Connecting Culture and Nature in Detroit's Downtown Core: The Design of a Technical College Campus

by

Peter Braithwaite

Submitted in partial fulfilment of the requirements
for the degree of Master of Architecture

at

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DALHOUSIE UNIVERSITY

SCHOOL OF ARCHITECTURE

The undersigned hereby certify that they have read and recommend to the Faculty of Graduate Studies for acceptance a thesis entitled “Connecting Culture and Nature in Detroit’s Downtown Core: The Design of a Technical College Campus” by Peter Braithwaite in partial fulfilment of the requirements for the degree of Master of Architecture.

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Supervisor: _____

Reader: _____

Reader: _____

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ABSTRACT

This thesis addresses the City of Detroit`s transformation from a thriving center of trade and commerce to its present abandoned state. Due to the decentralization of industry and massive suburbanization since the 1950s, Detroit presently resembles a ‘middle landscape,’ somewhere between urban and rural.

This thesis proposes an urban design strategy for Detroit that mediates between nature and culture, through the vehicle of a design for a new technical college campus. First, investigation into the ‘zone of influence’ explores the city`s present conditions including its infrastructure, buildings, and its current relationship with the natural environment. Secondly, the ‘zone of control’ proposes a new urban typology that is appropriate to the proposed college institution. Lastly ,this thesis considers the ‘zone of effect,’ which displays the influence the proposed campus could have in promoting land development in the city`s residential areas, Eastern Market District, and Rivertown Warehouse District along the Detroit River waterfront.

ACKNOWLEDGEMENTS

The support and guidance of many made this work possible.

I would like to sincerely thank my supervisor, Christine Macy, for her continuous guidance and inspirational advice; without her this work would not have been possible.

I would also like to thank my advisor, Eric Stotts, whose enthusiasm and invaluable constructive criticism kept this project exciting and fun throughout its development.

Thanks to the Estate of Bruce and Dorothy Rosetti that allowed me to travel to Detroit during August of 2011.

I would like to dedicate this work to my parents, Katherine and Anthony Braithwaite, and grandmother, Doreen Brisbin, for your enduring support, patience, and generosity.

CHAPTER 1: INTRODUCTION

Thesis Question

How can the integration of natural and urban systems inform the design of a technical college campus in Detroit's downtown core?

Model City to Ruins in Fifty Years

Detroit first developed as a center of trade and commerce, but with the success of the assembly line and a flourishing automotive industry, it quickly grew into a modern metropolis. As John Gallagher stated in his book *Reimaging Detroit*, "no boomtown ever boomed so long and so hugely as Detroit... the ride began, we might say, in 1914 when Henry Ford announced his five-dollar-a-day wage for factory workers..." (Gallagher 2010, 37).

Detroit's Central Business District, 1954. (Great Lakes Aerial Photos 2011)

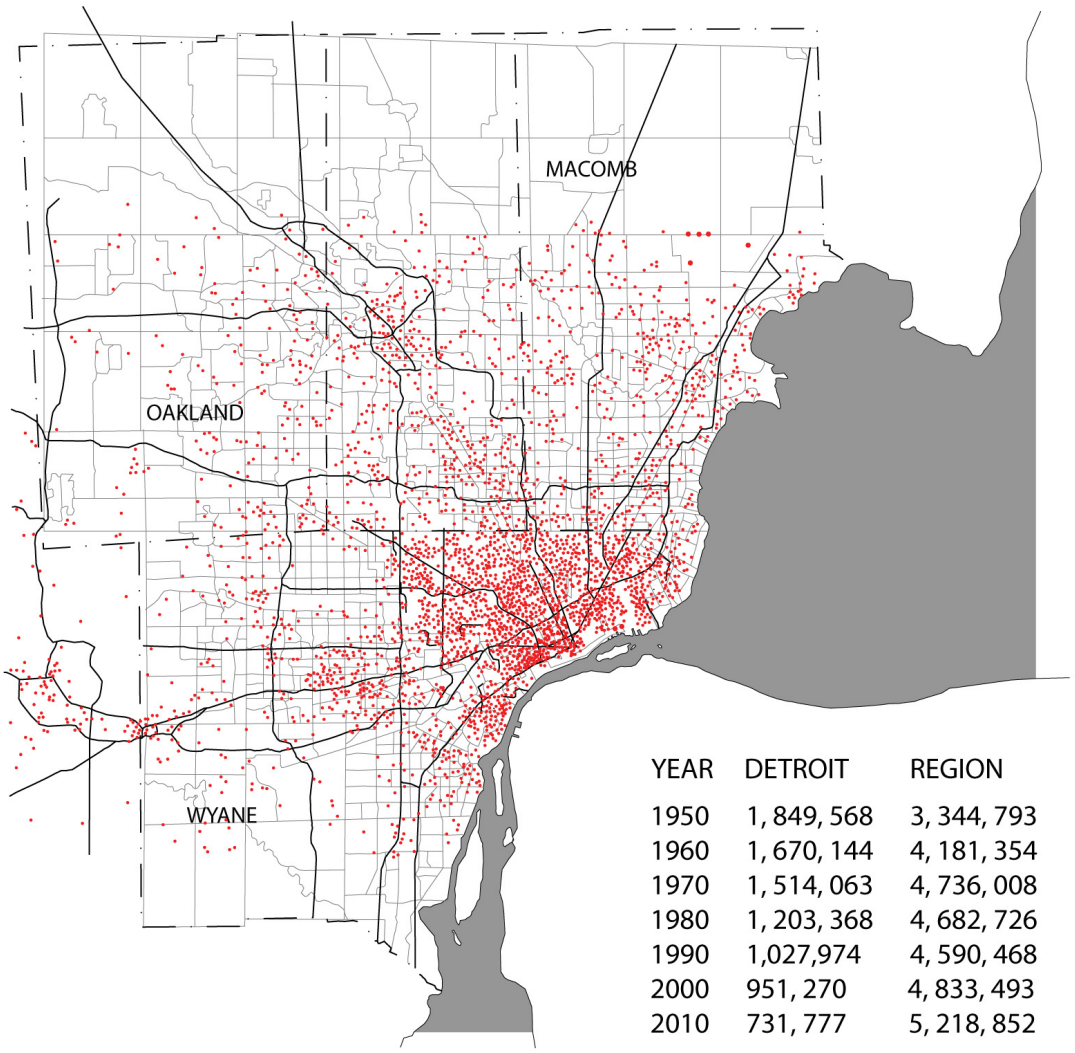
In the late 1940s, "the spatial path taken by an expanding auto industry, abetted by federal transportation and housing policies, yielded massive suburbanization" (Darden 1987,11). Between 1947 and 1955 the Big Three automotive plants (Ford, Chrysler, and General Motors) constructed 20

new plants in suburban Detroit. As Thomas J. Sugrue explains in *The Origins of the Urban Crisis: Race and Inequality in Postwar Detroit*, decentralization of the auto industry from the city's core coupled with the reorganization of commercial capital from downtown to regional shopping centers caused a major decrease in the number of stable and secure blue-collar jobs that existed within the city's core. As a result two Detroits were created, Joe T. Darden explains in *Detroit: Race and Uneven Development*, that while Detroit metropolitan area as a whole had a thriving economy, the central city had became home for hundreds of thousands of poor and unemployed people.

Intersection of Helen and Georgia Streets that was once filled with middle class houses. (Sean Hemmerle 2011)

House in Brush Park neighbourhood, 2011.

The population of Detroit plummeted from 1,670,144 residences in 1960 to a mere 912, 062 in 2008. While some areas of the city still remained intact and stable, this 45 percent decrease in population caused entire blocks to disappear as people abandoned their homes, which the city then demolished.

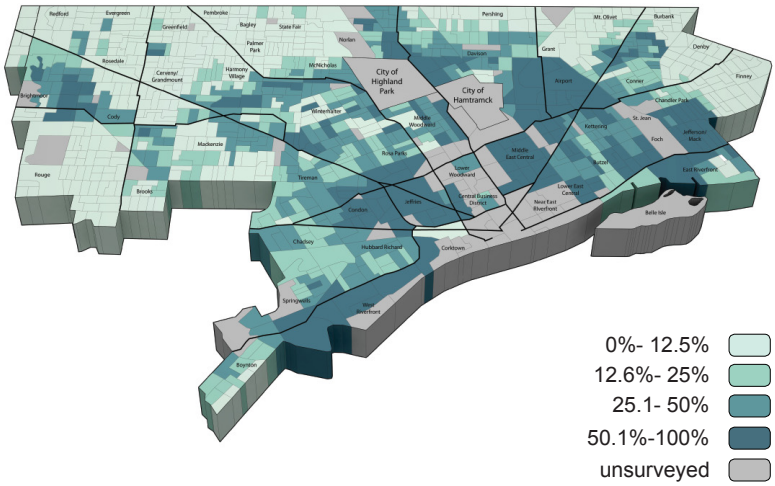


YEAR	DETROIT	REGION
1950	1, 849, 568	3, 344, 793
1960	1, 670, 144	4, 181, 354
1970	1, 514, 063	4, 736, 008
1980	1, 203, 368	4, 682, 726
1990	1,027,974	4, 590, 468
2000	951, 270	4, 833, 493
2010	731, 777	5, 218, 852

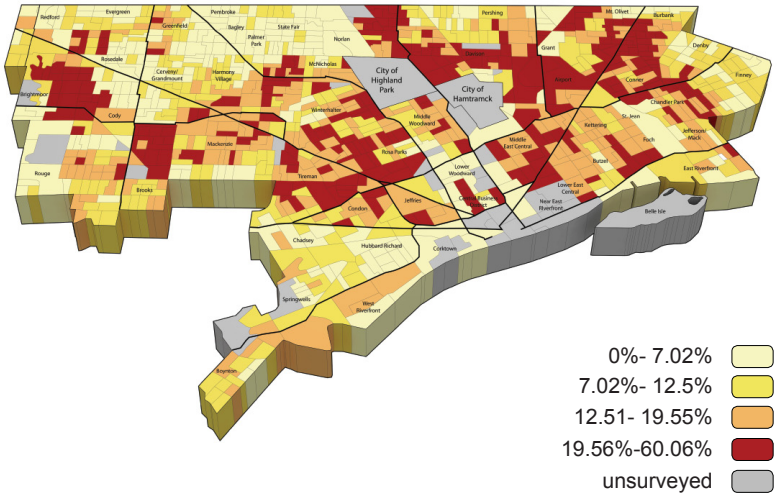
Map representing home abandonment in Detroit over the last 60 years. Each red dot represents five abandoned houses.

Visiting an at-risk district of Detroit today, the most striking aspect is the vacant feel of the city with one or two houses left on a street amongst abandoned lots that have been reclaimed by trees, tall grasses, and wildflowers which bloom amongst the rubble. The scale of the vacancy in many parts of the city have created vast patches of rural landscape that led Detroiters to coin the term 'urban prairies.' Detroit's civic leaders have contributed to the city's wide open spaces by "ambitiously demolishing many vacant structures in the expectation of new development, much of which never happened" (Gallagher 2010, 25). Dan Kildee, an innovative civic leader from Flint, Michigan and the chair of the Gen-

esee County Land Bank, describes Detroit as “probably the most significant vacant property problem in the country” (Gallagher 2010, 22).

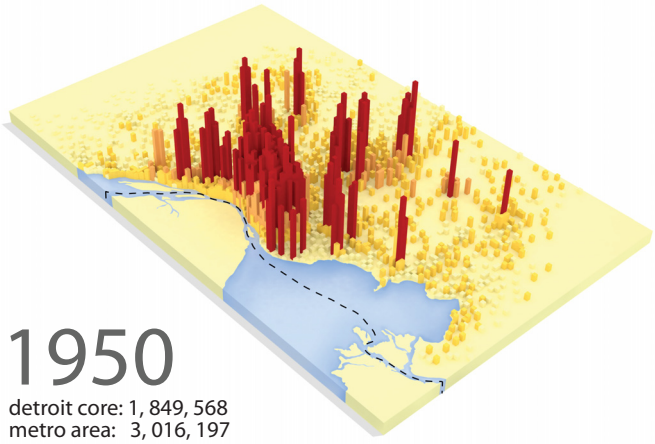


Vacant lots as a percentage of total residential parcels

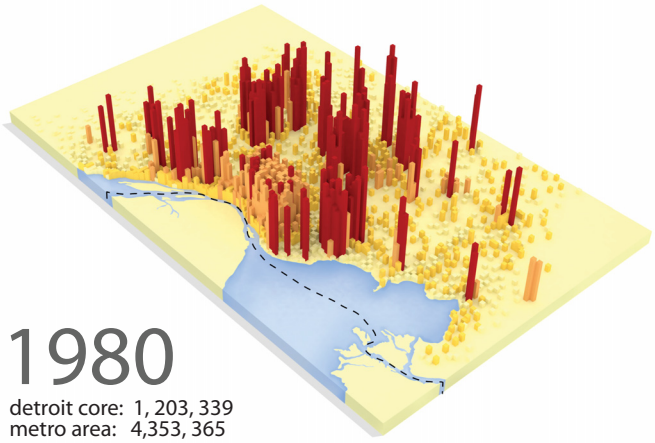


Percent of land parcels with vacant houses

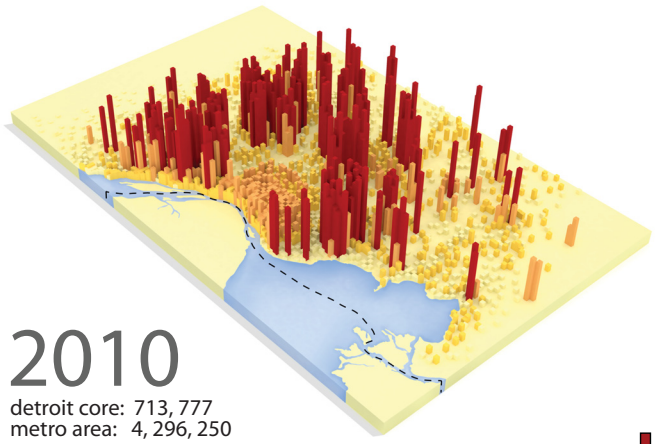
Maps representing current land and house vacancy in Detroit City.



1950
detroit core: 1, 849, 568
metro area: 3, 016, 197



1980
detroit core: 1, 203, 339
metro area: 4,353, 365



2010
detroit core: 713, 777
metro area: 4, 296, 250

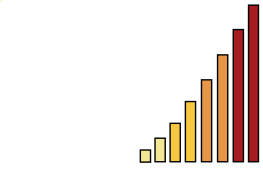


Diagram representing Detroit city's population decentralization over the last 60 years.

Current City Conditions

Urban Center, Urban Prairie, or Somewhere Between?

Many attempts have been made over the past forty years to revitalize the City of Detroit by repopulating its vast empty spaces and returning the downtown to the shopping mecca it once was. These attempts have failed to significantly counter the exodus of people and investment from the city's core.

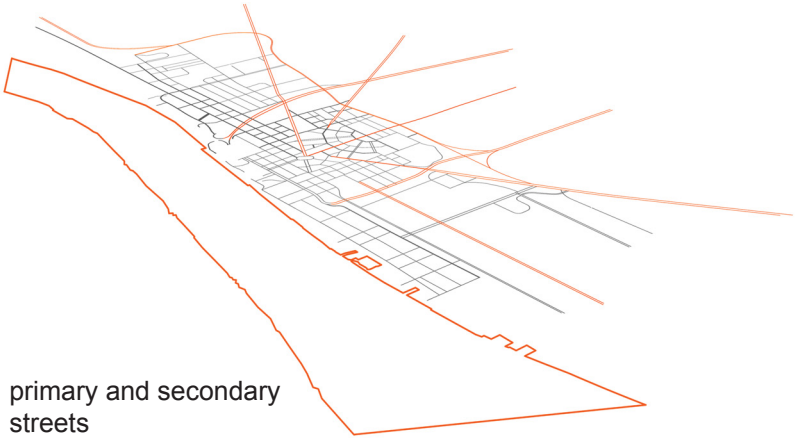
Urban farm on Detroit's East Side, 2011.

Some Detroiters see their shrinking city as an opportunity rather than a curse, the increasing greenery makes the city cooler in the summer and healthier year round. John Gallagher expresses these views in *Reimaging Detroit*, where he states that "getting smaller opens up the possibility for something new to take place. A smaller city creates the canvas to become a better city" (Gallagher 2010, 11).

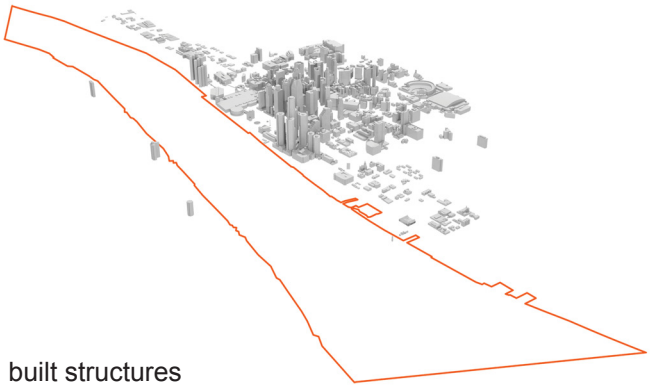
Abandoned building on Michigan Avenue, 2011.

Michigan Central Depot built in 1912 for the Michigan Central Railroad, Detroit, 2010.

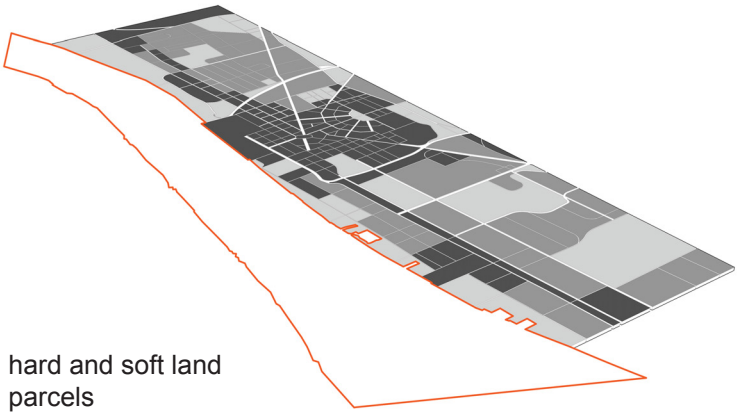
Many people now describe Detroit as a new ‘middle landscape,’ which is something between rural and urban. Alan Mallach, an urban planner and research director of the National Housing Institute in Montclair, New Jersey, who conducted a study of Detroit in late 2008 with a team of experts, concluded that Detroit was dissolving into a “lumpy urban porridge, with areas of concentration surrounded by areas of much lower density.” (Gallagher 2010, 31). Mallach further explained that this wasn’t necessarily a bad thing “...it’s fabulous because you have high density development on one side of the street and cows on the other, quite literally” (Gallagher 2010, 31).



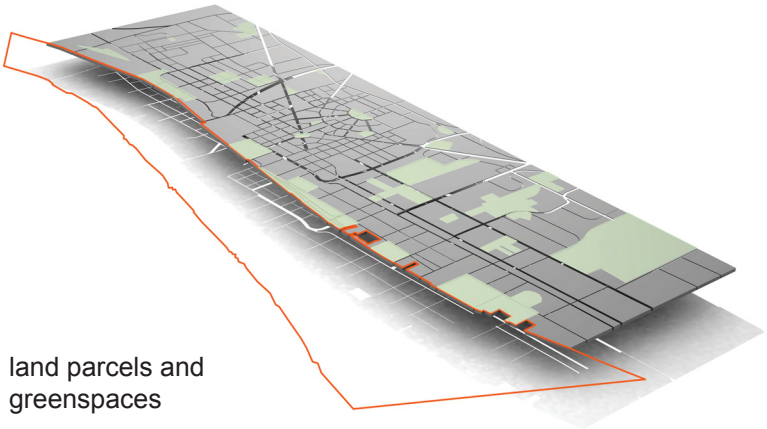
primary and secondary streets



built structures

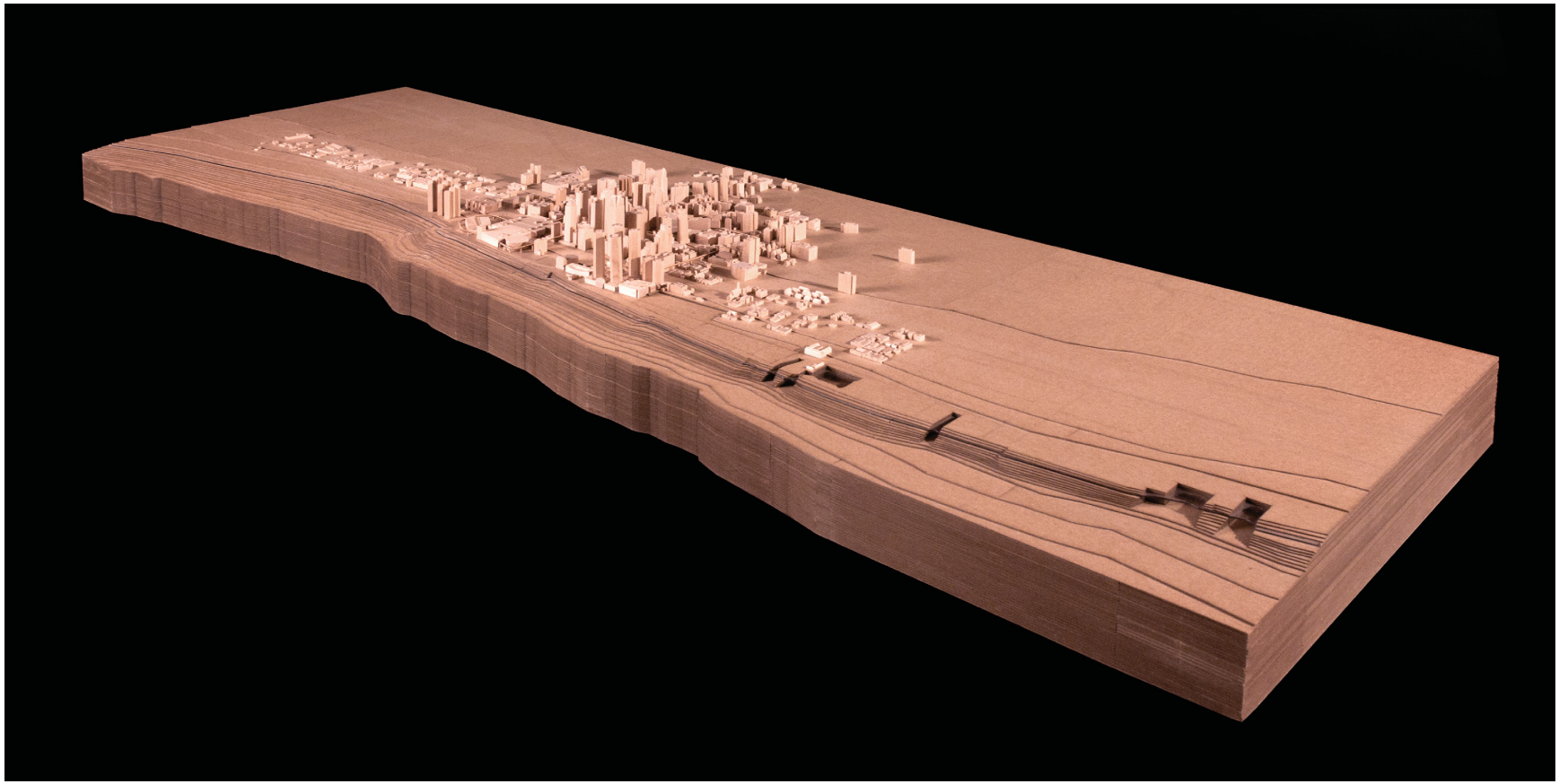


hard and soft land parcels

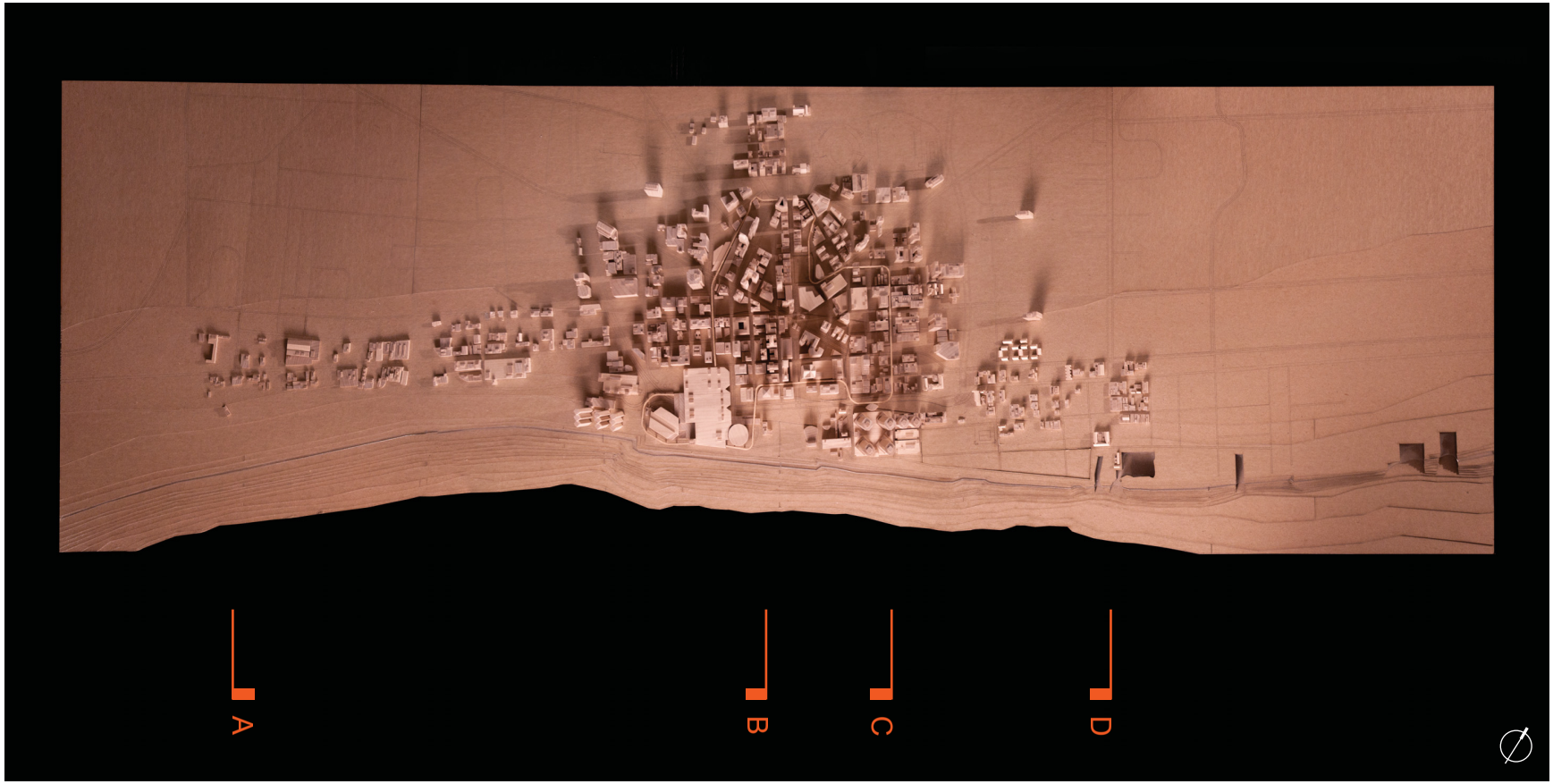


land parcels and greenspaces

Current infrastructure and land distribution within Detroit's downtown core.



Model showing relationship of Detroit`s downtown core the Detroit River.



Model showing relationship of the Detroit River to Detroit`s Cental Business District (center of model) and the former industrial centers that stretch along the shoreline both east and west of the central city. The Rivertown Warehouse District is to the east and West Side Industrial District is to the West.

section A

section B

section C

section D

City sections showing present city infrastructure. Section D shows the view from Dequindre Railway Cut towards the city central core.

Uneven Development in Detroit's Downtown Core

Following its massive suburbanization in the late 1940s, the city of Detroit administered various methods of distributing of federal, state, and private resources with the intention of restoring vitality to the city's downtown core. Somewhat paradoxically, as industrial and commercial corporations abandoned the city, "new private investments (backed by public "incentives") were targeted to the redevelopment of downtown" (Darden 1987,11). As a result a dualistic pattern of uneven development occurred where financial, cultural, and recreational activities bloomed in the central business district while the surrounding neighbourhoods fell into a state of rapid decline.

Top-Down Development

Central Business District

The majority of the resources spent on Detroit's development has been devoted to the *Central Business District*. Detroit's 1984 development plan included $2. billion spent on infrastructure for the downtown core which made up 74.2% of the allocated funds (Darden 1987, 188). Many criticise this concentration of city, federal, state and private resources on the central business district as disrespect for Detroit's neighborhoods. The city claimed that the central business district serves as the symbolic retail center of the city and region.

Neighbourhood and Housing

Detroit's 1984 economic development plan included $70, 624, 950 for the redevelopment of neighbourhoods and housing which made up a mere 7.2% of the allocated funds for development. A large part of this investment was located near the riverfront district and the Elmwood Park project, located east of the central business district. These minor attempts have made little changes to the basic conditions of most of Detroit's neighbourhoods (Darden 1987, 188).

Central Functions District

The Central Functions District, located in the corridor between the Central Business District and Wayne State University/ Medical Center area, received 4.5% of the 1984 economic development plan, which totalled $12, 797, 500 . The money spent in this Woodward Corridor has supported many residential projects in the Cass Corridor, Medical Centre, and New Center areas. These contributions also helped fund local retail development although little impact has been shown in the improvement of these areas (Darden 1987, 189).

Riverfront Development

In the mid-1980s the city initiated a large east-side riverfront development project to beautify several miles of riverfront land sweeping east and west of the civic center and creating links with the previously developed central business district riverfront development. Since 2003, the Detroit Riverfront Conservancy has been working to transform more than three miles of waterfront property into a river walk with integrated parks and pavilions. The Conservancy`s ultimate vision is to continue the river walk further west to the Ambassador Bridge.

Bottom-Up Development

Community-Scale Gardens

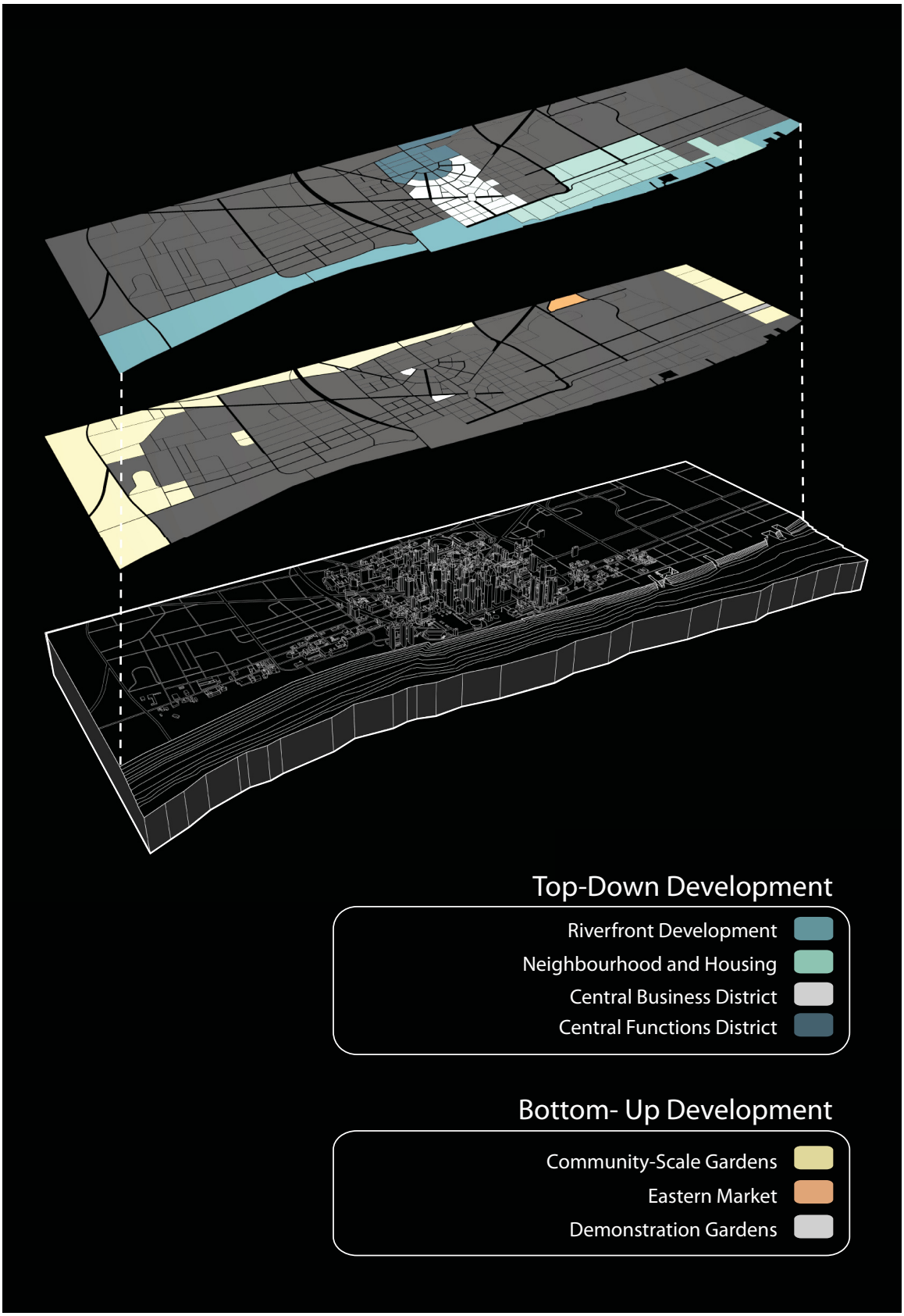
The neighbourhoods with high concentrations of community gardens are typically supported by either the Detroit's Garden Resource Program or urban farming. In 2009, the *Garden Resource Program* provided support to more than 875 urban gardens and farms in Detroit, Highland Park, Hamtramck, including 265 community gardens and 55 schools. Urban Farming, based in Detroit and leading gardening efforts across the country, support dozens of 20' by 20' garden plots throughout the city.

Eastern Market

Each week as many as 40,000 people flock to Eastern Market for its Saturday Market to enjoy the local food district with more than 250 independent vendors and merchants processing, wholesaling, and retailing food. Not long ago, the financially strapped City of Detroit turned over the governance of the Eastern Market to a nonprofit organization. Since this change of hands, nonprofit foundation have been giving generously to renovate and restore the historic market buildings, many of which date back a century. (Gallagher 2010, 27).

Demonstration Gardens

Lafayette Greens, built on the former site of the historic Lafeyette Building, is a good example of a demonstration garden that brings public awareness to environmental issues facing the city. These types of gardens demonstrate the large quantity of food one person can grow in a city backyard using intensive, organic methods of cultivation.



Various development strategies administered by both Detroit`s civic leaders and the general public.

Natural Context

Codependency Between Nature and Culture Within the City

It could be argued that our relationship to the natural environment has been the single most prominent feature in defining human culture throughout history. In his book *The Problem of Nature,* David Arnold states, "a significant relationship exists between what is conventionally referred to as 'man' and 'nature' and that this relationship influences the character of individual societies and the course of their histories"(Arnold 1996, 9). Seymore Wapner further illustrates this concept in the book *Experiencing the Environment,* by explaining that there are "problems inherent in trying to identify and preserve an environment independent of human conceptions and considerations. Man's conception of the environment is related to this conception of himself and his actions, and change in the conception of one affects the conception of the other" (Wapner 1976, 189).

During the last century, both European and North American cultures have experienced a great erosion that has vastly

Michigan Central Depot built in 1912 for the Michigan Central Railroad, Detroit , 2010.

diminished the importance of nature in our understanding of place and culture, " the western assumption of superiority has been achieved at the expense of nature" (McHarg 1992, 28). Unfortunately for the countless contemporary cities that have developed through a dependence on cheap energy and the dominance of nature, the ongoing exploitation of the natural world can not be indefinitely sustained and will eventually require the reestablishment of balance between urbanity and nature. This realignment will not be achieved until man's "arrogance and ignorance are stilled and he lies dead under the greensward. We need this unity to survive" (McHarg 1992, 24).

House in Brush Park, Detroit, 2011.

Nature in the Motor City

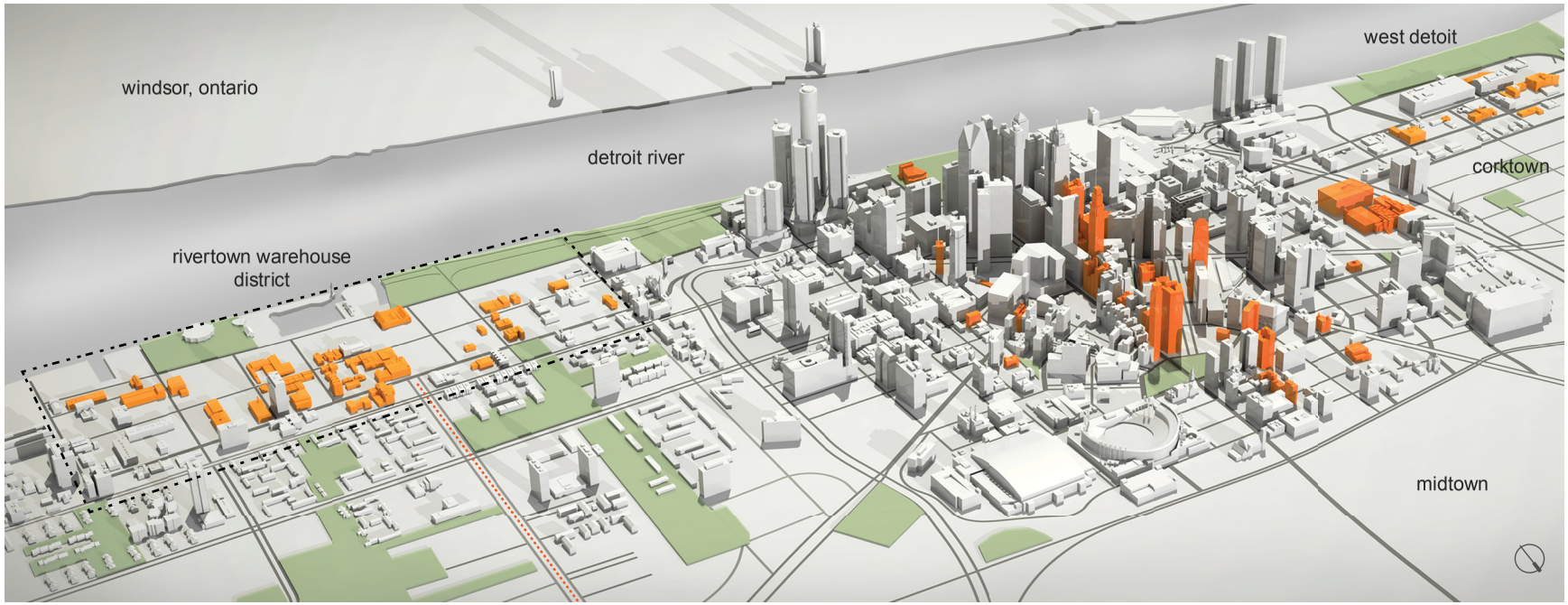
Although both natural and built environments presently exist within the City of Detroit, they are not integrated. Nature thrives in the abandoned industrial and residential lots while the urban environment has decayed in the city's ever shrinking core where the natural world is almost entirely absent expect for small, nurtured pedigreed landscapes with little biodiversity.

House on Walden Street, East Side.
(Andrew Moore 2010)

This separation of built and natural environments within Detroit decreases both the cultural diversity and biodiversity of the city and has begun to create what Jane Jacobs refers to as 'border vacuums.' Jacobs suggests the "massive single uses in cities have a quality in common with each other. They form borders, and borders in cities usually make destructive neighbours" (Jacobs 1993, 336).

The increasing presence of borders in Detroit are evident when areas of high abandonment are plotted in relation to the greenspaces. As displayed in illustrations on the following two pages, nature's dominance in the areas surrounding the former industrial cores, to the east and west of the Central Business District, is becoming quite evident.

To begin to heal the City of Detroit, city planners and architects must not look to single programmed solutions, such as additional parkland or the added investment in the Central Business District, but rather they must focus on more diverse solutions that bridge the gap between rural and urban and the natural and cultural. As Martha Schwartz explains in *Ecological Urbanism*, we must concentrate our efforts to not only "natural systems but to humans systems...if we are to deliver a sustainable built environment, we must create places that people will value and to which they can connect emotionally" (Schwartz 2010, 525).



Comparing areas of abandonment to areas with high levels of vegetation in Detroit's downtown core.

1. Ford Auditorium
2. 501 Woodward
3. 600 Woodward
4. Kresge Building
5. 1200 block Woodward
6. Elliot Building
7. 1413-1415 Woodward
8. 1412 Woodward
9. 1420 Woodward
10. 1459 Woodward
11. 1500 Woodward
8. 1412 Woodward
9. 1420 Woodward
10. 1459 Woodward
11. 1500 Woodward
12. 1505 Woodward
13. 1515 Woodward
14. Former Arts League of Michigan
15. David Whitney Building
16. 124 Grand River
17. Farwell Building
18. 1120 Griswold
19. 1133 Griswold
20. 751 Griswold
21. Jamie C. Kennedy Public School
22. Charlevoix Hotel
23. 2001 Park
24. Woman's City Club of Detroit
25. Detroit Life Building
26. Blenheim Building
27. 30 Clifford
28. 1301 Broadway
29. 1509 Broadway
30. Metropolitan Building
31. United Artists
32. Former AAA Building
33. 1214 Randolph
34. Dell Pryor Galleries
35. Former National Theater
36. Former Federal Court Building
37. Lafayette Building
38. Former Detroit Free Press Building
39. Former MGM Grand Casino
40. Book Tower

Showing vacant monuments in Detroit's downtown core.

Connecting the Dots: Environmental Trends in Detroit

The non-profit Detroit Riverfront Conservancy, which was created in 2003, is dedicated to the mission of bringing public access to the Detroit River by connecting nearly five and a half miles of riverfront into a continuous park that is intended to serve as a catalyst for economic development in the city.

Although this strategy has generated great improvements for the city's riverfront, it could be argued that it is also contributing to additional borders within the city by isolating the riverfront from other large greenspaces throughout the city .

During a 2009 planning charrette at Wayne State University, students proposed that connecting vacant city owned lots would create green links, also referred to as green fingers, between the Detroit River waterfront and various other parts of the city. In this way, a unified development strategy could simultaneously benefit many parts of the city at once rather than the waterfront alone.

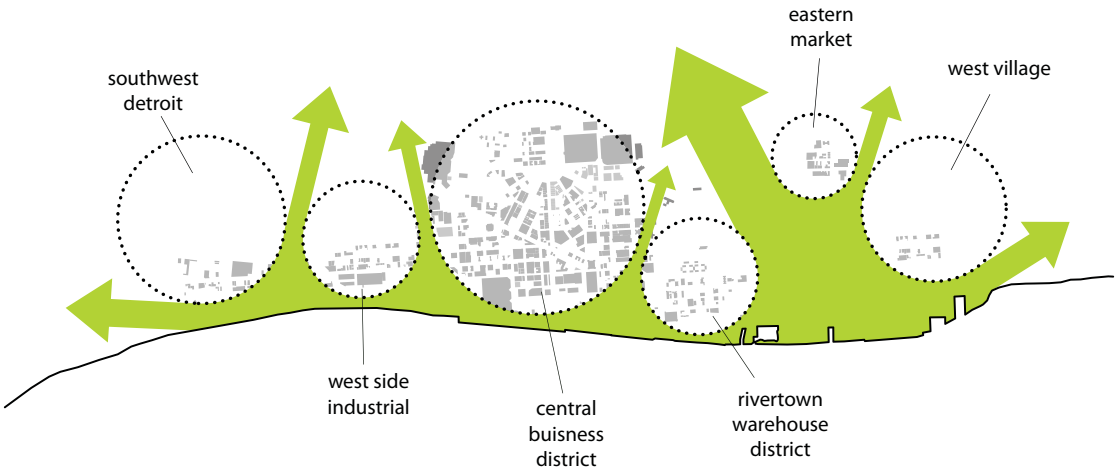


Diagram showing potential green finger connections from the riverfront back into the city core.

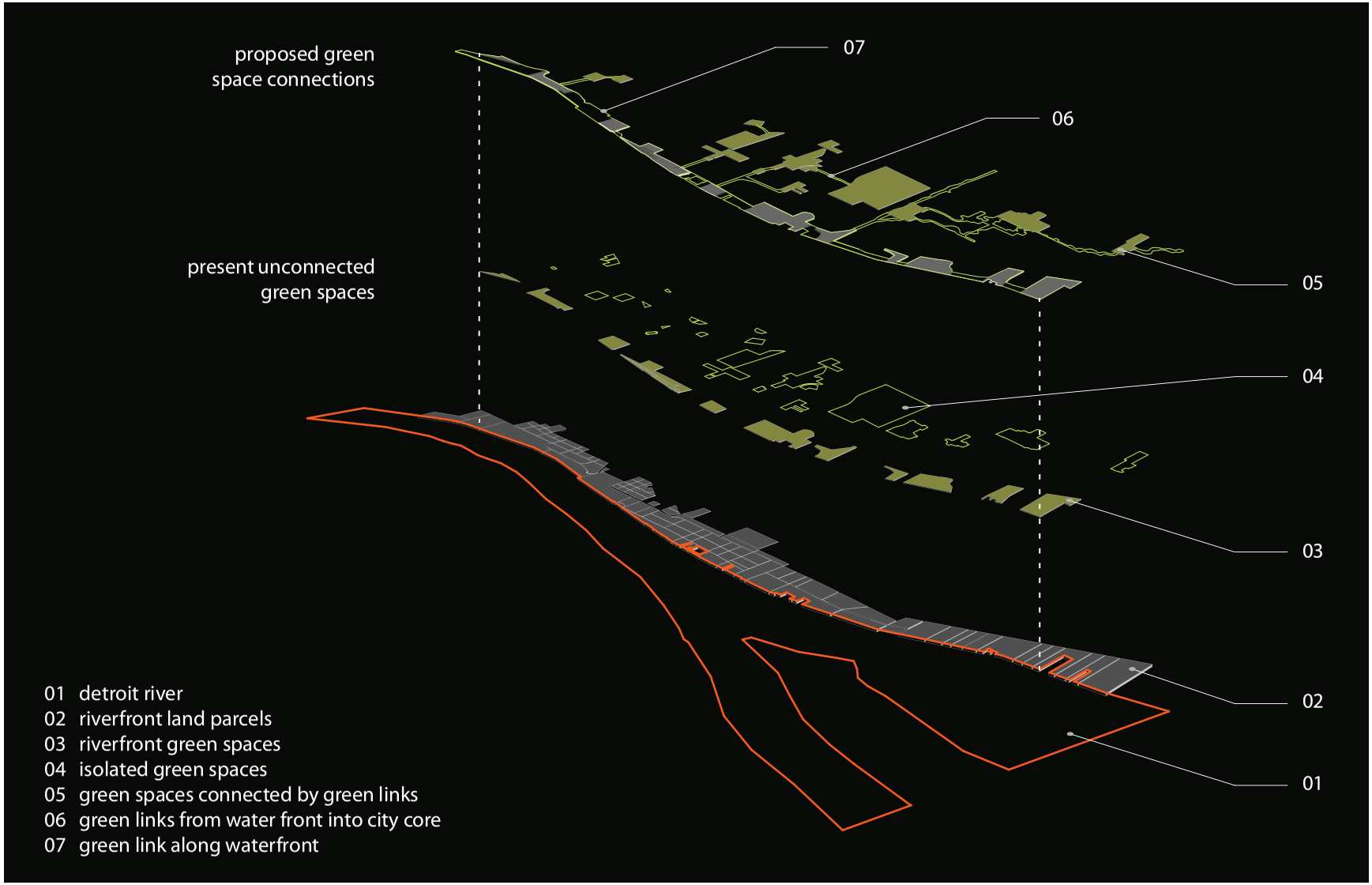


Diagram showing present unconnected green spaces and proposed future connections in Detroit`s downtown core.

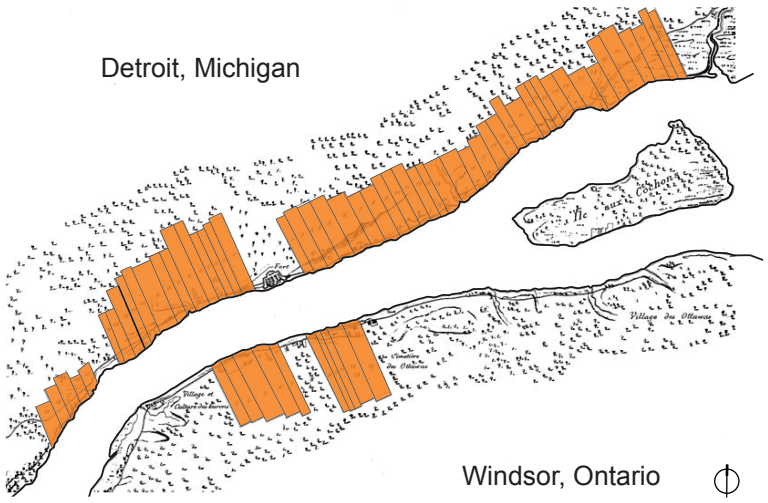
Historic and Cultural Context

> ...a society which sees itself as having slowly evolved, beginning with the very first settlements in its own environment, is more likely to celebrate its legendary, half-forgotten origins in the landscape... (Jackson 1980,100)

Importance of the Riverfront

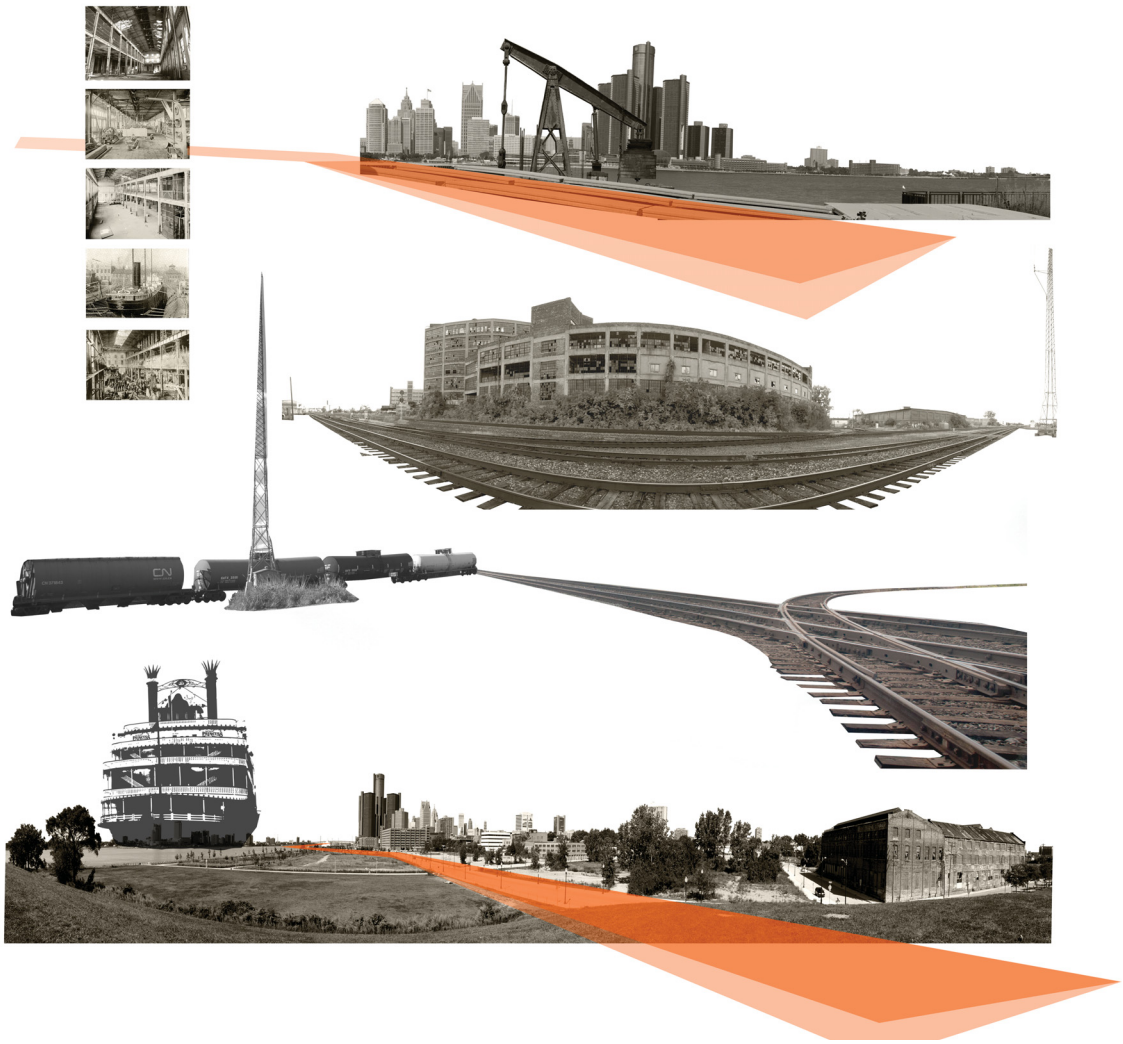
"Detroit is where it is because of its strategic location on the Great Lakes. The city's name comes from the French word 'etroit,' which means the 'strait'" (Darden 1987, 44). For more than two centuries the riverfront was Detroit's window on the world. During the 18th century, ribbon farmers cultivated long narrow strips of land that jutted out from the river giving each landowner access to the water for transportation and irrigation. In addition these ribbon farms provided a variety of soil types and drainage methods within one lot while also encouraging socialization between the houses that were clustered together along the river.

By the beginning of the 20th century, the rhythm of life along Detroit's riverfront was "orchestrated by ships docking and

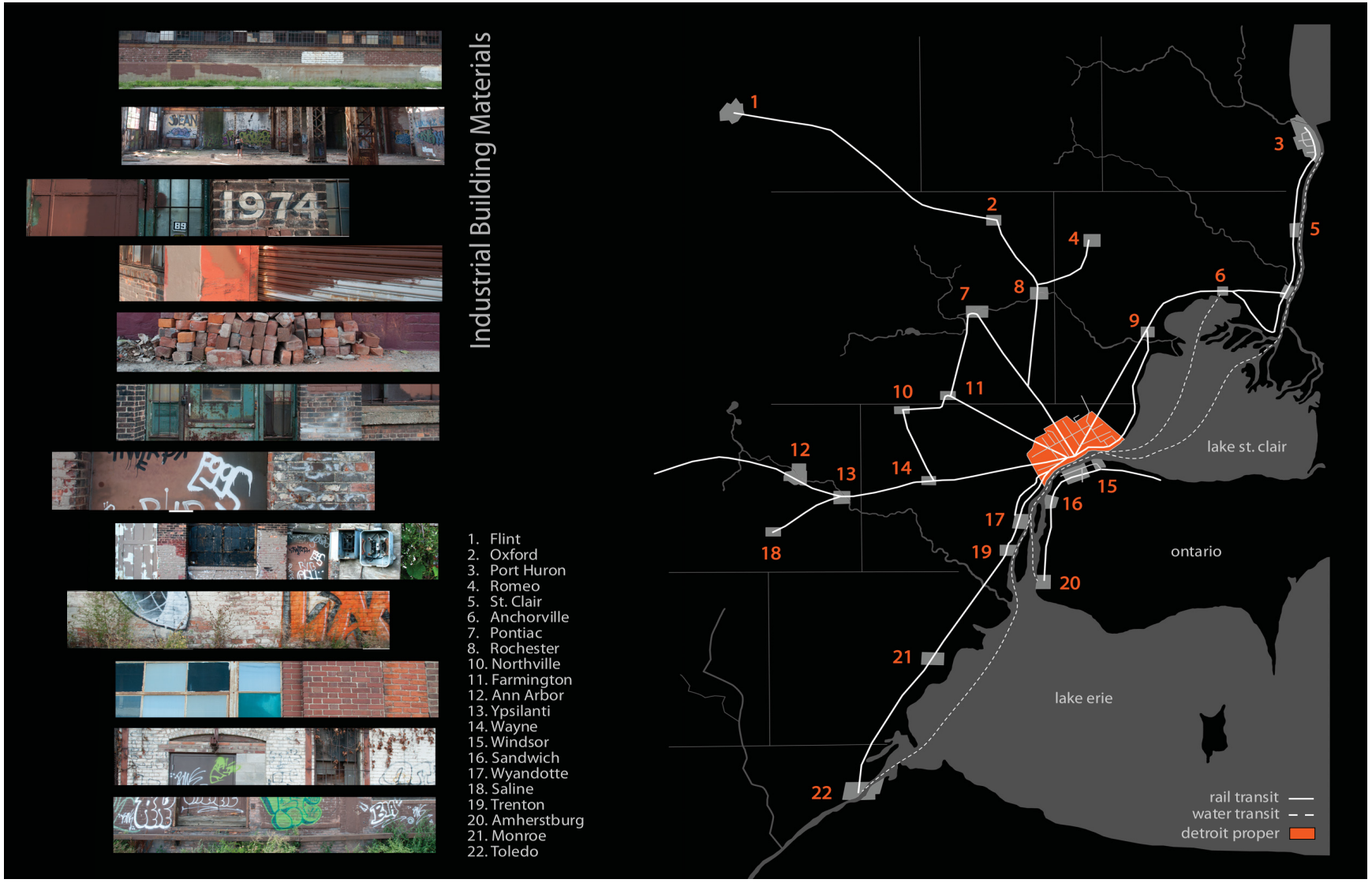


Ribbon farms along the Detroit River in 1796, where modern Detroit now stands. (George Henry Victor Collot, 1796)

unloading cargo at riverside piers, by railroad cars arriving at the waterfront storage depots, and by ferries and lake bound cruise boats coming and going" (Darden 1987, 44). At this time factories and warehouses crowded the river's edge while the adjacent streets were full of one and two story houses, butcher shops, saloons, bakeries, blacksmitheries, and grocery stores. This area, that is now referred to as the Rivertown Warehouse District, was once a vibrant mixed use urban village.



Collage displaying industrial and transportation infrastructure around the Detroit River.



Material study of historic Rivertown factories and the former railroad and shipping transportation links that supported the district.

As the industry grew throughout the 20th century, the importance of the railroad and the river for freight shipping diminished. The accelerated production of interstate freeways and the construction of the Ambassador Bridge to Windsor, Ontario caused an exodus of industry from the riverfront to the city's suburbs which offered considerable room for industrial growth. This emigration from the riverfront left Detroit with "miles of shoreline blighted by dilapidated buildings, rusted tracks, and vacant, littered lots" (Darden 1987, 45). What acted as the city's front door for more than two centuries, quickly became the Motor City's backyard.

Present abandoned interior of Detroit Dry Dock Company, 2011.

Present land taxonomy of Detroit's former industrial centers along the Detroit River.

Site

The Rivertown Warehouse District`s 323 acres is currently made up of abandoned buildings, decrepit factories, and large parcels of vacant land that are cluttered with industrial debris and rusting metal.

As displayed in the diagram below, a small amount of retail and commercial business such as the Atwater Brewery and the Elevator Building, that houses 24 small businesses, have recently began to establish themselves around the periphery of the area. Rivertown`s connection to the Dequindre Railway Cut, a recently converted former railway line into a below-grade greenway, has provided a much needed connection between the once isolated Eastern Market District and the riverfront.

Contrary to the fate of Rivertown, the Eastern Market is one

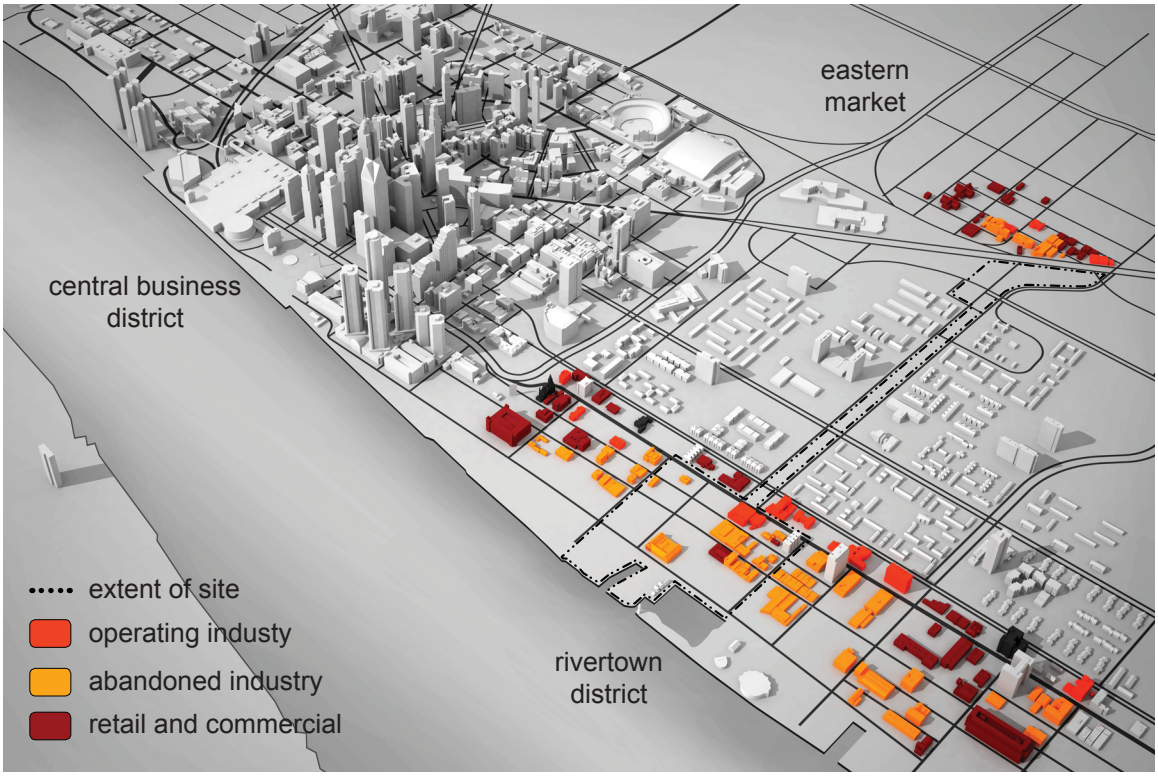


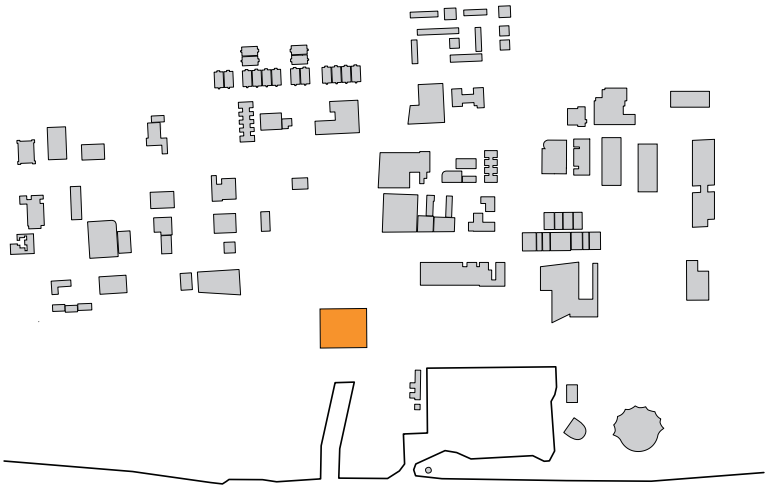
Diagram showing Rivertown Warehouse District and building taxonomy.

Detroit Eastern Market, 2011.

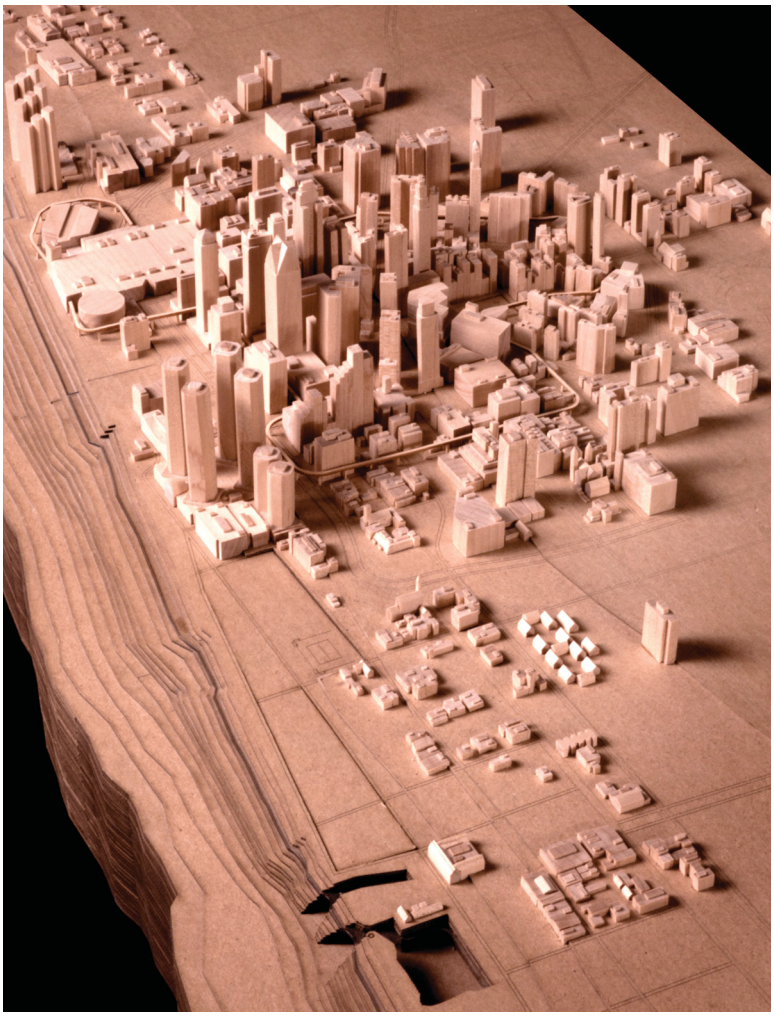
of the few places in Detroit that still thrives as a center of social life and local food economy. “New loft apartments, in old brick industrial buildings, share the outer blocks with bakers, wholesale produce dealers, and meat packers” (Gallagher 2010, 26). Every Saturday morning local farmers arrive to meet thousands of shoppers strolling the stalls and buying fresh fruits and vegetables. Ironically, just a few blocks east of the market, many streets are abandoned with only one or two houses still standing within entire blocks.

Maps showing a change in the Detroit River shoreline and building density of Rivertown over the last 70 years. Orange building represents the Detroit Dry Dock Company.

Rivertown Warehouse District, 1920.



Rivertown Warehouse District, 2010.

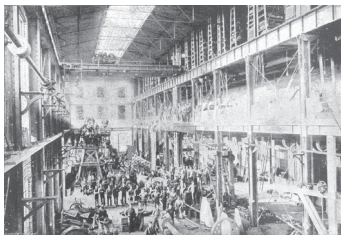


Model showing relation of the Rivertown (lower right) to the Cental Business District.

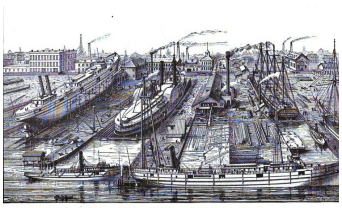
Model showing the current condition of the Rivertown Warehouse District.

Detroit Dry Dock Company

One of the most notable contributors to Rivertown's success during the early part of the 20th century was the Detroit Dry Dock Company that leading contemporary architectural historians argue "is the most important surviving nineteenth century industrial building in Detroit" (Hill and Gallagher 2003, 254). This building, originally constructed between 1892 and 1919, was the first factory building in Detroit to use a steel frame structure to create huge interior spaces necessary to build/manufacture the massive steam engines that had become necessary to propelled ever larger ships through the Great Lakes. It was in this building that "a young man named Henry Ford acquired machinist skills as an apprentice to naval architect and master shipbuilder Frank Kirby" (Hill 2003, 254).



Interior of Detroit Dry Dock Company in 1894. (Maritime History of the Great Lakes 2011)



Engraving of Detroit Dry Dock yard in 1884. (Silas Farmer, 1884)

Current abandoned interior of Detroit Dry Dock Company, 2011.

CHAPTER 2: DESIGN METHOD

The principle theme guiding the design work in this thesis is the establishment of a balance between Rivertown's cultural past and the natural systems that have claimed this area since its abandonment nearly sixty years ago. Rather than continuing the industrial tradition of relating to the landscape as an exploitable resource, the establishment of a dynamic and interactive relationship between both human life and the natural environment will ensure the creation of a sustainable and enriching environment. As Michael Hough argues in *Cities and the Natural Process*, "...it is clear that the links between nature, cities and sustainability have profound implications for survival" (Hough 2004, 5).

Working Within a Shifting Landscape

Similar to a river working its banks in a continuous act of erosion and deposition, cities also follow an ambiguous act of construction and destruction as weathering continuously erodes the surfaces of buildings and records the passage of time. These traces of urban transformations are evident in nearly every built structure in Detroit's central core. One might argue that the act of weathering is the most prominent connection between the natural and built environment, "never is one's past not present, nor is the individuals's past ever cut off from the tradition of one's culture and the time of the natural world" (Mostafavi 1993, 116).

Campus and Landscape

Unlike the European tradition of a campus as the assembly of various cloister-like structures, the American college, from its beginnings at Harvard in the seventeenth century, has been in favor of separate buildings set in open green space. In fact, when the word campus was first used to describe a school “the word *campus* had simply its Latin meaning, a field, and described the green expansiveness already distinctive of American schools” (Turner 1984, 4).

Historic and Cultural Revitalization

In his book *The Necessity of Ruins,* J. B. Jackson makes the argument that “much of our enthusiasm for historical preservation seems to be prompted by the same instinct: history means less the record of significant events and people than the preservation of reminders of a bygone existence and its environment” (Jackson 1989, 90). In addition to this Mohsen Mostafavi and David Leatherbarrow suggest, in their book *On Weathering,* that the past must not be thought of as a specific or limited period which has run its course, but rather the past should be seen as “what has come to be” (Mostafavi 1993, 116). In this way, the remaining buildings and monuments which depict the once diverse and thriving Rivertown culture should not be restored to their original state as a kind of reminder of what once was, but should rather act as a guide to the future and help determine the actions of the years to come.

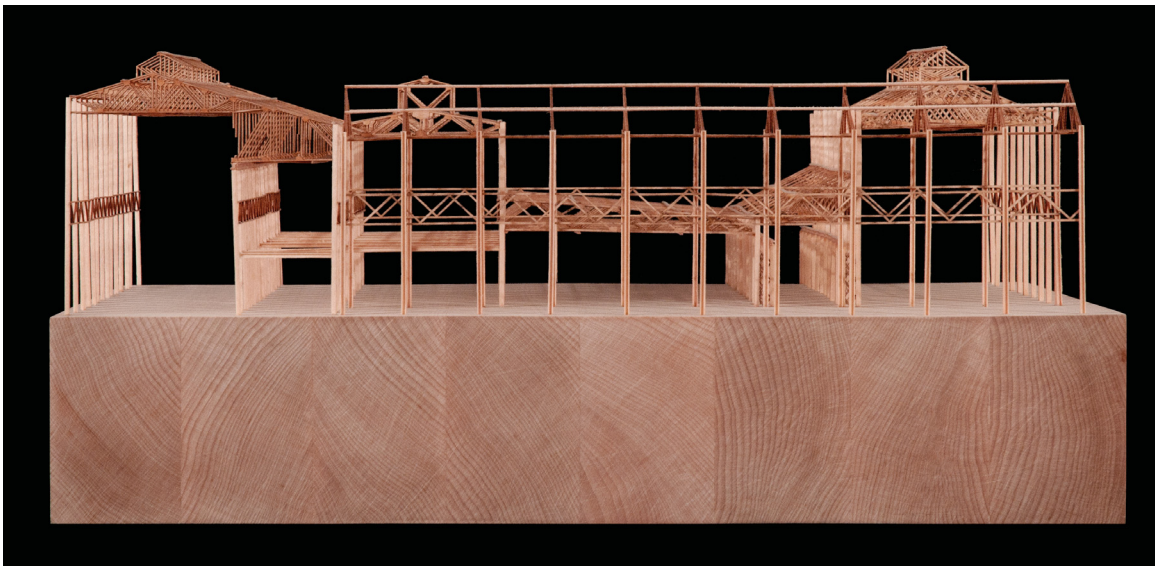
Detroit Dry Dock Building

Although this building could be praised strictly for the integral role it played in defining both Detroit's and Rivertown's history, the technical knowledge embedded in the steel construction and formal arrangements stretch far beyond its historical attributes alone. This building exemplifies a number of revolutionary changes from the traditional industrial architecture that appeared in many American Rust Belt cities during the 19th century and it was these alterations that ensured this building's survival for more than a century.

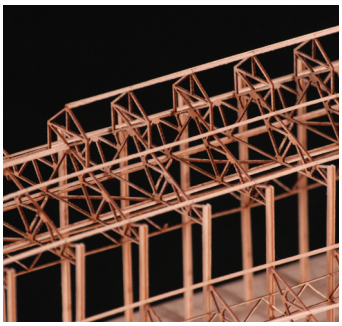
Interior of former chipping room , Detroit Dry Dock Building, 2011.

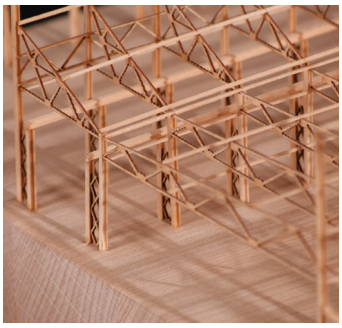
Steel Construction

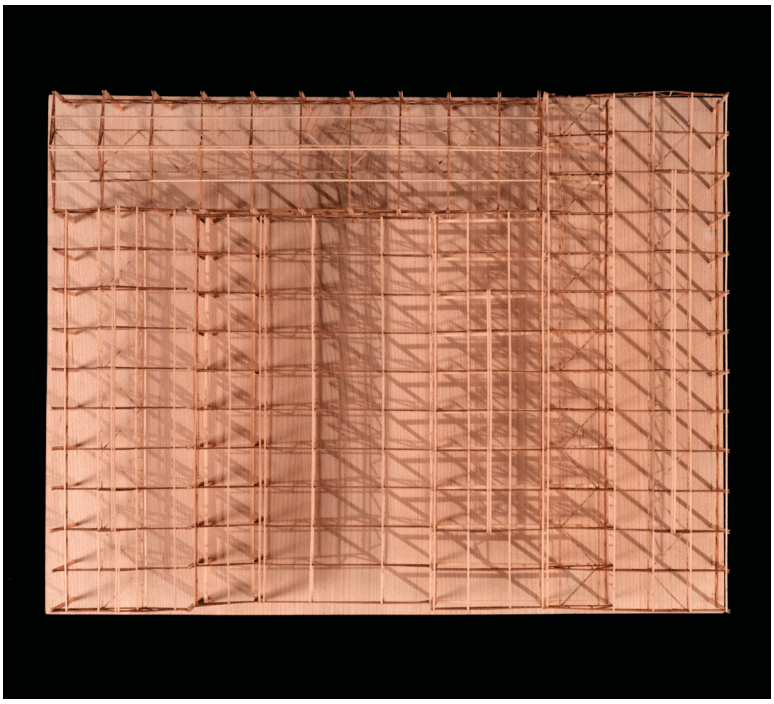
Unlike traditional industrial buildings that depended on load bearing masonry construction, this building's innovative steel structure allowed the exterior walls to be reduced to a simple "curtain wall covering" that could be fitted with many large openings allowing ample light penetration and good air circulation. In addition, this steel structure's ability to create large open spaces without supporting columns enabled the Dry Dock Company to "take advantage of what was the



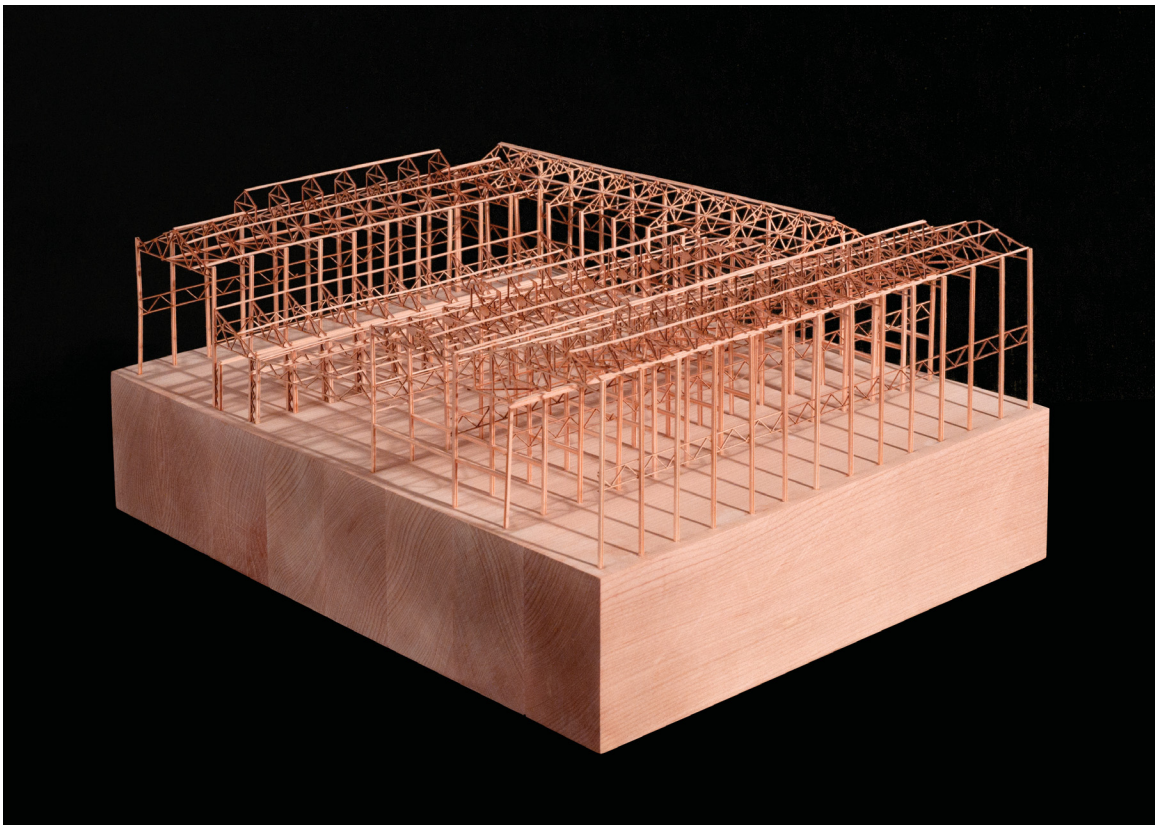
Model showing the large spaces created by the steel structure of the Detroit Dry Dock Company.



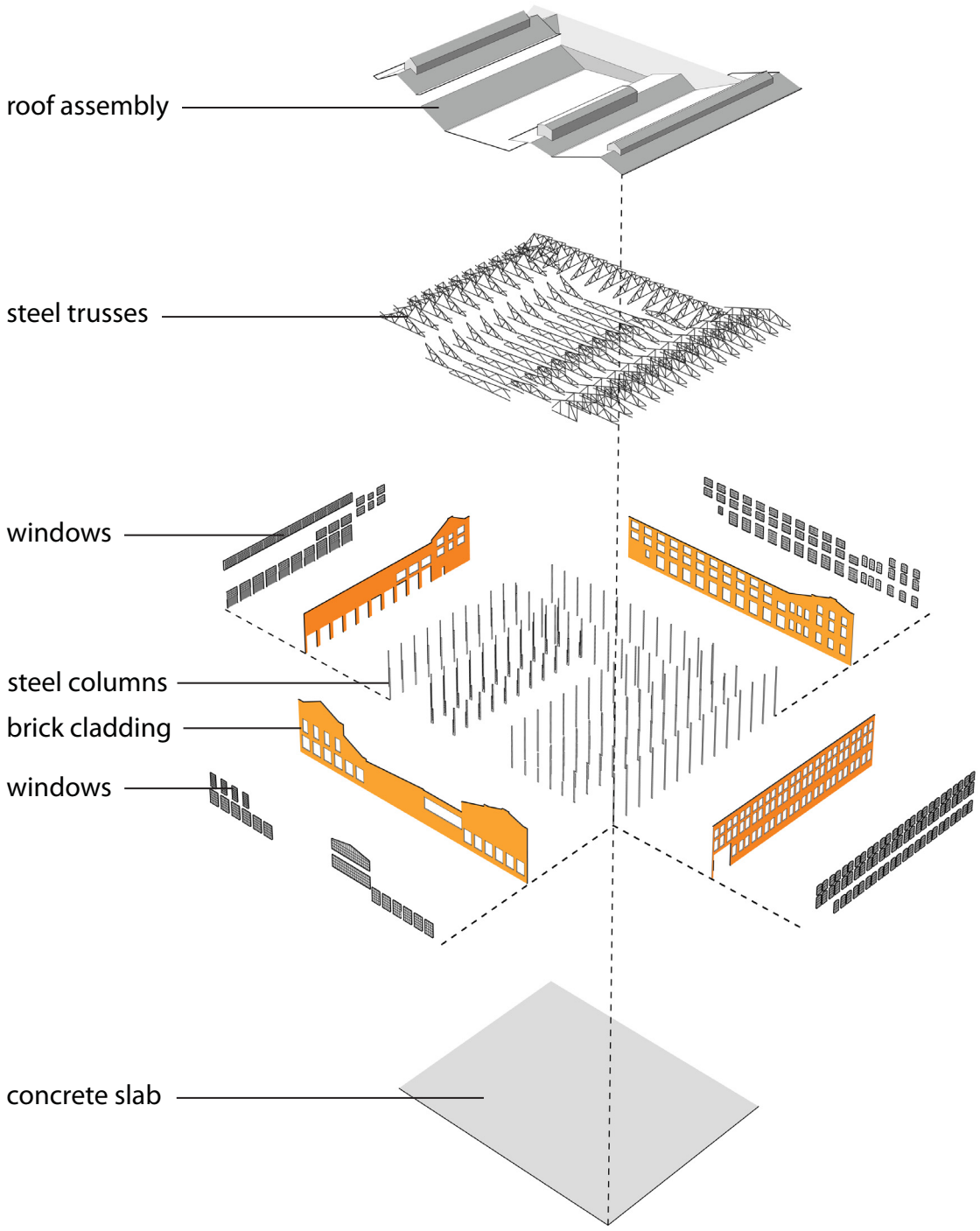




Top left: roof monitors that add addition light and ventilation to the building.
Bottom left: reinforced columns to carry the load of long interior spans.
Right: plan of Detroit Dry Dock building displaying long interior spans.



Model showing Detroit Dry Dock building structural steel construction.



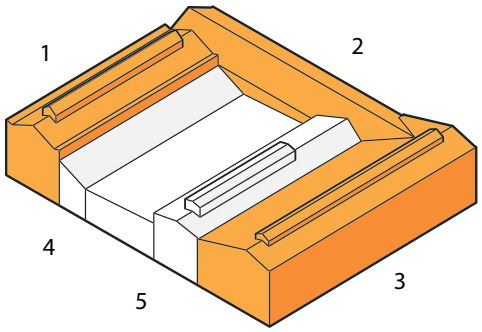
Exploded drawing showing the various building components of Detroit Dry Dock building.

most modern of innovations applied to manufacturing buildings: electric drive machinery and an electrically driven traveling overhead crane" (Klug 2002, 1).

Applying a similar structural system to the proposed institutions's workshop courts will equip the new school with large open workshop spaces devoted to design and fabrication. Similar to the Dry Dock building, these large spaces will display ample natural light and administer passive ventilation techniques.

Program and Form

What now makes up the Detroit Dry Dock building was constructed over a 20 year period. The initial machine shop and foundry buildings were built between 1892 and 1902 to form a three sided courtyard. This form was intended to maximize light penetration and passive ventilation but rapid industrial growth led to courtyard being closed in the early part of the twentieth century.

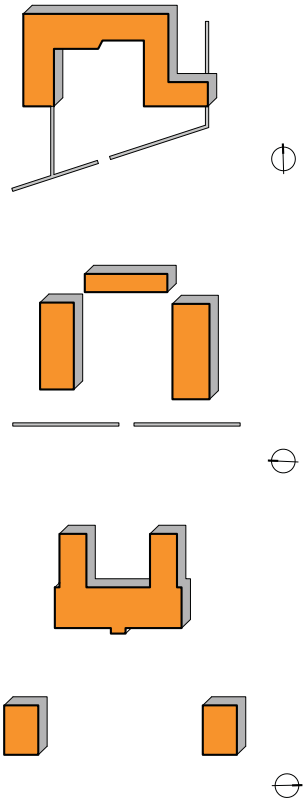


Initial Workshop Buildings
1. Foundry (1902)
2. Industrial Loft Building (1902)
3. Machine Shop (1892)

Support Building Additions
4. Chipping Room (1910s)
5. Shipping and Receiving (1918)

Diagram representing the order of construction of the Detroit Dry Dock building.

Following the formal tradition of many colonial American colleges, that began with three sided courtyard building, the design for the proposed school will reopen the Dry Dock building to its original open ended courtyard form. This building is proposed as the main administrative hub of the new campus. Holding the longest history of the site and sitting at the head of the new campus, the Detroit Dry Dock building will once again display a prominent position within the Rivertown community.



Schematic plans displaying three sided courtyard typology of 17th and 18th century college buildings.

Environmental Revitalization

> Clearly the problem of man and nature is not one of providing a decorative background for the human play, or even ameliorating the grim city: it is the necessity of sustaining nature as source of life, milieu, teacher, sanctum... (McHarg 1976, 19)

View of industry surrounding Dequindre Railway Cut. (Healthiermi, 2009)

The traditional design principles that shaped the physical landscape that now makes up Detroit's riverfront, were predominantly defined by the needs of industry's expansion and fueled by capitalist greed. As Michael Hough explains in *Cities and the Natural Process*, urban design that was created under traditional values such as these "contributed little to their environmental health, or to their success as civilizing, enriching places to live in" (Hough 2004, 1).

Dequindre Cut as a Green Finger

The proposed campus will support and make use of Detroit`s recent investment in a three phase transformation of the former Grand Trunk Railway line into a below grade greenway, 1.35 miles long. Phase one of this transformation opened in May of 2009, creating a pedestrian link between the Detroit Riverfront, the Eastern Market and the many residential neighborhoods between the two. Considerations have been made to expand the pedestrian pathway to include a light rail component in a later phase of this project.

Bridge in Dequindre Railway Cut prior to transformation into greenway. (Jeff O'Brian, 2006)

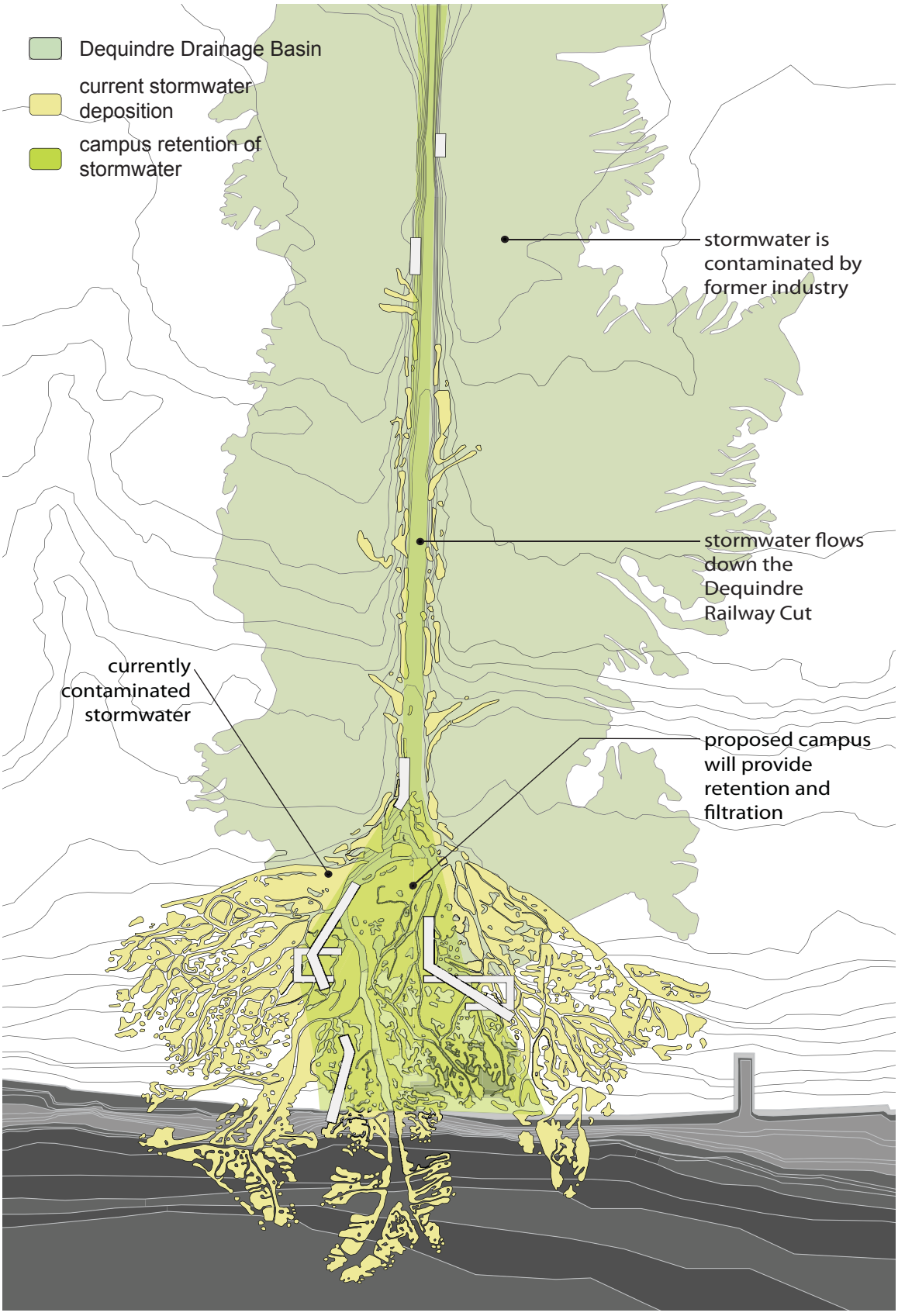
Aside from the circulation benefits of this new Dequindre Cut Greenway, future developments in combination with the proposed campus, will provide numerous environmental and ecological benefits for both Detroit and the Detroit River.

Stormwater Retention and Filtration

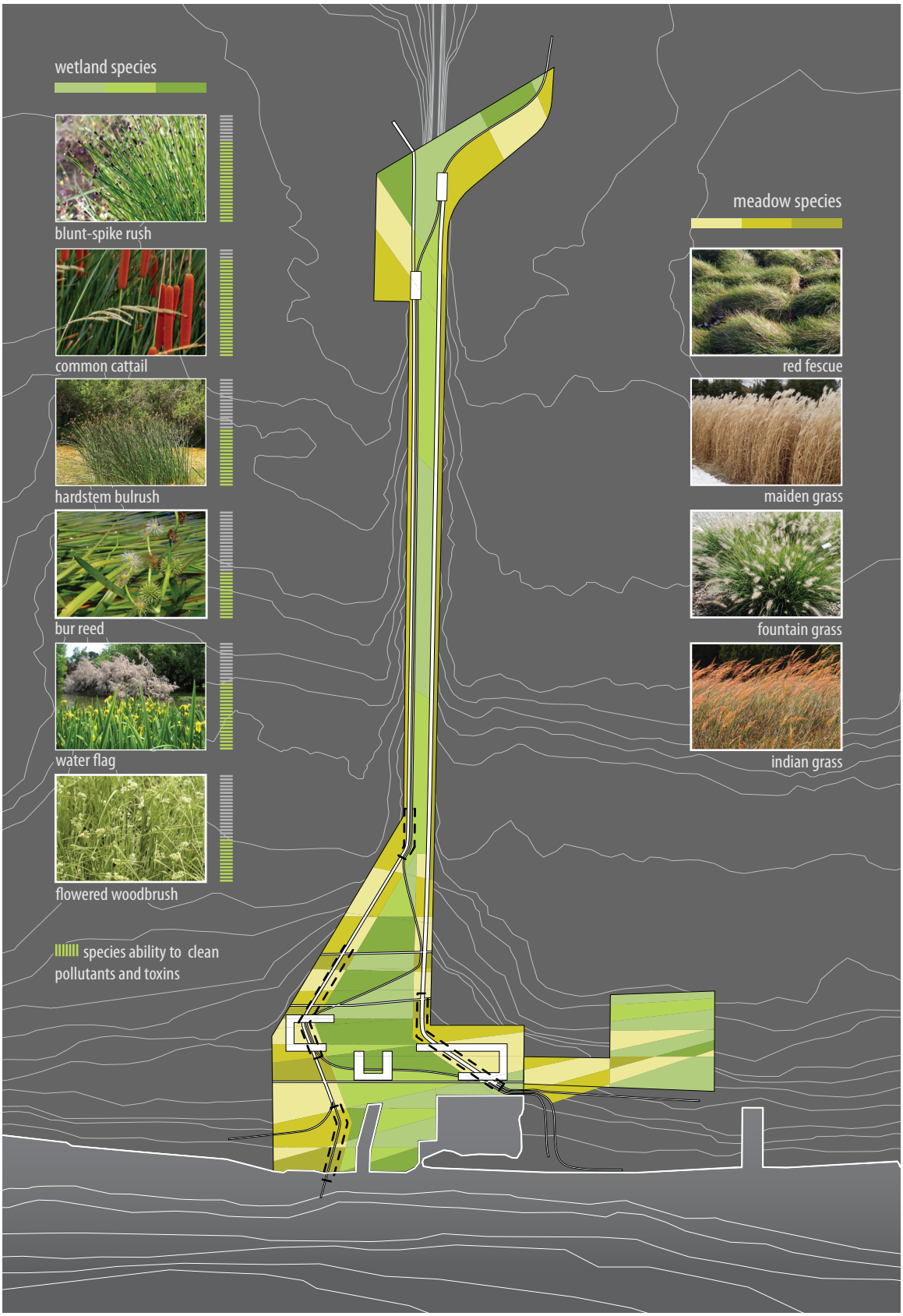
Currently stormwater that collects in the below grade Dequindre Cut Greenway, flows down the railway cut, and across the former industrial Rivertown Warehouse District to be ultimately discharged into the Detroit River. The United States Environmental Protection Agency has identified that urban and industrial development in Michigan's watersheds are one of the major components in high pollutant levels within the Detroit River.

The proposed campus design introduces a series of landscaped berms that funnel stormwater from the Dequindre Railway Cut into constructed wetland for retention and treatment. These wetlands will contain various plant species with high phytoremediation qualities to mitigate soil contaminants before discharging the stormwater into the Detroit River.

Reforestation of both the Dequindre Cut embankments and the campus will further enhance stormwater retention in the area. Currently the embankment leading down the railway cut has a 31% tree canopy that retains 227, 000 cubic feet of stormwater. According to an article published by American Forests, "if the tree canopy were increased from [its] existing 31% to 40%, the greenway would reduce the amount of stormwater the city must manage by an additional 92, 000 cubic feet" (American Forests 2012, 12).



Proposed campus will act to retain and filter contaminated stormwater.



Proposed vegetation strategy for the campus to mitigate contaminated stormwater.

Increased Biodiversity

Linking existing greenspaces in Detroit's downtown core and introducing constructed wetlands will increase the production of new and more diverse flora and fauna habitat. This will promote biodiversity within the city and strengthen existing ecosystems.

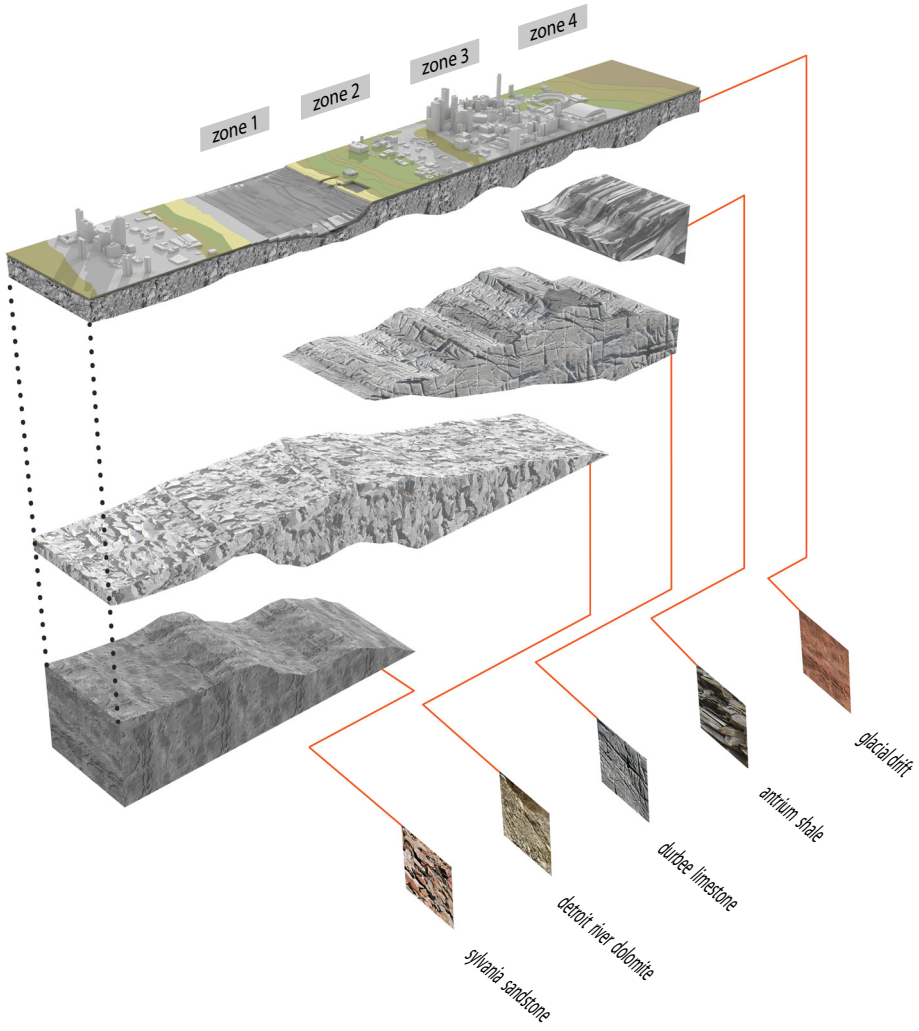


Diagram showing various ecosystems that separately exist within Detroit: *zone 1* - species that reside within the Detroit River, *zone 2* - riparian species found along the banks of the Detroit river, *zone 3* - species that fill the vacant lots and neglected landscapes within the city, *zone 4* - species found in the large open abandoned areas of the city that are commonly referred to as Detroit's urban prairies.

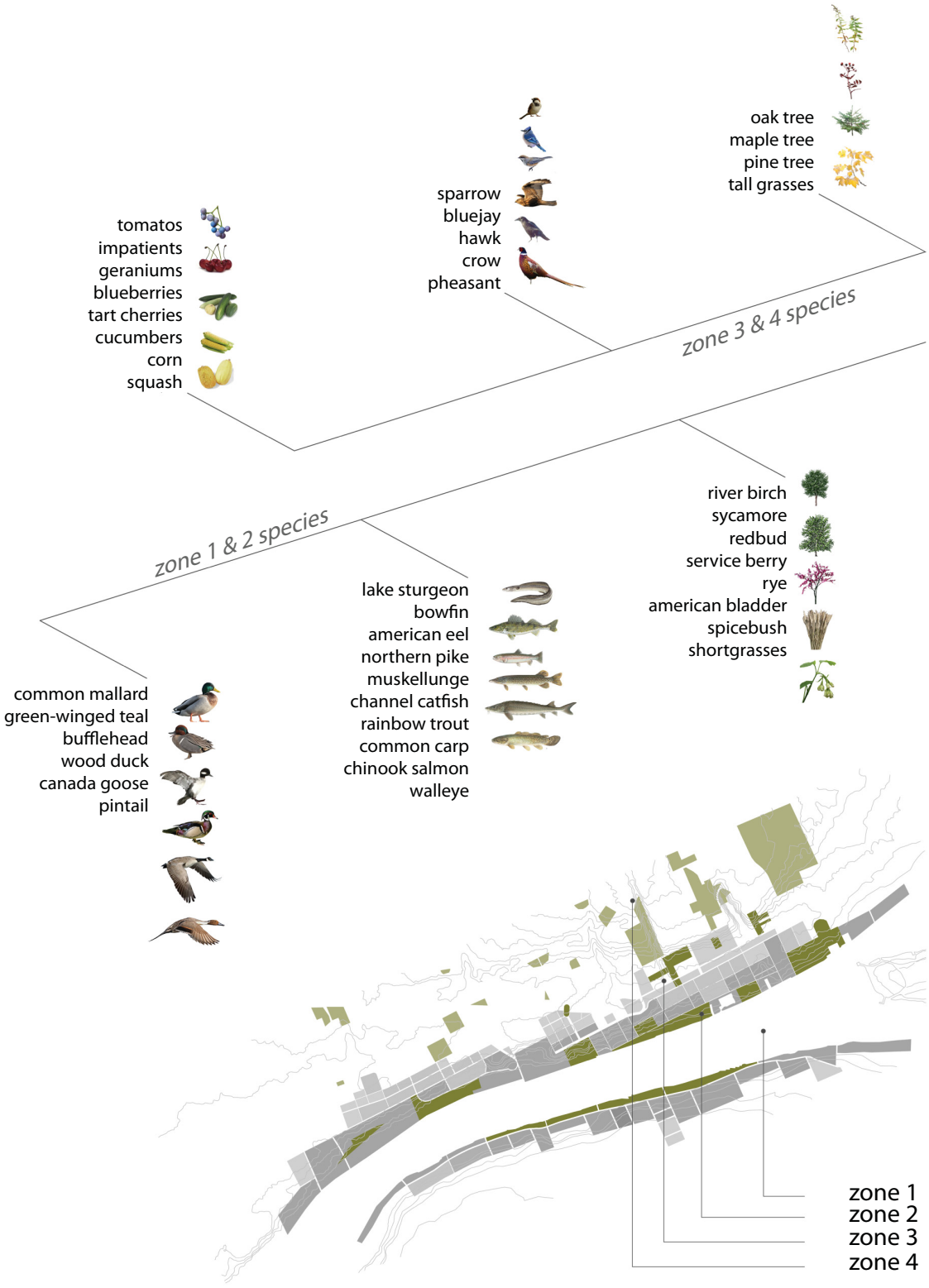


Diagram showing various species which reside in different ecological zones throughout Detroit.

Layering Systems

> Nature and culture are dynamically linked and history is in some central way connecting this intimate and continuing relationship... (Arnold 1996, 11)

If we are to understand how the natural environment can function in harmony with an urban landscape, cities must be seen as living organisms rather than merely collections of buildings. As Mohsen Mostafavi suggests in *Ecological Urbanism*, an urban space is made up of a complex set of relationships including ecology, culture, and social interaction, and designers must develop "an equally complex range of perspectives and responses that can address both current conditions and future possibilities" (Mostafavi 2010, 13). Martha Schwartz states that "unless we truly embrace all systems, human and natural, we will not be able to design optimal cities for people" (Schwartz 2010, 525).

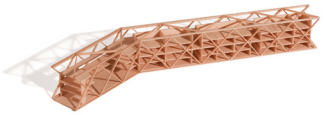
For these reasons, the preliminary steps in developing a campus design that responded to this multi-faceted Rivertown site, was distinguishing and isolating the site's various components into two main underlying systems. These were broadly defined as the natural system and the urban system. A design response was then developed to address each of these systems individually. In this way the campus design would echo the environment in which it is situated.

Great Serpent Mound in Adams County, Ohio which stretches four football fields and measures up to 20 feet tall. (Cave to Canvas, 2012)

Identification of the site's natural systems required an analysis of the topology, ecology, and geology of the site in relation to its surrounding. Drawing on both the previously discussed stormwater retention concepts and the Hopewell mound building tradition (that flourished in many Native American cultures that resided along rivers in the northeastern and Midwestern United States from 200 BCE and 500

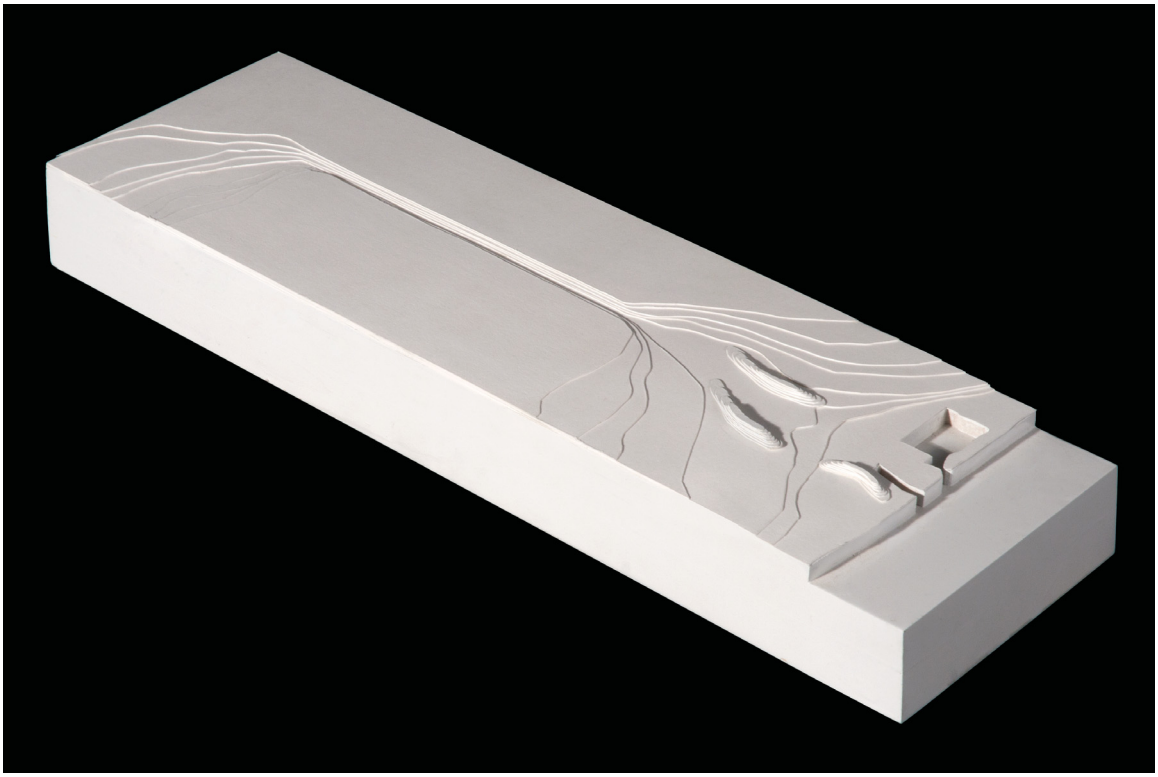
CE), the site strategy proposes a set of mounds that will stitch the Dequindre Cut to the Detroit riverfront.

Investigation of the site's urban systems, includes an assessment of local building typologies and the existing urban grid, informed the proposal for two open ended courtyard buildings. These buildings will house the school's workshop spaces.

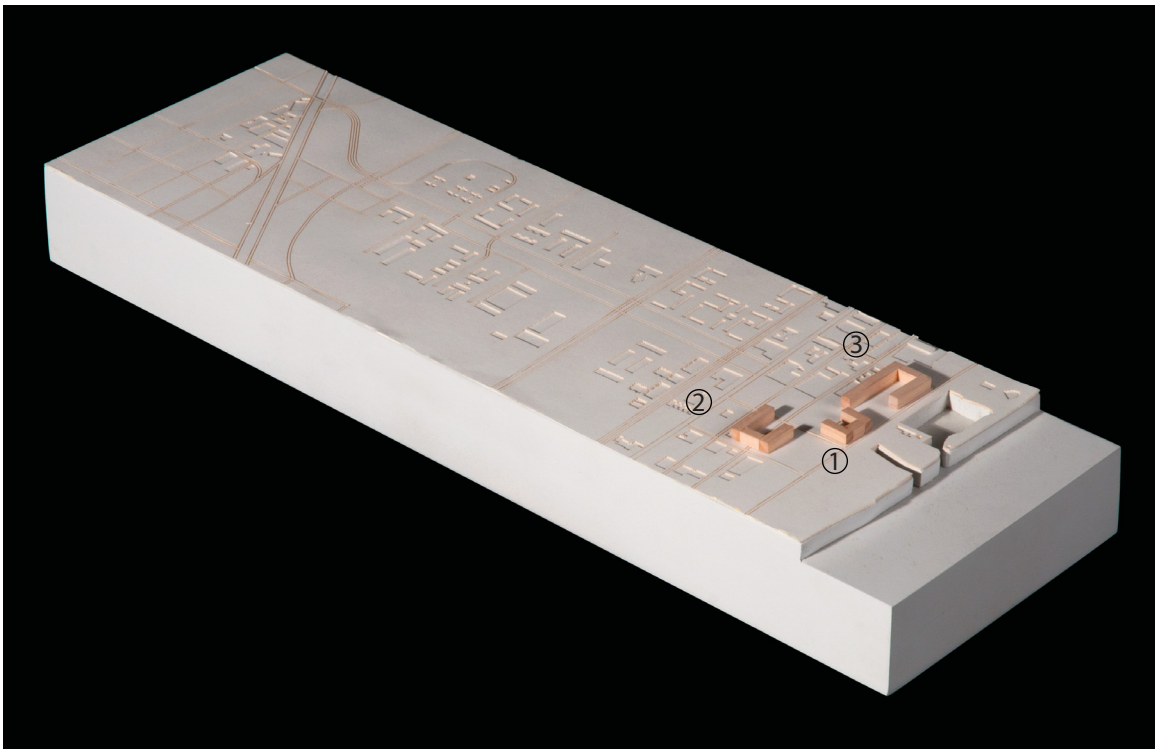


Preliminary programmatic and structural models for linear bridge buildings.

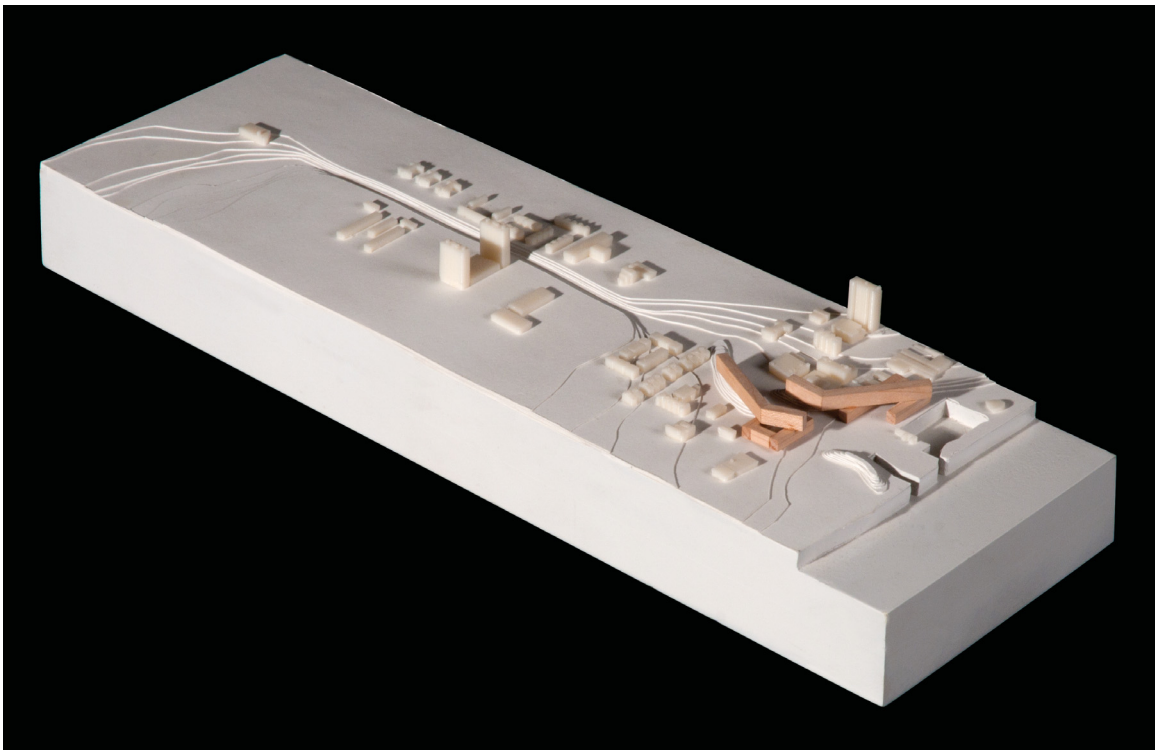
The final piece in this layering of systems was the development of a connection between the two systems in the form of a linear buildings typology that bridges the mounds and courtyard buildings. These ribbon like building contain most of the school's collegiate functions, including classrooms, labs, breakout spaces, offices, and a library.



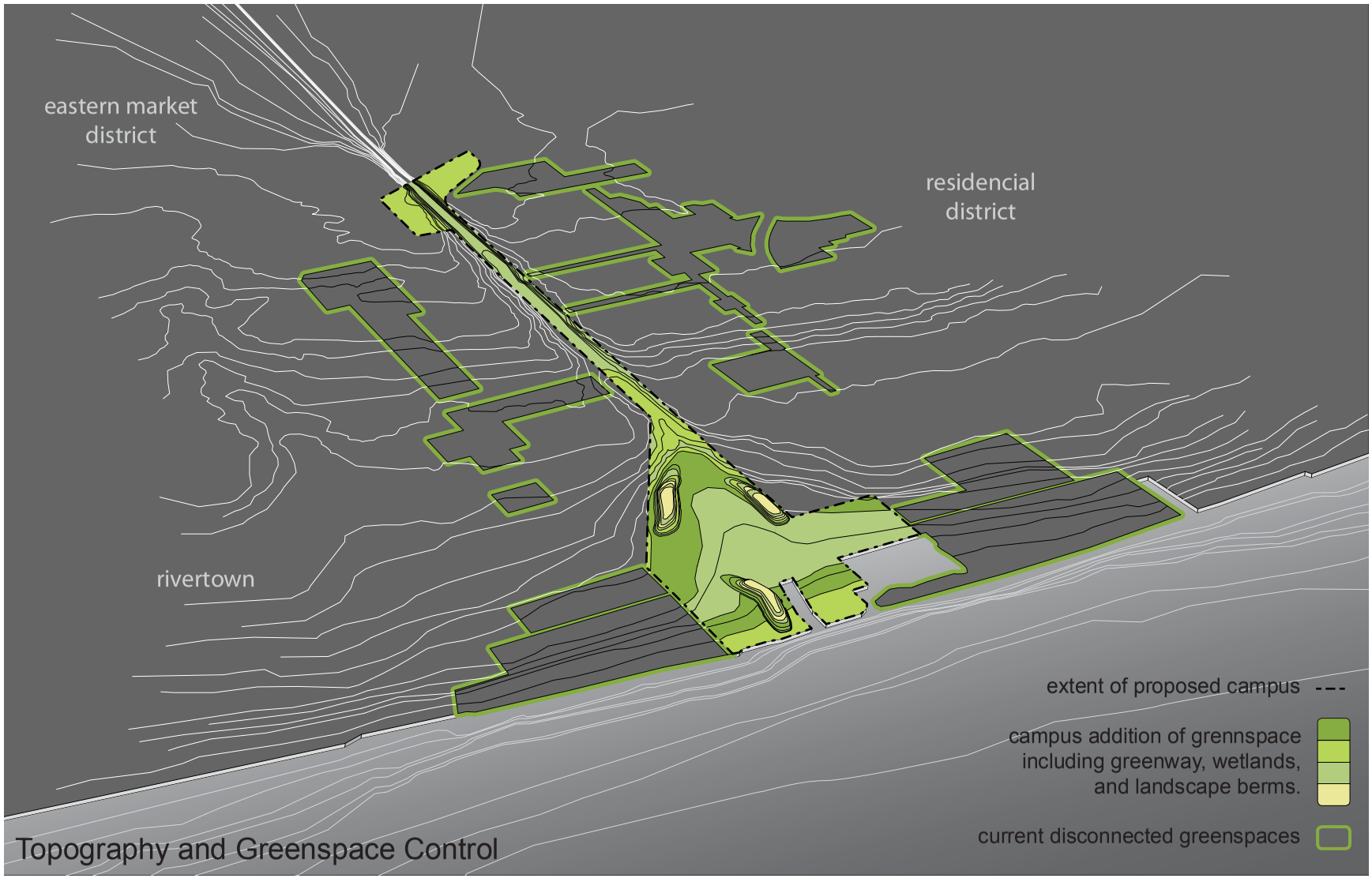
Model showing topography of Rivertown and a set of mounds responding to this landscape.



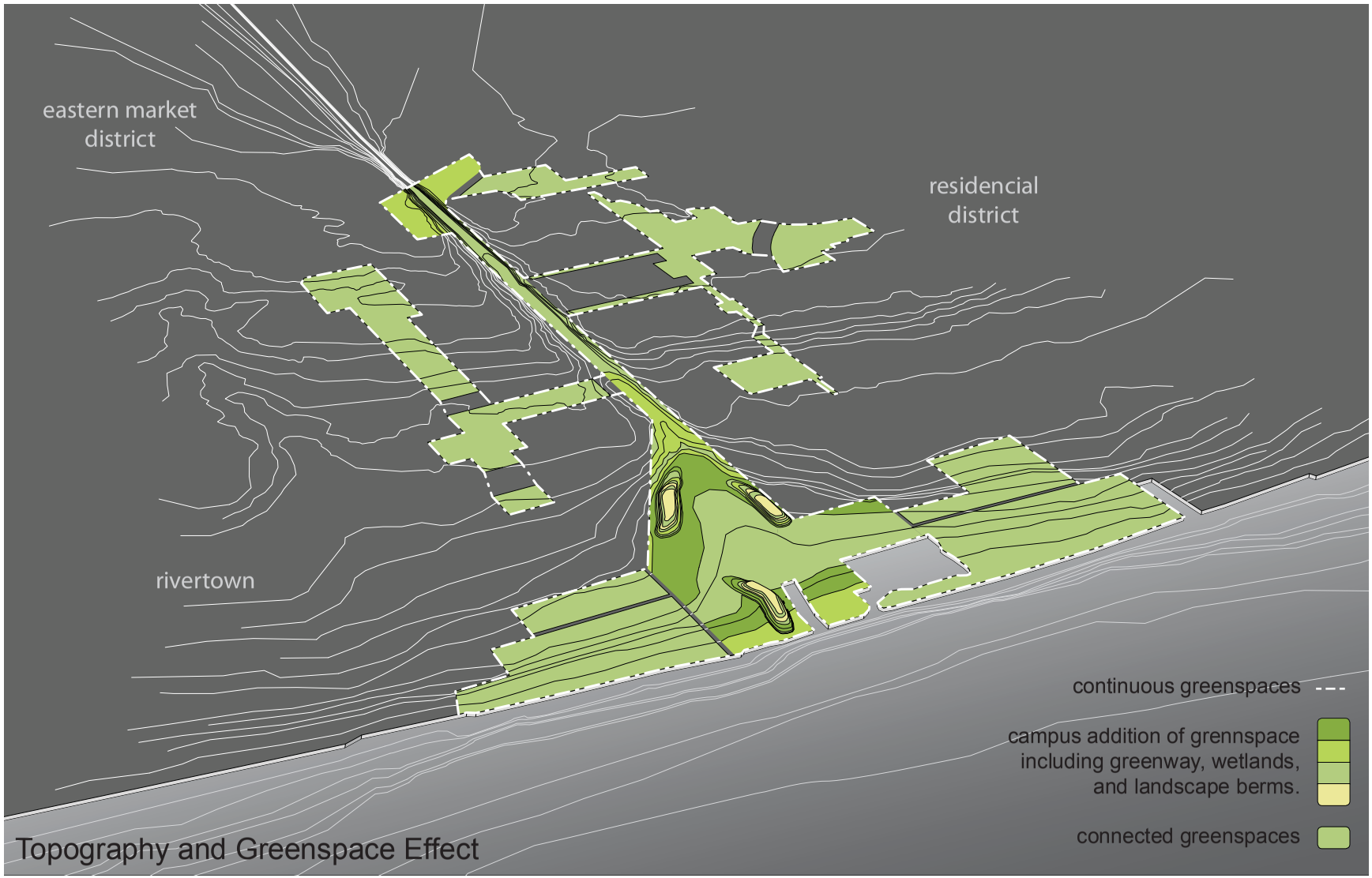
Model showing the urban grid of Rivertown and the Detroit Dry Dock building's three sided courtyard typology (1). Buildings 2 and 3 are the proposed campus warehouse buildings responding to the grid and the courtyard typology.



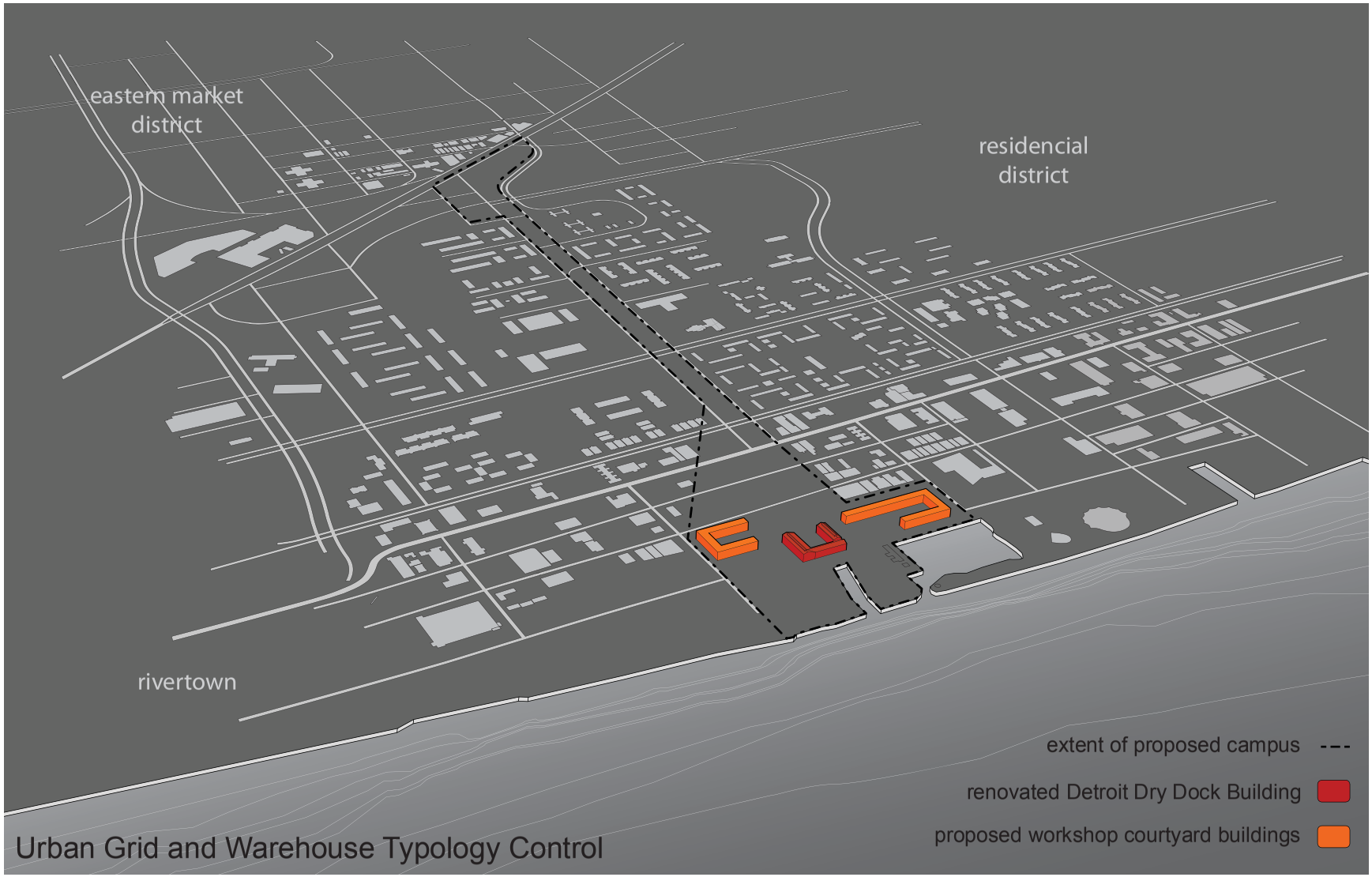
Model showing layered schematic scheme of the campus.



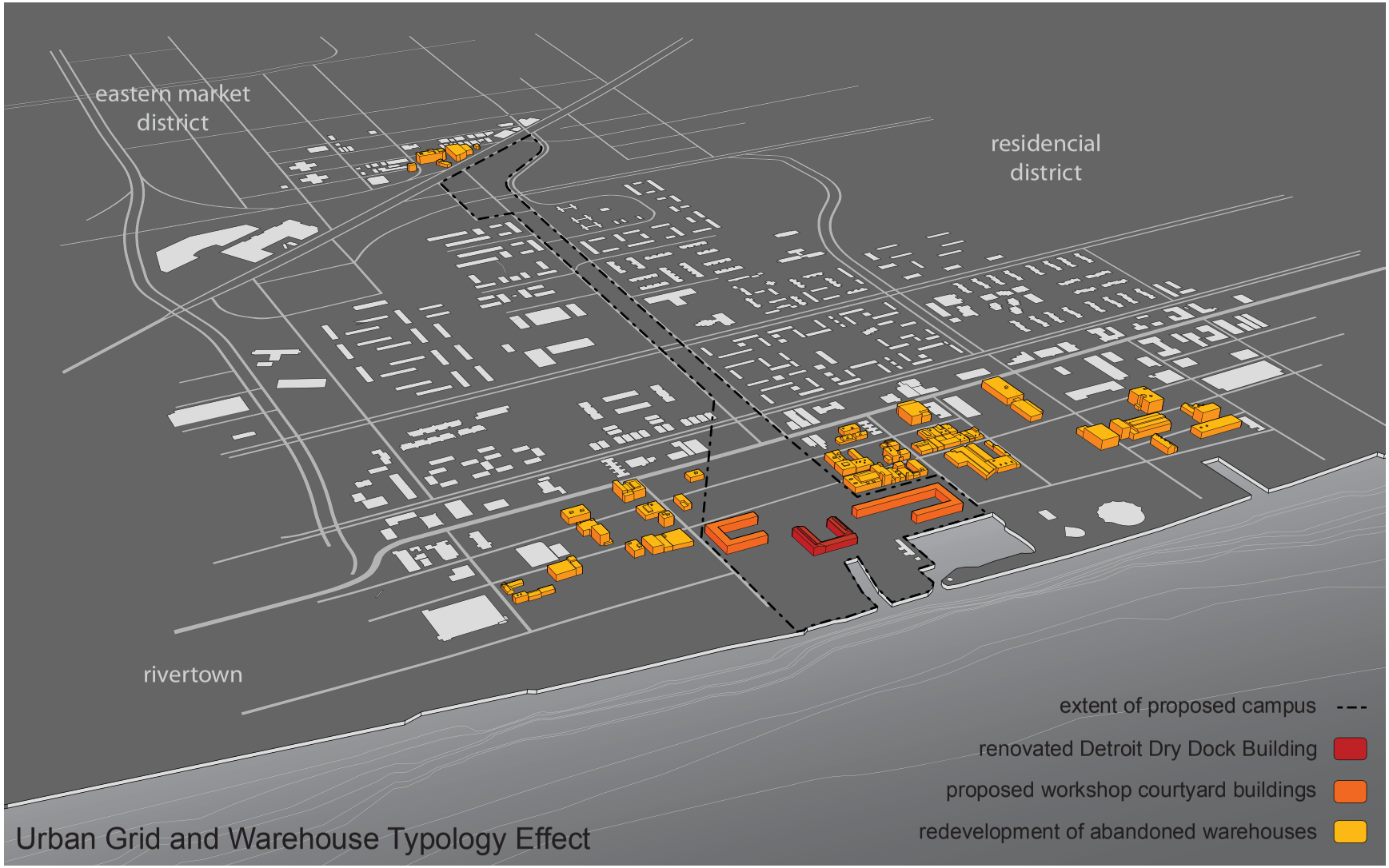
Showing the proposed campus response to the disconnected greenspaces in Eastern Detroit.



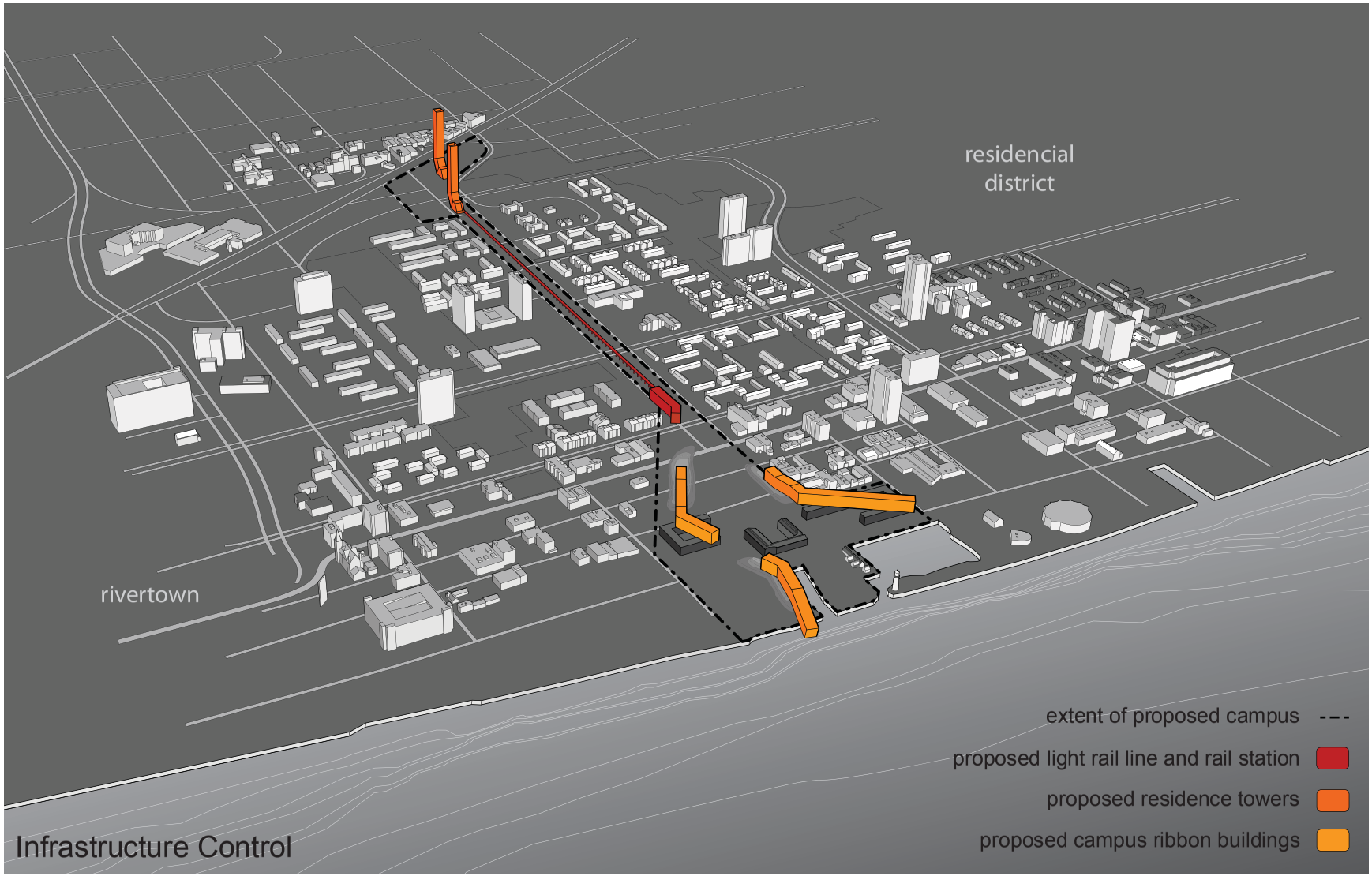
Showing the intended effect of the proposd campus to connect the various grennspaces in Eastern Detroit into a unified park system.



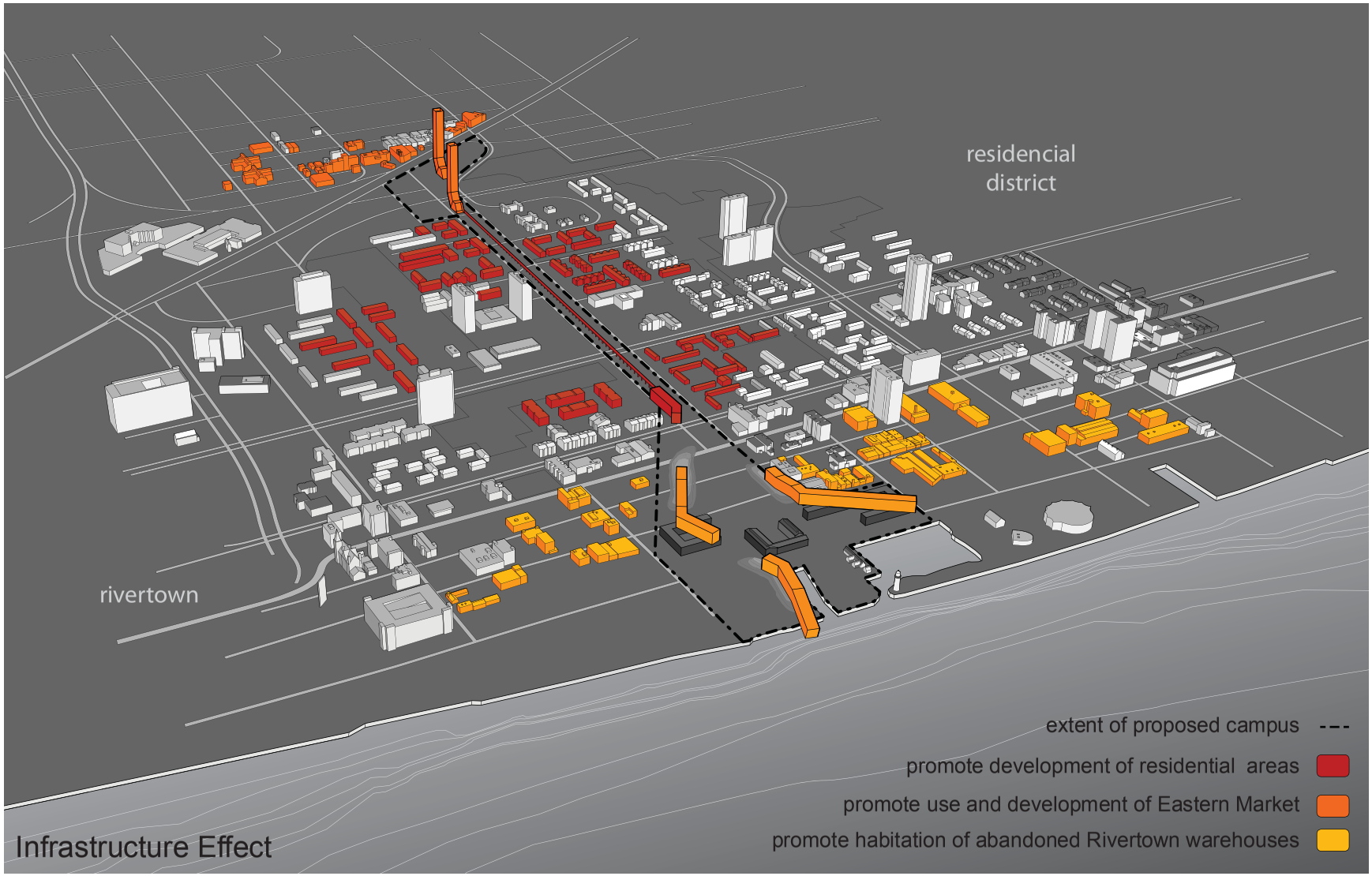
Showing the proposed campus response to Rivertown`s urban grid and the three sided courtyard typology of the Detroit Dry Dock building.



Showing the intended effect of the proposed campus warehouses to redevelop a working community in Rivertown and in turn reinhabit some of the abandoned warehouses in the district.



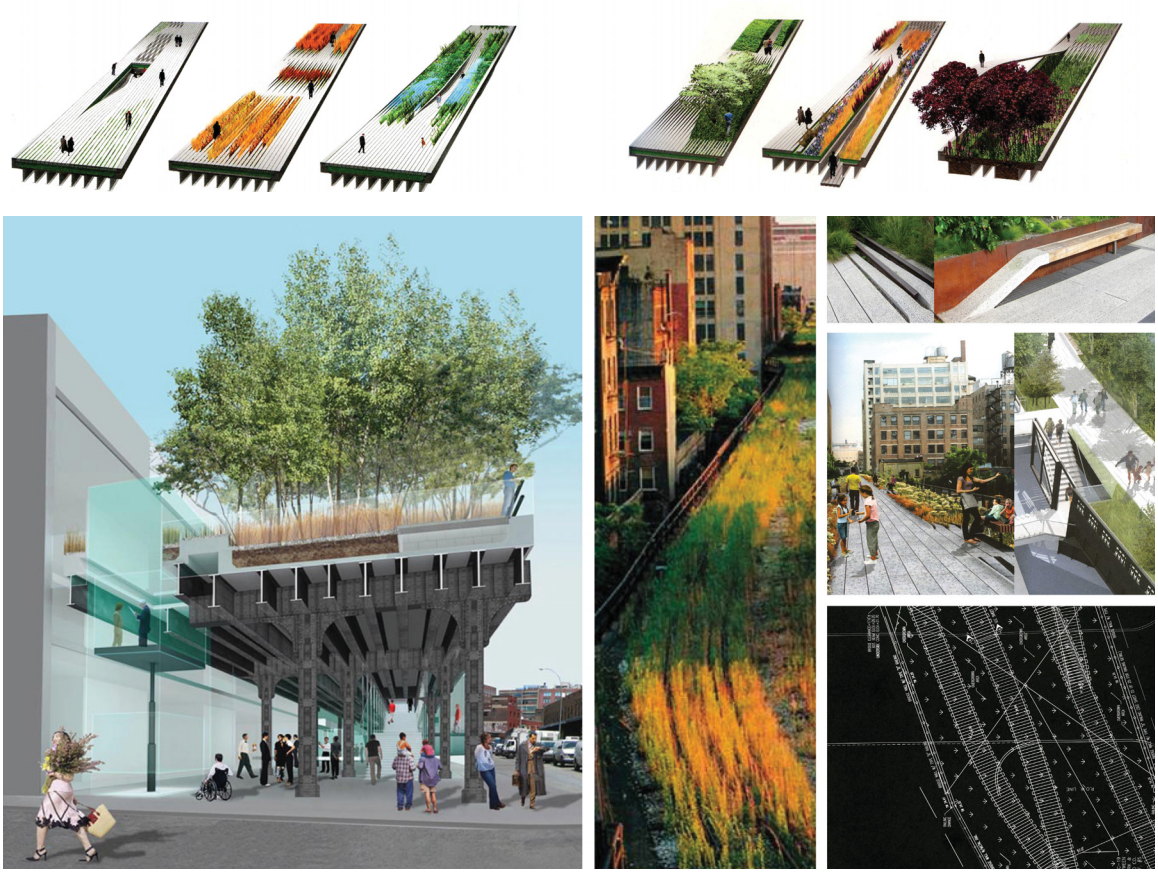
Showing the proposed campus structures that respond to the historic Dequindre Railway Cut and address the campus requirements.



Showing the intended developmental effect of the proposed campus infrastructure on the surrounding areas of East Detroit.

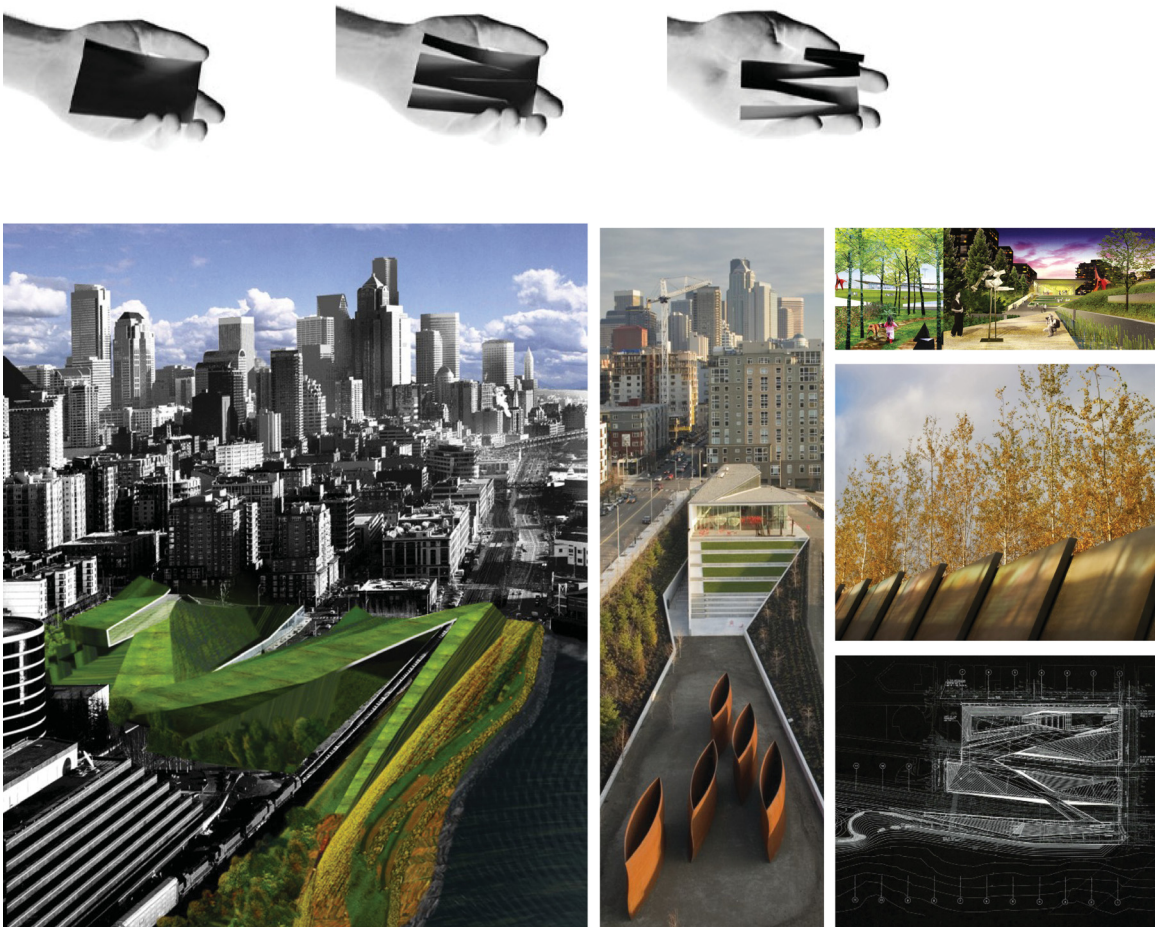
Precedents

The High Line project by Diller Scofidio + Renfro revitalizes an abandoned elevated feild office and railway line that was slated for demolition in 1999 under the administration of New York Mayor Rudy Giuliani. The design concept was to create a type of experimental city park that celebrated the historic infrastructure of the elevated railway and transformed it into an urban park. As a linear park, this project explores ideas of procession with varying destinations. The completed project retained the sense of wilderness and mystery of the original overgrown structure, while making it accessible to the public and extending its civic function. The project has gained widespread recognition and is now a well used public space in the city. It has also significantly increased land values in Manhattan and the lower west side.



Various images from the High Line project in New York City. (Patrick Hazari 2008)

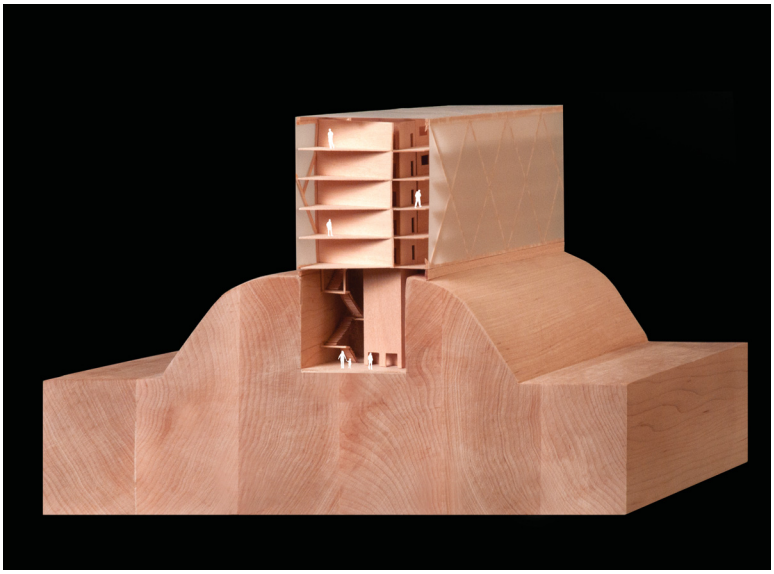
Olympic Sculpture Garden by Weiss/ Manfredi Architects transforms the degraded site of a former fuel storage station on into a eight and a half acre Olympic Sculpture Park on Elliot Bay in downtown Seattle. Similar to the High Line, this project pays close attention to the importance of procession as the path leads visitors through three distinct areas; a new concrete, steel, and glass pavilion (for art, performances, and educational programs), various outdoor sculpture galleries, and concludes on the shoreline. The project`s design not only bring culture out of the museum walls, it also brings the new experience of nature into the city.

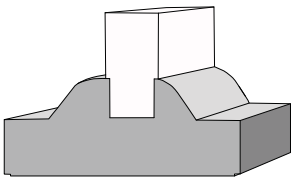


Various images from the Olympic Sculpture Garden in Seattle. (Reed 2008)

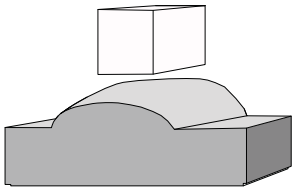
Landscape and Built Form

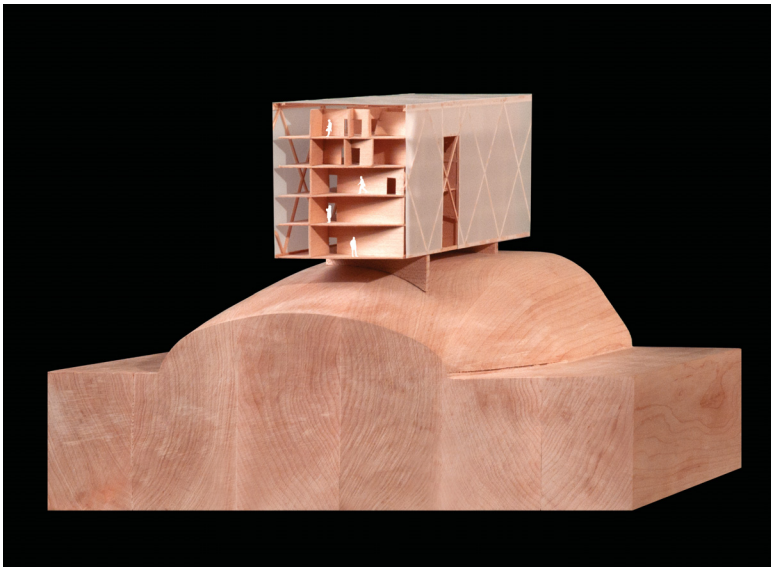
In his book C*ities and the Natural Process* Michael Hough states that “urban form is the consequence of a constant evolutionary process fuelled by economic, political, demographic and social change” (Hough 1993,19). This leads one to wonder how the form of a building might differ if a harmonious relationship to the natural environment were to become a precedent for design intensions. The following series of models investigates various ways that the linear bridge classroom buildings might interact with the landscape mounds at their point of contact.



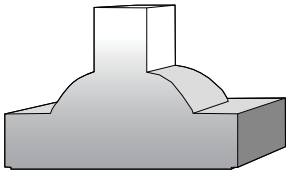


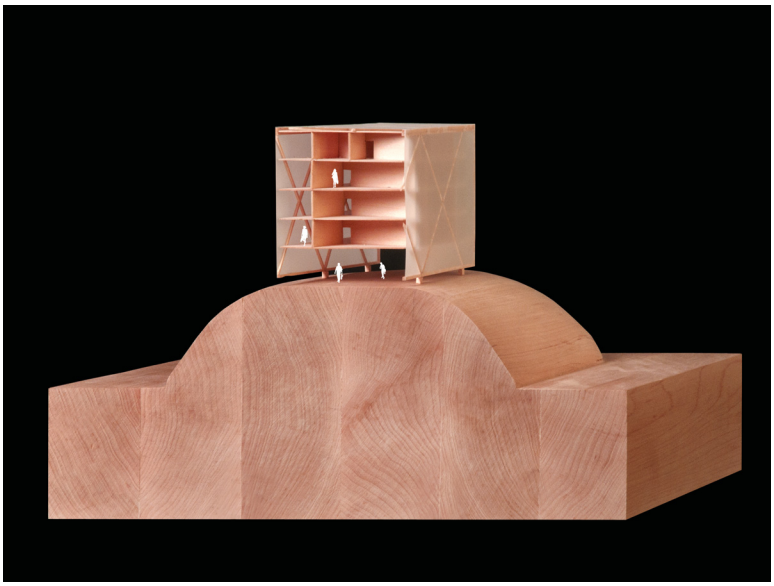
Building into Berm: concrete strip footing create a sealed unit between the building and the inhabited portion of the berm below.





Building on the Berm: concrete fins create a separation between the berm and the building.





Building with the Berm: removing the bottom floor and supporting the building with a series of concrete piles is intended to blur the line between built form and berm.

CHAPTER 3: ARCHITECTURAL DESIGN OF THE CAMPUS

Drawing on the both Detroit`s historic ribbon farm tradition and the environmental concept of a green finger, the architectural design for the campus makes use of a conceptual linked framework which traces the path of the historic Dequindre Railway Cut from the Detroit riverfront back into the city. Like a nervous system connecting to a spinal column or tributaries connecting to a river, this framework allows the campus to grow over time, as new buildings are linked into it and additional connections are made with bordering neighbourhoods throughout the city.

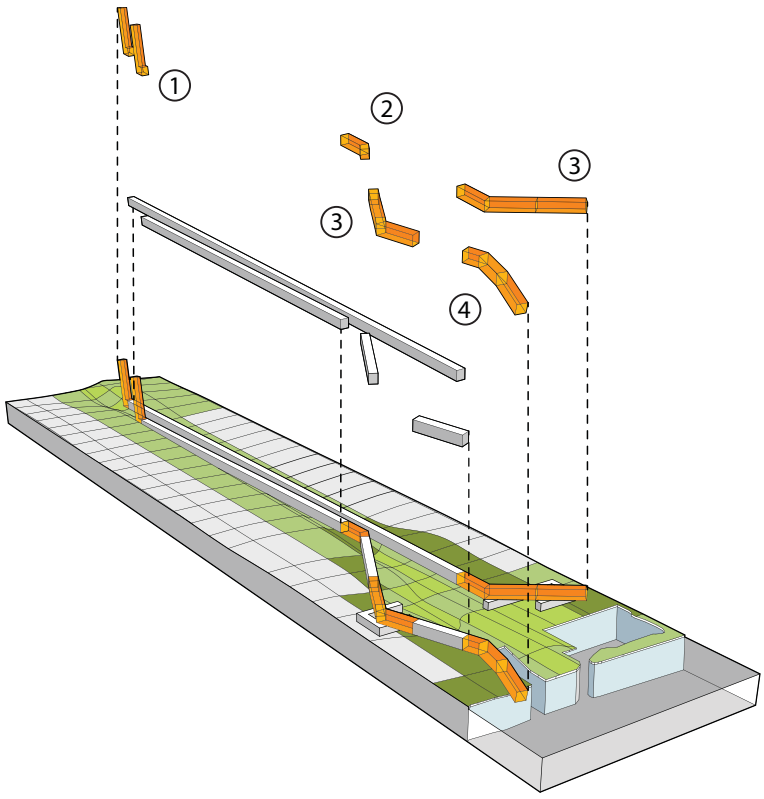


Diagram showing conceptual connections between campus buildings. Numbers correspond to drawing on next page.

Residence Towers

residence units 240,000 sq. ft. 77%

circulation 50,000 sq. ft. 8%
admin and station 25,200 sq. ft. 15%

Rail Station

circulation 25,560 sq. ft. 28%
offices and admin 27,000 sq. ft. 30%
rail station 34,340 sq. ft. 42%

Classroom Bars

circulation 57,900 sq. ft. 16%
offices and admin 53,900 sq. ft. 14%
classrooms 190,350 sq. ft. 42%
library 46,848 sq. ft. 12%
lecture halls 31,200 sq. ft. 8%

Water Building

circulation 34,560 sq. ft. 18%
offices and admin 55,536 sq. ft. 29%
classrooms 83,304 sq. ft. 43%
boat slip workshops 18,600 sq. 10%

Workshop Courts

circulation 18, 600 sq. ft. 24%

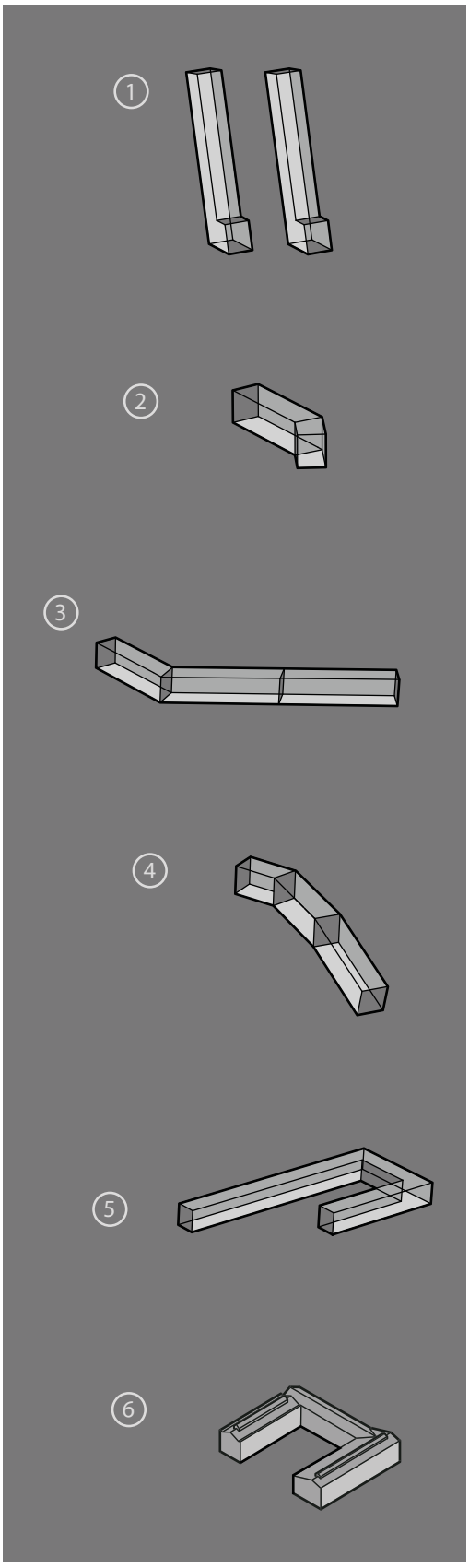
workshops 34,560 sq. ft 76%

Dry Dock Building Renovation

circulation 4,000 sq. ft. 14%

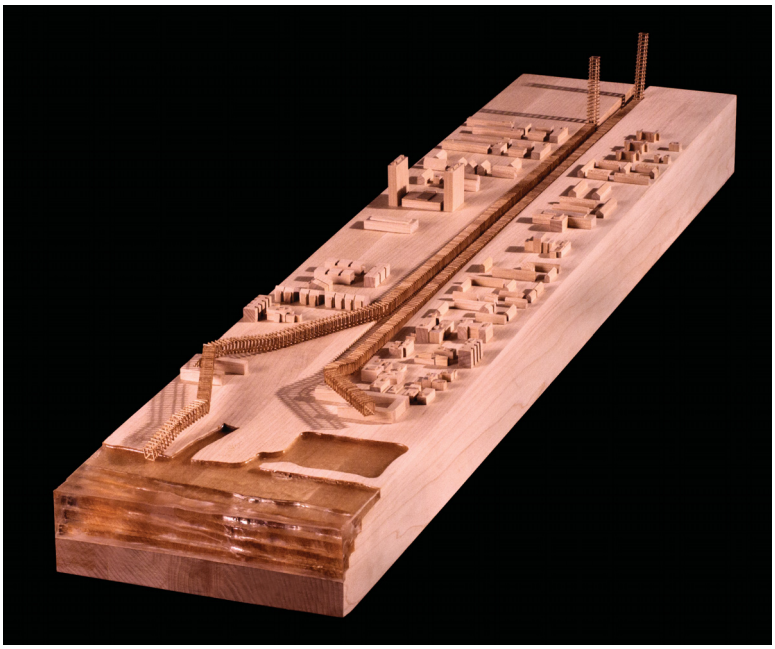
admin offices 15, 845 sq. ft. 55%

lounges 9,000 sq. ft. 31%

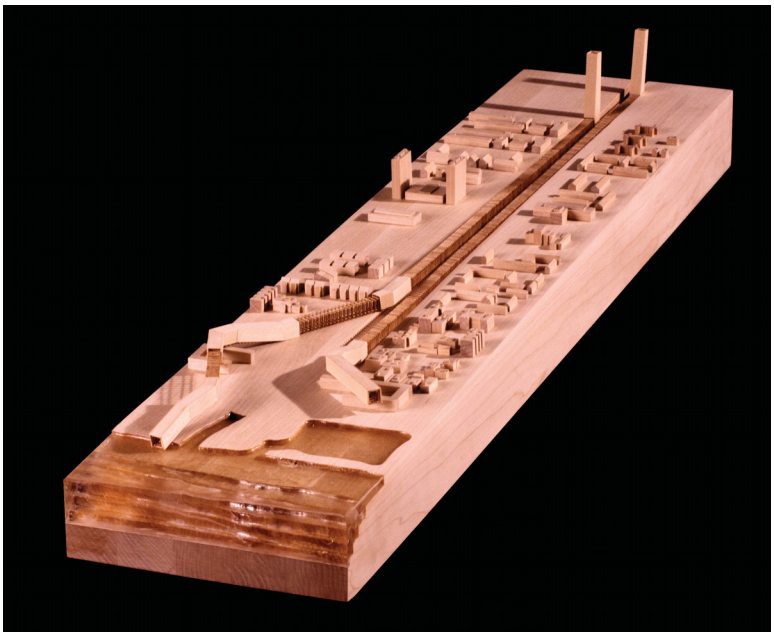


Proposed program for campus buildings.

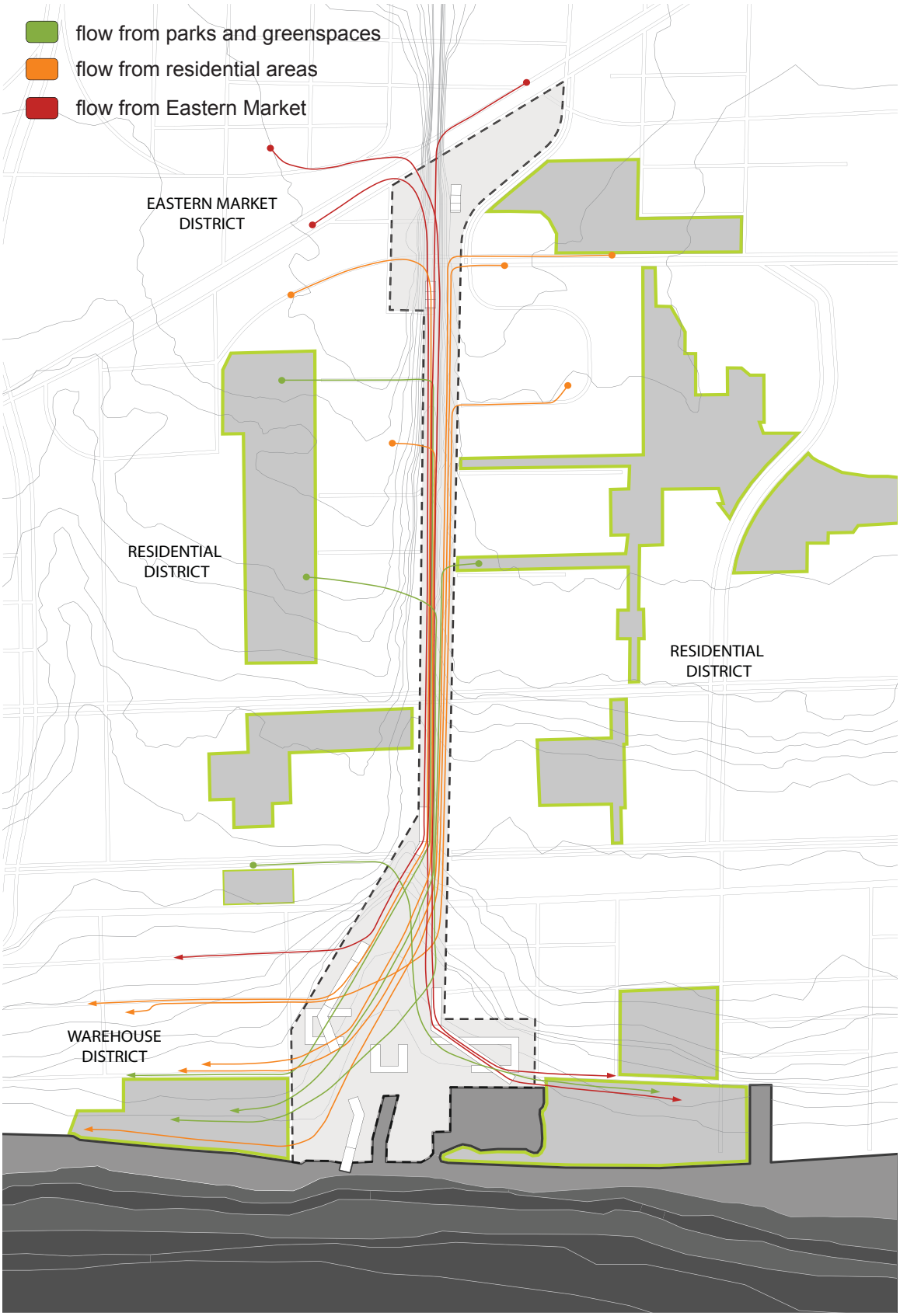
As stormwater flows down the Dequindre Railway Cut to accumulate in the campus wetlands, social and cultural accumulation will take place as people and activities congregate in the new campus, once again creating a vibrant and diverse community within the Rivertown Warehouse District.



Model showing conceptual framework linking the Detroit River to the Eastern Market District.



Model showing proposed campus buildings cut out of conceptual framework.



Proposed flow of people from neighbouring areas into and congregating in the proposed campus.

Proposed Buildings Responding to Site Landscape

- phase one buildings
- phase two buildings

Proposed Campus Circulation

- light rail

Proposed Campus and Surrounding Greenspace

- extent of campus
- surrounding green-space

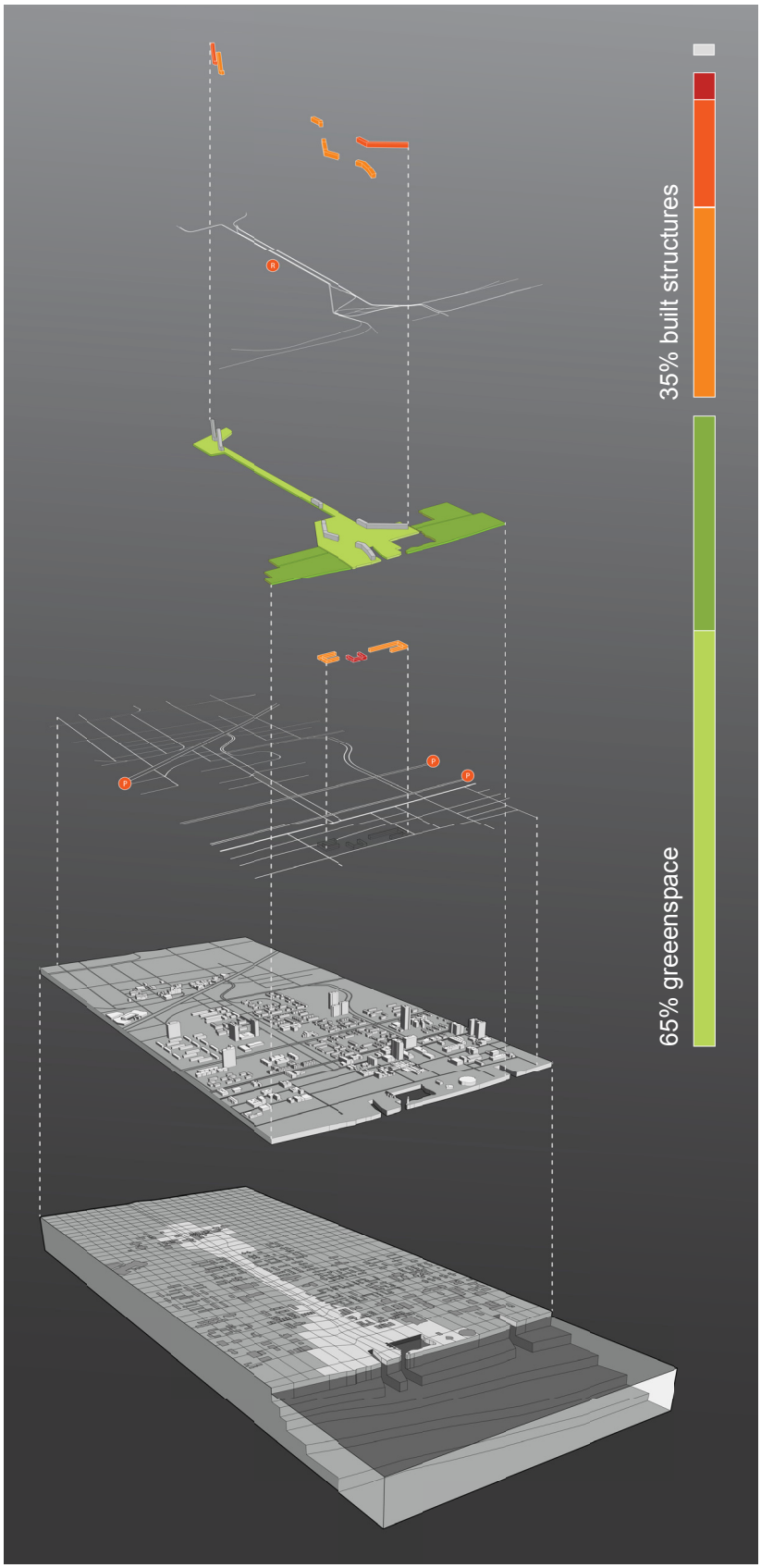
Proposed Workshop Buildings Responding to Urban Grid

- workshop courts
- renovated *Detroit Dry Dock* building
- primary streets

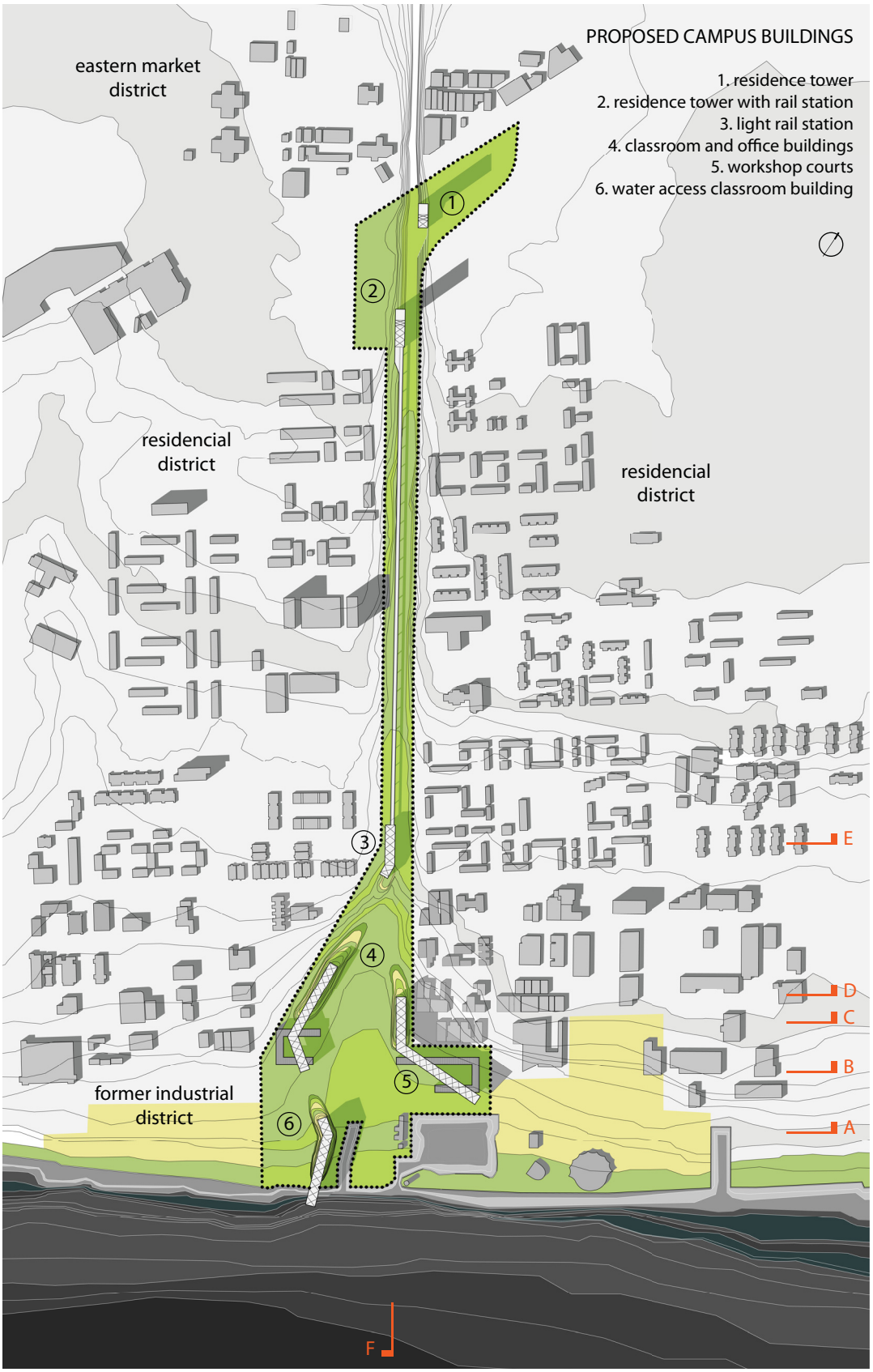
Existing Urban Fabric

Existing Landscape

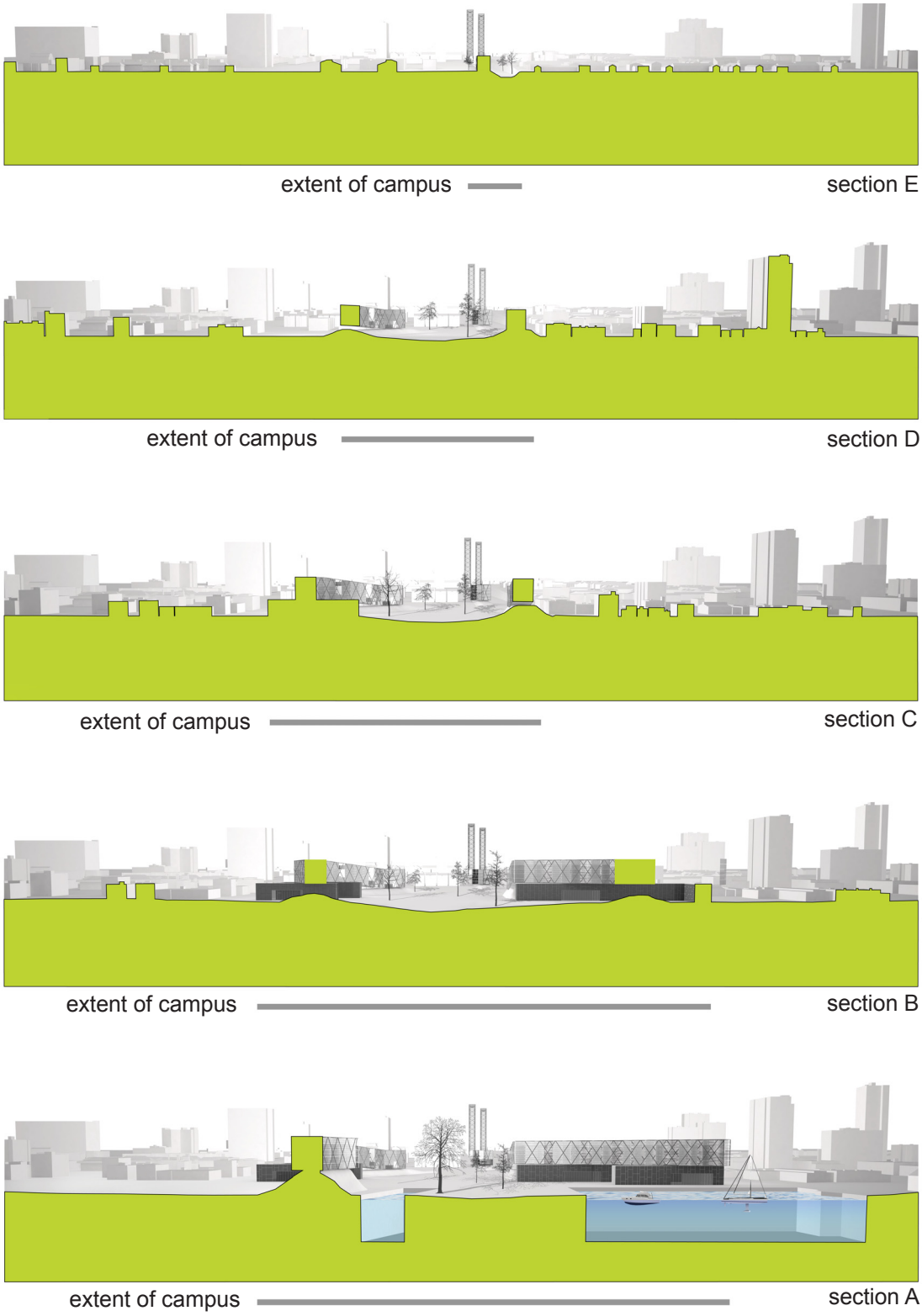
- Dequindre railway cut drainage basin



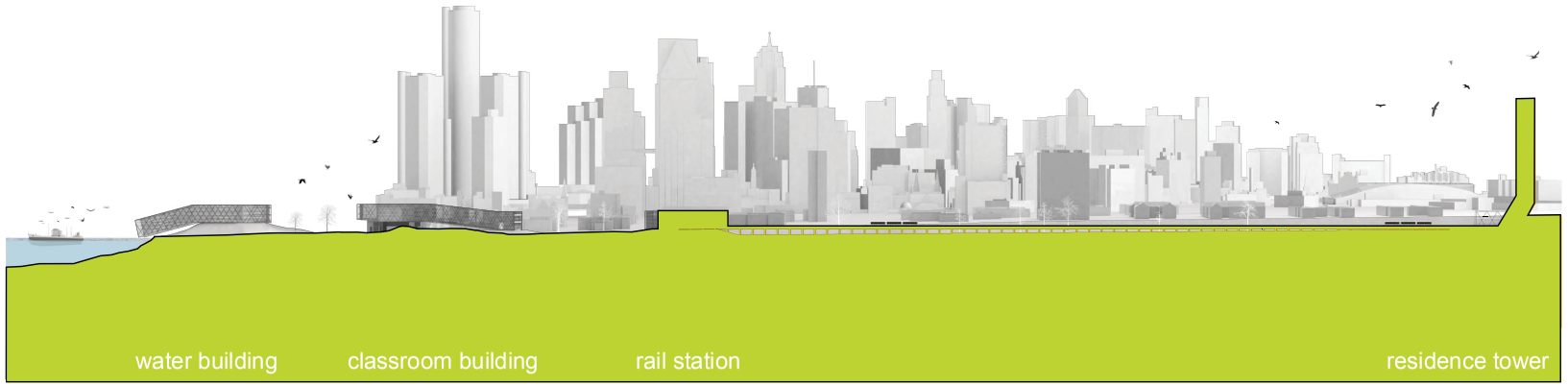
Exploded drawing showing existing and proposed components of campus design.



Site plan of proposed campus.

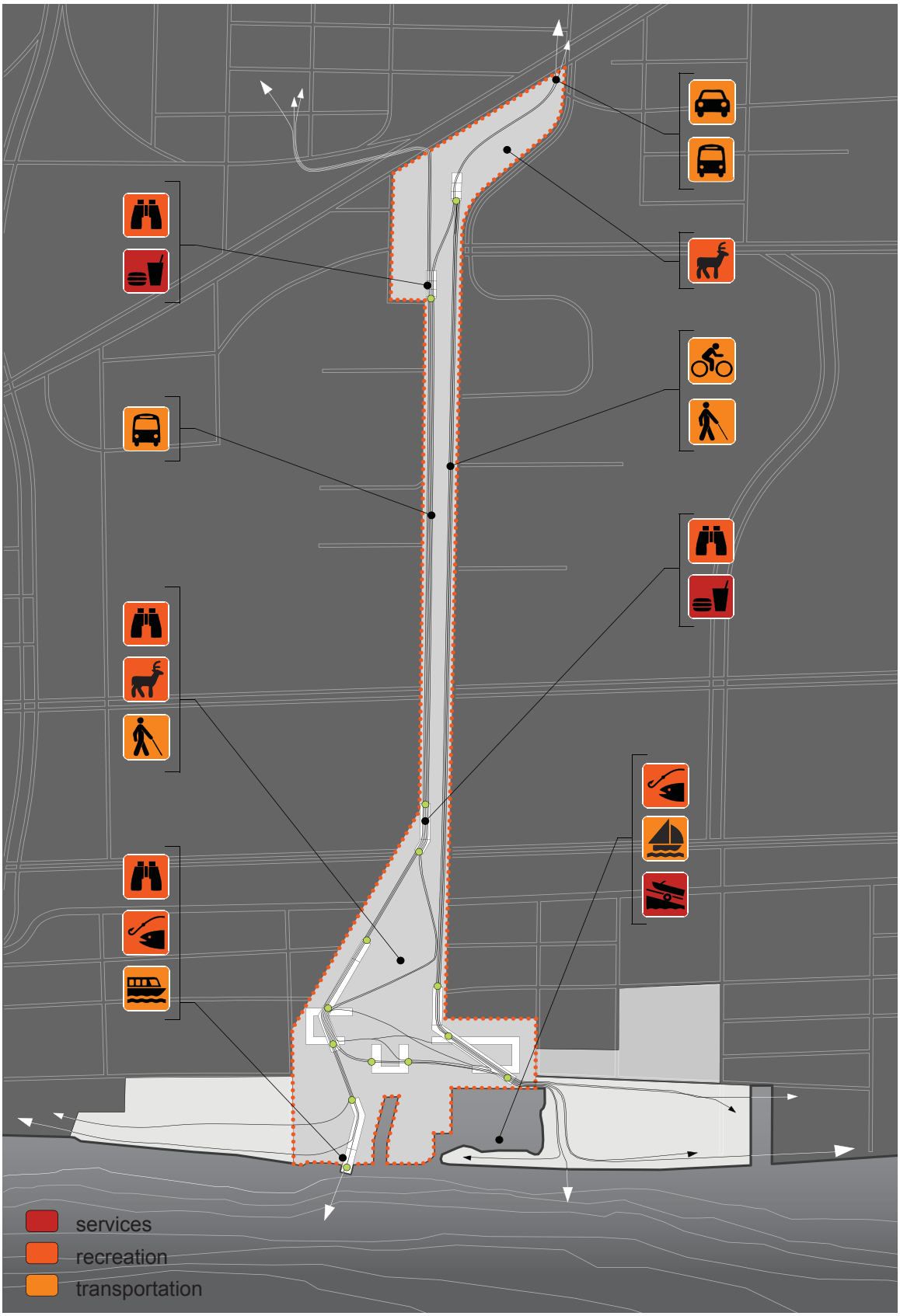


Cross sections through proposed campus, reference section lines on map above.

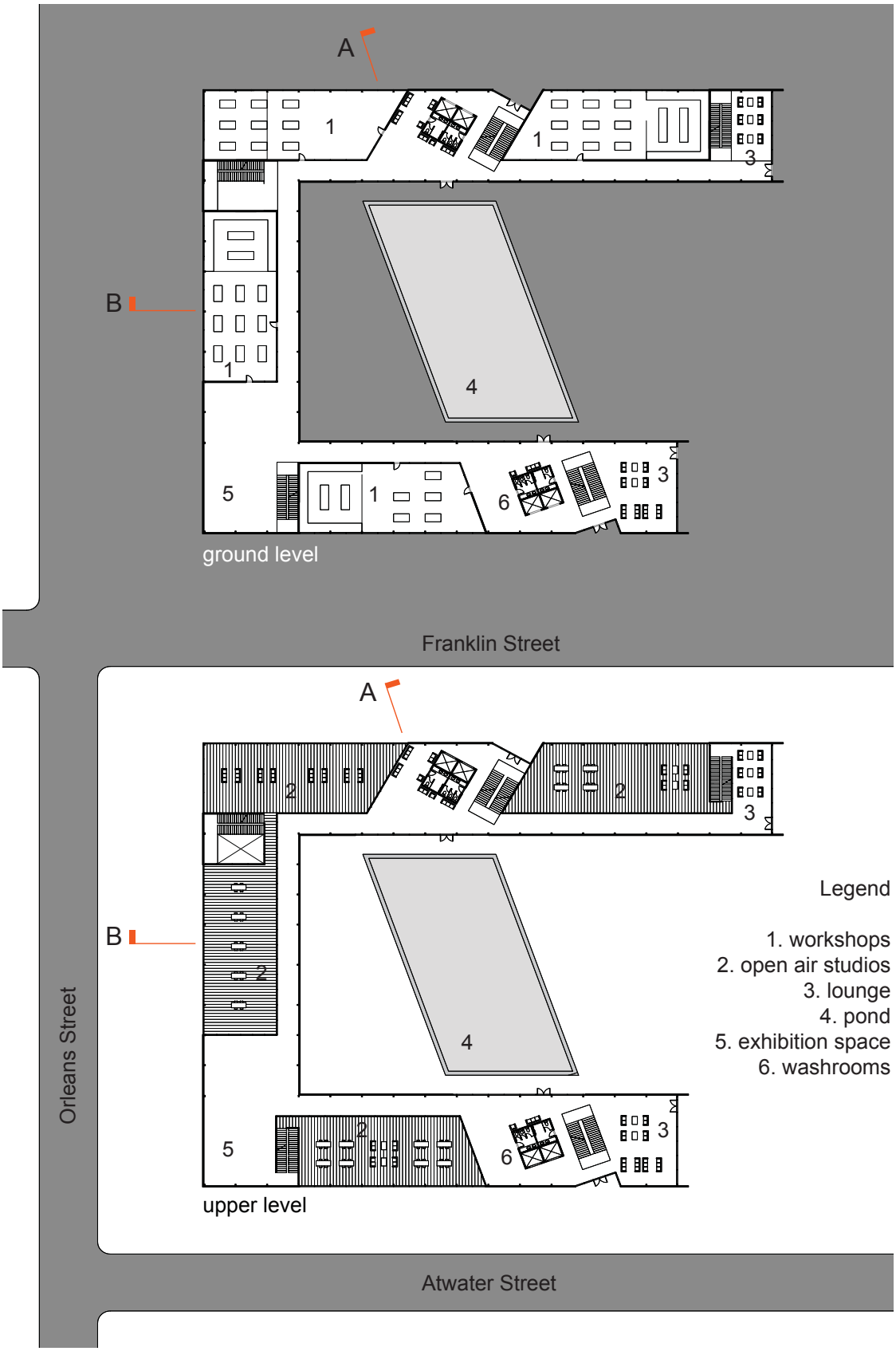


section F — extent of campus

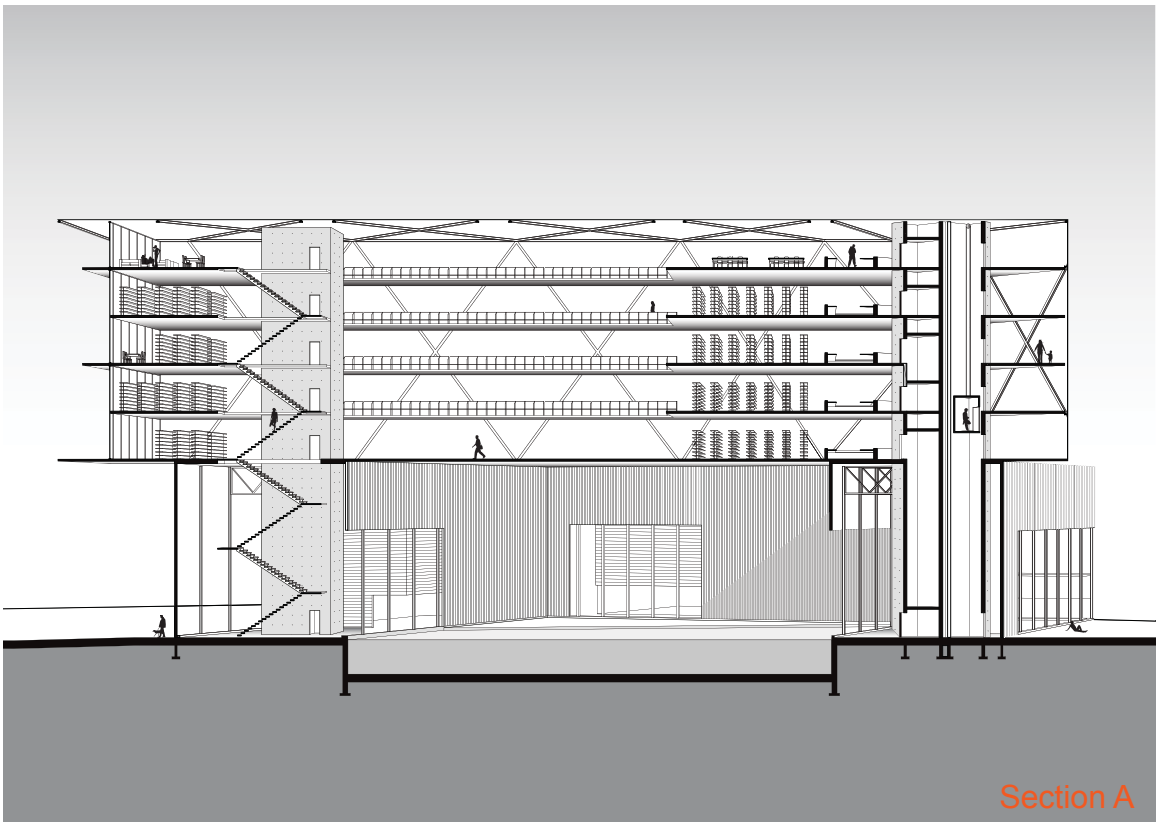
Longitudinal section through proposed campus showing connection between riverfront and Eastern Market District.

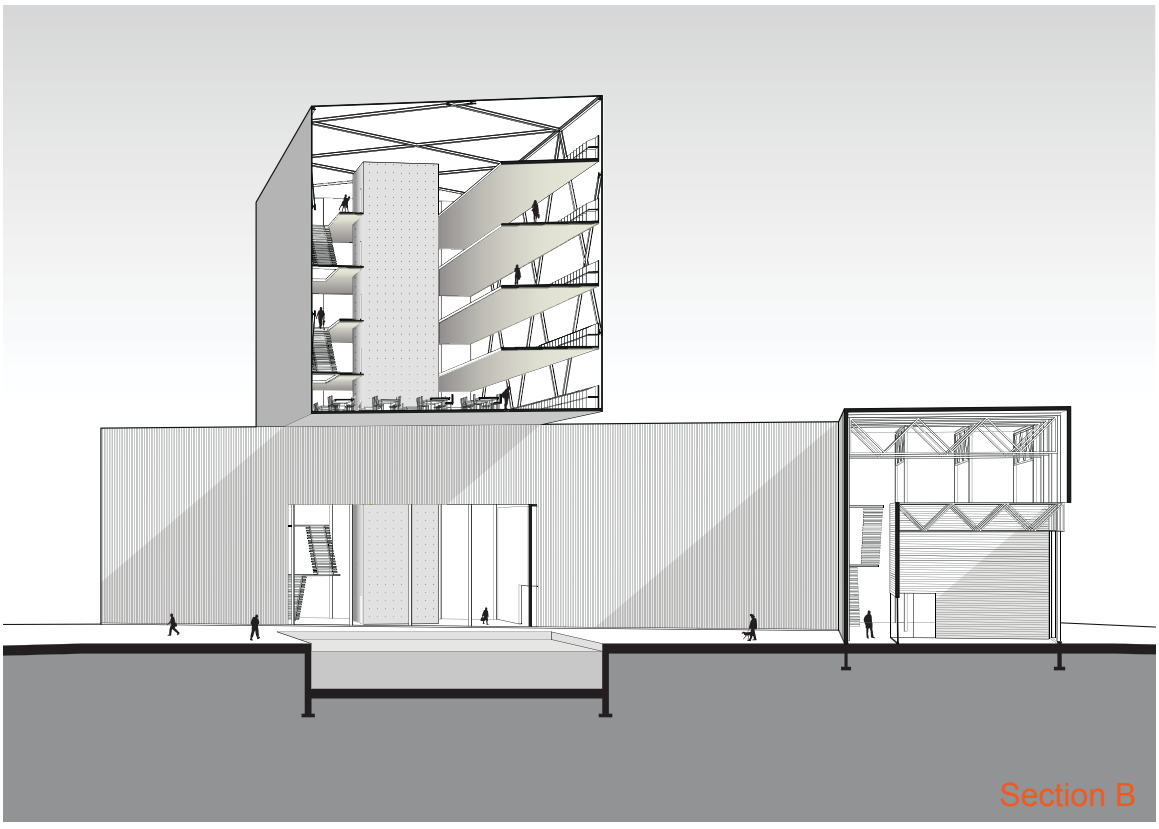


Proposed circulation and services for campus.

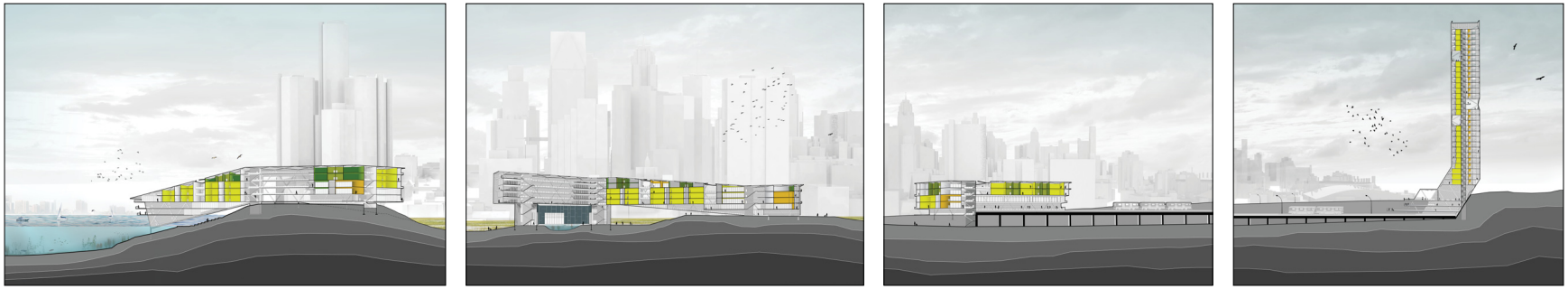


Plans of workshop court building.

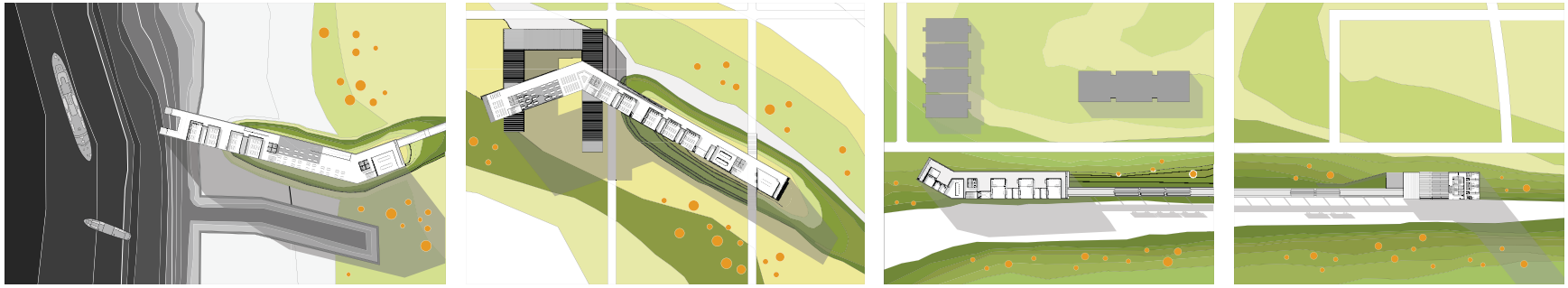




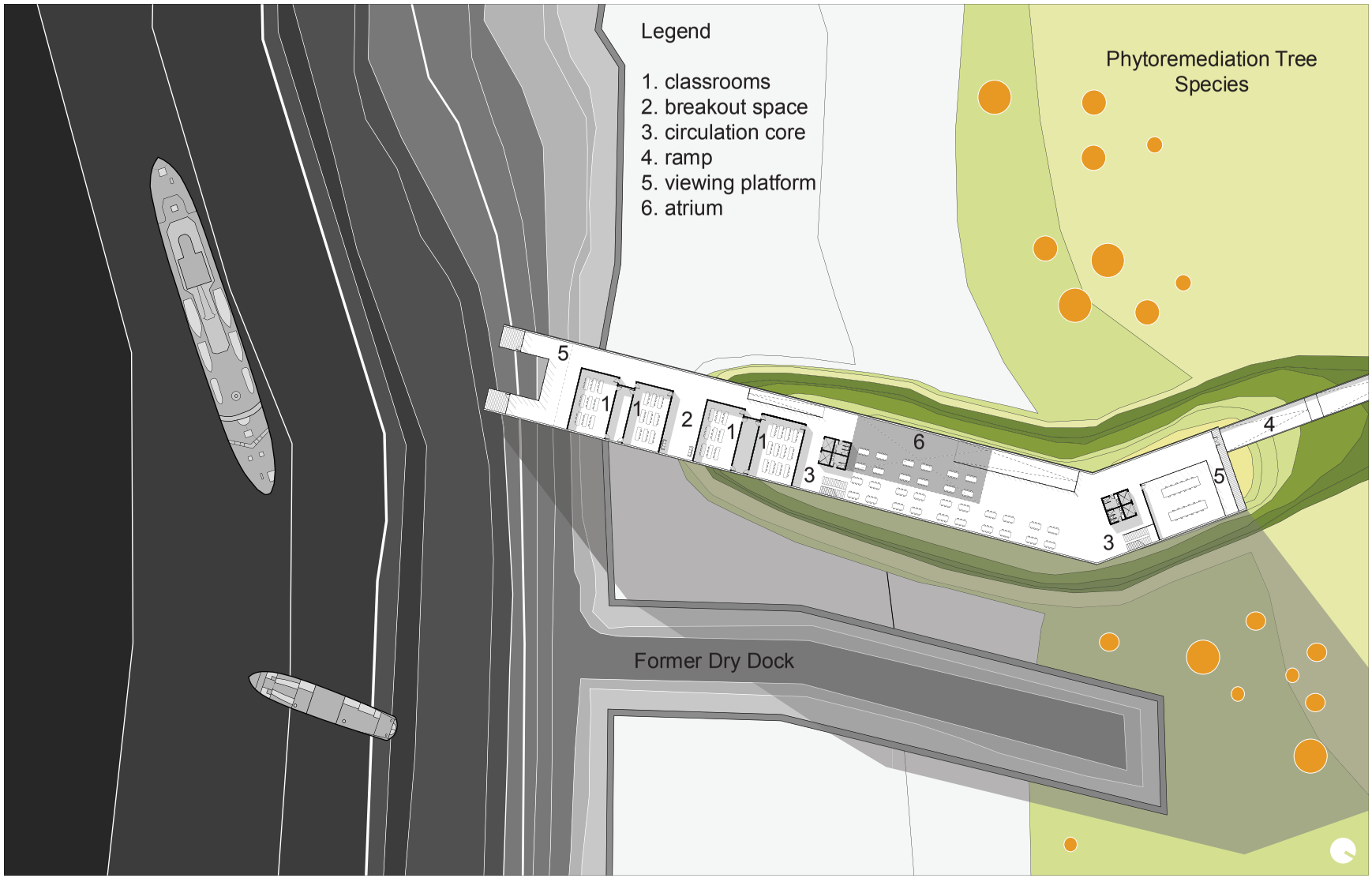
Sections through workshop court building.



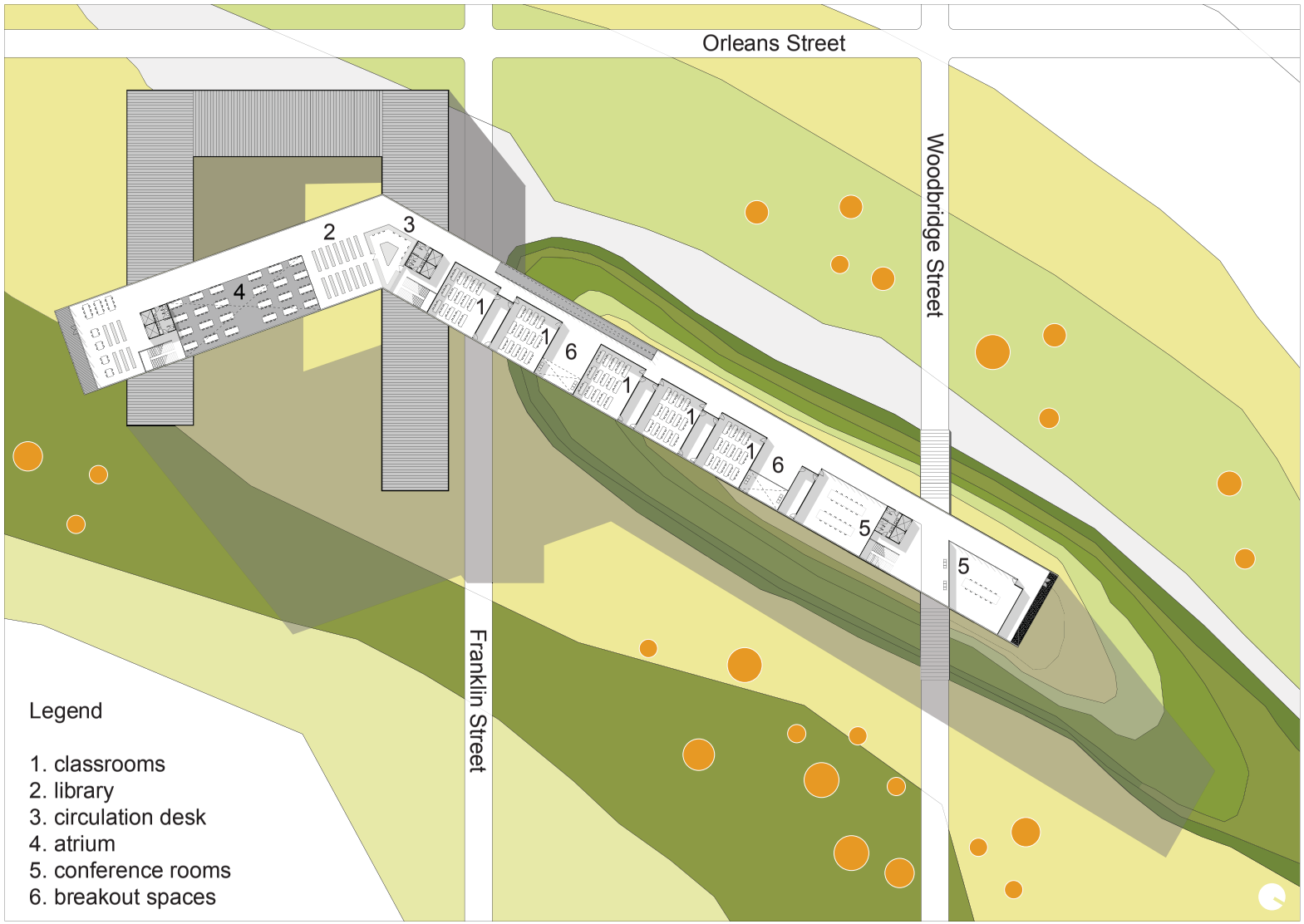
Longitudinal section through four campus buildings that stretch from the Detroit River banks to the Eastern Market District.



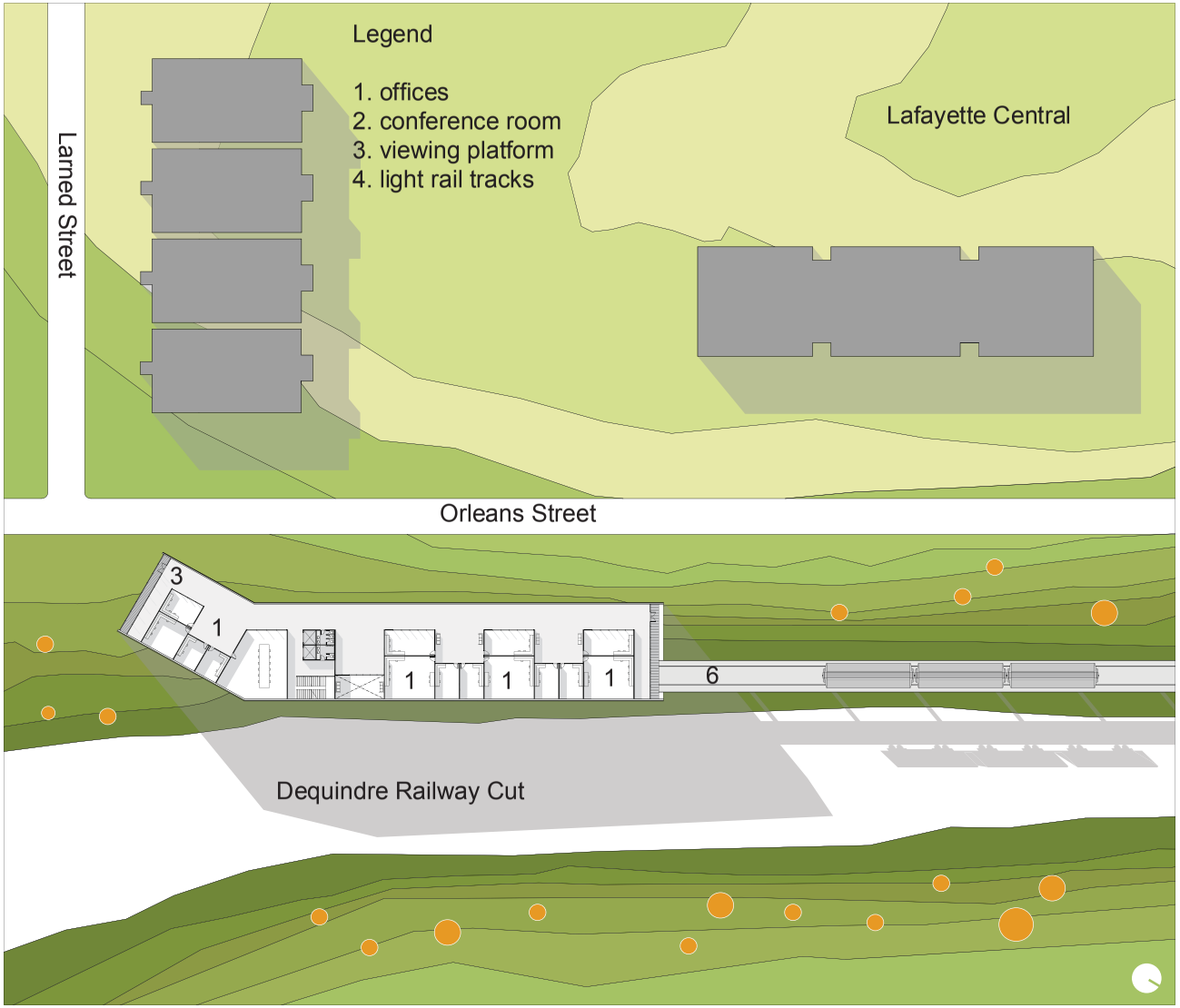
Plans of four campus buildings that are respectfully the water building, a classroom ribbon building, the rail station, and a residence tower.



Plan of water building on the bank of the Detroit River in the Rivertown Warehouse District.

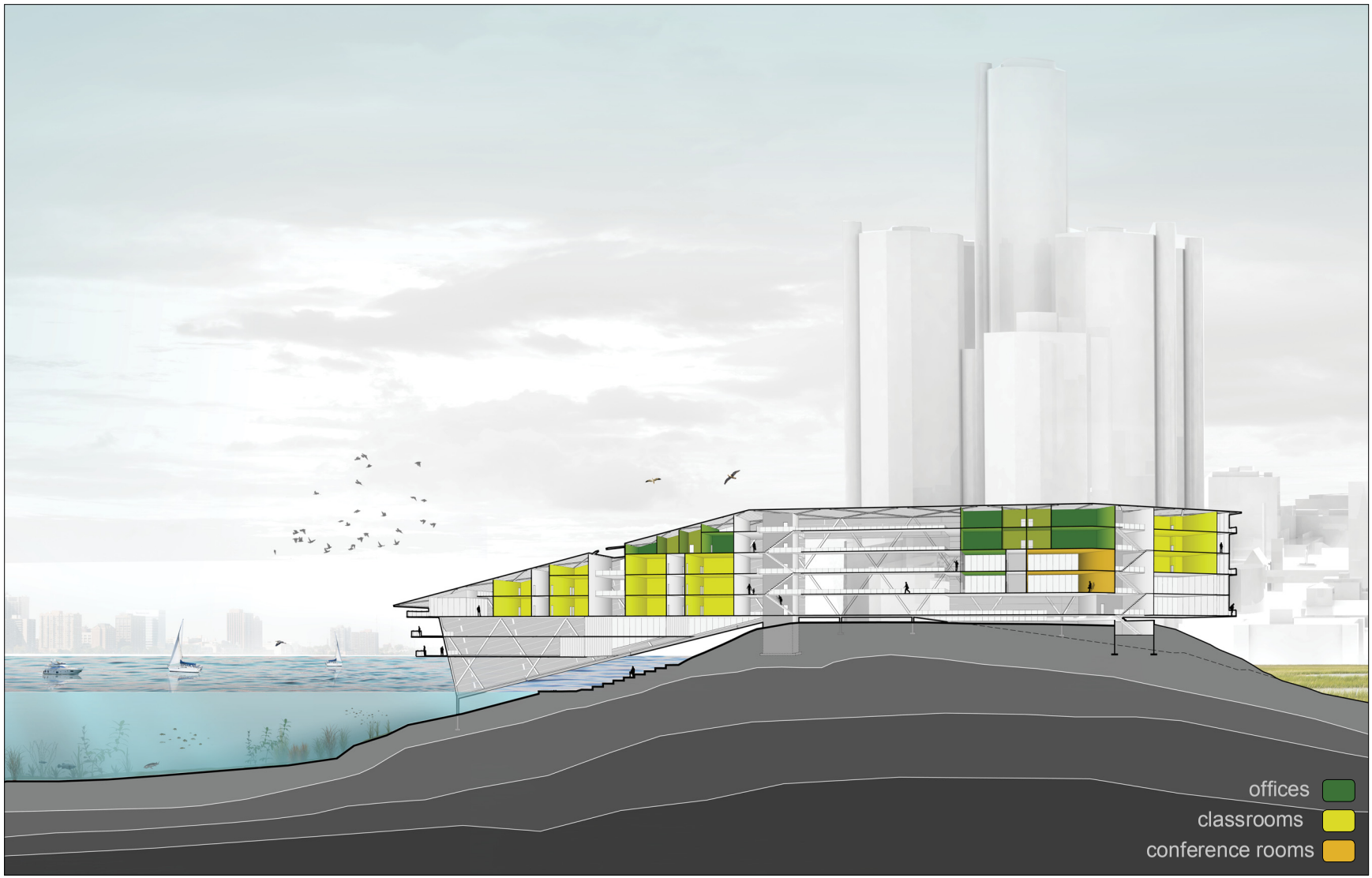


Plan of a classroom ribbon building in Rivertown Warehouse District.

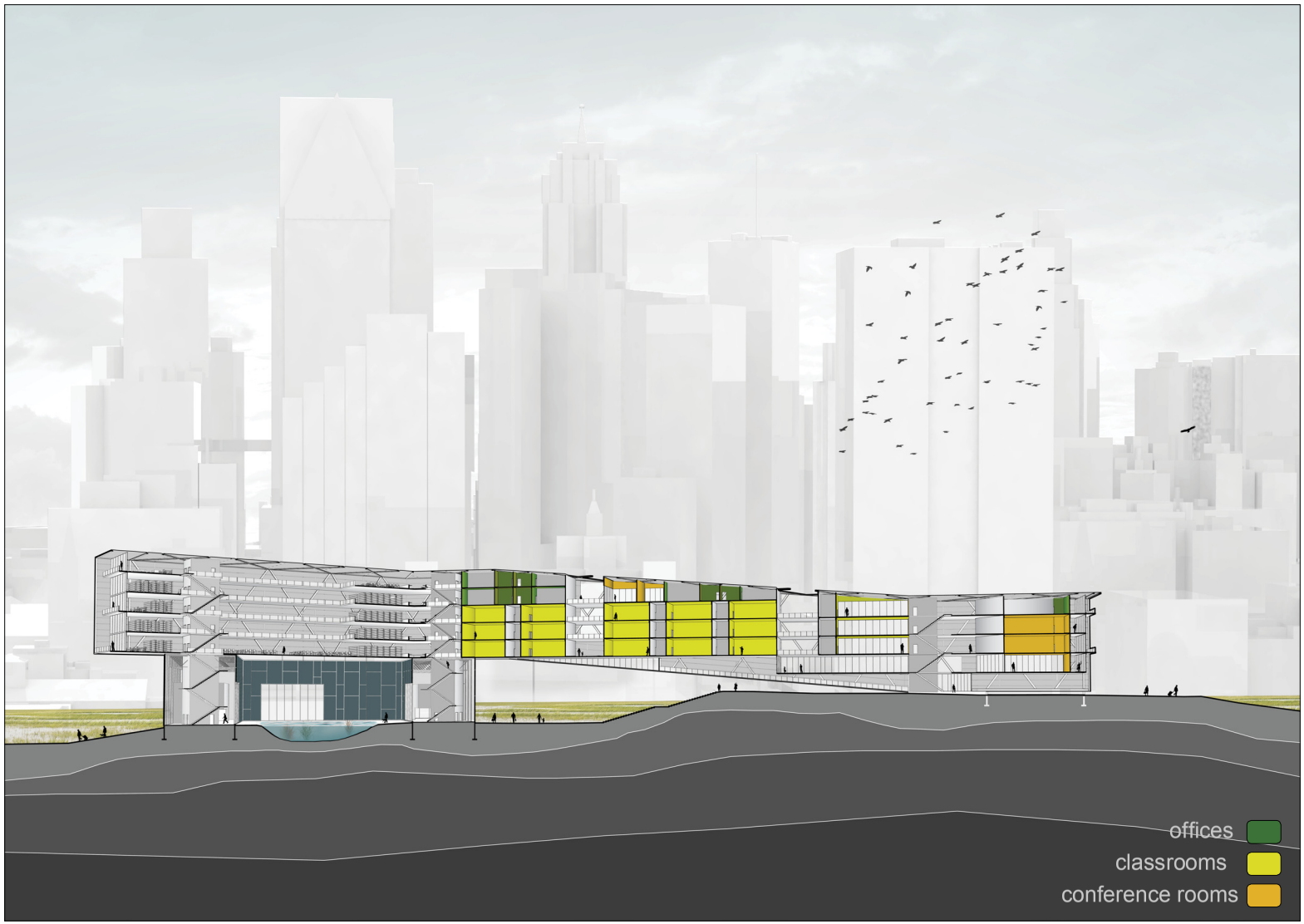


Plan of rail station beside the Dequindre Railway Cut and near the Rivertown Warehouse District.

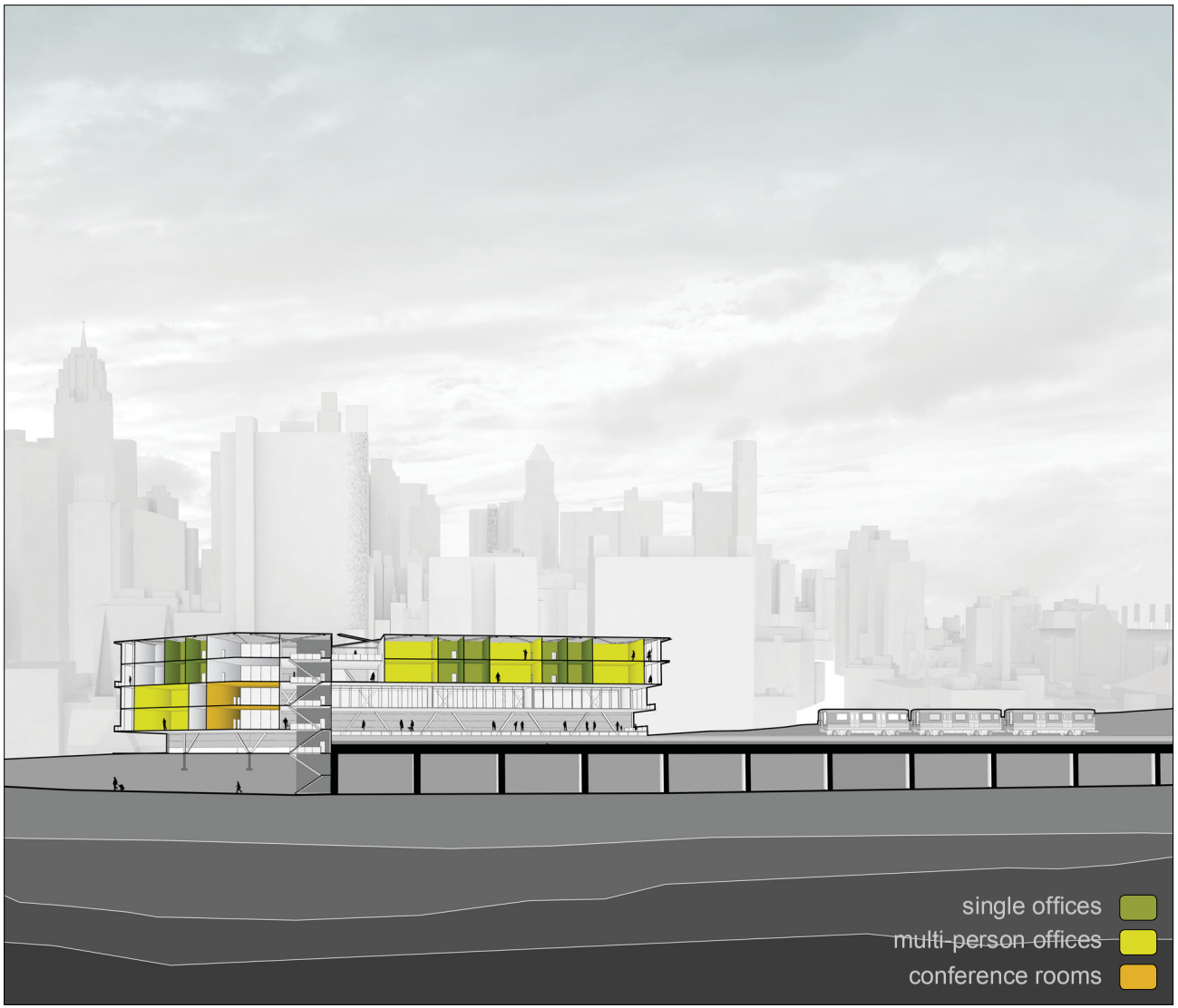
Plan of residence tower beside Dequindre Railway Cut and near Eastern Marke



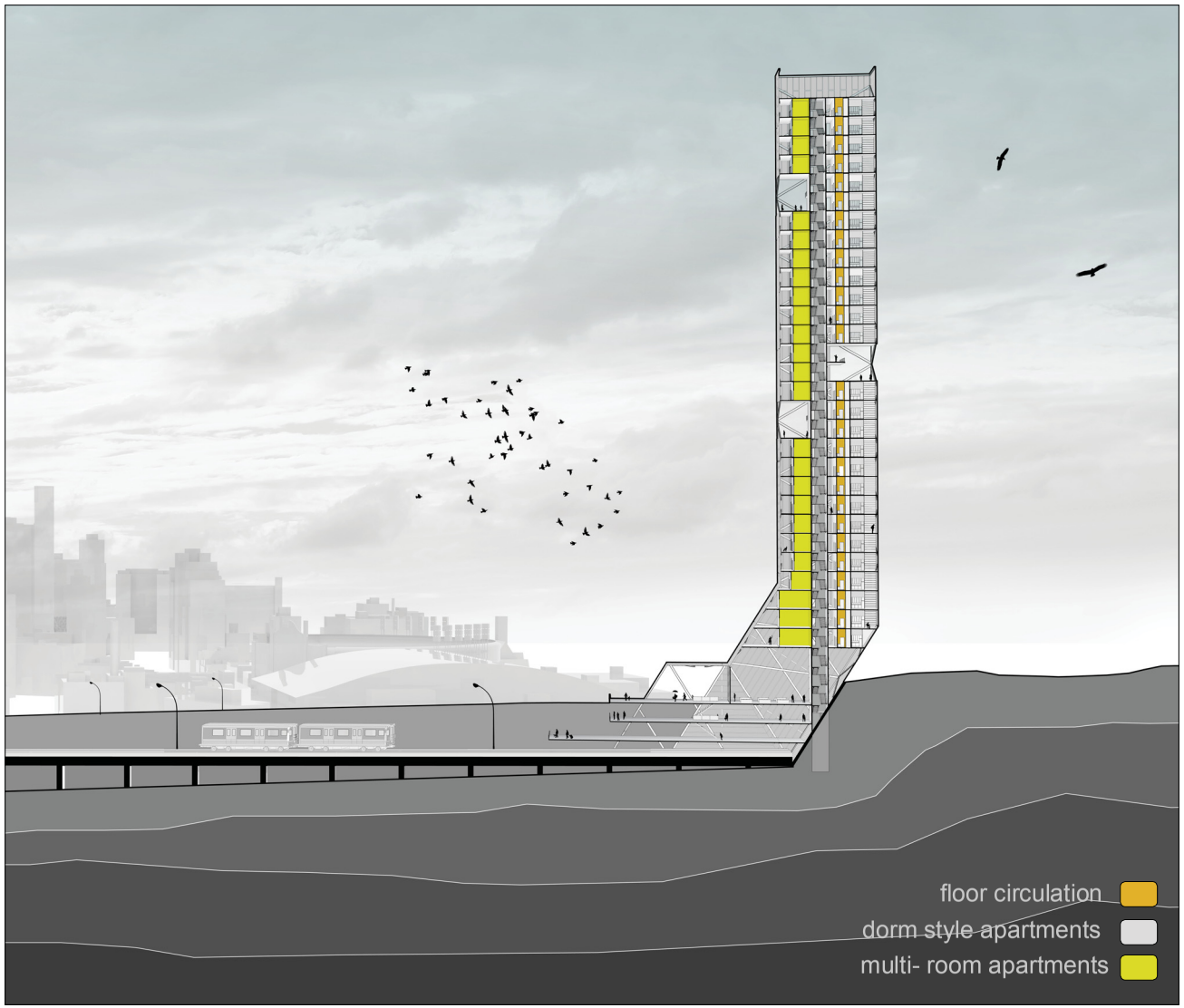
Longitudinal section through the water building on the bank of the Detroit River in the Rivertown Warehouse District.



Longitudinal section through the classroom building in Rivertown Warehouse District.



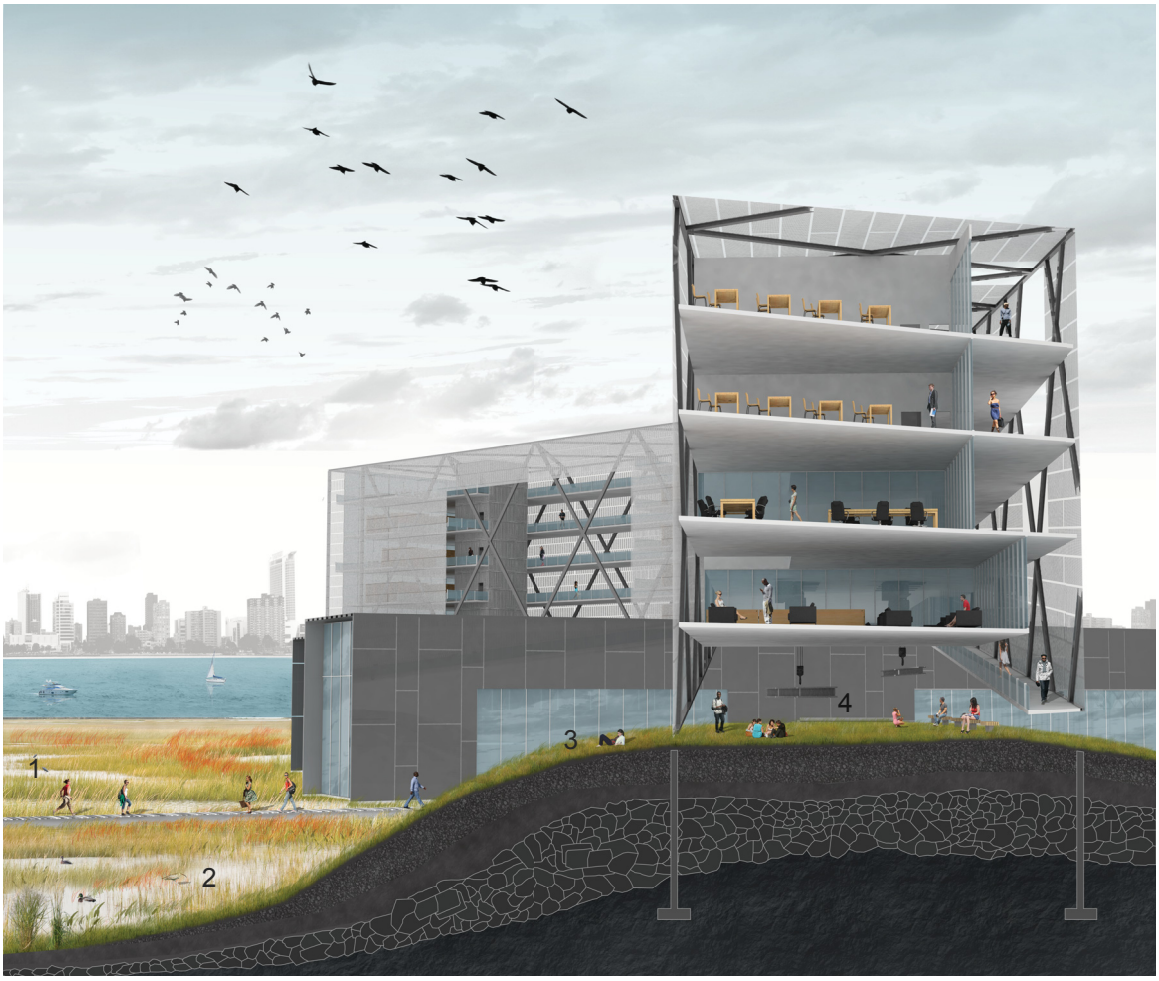
Longitudinal section through rail station building near Rivertown Warehouse District.



Longitudinal section through residence tower near Eastern Market District.

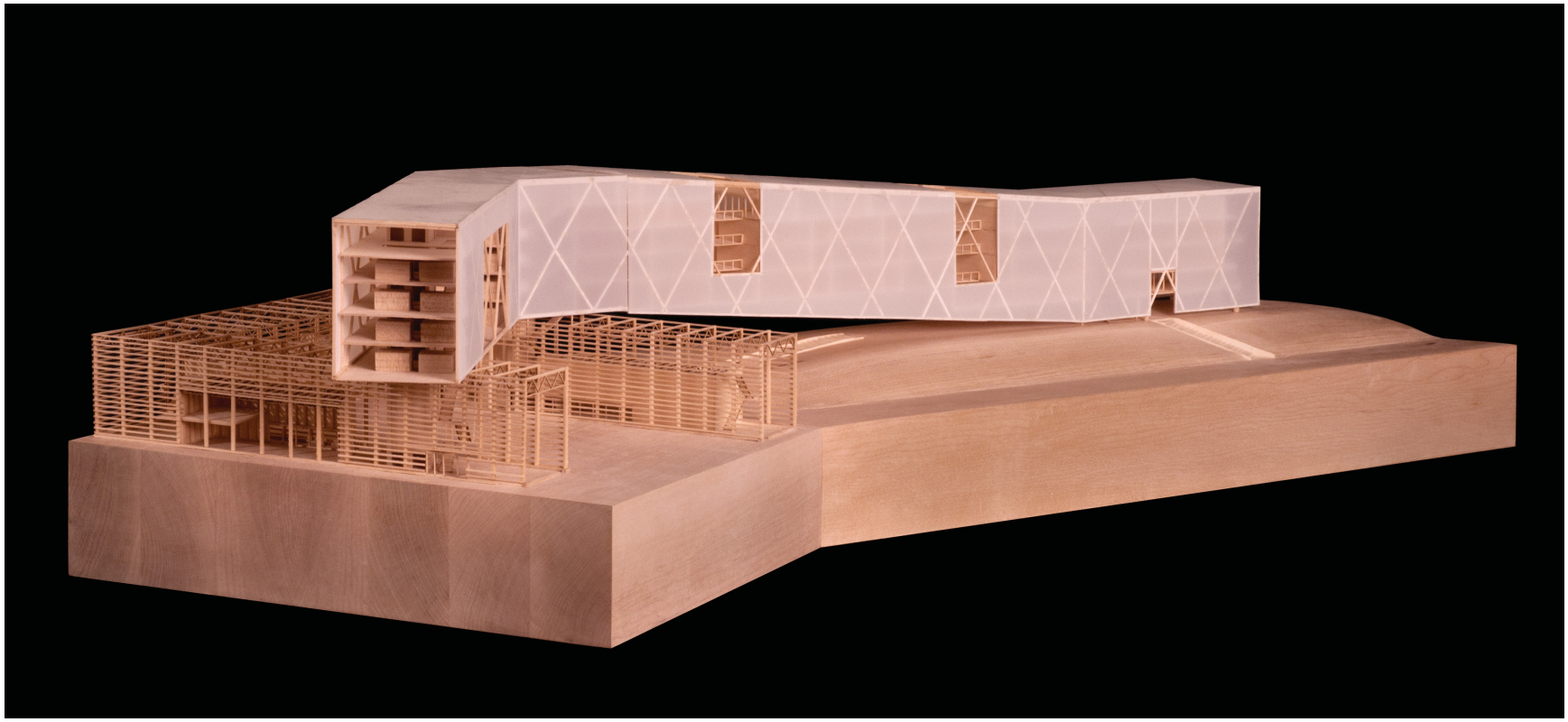
Rendering looking back at the water building from the Detroit River that displays various improvements the proposed campus will have on both the natural and the cultural aspects of the Detroit riverfront including:

1. decreasing the toxin levels in the Detroit River
2. strengthen the ecosystems within the Detroit River
3. increase the biodiversity along the riverfront
4. reestablish the general public's engagement with the waterfront
5. redevelop a working waterfront

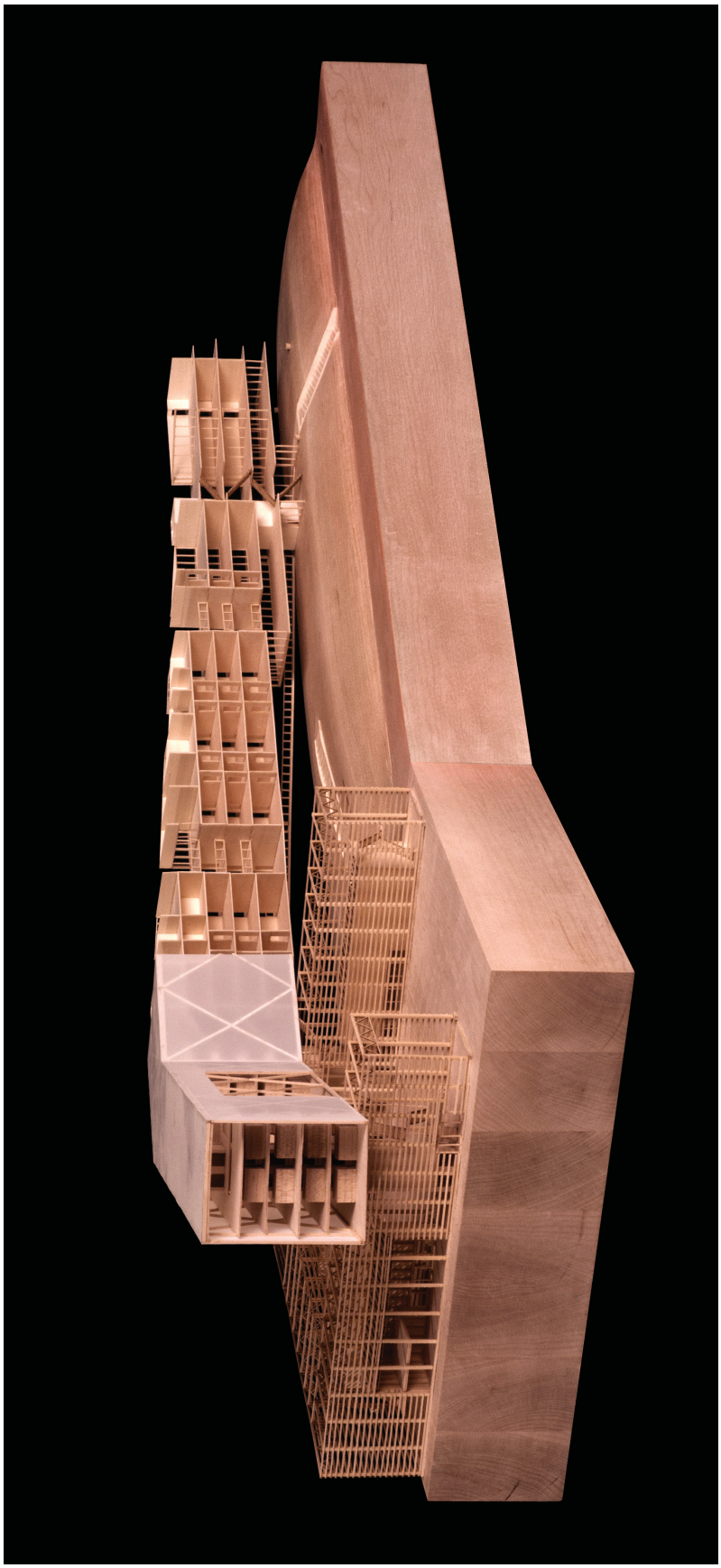


Rendered section through the classroom buildings that displays various improvements the proposed campus will have on the natural and the cultural aspects of the Rivertown District including:

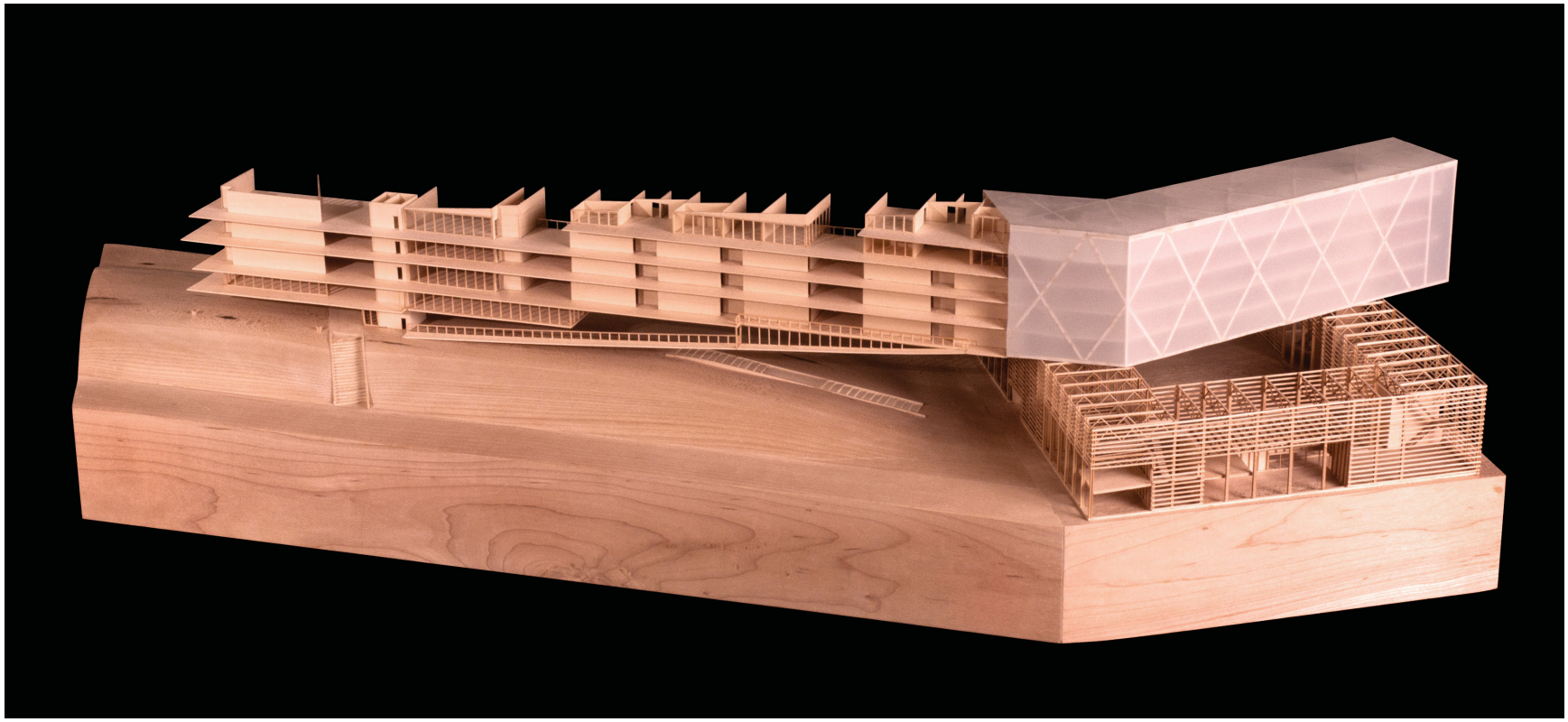
1. the retention of filtration of contaminated stormwater
2. generation of animal habitat
3. encouragement of human interaction with nature
4. reestablishment of a working community



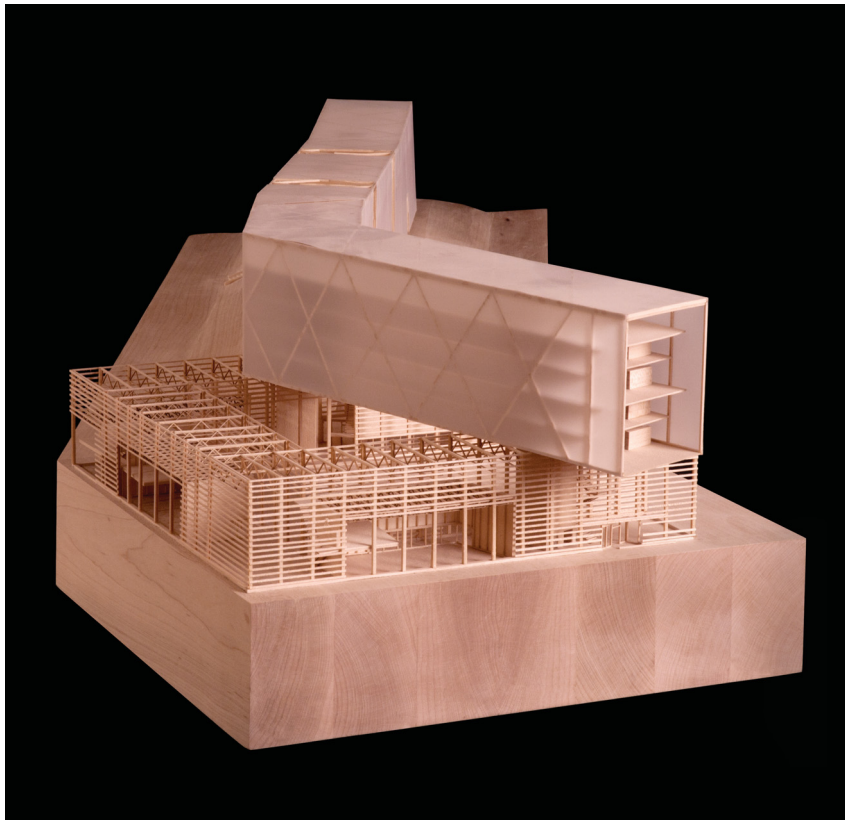
East side of a classroom building with a workshop court below.



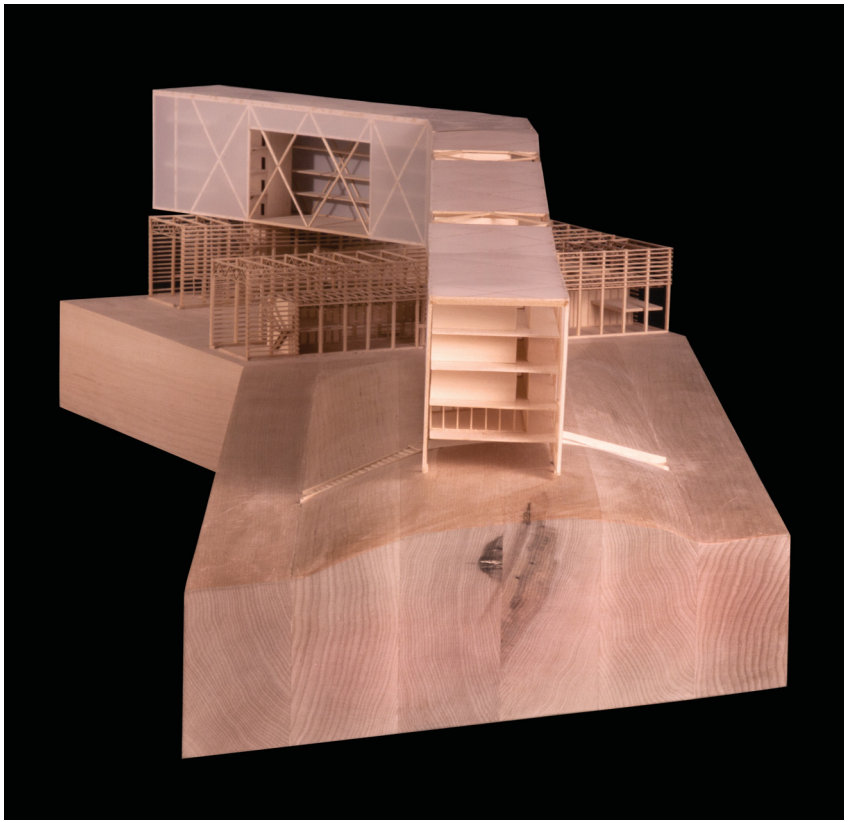
East side of a classroom building with structure and cladding removed.



West side of a classroom building with structure and cladding removed.

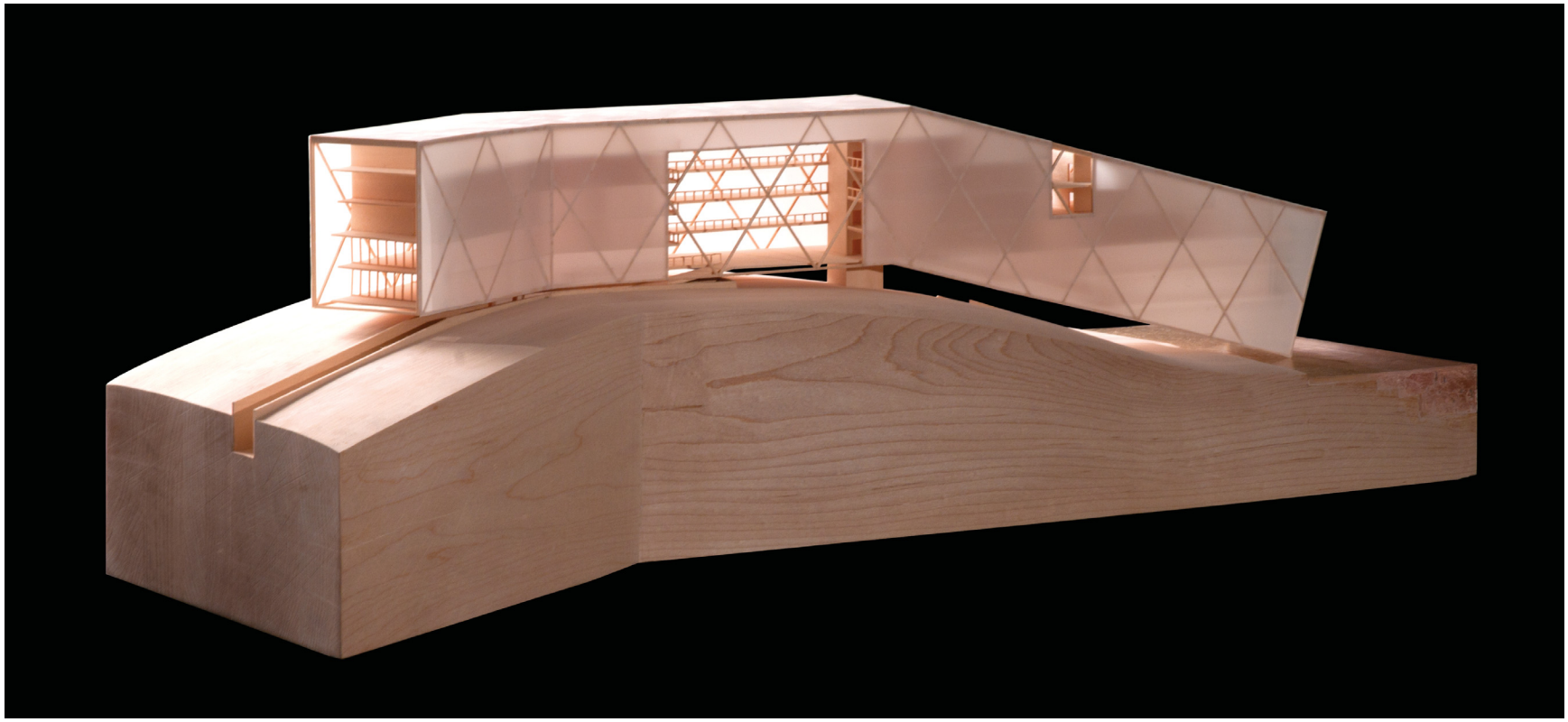


South side of classroom building with workshop court below.



North side of classroom building showing relationship of building to landscape berm.

West side of a water building with structure and cladding removed.

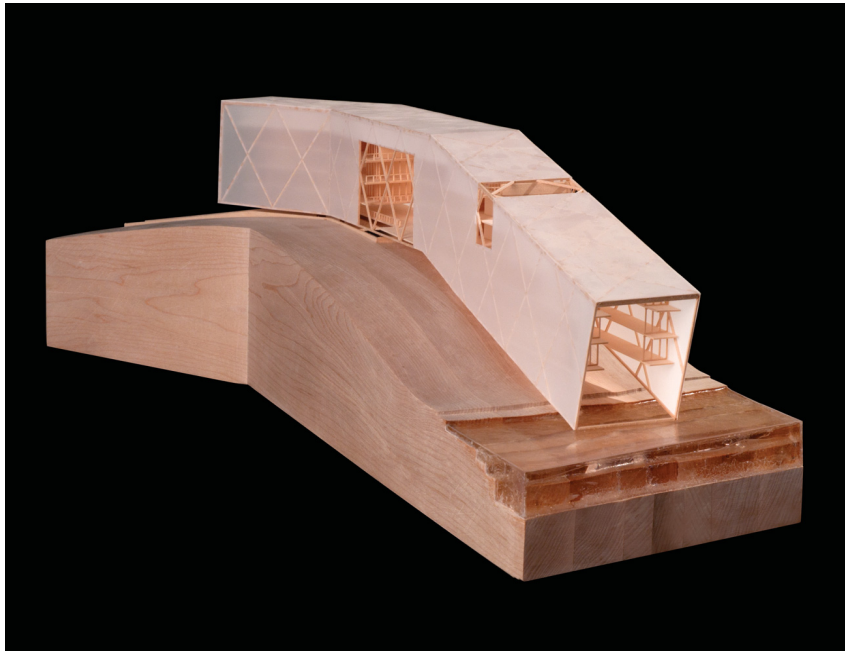


West side of a water building.

West side of water building with structure and cladding removed.

East side of a water building with structure and cladding removed.

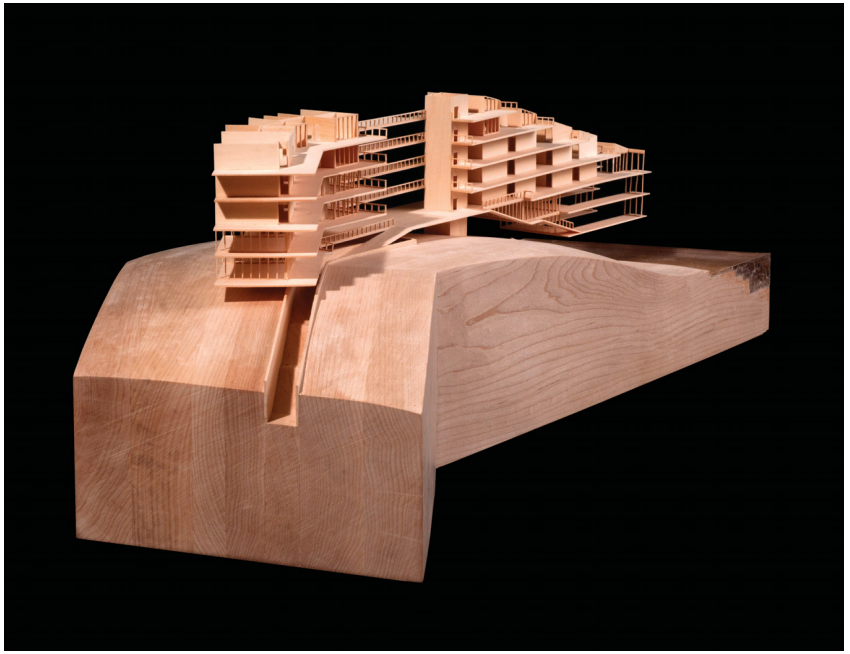
East side of a water building.



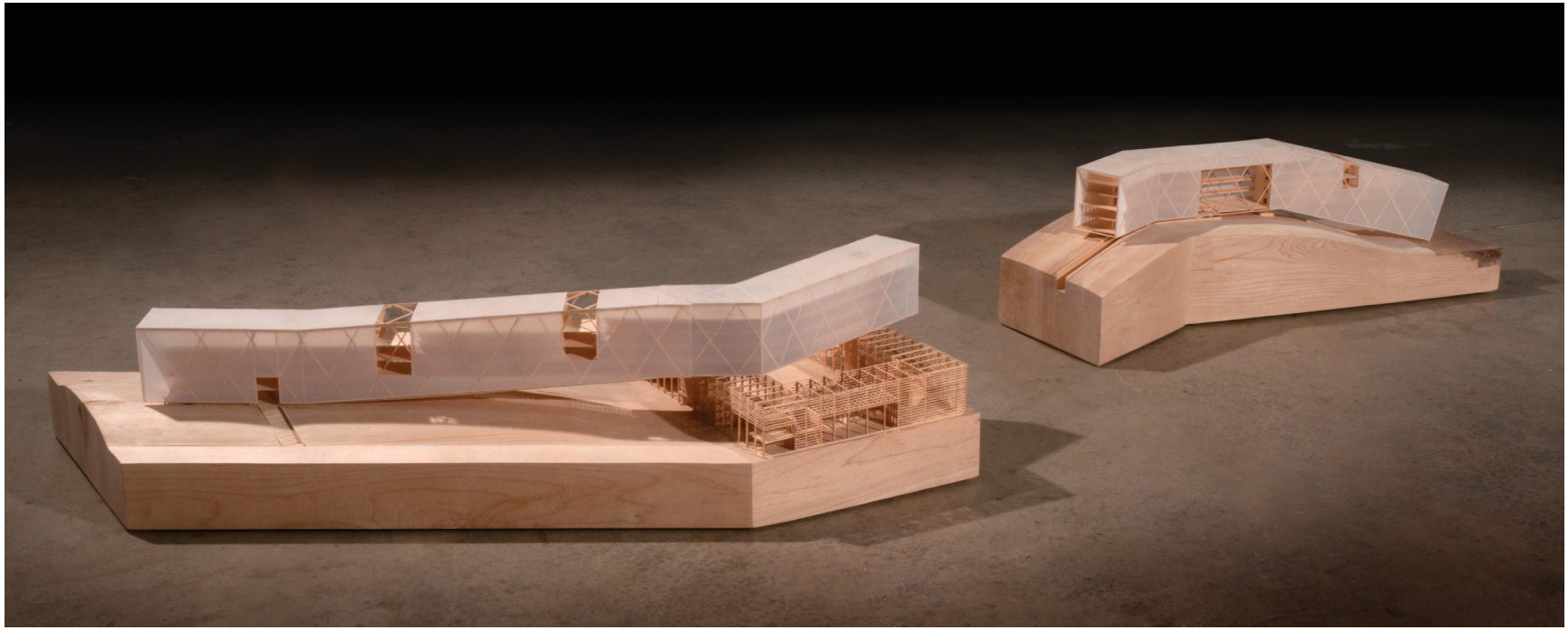
South side of water building showing relationship of building to berm and water.

South side of water building with structure and cladding removed.

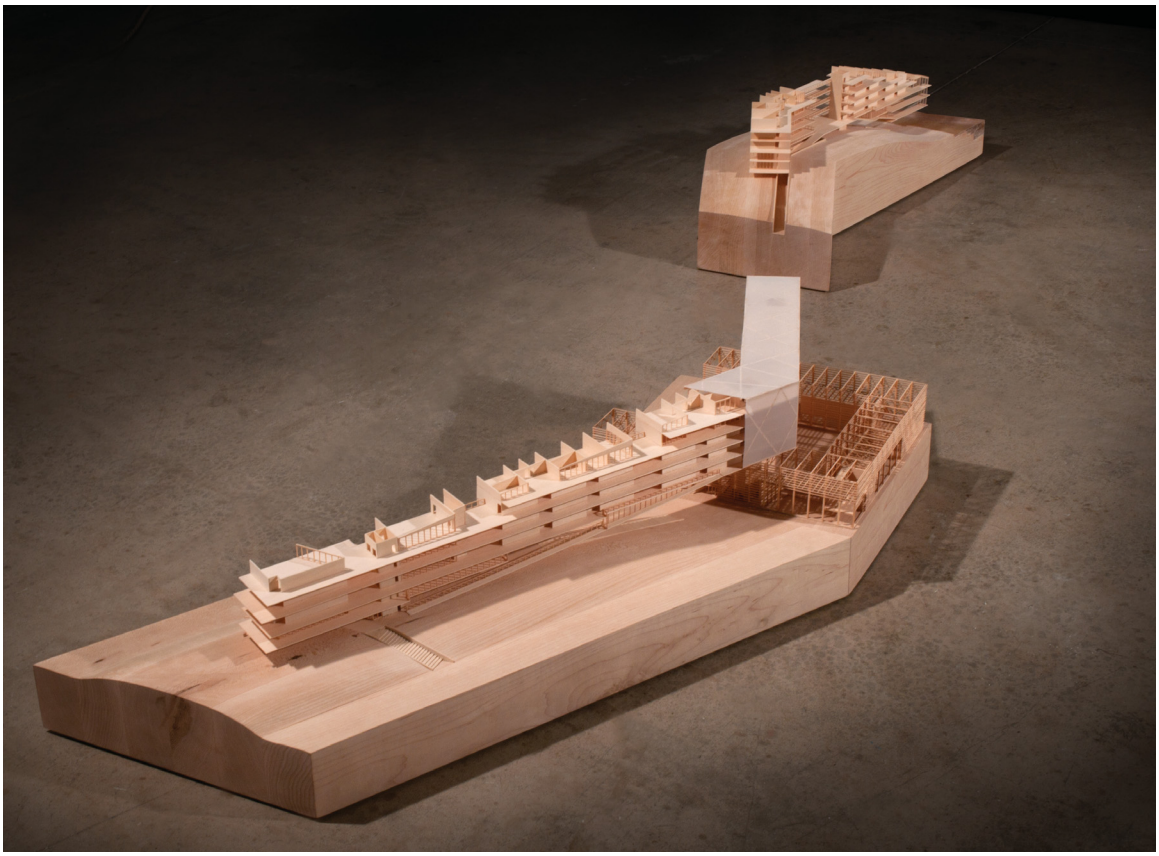
North side of water building.



North side of water building with structure and cladding removed.



Showing visual and physical relationship between the classroom and water building.



Showing visual and physical relationship between the classroom and water building.

CHAPTER 4: CONCLUSION

An underlying theme in the development of this project was the aspect of time. This is evident in the strategy to investigate this project's influence on the City of Detroit from three distinct temporal zones including the 'zone of influence,' the 'zone of control,' and the 'zone of effect.' Perhaps the next step in the development of a project of this magnitude is the establishment of a durational plan or phasing strategy that could be incorporated into the overall project design. The feasibility of such a grand enterprise occurring in a relatively short moment in time, especially in an economically depressed area, would not be viable. As a result a strategic growth strategy that could occur over many years would need to be developed and administered. This would in turn establish many opportunities for investigating how specific design intensions, either natural or urban, would benefit or detriment future developments.

This development of a technical college campus within this thesis provided a vehicle to investigate issues that plague many American Rust Belt cities such as the remediation of underused or abandoned industrial infrastructure and the need for a new architectural typology that is appropriate to shrinking cities. The intention is that the strategies developed in this thesis could be applied to not only other parts of the City of Detroit but also to other cities experiencing a similar decline.

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