



## ABSTRACT

Title of Thesis: HARBOR AS VENUE: BALTIMORE'S WATERFRONT  
MUSIC HALL AND MIXED-USE COMMUNITY

Degree Candidate: Nicolas Frederic Mansperger

Degree and Year: Master of Architecture, 2004

Thesis directed by: Associate Professor Carl Bovill, RA  
School of Architecture, Planning, and Preservation

As United States port cities evolve from heavy industry to service based economies, brownfield sites become opportunities to secure our cities' vitality. This thesis studies architecture's relationship to the essence of the urban waterfront through connectivity, imageability, genius loci, and the pageantry of place.

The site is located in Baltimore's Fells Point, at the former location of the Allied Chemical chromium facility. This 27 acre environmentally capped peninsula mediates between the fine historic grain of Fells Point and the contemporary 30+ story Inner Harbor East. How can the inherent disparate nature of the harbor be infused with connections to bring people together? The prominence of the site demands a study of the harbor's accessibility to maximize this amenity's connectivity back to the city.

The urban program studies the implications of a mixed-use community on a prominent waterfront site. As a regional performance anchor, the site becomes home to a new music hall. A public portion of the site serves locals and tourists alike, connecting

the Inner Harbor with Fells Point via a waterfront promenade. The pageantry of place, not unlike Garnier's Opera House, is studied both at the macro and micro scale, from the city's procession in and around the waterfront to the local scale of the music hall. Being inherently introverted, as seen in Sydney, how can a waterfront hall look at the harbor as venue? Is it appropriate to visually and physically link the site to its present and past industrial and natural essence?

HARBOR AS VENUE: BALTIMORE'S WATERFRONT  
MUSIC HALL AND MIXED-USE COMMUNITY

By

Nicolas Frederic Mansperger

Thesis submitted to the Faculty of the Graduate School of the  
University of Maryland, College Park in partial fulfillment  
of the requirements for the degree of  
Master of Architecture  
2004

Advisory Committee

Associate Professor Carl Bovill, RA, Chair  
Professor of the Practice Gary Bowden, FAIA  
Dean Steve W. Hurtt, AIA  
Mr. Steve Ziger, AIA

©Copyright by

Nicolas Frederic Mansperger

2004

## DEDICATION

I dedicate my educational experience to my family and friends. Without their relentless loving support over the years, this would not have been possible.

## ACKNOWLEDGEMENTS

I would like to thank my colleagues who believed in this thesis and helped it become a reality. My fellow thesis classmates have been an incredible inspiration over the past few years. Their encouragement has allowed me to succeed. The Harbor Point presentation team was also an invaluable group that helped this process become a realized presentation. Thanks to Annie, Smriti, Shengyin, Drew, Ethan, Seth, Sarah Beth, Brian, Ryan, and Duncan.

## TABLE OF CONTENTS

List of Figures	v
Chapter I: Introduction	
Harbor as Venue	1
Urban Contextualism	2
Imageability	3
Genius Loci	5
Architectonic Kinetics	6
Pageantry of Place	10
Chapter II: Site: Harbor Point	
Site Description	12
Site History	29
Prior Site Proposals	34
Chapter III: Precedents	
Urban Precedents	47
Building Precedents	55
Kinetic Precedents	68
Chapter IV: Functional Considerations and Program	
Design Goals	73
Design Issues	74
Site Development Program	75
Concert Hall Program	75
Detailed Program Description	77
Building Program Organization	87
Chapter V: Design Strategies	
Urban Partis	88
Urban Sectional Partis	107
Urban Waterfront Promenade Studies	109
Park Partis	110
Building Partis	112
Building Section Studies	127
Building Elevation Studies	130
Chapter VI: Design Conclusions	
Urban Conclusions	135
Music Hall Conclusions	148
References	164

## LIST OF FIGURES

1.	Context: Baltimore's harbor in the 1860's	7
2.	Context: Baltimore's harbor in 2003	7
3.	Aerial: Baltimore in 1992	12
4.	Aerial: Baltimore in 1980's	13
5.	Diagram: districts	14
6.	Diagram: walkability	14
7.	Diagram: visibility	15
8.	Site panorama: from Inner Harbor East	15
9.	Site panorama: from Federal Hill	16
10.	Site photo: from Inner Harbor East	16
11.	Context Rendering: Inner Harbor East	17
12.	Context: typ. Inner Harbor East street	17
13.	Context Aerial: Fells Point	18
14.	Context: typ. Fells Point street	18
15.	Context panorama: Fells Point and Canton waterfront	18
16.	Site panorama: boat view from west	18
17.	Site panorama: boat view from southeast	19
18.	Context: Inner Harbor from water	19
19.	Diagram: water	20
20.	Context: Living Classrooms Foundation	21
21.	Context: Ferndale Fence Co.	21
22.	Context: Lancaster St. canal	21

23.	Site photo: Skyline looking northwest from site	21
24.	Site diagram: street names	22
25.	Street character: S. Caroline St.	22
26.	Street character: S. Eden St.	22
27.	Street character: S. Central Ave.	23
28.	Street character: Bond St.	23
29.	Site diagram: Street Hierarchy	23
30.	Site diagram: Street Sections	24
31.	Site Diagram: grid orientations	24
32.	Site diagram: Water taxi stop 5 min. radii	25
33.	Site diagram: Site topography and sections	26
34.	Site diagram: Existing Figure Ground	27
35.	Site diagram: Blocks	27
36.	Site diagram: building heights	28
37.	Site diagram: Land Use	28
38.	Plan: 1792 Baltimore	29
39.	Aerial: Allied Signal chromium facility in '70's	30
40.	Aerial: Baltimore in '70's	31
41.	Site diagram: multimedia environmental cap plan	32
42.	Site diagram: multimedia environmental cap section	32
43.	Diagram: 1988 waterfront study area	35
44.	Diagram: 1988 forces on Fells Point and Canton waterfront	35
45.	Diagram: 1988 waterfront redevelopment plan	36

46.	Diagram: 1988 site redevelopment park plan	37
47.	Diagram: 1904 Baltimore park plan	38
48.	Aerial: Baltimore in 1980's	39
49.	Plan: 1993 PUD	40
50.	Diagram: 1993 blocks	41
51.	Diagram: 1993 building heights	41
52.	Model: 2003 PUD	43
53.	District Plan: 2003 PUD	43
54.	Site Plan: 2003 PUD	44
55.	Diagram: 2003 PUD streets and open space	44
56.	Model: 2003 PUD massing	45
57.	Diagram: 2003 PUD parcels	45
58.	Diagram: 2003 PUD building heights	46
59.	Diagram: 2003 PUD maximum build axon	46
60.	Battery Park City: model	47
61.	Battery Park City: Plan: open Space	48
62.	Battery Park City: Plan: land use and blocks	59
63.	Mission Bay: plan	50
64.	Mission Bay: model	51
65.	Mission Bay site model	51
66.	Blackwall Peninsula: model	52
67.	Blackwall Peninsula: process schemes	53
68.	Opera National de Paris: grand stair perspective	55

69.	Opera National de Paris: transverse section	55
70.	Opera National de Paris: longitudinal section	56
71.	Opera National de Paris: plan	57
72.	NJPAC: site plan	58
73.	NJPAC: plan	59
74.	NJPAC: section	60
75.	Sibelus Hall: exterior photo	61
76.	Sibelus Hall: plan	61
77.	Sibelus Hall: Forest Hall exterior	61
78.	Sibelus Hall: Forest Hall interior	62
79.	Sibelus Hall: concert hall interior	62
80.	Sydney Opera House: site photo	63
81.	Sydney Opera House: site plan	65
82.	Sydney Opera House: ground level plan	65
83.	Sydney Opera House: stage photo	66
84.	Sydney Opera House: seating photo	66
85.	Performance halls to scale on Harbor Point site	67
86.	McCurdy Pavilion: plan	68
87.	McCurdy Pavilion: section	69
88.	Autostadt: exterior façade	70
89.	Autostadt: interior kinetic façade	70
90.	Church of the Sacred Heart: Kinetic façade	71
91.	Church of the Sacred Heart: Plan	72

92.	Program organization	87
93.	Urban parti I: plan	88
94.	Urban parti I: waterfront character	89
95.	Urban parti I: diagrams	89
96.	Urban parti I: axon	90
97.	Urban parti II: plan	91
98.	Urban parti II: axon	92
99.	Urban parti II: diagrams	92
100.	Canal waterfront character	93
101.	Urban parti III: plan	94
102.	Urban parti IV: plan	95
103.	Urban parti V: plan	96
104.	Urban parti VI: plan	97
105.	Urban parti VI: axon	97
106.	Urban parti VII: plan	98
107.	Urban parti VII: axon	98
108.	Urban parti VII: aerial	99
109.	Urban parti VIII: plan	100
110.	Urban parti VIII: axon	100
111.	Urban parti IX: plan	101
112.	Urban parti IX: axon	101
113.	Urban parti X: plan	102
114.	Urban parti X: axon	102

115.	Urban parti XI: plan	103
116.	Urban parti XII: plan	103
117.	Urban parti XIII: plan	104
118.	Urban parti XIII: axon	104
119.	Urban parti XIII: aerial	105
120.	Urban parti XIV: plan	105
121.	Urban parti XV: plan	106
122.	Sectional partis A, B, C	107
123.	Sectional partis D, E, F	108
124.	Urban waterfront promenade studies	109
125.	Park parti I	110
126.	Park parti II	110
127.	Park parti III	111
128.	Park parti IV	111
129.	Building parti I: plan	112
130.	Building parti I: axon	112
131.	Building parti II section	113
132.	Building parti II: character study	113
133.	Building parti III: plan, section, axon	114
134.	Building parti IV: plan, section	115
135.	Building parti IV: axon	115
136.	Building parti V: plan, section, axon	116
137.	Building parti VI: plan, section, axon	117

138.	Building parti VII: axon	118
139.	Building Parti VIII: plan	118
140.	Building Parti IX: plan	119
141.	Building Parti X: plan	119
142.	Building parti XI: plan and axon	120
143.	Building parti XII: plan and axon	121
144.	Building parti XIII: plan and axon	122
145.	Building parti XIV: plan and axon	123
146.	Building parti XV: plan and axon	124
147.	Building parti XVI: plan	125
148.	Building parti XVII: plan	125
149.	Building parti XVIII: plan	126
150.	Building parti IXX: plan	126
151.	Building section I	127
152.	Building section II	127
153.	Building section III	127
154.	Building section IV	128
155.	Building section V	128
156.	Building section VI	128
157.	Building section VII	129
158.	Building section VIII	129
159.	Building elevation I	130
160.	Building elevation II	130

161.	Building elevation III	130
162.	Building elevation IV	131
163.	Building elevation V	131
164.	Building elevation VI	132
165.	Building elevation VII	132
166.	Building elevation VIII	133
167.	Building Elevation IX	133
168.	Building elevation X	134
169.	Building elevation XI	134
170.	Context Plan	138
171.	Context Section	138
172.	Context Model: from above	139
173.	Context model: from south	139
174.	Urban diagrams	140
175.	Urban aerial from southeast	141
176.	Urban aerial from northwest	141
177.	Master plan	142
178.	Site model: from above	143
179.	Site model: aerial from south	144
180.	Site model: water level from south	144
181.	Site model: from southeast	145
182.	Site model: from west	145
183.	West block plan	146

184.	Block section transverse	147
185.	Block section longitudinal	147
186.	Building diagrams	153
187.	Entry/first level plan	154
188.	Second – Fifth level plans	154
189.	Music hall model: aerial from southeast	155
190.	Music hall model: aerial from northeast	155
191.	Music hall model: from park	156
192.	Music hall model: aerial from southwest	156
193.	Music hall model: aerial above park	157
194.	East/Central Ave. elevation	157
195.	South/Thames St./park elevation	158
196.	Building perspective from park	158
197.	Entry perspective from across Central Ave.	159
198.	Lobby perspective	160
199.	Building section: transverse looking at stage	160
200.	Building section: longitudinal through hall	160
201.	Building section: transverse through lobby	161
202.	Building section: transverse looking at rear of hall	161
203.	Building section perspective: transverse looking at stage	162
204.	Building section perspective: longitudinal looking at hall	162
205.	Balcony/lobby façade detail	163

## Chapter I: Introduction

This thesis explores the impact that urban and architectural designs have on a culture. How can the reclamation of a prominent brownfield site strengthen cultural relationships between local residents as well as market a city for greater national appeal? To answer this question, the study of “Harbor as Venue” explores the built environment’s relationship to culture through urban contextualism, imageability, genius loci, architectonic kinetics, and the pageantry of place.

### **Harbor as venue**

The term ‘venue,’ in Webster’s Dictionary, comes from the French verb *venir* meaning *to come*. Its deliberate usage in this thesis’ title is to emphasize a waterfront’s ability to make people come together. Since the Baltimore harbor’s rehabilitation into a national tourist attraction, it has proven its ability to draw people from around the world. A venue is “a locale of a past or projected real or imaginary event; especially a place designated to be the scene of a proposed gathering” (2542). The Baltimore harbor is the *locale* featuring the *past event* of an industrialized infrastructure located in direct proximity to nautical shipping. With the economic paradigm shift to a service and communication based economy, the same locale has the potential to project imagery of an event in reference to the reality of the past.

What is the reality of the past? During the zenith of the industrial movement, Baltimore’s waterfront exuded dynamism. The harbor was bustling with diverse merchant ships moving a wide variety of goods. Baltimore’s primary export was actually the vessel that all other ports relied on for their own vitality. The city built and exported merchant and warships.

The constant movement of cranes loading the ships and the relentless smoke billowing from tall stacks across the skyline only heightened the experience of being in a living, dynamic environment. Baltimore's waterfront is its lungs, and the people its heart. As the industrial era has come to a close, it has become the urban designer and architects' responsibility to understand and reinterpret how a city breathes.

Can a city be charged with the task of being a venue that integrates distinct neighborhoods in order to spur cultural socialization, education, and integration? Perhaps a single built form cannot carry this load, but a specific design strategy for a mixed-use urban environment can foster the development of a venue for social discourse.

### **Urban Contextualism**

The chosen site's high profile requires a strong attention to architectural and urban detail. The visibility of the site from up and down the harbor will render it a permanent addition to the Baltimore skyline. Due to its high visibility, it is important that the site and its buildings are designed responsibly to ensure a positive influence on the city's future development architecturally, urbanistically, and culturally. The study of Steve Hurr's "contextualism," the spirit of context, promotes a continuation of a place's essence by attempting to derive architectural-urbanistic form from context. While this is generally a derivation of physical form, it also includes what Colin Rowe and Fred Koetter call the psychocultural field. In other words, through a thorough investigation of the existing built form and the local sociological/historical traits of a place, a greater understanding of a site's possibilities can be explored. This helps ensure that new interventions have strong relationships to their context and strengthen the established intrinsic worth that make Baltimore unique.

The success of the design of the site will have a direct impact on future waterfront development of Baltimore's 7.5-mile shoreline, much of which may be available for redevelopment in the coming years. Moreover, it could also drive zoning and architectural ideals in adjacent waterfront neighborhoods and adjacent inland communities such as northern Fells Point and Little Italy.

### **Imageability**

Imageability, as defined by Kevin Lynch, is "the quality in a physical object which gives it a high probability of evoking a strong image in any given observer" (9). Imageability is built through the use of paths, edges, districts, nodes, and landmarks. The specific use of these elements has the ability to create strong memories of place.

Paths are the channels along which the observer customarily, occasionally, or primarily moves. Lynch defines paths as the predominant elements of image, whether they are streets, walkways, canals, transit lines, etc. (47). This suggests creating layers of connected circulation types throughout the site to heighten the ways in which a place can be experienced.

"Edges are the linear elements not used or considered paths by the observer" (Lynch 47). Baltimore's edge, once dominated by industry, has reaffirmed itself. The harbor's edge has transformed into a public path, alleviating the disconnect between a city and its reason for being. The duality of this edge/path lends itself to being an imageable feature in the urban landscape due to its power to organize the relationship of land to water.

A district is a "medium-to-large section of the city, conceived of as having two-dimensional extent, which the observer mentally enters 'inside of,' and which are

recognizable as having some common, identifying character” (Lynch 47). This raises questions about Harbor Point’s relationship to its contextual districts. Is it meant to become part of Inner Harbor East, Fells Point, or become its own district? An exploration into its district type will inform massing, typology and programming on the site.

Lynch describes nodes as “points, the strategic spots in a city into which an observer can enter, and which are intensive foci to and from which he[/she] is traveling” (47). The site may have nodes of different intensities, whether transit hubs, public spaces, and/or a cultural building. Both inland and waterfront nodes will be explored.

The site may also include relationships to landmarks. Landmarks are “another type of point of reference, but in this case the observer does not enter within them, they are external” (Lynch 48). The rather simply defined “Domino Sugar” factory sign across the harbor could draw people into the Harbor Point site. The site’s nautical aspect warrants exploration into the study of how a landmark on the site could create a nautical threshold in the Inner Harbor. Additionally, the site’s urban design as well as individual buildings should strengthen the site’s imageability as one pearl in a string of pearls along the waterfront. The sites visibility should work in concert with, not dominate, established nodes, figural buildings, and landmarks in the area.

Understanding Paul Stern’s similar notion of "apparency" can clarify design intentions related to imageability. Stern defines apparency in art as having the function of creating “images which by clarity and harmony of form fulfill the need for vividly comprehensible appearance” (165). Simple visual and physical connections can enhance the apparency of place. The shape, color, and arrangement facilitate “the making of

vividly identifiable, powerfully structured, highly useful mental images of the environment” (Lynch 9).

### **Genius Loci**

The Roman concept of the guardian spirit of place should be explored in all built projects. Christian Norberg-Schulz describes the two psychological functions of the spirit of place as orientation and identification. Orientation keeps one from getting lost while identification allows one to develop deeper knowledge of and intensely experience a particular environment (18). This allows one to be comfortable and therefore free in his/her surroundings. This freedom has the capacity to increase dynamism and interaction by liberating one’s mind in a familiar, recognizable environment. But, this liberation can only be attained through a strong relationship to the human scale. One relates buildings of human scale to human identity, which is a basis for the fundamental human need, a meaning or sense of belonging. Therefore, an urban fabric with a strong sense of human scale should be studied to ensure a participant’s sense of meaning on the site.

The “genius loci” is the harbor and the sense of history the harbor exudes on its particular place. The addition of a major civic/cultural waterfront program, such as a music hall, has the capacity to either emphasize or downplay this sense of place. The hall will play the role of attracting local and regional residents to the harbor through regular widely varied performances. This hall will eventually replace the existing Pier 6 concert pavilion in the Inner Harbor. This existing pavilion is a non-conditioned tensile structure with a limited season. Its 3,400 seats and 1,000-seat lawn are located on a single sloped seating bowl. The pavilion suffers from blocked vantage points due to structure, poor

acoustics, poor audience-performer relationship, as well as a weak connection to the harbor. The pavilion is under re-development pressures due to its inability to expand and the real estate value of its pier. In contrast to this building, the Harbor Point music hall will be a year round venue correcting many of the shortcomings of the existing pavilion.

### **Architectonic Kinetics**

This thesis will study the relationship of kinetic architecture to a waterfront site. Kinetics is “a branch of dynamics that deals with the effects of forces upon the motions of material bodies” (Webster’s 1244).

The Milwaukee Museum of Art by Santiago Calatrava is a strong example of kinetic architecture’s relationship to a city and its waterfront. During the museums business hours, the waterfront façade opens like the wings of a bird to expose a great enclosed space to the waterfront. However, in this building, the movement of the façade is merely a signifier that has no direct relationship to the building’s volume or functional capacities. Is there a way to create a volume that metaphorically or literally encompasses the harbor and its inhabitants as well?

Two driving factors behind studying a dynamic tectonic are reverence for the site’s past and redevelopment of the site to embrace the harbor as venue. Throughout history, people have adapted the built environment to changes or used the built environment as a catalyst for change. This duality has allowed architecture, urban design, and planning to become influential professions. Through an understanding of the power these professions hold comes responsibility to design a world focused on the betterment of today as well as tomorrow. This responsibility is heightened to a climax whenever there is a paradigm shift in the foundation of a culture. Our current era,

moving from the industrial age of the 19<sup>th</sup> and 20<sup>th</sup> centuries into the boundless 21<sup>st</sup> century, is immersed in this paradigm shift. Adaptation to this shift must coincide with the movement and cannot merely be a reaction to it. This is the weight placed on designers of the built environment today.



**Figure 1 Baltimore's Inner Harbor from Federal Hill in 1860's (Beirne)**



**Figure 2 Inner Harbor from Federal Hill in 2003**

As our post industrial society evolves, the vitality of our cities is threatened. Transportation and communication systems become increasingly efficient, reducing the requirement for industry to locate on a waterfront site. Manufacturing processes have simultaneously evolved with the ever-expanding global infrastructure allowing a divorce from the requirements to place industrial facilities on waterfronts. This movement of industry to less expensive, more expansive sites, has abruptly left voids in some of the otherwise densest areas of industrialized nations. These now vacant waterfronts, once made vibrant by the movement of industry, need to be reinvented and ideally linked to their local neighborhoods as well as their cities.

The role of the water itself has changed from that of a place-maker for the location of industry, and therefore cities, to that of a potential amenity for residents and visitors. Can a built form relate to the history of a context through kinetics? As the harbor has shifted to a recreational boating amenity, perhaps the site can lure nautical activity that would rival the dynamics of great merchant ships at berth. The daily transformation of a building or urban fabric can act as a signifier to the community of social interaction to foster cultural maturation.

For a concert hall to enthusiastically embrace the harbor as its seating bowl, there could be some degree of visual, physical, or aural transformation. Perhaps the seating bowl could be seen as the entire harbor's water, or even as far-reaching as Federal Hill across the harbor. By placing the hall on such a peninsula, it cannot merely be an introverted modern building such as Baltimore's Meyerhoff Symphony Hall. Perhaps it can respond to the forces of the adjacent waterfronts and embrace the surrounding neighborhoods as its forum. If the venue is to be conditioned for year round use, a level

of dynamics could be explored to allow an adaptation of form. The water is the most powerful public amenity in Baltimore's central business district, putting great forces on its adjacent sites. Both direct and indirect access of the music hall to the water should be explored in many diverse ways to fully understand this potential relationship.

In speaking about his buildings' tectonics, Calatrava states, "façade, space, and construction principles must coalesce, giving a sense of transparency" (Blaser 26). This idea of transparency can be used to inform the music hall's dynamic relationship to its surroundings during the warmer times of the year. The building may be able to transform from a strictly interior performance space during the winter months to a more transparent exterior hall during the warmer months. The idea of transparency will be important to explore throughout the design process at both the macro/urban and micro/architectural scales. As the hall could easily comprise over 150,000sf, it may be necessary to explore a break down in massing. A study of transparency may help the building and site relate to the disconnect in the transect between the Inner Harbor East and Fells Point.

Visual clues from the building's interior to that of downtown, Tide Point, Fells Point, etc. will help inform the building's orientation and relationship to place. Camden Yards is a local example of a highly successful reinvestment in downtown cultural venues, both through its physical location and visual link to the central business district. The idea of tectonic transparency is further supported by a cultural transparency. A building that invites participants from all classes, all neighborhoods, via all forms of transportation must be welcoming. Therefore an exploration into solid/void relationships and their influence on tectonic and aesthetic choices will be explored.

The placement of a music museum, sited in close proximity to the hall, will be explored to draw international participants to the city. As Harbor Point is currently the only major break in the promenade from Federal Hill to Canton, it is a prime location for a building with national as well as local appeal. The music museum also helps to bridge the gap between the tourist driven development of Harbor Place and the historic residential culture of Fells Point. Currently there is an ideological disconnect between these two areas. Fells Point is both a local and regional draw due to its ability to act as an informal social core. Its social importance is driven by its local music and bar scene that draws local and metropolitan-wide customers. In contrast, the areas directly north of Harbor Place lack many residents, resulting in a lack of permanence or ownership to the area. A music museum and its connection to the concert hall, whether physical or figural, may have the ability to mesh and transform these two worlds which both have their own significant values. Through this transformation, it will be important to maintain the essence of place that nearby Little Italy and Fells Point possess.

### **Pageantry of Place**

The common bond amongst the neighborhoods surrounding the site is the pageantry that Baltimore's harbor fosters. Harbor Place's waterfront is given over to the people of Baltimore with its wide concourses and un-obscured public access. The harbor's small physical size yields an intimate feeling through its pedestrian connection to the water, continuous promenade, and sense of enclosure. Contributing to the pageantry, the water taxi service connects opposite sides of the harbor ensuring easy links across the amenity. Fells Point shares in this pageantry through its strong historic and contemporary residential and merchant relationship to the waterfront. The mix of

residences, seafood markets, restaurants, clubs, bars, and access to the water have made this a social core for the common man/woman to interact. The harbor is becoming a place to see and be seen.

This pageantry has a history across Baltimore in places such as Mt. Vernon. This small cruciform public space activates a mixed-use community with weekly activities for residents and businesspersons. In the center of Baltimore's cultural district, the Charles St. corridor has brought vitality to the heart of the city that could be used as a model for future developments. The design of Harbor Point must recognize and enhance the pageantry that is the essence of Baltimore and its waterfront.

### **Conclusion**

This thesis will explore mankind and the built environment's connection to a natural amenity. It will test the importance of understanding a locale's essence to further develop its sense of place. Ultimately, it will yield a greater understanding of the built environment's ability to bring together diverse participants in an ever-evolving waterfront, acting as a venue for cultural maturation.

## Chapter II: Site: Harbor Point

### Site Description



**Figure 3 Aerial: Baltimore in 1992. Site location marked by white square.**

Harbor Point is located on the waterfront in Baltimore, Maryland. It is on the north side of the water between the Inner Harbor and Fells Point. Surrounded by neighborhoods with both rich histories and contemporary ideals, Harbor Point is in a prime location to study the ways the urban environment can mediate between built forms of strikingly different eras, and ways it can mediate between built and natural forms.



**Figure 4 1980's Aerial: Looking northwest from the bay toward Baltimore and site (RTKL)**

North of the site lies Inner Harbor East, a new development currently under construction. Historic Fells Point is located directly to the east with a view of redeveloping Canton just beyond. Tide Point to the southeast across the water abuts the Domino Sugar factory, immediately south of the site. Locust Point, south across the harbor, lies adjacent to Federal Hill, located southwest of Harbor Point. Northwest of the site is the Inner Harbor, primarily a tourist district, anchoring the south edge of the central business district.



**Figure 5 Local districts: 2.5 & 5 min. walking radii**



**Figure 6 Walkability: 5 & 10 min. radii from Harbor Point**



**Figure 7 Expansive visibility of site from surrounding context**

Harbor Point is located at the transect between the Inner Harbor East development, currently under construction, and the warehouse/rowhouse neighborhood of Fells Point. It will play the role of mediator between the 30+ story buildings to the northwest and the two to three story homes to the east.



**Figure 8 Panorama: Harbor Point from Inner Harbor East looking southeast**



**Figure 9 Panorama: Harbor Point from Federal Hill, looking east**



**Figure 10 Harbor Point from Inner Harbor East looking southeast**

Inner Harbor East has taken the approach of placing density on the amenity by building massive buildings on the waterfront. This approach is often used in places such as New York's Central Park, where the taller buildings front the park. Fells Point represents an opposite approach; it has traditional rowhomes with the long side of its blocks oriented north/south to give the most people visual access to the water via street corridors. Harbor Point could combine the approaches by blending the idea of density on the amenity while ensuring unrestricted views to the water from the surrounding street fabric. Zoning currently calls for 'wedding cake' massing with the largest masses in the middle of the site and smaller masses at the edges. As parti development ensues, the

zoning strategy may be challenged by ideas of giving as many tenants as possible views of the water.



**Figure 11 Rendering of Inner Harbor East (Fillat) Figure 12 Typ. Inner Harbor East street**

Fells Point's rich character and history is quite the opposite of the newer development. It was originally a marsh of cedar and oak trees, the perfect woods for shipbuilding. Immigrant William Fell arrived at the colony of what is now Baltimore in the early 18<sup>th</sup> c. Seeing the potential for the area, he became a real estate investor in the 1730's and developed the area into America's largest ship manufacturer by the time of the Revolutionary War. Battleships like the Baltimore Clipper, which was faster than any British ship, were produced at Fells Point. This ship was sent to England and single-handedly blockaded the British Navy from sending more ships to America. After the war of 1812, the market for battleships decreased while merchant ships came into demand. Baltimore was America's first choice for the manufacturing of ships for slave trade and merchant vessels traveling to the Indies. Not until the advent of the steam ship did Baltimore have good reason to look to other means of business. Fells Point transitioned to can manufacturing while remaining the primary merchant marine port in the

Chesapeake Bay. Today, Fells Point is a viable market and nightlife district for local and regional visitors while retaining its historic character.



**Figure 13 Aerial: Fells Point (RTKL)**



**Figure 14 Typ. Fells Point street**



**Figure 15 Panorama: Fells Point and Canton waterfront from south**



**Figure 16 Panorama: Harbor Point from west. Fells Point in distance at right edge of site.**



**Figure 17 Panorama: Harbor Point from south. Inner Harbor and CBD to northwest.**



**Figure 18 Inner Harbor waterfront from southeast**



**Figure 19 Water surrounds three sides of Harbor Point peninsula raising connectivity concerns**

Harbor Point is bound by the harbor to the south and west, and by a 40' wide canal to the north that separates Harbor Point from Inner Harbor East. Caroline St. edges the east side of the site, with new rowhomes on the east side of the street. The Ferndale Fence Co. and Lady Maryland structures are historic buildings adjacent to the east edge of the site. Along the north edge of the site lays the Living Classrooms property with a learning center and nautical watchtower. The Living Classrooms' adjacency to water is important to note due to the aquatic nature of the program.



**Figure 20 Existing Living Classrooms center on north edge of site**



**Figure 21 Existing Ferndale Fence Co. on southeast edge of site**



**Figure 22 Canal along Lancaster St. separates site and Living Classrooms tower from Inner Harbor East (Reichart)**



**Figure 23 Skyline looking northwest from site**

The region is accessed via I-83 from the north, I-95 from the east and south, or I-395 from the south and west. Currently, routes from these interstates likely converge along Fleet St. and direct access to the site is only from S. Caroline or Thames St. Many potential vehicular, pedestrian, and/or visual links could occur from north-south streets including Felicia St., S. Exeter St., S. Central Ave., S. Eden St., and S. Spring St.



**Figure 24 Street system names. S. Caroline St. edges east site boundary as only access road.**



**Figure 25 S. Caroline St. looking south toward site Figure 26 S. Eden St. looking south toward site**



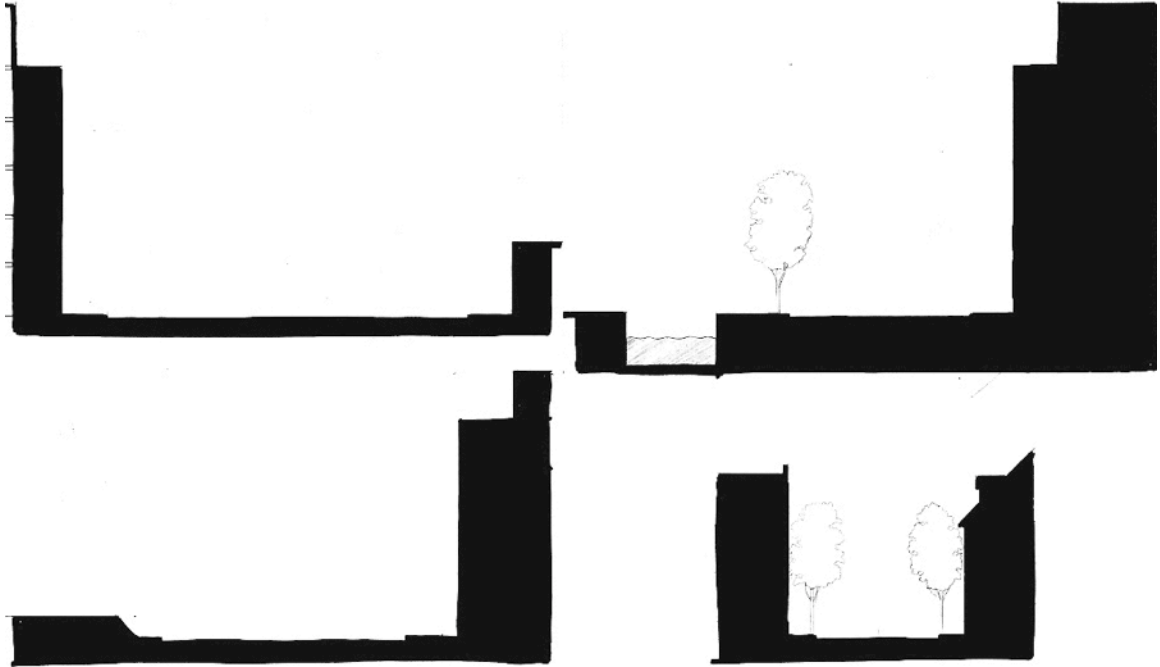
**Figure 27 S. Central Ave. looking south to site**



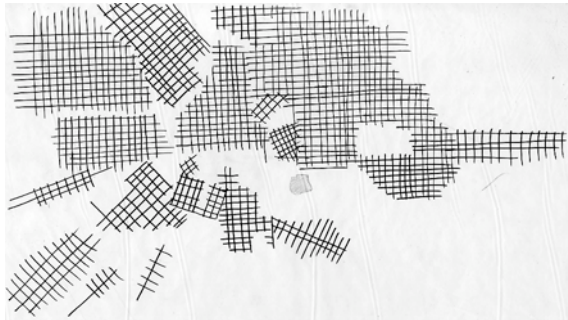
**Figure 28 Aliceanna St. looking east from Fells Point warehouse district towards Inner Harbor East**



**Figure 29 Street hierarchy and limited access around site suggests need for connectivity**



**Figure 30 Diversity of street sections: Upper left: S. Exeter St. Upper right: Lancaster St. Lower left: S. Caroline St. adjacent to site. Lower right: S. Bond St.**



**Figure 31 Street grid shifts around CBD for access to city center and water**

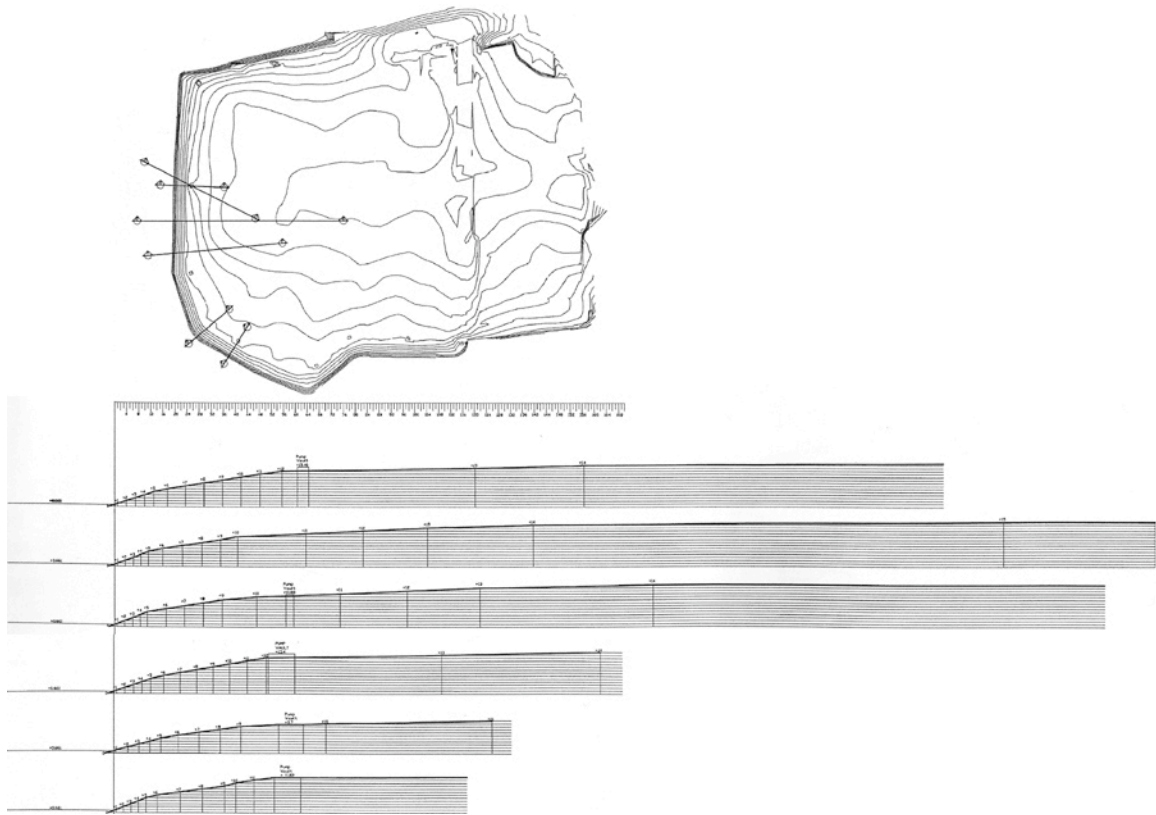


**Figure 32 Water taxi stops and their 5 min. walking radii suggest a new stop at Harbor Point**

Vehicular accessibility to the site is limited to S. Caroline St. along the east edge and the terminus of Thames St. to the southeast. The water taxi, providing nautical transit throughout the harbor, has regular accessible stops along a majority of the harbor's waterfront except at Harbor Point. The Baltimore subway stop north of the site is too far to be considered walkable, about 20 minutes away, and there are currently no bus routes near the site to connect it. However, taxi service to the north of the site on Aliceanna St. is prevalent due to nearby hotels. Inner-block parking facilities are becoming more common as new development occurs north and east of the site along Lancaster, Aliceanna, and S. Caroline Streets. As new development ensues, changes and expansion of transit routes should be explored.

The 27.35-acre Harbor Point peninsula measures approximately 1300' east west by 1200' north south. Of the site's mile long perimeter, only 1100' is attached to land. The typical site section rises from water level to +5' within 12' of the water's edge. This

edge typically consists of large rocks to prevent erosion due to the nautical nature of the harbor. The site is +11' at 50' from the water's edge. The center of the site crowns at +15'. The majority of the site is covered with impervious asphalt. It should be noted that much of the harbor's waterfront rises naturally at a gradual slope from the water's edge, but due to the temperament of the environmental cap, the site rises unnaturally high above sea level at its crown. Nowhere else expect Federal Hill', at +65', is there such a high point within 200' of the water's edge. The 100 year flood level was reached in the fall of 2003 at +5'.



**Figure 33 Site topography and sections show crown +15', significantly higher than surrounding areas (White)**



Figure 34 Existing figure ground



Figure 35 Block diagram



**Figure 36 Building heights. (lightest = 1-2 stories, darkest = +10 stories)**



**Figure 37 Land Use**

## Site History



**Figure 38 1792 Baltimore plan. Only a thin hook of land existed where infill site is today. (Beirne)**

Harbor Point was the location of the Allied Signal, Inc. chromium facility from the early 1900's through the 1980's. After its closure, the factory complex remained dormant on the site through the early 1990's. As contamination concerns about the site rose, the Environmental Protection Agency conducted tests on the site. During the decades of the facility's existence, chromium was allowed to penetrate the site's topsoil and eventually reach the water table just below the earth's surface. This chromium eventually found its way into the harbor's water and the Chesapeake Bay. In 1992, the

EPA mandated that a cleanup effort be made to prevent any further chromium from entering the harbor.



**Figure 39 Allied-Signal chromium facility in 1970's (Notter)**

Traces of chromium can be found throughout the entire city, but concentrations are generally too low to be deemed a health concern. However, the combination of the chromium facility's contamination and its proximity to water caused the EPA to enforce a cleanup of the site. The ill effects of chromium exposure are not contracted through the air, but rather only through drinking water. For this reason, a \$100 million cap was built over a portion of the site to prevent the contaminated soil from coming into contact with groundwater.



**Figure 40 1970's aerial looking east across Baltimore's harbor at site to upper right (Reichart)**

The multimedia cap built from 1994-1998 covers 15 acres of the 27.35-acre site. It ranges from 3.5' to 5.5' thick. After the factory was razed in 1992, a layer of asphalt was placed over the site. Above the asphalt lies a capillary break with a geotextile surface above it. On top of this is a geosynthetic layer with a synthetic drainage material above that acts to divert rainwater to pumping stations throughout the site. Above the drainage material is cover soil with a bright colored visual barrier aimed at stopping unwarranted digging from penetrating the cap. Currently a second layer of asphalt acts as the exposed ground plane over the entire site. The asphalt is meant to block rain from entering the soil, and instead divert all rainwater to the site's edges and into the harbor. Foundation types and cap penetration will need to be explored for environmental and structural purposes.



Figure 41 Plan: multimedia cap covers 55% of site (Fineberg)

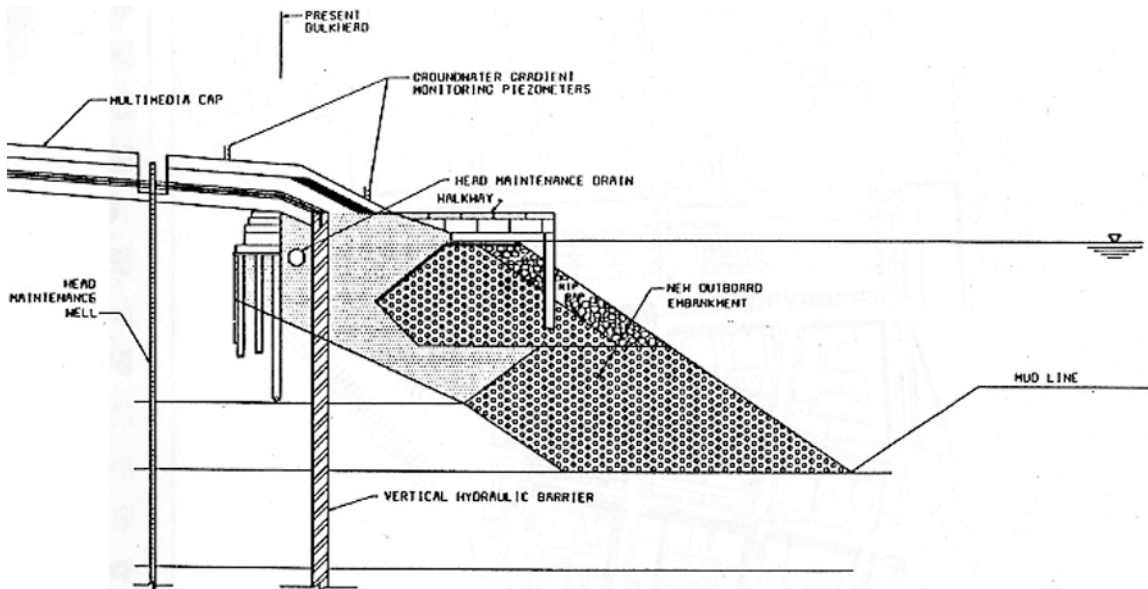


Figure 42 Section: multimedia cap's relationship to proposed promenade and water (Fineberg)

Pumping stations throughout the site gather rainwater that does enter the soil and divert it to the Honeywell monitoring station, the only building on site. All water runoff

that penetrates the soil within the 15-acre cap is collected and shipped via trucks to an off-site processing plant. Surrounding the 15-acre cap, a barrier wall was constructed 80' down to the bedrock to reduce seepage from the site to the Bay. It is within this 15-acre portion that the ground rises from 6' above the harbor to a crown at 15' above the mean water level to aid drainage.

To clean up its contaminated reputation, Allied Signal purchased Honeywell and adopted its name. Now the on-site Honeywell station monitors sensors through out the site to ensure that the site's cap performs flawlessly.

In 1990, Allied Signal contracted Baltimore developer Struever Bros., Eccles, and Rouse to conduct a feasibility study for the site. A master plan by Baltimore based Cho, Wilks, & Benn Architects led to a PUD approved by the Baltimore City Department of Planning in 1993. Despite this effort, no further steps were to be taken until the completion of the cap in 1998. To prove reliability of the cap, Honeywell ran stringent monitoring tests for several years before following through with the development process.

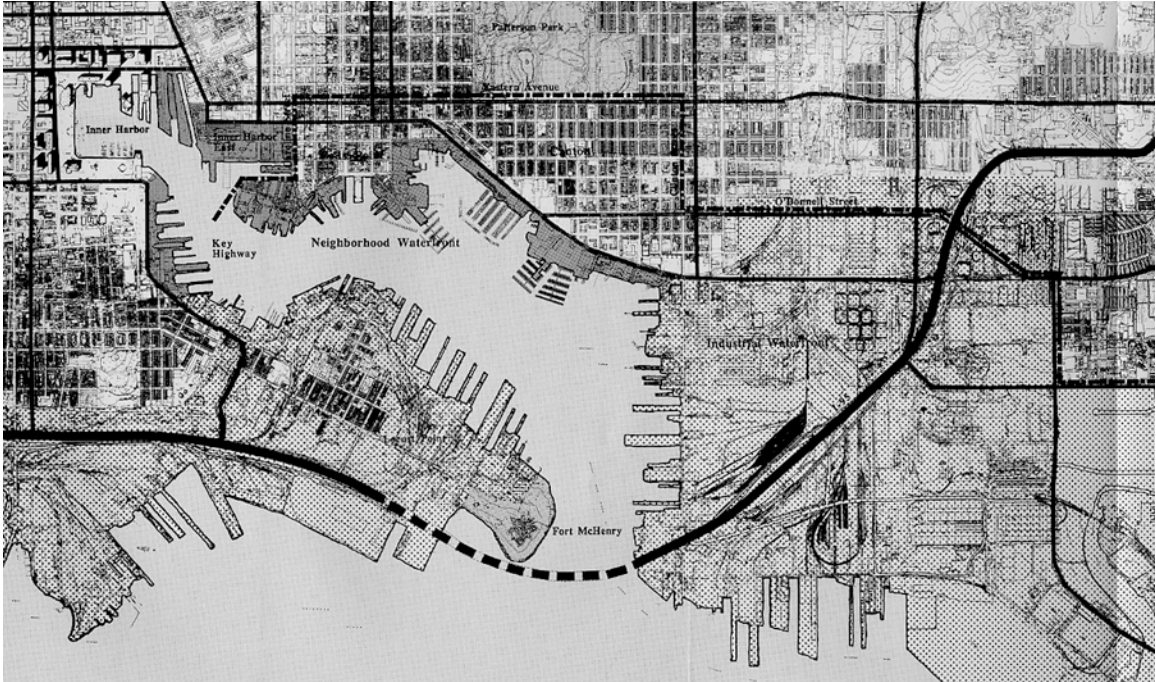
In spring of 2003, the ground lease was signed between Struever Bros. and Honeywell. This has allowed Struever Bros. to work with Ehrenkrantz, Ekstut, and Kuhn Architects of N.Y. on a new master plan for the site. They will submit a new PUD proposal to the Dept. of Planning in the winter of 2004.

## Prior Site Proposals

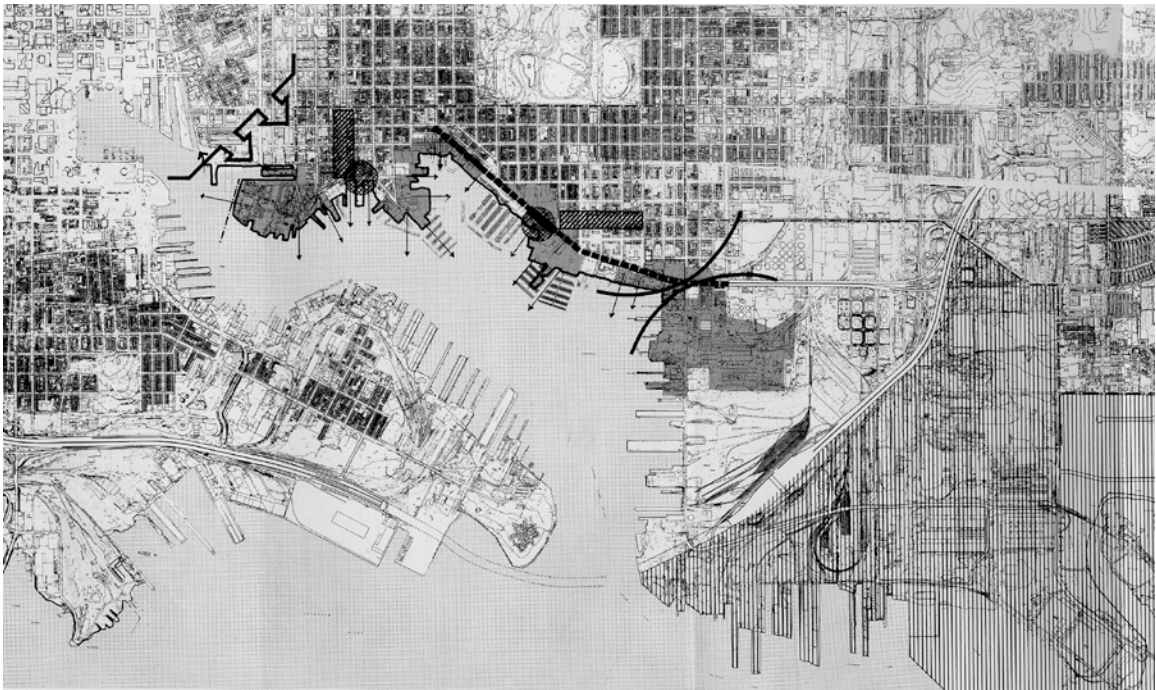
The Inner Harbor Redevelopment Plan of 1965 marked the beginning of the city's conscious reclamation of the waterfront to spur development. As the harbor's piers had transformed from vibrant industrial sites to mere waterfront storage lots, Baltimore took action to deter this symbol of stagnation. In 1985 the Department of Planning released an overview of plans and goals in The Baltimore Harbor. Around this same time, Baltimore's Mayor Kurt Schmoke called for a "vision for the waterfront." Washington D.C. based architecture firm Notter, Finegold, and Alexander, Inc. was hired to conduct a study of the Baltimore Waterfront. In 1988, this study yielded a Fells Point and Canton Urban Design Plan with three overriding goals:

“the use and scale of new development should not disrupt the existing character of the neighborhood. The public space connecting the community to the waterfront and along the water's edge must be attractive and well defined; and economic development, benefiting both the neighborhood and industrial waterfront is vital for Baltimore's continued growth.” (Notter 8)

One underlying principle of the concept strategy was that of the waterfront belonging to all Baltimore residents, therefore requiring public access. This goal has resulted in rules regulating the design of a continuous waterfront promenade from Canton, around the inner harbor, to Tide Point. While it is understood this promenade may take decades to complete, the framework has been established to ensure its vitality. This promenade is to be no less than 12' of hard-scape for pedestrian movement with no less than 8' of landscaping on the landward side of the pathway.



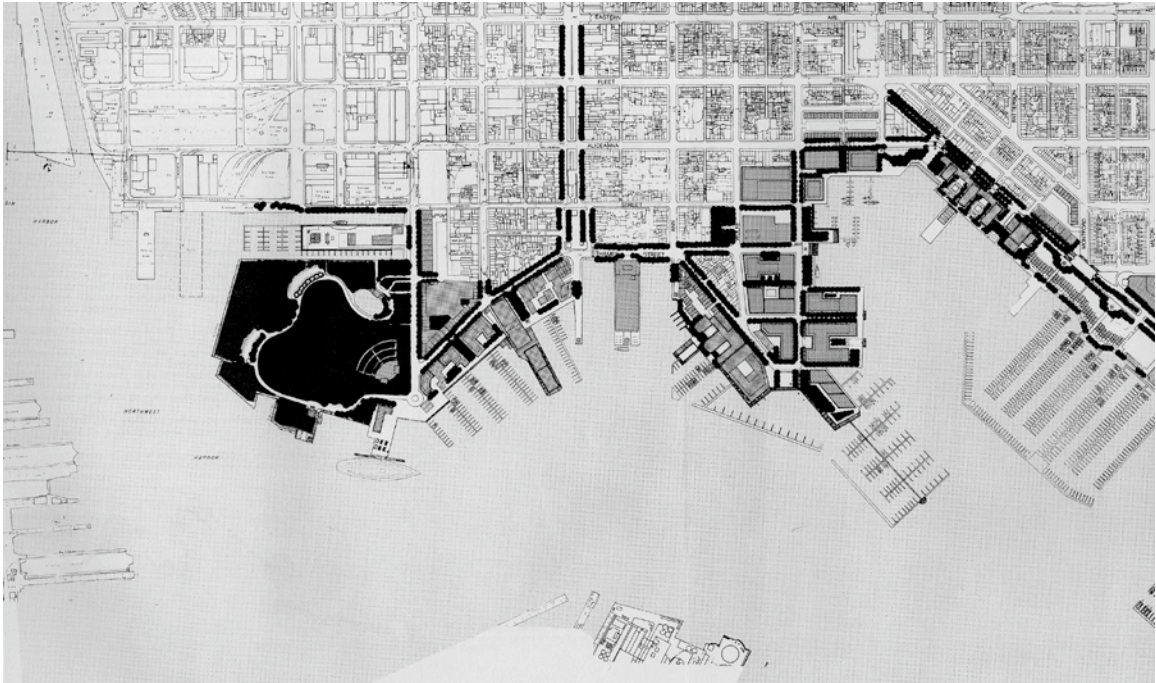
**Figure 43 1988 Waterfront study area (Notter)**



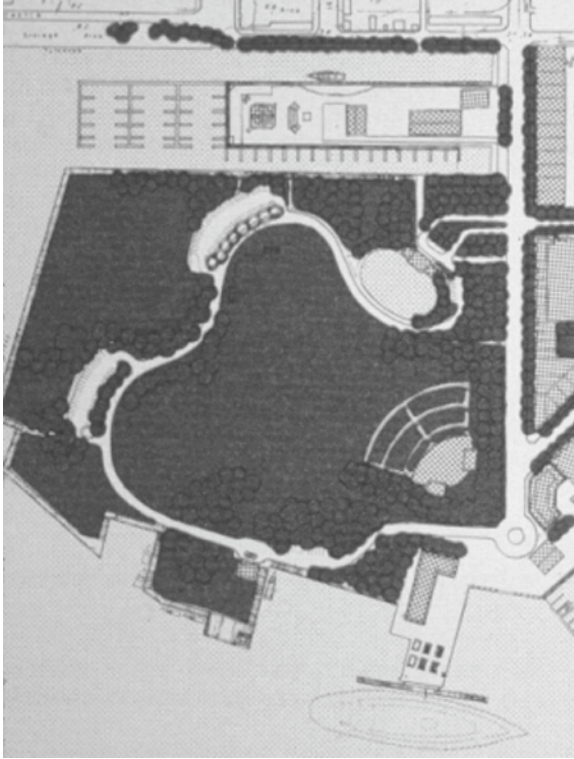
**Figure 44 Forces on Fells Point and Canton waterfront (Notter)**

This urban plan proposes a park on the Harbor Point site to act as an anchor at the west end of the Fells Point and Canton urban plan. It would be supported by a park at the

east end of the plan in Canton, and together these would serve as end-pieces to a “string of pearls” along the waterfront of these two communities. Harbor Point’s public park would also buffer the impending development of Inner Harbor East from the delicate Fells Point fabric. With seemingly good intentions, this use for the site had many shortcomings.



**Figure 45 1988 Plan for waterfront redevelopment (Notter)**



**Figure 46 1988 Plan park plan for Harbor Point site (Notter)**

The site itself is perhaps the most visible peninsula of land on Baltimore's waterfront from both the Inner Harbor and from the Chesapeake Bay. This also means that incredible views from the site can be had in all directions along the waterfront. So, a proposal of public space on a portion of the site should be studied. A park of 27 acres may better serve a community at its center rather than edge. But, cities such as Chicago have proven the success of waterfront parks. Harbor Point's public space could act as a local park, supplementing the regional Patterson Park. A study of public space in a multiplicity of densities will be necessary to understand "built vs. un-built" implications. The quality and programming of other nearby hard-scape areas such as the Broadway Square should also be explored.



**Figure 47 Baltimore's 1904 park plan: Small local parks part of block structure. Regional blocks around periphery of density. Note proximity of Paterson Park to west of site. (Olmsted)**



**Figure 48 1980's Aerial: prominence of site on waterfront (Landslides)**

Lessons to take away from this plan are the values of open public space and buffering between Fells Point and the Inner Harbor East. This thesis will explore both a public space component as well as buffering massing differences through the built environment.

### **1993 Allied Signal PUD**

The 1993 PUD prepared by Cho, Wilks, & Benn Architects proposes a new street grid on the site. This nine-block grid disassociates itself from the surrounding streets by orienting itself slightly west of south. Perhaps this orientation is worth investigating because of the street-corridor views back to the Inner Harbor and downstream towards the Bay. However, linkages to the site are weak. A pedestrian bridge links the north edge to Lancaster St., but vehicular access is limited to S. Caroline St. The block shapes are very rational and appropriate. However, the long direction of the block runs east

west, contrasting the existing context whose blocks are oriented north-south, for access to the water. The massing of the site is highly introverted with the tallest mass in the center. This parti creates a lack of cohesion between the site and its surrounding context.

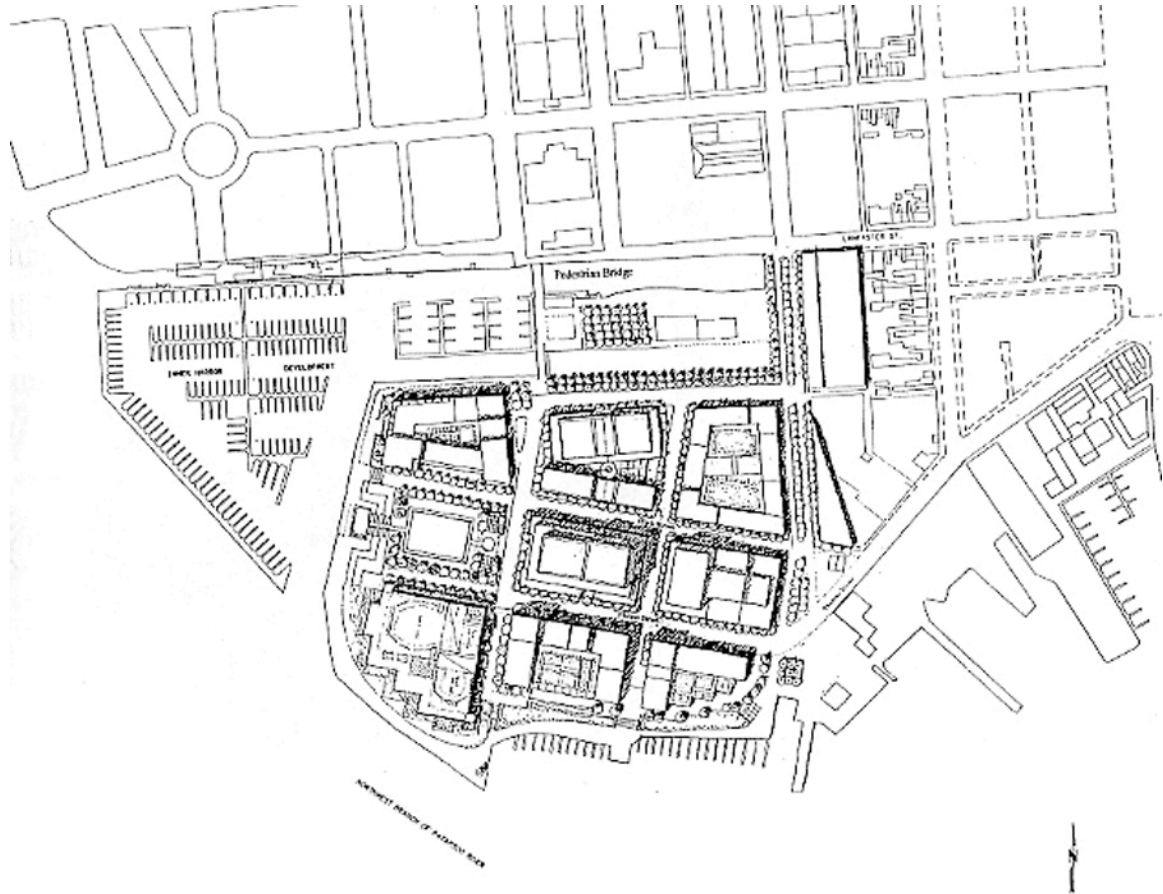


Figure 49 1993 PUD plan (White)

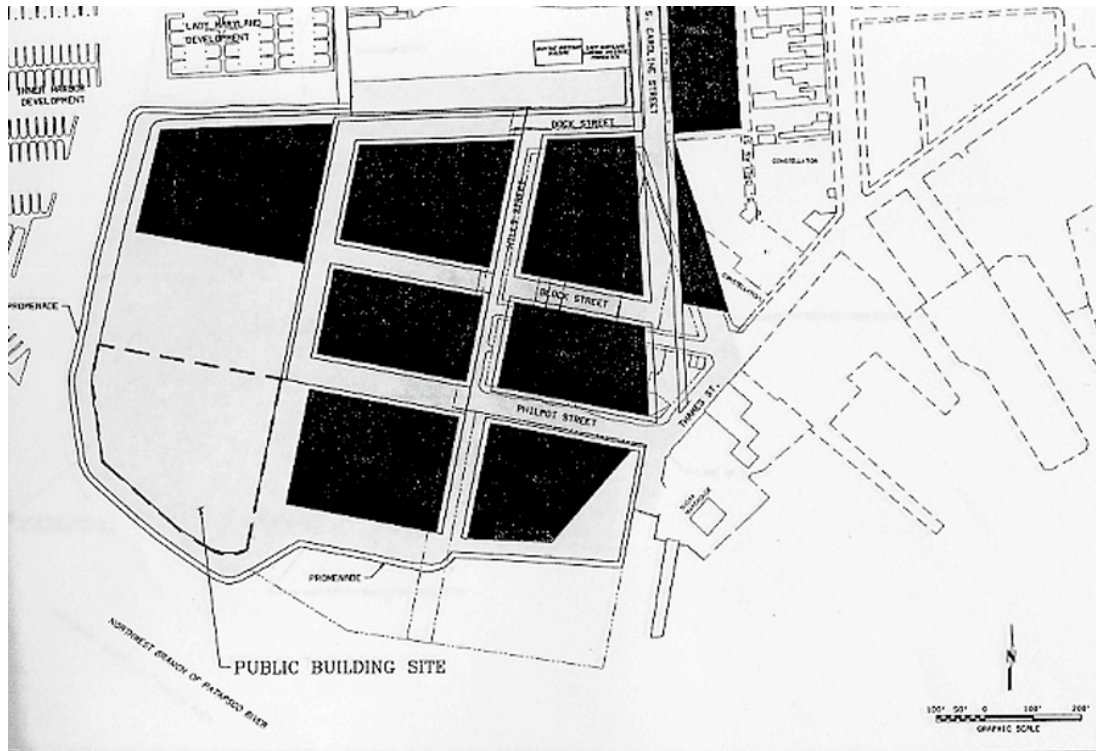


Figure 50 1993 PUD Block Diagram (White)

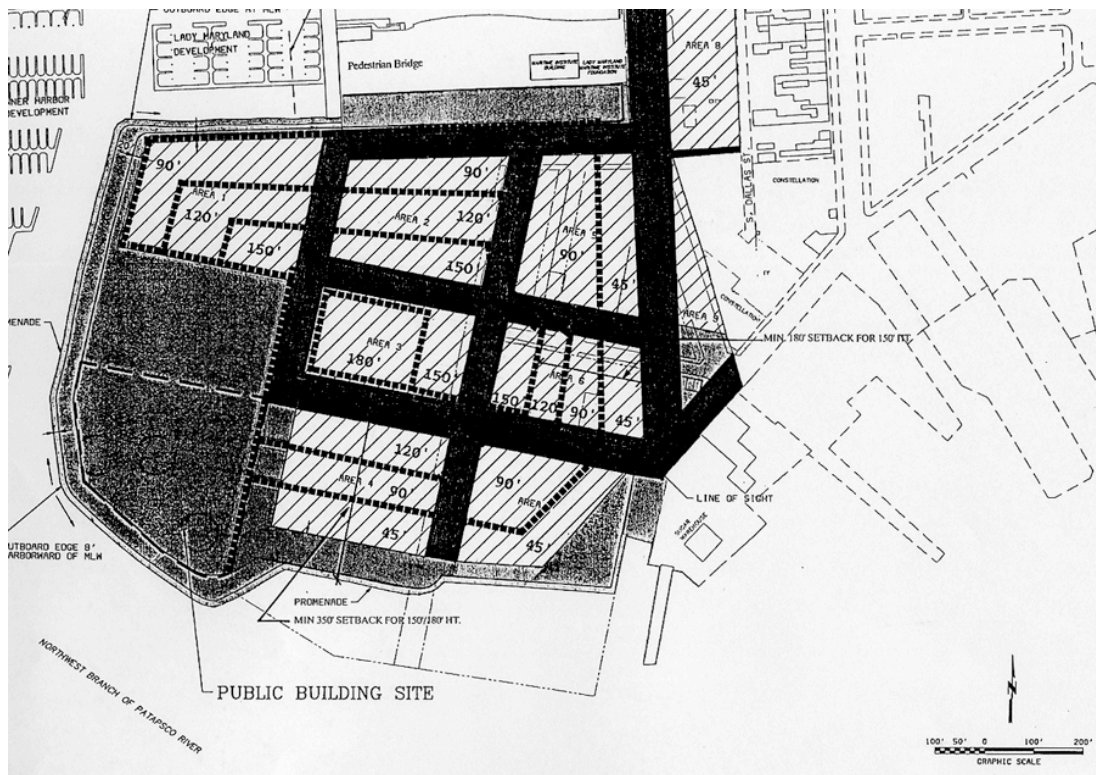


Figure 51 1993 PUD building heights (White)

## **2003 Proposed PUD**

Since development of the site was placed on hold in 1993, several blocks of the Inner Harbor East have been constructed, revealing a disconnect in massing between this area and the Fells Point fabric. The 31-story Marriot Hotel lies northwest of the site while a 13 story Marriott Courtyards stands directly north of the site. For this and other reasons, the PUD has been reevaluated. The new PUD, to be proposed to the Baltimore City Dept. of Planning in the winter of 2004, bears strong resemblance to the old, but pushes the massing around in response to Inner Harbor East. Massing at the north edge of the site has been increased to allow 180' buildings, discarding the site's wedding cake mass.

Rather than a grid of equal block sizes, the central blocks become smaller. This yields more space for the waterfront blocks, wisely placing density on the waterfront amenity. These waterfront blocks extend into the harbor on piers, continuing the waterfront character from Canton to the Inner Harbor. The waterfront promenade wraps around the building's water-edge and cuts through unconditioned passageways in these pier buildings, similar to the nearby RTKL office. However, these pier buildings block views to the existing Lady Maryland and Living Classrooms structures. Perhaps the significance of these existing sites demands greater waterfront visibility.

The street infrastructure has been reduced by 30% from the original PUD. Instead of non-hierarchical street dimensions, a single loop road encircles four of the blocks, which have alleyways dividing each block. This effectively creates two mega-blocks out of scale with the contextual fabric.

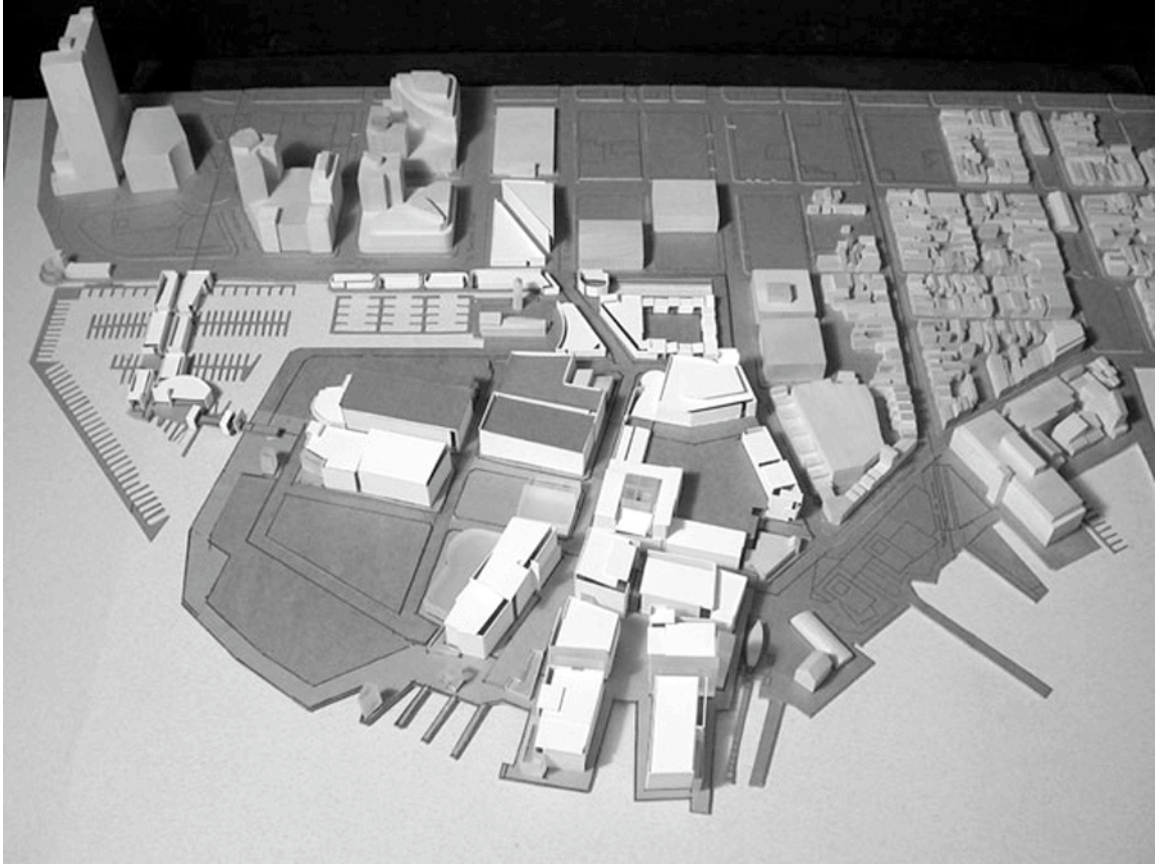


Figure 52 2003 PUD Massing (Ehrenkrantz)

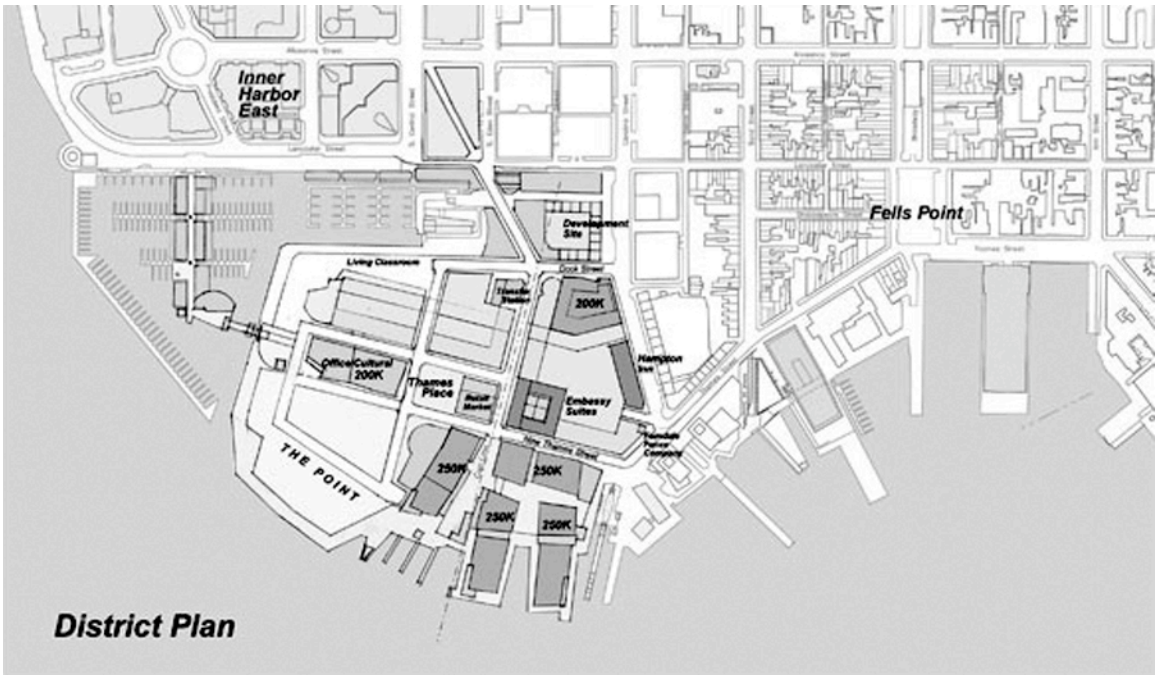


Figure 53 2003 PUD (Ehrenkrantz)

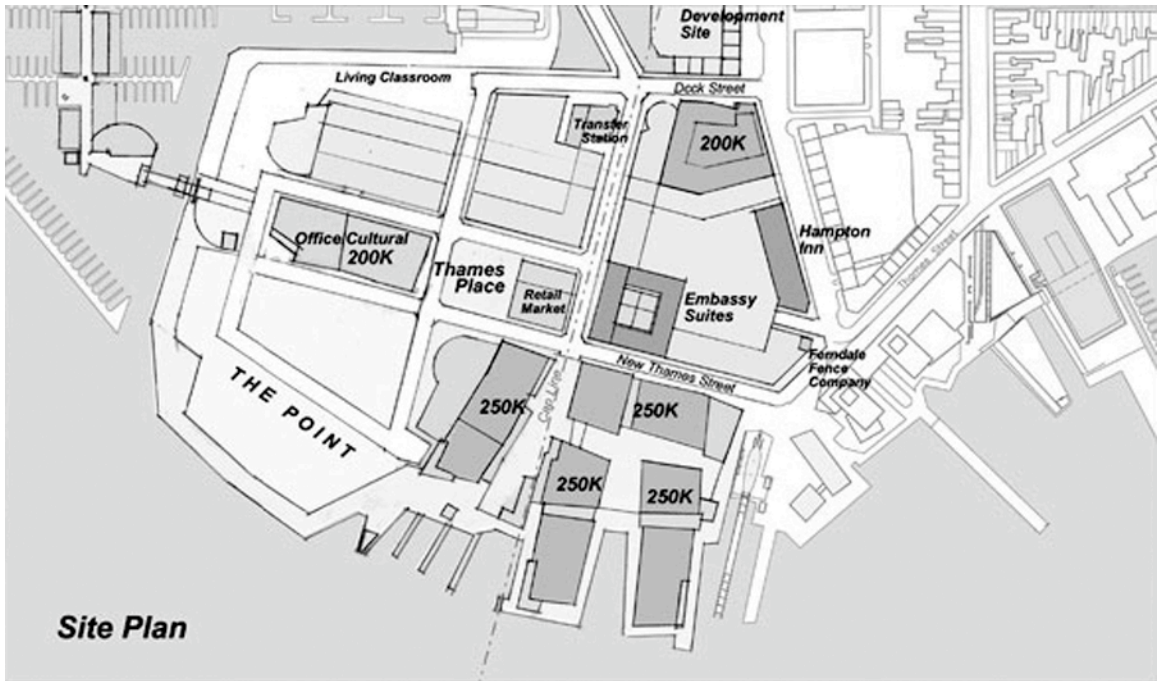


Figure 54 2003 PUD (Ehrenkrantz)

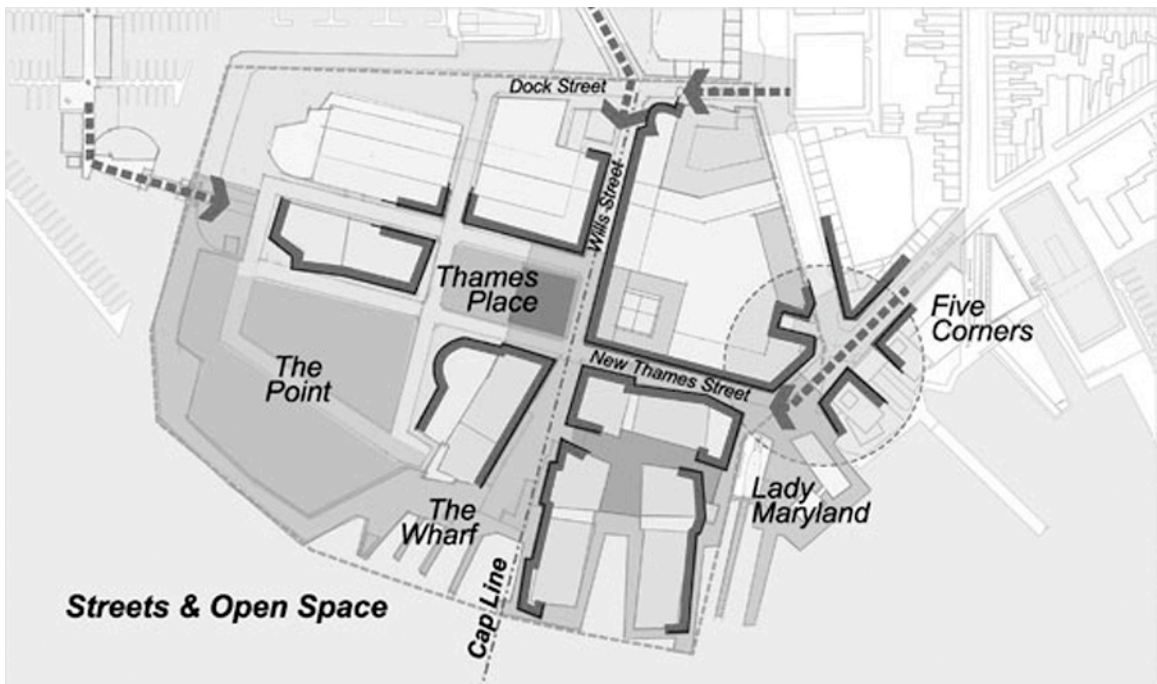
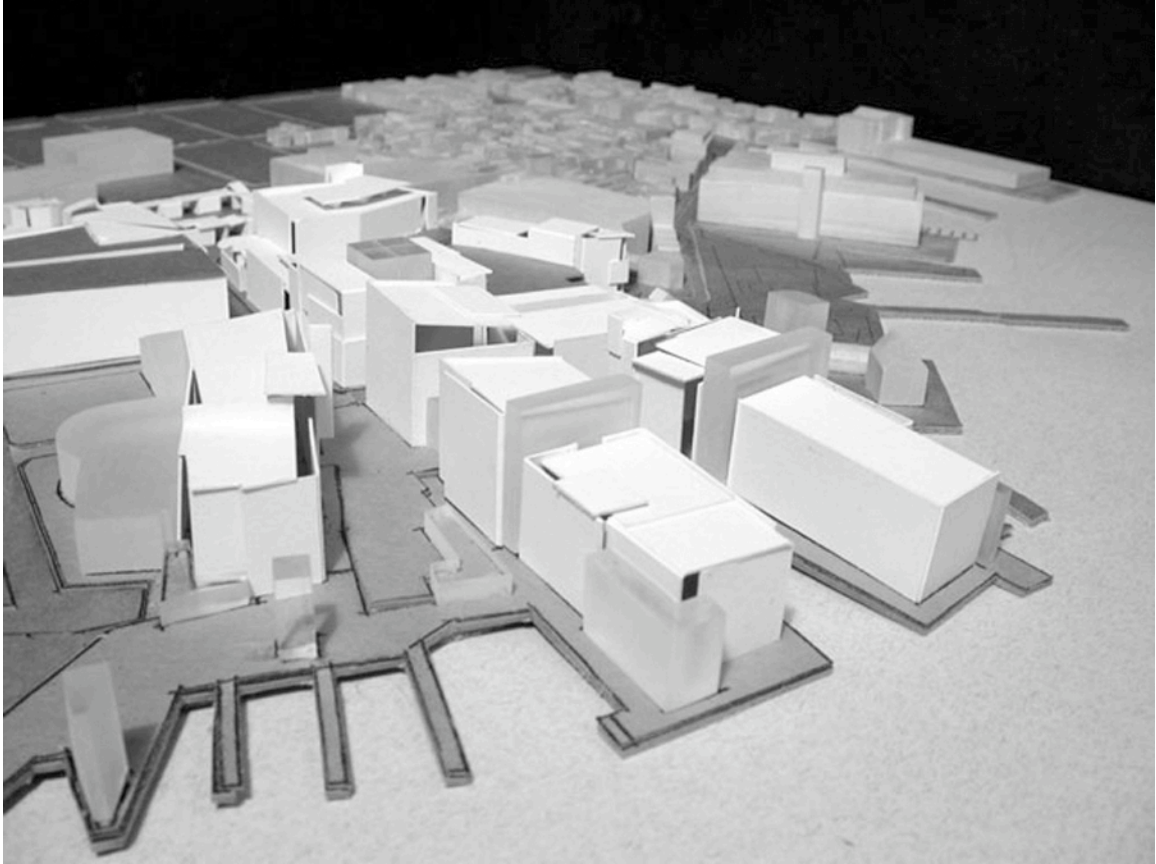
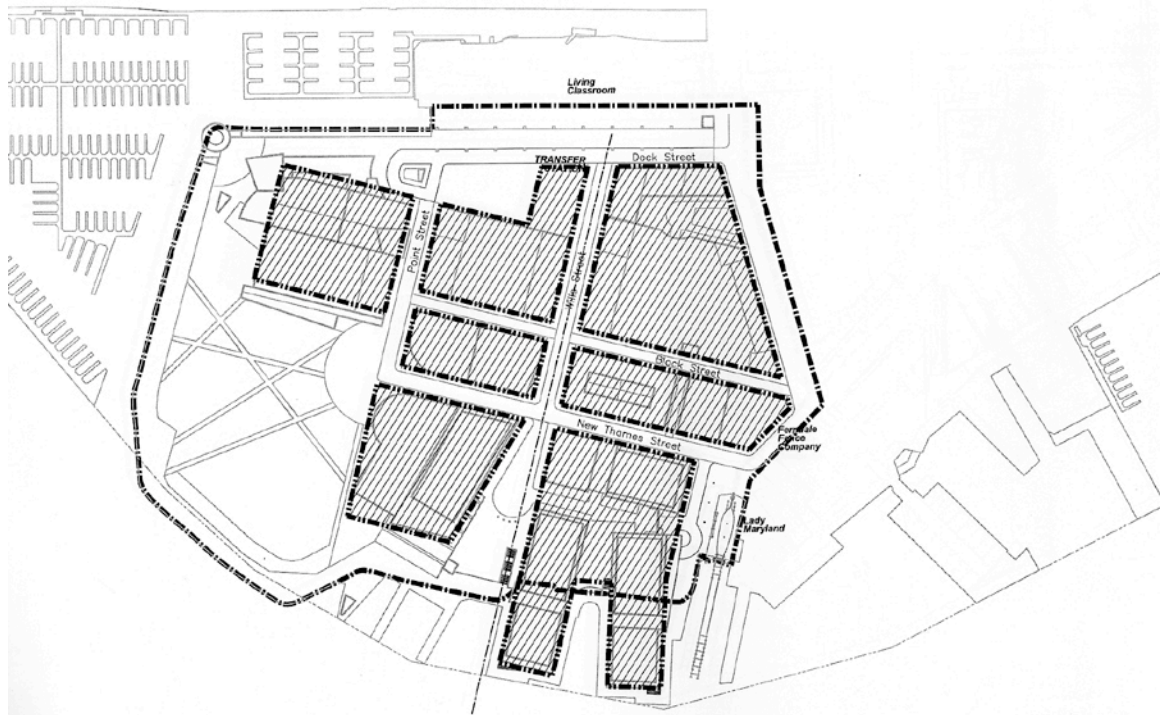


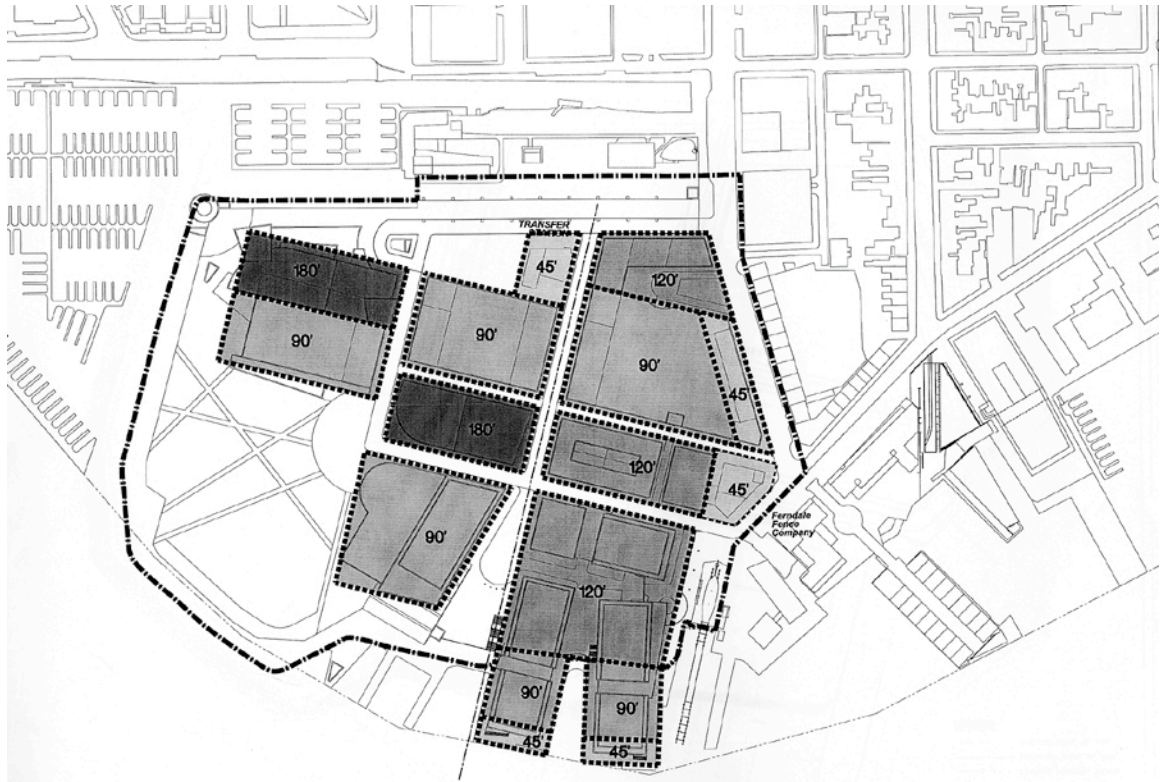
Figure 55 2003 PUD (Ehrenkrantz)



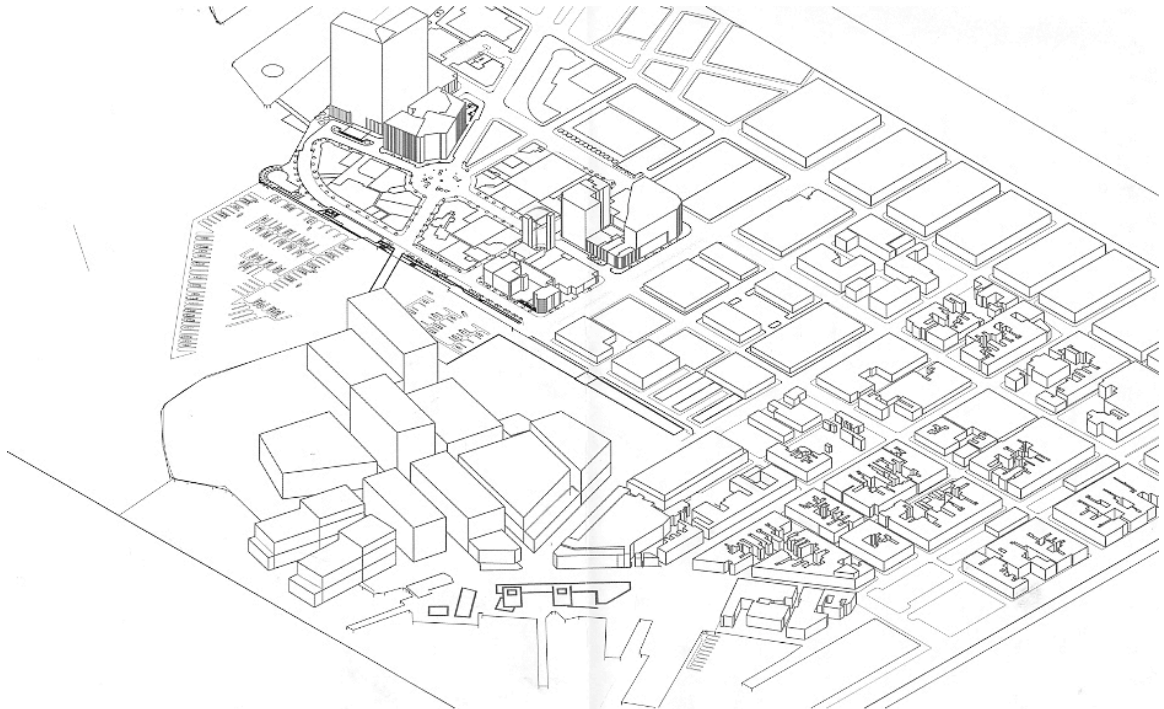
**Figure 56 2003 PUD Massing model: continuation of pier-building tradition (Ehrenkrantz)**



**Figure 57 2003 PUD parcels (White)**



**Figure 58 2003 PUD building heights (White)**



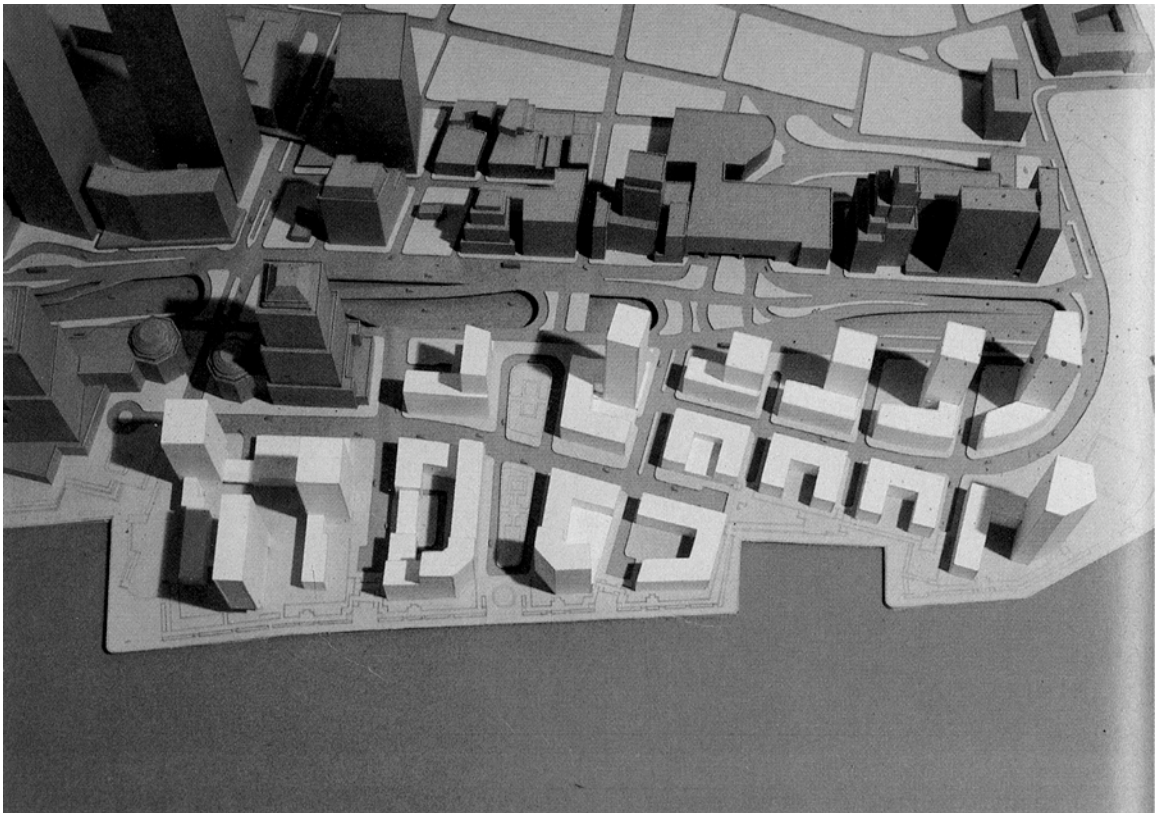
**Figure 59 Massing of site if built to maximum zoning heights**

## Chapter III: Precedents

### Urban Precedents

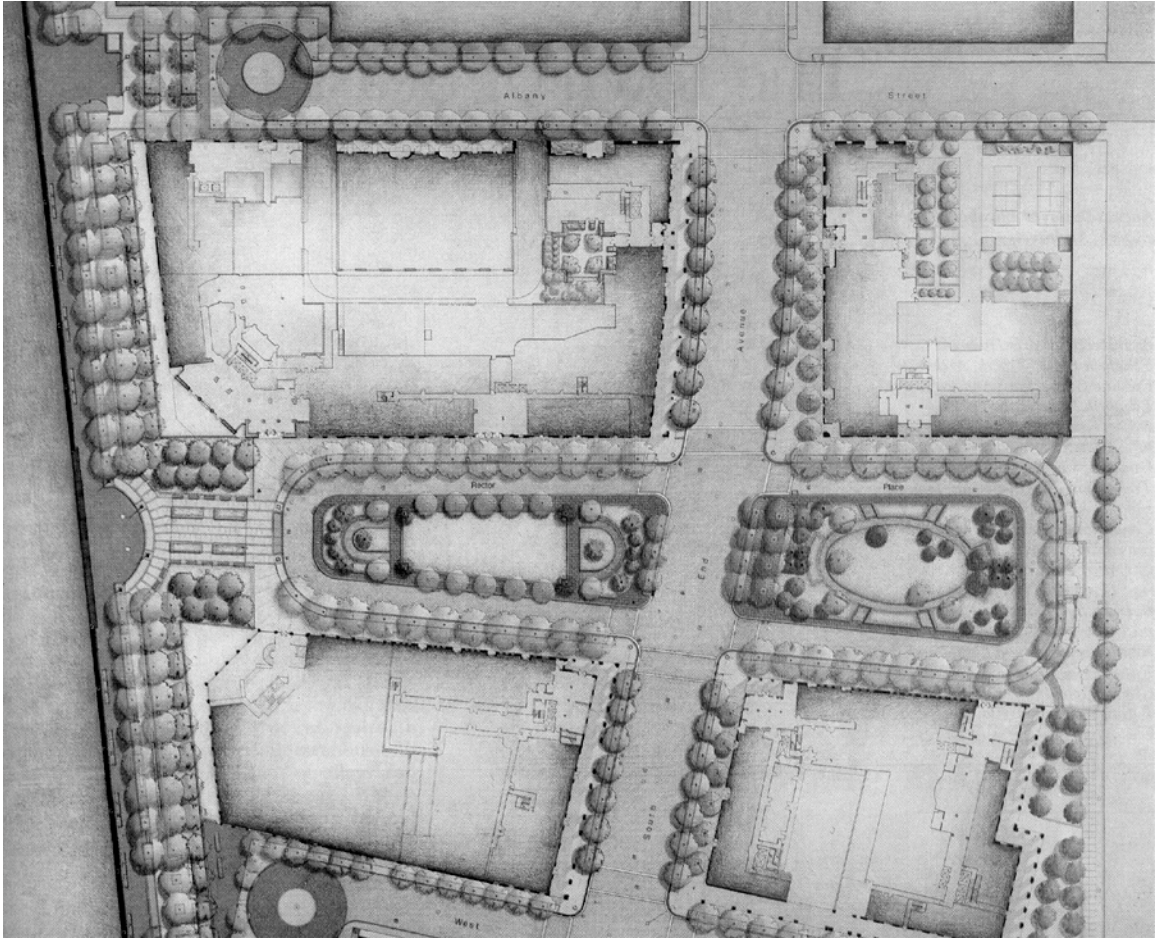
#### Battery Park City, New York, New York by Ehrenkrantz, Ekstut, and Kuhn

##### Architects



**Figure 60** Model view of Battery Park City (“Battery”)

Battery Park City is a highly successful infill project because of its strong connectivity. The plan connects to the existing Manhattan street grid at many strategic points, blurring the distinction between the new and existing fabric. Many of these grid connections continue to the water’s edge, giving views from deep within the city fabric to the Hudson and across the river. The grid does not orient itself perpendicular to the water’s edge, but rather remains true to the existing grid, creating unique edge conditions at the waterfront.



**Figure 61 Battery Park City’s public space gives views to water while placing largest plaza area inland where density is greater (“Battery”)**

A continuous waterfront promenade edges the site along the Hudson River. Its depth and incidence vary, creating distinct events along the path. There are also strategically located open spaces along this promenade that penetrate several blocks deep into the fabric. This gives more buildings views of the waterfront, increasing real estate value and the perception of access to the waterfront. The primary public space is narrower at the water’s edge, with the widest point located two blocks in from the water. This allows for a larger public space to be located inland, where the density is higher, while still creating a strong physical and visual link to the river.

Programmatically, there are two large residential areas north and south of a central commercial district. While residential is commendable, a stronger integration of mixed housing and commercial could ensure a 24-hour vitality.

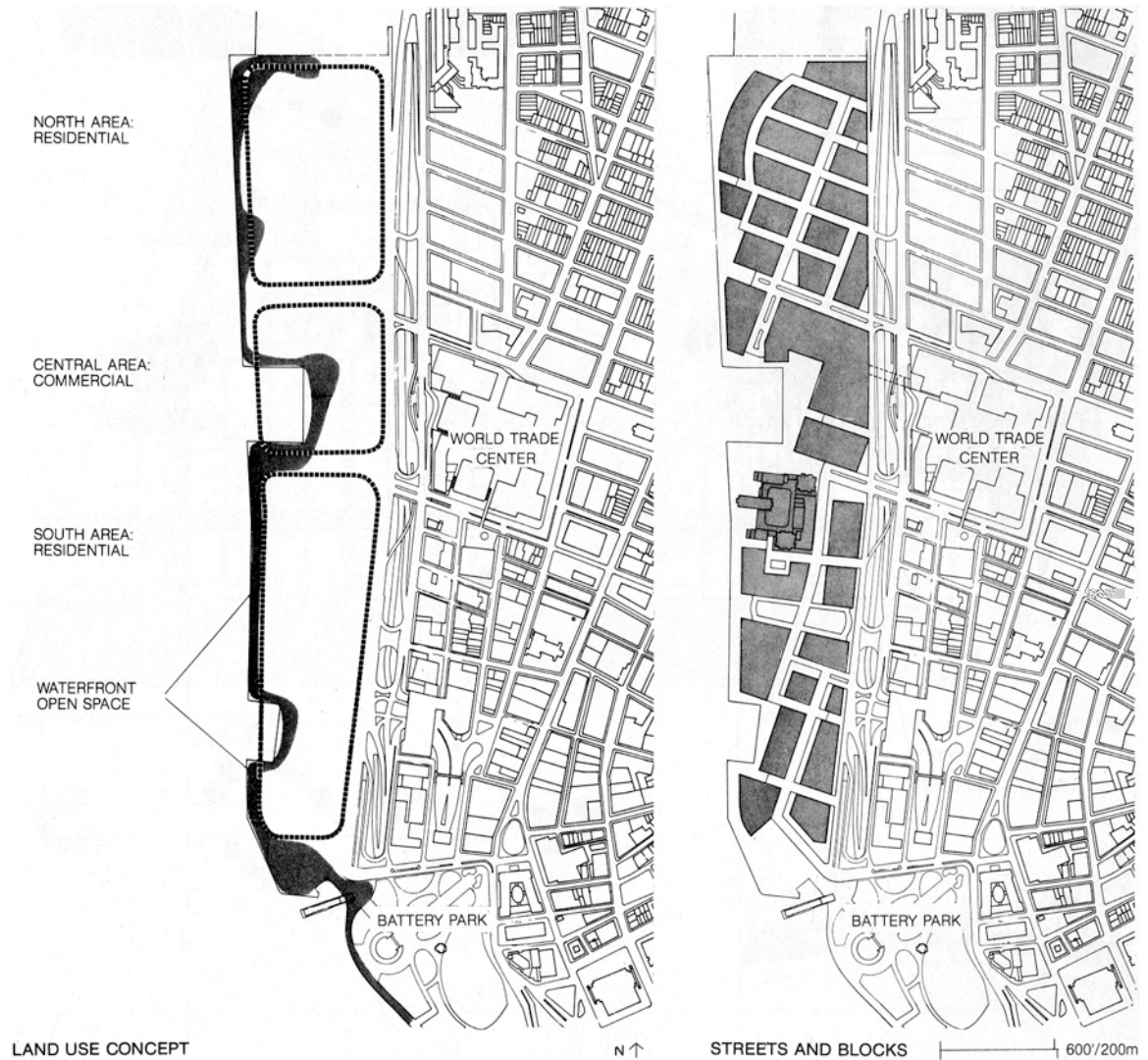


Figure 62 Programmatic layout and block diagram showing grid continuity (“Battery”)

## Mission Bay, San Francisco by I. M. Pei/WRT Assoc.

Mission Bay is a 195-acre mixed-use development one-mile from downtown San Francisco. Its parti is a series of rings that create a quieter, more intimate residential core. A series of public parks, open spaces, and a canal form a central island. These public spaces are bordered by low-scale residential and retail uses. The outer edge of the canal is primarily office/commercial development, shielding the residences from a freeway and industry. The island core cleanly mediates between the extensions of existing overlapping grids.

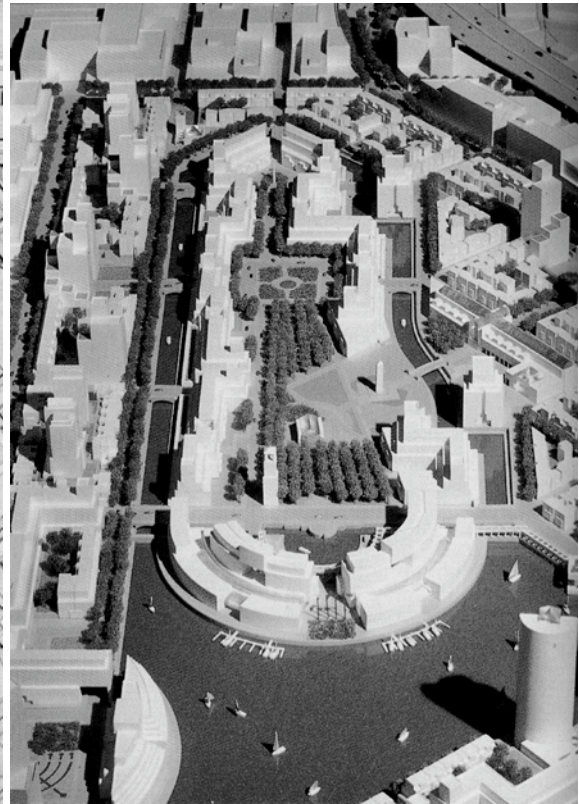
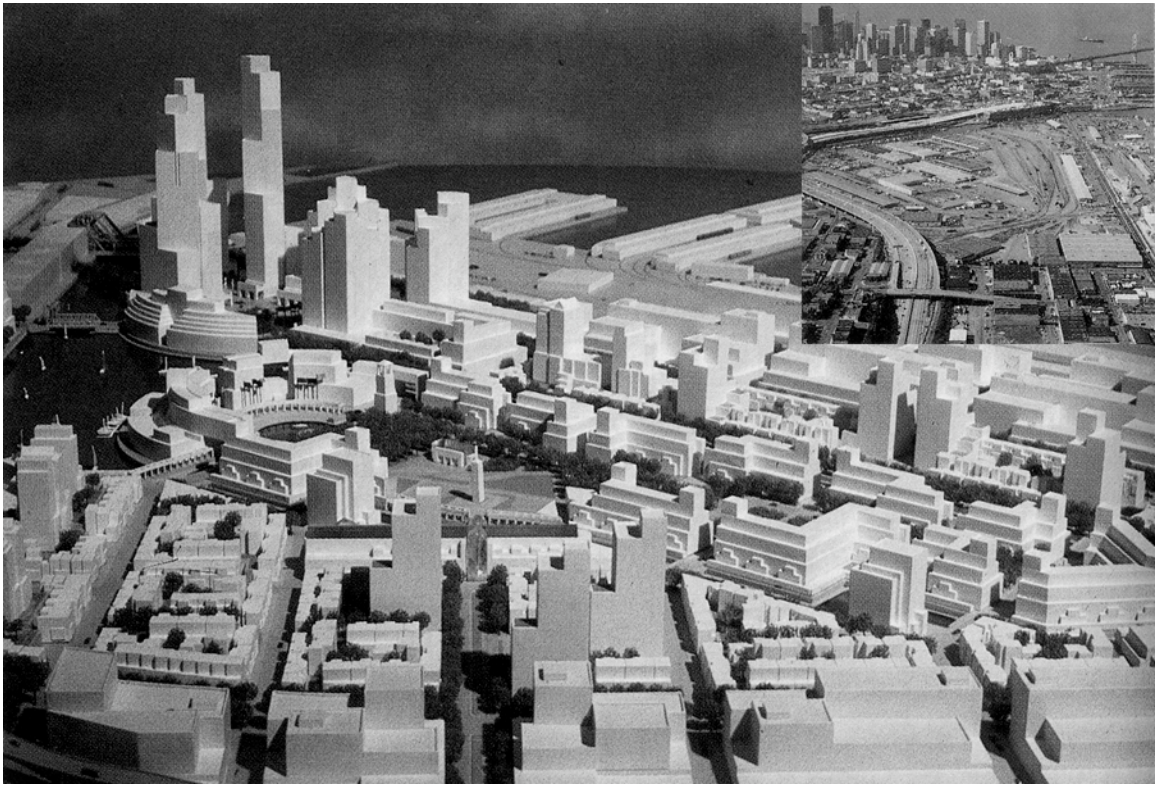


Figure 63 Mission Bay master plan (“Mission”)

Figure 64 Mission Bay site model (“Mission”)

The scheme has successfully portrayed a community with landmarks, edges, paths, nodes, and districts. This creates spatial linkages and visual termini. The large

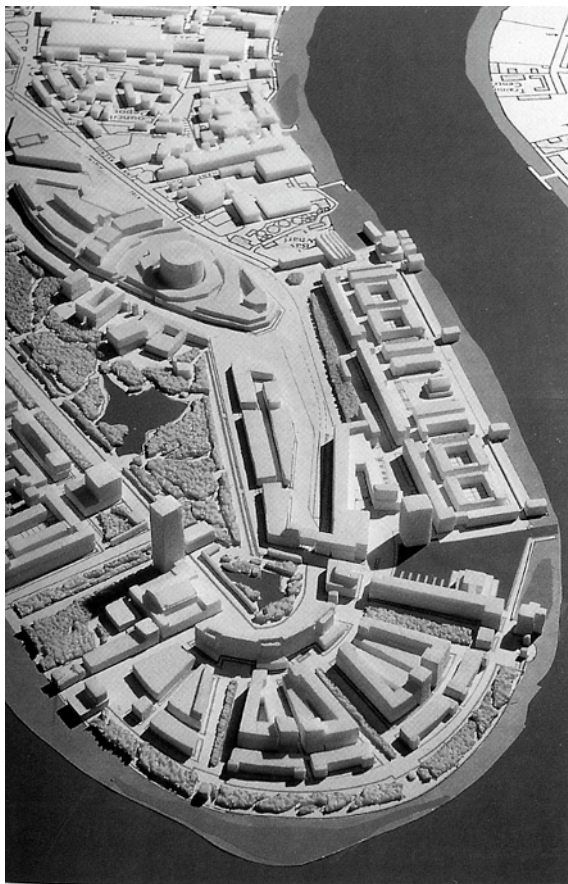
central space becomes amorphous due to a break down in fabric edge, but the plan's open spaces appear deliberate rather than residual.



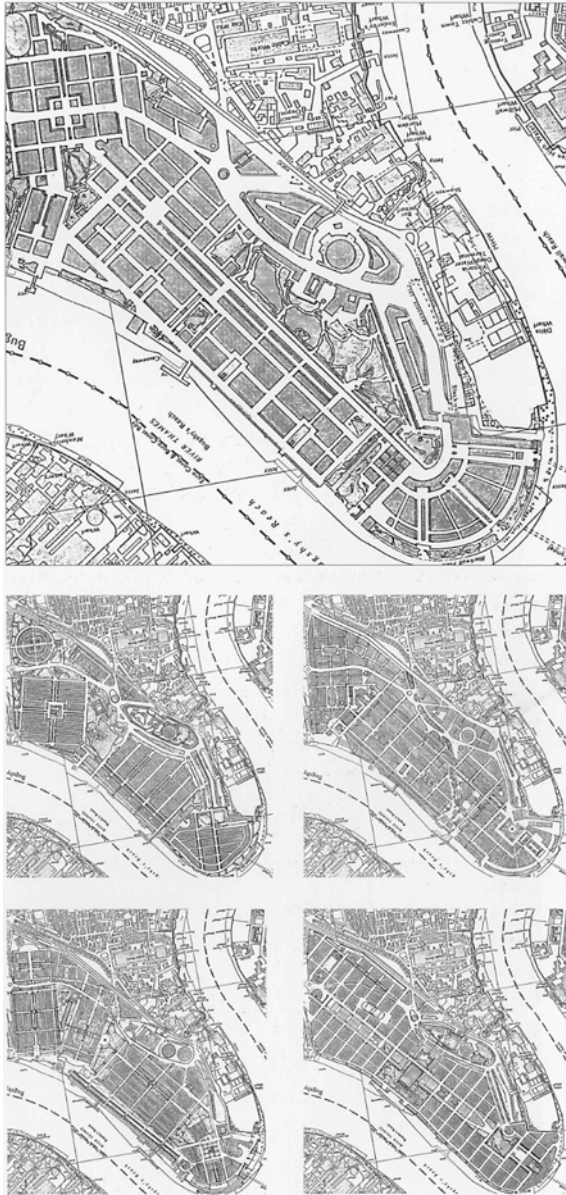
**Figure 65 Mission Bay massing model. Upper right: existing site photo. (“Mission”)**

## **Blackwall Peninsula, East London by Koetter and Kim Architects**

Blackwall Peninsula is a 300 acre 25,000 resident waterfront community. It is formed through intense, limited scale interventions. The varying sizes and shift in urban patterns creates a legible series of nodes. Due to the site's size, the site needed a "counter amenity" in the center. Streets, residential squares, and a boat basin link the waterfront to the internal park. This plan attempts to create a "genuine urban presence: complex, variable, dense, identifiable, relatively unprogrammed, and changeable relative to specific use patterns" (Koetter 80).



**Figure 66 Blackwall Peninsula site model shows "counter amenity" (Koetter)**



**Figure 67 Blackwall Peninsula process schemes (Koetter)**

## **Urban Design Questions**

Because of the existing canal at Harbor Point, how much connectivity is required/feasible from the north of the site? Is there an opportunity to connect the canal's dead end to the harbor, creating an island like that of Mission Bay? Is the creation of a public space on Harbor Point's waterfront enough open space for a 27-acre site? Would an inland "counter amenity" be appropriate? How does a site's scale affect its needs for paths, nodes, edges, districts, and landmarks?

## Building Precedents

### Opera National de Paris, France by Charles Garnier

This 2,000-seat opera house completed in 1875 is a prime example of pageantry. From its location and prominence in the city to its architectural development, the Paris Opera House emphasizes the procession to and through the site. The beginning of the spectacle can be credited to the site of the building. Napoleon III ordered Baron Haussmann to clear a site in the new quarters to the west of the capital. The location became the terminus of several grand boulevards that visually link the opera house to other important parts of the city. The slow ride by horse and buggy along the grand boulevard to the masterfully decorated opera house would have been an awe-inspiring arrival.

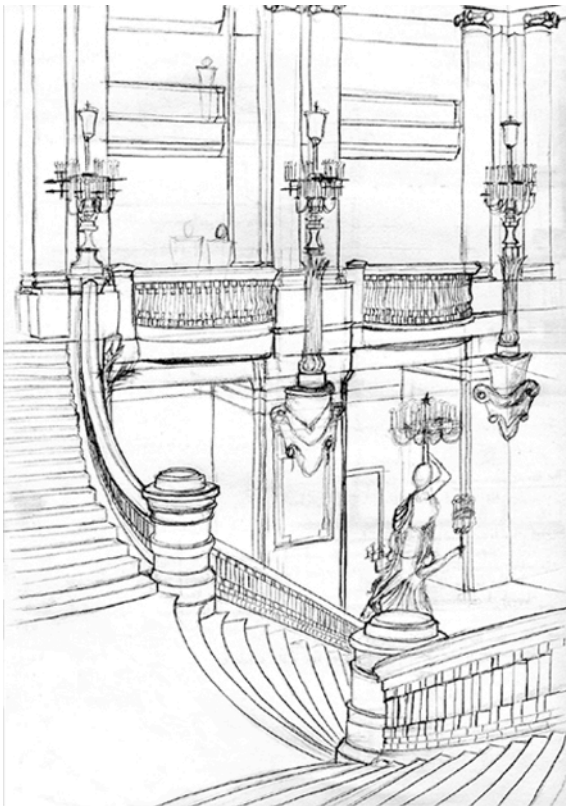


Figure 68 Opera National de Paris grand stair

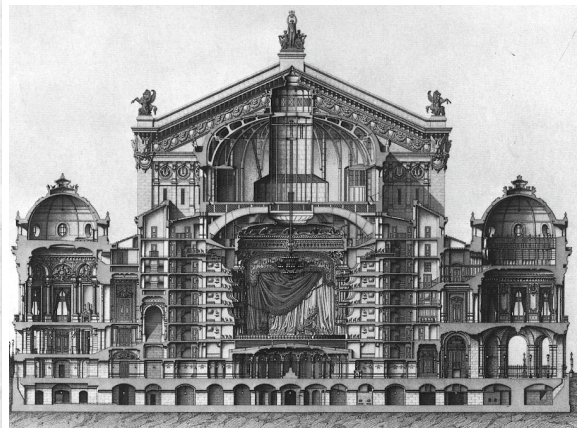
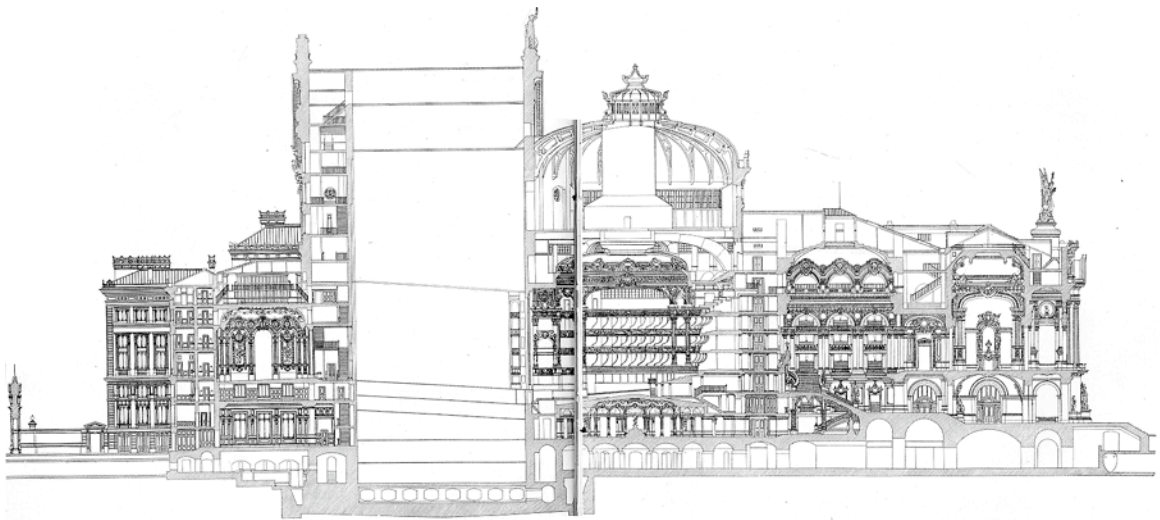


Figure 69 Opera National de Paris transverse section shows hall-to-circulation ratio (Beauvert)

Load bearing structure throughout the entire complex coordinates the procession from the entry colonnade to the auditorium. A splitting grand stair is overlooked by a series of balconies. The setting creates a place to see and be seen. Perhaps the main event is not so much the lyrical performance, but rather the pageantry of public socialization in elaborate gowns and tuxedos. The procession in plan and section reveal the heightened importance and drama of public movement through the building.



**Figure 70 Opera National de Paris longitudinal section shows spatial promenade from the street to the opera hall (Beauvert)**

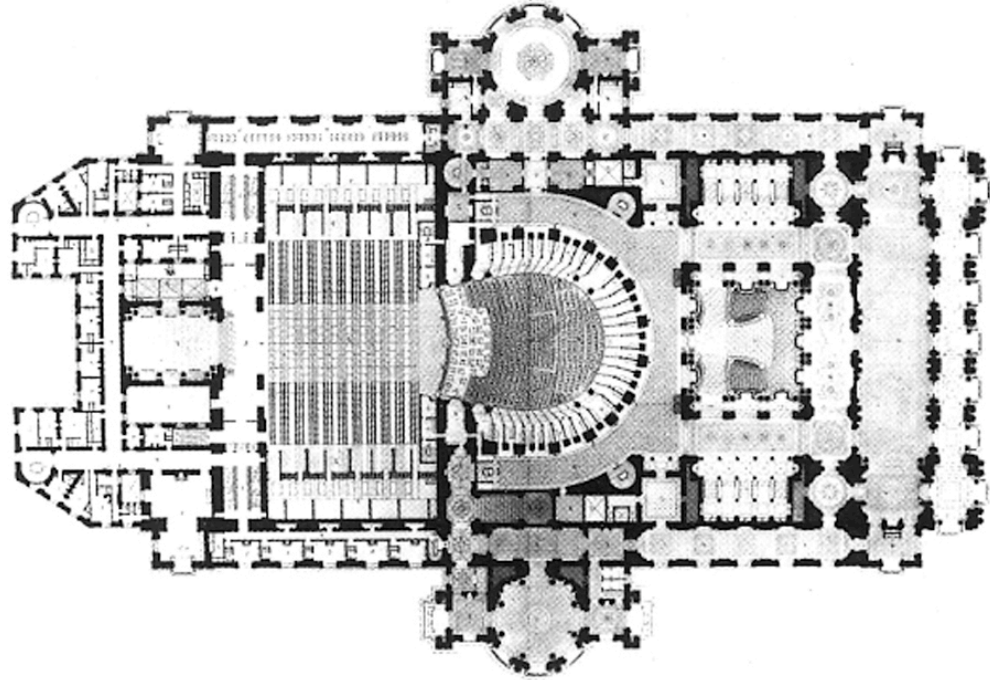


Figure 71 Opera National de Paris plan shows dominance of circulation spaces (Beauvert)

## The New Jersey Performing Arts Center in Newark, New Jersey by Barton Myers Associates

NJPAC is a contemporary example of a strong understanding of the performance hall's urban responsibility. There is a tendency for designers to make the performance hall an object for several reasons including cultural significance and sheer program size. Architect Barton Myers criticizes this objectivity stating, "Places like Lincoln Center, as magnificent as they are, were conceived as temples of art. They're separated from the urban fabric, set back on plazas, literally elevated above people's daily lives..." (Webb 5). A comparison of the successes of the Paris and Newark complexes warrants an exploration into object vs. fabric buildings.

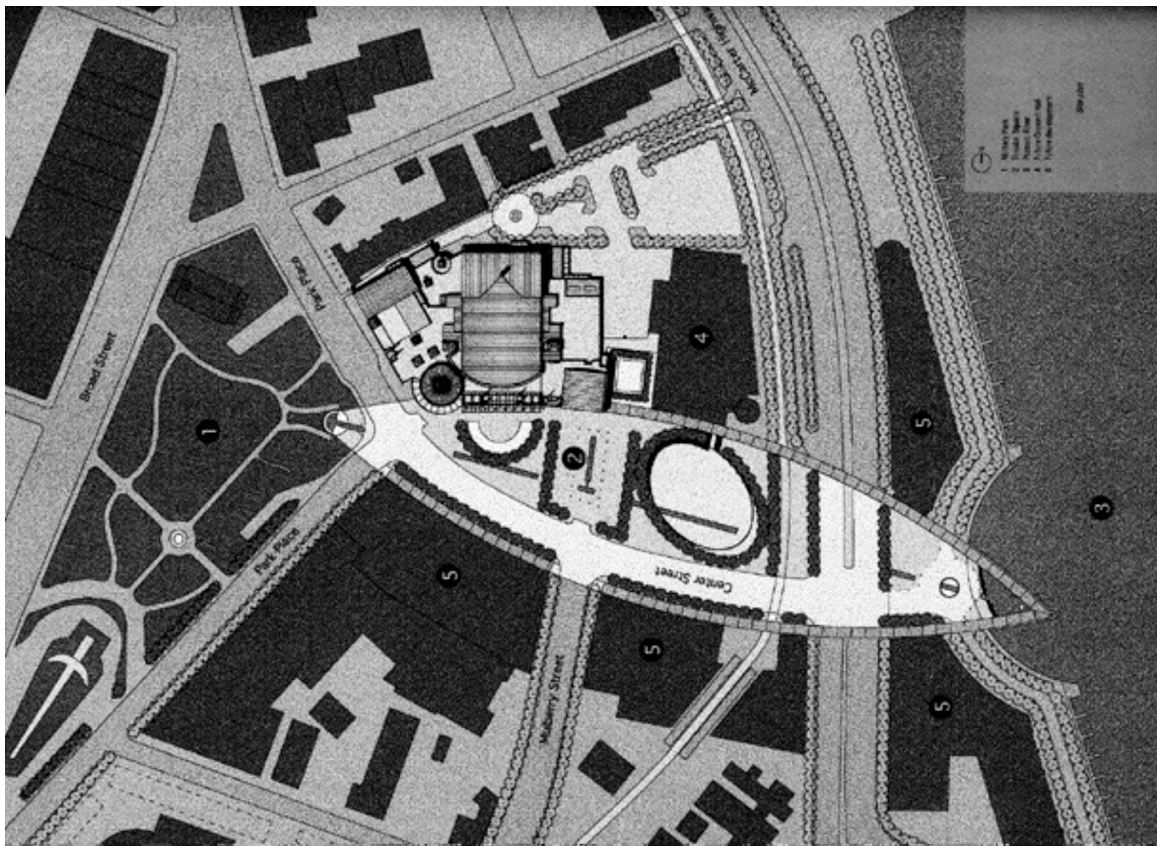
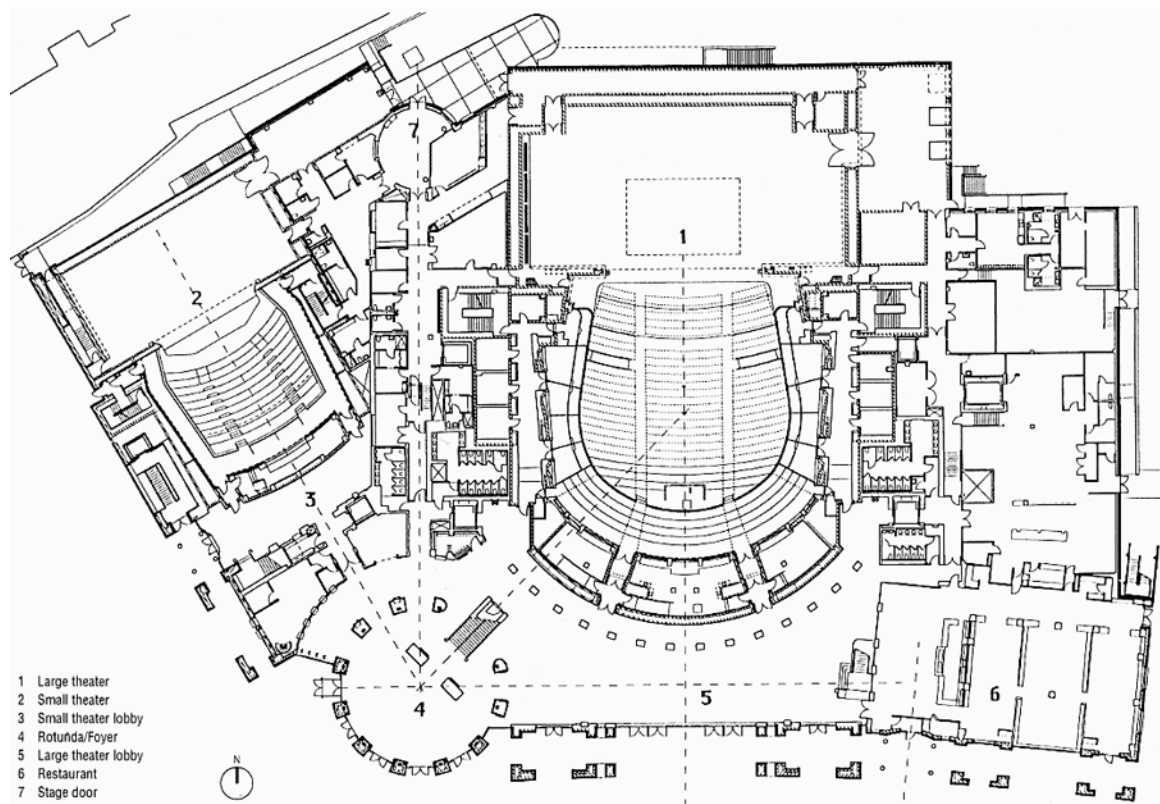
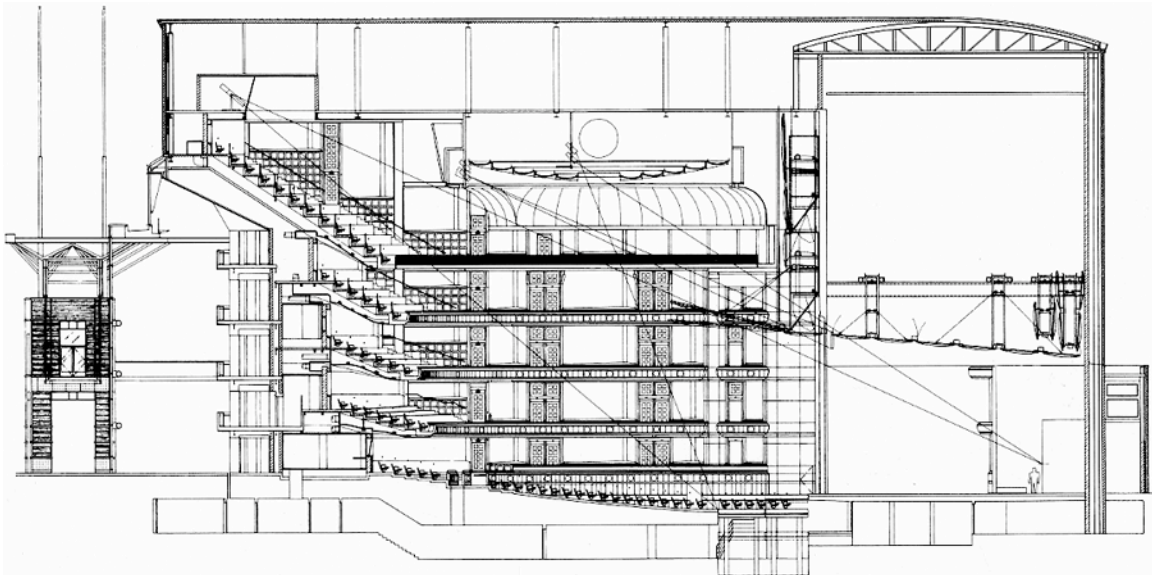


Figure 72 NJPAC site plan shows complex as fabric building defining urban spatial edge (Webb)

Similar to the Harbor Point site, the Newark hall is located one block from the waterfront on a redeveloped site. A public plaza in front of the site acts as a forecourt and point of arrival for the venue. This type of front room allows the procession to begin from the street rather than from the moment one enters the building. The irregular footprint of the structure maintains a strong street corridor and plaza edge, while a rotunda receives the Park Place axis. A series of three separate figural forms along Theater Square modulate massing to a comfortable scale.



**Figure 73 NJPAC plan resolves urban conditions through geometric and grid relationships (Webb)**

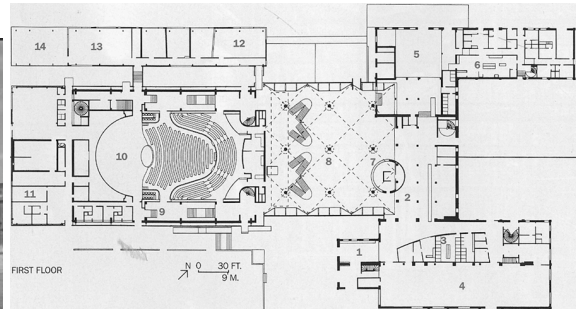
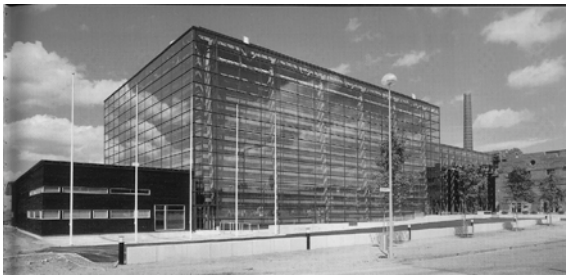


**Figure 74 NJPAC section (Webb)**

The building cleverly houses two theaters on separate grids. The requirement of separate foundations for acoustic separation between the structures justifies the feasibility of utilizing separate grids. These grids are related by the rotunda foyer that links directly to the individual lobbies of each theater. The interstitial poche between the halls houses more private functions. A slight crank to the restaurant at the east end of the building relates to the curve of theater square and distinguishes this programmatic and socialization element from the large 2,700 seat theater lobby, further enhancing the pageantry. NJPAC becomes a soldier building within the fabric while housing a cultural hero, the performance arts.

## **Sibelius Hall in Lahti, Finland by Artto Palo Tikka Architects**

At Lahti, the hall enhances the city's skyline while revitalizing this waterfront district. This 1,250-seat concert hall completed in 2000 is located in Finland's forestry capital. The design goals were not merely to create an excellent hall, but also show innovation in wood construction to showcase Finnish wood in design. This hall is a wooden vessel encased in glass on the harbor.



**Figure 75 Sibelus Hall glass box surround seating (Downey)**

**Figure 76 Sibelus Hall plan shows distinct zones (Downey)**



**Figure 77 Sibelus Hall's Forrest Hall exterior (Downey)**

Should the Harbor Point hall utilize the rich history of Baltimore's shipbuilding days and future movement towards a digital harbor to inform its material aesthetics? Lahti's unique plan is a great example of adaptive reuse of a masonry building that doubles as building entry and non-public spaces. The great Forrest Hall acts as the lobby between the foyer and the hall itself.



**Figure 78 Sibelius Hall's Forest Hall (Downey)**



**Figure 79 Sibelius Hall interior continues wood aesthetic (Downey)**

## **Sydney Opera House, Sydney, Australia by Jorn Utzon**

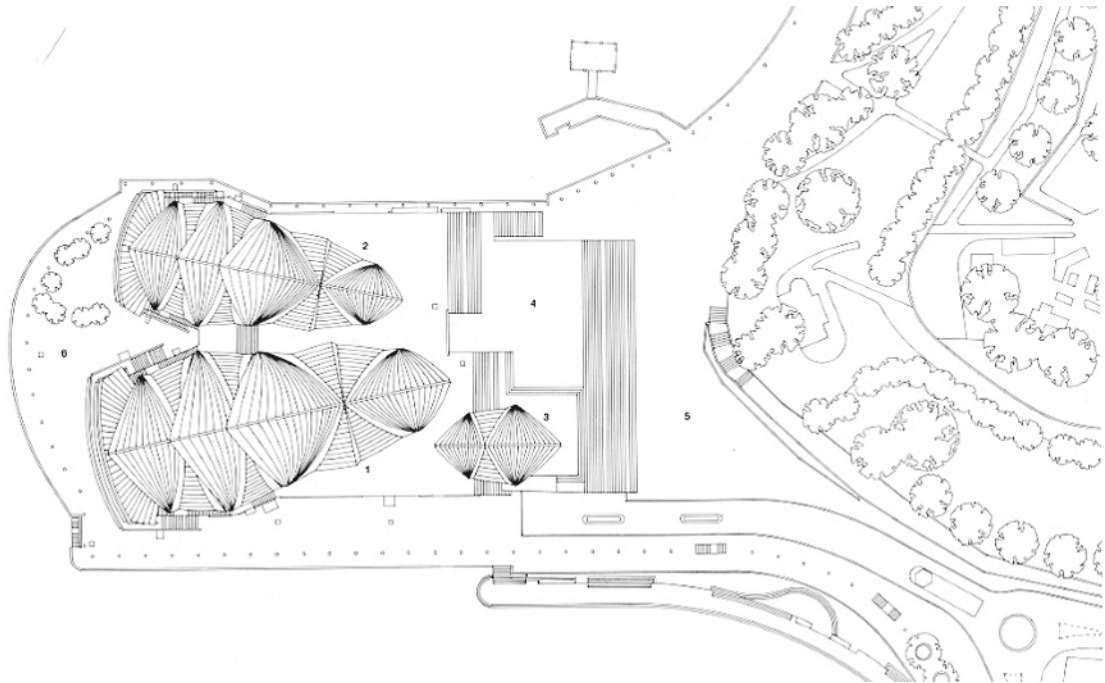
Like Notre Dame to Paris, the Sydney Opera House defines a city not only architecturally, but more importantly, culturally. The opera house's sculptural forms create a uniquely distinctive skyline which confirms the essence of place in Sydney. This imageable form introduces the city to the water.



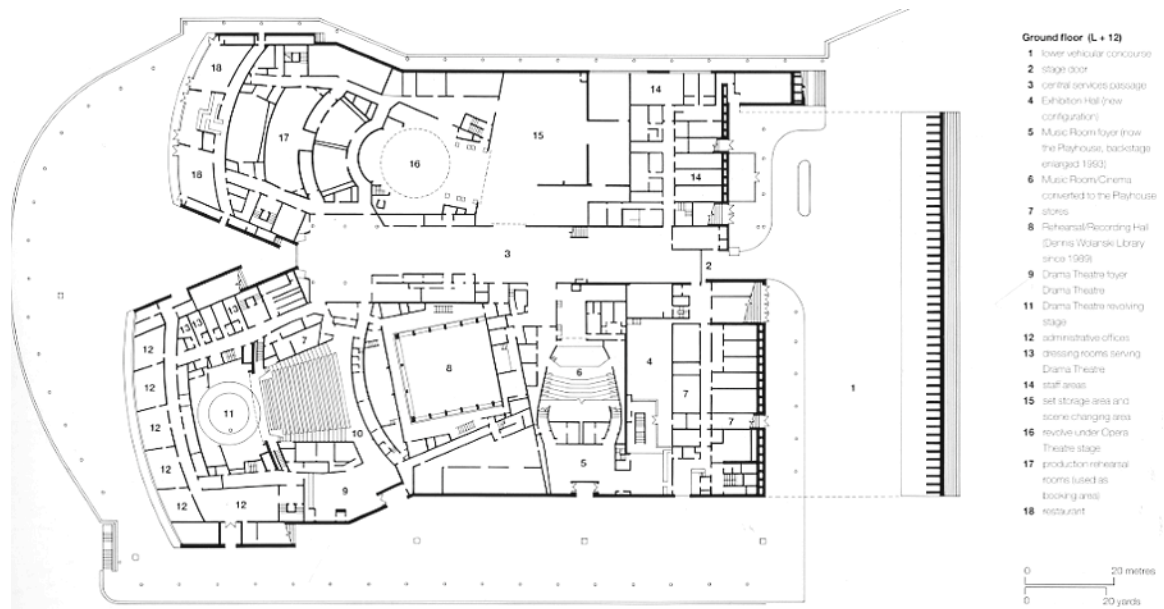
**Figure 80 Sydney Opera House on Bennelong Point (Drew)**

Similar to Harbor Point, the Bennelong Point site is visible from many angles as the peninsula juts out in the Sydney harbor. The complex sits on a three-tier terraced base. The base's horizontality is meant to draw one's eye out to the landscape. By raising the building onto a plinth, the sectional promenade becomes more experiential. Functionally, the plinth allows service spaces to occur below in an attempt to solve the front/back issues of a peninsula building. However, there is a disconnect from the levels of the waterfront promenade and park adjacent to the site.

Utzon, trained in shipbuilding, used his knowledge of vessel construction to inform the sculptural roofs. The axiomatic difference between the base and roof further heightens the drama of the sculptural shell. Shaped similarly to the sails of a ship, the sizes of the roof vaults correspond to the size of the performance spaces they house. These vaults signify the concert and opera halls while the base houses the drama theater, rehearsal space, exhibit halls, and all the support spaces.

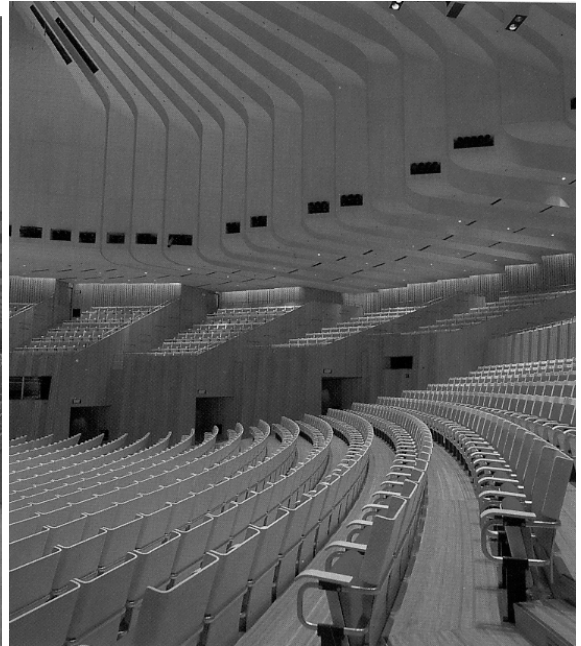
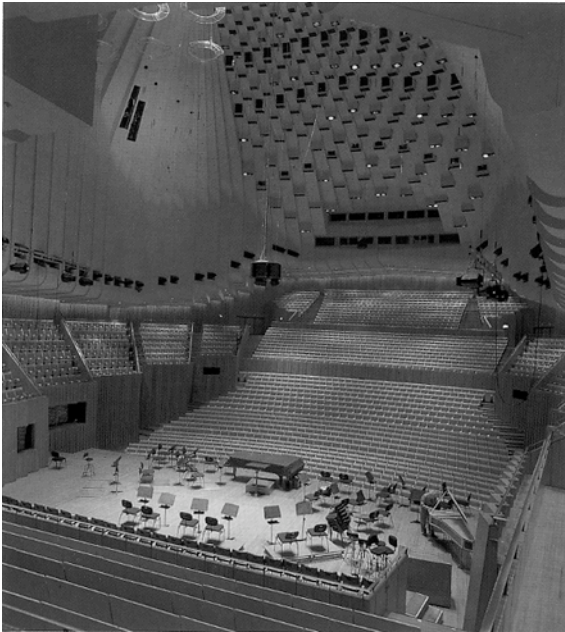


**Figure 81 Sydney Opera House site plan shows grand stair to plinth atop peninsula site (Drew)**



**Figure 82 Ground floor (beneath plinth) vehicular and service access (Drew)**

While the complex has become an international symbol for Sydney, the building itself suffers from several shortcomings. The plinth of the building separates people from the water's edge. The relentless use of concrete at the plinth and boardwalk levels creates a monotonous impervious surface. The grand plinth stair lacks any connection to the large park it faces. Is there a way to create a building with a strong visual impact like the Sydney Opera House that can also feel integrated with its context, whether park, water, or built fabric?



**Figure 83 Sydney Opera House int. photo (Drew)    Figure 84 Sydney Opera House int. photo (Drew)**

## Performance halls we know and love, to scale on the Harbor Point site

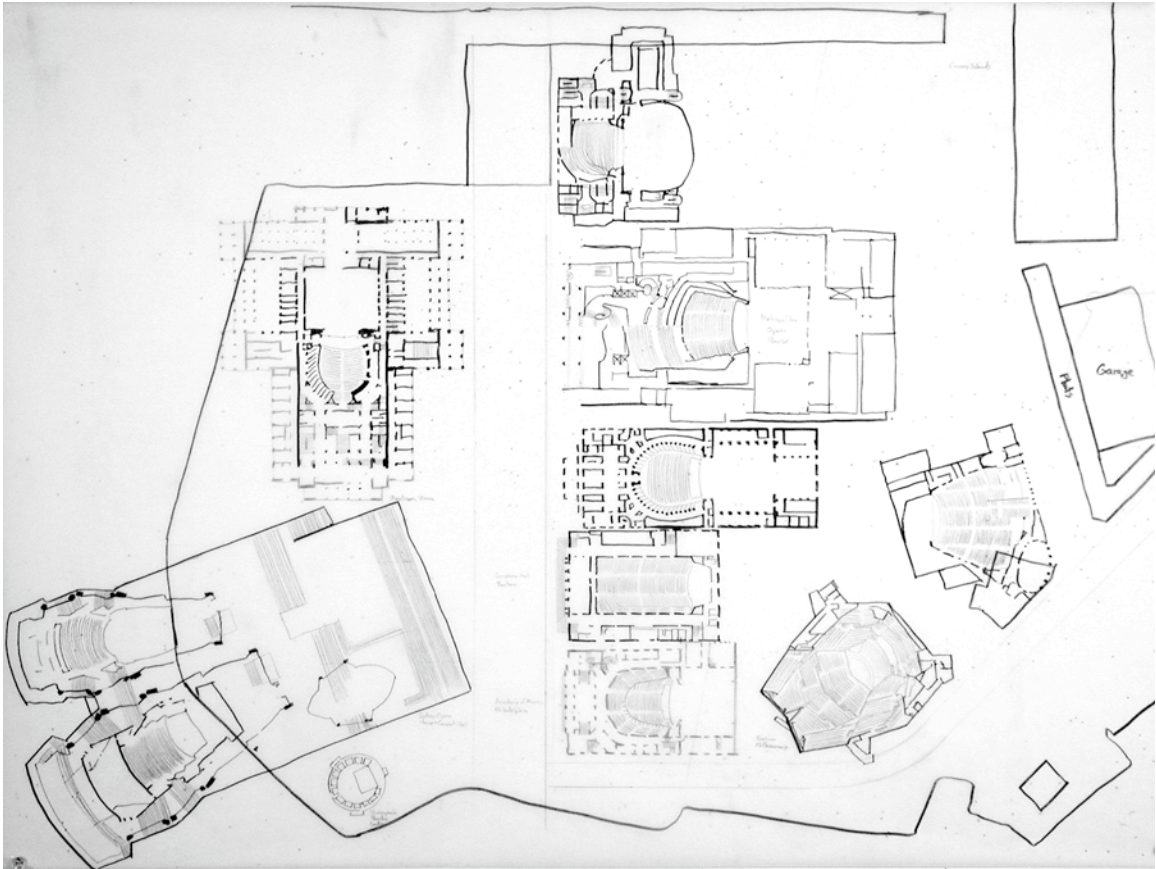


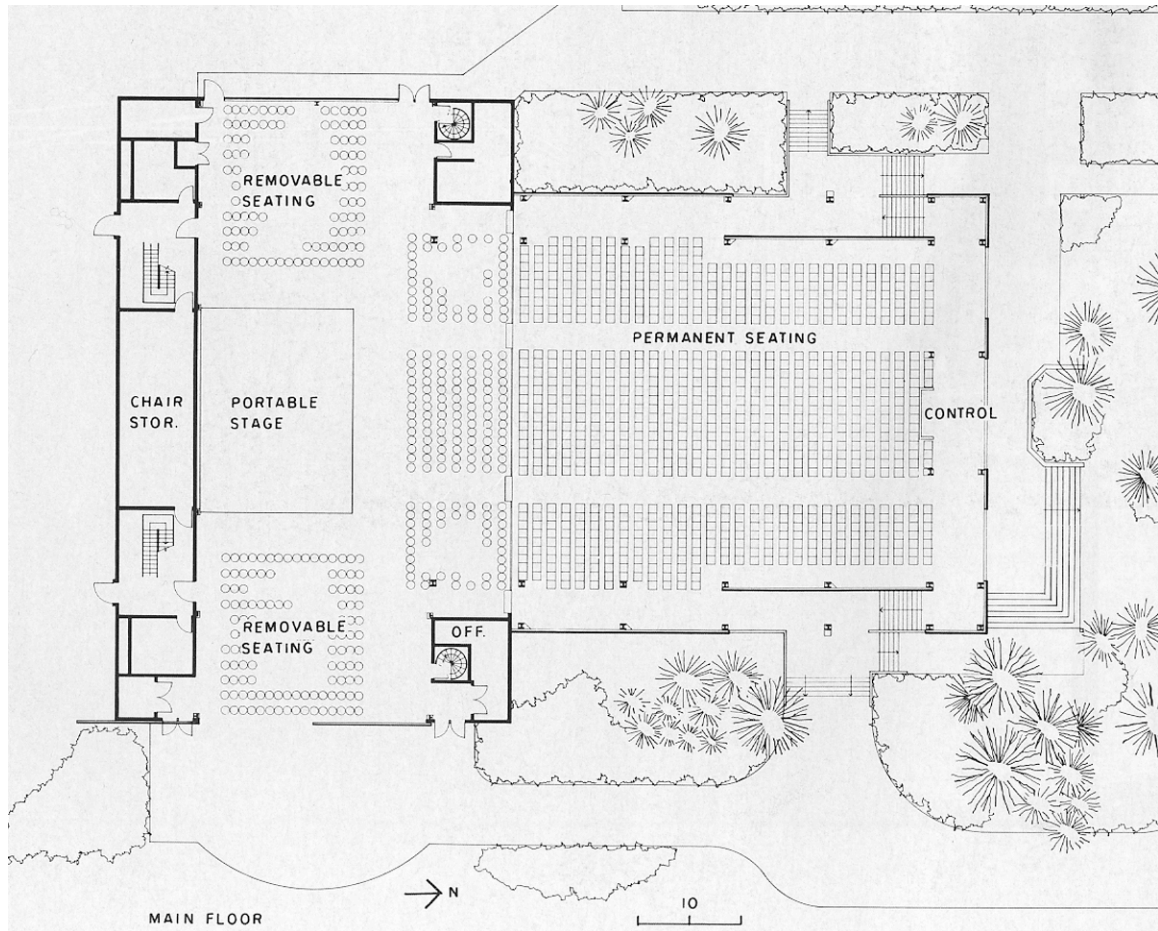
Figure 85 World-class halls and theaters to scale on the Harbor Point site

### Building Conclusions

How can an introverted program allow a user to understand the building's greater context? How object-like vs. embedded should the hall be? Can it be both an object and fabric building? Should its materiality and tectonics relate to the city's wooden shipbuilding history or contemporary steel manufacturing?

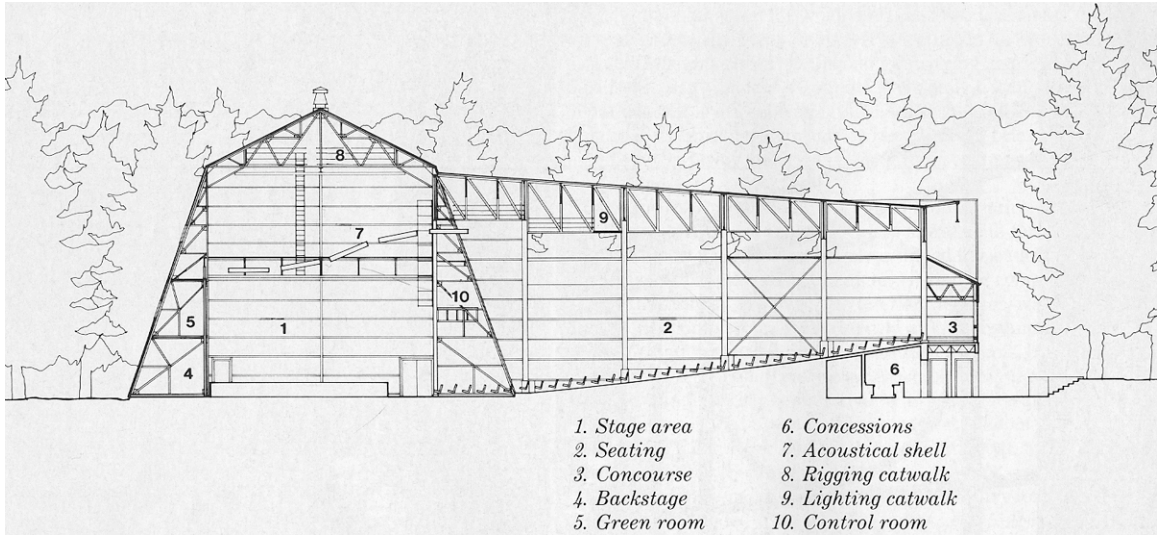
## Kinetic Precedents

### McCurdy Pavilion in Port Townsend, Washington by The Bumgardner Architects



**Figure 86** McCurdy Pavilion shows the moveable east façade with lawn for additional seating (Linn)

This adaptive re-use project of a World War I balloon hangar into a 1,620-seat performance hall exemplifies the possibilities of a kinetic façade. The two 26- by 46-foot doors of an 80-year-old balloon hanger flank either side of the portable stage. With the doors open, the hall's capacity increases by 2,000 where spectators sit on the lawn that previously acted as the balloon staging ground. Can the harbor's waterfront be synonymous with this hall's lawn?



**Figure 87 McCurdy Pavilion section (Linn)**

## Autostadt in Wolfsburg, Germany by HUNN Architekten Ingenieure

Kinetic facades blur the distinction between onlooker and participator.

Volkswagen opened an engaging theme park for its current and future customers in 2000.

Included in this 62-acre entertainment/showroom facility is an engaging visitor's center.

A glass façade separates the large interior forum from the exterior grand stair that

overlooks a water feature. However, within moments, the glass façade's 60- x 20-foot

panels can be rotated around the structural columns to create an indoor piazza. The

transparency alluded to by the all glass façade becomes a reality. Would it be appropriate

to open the building's façade to its interior as a continuation of a public space/amenity or

waterfront promenade?



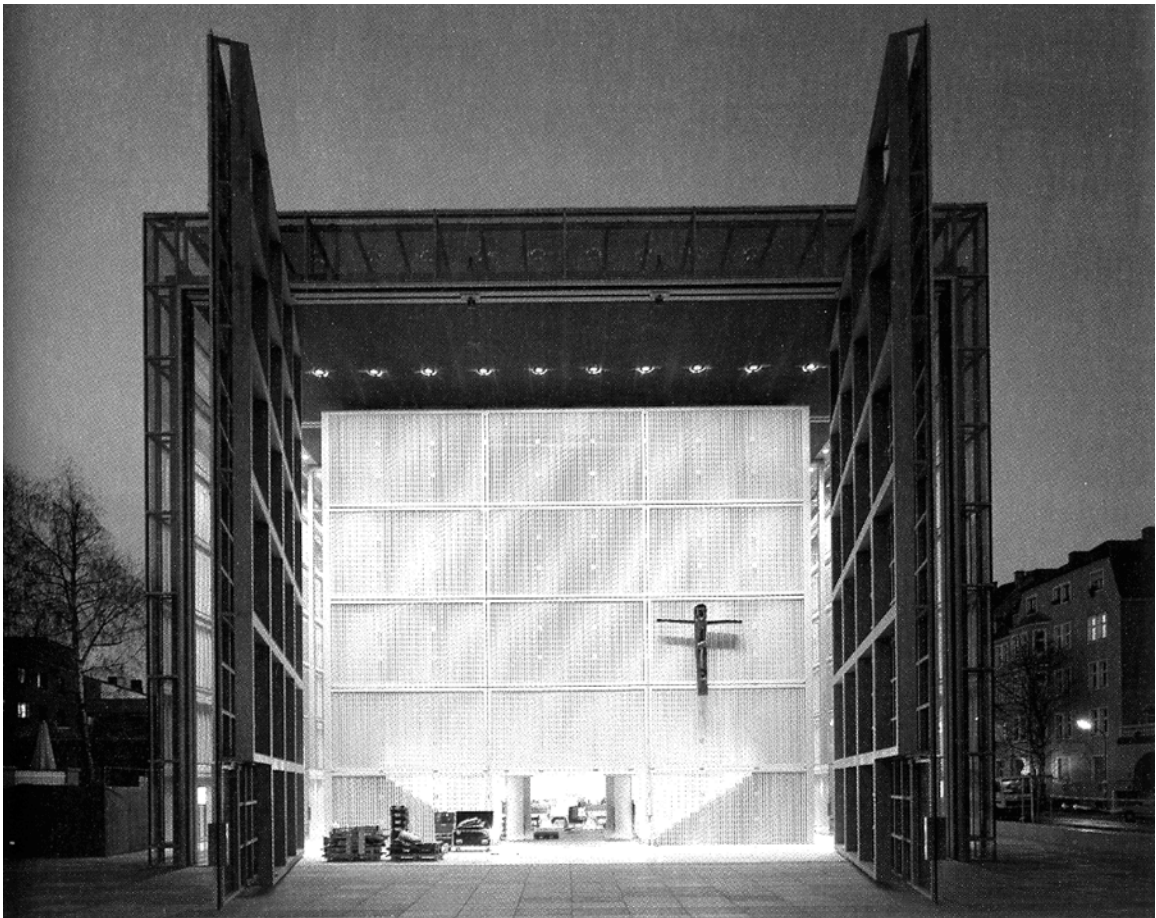
**Figure 88** Autostadt glass façade and grand stair (Weber-Hof)



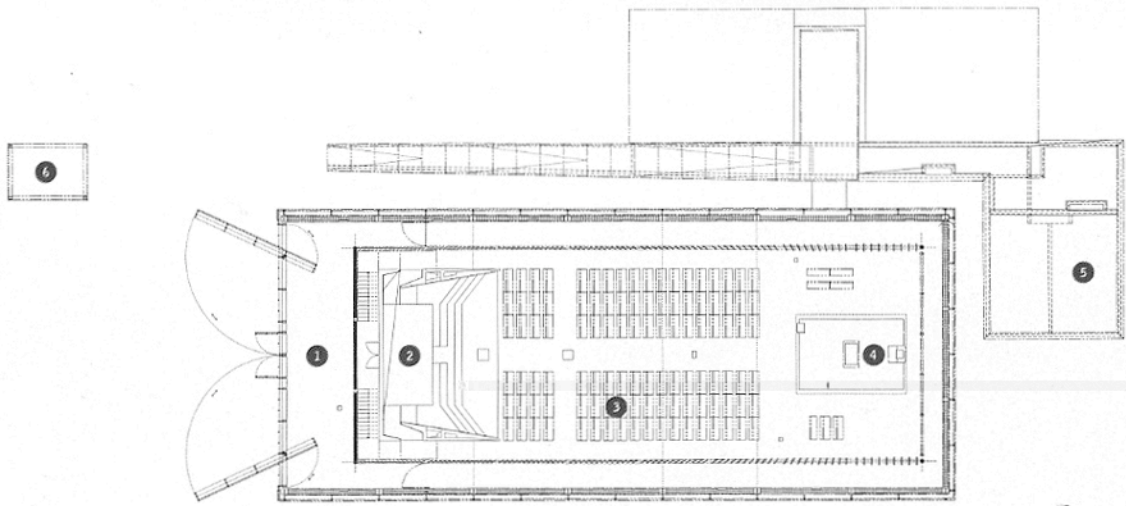
**Figure 89** Autostadt façade opens great piazza (Weber-Hof)

## **Church of the Sacred Heart, Munich by Allmann Sattler Wappner Architects**

The Church of the Sacred Heart uses kinetics to signify and invite. This building's glass cubic shell wraps an interior composed of freestanding walls and a floating ceiling plane. The giant glass façade opens on holy days to draw in the congregation. Not only do these pivoting planes create a threshold that heightens the sense of arrival, but they also signify the important events taking place inside. With the doors open, the large outdoor hard-scape plaza becomes an outdoor room. The distinction between the vestibule and the parvis is blurred into one large space, with the large doors defining its edges.



**Figure 90 Church of the Sacred Heart's pivoting façade doors open the vestibule to the parvis (Giovanni)**



Upper-level plan 17' ↘

**Figure 91 Church of the Sacred Heart plan showing the pivoting façade in relation to the building's interior spaces (Giovanni)**

### **Kinetic Conclusions**

Should the building be oriented for views of the water, skyline, or bay? Is the hall an element of the urban edge, a gateway to the Inner Harbor, or both? How are admissions controlled if a public space can become part of the venue? Can the lobby open to a public space to create an indoor/outdoor piazza? Is an exterior amphitheater appropriate as a compliment to the interior hall since acoustic concerns may warrant a hermetic hall? Can the waterfront promenade interact with the building's interior?

## Chapter IV: Functional Considerations and Program

### **Design Goals**

#### Urban Fabric

- Connect the site to the existing city grid
- Give physical and visual access to the waterfront around the site
- Spark S. Central Avenue and the warehouse district's redevelopment to the north of the site
- Splice together the transect between Inner Harbor East and Fells Point
- Create a nautical threshold to enhance a sense of arrival to the harbor
- Further Baltimore's economic renaissance by attracting investment through a commitment to strong infrastructure
- Become a model for urban waterfront development
- Enhance the city's skyline to enhance international appeal
- Utilize the harbor's water as a connector

#### Community

- Create a human-scale place
- Mask the grand size of Inner Harbor East
- Introduce a strong residential component to enhance 24-hour vitality
- Provide a public park for downtown Baltimore as relief space along the promenade
- Create a sense of place that is attractive and safe for local residents and visitors alike
- Create a hub of activity that furthers the string of pearls along the promenade

## Economic

- Create a series of efficient blocks that will draw development
- Encourage and accommodate water taxi, bus, taxi and subway use
- Provide accommodations for visitors
- Create a destination for visitors
- Create a destination: concert hall and museum that cater to the residents and the nation
- Make a strong connection to Broadway to strengthen economy and vitality of Fells Point

## **Design Issues**

### Urban Fabric

- Connecting to the city's grid without disconnecting the Living Classrooms from water access
- Building new infrastructure and buildings over the environmental cap in a safe manner
- Organizing the collision of different grids and block sizes near site
- Alleviating traffic congestion before and after events
- Creating a procession from primary streets to the site
- Ensuring that the harbor is not seen as a divider

### Community

- Resolving sympathy towards the historic nature of Fells Point while maintaining the contemporary spirit of Inner Harbor East
- Safely creating housing on a contaminated site

-Maximizing views of the waterfront and CBD without denying same views from existing context

-Allowing existing music/nightlife entertainment of Fells Point to inform concert hall as anchor for new development

**Economic**

-Creating a new waterfront hub for development without detracting from Fells Point's Broadway

-Using ingenuity to design structures on the environmental cap in a cost-efficient manner

**Site Development Program**

The following urban program is an initial estimate based on 2003 PUD site proposals and does not reflect final design specifics.

<b>Urban Program</b>	total sq. ft,
Total Existing Site Area	27.35 acres = 1,180,000 sq. ft.
Residential	750,000
Residential density	30 units/acre
Retail	100,000
Commercial	1,000,000
Institutional	330,000
Parks	3-6 acres = 130,000 – 260,000 sq. ft.
Parking	1500 spaces (does not include hall requirements)
<b>Urban Program total net</b>	<b>+/- 2,500,000</b>

**Music Hall Program**

<b>Performance space</b>	sq. ft./unit	qty.	total sq. ft,
Music hall @ 9 sf/seat (1,350 seats)	12,000	1	12,000
Stage	3,500	1	3,500
Chair wagon storage	1,000	1	1,000
Stage storage	700	1	700

Quick change/toilet	80	1	80
Audio and lighting electric room	180	1	180
Lighting control booth	100	1	100
Sound control booth	100	1	100
Sound mix in concert hall	100	1	100
Broadcast announce/control booth	100	1	100
Projection Booth	150	1	150
Follow-spot Booth	200	1	200
<b>Sub-Total</b>			<b>18,210</b>

#### **Front-of-house and public spaces**

Box Office suite/sales area:	1,180	1	1,180
2 sales windows + work area	120	1	
BO manager office and work area	140	1	
Accounting work room	100	1	
Records storage	100	1	
Kitchenette	20	1	
Marketing stations and materials storage	700	1	
Lobby /foyer areas @ 12 sf/seat	16,200	1	16,200
Coatroom (1350 coats)	700	1	700
Bars and concession areas	900	1	900
Bar storage/workroom	200	1	200
Public WC's @ 1 fxtr/30 seats (90 fxtrs; 54F, 36M, @44sf/fxtr)	3,960	1	3960
Donor's Lounge	845	1	845
Misc. FOH Storage	200	1	200
House manager's office/first-aid	180	1	180
Usher's locker room	200	1	200
<b>Sub-Total</b>			<b>24,565</b>

#### **Catering and Restaurant Facilities**

Fine restaurant, 100 seats @ 14sf/seat	1,400	1	1,400
Common kitchens for all food svc	2000	2	4000
Informal buffet/café (200 seats @ 13sf/seat)	2,600	1	2,600
Banquet Room/Rehearsal room	2,500	1	2,500
Banquet, rehearsal Storage	300	1	300
<b>Sub-Total</b>			<b>10,800</b>

#### **Backstage and Support Spaces**

Rehearsal room (as stated above)	3,500	1	3,500
Green Room	1,000	1	1,000
Private dressing rooms w/t&s	220	3	660
Common dressing room (up to 4 persons/room)	200	4	800
Chorus (5-8 person rms w/ t&s)	1,500	1	1,500
Musicians' changing rooms	480	2	960
Laundry and wardrobe maintenance	875	1	875

Visiting manager's offices	80	2	160
Performer's lounge w/ kitchenette	500	1	500
Crew office, lockers, toilets, showers	420	1	420
Stage and Production Manager's offices	100	2	200
Stage door lobby and security office	240	1	240
Stage loading dock 2-55' semi's, 1-24' truck	400	1	400
Scenery loading & maintenance area	1,375	1	1,375
Engineering/control office	100	1	100
Janitorial office	80	1	80
Kitchenette (pay phone, vending machine)	80	1	80
Backstage toilets	100	2	200
<b>Sub-Total</b>			<b>13,050</b>
<b>Administrative offices</b>			
Office suite	4,500	1	4,500
Conference Room	450	1	450
Toilets	100	2	200
Kitchenette	80	1	80
<b>Sub-Total</b>			<b>5,230</b>
<b>Program sub-total net</b>			<b>71,855</b>
Circulation (30%)			21,257
Mechanical (15%)			10,628
<b>Program total net</b>			<b>103,740</b>
Net to gross adds @ 1.56 multiplier			57,534
<b>Program total gross</b>			<b>160,274</b>

## Detailed Program Description

### Performance Space

This space will be a main attraction to the complex to bring together both local and regional visitors year round. Daily and evening performances by local through international artists representing all genres of music will be scheduled to open the facility to patrons from all backgrounds and to diversify cultural interaction.

### Concert Hall

The 25,000sf concert hall accommodates seating for 1,350 people. While the hall is specifically designed for rich symphonic acoustics as well as amplified music, the

space's stage and seating are flexible enough to accommodate almost any type of performance or experimental art.

### **Stage**

The stage must be large enough to accommodate any type of performance. It must be deep and wide for adequate side and backstage areas. Moveable acoustic panels will likely be brought on to stage to vary the hall's acoustic properties depending on the particular performance's requirements.

### **Stage Storage**

Storage adjacent to the stage for moveable acoustic panels will be required when they are not in use.

### **Chair Wagon Storage**

Storage for temporary seating will be required.

### **Green Room**

The Green Room is a place for members of the audience to meet with performers after concert. It needs to be accessible by the public, but also to the backstage area for musician access. A connection to the exterior landscape/cityscape should be a strong consideration since it can help enhance the gathering in this space and become a backdrop to the green room's events.

### **Quick Change/Toilet**

A quick-change room adjacent to the stage will be necessary for performers use.

### **Audio and Lighting Electric Room**

Electrical rooms for the concert hall's audio racks and lighting program processors will be needed. These systems should be isolated from one another to prevent

electrical noise from contaminating the audio system. These should be places close to the lighting and audio booths for quick access.

### **Lighting Control Booth**

A small room for lighting specialists to run a performances light show will need a direct view of the stage.

### **Sound Control Booth**

A small room for audio specialists to run a performances sound mixing and recording will need a direct view of the stage and the sound mix area on the concert hall floor.

### **Sound Mix in Concert Hall**

A small area is required in the center of the ground level of the audience for audio mixing equipment and several audio specialists.

### **Broadcast Announce/Control Booth**

A small room for an announcer to run audio equipment and make announcements to the audience will need a view of the concert hall and stage.

### **Projection Booth**

A small room for several projectors and video equipment racks is required to be located on center with the stage with an unobstructed view of the stage and both sides of the proscenium for projection.

### **Follow-spot Booth**

An area for several spotlights with unobstructed views of the stage must be located well above stage level toward the rear of the audience. Care must be taken against glare to ensure that audience members cannot see the spotlight's source while

looking in the stage direction. Multiple booths on either side of the seating bowl may enrich the lighting.

## **Front of House and Public Areas**

### **Box Office Suite/Sales Area**

Space adjacent to the lobby and exterior façade is required for 4 ticket salespersons, a B.O. manager, accounting workroom, records storage, kitchenette, and marketing suite with materials storage.

### **Lobby**

The lobby links the exterior of the building to the concert hall. Its size should be controlled by a 12sf/seat calculation. The promenade to an event begins in the streets, where concertgoers engage in a procession from their unique backgrounds, toward the complex itself. The diverse interaction with other concertgoers begins in the street and extends through the lobby space where excitement and anticipation is mutually enjoyed into the performance space itself. Its adjacency to the exterior landscape is a most important asset that must be explored to its fullest potential. The lobby is the space where people go to see and be seen. It should be a masterfully designed space that opens the audience's eyes not only to the surrounding harbor, city, and architecture, but also to each other, encouraging a flirtation of emotions and intellect. Often equally as important as the concert itself is the intermission. A strong connection to the site's landscape can enhance both the promenade to the building and the intermission experience.

### **Coatroom**

Adjacent to the lobby, storage is required for 1350 coats.

### **Bars and Concession Areas**

A bar and concession should likely be located off the lobby on every main floor of the concert hall. These will likely be stacked above the kitchen for the efficient use of a dumb-waiter.

### **Bar Storage/Workroom**

A room with refrigeration equipment will be necessary for proper food and drink storage. This room should be located near the kitchen as well as a service corridor for deliveries.

### **Public WC's**

At 1 fixture per 30 seats, 90 fixtures are required for a full house. About 54 should be female and 35 male. Each fixture requires about 44sf per bathroom. There should be WC's on every floor of the concert hall with the fixture count per floor associated with the seat count per floor.

### **Misc. Front of House Storage**

Storage for chairs, tables, and misc. items should be located near the lobby, perhaps along a service corridor.

### **Donor's Lounge**

A lounge near the building's food service should prominently display the building's design principles. It is not only a room that past and present donors are welcome to, but it is also used to entice future donors to support the performing arts in Baltimore. Views of the waterfront and cityscape will likely enhance the drama of the room, making it more fruitful.

### **House Manager's Office/First Aid**

An office likely located directly off the lobby would help promoted public relations between the audience and administration.

### **Usher's Locker Room**

An employee locker room will be necessary with easy access to both the lobby and concert hall itself.

## **Catering and Restaurant Facilities**

### **Fine Restaurant**

An up-scale restaurant with seating up to 100 people should have access to the lobby and street. An estimated 14sf/seat should be used.

### **Informal Buffet/Café**

A Casual atmosphere for 200 people should have access to both the street and lobby. Its space should be calculated at 13sf/seat.

### **Banquet Room/Rehearsal Room**

The banquet room requires both public access and backstage access when it is used for rehearsal. A horizontal or vertical connection to the kitchen would serve it well.

### **Banquet/Rehearsal Storage**

An area for table and chair storage will be required off the banquet hall.

### **Common Kitchen**

Two common kitchens should serve the restaurant, café, banquet room, concession booths, and requirements of the lobby. For this reason, its adjacency to these spaces is important for efficiency.

## **Backstage and Support Spaces**

### **Rehearsal Room**

Practice space for a full band or orchestra near the stage, sharing similar acoustic properties with the main hall, but acoustically isolated.

### **Private Dressing Rooms**

Three private changing rooms with toilets and showers are required backstage.

### **Common Dressing Rooms**

Four changing rooms for up to four persons per room are to be located backstage.

### **Chorus**

A preparation area with toilets and showers is required for up to 8 persons backstage.

### **Musician's Changing Rooms**

2 large changing rooms require direct access to the stage.

### **Laundry and Wardrobe Maintenance**

Laundry machines are to be located near the dressing and changing rooms.

### **Wig, Make-up, and Prop Storage**

Wig, make-up, and prop storage rooms should be located near the stage and changing rooms.

### **Visiting Manager's Offices**

Two small offices should be located backstage for visiting managers.

### **Performer's Lounge**

An area with a kitchenette should be located close to the common kitchen.

### **Crew Office, Lockers, Toilets, Showers**

A crew office with adjacent lockers, toilets, and showers should be located backstage.

### **Stage and Production Manager's Offices**

Two small offices should be located near the stage for easy access during a production.

### **Stage Door Lobby and Security Office**

A gathering space adjacent to the main entry to stage should have a security checkpoint such as an office or room behind a window.

### **Stage Loading Dock**

A loading space for two 55' semi's and one 24' truck should be located near the backstage.

### **Scenery Loading and Maintenance Area**

Adjacent to the loading dock, an overhead door should open to a large indoor loading space with adjacent room designated for scenery maintenance.

### **Engineering/Control Office**

An office should be provided backstage for control over the building's extensive mechanical systems.

### **Janitorial Office**

A Janitor's office is to be located backstage.

### **Storage Rooms**

Multiple backstage storage rooms are required for props, paints, audio equipment, video equipment, and misc.

### **Maintenance and Repair Area**

A room with tools and supplies for building maintenance should be located in a non-public area.

**Kitchenette**

A small kitchenette with pay phone, vending machine, coffee maker, etc., should be easily accessible to backstage staff.

**Backstage WC's**

Two large 425sf restrooms should be easily accessible to all backstage staff.

**Administrative Offices****Office Suite**

A large cluster of offices for the concert hall's administration will be required.

**Conference Room**

Conference space for meeting with clients/performers will require audio and visual equipment for presentations.

**Toilets**

2 WC's are required.

**Kitchenette**

A small kitchenette requires direct access to the office suites and conference room.

**Misc. Space requirements****Outdoor Space**

Size to be determined through design process. Estimate 6-10 acres. Outdoor space must have direct link to waterfront promenade.

**Parking**

600 shared parking spaces are required for the concert hall. This parking will be open to the general public a majority of the time, but will be used specifically for concertgoers during performances.



## Chapter V: Design Strategies

### Urban Parti I

This parti is based on a waterfront node. The node is aligned with existing primary street corridors. Block dimensions are typical of Fells Point, but are oriented east/west to maximize views toward the Inner Harbor, Fells Point, and give oblique views of the CBD. S. Central “Boulevard” is the primary vehicular and pedestrian promenade to the site, flanked by the highest density. A light rail stop is proposed at the north edge of the boulevard and a water taxi stop at the south edge, at the circular piazza. The concert hall is located to the west of the main plaza, acting as both a fabric and object building. A continuous waterfront promenade circumnavigates the site with multiple events along its path. The parti includes a large amount of infill that covers the existing canal. The proper amount of infill vs. “site memory“ will need to be studied.

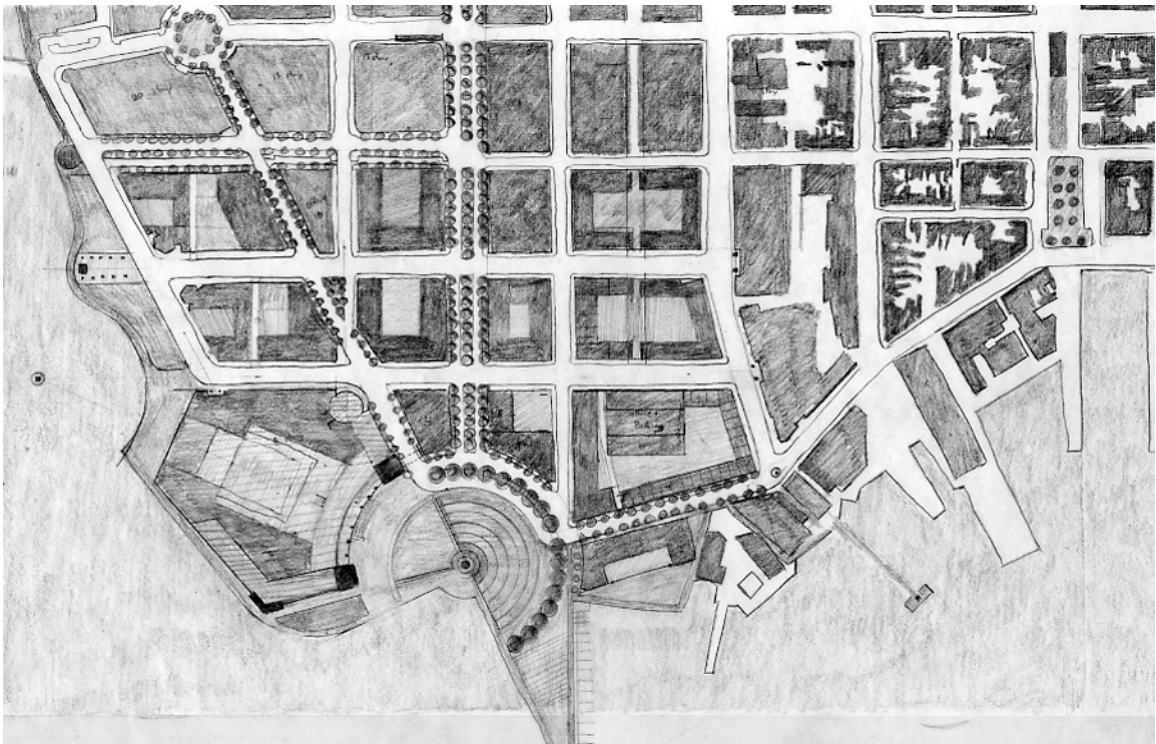
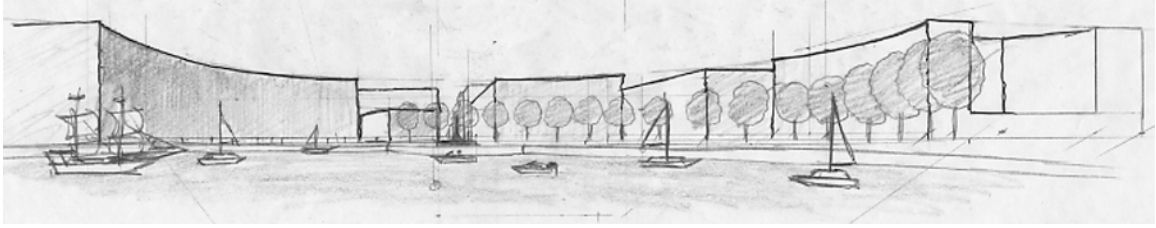
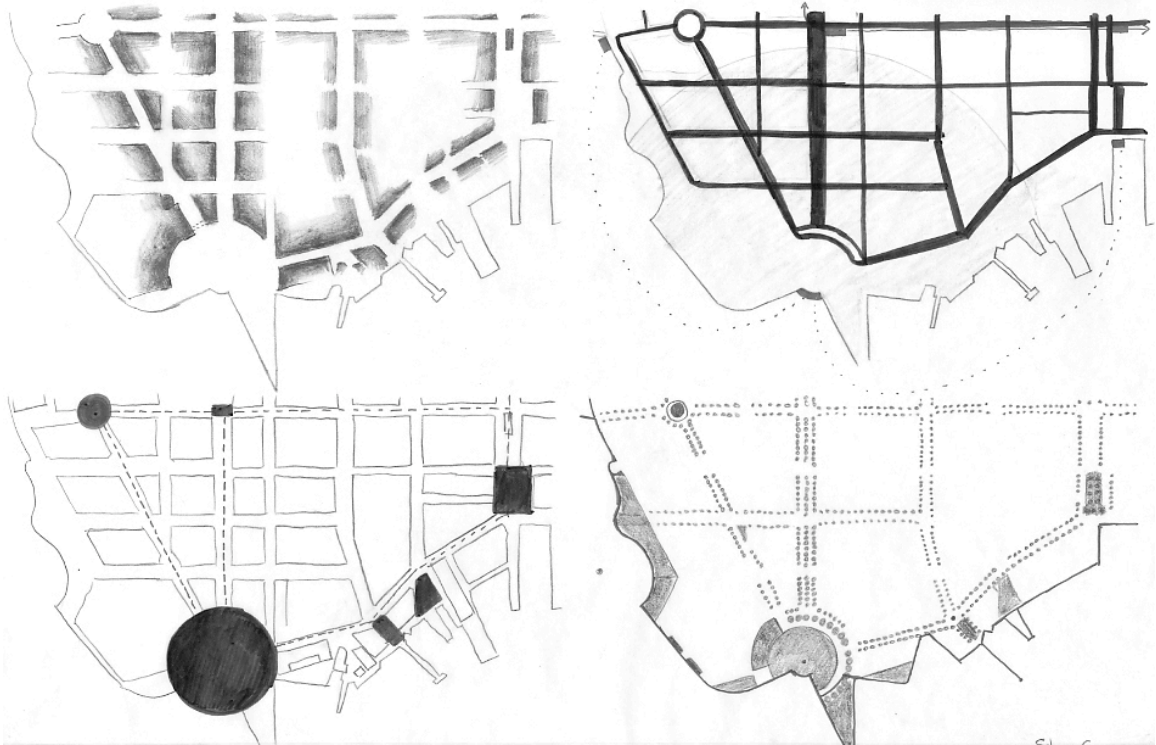


Figure 93 Parti I plan



**Figure 94** Parti I semicircular waterfront space



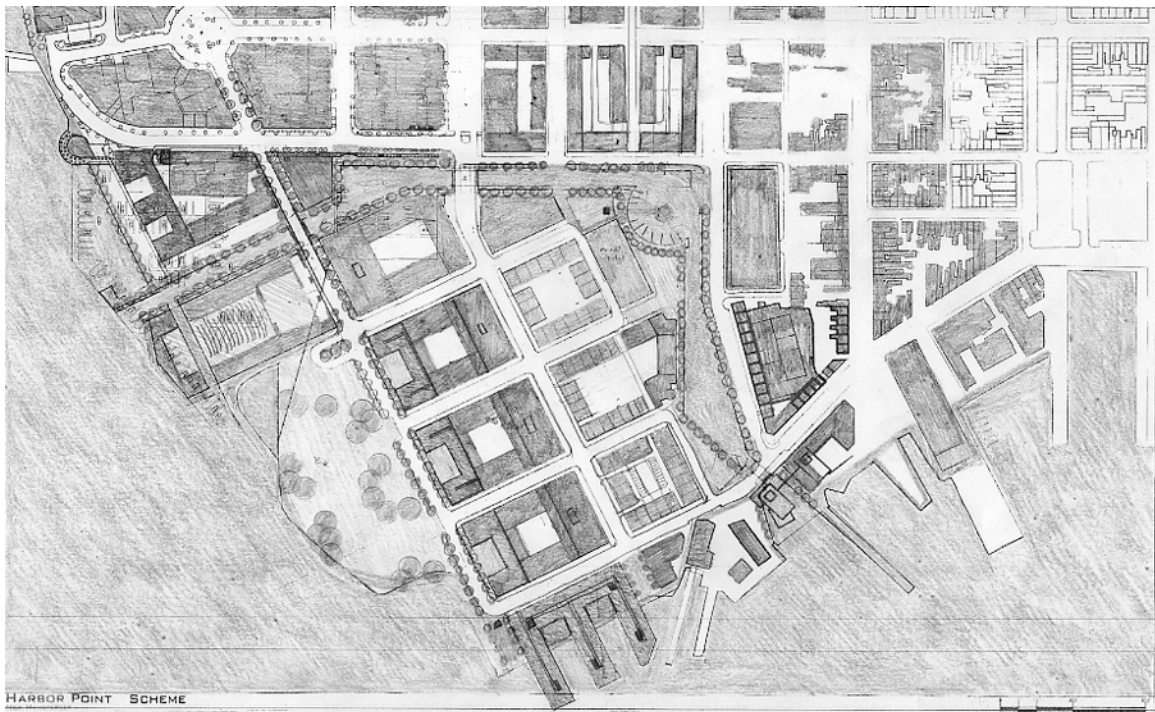
**Figure 95** (Upper left) Edge definition; (upper right) Path hierarchy; (lower left) Linking of nodes; (lower right) Landscape



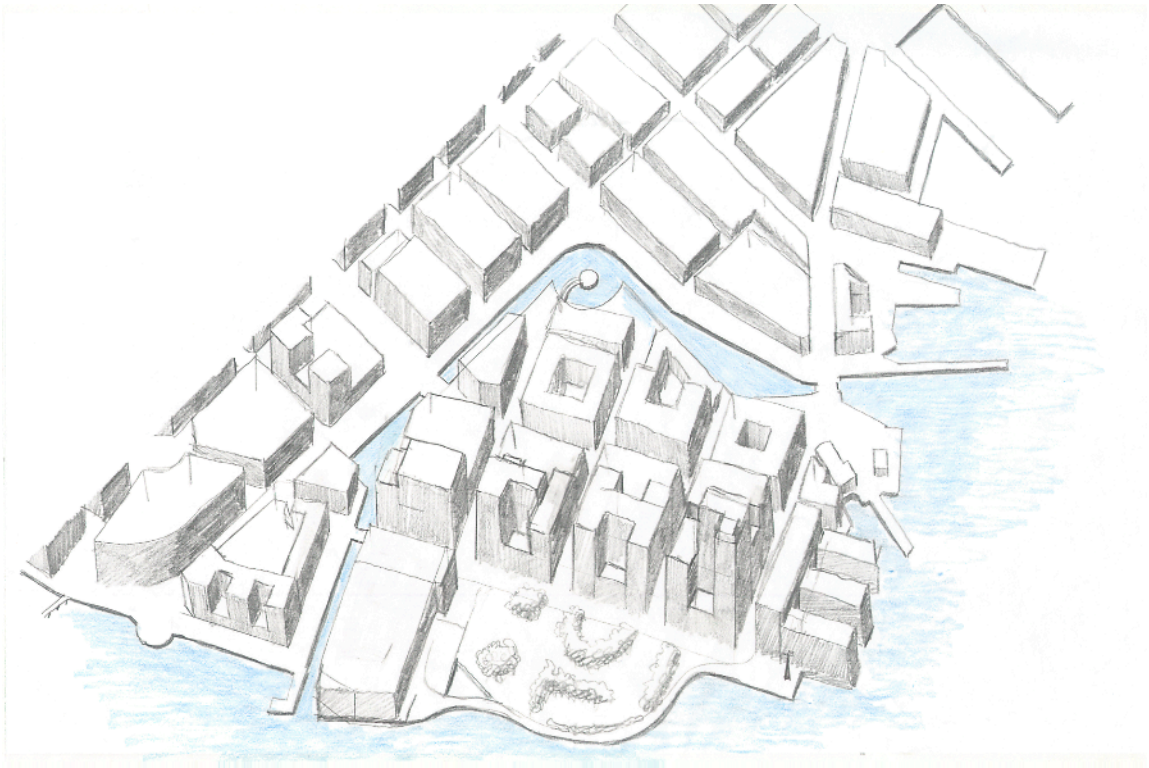
**Figure 96 Parti I axon suggests maximum density along S. Central Ave., tapering towards the waterfront and Fells Point**

## Urban Parti II

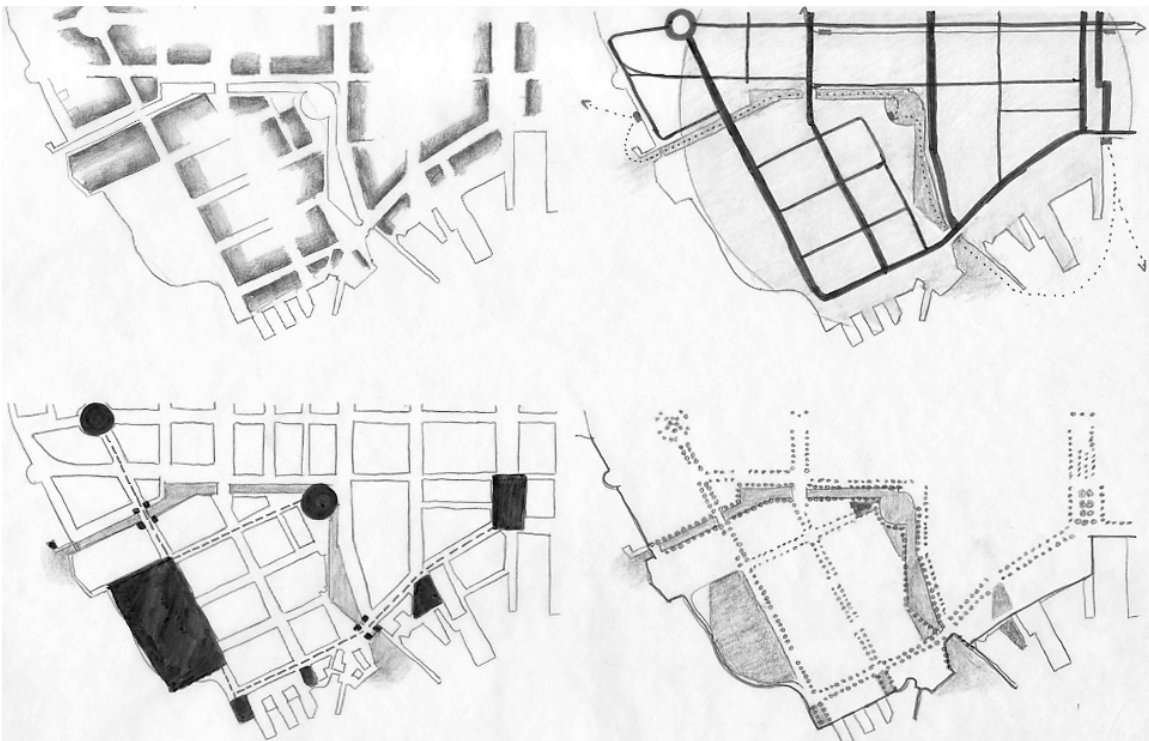
Parti II explores a shifted grid that plays on the importance of the I-83/President's St./Felicia St. axis aligned with the Domino Sugar factory. Mediating between this skewed grid and the existing grid is a continuation of the existing canal which links its "dead end" back to the harbor to create a continuous navigable loop. The canal is lined with boat parking for residents and public nautical traffic. Several activity nodes are located along the canal. The southwest edge of the site has a large harbor front park that compliments Federal Hill and rash field across the water. The performance hall edges the park and the canal, creating a threshold into the canal.



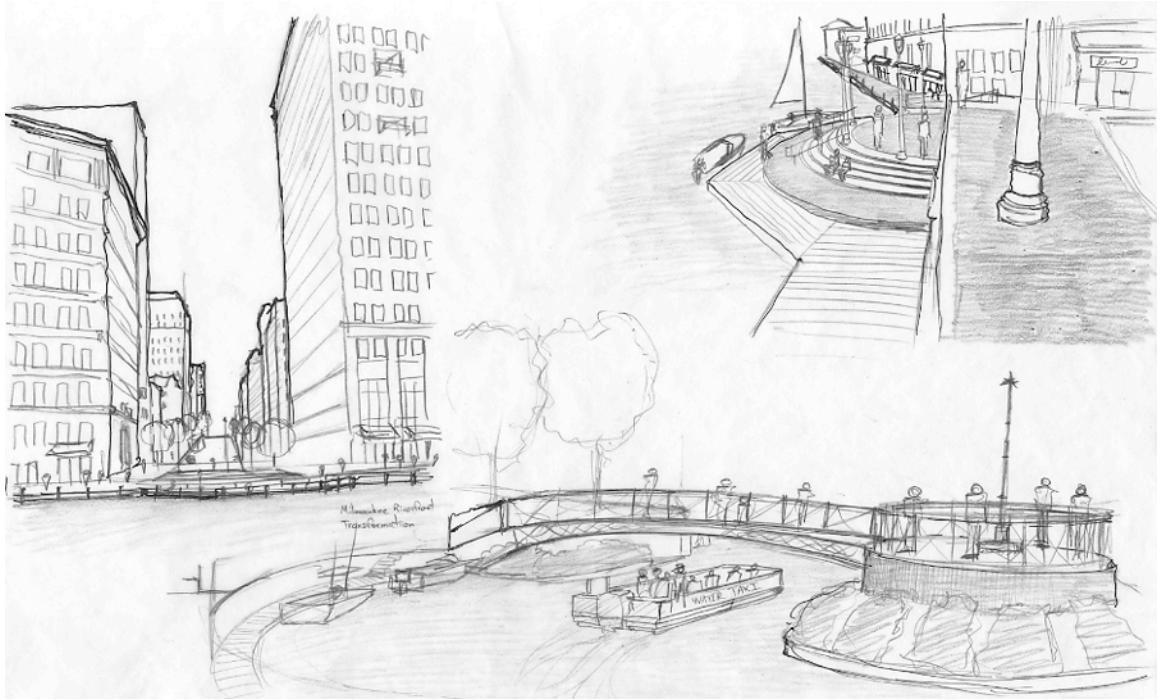
**Figure 97 Parti II plan**



**Figure 98 Parti II Axon**



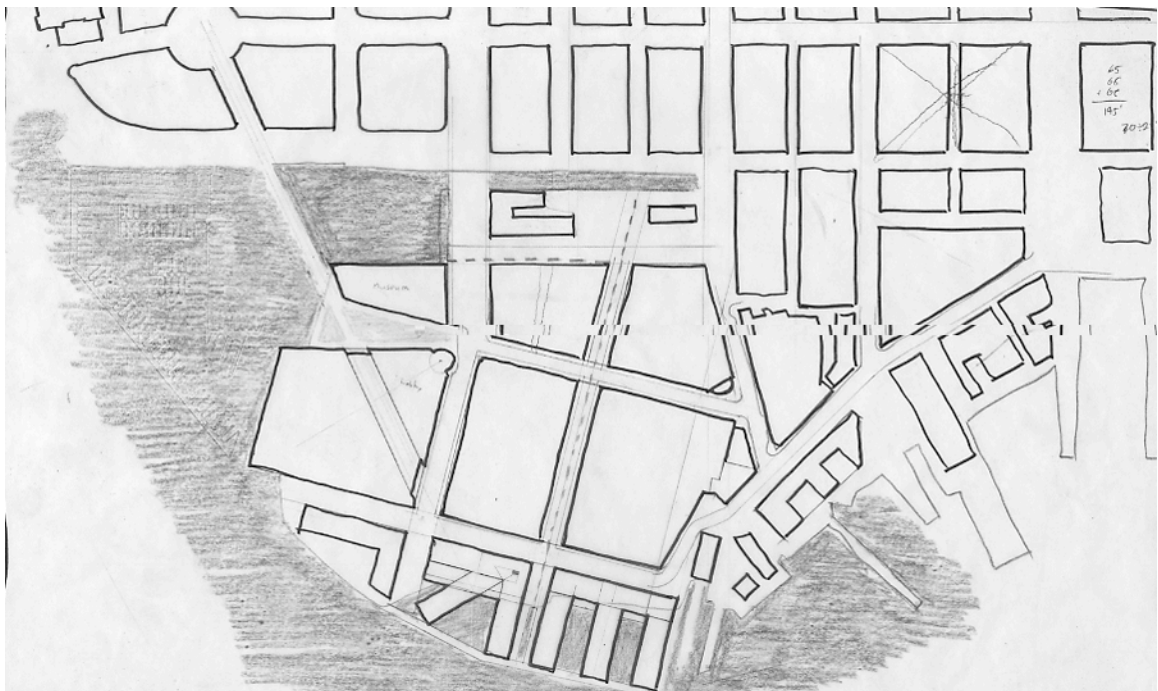
**Figure 99 (upper left) Edge definition; (upper right) Path connections and 5 min. walking radius; (lower left) Connection of nodes; (lower right) Landscape**



**Figure 100 Canal character studies**

### Urban Parti III

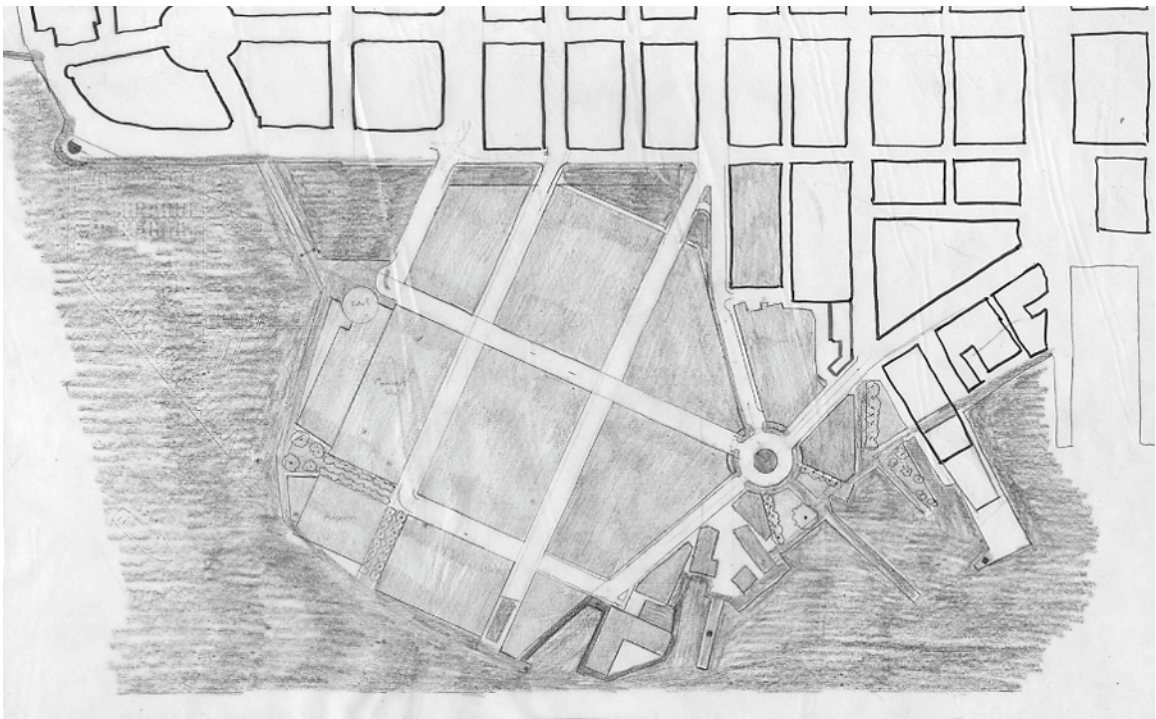
Parti III explores a grid orientation based on the environmental cap's edge. Like the proposed PUDs, it looks at a way to use the cap's edge as a financial rationale for block orientation. The performance hall is located on the west edge of the site, cantilevering into the harbor. A small public space is located at the end of the proposed Felicia St. footbridge. This parti conservatively leaves the Living Classrooms buildings and canal.



**Figure 101 Parti III plan oriented along environmental cap edge**

## Urban Parti IV

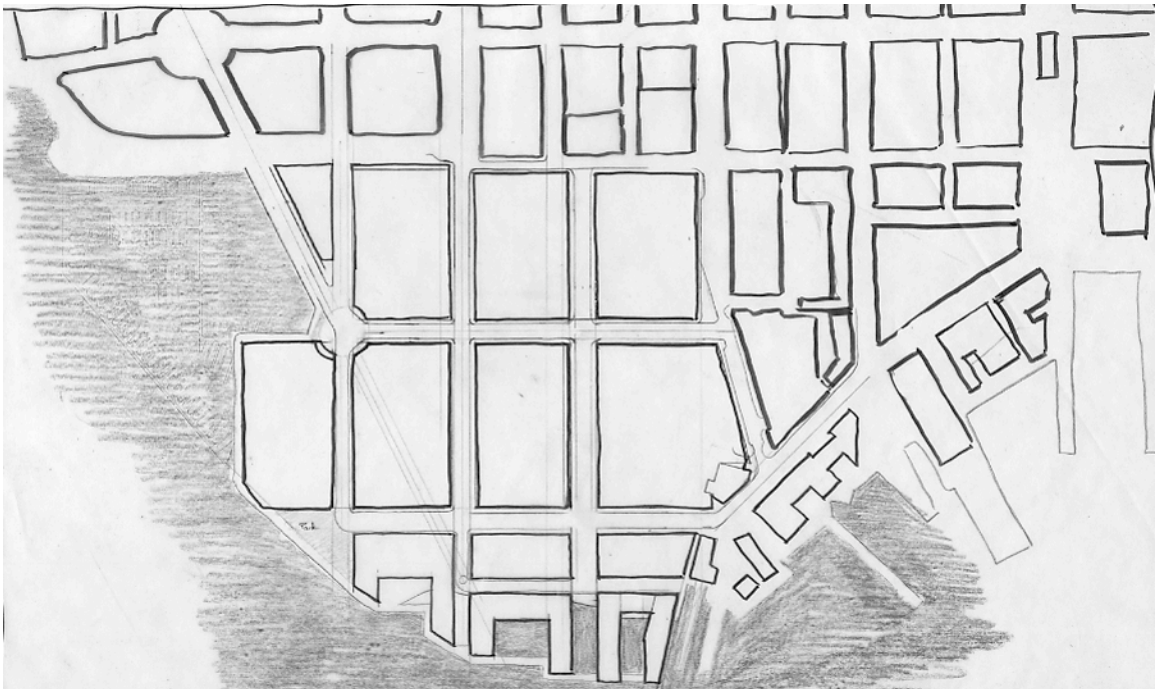
Parti IV explores a node at the S. Caroline/Thames St. intersection. The site's grid is oriented for prime views to the Inner Harbor's skyline and downriver towards the Key Bridge and the bay. A strong connection to the north fabric is made by three bridges that continue the existing street grid onto the site. The performance hall is located on the west edge of the site for high visibility to and from downtown. Open spaces are residual spaces along the waterfront promenade. More explicit open/park spaces should be explored.



**Figure 102 Parti IV plan oriented for skyline and bay views**

## Urban Parti V

Parti V is a highly rational scheme that extends the existing street grid from the north directly through the site. The block dimensions (shown here without alleys) are similar to those of Fells Point. Only one small park is located on the southwest corner of the site. The waterfront promenade could be explored further to create greater variations rather than a mere thin path along the water's edge. The performance hall is located at the intersection of S. Caroline and Thames St., embedded within the fabric. Several pier buildings extend off the south edge of the site, with open-air passages through the buildings for the waterfront promenade.



**Figure 103 Parti V continues existing streets and fabric dimensions over site**

Urban Parti VI

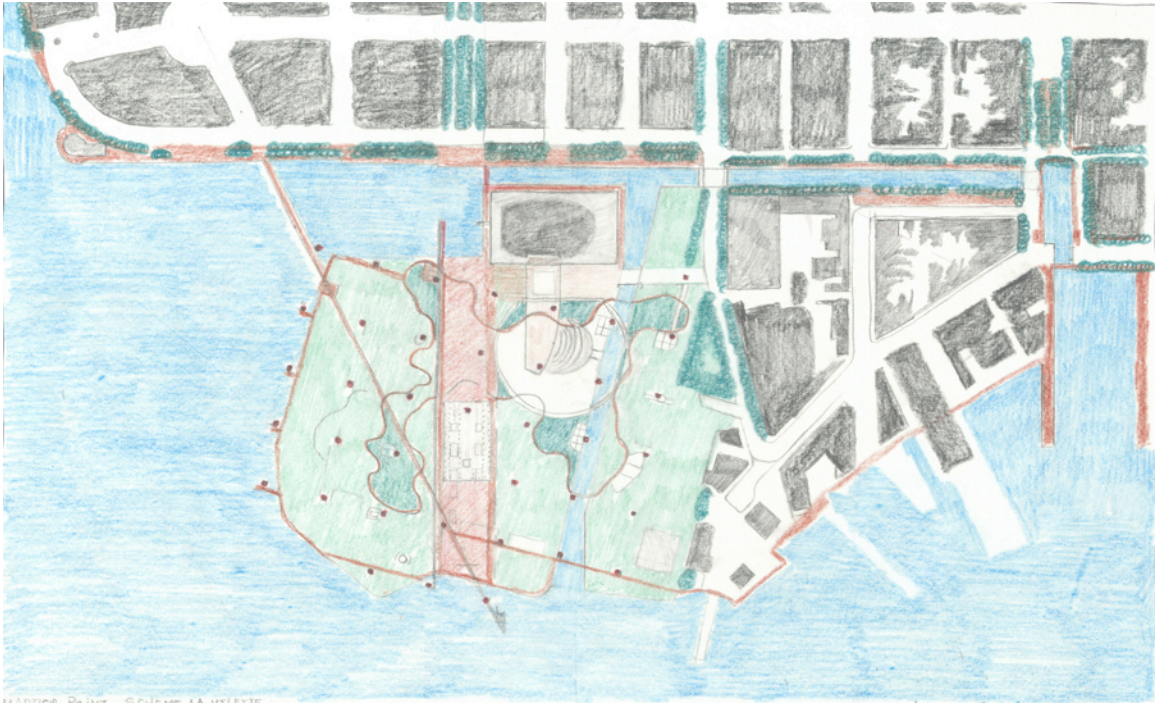


Figure 104 Parti VI draws from La Vilette to create a 27-acre regional park

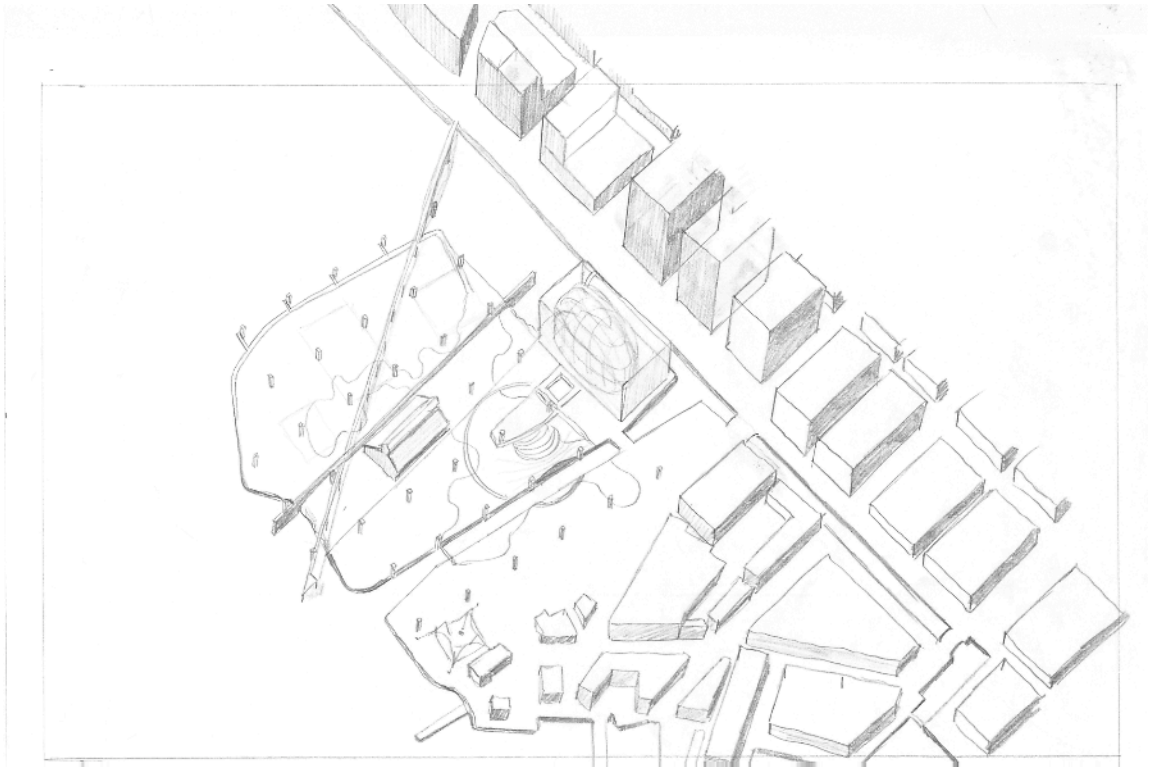


Figure 105 Parti VI Axon

Urban Parti VII



Figure 106 Parti VII connects waterfront streets similar to Charleston's Battery

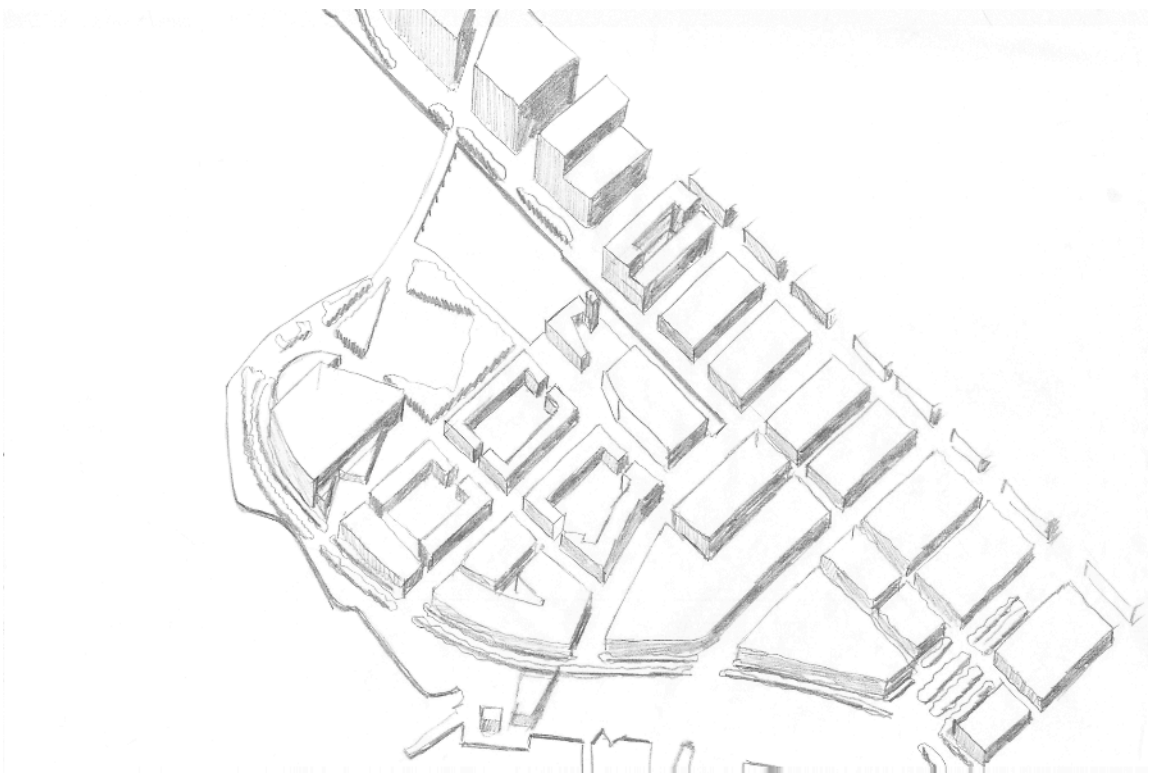
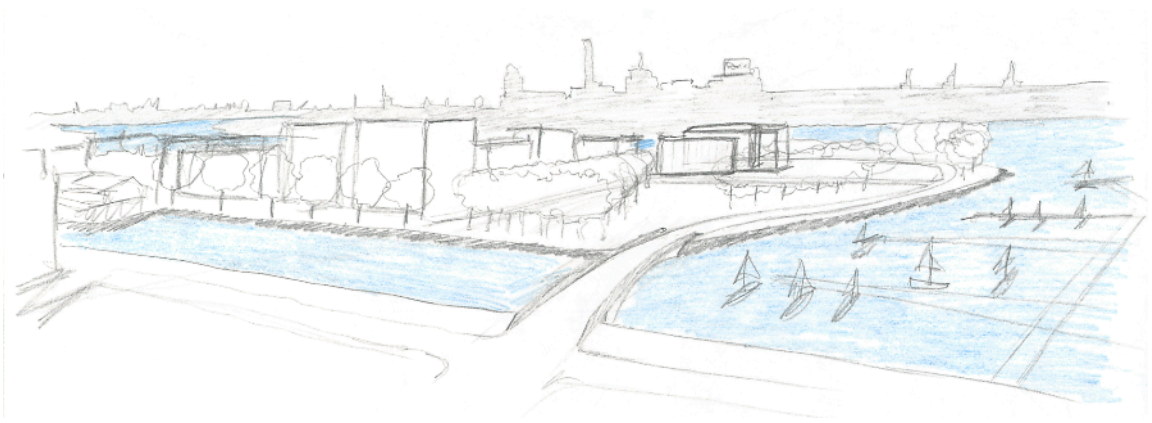
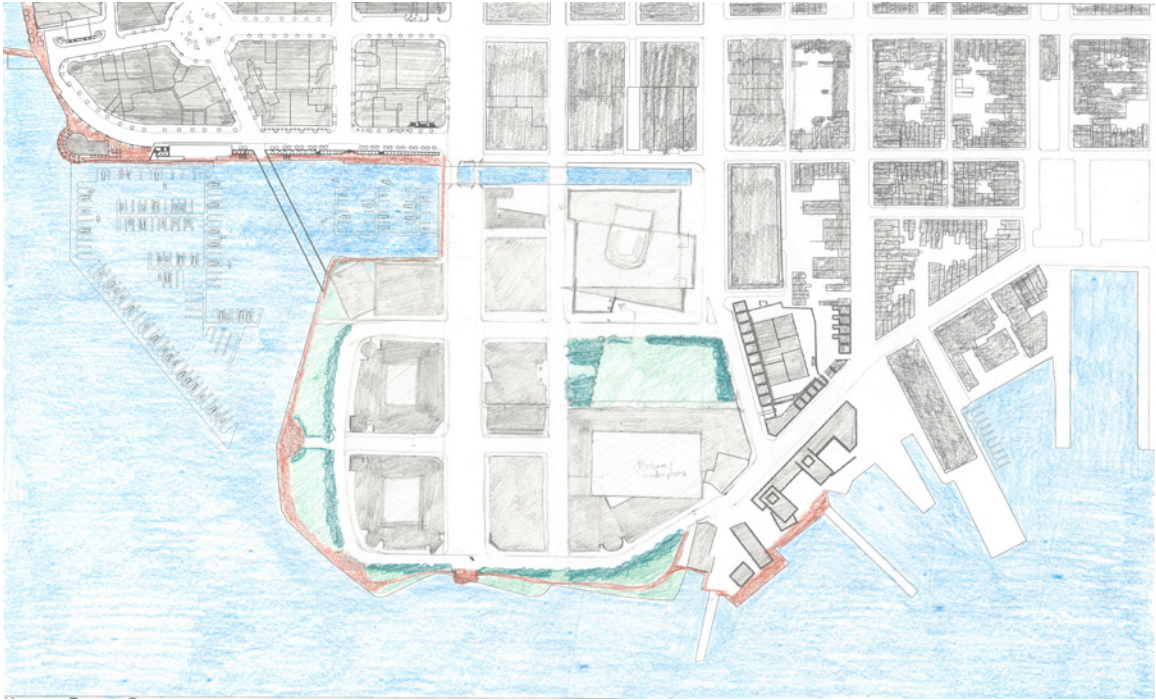


Figure 107 Parti VII axon

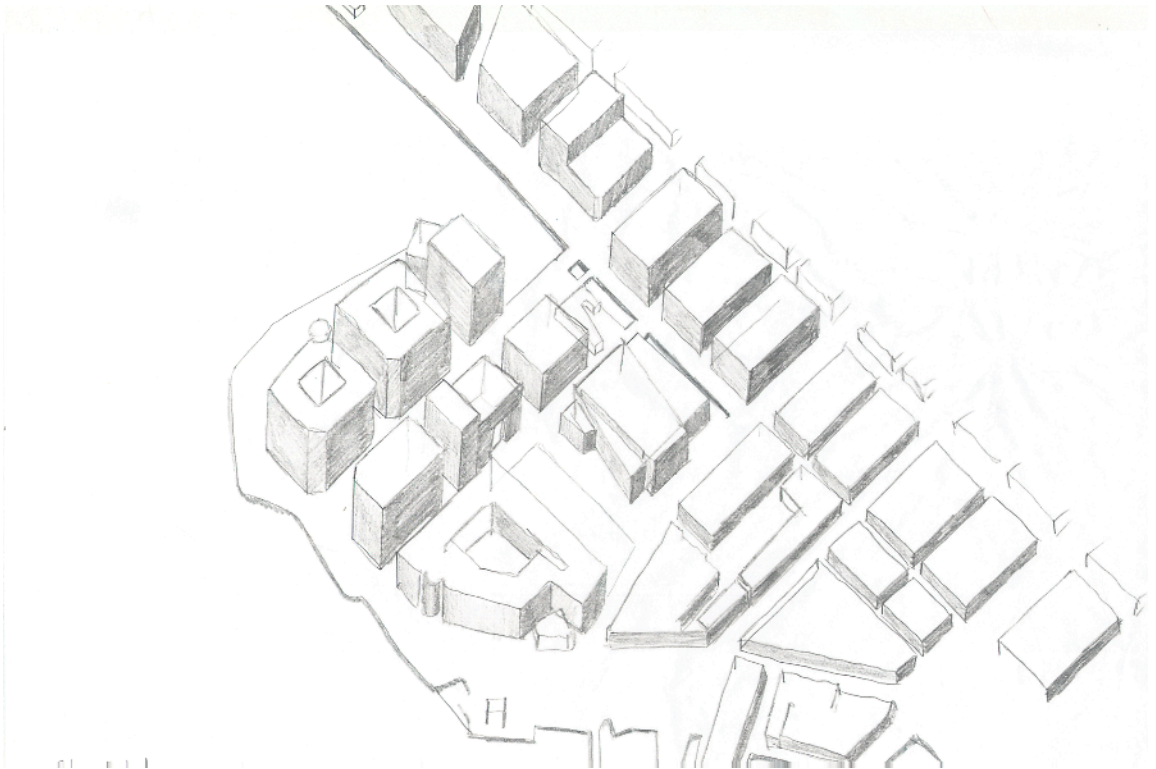


**Figure 108 Parti VII aerial**

## Urban Parti VIII



**Figure 109 Parti VIII creates an internal park and a waterfront esplanade**



**Figure 110 Parti VIII axon**

Urban Parti IX



Figure 111 Parti IX sets up a large waterfront park for the music hall, similar to that of Sydney

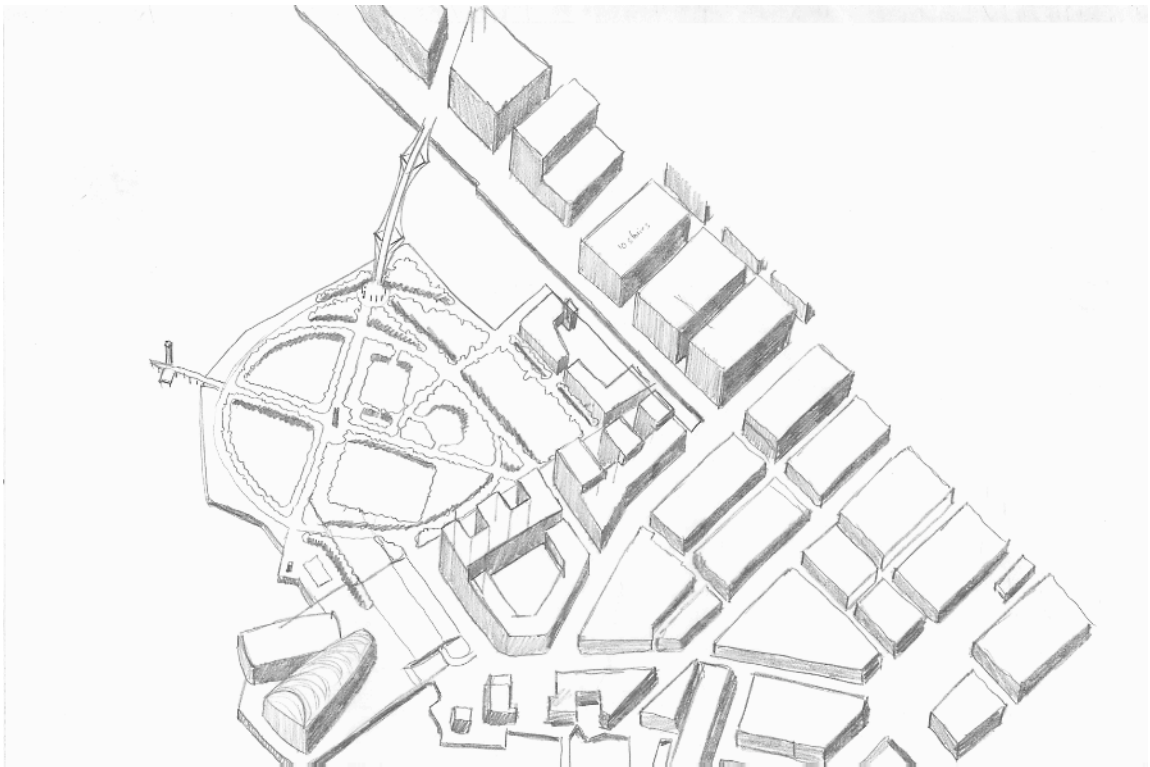


Figure 112 Parti IX axon

Urban Parti X

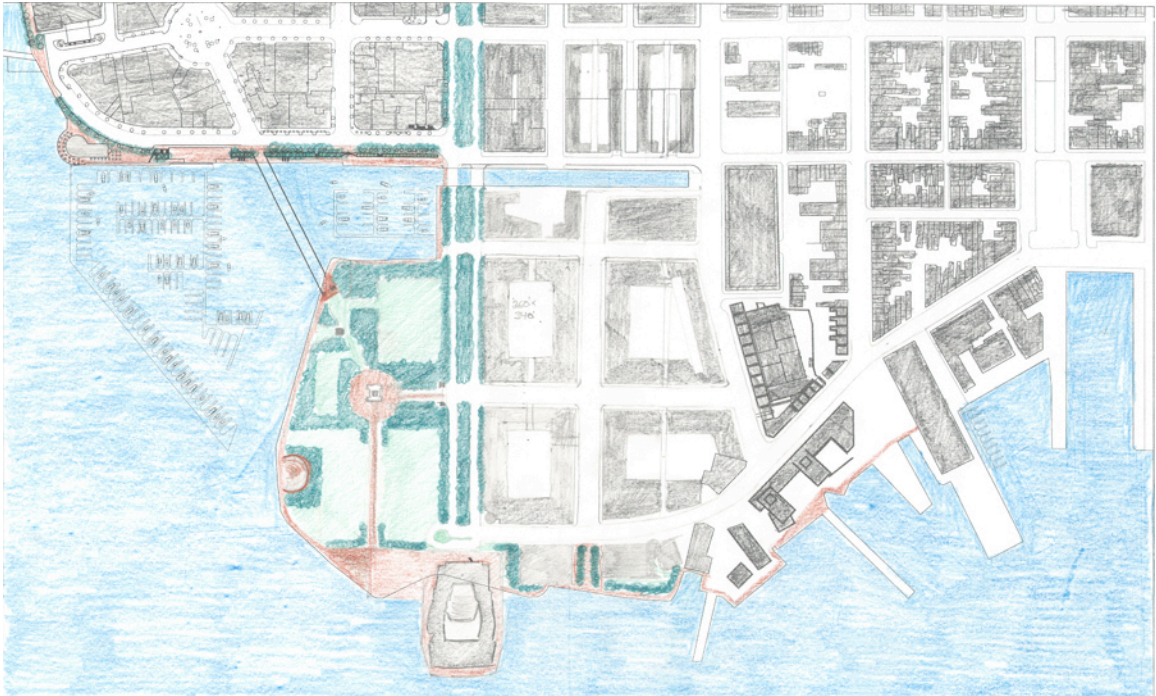


Figure 113 Parti X turns Central Ave. into a major city boulevard terminating at the music hall

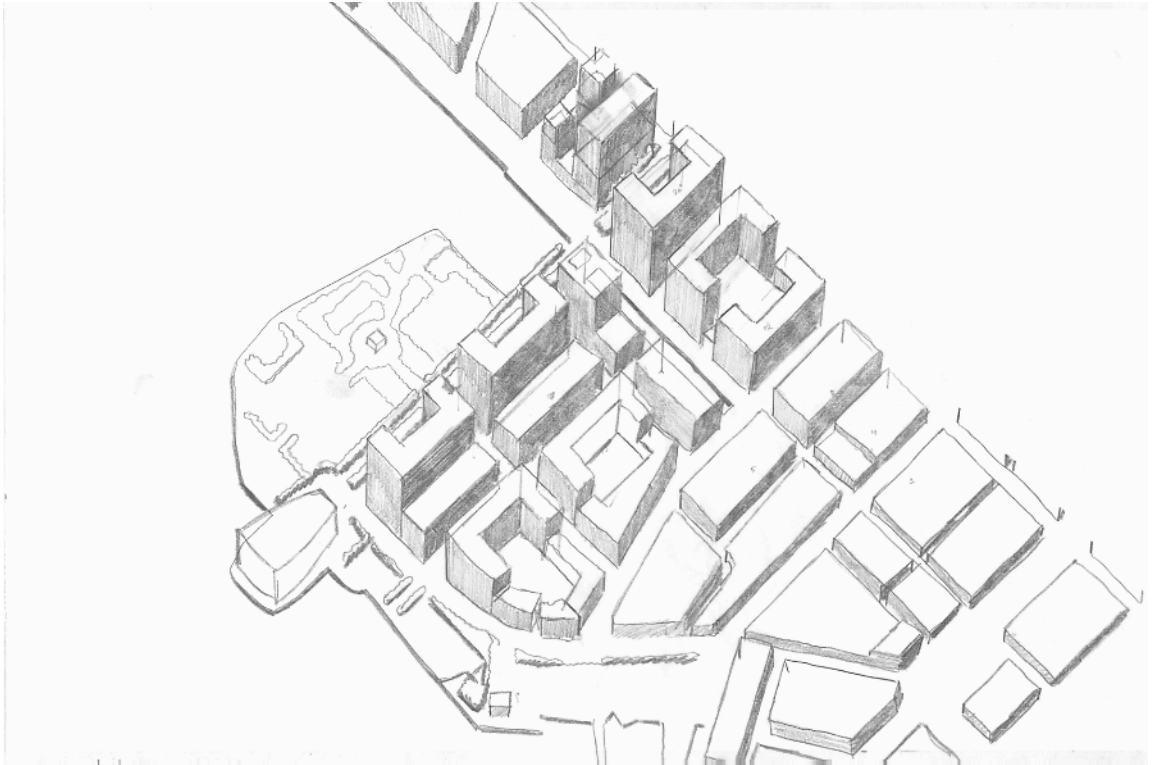


Figure 114 Parti X axon

## Urban Parti XI

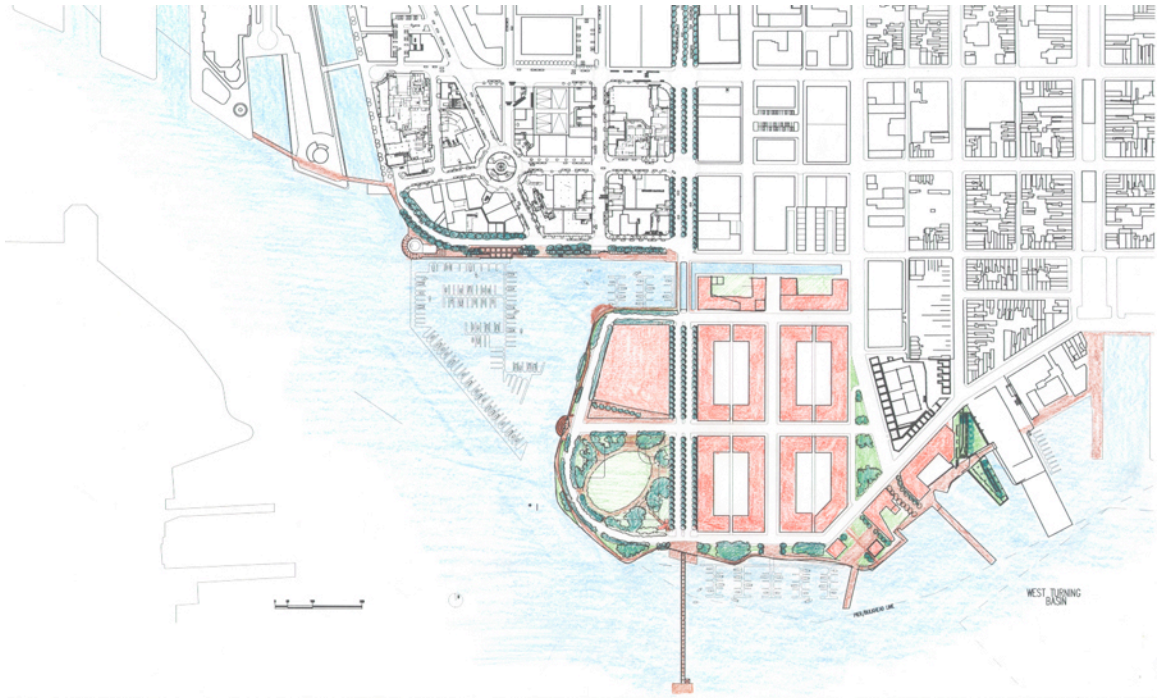


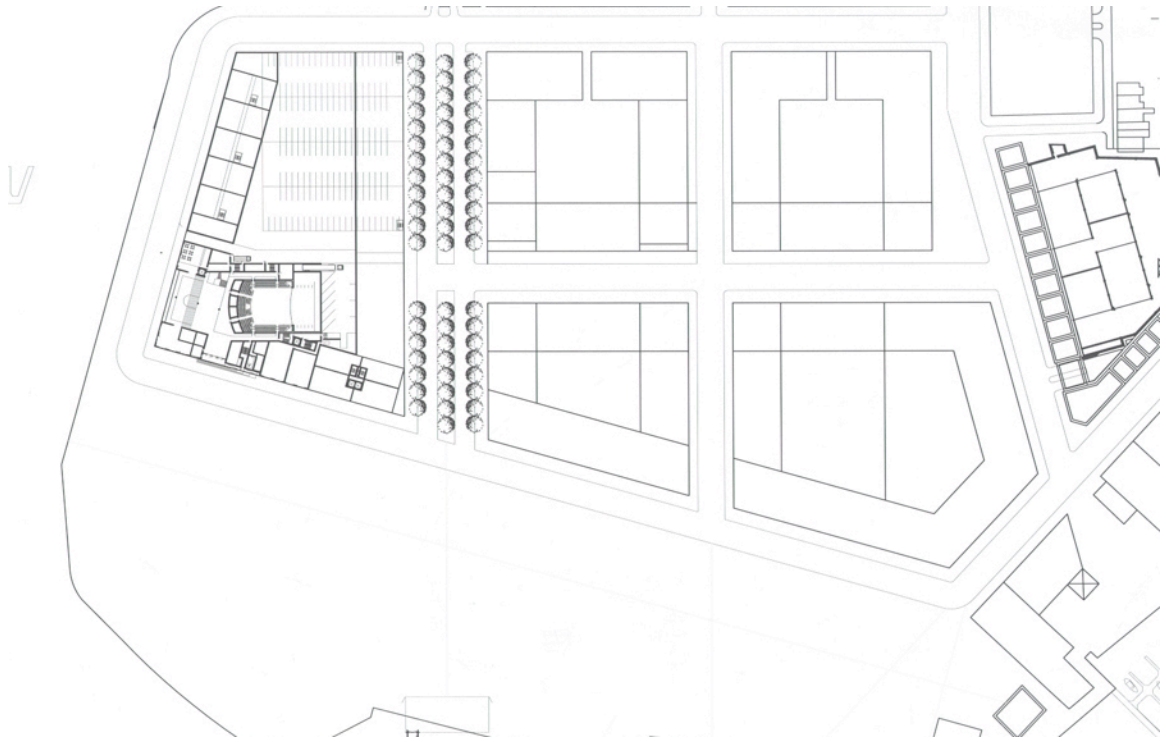
Figure 115 Parti XI uses Central Ave. as a connector of the fabric deep in the city to the waterfront

## Urban Parti XII

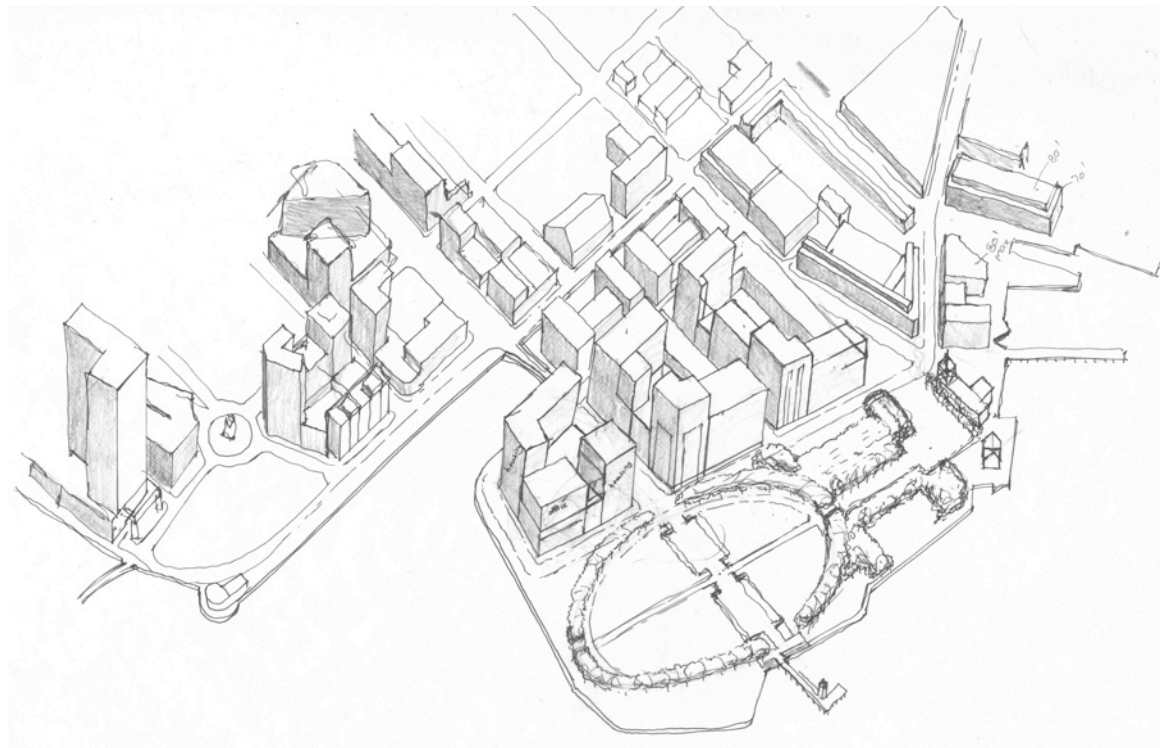


Figure 116 Parti XII

Urban Parti XIII



**Figure 117 Parti XIII builds on Parti XI's Central Ave. axis and terminates in an 8 acre waterfront park**



**Figure 118 Parti XIII formal park terminates Central Ave. axis**

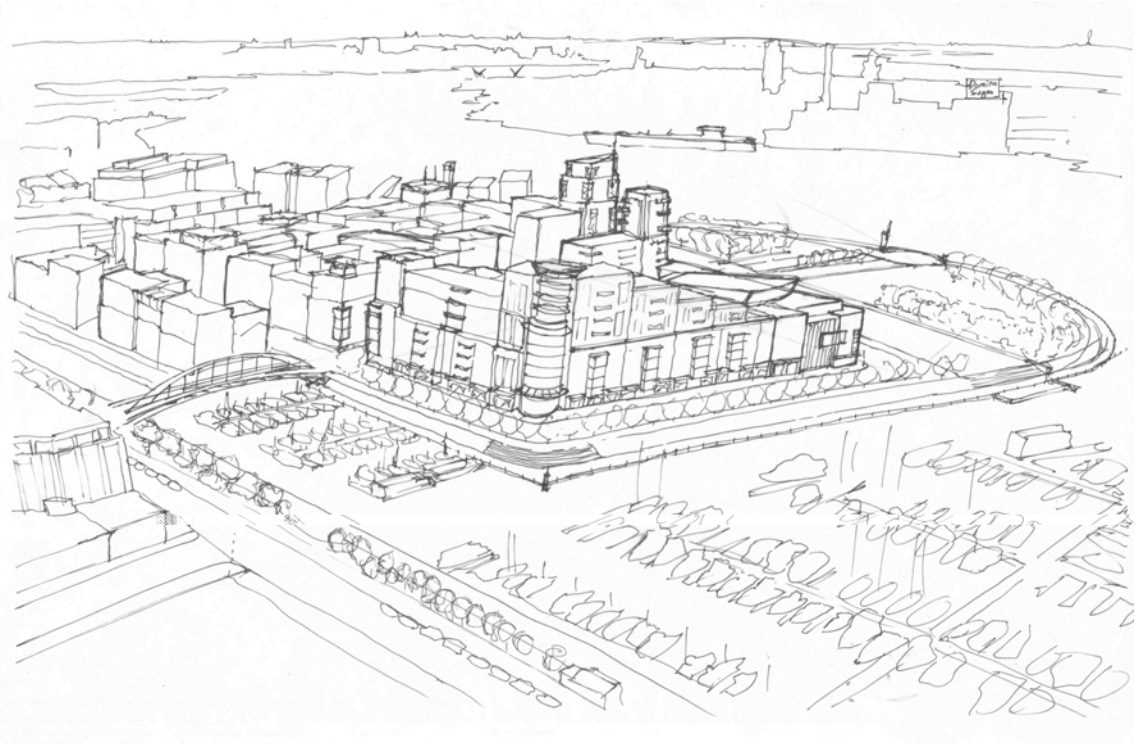


Figure 119 Parti XIII aerial

Urban Parti XIV

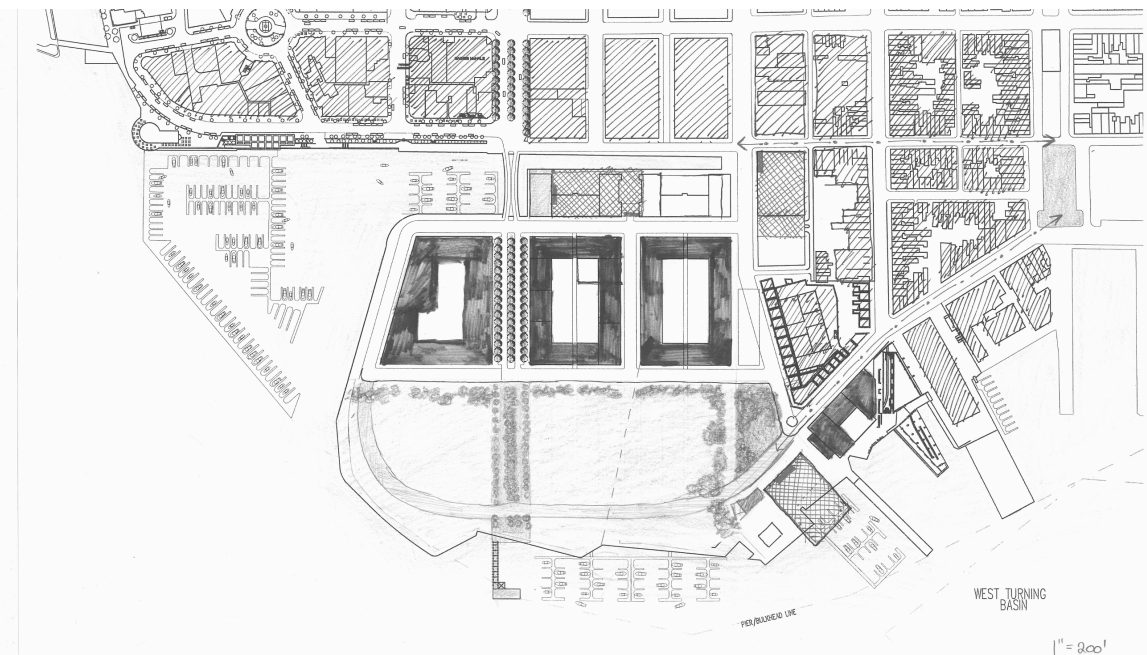


Figure 120 Parti XIV

## Urban Parti XV

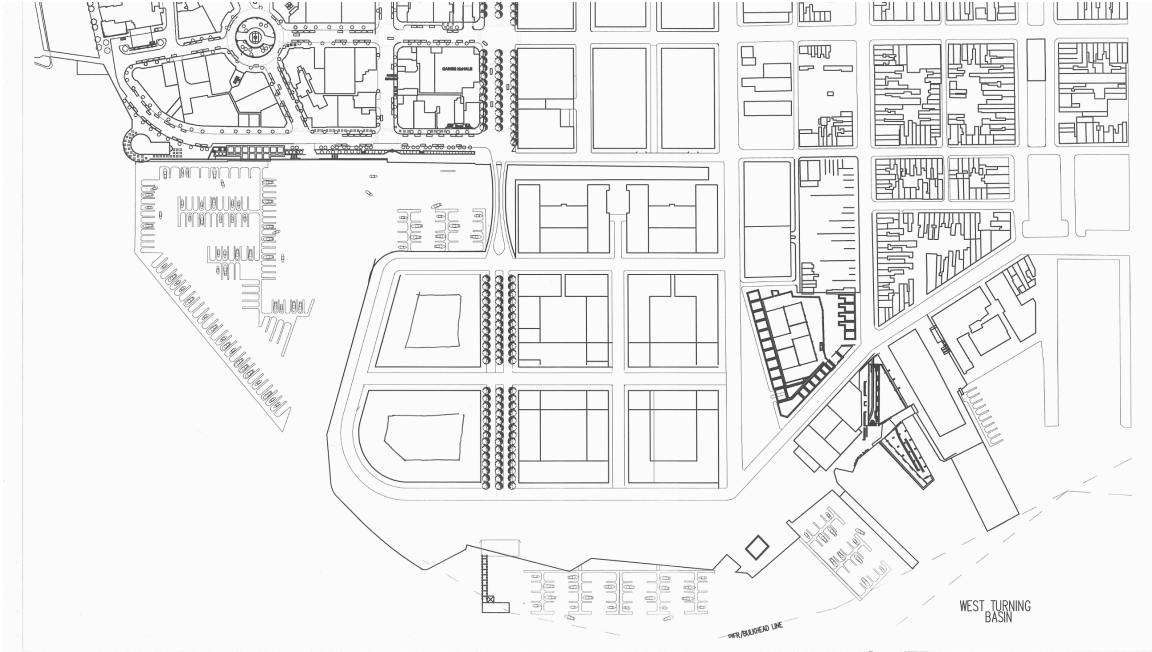


Figure 121 Parti XV

### Urban Sectional Partis A, B, C

These three massing partis look at building height and dimensions. The section is cut north/south through the center of Harbor Point, looking west towards the city. Notice the tall white building to the right of the section is the 31 story Marriott Hotel. “A” looks at placing Falls Point fabric on the site. “B” studies the “wedding cake” massing found in the 1993 PUD. “C” looks at smoothing the “wedding cake” to create a fabric that relates better to the fabric to the north of the site, while still stepping down at the water’s edge.

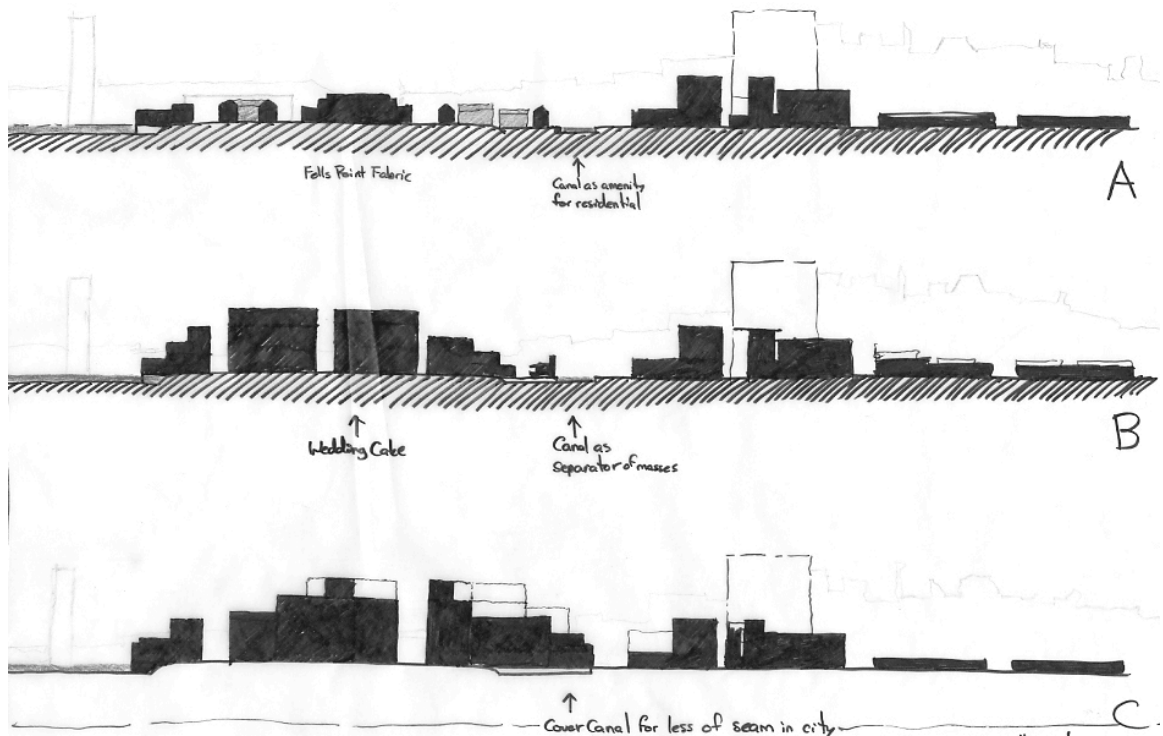
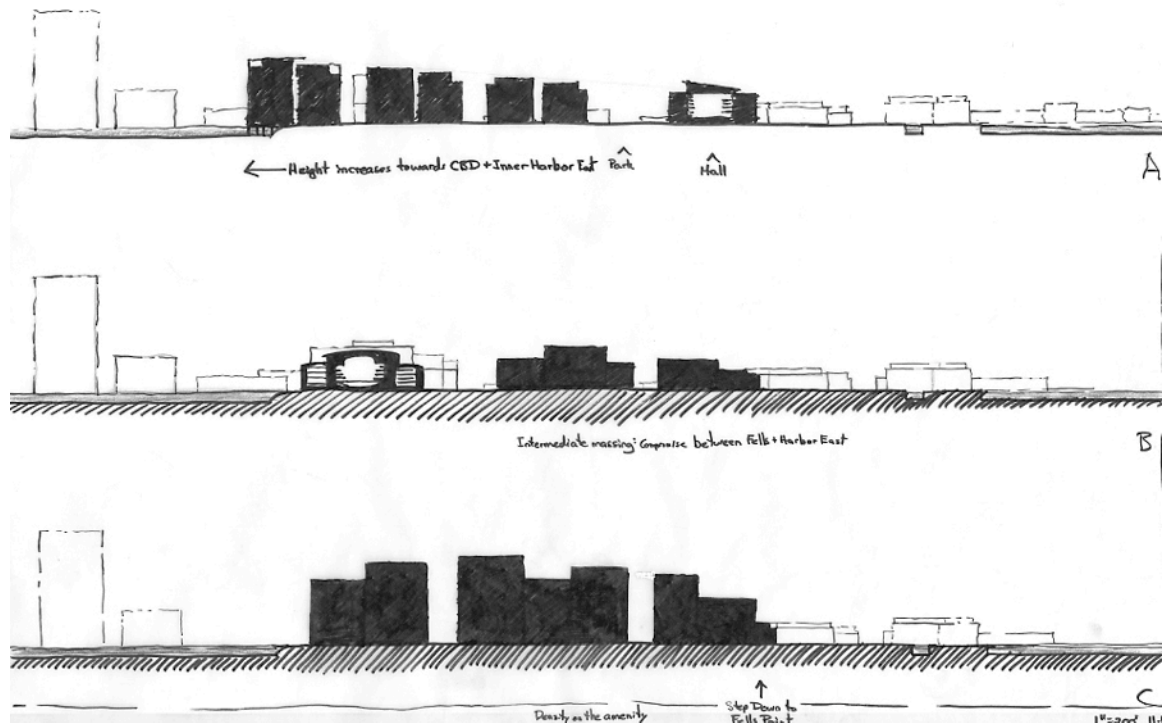


Figure 122 Sectional partis looking west

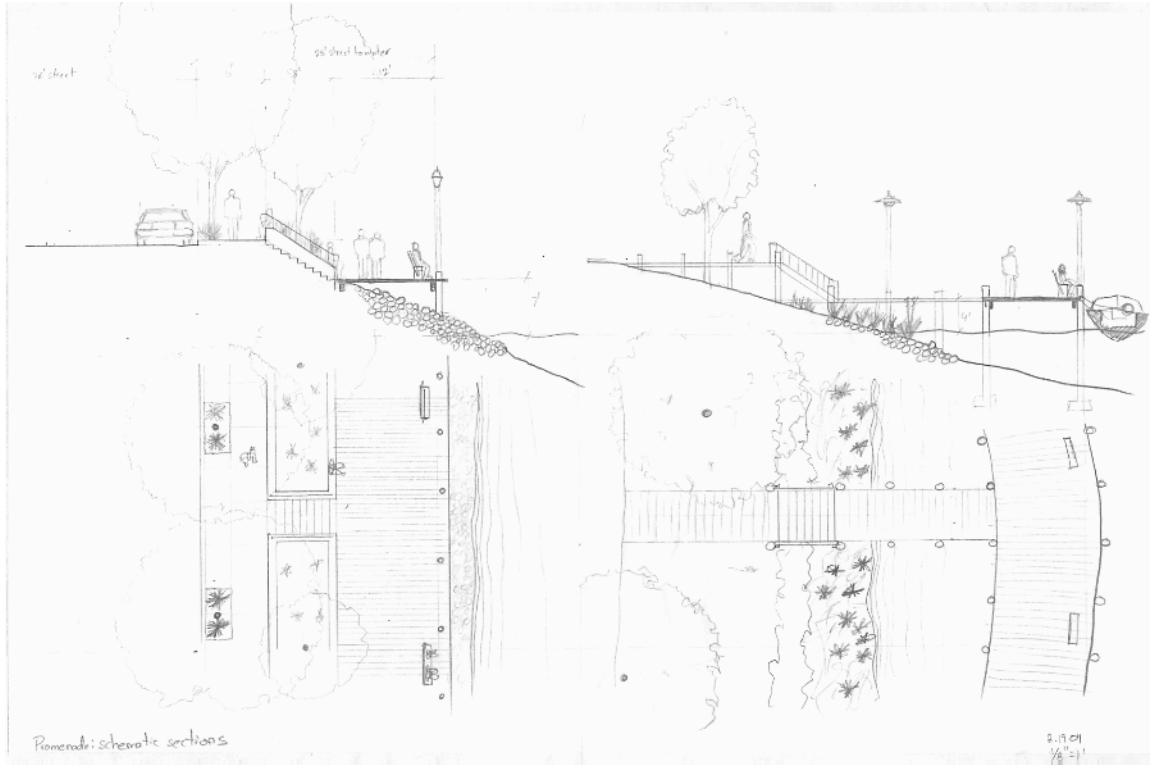
## Urban Sectional Partis D, E, F

These sections cut east/west through the site looking north. Notice the tall white building to the left is the 31-story Marriott Hotel and the lower massing to the right of the site is Fells Point. “D” looks at simply stepping up the massing at an even slope from Fells Point towards the taller downtown masses. “E” looks at creating intermediate height masses as a compromise between Fells Point and the Inner Harbor. “F” looks at placing density on the waterfront amenity where buildings might vary from 6 to 18 stories, stepping down at the Fells Point edge.



**Figure 123 Sectional partis looking north**

## Urban Waterfront Promenade Studies



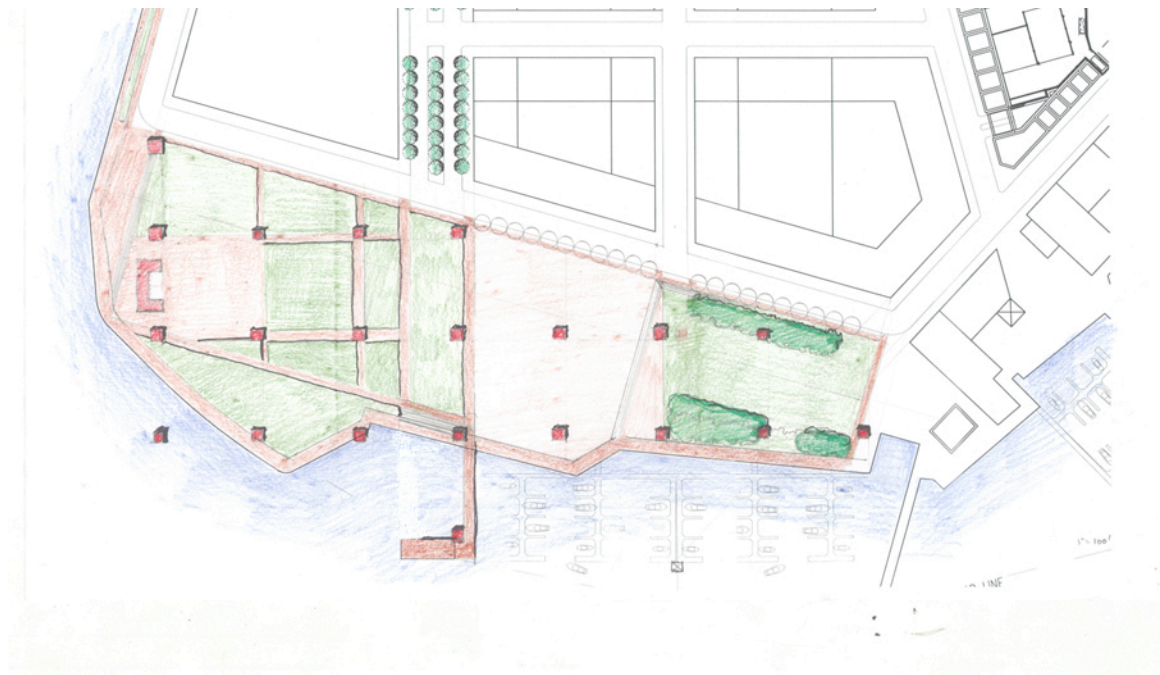
**Figure 124 Promenade studies at edge of environmental cap**

## Park Parti I



**Figure 125** Parti I creates a series waterfront spaces divided by the memory of the canal that used to run under Central Ave.

## Park Parti II



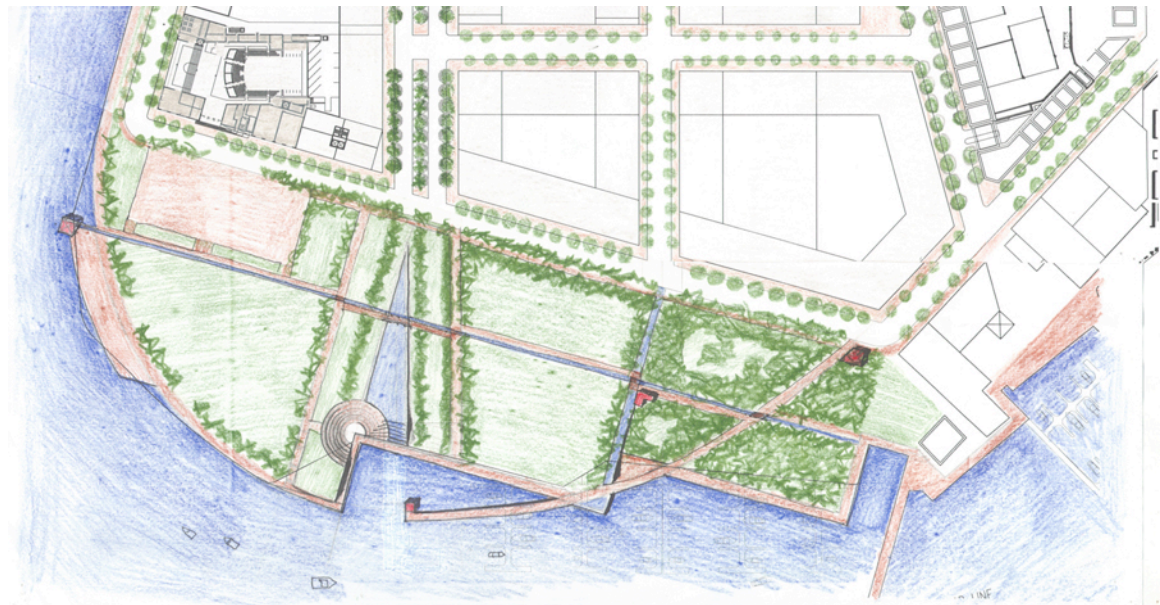
**Figure 126** Parti II creates a field of orienting pavilions similar to La Villette

Park Parti III



**Figure 127** Parti III uses a single large lawn to organize smaller adjacent spaces, similar to Parc Andre Citroen

Park Parti IV



**Figure 128** Parti IV uses a water collection system at the terminus of Central Ave to collect rain and filter it through a water retention pond at the east end of the park

## Building Parti I

Parti I studies the form of a hall with a waterfront lawn. The lawn façade of the hall may be able to open up to accommodate additional capacity on the lawn.

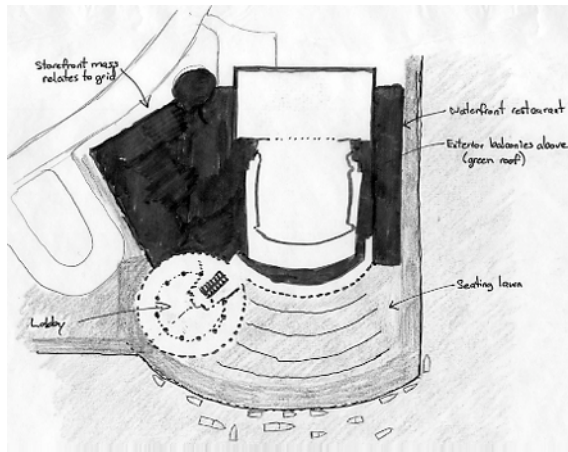


Figure 129 Parti I plan

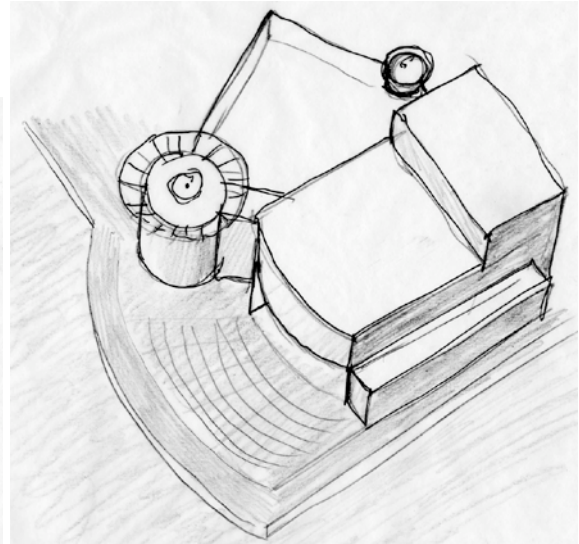


Figure 130 Parti I axon

## Building Parti II

Parti II looks at placing the hall's lobby directly on the waterfront promenade to allow stage views from both the water's edge and boats.

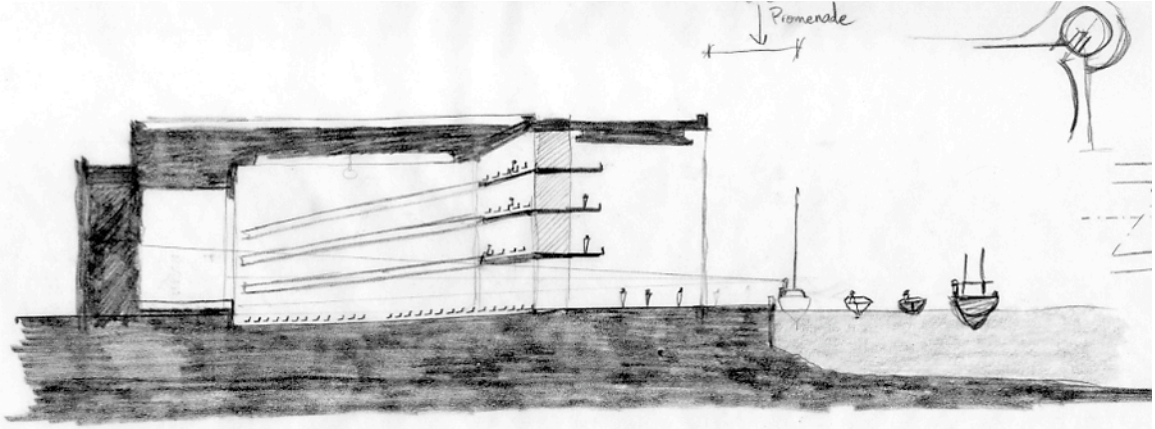


Figure 131 Parti II section

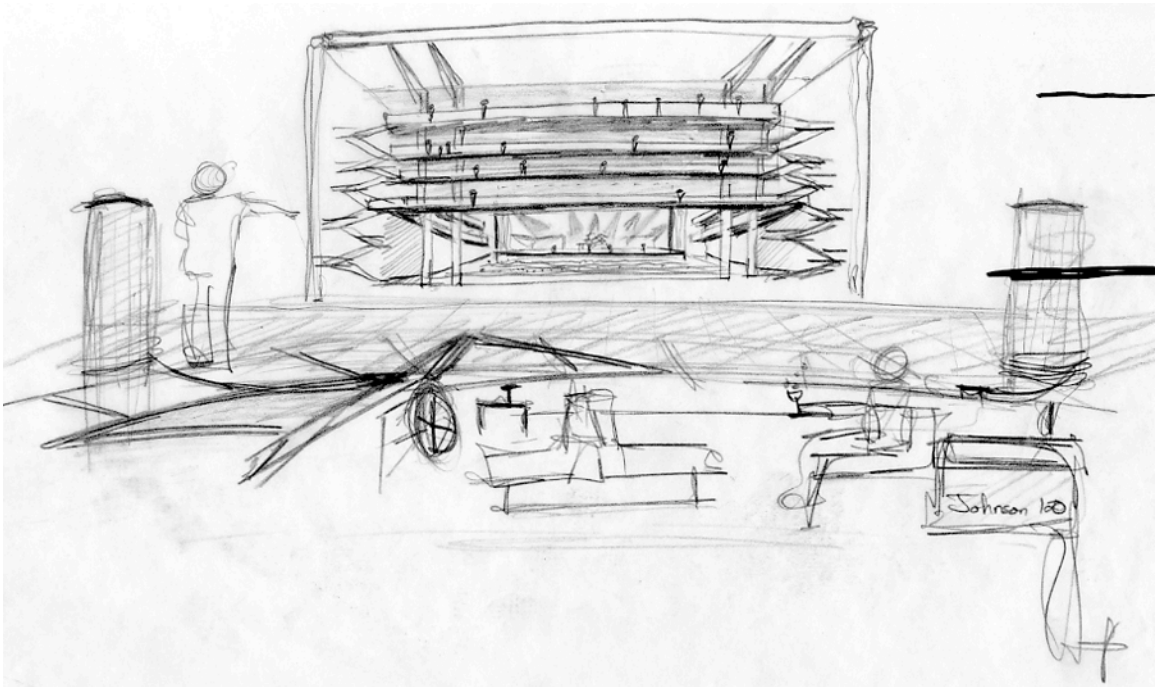
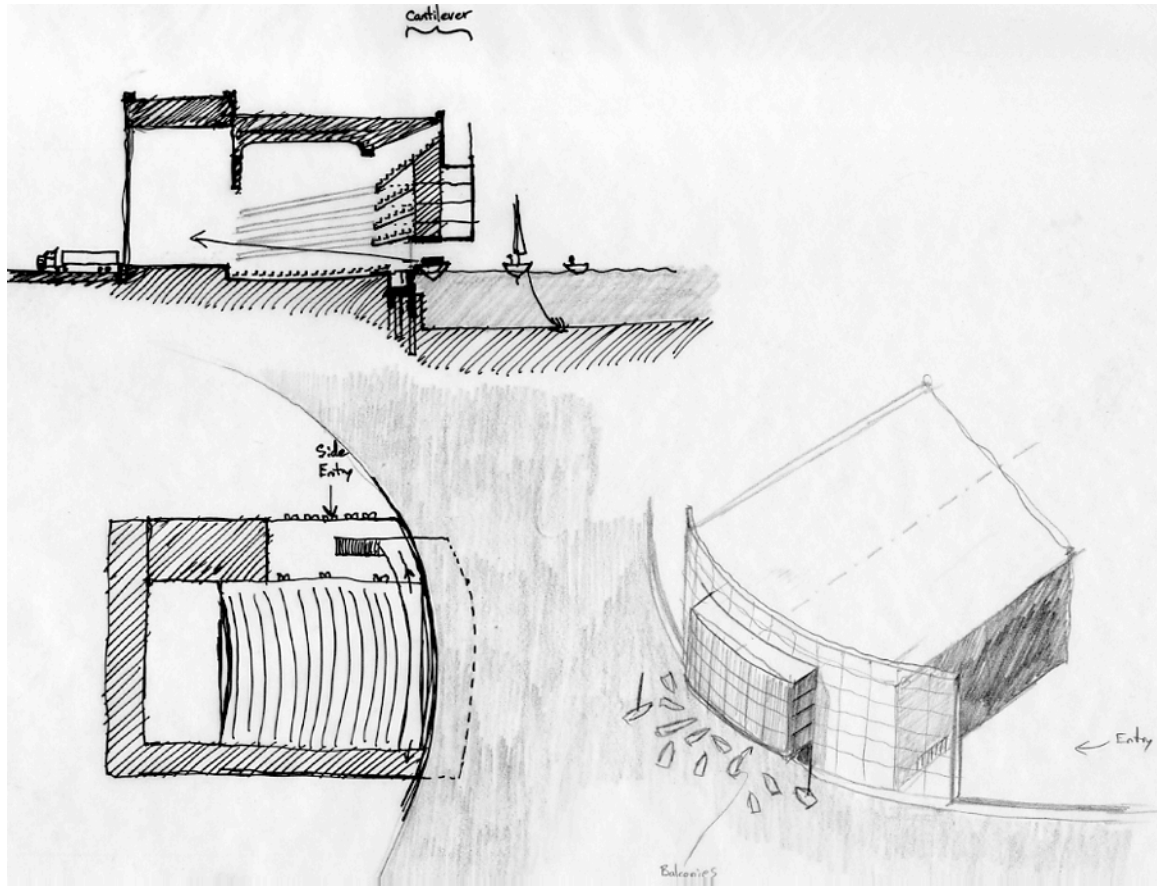


Figure 132 Parti II character study from boat looking under circulation balconies to stage

## Building Parti III

Parti III is the second iteration of Parti II. In this scheme, the building's circulation is cantilevered over the water, giving the waterfront promenade and boats a closer view of the stage. The lobby would be located to one side of the seating area since the rear of the hall is over water.



**Figure 133 Parti III plan, section, & axon of cantilevered circulation bringing waterfront promenade and water closer to performance**

## Building Parti IV

Parti IV studies a three-sided stage. During colder months, the stage would face the interior-seating bowl for indoor performances. During warmer weather, the stage could face the interior seating, the waterfront promenade and boats, or the lawn.

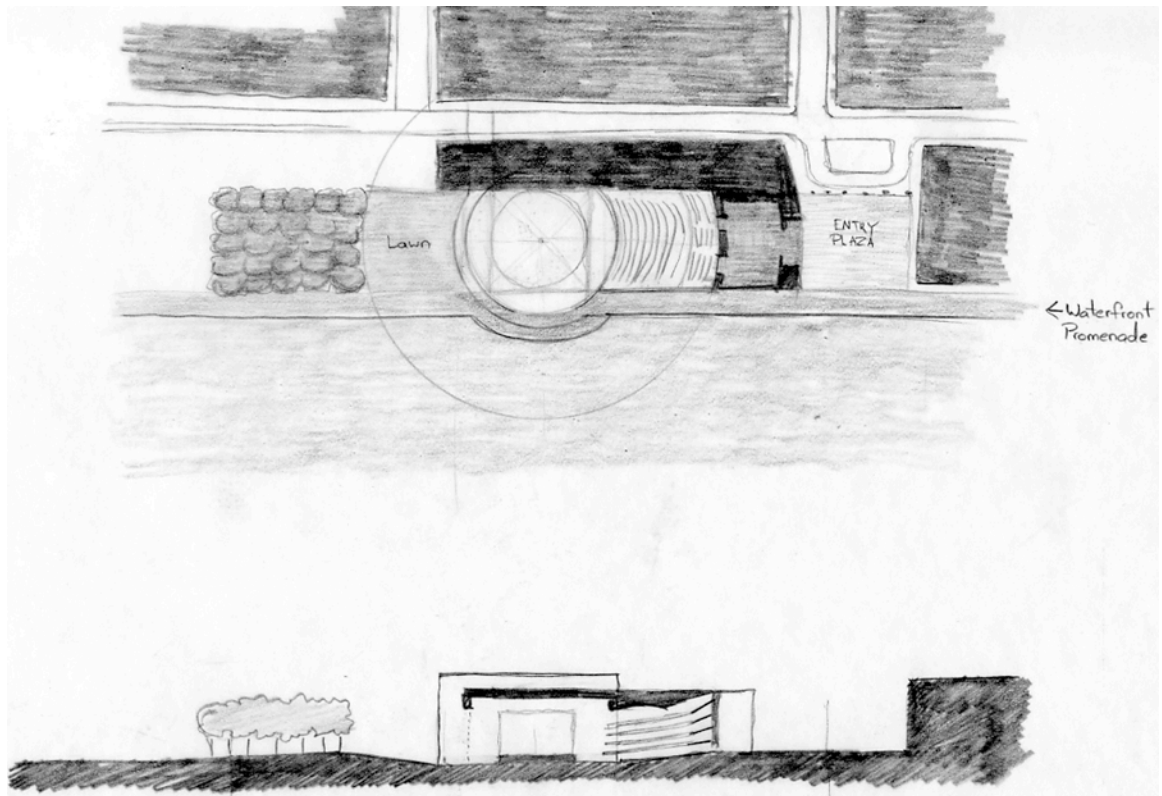


Figure 134 Parti IV Plan and section of tripartite seating

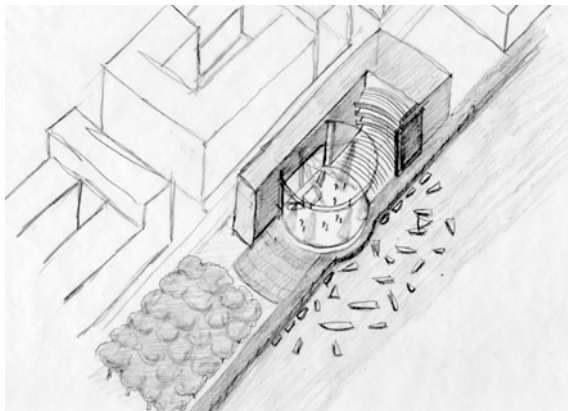
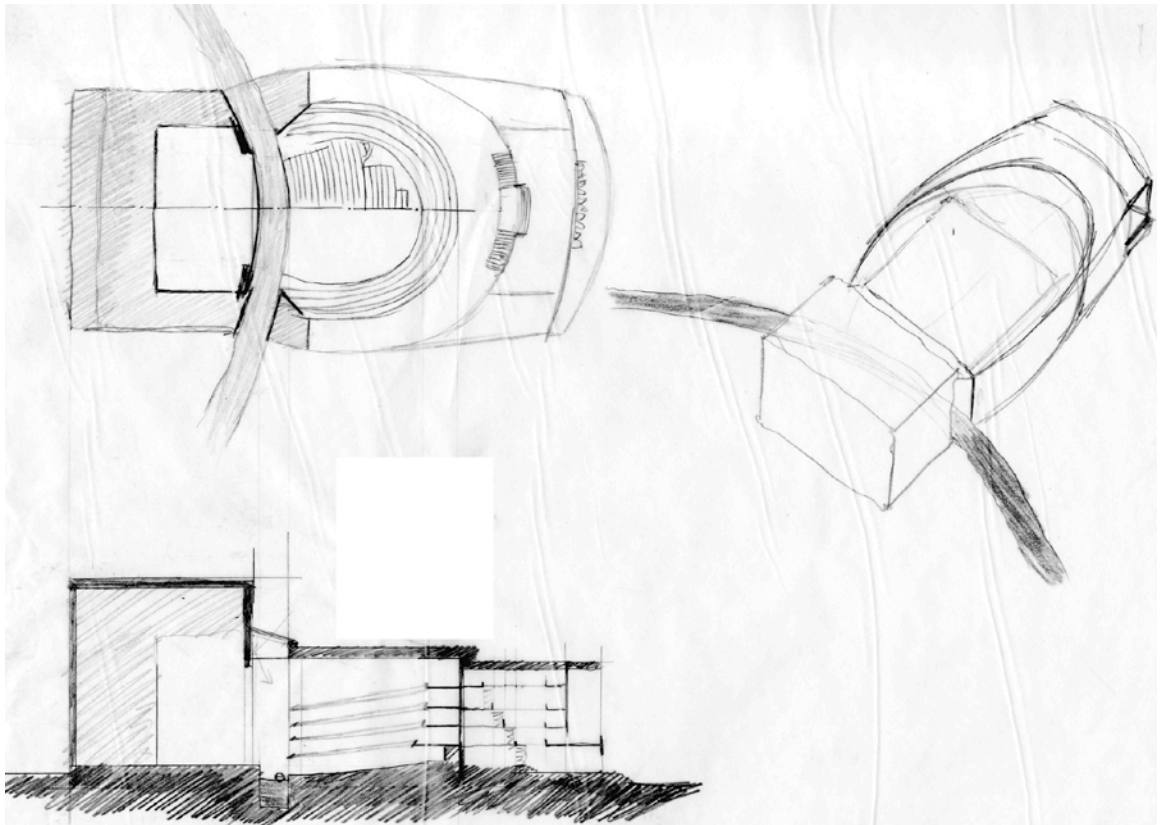


Figure 135 Parti IV axon of tripartite experience

## Building Parti V

Parti V explores a canal running through the building between the performers and the audience. This water feature could be a gesture to the water surrounding the site. It could also be a functioning waterway to allow boats through the performance hall.



**Figure 136 Parti V plan, section, & axon of water feature between performers and audience**

## Building Parti VI

Parti VI looks closer at the interior seating space. The balcony edges are located at the same radius from the performer, assuring a close and even viewing and listening experience.

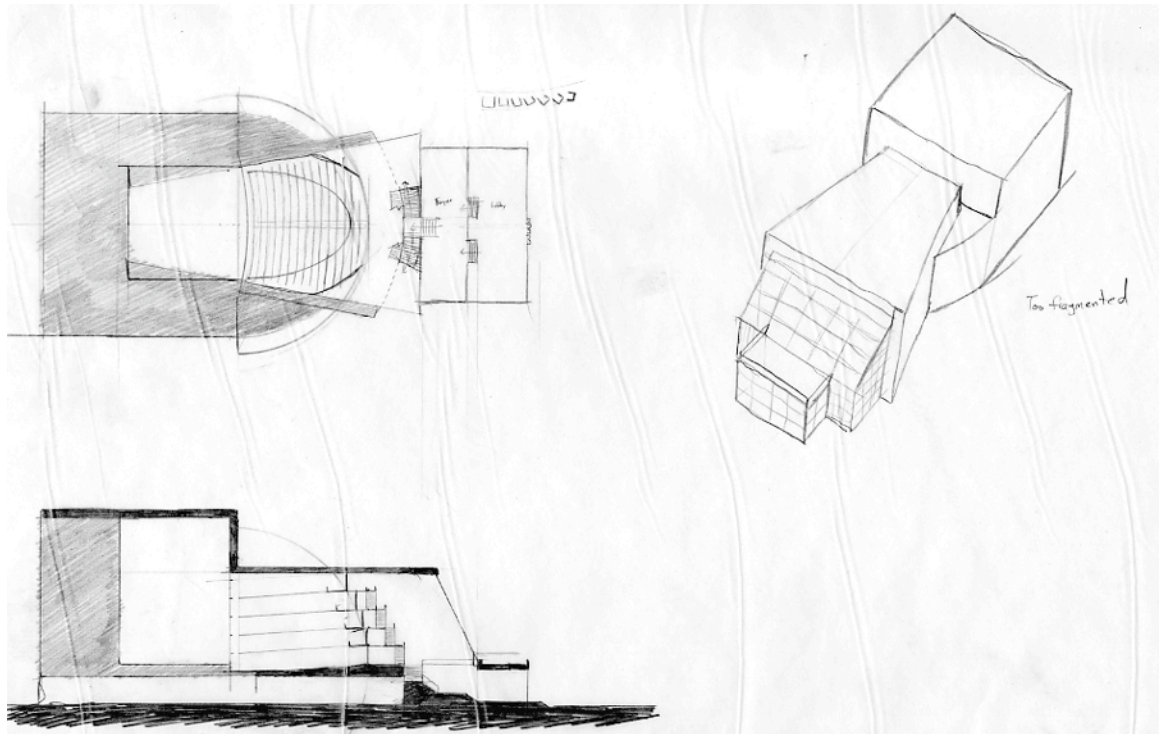


Figure 137 Parti VI plan, section, & axon based on equal viewing distance sphere

## Building Parti VII

Parti VII looks at placing a floating seating bowl in the harbor. This could allow small personal watercraft to dock between the performers and the audience to partake in the experience.

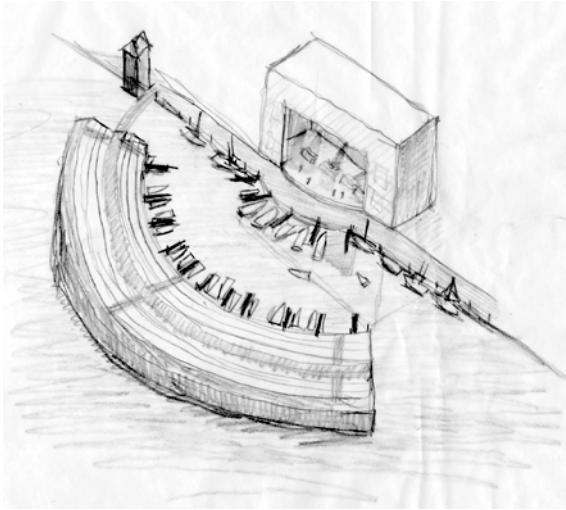


Figure 138 Parti VII axon of floating seating

## Building Parti VIII

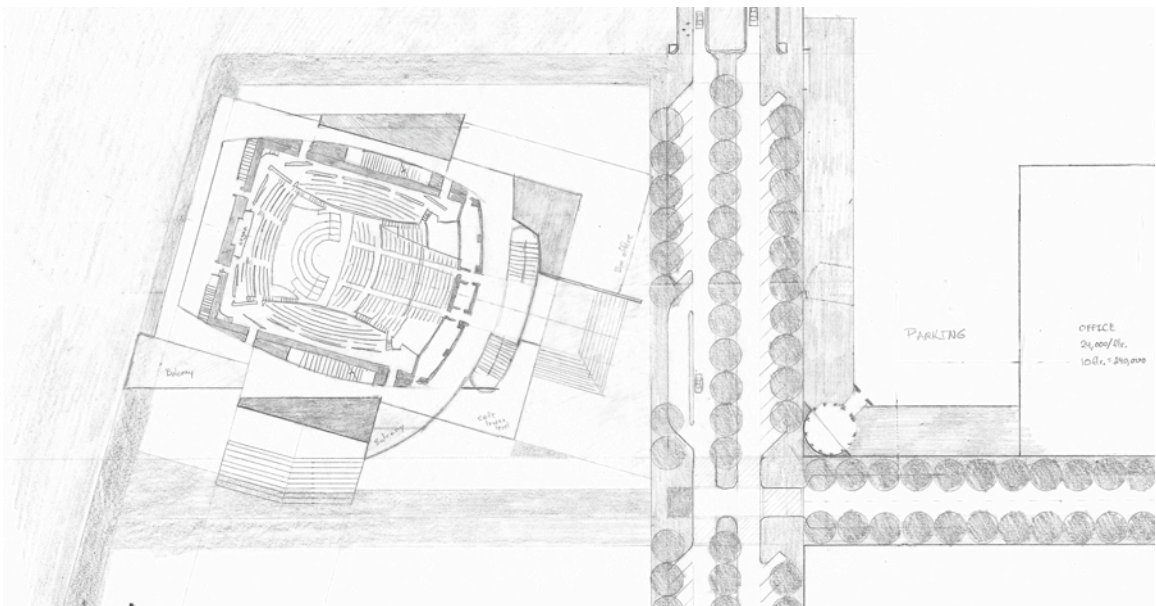


Figure 139 Parti VIII

Building Parti IX

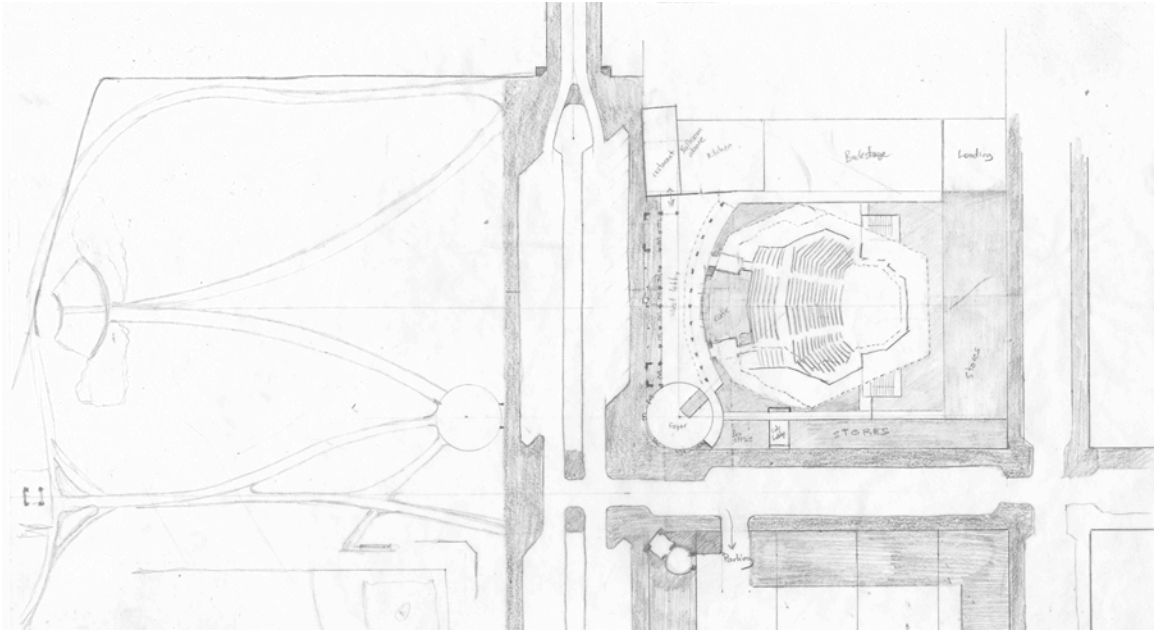


Figure 140 Parti IX

Building Parti X

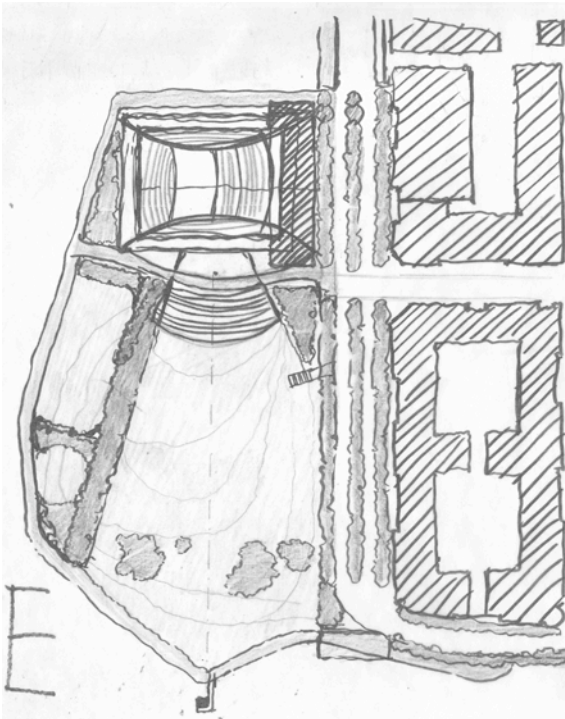


Figure 141 Parti X

Building Parti XI

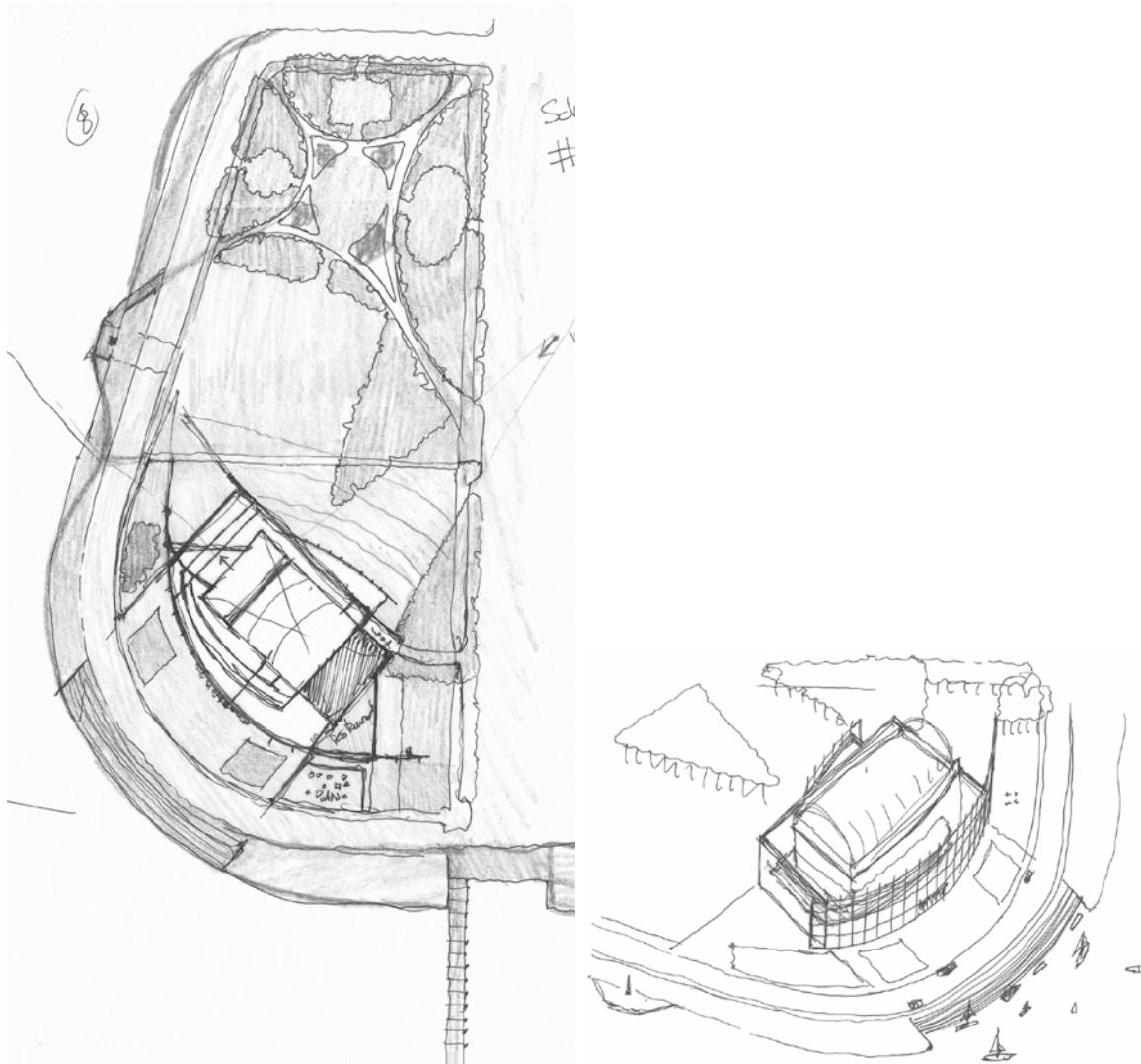


Figure 142 Parti XI plan and axon

Building Parti XII

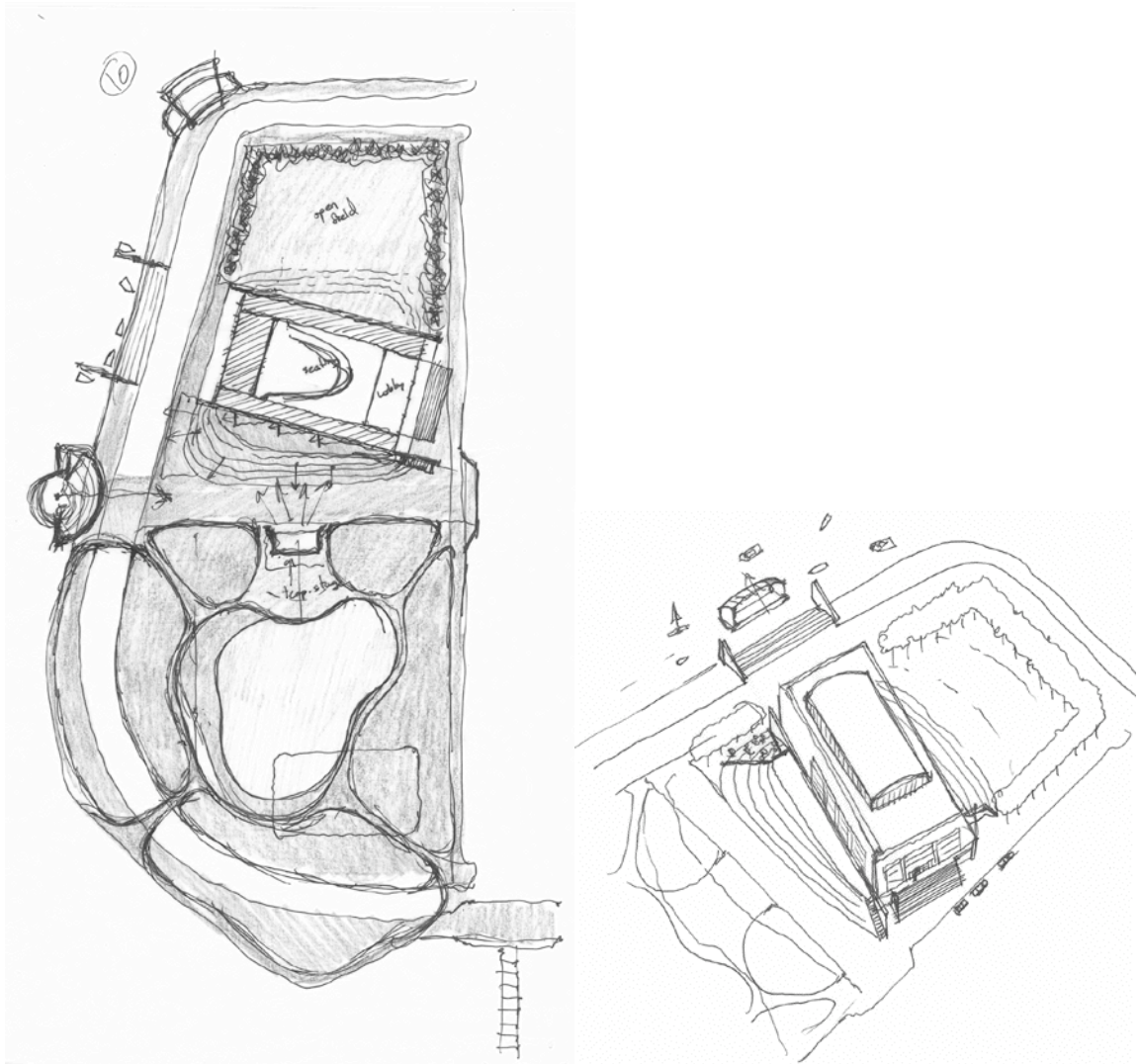


Figure 143 Parti XII plan and axon

Building Parti XIII

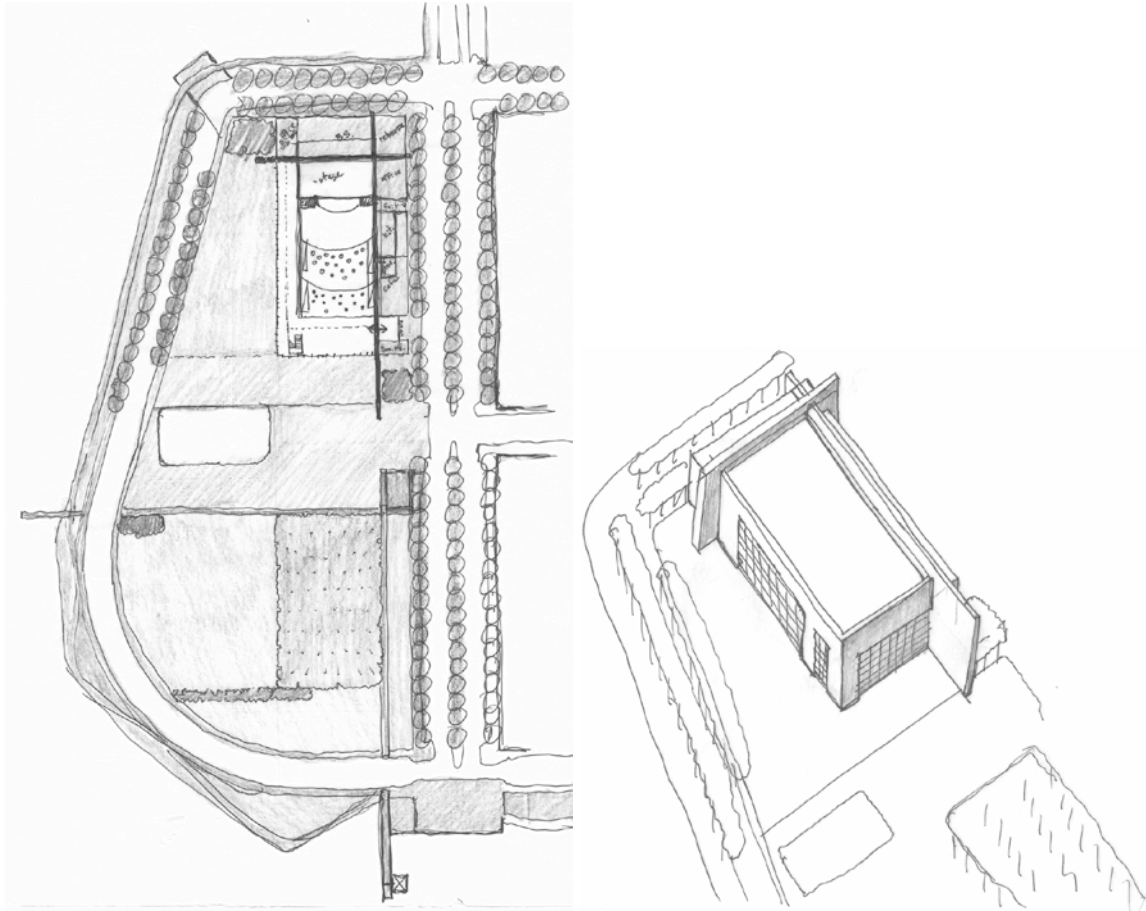


Figure 144 Parti XIII plan and axon

Building Parti XIV

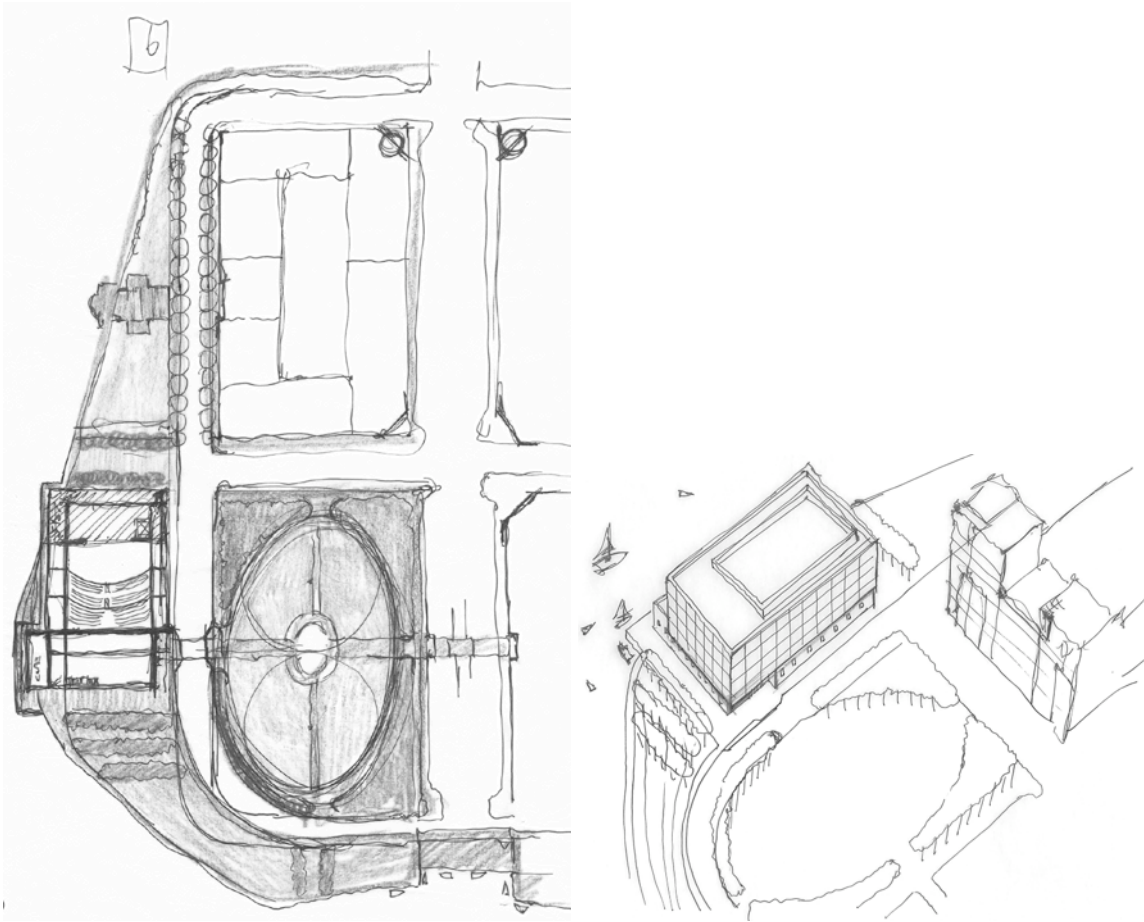


Figure 145 Parti XIV plan and axon

## Building Parti XV

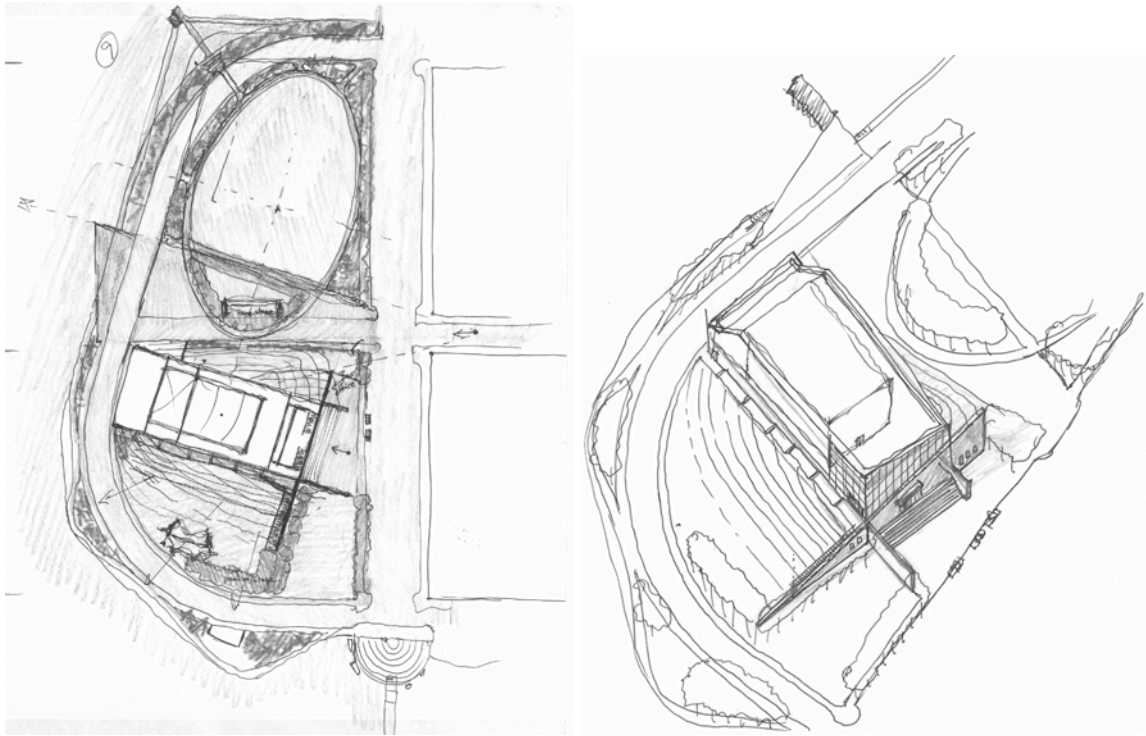


Figure 146 Parti XV plan and axon

Building Parti XVI

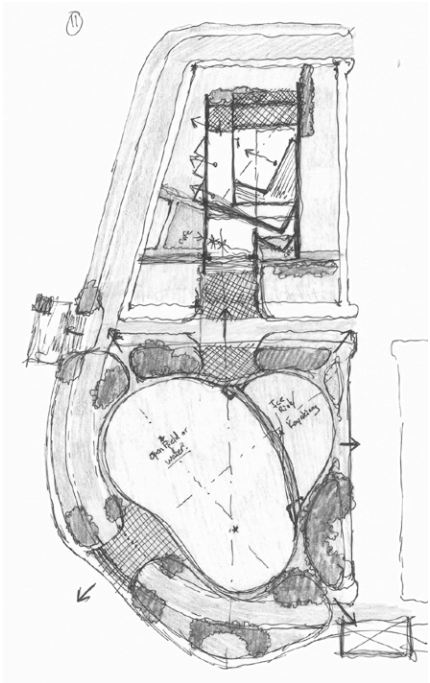


Figure 147 Parti XVI  
Building Parti XVII

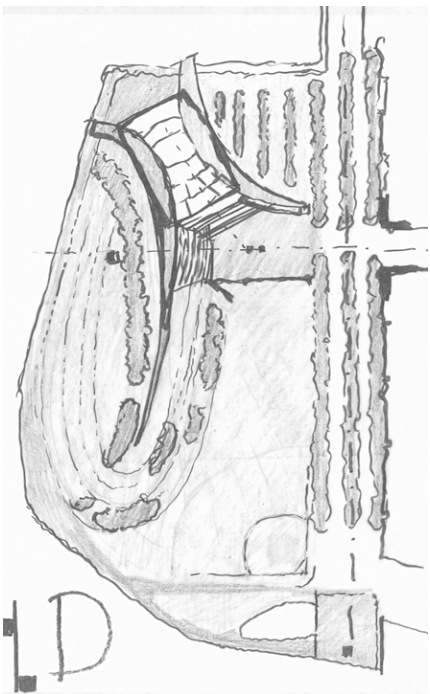


Figure 148 Parti XVII

## Building Parti XVIII

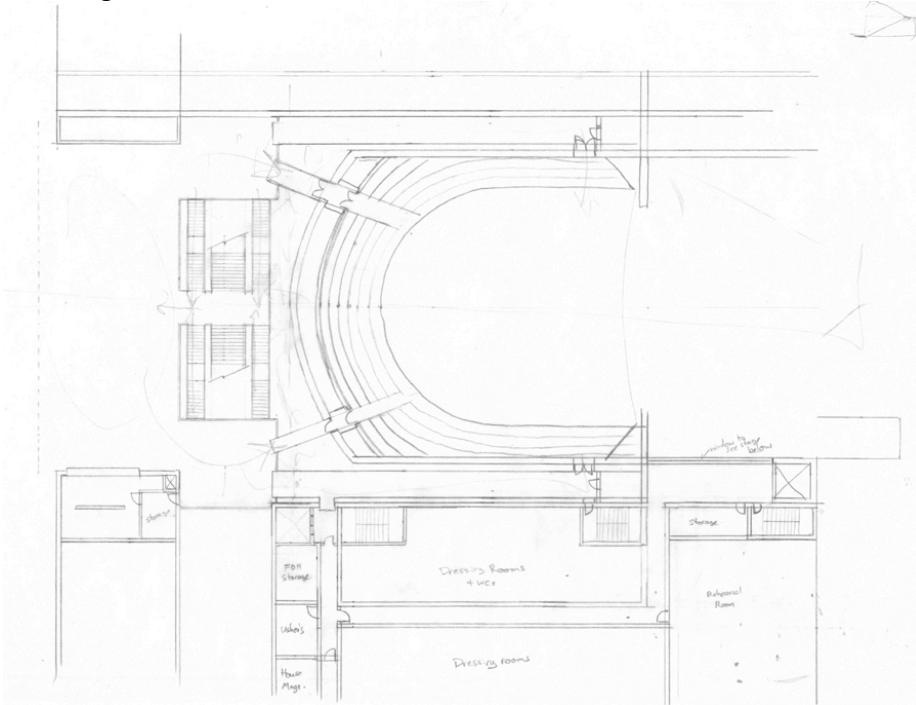


Figure 149 Parti XVIII

## Building Parti IXX

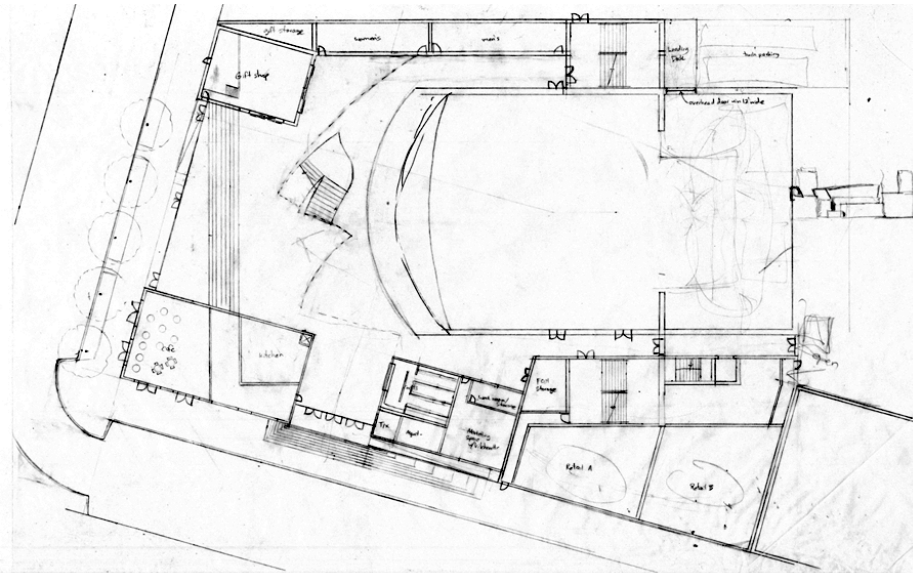
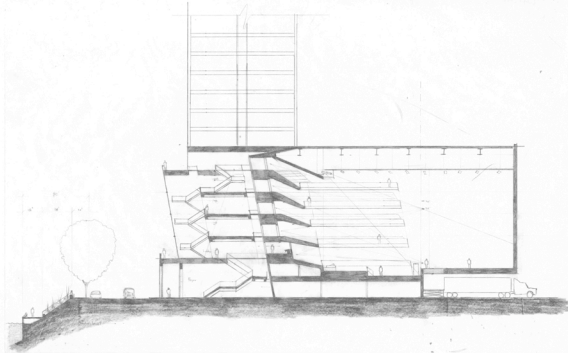
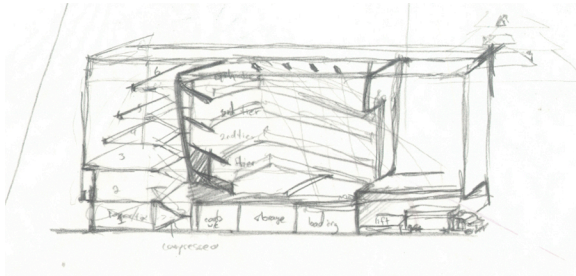


Figure 150 Parti IXX

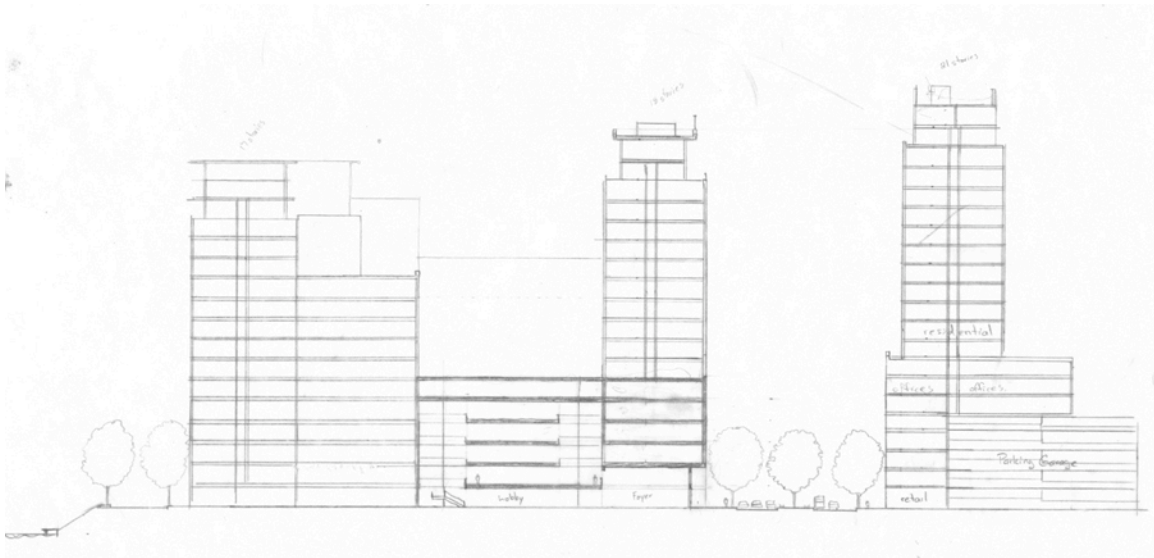
## Selected Building Section Studies



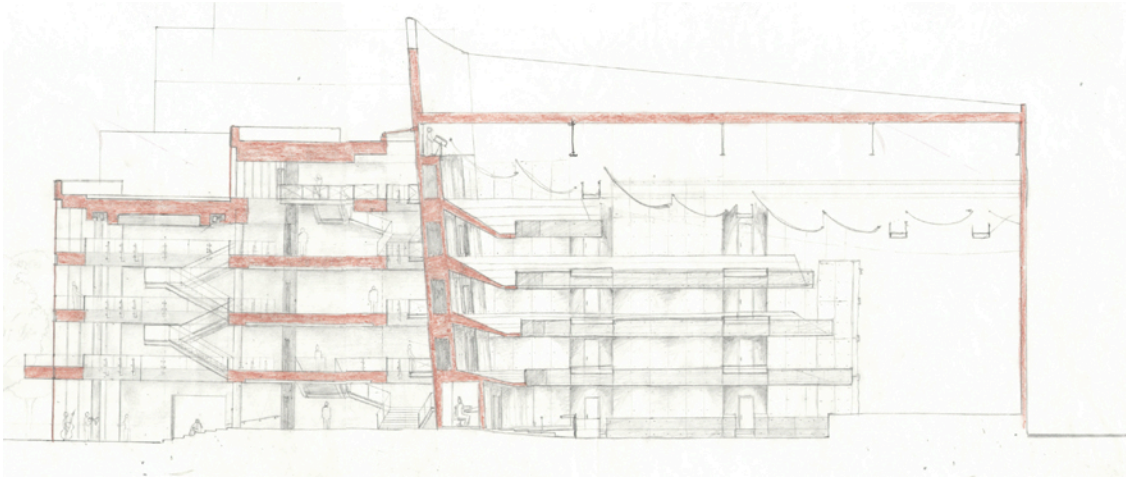
**Figure 151** This study looks at loading under the stage



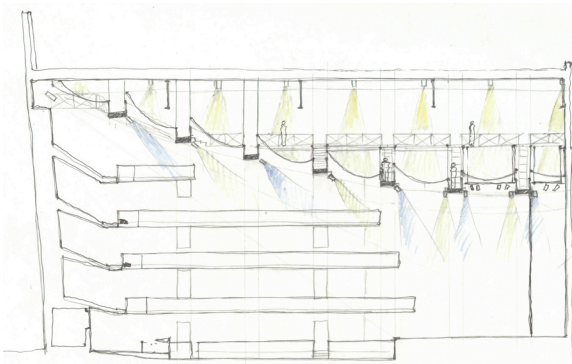
**Figure 152** Axon studies clarify the hall's volumetric relationship to the lobby and support spaces



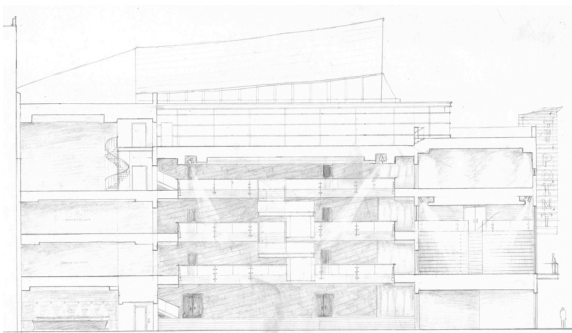
**Figure 153** An embedded hall retains the fabric edge with mixed uses above



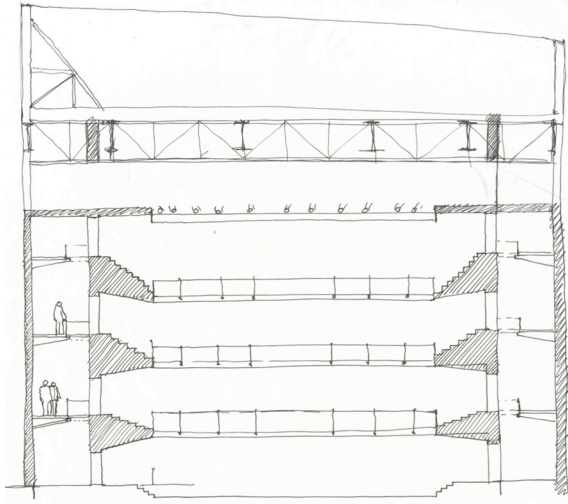
**Figure 154** An early study of a multi-layered lobby space of balconies, floor plates, and a skylight shaft adjacent to the back wall of the hall



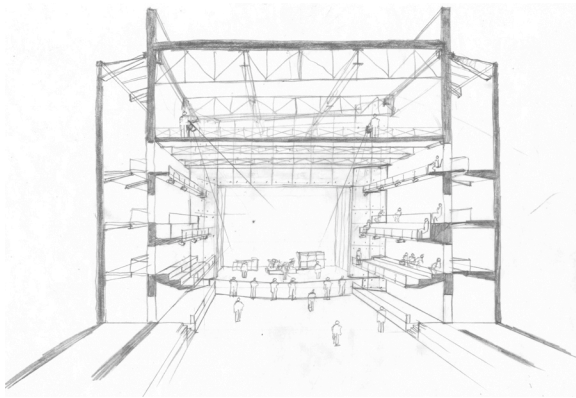
**Figure 155** An ceiling study showing catwalks that gently sweep down over the stage and audience to create a room with no proscenium



**Figure 156** This lobby section studies ideas about a less formal space for intermission performances



**Figure 157 Early hall sections study height to width ratios and sightlines**



**Figure 158 Section perspectives clarify the hall's interior volume and wall and ceiling designs**

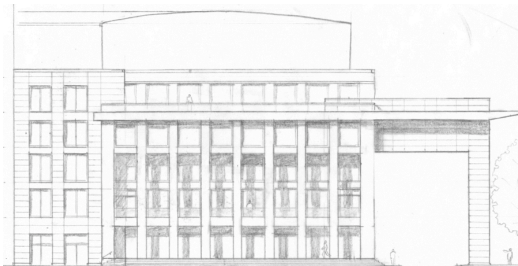
## Selected Elevation Studies

### Elevation Study I



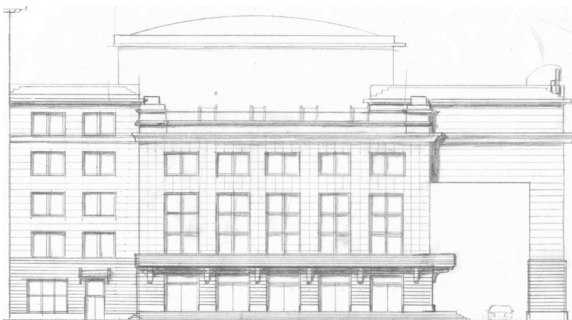
**Figure 159 Study I refers to Sullivan's Chicago Auditorium**

### Elevation Study II



**Figure 160 Study II looks at weaving a frame of horizontals and verticals**

### Elevation Study III



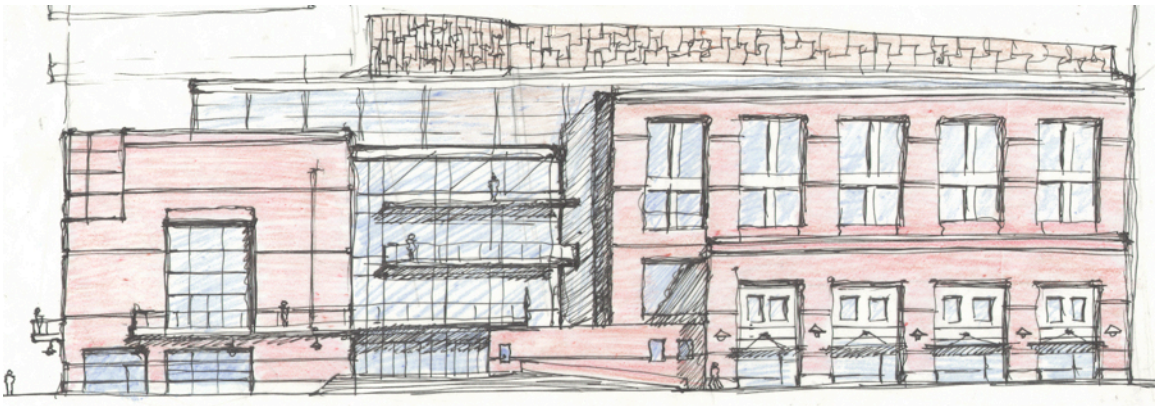
**Figure 161 Study III uses cladding system with exposed hardware similar to Wagner's Post Office Building**

### Elevation Study IV



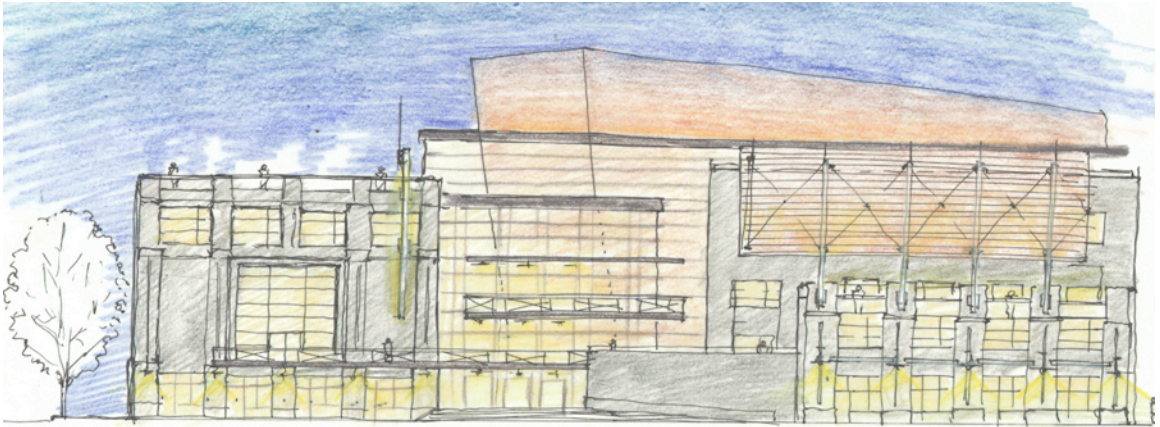
**Figure 162 Study IV continues study III's cladding to the east facade, creating a balanced asymmetry**

### Elevation Study V



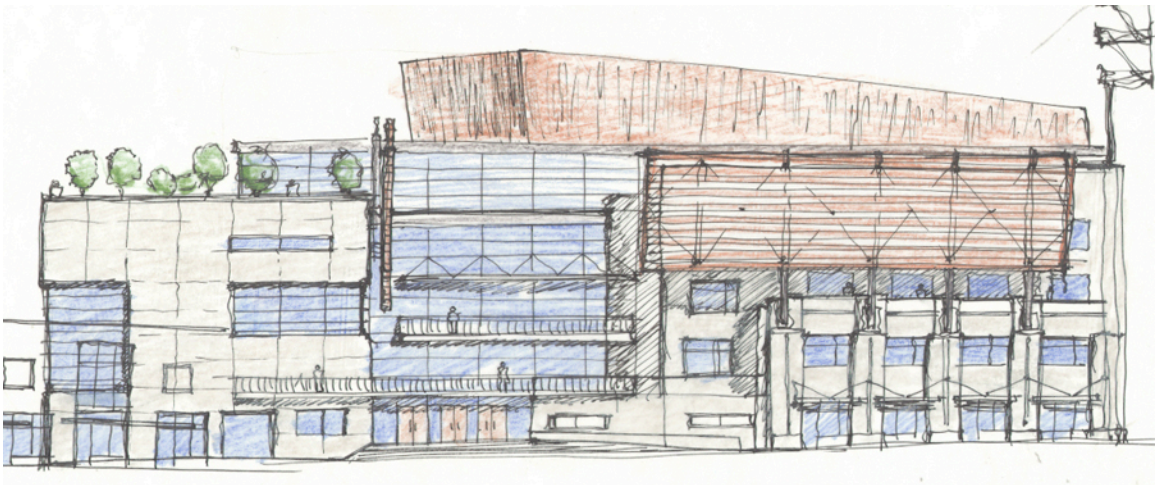
**Figure 163 Study V breaks volumes into pure solid and glass objects**

## Elevation Study VI



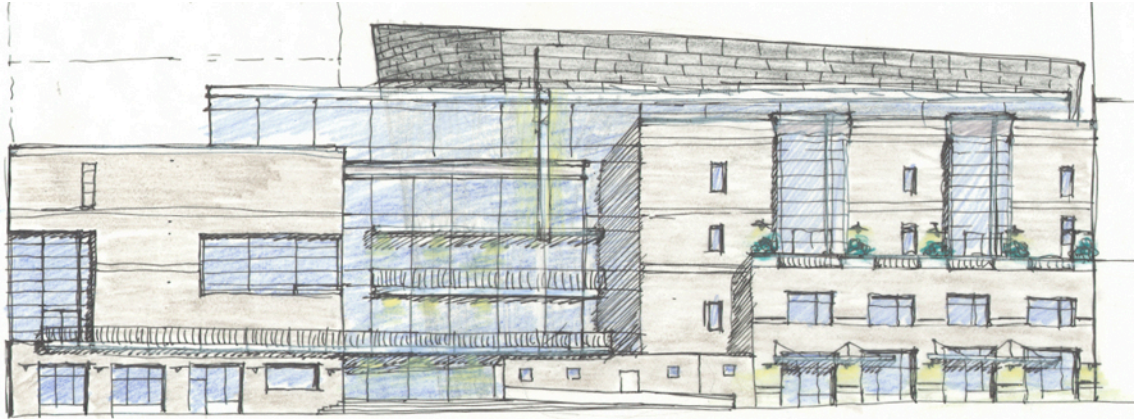
**Figure 164 Study VI looks at changes in material to signify public vs. private spaces**

## Elevation Study VII



**Figure 165 Study VII uses a curtain wall to mediate between a bay structure and corner windows**

## Elevation Study VIII



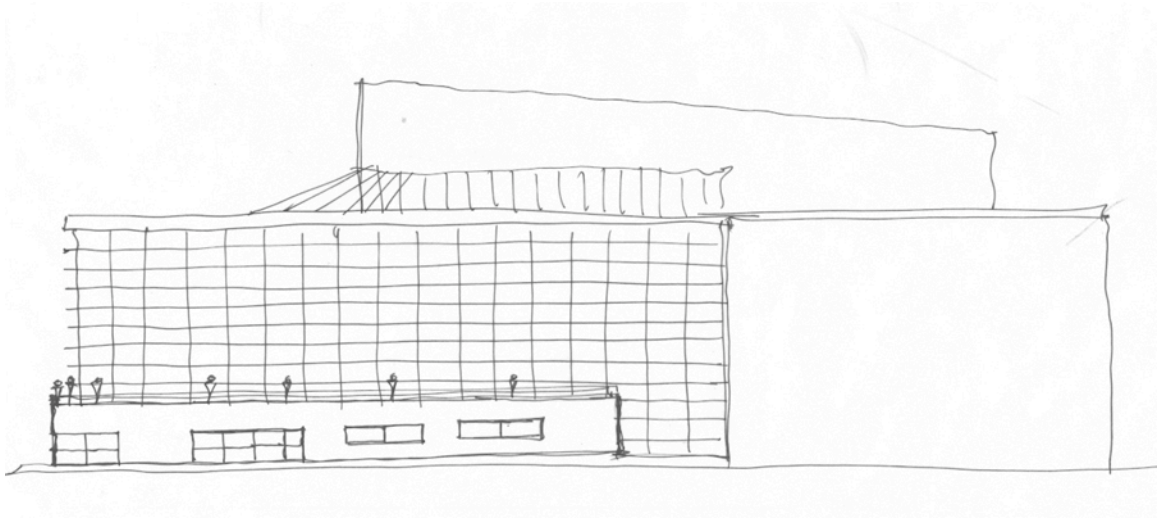
**Figure 166 Study VIII simplifies study VII**

## Elevation Study IX



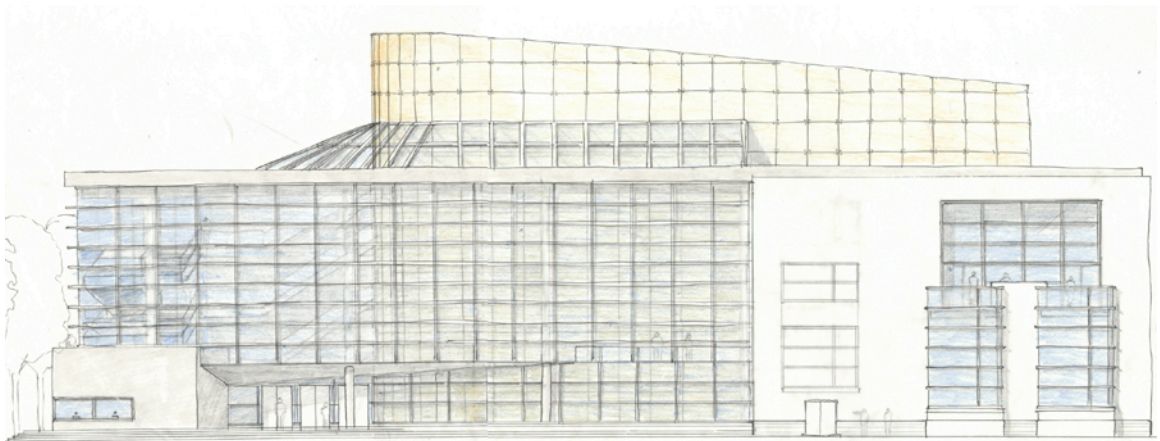
**Figure 167 Study IX attempts to break down a large curtain wall with repeating balcony bays**

## Elevation Study X



**Figure 168 Study X uses a street level mass to ground the large curtain wall**

## Elevation Study XI



**Figure 169 Study XI insets the door under a curtain wall to enhance the sense of threshold**

## Chapter VI: Design Conclusions

### **Urban Conclusions**

A thesis is a process of study that ultimately leads to a greater understanding of specifics allowing one to make informed decisions. The process for this particular thesis has resulted in a greater understanding of waterfront urban sites, mixed-use developments, regional parks, as well as the particulars of a music hall on such a site. The final scheme is driven by a series of decisions revolving around connectivity of the site to the greater city, imageability from within and around the site, and the enhancement of the site's genius loci that plays upon the pageantry already in place around Baltimore's waterfront.

The fabric itself is composed of 5 mixed-use blocks and two half blocks located along the existing canal at the north edge of the site. Primarily a residential community, Harbor Point will have retail and restaurant ground uses on the waterfront and park-front streets as well as the continuation of Central Ave. The building heights range from 80' to 200' averaging 120'. This allows lower buildings to mediate between the Fells Point fabric and taller buildings to maintain a strong urban edge along the proposed 8.5-acre park.

While the primary street network is an extension of the existing street grid from the North, an extension of Thames St. crosses along the northern edge of the park at an angle. This street recalls the location and angle of the primary street of the Allied Signal facility. The angle strengthens the urban scheme by creating a hierarchy to the park. The bulk of the park is located toward the west side, relating it back to the skyline of the CBD. By locating the park along the entire southern edge of the peninsula, it gains views

of the city's skyline, Locust Point across the harbor to the South, and well as the Key Bridge and out toward the Chesapeake Bay. Because an un-built-upon peninsula is so rare in an urban environment, it became very important to keep this panoramic vantage point of the entire city.

Connectivity to the existing fabric was a primary generator for the urban form of the final scheme. Central Avenue, which connects deep into the fabric of the city, is used as the primary connector of pedestrian and vehicular traffic to the site. This currently underutilized street is proposed as a new major North/South boulevard of mixed-use development that could spur great economic growth on the East side of the city. Its termination at the new Harbor Point Park and waterfront will finally give the existing residents on northern Central Ave. a connection to the harbor, creating a sense of place deep within the existing fabric.

The imageability at the south end of Central Avenue is very important in the scheme. Therefore, the tallest building on the site is on the southeast corner of Central Ave., across from the music hall. Together, the dynamics of scale of these two buildings creates a threshold to the new Harbor Point Park, and the waterfront beyond. The tallest building also acts as a signifier from within the city's fabric to locate the terminus of Central Ave. and the location of the park.

The pageantry of the proposed 6-mile waterfront promenade continues around the Harbor Point site. A pedestrian/vehicular bridge links Central Ave. over the existing canal along the north edge of the site. Here, the existing waterfront promenade crosses the canal from Inner Harbor East onto the Harbor Point site. The promenade continues along the northern and western edges of the site to the proposed water taxi stop at the

termination of the Thames Street extension. This is where the promenade expands into the Harbor Point Park. A large curve along the park's edge gives orientation. Several pavilions are located within the park including a restroom and food service pavilion at the terminus of Central Avenue. A public lookout tower on the south tip of the park acts as a visual terminus to Central Ave as well as an imageable mooring destination from elsewhere in the harbor. The promenade meets up with the existing promenade at the east edge of the site where the new Living Classrooms' campus is proposed.

The park itself is composed of a series of open flexible spaces for year-round use. A strip of water bisects the park as an extension of Central Ave, recalling the canal that used to run under the street. It is a visual signifier of the water retention system in place to collect rainwater and deposit it in a large retention pond on the east side of the park. This bio retention facility fronts the new Living Classrooms campus that acts as the eastern head to the park. The foundation uses the retention system as a didactic facility for inner-urban environmental sustainability.



**Figure 170 Context Plan**



**Figure 171 Context Section**

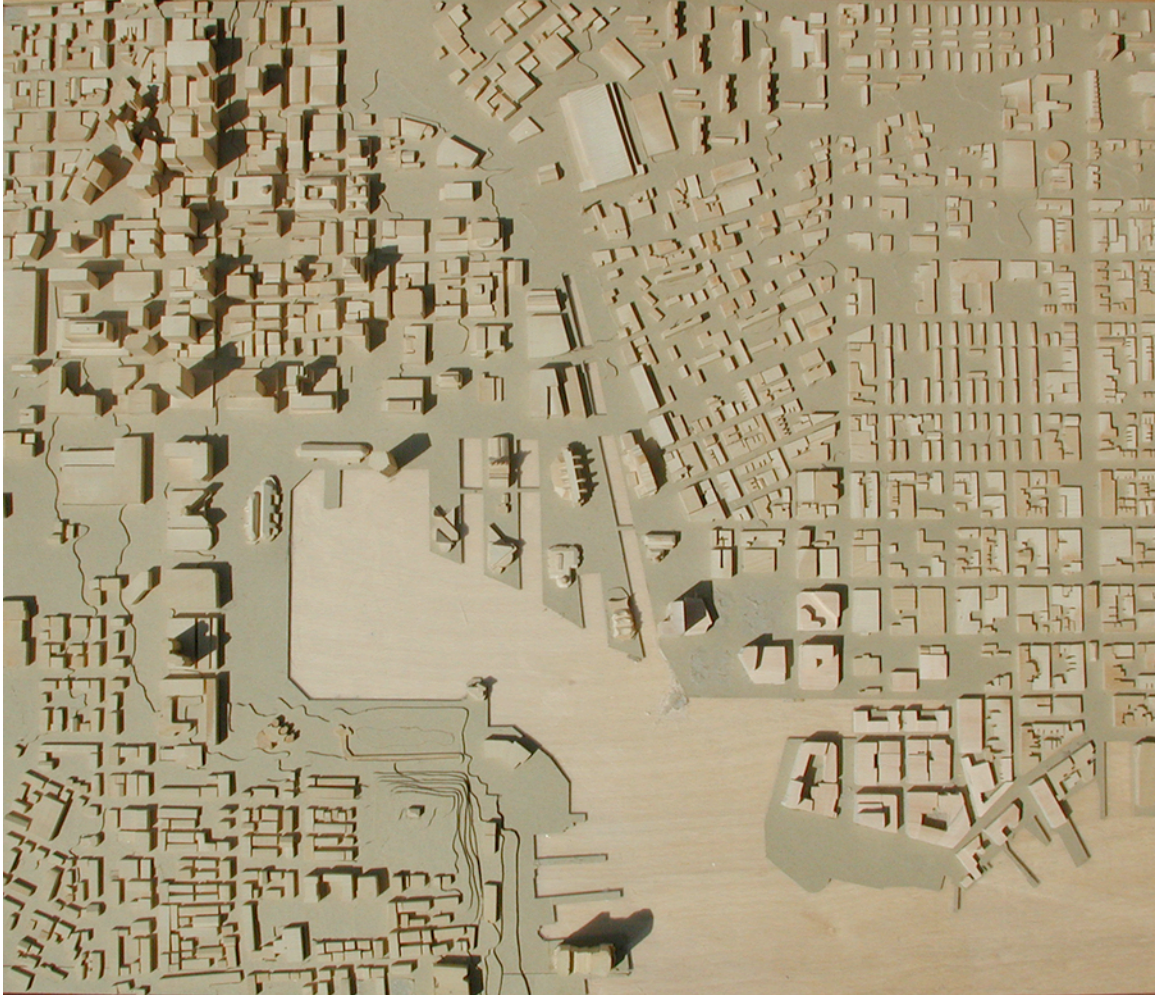


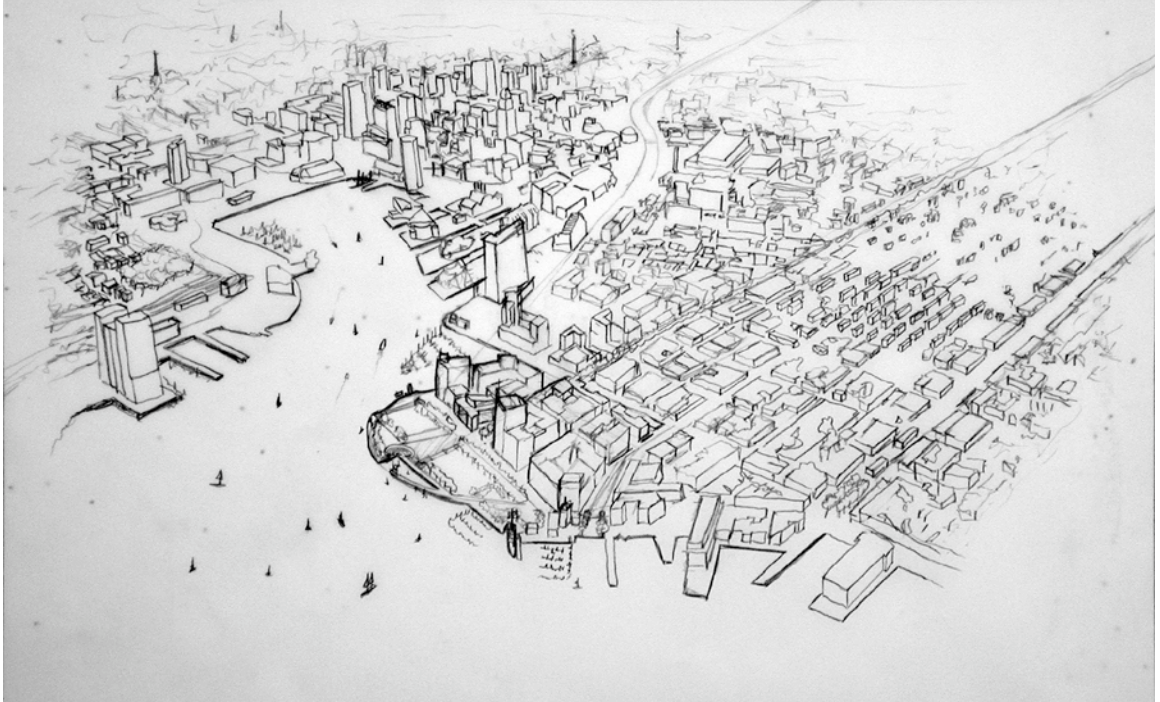
Figure 172 Context Model from Above



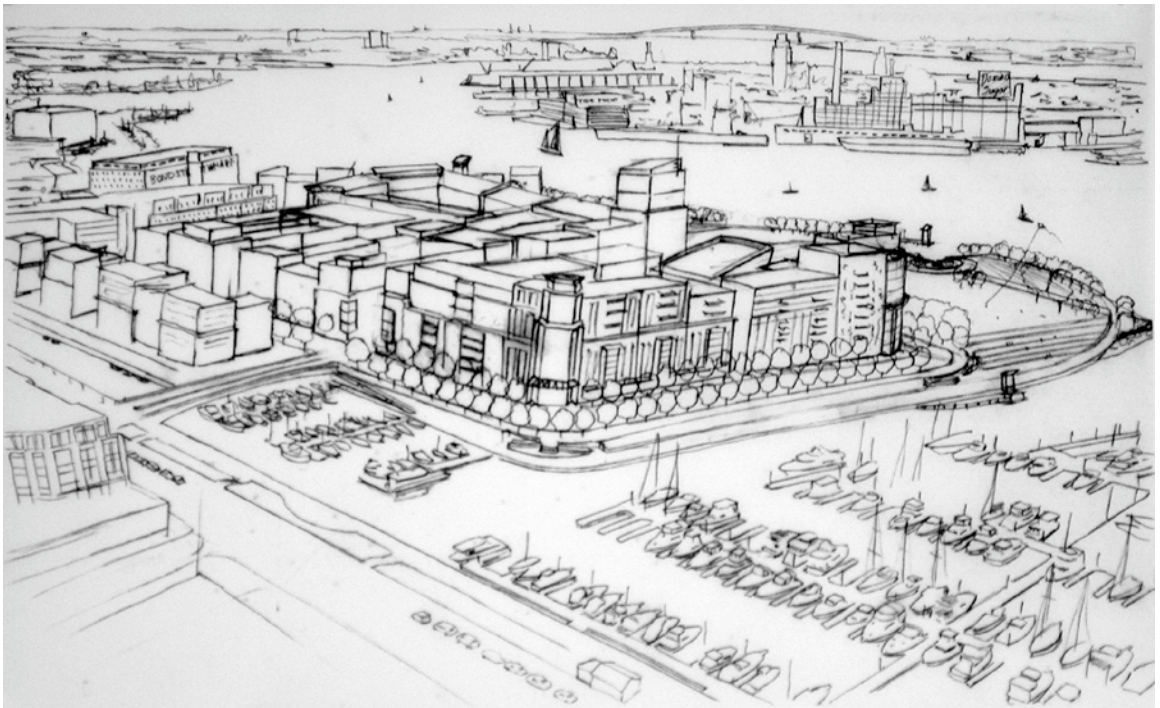
Figure 173 Context Model from South



Figure 174 Urban Diagrams: Parti, Figure Ground, Mass Transit, Promenade, Zoning



**Figure 175 Urban Aerial from Southeast**



**Figure 176 Urban Aerial from Northwest**



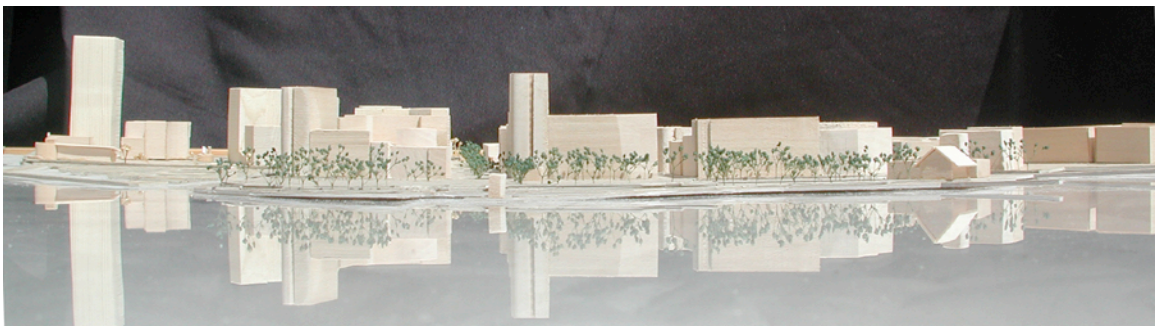
**Figure 177 Master Plan**



Figure 178 Site Model from Above



**Figure 179 Site Model from South**



**Figure 180 Site Model from Water Level South**



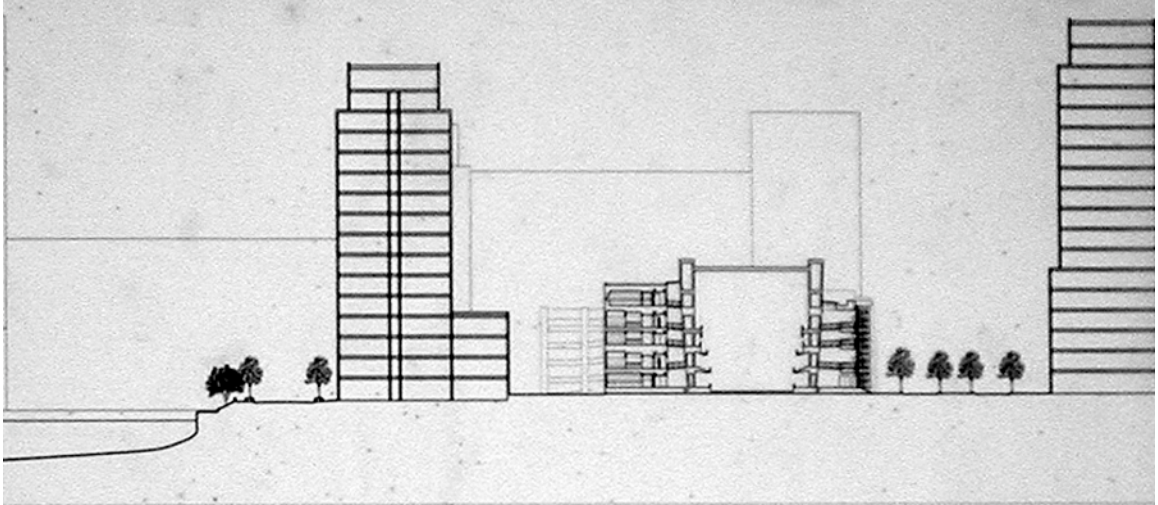
**Figure 181 Site Model from Southeast**



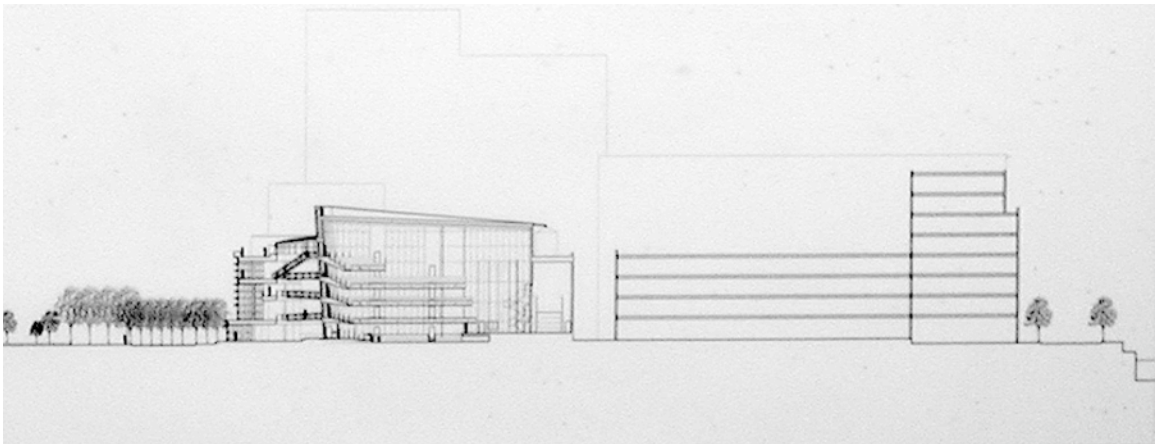
**Figure 182 Site Model from West**



Figure 183 West Block Plan



**Figure 184 Block Section Transverse**



**Figure 185 Block Section Longitudinal**

## **Music Hall Conclusions**

The decision to design a music hall came after in depth analysis of the all theater types including symphonic concert venues, opera houses, dramatic theaters, and interior and exterior amplified music venues. Research was conducted of all the major performance venues in Baltimore, including but not limited to the Meyerhoff Symphony Hall, Mechanic Theater, Hippodrome Theater, Center Stage Theater, Lyric Opera House, Pier 6 Pavilion, and First Mariner Bank Arena. The acoustics and building specifics of these venues were juxtaposed to the bar/club venues prevalent in the Fells Point area. Many of the aforementioned upscale venues seat approximately 2200-2600 people while a majority of the music clubs hold under 500. Pier 6 seats over 4000 while the arena seats over 10,000. Taking a closer look at the amplified music venues, it became apparent that the two large venues suffered from very poor acoustics and a complete lack of intimacy in comparison to the smaller scale clubs. However, it is difficult for small clubs to draw national acts because of their limited seating capacities. This study clarified the task of creating a medium size amplified music hall with world-class acoustics and a heightened sense of intimacy between the audience and the performer.

“The Point” Music Hall is located at the south end of Central Avenue, fronting the new Harbor Point Park. The primary promenade to the site is via Central Ave. from the north. By car, one would park in the mid-block parking garage north of the hall or across Central Avenue in parking garages. By foot, one could walk down Central Avenue from the proposed light rail stop at the intersection of Central Ave and Aliceanna St. The waterfront promenade and continuation of Thames St. link the site to the pre-existing

nightlife scene in Fells Point as well. The site can also be accessed via the proposed water taxi stop at the east end of Thames St.

The Parti of the building is generated from the imagery of a ship pulling into a port. The volume of the hall acts as the vessel that is moored alongside the 5-story bar of poche to the west. The lobby space, a cranked rectangle relative to north south, is understood in relationship to the pure mass of the hall. All points within the public space of the building are understood in reference to the size and materiality of the hall itself. The floors of the lobby space are pulled away from the exterior faces of the hall, with a skylight wrapping the hall to further accentuate this disconnect. This raises the awareness of the music hall's distinct volume within a larger building. To enhance the threshold into the different tiers of the hall, "gang-plank" bridges soar across the lobby's void, puncturing the hall at 6 locations per floor. The tectonics of these planks are strikingly different from that of the lobby balconies to increase awareness of their uniqueness in the procession to the hall. The bridges are also sloped, both up and down, to propose a tenuous relationship between the stability of the lobby and the dynamism of the hall.

By keeping the diagram very clean, the poche became very flexible over the course of laying out program throughout the building. All public spaces are located on the south side of the music hall. The northeast houses the musician's backstage areas on 4 floors. The northwest houses the stage crew areas, mechanical spaces, and administrative suite above. All food services are in the southeast bar of the building. A street-front café is used for concessions during performances. Its ground level kitchen

services the second and third floor concession areas above. A fine dining restaurant is located on the 4<sup>th</sup> and 5<sup>th</sup> levels, gaining access to the roof terrace overlooking the park.

The exterior of the hall is clad in coated copper panels. This highly reflective surface adds to the dynamism of the space by reflecting light and the movement of people throughout the lobby space. The copper continues above the skylight to create a skyline defining volume above the roof of the building. The remainder of the building is clad in limestone panels organized in a stacked bond. Floor surfaces include slate and carpeting for sound absorption in the public spaces.

The shape of the hall's interior is driven by acoustic and intimacy considerations. To keep the volume as small as possible, the rear, side, and overhead planes are brought close to the stage. They are then clad with acoustic panels for sound absorption. The main floor of the hall is flat to allow both standing room and temporary seating to be used. The stage is 5' above audience floor level for clear sightlines from anywhere within the standing section. To prevent obstructed sightlines, a seating tier rings the audience floor. To increase intimacy and obtain a critical mass of viewers, a series of 4 upper tiers ring the audience below, giving clear sightlines to the stage while keeping the upper audience close to the stage.

The tectonics of the hall are partially exposed in the ceiling plane for functional and aesthetic reasons. Catwalks cross the seating and stage area every 30'. These are used as spotlight and light rigging locations both for the stage and the audience. Between the catwalks are large draped sound dampeners. These absorb reverberation and decrease the volume of the hall during amplified performances. For an acoustically "live" sound, these can be pulled taught by individual pulley systems which allow the sound to reflect

off the underside of the roof surface, increasing the hall's volume and reverberation time. Each sound dampener can be individually controlled to effectively "tune" the hall to the performers' preference.

The hall's architecture connects the audience to the musicians in several ways. The continuous ceiling plane above the listeners and musicians gives the "room" a single identity rather than a seating and separate stage area. A proscenium is deemed inappropriate because of its ability to separate the performance from the audience. As a memory of the proscenium, the stairwells flanking the music hall protrude into the hall, creating a frame for the stage. On-stage, large moveable curtains define the un-seen backstage area from the audience. These curtains create a flexibility of stage size and perceived stage area to adjust to performers' requirements. Light rigging above the stage can also be raised and lowered to adjust the perceived ceiling height above the performance. The acoustic wall panels continue seamlessly from the audience to the stage area to continue the sense of a single room.

The halls' interior is clad in a neutral light grey acoustic panel system. This neutral tone allows the hall to take on a broad range of atmospheric qualities depending on the particular performance's lighting scheme. The suspended sound dampeners have a semi-translucent quality that allows them to be lit from above. This gives the ceiling a lightweight floating feeling and acts as the primary source of lighting before and between acts.

Overall, the "The Point" Music Hall attempts fill a void in the performance venues not only in Baltimore, but throughout the region. This mid-size hall balances audience size with specific attention to the audience's and musician's unique experiences.

Through the design of the entire building, there is a strong attempt to evoke emotions that can root this building in its context: the waterfront, the harbor, Fells Point, and the ever-thriving Baltimore nightlife.

## Conclusion

This thesis has been a fantastic learning experience about the process one must undergo to make informed decisions about the built environment. More important than the final urban and building designs were the didactic questions that came up throughout the thesis semester. Perhaps there are more questions now than there were when this project began, but these questions mean that the exploration has been a success. It has allowed a deeper understanding of an approach to design that will inform the exciting design challenges yet to come.

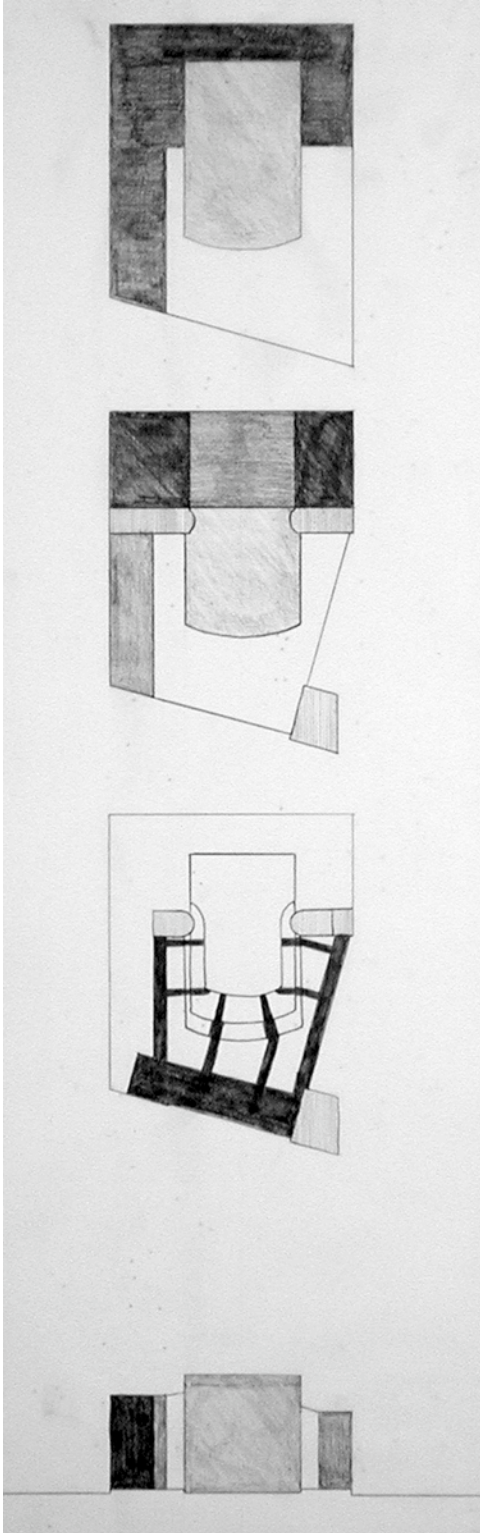
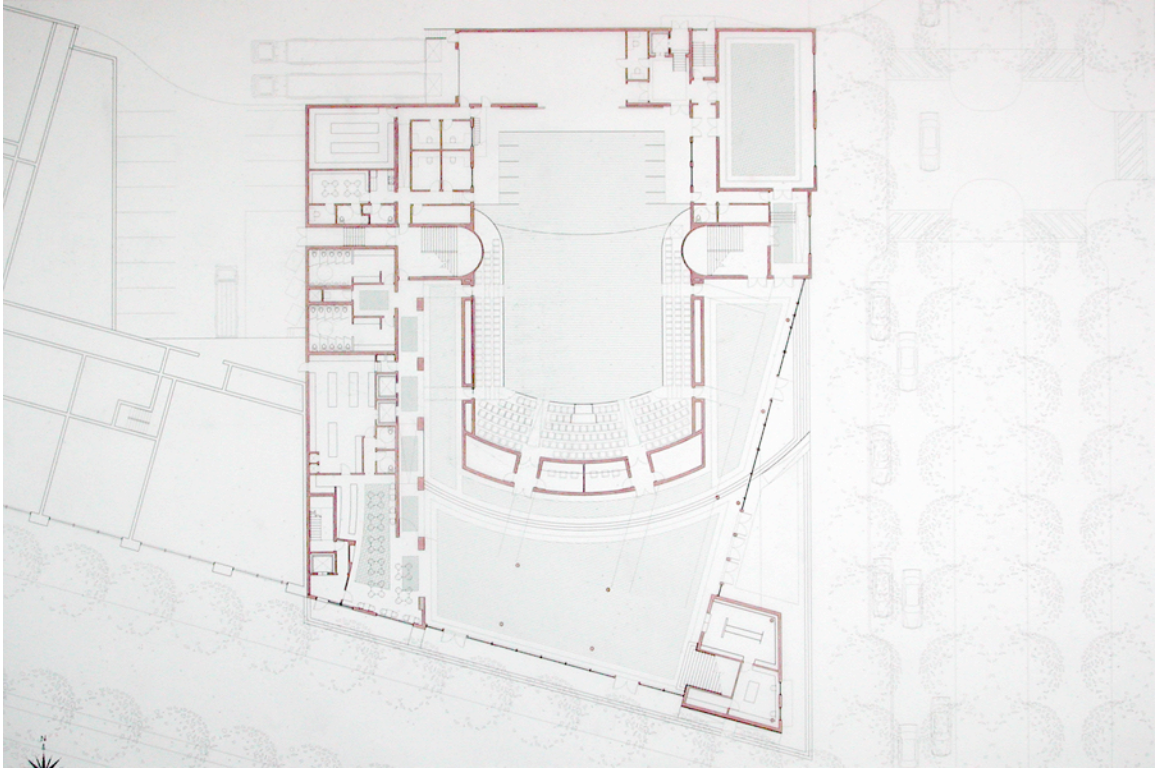
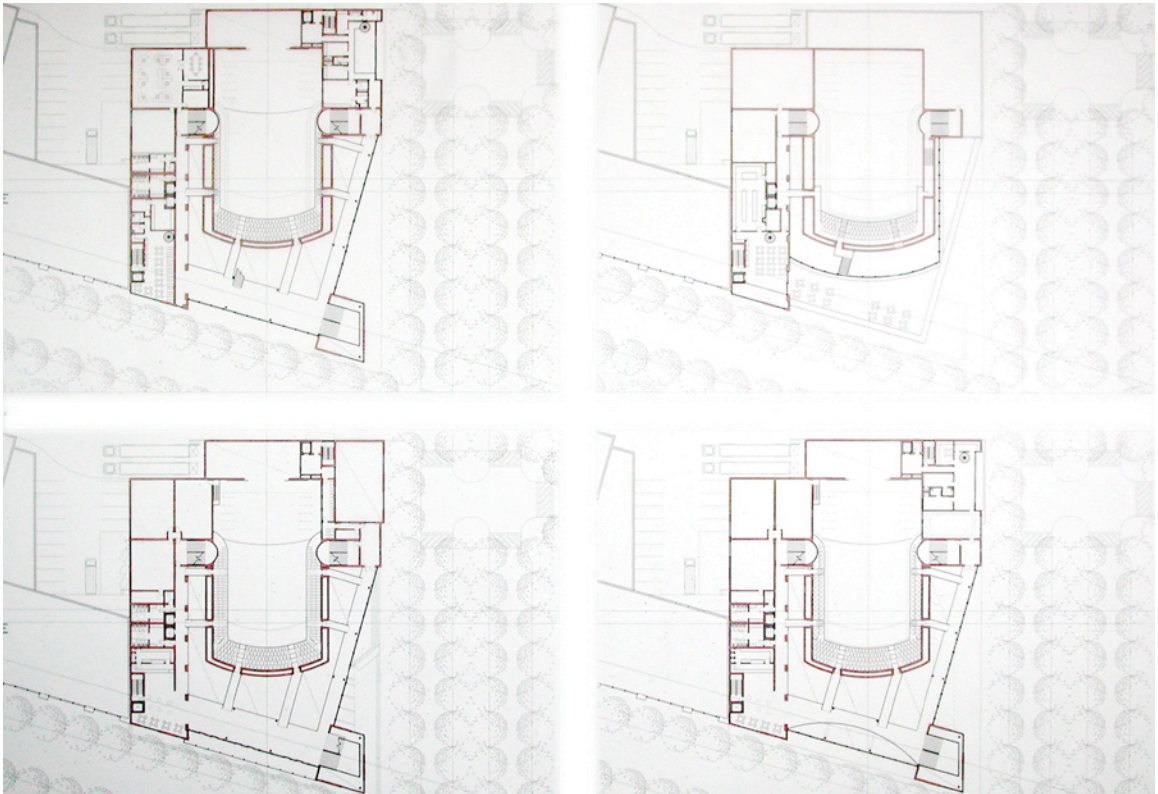


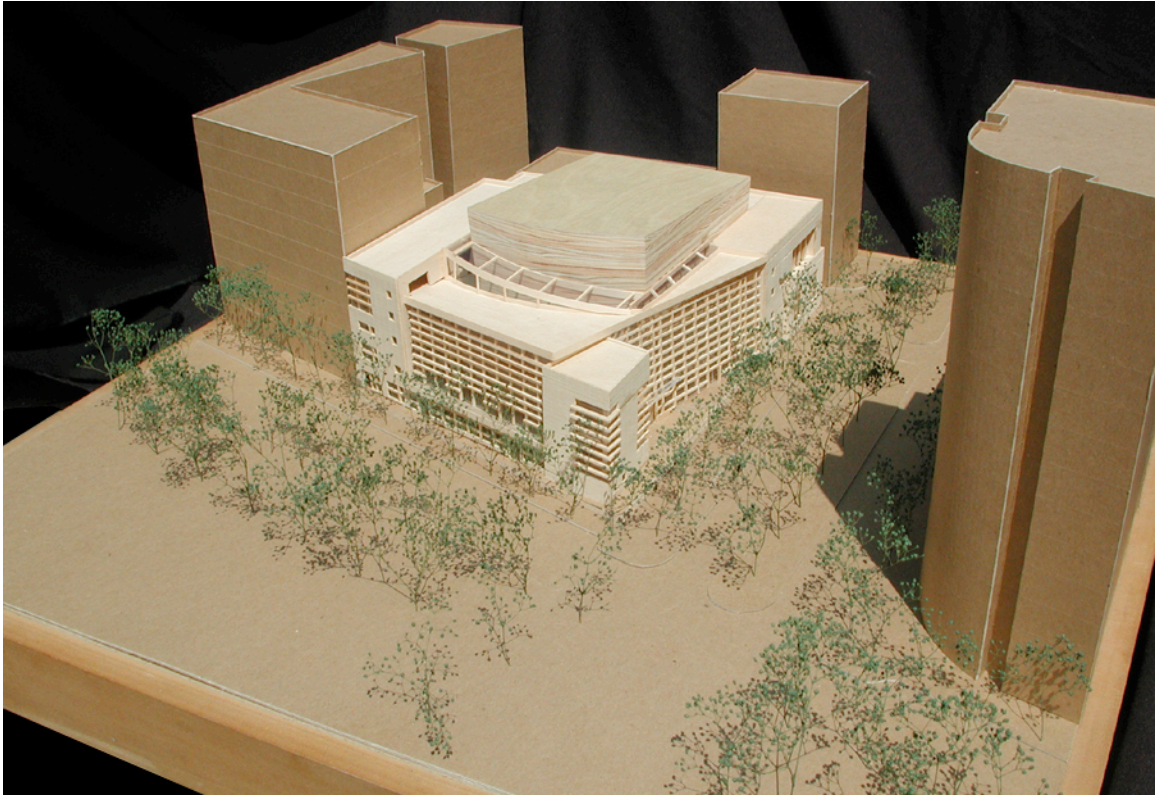
Figure 186 Building diagrams: Parti, Public vs. private zones, Primary Circulation, Sectional Parti



**Figure 187 Entry/First Level Plan**



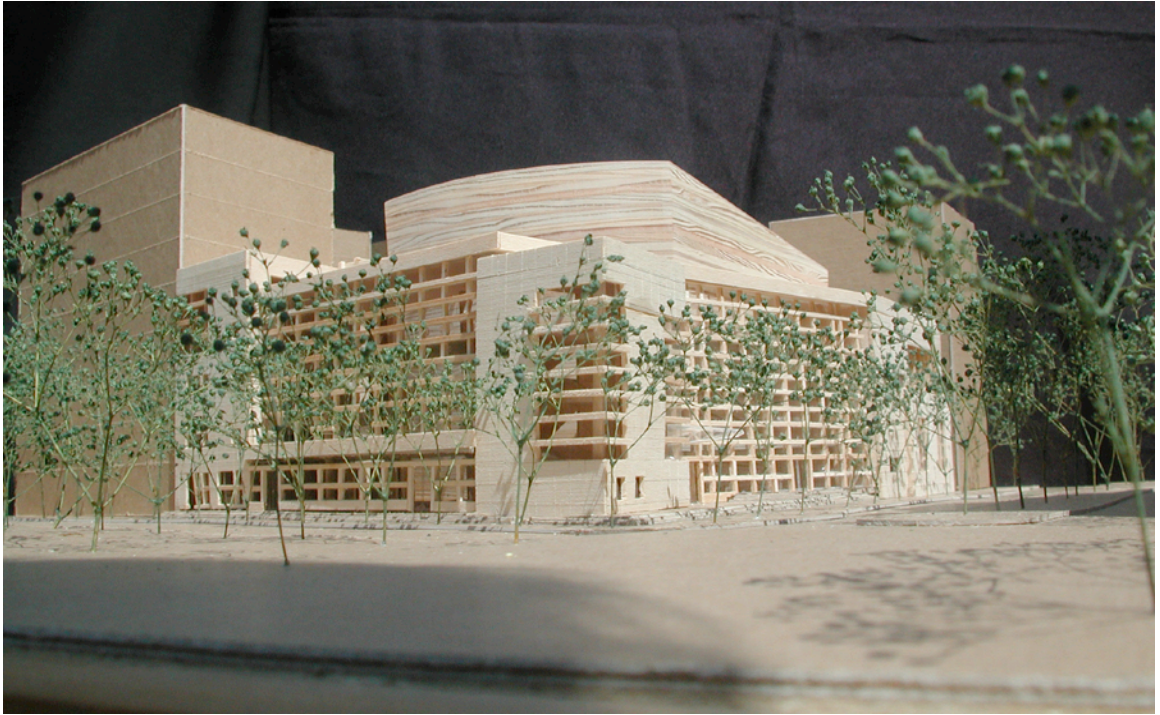
**Figure 188 2nd - 5th Level Plans**



**Figure 189 Music Hall Model from Southeast Aerial**



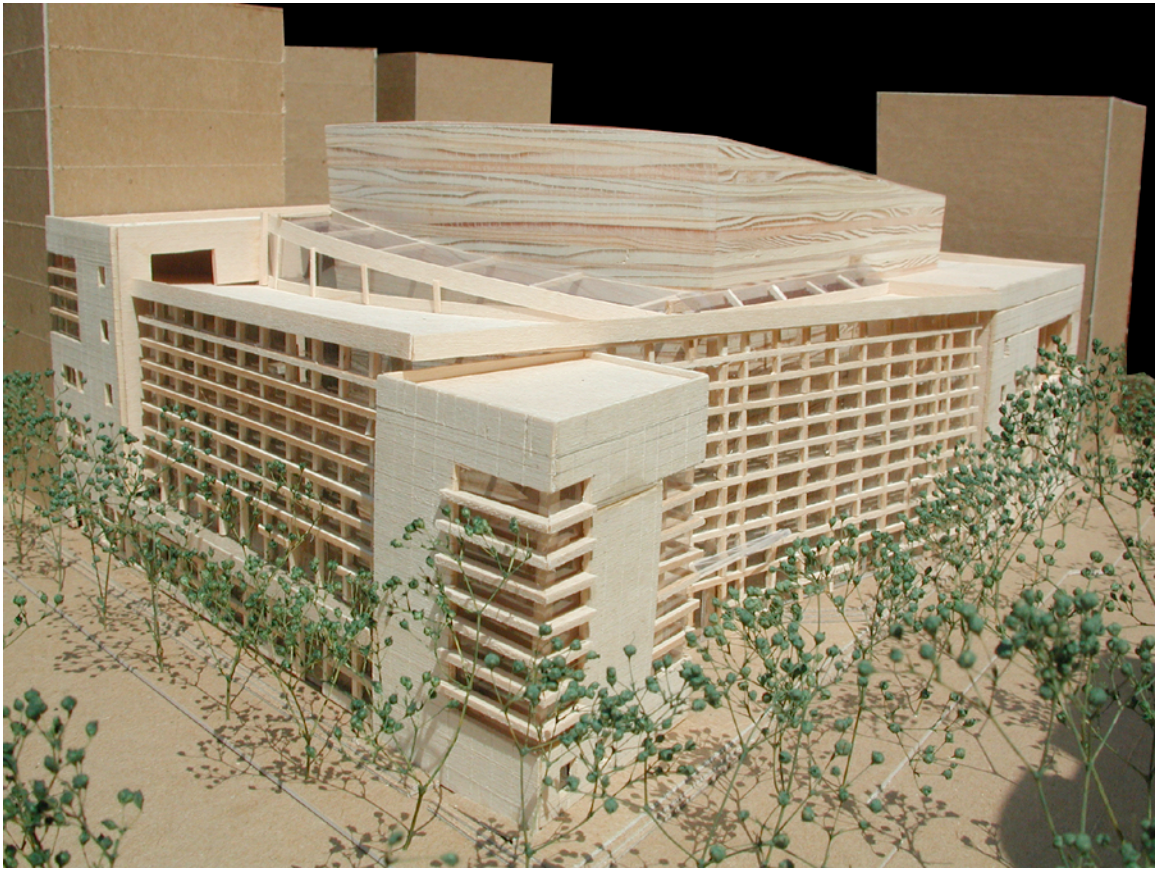
**Figure 190 Music Hall Model from Northeast Aerial**



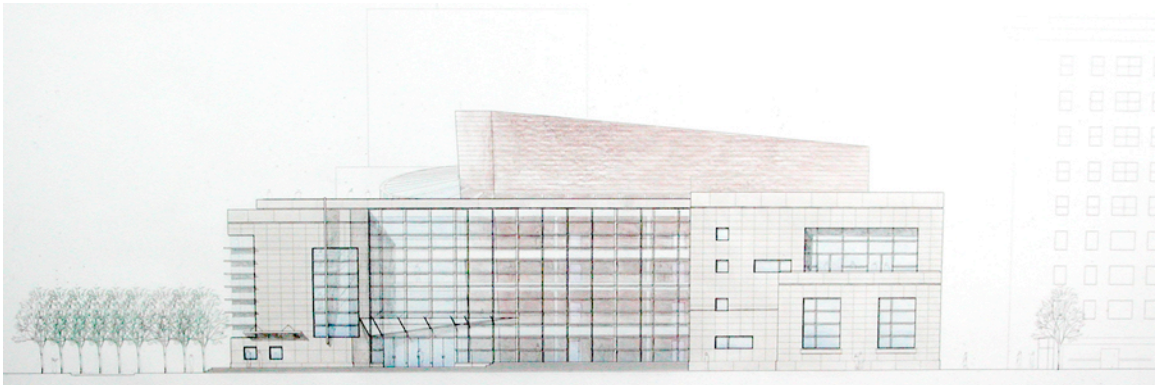
**Figure 191 Music Hall Model from Park**



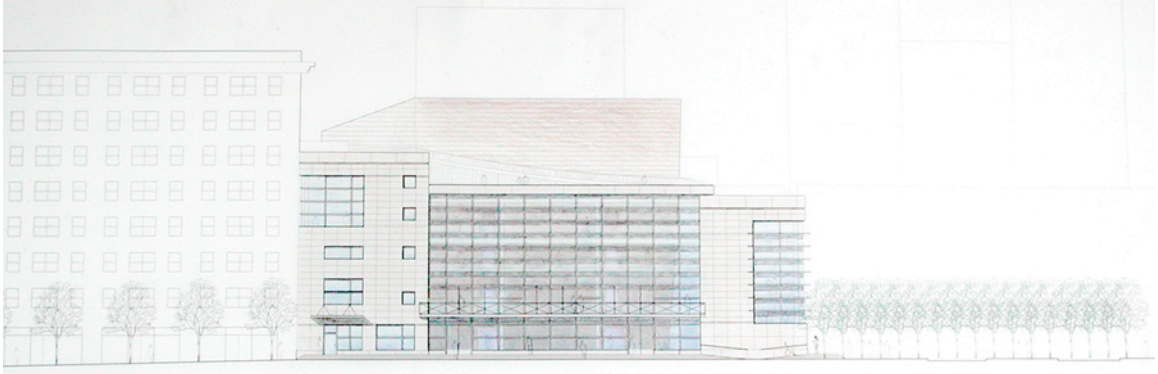
**Figure 192 Music Hall Model from Southwest Aerial**



**Figure 193 Music Hall Model from Southeast Aerial above Park**



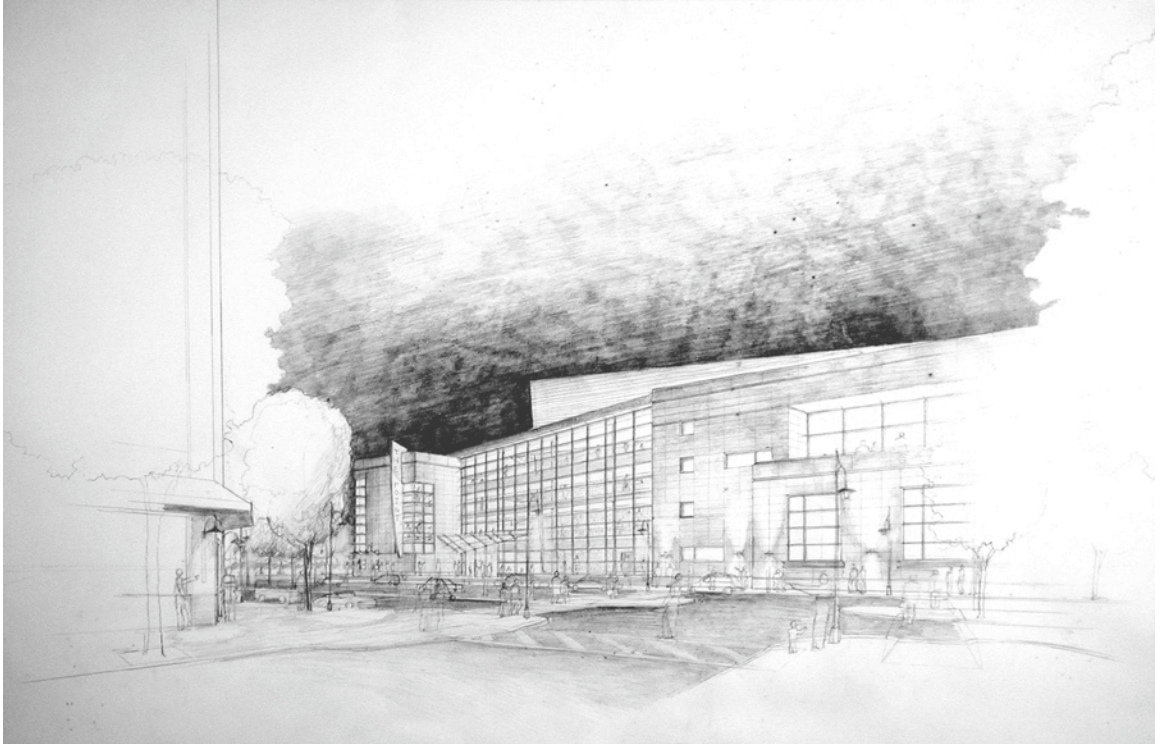
**Figure 194 East/Central Ave. Elevation**



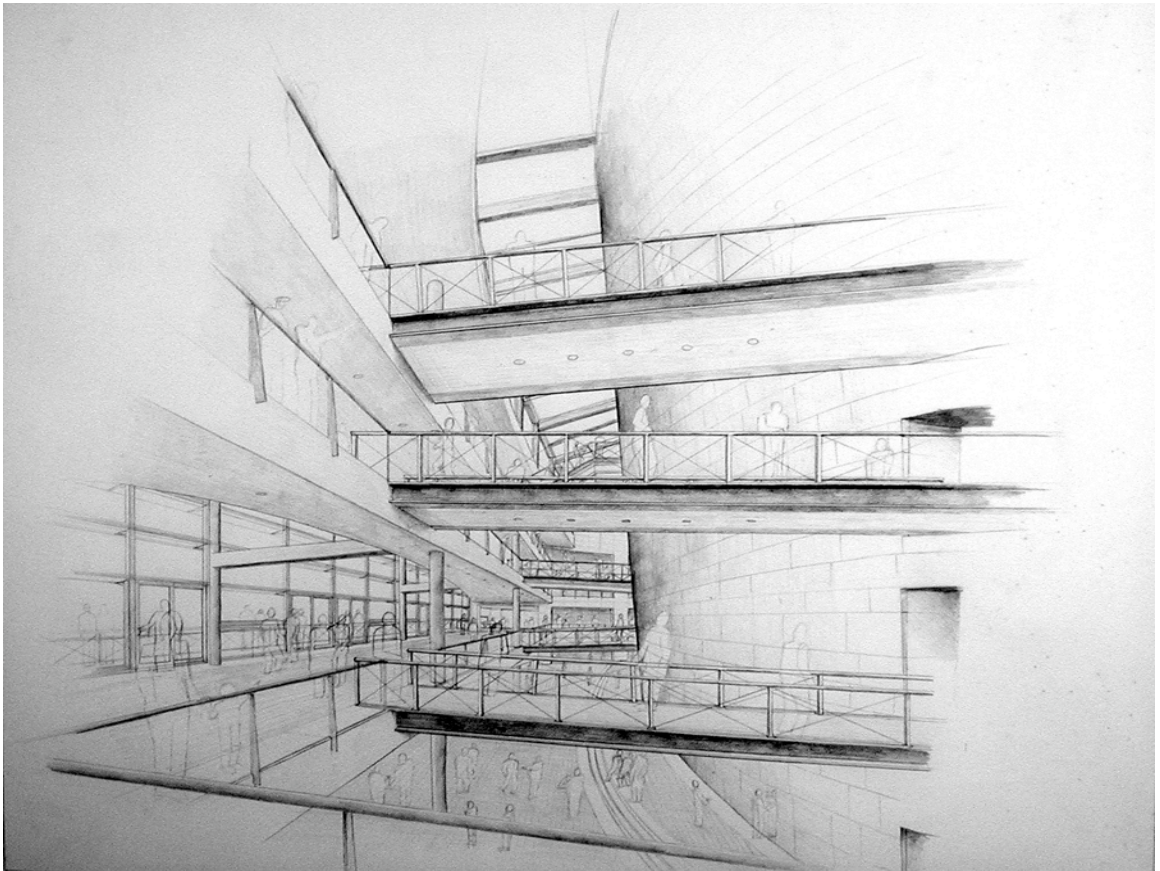
**Figure 195 South/Park/Thames St. Elevation**



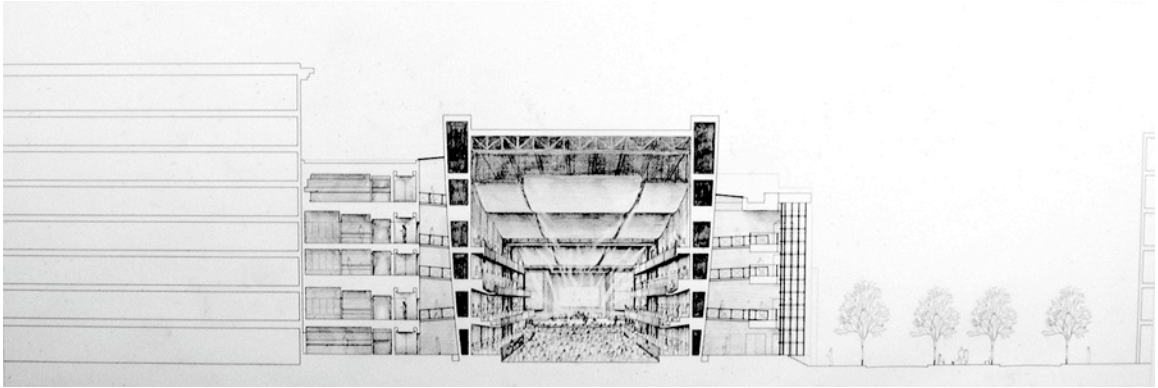
**Figure 196 Building Perspective from Park**



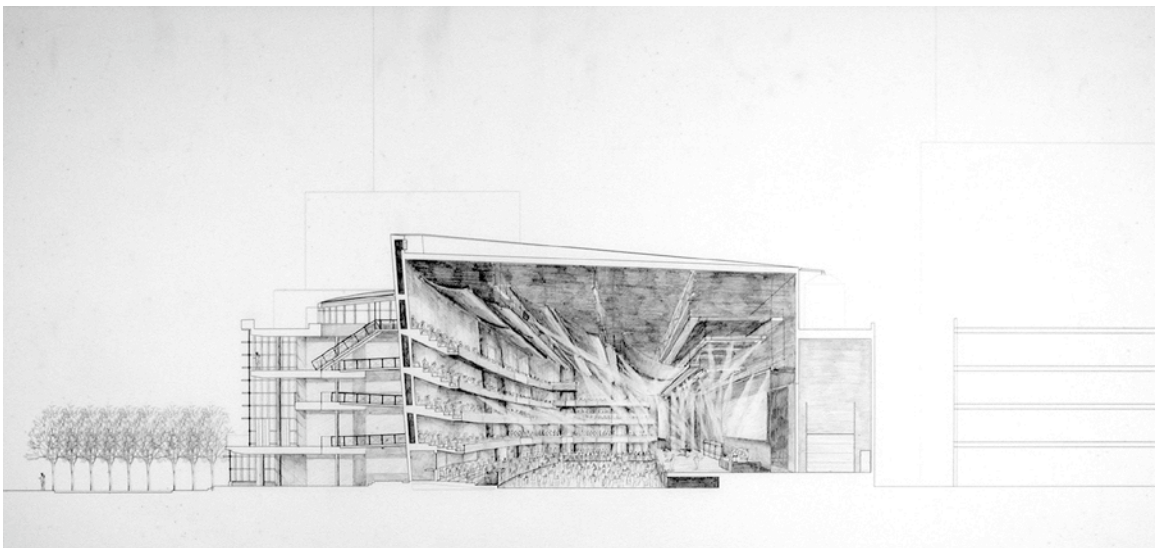
**Figure 197** Entry perspective from across Central Ave.



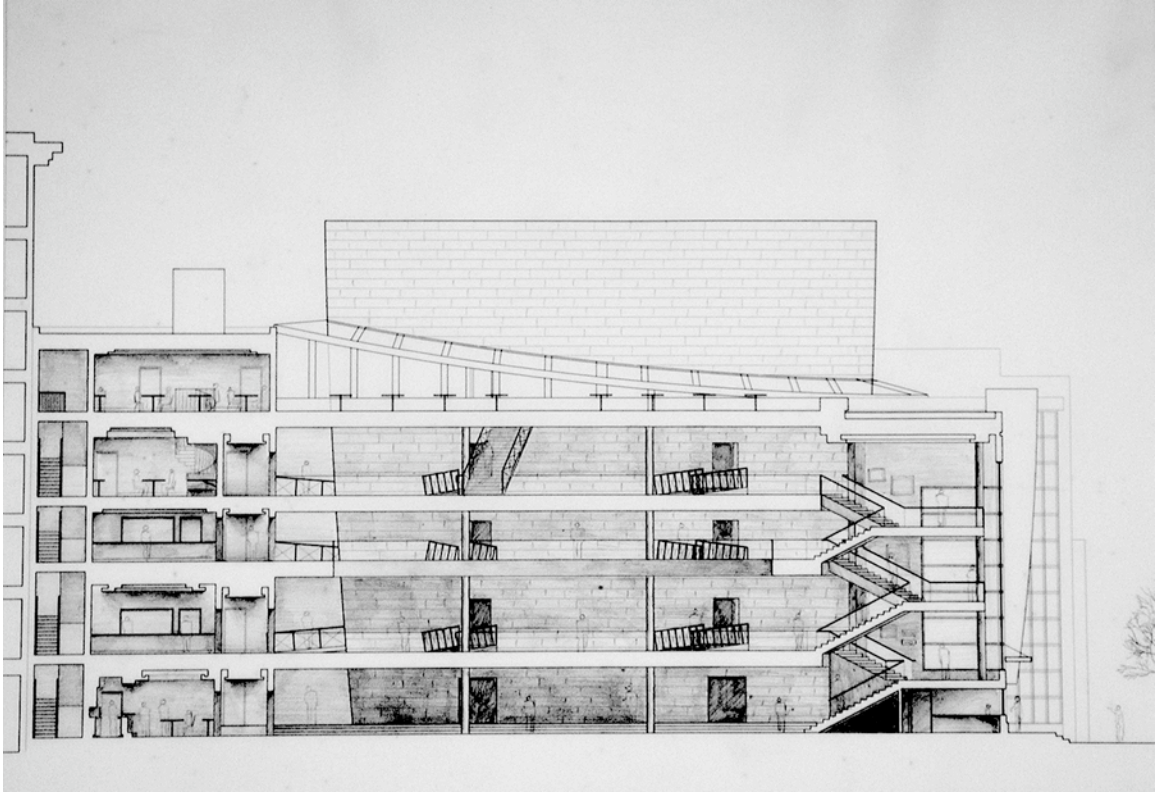
**Figure 198** Interior lobby perspective showing bridges between lobby floors and music hall



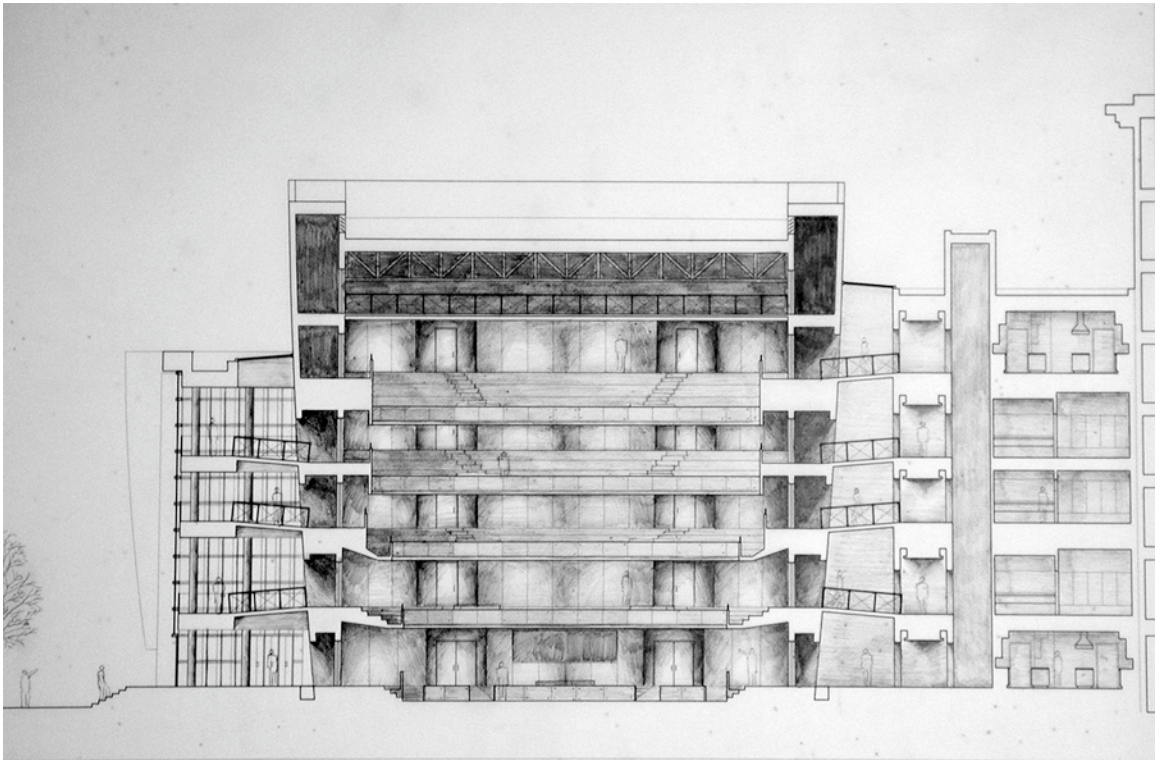
**Figure 199 Transverse Building/Music Hall Section looking north toward stage**



**Figure 200 Longitudinal Building/Music Hall Section**



**Figure 201 Transverse Lobby Section**



**Figure 202 Transverse Building/ Music Hall section looking south towards seating**

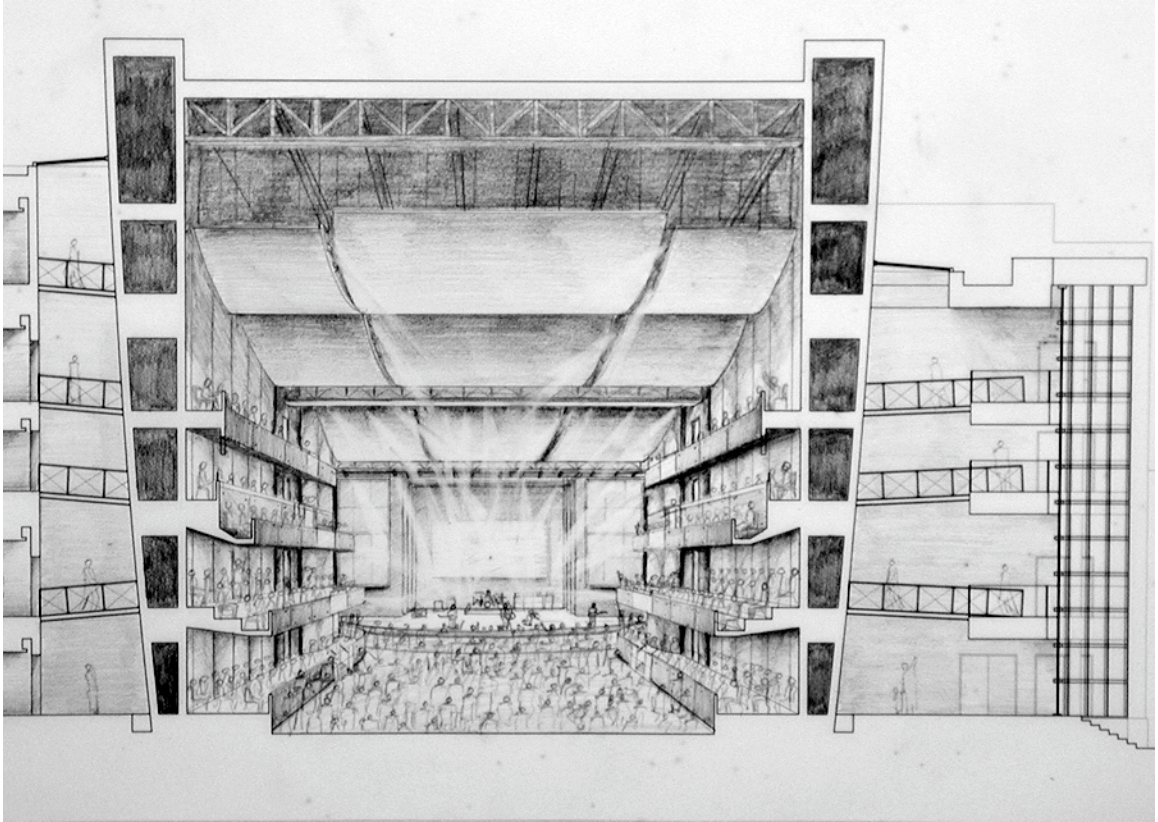


Figure 203 Transverse Music Hall Perspective

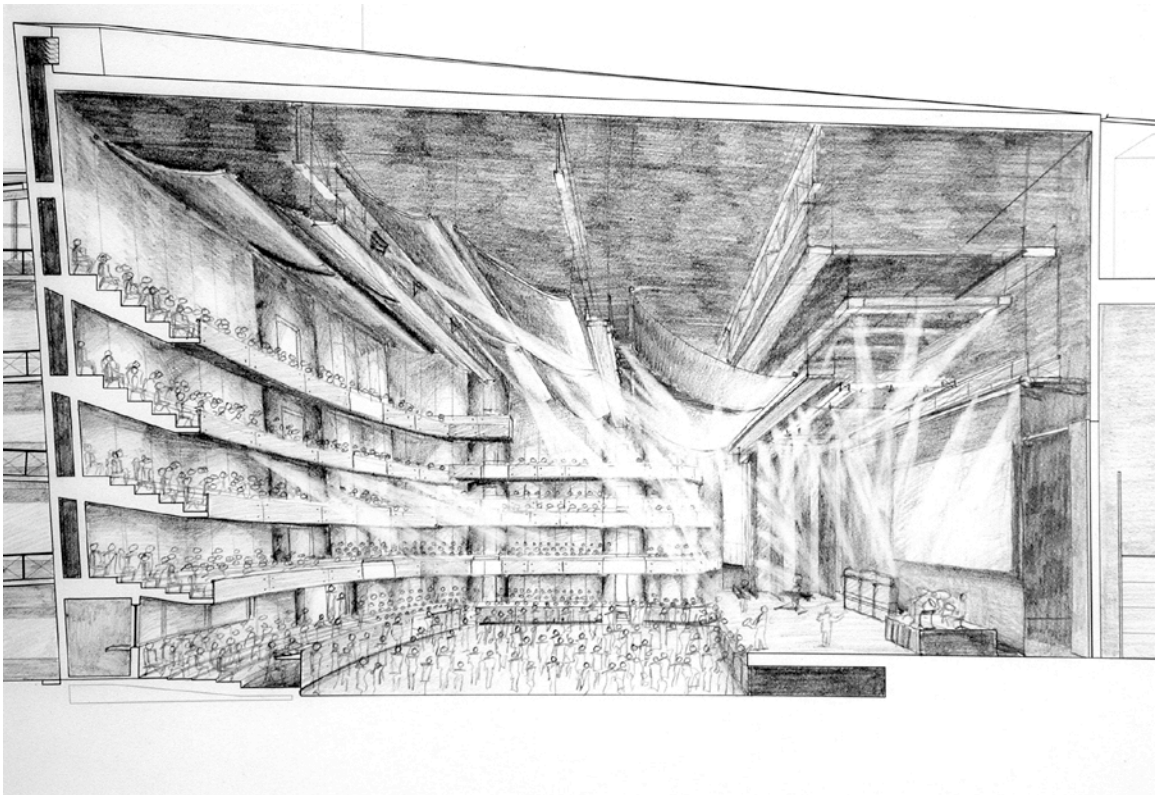


Figure 204 Longitudinal Music Hall Perspective

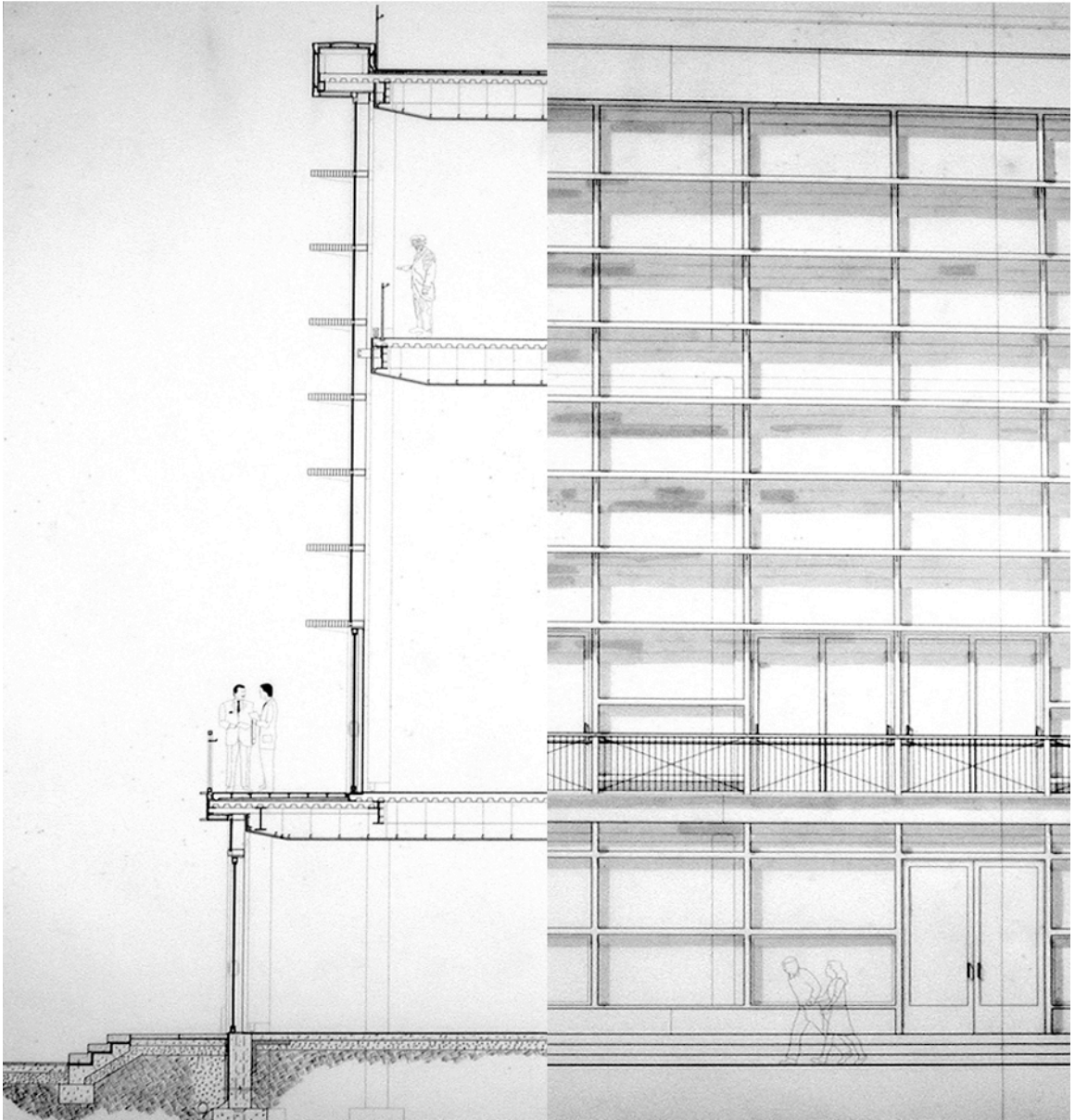


Figure 205 Balcony/Lobby Facade Detail

## REFERENCES

- Athanasopoulos, Chrisos G. Contemporary Theater Evolution and Design. Toronto: Wiley & Sons, 1983.
- Bacon, Edmund. Design of Cities. New York: Penguin, 1976.
- Baltimore City Department of Planning. Home page. 26 Nov. 2003. 1 Dec 2003  
<<http://www.ci.baltimore.md.us/government/planning/>>
- "Battery Park City Master Plan and Guidelines." Progressive Architecture. Jan. – March 1984: 66-67.
- Beauvert, Thierry. Opera Houses of the World. New York: Vendome, 1996.
- Beranek, Leo L. Music, Acoustics & Architecture. New York: Wiley & Sons, 1962.
- Charlet, Gerard. l'Opera Bastille. Paris: Editions du Moniteur, 1990.
- Downey, Claire. "Sibelius Hall." Architectural Record July 2001: 124-127.
- Drew, Philip. Sydney Opera House. Architecture in Detail series. London: Phaidon, 1995.
- Ehrenkrantz, Ekstut, and Kuhn Architects. Home Page. Oct. 2003  
<<http://www.eekarchitects.com/>>
- Fillatt Architects. Home page. Oct. 2003 <[http://www.pfarc.com/frame\\_fi.html](http://www.pfarc.com/frame_fi.html)>
- Fineberg, Lori. Baltimore City Department of Planning. Interview. Oct. 12 2003.
- Giovanni, Joseph. "Congregation of the Faithful." Architecture. Nov. 2001: 82-91.
- Hardy Holzman Pfeiffer Associates. Theaters. Mulgrave: Images, 2000.
- Haryward, Mary Ellen, and Charles Belfoure. The Baltimore Rowhouse. New York: Princeton Architectural, 2001.
- Jacobs, Allan B. Great Streets. Cambridge: MIT, 1995.
- Jacobs, Allan B, Elizabeth Macdonald & Yodan Rofe. The Boulevard Book. Cambridge: MIT, 2002.
- Jacobs, Jane. The Death and Life of Great American Cities. New York: Vintage Books, 1992.

- Koetter, Fred, and Kim, S. Place Time: Koetter Kim and Associates. New York: Rizzoli, 1997.
- Krier, Leon. Houses, Palaces, Cities. New York: St. Martin's, 1984.
- Linn, Charles D. "Saved for sound: Fort Worden Balloon Hangar and McCurdy Pavilion." Architectural Record. Jan. 1992: 114-117.
- Lynch, Kevin. The Image of the City. Cambridge: MIT, 1960.
- "Mission Bay." Progressive Architecture. Jan. – March 1984: 68-69.
- Norberg-Schulz, Christian. Genius Loci: Towards a Phenomenology of Architecture. New York: Rizzoli, 1980.
- Notter, Finegold, & Alexander. Baltimore Waterfront Study: Fells Point and Canton Urban Design Plan. Washington, 1988.
- Olmsted Brothers. Report Upon the Development of Public Grounds for Greater Baltimore. (1904). Reprint by Friends of Maryland's Olmsted Parks & Landscapes, 1987.
- Reichart, Shawn. Architect, RTKL. Interview. 18 Oct. 2003.
- Rowe, Colin, and Fred Koetter. "The Present Urban Predicament." Cornell Journal of Architecture II 1 (Fall 1981), 16-33.
- Sachs, Edwin O. and Ernest A. E. Woodrow. Modern Opera Houses and Theater. 2 vols. London: Bloom, 1968.
- Santiago Calatrava. Ed. Werner Blaser. Boston: Birkhauser; 1989.
- Santiago Calatrava. Ed. Dennis Sharp. London: E & FN Spon, 1992.
- Silverman, Maxwell, and Ned A. Bowman. Contemporary Theater Architecture. New York: N.Y. Public Library, 1965.
- Stern, Paul. "On the Problem of Artistic Form". *Logos*, Vol. V, 1914-1915, pg. 165-172.
- Struever Brothers, Eccles, and Rouse. Home page. 2003. Oct. 2003  
<<http://jobs.sber.com/default.asp>>
- Tzonis, Alexander. Santiago Calatrava: The Poetics of Movement. New York: Universe, 1999.

- Urban Spaces. Ed. John Morris Dixon. New York: Visual Reference, 1999.
- Webb, Michael. New Stage for a City: Designing the New Jersey Performing Arts Center. Australia: Images, 1998.
- Weber-Hof, Claudine. "Autostadt." Architectural Record. Nov. 2000: 148-153.
- Webster's Third New International Dictionary. Ed. Philip Babcock Gove, PhD. Springfield: G. + C. Merriam, 1967.
- White, Larry, Project Manager, Struever Bros. Eccles & Rouse, Inc. Interview. 16 Oct. 2003.
- Wilson, Janet K. Inner Harbor East: Baltimore's Neighborhood. Diss. U of MD, 1995.

