

ABSTRACT

Title of Document: ADAPTIVE REUSE IN POST-INDUSTRIAL DETROIT: TESTING THE VIABILITY OF THE ENGINE WORKS

Degree candidate: Jessica M. Green

Degree and year: Master of Architecture, 2008

Thesis directed by: Visiting Associate Professor Ronit Eisenbach
Dean and Professor Garth Rockcastle, FAIA
Professor Karl Du Puy, AIA

The decline of heavy industry and manufacturing in today's major cities has created a serious dilemma. These industrial areas which once brought success and vitality to our cities now exist only as derelict reminders of the past. Through adaptive reuse this thesis reinterprets the industrial landscape as a resource for future growth.

An example of post-industrial Detroit, the abandoned Dry Dock Engine Works facility no longer is the vital center of activity it once was. Using this isolated building on the Detroit Waterfront as the site of operations, this thesis seeks to establish a link between past and future, combining multiple new land uses (museum, market, ferry terminal, business incubator) and existing site elements (building, river, rail/trail) to generate a ripple effect of social energy. The interaction between these diverse elements not only creates a new "reason for being" for the Engine Works, but a reason for growth in a shrinking city.

ADAPTIVE REUSE IN POST-INDUSTRIAL DETROIT:
TESTING THE VIABILITY OF THE ENGINE WORKS

By
Jessica M. Green

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
2008

Advisory Committee:
Visiting Associate Professor Ronit Eisenbach, Chair
Dean and Professor Garth Rockcastle, FAIA
Professor Karl Du Puy, AIA

Acknowledgements

I would like to thank my committee members, for without their enthusiasm and patience this thesis would not have been possible.

I would also like to thank the following people for their help and support:

Erin Carlisle
Natalia Chetvernina
Lin Mao
Dan Pitera
Corey Powell
Kat Shieh
Cindy Thompson
Steven Vogel
Brittany Williams
Krista Wilson
Detroit Collaborative Design Center
University of Detroit Mercy School of Architecture

Table of Contents

Acknowledgements	ii
Table of Contents	iii
List of Figures	iv
Introduction	1
Site of Operations	3
Program Exploration	25
Design Strategies	31
Design Proposal	45
Reflection	57
Notes	58
Bibliography	59

List of Figures

Figure 1. Regional Map	3
Figure 2. City Map	3
Figure 3. Historic View of Detroit Riverfront [1855]	4
Figure 4. Map of East Riverfront District of Detroit, MI	5
Figure 5. East Riverfront District Land Use - Existing [top] + Proposed [bottom]	6
Figure 6. Detroit Riverwalk Historic Plaque	7
Figure 7. Site Plan locating the three marine engine firms.	8
Figure 8. Site Evolution of the Dry Dock Engine Works	9
Figure 9. Aerial View of Detroit's East Riverfront	10
Figure 10. Greater Detroit Context	11
Figure 11. Hard Connectors	12
Figure 12. Soft Connectors	12
Figure 13. Regional/International Hubs	12
Figure 14. Detroit Riverwalk Rendering	13
Figure 15. Photostitch : Dequindre Cut Trail	14
Figure 16. Photographs: Dequindre Cut Trail	15
Figure 17. Drawing: Dequindre Cut Trail	15
Figure 18. Site Aerial and Context	16
Figure 19. Site Aerial and Building Context	17
Figure 20. Spatial Investigation	18
Figure 21. Machine Shop Information	19
Figure 22. Industrial Loft Building Information	20
Figure 23. Foundry Information	21
Figure 24. Chipping Room Information	22
Figure 25. Machine Shop Addition Information	23
Figure 26. Shipping + Receiving Room Information	24
Figure 27. New Program Elements for the Dry Dock Engine Works Site	27
Figure 28. Program: Movement Systems	28
Figure 29. Program: Interface	29
Figure 30. Program: Detroit Museum of Industry + Innovation	30
Figure 31. Artists as Conceptual Drivers	32
Figure 32. Design Strategy: Formal Driver - Accretion	33
Figure 33. Design Strategy: Formal Driver - Connection/Extension	34
Figure 34. Design Strategy: Formal Driver - Insertion	35
Figure 35. Design Strategy: Formal Driver - Subtraction	36
Figure 36. Design Strategy: Formal Driver - Overlap	37
Figure 37. Site Interventions: Composite	38
Figure 38. Site Interventions: Existing Conditions	39
Figure 39. Site Interventions: Courtyard	40

List of Figures

Figure 40. Site Interventions: Transit System	41
Figure 41. Site Interventions: Bicycle System	42
Figure 42. Site Interventions: Museum	43
Figure 43. Site Interventions: Commerce	44
Figure 44. Ripple Effect: Site Resources	45
Figure 45. Ripple Effect: Program Strategy	46
Figure 46. Site Plan	47
Figure 47. Dry Dock Engine Works: Ground Floor Plan	48
Figure 48. Dry Dock Engine Works: Second Floor Plan	49
Figure 49. Dry Dock Engine Works: Third Floor Plan	50
Figure 50. Dry Dock Engine Works: Section Looking South	51
Figure 51. Site Evolution of the Dry Dock Engine Works: Including 2008 Proposal	52
Figure 52. View From Atwater Street	53
Figure 53. View Inside Machine Shop Museum Hall	54
Figure 54. Views of Courtyard	55

Introduction

“In the evolutionary urban order, Detroit today has always been your town tomorrow...Detroit remains a surpassingly purposeful place, as important to the nation right now as it has ever been - maybe more so, because right now it is telling us that the cities are in trouble. Detroit is the advance warning system - the flashing red light and siren - for what could be a catastrophic urban meltdown, and the country had damn well better pay attention.”

*- former Mayor Coleman A. Young
from his autobiography, 1994.*

This thesis began with a fascination with the past, and a curiosity of a city's future. Driving through the City of Detroit, one cannot help but wonder what activities once took place in the now vacant buildings and city blocks. Detroit was once one of the most populated cities in the United States. However, today it is considered a shrinking city; one that suffers from depopulation, fragmentation and neglect. Despite Detroit's deteriorated state, this author believes there are many lessons to be learned; especially ones of reappraisal and revival. This thesis poses several questions regarding the process of adaptive reuse as a design method and as a means of urban regeneration. As a design method, several conceptual and formal strategies are explored at both the urban and architectural scale. The application of these

strategies is the author's attempt at understanding how to reuse; how to integrate the old with the new; how to determine what to retain and/or demolish of existing historic structures. A mixed-use program is investigated on the selected site – The Dry Dock Engine Works – as an attempt to understand what role historic structures can play in the regeneration of communities and urban districts.

The Dry Dock Engine Works [DDEW] site is historically significant for two major reasons. One, the noteworthy role it plays in the evolution of American factory construction methods; the existing structures to serve as a vital showcase for one of the earliest steel-structure buildings in America. Two, the important role it played within the Detroit/Great Lakes shipbuilding industry; the DDEW was vital in the manufacturing and repairing of marine steam engines and boilers between 1866 and the mid-1920s. Today, this thesis explores how the adaptive reuse of the abandoned Dry Dock Engine Works site can play a vital role in Detroit's future. The reuse of such a site could generate a ripple effect of growth and activity along the valuable Detroit Riverfront, proving that even amongst such destruction one can find the seeds of revival.

Site of Operations

"I have never seen a derelict landscape where something wonderful could not occur."

- Patricia Johanson from her lecture, "Art and the Ecological Landscape", University of Maryland School of Architecture, Planning, and Preservation, October 17, 2007.



Figure 1: Regional Map. The red dot indicates the City of Detroit.
[Image by author.]

The Detroit Riverfront has transformed significantly from its origins of wilderness and farmland. What remains of the north-south grid of river-to-inland streets reminds us of the long and narrow farms that were here during the eighteenth century. During the nineteenth century, the effects of the Industrial Revolution were made visible along the riverfront. As a result of the rapidly developing heavy industry, the once natural face of the city became a production zone and transportation way of materials and goods. The maritime, railroad, and automobile industries all left their mark on the Detroit Riverfront.

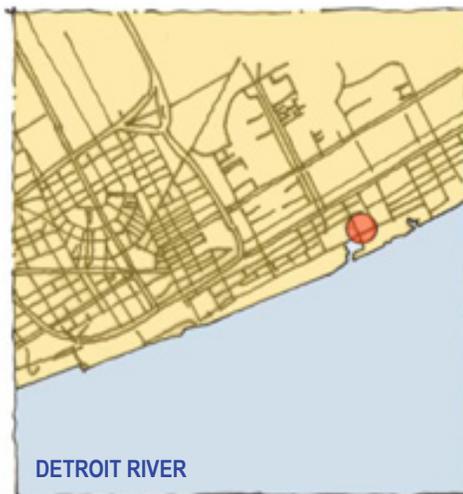


Figure 2: City Map. The red dot indicates the Dry Dock Engine Works site within the East Riverfront District.
[Image by author.]

By the mid-twentieth century, pieces of the industrially privatized riverfront were reclaimed, returning to the public places of civic purpose. This process of reclamation and reinterpretation continues today, especially through the efforts of the Detroit Riverfront Conservancy.

The Jefferson Corridor, by the late eighteenth century, was a sought-after place to live outside the boundaries of the frontier town. By the mid-nineteenth century, developing industries and rail lines infringed upon the quality of life along the corridor. At the beginning of the twentieth century, an assortment of apartment buildings, institutions, and commercial sites made for a lively urban environment; however, such dynamism was short-lived. Since the mid-twentieth century, planning and development efforts have been scattered and unfulfilled. Current efforts; however, show signs of improvement. This area of the city has transformed numerous times over the course of its 300 year history, and it continues to change today. The East Riverfront District is changing from a heavy industrial area to a mixed-use district containing residential, recreational, and commercial uses.



Figure 3: Historic View of Detroit Riverfront [1855]. This depicts the once densely developed and active [maritime] industrial riverfront. [The Buildings of Detroit: A History.]



Figure 4: Map of East Riverfront District of Detroit, MI. East of the Downtown core of Detroit is the East Riverfront District, also known as Rivertown. The selected site for this thesis lies within the boundaries of this district. It is defined by Jefferson Avenue to the north, the Detroit River to the south, the Belle Isle Bridge to the east, and Rivard Street to the west. [Image by author.]



Figure 5: East Riverfront District Land Use - Existing [top] + Proposed [bottom]. This depicts the City's intent to re-purpose the riverfront, assisting in the transformation from industrial to residential/commercial/recreational land use. [City of Detroit Master Plan of Policies.]

Before the automobile industry took hold of the City of Detroit and its riverfront in the early 1900s, shipbuilding constituted one of the more established industries of the city. More specifically, the East Riverfront District was a very important hub of shipbuilding activity. This district comprised of numerous manufacturers of marine steam engines, as well as multiple dry docks. Marine steam engines were constructed at the site of the Dry Dock Engine Works for a period of sixty years, between the mid-1860s and the mid-1920s.

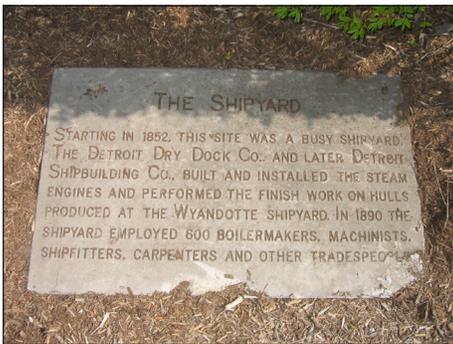


Figure 6: Detroit Riverwalk Historic Plaque.
[Photograph by author.]

Detroit saw its first steamship constructed, the *Argo*, in 1827. The *Michigan* followed soon after, in 1833. Rather than sending their vessels to Buffalo, NY for repairs, Detroit ship-owners expressed a need for the city to operate its own dock facilities; several dry docks were in operation by 1852. That same year, on the East Riverfront at the end of Orleans Street, a ship repair yard was established by Campbell, Wolverton and Company. "This site was the ancestor to a succession of shipbuilding firms: Campbell & Owen, the Detroit Dry Dock Company, and the Detroit Shipbuilding Company."¹

During the following decades the East Riverfront experienced extensive industrial development, as many more engine manufacturers and dry docks were established. Three significant marine engine firms appeared along the east riverfront between 1863 and 1866: Cowie, Hodge & Company, the Frontier Iron Works, and the Dry Dock Engine Works.

“[An] outstanding feature of these three firms was their geographic concentration along the east riverfront of Detroit. The Samuel Hodge enterprise was located at Rivard and Atwater. The Frontier Iron and Brass Works was established at the corner of Chene and Atwater. The Dry Dock Engine Works stood between these two facilities, at the corner of the intersection of Orleans and Atwater, opposite the Campbell and Owen Shipyard...For much of the nineteenth century, the downtown core of Detroit featured an array of residences, public buildings, retail stores, craft shops, and small industrial companies. In the 1860s...heavy industrial activities began to move beyond the central city to underdeveloped areas along the riverfront. By 1880, ‘the riverfront had become a long industrial strip.’”

- Thomas A. Klug²

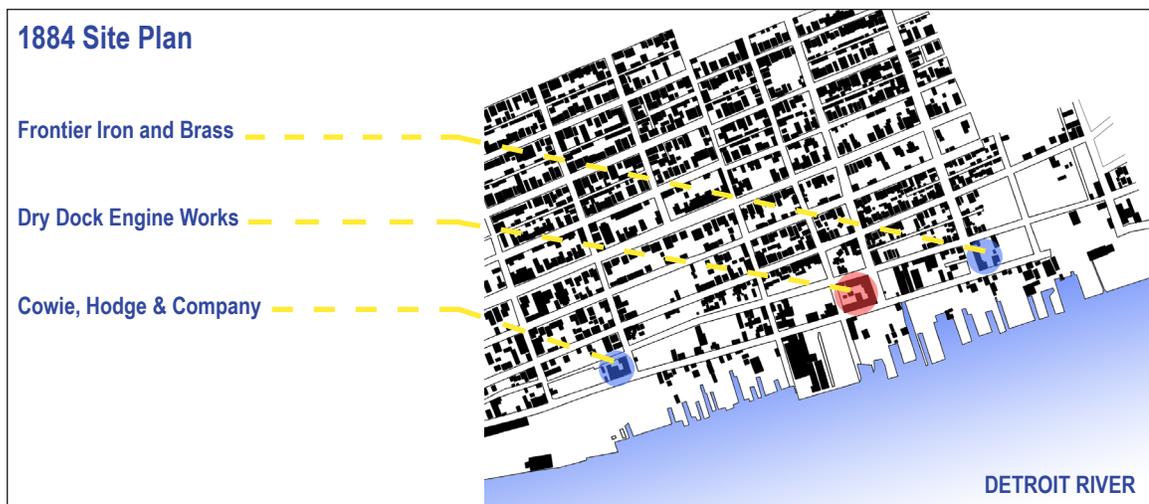


Figure 7: Site Plan locating the three marine engine firms. It is clear that the industrial concentration along the riverfront was not by chance; access to the river was, and still is, highly desirable. [Image by author.]

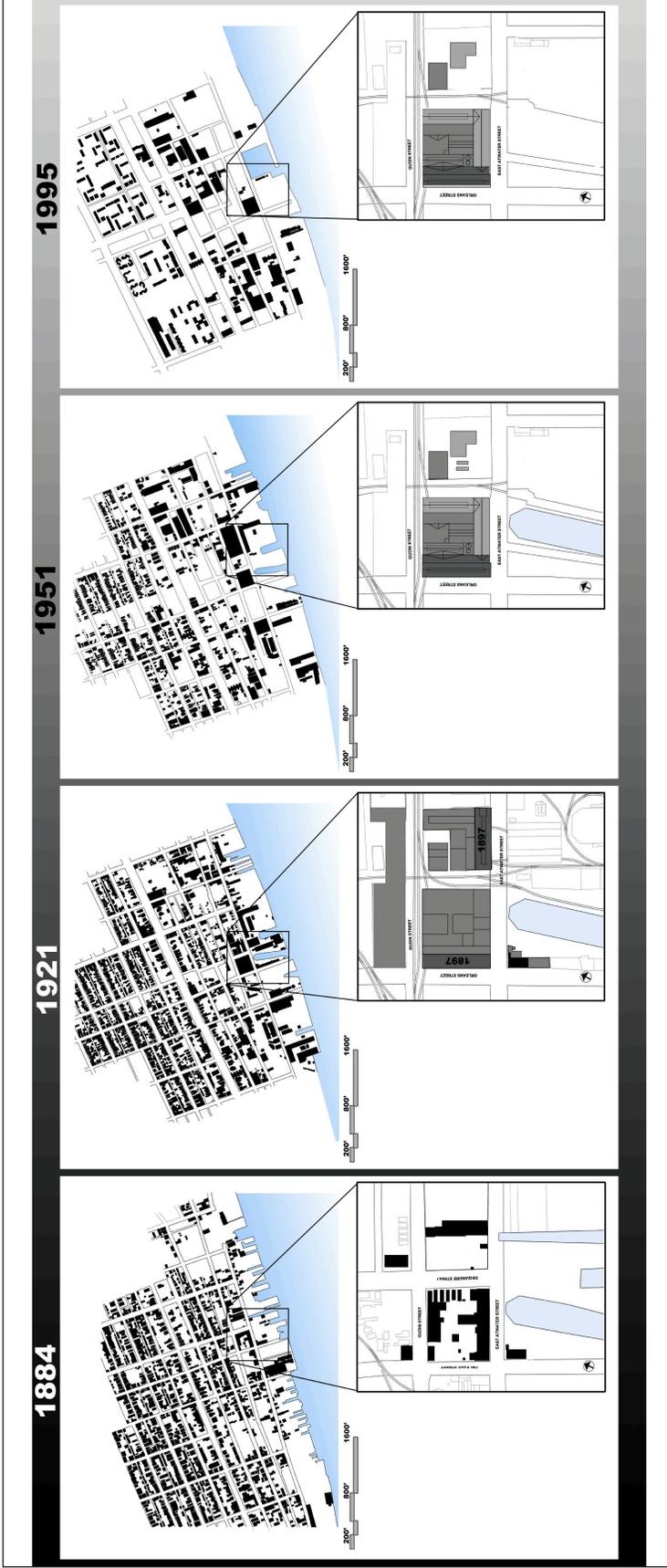


Figure 8: Site Evolution of The Dry Dock Engine Works. Depicted here is the growth and decay of the Detroit East Riverfront, as well as the urban context surrounding the Dry Dock Engine Works. The once heavily active industrial riverfront is now ripe for public intervention. Now is the time for the people of Detroit to take back their riverfront; perhaps the City's most important attribute. [Image by author.]

Presently, the Dry Dock Engine Works site is located 4 city-blocks south of Jefferson Avenue, and is immediately north of the Tri-Centennial State Park site along the riverfront. The current boundaries for the block within which the Dry Dock Engine Works site lies are: Franklin Street to the north, Atwater Street to the south, St. Aubin Street to the east, and Orleans Street to the west. As seen on the previous page, historically, the northern boundary was Guoin Street (between Atwater and Franklin) and the eastern boundary was Dequindre Street (between Orleans and St. Aubin, where the Dequindre Rail line entered the site.)



Figure 9: Aerial View of Detroit's East Riverfront. The aerial view shows the selected site [center] relative to the Waterfront Park System, Central Business District to the west, neighborhoods to the north and east, as well as Windsor, Canada to the south. The selected site is an important node within the city that must be developed. [Image by author.]

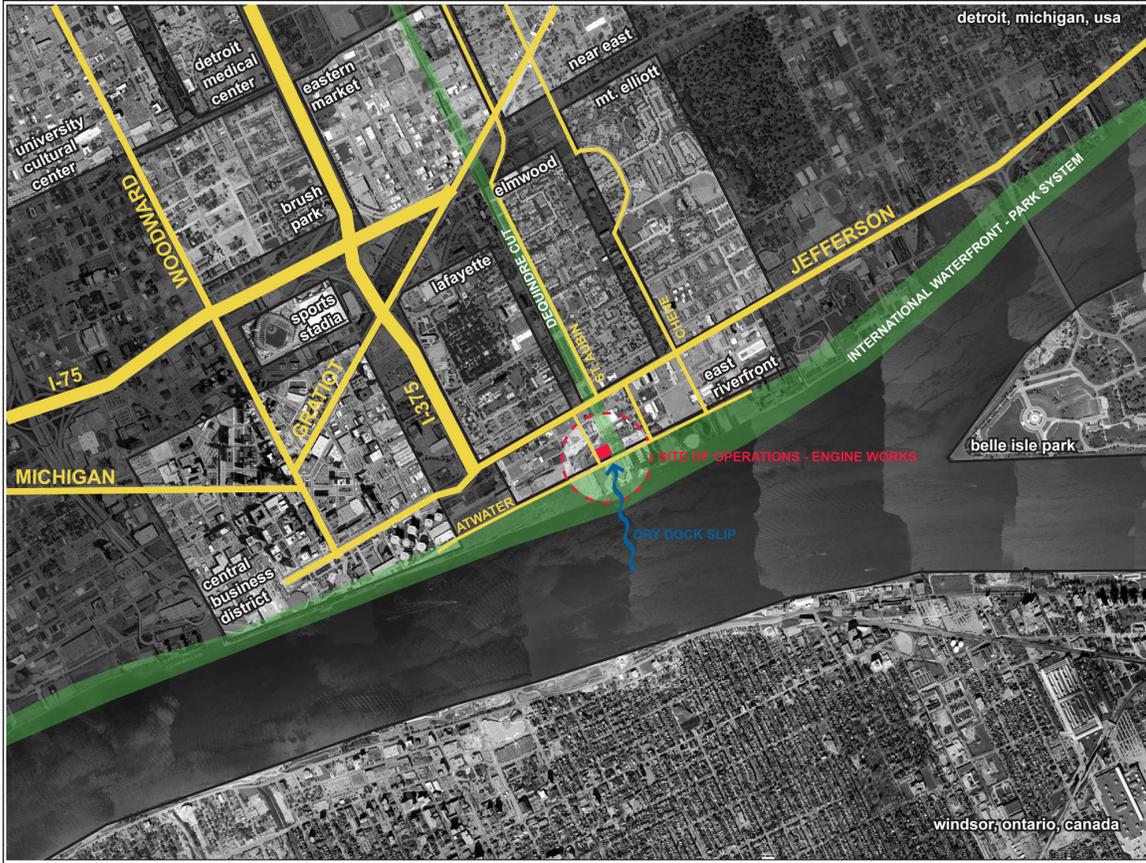


Figure 10: Greater Detroit Context. The Dry Dock Engine Works site has the benefit of many urban and regional connectors, primarily Jefferson Avenue. The site also lies at the intersection of two major city greenway systems [Dequindre Cut and International Waterfront Park System.] The surrounding urban fabric also creates an interesting dynamic, attracting a diverse range of people to this part of the city [local residents, daily commuters, tourists, etc.] [Image by author.]



Figure 11: Hard Connectors.
 Urban connection: Primary - red arrows
 Urban connection: Secondary - small dash
 Urban boundary: Freeways - large dash
 [Image by author.]



Figure 12: Soft Connectors.
 Dequindre Cut: non-motorized transportation corridor; connect people to/from river, riverwalk, parks, Eastern Market, Midtown neighborhoods, Hamtramck Trail.
 Detroit International Riverwalk: riverfront parks, plazas, bike trails, pedestrian trails/paths.
 Windsor Riverfront Bike Trail: riverfront parks, part of citywide Windsor Biketrail Network.
 [Image by author.]

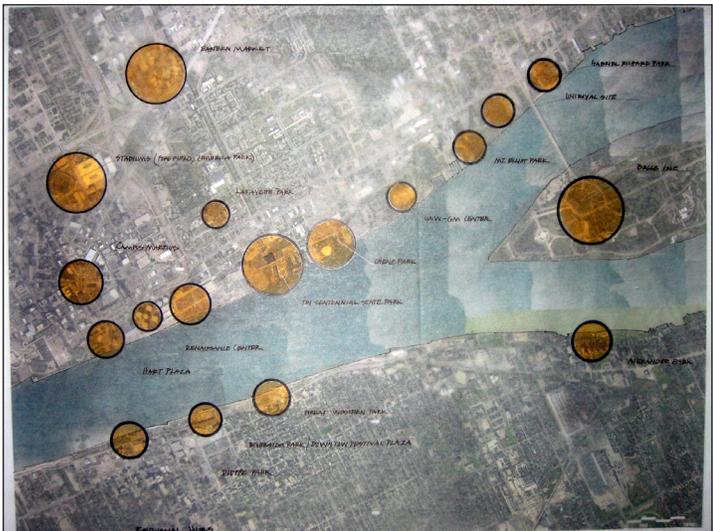


Figure 13: Regional/International Hubs.
 Includes parks, plazas, stadiums, business districts, and markets.
 [Image by author.]

The Dry Dock Engine Works site is not only accessible via urban and regional roadways, but by [international] waterways and greenways, too. The Ambassador bridge crosses the river and links Detroit with Canada, while the Detroit-Windsor Tunnel is one of the largest underwater international automobile tunnels in the world. Located along Atwater Street, the site is connected to the Detroit River by the resalvaged slip that once served the historic dry dock. The site also sits along the new Detroit Riverwalk, a paved promenade along the riverfront. “The Detroit International Riverfront is a planned 5.5 miles of waterfront, linked by a continuous riverwalk and parks, plazas and green spaces. As of June 2007, more than 2.5 miles of East Riverfront is open to the public.”³

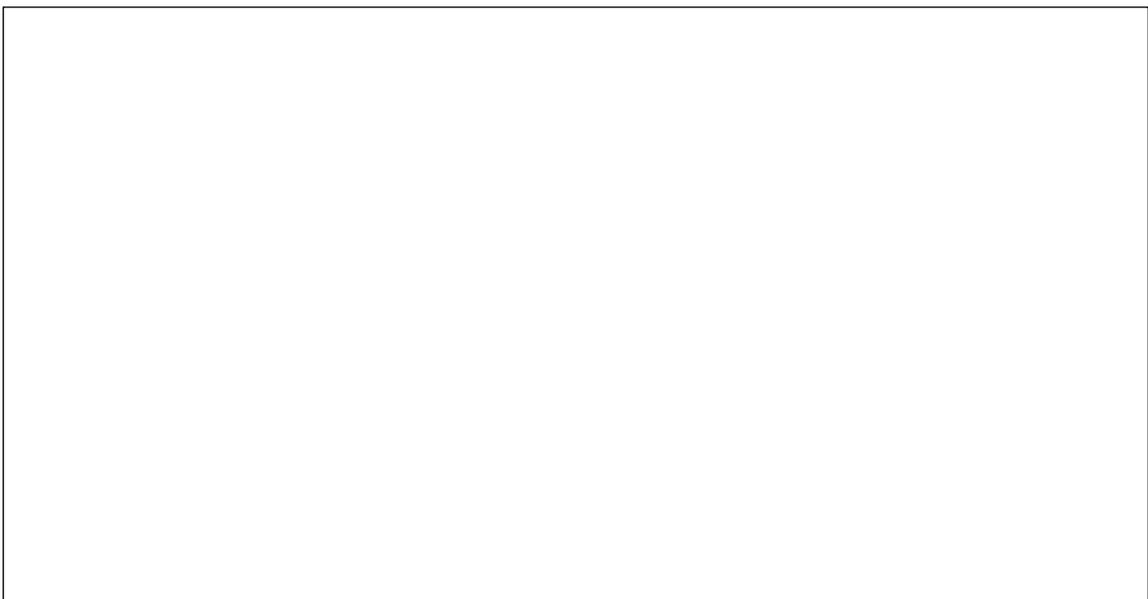


Figure 14: Detroit Riverwalk Rendering. This drawing shows the planned riverwalk with photographs of existing parks, plazas and green spaces, as well as proposed development. It is in the City’s best interest that the selected site be integrated with the riverwalk, providing it’s users with public amenities. [Detroit Riverfront Conservancy.]



The Dequindre Cut is an abandoned railroad right-of-way that extends from the Detroit River north to Eastern Market. Detroit has taken the initiative to adaptively reuse this old railroad bed, and transform it into a hiking/biking trail, with space reserved for future light rail transit. The eastern half of the cut will be covered with asphalt to provide a smooth surface for walking and “wheeling” - bikes, strollers, etc. The western half will be seeded and simply landscaped, with the expectation that someday [lightrail] tracks will be laid there.

“The graffiti...is staying. It decorates the old bridge abutments and helps to create a dazzling visual effect - gritty artwork, old walls and big shade trees contrasting with the newly paved path, plantings and modern lights and security phones. Fixtures for the lights and phones are in place...The path now starts at Gratiot on the north, just south of Eastern Market, and terminates about a block north of Atwater Street. Plans call for the trail eventually to punch through the thicket to Tri-Centennial State Park on the waterfront and extend gradually north toward the New Center area. The Cut essentially connects two other Detroit landmarks that have undergone recent renovation -- the RiverWalk and Eastern Market..”

- Bill McGraw⁴

Figure 15: Photostitch: Dequindre Cut Trail.
Plan of trail north of Jefferson Avenue.
[Detroit Economic Growth Corporation.]



Figure 16: Photographs: Dequindre Cut Trail. Views of trail development. [Faded Detroit blog; Detroit Free Press.]

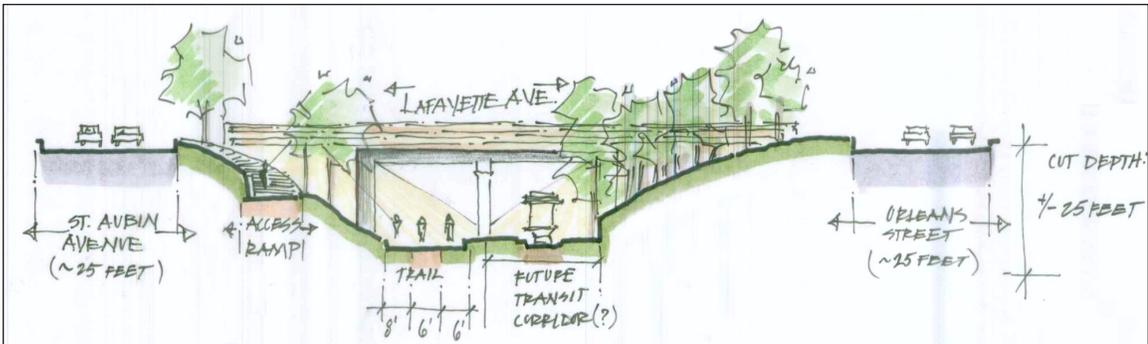


Figure 17: Drawing: Dequindre Cut Trail. Annotated section of trail development. [Image by author.]



Figure 18: Site Aerial and Context. The above images show the site and its existing surroundings: 1) View from Franklin Street, 2) Tri-Centennial State Park, 3) Marina, 4) View of historic dry dock slip. This thesis attempts to build upon the site's adjacency to the river and parkland [accessibility and entertainment], as well as the historic street grid that remains [pedestrian-friendly and has character.] [Image by author.]



Figure 19: Site Aerial and Building Context. The above images show the site and the existing structure: 1) View down Orleans Street, 2) Dry Dock Engine Works - north elevation, 3) Dry Dock Engine Works - east elevation, 4) View of adjacent vacant lot, 5) View from Atwater Street. This thesis attempts to salvage what remains of this district's past to generate growth and activity along Detroit's valuable riverfront. [Image by author.]

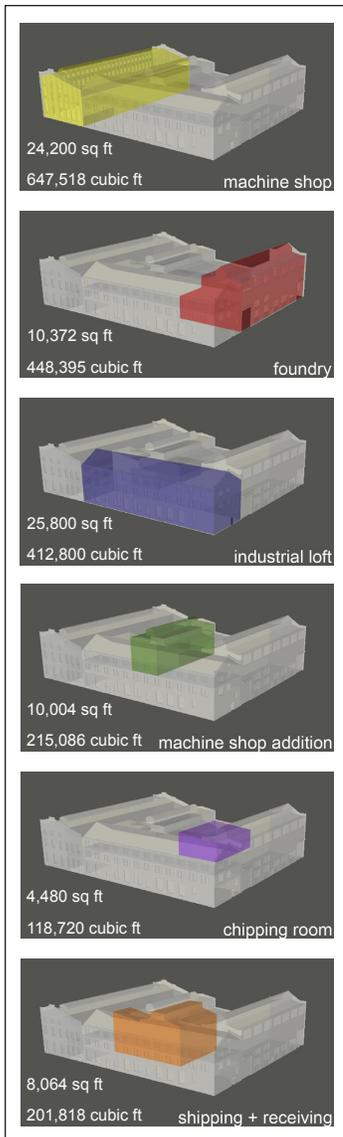


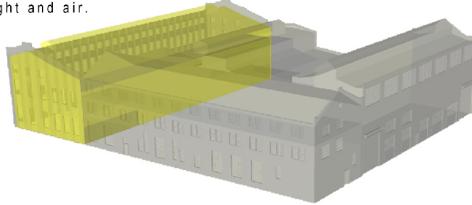
Figure 20: Spatial Investigation. Room location, Square footage + Volume. [Image by author.]

Although it has been almost eighty-five years since the last steam engine came out of the Dry Dock Engine Works, the six buildings that make up the industrial complex are a physical reminder of the ingenuity and prosperity that once was at 1801 Atwater Street. The existing structures on the site - the Machine Shop, the Foundry, the Industrial Loft Building, the Machine Shop Addition, the Chipping Room, and the Shipping + Receiving Room - also hold an important place in the evolution of factory design and construction. The buildings were designed for strength, light, ventilation, and economy in construction, as well as maintenance; it is no wonder the buildings remained in use long after engine production stopped. With that in mind, there is no reason why the buildings' lives should end here. The reuse of these structures not only respects a part of Detroit's history, but helps propel the city into the future.

The following six pages highlight the existing structures.

MACHINE SHOP (1892)

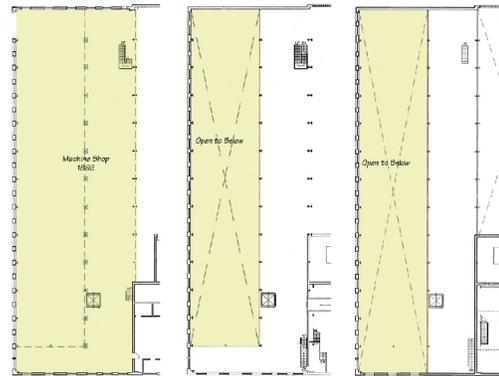
- Description:** First building erected in existing complex.
- Orleans Street:** 200'-0"
- Atwater Street:** 65'-0"
- Interior Section:** 37'-0" x 200'-0", open volume (marine engines and heavy machinery).
- Two mezzanine levels in the east section (light machine work and pattern storage).
- Electric elevator (no longer there) transported materials between floors.
- Structure:** Riveted steel angles, bars, plates.
- Exterior walls:** Non load-bearing brick infill set between columns.
- Roof system:** Twelve (12) Warren trusses supporting wood planks covered with asphalt; 167'-0" long monitor to provide light and air.



PHOTOS



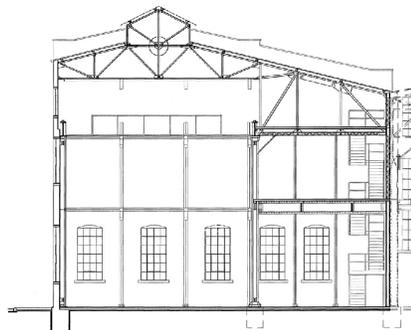
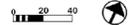
SITE PLAN



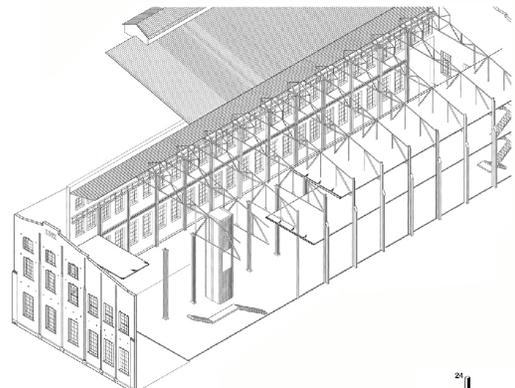
GROUND FL

SECOND FL

THIRD FL



SECTION



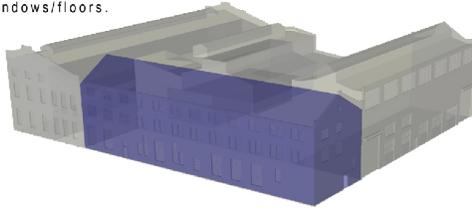
STRUCTURE



Figure 21: Machine Shop Information. [Image by author.]

INDUSTRIAL LOFT (1902)

- Description:** Three-story steel-frame and brick industrial loft faces Atwater Street, measuring 173'-0" x 50'-0".
- Functions:** Stock room, blacksmith shop, pattern shop and storage, tool room, drafting office, and screw cutting machinery.
- A driveway extended through the 1st floor connecting Atwater Street to the open yard behind the building. By early 1920s, 2 driveways ran through it to the shipping and receiving area.
- Ground floor unimpeded by interior columns; suspended the wooden floors from oversized Fink trusses, which also support the roof.
- Several skylights opened onto the steep roof.
- Originally there were 12 double-hung, wood-framed windows/floors.



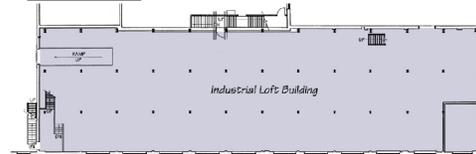
PHOTOS



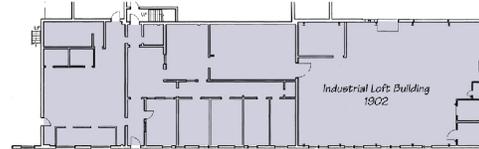
SITE PLAN



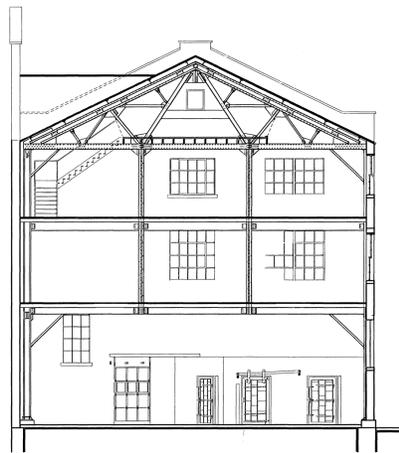
THIRD FL



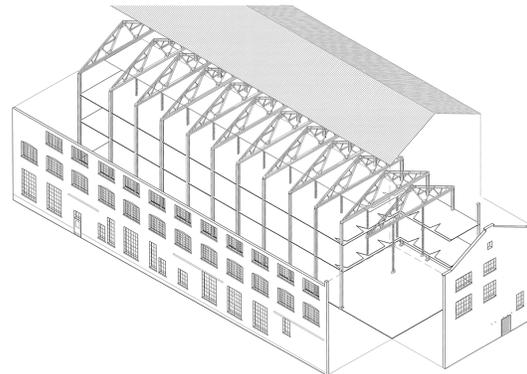
SECOND FL



GROUND FL



SECTION



STRUCTURE

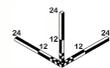
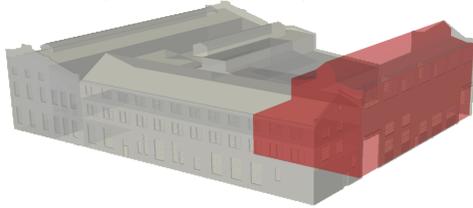


Figure 22: Industrial Loft Building Information. [Image by author.]

FOUNDRY (1902)

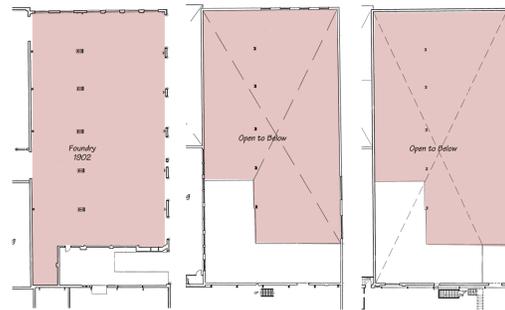
- Description:** 73'-0" X 131'-0" foundry building on the east side facing Dequindre. Constructed with similar methods as the machine shop 10 years earlier.
- Main difference is the column configuration
- Seven (7) evenly spaced bays, each with a freight door opening onto Dequindre.
- Roof system: Fink and Scissor trusses support poured-in-place concrete deck covered with asphalt. 107'-0" long monitor for light and air. Additionally, light/air from upper-level factory windows on east and west facades.
- Two overhead traveling cranes: one in 46'-0" wide section and one in 26'-0" wide section.
- 1910s: No longer foundry, used for engine assembly.



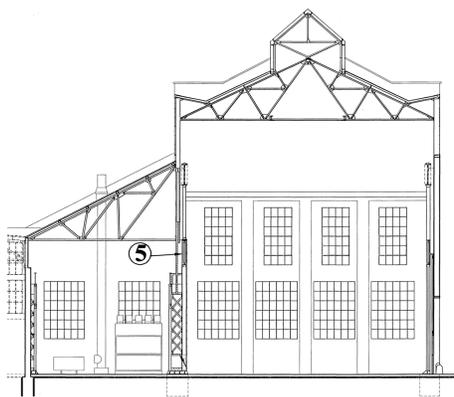
PHOTOS



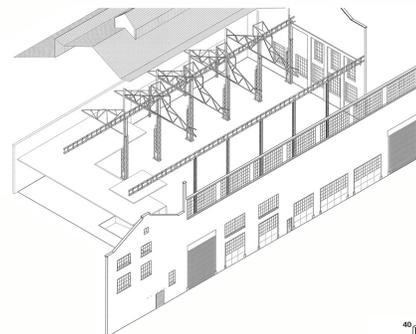
SITE PLAN



GROUND FL SECOND FL THIRD FL



SECTION



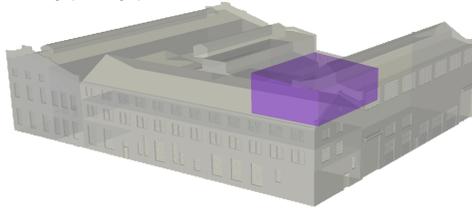
STRUCTURE



Figure 23: Foundry Information. [Image by author.]

CHIPPING ROOM (1910)

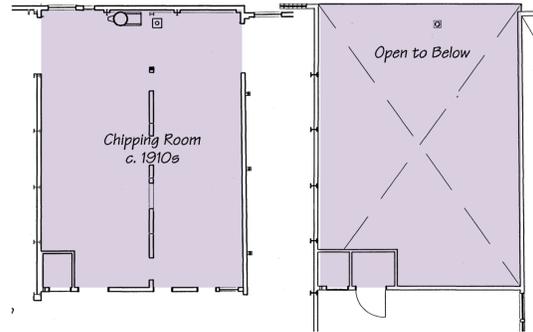
- Description:** One-story room; an internal railway track facilitated movement between machine shop, chipping room, and foundry.
- Exterior walls:** Steel members with brick infill.
- North wall:** Large window exposure
- East section:** Irregular Warren-style roof truss with rivet and plate connections.
- West section:** Light-weight Howe truss
- Roof:** Sloping from 29' to 24'; only building in complex without roof monitor.
- Misc:** An elevator at the SW corner of room connected the ground level to the second floor of Shipping and Receiving (storage).



PHOTOS

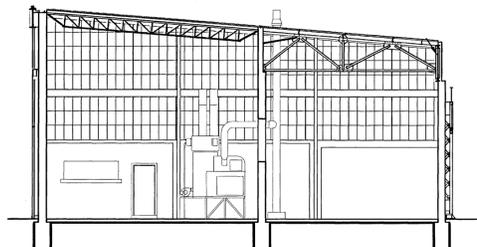
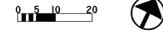


SITE PLAN

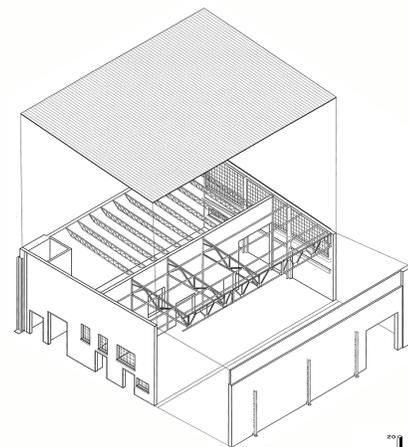


GROUND FL

SECOND FL



SECTION



STRUCTURE

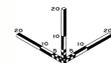
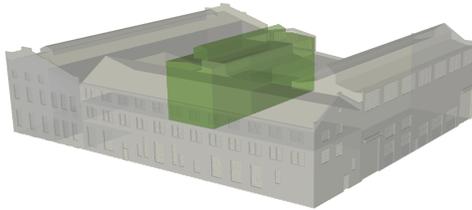


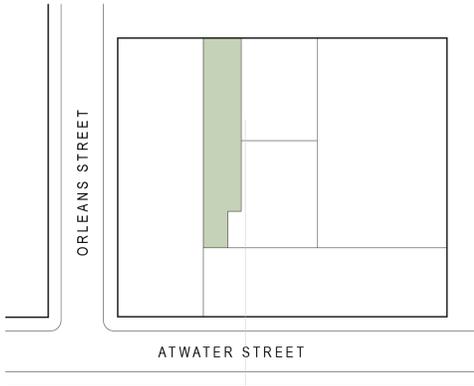
Figure 24: Chipping Room Information. [Image by author.]

MACHINE SHOP ADDITION (1910s)

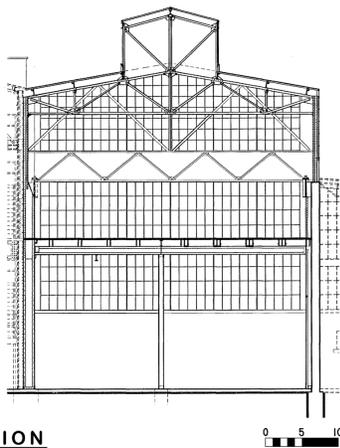
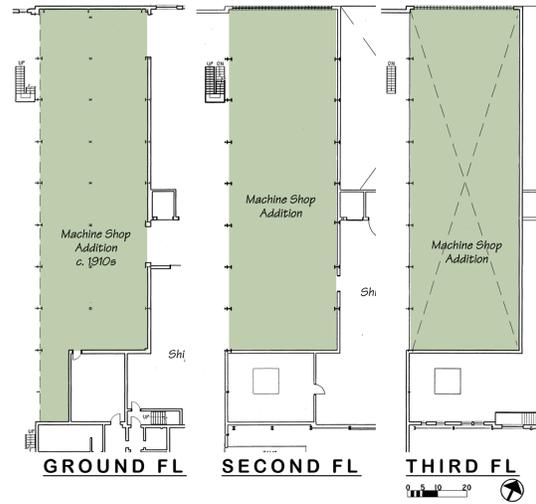
- Description:** Rectangular, steel-frame and brick addition
- Originally was a 43' high space topped by a roof monitor for light and air
- A second floor made of wood planks was added later
- A traveling crane once served the room.
- Row of steel columns about the columns of the original Machine shop. The brick infill that formed the east elevation of the original shop was removed to connect the two rooms.
- Roof:** Eight trusses which are variations on the standard Warren truss. Similar trusses also ran along the north and east walls to help support the long spans of factory window sections.



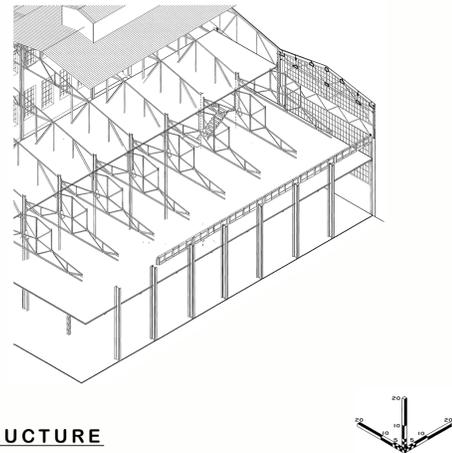
PHOTOS



SITE PLAN



SECTION

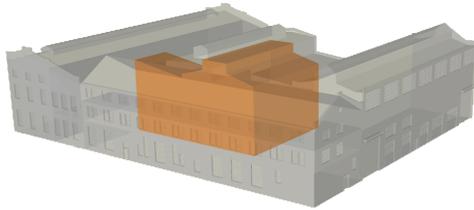


STRUCTURE

Figure 25: Machine Shop Addition Information. [Image by author.]

SHIPPING AND RECEIVING (1910s)

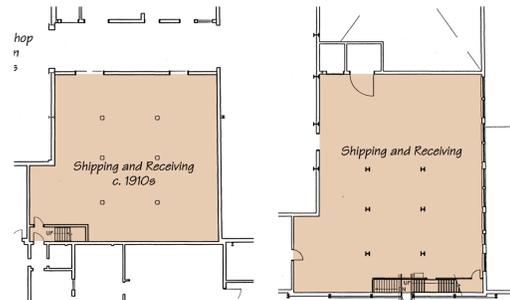
- Description:** Two-story steel frame and reinforced concrete structure; locate at the center of the complex.
- Most likely the last of the six (6) buildings erected.
- Bricked-in window openings on all sides of the first level indicate it was once an exterior space.
- Second floor originally was a stock room; ground level was a shipping and receiving area with access to Atwater Street (driveway).
- Unlike other buildings on site, this addition featured riveted steel columns encased in reinforced concrete, a rolled I-beam roof structure, and a poured-in-place reinforced concrete second floor and roof. Roof also has a full-length monitor.



PHOTOS

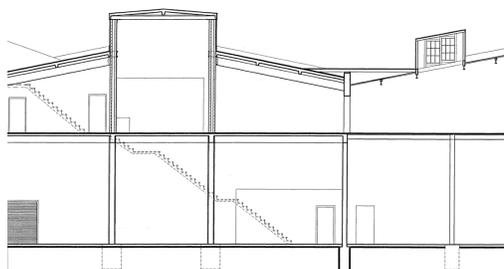


SITE PLAN

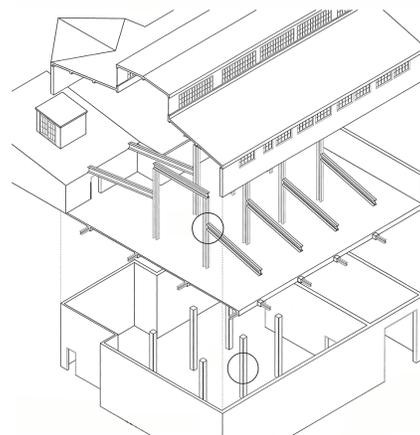


GROUND FL

SECOND FL



SECTION



STRUCTURE



Figure 26: Shipping + Receiving Room Information. [Image by author.]

Program Exploration

“It is people, not money and not technology, who have the imaginations, the ‘know how’ and the sense of purpose to prosper and to grow. If people are our main competitive resources, and the drivers of the new economy, then the more inventive, flexible and talented they are, the better it is for all of us. Given this, the question for both society and enterprise, is how best to release and enable people’s creative and imaginative potential. The answer, in part, lies with Design. Design, with its emphasis on people, its capacity to see things in a new way, and its ability to make things real, can help education foster a more creative and prosperous society.”

*- Josephine Green,
Urban Learning Space Board Member.*

The program is made up of three major elements: a museum facility, a network of movement systems [esp. ferry + bicycle], and a business incubator. Previous exploration did not include the ferry system; however it did include an educational facility separate from the museum, and an architectural salvage retail facility. After much analysis and testing of the site, as well as further investigation of community needs, the final program was selected; one that responds harmoniously with the nature of the existing buildings, and demonstrates a reappraisal of the built and natural elements remaining on the site.

A museum is proposed for the appreciation and understanding of Detroit's industrial/ous past, as well as for the emphasis and showcasing of Detroit's innovative work of today and it's future. The City of Detroit is known around the world for her myriad of industrial successes; here is a place for those to shine.

A network of movement systems is proposed for several reasons. First, as a means of accessing the site; people need to be able to get there. This necessity transformed into an exploration of diversity; how many different ways can one access this site. Second, in order to create a [socially] sustainable building, this site must be re-woven into the urban fabric. The reuse of the old dry dock slip and the Dequindre Cut as means of moveing to/around the site is not only appropriate, but unequivical.

A business incubator is proposed as a means of regenerating economic vitality in the once prosperous district. The existing lofty interiors provide great flexible space for a range of entrepreneurial companies. Also, by attracting new commpanies to the district, perhaps adjacent blocks will experience simimilar development as well.



Figure 27: New Program Elements for the Dry Dock Engine Works Site. This diagram maps out the new program elements for the chosen site. [Image by author.]

PROGRAM

MOVEMENT SYSTEMS



FERRY TERMINAL



BICYCLE CENTER



TRANSIT INTERCHANGE



PARKING

A significant part of this thesis exploration is focused on reconnecting the Dry Dock Engine Works site, as well as the valuable Detroit Riverfront, with the rest of the city. As a result of the site's multiple adjacencies - waterways, greenways + urban connectors - several movement systems are introduced to the site in order to create a functioning and accessible district that is securely woven into the greater city fabric.

Ferry Terminal:

Create an international connection between the cities of Detroit and Windsor. It would provide an alternative link for those who already commute via the congested Ambassador Bridge and the Detroit-Windsor Tunnel. It would Promote more cross-river travel, whether it is for work [daily commute] or play [tourism.]

Bike Center:

Create a bicycle retail, rental + service shop that appropriately anchors the Dequindre Cut Trail along the riverfront. It would provide much needed amenities to those traveling [recreational or for work] the network of paths/trails through the city, as well as promote a more sustainable and affordable means of travel.

Transit Interchange:

Create a transit hub that will mediate the diverse movement systems on/around the site - ferry, bicycle, light rail, bus, automobile + pedestrian. This program element accepts the proposal for a light rail track to run along the Dequindre Cut Trail.

Parking:

Create on-street parking, a lot near the transit interchange building, and secure, covered bicycle parking.

Figure 28: Program: Movement Systems. [Image by author.]

PROGRAM

INTERFACE



COURTYARD



BUSINESS INCUBATOR



MARKET SPACE



CAFE - BAR

INTERFACE

A significant part of this thesis exploration is focused on re-establishing the Dry Dock Engine Works site as a dynamic and prosperous area within the district. A mixed-use program is proposed; one that can make best use of the diverse historic spaces, as well as spawn future growth and attraction to the area.

Courtyard:

Create a true public space near the riverfront; a *piazza*. This would be shared by all on the site - an outdoor theater for the museum or local performers; host festivals; an exterior extension of the market space and cafe; a waiting area for the ferry; a place for kids to play.

Business Incubator:

Create rentable units for small/start-up businesses; promote entrepreneurship. In time, the businesses could move/expand to other building sites within the district, improving business/development in the area, creating a cycle of growth.

Market Space:

Create a year round market that connects local producers with consumers. Like the Bicycle Center, this too would be an appropriate anchor to the Dequindre Cut Trail along the riverfront, as it directly connects to Detroit's Eastern Market, the largest historic public market district in the United States.

Cafe - Bar:

Create a casual place to meet + dine near the riverfront. This cafe - bar would be a great amenity for both locals and visitors, providing service throughout the day [morning rush, mid-day snack, after-work drink/meal + a night out.]

Figure 29: Program: Interface. [Image by author.]

MUSEUM OF INDUSTRY + INNOVATION

A significant part of this thesis exploration is focused on creating a link between old + new. The Detroit Museum of Industry + Innovation would feature facilities for the collection/display of historic documents and artifacts relevant to the Dry Dock Engine Works, as well as those illustrative of Detroit's diverse industrial past [a physical timeline.] Additionally, to make the link between Detroit's past + future, facilities would also showcase current/on-going works of Detroit's innovative minds.

Galleries:

Create both permanent + flexible gallery spaces within the museum. The permanent gallery holds architectural + industrial history displays. The flexible gallery space holds temporary + traveling displays of current works.

Visitor Services:

Create an auditorium, classrooms + gift shop to enhance the visitors' experience at the museum. The auditorium + classrooms provide multipurpose space for orientations, schools + tour groups, films, lectures, performances, as well as other public programs. The gift shop allows visitors to purchase books, souvenirs, etc., as well as provides more commerce in the area.

Administration:

Create a space to hold the offices for the museum director and other employees, as well as a small reception area and shared employee area.

Support Space:

Create purely functional areas to hold mechanical space and storage of materials. Parking is necessary, but should be done in an attractive and sustainable way. Diverse movement systems around the site encourage parking alternatives.

PROGRAM

DETROIT MUSEUM OF INDUSTRY + INNOVATION



GALLERIES



VISITOR SERVICES



ADMINISTRATION



SUPPORT SPACE

Figure 30: Program: Detroit Museum of Industry + Innovation. [Image by author.]

Design Strategies

“Traditions can be reinterpreted; connections can be forged between the seemingly random or disparate. [Joseph] Cornell believed that artists renew and transform materials, experiences, and ideas, and this belief fueled his ability to communicate the beauty and magic in ordinary, often forgotten things.”

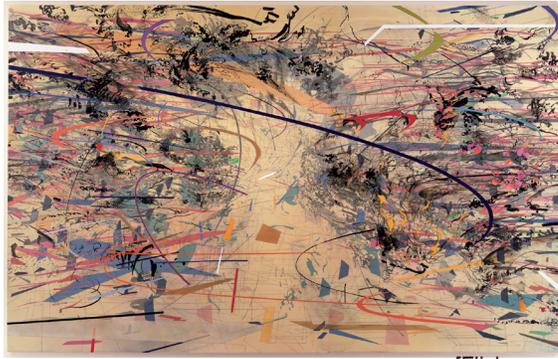
*- Lynda Roscoe Hartigan,
Peabody Essex Museum’s
Chief Curator and Curator of
“Joseph Cornell: Navigating the Imagination.”*

When designing, the question of how is ever-present.

How much...? How little...? In terms of adaptive reuse, these types of questions abound. *How does one integrate old + new?* How does one determine what to retain/demolish? How could things be done differently?

The approach taken by this thesis to answer such questions is rooted in analysis [site resources + community needs] and driven by multiple conceptual and formal strategies.

CONCEPTUAL DRIVERS



[Flickr.com]

COLLIDING FORCES:

“Dispersion”
Julie Mehretu

- re-envision the urban experience.
- inspired by community, history, and the built environment.
- dynamic layering of [conflicting] forces and site elements.

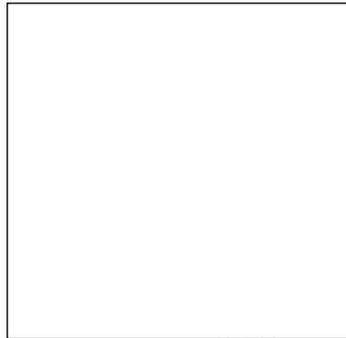


[Photograph by author]

TEMPORAL EVOLUTION:

“Das Geviert”
Anselm Kiefer

- transformation over time.
- collage elements of history.
- destruction and renewal.



[Artchive.com]

COLLAGE: DEFINING SPACE:

“The Hotel Eden”
Joseph Cornell

- collision and recombination of ideas.
- connection and interaction between disparate elements.
- reinterpretation
- alteration



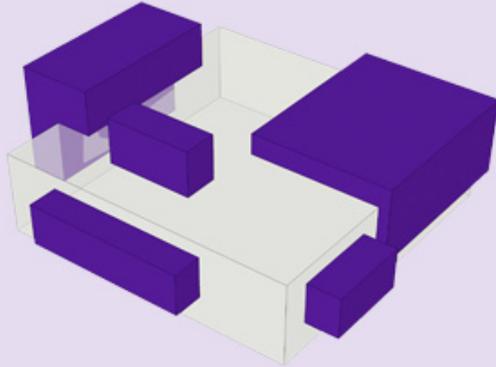
[Artnet.com]

COLLAGE: CAPTURING SPACE:

“City - Space - Scape V”
Louise Nevelson

- assemblages
- additive process
- heightened awareness of the space[s] between.

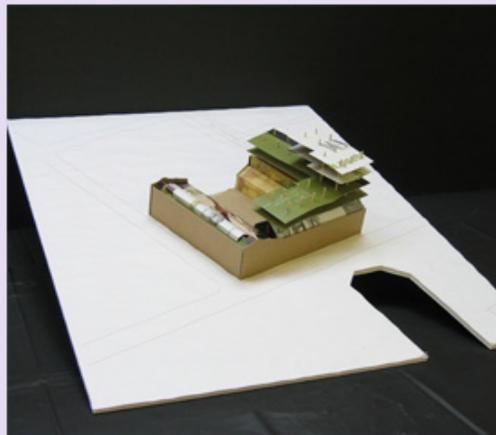
Figure 31: Artists as Conceptual Drivers. [Image by author.]



[Model by author]



[Streeteditors.com]



[Model by author]

A C C R E T I O N

DIALOGUE BETWEEN NEW + OLD:

existing structure serves as foundation
for development upon and around.

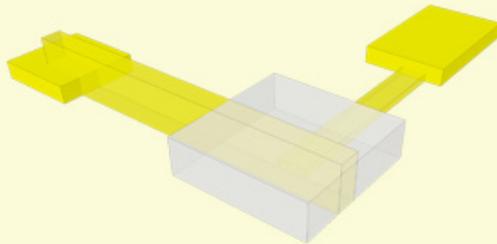
PRECEDENT:

Ruck Sack Haus, 2005

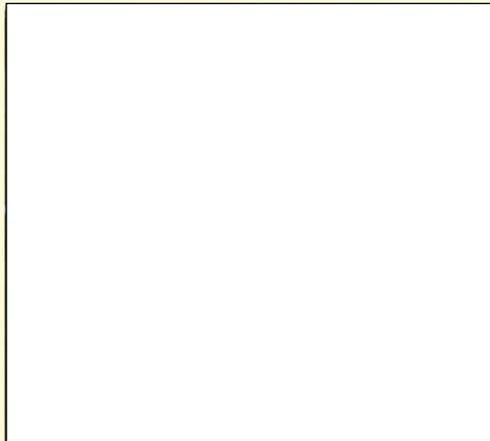
Munich, Germany

Stefan Eberstadt

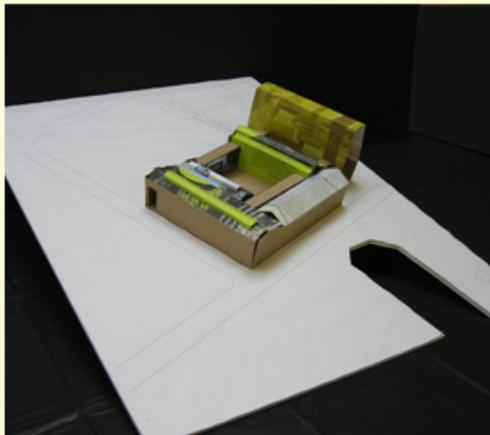
Figure 32: Design Strategy: Formal Driver - Accretion. [Image by author.]



[Model by author]



[Architecture Spoken, Steven Holl]



[Model by author]

CONNECTION / EXTENSION

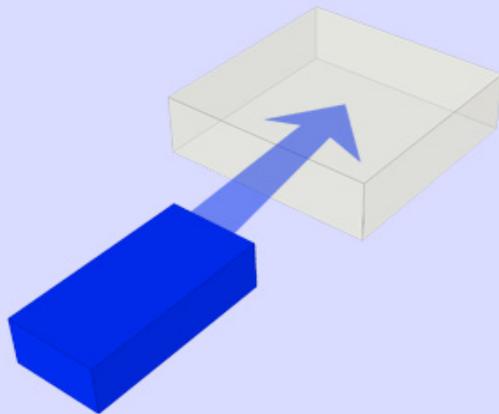
DIALOGUE BETWEEN NEW + OLD:

slot/in-between space serves as coordinator linking the existing spaces with the new spaces.

PRECEDENT:

Higgins Hall, 1997-2005
Brooklyn, New York
Steven Holl

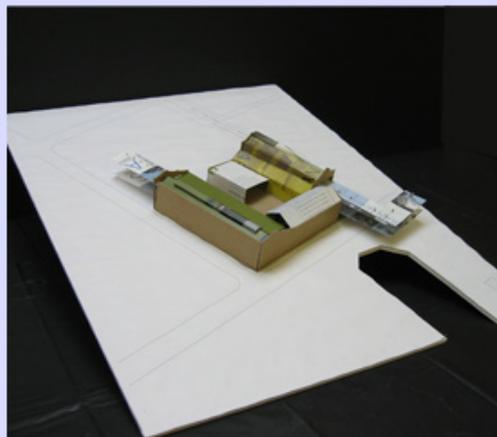
Figure 33: Design Strategy: Formal Driver - Connection/Extension. [Image by author.]



[Model by author]



[Meyer, Scherer + Rockcastle]



[Model by author]

I N S E R T I O N

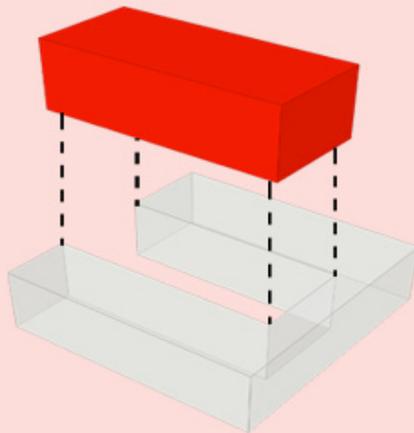
DIALOGUE BETWEEN NEW + OLD:

a break in the existing structure serves as point of intervention, inserting the new within the old.

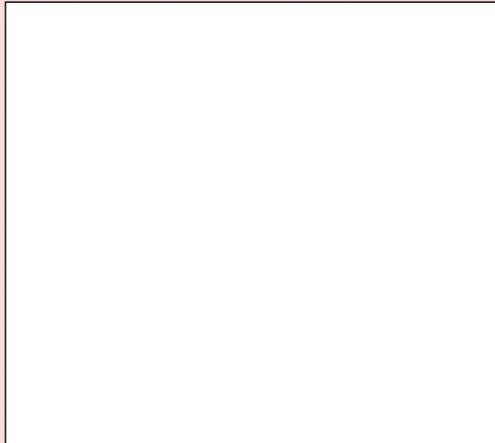
PRECEDENT:

Mill City Museum, 2003
Minneapolis, Minnesota
Meyer, Scherer + Rockcastle

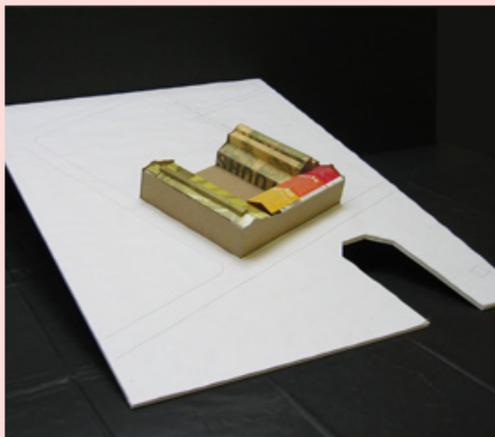
Figure 34: Design Strategy: Formal Driver - Insertion. [Image by author.]



[Model by author]



[LatzundPartner.de]



[Model by author]

SUBTRACTION

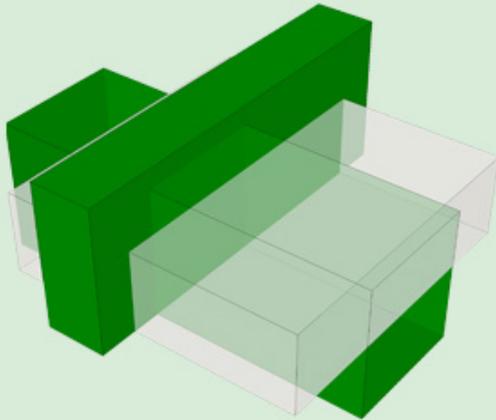
DIALOGUE BETWEEN NEW + OLD:

existing elements are removed to allow for new development, as well as to highlight the memory of the past.

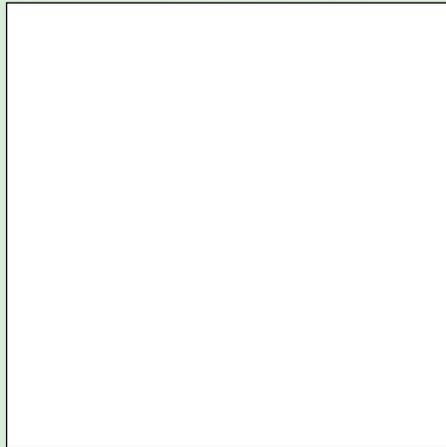
PRECEDENT:

Duisburg-Nord Landschaftspark, 2000
Duisburg Nord, Germany
Latz + Partners

Figure 35: Design Strategy: Formal Driver - Subtraction. [Image by author.]



[Model by author]



[Tschumi.com]



[Model by author]

O V E R L A P

DIALOGUE BETWEEN NEW + OLD:
new architectural/programmatic elements reach over/beyond existing boundaries.

PRECEDENT:

Le Fresnoy Art Center, 1992-1998
Tourcoing, France
Bernard Tschumi

Figure 36: Design Strategy: Formal Driver - Overlap. [Image by author.]

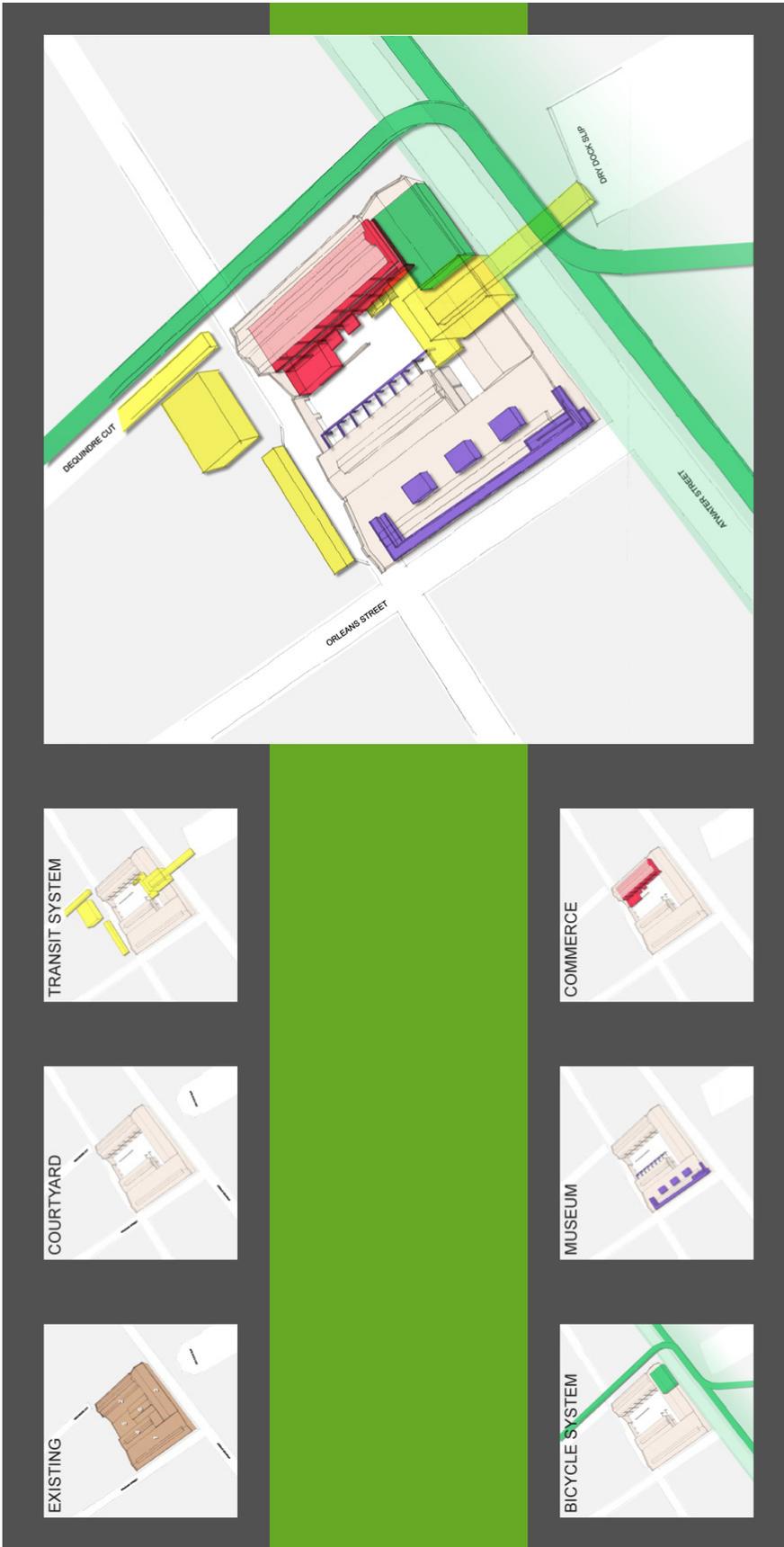


Figure 37: Site Interventions: Composite. [Image by author.]

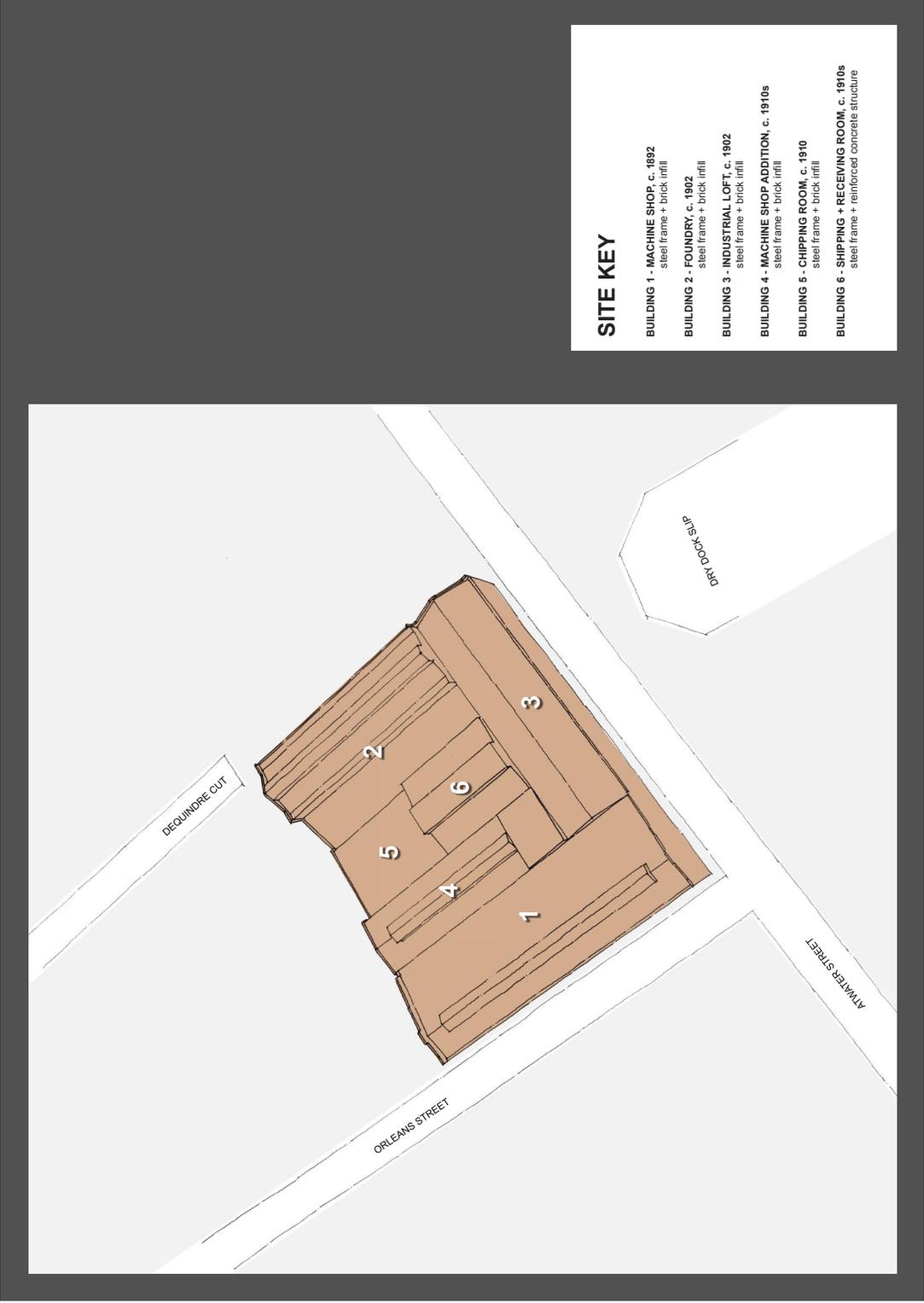


Figure 38: Site Interventions: Existing Conditions. [Image by author.]



SUBTRACTION

Removal of the Chipping Room and the Shipping + Receiving Room allows for the creation of a shared, mixed-use open space on the site.

Removal of the Chipping Room and the Shipping + Receiving Room provides access to light + air for the structures that are retained.

Retention of certain elements from the Chipping Room and the Shipping + Receiving Room provide a sense of scale, act as design features, as well as recall the memory of what once was here.

* Chipping Room: once had an interior railway track that facilitated movement between Machine Shop and Foundry. Now it is an exterior space that facilitates movement across the site.

* Shipping + Receiving Room: the last of the six buildings erected, it was once an exterior space with access to Atwater Street (driveways). Now it is once again an exterior space, linking the courtyard to Atwater Street.

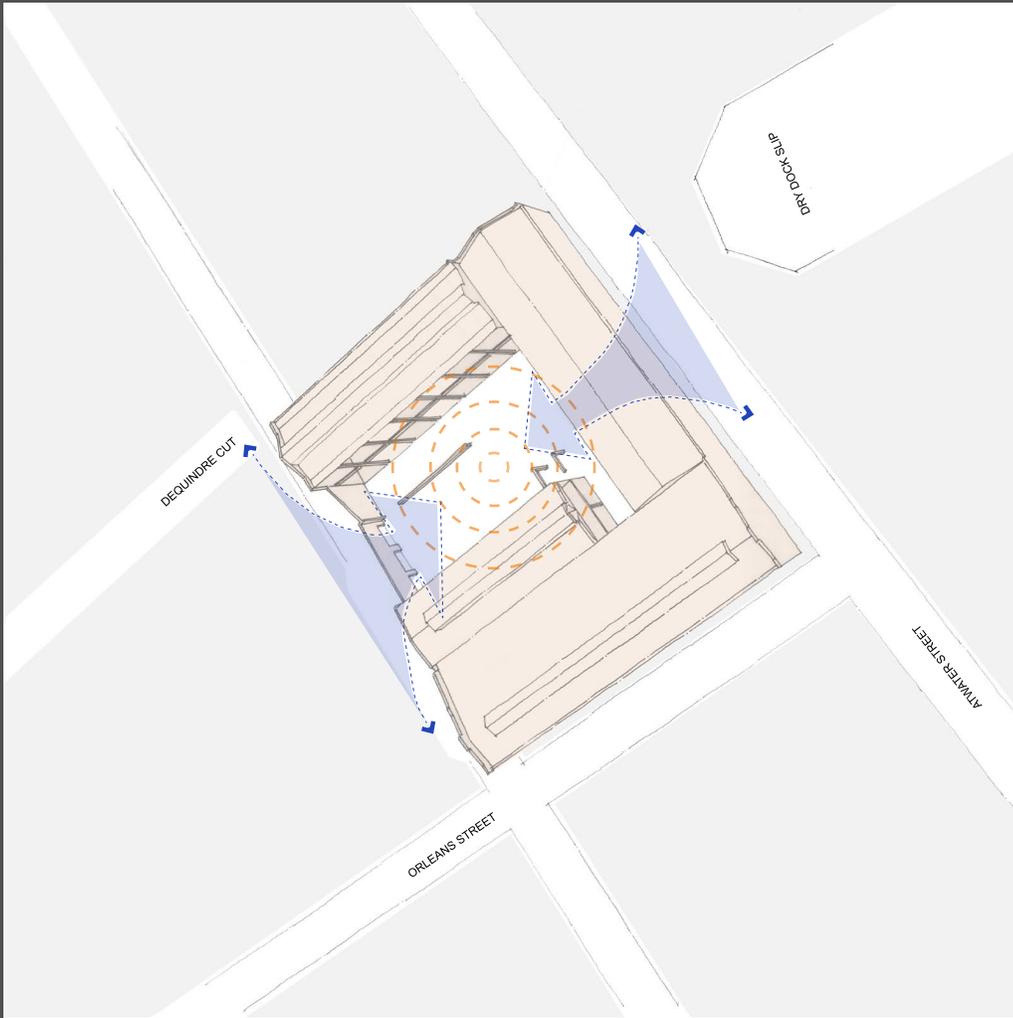


Figure 39: Site Interventions: Courtyard. [Image by author.]



ACCRETION

Addition of new bus/light rail interchange north of the Engine Works site.

CONNECTION/EXTENSION

Addition of light rail system and ferry terminal (bridges).
Remapping of Guoin Street (between Engine Works and transit interchange).

INSERTION

Addition of ferry terminal/waiting area, balcony, and stair.

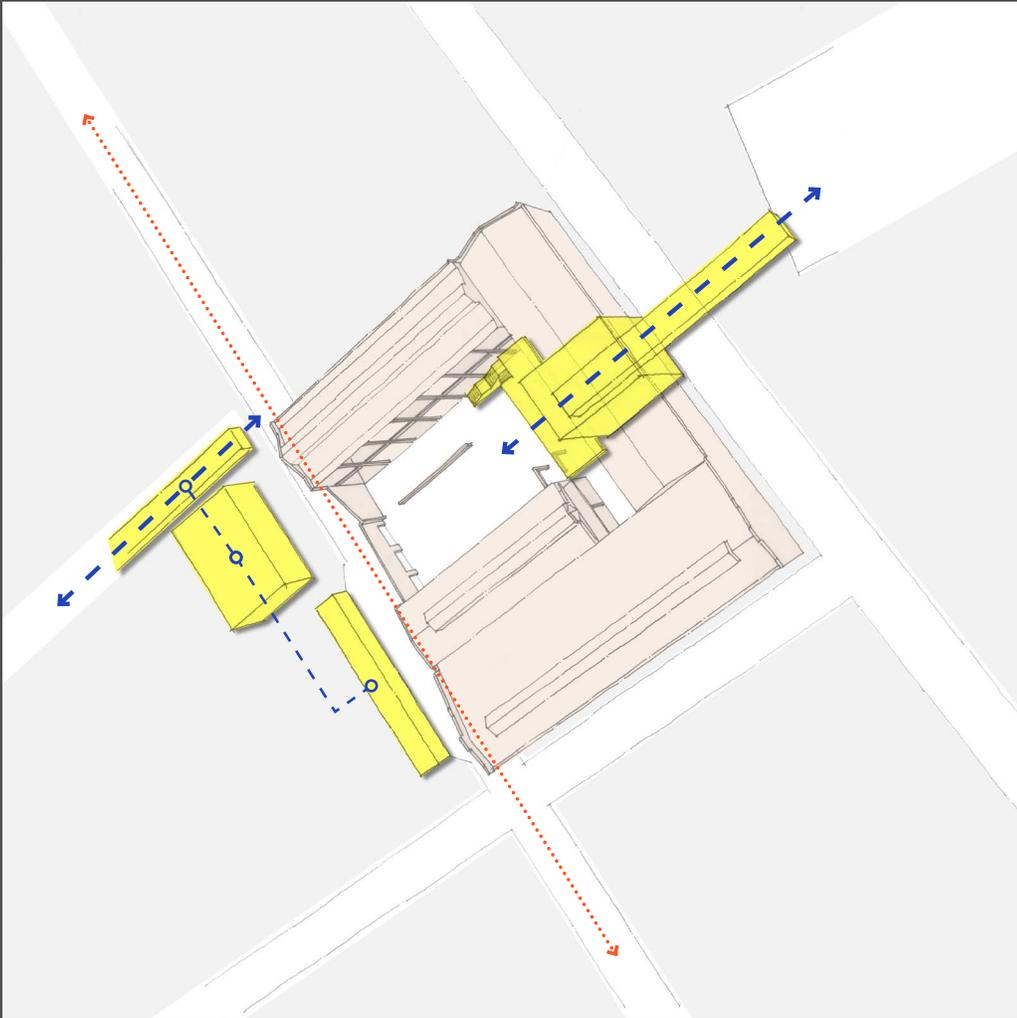


Figure 40: Site Interventions: Transit System. [Image by author.]



CONNECTION/EXTENSION

Extension of Dequindre Cut bicycle trail through the site, linking with waterfront park system

INSERTION

Addition of bicycle center (sale, rental, repair, tours) within Industrial Loft Building.

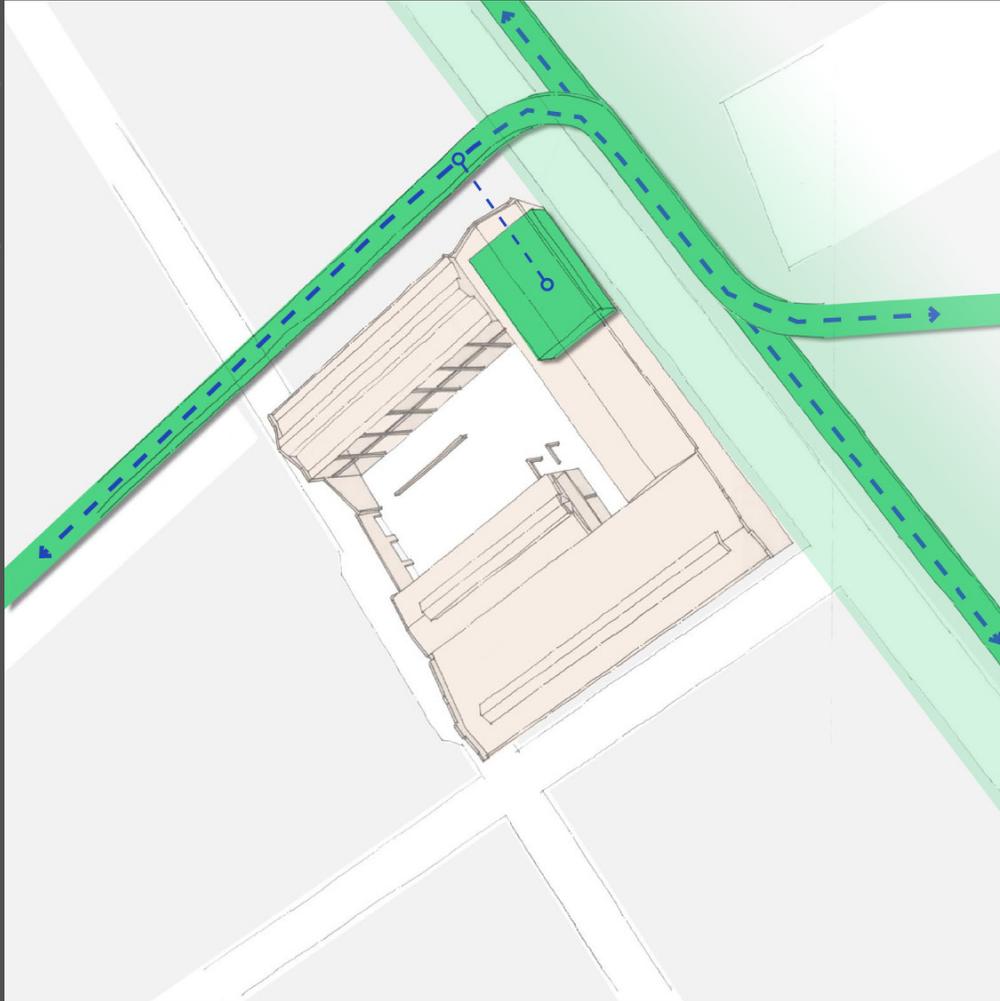
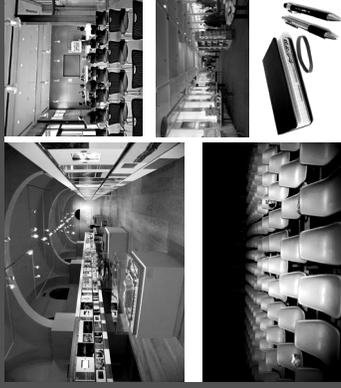
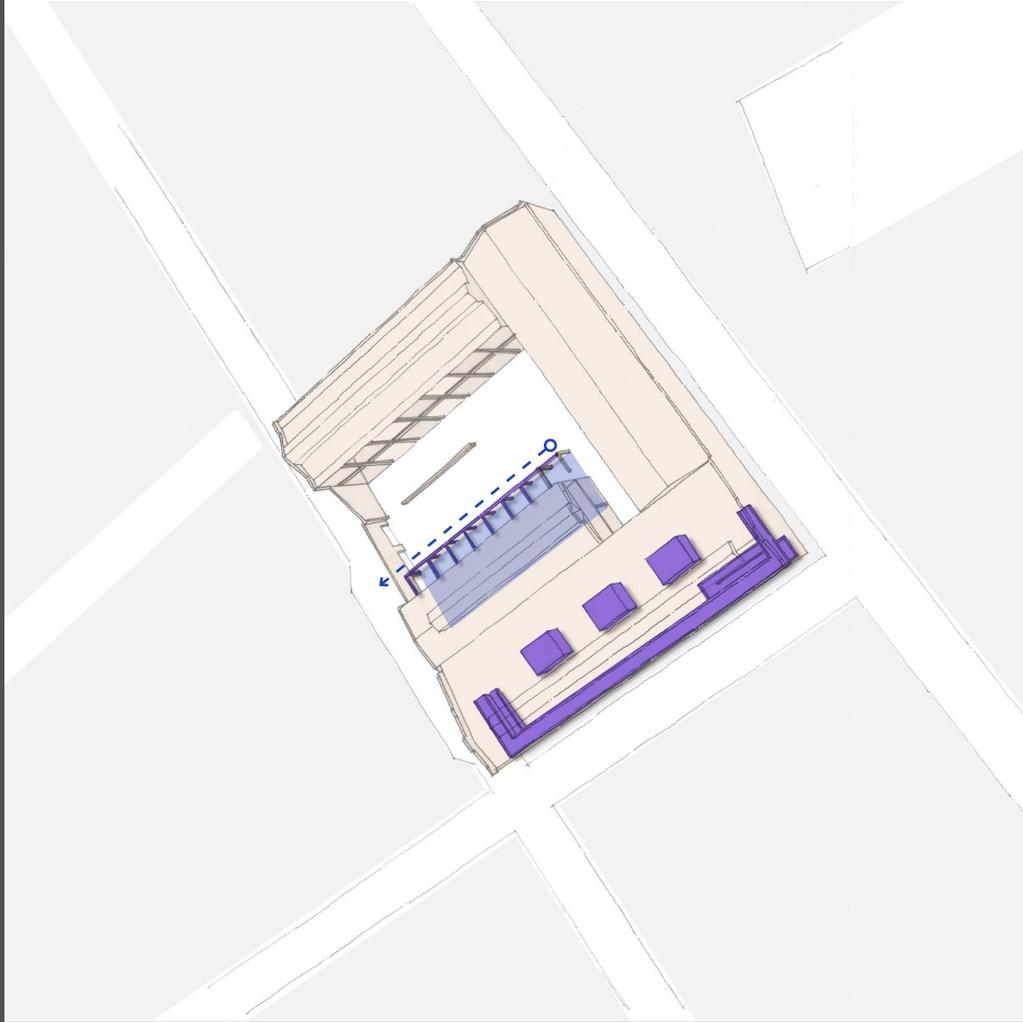


Figure 41: Site Interventions: Bicycle System. [Image by author.]



ACCRETION

Attachment of small exhibit spaces to second level of Machine Shop.

CONNECTION/EXTENSION

Extension of retained structure (Shipping + Receiving Room) to create colonnade.

INSERTION

Addition of ramp system within Machine Shop

OVERLAP

Interior/Exterior overlap of exhibition space (Machine Shop Addition) + courtyard colonnade.

Figure 42: Site Interventions: Museum. [Image by author.]



CONNECTION/EXTENSION

Connection of courtyard and adjacent park/farmer's market through ground level market space.

INSERTION

Addition of floor plates within Foundry (rentable office space.)
Addition of cafe/bar within Foundry.

OVERLAP

Interior/Exterior overlap of market space + activity (open swing doors.)

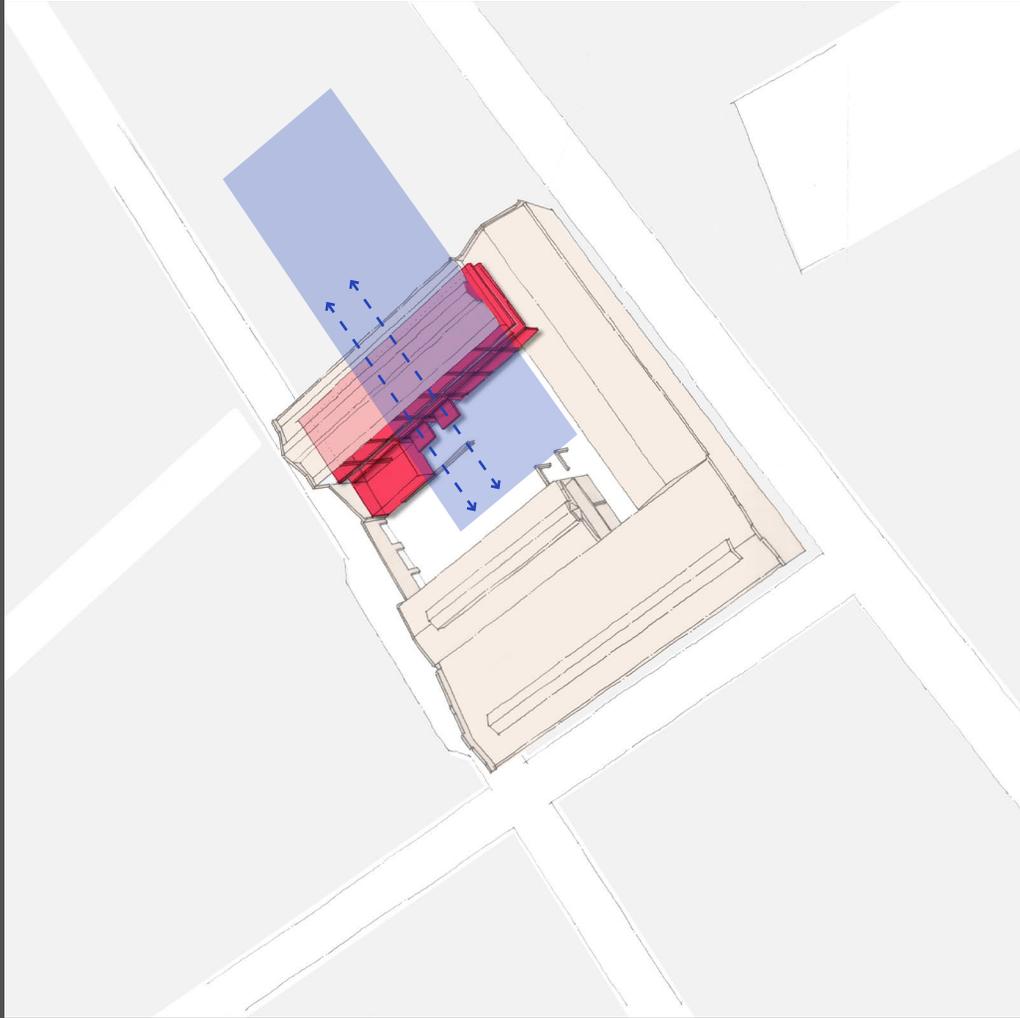


Figure 43: Site Interventions: Commerce. [Image by author.]

“We seek an approach that can respond to changes in the economy and the building market, to changes of program, and to the diversity of future lifestyle aspirations that no one can predict. Like a bricoleur, we create design strategies that can cope with incompleteness and can transform a situation of multiplicity of styles and expectations into a pleasure.”

*- Florian Beigel + Philip Christou,
“Specific Indeterminacy.”*

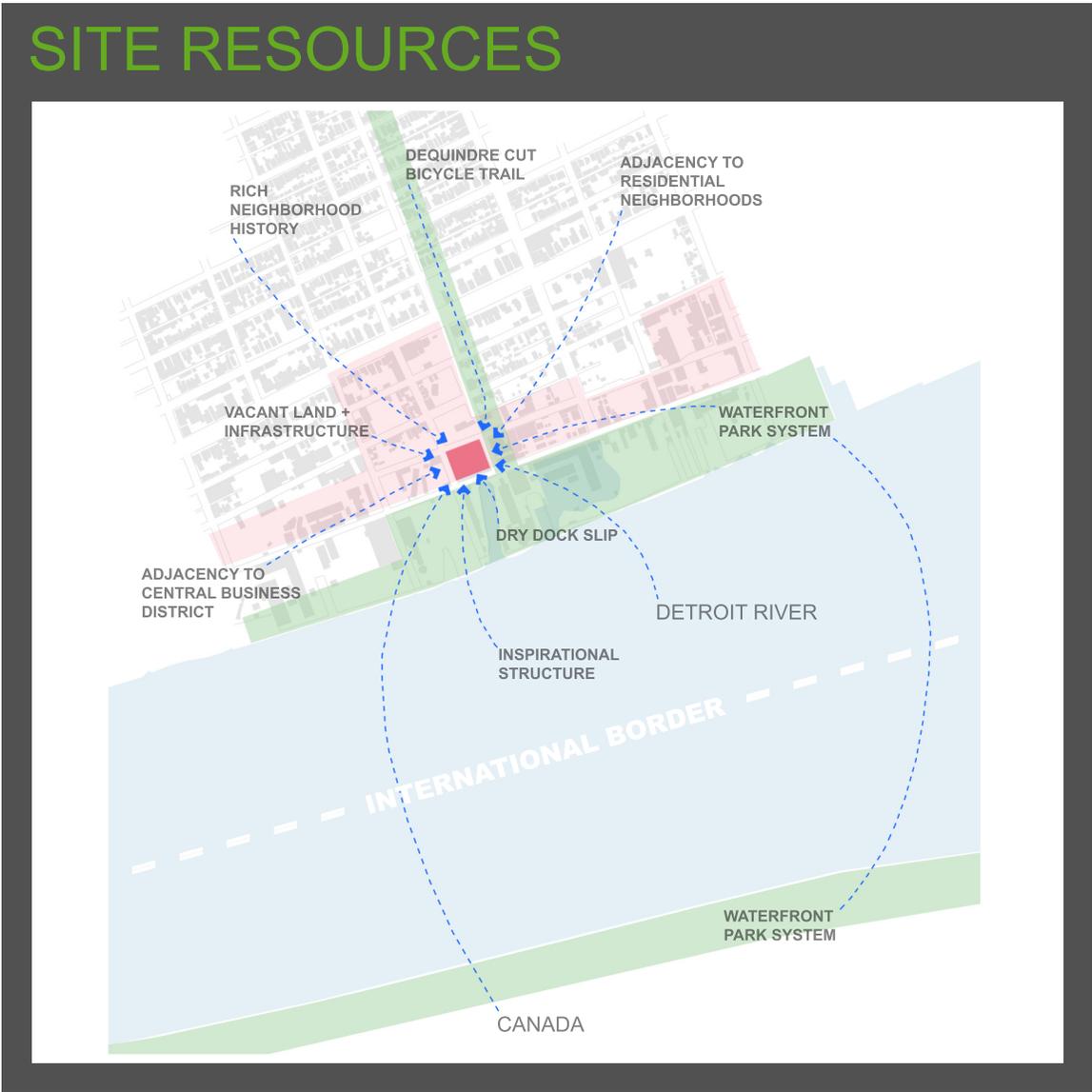


Figure 44: Ripple Effect: Site Resources. [Image by author.]

PROGRAM STRATEGY

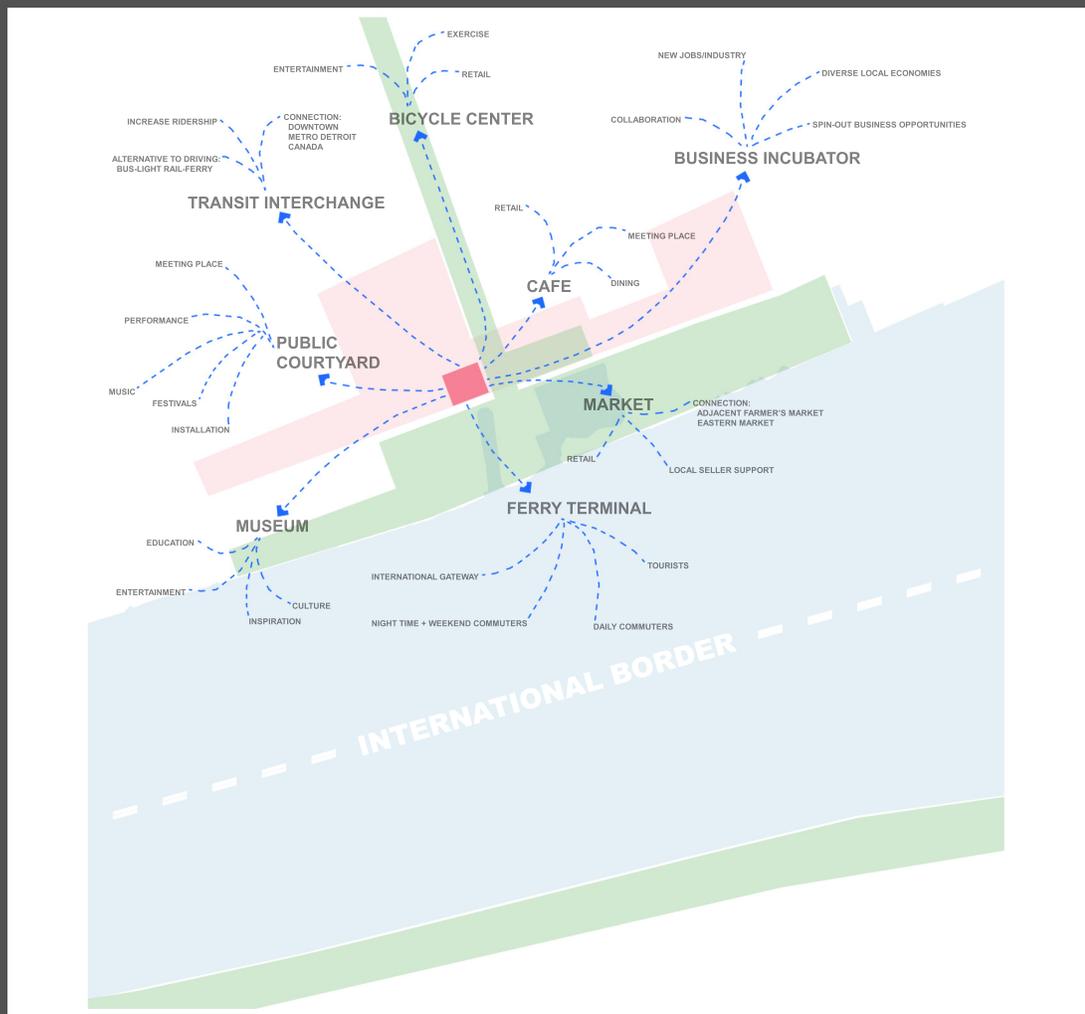


Figure 45: Ripple Effect: Program Strategy. [Image by author.]



Figure 46: Site Plan. Dry Dock Engine Works, East Riverfront, Detroit. [Image by author.]

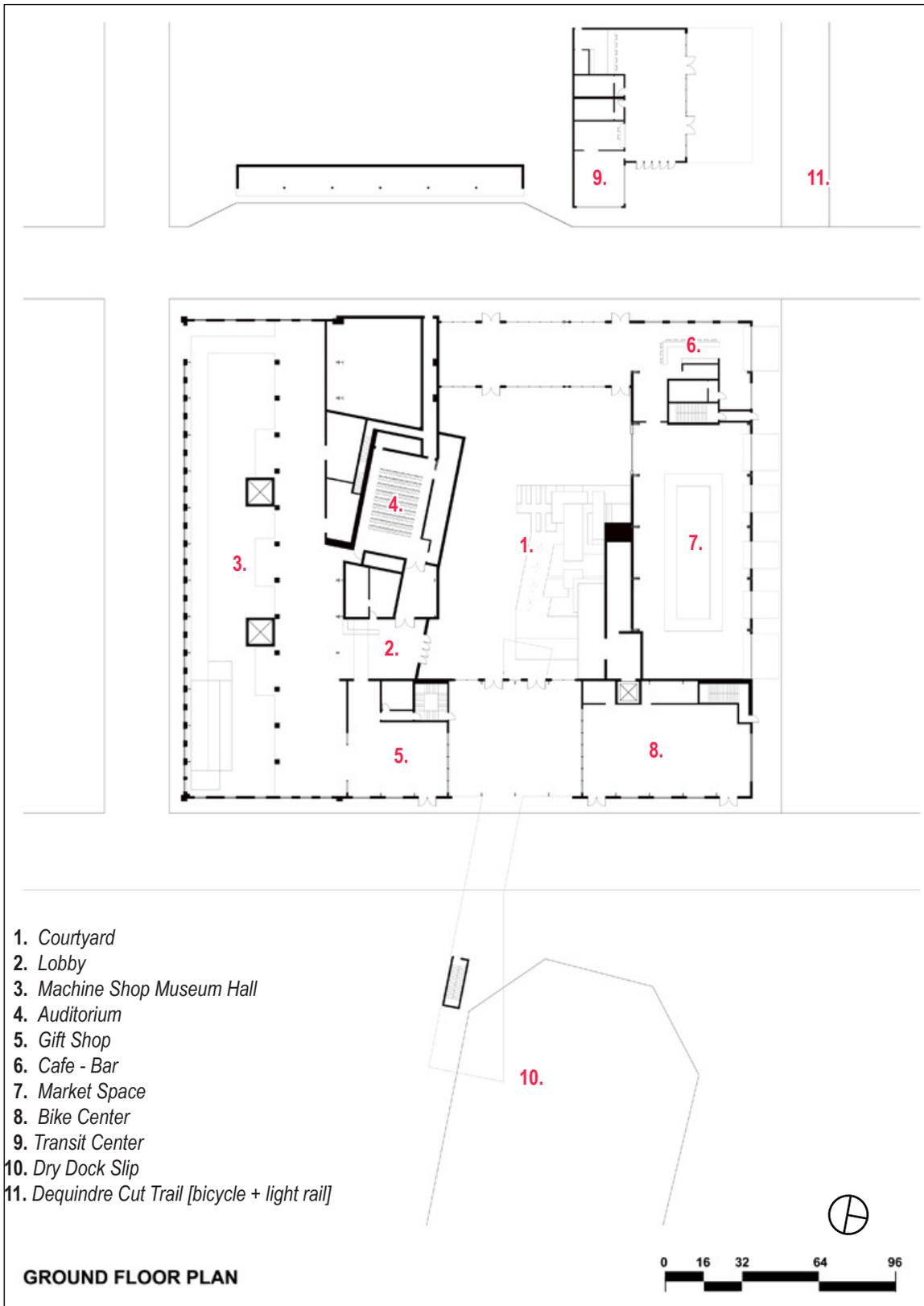


Figure 47: Dry Dock Engine Works: Ground Floor Plan. [Image by author.]

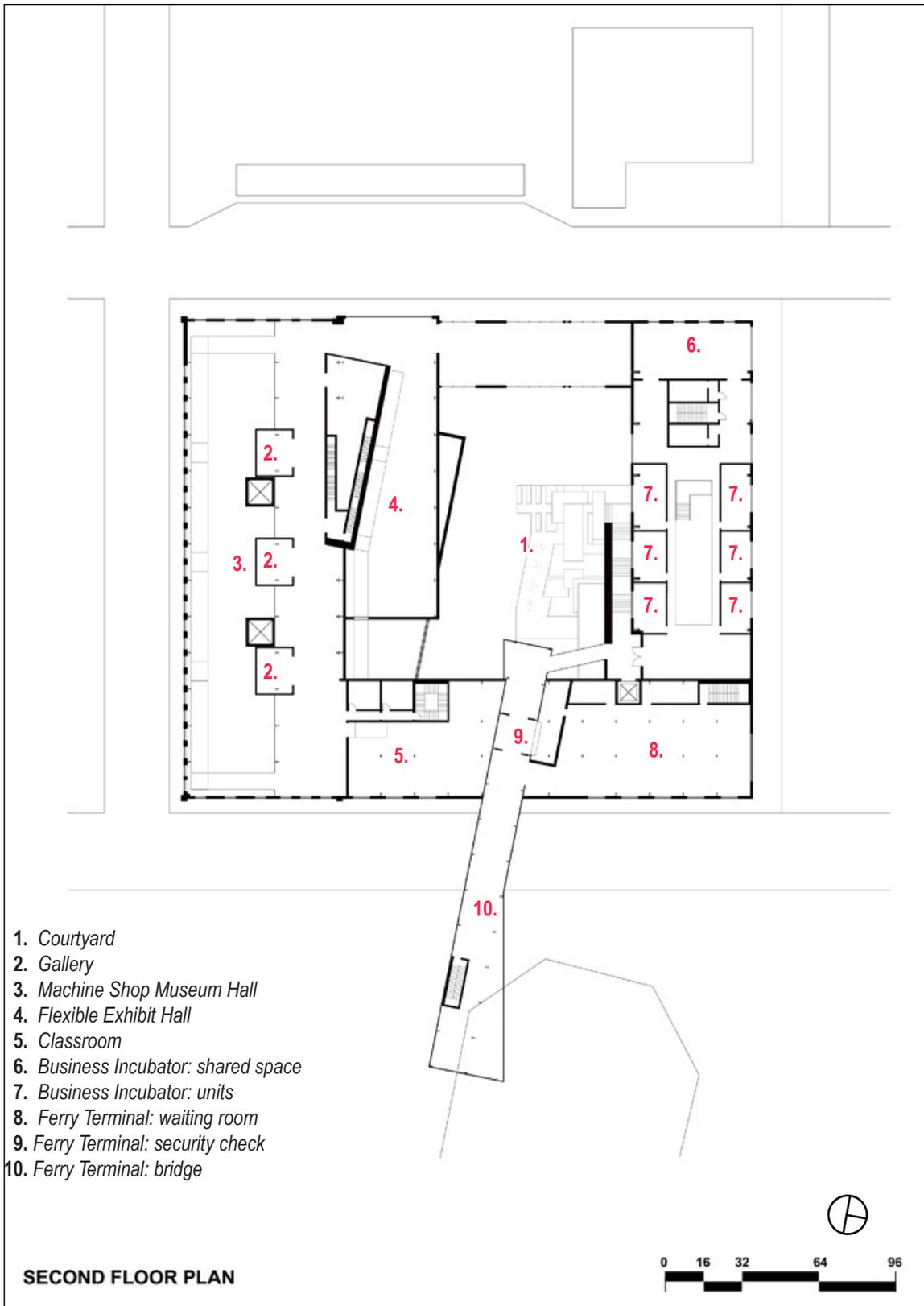


Figure 48: Dry Dock Engine Works: Second Floor Plan. [Image by author.]

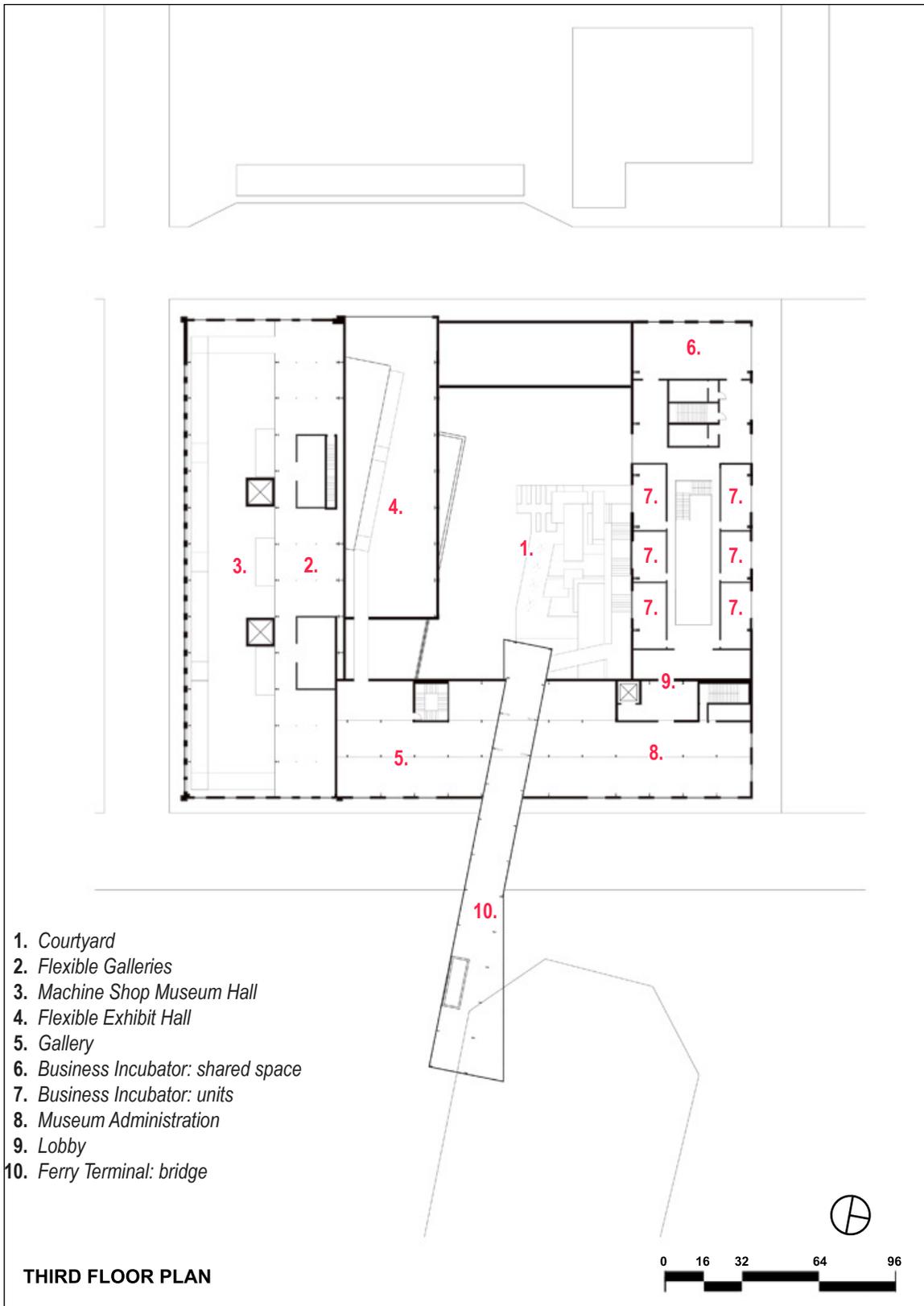


Figure 49: Dry Dock Engine Works: Third Floor Plan. [Image by author.]

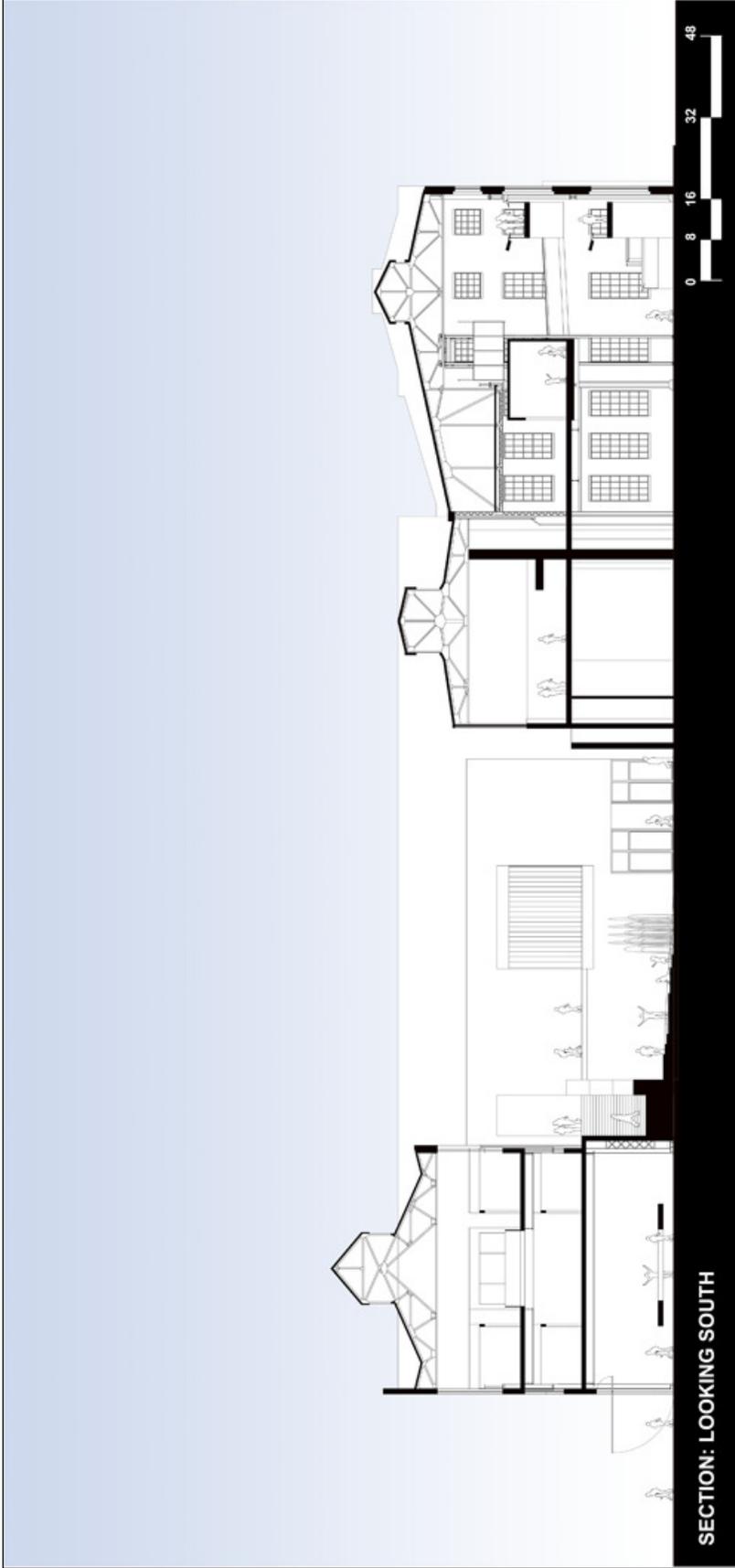


Figure 50: Dry Dock Engine Works: Section Looking South. [Image by author.]

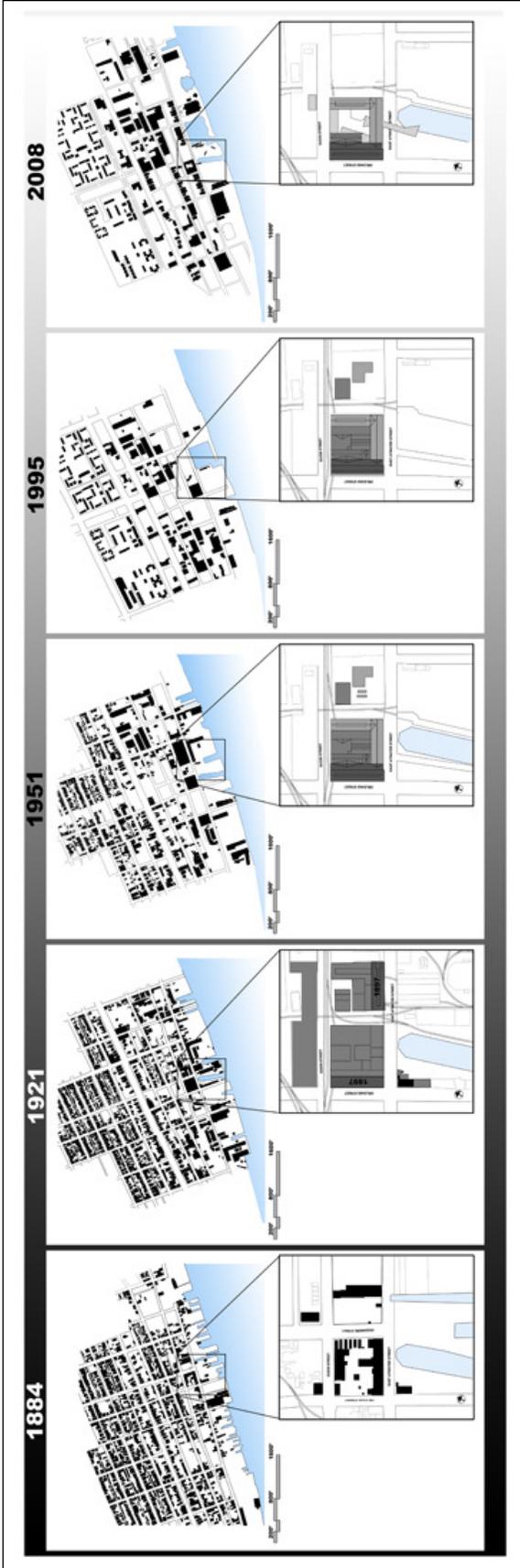


Figure 51: Site Evolution of The Dry Dock Engine Works: Including 2008 Proposal. [Image by author.]

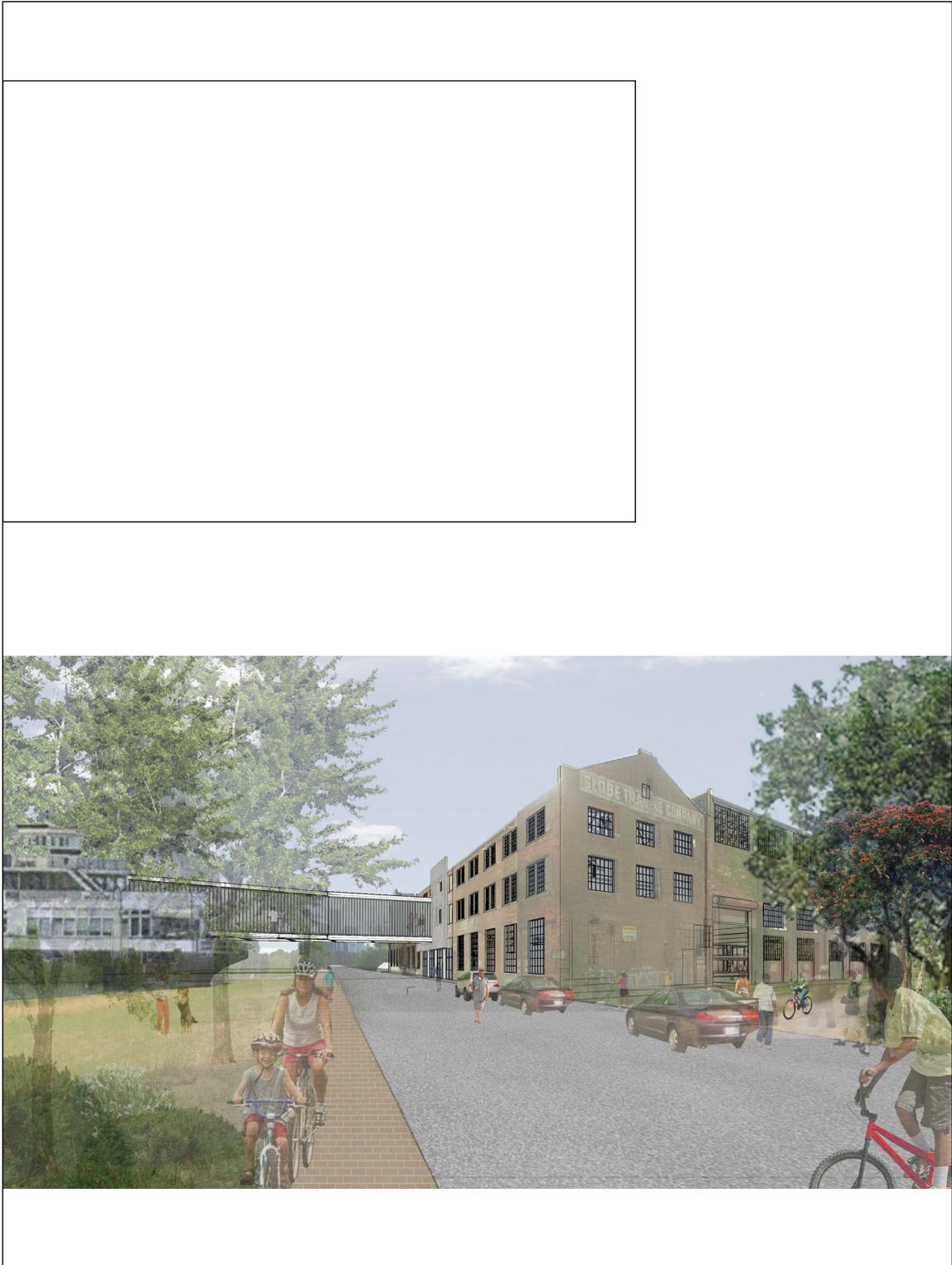


Figure 52: View From Atwater Street. Before intervention [top] + After intervention [bottom.]
[Historic American Buildings Survey; Image by author.]

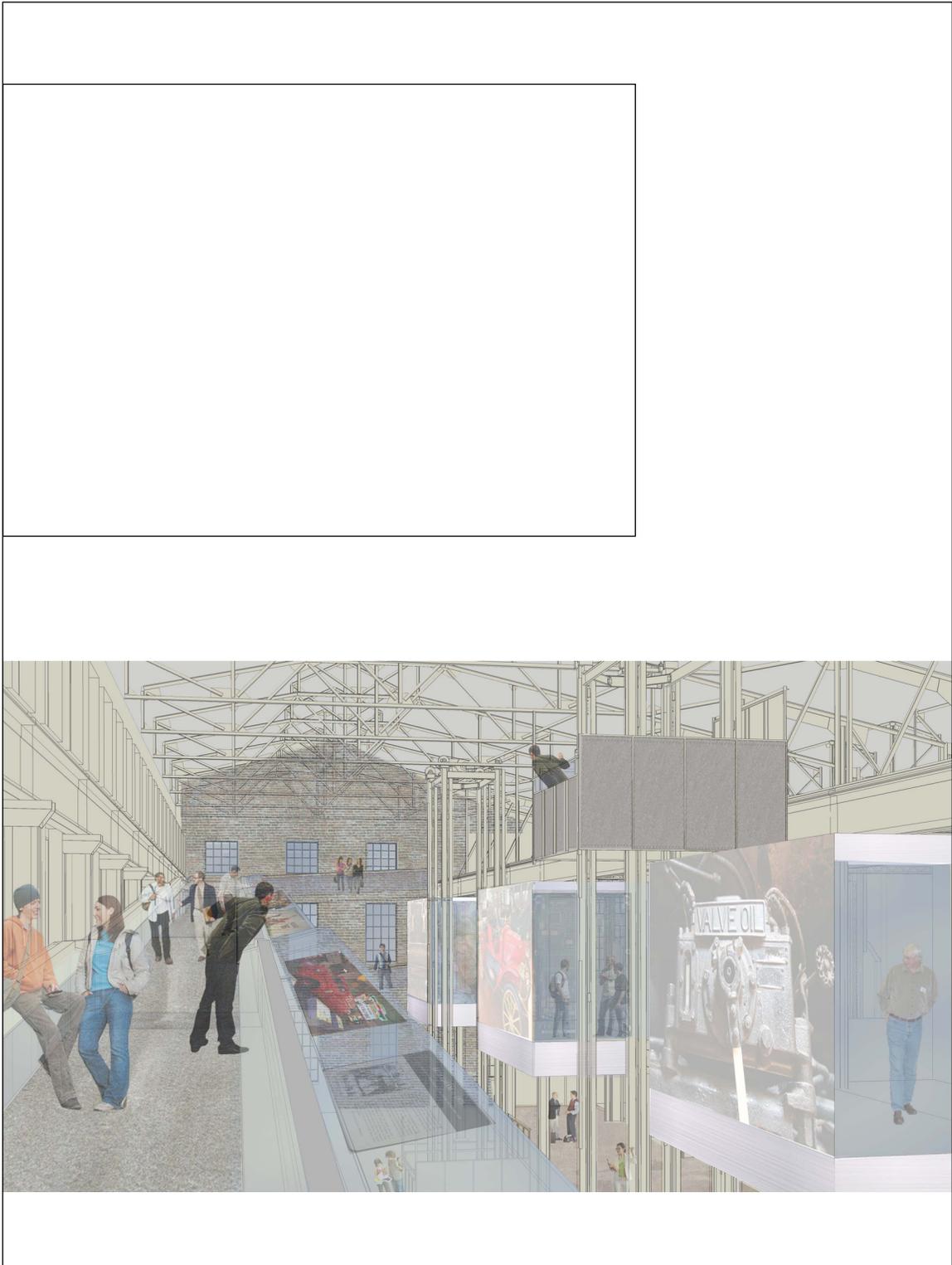


Figure 53: View Inside Machine Shop Museum Hall. Before intervention [top] + After intervention [bottom.]
[Historic American Buildings Survey; Image by author.]



Figure 54: Views of Courtyard. Before intervention [left 3] + After intervention [right 3.]
 [Historic American Buildings Survey; Image by author.]

Reflection

“Cities are places of communication and exchange. Yet this basic condition of urban life is critically undermined by the effects of shrinkage - migration, population decline, fragmentation, and introversion. Artistic interventions foster communication and new relationships between individuals, a city and its residents, the people who moved away, and those left behind. At the same time, novel forms of representation and changes in perception lead to reflection about oneself and a reappraisal of one’s environment. The very diversity of conflicting opinion lends a new quality to public space.”

- Philipp Oswalt, “Shrinking Cities: Volume 2.”

Reflecting on the development of this thesis, several points come about: the [im]balance of analysis + design, levels of hesitation/assertiveness, and overall design process and clarity. Perhaps a symptom of adaptive reuse projects, this author found that extensive research and documentation of the site proved to be a significant obstacle in the design process. Although a comprehensive understanding of the site and its history seemed necessary for an appropriate design, it in fact led to an apprehension of intervening, preventing the author’s pursuance of an aggressive design. A myriad of precedents [program + design], too, proved to be an obstacle, flooding the drawing board with too many possibilities.

At the public review, more time was recommended in order to heighten the level and clarity of the design. Additional diagrams were also requested to help clarify the final design, as well as the design process. Further development of the thesis focuses on redesigning the courtyard, as well as certain museum elements [ie. entry and auditorium], as they relate directly to the new courtyard design.

With adaptive reuse projects there will always be those questions of how. *How to achieve the appropriate level of intervention?* The explorations conducted through this thesis show that this is not an easy question to answer, yet it is one that deserves much attention. The fear of taking on too much may be daunting, but this author still believes that the challenge posed by adaptive reuse projects is one that must be accepted – as a personal exercise of design abilities, and as a necessary tool for reinterpreting Detroit and the many other shrinking cities around the world.

Notes

1. Dry Dock Engine Works, by Thomas A. Klug. Page 5.
2. Dry Dock Engine Works, by Thomas A. Klug. Page 7.
3. "About the Riverfront," at <http://www.detroitriverfront.org/about/> .
4. "Dequindre Cut Path At Least 6 Weeks Away From Opening," Detroit Free Press, Bill McGraw.

Bibliography

Allinson, Kenneth. London's Contemporary Architecture + : A Visitor's Guide. Oxford; Boston: Architectural Press, 2000.

Aulenti, Gae. Gae Aulenti / Margherita Petranzan. New York: Rizzoli, 1997.

Behrens, Thomas M. and Michelle Bowman. Dry Dock Engine Works. Historic American Engineering Record, no. MI-330. 2002-2003.

Beigel, Florian and Philip Chritou. "Specific Indeterminacy: Witznitz Briquette Factory." Shrinking Cities. Vol. 2. Ed. Philipp Oswald. Germany: Hatje Cantz Publishers, 2006. 136-141.

Bergeron, Louis. Industry, Architecture, and Engineering: American Ingenuity, 1750-1950. New York: Harry N. Abrams, 2000.

Cantacuzino, Sherban. Re-Architecture: Old Buildings / New Uses. New York: Abbeville Press, 1989.

City of Detroit Planning and Development Department. Master Plan of Policies: Neighborhood Cluster 4 Near East Riverfront. City of Detroit, 2004.

Colquhoun, Ian. Urban Regeneration An International Perspective. London: B. T. Batsford Ltd., 1995.

Darley, Gillian. Factory. London: Reaktion, 2003.

Design Council. Streets Ahead. New York: Whitney Library of Design, 1979.

Detroit City Plan Commission. Detroit 1990: An Urban Design Concept For the Inner City. Detroit City Plan Commission: 1970.

Detroit Riverfront Conservancy. 7 August 2008. Detroit Riverfront Conservancy. October 2007 <<http://www.detroitriverfront.org/>> .

Ferry, Hawkins W. The Buildings of Detroit: A History. Detroit: Wayne State University Press, 1968.

Gaventa, Sarah. New Public Spaces. London: Mitchell Beazley, 2006.

Greer, Nora Richter. Architecture Transformed: New Life For Old Buildings. Gloucester, MA: Rockport Publishers, 1998.

Griffin, Kenneth W. Building Type Basics For Transit Facilities. Hoboken, NJ: John Wiley & Sons, Inc., 2004.

Grube, Von Hans Achim. Nach Nutzung / Re-Use. Berlin: Jovis, 2006.

Haydn, Florian, and Robert Temel. Temporary Urban Spaces Concepts For the Use of City Spaces. Basel: Birkhäuser, 2006.

Hill, Eric J. AIA Detroit: The American Institute of Architects Guide To Detroit Architecture. Detroit: Wayne State University Press, 2003.

Holl, Steven. Architecture Spoken. New York: Rizzoli, 2007.

Klug, Thomas A. Dry Dock Engine Works". Historic American Engineering Record, no. MI-330. August 2002.

Krier, Rob. Urban Space. New York: Rizzoli International Publications, 1979.

Lennard, Suzanne H. Crowhurst. Livable Cities Observed: A Source Book of Images and Ideas For City Officials, Community Leaders, Architects, Planners and All Others Committed to Making Their Cities Livable. Carmel, CA: Gondolier Press, 1995.

McGraw, Bill. "Dequindre Cut Path At Least 6 Weeks From Opening." Detroit Free Press. 17 July 2008. < <http://www.freep.com/apps/pbcs.dll/article?AID=/20080717/COL27/807170380> >

Moore, Rowan. Building Tate Modern: Herzog & De Meuron Transforming Giles Gilbert Scott. London: Tate Gallery, 2000.

Naredi-Rainer, Paul v. Museum Buildings: A Design Manual. Basel; Boston: Birkhäuser, 2004.

Nelson, George. Industrial Architecture of Albert Kahn, Inc. New York: Architectural Book Publishing Company, Inc., 1939.

Norten, Enrique. Working - 20 Projects in Process: Enrique Norten, TEN Architectos. New York: Monacelli Press, 2007.

Oswalt, Philipp. Shrinking Cities. Vol. 2. Germany: Hatje Cantz Publishers, 2006. 2 vols.

Powell, Kenneth. Architecture Reborn: Converting Old Buildings For New Uses. New York: Rizzoli, 1999.

Reed, Peter Shedd. Groundswell: Constructing the Contemporary Landscape. New York: Museum of Modern Art, 2005.

Reichen, Bernard. Reichen & Robert. Basel; Boston: Birkhäuser, 2003.

Robert, Philippe. Adaptations: New Uses For Old Buildings. Paris: Editions du Moniteur, 1989.

Sanborn Map Company. "1922 Insurance Maps of Detroit, Michigan." New York, NY: The Sanborn Map Company, 1922.

Sanborn Map Company. "1951 Insurance Maps of Detroit, Michigan." New York, NY: The Sanborn Map Company, 1951.

Sanborn Map Company. "1996 Insurance Maps of Detroit, Michigan." New York, NY: The Sanborn Map Company, 1996.

Sanborn Map & Publishing Company Limited. "1884 Insurance Maps of Detroit, Michigan." New York, NY: The Sanborn Map & Publishing Company Limited, 1884.

Sanborn Map & Publishing Company Limited. "1889 Insurance Maps of Detroit, Michigan." New York, NY: The Sanborn Map & Publishing Company Limited, 1889.

Sanborn-Perris Map Company Limited. "1897 Insurance Maps of Detroit, Michigan." New York, NY: The Sanborn-Perris Map Company Limited, 1897.

Schervish, Vogel, Merz P.C. Linked Riverfront Parks Project. Detroit: Schervish, Vogel, Merz P.C., 1979.

Thiébaud, Pierre. Old Buildings Looking For New Use: 61 Examples of Regional Architecture Between Tradition and Modernity. Stuttgart: Edition Axel Menges, 2007.

Tibbalds, Francis. Making People-Friendly Towns: Improving the Public Environment in Towns and Cities. Harlow, England: Longman, 1992.

Vranckx, Bridget. Urban Landscape Architecture. Gloucester, MA: Rockport, 2006.

Wang, Yan Li. China Lofts. Gloucester, MA: Rockport Publishers, 2006.

Zeiger, Mimi. New Museums: Contemporary Museum Architecture Around the World. New York: Universe, 2005.