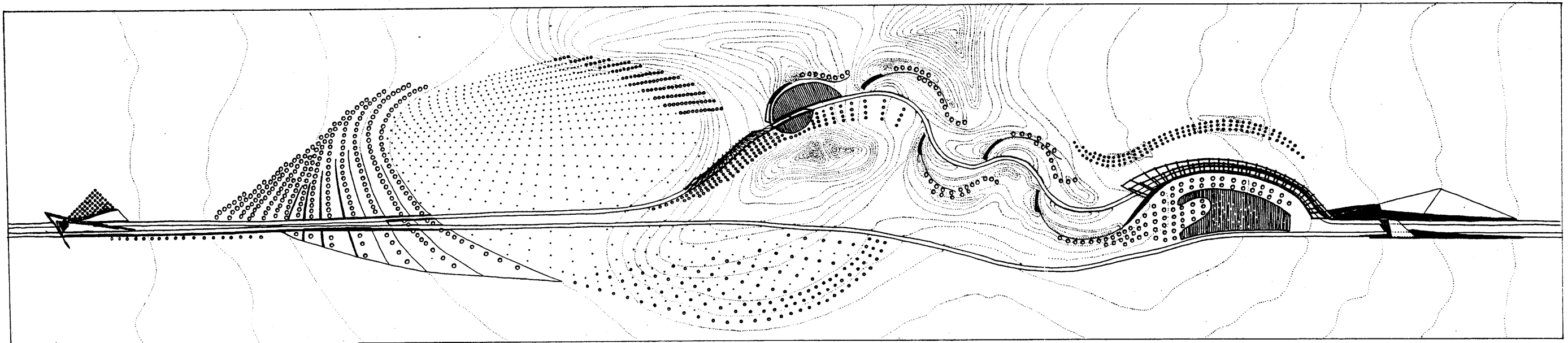
I explored the sequences of the different events in the design, through a diagrammatic model, which illustrates the different spatial qualities of each event along the road; starting from the water, to the floating sensation while driving in the field of lights, and finally to the portal piece.

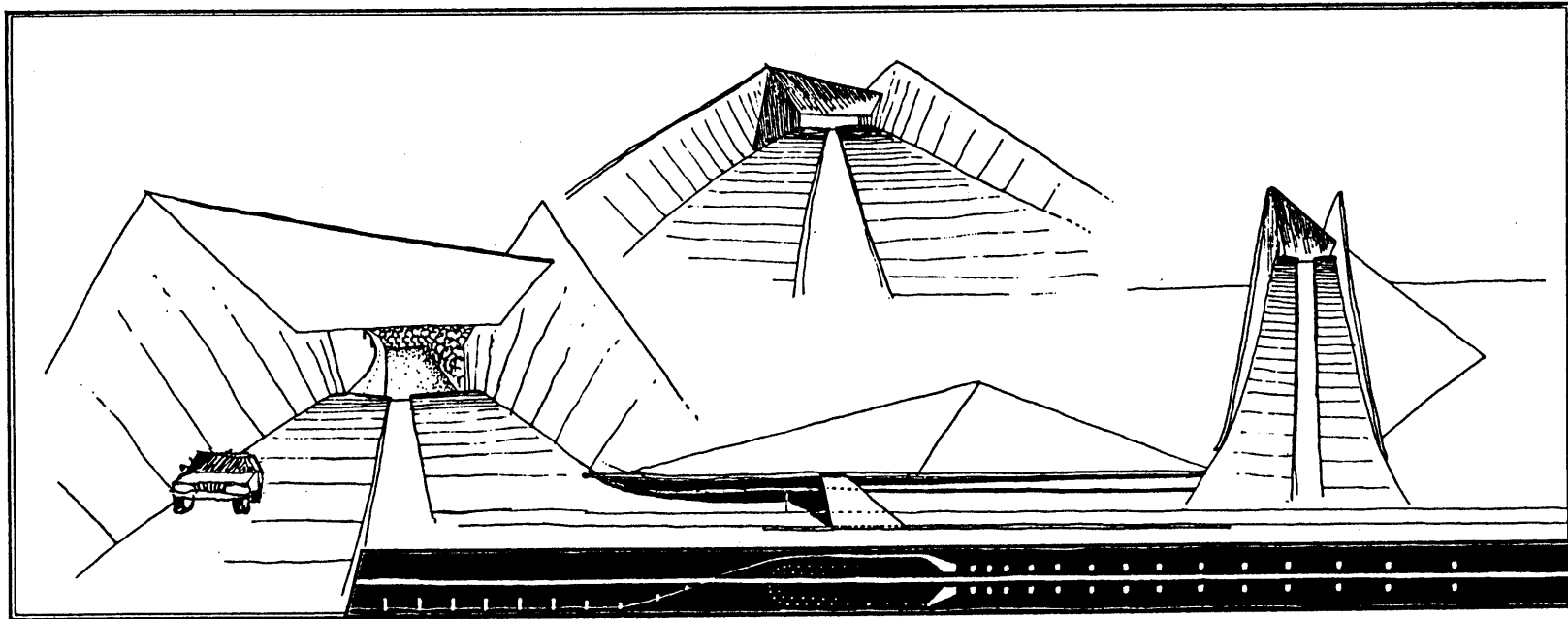










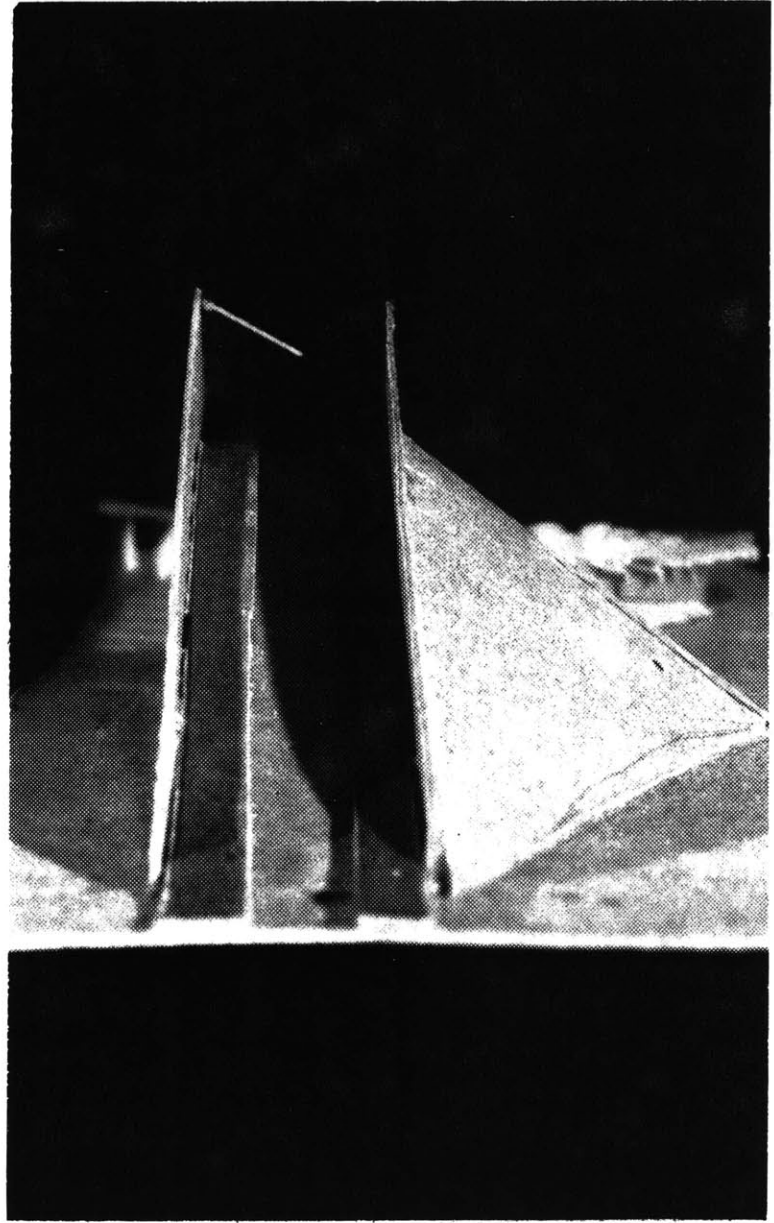
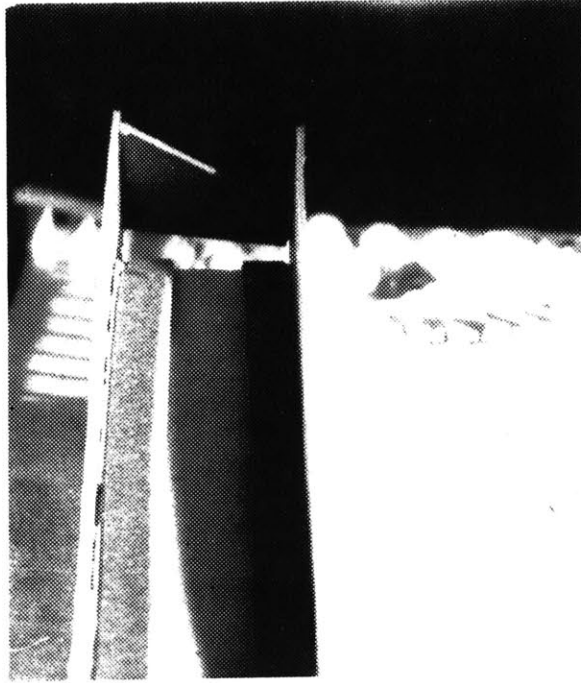


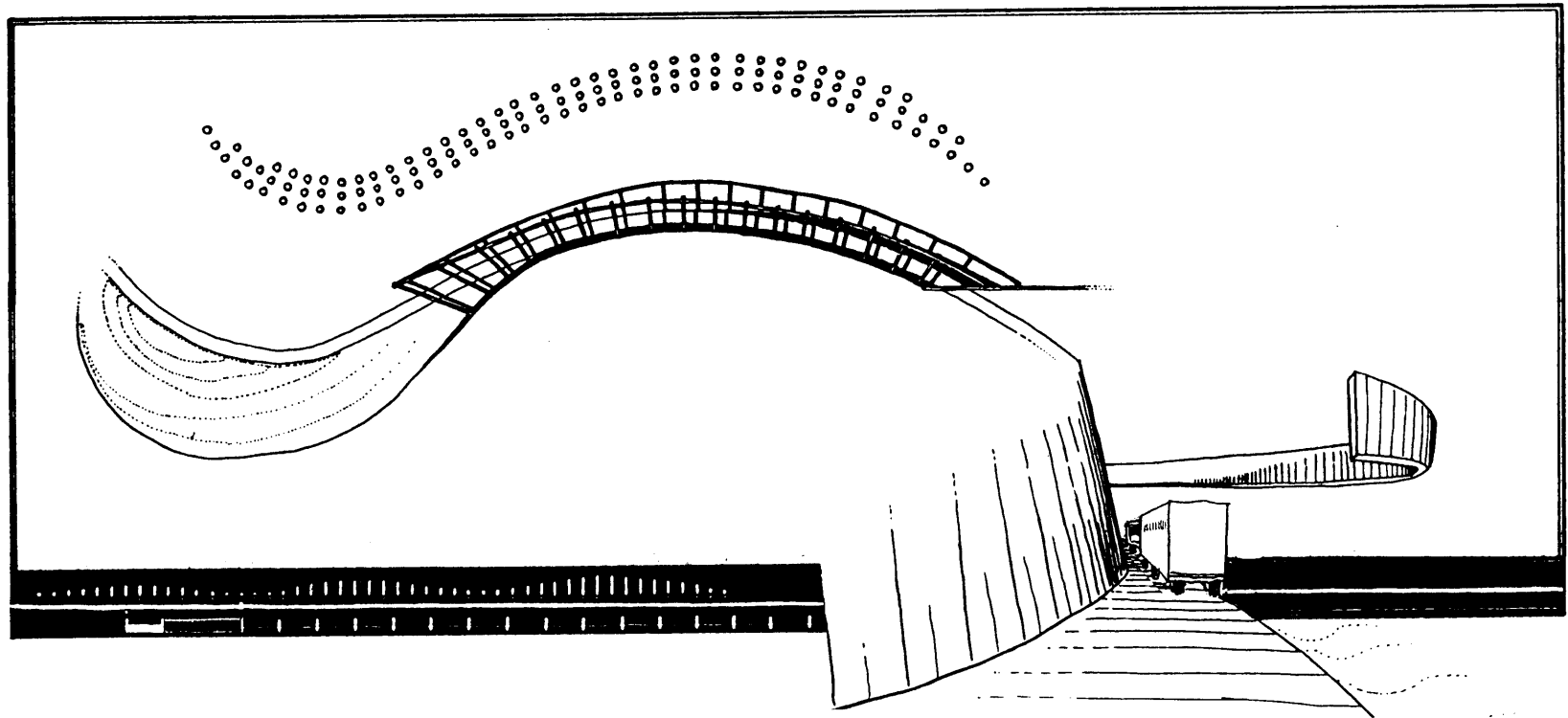
Entry

*Approx. duration: 25 sec
Recommended speed: 60 mph*

The initial element that greets the driver as he approaches Florida from Georgia, is a large built mound of earth, cut open by large triangular walls that allow the road to go through. The pyramid-like configuration, which is one of the most anchored and powerful forms, serves as the

initial landmark in the landscape as it inaugurates the motorist into new territory. The overhead canopy of the pyramidal form unfolds as the automobile ascends it, slowly revealing the first image of Florida below - a body of water. This ascension, like climbing a flight of stairs, builds up the rider's anticipation of arrival at its apex, and provides an overview of the succeeding surrounding. The view he receives is compatible with most people's ideal of Florida; a state of abundant water, beaches and orange groves.





Transition

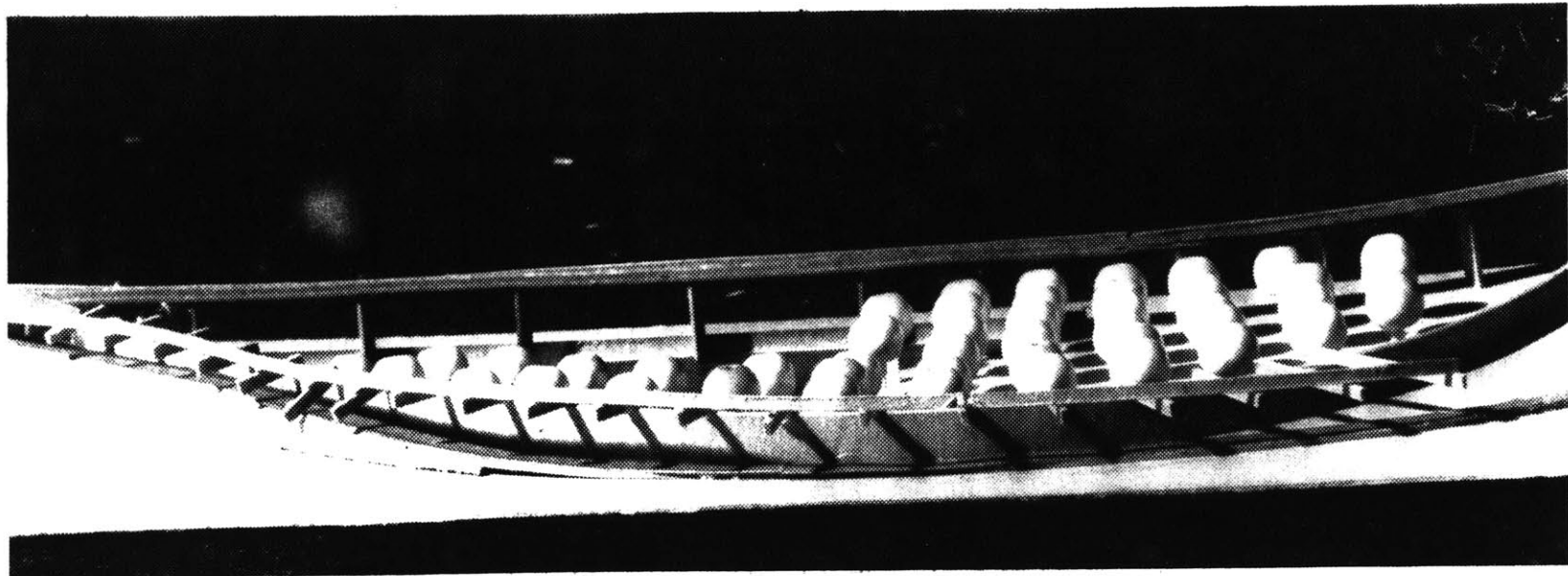
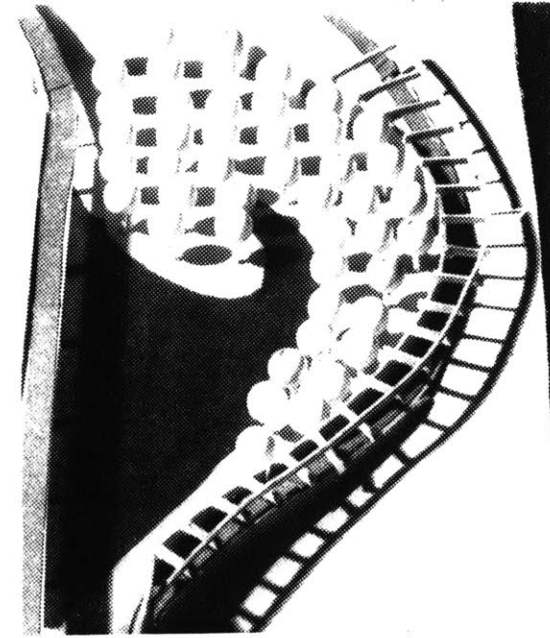
Approx. duration: 30 sec

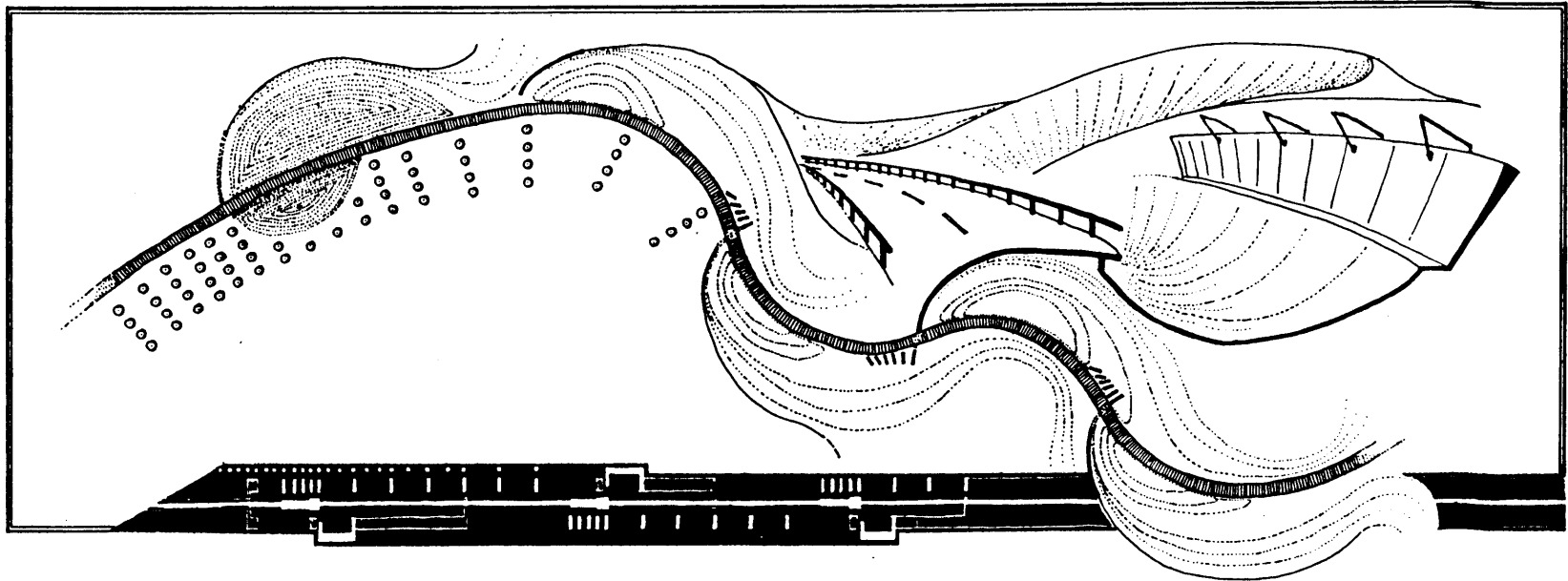
Recommended speed: 50 mph

In ascending the entry piece, one is disoriented by the scale, because of one's elevated state and the panoramic view offered. The revelation and perception of a larger ground area from that vantage point, allows the motorist to actually feel smaller in relation to the larger surrounding because of the relative size of the automobile

to the landscape (for example, one would feel larger in a seven foot high room, than while standing in a cathedral). In trying to keep this feeling of a diminished scale intact for the next phase, the road drops sharply and curves around and out of view of the water, thereby never reaching it and realizing one's true scale. This sudden separation helps to transition the motorist into the next event, where the relationship of the driver to the landscape is not conventional in scale, and where feeling smaller makes for a better reading of the context.

The repetitive overhead beams along the curving road help in creating that transition by setting up a tempo and rhythm as they cast their shadows onto the road in the daytime, and are illuminated at night. The beams stretch out further at the end as the road sways away from the curving walled edge, to be "cast" into the next "water" phase.





Water

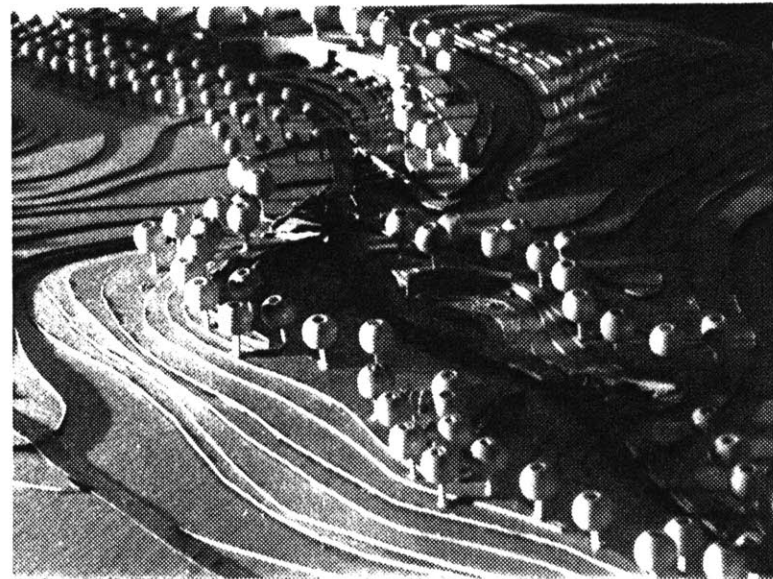
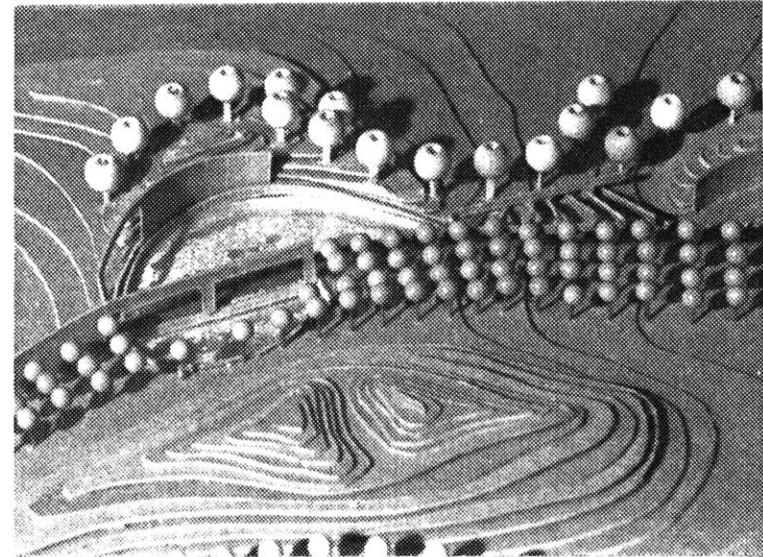
Approx. duration: 55 sec
Recommended speed: 50 mph

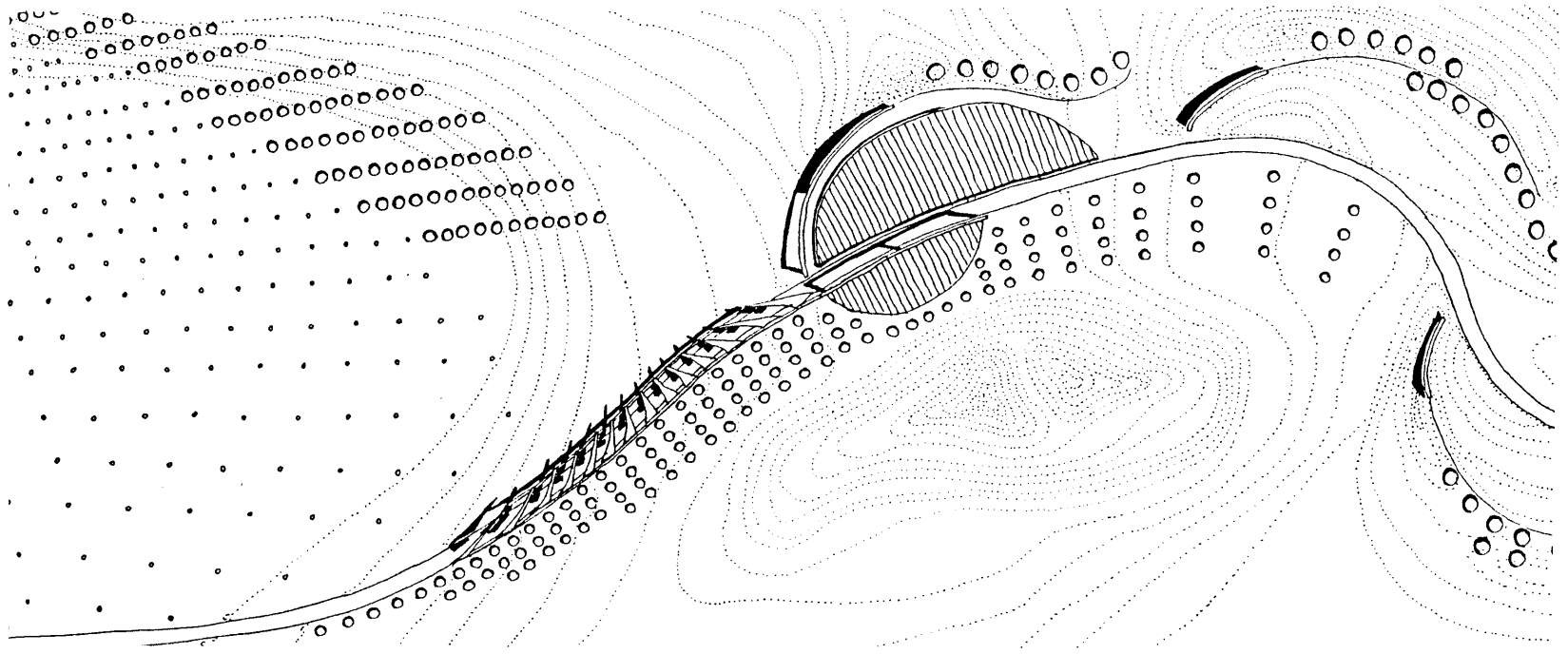
One of the most important images of Florida for me is water, and it is a key element in most peoples' ideal of Florida, as I mentioned earlier. I attempted to simulate the sensation of water in the way the driver moves through the sculpted hillside, and the way this landscape is configured. As the road winds up the landscape, the hillside rises

steadily on the side and drops directly in front of the driver's vision, analogous to the rising and crushing of waves. The successive repetition of these landscape forms and the meandering structure of the road mimic a feeling of flowing water and waves. Billboards imbedded within the landscape (placed directly in the driver's line of vision) portraying water-like images further enhance that feeling. Therefore, the landscape forms and the billboards are working in unison, generating creative associations to the

experience of water, and informing the motorist of one of the essential meanings of this place.

As the driver reaches the highest level of terrain, the road is physically flanked by water on both sides to verify his previous experience, and to prepare him for the next transitional phase of "driving through water". Before entering the "water gorge", the driver gets a glimpse of hundreds of twinkling lights in an open field below, resembling the lights of a distant city.



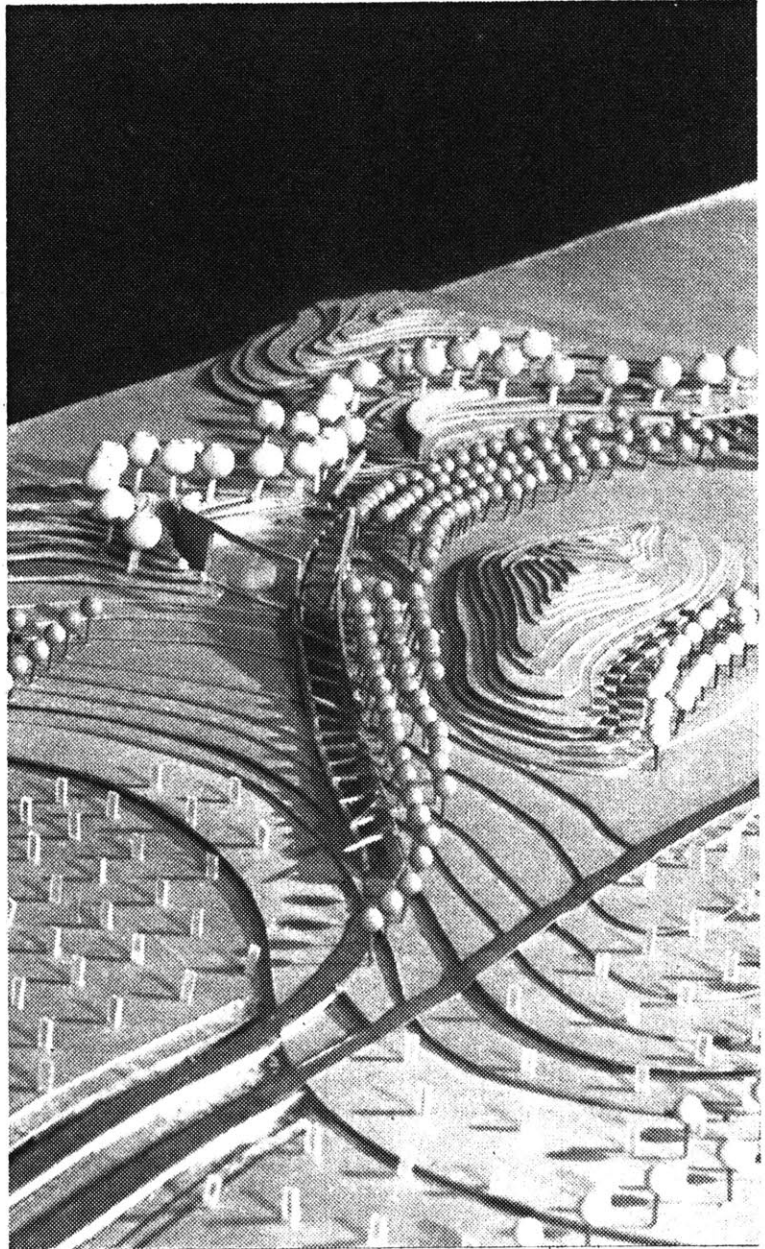
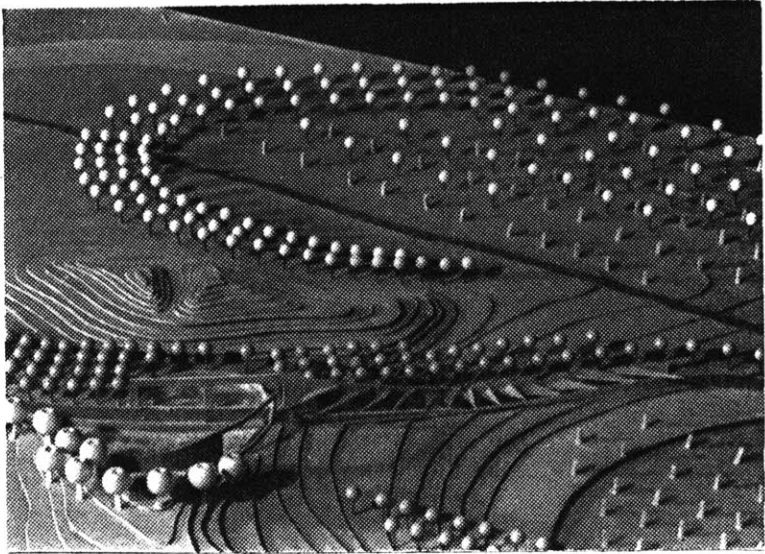


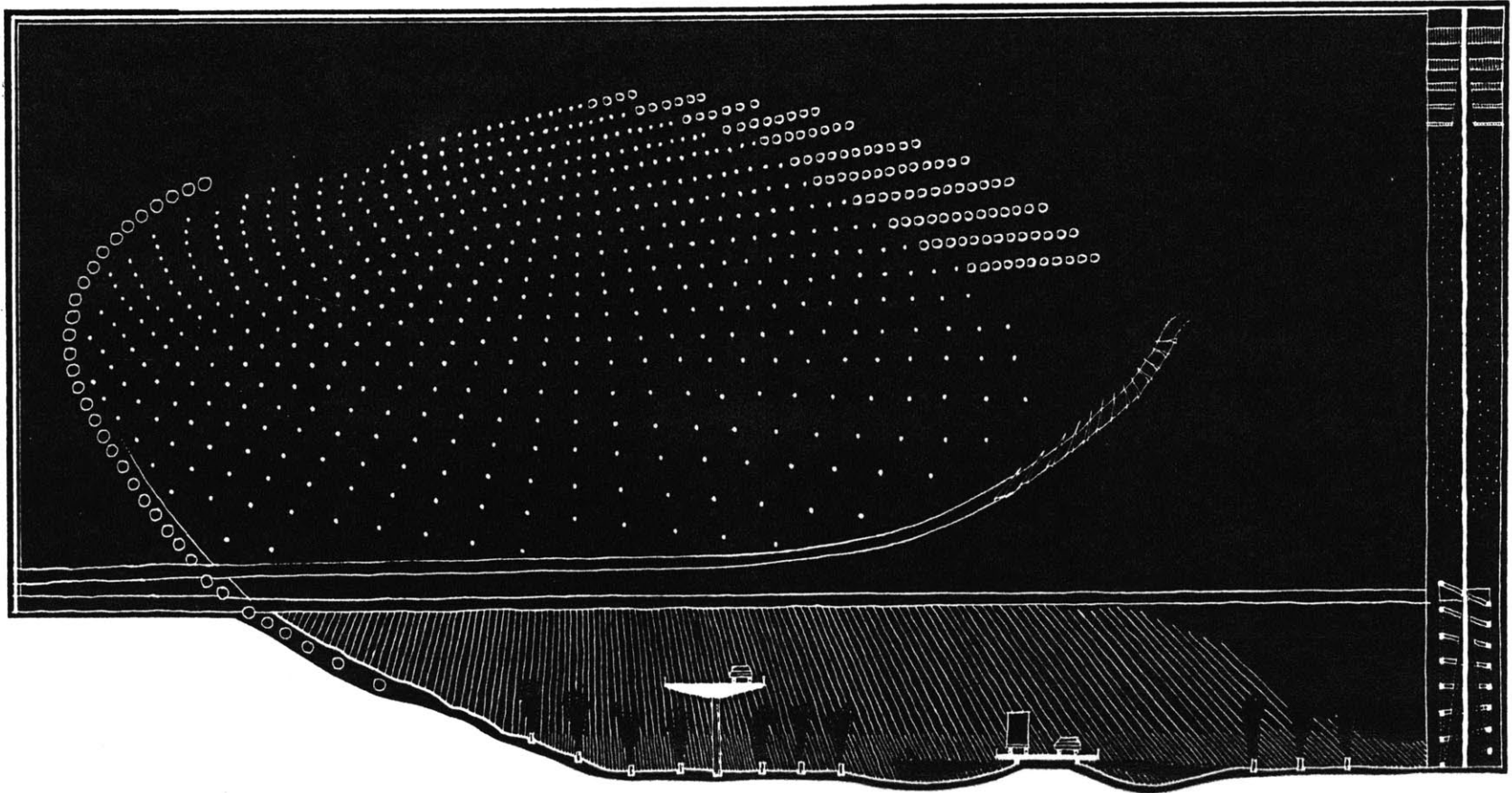
Transition

Approx. duration: 15 sec
Recommended speed: 50 mph

Having bridged the water, the road descends down a narrow ravine, whose angled walls are comprised of trickling water. Spanning the length of the canyon are also repetitive, flapping overhead fins, made of sail-like material. The movement of the automobile through this narrow space creates a sensation of rushing through

water, in preparation for the "birth" into Florida. The combination of a narrow space, objects flapping overhead and the sound of water, intensify the feeling of driving at high speed and of propelling through, before being launched into a wide open field of lights. The juxtaposition of closed and open spaces one right after the other heighten the spatial qualities of each, just like walking from a completely dark space to a brightly lit one.



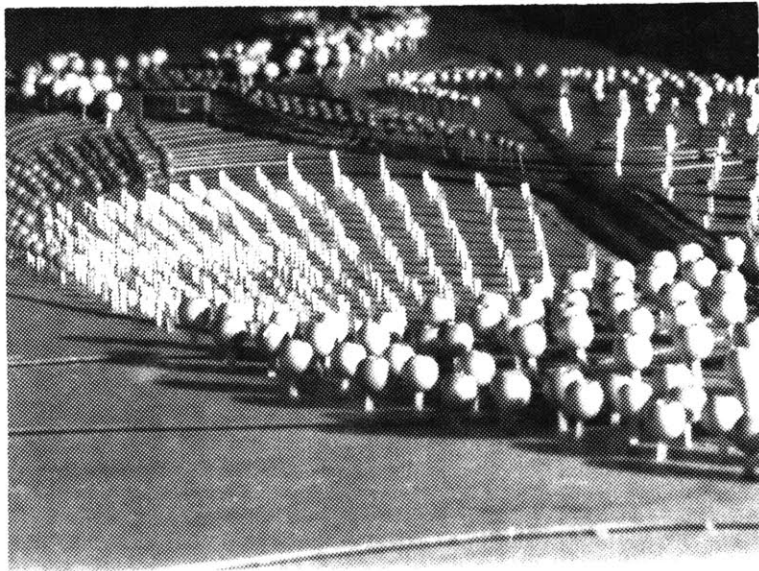


Arrival

Approx. duration: 25 sec
Recommended speed: 60 mph

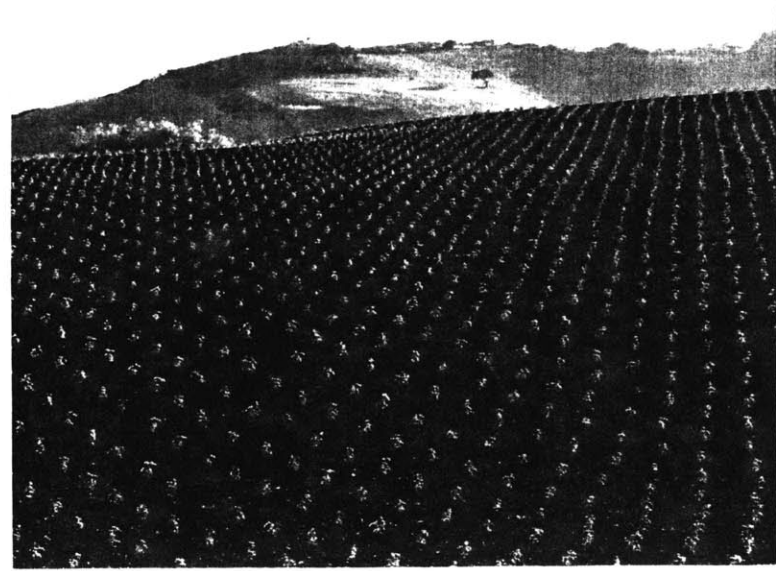
The first glimpse of the lighted field occurs on top of the hill. The view is reminiscent of the lights of the city as seen from an airplane and is the first reassuring sign of arrival into the

new territory. The transition from the tight canyon to the open field is a dramatic one, where the former's dominant characteristics are tension and speed, while the latter's is a leisurely floating sensation. The two sensations are possible only when presented directly after each other, just like the relief one experiences after having been in a constipated



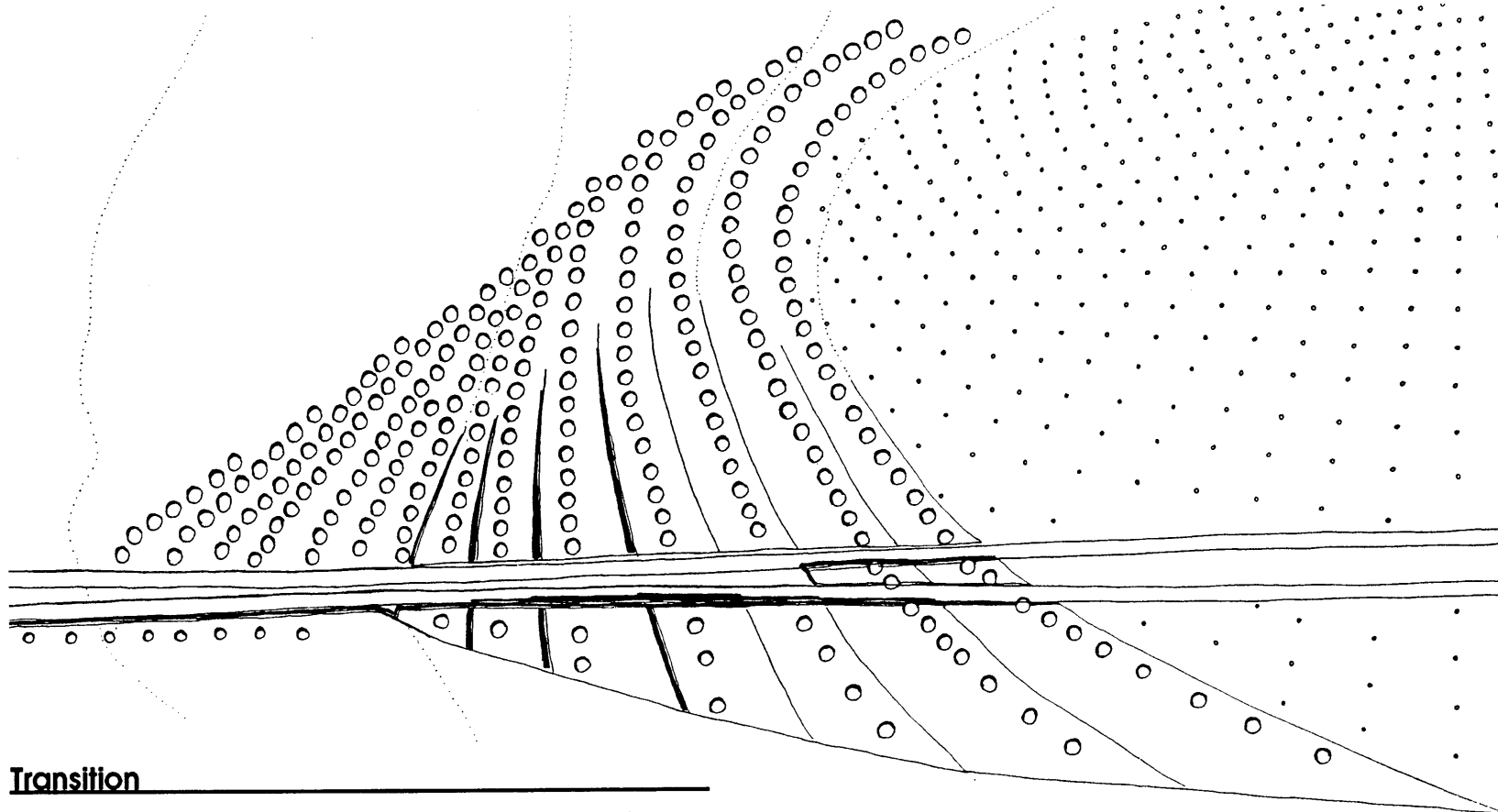
state. Once released into the field, the numerous rays of light read like landing blue lights at airports, guiding the airplane indicating arrival.

This experience is of course only possible at night. During the daytime, the concentration is focused more on the gridded geometry of the light posts, which is derived from the tree-lined orange groves common to Florida. (This image is common in most states, whether it is grape



20.

orchards in California or wheat fields in Illinois). The grid in plan is set up as an outline for a two point perspective with the vanishing points receding into the horizon to the left and in front of the road. I feel this forced perspective animates the field even more, allowing the row of lights to be perceived as curving back to the horizon as the motorist moves rapidly alongside them.

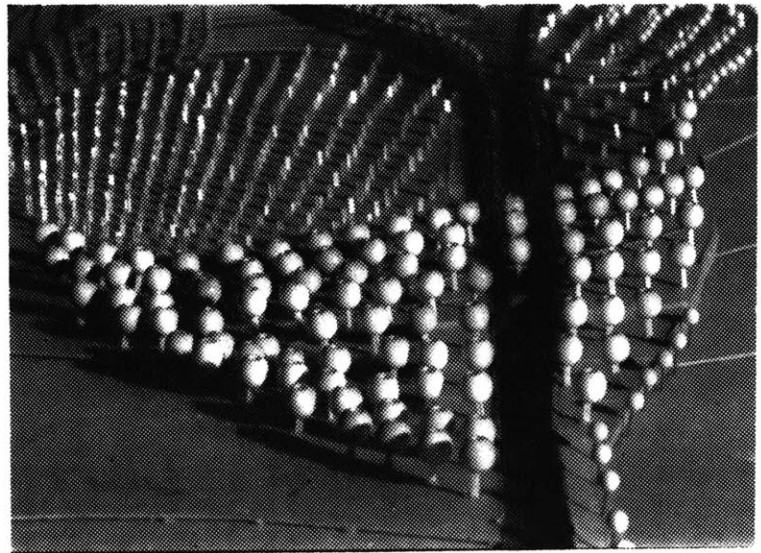
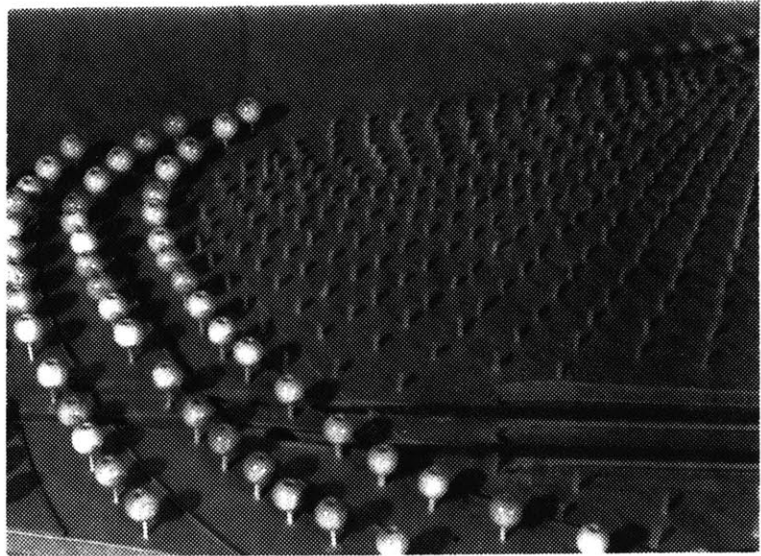


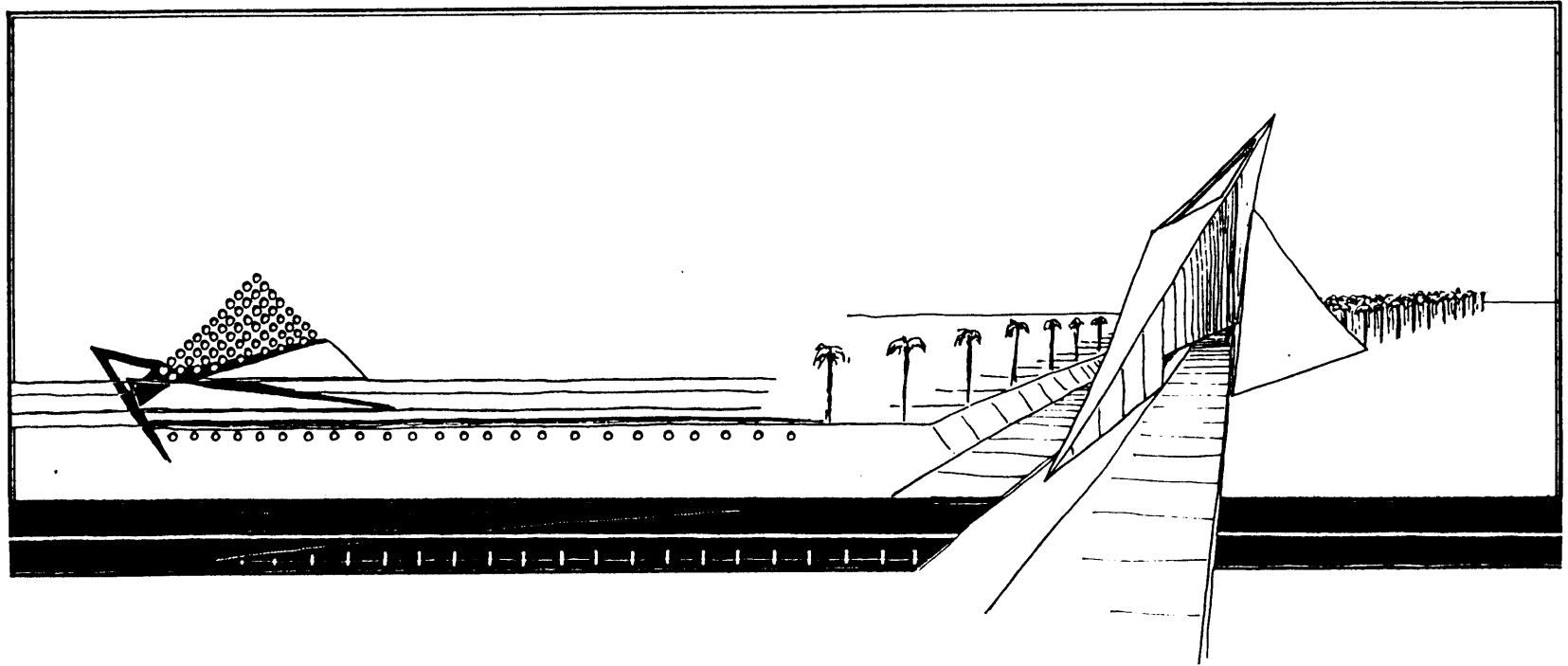
Transition

*Approx. duration: 18 sec
Recommended speed: 60 mph*

This phase is to facilitate the transition between the "landing" zone and the final "official" entry or portal into Florida. As the motorist progresses through the lighted field, the road descends slightly and the ground rises in elevated tiers of oak trees, embracing and containing the field. The

road surfaces again under the canopy of trees which frames the view of the final portal piece. Driving down into the ground and through the tiered plateaus of trees reintroduces the driver to the land after having experienced water and light, and sets up his transition to experiencing Florida's earthscape now that he has passed through the initiating procession.





Portal

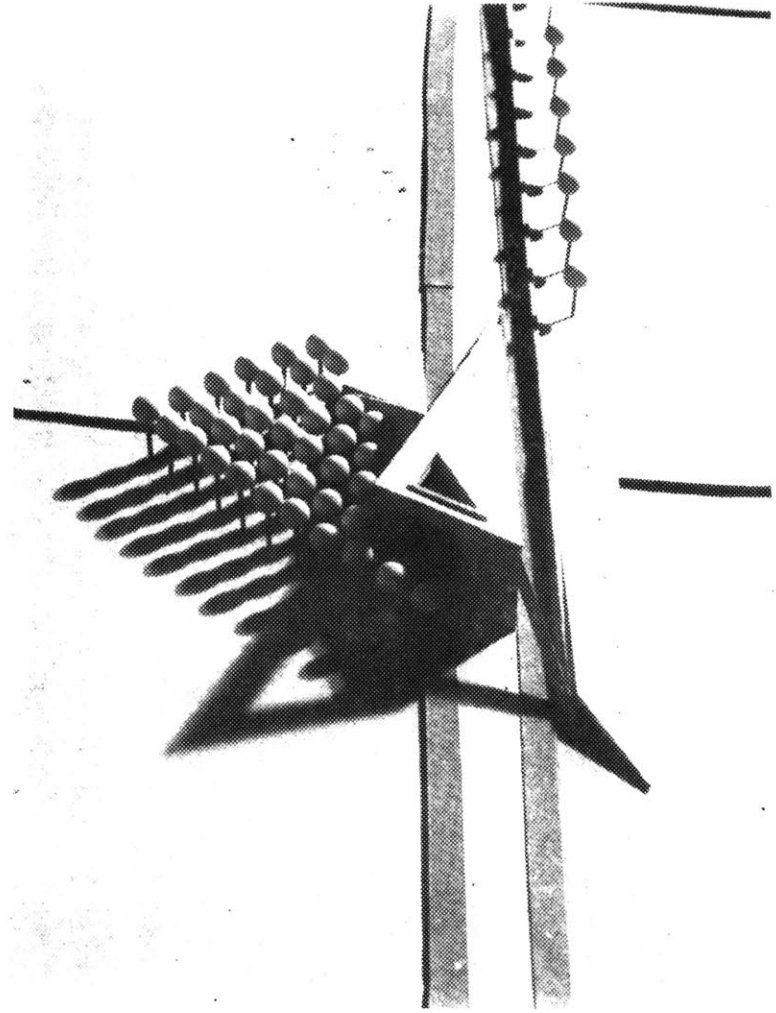
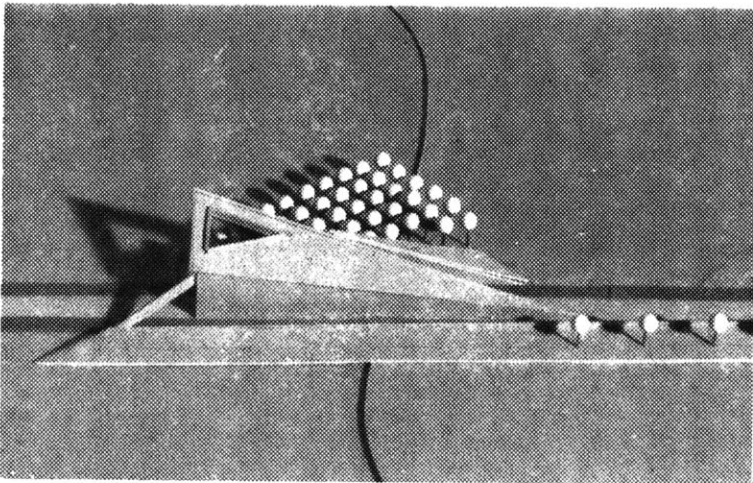
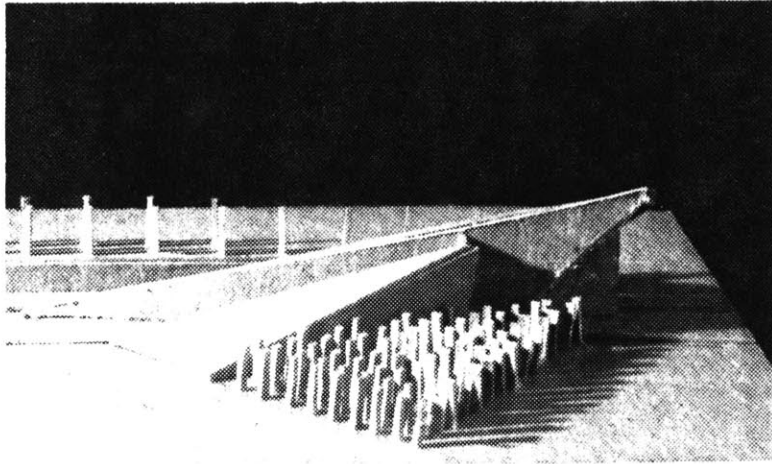
Approx. duration: 20 sec

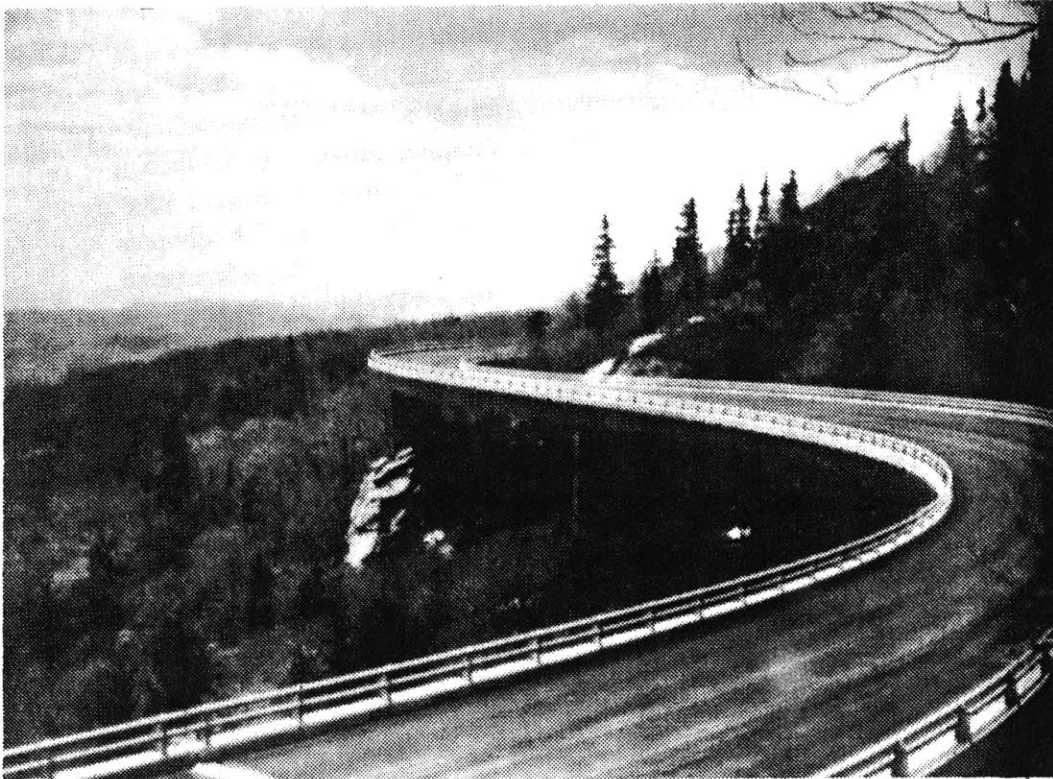
Recommended speed: 60 mph

The portal piece, like the first entry piece takes the form of an extruded pyramid, and again is meant to be read as a landmark in the landscape. In contrast to the first piece, which one ascends, this piece is opened up at the bottom and straddles the road, allowing the driver to go through it.

Palm trees line the left hand side of the road, creating a processional feel as the car approaches the structure.

Entry is through a relatively low, dark opening which proceeds onward, finally opening up dramatically to a panoramic view of the Florida landscape, under the canopy of the pyramid's top. The portal piece is like the official stamp, certifying arrival into Florida and subsequently releasing the driver to the "outdoors", thus ending the "Welcoming Center".





21. *Cinematic Architecture. The highway floats over the landscape, creating sweeping views over the surrounding valley.*

PERCEIVING OUR SURROUNDINGS THROUGH MOTION:

Notes on designing on the highway

The perception of our visual world is always a dynamic process involving the passage of time. Architecture is like frozen music, where man is the pick-up and whose movement through the designed space is required to activate the experience. *"Only when we walk around a building and move through it, can we share in its life"* - Goethe.

This chapter will deal with issues concerning perception of our surroundings through motion. It is largely a summary of my design findings and of issues that have been investigated by Donald Appleyard, Kevin Lynch and Jack Myer in their book [The View From the Road](#).

The driving sensation is primarily the result of the interaction of space and motion, with vision as the most active sense. Driving along the highway is all about movement through space and the relationship of objects and fields as we move through them. It is not a static relation between objects and places, but a dynamic temporal experience. This driving sensation is derived from

a spatial and experiential sequence that should be configured in a temporal flow, like composing a musical piece or creating cinematic images.

The driving experience has frequently been likened to watching television or a movie. That is because the automobile has transformed the windshield of the car into a proscenium arch framing one of the most fascinating movies: the landscape played at high speed. A major difference that makes watching television more engaging is that a T.V. drama is often calculated to minimalist details to present us with a meaningful mental picture that we can recall later. However the visual events and impressions one receives while traveling on the highway have become so familiar that they barely register at any level above the subconscious.

It is interesting to note that the highway is also criticized for similar reasons as television. The highway is considered a national network and mass medium; and just as we criticize television's impact on society, we bemoan the highway's environmental impact on its surroundings and

on the urban fabric. Where highways have been introduced for example, trees have been cut, hills leveled, valleys filled, and old meandering roads straightened. Instead of grand facades, backs of buildings now greet the motorists as they follow the bypass route through town. My design attempts to bring back those unique sensations that potentially exist in the driving experience, such as climbing up hills, swooping down into valleys, and sweeping round curves and turns.

Sense of Motion

There are three different conditions that operate simultaneously to present us with a sense of motion:

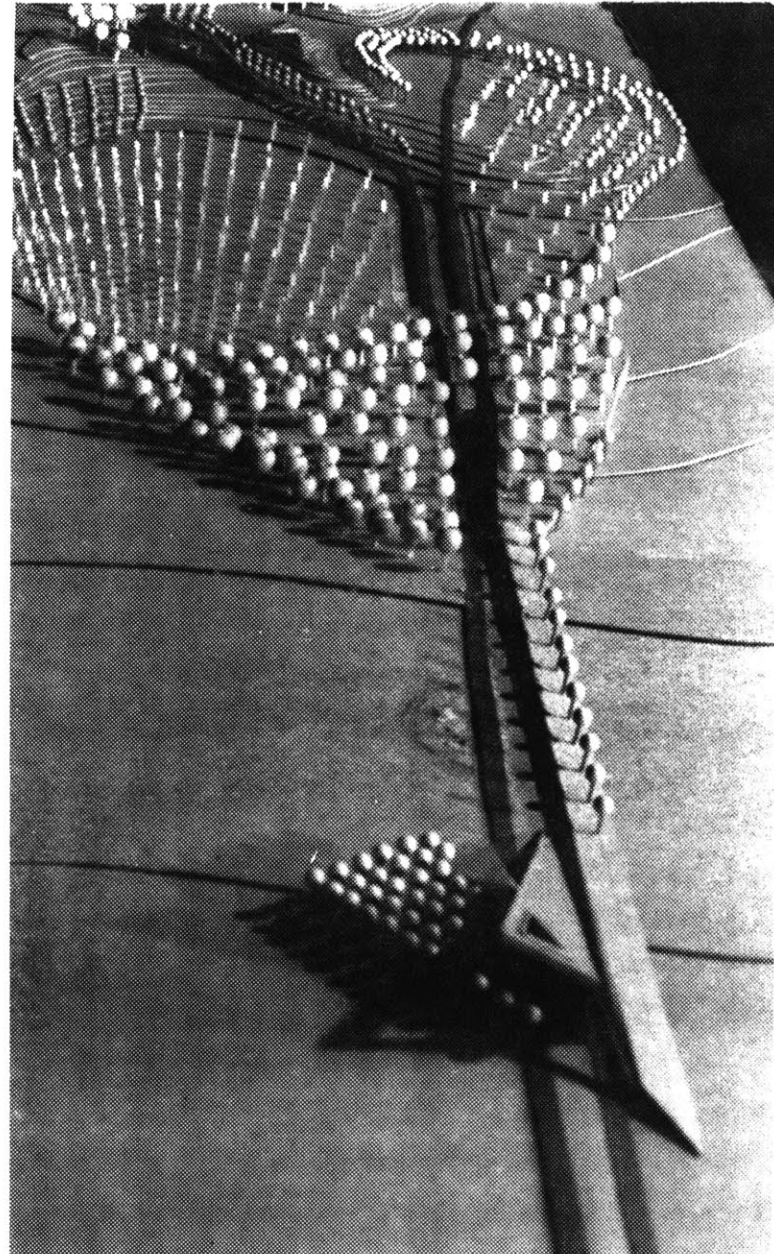
- *The individual's awareness of his own movement*
- *The apparent movement of surrounding objects*
- *Shape of space being moved through*

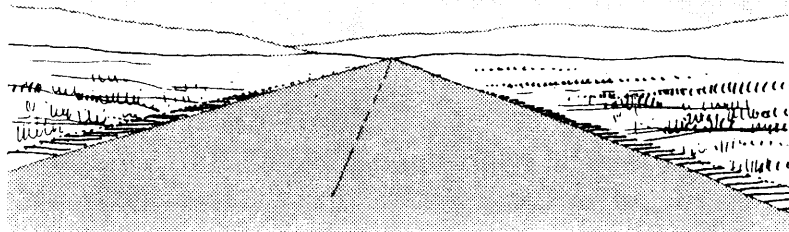
The highway must present the motorists with objects in the landscape, as assurances of movement. One assumes that physically moving on the highway will be accompanied by the sensation of movement. I have found that this is not necessarily true, especially in a totally featureless landscape on a long stretch of straight flat road. One could drive for hours, and yet feel of going nowhere. That is because of a lack of visual events which we need, to reinforce our perception of movement.

Another unique way one experiences motion at high speed is as the reversal of the driving sensation. In this case

the landscape seems to roll past under the wheels of a stationary car. This is a common experience when the driving altitude remains constant while the surrounding landscape swells up and diminishes. There is a sense of excitement that can be derived from the motion of the field and the apparent movement of objects, i.e. objects welling up and falling behind, breaking in two, slipping sideways or rotating as we drive by them. The apparent movement of surrounding objects as they move from the left side of the road to the right, creates an engaging experience between the driver and his surroundings.

Motion is always perceived in relation to the enclosing spatial form, and therefore the shape of the space one is

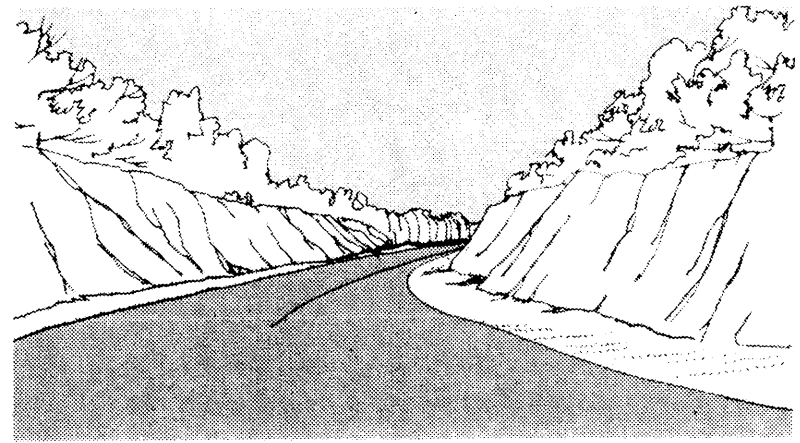




22.

moving through will alter one's awareness of movement, either by intensifying and heightening the perception of speed, or creating the opposite effect and seeming to suspend motion. For example, when the landscape is featureless, as mentioned earlier, one's sense of movement becomes inoperative and one has feelings of floating, suspended, with no forward movement. Whereas going through narrow spaces or underneath overhead objects (as in the "water gorge" of my design) one can experience a sensation of increased speed.

Noise derived from the contact of wheels with the road or emanating from the engine can also intensify the sense of speed. Loud humming noises makes one much more



23.

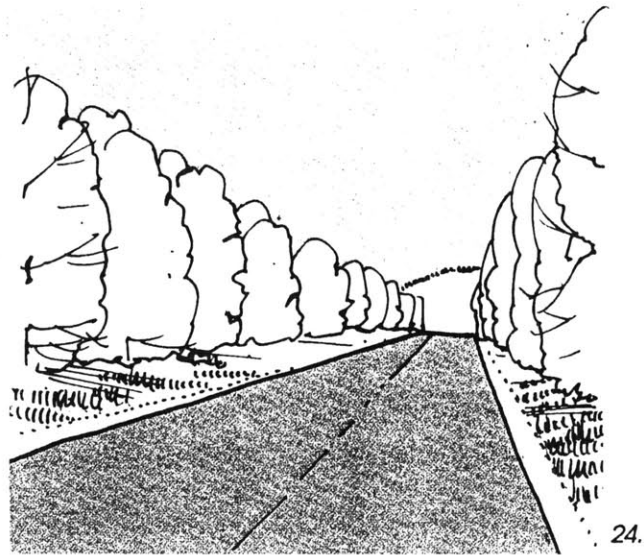
aware of speed, while a totally silent ride can produce the feeling of driving in a vacuum with no sense of how fast one is moving. (In my case, the combination of silence and an open flat terrain has had the unfortunate consequence of me being chased by the police and being issued a speeding ticket). Feelings of drowsiness, frustration or excessive speed (as in my case) can result because of long, undilinated stretches of landscape, and can also cause a perceived lack of progress towards one's destination. Therefore objects are needed along the way to counteract the static sense and to reassure one of progress, achieved through movement.

Sense of Space

Perception of space can be modified by adjusting various factors:

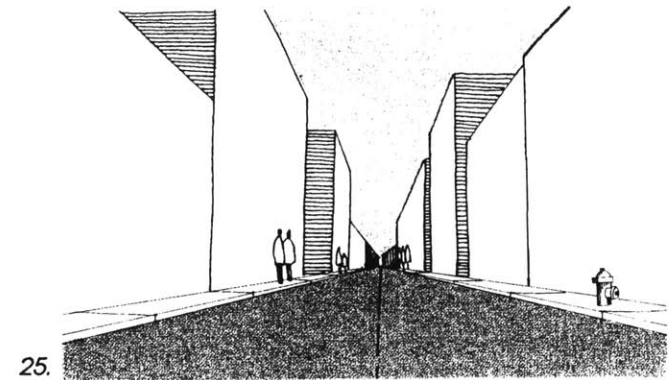
- *Space form or proportion*
- *Character of the defining elements*
- *Position of the observer in relation to the context*
- *Speed with which one perceives space*

These four factors can be used to alter one's perception of the surrounding environment and of oneself in relation to it. The proportion of a space can alter the perception of one's size in relation to a building or landscape, by creating a sensation of either growth or shrinkage. For example as one drives adjacent to tall and large structures or landscape elements (as in the entry piece in my design), one has a feeling of shrinking; while, when surfacing from a depression in the landscape, one seems to grow larger (as in the transitional phase of the tiered plateaus before entering the portal piece). This also applies to how the



position of the observer within the space, affects the perception of his surroundings.

The character of the elements that occur along the road also affect perceptions of the space. Hard edged walls for example, have a different impact on one's cognition of the space than soft-edged objects such as trees. Even if the distance between a wall and the road was similar to that of trees to the road, one would feel more confined by the former than by the latter. This perception of different levels of confinement can be better illustrated by comparing the driving experience of passing through a tunnel, to that of driving under a canopy of trees which has the same spatial configuration as that of the tunnel.



| Speed | Focal Dist. | Angle of Vision | Peripheral Angle |
|--------|-------------|-----------------|------------------|
| 40 mph | 1100 ft | 37 | 60 |
| 50 mph | 1400 ft | 29 | 55 |
| 60 mph | 1800 ft | 20 | 45 |

Speed has a paramount role in how we see and experience space. As speed increases, one's space perception becomes impaired. The foreground detail fades and the point of concentration recedes. Therefore one focuses on distant and stable elements rather than focusing on harder to discern elements immediately adjoining the road. One's peripheral vision recedes as well, so objects that are placed right up ahead of the road are more likely to be picked up visually than those to the left or right of the road. Slower speeds obviously allow the motorist to see more of the surroundings as one's head motion tends to meander from left to right in a leisurely manner.

Meaning

The thesis attempts to design in a way that will enable motorists to make meaning out of the experience of travelling by car, through places. My design tries to convey an experience of arrival to a new territory: Florida, and begins to create a sense of the place as the driver approaches it. Through different spatial and landscape configurations, and sequential experiences, I have tried to convey visual impressions that are representative and interpretative of Florida as I see it, and to prepare the driver, in advance, for the new culture he is entering. In some cases, the design approach I propose may help to alleviate culture shock, although this particular design may be too intensive an introduction to have this effect.

Rhythm and Continuity

The rhythm of elements along the highway plays a pivotal role in one's perception of the road. By rhythm I mean the spacing and frequency of objects along the road that start to establish a tempo with which one can associate, as with the spacing of street lights, or other orientational landmarks. The tempo affects the motorist, just as speed has an impact on one's experience of space. For example when the tempo is rapid, there is a heightened state of tension and the concentration is more on the immediate objects straight ahead. When the tempo is slow, the observation generally shifts from right to left in a leisurely and floating manner. Both of these effects can also be achieved through the location of the objects in relation to the driver. Objects that are right adjacent to the side of the car will simulate the former condition, while objects in the distance will create the latter condition.

A rhythm can also be achieved in an audio manner by

altering different textures on the road, as one experiences when passing over a grooved bridge or crossing over the metal "warning bumps" located in the middle of the road. By design, we can create a "soundtrack" of different noises and tempos to accompany the driving experience as one moves through a stretch of the highway, thereby enhancing the journey and complementing the visual events. The beat and rhythm established by strong visual impressions and slower intervals - in fact the entire driving experience - is I think, better measured in time intervals (such as minutes and seconds) rather than in units of distance. This is why I refer to my design in the abstract, as a journey lasting over three minutes in duration, rather than as spanning a distance of three miles.

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Illustration Credits

- Fig. 1 C. H. Liebs, 1982
- Fig. 3 Dorothea Lange, 1938
- Fig. 4 Doug Michels, 1974
- Fig. 5 C. H. Liebs, 1981
- Fig. 6 L. L. McAllister, 1948
- Fig. 8 Dorothea Lange, 1939
- Fig. 9 Albuquerque Museum Photoarchives, 1903
- Fig. 10 C. H. Liebs, 1982
- Fig. 11 Richard Longstreth, 1975
- Fig. 12 C. H. Liebs, 1981
- Fig. 13 C. H. Liebs, 1982
- Fig. 14 C. H. Liebs, 1982
- Fig. 15 John Fauver, 1930
- Fig. 16 John Fauver, 1935
- Fig. 17 John Fauver, 1957
- Fig. 18 Gloria Scott, 1984
- Fig. 21 Presidential Design Awards Program, 1984
- Fig. 22 David Mittelstadt, 1971
- Fig. 23 David Mittelstadt, 1971
- Fig. 24 David Mittelstadt, 1971
- Fig. 25 David Mittelstadt, 1971

