

ABSTRACT

Title of Thesis: PREPOSITION-POSITION: DESIGN STRATEGIES IN A
MASTER PLAN FOR REDEVELOPMENT, MCMILLAN SAND
FILTRATION SITE, WASHINGTON, DC

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Degree and year: Master of Architecture, 2003

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Preposition: *“a function word (or) phrase that...usually expresses a
modification”¹ ... “locating something in time and space.”²*

Position: *“an act of placing or arranging: as...the laying down of a proposition or
thesis”³*

This is an adaptive reuse of a former public works facility. Its modification is based on a series of positions taken relative to the site’s evolving grammar and context, subdivided into abstract structural interventions (“pre-positions”), and encapsulated into a master plan (“position,” or “thesis”). The core concepts of that master plan relate to notions of social, ecological, and cultural sustainability: through urban redevelopment and inhabitation, through the physical integration of manmade and natural systems, and through didactic consideration of the site’s history and position in both the larger

¹ Merriam-Webster www.m-w.com

² <http://webster.comnet.edu/grammar/prepositions.htm>

³ www.m-w.com

framework of the symbolic realm of the nation's capitol and the everyday life of its citizenry.

Specifically the thesis proposes the conversion of the property for residential, civic, and recreational uses. It argues that the site can be regarded as a valuable piece of the public realm and should be redeveloped with the same civic commitment that brought about its creation.

PREPOSITION-POSITION: DESIGN STRATEGIES
IN A MASTER PLAN FOR REDEVELOPMENT,
MCMILLAN SAND FILTRATION SITE, WASHINGTON, DC

by

Joseph Russell Harris

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
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TABLE OF CONTENTS

LIST OF FIGURES.....	iv
INTRODUCTION.....	1
Background.....	3
<i>Why Washington, DC?</i>	
<i>Why McMillan?</i>	
<i>On the urban-suburban polarity</i>	
Critical Influences.....	6
SITE.....	9
General Site Description.....	10
Site & Physical Description.....	25
Local Site Description.....	29
Neighborhood Description.....	45
PRECEDENT ANALYSIS.....	50
DESIGN ISSUES & APPROACH.....	74
PROGRAM.....	82
Comparative Analysis.....	83
Considerations & Description.....	86
Tabulation.....	87
PRELIMINARY DESIGN.....	88
APPENDICES.....	105
BIBLIOGRAPHY.....	112

LIST OF FIGURES

<p>Figs. 1-2: Site sketches Fig. 3: Aerial photo Fig. 4: Aerial photo Fig. 5: Local land uses Fig. 6: Major streets Fig. 7: Figure ground Fig. 8: Local amenities Fig. 9: Urban pattern Fig. 10: Parks/open space Fig. 11: Urban pattern Fig. 12: Local metro Fig. 13: Local bus Fig. 14: Topo edges Fig. 15: Hard edges Fig. 16: Grid landscape Figs. 17-18: Site photos Figs. 19-20: Site sketches Fig. 21: Aerial photo Fig. 22: Córdoba Fig. 23: UVa Lawn Fig. 24: Reston Figs. 25-28: Historic maps/views Fig. 29: Street hierarchy Fig. 30: Topography Fig. 31a-c: Site axon Fig. 32: Manhole plan Fig. 33: Site explanation Fig. 34: Structural conditions Figs. 35-38: View corridors Figs. 39-42: Grassy filter plane Figs. 43-46: Concrete sand bins Figs. 47-50: Underground cells Figs. 51-53: Regulator houses Figs. 54-60: Rowhouses Figs. 61-66: Condominiums Figs. 67-74: Glenwood cemetery Figs. 75-80: Howard University Figs. 81-88: Hospitals Figs. 89-92: Jerusalem Cardo Figs. 93-97: Mérida Figs. 98-102: Alvaro Siza</p>	<p>Figs. 103-107: Ceremonial Axis Figs. 108-112: Lucca Figs. 113-116: Villette Figs. 117-120: Citroen Figs. 121-124: Viaduct des Artes Figs. 125-128: Burnett Park Figs. 129-131: Deutscher werkbund Figs. 132-135: Wind screen Figs. 136-138: Istanbul cistern Figs. 139-140: Market Figs. 141-145: Kimbell Art Museum Figs. 146-150: Northside Park Figs. 151-153: Ellen Wilson Twnhomes Figs. 154-156: Sunrise Place Figs. 157-161: Infill housing Figs. 162-167: Daybreak Grove Figs. 168-171: Rustem Pasa Figs. 172-175: St. Vincent de Paul Figs. 176-179: 202 Island Inn Figs. 180-184: La Tourette Fig. 185: Ellen Wilson program Fig. 186: Daybreak program Fig. 187: St Vincent program Figs. 188-192: General concept Figs. 193-194: Site scheme 1 Figs. 195-196: Site scheme 2 Figs. 197-198: Site scheme 3 Figs. 199-200: Site scheme 4 Fig. 201: Final Presentation Fig. 202: Intervention plan Fig. 203: Intervention axon Fig. 204: Site strategy Fig. 205: Site intervention Fig. 206: around Fig. 207: through Fig. 208: upon Fig. 209: within Figs. 210-215: Slow sand filtration Figs. 216-220: Concrete columns Figs. 221-223: Figure grounds</p>
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INTRODUCTION

Background

Critical Influences

“Looking back on the garden, seeing it as it is now, it seems to be almost inevitable that it should be there.” *Geoffrey Bawa, on Lunuganga Garden*

“To dwell then meant to inhabit one’s own traces, to let daily life write the webs and knots of one’s own biography into the landscape...Man’s habitable traces were as ephemeral as their inhabitants. Dwellings were never completed before occupancy...a tent had to be mended daily...a homestead waxes and wanes with the state of its members...”
Ivan Illich: “Dwelling”

“You need a mix of people to support an economy. That’s how it works.”
Eric Nelson, local planner, as quoted in “The Washington Post,” 3/9/03

“One must raise the question, then, of how much one’s defense of traditional forms of building houses and cities is, perhaps unintentionally, also a defense of associated patterns of social interaction, including those that reinforce ‘traditional’ patterns of domination and control”
Janet Abu-Lughod: Disappearing Dichotomies

“I discovered quite early in my professional life that it is not the architect who builds meaning into the design of a building; only its users can imbue it with meaning by repetitive, sensual behaviors.” *Labelle Prussin: African Nomadic Architecture: Space, Place, & Gender*

“We need a way to create possibilities, not outcomes, and a way to learn while we act, not act on what we already presume we know.”
Edward Robbins: Culture, Policy, and Production: Making Low-Cost Housing in Sri Lanka

“We might think instead of dynamic models that are inviting of transformations and tolerate spontaneity, that are responsive to change, that are synthetic and made up of systems rather than artifacts, structured by the values, prejudices, and actions of those who live in and near them.”
Nabeel Hamdi: Housing Without Houses: Participation, Flexibility, and Enablement

“The overflow is overflowing.” *Stephen Cleghorn, of the Washington Metropolitan Council of Governments, on the state of homeless shelters, “The Washington Post,” 1/23/03*

Background

The quotations on the preceding page are integral to this thesis. Together they form the basis of a critical and theoretical framework for the reinvigoration of a historic site. In the following pages this framework will be further defined within the context of the thesis in order to set up a scenario for their synthesis in the course of design.

Why Washington, DC?

Washington DC is currently undergoing a remarkable period of redevelopment. Since the suburban flight of the 1960's, punctuated by the race riots of 1968, the nation's capitol city has seen little growth outside of ongoing federal institutional commissions. Within this recent historical context, current development is as staggering as it would seem improbable. However, this most recent progress often appears to be unbalanced and inequitable. The assertion that the well-conceived and sustainable growth of a city cannot occur without serious and committed regard for all segments that make up its collective spirit is a sub-theme of this thesis. Furthermore, this thesis asserts that the most pragmatic approach to sustainable development begins with the rebuilding of cities. Washington, DC is both a laboratory of urban problems and a history book of solutions. If sustainable growth is to catch on, Washington may be among the most symbolically important places for it to be approached.

Why McMillan?

The thesis site was chosen for its obvious dramatic architectural appeal, its location in a varied urban context, its historic meaning to the city it served, and for its

curious and potentially central position in the debate over the nature of Washington's current redevelopment.

Based on the most recent and comprehensive site survey and analysis, current predictors point to development of the site that is medium- to high- density office, commercial, and luxury residential; the cost of the site stabilization, the report argues, is prohibitively high for most other uses. More to the point, such costs are what have kept McMillan from being redeveloped thus far. It is this paradox of development that has held the property in trust to a potentially better future and that has made it an interesting choice for an architectural thesis exploration. Furthermore, McMillan's proximity to some of the neighborhoods hardest hit by unchecked gentrification make it a practical consideration for mixed-use, mixed-income urban intervention.

On the urban-suburban polarity

Urbanization has always been a curious thing for Americans, something many of us simultaneously cherish and loathe. Jefferson was among the first to identify this unusual moralism of the New World:

*"I think our governments will remain virtuous for many centuries as long as they are chiefly agricultural; and this will be as long as there shall be vacant lands in any part of America. When they get piled upon one another in large cities as in Europe, they will become corrupt as in Europe."*¹

*"I view great cities as pestilential to the morals, the health and the liberties of man. True, they nourish some of the elegant arts; but the useful ones can thrive elsewhere; and less perfection in the others, with more health, virtue and freedom, would be my choice."*²

Affection for the natural landscape has been built into our cultural heritage by pioneers and writers alike, helping to propagate the 20th century myth of

¹ <http://www.geocities.com/Athens/7842/archives/cities.htm> (Thomas Jefferson to James Madison, 1787. Papers 12:442)

² Ibid. (Thomas Jefferson to Benjamin Rush, 1800. ME 10:173)

suburbanization.³ Such a longing for life removed from the collective body (as represented by the city) would become so commonplace among Americans by the 1950's that the automobile would make travel to and from the bucolic (and cheap) stretches a certain culturally accepted imperative.

The problem with this luxury is that it is rooted in willing self-deception, if not pure fiction. A commuter who takes a Jeep Pioneer or Ford Explorer between her job and home is of course no more pioneer than she is explorer. As with all great stories, many have trouble distinguishing this new concept of “roughing it” with what is in fact true. So deep has the split between such (mostly fictional) polarities become that it predicts our political leanings: “large cities...voted for Mr. Gore by a 71% to 26% margin, while small towns and rural areas voted for Mr. Bush by 59% to 38%.⁴

What does this mean to architects? Most importantly, architects might look at their craft as an opportunity to build bridges—social, cultural, economic, political, or architectural—wherever possible. This rift between two psyches of the collective spirit of our culture can be healed. By striving to understand this simultaneous desire for the city and the country inside each of us, we can begin to outline what is important in the consideration our built environment. More concretely, we can begin to approach its design as both an exercise of collectivity *and* independence. We are not as static as pollsters would assume, after all. Creative individualism can be achieved even within the framework of density and the cultural amenities that it brings. This thesis will help set up an exploration of this psychological dichotomy.

³ This affection unsurprisingly influenced the thought of our architects, notably Frank Lloyd Wright, whose Broadacre City sought social equity through radical land redistribution, and in many ways predicted our current settlement patterns.

⁴ “Lexington: Steamroller Ashcroft,” The Economist, 3 May 2003, p36.

Cradle to Cradle W. McDonough & M. Braungart, 2002
Chapter 3: Eco-effectiveness

“Consider the cherry tree: thousands of blossoms create fruit for birds, humans, and other animals, in order that one pit might eventually fall onto the ground, take root, and grow. Who would look at the ground littered with cherry blossoms and complain, “How inefficient and wasteful!” The tree makes copious blossoms and fruit without depleting its environment. Once they fall on the ground, their materials decompose and break down into nutrients that nourish microorganisms, insects, plants, animals, and soil...In fact, the tree’s fecundity nourishes just about everything around it.

“What might the human-built world look like if a cherry tree had produced it?”⁵

Statement of relevance:

Slow sand water filtration is a tree-like operation. Natural input—sand, water, time, and place—yield a natural output. First, the source of water must be close by. The water is stored underground, where it is protected from the varying climate above. The sand that is injected into the cells of water is a clean and naturally-occurring material. The waste from the system of filtration is itself organic, so it may be cleaned and reused without harmful impact. The output, clean water, produces a healthy growing community. It is inherently sustainable and therefore “eco-effective”.

The adaptive reuse of such an organism should be likewise tree-like. Whether they are homes, markets, industry, or institutions, the buildings that grow out of the “decomposing” McMillan sand filtration site must continue this legacy of sustainable eco-effectiveness, extending the metaphor from physical input to even perhaps socio-cultural output. By populating the site with mixed income housing and other mixed uses, the legacy of life generation can continue.

⁵ McDonough, W. and Braungart, M. Cradle to Cradle: Remaking the Way We Make Things, North Point Press, 2002, p72-3.

Dwelling Ivan Illich, 1986

“To dwell then meant to inhabit one’s own traces, to let daily life write the webs and knots of one’s own biography into the landscape...Man’s habitable traces were as ephemeral as their inhabitants. Dwellings were never completed before occupancy...a tent had to be mended daily...a homestead waxes and wanes with the state of its members...”⁶

Statement of relevance:

Illich identifies the difference between what it means to be a resident of contemporary rental space and to be a “dweller,” that is, one who gives physical shape to his or her own environment. He suggests that the limitation of people’s basic rights to dwell may be to blame for the social and psychological malfunctioning of society. More concretely, disparities resulting from the industrial model of politico-economic structure plague our collective sense of well-being, cultural progress, and security. Built environment in this case can be regarded as both victim and accomplice of the status quo and as such must be questioned. We should look instead to examples of models of human settlement and organization that work.

This article has continued to guide me ever toward what I love about the built environment, meanwhile cautioning me from the trappings of the *status quo*, be they political, economic, social, or architectural. The concept of “dwelling”, which is defined in opposition to the currently accepted notion of housing as the simple provision of units, has been at the root of my interest in housing as a vehicle for the study of architecture’s social mandate. Illich’s ideas are therefore at the root of my thesis explorations as well.

His article is a call to resistance. It is an acknowledgement of a problem and an affirmation of the human will that will be necessary to propose its solution.

⁶ Illich, Ivan. “Dwelling,” Development: Seeds of Change 1986: 4. p82-4.

Housing without Houses Nabeel Hamdi, 1991
Chapter 10: Changing Professional Responsibilities & Training

“We will need to shift our attitudes out of the confines of the master plans, with their singular prescriptive solutions, their reliance on consistency rather than diversity, with all the futures they envision and the guesswork they entail. We might think instead of dynamic models that are inviting of transformations and tolerate spontaneity, that are responsive to change, that are synthetic and made up of systems rather than artifacts, structured by the values, prejudices, and actions of those who live in and near them.”⁷

Statement of relevance:

The most relevant idea in this article is stated succinctly in the quotation above. I would like this thesis project to be a design problem in dynamic planning. Through a manner of appropriation that may yet be unresolved, the McMillan property could become a laboratory in the teasing out of this sort of problem.

Hamdi asserts that architectural education will need to adjust itself from atelier models—which celebrated the isolated genius—to ones that provide students with the real-world tools of facilitation and enablement. The way building might occur in this thesis and the degree to which that process is controlled will be considered in light of this concept of the architect as facilitator.

Hamdi also underscores the importance of everyday models in architectural design rather than “the cult of the new.” This has particular meaning in the context of historic preservation and adaptive reuse. I would like this thesis to rely on precedents which are rooted in a basic vocabulary of elemental building systems, typologies, and techniques.

⁷ Hamdi, Nabeel. Housing without Houses: Participation, Flexibility, and Enablement, Van Nostrand Reinhold, 1991, p180.

SITE

General Site Description

Site & Physical History

Local Site Description

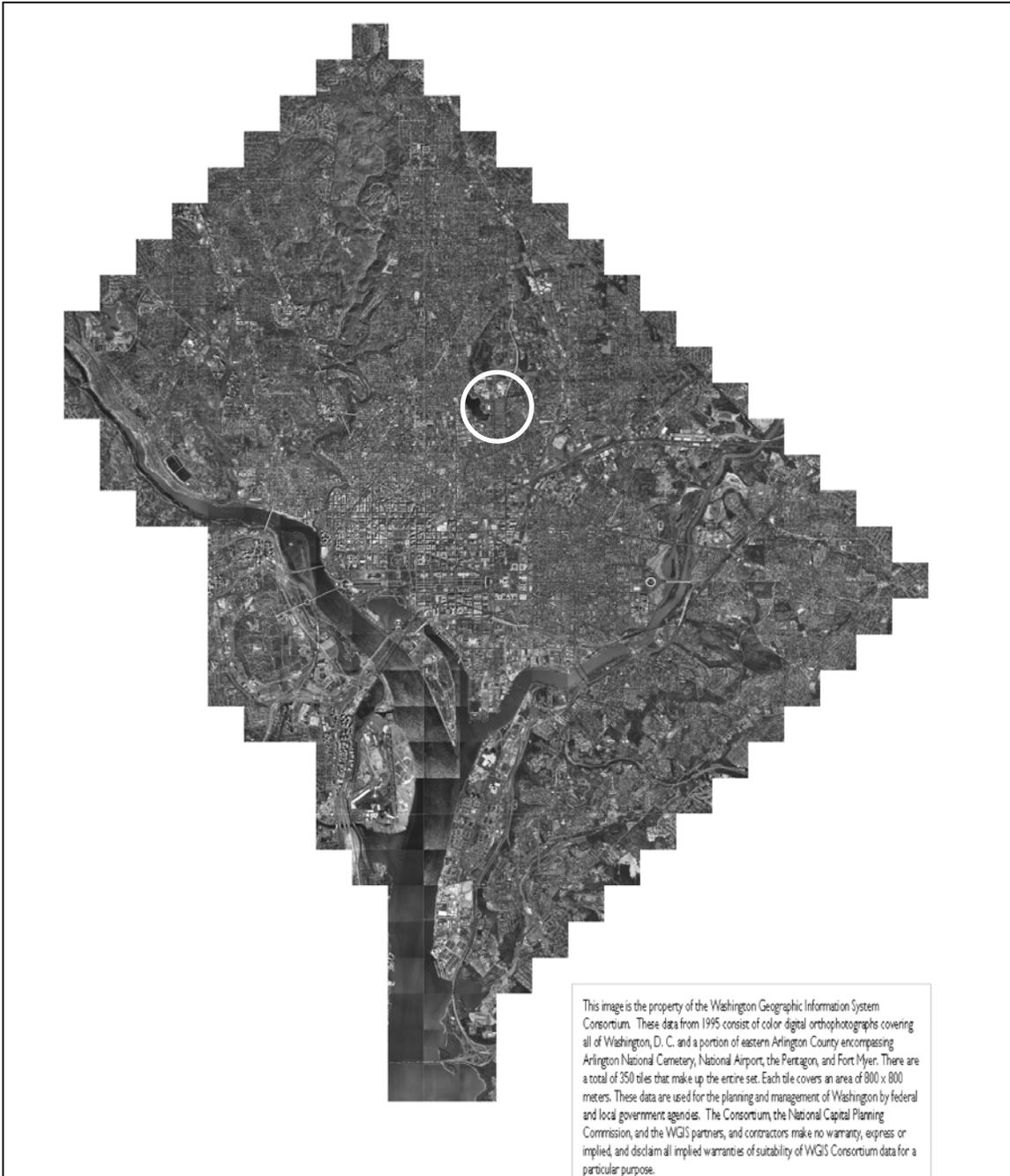
Neighborhood Description

General Site Description

The thesis site is located in the upper central portion of the District of Columbia. Positioned on top of the site of a natural spring that at one time provided water to the city, the land was cheaply purchased at a time when it was considered remote farmland. The adjacent McMillan Reservoir is supplied from the Dalecarlia Reservoir in Georgetown (to the west of the site) where water from the Potomac's Great Falls is directly stored. The site is surrounded by major arterials, institutions, and historic neighborhoods. Washington Hospital Center, Children's Hospital, and Veterans' Administration Hospital along Michigan Avenue create its northern boundary. To the east, North Capitol Street and Glenwood Cemetery and to the south, the historic Bloomingdale neighborhood form a more residential context. The city's current water filtration plant and Howard University are its western neighbors. The following diagrams help describe the general site and its context.



Figs. 1-2: Site sketches *General neighborhood context (by author)*



*General Site Description:
Greater Washington, DC context*

Fig. 3: Aerial photo (*Washington GIS Consortium, 1995*)



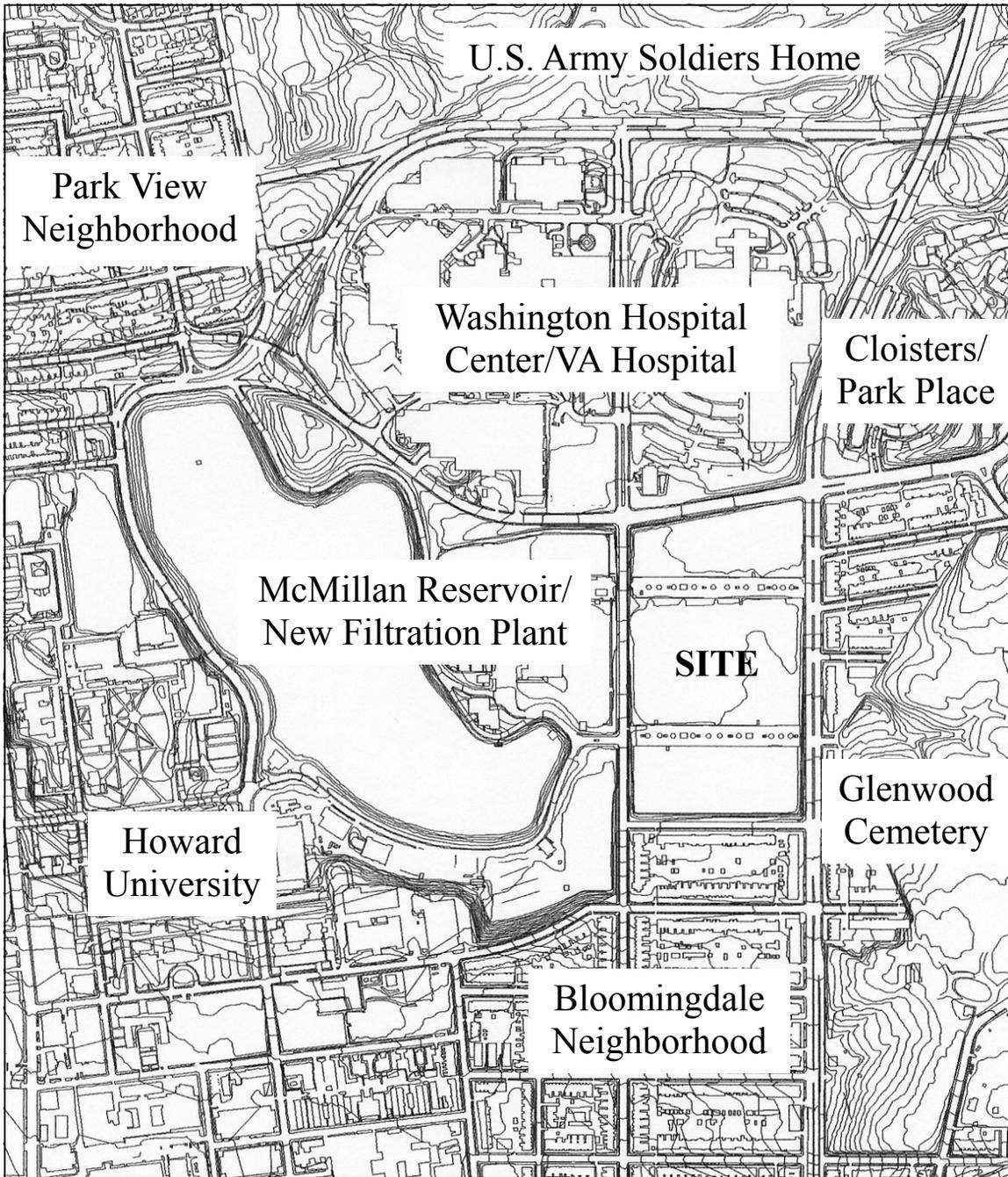


*General Site Description:
Aerial photo of site*

Fig. 4: Aerial photo (DCOP, 2003)



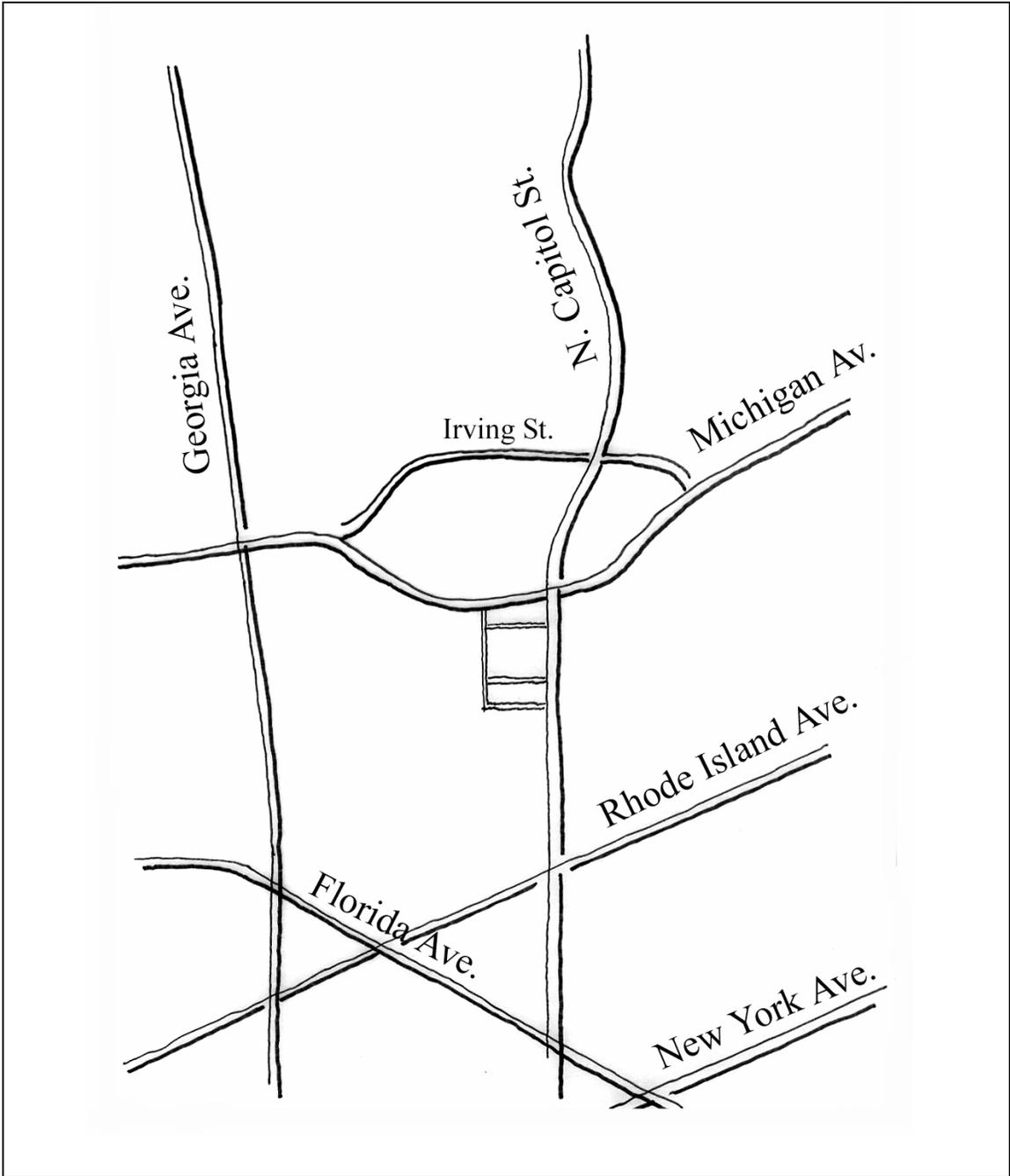
Aerial photography: Not-to-scale



*General Site Description:
Local land uses*

Fig. 5: Local land uses (DCOP, 2003)





*General Site Description:
Major streets*

Fig. 6: Major streets *(by author)*



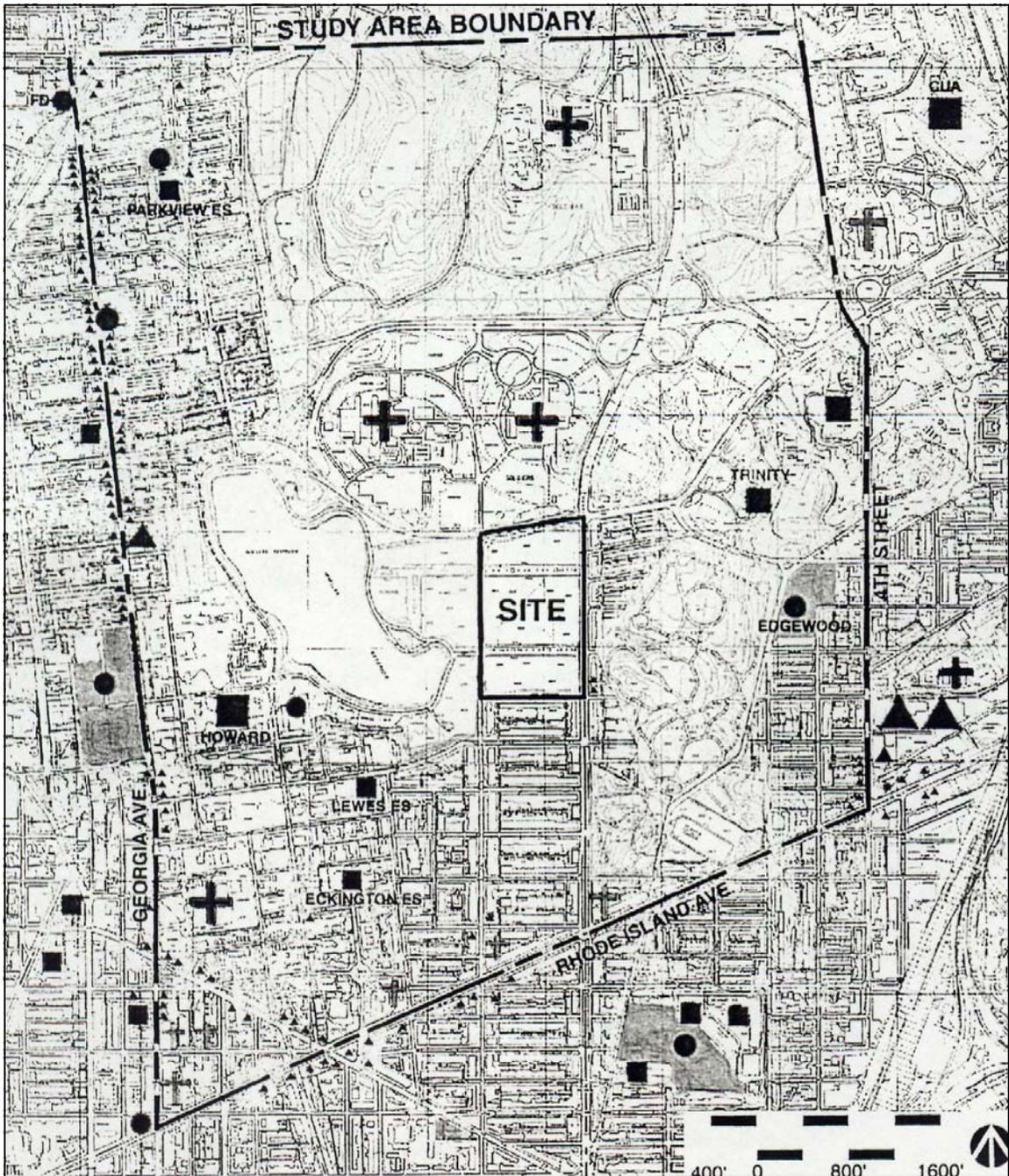
Sketch Diagram: Not-to-scale



*General Site Description:
Figure ground*

Fig. 7: Figure ground *(by author)*



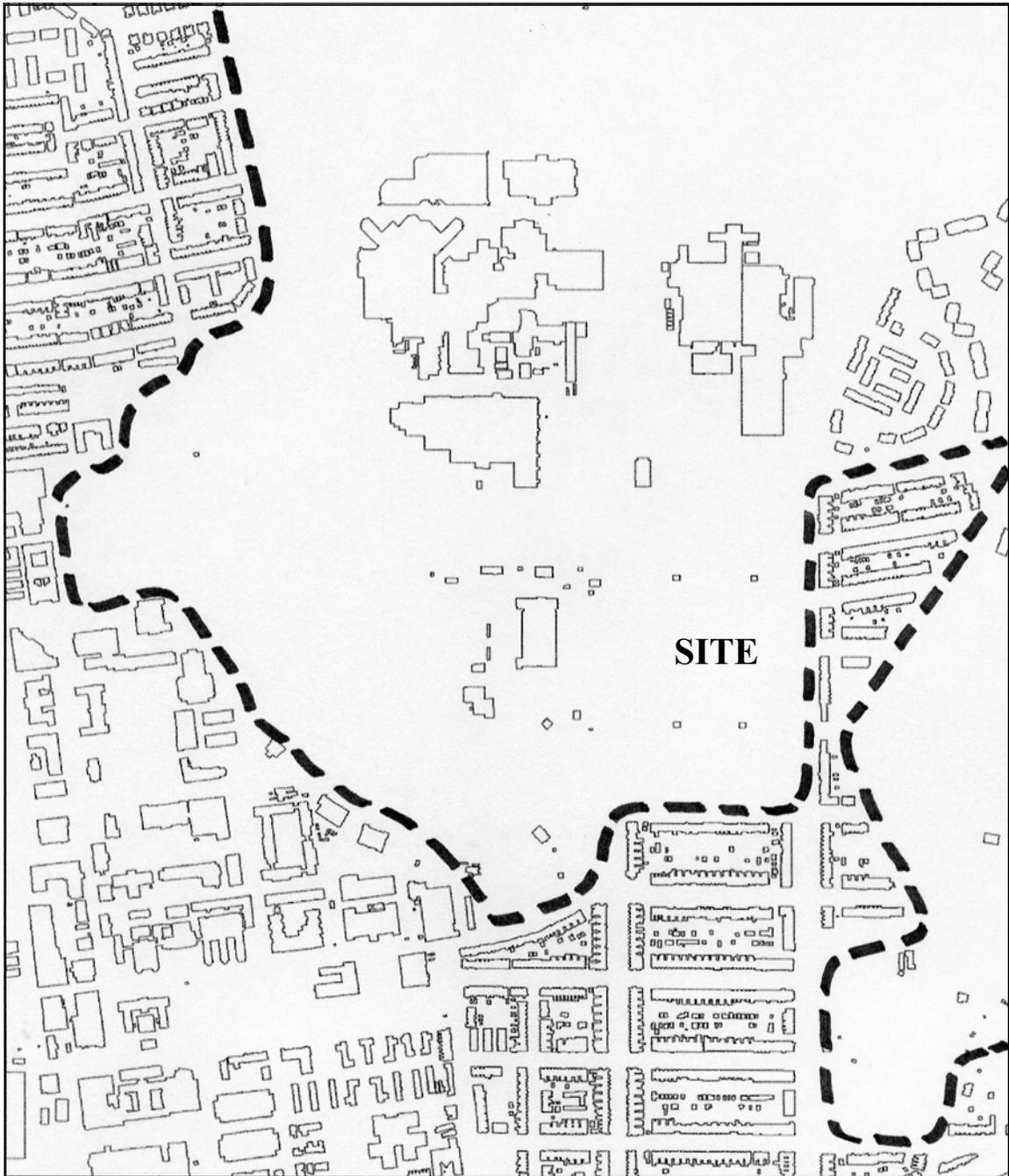


*General Site Description:
Local amenities*

Fig. 8: Local amenities (*Greenhorne & O'Mara, p2-18*)

LEGEND	
	Large ← Small
SHOPPING	▲ ▲ ▲
SCHOOLS	■ ■ ■
CHURCHES	✕ ✕ ✕
COMMUNITY CENTERS	● ● ●
HOSPITALS	✚ ✚ ✚
OPEN SPACE	□ NOT OPEN TO GEN. PUBLIC
PARKS & RECREATION	■





*General Site Description:
Urban pattern: Density vs. scarcity*

Fig. 9: Urban pattern (DCOP and author)





*General Site Description:
Parks and Open space*

Fig. 10: Parks/open space (*DCOP, 2003 and author*)

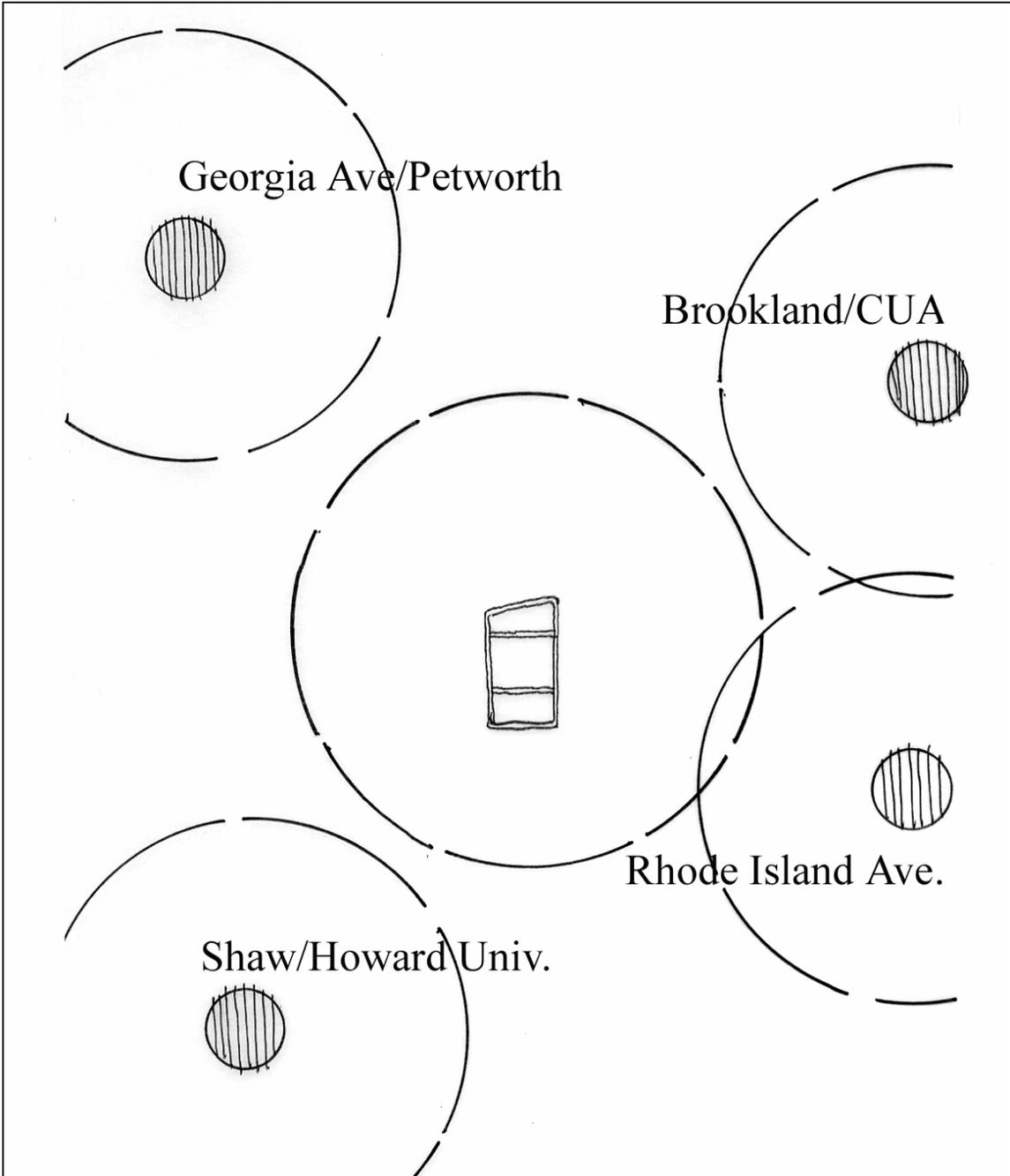




*General Site Description:
Urban pattern: Institutional vs. residential*

Fig. 11: Urban pattern (*DCOP, 2003 and author*)



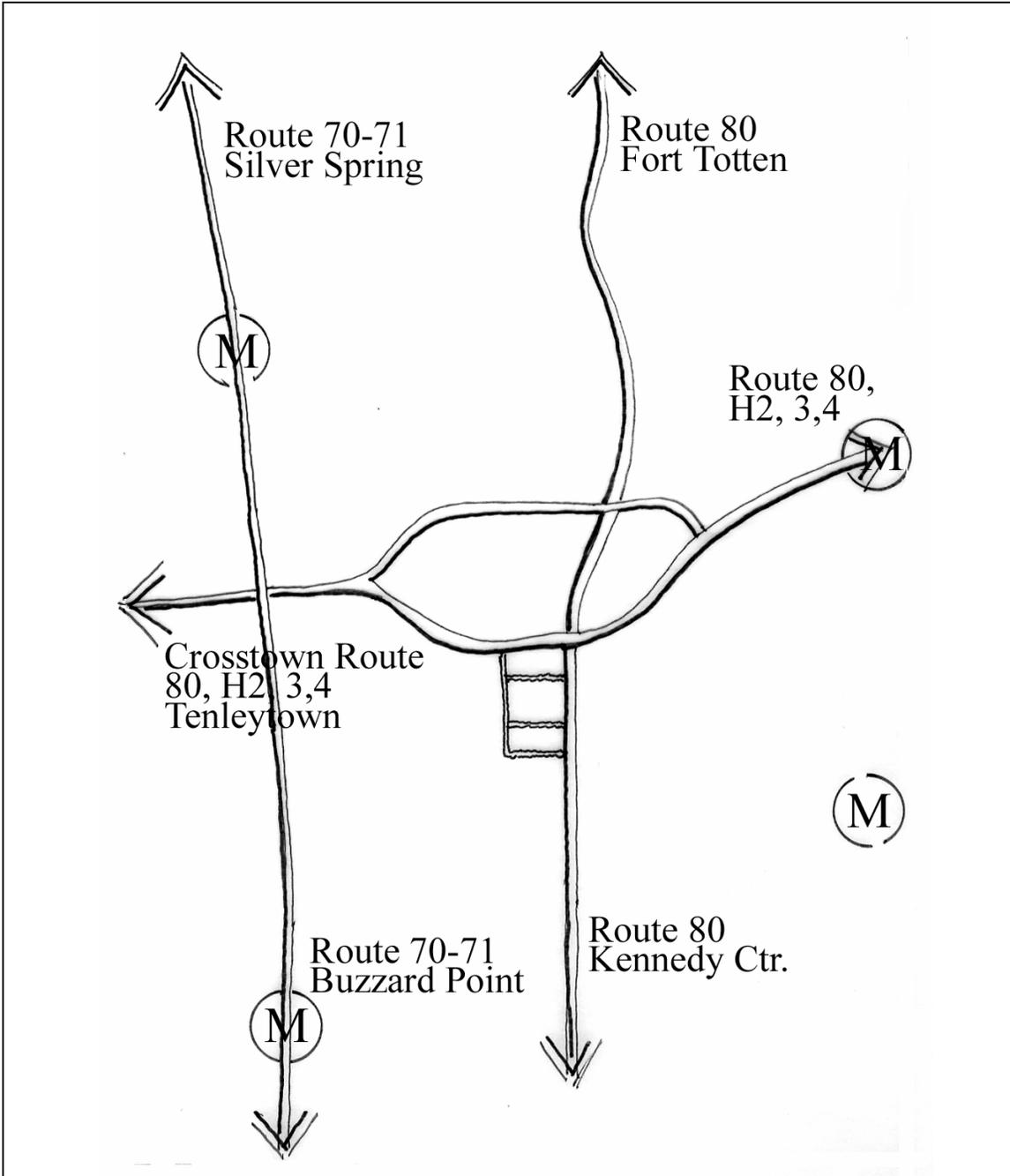


General Site Description:
Local metro stations
Showing 5-minute walking radii from site and stations

Fig. 12: Local metro (by author)



Sketch Diagram: Not-to-scale

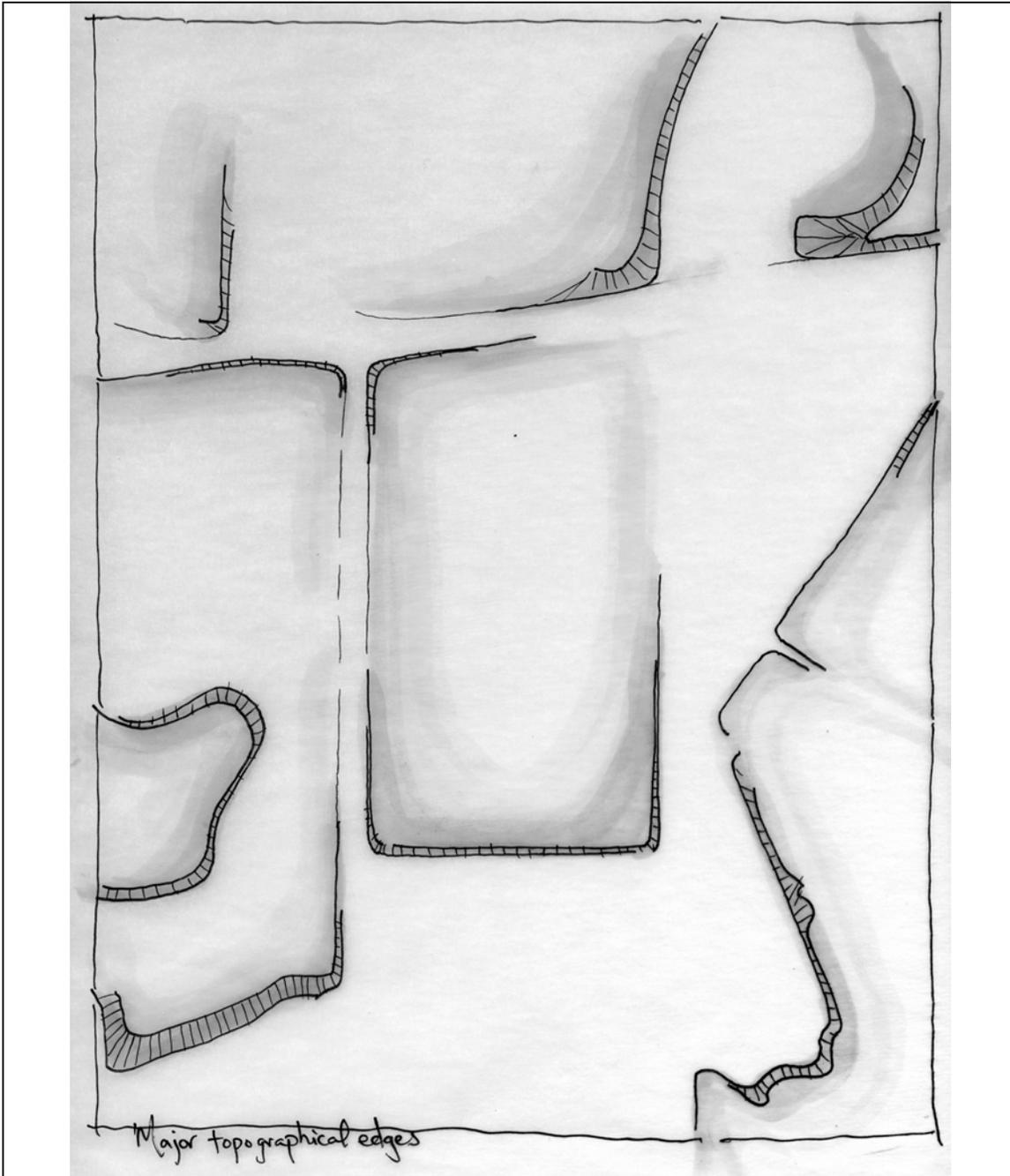


*General Site Description:
Local bus routes*

Fig. 13: Local bus (by author)



Sketch Diagram: Not-to-scale

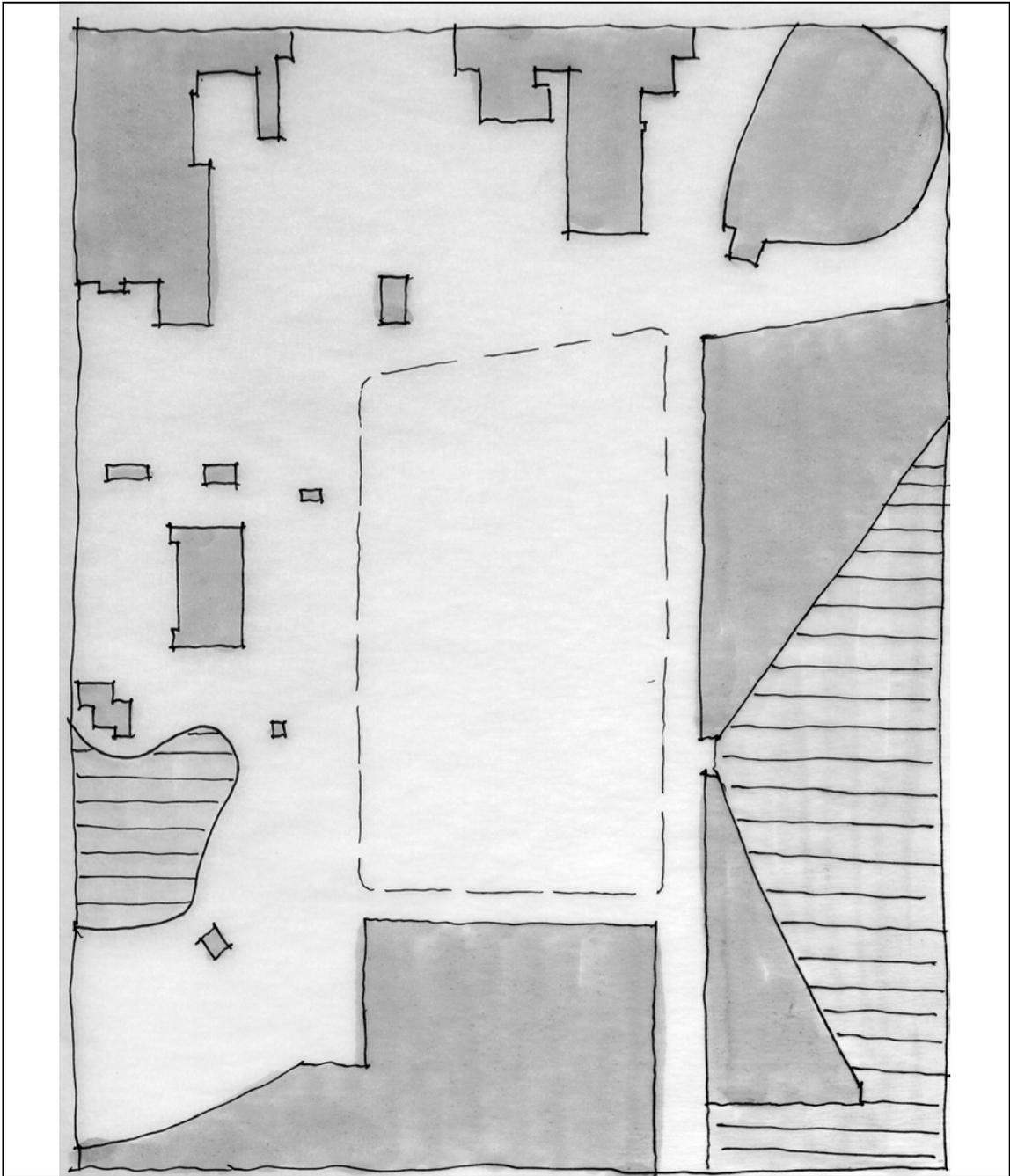


*General Site Description:
Topographical edges*

Fig. 14: Topo edges (by author)



Not-to-scale unless noted otherwise

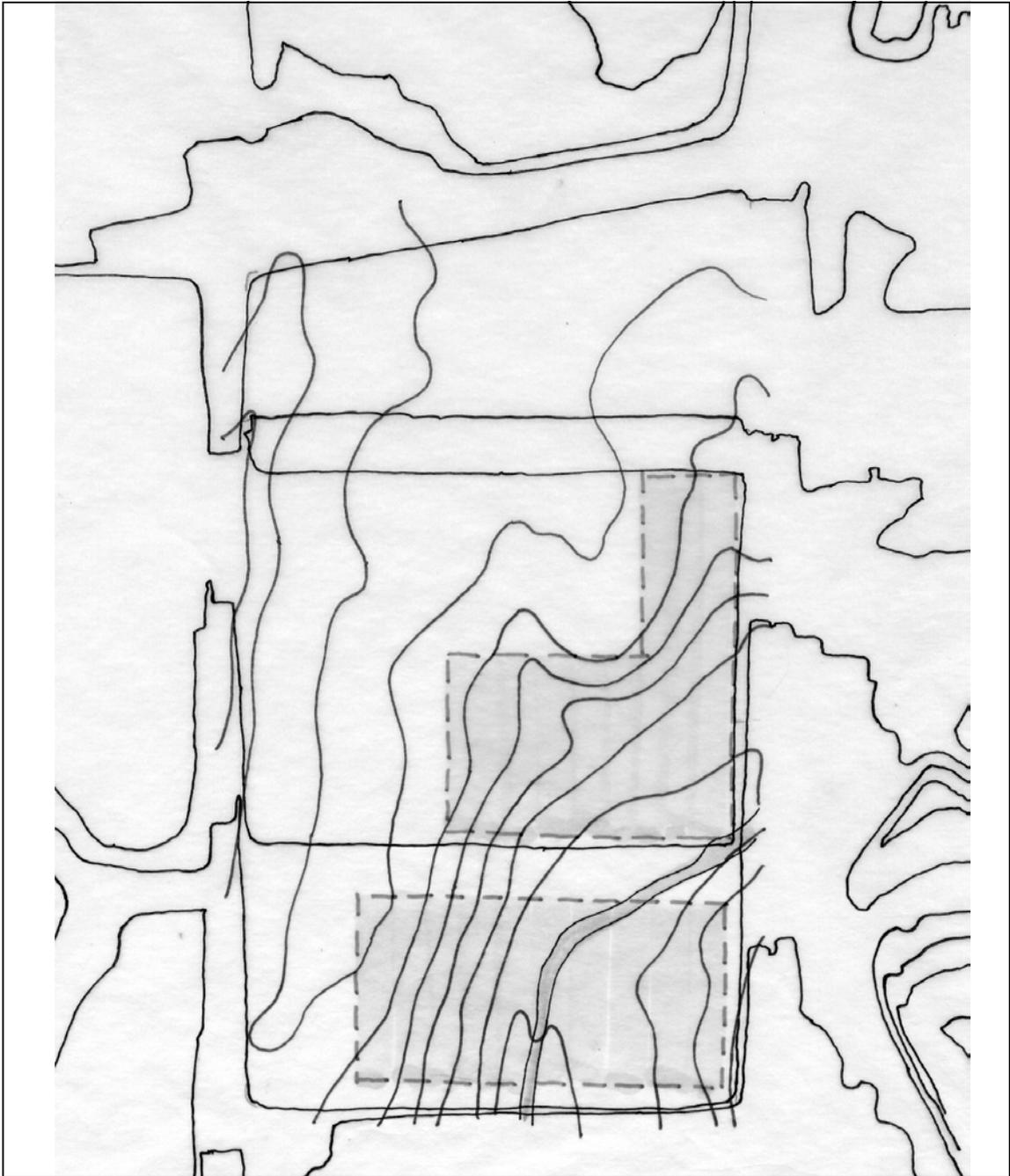


*General Site Description:
Hard edges*

Fig. 15: Hard edges (by author)



Not-to-scale unless noted otherwise



*General Site Description:
Intersection of grid & landscape*

Fig. 16: Grid landscape *(by author)*



Not-to-scale unless noted otherwise

Site history

Once farmland in the upper reaches of the District of Columbia, the property that would become the McMillan Reservoir and Sand Filtration site was owned by Howard University until the end of the 19th century.¹ The Tiber Creek, or Goose Creek, on which Pierre L'Enfant envisioned his waterfront capitol scheme for Washington, DC,² ran through the southeast corner of the future site, making it a source of high quality water. This spring supplied water to the U.S. Capitol until the new water purification facilities were opened in 1905³.

In the now famous Senate Park Commission Plan of 1901-1902, the site was taken into the “Emerald Necklace” of parks and civic sites. Chaired by Senator James McMillan, the commission took as its mandate the beautification of the lackluster federal city through a series of initiatives that were inspired by the forces of the City Beautiful movement. As part of this plan, the property was converted into a state-of-the-art water purification facility. Costing (in today’s dollar value) around \$226 million,⁴ the elaborate strategy employed by the McMillan Commission answered Washington’s growing demand for clean water supplies to help combat typhoid fever and other infectious outbreaks. The site was subsequently developed into a public park by the landscape architect Frederick Law Olmstead, Jr. in 1911 as part of the same civic effort.

The property served this double function until the outbreak of World War II, when fear of contamination of the city’s water by would-be conspirators led the government to fence the facility from the public. Deemed “federal surplus” when the

¹ Information from interview with Mr. Derrick Woody, D.C. Office of Planning, 3/11/03.

² Miller, Iris. *Washington in Maps, 1606-2000*, Rizzoli International Publications ©2002, p56-7.

³ Greenhorne & O’Mara. *Final report and recommendations: McMillan Reservoir Sand Filtration Site*, January, 2001. Submitted to the DC Office of Planning, p2-7.

⁴ Ibid, p2-10.

slow sand filtration system was replaced with more modern means,⁵ the facility was sold to the District government in 1987 for \$9.3 million. Still undeveloped and unused, the property has been the focus of no fewer than 12 government-sponsored studies, workshops or public forums regarding its use since the mid-1980's. In 1991, the property was listed on Washington, DC's Inventory of Historic Sites.



Figs. 17-18: Site photos *Above and below ground (by author)*

⁵ “The (new) plant has a capacity of 164 million gallons per day (mgd) based on filtration rates of two gallons per minute per square foot, and a maximum capacity of 264 mgd. Its treatment scheme consists of screening, chemical additions for flocculation and sedimentation, rapid sand filtration, and chemical additions for chlorination, fluoridation and pH control.” (<http://www.dcwasa.com/about/facilities.cfm>)

Physical history

When the U.S. government purchased the 25 acres that would become the McMillan Reservoir's Sand Filtration site from Howard University, the land was still largely agricultural. After capital expenditures totaling \$2.2 million in 1905, the site was dramatically and permanently transformed.⁶ In a feat of hydraulic engineering that can appropriately be compared to that of the ancient Romans, the landscape of northwest Washington, DC was changed forever.

Through a network of aqueducts stretching from the Great Falls of the Potomac River to the heart of the District of Columbia, fresh water was carried to and stored in the McMillan Reservoir before being pumped into the on-site sand filtration cells. New York engineer Alan Hazen designed the complex, the first of its size, which consisted of twenty unreinforced concrete cells, each approximately one acre in area.⁷ The cells were built on a 14-foot vaulted bay, which were formed *in situ*. Above the vaults, a concrete platform was poured and two feet of top soil added, thus creating the flat surface that would characterize the site to the present day. Two parallel service alleys lined the site and contained the most memorable architectural elements, notably twenty cylindrical sand storage towers. Olmstead's plan for the public amenities on the site made use of the upper fields for park land, including a dense network of deciduous trees lining the streets and service alleys.

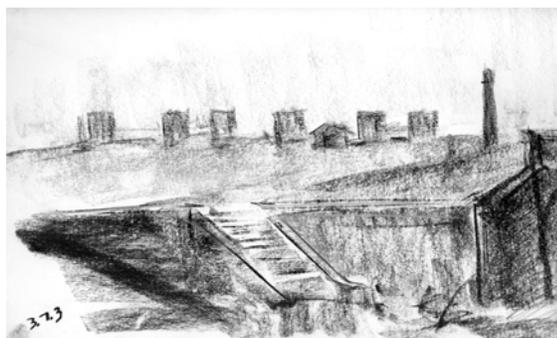
The site is today perhaps more characterized by the later intervention of wartime security measures and the shabby vegetation of urban neglect. A barbed-wire fence encircles the site protecting pedestrians from the deteriorating concrete cells and 2,100

⁶ Greenhorne & O'Mara, p2-7.

⁷ For more information on the history and design of slow sand filtration, see Appendix A.

uncovered manholes on the property; and a form of Boston ivy has overtaken the sand towers, resulting in some structural vulnerability.⁸ According to the latest structural analysis, the cells to the south and east have been the most damaged due to the backfill over the Tiber Spring that occurred during original construction 100 years ago. Additionally, the northernmost cells have suffered from ‘moderate’ deterioration. Only a fifth of the cells are considered ‘stable’.⁹

The site is bounded on all sides by streets consistent in size and spirit with the L’Enfant plan of Washington, DC. However, it denotes a boundary of that particular pattern of urban settlement and use; the suburbs begin on its northern edge.



Figs. 19-20: Site sketches (*by author*)

⁸ Parsons, McMillan Water Treatment Plant, Landscape Survey and Treatment Plan, Prepared for the DC Office of Planning, Historic Preservation Division, 2002.

⁹ http://www.planning.dc.gov/project/mcmillan_reservoir/index_recommnd.shtm (Site Conditions diagram), CCMJ Structural Analysis, June 2001, p13.

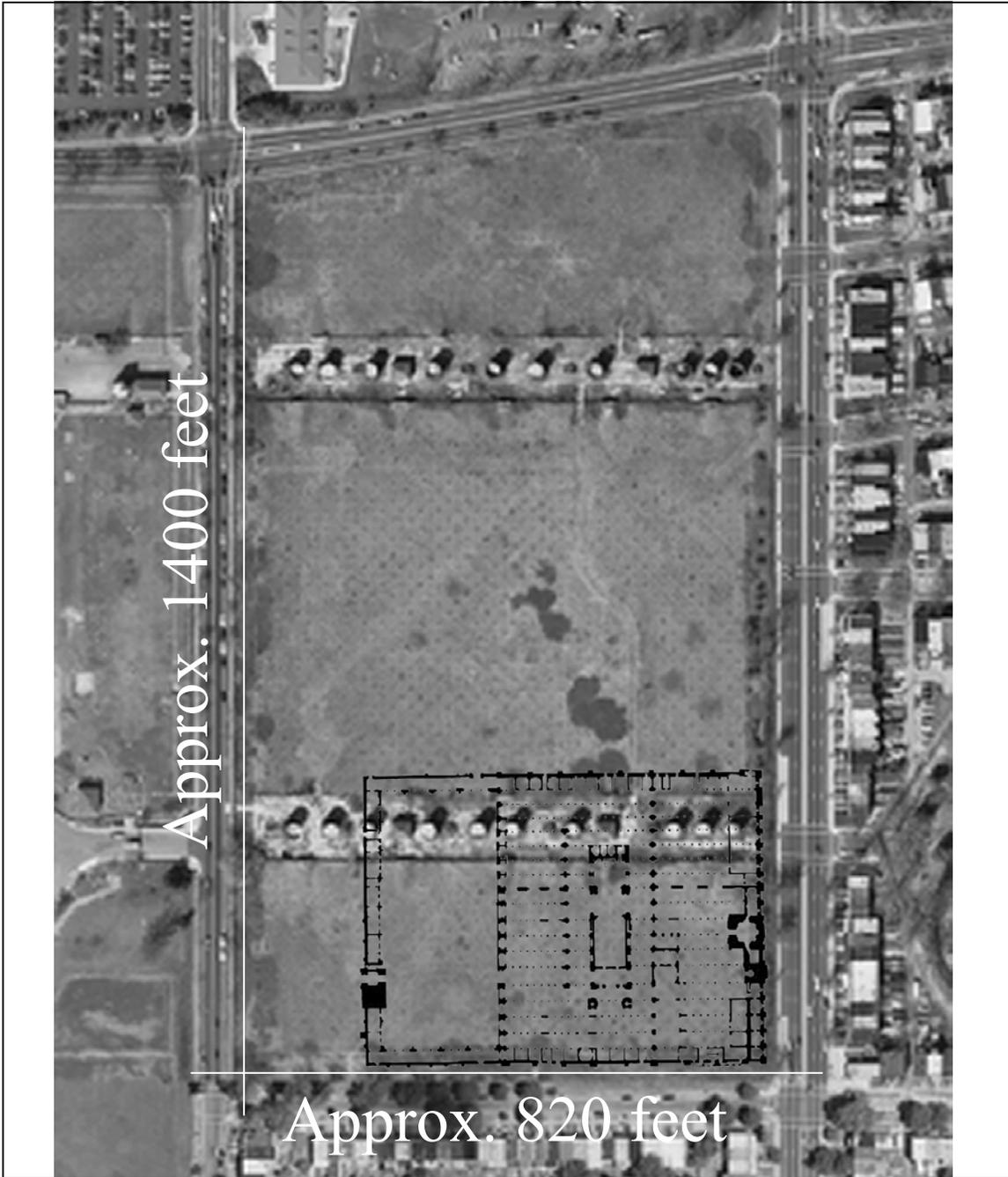


*Local Site Description:
Aerial photo*

Fig: 21: Aerial photo (DCOP, 2003)



Not-to-scale unless noted otherwise



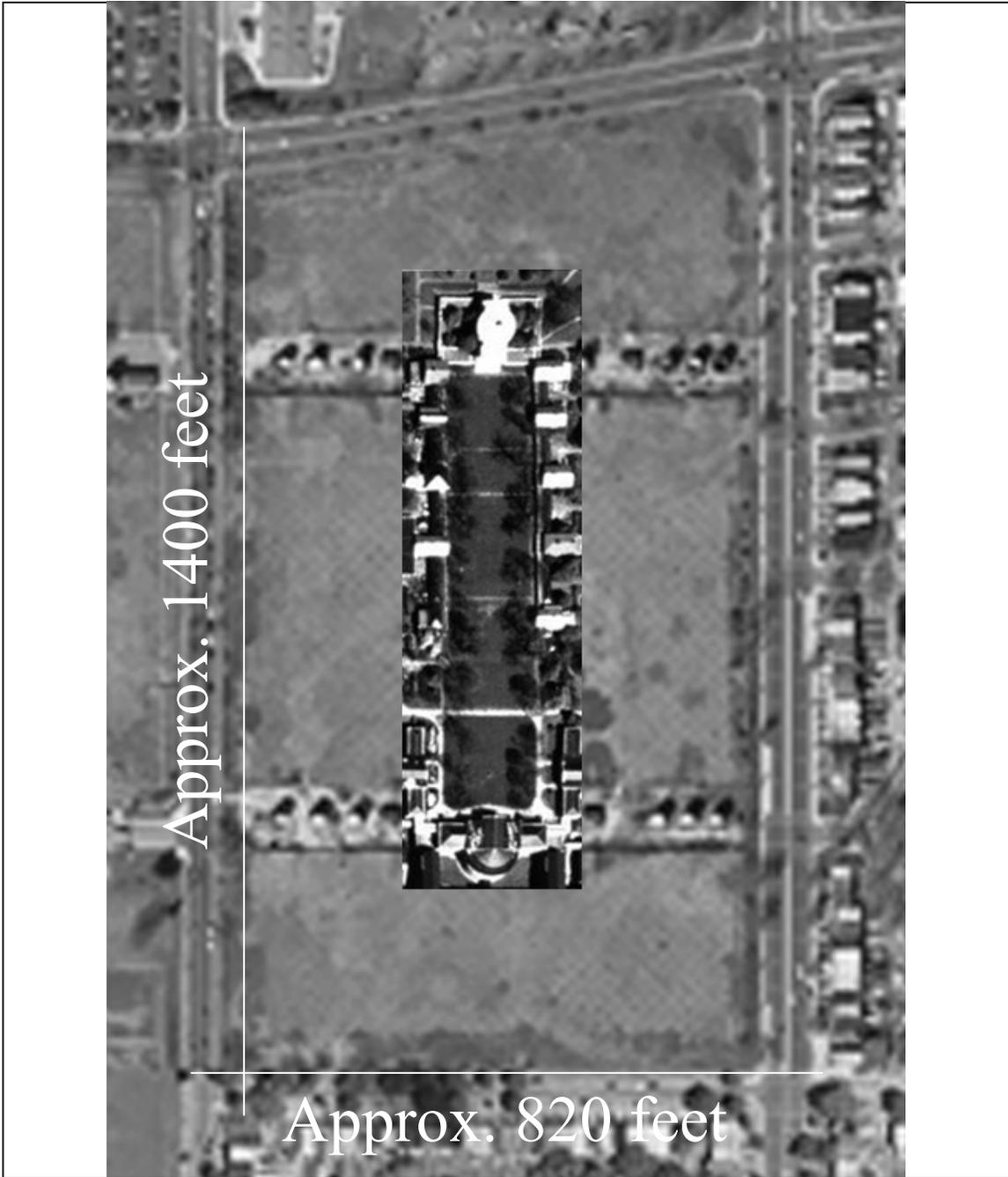
Local Site Description:

Scale comparison: Great Mosque, Cordoba superimposed

(Mosque at Cordoba dimensions: 597' x 427')

Fig. 22: Cordoba (by author)





Local Site Description:

*Scale comparison: UVa's Lawn superimposed
(UVa Lawn dimensions: 740' x 192')*

Fig. 23: UVa Lawn (by author)





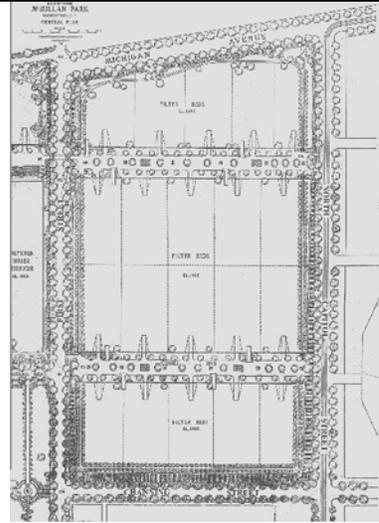
*Local Site Description:
Scale comparison: Reston Town Center
at Lake Anne superimposed*

Fig. 24: Reston *(by author)*





Peters Co. map, 1896



Olmsted plan, 1911



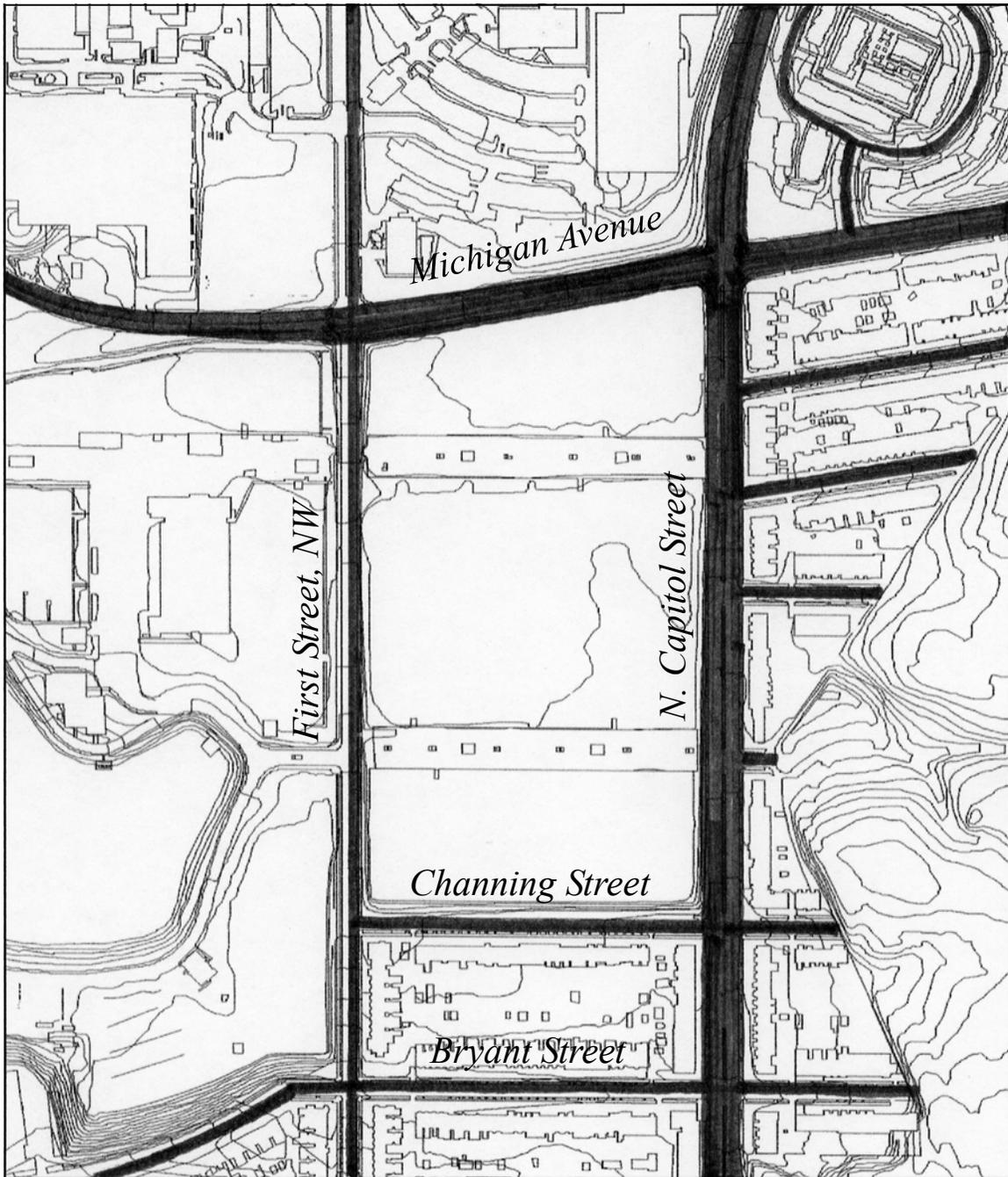
Aerial photo, 1997



Aerial view of site, 1921 (Cameron, p60)

*Local Site Description:
Historic maps and views*

Figs. 25-28: Historic maps/views (In clockwise order, from top right: Miller, p 103; Greenhorne & O'Mara, p ix; DCOP, 2003)



*Local Site Description:
Street hierarchy*

Fig. 29: Street hierarchy (DCOP, 2003 and author)

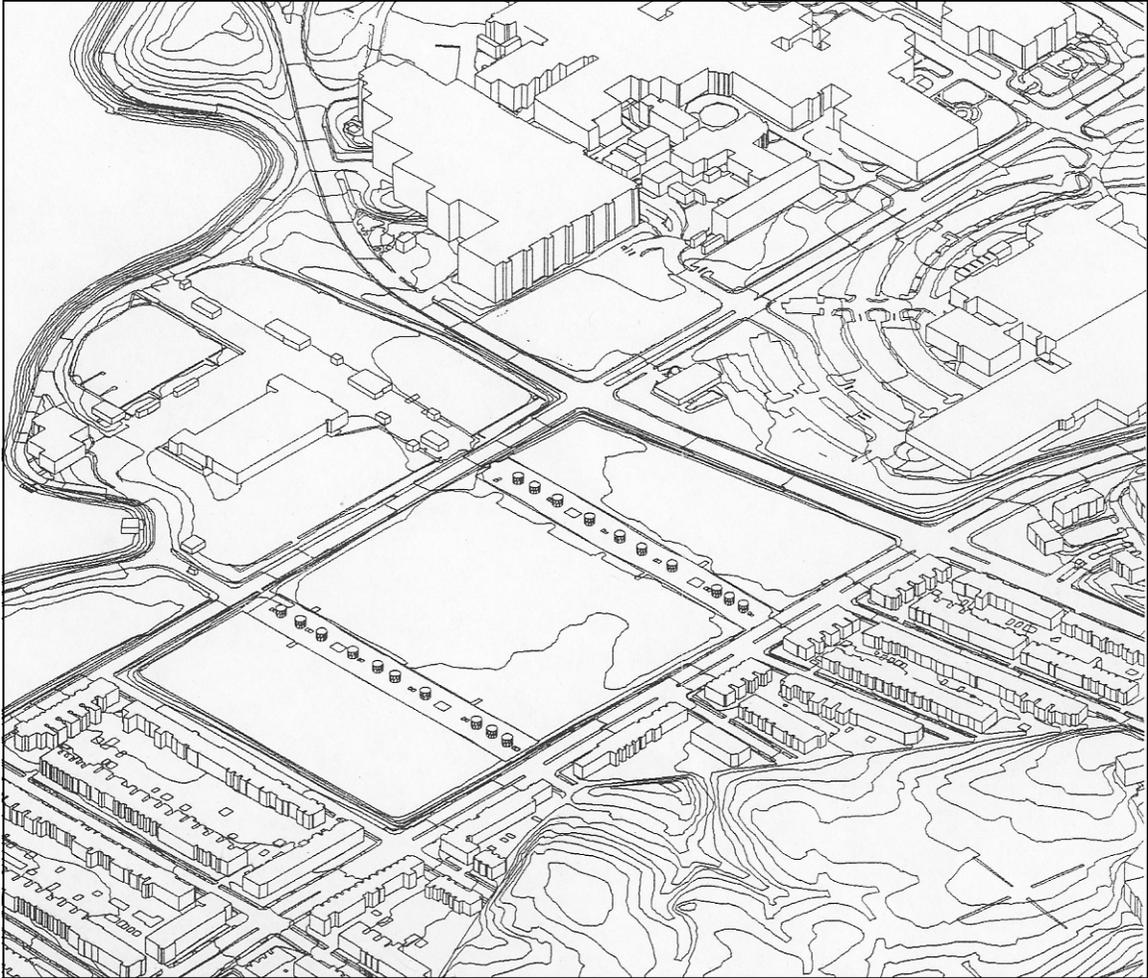




*Local Site Description:
Topography (1 meter contours)*

Fig. 30: Topography (DCOP, 2003)

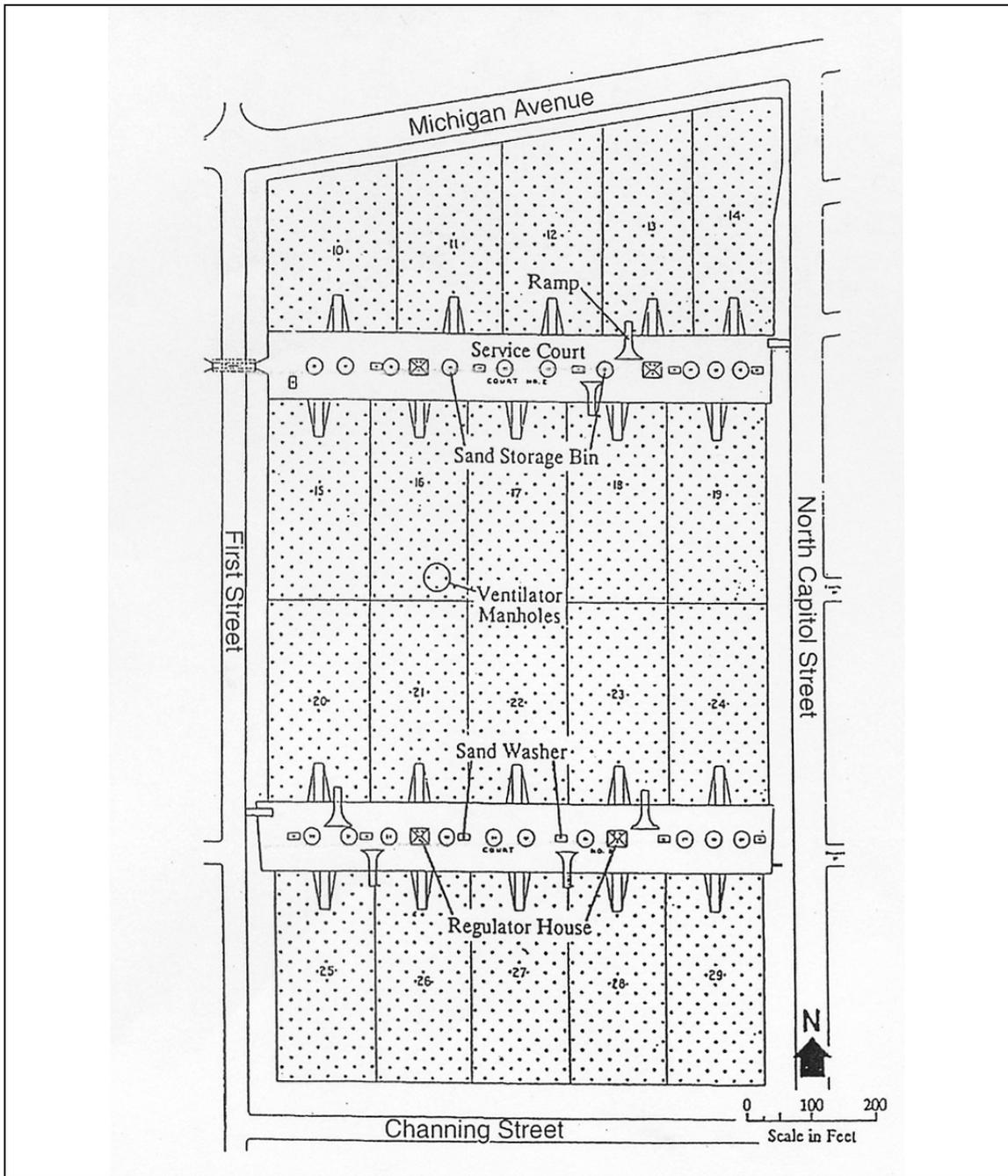




*Local Site Description:
Site axonometric*

Figs. 31a-c: Site axon (top: DCOP, 2003 and author;
bottom right: Greenhorne & O'Mara p2-9; bottom left: by author)





Local Site Description:

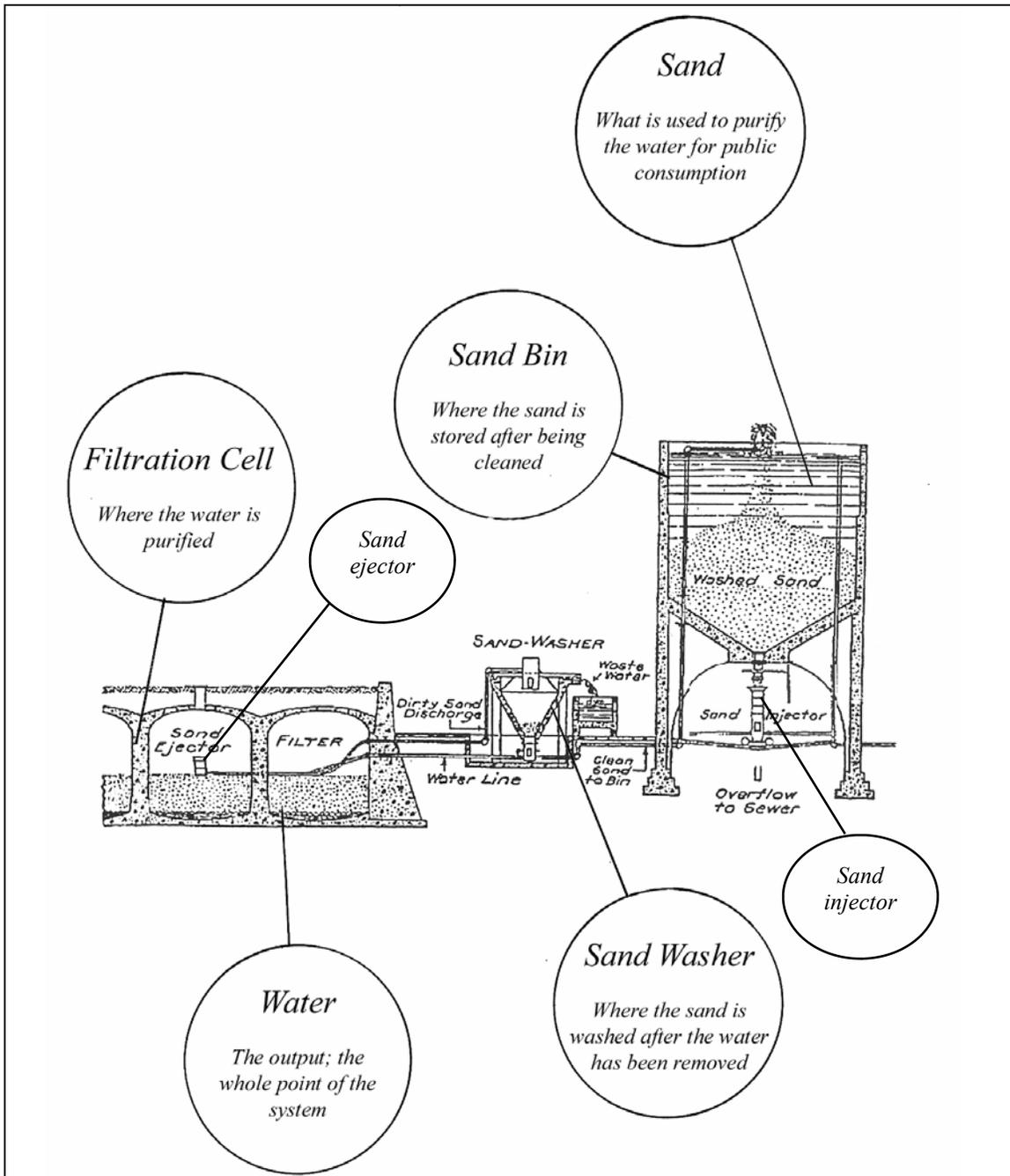
Manhole plan

Twenty "cells" outlined and numbered (Approx. dim.'s: 146' x 307' each)

Fig. 32: Manhole plan (Greenhorne & O'Mara, p2-2)

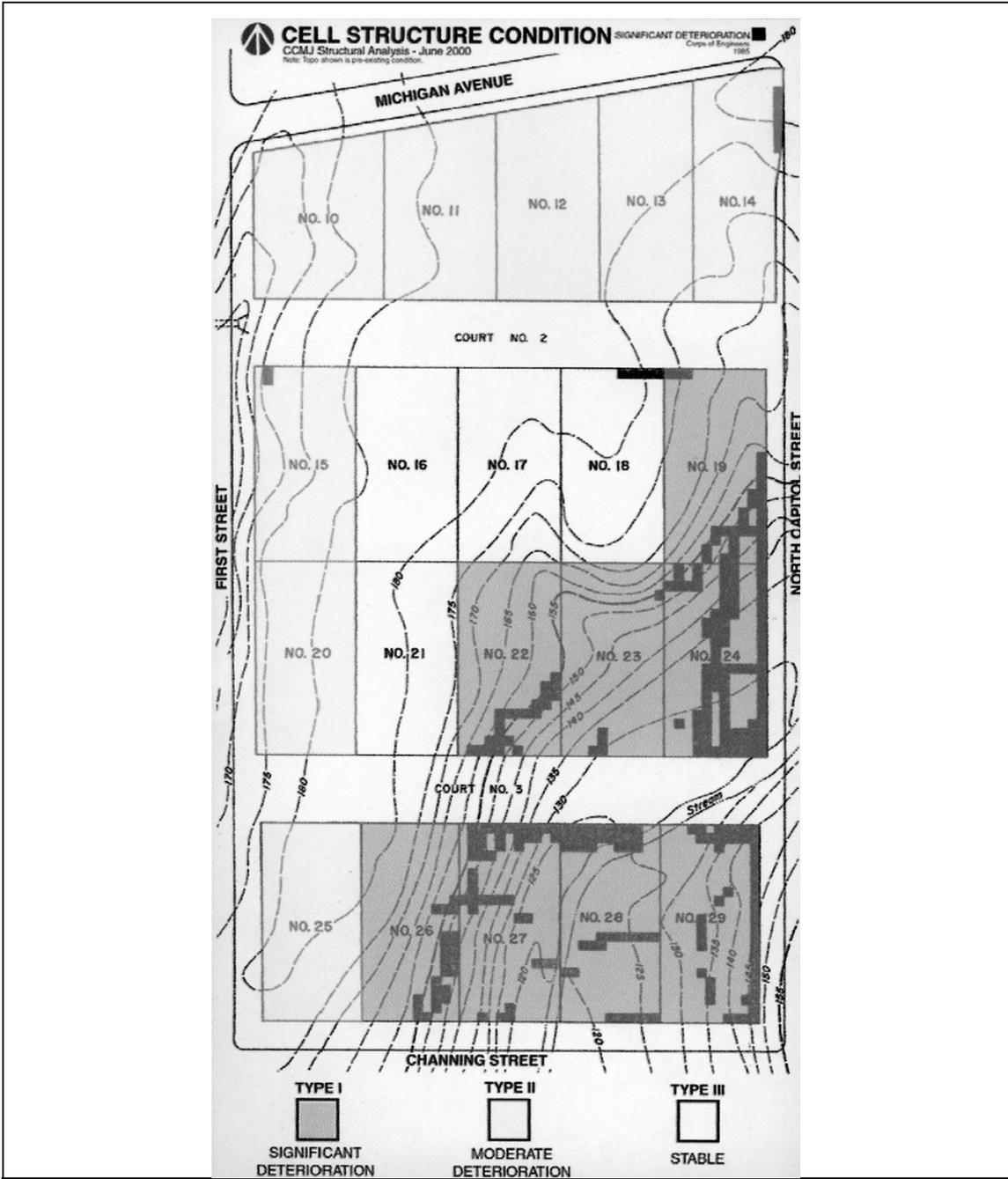


Not-to-scale unless noted otherwise



*Local Site Description:
Explanation of sand filtration system*

Fig. 33: Site explanation (Greenhorne & O'Mara, p2-9 and author)

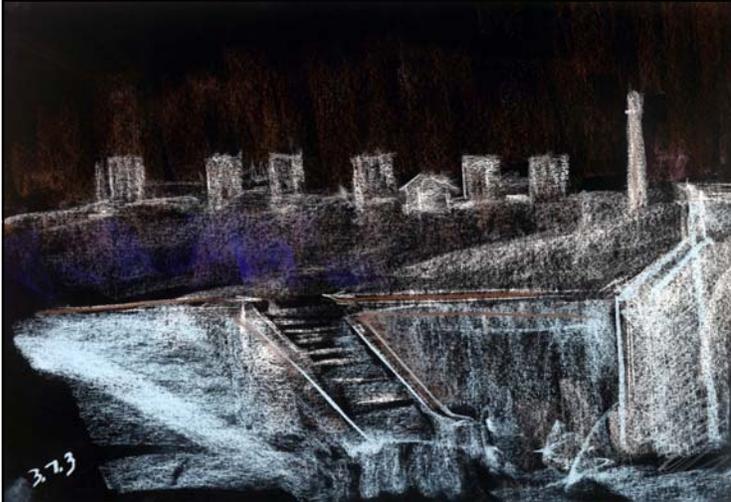


*Local Site Description:
 Current structural conditions
 Topography shown is preexisting*

Fig. 34: Structural conditions (http://www.planning.dc.gov/project/mcmillan_reservoir/index.shtm)



Not-to-scale unless noted otherwise



Sketch view from the north service alley



*View of Capitol dome
over site*



View of Washington Monument from site



*Howard University as
seen from Channing St.*

*Local Site Description:
View corridors*

Figs. 35-38: View corridors (by author)



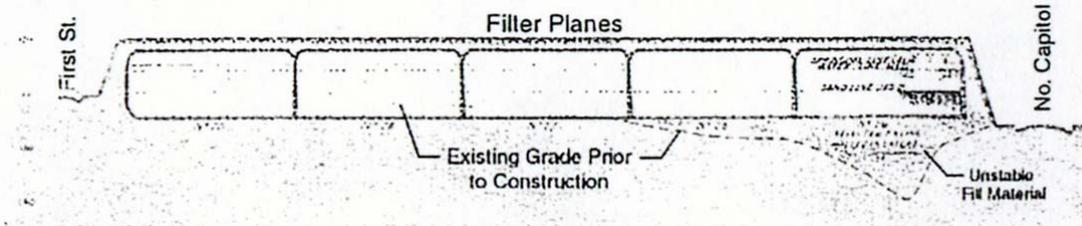
Aerial view of site (photo: Anice Hoachlander, copyright 1990)



General view of filter planes



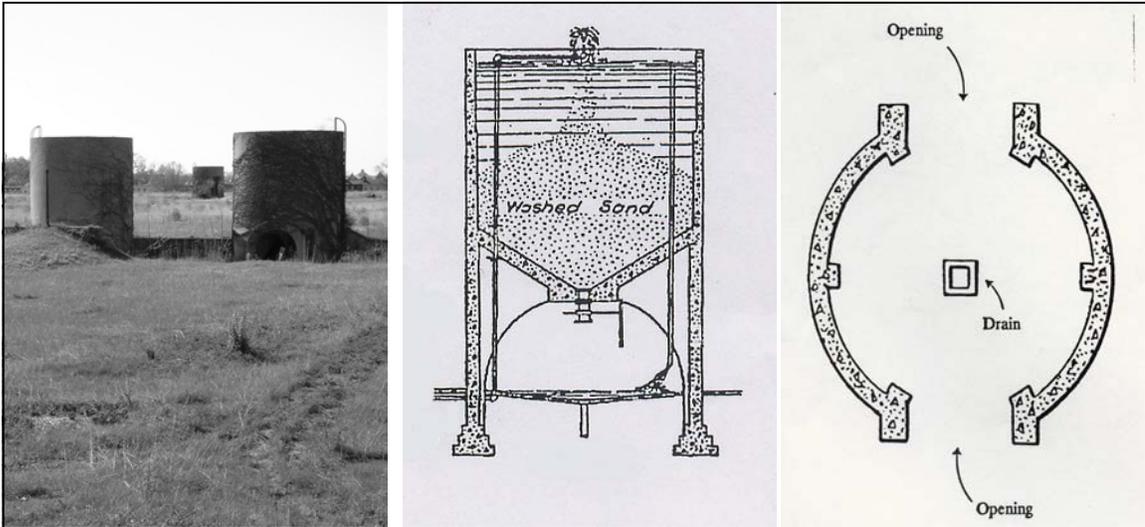
View of typical man-hole



Site section at Channing Street (Greenhorne & O'Mara p2-3)

*Local Site Description:
Grassy filter planes*

Figs. 39-42: Grassy filter planes *(by author unless noted otherwise)*



Sand bins

Section

Plan



Fig. 1: View into service alley (photo: Anice Hoachlander, copyright 1990)

*Local Site Description:
Concrete sand bins*

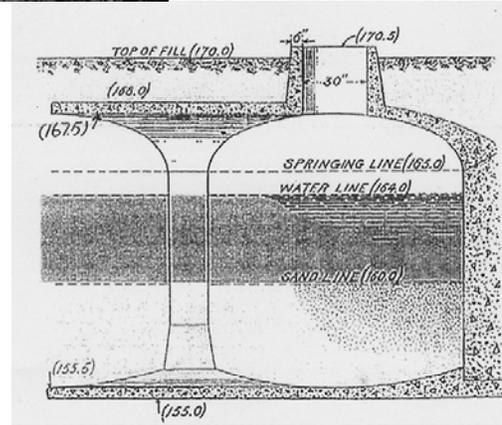
Figs. 43-46: Concrete sand bins (top left to right: by author, Greenhorne & O'Mara p2-9, Engineering-Science, Inc. Survey, June 1990)



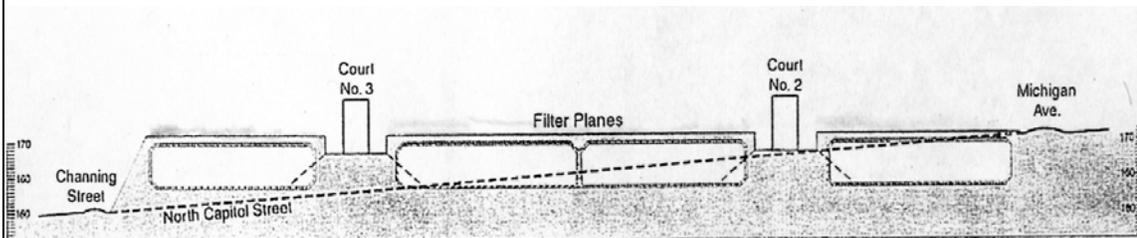
Interior of typical underground water filter cell
(photo: Anice Hoachlander, copyright 1990)



Entry to typical filter cell (by author)



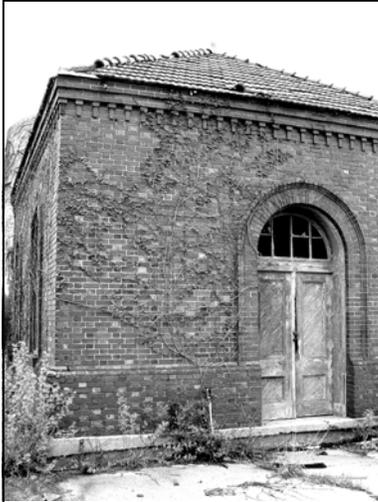
Section of filter cell



Site section at N. Capitol Street

*Local Site Description:
Underground filter cells*

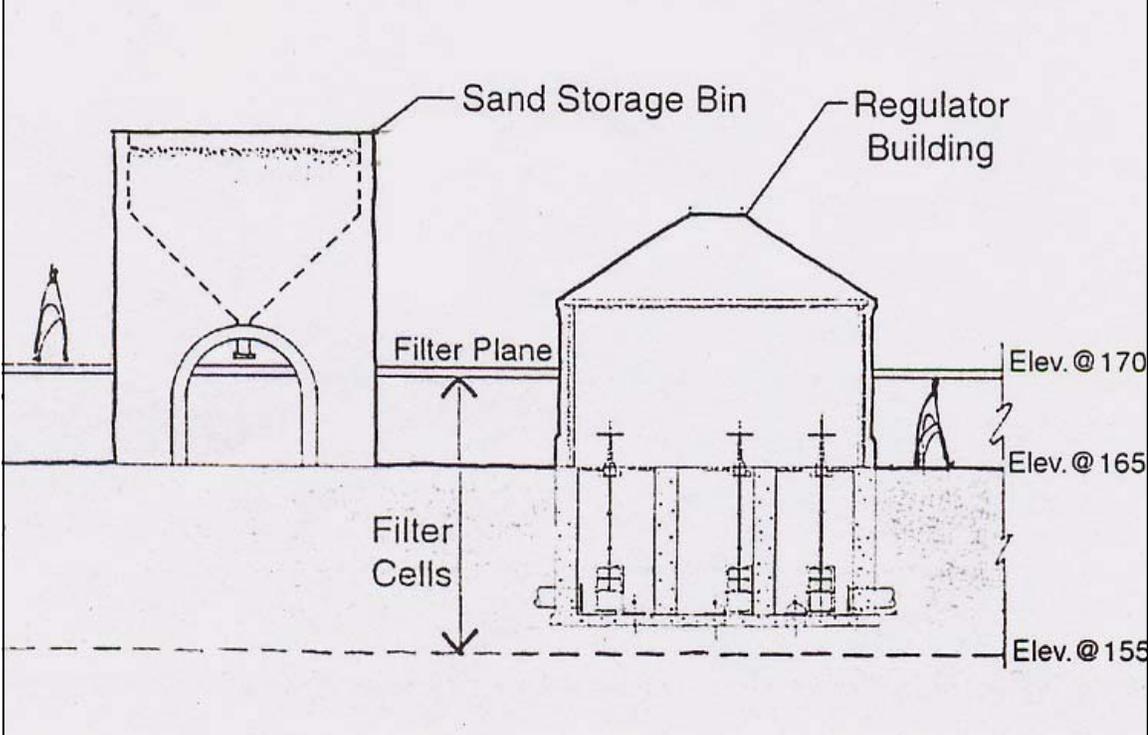
Figs. 47-50: Underground cells (Greenhorne & O'Mara, below: p2-3, and center right: 2-8, unless noted otherwise)



Regulator house exterior



Regulator house exterior



Site section at typical service alley (Greenhorne & O'Mara, p2-4)

*Local Site Description:
Regulator houses*

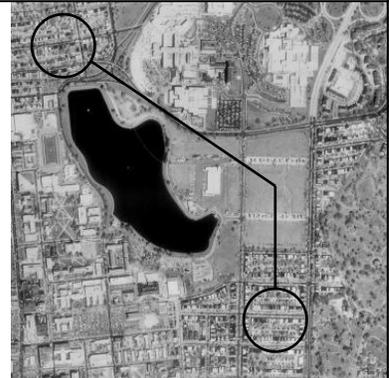
Figs. 51-53: Regulator houses (Greenhorne & O'Mara, below: p2-3, and center right: 2-8, unless noted otherwise)



Aerial view by Cameron, p

*Neighborhood Description:
Rowhouses
Bloomingdale & Park View neighborhoods*

Figs. 54-60: Rowhouses (by author)





*Neighborhood Description:
Condominiums
Park Place, The Cloisters, & Franklin Commons*

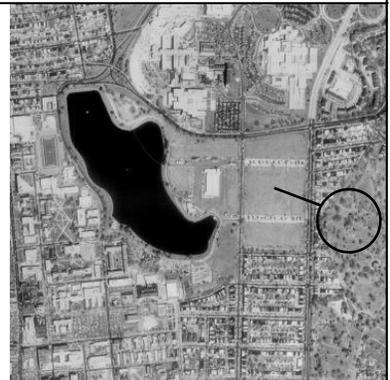
Figs. 61-66: Condominiums *(by author)*

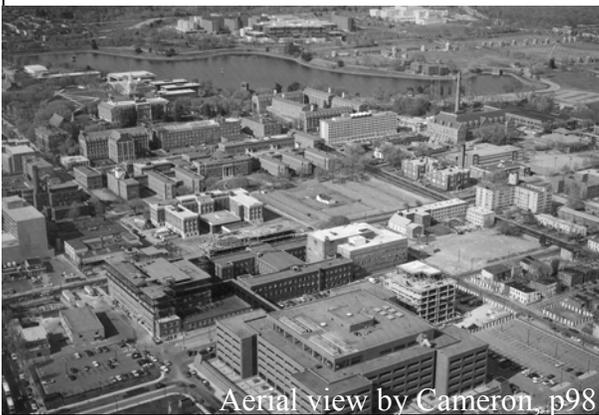




*Neighborhood Description:
Glenwood Cemetery*

Figs. 67-74: Glenwood cemetery (by author)





Aerial view by Cameron, p98

*Neighborhood Description:
Howard University*

Figs. 75-80: Howard University (by author,
unless noted otherwise)

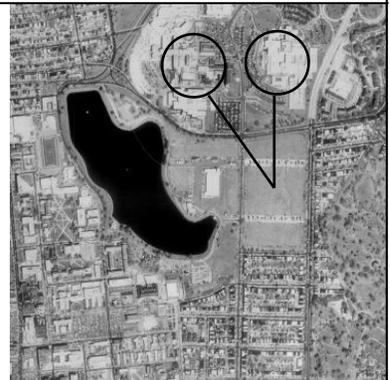




*Neighborhood Description:
Hospitals*

Washington Hospital Center, Veterans Admin. Hospital, National Rehabilitation Hospital, Children's Hospital

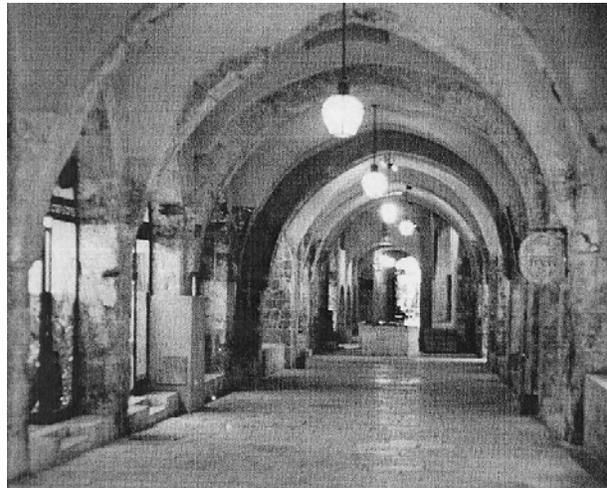
Figs. 81-88: Hospitals (by author)



PRECEDENT ANALYSIS

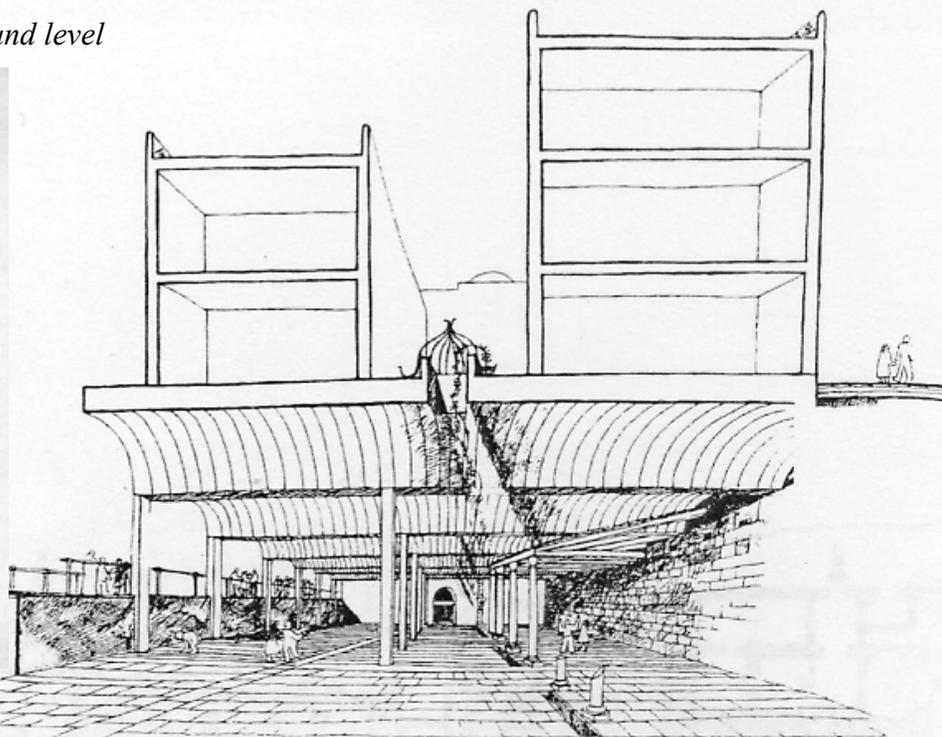
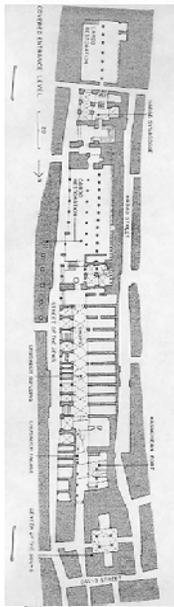
Relevance:

- Byzantine Cardo two meters below existing grade unearthed to inform new urban connections and amenities.
- Superstructure allowed housing construction to occur above archaeological dig; history and present coexist.
- “from the top down” approach liberates need to develop total site in one moment; flexibility to grow...
- Reuse builds on the heritage of place: Byzantine market and Arab bazaars are united in Jewish quarter



Mixed-use facility reuses existing vaults

Plan of ground level



Section perspective of adaptive reuse

Site Precedent:

The Cardo: Jerusalem, Israel
Bugod, Niv-Krendel, Aronson, 1985

Figs. 89-92: Jerusalem Cardo

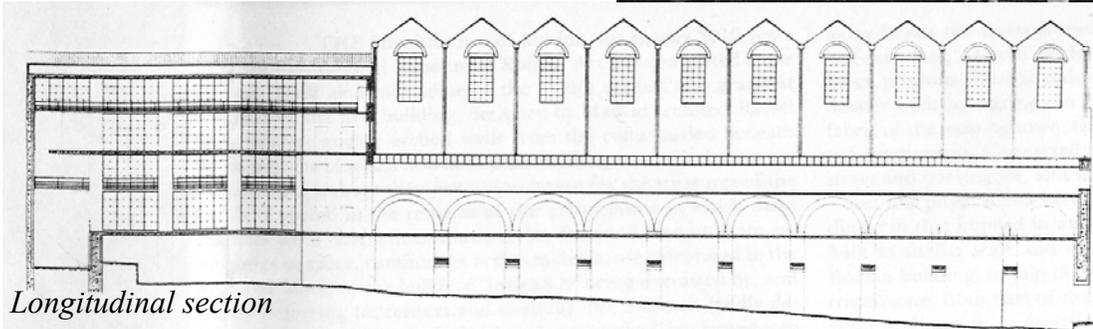
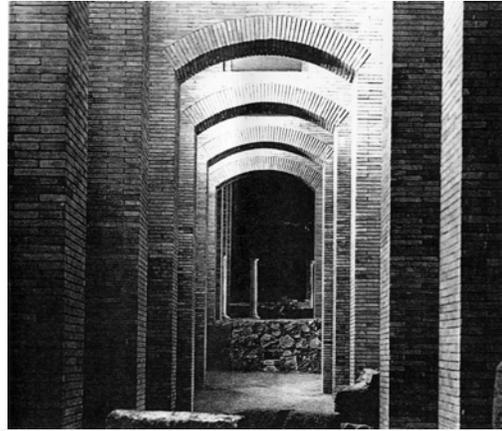
(Architectural Record, May 1985, p118-123)

The numbers:

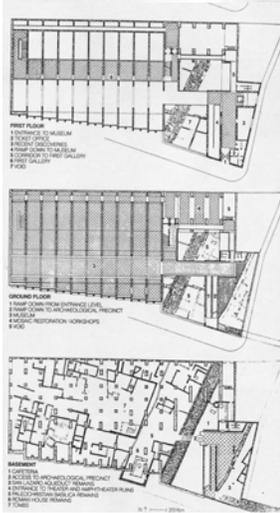
Total area: 22 acres
25 layers of civilization unearthed
Byzantine Cardo: 72' wide, 18' colonnade per side; net: 36' center blvd.
Housing: 37 apartments above
2 streets section residential uses from shopping uses

Relevance:

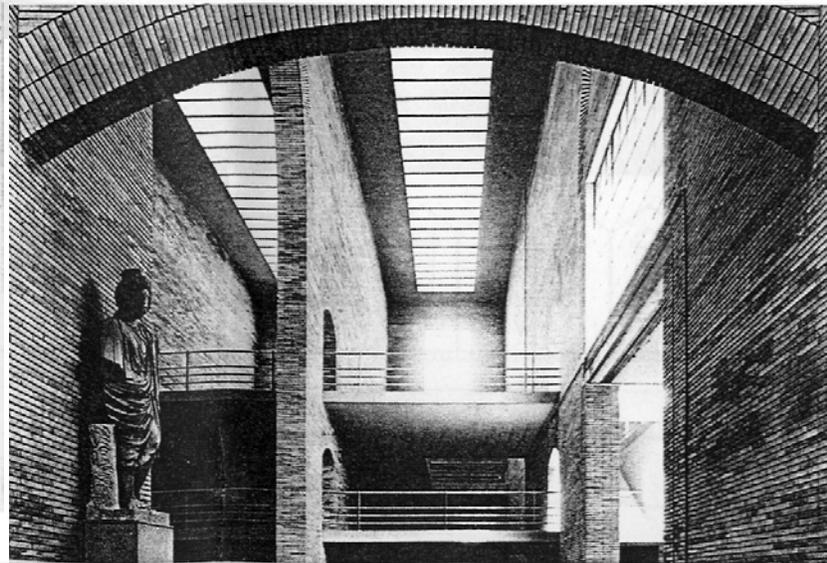
- *A respect for history is framed within a participatory, rather than mere observatory, experience of it.*
- *Building vocabulary supports the argument: the heritage of place is added upon by a layering that complements the original spirit, suggesting a relationship of the old and new.*
- *Rhythmic composition of the new enclosure acts as a background to the ruins.*



Longitudinal section



Plans



Site Precedent:

*Museum of Roman Art: Merida, Spain
Raphael Moneo, 1980-85*

Figs. 93-97: Merida

(Progressive Architecture, 6/86)

The numbers:

Total area: 124,000 s.f.
Program: *museum, archaeological precinct, cafeteria, workshop, lecture room, library, and offices*
Construction: *brick bearing/concrete core wall*
Grand gallery: 50' high

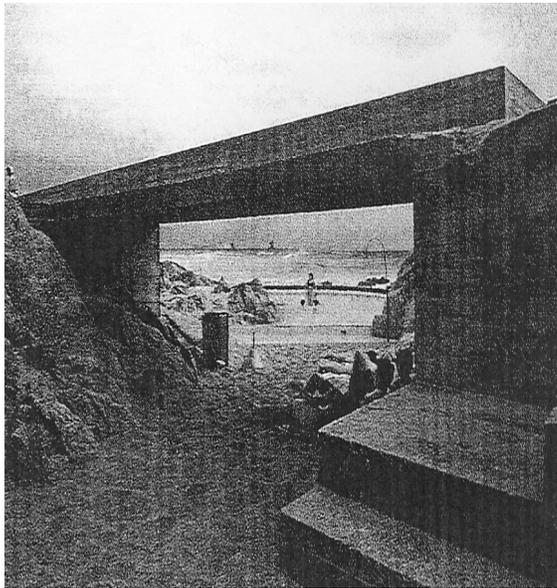
Relevance:

-Swimming facility was built from 1961-1966 along the coast of Portugal. The view of the sea is unobstructed because pools are below street level.

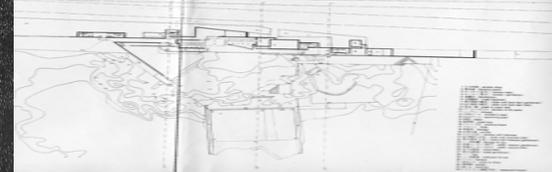
-Built amid the rocks, the complex interweaves the manmade and the natural and uses the existing rock formations to determine its boundaries.



View of children's pool and rock wall



Access to swimming pool and beach



Site plan, floor plan, and elevation



Design Sketch



View of swimming pool and beach

Site Precedent:

Swimming Pool: Leca da Palmeira, Portugal

Figs. 98-102: Alvaro Siza (Sources: *Alvaro Siza: Complete Works p*)

The Numbers:

- 1 adults' pool
- 1 children's pool
- 1 changing facilities
- 1 bar.

Relevance:

- The traditions that have shaped the design of Washington, DC are varied but share some essential ideas:
- Pedestrian relationship to loci of power by ceremonial axis (enclosed by repetitive vertical elements)
- Astronomy, sacred objects, landscape and/or open space inform axis termination.
- Vista is key to urban connections; gateways introduce and orient.

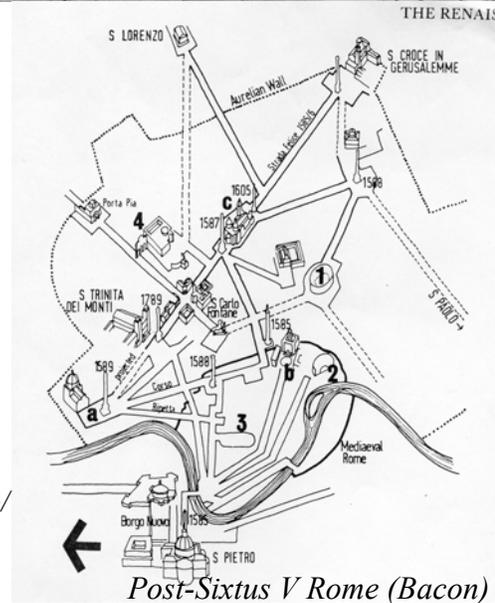


Roman cardo, Timgad (Algeria)

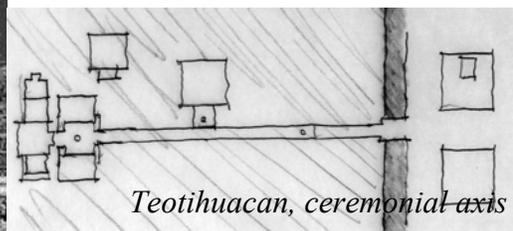


Diagram of Rome before Sixtus V (Bacon)

View of Teotihuacan's Avenue of the Dead
<http://www.archaeology.org/online/features/mexico/>



Post-Sixtus V Rome (Bacon)



Teotihuacan, ceremonial axis

Site Precedent:

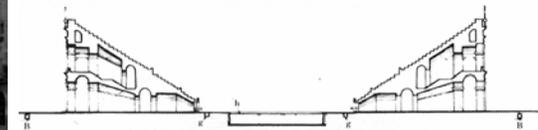
Ceremonial Axis: Teotihuacan, Timgad (Algeria), and Sixtus V Rome

Figs. 103-107: Ceremonial Axis

(sources: www.archaeology.org/online/features/mexico/; Morris, AEJ: History of Urban Form p181; Bacon, Edmund: Design of Cities p143; Kostof, Spiro: The City Shaped p263, and by author)

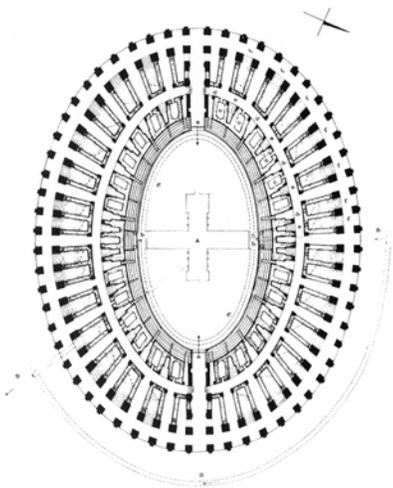
Relevance:

- Roman amphitheater converted into mixed-use commercial and residential.
- Central piazza takes oval shape from original form of amphitheater.
- The heritage of place is added upon by a layering that does not replicate the first use, but converts its form into a new use.
- Structural system of original building is reused by a vernacular process of pattern adaptation.



View of market/residences from ground

Section through typical amphitheater



Plan of typical amphitheater

Aerial view of Lucca amphitheater

Site Precedent:

*Piazza del Mercato: Lucca, Italy
(converted Roman amphitheater)*

Figs. 108-112: Lucca

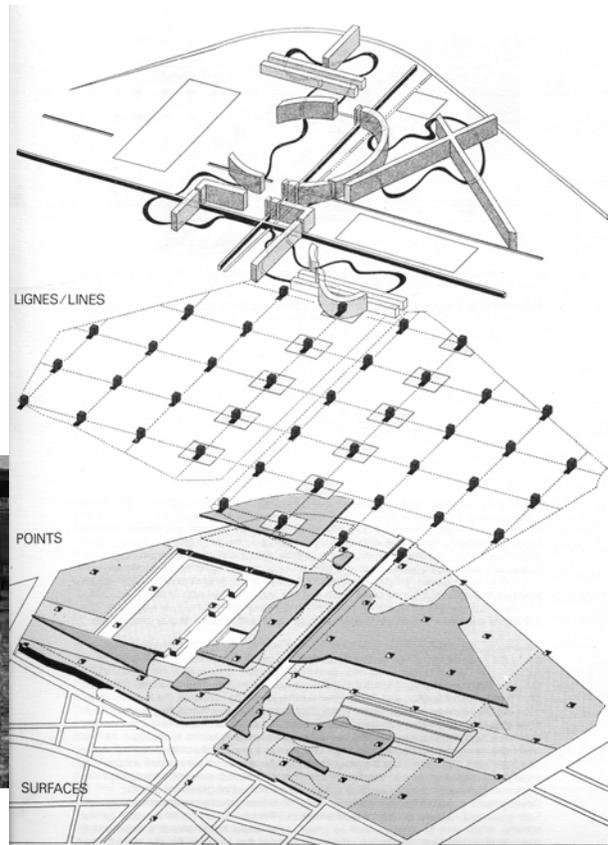
(Sources: Favole: Piazze d'Italia, p80)

Relevance:

- An overlapped, superimposed grid established by the red follies acts as a datum against which the more ambiguous program contrasts.
- Participation with existing urban fabric and natural landscape gives continuity to concept, even through discontinuous building.
- Juxtaposition of seemingly natural and manmade systems is a theme.



View of a folly and geode



Axon diagram



Aerial view

Site Precedent:

*Parc de la Villette: Paris, France
Bernard Tschumi, 1982-83*

Figs. 113-116: Villette

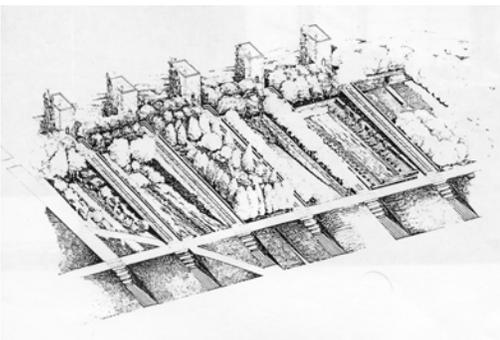
(Cinegramme Folie: Le Parc de la Villette, B. Tschumi; & www.la-villette.com)

The numbers:

Total area: 125 acres
Follies: 10' x 10', 120' spacing O.C.
Location: 35 minutes NW of Paris
Major program: Geode, Cite des Sciences (technology museum), Cite de la Musique (music school), Zenith concert hall

Relevance:

- An urban park sited in the former location of the Citroen automobile factory.
- Adaptive reuse: the streamlined layout of an industrial factory informs the garden's theme; legacy of horizontal movement continues
- Regularization of natural amenities into a rational grid sets up dramatic contrast of manmade and natural.



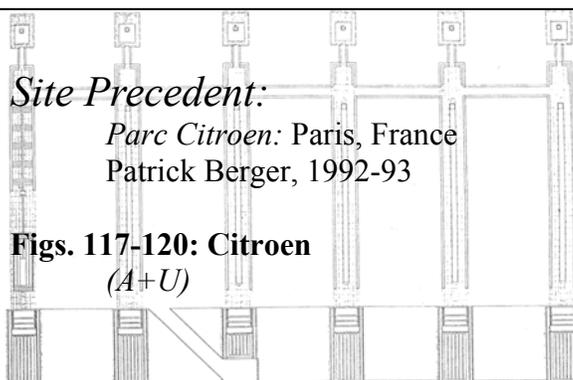
Aerial sketch of the Serial gardens



Water directs the overall scheme



General view of Serial gardens



Site Precedent:

*Parc Citroen: Paris, France
Patrick Berger, 1992-93*

**Figs. 117-120: Citroen
(A+U)**

The numbers:

Total area: 35 acres

4 themes: artifice, architecture,
movement, nature

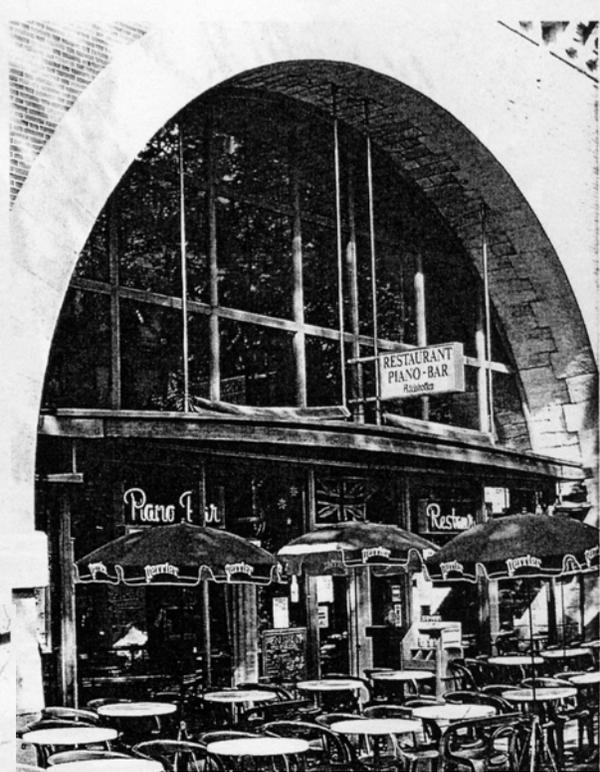
1985: city purchased land & invited
10 teams to compete for commission

Elements: Fountains, canals, framed
and oblique vistas, varied landscape

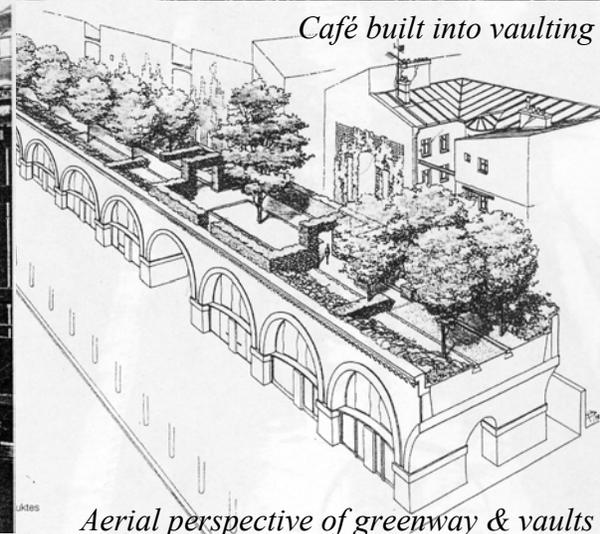
Relevance:

- Abandoned railroad viaduct re-claimed by city government and converted into elevated greenway, with shops and studios tucked underneath. (Industrial infrastructure converted into mixed-use facility)
- Structural expression of the vaulting is celebrated and exposed to the everyday reuse
- Urban landscape merges with an imposed natural landscape
- Critique: rehabilitation effectively drove existing (poorer) neighbors out

Interior view of crafts studio



Café built into vaulting



Aerial perspective of greenway & vaults

Site Precedent:

*Viaduct des Artes: Paris, France
Mathieux, Vergely, Berger, 1992-93*

Figs. 121-124: Viaduct des Artes

*(Architecture, April 1997, p138-42;
Detail, June 1996, p. 829-33)*

The numbers:

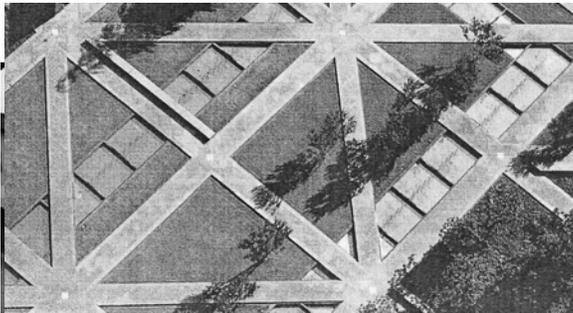
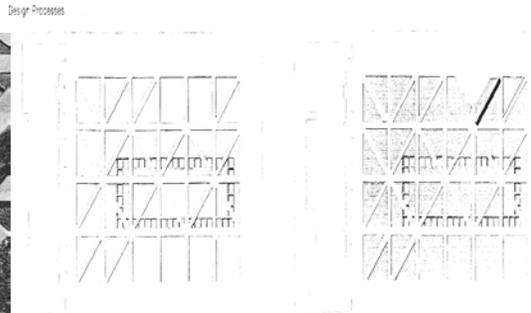
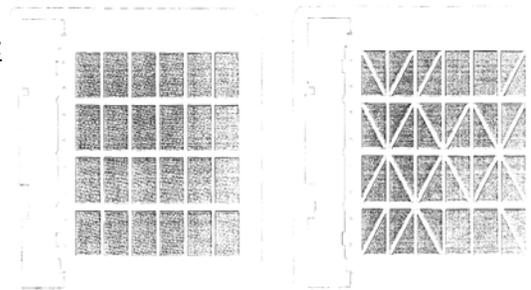
- 1.4 miles of elevated railway
- 12th arrondissement of Paris
- 1859: Viaduct erected
- 1986: city purchased obsolete facility
- Cost: \$16 million

Relevance:

-Rehabilitated urban park combines a plaza with a public park and subtly blends the two while also contrasting them.

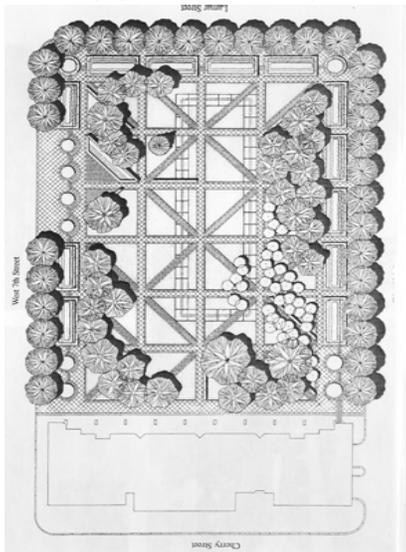
-The lawn, walkways, and pools layer upon over each other as each is on different elevation.

-Park's gradual incline allows for its use as an amphitheater.

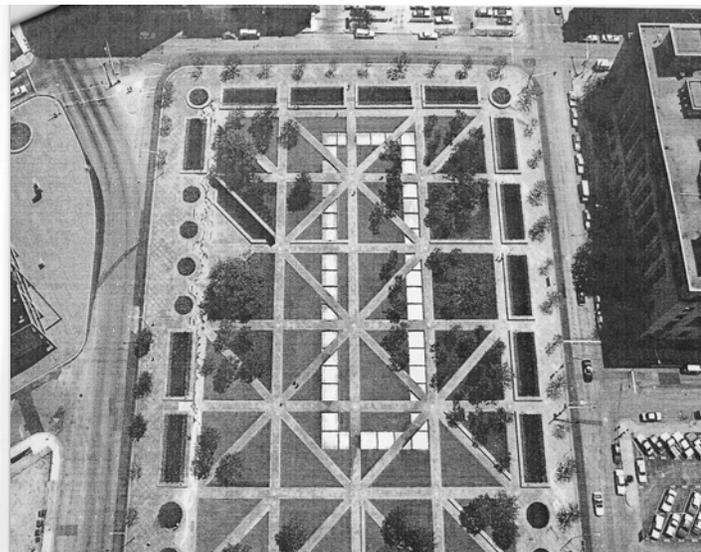


View of granite walkways across lawn

The design processes



Plan of Burnett Park



Aerial view of Burnett Park

Site Precedent:

*Burnett Park: Fort Worth, Texas
(rehabilitated urban park)*

Figs. 125-128: Burnett Park(Sources: *GA Document,*)

The numbers:

(250' by 80') pools below walkway

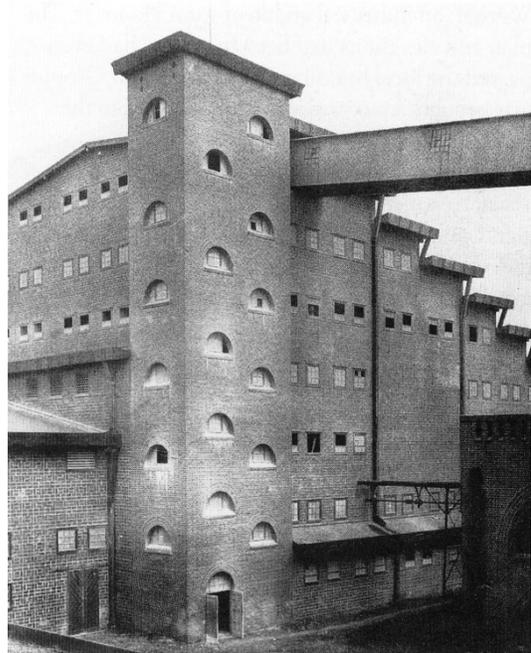
Seating for 2,000 people if seated on walls, planters, and lawn.

Relevance:

- *Economically-driven efficiency: engineering aesthetic emerges in early Modernism.*
- *Putting McMillan in its historical context: European architects looked up to American engineers as masters of the new ideology.*
- *McMillan's original reason-for-being may inform its second use and design: layering of uses, coexistence of park and engineering facility, rational ordering, and durable materiality.*



Behrens: Gasworks, Frankfurt



Poelzig: Chemical Factory, Luban



Photograph of McMillan's sand towers by Robert Lautman

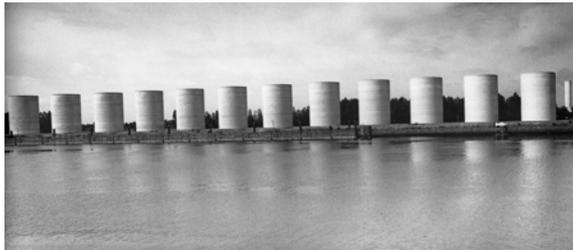
Site Precedent:

Deutscher Werkbund: Germany
Peter Behrens, Hans Poelzig 1911-12

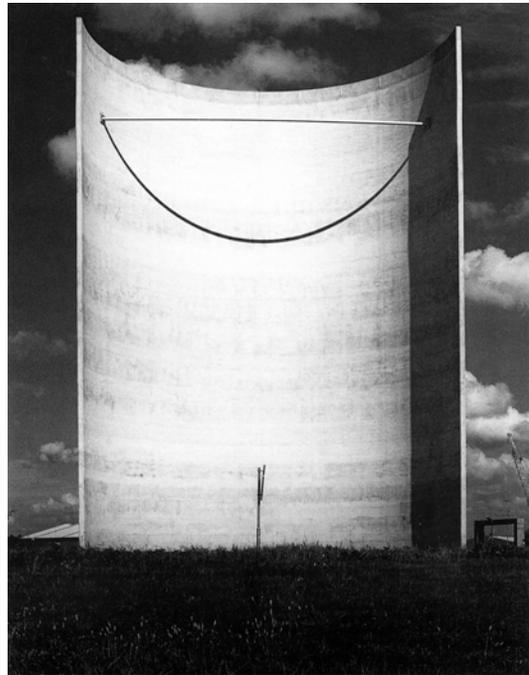
Figs. 129-131: Deutscher Werkbund (*Curtis, W.J.R., p102-3 unless noted otherwise*)

Relevance:

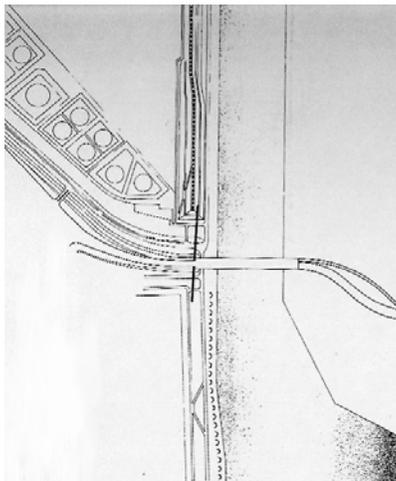
- Freestanding reinforced concrete semicircular forms that act as wind screens, as well as symbolic gateway, for the ships coming into harbor.
- The forms mimic the industrial aesthetic of the port context, but are artistically self referential.
- The landscape is rationalized for practicality, but without losing a sense of sculptural Platonism.



Windscreens as seen from the water



Detail of a windscreen



Site plan



Aerial view of Rotterdam's Caland Canal

Site Precedent:

*Wind Screen: Rotterdam, Netherlands
Maarten Struijs, 1983-5*

Figs. 132-135: Wind screen

(Berrizbeitia & Pollak, p160-5)

The numbers:

Total site length: 1 mile
Semicircular shells:
80' high
29' diameter
39' spacing

Relevance:

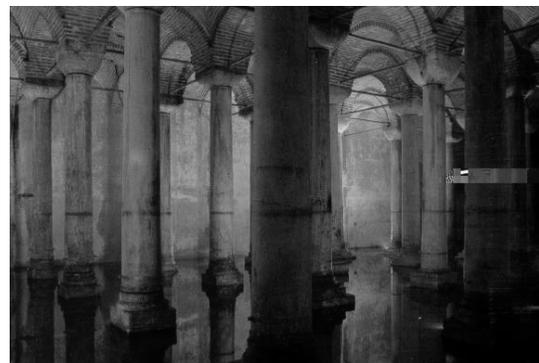
- *Underground water storage facility dating from the Byzantine era converted into a dining and music hall.*
- *Underground microenvironment enhanced by water gives relief from scorching Istanbul summers.*
- *Mixed-use appeal: the mystery and romance of such a facility represent its sustaining asset.*



Dining and music facilities built in 1987



View of the pedestrian deck



View of columns and water

Site Precedent:

*Underground Cistern Istanbul, Turkey
Byzantine, 4th c. AD, renovated 1987*

Figs. 136-138: Istanbul cistern
(yerebatensarnici.com)

The numbers:

Total site area: 2.42 acres
336 columns under city grade
80,000 cubic meters of water storage

Relevance:

- Washington, DC once boasted a network of 5 public markets that, like the McMillan water filtration facility and its gardens, gave the city places of civic use and value: Eastern Market is the last surviving.

- Farmers markets, flea markets, and bazaars represent places of democracy, like the agora of ancient Athens or Forum of ancient Rome, where ideas are traded as much as goods.

- Architecturally, it is essentially a free plan for vendors to display and an environment that is attractive to would be shoppers



Vendor outside of the Eastern Market



View of the Grand Bazaar in Istanbul

Site Precedents:

Eastern Market Washington, DC 1873

Grand Bazaar Istanbul, Turkey 1461

Figs. 139-140: Market (*easternmarket.net*
and *cruisesrfun.com*)

The numbers:

Eastern Market:

Total site area: approx. 2 acres

Vendor area: 50-200 s.f.

Grand Bazaar:

Total site area: approx. 30 acres

Vendor area: 150-200 s.f. (4400 shops in total)

Relevance:

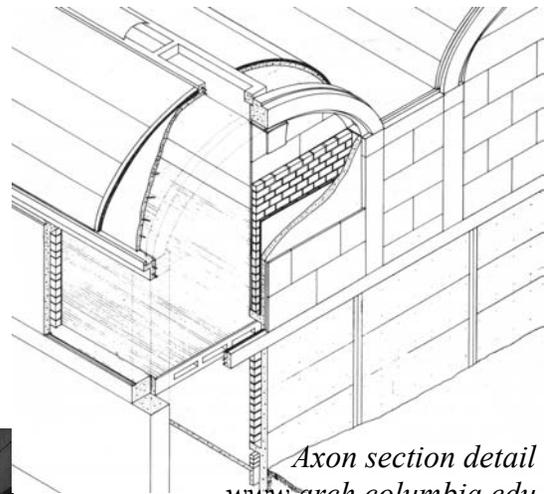
- Post-tensioned reinforced concrete on a repetitive bay system informs the open space of the gallery.
- The tectonic quality of the museum is on display as much as the art, though it does not detract from it.
- Natural light is diffused in the vaults by a deflection mechanism.
- The timelessness of the form is unmistakable.



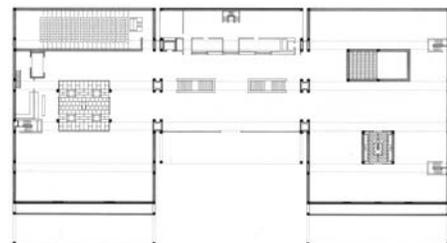
Interior at entry, www.greatbuildings.com



View of waterwall and typical structural bay



Axon section detail
www.arch.columbia.edu



Plan, www.arch.columbia.edu



Exterior view of arches
www.greatbuildings.com

Site Precedent:

Kimbell Art Museum: Fort Worth, TX
Louis Kahn, 1966-72

Figs. 141-145: Kimbell Art Museum

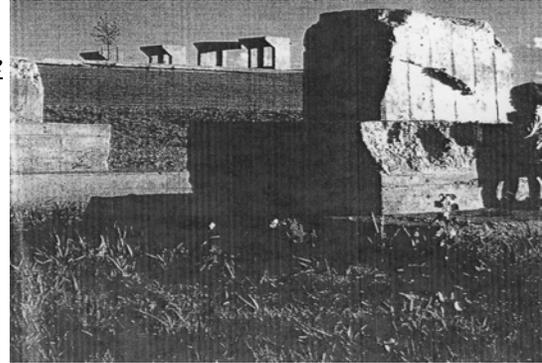
(Curtis, W.J.R. p524-5, unless noted otherwise)

The numbers:

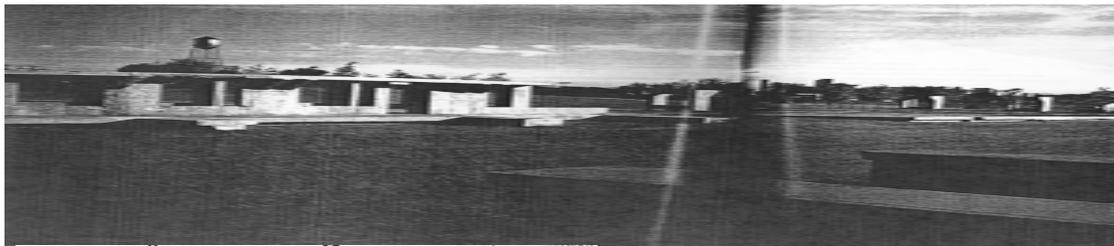
Total site area: 1.3 acres
120,000 s.f. (18% is gallery space)
Sixteen 100' x 20' structural bays
Four 24" concrete columns per bay

Relevance:

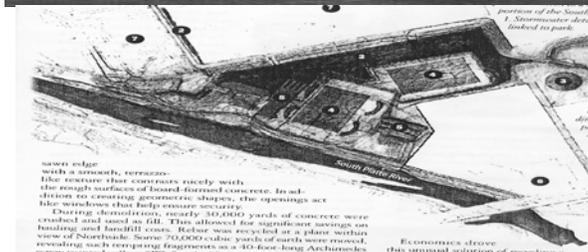
- Much of the sewage plant's infrastructure was left as part of the park. Some was dug up to expose what was once below ground while other parts were filled in.
- Storage tanks were excavated and now scatter the park casting shadows across the open green spaces creating a connection between the river and the wetlands of the park.



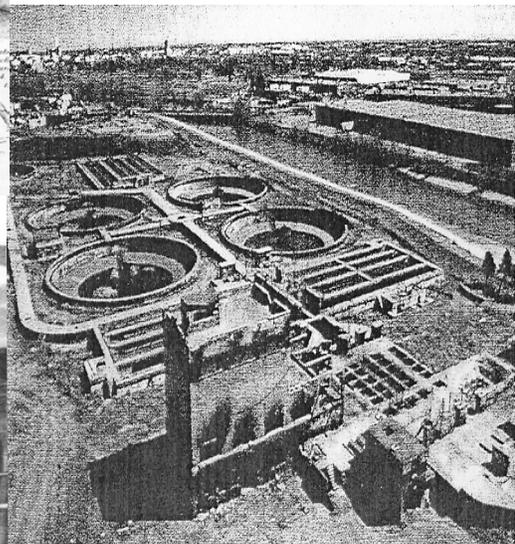
View of sculptural elements of park



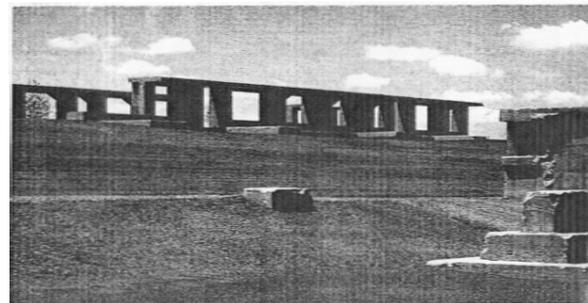
View of park's open spaces



Original site plan



Aerial view of original treatment plant



View of old foundations

Site Precedent:

Northside Park: Denver, Colorado
 (converted sewage treatment plant)
 Wenk Associates

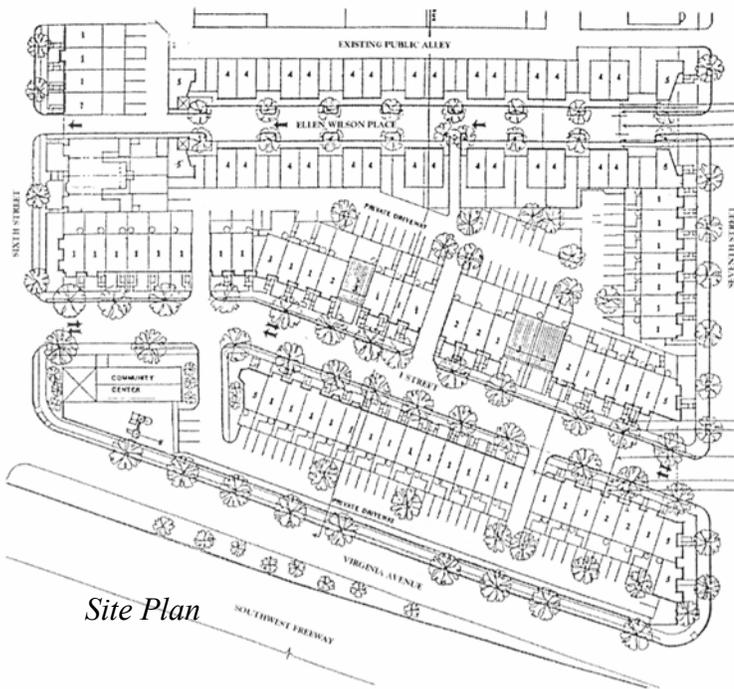
Figs. 146-150: Northside Park

The numbers:

14 acre park on site of 1930's sewage treatment plant.
 30,000 yards of concrete demolished
 70,000 cubic yards of earth moved

Relevance:

- local vernacular of brick row houses is extended to new affordable housing.
- variation on a theme: multiple facades dress up uniform plans in an attempt to blend affordable with market-rate units.
- Truly mixed-income development: market-rate, submarket rate, and subsidized units
- interiors are spare, a reflection of the constrained construction costs, but flexible, leaving room for individual expression.



Site Plan



Elevations



Floor plans

Rowhouse Precedent:

*Ellen Wilson Townhomes: Wash. DC
Amy Weinstein Associates, 1994*

Figs. 151-153: Ellen Wilson Townhomes
*(CHCHA brochure 2000, and
www.dchousing.org)*

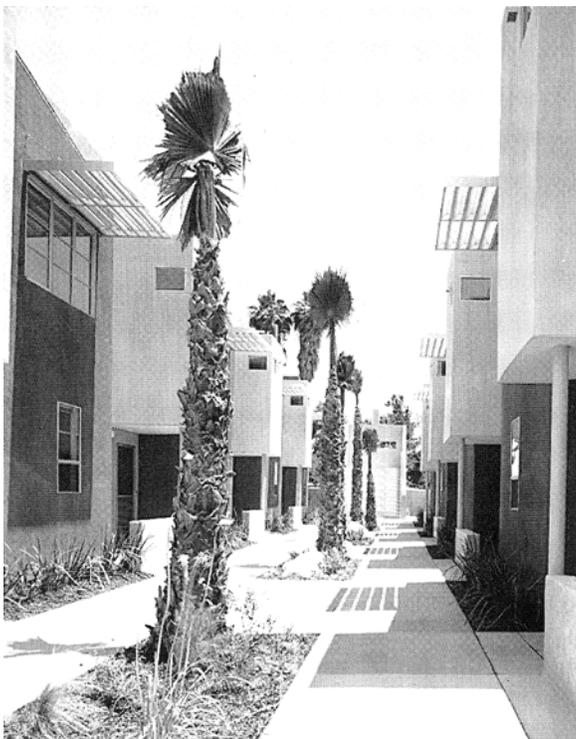
The numbers:

1BR: 52 units (560-605 s.f./ea.)
2BR: 95 units (783-1250 s.f./ea.)
3BR: 6 units (1250 s.f./ea.)
Total site area: 5.3 acres (25du/ac)
Project sponsored by HOPE VI grant

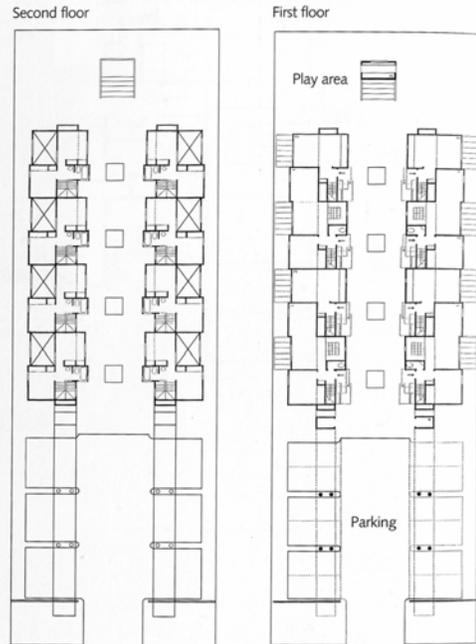
Not-to-scale, unless noted otherwise

Relevance:

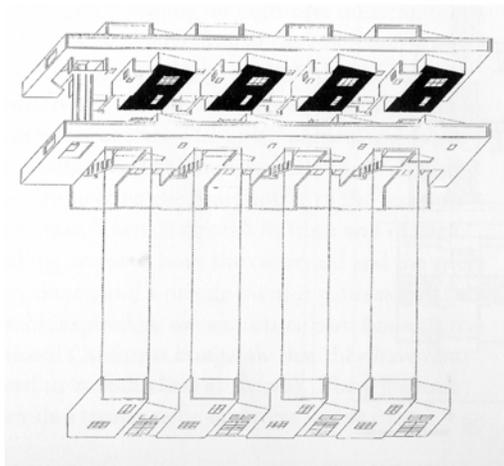
- *abstraction of the local vernacular in both plan (bungalow court) and form (Spanish mission style)*
- *clearly articulated thresholds give each unit dignity and presence*
- *porches in front and back: integration of building with landscape*
- *free plan interiors allow for personal expression to counter the uniformity of facades*



Shared public alley: blends exterior & interior space with spatial articulation



Floor plans



Section axon: diverse plans inside of regular townhouse form

Rowhouse Precedent:

*Sunrise Place: Escondido, CA
Davids Killory Architects, 1991-92*

Figs. 154-156: Sunrise Place
(Davis, p184-8)



The numbers:

2BR: 8 units (760 s.f./ea.)
Private patios: 140 s.f. (each house)
Total site area: 0.44 acres (18du/ac)
Parking: 12 on-site spaces
Homeless family interim housing

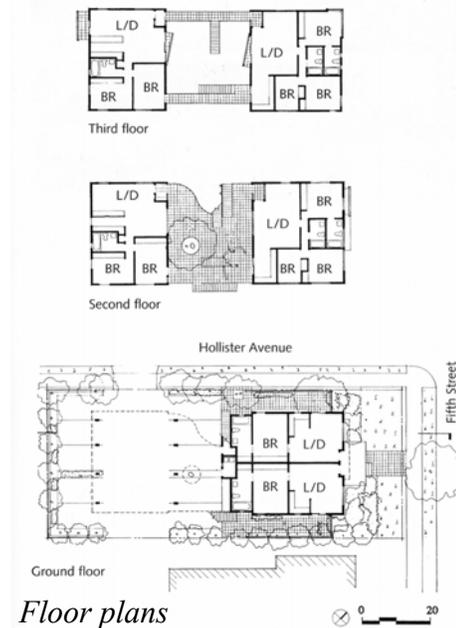
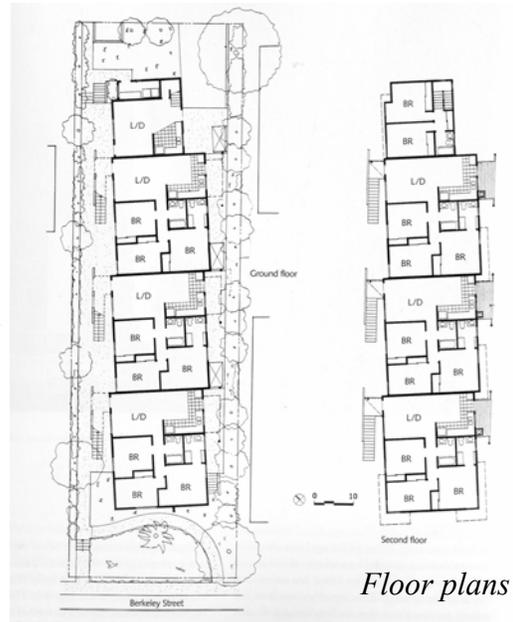
Not-to-scale, unless noted otherwise

Relevance:

- Top right: units share party wall and yet, are clearly distinguished by independent entries and landscaping.
- Bottom left & right: 2 freestanding units share amenities such as parking and courtyard
- All three: free plan interiors allow for personal expression to counter the uniformity of facades
- Character is rooted in local tradition.



Common courtyard, see below right



Rowhouse Precedent:

Infill Housing: Santa Monica, CA
Koning Eizenberg Architects, 1987

Figs. 157-161: Infill housing
(Davis p169-178, and Jones, Pettus, Pyatok p148-9)

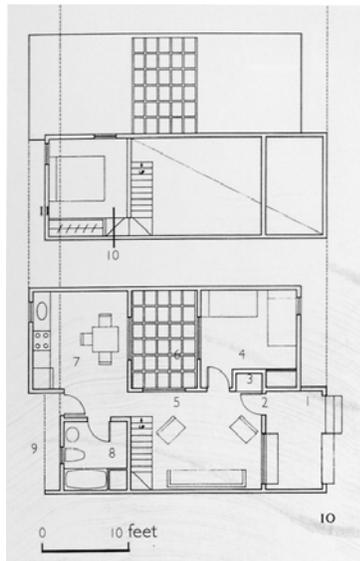
The numbers:

(*St. John's Hospital Housing, top*)
1BR: 1 unit (550-650 s.f.)
2BR: 4 units (750-1050 s.f./ea.)
3BR: 19 units (890-1050 s.f./ea.)
Total site area: 0.53 acres (45du/ac)

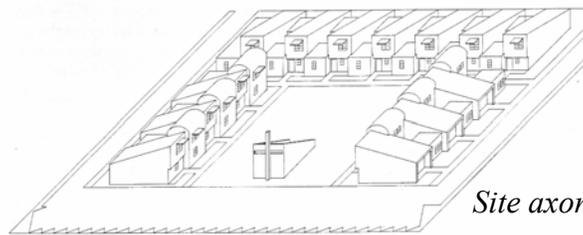
Not-to-scale, unless noted otherwise

Relevance:

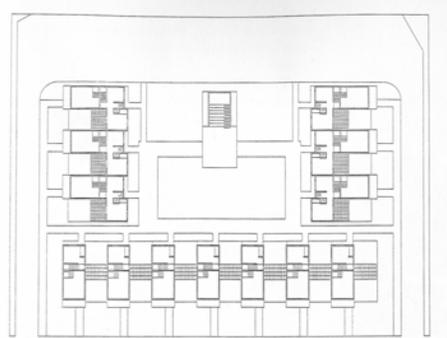
- *abstraction of the local vernacular in both plan (bungalow court) and form (Spanish mission style)*
- *clearly articulated thresholds give each unit dignity and presence*
- *porches in front and back: integration of building with landscape*
- *free plan interiors allow for personal expression to counter the uniformity of facades*



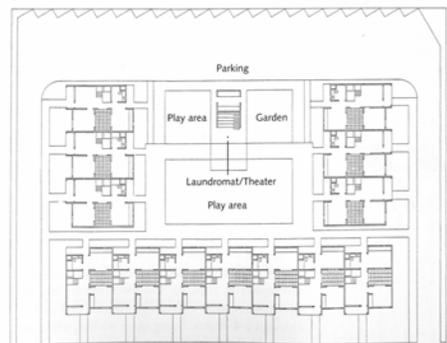
Unit plans: open, diverse, layered thresholds



Site axon



Second floor



First floor

Floor plans



Southwest court view Davids/Killory



Human scale massing

Rowhouse Precedent:

*Daybreak Grove: Escondido, CA
Davids Killory Architects, 1991-92*

Figs. 162-167: Daybreak Grove

Source: Davis p184-8, and Jones, Petrus, Pyatok p132-5.

The numbers:

2BR: 7 units (730 s.f./ea.)
3BR: 6 units (860 s.f./ea.)
Public courtyard: 11,200 s.f.
Total site area: 0.84 acres (18du/ac)
Avg. income \$9,000-\$28,000/year

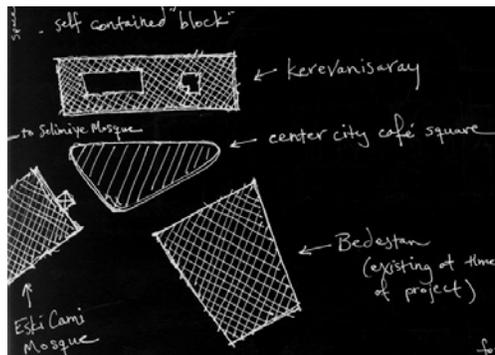
Not-to-scale, unless noted otherwise

Relevance:

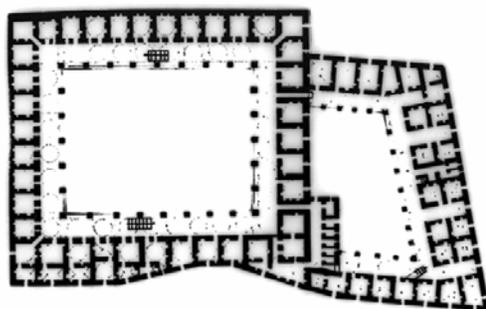
- Exemplifies how private functions can co-exist with and enhance the urban fabric.
- Microenvironments are distinguished by landscaping, elevation, and view.
- The self-contained block can sponsor multiple uses inside of a single form.
- Interior (private realm) functions differ from exterior (public realm) functions, as in a Roman palazzo or Parisian hotel.



Inner courtyard facade



Plan of block (by author)



Second floor plan



Covered gallery on second floor

S.R.O. Precedent:

Rustem Pasha Karavanserai
Edirne, Turkey
Sinan, Architect, 16th century

Figs. 168-171: Rustem Pasa
(archnet.org unless noted otherwise)

The numbers:

Single room: 75 units (≈ 200 s.f./ea.)
Public courtyards: approx. 34300 s.f.
Total site area 2.5 acres (30 du/ac)
Single-loaded corridors
Public W/C facilities

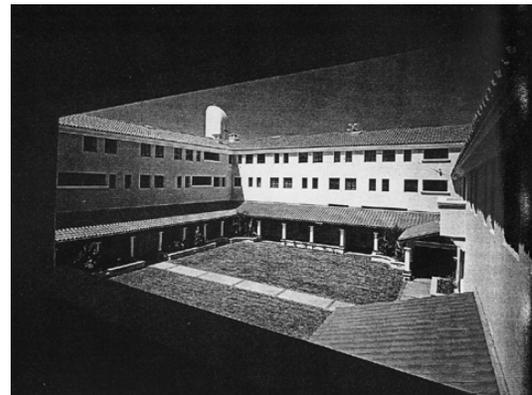
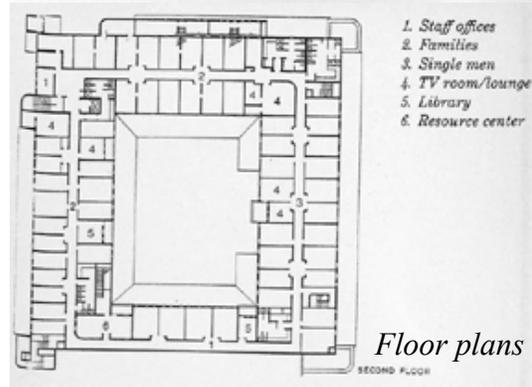
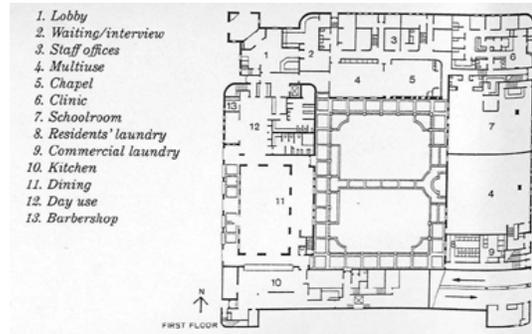
Not-to-scale, unless noted otherwise

Relevance:

- Urbanistically-contained.
- Mixed use building provides a dining hall, drop-in medical clinic, chapel, library, laundromat, barber shop, underground garage, and job counseling offices.
- Courtyard scheme provides passive cooling and access to direct natural light on both sides of double-loaded corridor.
- Energy saving devices: cogeneration and waste heat recovery, thermal storage.



View at main entry: local vernacular expression makes building familiar. Bell tower is also a wind scoop and exhaust tower.



Shelter courtyard: refuge from the world outside.

S.R.O. Precedent:

*St. Vincent de Paul/Joan Kroc Center
San Diego, CA
Fred de Santo Architect, 1988*

Figs. 172-175: St. Vincent de Paul

 *(Arch'l. Record, Nov 1988, p94-97)*

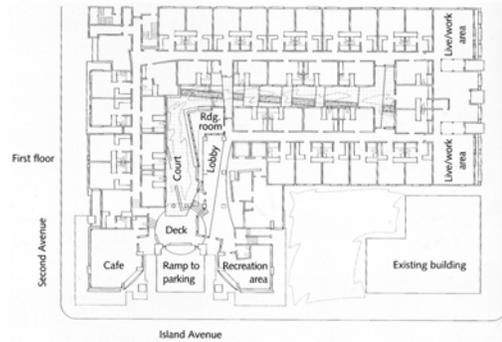
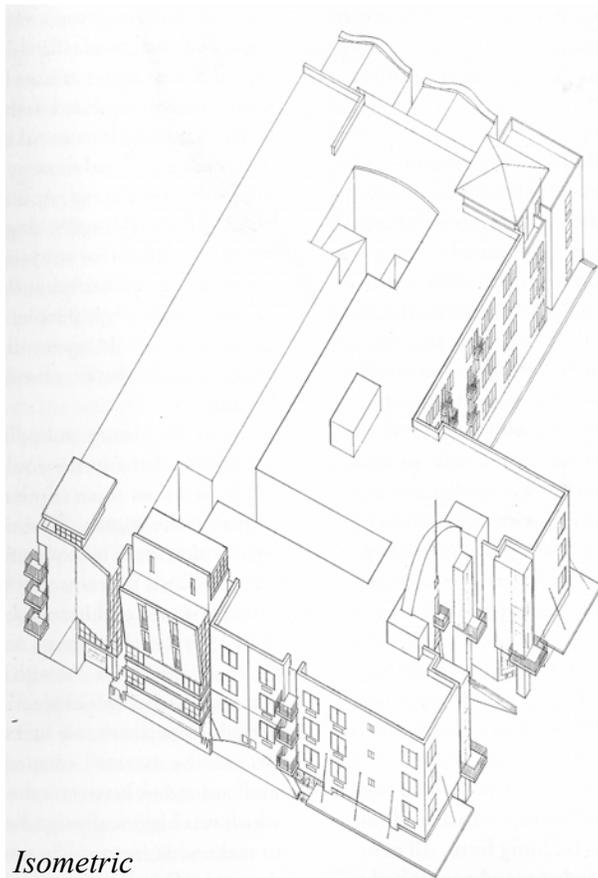
The numbers:

Single room: 105 units (225 s.f./ea.)
Public courtyard: 9000 s.f.
Total site area 0.75 acres (140 du/ac)
Double-loaded corridors
Basins in each unit + public W/C's

Not-to-scale, unless noted otherwise

Relevance:

- Large recesses, which also serve to bring light from multiple directions, diminish the massing of this large building.
- Internal courtyard is source of natural light to units on the “wrong” side of double loaded corridor. Waterfalls and bamboo create sound and sight privacy.
- Economical: 197 units on 2/3-acre.
- Mixed-use amenities are shared: café, recreation, underground parking garage



Floor plans



Elevation: massing broken up for scale with deep recesses

S.R.O. Precedent:

202 Island Inn: San Diego, CA
Rob W. Quigley Architect, 1993

Figs. 176-179: 202 Island Inn
(Davis p145-151)



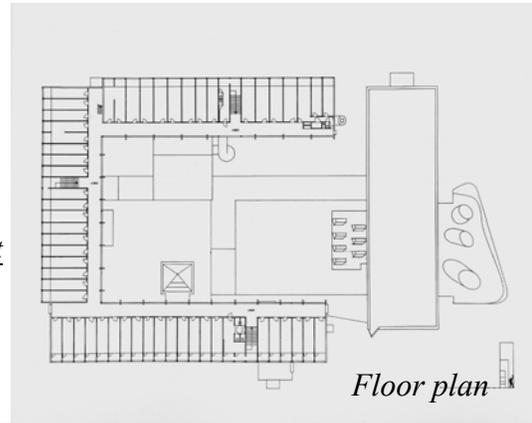
The numbers:

Single room: 197 units (300 s.f./ea.)
Public courtyard: 10’-wide light well
Total site area 0.65 acres (300 du/ac)
Double-loaded corridors
Individual W/C’s built into each unit

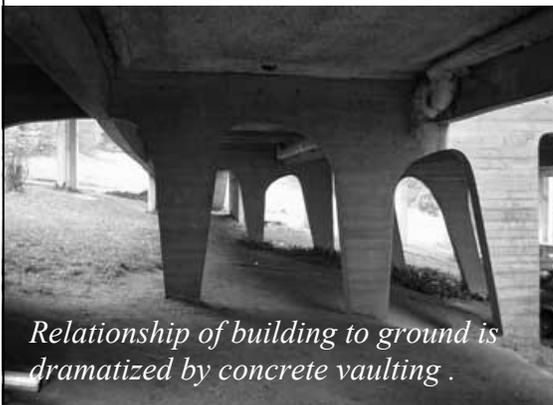
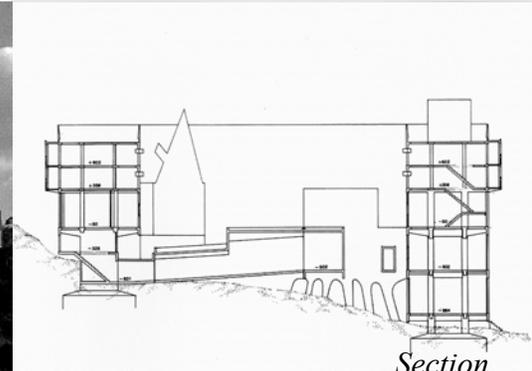
Not-to-scale, unless noted otherwise

Relevance:

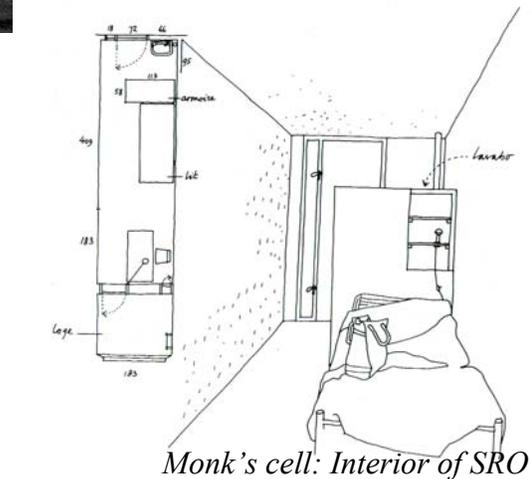
- Two cellular housing units are basis for ordering module & structure, though grid is departed from in hierarchical spaces.
- Light, shadow, silence, and promenade: elements in the architecture's "music".
- Mystery/metaphysics: underworld vs. light
- Concrete construction with engineering aesthetic.
- Self-contained multi-use facility built on a courtyard parti.



General view



Relationship of building to ground is dramatized by concrete vaulting .



S.R.O. Precedent:

Monastery at La Tourette
Eveux-sur-l'Abresle, France
Le Corbusier, 1957

Figs. 180-184: La Tourette

(H. de Soeten: La Tourette &
www.arcspace.com)



The numbers:

Single room: 100 units (114 s.f./ea.)
Interior courtyard: 11,250 s.f.
Total site area 0.75 acres (133 du/ac)
Single-loaded corridors
Basins in each unit + 8 public W/C's

Not-to-scale, unless noted otherwise

DESIGN ISSUES & APPROACH

Design Issues & Approach

This thesis begins with certain issues – social, physical, and economic – that do not concern projects of a smaller scope. Some are self-imposed and some are imposed upon the project by the special site conditions and restrictions inherent to McMillan. Some are simple to answer but most are not, and will need to be teased out over the thesis design semester and throughout a professional career.

The principal goal of this thesis is to find a re-use and design for the McMillan facility that simultaneously addresses the interrelationship of manmade and natural systems while considering the symbolic value of such a historic property to its constituency and to its neighbors. The way in which this goal is approached says as much about the thesis as the program or the final design conclusion. By delineating some core conceptual issues and attempting to propose approaches that may see to their resolution, a certain first step will have been taken.

Issues:

What should happen to government-owned property after it has been deemed surplus? How should McMillan be reused or revived? What responsibility does a city have in preserving its built environment and how can its fulfillment be achieved in such a way that enhances its value? How might the first use of a historic property help to define its reuse?

Approach:

The McMillan sand filtration site is nothing if not mysterious. The unusual relationship the towers have kept with the *basso continuum* of row housing that line the site's edges and the unseen but legendarily-discussed underworld below its green fields are two striking examples of what makes this site so interesting. Perhaps as enigmatic are the chain-link fences that encircle it. What must be hiding behind warnings of “No

Trespassing” even as we see that it is clearly benign? The first great design move will be to take the fences down, to let people take what is rightly theirs, and to finally make McMillan public again.

The early founders of the site recognized its appeal. Frederick Law Olmstead, Jr. was hired to augment it with landscape amenities that could see to its proper enjoyment. With its original use now obsolete, there are new layers of understanding that can finally be revealed as well. The job of the site design of this thesis is to simultaneously consider the public’s relationship to its rightfully-owned property as it attempts to define what practical role the site will have in the future. Similar properties in older civilizations have been either successfully adapted to new uses or flatly ruined. In a country with few such relics, this opportunity cannot be squandered.

For this reason, we might look to the original role of the property itself. The site was indeed not created for public admiration alone, even though it was created, in part, by a movement (“City Beautiful”) that sought to express the beauty of public functionality: courthouses were civic set pieces; dams were assertions of daring, and train stations, symbols of newfound mobility. The site was *intentionally* beautiful, but it was created foremost in a unified effort to stop the *public* menace of typhoid fever. Water standards, as with most utilities at the time, were mortally low. The onset of progressivism, through a dedicated public spirit, brought calculated efforts of self-preservation to a city that was regarded to be the center of the nation’s greater civic body.

In the reuse of the McMillan property therefore, it is paramount that we consider both sides of the site’s original *raison-d’etre*; even as we consider the site’s current condition and aesthetic value, we must ask, what can it do for practical public benefit?

A potential answer to that question involves an analysis of what we, as a collective body of citizens, regard a city to be. This is a daunting task, much larger itself than the scope of any master's thesis. But for the sake of direction and perspective, perhaps a quick survey is in order. Following is a brief list of definitions of the term "city":

"a center of population, commerce, and culture; a town of significant size and importance," www.dictionary.com

*"a community of substantial size and population density that shelters a variety of non-agricultural specialists, including a literate elite,"
Gideon Sjoberg*

"a relatively large, dense, and permanent settlement of socially heterogeneous individuals," Louis Wirth¹

a "point of maximum concentration for the power and culture of a community," Lewis Mumford²

*"a relatively permanent and highly organized centre of population, of greater size or importance than a town or village."
www.britannica.com*

In this small sample, we see a reoccurrence of the ideas of population density, concentration, culture, and commerce. It is a goal of this thesis to invigorate the historic site with each of these ideas, populating it with a certain critical mass of people (residents *and* visitors) and selectively concentrating their diverse energies (cultural, commercial, etc.). This form of reuse would involve sweeping redevelopment, but would raise the argument that urban reinvestment is better than current, wasteful *suburban* development practices. This form of reuse asserts the belief that urban reinvestment is perhaps the

¹ Kostof, Spiro. The City Shaped: Urban Patterns and Meanings Through History, Bulfinch Press, 1991, p37.

² Ibid.

most fundamental and essential commitment to sustainable development in both an environmental and socio-cultural sense.

Issues:

What role might the natural landscape play in an urban intervention? What does Washington's early history suggest about the importance of natural landscape in urban planning? What role might water play in the reuse of this facility? How might an urban adaptive reuse set up a didactic on the relationship of man to his environment? In what ways might the diverse landscapes of man and nature coexist on a historic site? What responsibility do architects have to protect, nurture, and enhance the natural environment?

Approach:

There are many important diagrams that must be included in a rigorous analysis of such a site before design can be tackled with the necessary care. Foremost in these involves the interesting role that water has played on the site from its natural diastrophism to its later, manmade condition. Likewise, a study of the circulation systems that informed and maintained the working order of both organisms, human and natural, would reveal much about what a new use of the site may be. As long as these questions remain unanswered, any approach to this special site would be haphazard.

The site has been used to channel water for the growth and development of the city since its inception in 1791. The waters of the Tiber Spring that trickled through the site before the McMillan intervention began in 1901 were first used as a natural source for fresh drinking water. When this spring was culverted and subsequently filled over for the new construction, its legacy was continued, inadvertently perhaps, with the water filtration facility. As years passed, the back fill under the unreinforced concrete facility gradually led to a slow deterioration of its structure. One might imagine that the power of nature reasserted its will on the built landscape.

Many parallels to archaeology would naturally seem to follow as the site has now essentially arrived at a state of ruin. This thesis is particularly interested, however, in those examples of archaeology that merge with new development. In the *Precedent Analysis* chapter of this document, close attention should be paid to Rafael Moneo's Museum of Roman Antiquity in Mérida, Spain; the coliseum at Lucca, Italy which has been vernacularly adapted into an informal mixed-use piazza; and the Roman Cardo in Jerusalem's Jewish Quarter, which has been redeveloped into an urban collage of multi-use structures. The underlying datum in each of these examples is a natural landscape that first brought about the demise of early built structure, and then contributed to the projects' exceptional reconstitution. The compositions are notable for their timelessness, for interweaving layers of time and space and for the seemingly coexistent natural and built landscapes.

This project differs from those examples in that it introduces a third essential site characteristic: *water*. A site strategy for redevelopment may include a certain reconstitution of the Tiber Spring, with a goal of involving visitors in a didactic presentation of the role of water in the city's development, and perhaps in instructing the value of nature's relationship to our built environment.

Issues:

How might this site help to bridge the larger, symbolic order of Washington, DC with the everyday realm of its citizenry? How might the disparate and seemingly unrelated uses around the McMillan site be connected into symbiosis? How are edges, gateways, and parks defined in other parts of the city and how might those bear upon design decisions at McMillan?

Approach:

Washington, DC was conceived of, planned, and finally realized at the confluence of the Potomac and Anacostia Rivers to be a great city to serve the great humanistic notion that we can live in a world free of tyranny and oppression and pursue our certain God-given rights. That one of the great stories of the Enlightenment should be sown in the valley of these two rivers has as much to do with chance as with political endeavor. And yet, in the years that followed its birth, the city of Washington has become. In broad strokes of urban design occurring near the turn of both of the previous two centuries the symbolic order of Washington was set. First in 1791, Pierre L'Enfant, a French designer with experience planning Baroque palaces and gardens, laid down a systematic yet whimsical *gardenesque* city for the new Republic. Later the Senate Park Commission of 1901 would attempt a certain reconstitution of the early spirit of those plans, resulting in a new dedication to the symbolic city center as well as the infrastructures (transportation, waterworks, etc.) that supported it.

But the city of Washington is alas much more than a symbolic center. It is a fully functioning, thriving metropolitan city. It has become home to many diverse groups of people. It has become the lifeblood of organizations and institutions, schools and commercial enterprises. The city that was planned to be the great capital city of democracy has been washed in more than two centuries of human experience and has grown to be perhaps more *and* less than L'Enfant or McMillan might have imagined.

As one approaches large scale urban intervention into a city such as Washington, both layers of experience must be evenly assessed. On the one hand, Washington is a symbolic place. It is the figural capital of the modern notion of democracy. But equally important, as home to over a half-million people it is a city with its own history and its

own sense of identity. It is this dual character that makes it such a strikingly unique experience and that makes its architectural development complex.

Many of Washington's complexities are shared by the McMillan site. It is bordered on the east by North Capitol Street, the great thoroughfare that connects due North to the center of the U.S. Capitol building, the center of the nation's caucus. Its former uses, both as a natural source of the Capitol's drinking water and later as a public mechanism for the city's water supply, were critical to the well-being and growth of the city. Furthermore, its position on a crest above downtown gives it a clear vantage point of some of the most ceremonial monuments of the symbolic city. In many ways, however, the site is as "everyday" and profane as any other. The McMillan property sits at the center of a drift of institutional, residential, and industrial uses.³

Using architectural elements that relate to both the symbolic and profane realms of this diverse city should be a first consideration of any intervention. Ideally, one should strive to make the two realms merge.

³ See Appendix F for a diagram of design scenarios which take this complexity into consideration.

PROGRAM

Comparative Analysis
Considerations & Description
Tabulation

St. Vincent De Paul/Joan Kroc Center
 San Diego, CA (completed 1988)
 Fred A. De Santos, Architect



Comparative Program Analysis

Single-room-occupancy precedent (fig. 187)

Program	# units	sq. ft./each	total sq. ft.	floor area
Lobby	1	813	813	0.7%
Waiting/Interview	1	832	832	0.8%
Staff offices	12	158	1900	1.7%
Employment counseling c	4	300	1200	1.1%
Large multiuse	2	1580	3160	2.9%
Chapel	1	660	660	0.6%
Clinic	1	1519	1519	1.4%
Schoolroom	1	2000	2000	1.8%
Laundry (residents')	1	360	360	0.3%
Laundry (commercial)	1	272	272	0.2%
Kitchen	1	1825	1825	1.7%
Dining/Gymnasium	1	3360	3360	3.1%
Day-use shelter	1	590	590	0.5%
Barbershop	1	100	100	0.1%
Family units_temporary	32	200	6400	5.8%
Family units_transitional	37	200	7400	6.7%
Single men_temporary	18	250	4500	4.1%
Single men_transitional	18	250	4500	4.1%
TV room/lounge	4	750	3000	2.7%
Library	4	220	880	0.8%
Computer center	1	560	560	0.5%
Courtyard	1	9000	9000	8.2%
Restrooms	19	192	3648	3.3%
Showers	27	30	800	0.7%
Circulation_corridors			9700	8.8%
Circulation_stairs			2915	2.7%
Circulation_elevators			208	0.2%
Storage			1400	1.3%
HVAC/Mechanical			15000	13.6%
Parking garage			15000	13.6%
Garage security office			425	0.4%
TOTALS			103927	0.9448
Note: Building footprint is approximately 180' x 185' (0.76 acres), 140 du/ac				
Note: Estimated figures (+/- 10,000 square feet, or +/-10% accuracy)				

Program Considerations

McMillan's buildable area is limited according to the current underground cell conditions. Where the cells are in good shape, they will be reused accordingly. Where they are deteriorating, they will either be stabilized or demolished. These decisions will be made as site planning progresses. As has been repeatedly asserted, master planning for such a project cannot occur in one independent, singular phase, but will necessarily occur, dynamically, *throughout* the design process.

Based on the size of the proposed site, many uses may fit into the master plan. According to DCOP figures, 131,000 square feet of retail and 70,000 square feet of office space can be included in the new design. The retail will be designed in the form of a bazaar, taking full advantage of the site's unique underground cells. Entry into this facility might occur at one of the deteriorated points, so that the cells, re-inhabited by vendors' tables, might practically and seamlessly open up to the public realm. The office space might fall to the north, where natural adjacencies such as the institutional buildings belonging to the hospitals are located. Allocations for a public park, an interpretive museum, a public bazaar, and other mixed-uses will ensure that resulting site development accommodates detailed public realm design.

Program Description

Because of the large site (26 acres, total), the master planning will occur in both of these two stages, once as general zoning and again, as the detailed intervention progresses. The main elements of the general site design are housing, office and retail, and "public use", which refers to the recreation center, farmer's market, gallery/library and park space. The numbers for the office and retail components have been taken

directly from the latest DCOP-commissioned study of the McMillan site by Greenhorne & O’Mara. They suggest “a total of approximately 131,000 SF of gross leasable convenience and personal service retail floor space...including approximately 10,000 SF for drugstore goods...and 9,990 SF of personal service floor space.” Additionally they recommend “60,000 SF of office development on the subject property...(including) 10,000 SF of neighborhood office space (banks, insurance, medical, legal, etc.).¹

Program Tabulation

Site tabulation:

Housing.....	6 acres
<i>Rowhouses</i>	3 acres
<i>Single-room-occupancy</i>	1 acre
<i>Residential open space</i>	2 acres
<i>(including public open space, front yards, & parking)</i>	
Retail.....	2.9 acres
<i>Market/Bazaar</i>	1 acre
<i>Convenience stores</i>	1.7 acres
<i>Drugstore goods</i>	0.2 acres
Office.....	(70,000 SF).....0 - 1 acres
<i>High-density office</i>	(60,000 SF)
<i>Neighborhood office</i>	(10,000 SF)
Public Use.....	16 acres
<i>Interpretive museum</i>	2 acres
<i>Existing service courts</i>	2.4 acres
<i>Park/open space</i>	11.8 acres
<i>(including new streets, plazas, & general parking)</i>	
<u>TOTAL:</u>	<u>26 acres</u>

¹ Greenhorne & O’Mara, p xvi.

PRELIMINARY DESIGN

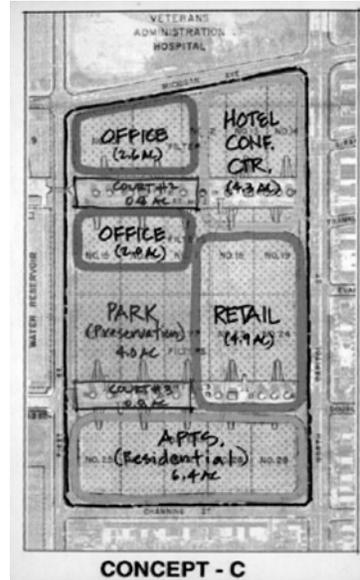
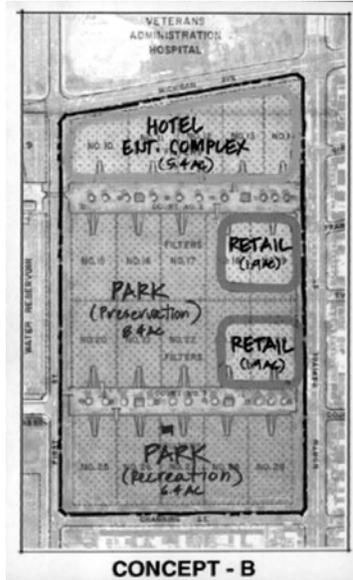
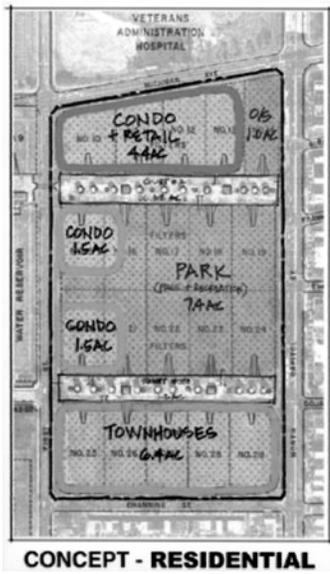
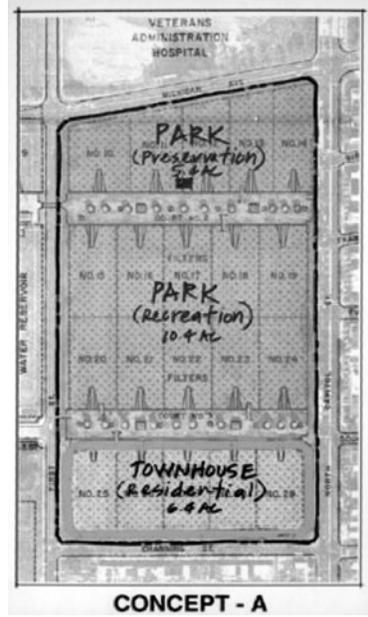
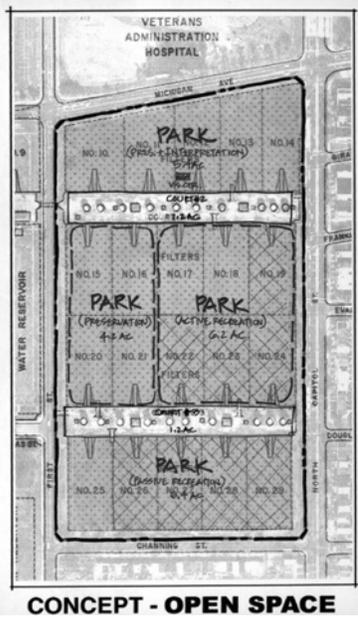
General site concepts

Local site strategies

- DC Office of Planning has issued these five scenarios for the possible development and revitalization of McMillan.

- Front-end stabilization for these schemes ranges from \$12—\$15 million (see Appendix D for cost table).

- The District government favors increased tax base that would come with both residential and office land uses.



*General Site Concepts:
DCOP Site Scenarios (2002)*

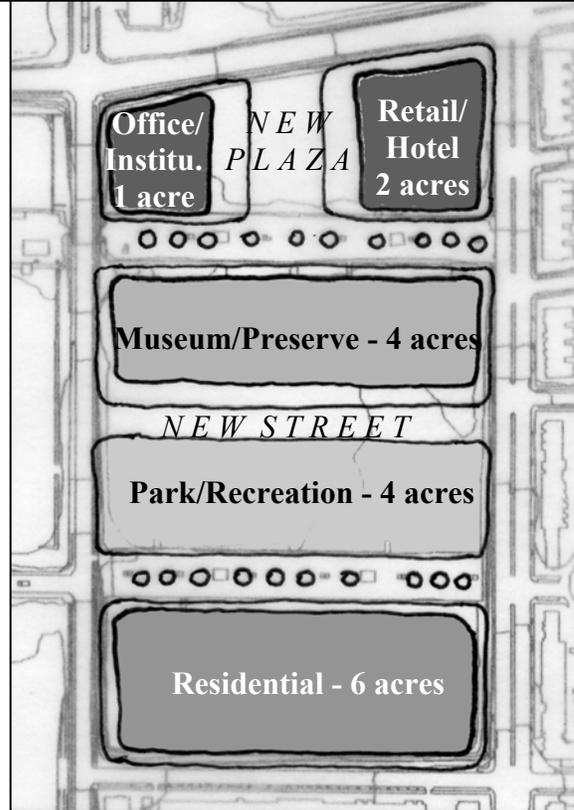
Figs. 188-192: General Concept
(http://www.planning.dc.gov/project/mcmillan_reservoir/index.shtm)



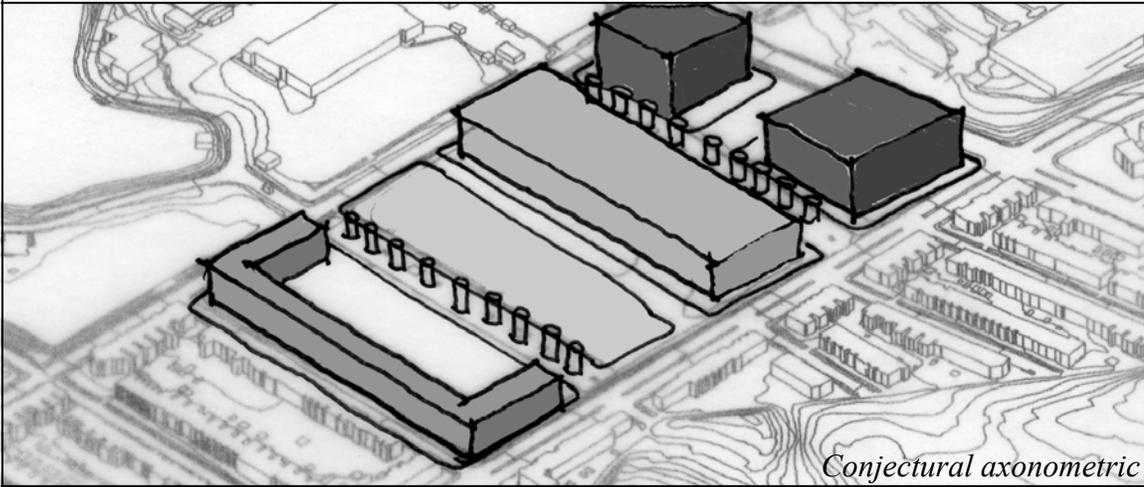
Schematic plans: Not-to-scale

Strategic Ideas:

- *Site is zoned according to local adjacencies.*
- *Strict separation of residential land use from institutional/offices with creation of a museum/historic preserve and public park.*
- *Museum access occurs with a new thru-street and for pedestrians, by a new plaza on the north.*
- *Park is utilized by both the residents of the neighborhood as well as by guests to the site.*



Scheme 1 site plan



Conjectural axonometric

*Local site strategy
Scheme 1*

Figs. 193-194: Site scheme 1

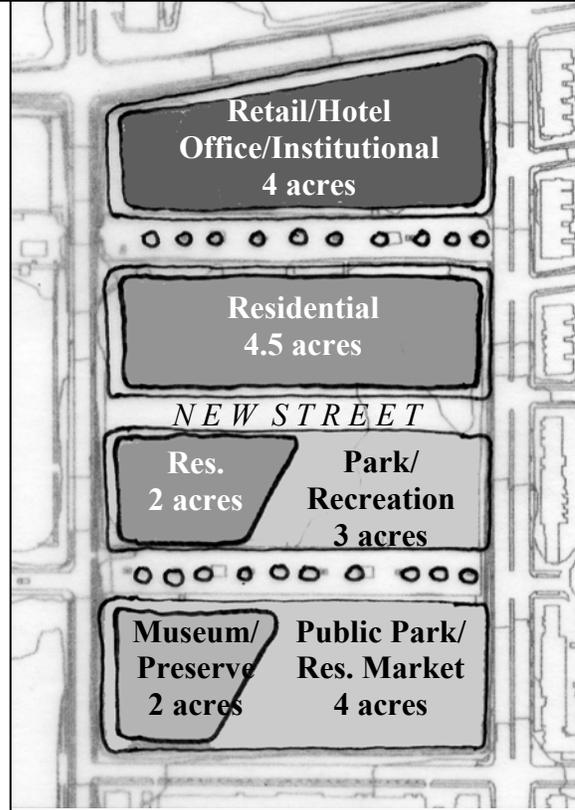


Strategic Ideas:

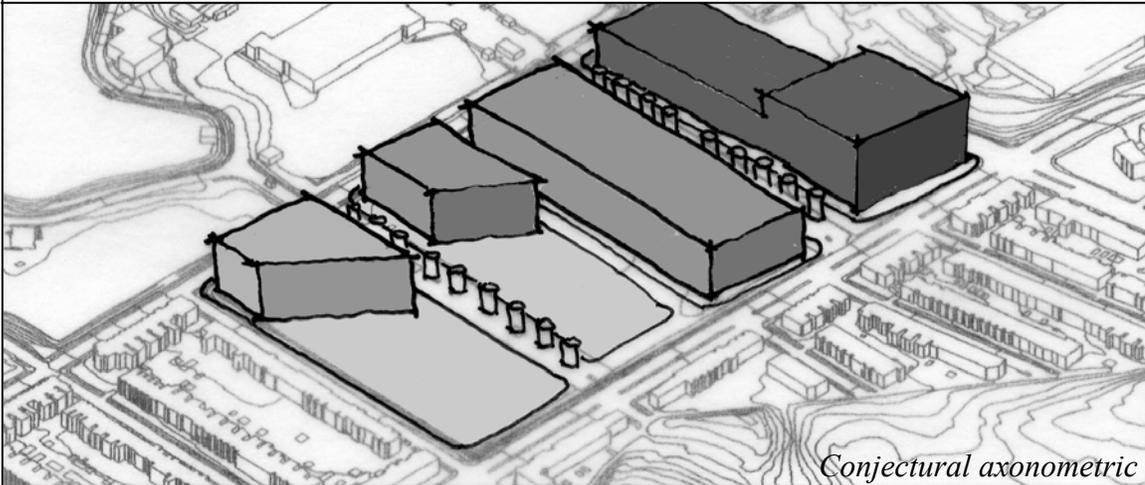
- *This scheme is predicated on the current structural conditions of the water filtration cells, making use of deteriorated cells for park space.*

- *A public park and residential open-air market serve the neighborhoods to the south, while higher density public uses engage the busy intersection of Michigan Avenue and N. Capitol Street.*

- *A museum/preserve is located along the deteriorated precinct.*



Scheme 2 site plan



Conjectural axonometric

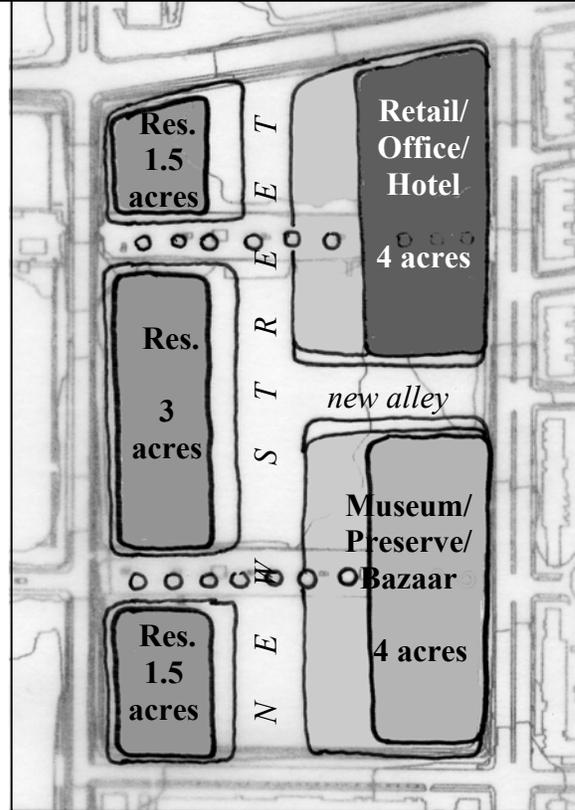
*Local site strategy
Scheme 2*

Figs. 195-196: Site scheme 2

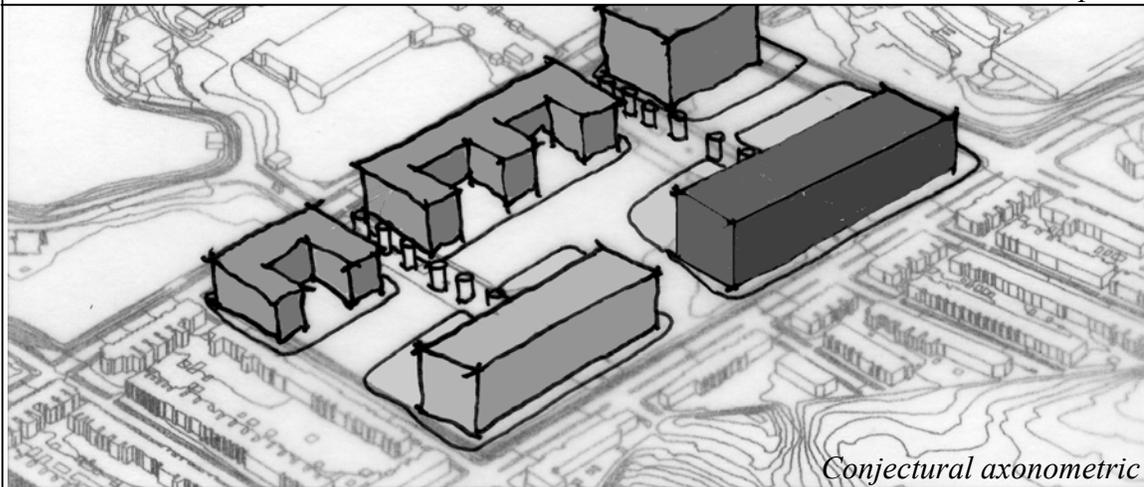


Strategic Ideas:

- East-west land use zoning with creation of new street and/or greenway between public buildings to the east and private residences to the west.
- Public facilities run along the main arterial of N. Capitol, while private uses front on the secondary (First Street)
- Sand towers engage the interior spaces of the hotel, office complex, retail, as well as the museum and bazaar for preservation and architectural intrigue.



Scheme 3 site plan



Conjectural axonometric

Local site strategy
Scheme 3

Figs. 197-198: Site scheme 3

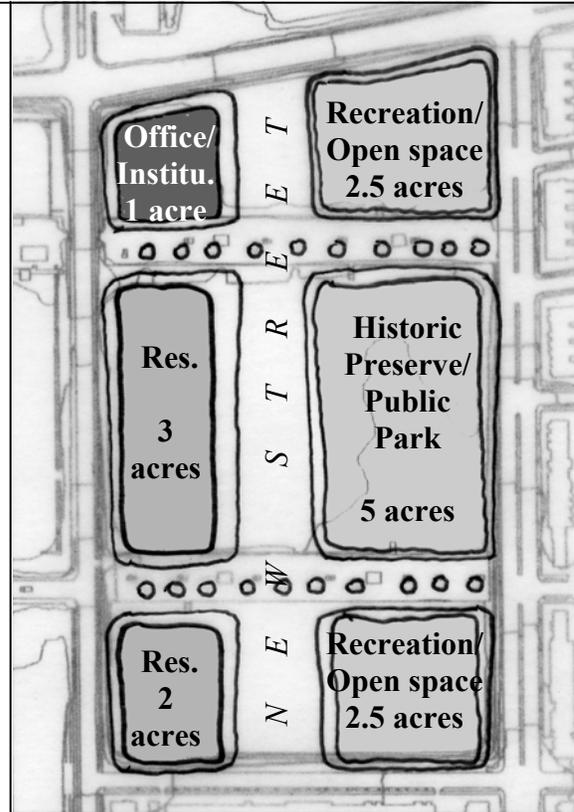


Strategic Ideas:

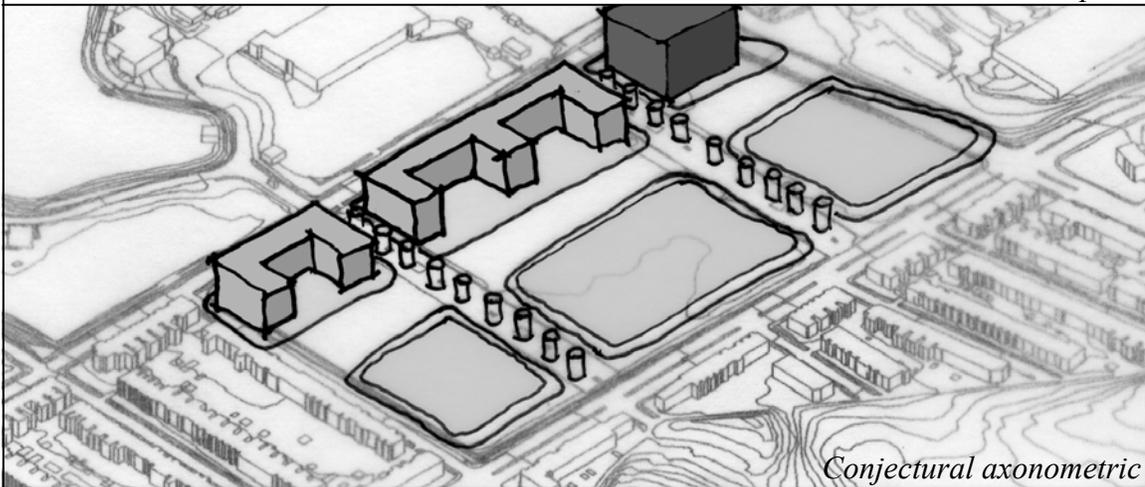
- Respectful of the historic experience of the site, this scheme proposes open space along N. Capitol, reserving development for the quieter First Street corridor.

- Any re-use of the east side would be primarily recreational or interpretive, low density, and heavily landscaped.

- The museum and bazaar functions would be temporary in nature, designed to capitalize on the archeological spirit of the site.



Scheme 4 site plan



Conjectural axonometric

Local site strategy
Scheme 4

Figs. 199-200: Site scheme 4

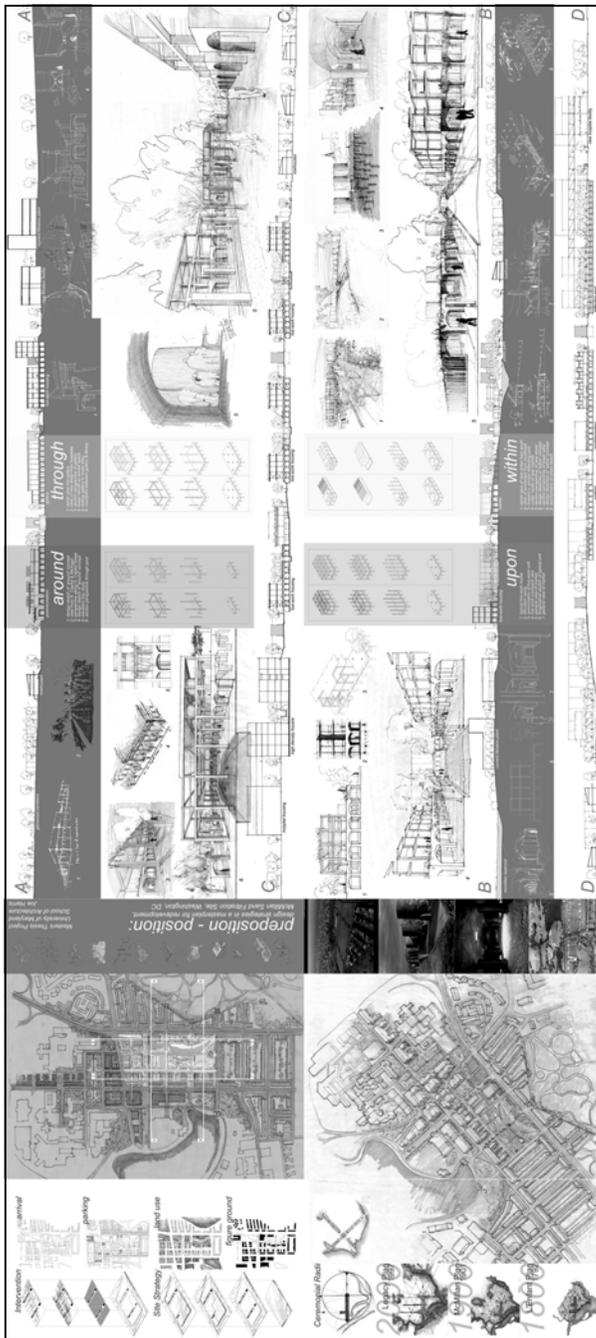


DESIGN CONCLUSIONS

In the course of the design semester, a list of “prepositions” was developed to organize the various conceptual approaches to the site’s structure. The site schemes developed before the realization of the organized structural strategies were deemed to be insufficiently abstract. Without some sort of design logic to begin to move toward a clearer understanding of the architectural scale, no urban intervention at McMillan is really feasible. This is a critique of the DC Office of Planning schemes, which do not account for the architectural experience of the underground vaulted spaces in anyway, or the urban experience in general. This site cannot simply be approached in terms of a traditional bird’s-eye-view master plan. The structural feasibility and architectural space-making must occur in tandem with wider decisions about the site’s reuse.

The prepositions developed in abstract structural exercises are ‘around,’ ‘through,’ ‘upon,’ and ‘within.’ These refer to the specific relationship between the new structure and the existing columns and vaults. For example, ‘around’ describes new structure that is placed *around* the existing structure.

The final presentation concept is arranged to explain the thesis concisely and with visual impact. The sections which run from the title bar to the right edge are keyed to the site plan at left. The four interventions (around, through, upon, within) are highlighted on the site plan with corresponding colors. The left side gives brief diagrammatic description, while the right side is dedicated to a more in-depth illustration of the spatial/experiential dimension afforded by the intervention strategies. These vignettes illustrate the dramatic opportunities inherent in the McMillan property, and are supported by the abstract axonometric diagrams of structural feasibility, located inside the vertical strips at middle.



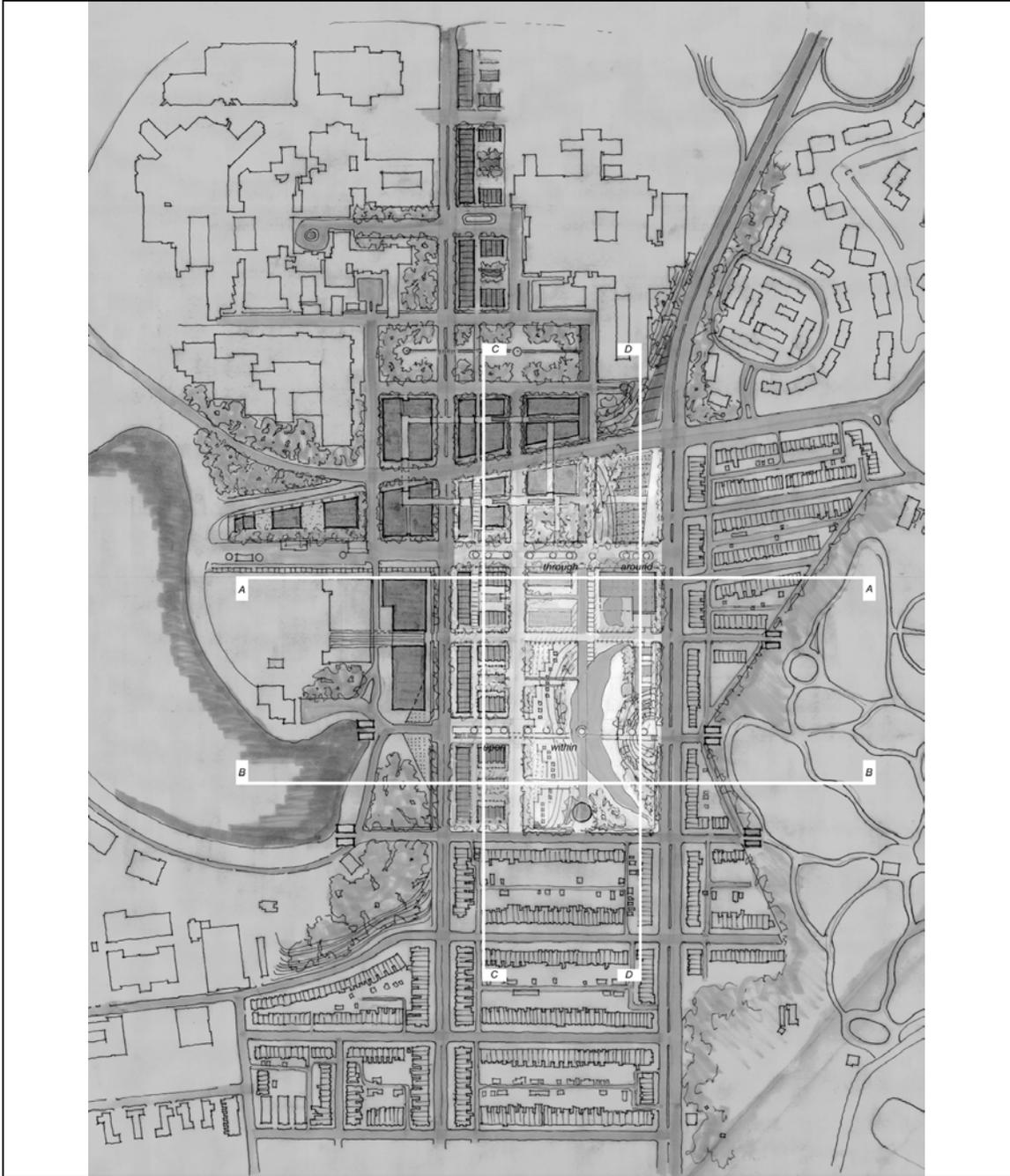
Final Presentation Board, actual dimension 18ft. x 8ft. (by author)

The final presentation concept is arranged to explain the thesis concisely and with visual impact. The sections which run from the title bar to the right edge are keyed to the site plan at left. The four interventions (around, through, upon, within) are highlighted on the site plan with corresponding colors. The left side gives brief diagrammatic description, while the right side is dedicated to a more in-depth illustration of the spatial/experiential dimension afforded by the intervention strategies. These vignettes illustrate the dramatic opportunities inherent in the McMillan property, and are supported by the abstract axonometric diagrams of structural feasibility, located inside the vertical strips at middle.

*Design Conclusions:
Intervention: Final Presentation*

Fig. 201: Final presentation (by author)

Not-to-scale



*Design Conclusions:
Intervention master plan*

Fig. 202: Intervention plan (by author)



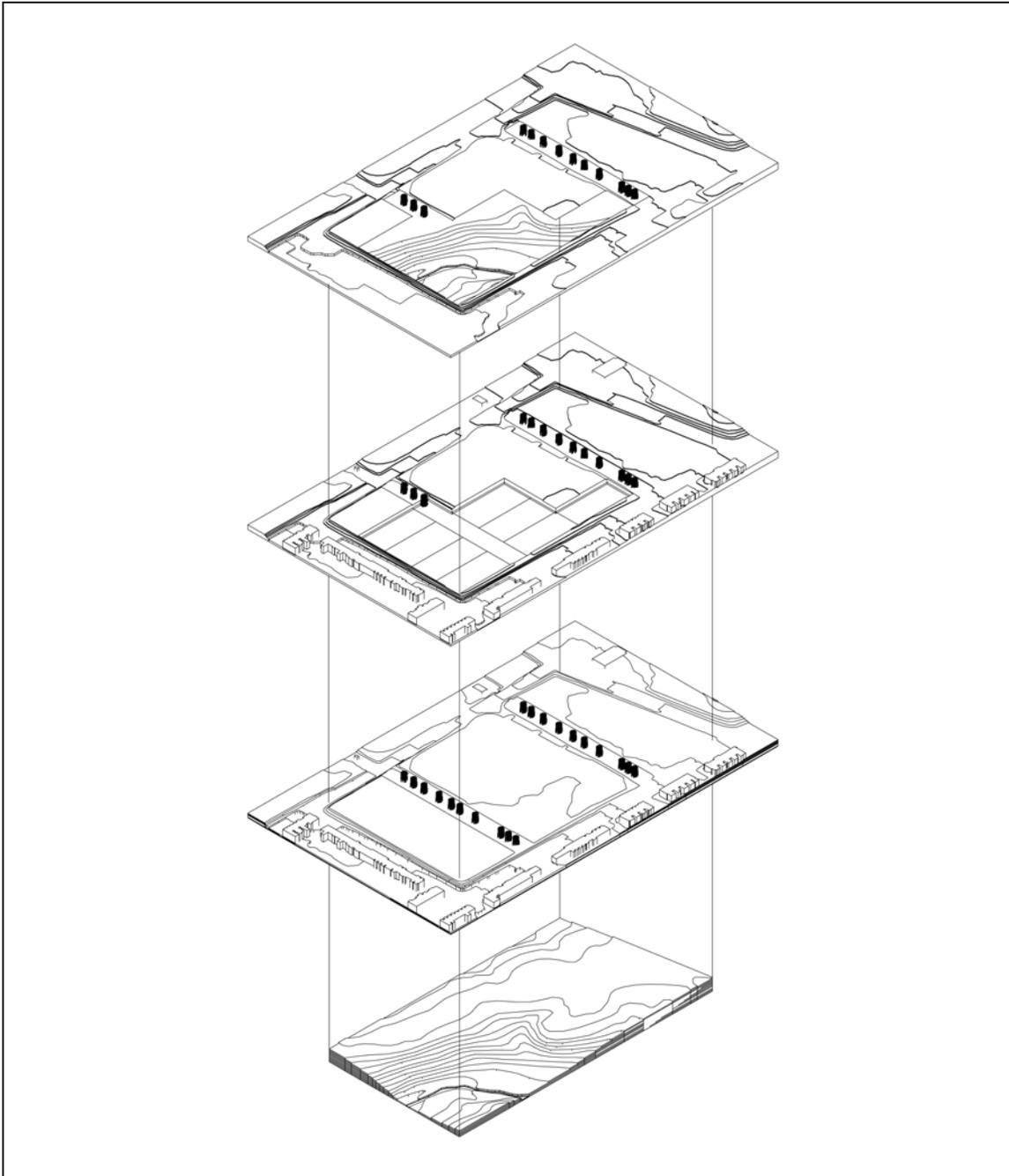
Not-to-scale



*Design Conclusions:
Intervention axonometric*

Fig. 203: Intervention axon (by author)

Not-to-scale



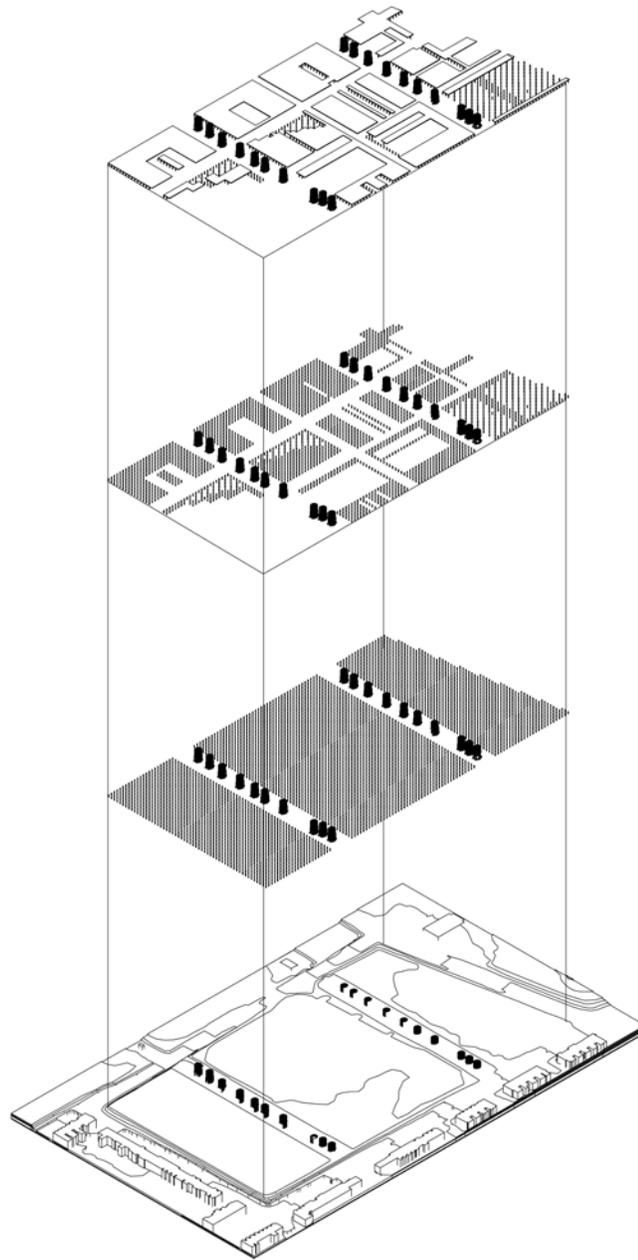
Design Conclusions:

Site strategy

Exploded axon depicting the layers of topographic history at McMillan, culminating in an abstract strategy that weaves them into interrelationship.

Fig. 204: Site strategy (by author)

Not-to-scale



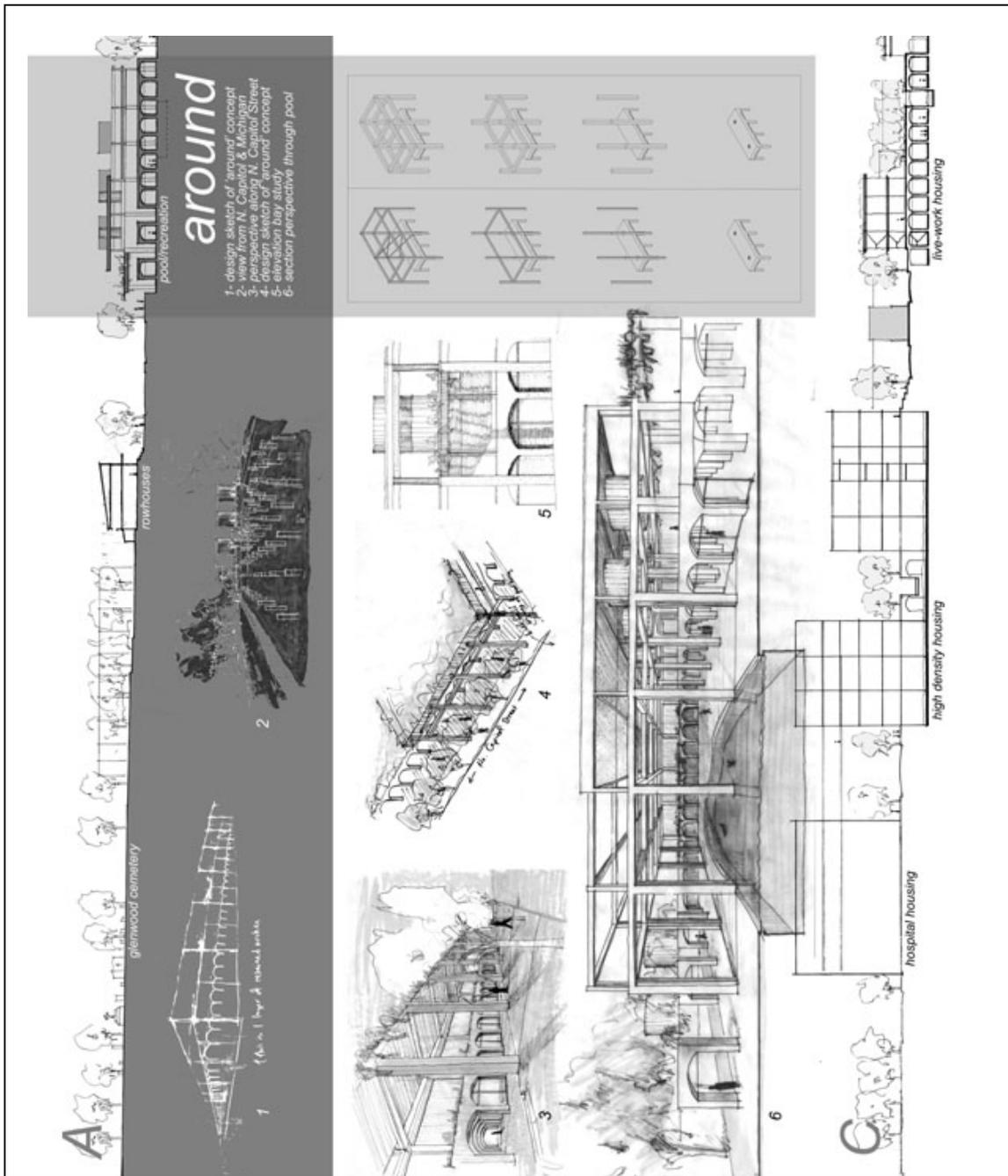
Design Conclusions:

Site intervention

Exploded axon depicting the intervention strategy in more detail. Columns and vaults are selectively subtracted to make room for new development.

Fig. 205: Site intervention (by author)

Not-to-scale

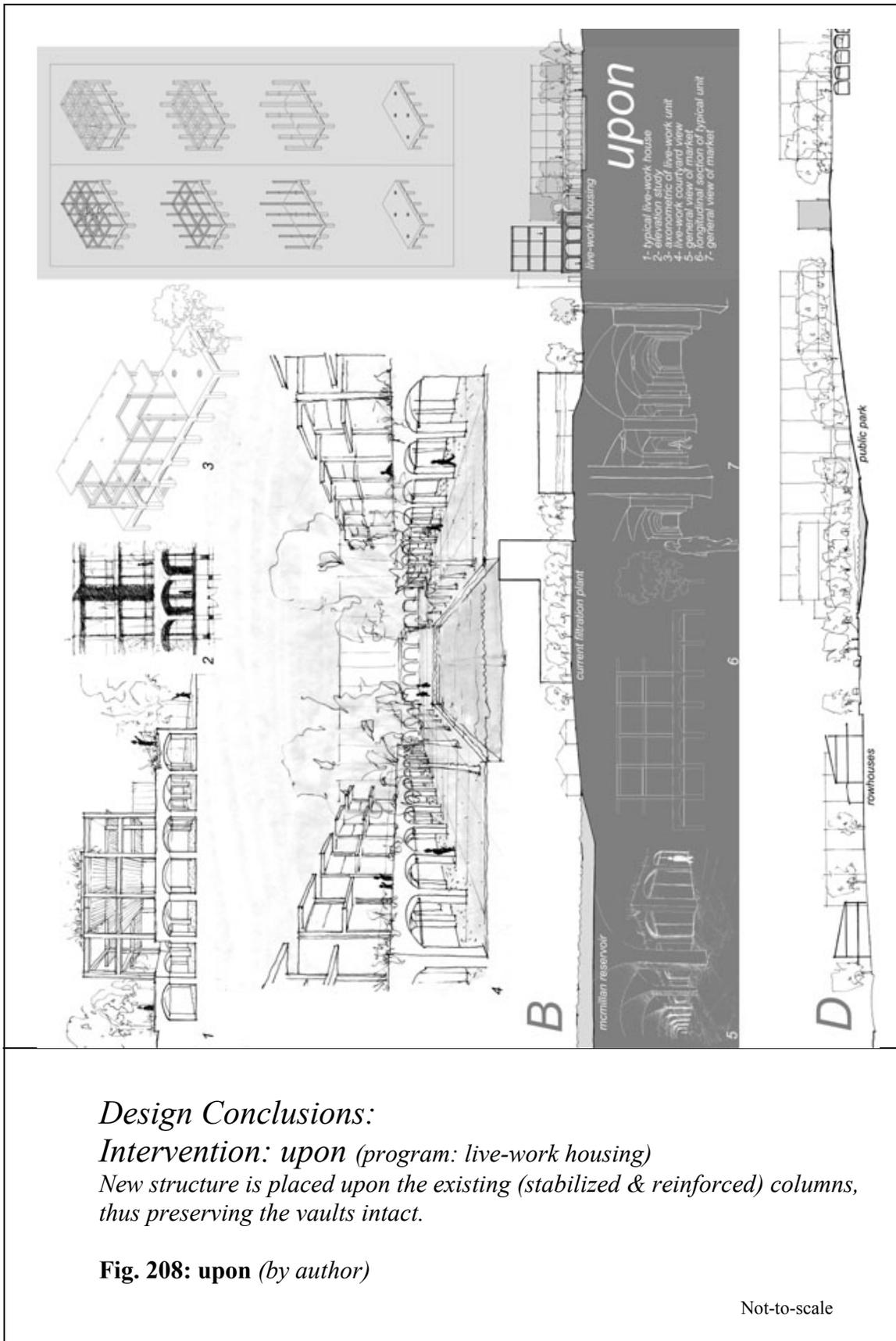


Design Conclusions:

Intervention: around (program: swimming/recreation building)
 New structure is placed around the existing, thus preserving vaults intact.

Fig. 206: around (by author)

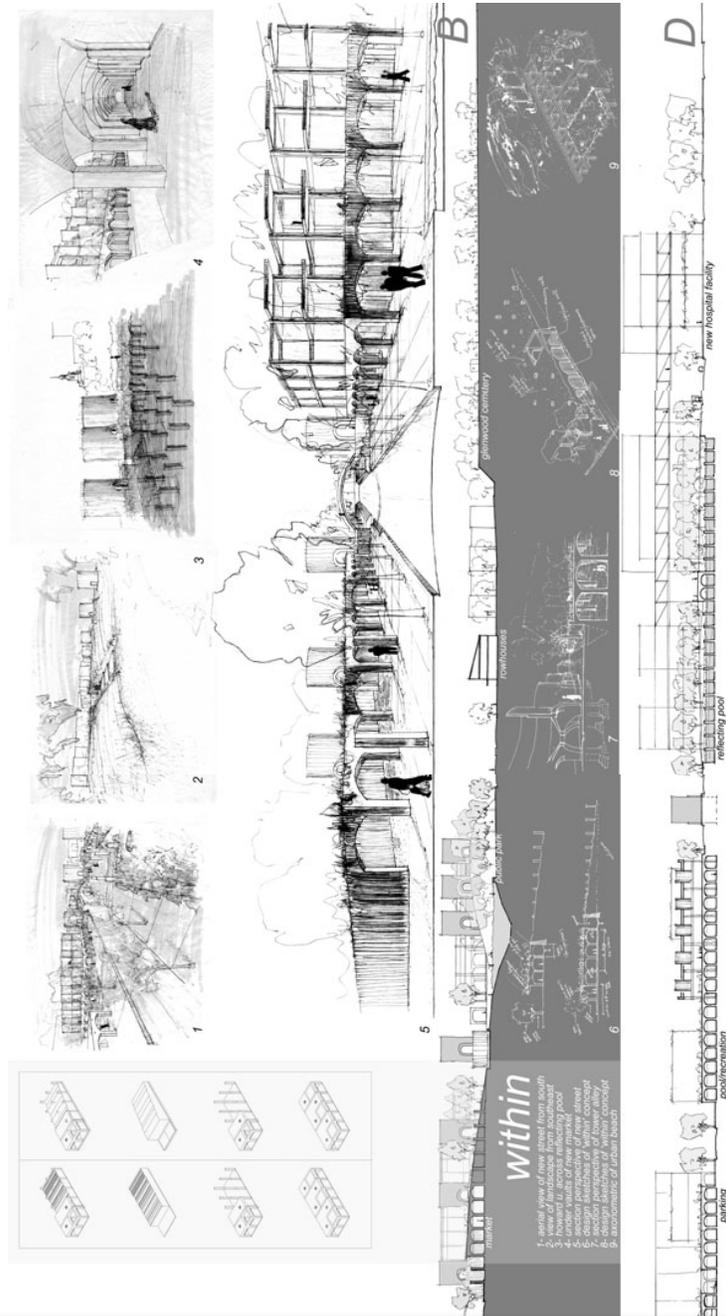
Not-to-scale



Design Conclusions:

Intervention: upon (program: live-work housing)

New structure is placed upon the existing (stabilized & reinforced) columns, thus preserving the vaults intact.



Design Conclusions:

Intervention: within (program: landscape, open-air market)

Earth and/or water are placed within the existing infrastructure, preserving the vaults intact, and setting up an interrelationship of material and use.

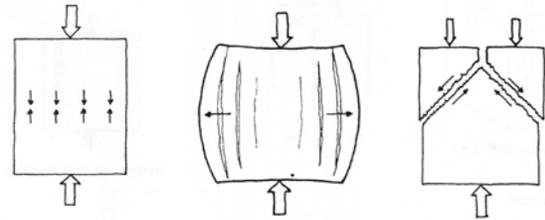
Fig. 209: within (by author)

Not-to-scale

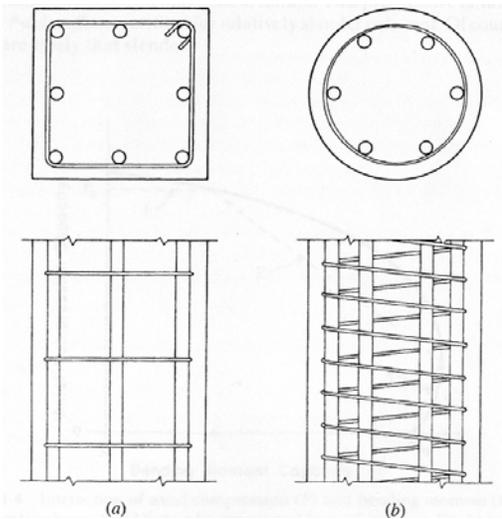
APPENDICES

Notes:

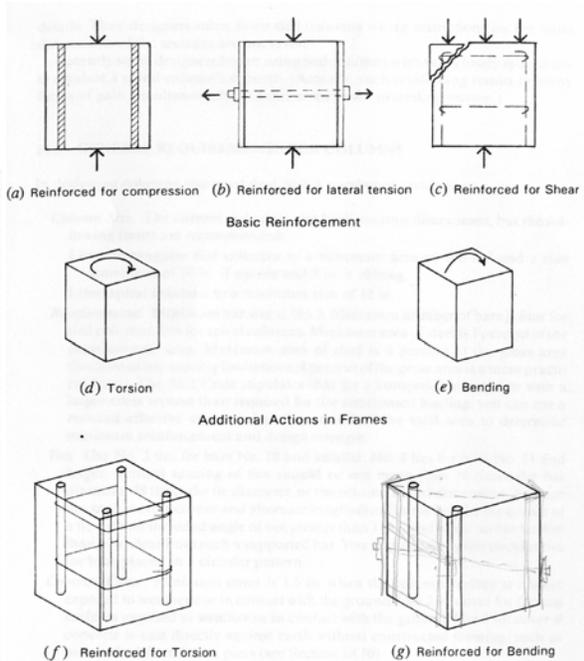
- Stabilizing concrete columns is simple: add rebar by drilling, filling, grout, and epoxy (metaphor: dentist's approach to a tooth cavity)
- Epoxy is very strong in compression and has some tensile strength
- Tie-rods are a very common manner of keeping an arch from thrusting outward once the lateral support or vaulting is removed. (Example: Turkish monumental architecture)



Compression Tension Shear
3 major stress responses in concrete columns



(a) rectangular layout of vertical bars with lateral ties
(a) circular layout of vertical bars with continuous helix (spiral) wrap

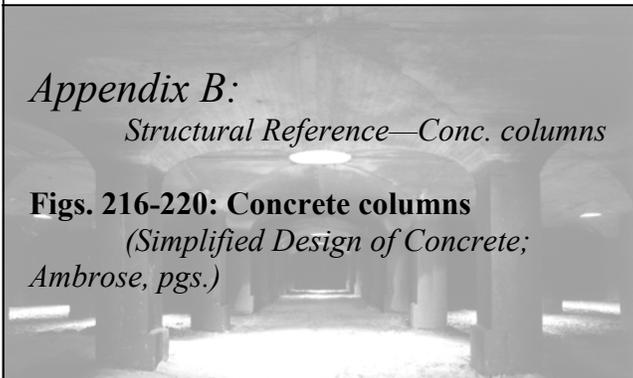


For Compression: add steel bars in direction of force (stronger than concrete itself)
For Tension: "contain" the concrete from moving laterally (jacket, plate or fiber)
For Shear: add vertical bars and lateral ties or spiral; more bars = more reinforcing

Appendix B:

Structural Reference—Conc. columns

Figs. 216-220: Concrete columns
(Simplified Design of Concrete; Ambrose, pgs.)



The numbers:

- Min area of steel rebar: 1% of gross column area
- Max area of steel rebar: 8% of gross column area
- Vertical spacing of ties– not more than 16X the bar diameter, 48X the tie diameter, or column's least dim.

TABLE 2.15, STRUCTURAL REQUIREMENTS FOR DEVELOPMENT			
	CELL DESIGNATION		
	TYPE I	TYPE II	TYPE III
CELLS	19,22,23,24,26,27,28,29	10,11,12,13,14,15,20,25	16,17,18,21
DESCRIPTION	Built on fill, active cracking, some failures, additional failures likely	Built in cut areas, active cracking observed around perimeter	Interior cells, built in cut areas, no apparent new cracking in last 30 years
CONDITION	Unstable, Unsafe	Stable except at edges	Stable
OPEN SPACE			
PRESERVE FILTERS			
Struct. Req'ments	Not Feasible	Reinforced top slab and exterior walls	Reinforced top slab
Geotech. Req'ments	N/A	None	None
Cost Estimate	N/A	\$2.02M per cell	\$1.79M per cell
DEMOLISH FILTERS			
Struct. Req'ments	None	None	None
Geotech. Req'ments	None	None	None
Cost Estimate	\$860K per cell	\$860K per cell	\$860K per cell
FILL FILTERS			
Struct. Req'ments	None	None	None
Geotech. Req'ments	None	None	None
Cost Estimate	\$440K per cell	\$440K per cell	\$440K per cell
SINGLE STORY BUILDING			
PRESERVE FILTERS			
Struct. Req'ments	Not Feasible	Reinforced top slab, columns and exterior walls	Reinforced top slab and columns
Geotech. Req'ments	N/A	Spread footers	Spread Footers
Cost Estimate	N/A	\$2.25M per cell	\$2.02M per cell
DEMOLISH FILTERS			
Struct. Req'ments	None	None	None
Geotech. Req'ments	Pile Foundation	Spread Footers	Spread Footers
Cost Estimate	\$1.33M per cell	\$1.24M per cell	\$1.24M per cell
FILL FILTERS			
Struct. Req'ments	None	None	None
Geotech. Req'ments	Pile Foundation	Spread Footers	Spread Footers
Cost Estimate	\$920K per cell	\$790K per cell	\$790K per cell
FOUR STORY BUILDING			
PRESERVE FILTERS			
Struct. Req'ments	Not Feasible	Reinforced top slab, columns and exterior walls.	Reinforced top slab and columns
Geotech. Req'ments	N/A	Spread Footers	Spread Footers
Cost Estimate	N/A	\$2.56M per cell	\$2.33M per cell
DEMOLISH FILTERS			
Struct. Req'ments	None	None	None
Geotech. Req'ments	Pile Foundation	Spread Footers	Spread Footers
Cost Estimate	\$2M per cell	\$1.37M per cell	\$1.37M per cell
FILL FILTERS			
Struct. Req'ments	None	None	None
Geotech. Req'ments	Pile Foundation	Spread Footers	Spread Footers
Cost Estimate	\$1.61M per cell	\$920K per cell	\$920K per cell

Appendix C: Structural Requirements Table

Source: Greenhorne & O'Mara, p2-44

TABLE ES.3 ESTIMATED PARK DEVELOPMENT COSTS AND PUBLIC INVESTMENT REQUIRED (in millions of dollars)

Description	Open Space	Concept A (Low Intensity)	Concept B (Medium Intensity)	Concept C (High Intensity)	Concept A-1 (Low Intensity-Residential)
Site Stabilization	\$16.0	\$16.9	\$15.5	\$12.6	\$12.5
Development of Park facilities and restoration of historic elements.	\$6.0-\$12.0	\$4.4-\$8.7	\$3.7-\$7.4	\$1.1-\$2.1	\$2.6-\$5.2
Total Public Investment Required	\$22.0-28.0	\$21.3-\$25.6	\$19.2-\$22.9	\$13.7-\$14.7	\$15.1 - \$17.7

**NOTE: Total Public Investment Required does not include operations cost for parks and historic elements. Operations cost can not be estimated without an actual open space development plan.

Source: Greenhorne & O'Mara

TABLE ES.1, SITE STABILIZATION COSTS

	CELL DESIGNATION		
	TYPE I	TYPE II	TYPE III
CELLS	19,22,23,24,26,27,28,29	10,11,12,13,14,15,20,25	16,17,18,21
DESCRIPTION	Built on fill, active cracking, some failures, additional failures likely	Built in cut areas, active cracking observed around perimeter	Interior cells, built in cut areas, no apparent new cracking in last 30 years
	Unstable, Unsafe	Stable except at edges	Stable
<u>OPEN SPACE</u>			
PRESERVE FILTERS	Not Feasible	\$2.02M per cell	\$1.79M per cell
DEMOLISH FILTERS	\$860K per cell	\$860K per cell	\$860K per cell
FILL FILTERS	\$440K per cell	\$440K per cell	\$440K per cell
<u>SINGLE STORY BUILDING</u>			
PRESERVE FILTERS	Not Feasible	\$2.25M per cell	\$2.02M per cell
DEMOLISH FILTERS	\$1.33M per cell	\$1.24M per cell	\$1.24M per cell
FILL FILTERS	\$920K per cell	\$790K per cell	\$790K per cell
<u>FOUR STORY BUILDING</u>			
PRESERVE FILTERS	Not Feasible	\$2.56M per cell	\$2.33M per cell
DEMOLISH FILTERS	\$2M per cell	\$1.37M per cell	\$1.37M per cell
FILL FILTERS	\$1.61M per cell	\$920K per cell	\$920K per cell

Source: C.C. Johnson & Malhotra, PC

Appendix D: Site Development Cost Tables

Source: Greenhorne & O'Mara, p xxviii and xxi.

PROVIDE OPEN SPACE

- Develop publicly accessible recreation/open space on the Site.
- Provide for both active and passive recreation uses.
-
- Create imaginatively developed open space in critical locations that preserve significant existing views into the Site, particularly at the intersection of Michigan Avenue and North Capitol Street.
- Ensure that high standards are adhered to for open space maintenance, landscape design, accessibility, and security.
- Incorporate thoughtfully considered signage and lighting in the landscape design plan.

PRESERVE AND ADAPTIVELY REUSE THE SITE FEATURES

- Restore key above ground elements of the Site in a way that is compatible with the original plan.
- Maintain the alleys or courtyard as a prominent connection to the McMillan Reservoir Site.
- Use currently stable cells as a historic record of the Site.
- Revitalize the Site through adaptive reuse with a mix of uses.
- Retain, restore, and incorporate the historic McMillan Fountain as a part of the improved site design.
- In areas where the cell structure may be completely or partially removed, attempt to incorporate references to the removed elements.
- Understand the cultural significance of this Site and others that were part of the McMillan Plan so that proposed development is sensitive and respondent.
- Understand the historic landscape so that it can be accurately interpreted, preserved, and/or recreated as appropriate.

BE CREATIVE

- Think “outside the box” to make elements of the revitalized Site more of an amenity—“a jewel”—to residents and others.
- Seek new, historically sensitive and creative uses to occupy key elements of the Site.
- Consider incorporating a well-designed and appropriate monument, memorial, and/or museum into the Site.
- Explore the significance of technology as a tool for redevelopment and reuse of the Site.

MITIGATE NEIGHBORHOOD IMPACTS

- Reduce the impacts and/or visibility of parking, traffic, and noise.
- Coordinate area-wide planning and development efforts.
- Make new development architecturally compatible with the surrounding communities.
- Integrate new development on the Site architecturally and structurally with the historic structure.
- Encourage redevelopment or rehabilitation of existing vacant or unoccupied housing sites within the neighborhoods simultaneous with new development on the Site.
- Improve transportation options for the neighborhood in conjunction with any improvements to the Site, where feasible.

MAKE IT FEASIBLE

- Maximize, to the extent possible, revenue-producing opportunities on both private and non-profit components of the Site development.
- Partner with private, not-for-profit, and other public sector investors to obtain resources to achieve community goals for the Site.
- Develop a mix of preferred uses including open space, housing, and neighborhood serving retail.

BE RESPONSIVE TO COMMUNITY NEEDS & CONCERNS

- Develop amenities or a site program that would be attractive to and accessible by a diverse population of residents and others.

*Appendix E: Community Workshop
Goals & Objectives*

Source: Greenhorne & O’Mara, p xxii-xxiii.

- The figure-ground to the right represents current development.

- Below are two schemes of hypothetical site development: the right side depicts an extension of the urban grid from the south; the left shows an extension of the more suburban pattern, as established by the hospitals and campuses to the north.

- This exercise reiterates the potential flexibility of the site's development as a result of its proximity to a wide range of land uses and patterns.



*Appendix F:
Two models of settlement*

Figs. 221-223: Figure grounds
(Source: by author and DCOP, 2003)



Figure-ground plan: Not-to-scale

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