To the Graduate Council:

I am submitting herewith a thesis written by Scot William Frontis entitled "Connecting Boundaries: Creating A Dialog Between Interior and Exterior Identities-A Nautical Museum in Figueira da Foz." I have examined the final 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.

Dr. Peter Lizon, Major Professor

We have read this thesis and
recommend its acceptance:

Accepted for the Council:

Associate Vice Chancellor and
Dean of the Graduate School

Connecting Boundaries:

Creating A Dialog Between Interior and Exterior Identities- A Nautical Museum in Figueira da Foz

A Thesis

Presented for the

Master of Architecture

Degree

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Scot William Frontis

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Dedicated to the memory of my grandmother

Marjorie Creighton

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Abstract

This thesis addresses boundaries as they relate to critical regionalism. For the purposes of this thesis the central issue of critical regionalism revolves around the question of how does one become or remain modern in a global, universal world while still maintaining a coherency of place, so that one's roots and traditions may be acknowledged. The thesis will focus on this boundary between the particulars of a place and its global context. Boundaries have the dual capacity to isolate and connect places and artifacts to make them distinguishable. Additionally, bounded situations address interior conditions as well as exterior conditions. Boundaries are conditions of the inbetween and therefore naturally create edges.

To explore the notions of boundaries both a site and a program were chosen which inherently manifested these issues so they could be explored in depth and breadth. The site, located in Portugal, straddles both water and land as well as straddling the old and new precincts of a city. The program is a nautical museum, addressing Portugal's distinguished history of being a seafaring nation, traveling to all corners of the globe, while being bounded to particular traditions, place, and time. Boundaries between contemporary and traditional construction will be explored in the thesis as well as the metaphorical and symbolic capacities that boundaries contain.

Preface

During the summer of 1996 I had the unique experience of going to Portugal and participating with a group of architecture and planning students to analyze and create a redevelopment plan for the city of Figueira da Foz. As well as staying in that city, the group stayed in Colmbra, as well as visiting other significant areas. This being my first trip to Europe, it was definitely a thrilling and eye opening experience. The specific area I analyzed in Figueira da Foz was the city's river front. This area was on the edge of some very exciting possibilities. It was here that I began to observe especially how within a historical context a contemporary building could become successfully intertwined with the fullness of its place in order to not deny the past nor the future, but to use the two to create a meaningful identity.

Chapter One defines the notion of boundaries that are inherent within every context. An investigation into the issues are established to clarify a variety of expressions that can be drawn from these boundaries.

Chapter Two examines a set of architectural precedents that incorporates the notions of connecting specific boundary elements into a contemporary expression. While these architects demonstrate a connection to the building's site, design responses vary.

Chapter Three identifies a specific area in Portugal, Figueira da Foz, and uses the design issues and concepts of connecting boundaries to produce a design for a nautical museum. An analysis of the unique boundary elements within this location are examined and incorporated into the design through diagrams, drawings, and photographs. A summary of the ideas presented in the study is made in regards to the design project and how it pertains to the notions of the boundaries that become connected.

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Chapter 1

Connecting Boundaries

Introduction

In the past, buildings were used for protection from various elements. As time went on, an accretive process occurred within a built environment and the boundary of what was known became expanded. The notion of what a boundary is has changed throughout our history. In many cases, the boundaries within our cities have transformed so much that it no longer pertains to what used to be the old division between city, country, and now the world. Identifiable boundaries in many places no longer exist.

It is the contention of this thesis that meaning in contemporary architecture be found within the boundary between its interior and exterior identities. It is not to deny the localization of its place nor its global context, but to simultaneously respond to both. The boundary thereby enables a dialog to occur, questioning both inside and outside, allowing a linkage to create a meaning that is responsive to its place. As Steven Holl states, "a building transcends physical and functional requirements by fusing with a place, by gathering the meaning of a situation. Architecture does not so much intrude on a landscape as it serves to explain it," (Holl 91). Architecture has the prominent distinction of being a powerful medium to resonate meaning to a place that expresses a connection within its bounded situation. As Alvaro Siza simply stated, "Tradition is a challenge to innovation," (Bussel 95). This modernist point of view signifies a connection should be made in combining the characteristic elements that have sustained a culture's identity, and to fuse that aspect with the universal components that our technologically innovative world has given us.

Interior Boundaries

A building is not independent of its place, it is unmovable and bound to its specific location. A building must embrace its surroundings to become an extension that expresses the circumstances and characteristic elements which have brought the place into its current condition. As Amos Rappaport states,

> "Each setting can be seen as a place having an order which becomes recognizable, because it can be described by a set of characteristics: its location, its relation to landscape, having certain elements, having certain settings, having spaces of a certain type, being named in particular ways, using certain orientation systems, having certain colors, textures, etc., having certain sounds, smells, temperatures, air movements, having certain people, engaging in certain activities, and so on," (Agnew, Mercer, and Sopher 84).

Therefore, buildings cannot be considered alike everywhere. Within a given place the embodiment of its particular qualities is what identifies it from any other building. Norberg-Shultz claims that, "From ancient times this quality has been recognized as the genius loci," (Norberg-Shultz 88). The interior boundary of the 'genius loci' seeks to embody specific meanings that are distinct from any other situation. As Heidegger says, "The buildings bring the earth as the inhabited landscape close to man and at the same time places the nearness of neighborly dwelling under the expanse of the sky," (Norberg-Shultz 88).

Establishing that an area is bounded by the idiosyncrasies of a specific place as well as between the earth and sky creates a connection that intertwines the building both physically and metaphysically to both its place and to the world. But, a coherency should be established to reiterate the characteristic elements of the subjective experience one gets when being within a specific place. The bounded space within a given site is established through one's own experience, as well as the collective experience that a specific cultural condition responds to within its inner world (Figure 1.1).

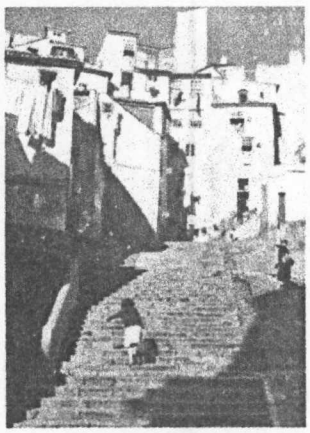

Figure 1.1
Medieval Lisbon

The bounded situation of a place is subjective, in that it pertains to a specific setting which is not absolute. Within it there becomes a recognizable order that is identifiable and unique. For example, in a historic Portuguese town, this experience is dominated by tightly knit medieval streets with compacted buildings that have clothes hanging from the windows, drying in the temperate climate. The buildings are austere, with punched openings that are framed. Their compactness adheres to the hilly topography to give them a dynamic feel (Figure 1.1 and 1.2). Although the idiosyncrasies of a place should be sustained, a reliance towards literal historical precedent leads to a regressive strategy, and denies the present condition. Acknowledging the boundary elements contained within a culture into a contemporary expression enables a cohesive fit to sustain an area's significance.



Figure 1.2
Typical buildings in Luso

Exterior Boundaries

Our built environment is increasingly being based on the global context. With this, a coherent sense of what a place is has become lost and so is the perception of its distinguishable boundaries. Today's architecture should correspond with and connect to its place to create meaning. Within many environments one can observe and experience identical situations, thus cities are no longer identifiable as unique entities. In many cases the same experiences are developed as one can find the same mini-mart or strip mall. This tendency has lead to a disturbing subculture of mass consumerism, destroying any authentic language that has been established. These influences destroy the old city to create a new form and the result is no permanent sense or definition of a boundary to define specific territories. Figure 1.3 shows the ocean front in Figueira da Foz, Portugal. The buildings in this area do not help to establish any recognizable identity, they could be anywhere.

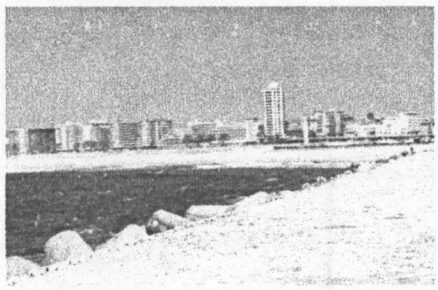

Figure 1.3 Figueira da Foz oceanfront

Modern architecture's asset is its universality and ability to incorporate the technological advances that have occurred within our time and to develop an architecture around this. Holl states, "Today the link between site and architecture must be found in new ways which are part of a constructive transformation in modern life," (Holl 91). The challenge for architecture is to not abandon its specific place, but to allow for the two values to be understood together. Boundaries within an architecture allow for different elements to be combined to resonate meaning. The challenge is to not look for a regressive strategy which relies purely on historical precedent, but to define significant characteristics that can associate with a culture, thereby sustaining it. Today, there are universal elements that have come to characterize and symbolize the image and life of a city. An example can be drawn again from Figueira da Foz, and the influence of its shipping port (Figure 1.4). Cargo ships carry with them not only goods from other areas, but also a universal component.

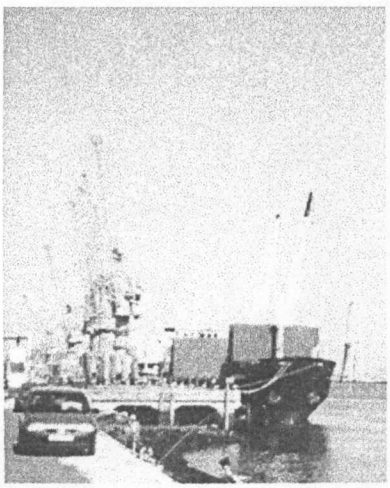

Figure 1.4 Port of Figueira da Foz

A ship could be on any dock and its form and function still be the same. Being a city on the water, as well as a main port, offers a variety of solutions that are not only universal, but also create a connection to the area through this influence. Therefore, it is the challenge of architecture today to incorporate these two attributes, and establish identifiable boundaries that can be understood both inside and outside of their given position.

A coherency of form needs to be identifiable within a place and acknowledged in order to connect a boundary both inside and outside. As Paul Ricoeur suggests, "that sustaining any kind of authentic culture in the future will depend ultimately on our capacity to generate vital forms of regional culture while appropriating alien influences at the level of both culture and civilization," (Frampton 92). Technology is an aspect within our world that can be established on both a cultural and universal level. Just as cargo ships and tourists come and bring alien influences to Figueira da Foz, that in return begins to provide an identifiable aspect to the city. In Lisbon the ability to expand its city boundaries was established through the use of technology (Figure 1.5). The bridge establishes a connection and provides for an identifiable image which also carries with it a multivalence for a connection of external boundaries. The design of the bridge was done by the same engineer that did The Golden Gate Bridge in San Francisco, which coincidentally is on the same latitude as Lisbon and has a similar climate and topography. This bridge becomes an excellent example of connecting boundaries through a universal means within the city, as well as connecting them to the outside.

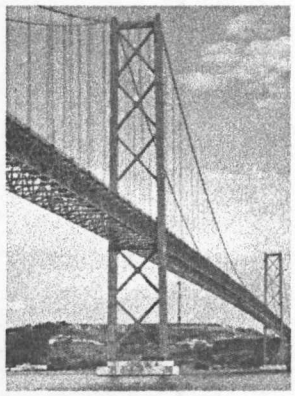

Figure 1.5
Salazar Bridge

In order for boundaries to be connected an architecture is to be anchored to its interior world that is rooted to its unique place setting, but also anchored to its exterior world which seeks to embrace the universal world. The architecture therefore bridges the gap between inside and outside within a perceptible boundary.

Boundary as Mediator

An architecture may become a mediator between its boundaries through an acknowledgment of physical and metaphysical site characteristics. The concept of a boundary can be paralleled to that of an arc of a circle (Figure 1.6). Within the boundary where a building resides exists the interior world. This is similar to the area within a circle. The area within and the radius extending to the arc can be measured and calculated, and thus it is known, understood, and accepted. Order within this area can be identifiable and maintained. Outside of the arc, the exterior of the circle, however, lies the uncertainty and a lack of definition. The meaning of a boundary is enhanced through this idea of the circle's arc and known and unknown influences that are incorporated into the built form. This serves both as isolating and connecting factors that establish a continuity between past and present, inside and outside. The building becomes a conceptual wall that layers the boundary between two realms, enabling both conditions to establish a dialog with each other.

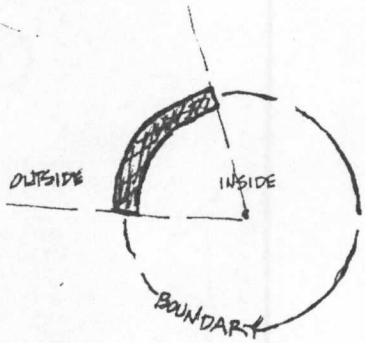

Figure 1.6
A mediator between realms

Joseph Chronister states, "The wall can establish this much-needed boundary between realms of inside/outside, public/private, man/nature, known/unknown, us/them, and sacred/profane. For the wall itself belongs to neither realm; it becomes the mediator between the two and therefore allows for passage back and forth," (Chronister 82). The wall acts as an important boundary within architecture, for it is a connector as well as a separator which reinforces what is around us. Wolfgang Zucker suggests, "that the erection of a boundary separating inside from outside is the primeval act," (Arnheim 77). Traditionally a city was fortified by a thick wall so that the outside world would be unable to successfully penetrate the inside during an attack. Figure 1.7 shows Coimbra, Portugal, in which the older structures are enclosed within a protective wall. Newer buildings however have been erected outside of the wall, so that

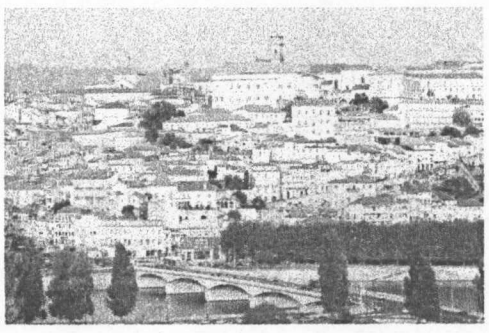

Figure 1.7 Coimbra

its original boundary is barely perceptible. The city's protective barrier now has become an important strand in the fabric of this town that conveys meaning between past and present. As the city grows, strict ordinances help to preserve the city's ancient origins. So the wall can literally signify a constructed intercessory between its two realms, that as Chronister notes becomes, "a conveyor of meaning, having magic powers since they were outward signs of dogma," (Chronister 82). Through a city's center to its periphery a story is told through the various transformations these boundary walls have undergone and evolved into. From a city's center, each layer which moves out acknowledges the other so an order can be maintained. A linkage between two realms of the interior and exterior boundaries of a place allows the periphery to fuse them together, and in turn, strengthen them. Alvaro Siza notes, "We must not forget that the city is not only made, especially nowadays, from its reality, but also from its memory," (Bussel 95).

Where a building is positioned becomes a mediator between two realms so that a symbolic interpretation can be achieved, giving significance to a boundary. A powerful example is the Pyramids of Chephren, Mycerinus, and Giza . By being positioned between the fertile Nile River and desert, it becomes a symbol of life and death, and a gateway to eternity. Charles Jencks states, "Since a symbol is meant to mediate between everyday existence and eternity, it has several related meanings which unify the two," (Jencks 85). The Pyramids create within them multiple boundaries which allow for different interpretations that establish an eternal significance. Jencks notes,

> "Another related meaning concerns the orientation of the pyramid to the sun's path and the axis of the Nile. Since the pyramid was placed on the West Bank and had its offering table on the riverside facing the morning sun and the fertile Nile, it became a very real gateway to eternity. The sun set behind it and a thousand miles of desert, or death, stretch out immediately from this point," (Jencks 85).

Positioning an architecture on the edge of a boundary enables for a symbolic interpretation to occur. Even in contemporary cities today there are edge conditions that can create a symbolic interpretation. The Tower of Belem in Lisbon is an example of positioning an architecture on a boundary which can be interpreted symbolically (Figure 1.8). The Tower is positioned on the edge of land and water, which is now considered a monument to the discoveries. Vasco de Gamo is said to have prayed in the tower the night before his voyage to discover India. The position being on a boundary between land and sea acts as a mediator. The meaning for which symbolizes a connection to the voyagers that are at sea to the mainland.

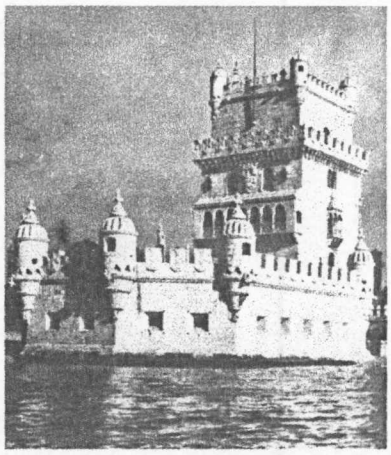

Figure 1.8
Tower of Belem

In Figueira da Foz, the river front offers a symbolic edge condition (Figure 1.9). Within this area is a boundary between the city, a historic river, and the sea. A symbolic interpretation can be drawn from the fact that the sea represents the horizon, and endless possibilities. The city, grounded in history and culture, by the Mondego River, represents Portugal's interior realm. The edge between city and water therefore offers to become a powerful location to act as a mediator between boundaries that can interpret meaning to that specific place, as well as universal possibilities.

By making the building an interpretation of its area, and mediating between the reality of universal civilization with a cultural past, the identity of a place and boundaries within it are strengthened. As a result, the meaning and identity of a place is preserved while still engaging the broader world.

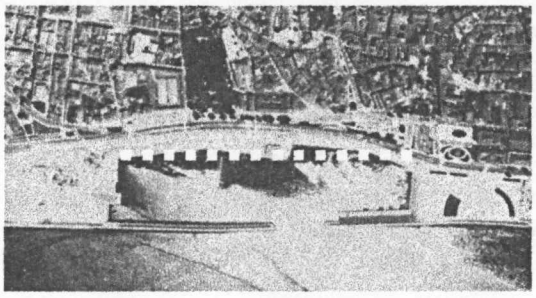

Figure 1.9 Edge condition in Figueira da Foz

Summary

A boundary enables the development of an edge that provides a link between two realms to expand an understanding of each. The issues are as follows:

- A boundary responds to a given environment by reflecting existing forms tectonically.
- A boundary provides a link between its two realms through materiality.
- A boundary enables a symbolic link between two realms, through its unique site characteristics.
- A boundary mediates and allows for a paradox to exist with meaning rather than confusion, so that one edge may inform the other.

The concept of interior and exterior boundaries establishes a distinctive connection within both of these realms. The building fuses these characteristic influences from the interior and foreign influences from the exterior for the creation of a dialog between an objective experience of our inner world and the subjective experience of our external world. Hence, the goal is for buildings to be understood, experienced, and interpreted in a broader context that relates to its time and place.

The building seeks to become a critique of its place by incorporating external influences. The end result is to enable a more enhanced definition that is capable of maintaining an identity within a contemporary expression. This critique clarifies the building's intention by fusing foreign qualities within the context of known values to create an altogether new level of understanding of a place's identity.

To accomplish this, the building aspires to parallel elements that are characterized by a universal understanding while maintaining the spirit of the place where the building resides. The building should incorporate characteristic components that are rooted in the past to identify a regional quality. In addition, the building strives to incorporate universal influences to produce a contemporary interpretation so that its connection can be a mediator of meaning that enables an understanding between both realms without confusion. To do this, the building should establish a boundary between its interior world and its surrounding exterior world so that both a dialog and a deeper understanding is established.

Chapter 2

Boundary Precedents

Introduction

The buildings that were selected for analysis as an appropriate architectural precedent are due to the conceptual response the buildings have with their specific environments, and the role of modern architecture within the environment. The designs for these buildings vary, but the intention within them all have similar underlying meanings. Combined, these architects all create links to their place through a contemporary response. Although their methods of analyzing the place is different, they all seek to combine meanings within the building which acknowledge specific boundaries that are relative to its place.

School of Architecture

Alvaro Siza

The school of architecture in Porto, Portugal overlooks the Douro River. The building is fixed into the hanging slope of an uneven topography. The response is an abstract representation of a miniature city for academic and social activities, as well as mimicing the buildings that are on the banks of the river (Figure 2.1).

Siza's contextual building of urban fragments becomes an associative intervention with the new being parlayed against the old through scale and form. The building imitates constant themes in Portuguese architecture, such as villages with closely knit buildings and walls, extending platforms, and ramps (Figure 2.2). Punched openings for the fenestration and fragmented forms correspond to the contextual buildings of Portugal's inner city.

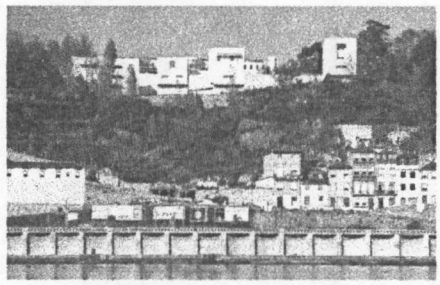

Figure 2.1 A contextual response

By reinforcing these characteristic elements, Portugal's insular boundary is strengthened. This abstract interpretation creates a contrast between the visual connection of its context by adapting a response that is tectonic. With the building set into an uneven landscape, the free standing pavilions are linked and penetrated by ramps. These pavilions produce a compression and expansion of spaces within the urban fabric of its city. The symbolic link of the ramp to a Portuguese street is also a source of interaction within their culture.

Abstract gestures such as platforms are intended for people to see other people moving through or going about their business as well as relating to other buildings, which corresponds to Portugal's vibrant street activity. Within the school of architecture people can get views of the gardens between the buildings and allow for glimpses from one studio to another. This allows for a protected but unconfined internal world to become engaged with the conditions of its external surroundings.

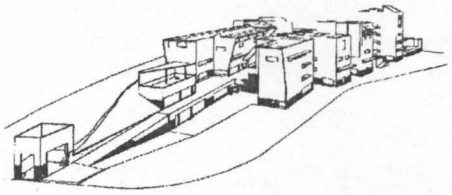

Figure 2.2 Aerial perspective

Museum of Contemporary Art

Steven Holl

The museum in Helsinki, Finland has interior volumes that are juxtaposed with one another to create an exterior shape that metaphorically resembles a huge wave on the waterfront. Holl's concept of 'intertwining' creates an environment that manipulates one's circulation from the front to the back of the building. It corresponds to its existing condition through axial lines from various significant points within the city. These axial lines thereby direct the building's design and form. Figure 2.3 shows how the building is guided by a line of culture, nature, and the city. As Holl states, "An implict cultural line curves to link the building to Finlandia Hall while it also engages a natural line connecting to the east landscape and Toolo Bay," (Holl 96). These two lines then correspond with the grids that dictate the city. The building's site combines the multiple boundary conditions which, "stem from the proximity of these monuments, and the confluence of various city grids," (Holl 96). These lines which influence the form and position of the building creates a connection of boundaries to establish a meaning that identifies with its place (Figure 2.4).

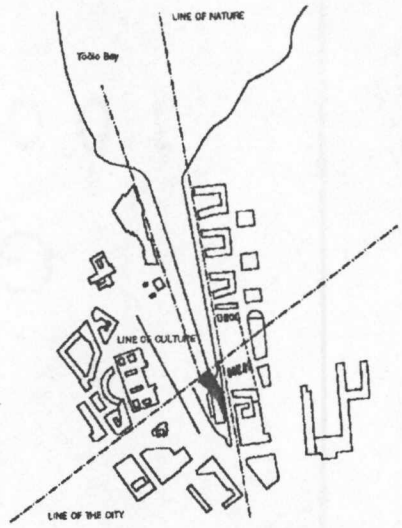

Figure 2.3
Axial lines which guide the design

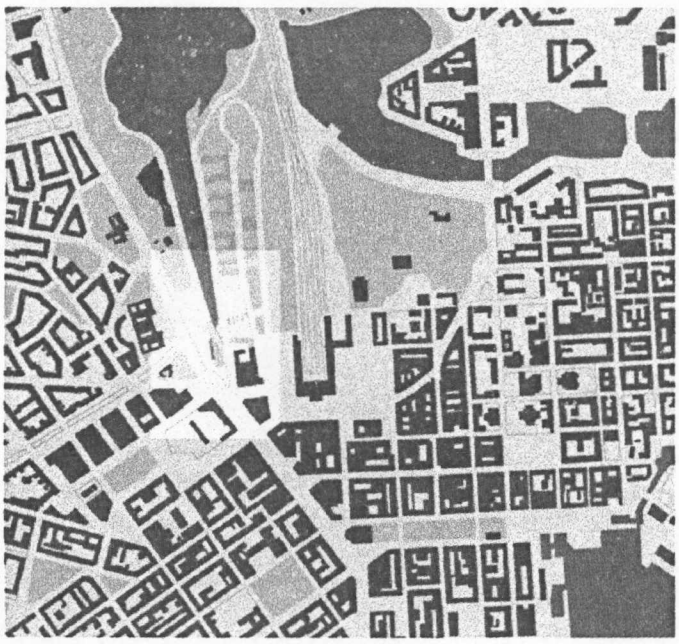

Figure 2.4 Figure/ground of site

This museum envisions an urban design proposal that includes a waterfront development. At the southern edge of the site, the bay winds through the museum as a water-lined passage and reflecting pool. The building's sculptural form is wrapped in metal cladding which creates a contrast to the existing context but succeeds in establishing a relationship with neighboring streets and buildings positioned at different angles (Figure 2.5). Along with the museums galleries, a café will be incorporated which is intended to be open beyond the museum's regular hours. This enables the building to be occupied for most of the day and the night.

The concept of 'intertwining' that Holl uses within the fabric of the city extends inside the building, guiding its form, to break down the distinction between inside and outside. This is done not only in the building's expression within its environment, but also within the building's plan and circulation. This allows for a truly unified entity.

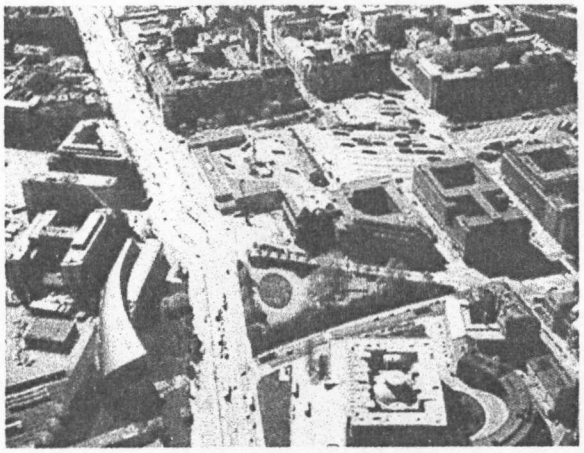

Figure 2.5 The Museum of Contemporary Art

Nelson Fine Arts Center

Antoine Predock

The arts center contains a museum, theater, art and dance departments on Arizona State's campus in Tempe, Arizona. This building's response is influenced by its desert environment in the use of materials and form. The primary material is concrete, which creates a tough exterior that deals with the reality of its environment, a harsh environment defined by relentless sun. The building symbolizes the power of this desert place in its materiality, which acknowledges the need for shelter from the sun and heat. Indigenous forms found in existing desert architecture are abstracted to create a logical fit into its setting. These forms found in previous cultures maintain the identity of its place by acknowledging its natural environment.

The building connects with its site through association. Linkage to site also occurs metaphysically by corresponding with a symbolic connection between the ground and sky. Underground courtyards make a connection to the ground and an isolation from the sun, with water and diffused natural light creating a protective environment. Penetrating the building is a brick arcade aqueduct that delivers water to three exterior fountains. Water holds a special significance with the desert, plentiful underground, but hard to find above ground; it symbolizes life and relief from the heat. The building creates a journey, both horizontal and vertical, that enables options and potentials for engagement of its functions. This journey from the horizontal to vertical completes the connection from ground to sky which is also found in form. Forms act as mesas which creates a number of vantage points which is inherent within the desert landscape (Figure 2.6).

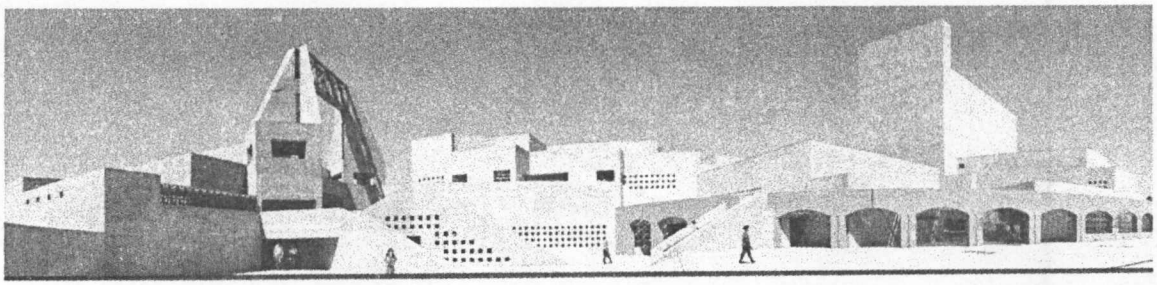

Figure 2.6 The abstract forms create a connection to the desert landscape

This building creates a connection of boundaries defined by a previous culture's need for survival from the forces of nature (Figure 2.7). Predock reinforces the identity of its place by harmonizing with the desert through a modern interpretation.

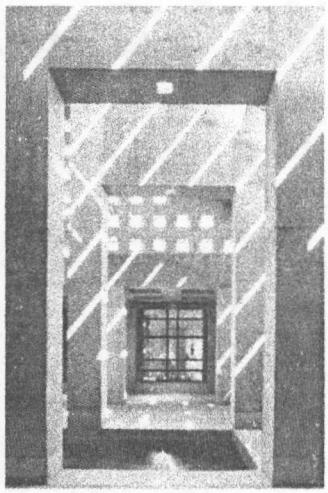

Figure 2.7
The protected interior

Atheneum

Richard Meier

Inherent in its intent is for the building to be a place of arrival, beginning a tour (or exploration) through New Harmony, Indiana. The building is an abstract representation of a steamship which gives it a quality that is foreign to its unique context which consists of Shaker-like forms. With railings running through the interior and exterior of the building and white porcelain paneling, the intent was to produce a contrast to its environment, becoming both foreground and background. This paradox was done to possibly make the context as well as the building stand out more against each other. The context which is primarily wood and brick structures enables the architecture to become a sightseeing attraction.

Although the building does not consider its interior boundary through materiality or form, it does consider its surroundings by creating reference points for one to orient themselves around the town and its history. Reference points are established within the building through skewed grids producing a manipulation of movement patterns. A narrowing and opening of spaces from these different grids forces visual perception in directions of these distant focal points. A spatial fluidity is created with weightless planes exploding from the inner core to the exterior (Figure 2.8). A literal play between interior and exterior is established though circulation ramps which frame views between the building and the town. The skylights and punctured planes also help to bring the outside in through natural light. All these elements speak to the external condition which is defined by the universal world, but these aspects help to amplify the internal world that this building exists in.

This building provides an excellent contemporary example for the way in which a building can identify with its environment in an abstract and ambiguous way. The Atheneum enhances its interior boundary through universal principles in materiality and form. This solution articulates a reversal in the sense that the exterior boundary explains and enhances its interior boundary.

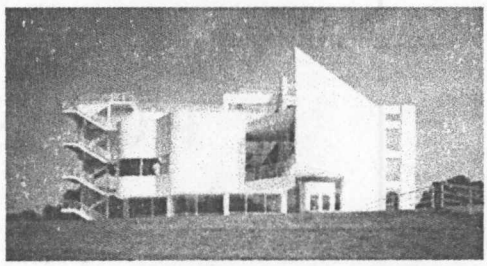

Figure 2.8 The Atheneum

Linda Vista Library

Rob Quigley

The building's expression creates a dialectic play between its exterior and its interior. The outside takes cues from the California missions in form and basic materials. The building becomes a fortress within its shopping mall site acting as a focal point and cultural center within the community (Figure 2.9). Inherent within its purpose is the way in which the library takes a regional icon to become a descriptive work that creates a sense of order (Figure 2.10). The library's interior counteracts with the tough and weighted massing of the exterior. There is a definite open weightlessness that is achieved by the lightweight stick framing that allows natural light to come inside making for a sympathetic interior environment (Figure 2.11). The architecture successfully oscillates between its two poles of heavy and light, interior and exterior to strengthen the perception of the areas boundaries.

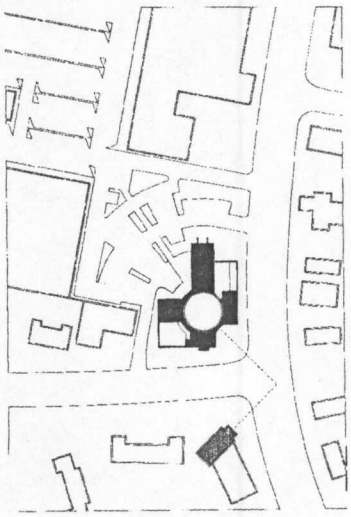

Figure 2.9
Libraries Site Plan

The use of the typical historic Spanish mission forms which were abstracted in the early twentieth century by architect Irving Gill are a source of inspiration for the architect to make for a distinctive connection that reinforces the character of its place.



Figure 2.10
Libraries exterior depicts
Mission style forms

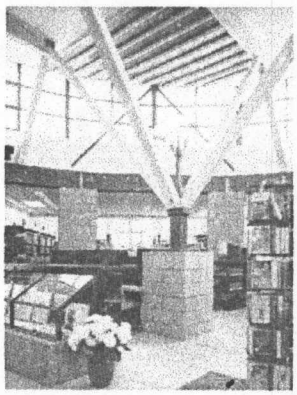

Figure 2.11
Interior of Library

Chapter 3

A Nautical Museum

Introduction

Figueira da Foz is a city with inherent boundary conditions. Its position, history, and influences which guide it today enable for a linkage of the multiple boundaries existing within the city and surrounding area to become manifested into a building that can provide meaning to this place. Acknowledging these inherent characteristics, a Nautical Museum that celebrates the importance of Portugal's maritime history (Figure 3.1) would be an appropriate and valuable institution for the city as well as for the country. This museum can aid in providing an awareness of this country's historical significance, and provide a vision towards the future.



Figure 3.1
Henry the Navigator who founded the nautical school in 1412

Portugal

Portugal is a small isolated country surrounded by Spain to the north and east and the Atlantic Ocean to the south and west (Figure 3.2). The country is divided into five regions: the Northern Region, the Central Region, the Tagus Valley Region, the Alentego Region, and the Algarve Region. The country has a rich nautical history and is primarily regarded for its discoveries in the fourteenth century. The Age of Discovery had an enormous impact on Portugal, as well as the world, by influencing other cultures. These cultures in turn influenced Portugal's cultural history. This can be seen by the many different mixes of architectural styles this country has to offer. Prior to the Age of Discovery, Portugal has had a turbulent history. Influences from past civilizations in this region include the Romans in the first century and the Moors in the third century, until the Iberians moved north in the tenth century to create the Kingdom of Portugal.

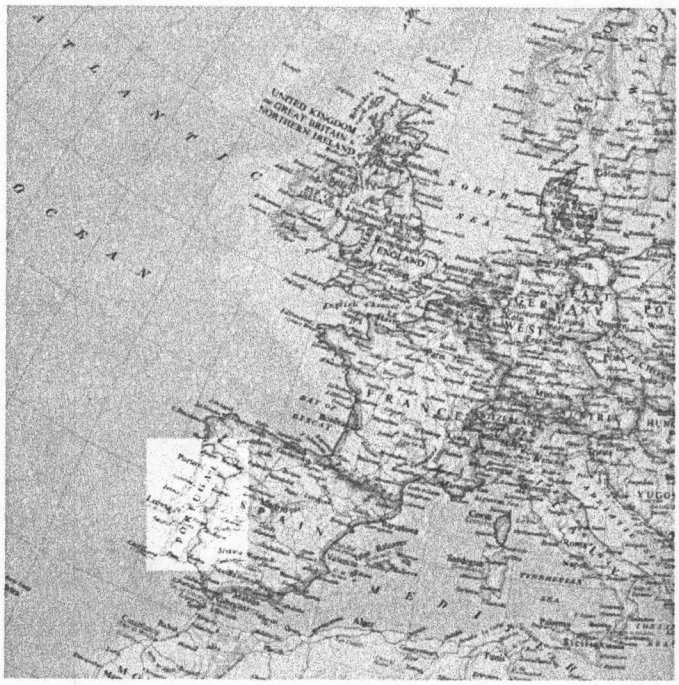

Figure 3.2
Map of Europe

The architecture within Portugal consists of primarily white plaster buildings, but there are colorful variations that create diversity in the landscape (Figure 3.3). The architecture closer to the ocean becomes more colorful. Red tile roofs compliment the plaster walls, injecting the area with Mediterranean like qualities. Ceramic tiles are inlaid everywhere, the decorative designs cover the sidewalks, the sides of buildings, retaining walls, etc. The tiles often depict stories of the past and Portuguese myths. Through these tiles, it is possible to derive what a place was like when the building was built, creating an imbedded condition, literally and metaphorically.

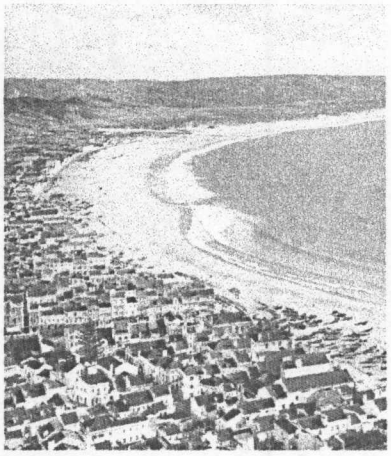

Figure 3.3
Nazare

In Portugal there is a central and very important river, the Mondego (Figure 3.4). This river is the only to run the entire course in Portugal, and is a consistent theme in Portuguese literature which is also known as the 'River of Poets.' This river also serves as a symbolic link to Portugal's history. Located on a hill above the river in approximately the center of the country is the city of Coimbra which was founded in prehistoric times. This city's name was taken from Conimbriga, a nearby Roman settlement. Coimbra was the country's original capital. It is also home to one of the oldest universities in Europe, and was the only institution of higher learning in the country up until this century.

As the Mondego River winds its way towards the Atlantic Ocean, it runs by other important historical sites, such as castles and Moorish ruins. Before this historical river empties into the Atlantic it passes by the city of Figuiera Da Foz (Figure 3.5), which use to help protect the ancient city of Coimbra and the Central Region of Portugal (Figure 3.6).

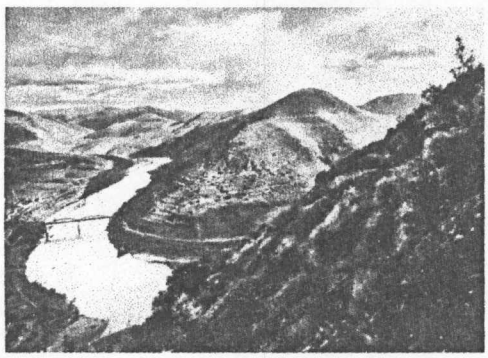

Figure 3.4
The River of Poets



Figure 3.5 Map of Portugal

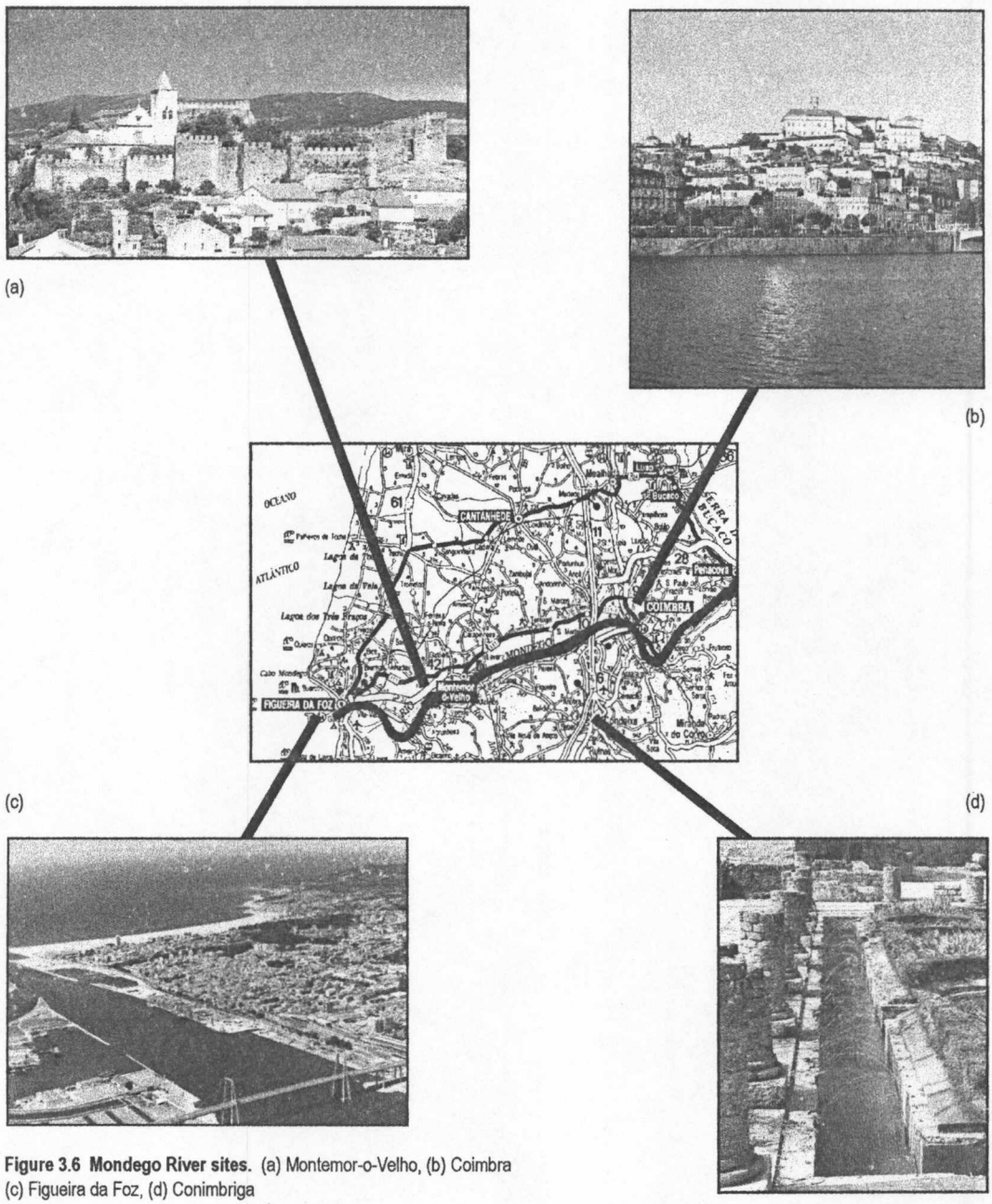

Figure 3.6 Mondego River sites. (a) Montemor-o-Velho, (b) Coimbra (c) Figueira da Foz, (d) Conimbriga

Figueira da Foz: Present Conditions

The city of Figueira da Foz lies on a boundary between its country's internal world and the external world. As the Mondego River empties into the Atlantic Ocean it passes by the city to create a powerful symbol of two distinctive identities connecting at this point (Figure 3.7 and 3.8).

Figueira da Foz has a population of 50,000 people. Lisbon, Porto, Coimbra, and Aveiro are within a short drive or train ride to the city. Access to the city is by train, automobile, or ship. Beginning at the southeast corner of the city is the junction where vehicles enter. In addition, this is the location of the main train station where visitors capture their first glimpse of Figueira da Foz. This road, therefore, is a powerful and integral element that creates a major axial spine into and out of the city (Figure 3.9).



Figure 3.7 Figueira da Foz

As one travels along this main street, Rua de Outuburo, to the north is the edge of the city and to the south is the edge of the river front development, and the Mondego River. The medieval areas of the city are to the east (Figure 3.10). This is where the majority of the locals reside, and is very well maintained. To the west of the river front is the oceanfront (Figure 3.11). This is the main attraction of the city. The oceanfront consists of a boardwalk that extends from the southern edge which is the northwestern tip of the river front to Buarcos, a small historic fishing village that is the northern most portion of the Figueira da Foz oceanfront. The ocean front area is dominated primarily by high-rise hotels and condominiums to house the thousands of tourists which come to Figueira. The city is considered to be very fashionable and modern, when compared to other cities in Portugal. Although being a very contemporary city, Figueira still maintains traditional ties. Every morning small fishing boats are still launched into the water by oxen. When they return locals come to bid for their catch of the day.

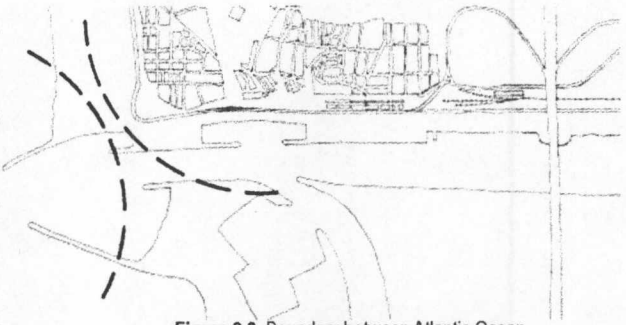

Figure 3.8 Boundary between Atlantic Ocean and Mondego River

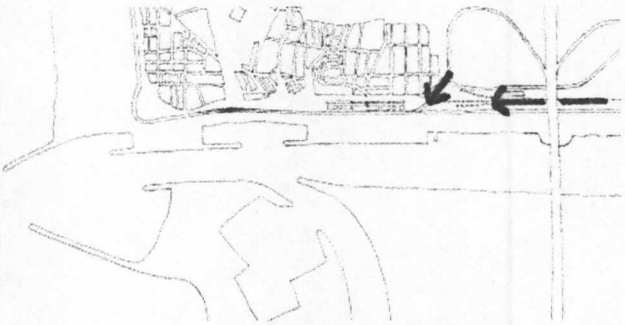

Figure 3.9 Entrance to Figueira da Foz



Figure 3.10 Old area of Figueira da Foz



Figure 3.11 Figueira da Foz oceanfront

These aspects create boundary elements within the city. Figueira da Foz begins to establish a connection of boundary elements by maintaining ties to its history as well as being a contemporary city. The maritime events both traditional and modern also makes for an ideal setting for the museum to connect these boundaries.

Figueira da Foz is historically known as the tourist capital of Portugal, drawing people from all over Europe. Sometime ago, Figueira's focus shifted to the shipping industry, as well as tourism (Figure 3.12). This aspect presents an interesting dialog because of the influences which the port and tourists bring to the city (Figure 3.13 and 3.14). Both of these aspects show an influence from other cultures (tourists and ships) coming to the city, thereby influencing it, as well as being influenced. As a result, there are inherent boundaries that exist from this. Just as the Age of Discovery helped the Portuguese influence others, and in return be influenced, today visitors and ships come to experience its history and beauty, and in return help the city to become part of a larger world, while still maintaining its identity. Again, a connection of the inherent boundaries between an interior and exterior world is achieved not only through this port, but also through tourism.

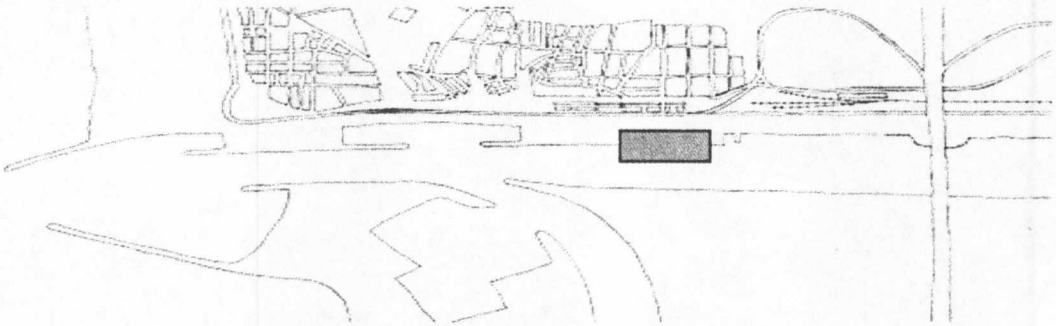

Figure 3.12 Figueira da Foz industry port between land and sea

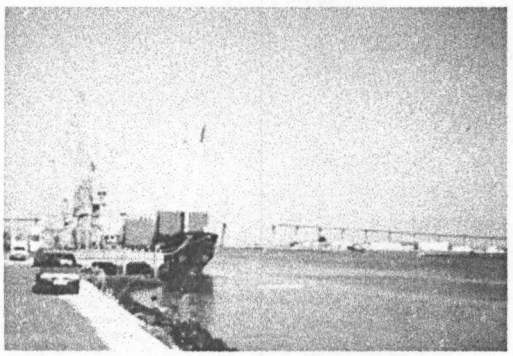

Figure 3.13 Port of Figueira da Foz



Figure 3.14 Aerial of port

Boundaries within Figueira da Foz

Within the city itself, multiple boundaries exist which help to explicate and maintain an identity for the city. To the east where the major entrance of the city occurs is the old historic district with medieval origins. The buildings are typically low-rise, more dense, and heavier in construction. The streets are long, narrow, and winding to give this area an organic pattern (Figure 3.15). Primarily the architecture consists of whitewashed buildings, with red tile roofs, and punched openings. Many of buildings have wrought iron balconies. Even though the architecture is somewhat austere, potted plants and clothes hanging to dry give an ornamental feel to them. The clothes which are perpetually hanging in the temperate climate give a playful effect as they seem to dance around in the constant breeze.

Although the city maintains very distinctive historical origins, it is also resolutely modern. The southwest side of the city and along the oceanfront to the north has been influenced by modern development. Overtaking a historic fishing village to make way for tourists are high-rise condominiums and hotels. This area is dominated by a lighter construction of buildings and a grid-like city structure as can be seen in figure 3.16.

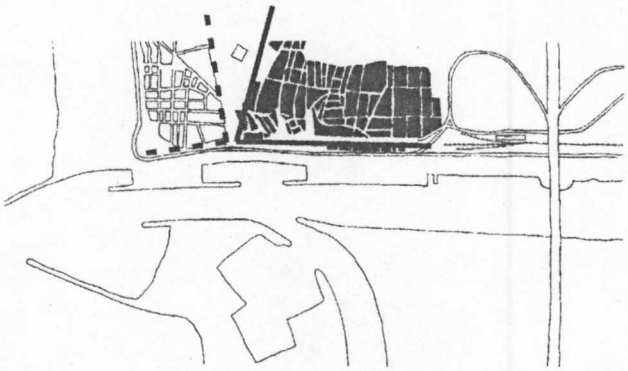

Figure 3.15 Old boundary of city

Bisecting these two areas is a greenway that penetrates through the city. This powerful element, starts at the edge of the river front harbour and ends at the north end of the city to create a boundary which links new and old (Figure 3.17 thru 3.21).

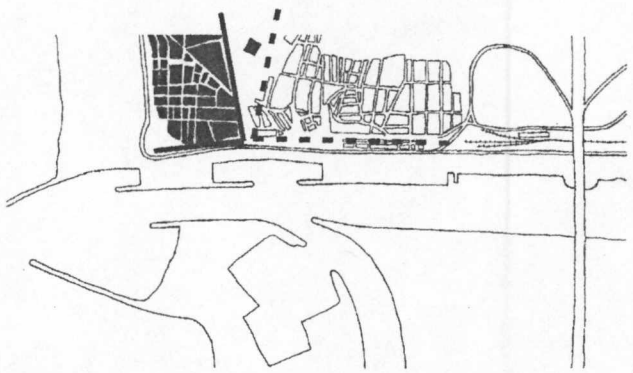

Figure 3.16 New boundary of city

With the entrance to the city being to the east, one travels along exploring almost in a historical timeline from old to new (Figure 3.17). The greenway breaks these two aspects, creating a distinctive boundary element that enables for a dialog to occur. These boundary conditions within the city become intensified through the city's edge and its relationship to the water's edge (Figure 3.18). Between these two edges, though, occurs another boundary, Rue de Outuburo (Figure 3.19). This main street that one enters the city lies between the city's and river front's edge, and therefore becomes a barrier and connecting element.

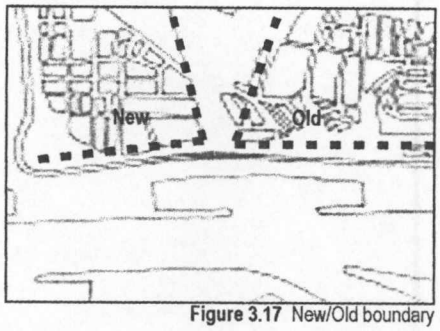

Figure 3.17 New/Old boundary

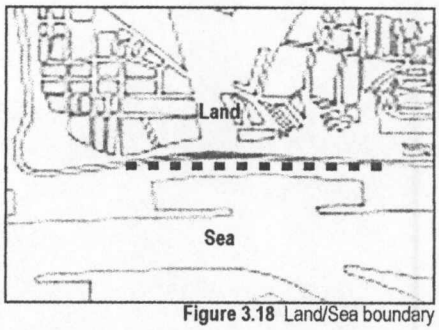

Figure 3.18 Land/Sea boundary

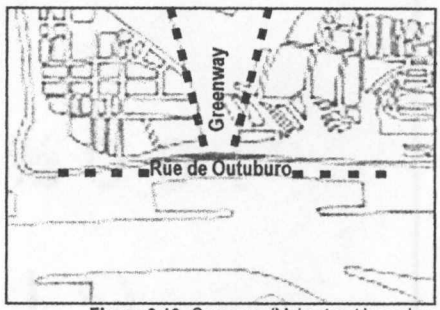

Figure 3.19 Greenway/Main street boundary

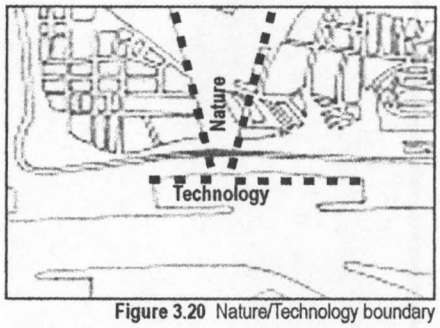

Figure 3.20 Nature/Technology boundary

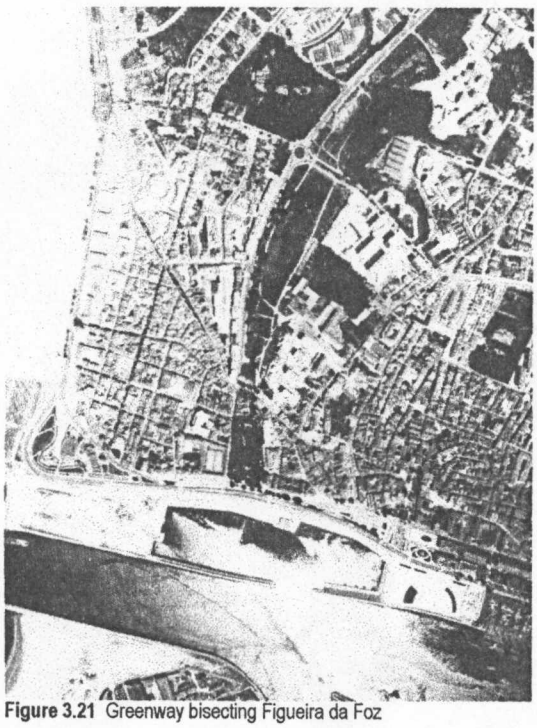
Figure 3.21 Greenway bisecting Figueira da Foz

Thus, the location for a nautical museum to help explain the meaning of these multiple boundaries, both inside and outside of the city becomes obvious (See Figure 3.22). The position of a building becomes informed by its edges, between city and sea, as well as being between the old and new sides of the city on the edge of the greenway, so that the building connects the boundaries inherent within its place through a contemporary interpretation.

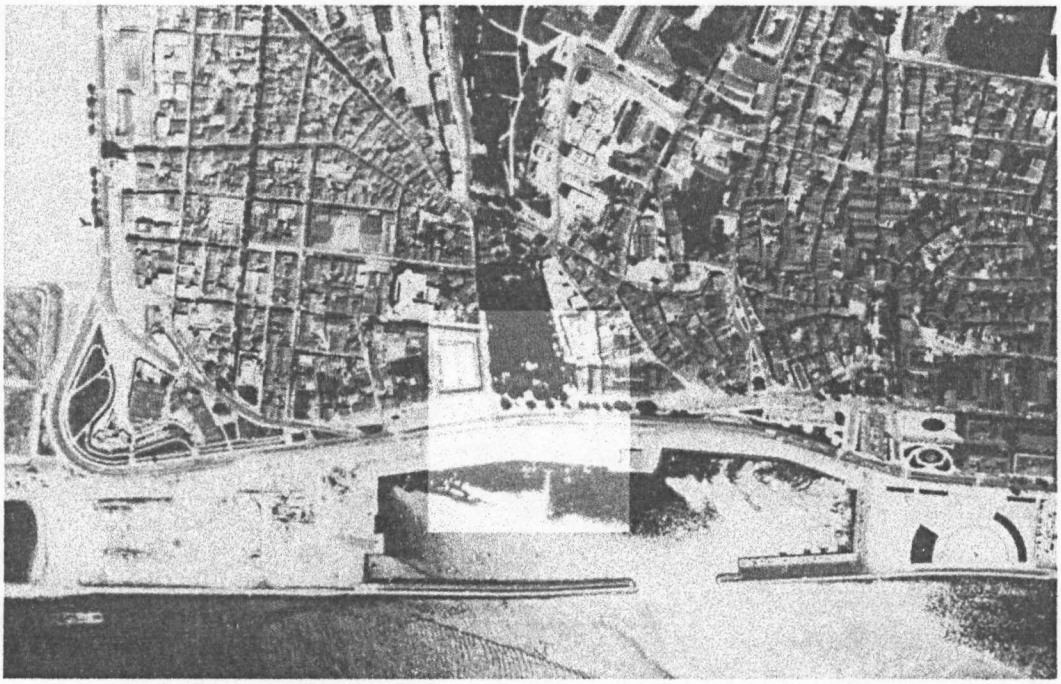

Figure 3.22 Site location for Nautical Museum

Nautical Museum Program

The design of the museum is to be a three-dimensional expression that resonates its existing contextual boundaries that have been described and analyzed. The building's aim is to act as a boundary which, as Martin Heidegger defines, "not the edges of things where they stop, but the places from which they begin their essence, their definition," (Prince 92). An articulation of a boundary will be established in form, creating a dialog for the building that links and serves as an edge between the city's cultural identity and the modern world. The boundary is also to act as a protective wall, which separates rather than links. This wall also will correspond to Figueira da Foz's, surrounding cities, and castles that enable for a barrier between the interior world that protected the people from the exterior world. The concept of the boundary enhancing the meaning of a place will be used to unite the project to its built form. As Joseph Chronister notes,

> "The wall can establish this much-needed boundary between realms of inside/inside, public/private, man/nature, known/unknown, us/them, and sacred/profane. Once this separation is achieved however the two realms become important. For the wall itself belongs to neither realm; it becomes the mediator between the two and therefore allows for passage back and forth," (Chronister 82).

The concept of the design becoming a boundary enables the building to become a mediator that does not separate, but allows for the two edges to speak to each other simultaneously.

Aside from the theoretical direction the design is to accomplish, the pragmatic concerns must also be identified. The function, size, and location of the various spaces within the museum will also address and help define the boundary conditions. The museum is to be divided into five areas, and spaces measured in square meters:

Area 1: Main Exhibition
Area 2: Administration
Area 3: Management
Area 4: The Wall
Area 5: Public Space

Area 1: Main Exhibition

Lobby 600 sq. meters

This area is the point of entry for all visitors. This space is considered to be an important transition area before moving further into the building. The space should establish an initial experience of the overall meaning of the place. The visitor begins to understand the notions of boundaries within this space by entering the building from the city side, thereby representing a culture with a strong historical significance. Therefore, it is to be considered an initial exhibit space that will create a historical overview of Portugal's nautical history up to modern times. The central space of the main lobby is to have a small garden space possibly alluding to the communal space of the ancient Roman gardens at Conimbriga. This space is to evoke a sense of excitement and mystery making the visitor anticipate an exploration of the rest of the facility in the use of light and views to other areas within the building, as well as the different forms and changes in materiality.

This space will have an information desk for visitors to gather necessary information about activities within the facility and around the city. It will also allow for someone to control and monitor the flow of people through the facility.

Exhibits 3000 sq. meters

The intention of the exhibition area is to educate and excite the visitor towards the various aspects of Portugal's unique history and culture through its maritime events. An understanding of the significant events that have taken place in their history is to be depicted through pictures, drawings, and actual artifacts. The exhibition spaces will have a series of large spaces, as well as smaller, more private spaces. The area should evoke associative images that capture a sense of the sea, and the qualities of being on a boat. Associative forms may also have an abstract contextual resonance that has been established within its specific setting. The exhibits will conform to the conceptual boundary in relation to specific exhibition activities in order to create meaning within the building. Views of the ocean and city will be utilized, allowing the user to understand their position between the city and the sea, between its specific place and the possibilities contained in the larger world.

Theater 400 sq. meters

The purpose of this area is to educate and entertain. This is to be a place where technology has the capacity to connect the viewer to the wider world, as well as telling a story about Figueira da Foz and Portugal. It is to be used as part of the museum for exhibit purposes, but also for the public use as well. The space then can be used beyond normal functioning hours of the museum. It should have primary access to the outside, as well as to the exhibit areas. The theater should be able to be closed off when the museum is not operating, so that the public cannot occupy any other part of the facility.

The theater will include a fixed sloped seating for 175 people, motorized projection screen and a podium. Within the space, there will be a projection room (8 s.m.) with two projectors and storage for slides.

Cafe 230 sq. meters

The cafe should be in close proximity to the main exhibit space. This area will provide food and beverages for the public and visitors of the museum. This aspect also provides the ability to establish a connection of boundaries through the local and global qualities that food can represent. The cafe will be able to be open during non-museum hours, so it should be able to be closed off from the rest of the facility. This space should have good views of the water, boats, and city, and have direct access to the public space.

Bathrooms 30 sq. meters

Two Bathrooms able to accommodate up to three people in each room will be provided in the exhibit areas and adjacent to the theater.

Area 2: Service

Semipublic entry 10 sq. meters

This is the place of entry for administrative purposes and not to be used by the general public. This space should have access to the other administration areas.

Secretary 12 sq. meters

This area is a place where people come to do business with the museum. The area will include a waiting area for four and desk and chair for the secretary. The area should convey a sense of direction and be connected to the rest of the administration facility.

Director's Office 25 sq. meters

The director is the head of the museum. The room should include a desk, four chairs, and a storage closet. It should have a view to the outside and have access to the secretary.

Coordinator's Office 25 sq. meters

The coordinator manages the office and trains workers. It represents the heart of the administration area because of the importance of this job. It should connect with the director's office, secretary, and conference room.

Curator's Office 25 sq. meters

The curator deals with donations to the museum and artifacts in general. The office is to connect with the secretary, conference room, and accession room.

Conference Room 40 sq. meters

This area is to hold twelve people, and be a place where the management and staff come to discuss various issues. This room should include a conference table, twelve chairs, and storage shelves. It also should have a view to the outside because it is a place of communication dealing with the museum that is linked to aspects on the outside. A connection to the director's office, curator's office, coordinator's office, and secretary should be made.

Technician's Office 25 sq. meters

The museum technician is to work in the gallery space repairing various artifacts. The office should include a desk and seating for three.

Copy Room 20 sq. meters

This place is where employees come to copy files. It should include a copy machine and file cabinets.

Lounge 40 sq. meters

This area is for employees to relax and take breaks from work. It should include a counter, refrigerator, and microwave oven.

Bathrooms 10 sq. meters

One bathroom is to be provided for the employees. It should be centrally located within the administration area.

Area 3: Management

Exhibit Storage 125 sq. meters

This area is for artifacts to be stored before being put on display and where the permanent collection is kept when not on display. It includes four chairs, three work tables, shelves and cabinets for the artifacts. It should connect to the registration room, exhibit fabrication, and main gallery. It should be a secured area with controlled lighting for the sensitive objects.

Exhibit Fabrication 125 sq. meters

This area will be the last step where the process of artifacts takes place before they are put in the main gallery area. A place between storage and gallery that enables for a boundary condition to occur. Within the space artifacts will be prepared for display, so this area may be considered an interstitial area between the stage of storing and exhibiting. This space should connect to the gallery, as well as the other collections management areas. This area should have natural light, but be inward focused.

Loading/Unloading Area 30 sq. meters

This area is for loading and unloading artifacts to the museum. It should be isolated from the public and have secured access. It will include drive-in space for large trucks, and a raised platform.

Area 4: The Wall

Wall 700 sq. meters

A physical wall will act as a conveyor of meaning in form that will be a source of communication between the sites edges. The function of this space is to house the service facilities, as well as circulation to other spaces. The wall is to become the symbolic heart which has structural capabilities literally and metaphysically, providing meaning and life throughout the building. The wall is to act both as an isolator and a connector between realms so that space can meet, enabling interior and exterior identities to become juxtaposed, representing an interstitial condition. The wall therefore expresses within itself the meaning of the whole, and a thing of substance.

Area 5: Public Space

Outdoor Public Space 1,500 sq. meters

This space is for the public as well as visitors use and should be open and festive, so that people can walk freely, enjoying the atmosphere of the river front park. Views should be made available of the city and the boats in the harbor. Access should also be made available to the river front walkway, the museum, and the water.

This space should make people feel welcome, so that it will be occupied by people who are not going specifically to the museum.

15th Century Ship 250 sq. meters

A rebuilt ship from the 'Age of Discoveries' (Figure 3.23) will be docked adjacent to the museum and in close proximity to the exhibit areas. The ship will be used as part of the museum for the public to occupy. Boarding the ship, or just viewing the two together (ship and building) should create an experience of duality and a connection between past and present, old and new.

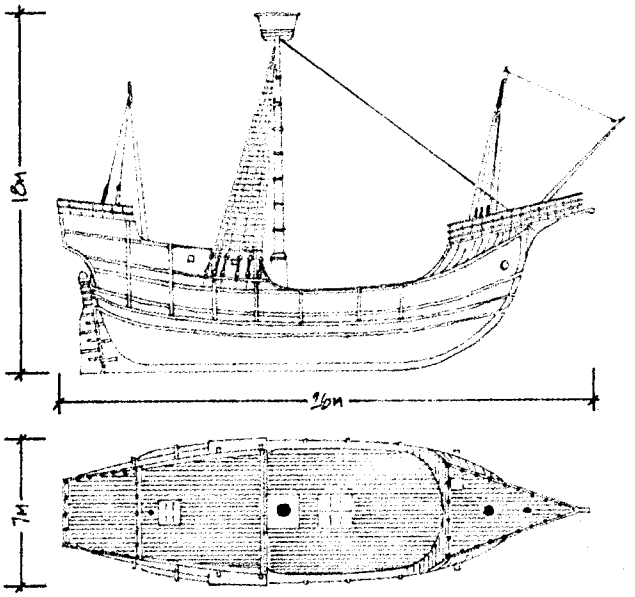

Figure 3.23 15th Century Ship

The Design

One enters the site through an axial line established by a pedestrian bridge (Figure 3.24). The bridge creates a metaphorical connection of boundaries. By symbolically extending the greenway into the river front, as well as penetrating the streets boundary, the bridge makes for a powerful force that guides one throughout the facility. The axial line is extended through a separation of form to the bow of a 15th century ship and beyond to a lighthouse at the edge of the harbour. Again, the axial line creates a boundary connection between city and sea (Figure 3.25).

The physical perception of a boundary is established by a limestone wall that is four meters wide at the base, but tapers to one meter at the top. The wall is curved so that the complex lies on the periphery between not only city and sea, but also providing a connection of the city's old and new districts. The building's position and form begins to question the idea of interior and exterior, enhancing the meaning of its place and creating a dialog with it. The (boundary) wall becomes a three dimensional mediator, slicing through the complex revealing distinctive forms, suggesting boundary changes. The walls form has associative qualities that resonate a contextual relationship.

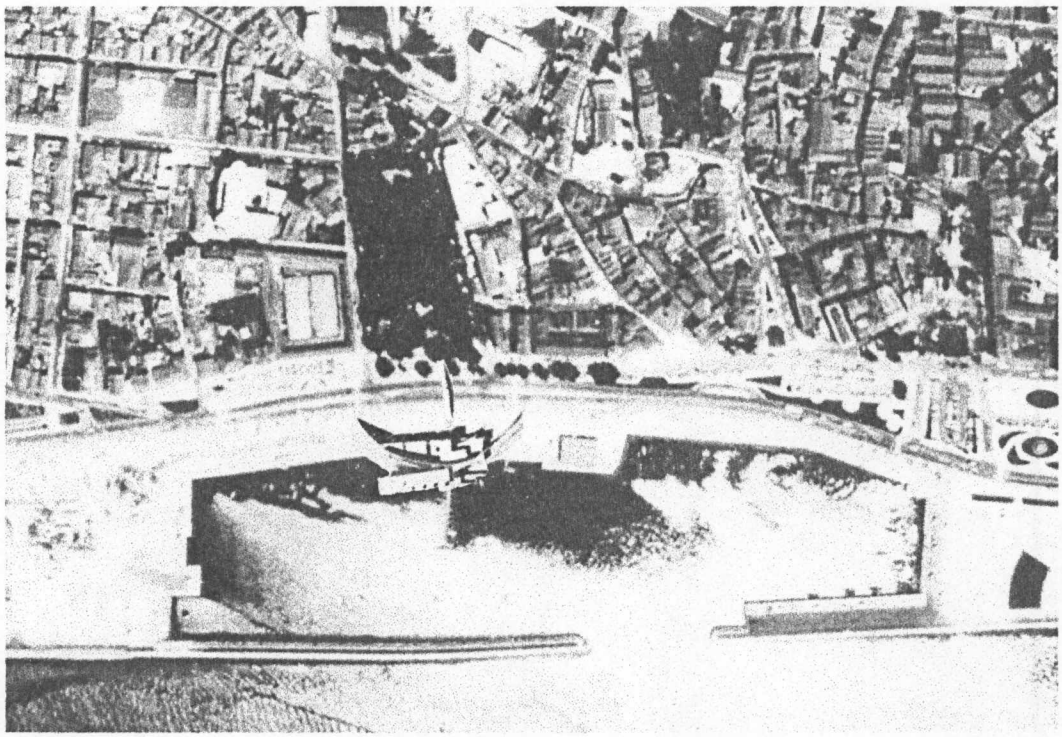

Figure 3.24 Site Model

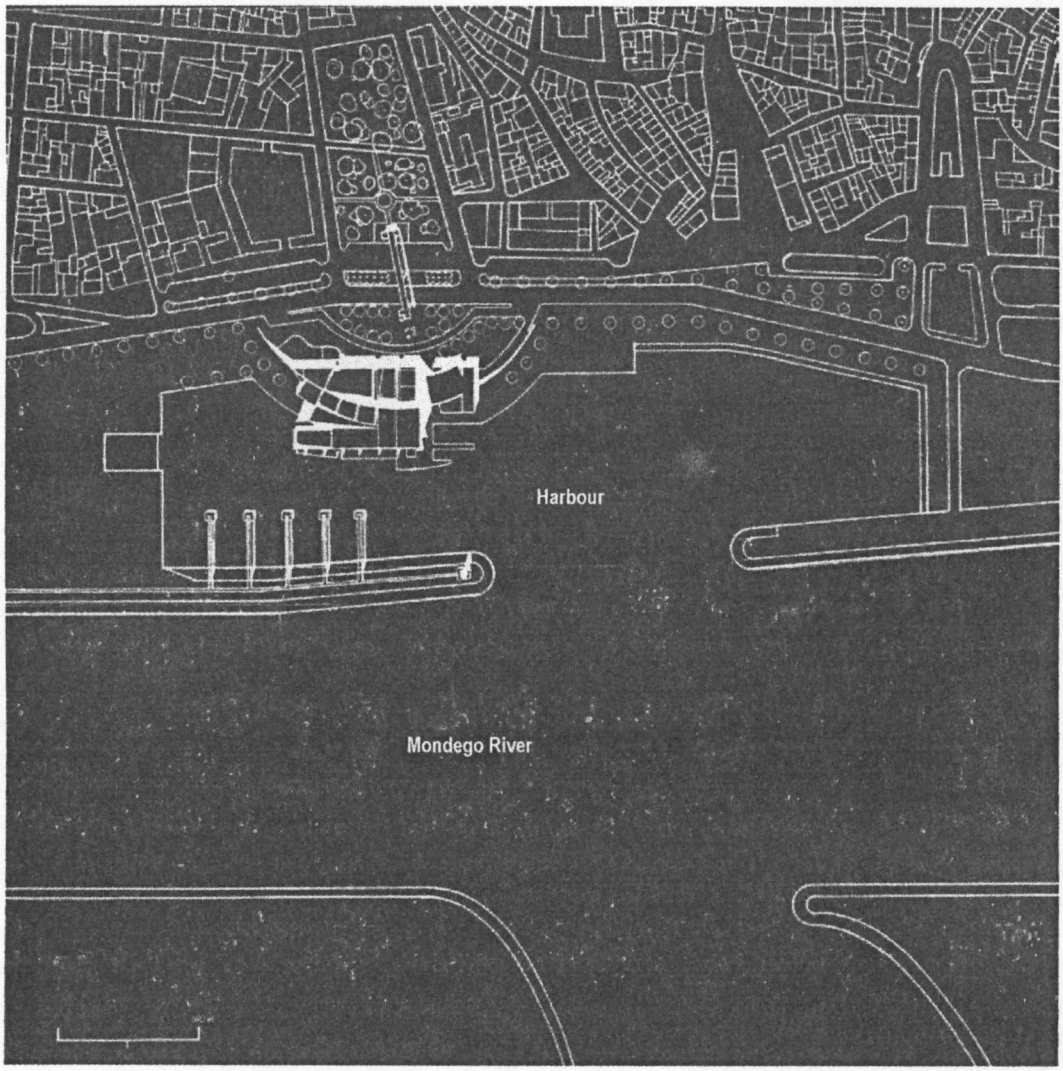

Figure 3.25 Site Plan

Modern in form, it speaks to the protective walls that once guarded historic cities. Also, a tectonic interpretation was drawn from the aquaducts within the area (Figure 3.26). This aspect becomes even more appropriate given that within the space between the wall becomes provided to circulate and serve the complex i.e. mechanical, electrical, and water. The wall again continues to not only provide meaning to its exterior situation but also within the interior spaces by feeding the whole building to become the symbolic heart.

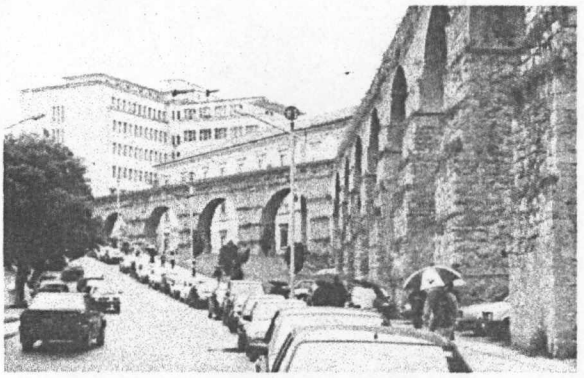

Figure 3.26 Aquaduct in Coimbra

The city side facade becomes an abstraction of characteristic Portuguese buildings (Figure 3.27 and 3.41). Closely knit buildings with punched openings differ in height and width to establish a quality that creates a sense of one cohesive building, yet each have a unique separateness (Figure 3.28). The front facade tries to resonate this distinctiveness so that the museum looks at first like many different buildings with their own idiosyncrasies. The fragmentation of form also helps the buildings scale to diminish, which in return becomes more appropriate to the surrounding context. The fragmentation of the exterior allows for the definition of the interior spaces and different functions within the forms. From this side the boundary wall can be seen as well as forms on the other side of the wall to reveal that something exists beyond one's interior realm.

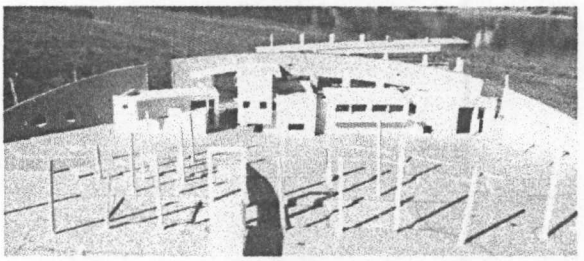

Figure 3.27 Front of Museum



Figure 3.28 Associative Buildings

The north elevation (water side) establishes a ship-like quality. As one approaches the building from the water, the building becomes an abstract ship (Figure 3.29). This side of the building is long and narrow, with decks establishing outside access. An association of the industrial towers in the port, add a technological aspect to this side of the building. Steel cords correspond to the ropes that are connected to the mast of a ship and its sails. The verticality of the steel posts also help to reduce the scale of this long horizontal building as well as layering this side, again creating an inside/outside dialog (Figure 3.42).

The axial line that guides one into the site divides the building into two distinctive entities to define the service facilities and the museum. The penetration through the facility becomes a boundary to the city or the sea. An association is made between the museum's gateway (Figure 3.30) and the gateway in Coimbra. Figure 3.31 shows the gateway between upper Coimbra, leading to the university at the top of the hill, and lower Coimbra. Entry into the museum is between the two functions of the museum and service facilities. The entrance into the museum is subtle with a canopy marking the entrance into the museum. Once inside the lobby of the museum one becomes guided towards the center of this space, which is a small garden that looks up to the second level exhibit spaces. The garden space eludes to the Roman ruins at Conimbriga. The lobby is therefore a community space where people can meet as well as giving an overview of Portugal's nautical history by various descriptive works within this space. Within the lobby space one becomes drawn towards the boundary wall and to the exterior which is more open with views of the waterfront.

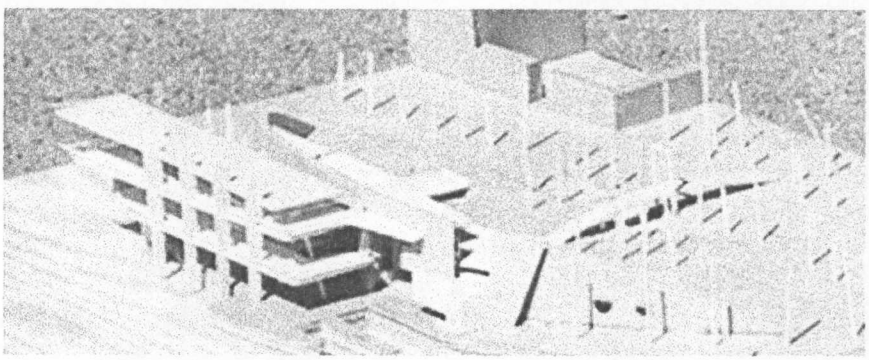

Figure 3.29 View of Model

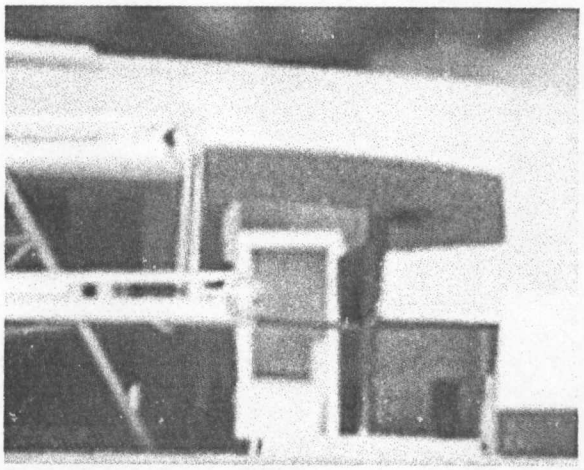

Figure 3.30 Gateway of Museum



Figure 3.31 Gateway in Coimbra

Progression up to the exhibit areas is by an elevator which is inside the interstitial space of the boundary wall. The elevator stops at the third level to begin an exploration of the exhibit spaces. As one steps out of the elevator they are encountered to their right with a view of the city on direct axis of the greenway. To the left is a view of the waterfront which symbolizes infinite space . This becomes a powerful connection of boundaries meeting at this point by being within the boundary of interior and exterior to view these two distinctive meanings (Figure 3.32).

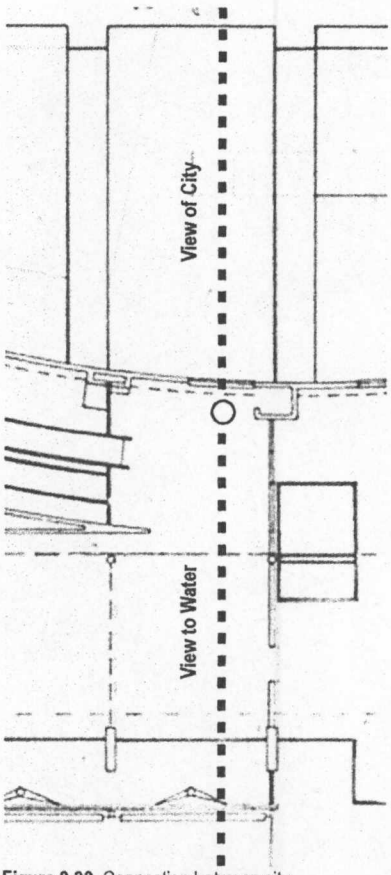

Figure 3.32 Connection between city and water

The third level exhibit space depicts present and future influences within Portugal's history. This level will be continuously changing, and may also be used for travelling exhibitions. Again, being a space conceptually on the exterior boundary enables for an interpretation and influence from other areas within this exhibition space.

Circulation down to the second level is by a long ramp, which also acts as an interstitial space between the north side and south side. The ramp which is curved, corresponding to the boundary wall is also an association of the Portuguese street (Figure 3.33). Taking the ramp down to the second level, one is given the opportunity to choose between the two exhibit spaces which are connected yet isolated by the boundary wall. The exterior boundary spaces of the second level draws one to the edge of this space through fenestration and decks, offering views of the Atlantic ocean's horizon. The city-side exhibit space does this in a similar way as well, through views, light, and sound.

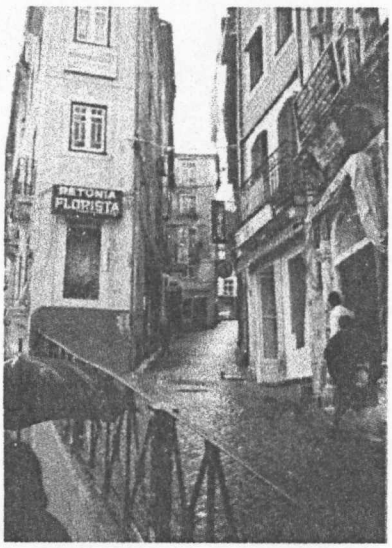

Figure 3.33 Street in Coimbra

The punched openings along the side of the north wall give views of the city, but at the end of the space is a small deck which is a subtle reference to the plank of a ship. This 'plank' is on direct axis of a street, so that one has an unobstructed view, as well as providing another connection within the city (Figure 3.34). Light and views help to guide a visitor to explore the edge of this exhibit space, but water also plays a role as well. A fountain next to the 'plank' can be heard from within this area, and the sound of the water also helps to force exploration to the edge of this space.

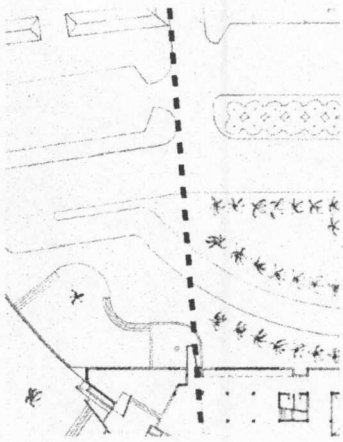

Figure 3.34 Connection into city

As one walks down the ramp back to the first level they then go to the theater which has a separate entrance for when the museum is closed. This also acts as an exit after one views a movie to go outside and board the historic ship, go to the cafe, gift shop, and then explore the rest of the city or take a boat ride up the Mondego River. An oscillation between these various activities that one encounters allows for an experience that produces a connection between past and present identities. Boundaries have now been fully connected, in that site and architecture have intertwined to reveal the significance and meaning of this area. (Figure 3.35 thru 3.51).

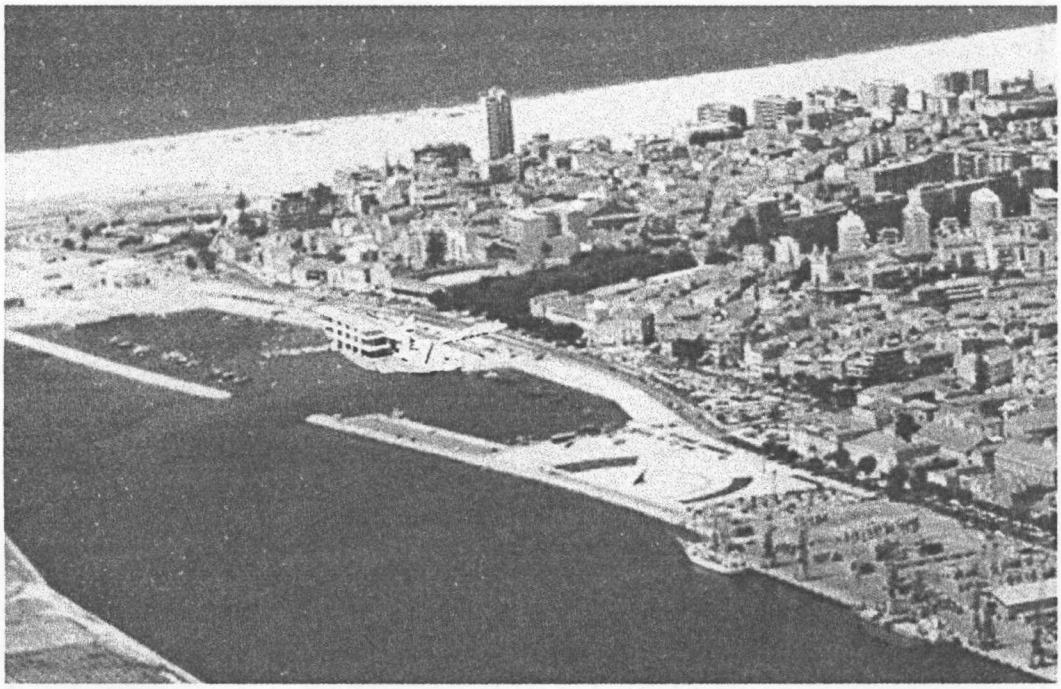

Figure 3.35 Aerial View of Museum

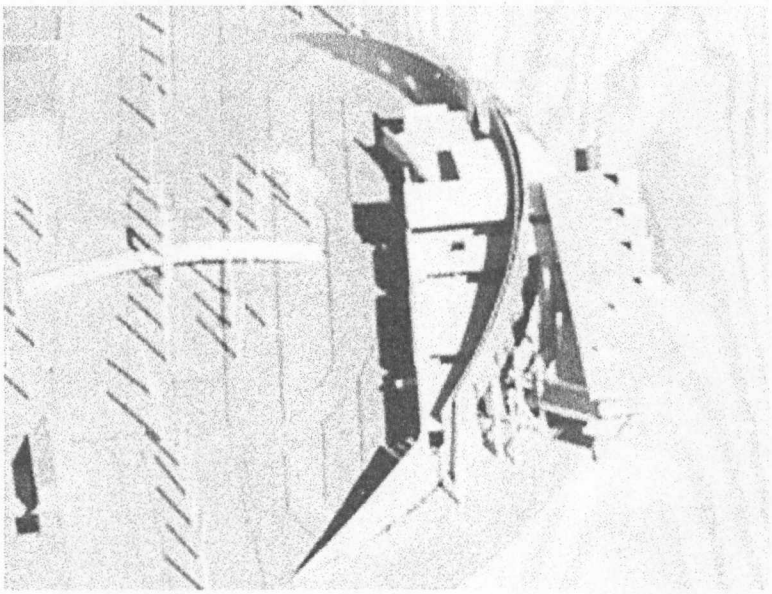

Figure 3.36 Aerial view from the west

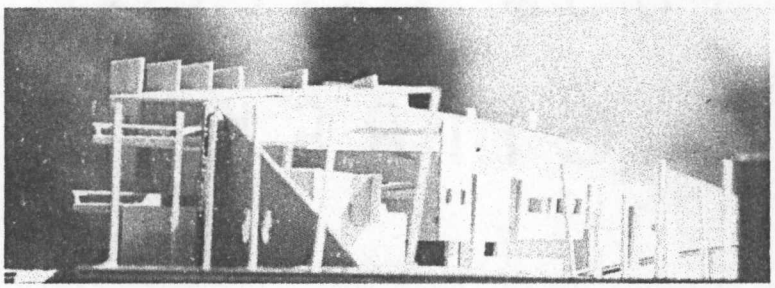

Figure 3.37 View from the east

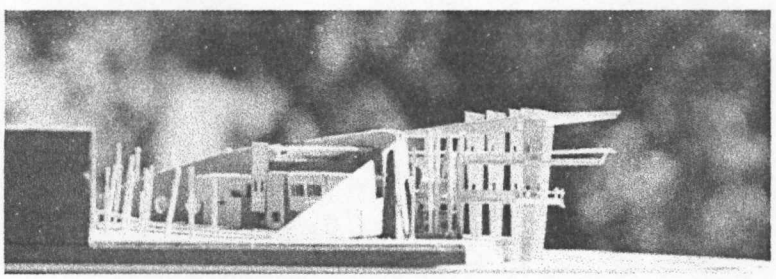

Figure 3.38 View from the west

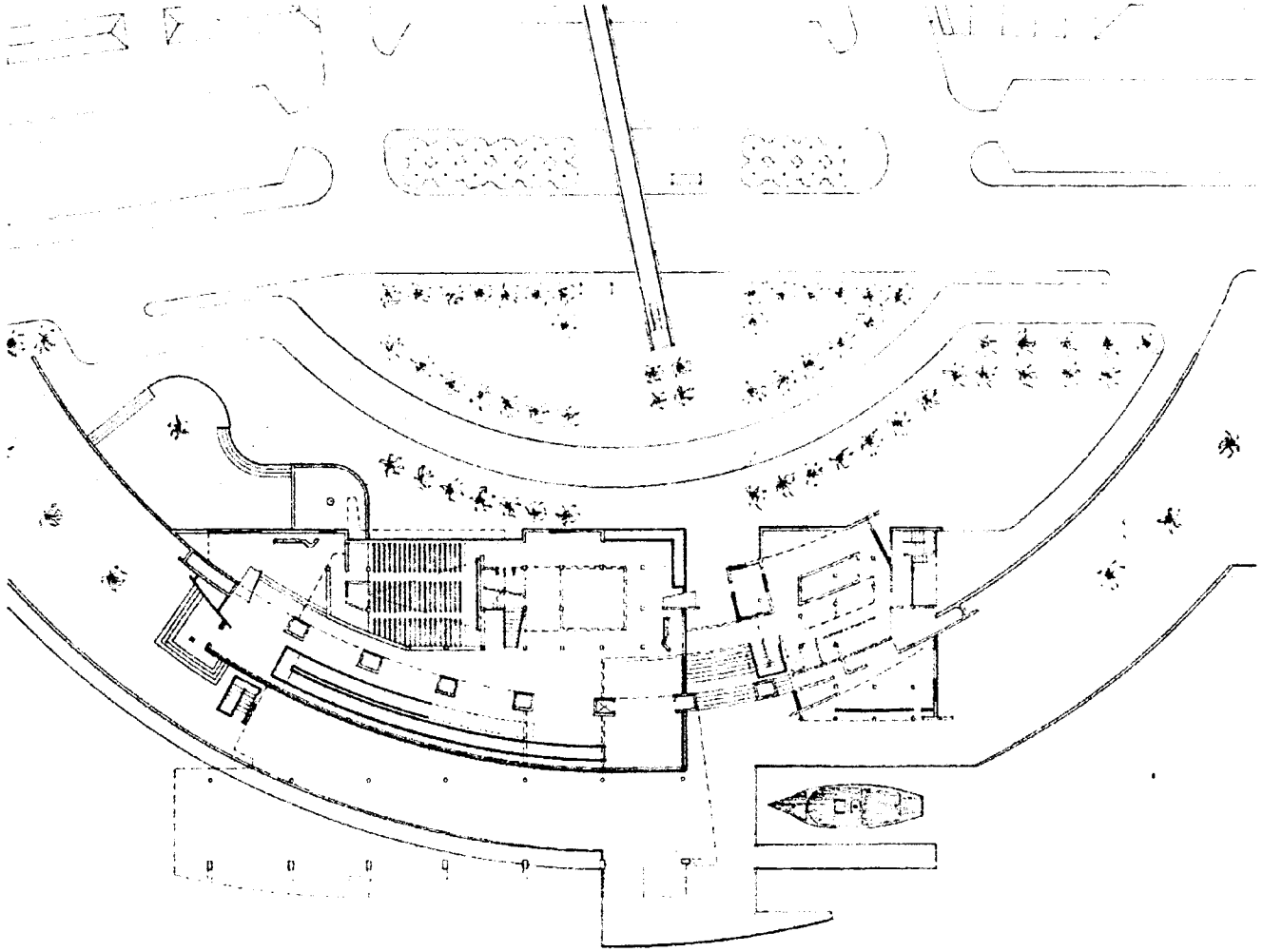

Figure 3.39 First Level Plan

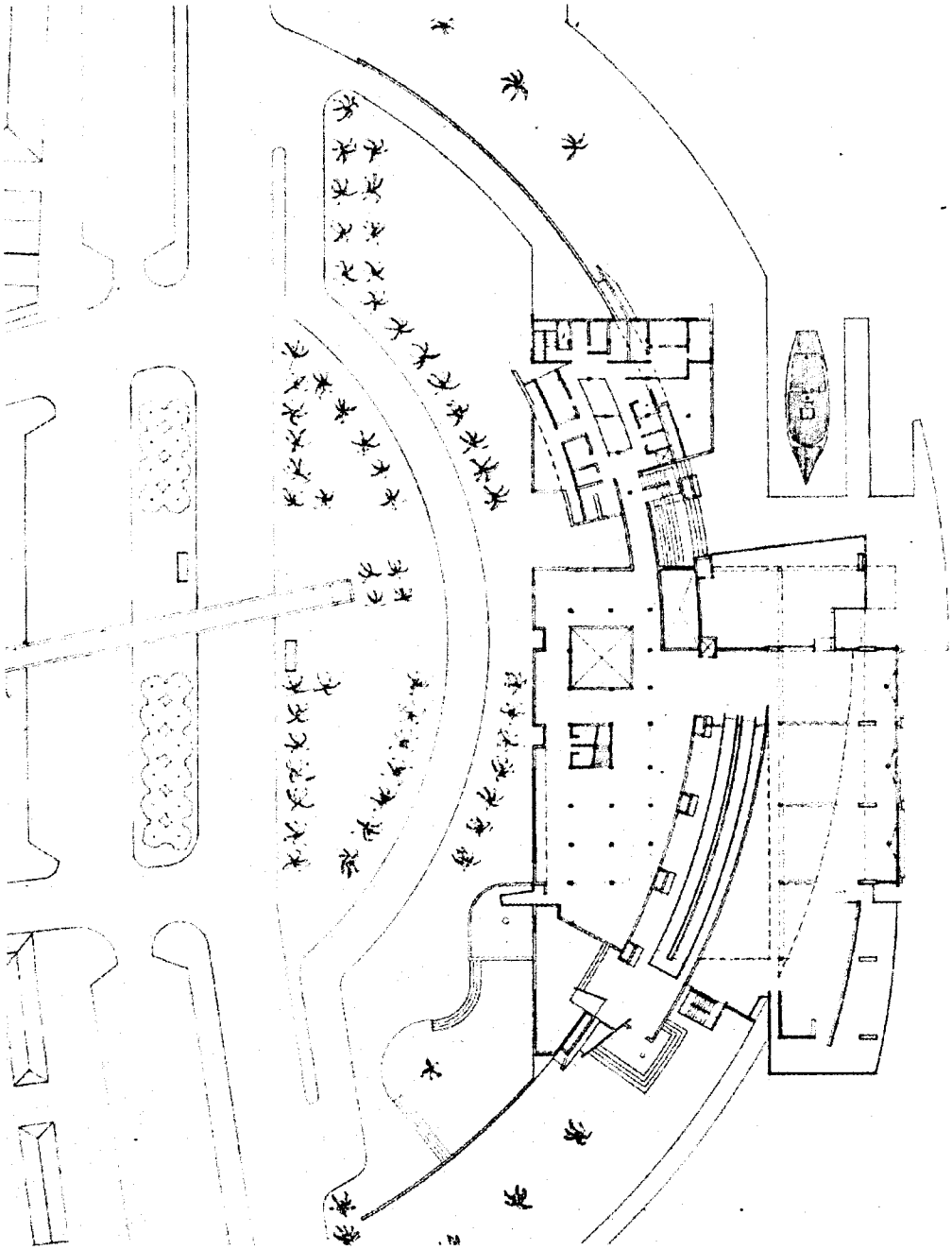

Figure 3.40 Second Level Plan

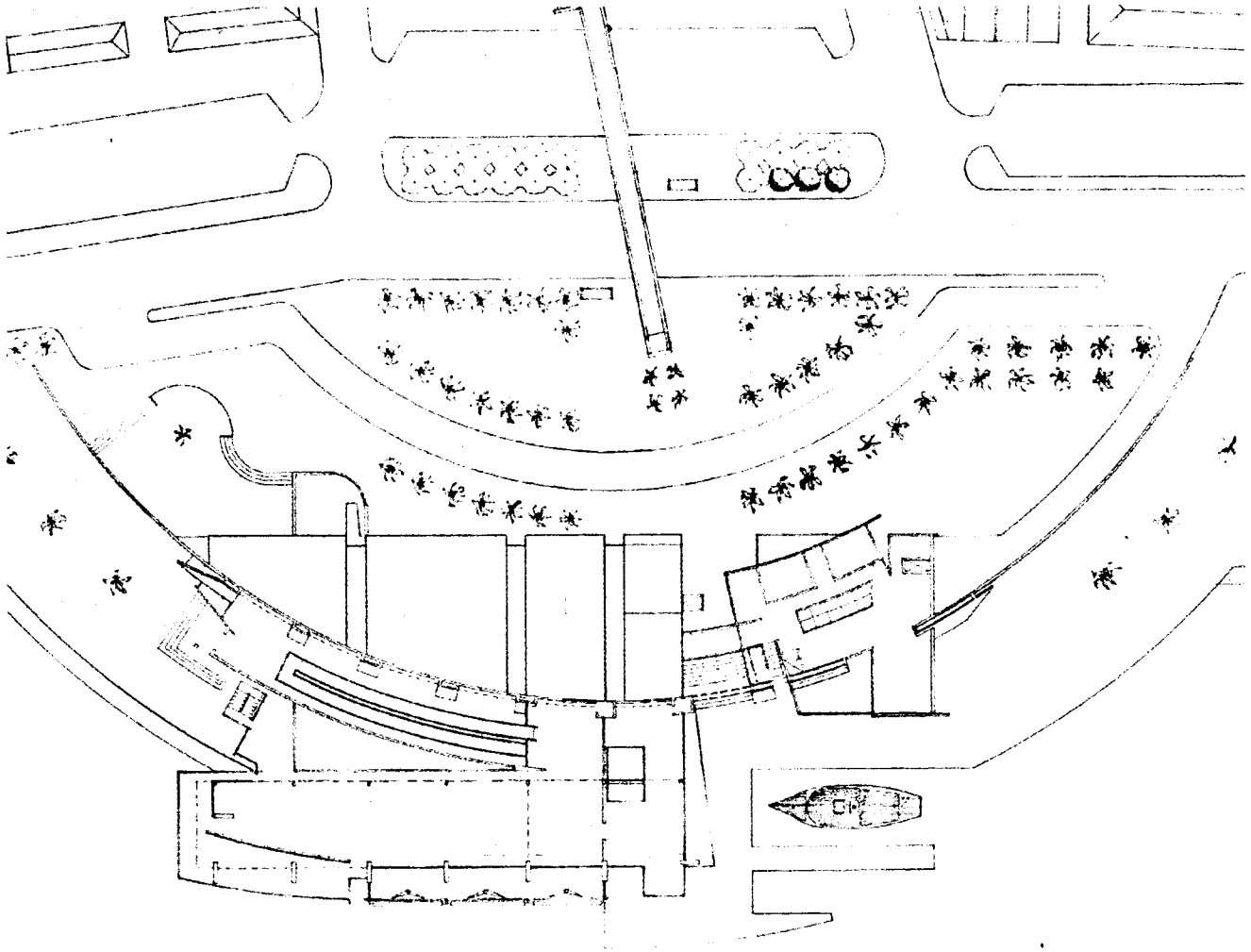

Figure 3.41 Third Level Plan

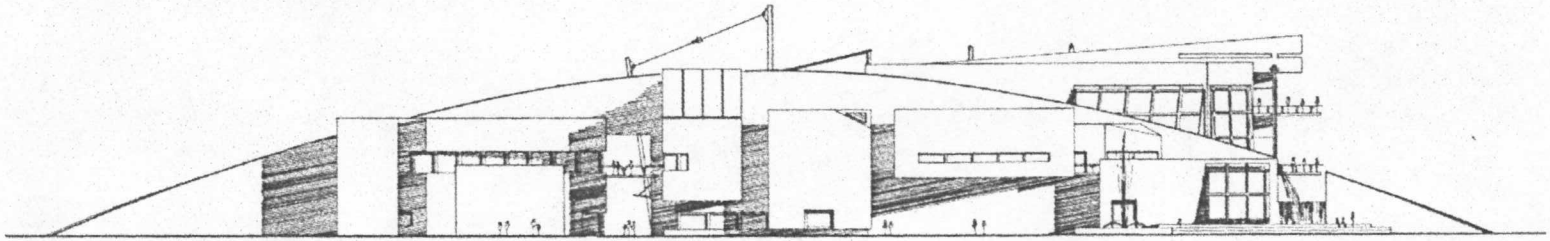

Figure 3.42 South Elevation

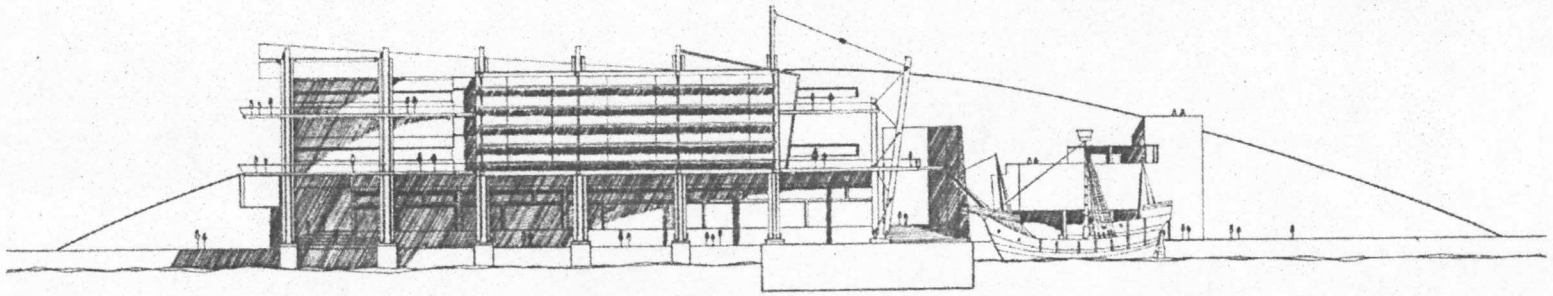

Figure 3.43 North Elevation

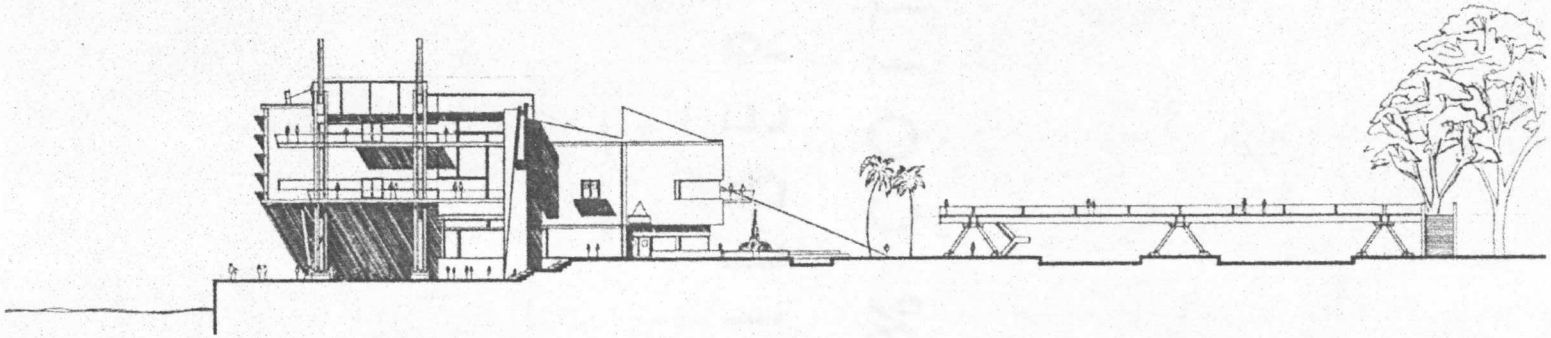

Figure 3.44 Site Section

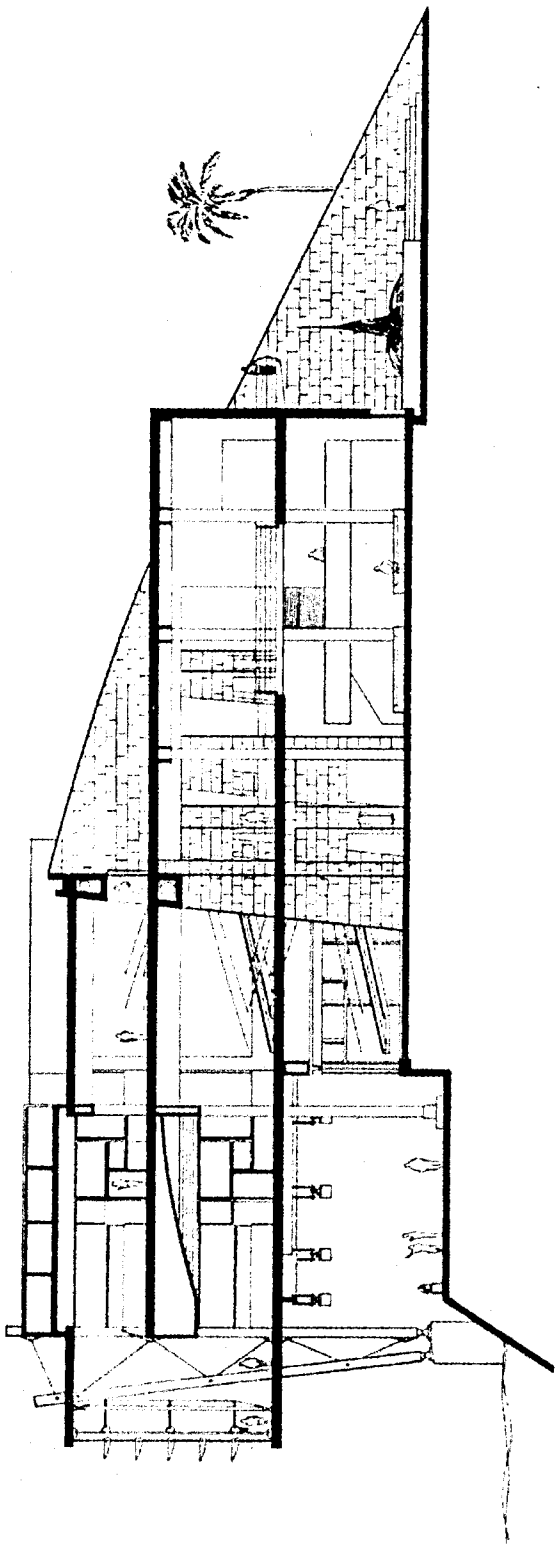

Figure 3.45 Building Section

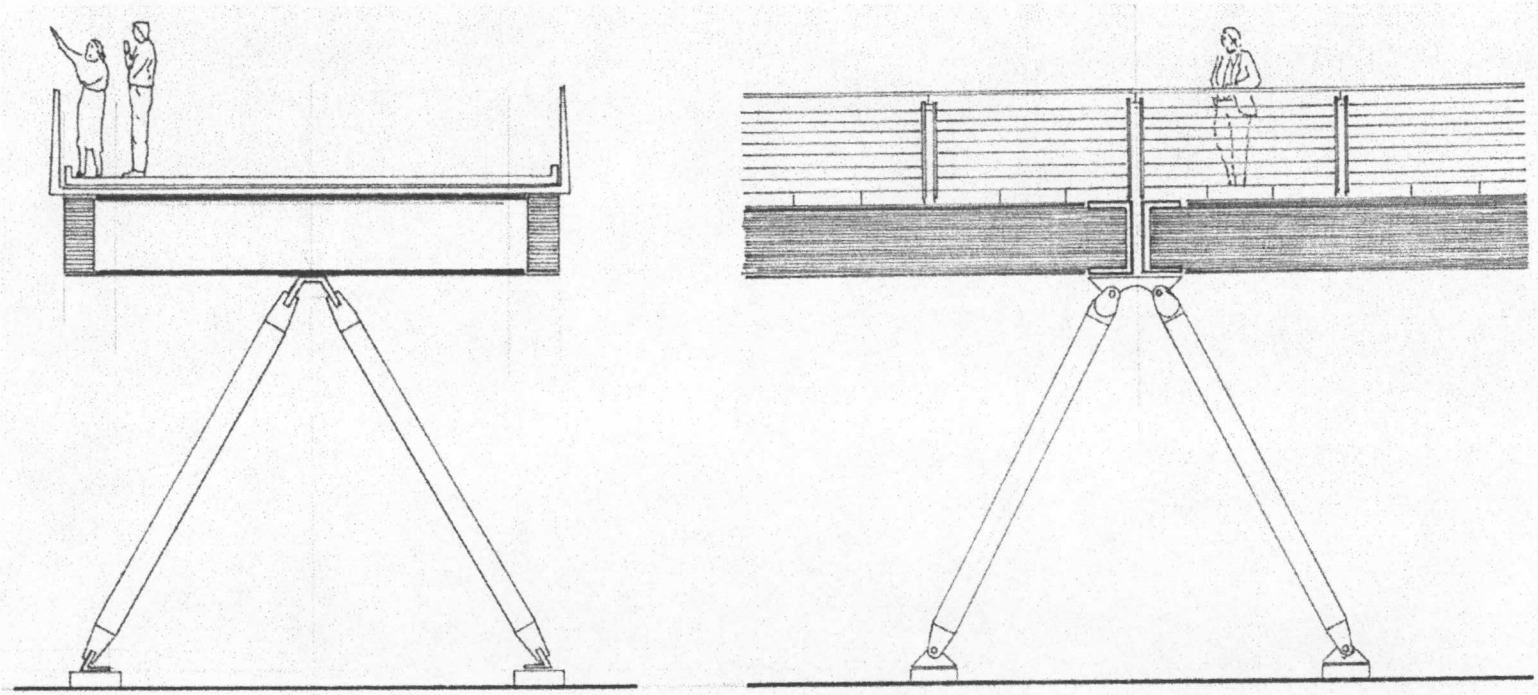

Figure 3.46 Section and Elevation Detail of Bridge

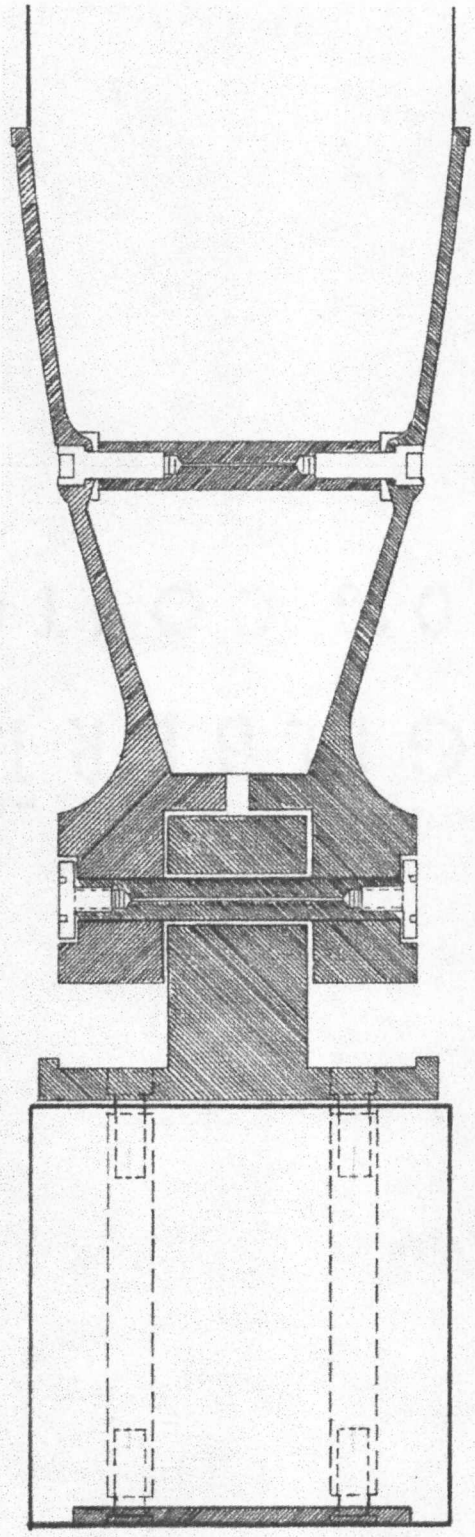

Figure 3.47
Steel Column Connection

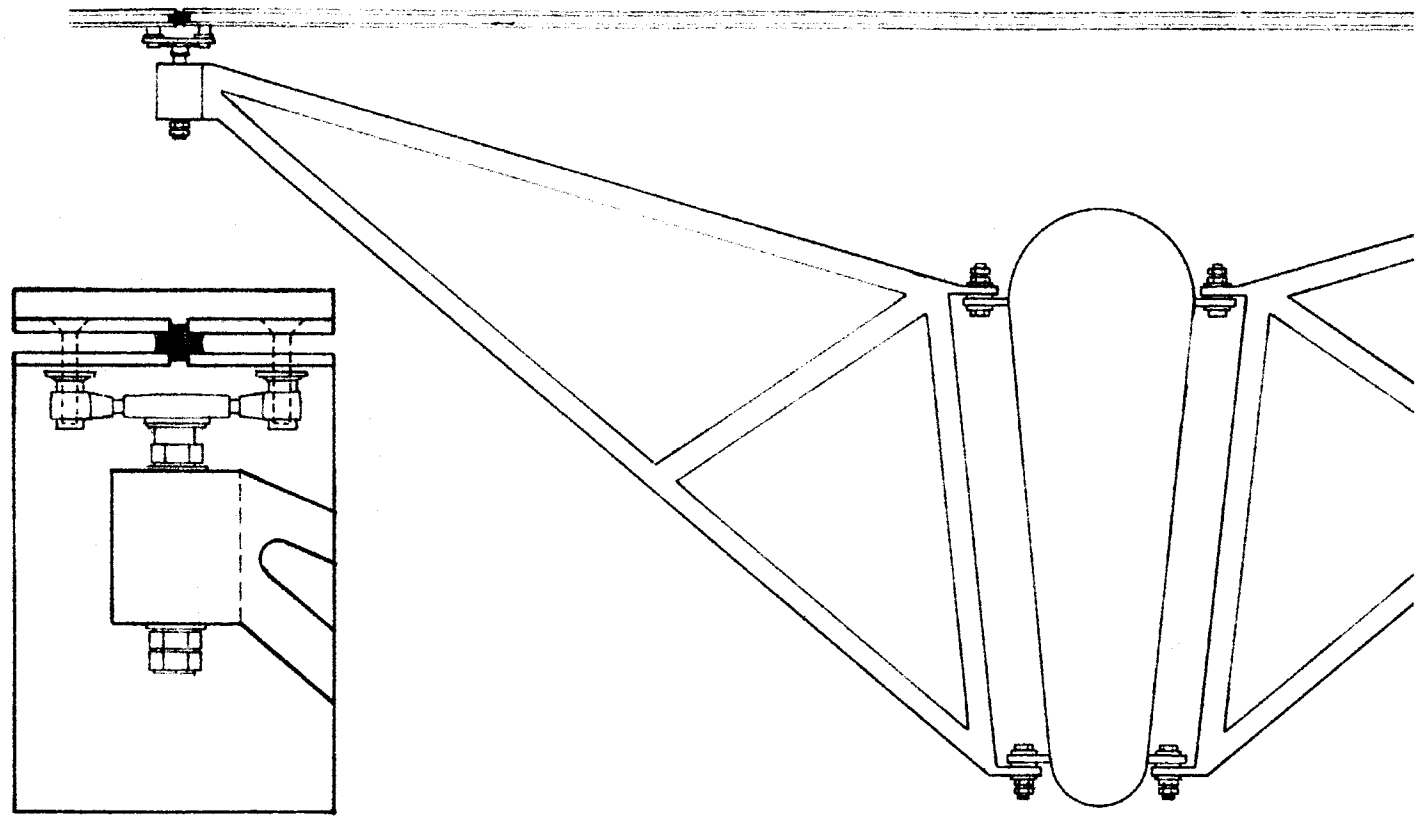

Figure 3.48 Window Wall Detail

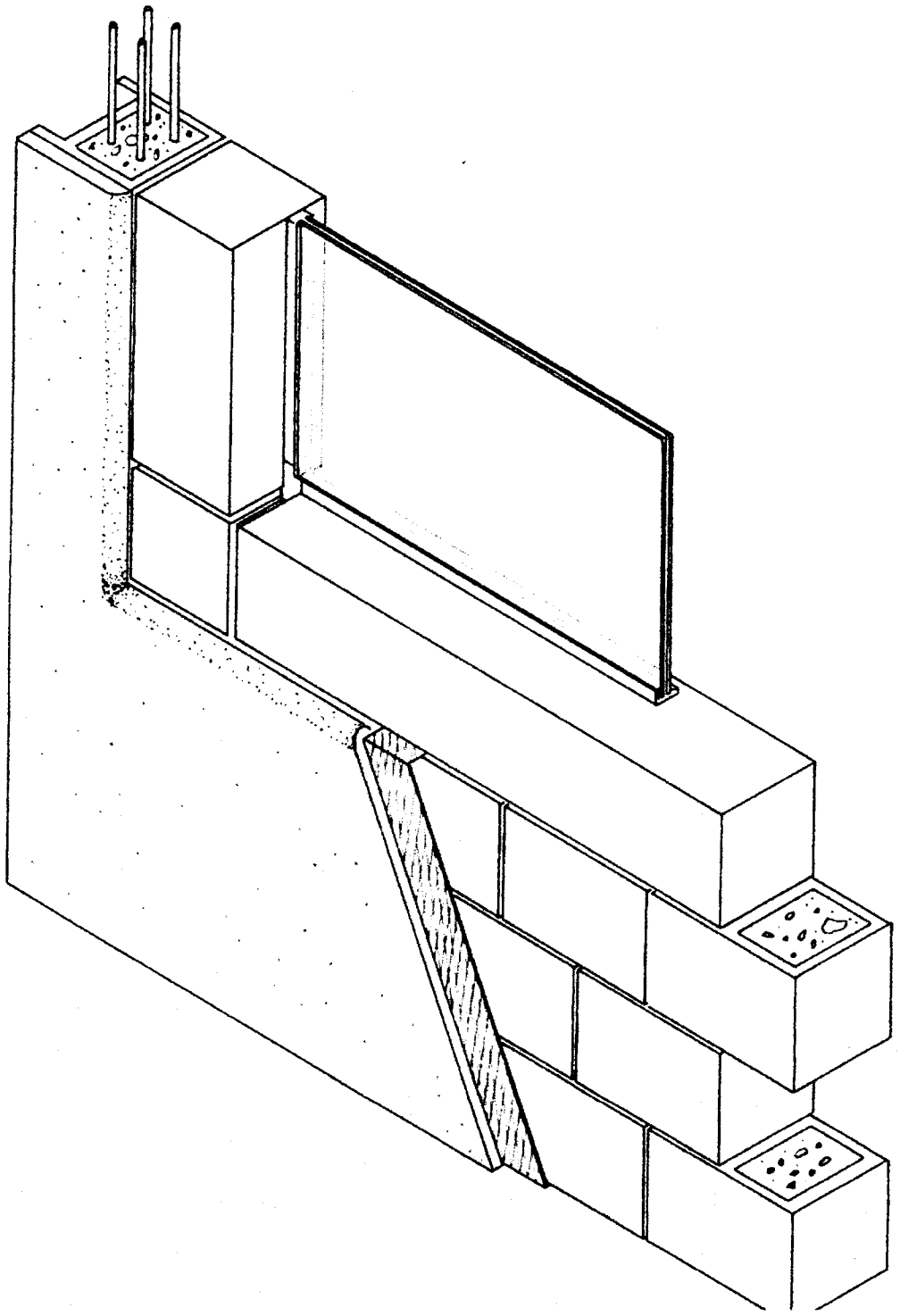

Figure 3.49 Exterior Axonometric Detail of Wall

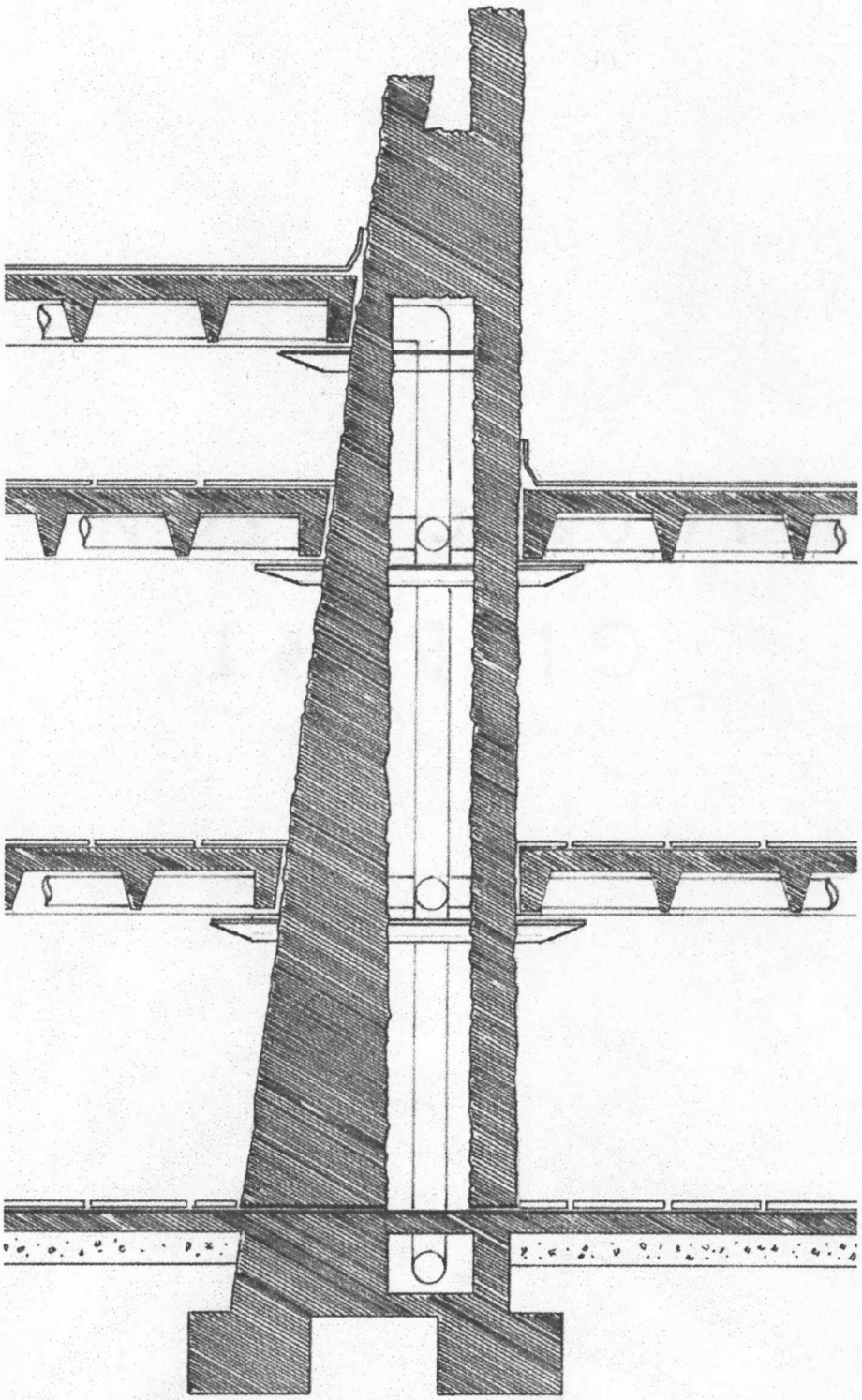

Figure 3.50 Boundary Wall Section



Figure 3.51 Boundaries Connected

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Vita

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