ABSTRACT

Title of Document:	AN URBAN CENTER FOR FOOD AND AGRICULTURE.
	Valerie L. Smith, Master of Architecture 2010
Directed By:	Professor of the Practice, Peter Noonan, School of Architecture, Planning and Preservation

Food does not merely nourish the body through absorption of nutrients, it creates rituals around the sharing of meals, contributes to the culture of a region or the character of a specific place and engages all of the senses. Architecture does not merely serve the basic need of sheltering the body from the elements, it conforms to or creates rituals, contributes to the style of a region or creates a 'place' in the landscape and has the ability to engage all of our senses. Both food and architecture serve as mediums through which we engage with and also represent the natural world.

Through composition of an agricultural, educational and culinary program for a new urban institution and interpretation of existing topography and hydrology of the site, this thesis examines the relationship between building and landscape, human scale and space, and temporality and architecture.

AN URBAN CENTER FOR FOOD AND AGRICULTURE

By

Valerie L. Smith

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
2010

Advisory Committee:
Professor of the Practice, Peter Noonan, Chair
Professor Emeritus, Ralph Bennett
Assistant Professor, Hooman Koliji

All photographs, drawings, diagrams and other graphics in this document are by author, except where noted. Satellite image underlays were retrieved from Google Earth© and manipulated by the author.

Acknowledgements

I would like to thank the following people who provided endless help and encouragement throughout this process and my academic career.

My family

Matthew Kirkley

Anne Palmer

JHU Center for a Livable Future

Peter Noonan

Hooman Koliji

Ralph Bennett

Lindley Vann

Thomas Schumacher

My Path B colleagues

My maynes

Table of Contents

List of Figures

Chapter 1: Background

> *"There is a quiet revolution stirring in our food system. It is not happening so much on the distant farms that still provide us with the majority of our food; it is happening in cities, neighborhoods, and towns. It has evolved out of the basic need that every person has to know their food, and to have some sense of control over its safety and security. It is a revolution that is providing poor people with an important safety net where they can grow some nourishment and income for themselves and their families. And it is providing an oasis for the human spirit where urban people can gather, preserve something of their culture through native seeds and foods, and teach their children about food and the earth. The revolution is taking place in small gardens, under railroad tracks and power lines, on rooftops, at farmers' markets, and in the most unlikely of places. It is a movement that has the potential to address a multitude of issues: economic, environmental, personal health, and cultural."*
>
> Michael Ableman[1]

1.1 The Conventional Industrial Food System

Industrial food system[2] *A global corporate model of agribusiness where producers and consumers are separated through a lengthy chain of processors, manufacturers, distributors and retailers. The system includes the agribusiness suppliers of farm input, industrial farms, the marketers of farm output and end product consumers.*

Industrial [conventional] agriculture[3] *capital-intensive, large scale, highly mechanized agriculture with monocultures of crops and extensive use of artificial fertilizers, herbicides and pesticides, with intensive animal husbandry*

Though the industrialization of food systems has seemingly obscured the direct relationship between food and landscape, "how and what we eat determines to a great

[1] Ableman, Michael. "Agriculture's Next Frontier: How Urban Farms Could feed the World." http://www.fieldsofplenty.com/writings/articles.php

[2] *Rural Sociology*. vol 55 n4 (1990): 594.

[3] *Ibid.*

extent the use we make of this world – and what is to become of it."[4] It is no surprise that two of the most publicized global epidemics of the last decade are related to the modern industrial food system; obesity and its related health problems and climate change.

According to the National Center for Health Statistics, the obesity rate among adult Americans has doubled within the last thirty years; approximately 1 in 3 adult Americans is *obese*. [5] Obesity is a major contributor to health problems, such as heart disease and type 2 diabetes, which are identified as the leading killer diseases. Charts constructed from the organization's census data illustrate that the increasing rates of obesity within America generally started during the 1970s, which was the same decade that the Secretary of Agriculture, Earl Butz, successfully dismantled New Deal programs designed to prevent crop overproduction. With passage of the 1973 farm bill, Butz aimed to increase agricultural production and subsequently drive down the price of raw materials (corn and soybeans) utilized by the industrial food chain.[6] Since the 1970s, farmers in the United States are producing 500 additional calories per person every day and at least 200 of those additional calories are consumed by the American public, mostly in the form of processed foods, such as high fructose corn syrup.[7]

In addition to contributing to rising obesity rates, production and distribution methods of the industrial food system have significant climatic impacts. Approximately 10 percent of fossil fuel energy used annually in the United States is consumed by the

---

[4] Michael Pollan, *The Omnivore's Dilemma: A Natural History of Four Meals* (New York: Penguin Group, Inc., 2006), 11.

[5] http://www.cdc.gov/nchs/data/hestat/overweight/overweight_adult.html

[6] Pollan, 103.

[7] Ibid.

food industry. Common practices of industrial farming, food processing and packaging, and food storage and distribution contribute to the inefficient use of energy and, ultimately, generation of waste; in the current food system, up to 10 calories of energy from fossil fuels are expended to produce only 1 calorie of edible food (Fig. 1.1).[8]

Often, industrial farming follows a monoculture-based agricultural model, which favors invasive production of a singular (and often genetically modified) crop in lieu of traditional crop diversity and rotational practices. The synthetic fertilizers utilized to foster the productivity required by industrial farming have detrimental effects on the health of regional watersheds and soil, contribute to greenhouse gas emissions, and leave chemical residues on food products that are ingested by consumers.

Agricultural production across the world doubled four times between 1820 and 1975 (1820-1920, 1920-1950, 1950-1965, and 1965- 1975), yet the number of farmers involved in production has significantly dropped due to increased automation in the farming process, while the number of consumers has continually grown (Fig. 1.2). In the United States, circa1940, each farm worker supplied 11 consumers, whereas in 2002, each worker supplied 90 consumers.[9] The number of farms has also decreased and their ownership is more concentrated, contributing to extensive rural depopulation and loss of farmers from the land.

The geographical consolidation typical of industrial farming practices requires food to be shipped long distances in order to reach the general population. In fact, food that constitutes a 'typical' meal in the United States travels an average of 1500 miles

[8] http://www.sustainabletable.org/issues/energy

[9] Matthew Scully, *Dominion: The Power of Man, the Suffering of Animals, and the Call to Mercy (*St. Martin's Griffin, 2003), 29.

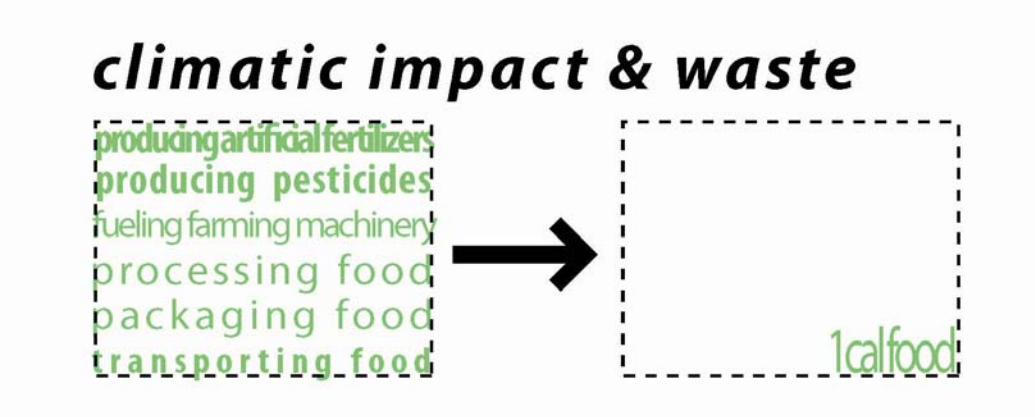


Figure 1.1 Relationship of fossil fuel and food calorie production

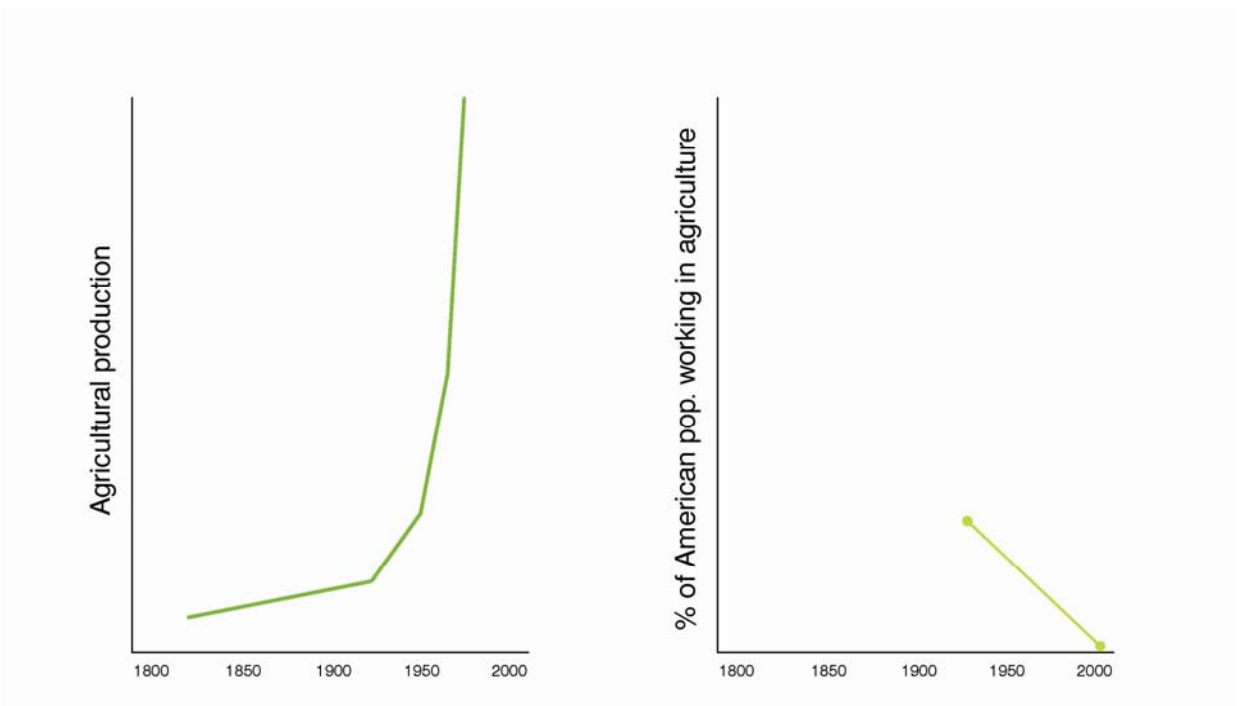


Figure 1.2 Increase in agricultural production and decrease in number of agricultural workers

from farm to plate.[10] In order to keep produce, dairy and meat from rotting on the long journey, foodstuff is treated with chemicals that are later ingested by the consumer. Not only are we choosing to saturate our bodies with chemicals by purchasing and eating these products, but we are saturating the environment with gas emissions and consuming massive amounts of fossil fuel in order to ship something that can easily be grown in a backyard, nearby community garden or local small farm.

1.2 The Alternative Local Food Movement

Local [community]food system[11] *A collaborative network that integrates sustainable food production, processing, distribution, consumption and waste management in order to enhance the environmental, economic and social health of a particular place. Farmers, consumers and communities partner to create a more locally based, self-reliant food economy.*

Urban [alternative] agriculture[12] *The practice of producing, processing and marketing food, largely in response to the daily demand of consumers within a town, city, or metropolis, on land and water dispersed throughout the urban and peri-urban area, applying intensive production methods, using and reusing natural resources and urban wastes to yield a diversity of crops and livestock.*

In response to the negative impacts of the modern industrial food system on economic, environmental, personal health, and cultural issues (which have become increasingly apparent and publicized throughout the last few decades), exploration and

[10] http://www.sustainabletable.org/issues/energy

[11] http://www.sarep.ucdavis.edu/cdpp/cfsdefinition.htm

[12] J. Smit, A. Ratta, and J. Nasr, "Urban Agriculture: Food, Jobs, and Sustainable Cities" (New York: United Nations Development Program, 1996).

application of an alternative local food system has been gaining global momentum. The local food movement is defined as "a collaborative effort to build more locally based, self-reliant food economies - one in which sustainable food production, processing, distribution, and consumption is integrated to enhance the economic, environmental and social health of a particular place."[13] A principal distinction between these alternative food systems and the conventional industrial food system is the spatial dimension.

A local food system promotes closely knit networks of sustainable production, distribution and consumption at multiple scales of intervention; these include, but are not limited to, personal/private vegetable gardens (whether rooted in the backyard or in a window sill box), community gardens, food co-ops, Community-Supported Agriculture (CSA), and farmer's markets. The concept of a 'local network' can either be defined by distance (the locavore defines 'local' as the area within a 100 mile radius) or in terms of ecology ('local' as the area within the unit of an ecoregion or foodshed) (Fig 1.3).

A foodshed is defined by shared attributes of climate, soil, watershed, species and local agrisystems; at the most basic level, it is an area where food is produced and eaten and its size is dependent upon the diversity and availability of seasonal foods.[14] According to authors Kloppenburg, Hendrickson and Stevenson, the term 'foodshed', "connects the cultural ("food") to the natural ("...shed") and thus becomes a unifying and

[13] G. Feenstra, "Creating space for sustainable food systems: lessons from the field" in *Agriculture and Human Values* 19:2 (2002), 99-106.

[14] http://en.wikipedia.org/wiki/Local_food

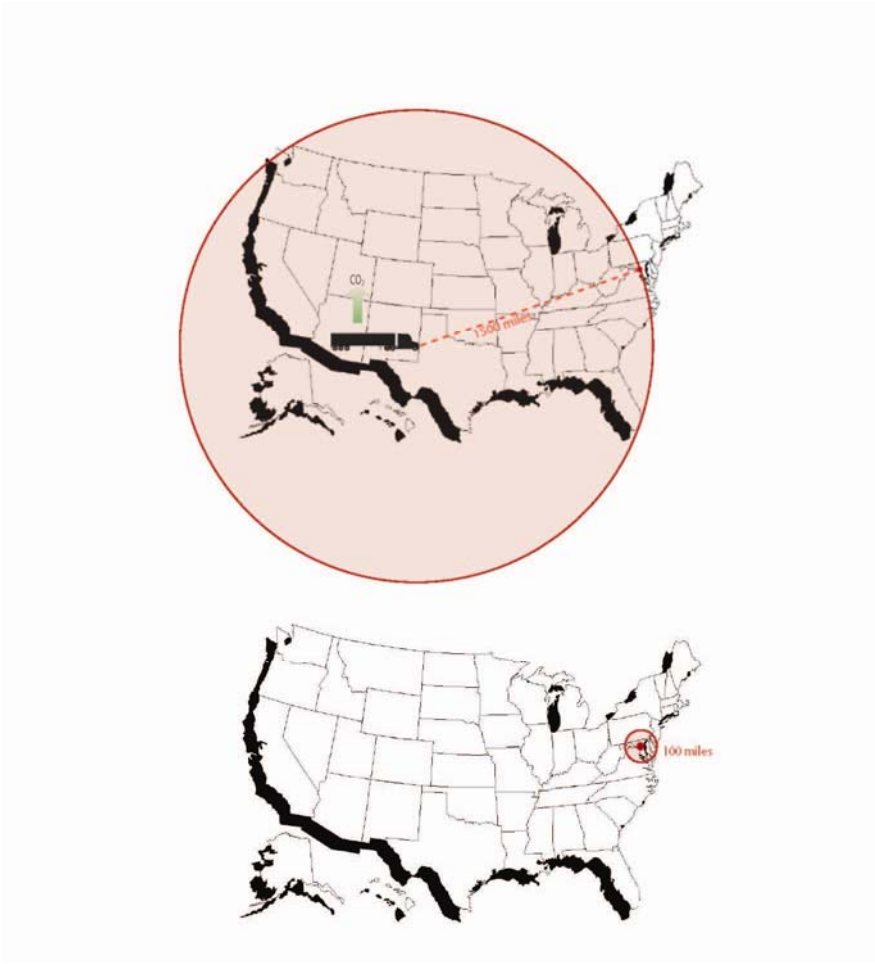


Figure 1.3 Average travel distance of food in industrial system vs. 'locavore' system

organizing metaphor for conceptual development that starts from a premise of the unity of place and people, of nature and society."[15]

Many people directly associate the local food movement with the promotion of urban agriculture; however, they are not mutually exclusive. Both challenge the current paradigm of vast physical separation between consolidated food production facilities within peripheral rural areas and food consumption within densely-populated cities. Thus, by employing the ideals of local food systems and urban agriculture, food production

[15] Kloppenburg, Hendrickson and Stevenson, "Coming in to the Foodshed" *Agriculture and Human Values* Summer 13:3 (1996), 3.

facilities are brought closer to the major source of consumption; this is suggestive of sustainable practices and the creation of an alternative type of urban landscape. More specifically, urban agriculture can provide food security to lower economic classes living within the city limits (studies show that limited access to healthy foods is highly prevalent in lower-income neighborhoods)[16], prompt re-discovery of the connection between what you eat and where it comes from, improve the appearance and value of vacant city lots, and provide places of social and communal gathering.

[16] Baltimore City Food Policy Task Force, "Using Zoning to create Healthy Food Environments in Baltimore City", 2.

Chapter 2: Site

2.1 Site Selection

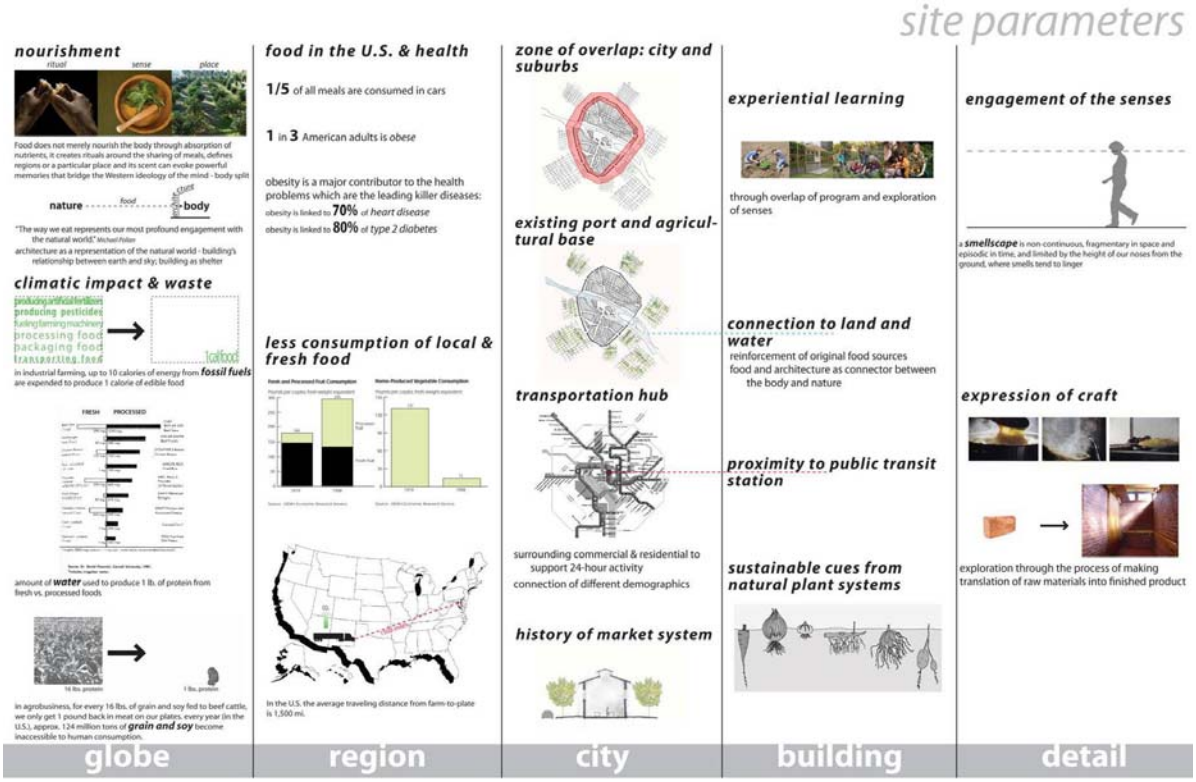


Figure 2.1 Site selection parameters

2.2 History_Urban Scale

Founded as a town in 1729, Baltimore has a rich history of agricultural production, distribution and consumption that is closely associated with the port of Baltimore and the greater Baltimore area. Located along the tidal portion of the Patapsco River, an extension of the Chesapeake Bay, the Port of Baltimore originally served as an official port of entry for the Maryland tobacco trade. During the remainder of the 18th century and the first half of the 19th century, the port of Baltimore became a granary for sugar-producing colonies in the Caribbean and a milling center for the export of flour and grain. With the charter of the B&O railroad (linking Baltimore with major markets in the Midwest) in 1824 and the construction of a federally-funded National Road, Baltimore became a major shipping and manufacturing center. In the early 20th century, the city limits of Baltimore grew as it began annexing new suburbs from the surrounding counties. Much of the character of the urban landscape was shaped by industrial forms, such as the grain silo, warehouses and elevators, associated with the import and export of food products.[17]

Concurrent with the establishment of the Port of Baltimore as a major eastern seaport of the North American colonies, was the creation of a public market system where producers and consumers organized a common meeting place and schedule for trading activities within the city. The first market house was completed in 1763 with the aid of a public lottery and was equipped with stalls, barns and a weighing platform to

[17] Robert C. Keith, *Baltimore Harbor: A Pictorial History. 3rd Edition.* (Baltimore: The Johns Hopkins University Press, 2005).

accommodate the sale of livestock from farmers of surrounding counties.[18] The public markets are Baltimore's oldest institution; not only did they act as the main source for distribution of food within the city, but often a second story within the wooden structure served as a place of political and social assembly.

Even though the products of trade have changed since the Port of Baltimore's founding (currently, the main import is forest products and main export is automobiles) and the economic base of the city is no longer manufacturing and shipping, the harborscape remains dotted with re-purposed industrial buildings and six of the eleven original public market structures, which are still in use today. In fact, Baltimore boasts the "oldest continuously operating public market system in the United States."[19] In 1995, the Baltimore Public Markets Corporation took over the management of Avenue Market, Broadway Market, Cross Street Market, Hollins Market and Northeast Market (Lexington Market is owned by a public-private corporation) to ensure maintenance of the structures and preserve the character and community of the respective market places. The public markets still thrive on the exchange of local goods, whether produce from farms in surrounding counties or fresh fish and oysters caught in the Chesapeake Bay, and serve as a symbol of the viability of the local food system in Baltimore.

In comparison with peer cities, Baltimore has a very progressive food policy and the local food movement has gained a lot of momentum and support over the last few years. The Office of Sustainability, which is under the management of the Baltimore City Planning Department, recently published "The Baltimore Sustainability Plan" in February

[18] http://www.bpmarkets.com/history.html

[19] Ibid.

of 2009. One of the main objectives of the sustainability plan is to "establish Baltimore as a leader in sustainable local food systems by increasing the percentage of land under cultivation for agricultural purposes, improving the quantity and quality of food available at food outlets, increasing demand for locally-produced, healthy foods by schools, institutions, supermarkets and citizens and developing an urban agriculture plan."[20] The Baltimore Food Policy Task Force was created shortly thereafter to aid in developing the initiative set forth by the sustainability plan and published "Transform Baltimore_Using Zoning to Create Healthy Food Environments in Baltimore City" shortly thereafter in December of 2009. The document calls for "encouraging urban agriculture, expanding farmer's markets, improving the food environment around schools and recreation centers, establishing healthy food zoning requirements."[21]

[20] Office of Sustainability, "The Baltimore Sustainability Plan" (Baltimore City Planning Department, February 2009).

[21] Baltimore Food Policy Task Force, "Transform Baltimore_Using Zoning to create Healthy Food environments in Baltimore City" (December 2009).

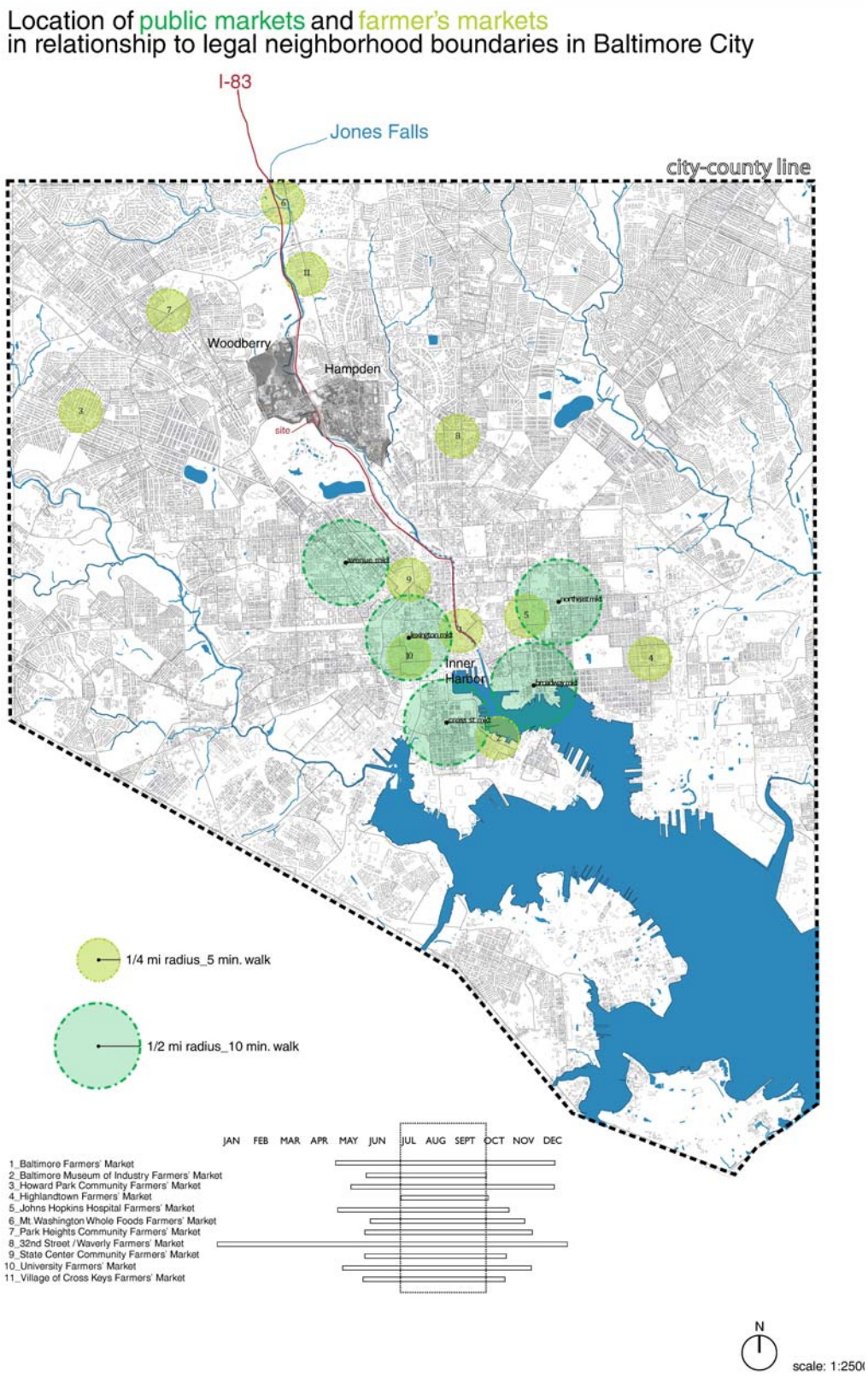


Figure 2.2 Location of public markets and farmer's markets in relationship to legal neighborhood boundaries in Baltimore City

2.3 History_Neighborhood Scale

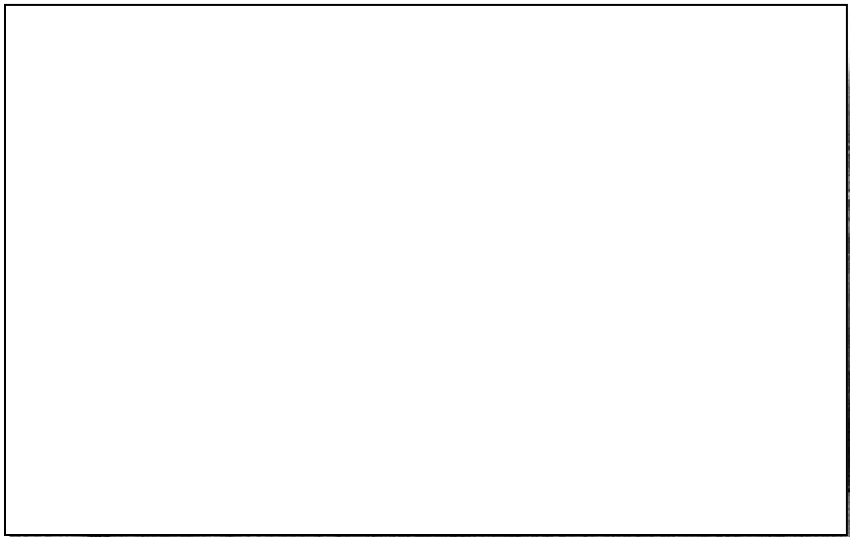


Figure 2.3 photograph of Hampden-Woodberry, 1920

Although Hampden and Woodberry are legally/politically defined as separate districts within Baltimore City today, they were more closely associated during the 19th and early 20th century with the mill area as their common ground. Hampden-Woodberry was the largest urban area in Baltimore County until 1888, when it was annexed to Baltimore city (the city line was extended to 43rd Street from its 1818 location at Boundary/North Avenue). Economic, social and physical factors (such as the barrier created by the development of I-83 over the Jones Falls) amplify the current disconnect of the two areas.

A. ***Location of Woodberry*** (also known as TV Hill)
   1. Bordered on the north by Coldspring Lane, on the south by Druid Hill Park, on the west by Greenspring Ave., and on the east by the Jones Falls and I-83
   2. Minutes from downtown area and accessible by the light rail
   3. Surrounded by preserved wooded areas and parklands
   4. Demographics - middle-to-upper class

B. ***Location of Hampden***

1. Bordered on the north by 41st Street, on the south by Clipper Mill, on the west by the Jones Falls, and on the east by Wyman Park
2. Demographics – lower-to-middle class, currently undergoing gentrification

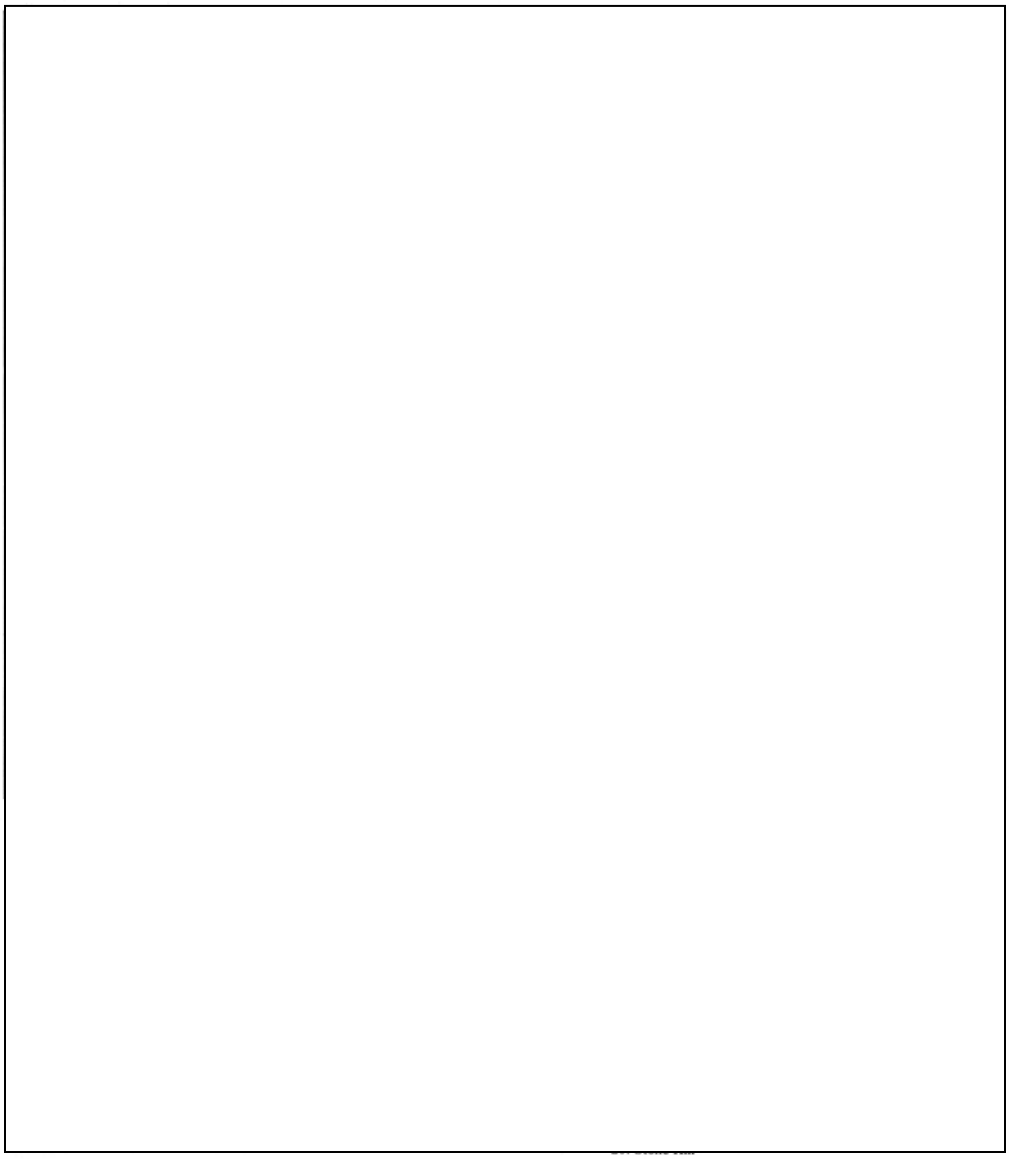


Figure 2.4 Map of original mill sites, mill villages and company housing in Hampden and Woodberry

C. ***History of the Mill Industry***

1. Grain milling operations were located along the many streams in the counties surrounding Baltimore City - the Jones Falls river connected the tributaries directly to the Port of Baltimore
2. Hampden-Woodberry began as a small mill town

- 1802: first flour mill created in 1802 to process grain grown in Frederick County for export
- By 1820, the Baltimore area was a world center for flour milling
- By 1830, cotton duck had grown in popularity → most of the flour mills were converted to cotton mills

3. 1850's: Poole and Hunt Foundry (created the cast iron columns for the Capitol's dome)and North Central Railroad came to Woodberry
4. During the Civil War era, there were 4 cotton mills in the Hampden-Woodberry area, mostly owned by the Gambrill family.
    - Small operations – 500 workers
5. 1870's: expansion of milling industry and population growth in Woodberry
    - Woodberry Mills is expanded and Meadow Mills is built by William Hooper & sons
    - people from Pennsylvania, northern Baltimore County, and Carroll County learn of the jobs in the area → workforce grows to over 2,900
    - mill owners play a patriarchal role in the worker's life by building churches, houses, schools and libraries in the community
6. 1870-1923: considered the "heyday" of Hampden-Woodberry as a cotton mill area
7. After World War I, demand for cotton duck decreased dramatically → several of the Mount Vernon Mills move out to more southern states
8. During World War II, mills experience a short renaissance, but decline sharply after the war due to adopted use of synthetic materials

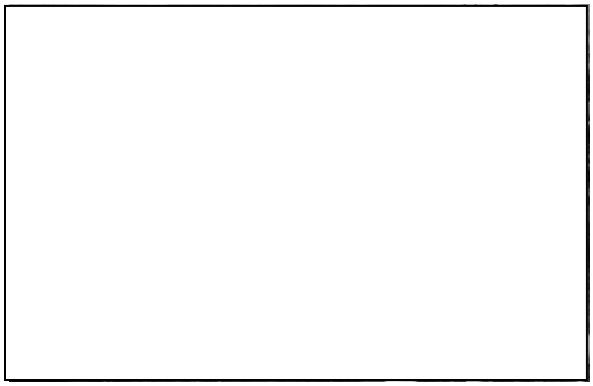


Figure 2.5 photograph looking NW from Mt. Royal Ave., 1920

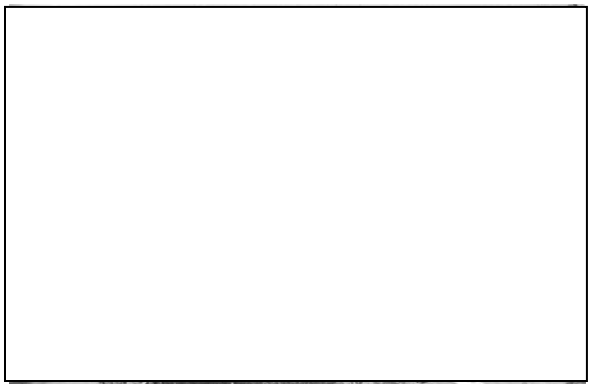


Figure 2.6 photograph of same, 1996

D. ***History of the Jones Falls***

1. Jones Falls watershed encompasses 58 square miles; stretches from rural segments of Baltimore County to Baltimore City's Inner Harbor, where it now emerges from a tunnel
2. 1804: Falls turnpike created (follows an old Indian trail out of Baltimore city, along the Jones Falls) → road spurred development in the area

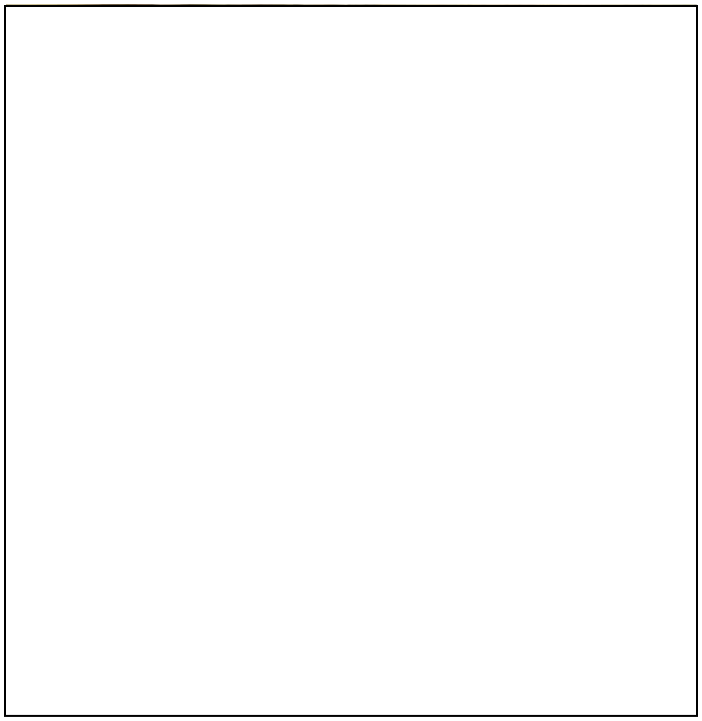


Figure 2.7 Olmsted map showing existing and proposed Park Lands, 1903

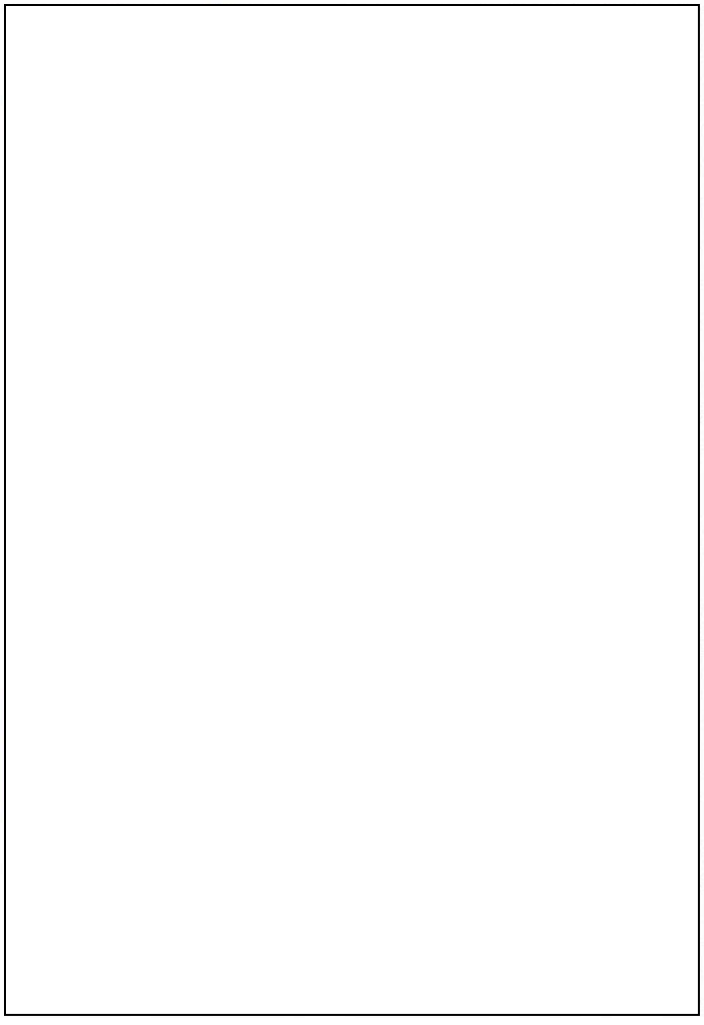


Figure 2.8 Map of Jones Falls Biking Trail phasing

Mills (built throughout 19th century) situated along the river spurred development of the railroad (MTA later adopts the Northern Central rail beds for the light rail)

3. Once used as a drinking source, pollution from industry situated along the banks renders it non-potable by the late 1880's and by 1910 public health officials propose the conversion of the last 2 miles of the river into an underground sewer – "bury the Jones Falls—not praise it" *Henry Barton*[22]
4. I-83 is developed alongside (and, in areas, over-top-of) the Jones Falls from 1969 until 1990

   -main N-S arterial highway – connects Baltimore County to Baltimore City
5. 1997: Jones Falls Watershed Association (JFWA) is formed to protect and restore the river and its tributaries
   - Holds annual festivals where Jones Falls is celebrated as a recreational resource (kayaking, hiking)
   - Provides educational programs about the importance of the Jones Falls to Baltimore
   - Jones Falls Trail – bike path and walking trail that runs along the Jones Falls; connecting downtown area to north of the city (2 out of 3 phases are complete_ phase 2 ends in Woodberry near thesis site)

2.4 Description_Meadow Mill at Union Ave Clipper Mill Rd

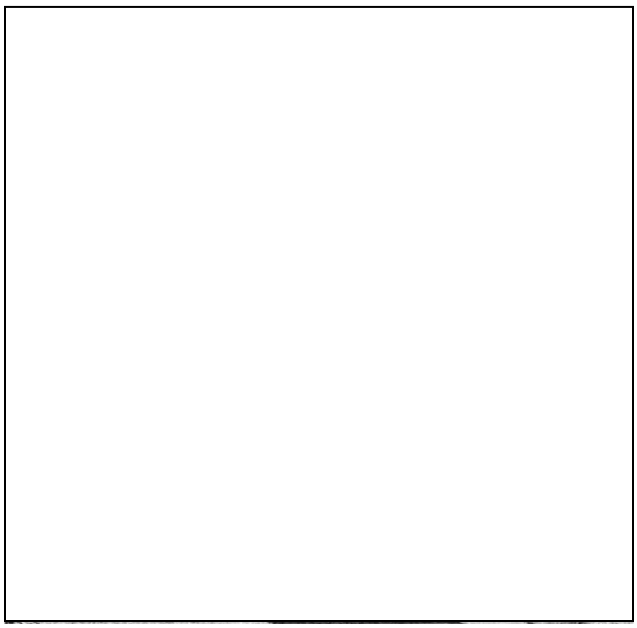


Figure 2.9 Photograph of Meadow Mill, early 1900s

[22] http://jonesfalls.org/files/26691263240542HistoryoftheJonesFallsWatershed.pdf

Figure 2.10 Photograph of Meadow Mill, current

Location of site

1. On the boundary edge between Woodberry and Hampden neighborhoods
2. Extents: Bounded on the north by Union Ave., on the south and east by the Jones Falls and I-83 expressway (overpass) and on the west by the light rail tracks
3. Area
    - approximately 2 acres
4. Existing buildings on site
    - *Meadow Mill:* built in 1877 by William Hooper & sons; on the National Register of Historic Places; renovated by Himmelrich Associates in 1990 into a 4 story office, studio and light manufacturing/flex complex
    - *Athletic club:* 1 story, 40,000 s.f. addition to south of the original mill building *[proposing demolition of this structure]*
5. Existing structures/access on site
    - *Public transport access*: Woodberry light rail stop at north west corner of site
    - *Vehicular access:* ramp located at the northwest corner of site off of Union Ave.; small bridge located central to site, underneath I-83 expressway, connects Clipper Mill Rd to surface parking lot on site
    - *Pedestrian access*: stairs and ramp located at the northwest corner of site

Surrounding Zoning and Land Use

1. Woodberry_Clipper Mill adaptive re-use: includes artisan workshops (glass, iron), Woodberry Kitchen (restaurant that uses local ingredients), and residential (mix of high-end condos and townhouses)

2. Hampden_residential (mix of 2 story town houses and duplexes) and main retail corridor (mix of restaurants, furniture stores, clothing and accessory boutiques on 36th St.)
3. Light industrial/commercial_Pepsi Co. bottling warehouse for Aquafina and small privately owned businesses directly across the Jones Falls

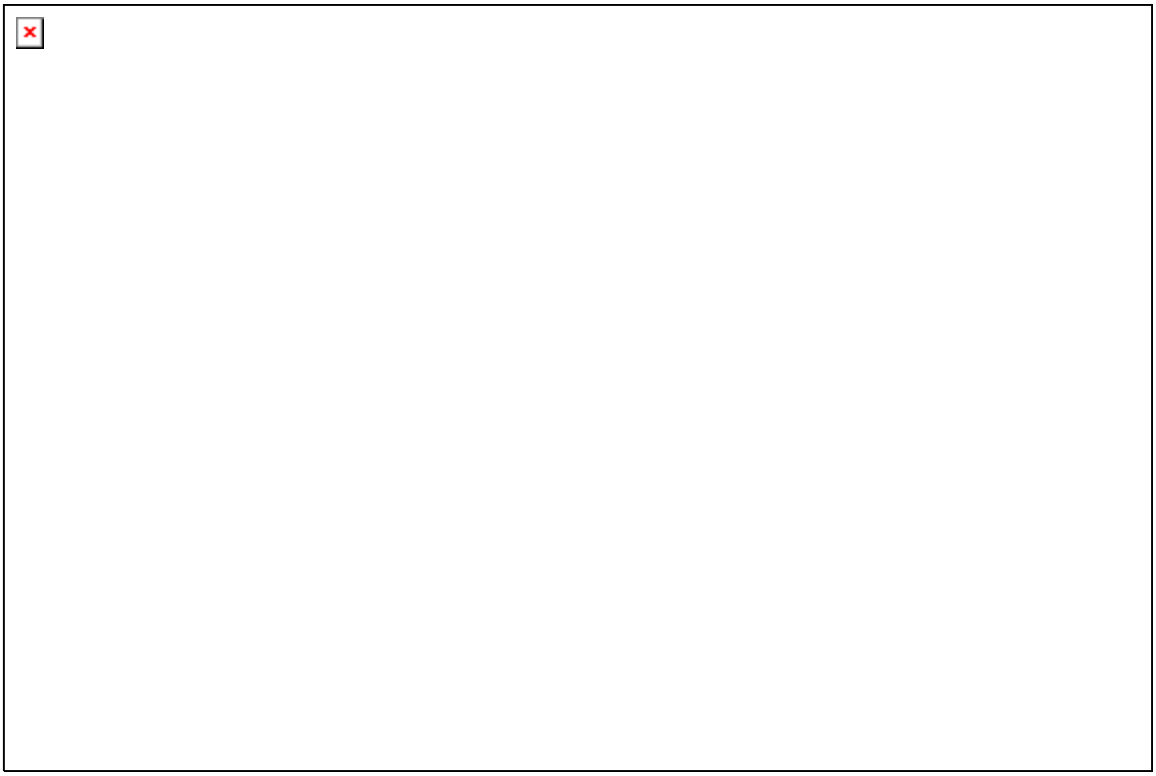


Figure 2.11 Existing site conditions

2.5 Analysis_Natural and Built Environment

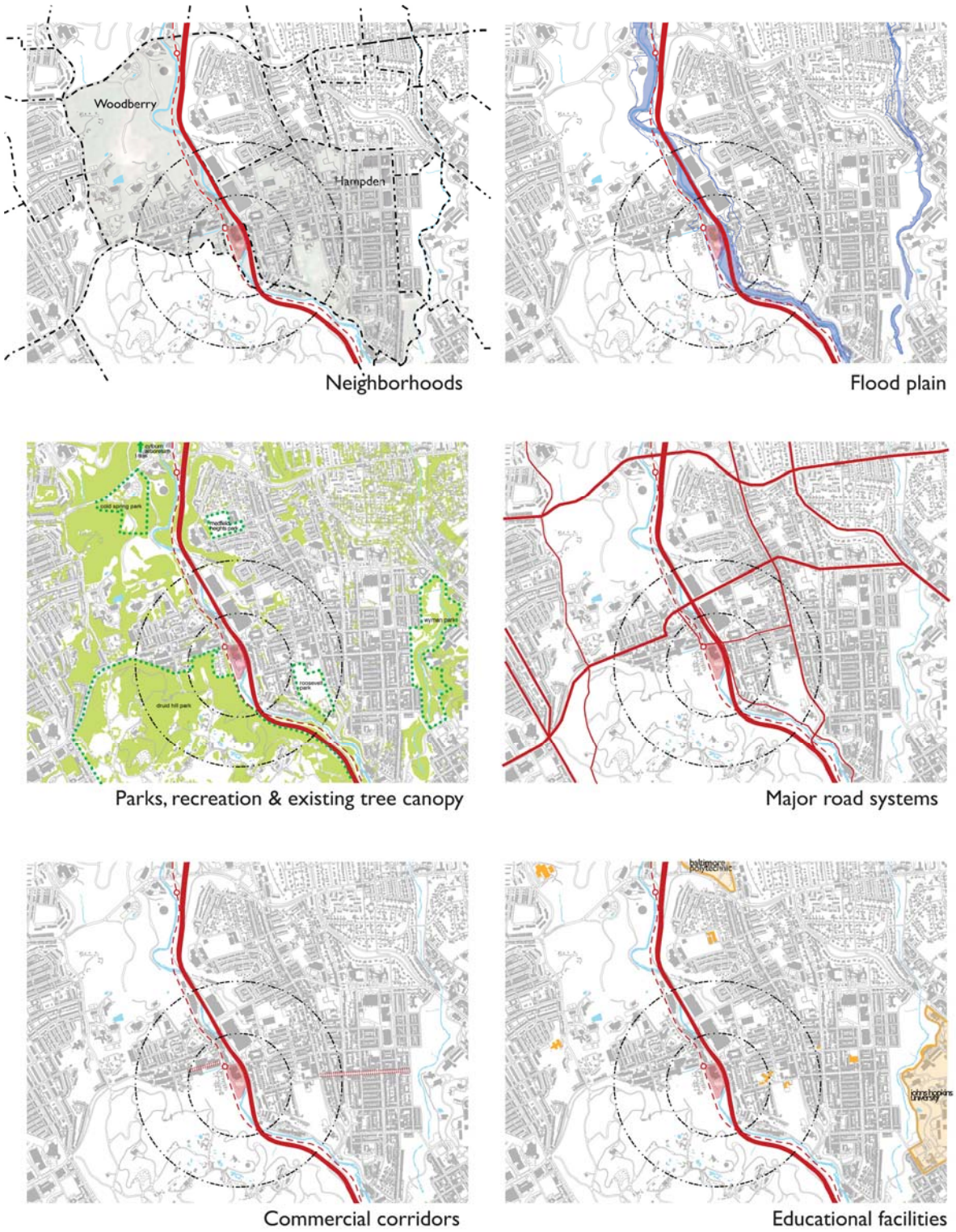
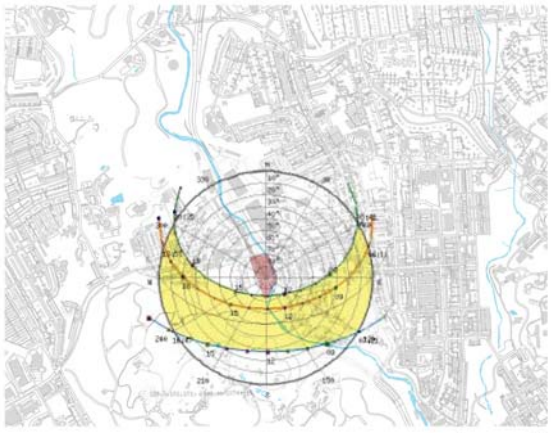


Figure 2.12 Site analysis diagrams

Topography (2ft intervals)

Bus routes



Sun path

Figure 2.13 Site analysis diagrams, cont'd.

Chapter 3: Program

> *"The way we eat represents our most profound engagement with the natural world. Agriculture has done more to reshape the natural world than anything else we humans do, both its landscapes and the composition of its flora and fauna. ..eating puts us in touch with all that we share with the other animals, and all that sets us apart. It defines us…What is perhaps most troubling, and sad, about industrial eating is how thoroughly it obscures all these relationships and connections."*
>
> Michael Pollan[23]

3.1 Programmatic Composition of a New Urban Institution

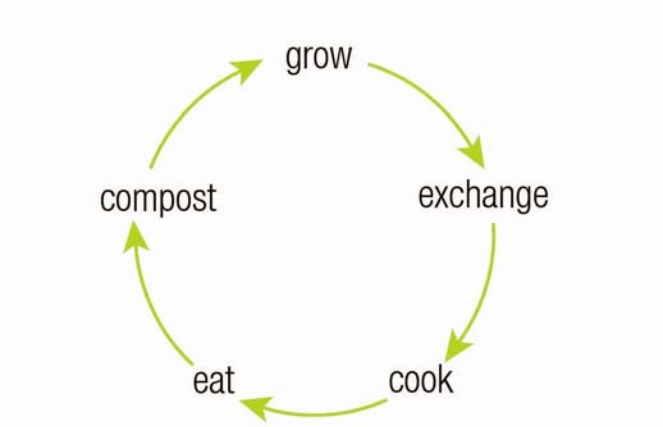


Figure 3.1 Diagram of a sustainable food cycle applicable to program investigation

Because an urban center for food and agriculture does not currently exist as a building typology, extensive research was conducted on agricultural, culinary, and educational programmatic elements that currently exist as separate entities and whose combination would reinforce the idea of connecting people back to their food source.

[23] Pollan, 10.

The acronym F.R.E.S.H. , which stands for Food, Recreation, Education, and Sustainable Harvest, was conceived as model for branding and is directly based on the program. Main programmatic elements include food production and consumption (community garden plots, small-scale orchards, market hall, eateries), a recreational cooking school, administrative center, tool storage and demonstration, and composting area.

3.2 Description of Space Allocations and Relationships

	Program	Area (s.f.)
	Food production/gardens/cultivation	
110 plots	Total Food production gardens	**11,800**
33 large plots	F.R.E.S.H. center use	5424
	(32) 4' x 42' raised beds	5376
	(1) 4' x 12' ADA planter	48
77 small plots	Community garden precincts	6360
	(74) 4' x 21' raised beds	6216
	(3) 4' x 12' ADA planter tables	144
	gleaning, communal gardens	1400
	orchards/bioswale areas	13,928
	(7) common apple, (9) crab apple, (8) plum, (4) pear	
	terraced rain gardens / demonstration ecobotanic gardens	4380
	constructed wetlands	9600
	Market Hall & Eateries	**23,410**
	flex space - market & event hall	4000
	loading docks	200
	market eatery	680
	market vendor kitchen	1335

lobby	750
exhibition/gallery space	2800
storage	210
(4) restrooms	
urban bistro (dining & bar)	2250
bistro kitchen	1335
(2) restrooms	
wine cellar restaurant (dining)	1700
hostess/coat check	100
lounge	380
wine tasting room/chef's table	350
wine cellar restaurant kitchen	1335
chef office	105
trash/recycle room	105
storage	50
(2) restrooms	
mech & water mgmnt	1900
Recreational Cooking School	**6550**
(2) large classrooms	1270
(2) small classrooms	870
(2) storage	130
lobby	560
(4) restrooms	
mech	
Administration	**2700**
(2) seminar rooms	280
open office	1120
mezz. Offices	784
(2) restrooms	
mech	80
Tool storage	**750**
loan desk	80
(1) restroom	
Compost & Mulch Distribution area	**500**

Total bldng programmed space	**33,910**
Total cultivation programmed space	**41,108**
Public plaza/node programmed space	**9342**

Chapter 4: Precedent Analysis

As discussed previsouly, no prescribed building typology exists for the proposed program. While the following precedents are sited in two different contexts (one rural, the other urban) and are at two different scales, both exhibit some of the programmatic elements that will be explored in the design of the architectural and agricultural intervention.

4.1 Stone Barns Center in Pocantico Hills, NY (Machado and Silvetti, 2004)

Location: Pocantico Hills, NY (rural)
Size: 40,000 s.f. (education center and greenhouse)
14,000 s.f. (Blue Hill restaurant)

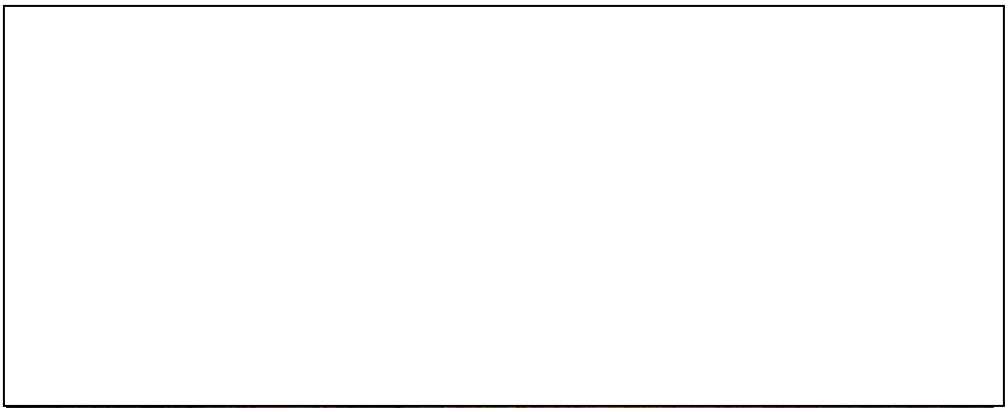


Figure 4.1 Photograph of Stone Barns facility from the entrance road

The Stone Barns Center, designed by Machado and Silvetti, is a combination of adaptive reuse and new construction located in the rural area of Pocantico Hills, approximately 20 miles north of Manhattan. The 80 acre site is a parcel of the original 4,000 acre Rockefeller estate and includes a cluster of fieldstone barns that were designed by Grosvernor Atterbury in the 1930s to provide fresh milk for the Rockefeller family at

Kykuit, the Rockefeller's weekend home. After conversion of the Kykuit residence into a house museum in the late 1970s, the stone barns no longer served their original purpose and were used by Peggy Rockefeller for her Simmental cattle operation. Upon Peggy's death in the 1990's, her husband and daughter turned 80 acres of the estate into a farmland preserve and dedicated the Stone Barns Center for Food and Agriculture in her memory.

The Stone Barns Center is utilized as an active year-round produce and livestock farm, a kitchen, and a classroom. The fundamental mission of the non-profit organization associated with the center is "to celebrate, teach and advance community-based food production and enjoyment, from farm to classroom to table."[24] This mission is achieved through the integration of programmatic elements associated primarily with the production and consumption of both food and knowledge. The client assembled a combination of non-profit and for-profit uses that the 80 acre site could sustain, including a four-season and pastured livestock farm, an education center, and eateries.

Machado and Silvetti's master plan for the project included the renovation of the existing barn complex to house classrooms, exhibition space, a visitors' center and

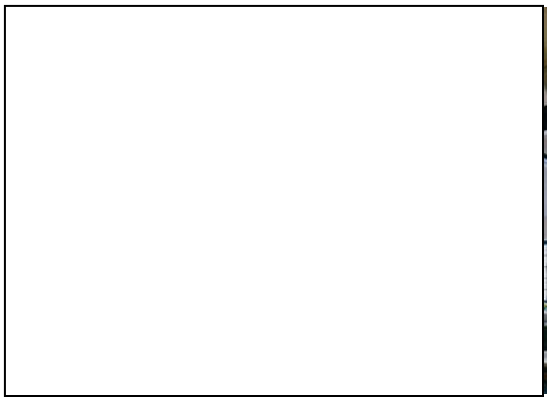


Figure 4.2 photograph of main dining room, Blue Hill restaurant

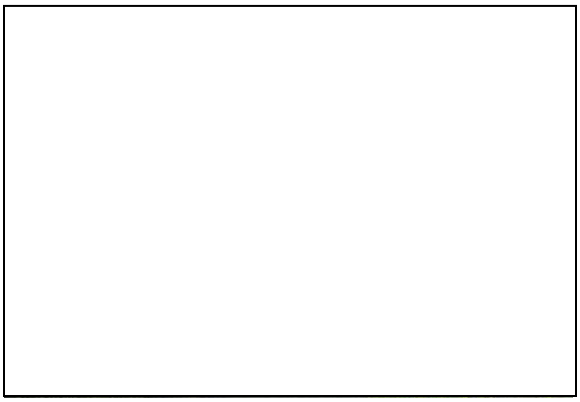


Figure 4.3 photograph of greenhouse interior

[24] http://www.stonebarnscenter.org/sb_about/mission.aspx

library, offices, event space, a café and restaurant and the construction of a new 24,000 s.f. greenhouse to provide fresh produce all year. All of the food that is prepared at both the café and restaurant comes from the surrounding fields of the Stone Barns Center and other local farms in the Hudson Valley, thus strengthening the connection between place, season and produce. Instead of a set menu, the for-profit restaurant, Blue Hill, provides diners with a list of ingredients that have been harvested earlier in the day and serves them in a traditional 'farmer's feast' manner.

The overall site is organized so that the visitor drives past the farming fields and the main complex of the renovated stone barns to a parking lot that is located between the main complex and the newly constructed greenhouse. Since the structural shells of the existing barns were reused for the main complex, the clustered parti follows that of the original dairy farm – a series of linear barn buildings that enclose a large, rectangular

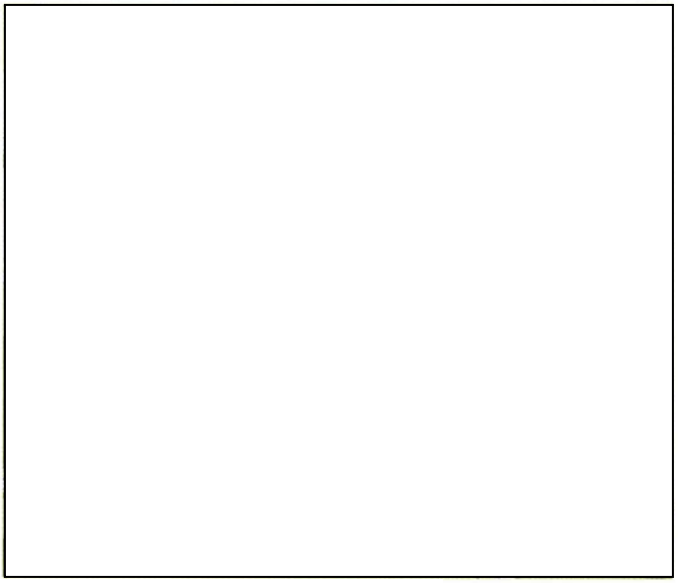


Figure 4.4 Site plan

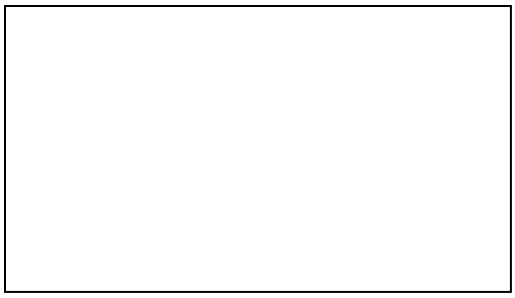


Figure 4.5 Photograph of entry court, NE

open-air courtyard. Entry is provided through a central portal gate into the outdoor courtyard, from which the visitor may proceed to the education center on the north (direct access is provided to the visitor's center, the library and the exhibition space) or to the offices, café and restaurant (each with direct access from the courtyard) on the south.

The Blue Hill restaurant provides a variety of dining experiences through the arrangement and treatment of its spaces. A large open plan main dining room accommodates 75 guests, an outdoor dining terrace that overlooks the surrounding farmland can seat 48 guests, and a flexible 'stable-size' space with visual connections to the dining terrace and the herb garden can accommodate up to 64 guests for a private event. Change in flooring material denotes the dining spaces from the circulation space; wide planks of antique heart pine lend warmth and coziness to the dining spaces, while Pompignon limestone distinguish the halls and vestibules in contrast.

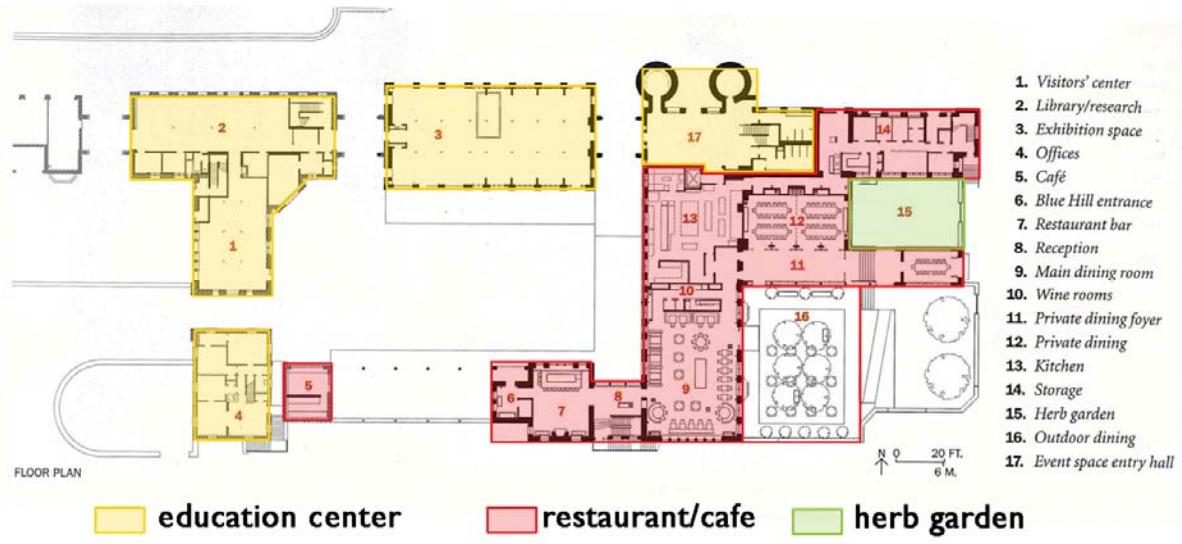


Figure 4.6 Plan diagram of program

4.2 P.S. 216 Edible Schoolyard in Brooklyn, NY (WORKac, 2009)

Location: Brooklyn, NY (urban)
Size: approx. 14,000 s.f. (entire site)
1600 s.f. (kitchen classroom)

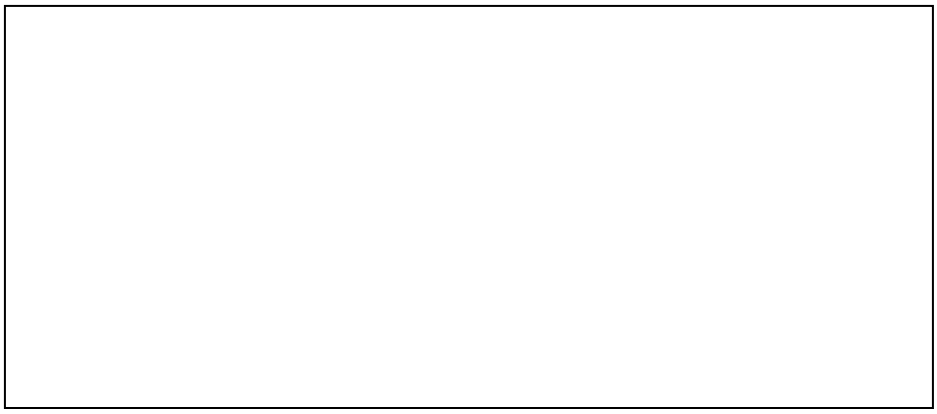


Figure 4.7 Rendering of kitchen classroom and gardens during spring

Along with the NY Public school system and Alice Waters' Chez Panisse Foundation, WORKac designed a kitchen classroom and school garden to replace a hard-paved parking lot adjacent to Brooklyn Public School 216. The project serves as a prototype for the Edible Schoolyard NY organization and, if it proves to be successful, could be implemented in other New York public schools in the future.

The built program (1600 s.f.) includes a kitchen/classroom where students can prepare and consume meals together, a "mobile greenhouse" that slides out to cover the soil during winter months for an extended growing season, and a "systems wall" that includes a cistern for rainwater, a compost bin, dishwashing equipment, tool storage and a chicken coop. Dan Andraos, a principal at WORKac, describes the design as a "full circle, from growing to harvesting to eating to composting."[25]

[25] McKeough, Tim. *Azure*. May 2010, 67.

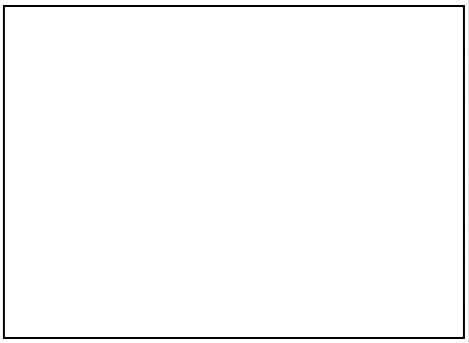


Figure 4.8 Site plan

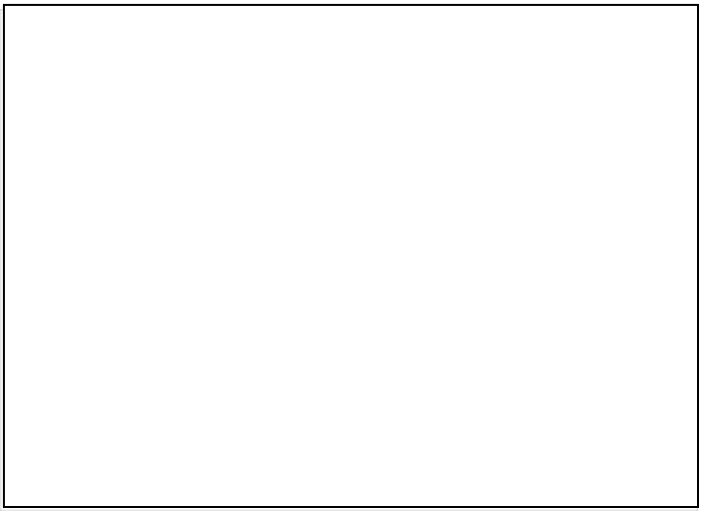


Figure 4.9 Plan

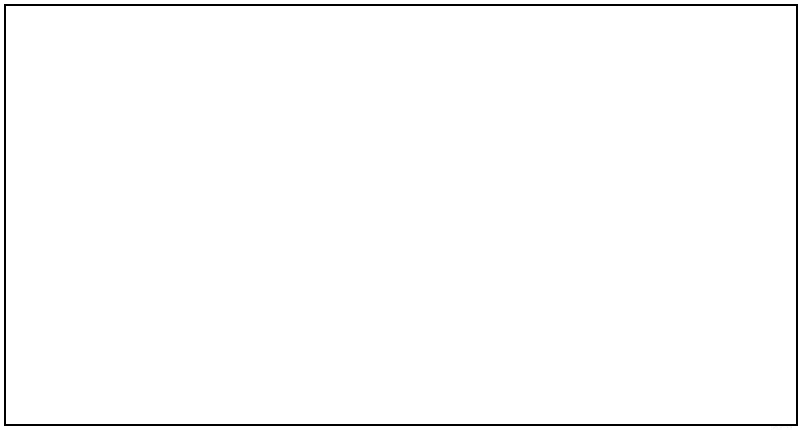


Figure 4.10 Section of the ‘mobile greenhouse’ during winter and summer

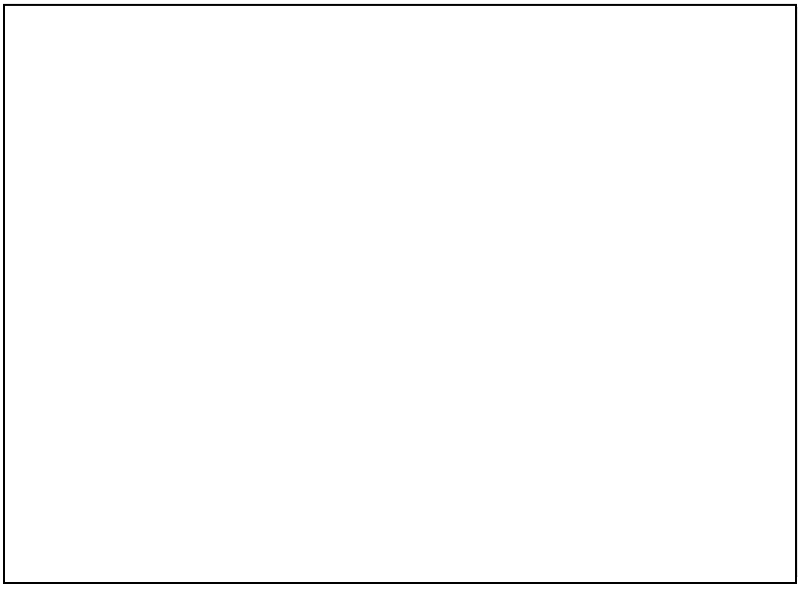


Figure 4.11 Plan diagram of the ‘systems wall’

4.3 Magnuson Community Garden, WA (Barker Landscape Architects, 2004)

Location: Seattle, Washington
Size: 4 acres

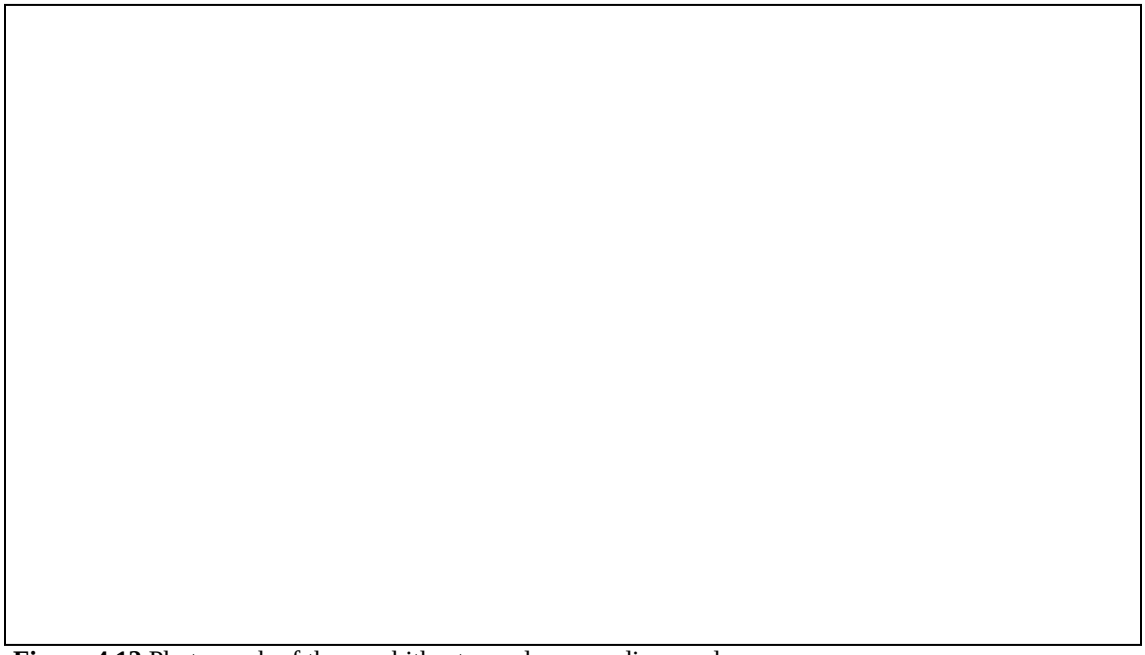


Figure 4.12 Photograph of the amphitheater and surrounding gardens

Magnuson Community garden is located within a large public park and offers different types of programmed outdoor space, including a children's garden, amphitheater, gathering area and food bank beds. The community garden consists of 140 plots, which range in size from 10x10 feet to 10x20ft. Raised beds are utilized for planting and cultivation.

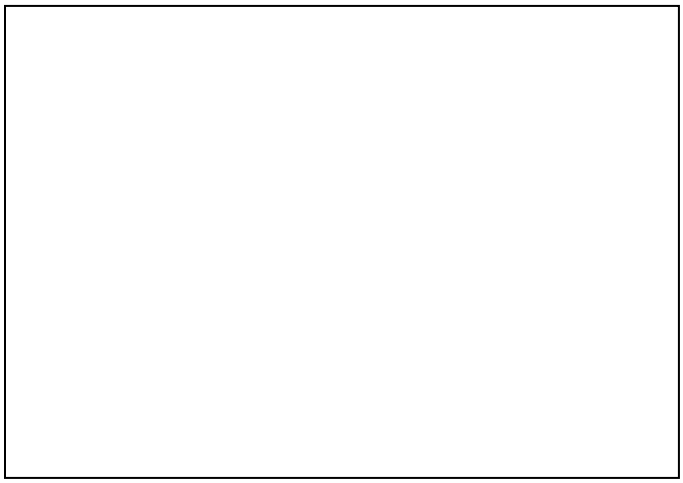


Figure 4.13 Surrounding land use

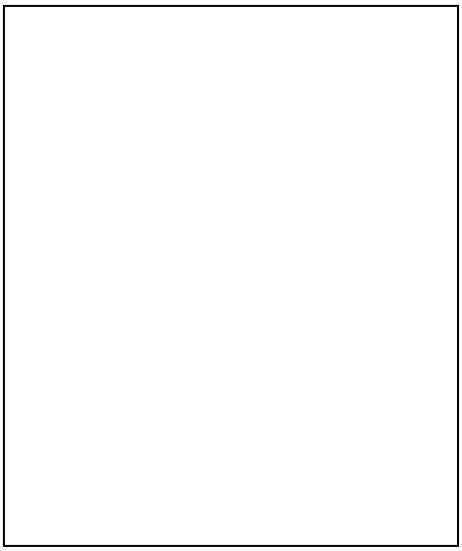


Figure 4.14 photograph of raised bed garden plots

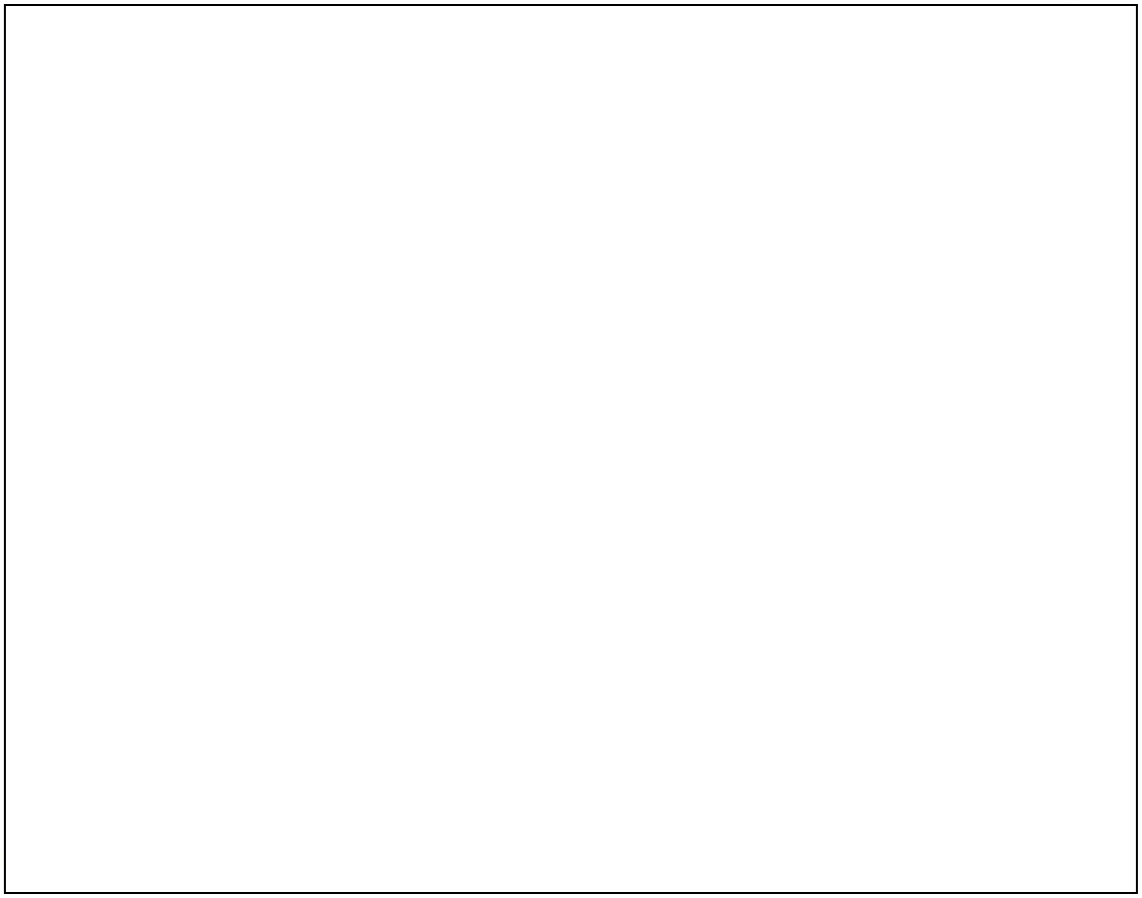


Figure 4.15 Site Plan of Magnuson Community Garden

Chapter 5: Design Process

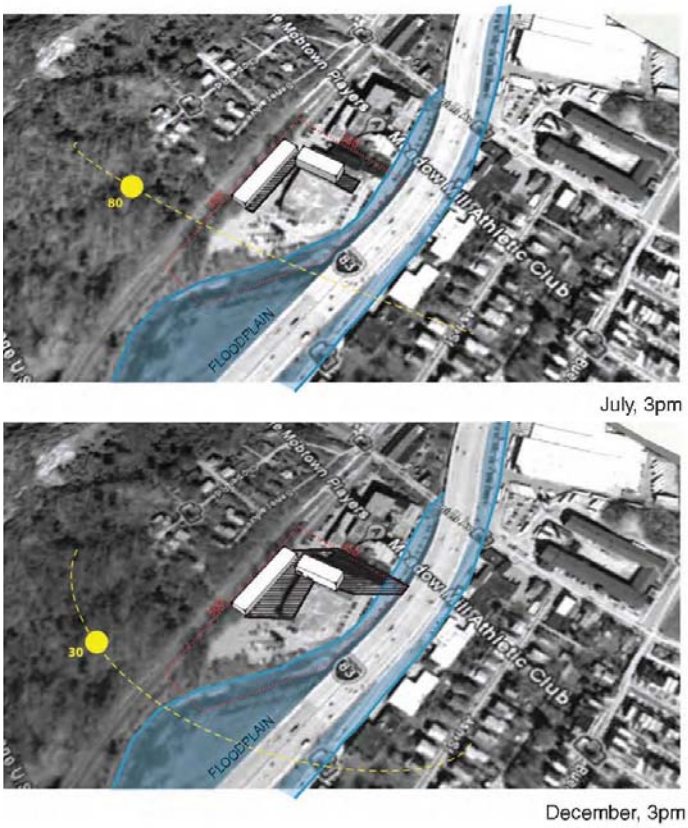


Figure 5.1 Solar studies of site and massing in December, July

Because a major portion of the program is dedicated to cultivation (food production, eco-demonstration and rain gardens), orientation of building massing on the site was explored through a series of solar studies (Fig. 5.1). An “L” shaped parti that embraced the berm on the west side of the site and created a vehicular street on the north side of the site provided maximum solar exposure for the gardens and privileged the gardens as an ‘outdoor room’.

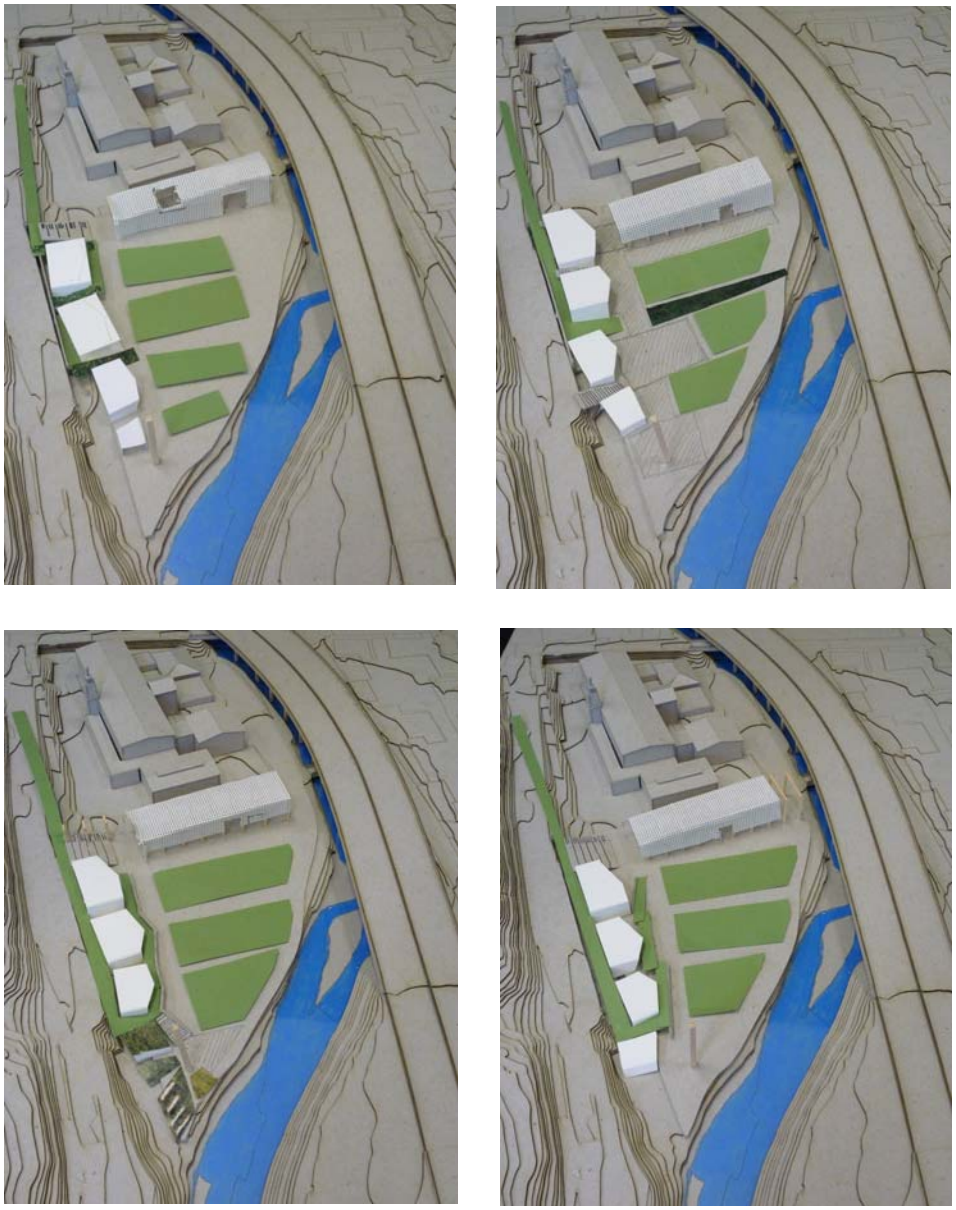


Figure 5.2 Site model explorations over the duration of the thesis

Once the basic siting of the buildings was decided, multiple iterations of massing, program organization and site circulation were explored through models and drawings at different scales simultaneously. Studies of elevations, details and material composition were inspired by the aesthetic character and tectonics of wooden slatted produce crates, which inscribes a rich layer of meaning to the architecture (Fig. 5.5).

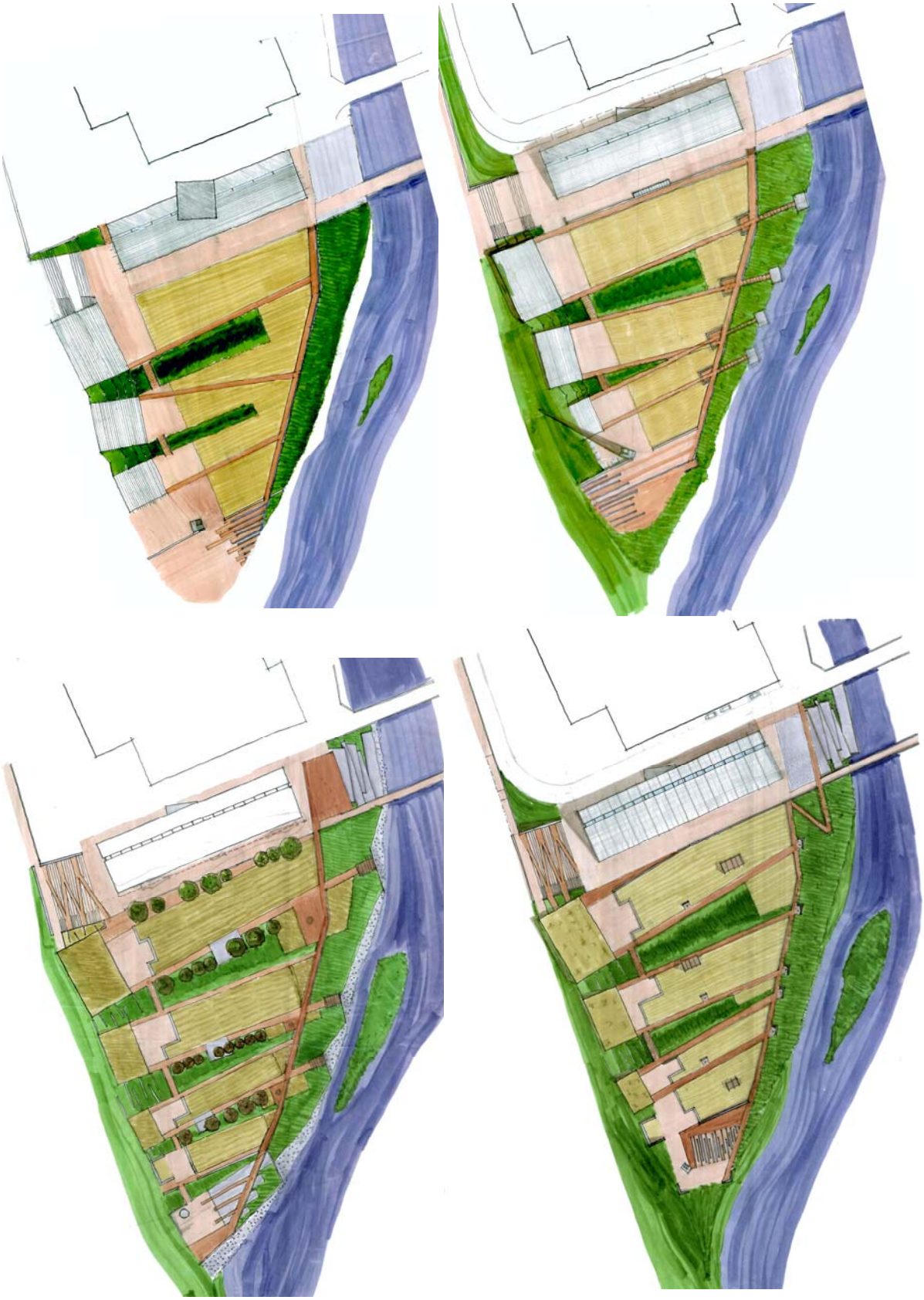


Figure 5.3 Drawings of site plan iterations over the duration of the thesis

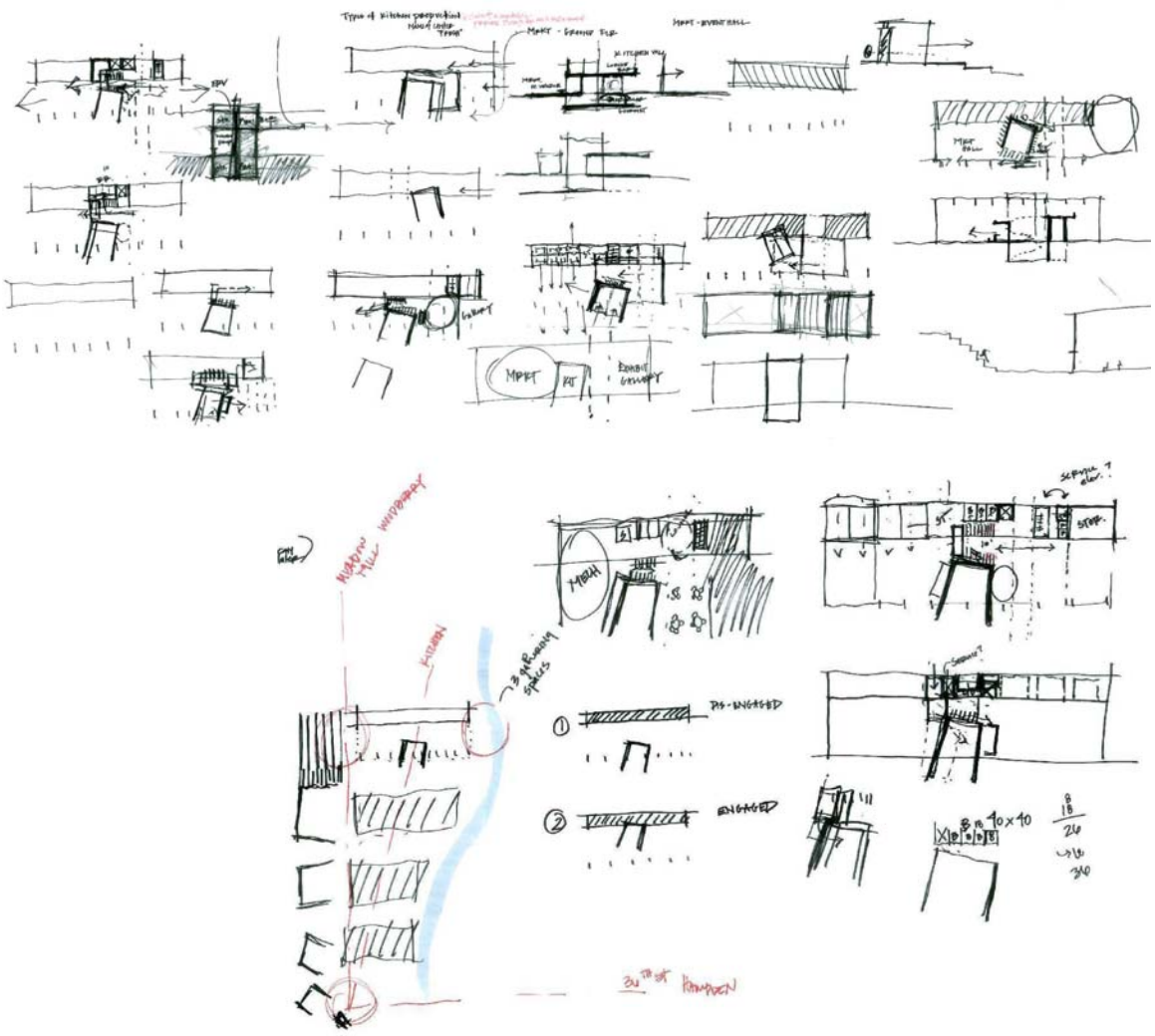


Figure 5.4 Sketches of plan diagrams and programmatic relationships

Figure 5.5 Inspirational images of traditional fresh produce crates

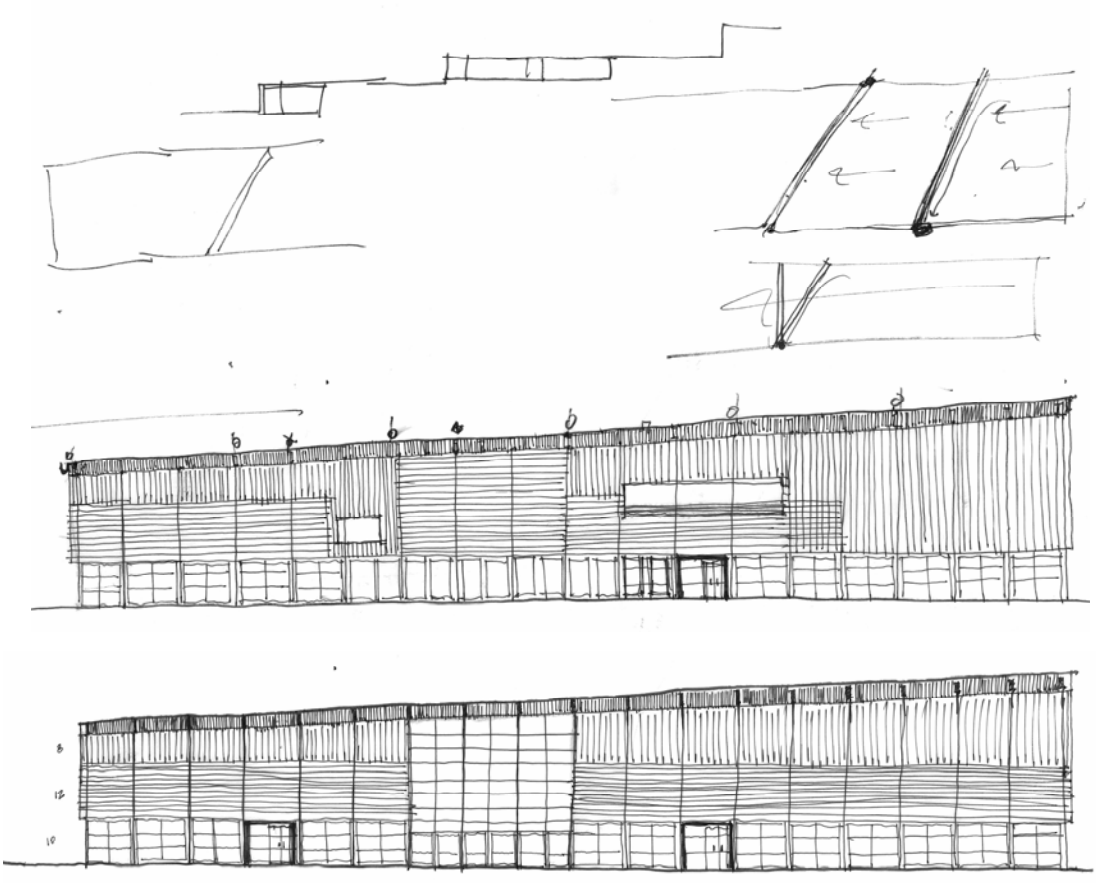


Figure 5.6 Sketches of South façade composition

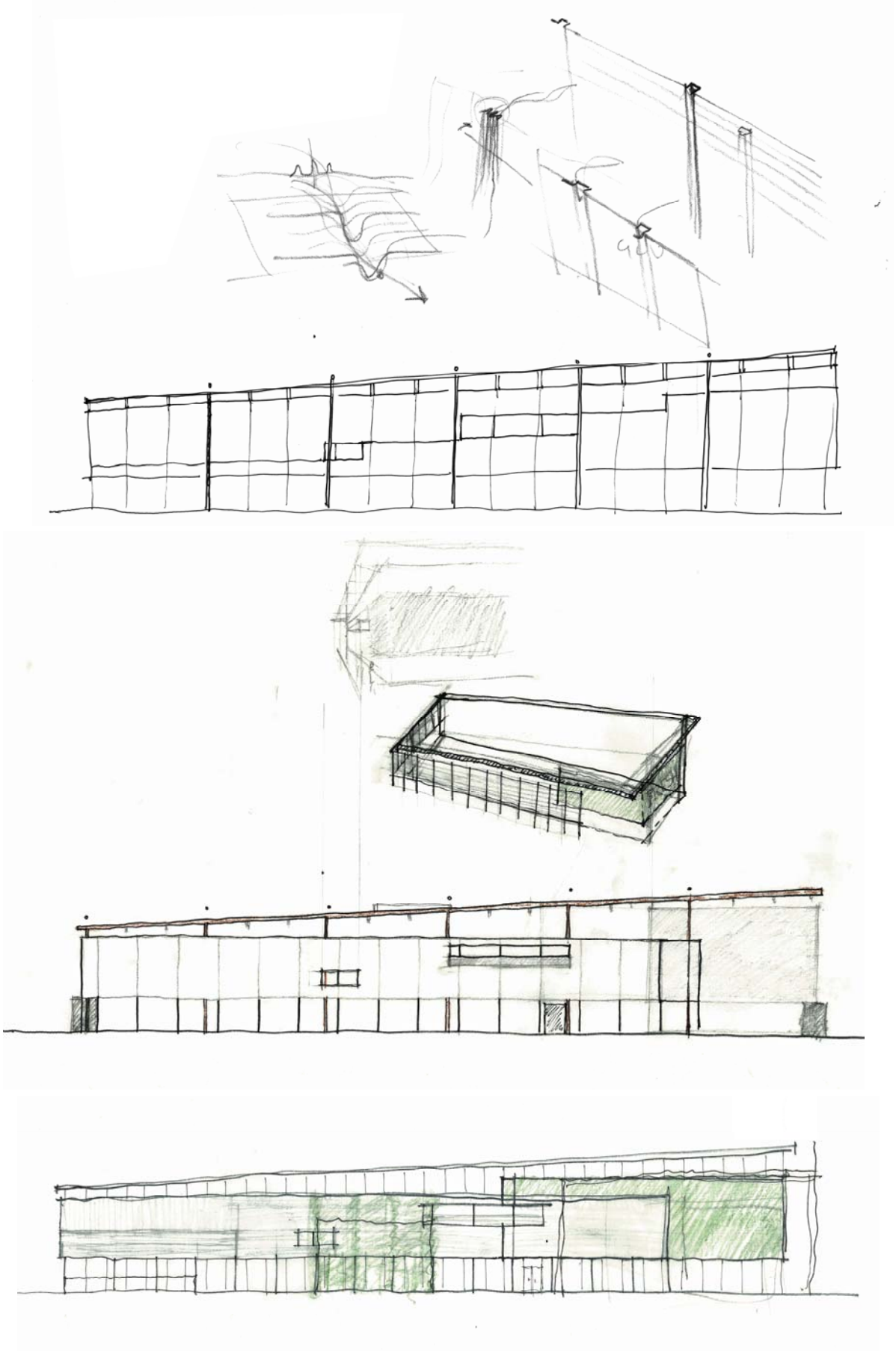


Figure 5.7 Sketches of gutter and green screen/vertical growing wall options

Chapter 6: Final Design Proposal

Figure 6.1 Aerial perspective of final design proposal

Throughout the design process, five main issues emerged and were continually explored at different scales (neighborhood, site, and building) through the generation of architecture and landscape:

1. The connection and interaction of building and landscape.
2. The dichotomies of the rustic vs. the urbane and the natural vs. the cultivated.
3. The creation of a communal gathering space; a node that promotes the exchange of knowledge, food, culture and traditions.
4. The relationship of human scale and space.
5. The role of temporality in architecture; how a building can become an effective backdrop for the changing of the seasons.

At the urban scale, the primary goal was to ‘stitch’ together the two communities of Woodberry and Hampden, which have become increasingly segregated due to the erection of I-83 over the Jones Falls during the early 1970s and differing rates of gentrification. Currently 36th Street, also known as “the Avenue”, dead ends into Ash Street. The final design proposal suggests that 36th Street is continued through to Clipper Mill Rd in order to connect the two main commercial streets of Hampden and Woodberry and facilitate interaction between the two communities. Siting the market & eateries building at the north end of the site creates an opportunity to provide a vehicular through-street (slow traffic) and service alley, which would also provide connection of the two communities through the site itself (Fig. 6.2).

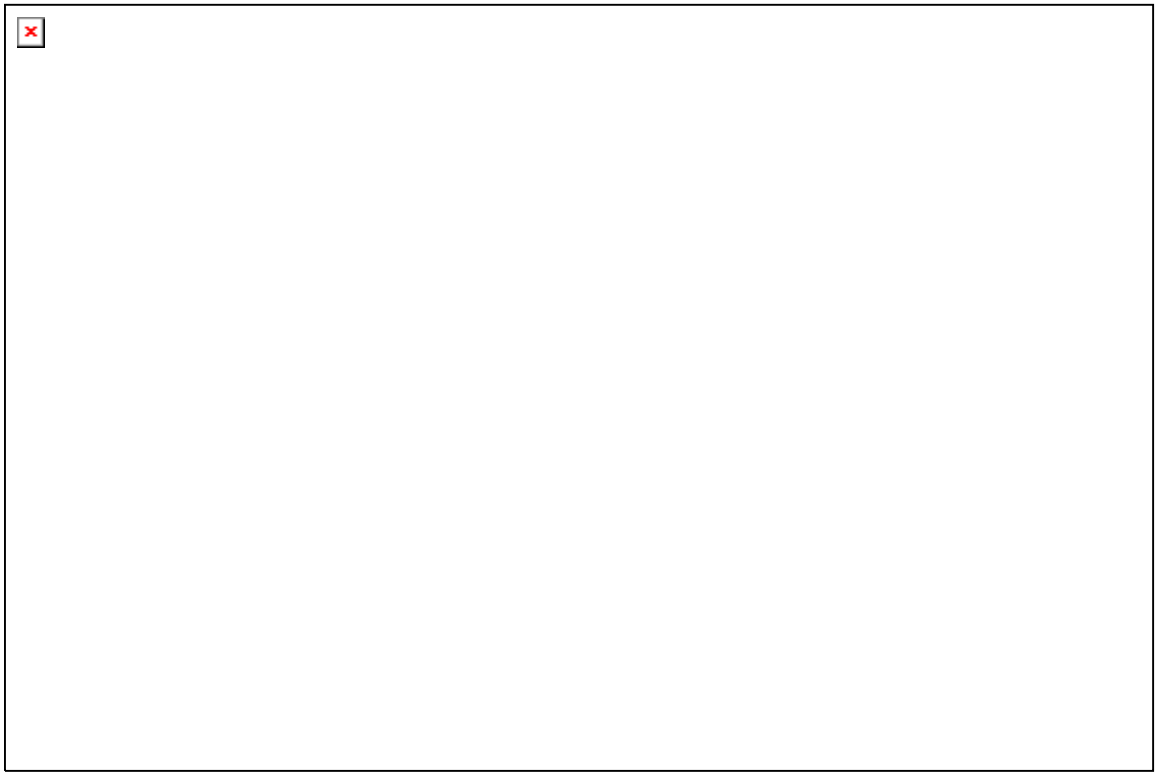


Figure 6.2 Urban diagram of proposed site connections

At the south end of the site, an observation tower placed on axis with 36th Street would not only serve as a visual marker within the urban fabric, but also provide breathtaking views of Baltimore and act as a billboard for the F.R.E.S.H. center, as it is highly visible from I-83. A new pedestrian bridge supplements the existing vehicular bridge on the site and connects the Hampden area to the Woodberry lightrail station along the south side of the market & eateries building, enhancing walkability and encouraging use of public transportation. Porosity of the terraced walkway would encourage people to meander through the community gardens and orchards, providing a means of engaging the senses and learning about growing, preparing and composting food.

The integrated design of building and landscape results from taking cues from existing site hydrology and topography (Fig. 6.4); both are essential to a productive garden. Observations of slope and site drainage prompted placement of terraced rain gardens and creation of 'green fingers' (bioswales and constructed wetlands) extending to the Jones Falls, reuniting the hill and the valley through the flow of water. Rain cisterns located along the green fingers would store excess stormwater runoff and provide non-potable water for irrigation of the community garden plots. The canting of the pavilion buildings (recreational cooking school, administration, and tool demonstration/storage center) is based upon the existing contours of the site and provides a framework for the terraced rain gardens and a channel for stormwater runoff. The organization of the garden precincts stems from the siting of these pavilion buildings, providing a visual and physical connection between building and landscape.

Figure 6.3 Site plan

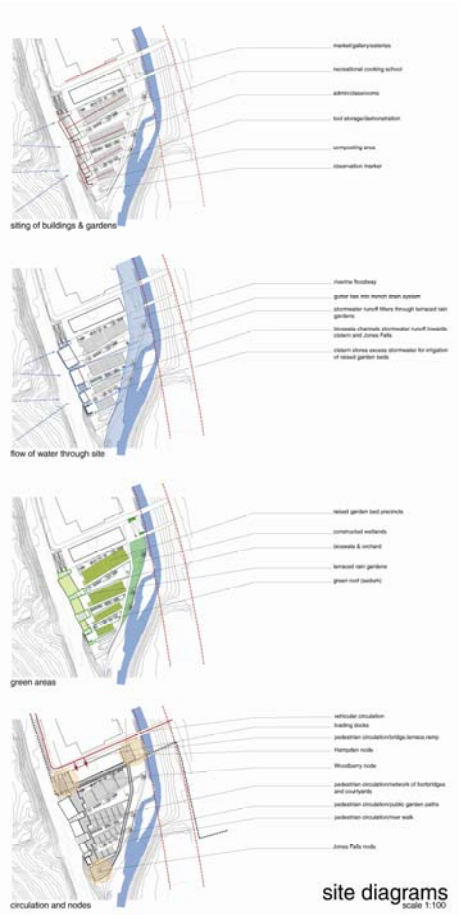


Figure 6.4 Site Diagrams

A hierarchy of pathways through the site (a main E-W terraced walkway, a pavilion path and courtyard network, orchard and garden entry paths, and a river walk) connects three main “nodes”. Each node maintains a distinct character and provides a space for communal/social gathering and recreation (Fig. 6.5). By treating the architecture as a ‘backdrop’ for the changing of the seasons, the ideas of growth cycles, connection of food to its original source of land, and our intimate and complex relationship with the natural world are amplified (Fig. 6.9).

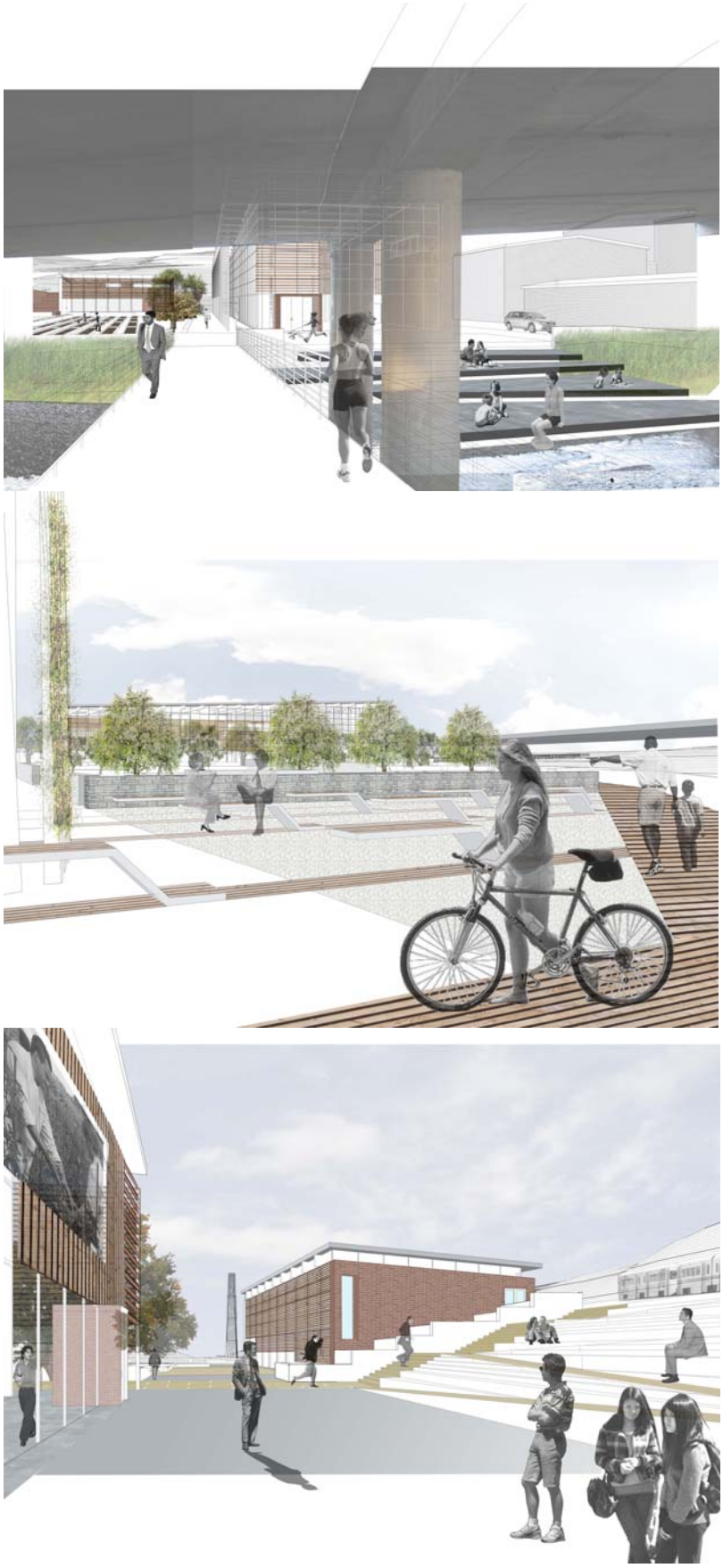


Figure 6.5 Perspectives of Woodberry, Jones Falls and Hampden ‘nodes’

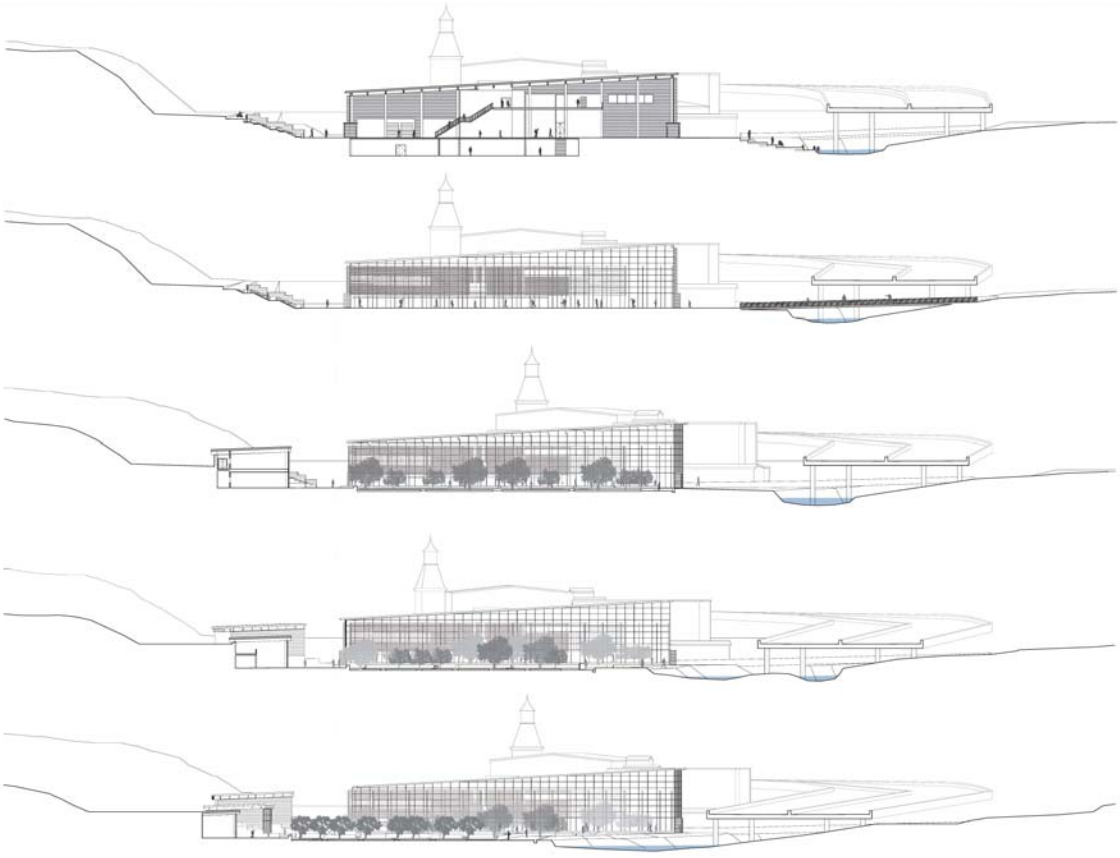


Figure 6.6 East-West site sections

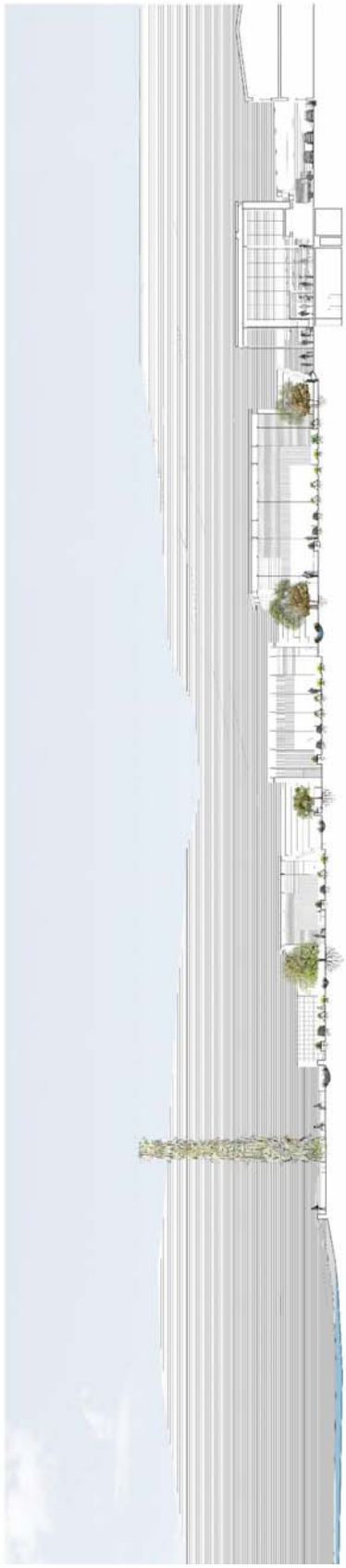


Figure 6.7 North-South site section through market/event hall

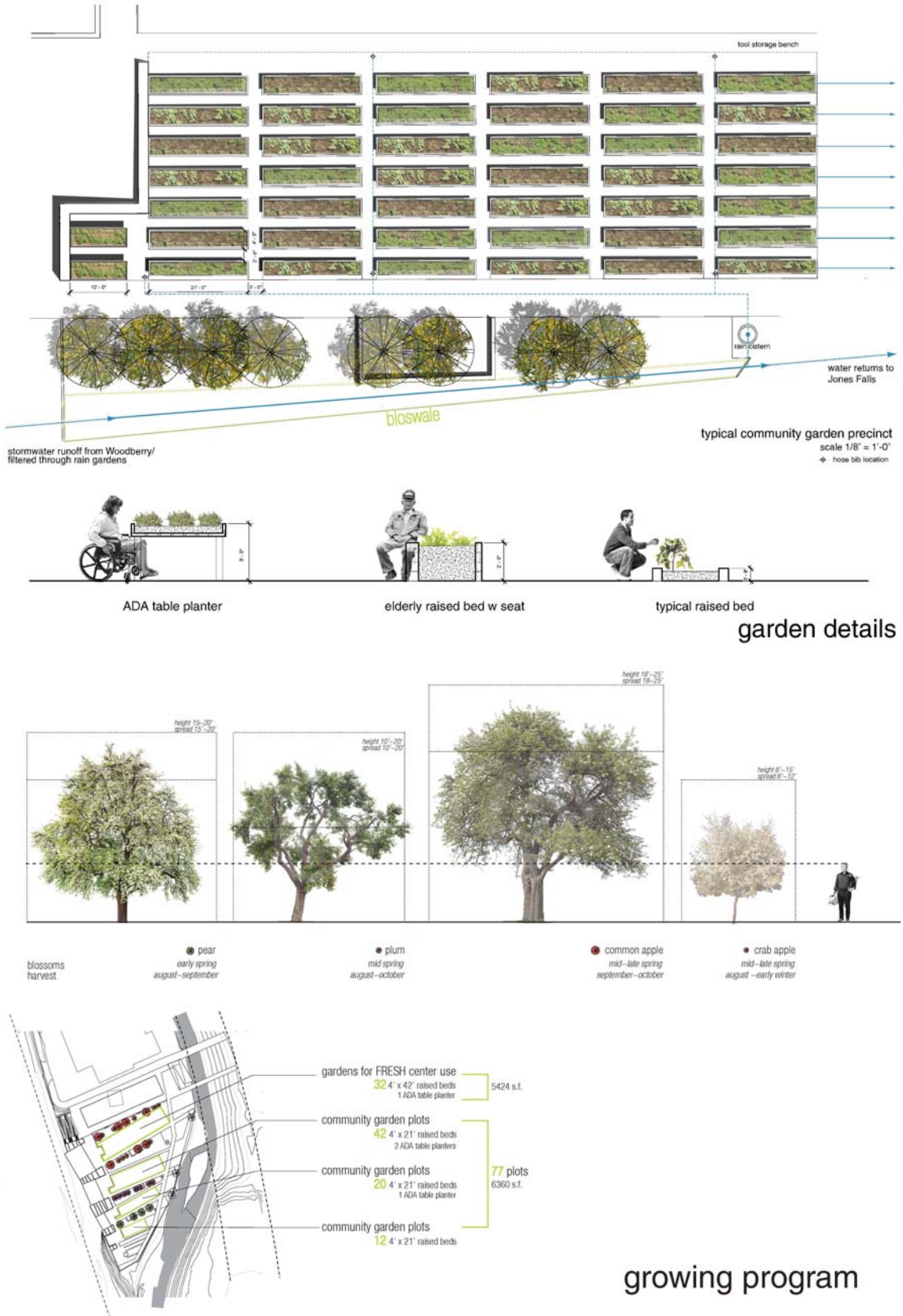


Figure 6.8 Cultivation program and garden details

fall equinox *09/22*

summer solstice *07/21*

spring equinox *03/20*

winter solstice *12/21*

Figure 6.9 Seasonal vignettes throughout the gardens

Figure 6.10 Market hall & eateries building plans and south elevation

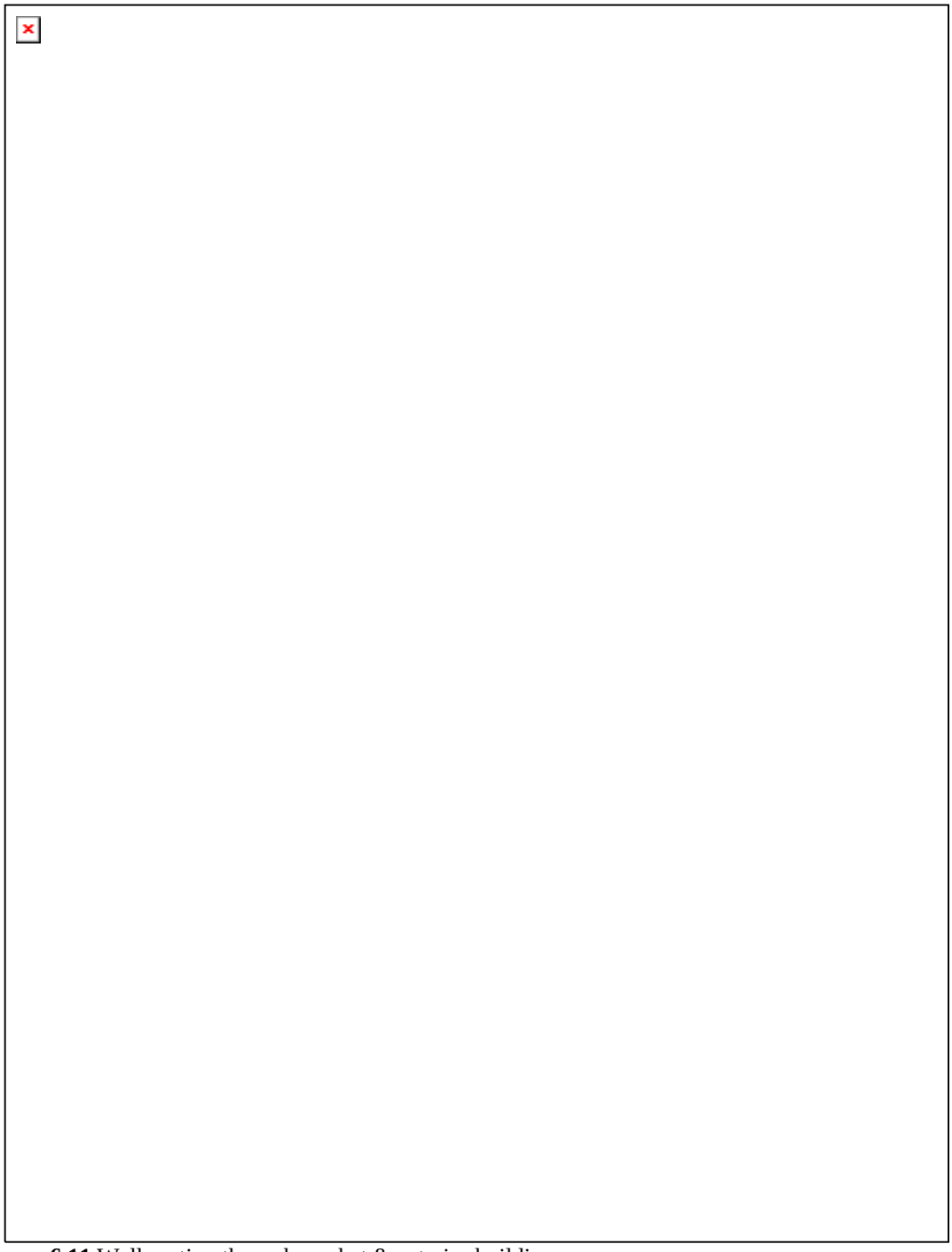


Figure 6.11 Wall section through market & eateries building

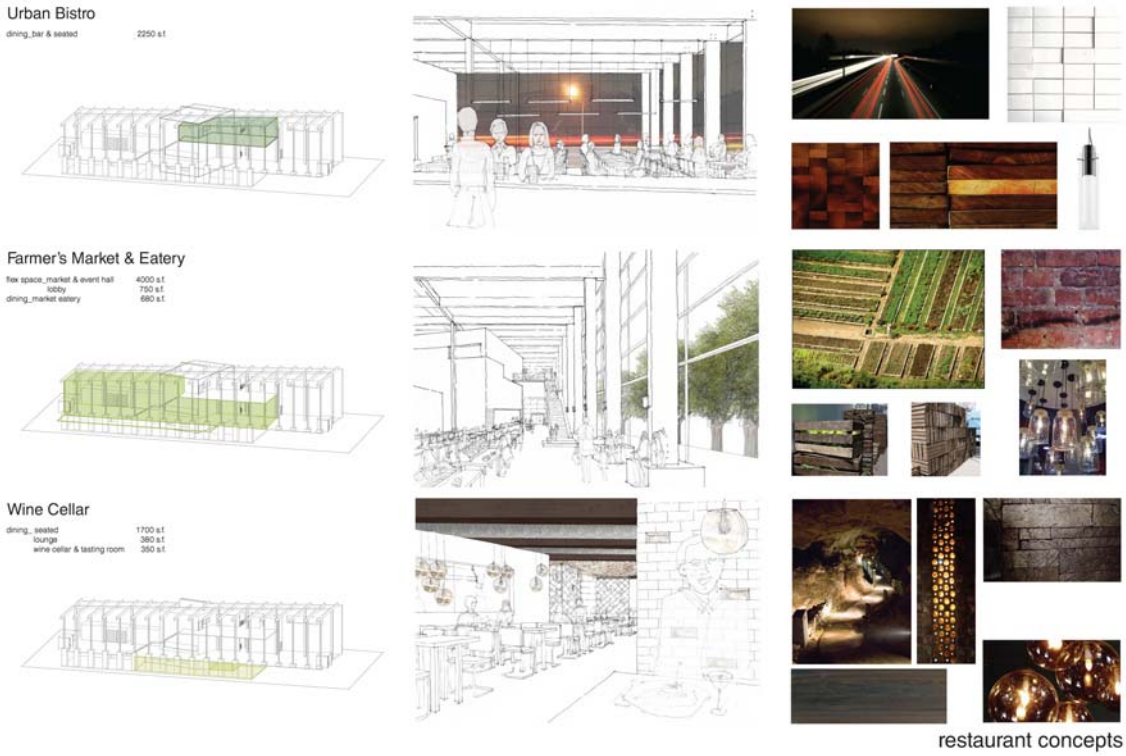


Figure 6.12 Program diagrams, perspectives, and design concepts for eateries

Chapter 7: Conclusion

Salient questions about site choice, access and circulation and parking were raised during the public thesis review – the most relevant concerns are addressed below.

The choice of site needed additional explanation to convince the jury of appropriateness for the thesis proposal. Michael Sewell, AIA asked why Baltimore and what was the reason that the project was not sited in a more dense urban fabric closer to the downtown area. Baltimore was chosen for a multitude of reasons that reinforced the main issues of exploration in this thesis. Baltimore is:

1. A city with a rich history of agricultural production and of historical importance to the flour-milling industry in early 19th century.
2. Has a progressive food policy which calls for additional urban agriculture areas within the city and expansion of farmer's markets.
3. Has an up-and-coming 'foodie' scene.
4. Has regional cuisine that is strongly tied to both land and water (Chesapeake Bay).

Site selection was also based on carefully determined parameters. Since the F.R.E.S.H center is conceived as a regional destination in addition to an amenity for the surrounding neighborhoods and a communal gathering space, a site that is located in the zone between the dense urban fabric of the downtown core and the sprawling suburbs

was compelling. The site of Meadow Mill at Union Ave. and Clipper Mill Rd. was chosen specifically for the following reasons:

1. Connection to the Jones Falls, an important watershed that feeds the Chesapeake Bay.
2. Connection to I-83, which follows the Jones Falls for a substantial length, one of the main interstate highways that joins the city to the suburbs of Baltimore county.
3. Opportunity to tap into existing green infrastructure, park system.
4. Suitable topography for meaningful sectional relationships and site design to explore the connection of building and landscape.

The nature of the access/service street on the North side of the building was also questioned. Comments made by Matt Bell, AIA suggested additional exploration in this regard. It was advised to combine vehicular and pedestrian traffic and make the North wall of the market and eatery building more porous in order to create a livelier urban street. In the final design proposal, the “lively urban street” was conceived as a pedestrian-centric street. This walkway is slightly elevated from the gardens, provides access from Hampden and Woodberry to the lightrail station and funnels the pedestrian along the South façade of the market & eatery building in order to give visual and physical access to the gardens, activate the market area and provide places to rest and observe.

It was intentional to separate the vehicular through-traffic from the pedestrian traffic at this site. The urban fabric is not dense enough at this location to support a prototypical urban street that successfully integrates vehicular and pedestrian traffic. It is also undesirable to move the main pedestrian way to the North side of the market & eateries building, as it would almost always be in shade and the view to the gardens would be lost.

The issue of parking was discussed at length by the jury. While limited parking on site was a main criticism of the final design proposal by many of the jurors, Suzane Reatig, FAIA argued that the thesis is about creating a park within the city and, therefore, suburban considerations for the car are a moot point. This idea resonates with the intention to create a 'farm park' within the city limits that promotes connection of neighborhoods and connection of people to terra firma, which can be reinforced by providing attractive pedestrian pathways. Direct access to public transportation networks, such as lightrail and bus, connection with existing bicycle paths, and proximity to main commercial streets were determining factors of site selection, so as to mitigate heavy usage of the automobile.

Because we cannot escape the reality that most people still rely heavily on the car to get from point A to point B, a small number of parking spaces (10) were created on the North side of the access/service road to accommodate handicapped and short-term parking. In addition, visitors to the food and agricultural center would be able to park along Clipper Mill Rd.

Bibliography

Beriss, David and David Sutton, eds. *The Restaurants Book: Ethnographies of where we eat*. Oxford: Berg, 2007.

Casamassima, Christy. *Restaurant 2000: Dining Design III*. New York: PBC International, 1998.

"Designs on Food." *Azure.* May 2010. pp 65-74.

Drobnick, Jim, ed. *The smell culture reader*. Oxford: Berg, 2006.

Fengler, Max. *Restaurant Architecture and Design: an international survey of eating places*. New York: Universe Books, 1971.

Fernandez, Armesto. *Near a Thousand Tables: A History of Food*. New York: Simon & Schuster Inc., 2002.

Hodgson, Petra and Rolf Toyka, eds. *The Architect, the Cook and Good Taste*. Berlin: Birkhauser Verlag AG, 2007.

Horwitz, Jamie and Paulette Singley, eds. *Eating Architecture*. Cambridge: The MIT Press, 2004.

Hou, Jeffrey, Julie M. Johnson and Laura J. Lawson. *Greening Cities, Growing Communites: Learning from Seattle's Urban Community Gardens.* Seattle: University of Washington Press, 2009.

Lappe, Frances. *Diet for a Small Planet*. 20th anniversary ed. New York: Ballantine Books, 1991.

Lawson, Fred. *Restaurant Planning & Design*. England: Architectural Press Ltd., 1973.

Lyle, John Tillman. *Regenerative Design for Sustainable Development.* New York: John Wiley & Sons, Inc., 1994.

Moore, Steven. *Technology and Place: Sustainable Architecture and the Blueprint Farm*. Austin: University of Texas Press, 2001.

Parasecoli, Fabio. *Bite Me: Food in Popular Culture*. Oxford: Berg, 2008.

Peyton, Jane. *Fabulous Food Shops*. West Sussex, England: John Wiley & Sons, Ltd., 2005.

Pollan, Michael. *In Defense of Food: An Eater's Manifesto*. New York: Penguin Press, 2008.

Pollan, Michael. *The Omnivore's Dilemma: A natural history of four meals*. New York: Penguin Press, 2006.

Riordan, John. *Restaurants by Design*. New York: HarperCollins, 2006.

Scapp, Ron and Brian Seitz, eds. *Eating Culture*. Albany: State University of New York Press, 1998.

Singer, Peter and Jim Mason. *The Ethics of What We Eat: Why our food choices matter*. New York: Rodale, 2006.

Thury, Eva and Margaret Devinney. Introduction to Mythology: Contemporary Approaches to Classical and World Myths. 2nd ed. New York: Oxford University Press, 2009.

Trubek, Amy. *The taste of place: a cultural journey into terroir*. Berkeley: University of California Press, 2008.

Yabuka, Narelle, ed. *Hip Entertaining: bars & restaurants*. Gloucester, Mass: Rockport Publishers, 2005.