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RECLAIMED IDENTITY/ INNOV-ROC

THE INNOVATION HUB + REVITALIZATION OF HIGH FALLS | ROCHESTER, NY

Roger Williams University
School of Architecture, Art + Historic Preservation
Masters of Architecture Thesis, Fall 2014
Justin M. Dufresne

ACKNOWLEDGMENTS |

"You can design and create, and build the most wonderful place in the world. But it takes people to make the dream a reality." (Walt Disney)

This thesis is the culmination of years of architectural education, and the sum of two semesters of research, analysis, design, and production. It was a daunting process that could not have been achieved on my own, therefor I wish to publicly thank several individuals who have made it possible.

To the faculty and staff of the SAA+HP who have given me the tools and resources to study what I love. To DJ Alexander who single-handedly keeps our studio from becoming a smoking crater. To Bill McQueen, David Corbin, and Andrew Cohen who have pushed me as a student and a designer to unlock potential and to explore what architecture is and what my architecture can be.

To my friends that have gone on this wild journey with me, who were always there to vent to, to share ideas with, and to collaborate.

To Glenn and Gary Lepore of LDL Studio, who gave me my first taste of the "real world" of architecture, allowed me to share and express my ideas, and who put up with my whacky school schedule...

And to my parents and family, for all of the love and support that you've given me along the way. For providing the rock that I could always count on when I needed it. For giving me the opportunities to study and practice what I love. And of course, for all of the Legos (so many Legos) that sparked my interest in architecture at such a young age.

Thank you.

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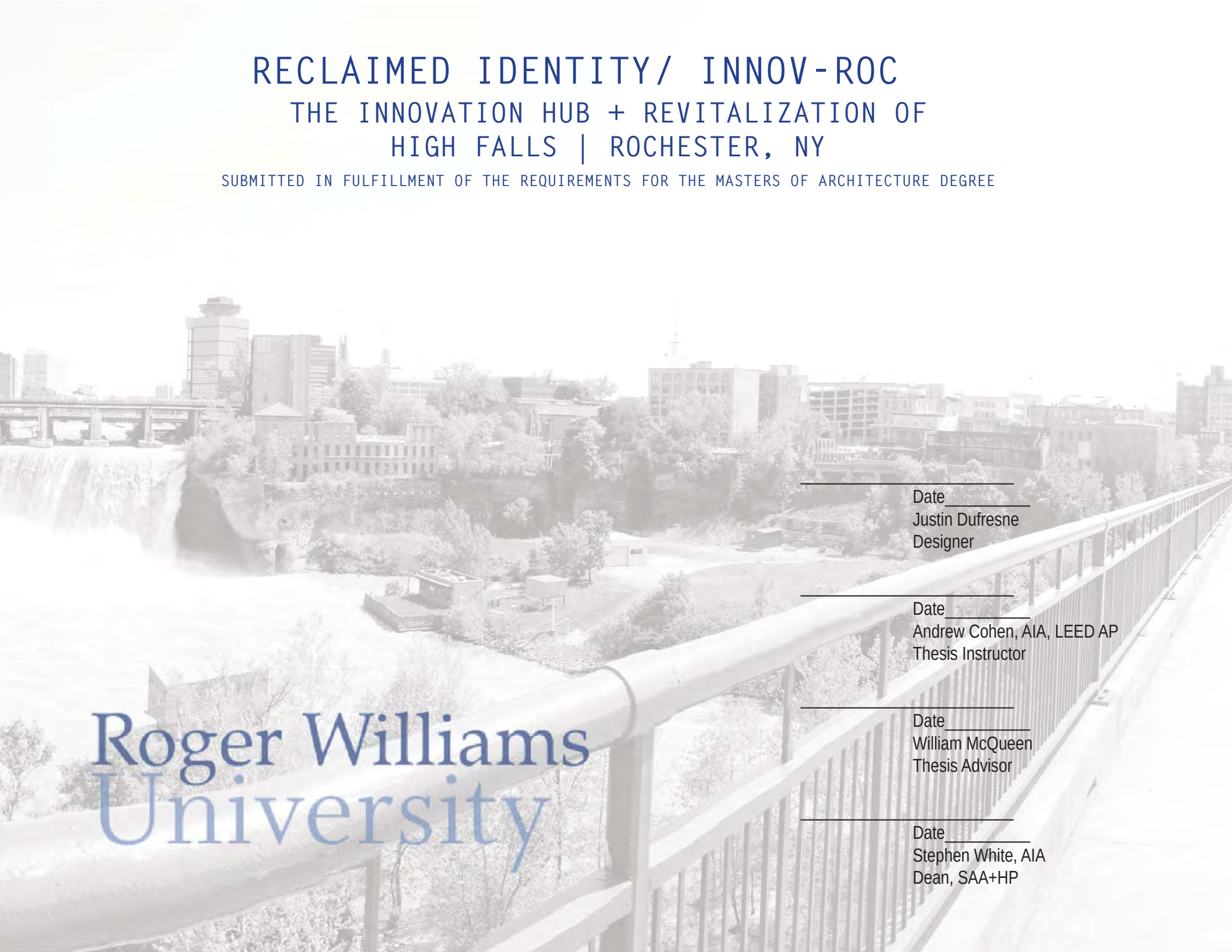
SUBMITTED IN FULFILLMENT OF THE REQUIREMENTS FOR THE MASTERS OF ARCHITECTURE DEGREE



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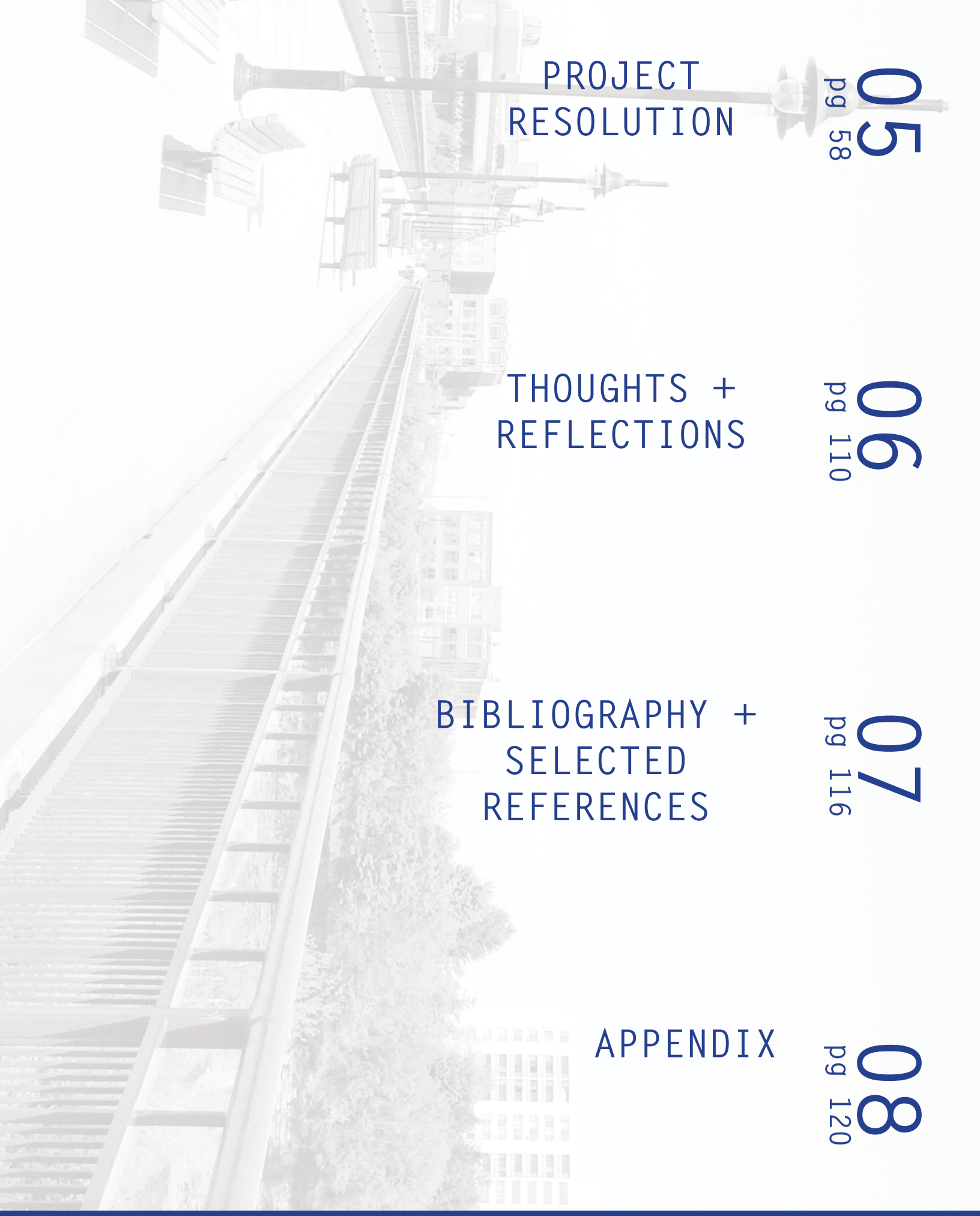

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01

INTRODUCTION

Founded on the banks of the Genesee River in 1817, Rochester quickly became one of America's first "boomtowns." Within two decades, Rochester earned its nickname of the "Flour City," as it was the largest flour producer in the United States. The mills that powered this industry created the architectural backdrop from which the rest of the city would grow, and they also formed an intimate relationship with the Genesee River and High Falls, the Erie Canal, and the entire surrounding region.

By the mid to late 19th century, wheat processing began to move west, following western explorers and agriculture. With their exodus came new economic opportunities that transformed Rochester in a new way. George Eastman founded Kodak in Rochester in 1888, the University of Rochester was established in 1850, and the Rochester Institute of Technology was established in 1829. Xerox also started in Rochester in 1906, and the eye health product company Baush & Lomb is currently headquartered in Rochester.

Despite this rapid shift from mill and manufacturing to tech and higher-education, in modern times Rochester hasn't kept pace with new demands. Kodak and Xerox, once the largest employers in the area are now only a shadow of what they once were. Despite the U of R and RIT's prestigious standings, graduates often leave the area in search of better career opportunities. At the same time, the population has been steadily decreasing for the last few decades.

Remnants of Rochester's vibrant past and roots still exist today. Portions of the old mills that once lined the river stand as hollowed-out shells or have been re-purposed. Most have been demolished. Channels carved into the earth to divert the power of the river can still be seen in the Brown's Race neighborhood of High Falls. Despite this rich past and potential, the areas along the Genesee and particularly around High Falls lay vacant and under-appreciated.

Could architecture serve as means of letting Rochestarians get back to their roots as a city? Can it also serve as a means of fostering new innovation and draw from the talent and skills of those associated with the city's universities, hospitals, and major corporations?

If Rochester is to not only to survive but to flourish, a dramatic revitalization must happen. This proposal aims to create a new beginning for the city of Rochester. Innovation, arts and culture, civic and landscape elements must all work in unison to bring life back to the city and to the High Falls district, a district barely half a mile from downtown but seemingly father removed.

1 | "Historic High Falls Photography." (Monroe County Library System).

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02

PROBLEM + PROJECT STATEMENT

High Falls has the potential to be the epicenter for culture, entertainment, and innovation in a vibrant and beautiful location of the city. For whatever reasons (most likely economic), this potential has not been realized.

By teaming up with local industries and institutions, a partnership can bring new life to High Falls by drawing on the talent and skill that already exists in the area.

The site occupies approximately ten acres of land, but is subject to numerous geological, transportation, political, and socio-economic conditions. The master plan strategy must develop an over-arching theme of unity in the present as well as connections to the past. Each component of the program must also work to reinforce the existing context, whether it be historic building or landscape. Though each component is significantly different, they must all create a public image regardless of usage.

As it exists today, the site is somewhat divided from downtown, and the east and west sides of the gorge. The only real physical connections between the two sides is the Pont de Rennes pedestrian bridge. Unifying the entire district by creating a continuous pedestrian ring around the site that also links to downtown by connecting under the Inner Loop and train tracks will be the vital artery that links the site. This ring can be thought of as a continuous linear park, adaptable to the seasons, and expressive of the history of the site.

On the eastern side of the site stands the Genesee Brewery. The brewery recently demolished a vacant historic building that was once part of the then Cataract Brewing Company, to make way for a proposed restaurant and micro-brewery. Granite Mills Commons, a public park, occupies the remaining portion of the east side of the river. Expanding on the brewery's plans to bolster the night life and draw people to the area is crucial.

On the west site of the gorge is Brown's Race, named after the channel that was cut into the ground that allowed water to be diverted from the river to power a row of mills. Today, a few restaurants and offices occupy these historic buildings, but there is still little to attract visitors. A laser-light show that took place in the gorge once drew large crowds, which in turn brought economic gain, but this event has been inactive for several years.

Reactivating Brown's Race by extending the pedestrian ring in the form of a linear garden to link the remaining site, as well as introduce new programmatic elements such as galleries, performance spaces, and restaurants will bring much-needed life to this side of the falls.

This project is not about creating a piece of architecture that will serve as an icon to an idea or movement. Rather, this project is about how a series of smaller architectural interventions can reinforce a context that is already established and has roots that can be traced back to the city's founding. A series of smaller programs linked together, and to the larger urban context will serve as a means of re-energizing this forgotten district, and re-energizing a city that has been in steady decline for the last several decades. The project must draw on several community partners and organizations, and the unique skills, services, and opportunities that they can offer each other, and the community as a whole.

Both the city of Rochester and the historic architecture found within it were fundamentally shaped by the mill. These unique structures lined the Genesee River, integrated with it, and provided jobs and an economic boom for countless individuals.

Though the mill industry has left the city, remnants of the structures that once housed many of Rochester's early industries can still be found. Brown's Race, now a preservation district, is comprised almost entirely of mill buildings dating back to the mid-to-late 19th century. Brown's Race itself (the raceway once used to channel water from the river to power mills) still exists. If one looks carefully you can still see the water wheels and mechanisms used to power the old mills, now covered in brush.

Since mill and industrial architecture defines the High Falls district, drawing from this style and building form will be crucial for the proposal to be faithful and fair to its context. At the same time however creating a new image for the district suggests that rebuilding some of the historic buildings "brick for brick" may not be the best solution either. A synthesis of old and new ideas, forms and materials will play an intricate role in unifying the re-energized High Falls.

This proposal is meant to be a means of strengthening the High Falls district, and bolstering new connections for innovators, artists, and visitors. In essence, the project belongs to the people.

A transparency and duality between the different programmatic elements will help to break-down any clear separation of these pieces of the project. A single building on the site can, and should serve multiple purposes, be it restaurant and housing, or lab and office. Each piece of the project must be mutually beneficial to the next.

Proposals already exist that would make High Falls one of New York State's first "Eco-Districts," (an area in the city that takes sustainability seriously in all aspects of life, building, and community). Introducing new sustainable practices will help to not only offset energy and materials consumption of the project, but also serve as a model to communities elsewhere.

Given Rochester's notoriously overcast skies, solar energy may not be a practical solution. Green roofs and landscapes using native vegetation will not only require less maintenance, but will strengthen local ecologies.

The flat topography and urban context make large-scale wind power generation impossible. Much as in the past, the power of the Genesee River, and the potential energy waiting in the drop of High Falls provides inexpensive, clean, and sustainable energy that can be used for new buildings in High Falls, but for the city as a whole and beyond.

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03

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CONCEPTUAL DESIGN GROUNDWORK

INTRODUCTION |

High Falls is not only a truly rare gem to find in a city, but it defines the area from which Rochester was founded, grew, and thrived. Despite being the oldest area of the city, today it is cut off from downtown by an interior connecting highway and train tracks. As modern Rochester expanded, it did so approximately half a mile south, and towards the sky, leaving High Falls to suffer the consequences of neglect and poor urban planning.

Today, historic mill and industrial buildings are now occupied by offices, shops, or restaurants. Bits and pieces of buildings that once occupied the site still stand as monuments to the industrial power that once existed. One is overwhelmed by a sense of old and new when entering Brown's Race. At the same time, lack of proximity to downtown and lack of interest in the area means that the potential that exists in Brown's Race and High Falls goes un-tapped.

Right now, two large elements exist on the site and have to a positive or negative extend shaped the way that High Falls is viewed. To the west at river level is Rochester Gas & Electric's (RG&E) Beebee power station. Built in stages between 1880 and 1959, the station was taken off-line in 1999. Today the building is considered hazardous, and is full of asbestos. RG&E has submitted a proposal to demolish the main station building and out-buildings, and regrade the site to make it suitable for vegetation. If approved, the station could be completely removed and the site restored by winter of 2016.

On the east is the Genesee Brewing Company. Founded in 1878 after the joining of several smaller companies, the Genesee Brewing Company has been one of Rochester's longest lasting industries. Since its early beginnings, High Falls has been home to the company, which in turn has made a commitment back to it. The Brewery recently demolished 13 Cataract Street, a historic building on the brewery complex to make way for its new microbrewery, restaurant, and tasting bar. The brewery has worked to increase its public appearance, and to bring more visitors and patrons to the area, and thus revenue.

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ALL IMAGES BY JUSTIN AND YVES DUFRESNE UNLESS OTHERWISE NOTED

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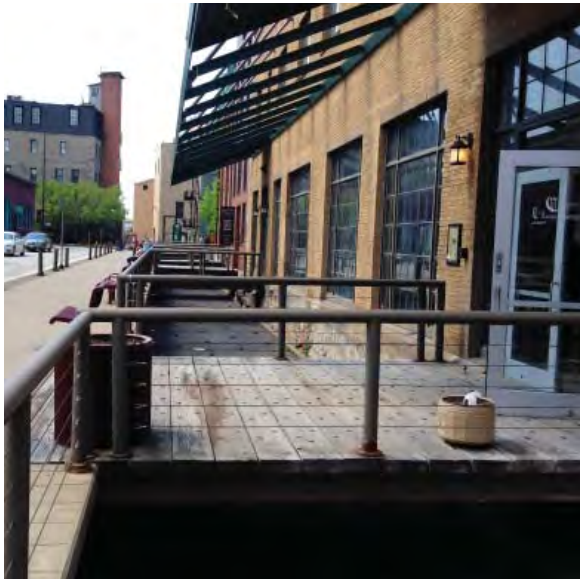
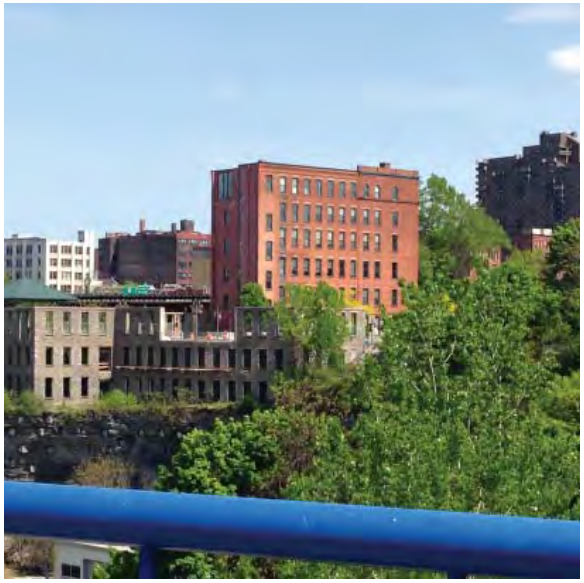
BROWN'S RACE TODAY

ALL IMAGES BY JUSTIN AND YVES DUFRESNE UNLESS OTHERWISE NOTED



BROWN'S RACE TODAY

ALL IMAGES BY JUSTIN AND YVES DUFRESNE UNLESS OTHERWISE NOTED



PONT DE RENNES BRIDGE

ALL IMAGES BY JUSTIN AND YVES DUFRESNE UNLESS OTHERWISE NOTED

EAST SIDE + GENESEE BREWERY

ALL IMAGES BY JUSTIN AND YVES DUFRESNE UNLESS OTHERWISE NOTED

PRECEDENT | HOLYOKE, MA

Like Rochester, Holyoke, MA rose to great economic standing through a mill-based industry. Also like Rochester, when the industries that occupied these mills left the city or failed, the essence of what made the city great left as well.

Today, Holyoke is undergoing a multi-year redevelopment master plan that includes several projects aimed at revitalizing key areas of the city, as well as creating an infrastructure and program that will attract high-tech jobs and individuals to fill them.

The anchor of this plan is the Massachusetts Green High Performance Computing Center (MGHPCC), which is a multi-party venture between the state's top research universities, international tech companies, private research organizations, and various government agencies. The building is the epicenter for computer simulations, programming, and calculations in a new era.

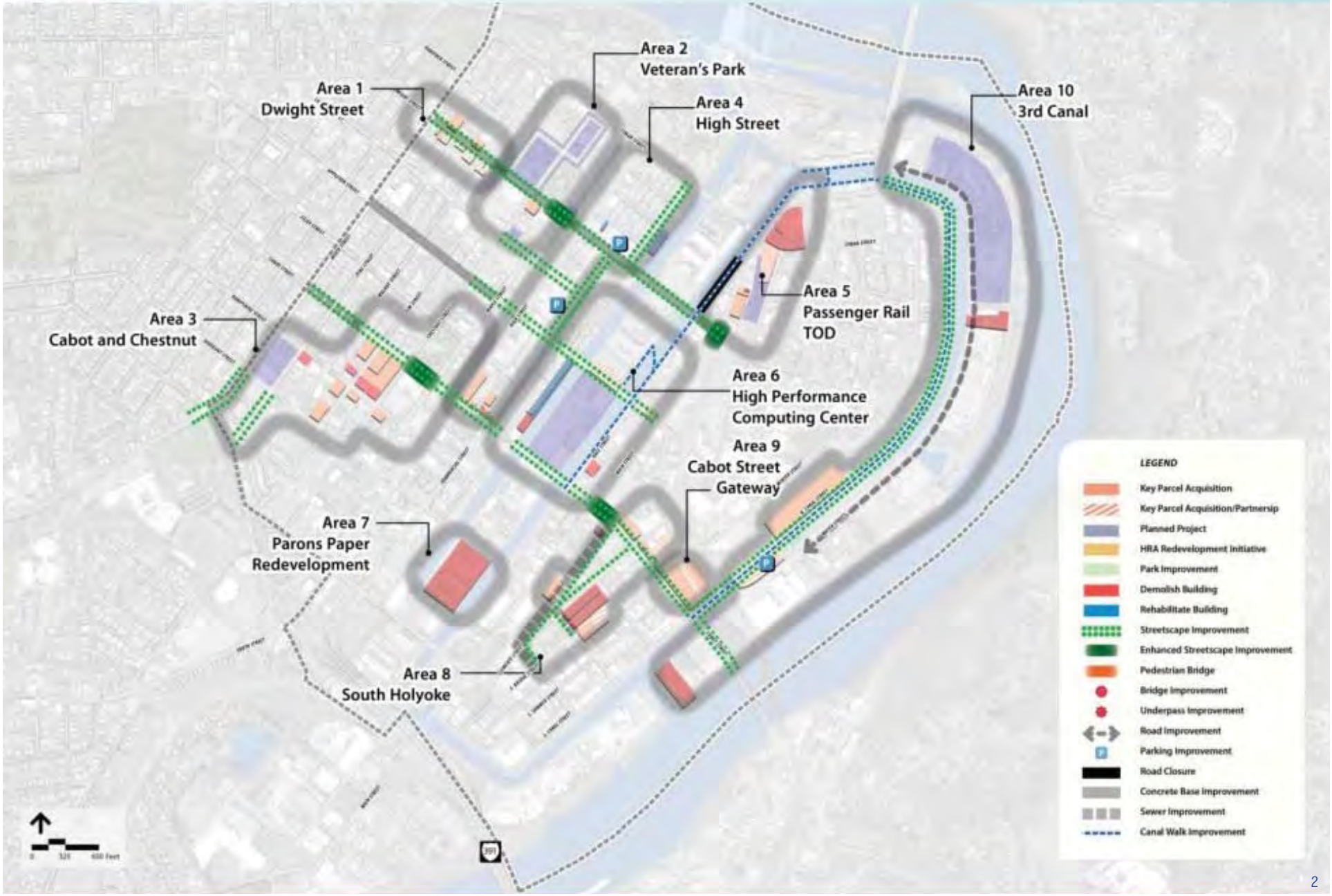
2 | "Urban Renewal Plan." (Holyoke Redevelopment CO)

2

2

2

Holyoke REDEVELOPMENT



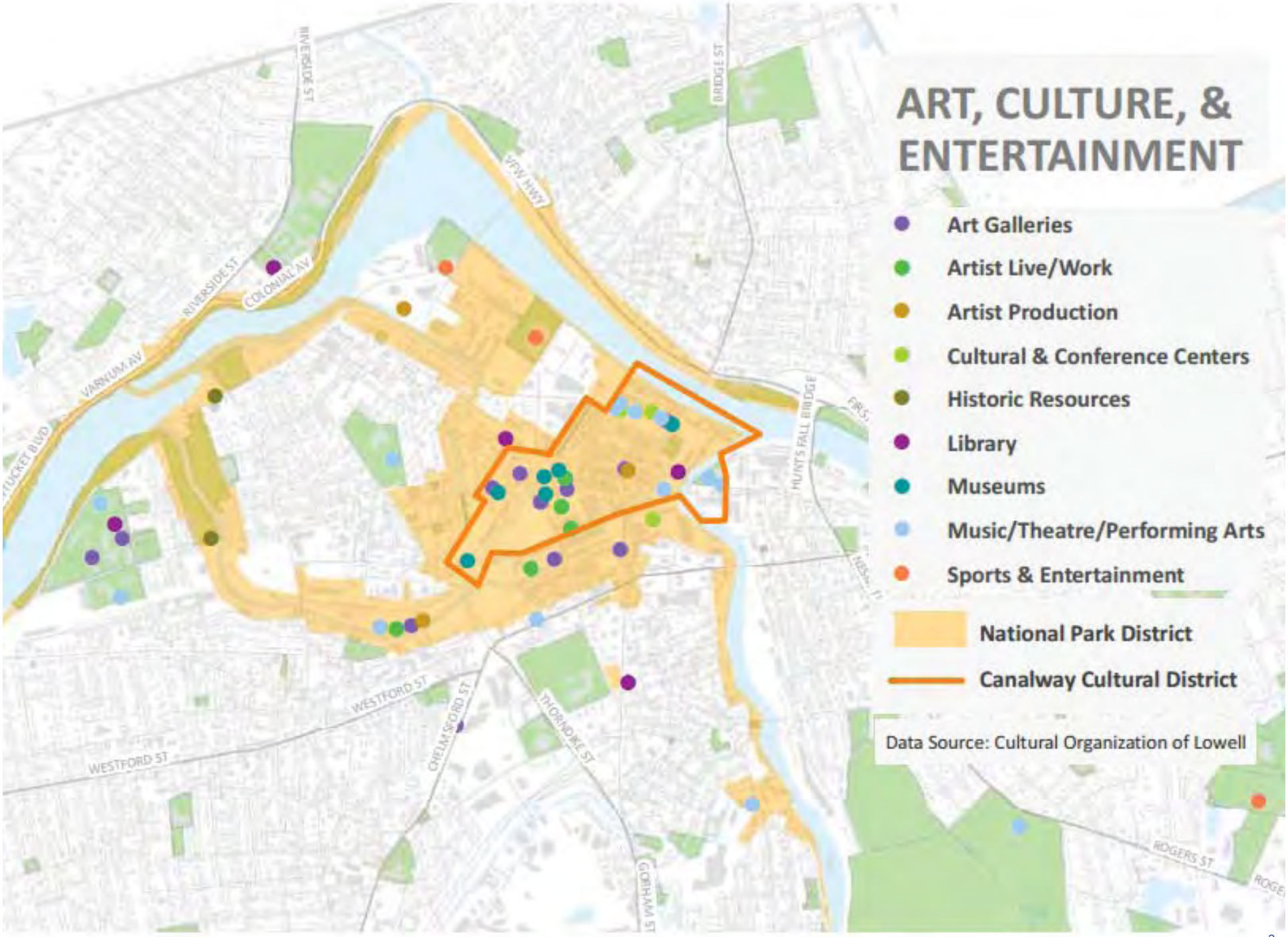
PRECEDENT | LOWELL, MA

In a similar way to Rochester and Holyoke, Lowell underwent the same peaks and depressions associated with the rise and fall of a single industry-base economy.

The master plan for Lowell focuses on creating and reinforcing an epi-center for arts and culture for the area by revitalizing the city and re-imagining the numerous vacant mill buildings that occupy the city.

Expanding educational and institutional access aims to attract new students and young professionals to Lowell as well as new high-tech careers and business opportunities.

3 | “Urban Revitalization + Development.” (City of Lowell, MA)


ART, CULTURE, & ENTERTAINMENT
Art Galleries
Artist Live/Work
Artist Production
Cultural & Conference Centers
Historic Resources
Library
Museums
Music/Theatre/Performing Arts
Sports & Entertainment
National Park District
Canalway Cultural District
Data Source: Cultural Organization of Lowell
RIVERSIDE ST
COLONIAL AV
VARNUM AV
VFW HWY
BRIDGE ST
HUNTS FALL BRIDGE
WESTFORD ST
CHELMSFORD ST
THORNDIKE ST
GORHAM ST
ROGERS ST

INITIAL PROGRAM OUTLINE

The site requires the activation of several different types of program, all intimately linked together; innovation, arts/culture, recreation, entertainment. The intention is to not only create a place where young professionals can gather to work on the next great technological advancement, but also a place for artists and performance to work and showcase their craft, patrons to wine and dine while overlooking the falls, and people to gather to learn about the rich history that existed here.

The anchor of the project is the Innovation Hub. Here, students, recent graduates, and researchers can work independently or under the assistance of faculty at U of R or RIT, or the direction of local companies such as Kodak, Xerox, and Baush & Lomb. Laboratories for different types of research would be housed here; computing, digital manufacturing, and chemical, as well as communal space for showcases and exhibitions.

The next largest component of the proposed program is dedicated to arts and culture. Rochester is home to a large population of artists and performers (many from the Eastman School of Music). Rochester is also home to numerous institutions for art and musical performance. What seems to be lacking is smaller studio and gallery space for many independent artists and performers, and space where they can work collaboratively. Providing for collaborative studios, intimate-flexible gallery space, and black box theaters/ recital halls will create a new epicenter for the arts in the city, in one of its most beautiful and dynamic districts.

While there are bars and restaurants dotting Brown's race, they are very disconnected and disjointed from the rest of the site. Connecting and adding to these elements will help to draw more patrons to High Falls, bolstering the neighborhood's economy.

Since the site is so large and so divided, linking all corners is crucial for its success as a whole element. The Pont de Rennes Bridge now serves as the only real pedestrian connection between the east and west sides of the gorge. Re-energizing this bridge to tie it to the landscape, as well as adding a new pedestrian bridge at the top of the falls will create a complete circle around the site, allowing easy pedestrian access, and forming a more cohesive union of east and west.

The following is a preliminary program and is subject to change. Additional research on what is existing in the area already my inform what program needs to be adjusted.

ENTERTAINMENT

1@ High Falls Museum (5000sqft)
1@ gallery (2000sqft)
1@ restaurant (2000sqft)
1@ restaurant (1000sqft)
1@ outdoor theater
2@ boutique stores (1000sqft ea)

total NSF: 12,000

INNOVATE

1@ lobby (500sqft)
1@ cafe/lounge (2000sqft)
2@ gallery/exhibition (2000sqft ea)
2@ computer lab (1000sqft ea)
1@ digital fabrication lab (3000sqft)
2@ robotics lab (600 sqft ea)
4@ chemical lab (1000sqft ea)
4@ lecture/assembly (500 sqft ea)
1@ administration (800sqft)
rentable office space (10,000sqft)

total NSF: 47,500

ARTS/CULTURE

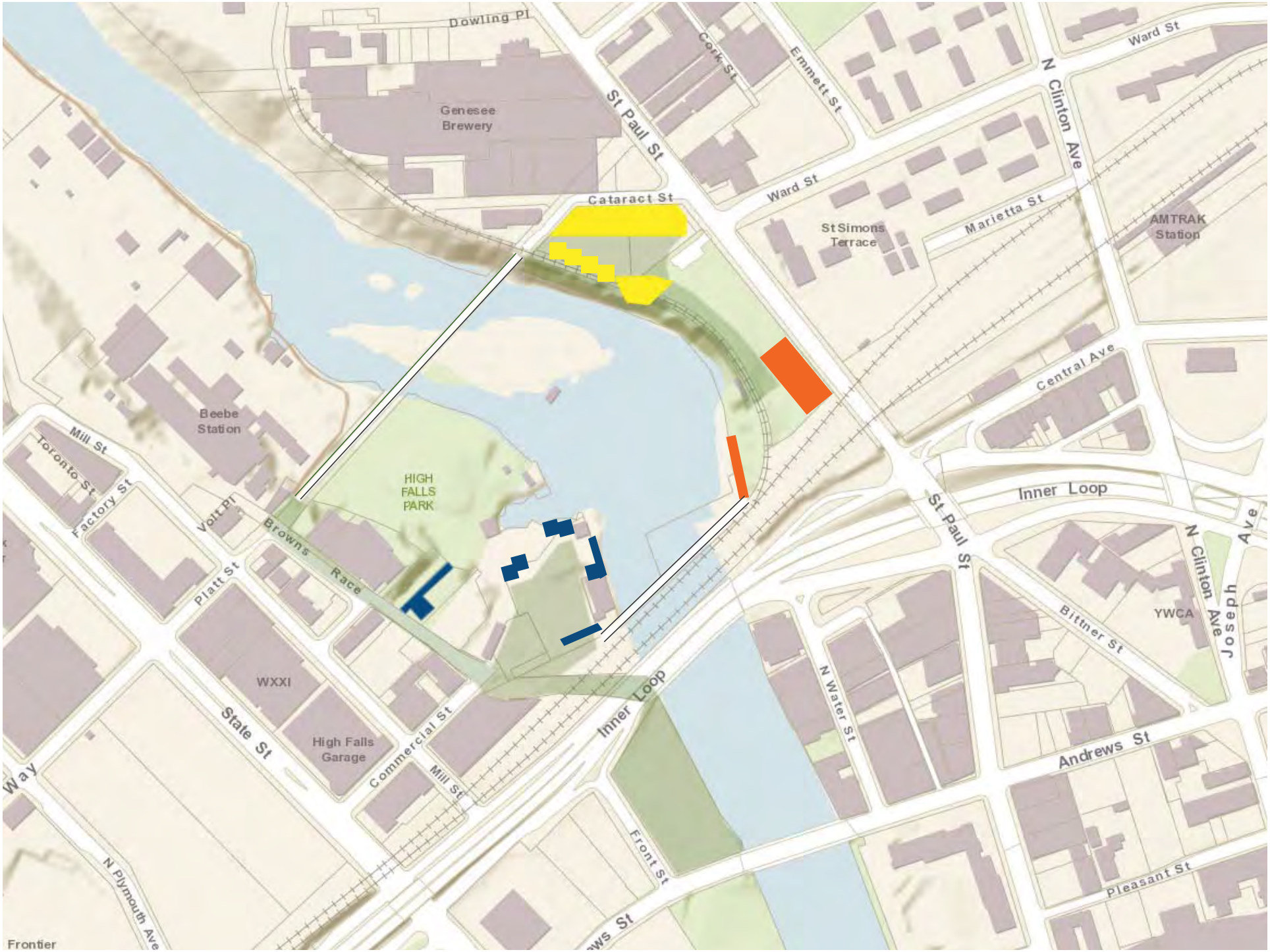
1@ flexible gallery (2000sqft)
1@ recital hall (1500sqft)
1@ black box theater (1500sqft)
4@ shops (800 sqft ea)
2@ bar or coffee shop (600 sqft ea)
6@ infill restaurants (existing bldgs)

total NSF: 9,400 new

LANDSCAPE

-linear garden on PdR Bridge
-pedestrian bridge @ top of falls
-public plaza in Brown's Race
-overlook
-bike path @ river level to Charlotte Beach

-landscape bridge over Inner Loop


Dowling Pl
Genesee Brewery
St Paul St
Cork St
Emmett St
N Clinton Ave
Ward St
Cataract St
Ward St
St Simons Terrace
Marietta St
AMTRAK Station
Central Ave
Beebe Station
Mill St
Toronto St
Factory St
Volt Pl
HIGH FALLS PARK
Browns Race
Platt St
Inner Loop
St Paul St
N Clinton Ave
Joseph Ave
YWCA
Bittner St
WXXI
State St
High Falls Garage
Commercial St
Mill St
Inner Loop
N Water St
Andrews St
Front St
Pleasant St
N Plymouth Ave
Frontier

INITIAL ZONING CONSIDERATIONS

Being entirely on the riverfront, the site is governed by the CCD-R (center city district-riverfront) zoning criteria of the City of Rochester's zoning code.

According to article IX, section 120-67 of the city zoning code, the purpose of the CCD-R district is to:

(1) preserve the exiting character of the riverfront
(2) promote development compatible with the desirable built character of the riverfront
(3) improve visual and physical access to the river's edge
(4) provide uninterrupted public access to the river's edge
(5) promote the riverfront as a place for public gathering and activity
(6) reduce the "barrier" effect of the river separating the east and west sides of the Center City; strengthen linkages across the river

The code also dictates certain physical and aesthetic qualities of new buildings within the district. The zoning board has created a "design checklist" that outlines the requirements for construction of new buildings in the CCD-R zone. They also provide notes for deviations to these outlines, and what would need additional review by the board or special commissions.

A synthesis of a few of the major requirements of the CCD-R zoning regulations include:

(1) maxiumum building length and depth shall be no more than 25% of the block length and 50% of the block depth
(2) the building can be minimum of three stories (30') to a maximum of six stories (72')
(3) buildings shall be parallel to the street frontage
(4) buildings fronting the river shall be parallel to the riverfront, and oriented to preserve or enhance views of the river
(5) setbacks for buildings adjacent to the river shall be 30'min and 60' max
(6) buildings shall maintain the alignment of horizontal elements of adjacent existing buildings
(7) facades shall be composed to exhibit a defined base, midsection, and crown
(8) buildings with river frontage shall be designed with a facade along the river equal in prominence to is primary street facade
(9) vehicular entrances are permitted on rear and side yards only
(10) windows and window openings shall diminish in size to reinforce the base, midsection, and crown
(11) the base shall be 50% min and 65% max window coverage
(12) the midsection shall be 35% min and 60% max window coverage
(13) all other facades and alley street frontages shall be 25% min window coverage
(14) the window height to width ratio shall be 1.5:1 to 2:1
(15) buildings facing the river shall provide a riverfront entrance equal in prominence to other primary facade
(16) entrances shall be flush with sidewalks
(17) rooflines shall be flat and delineated with a crown
(18) rooftop mechanical equipment shall be concealed so as not visible from the street
(19) the primary construction materials may be used on the street facade; brick, stone, stucco or decorative concrete
(20) parking shall not be located on the waterfront or at intersecting streets
(21) promenades and plazas adjacent to river must be 12' wide min, and landscaped with trees so is shaded to a min 50% at tree maturity
(22) plazas with mature trees must maintain open site lines to the river between 3'-7' high [4]

*Additional zoning criteria can be found in the appendix of this document.

Rochester has eight preservation districts encompassing over 1,000 properties. The first district was designated in 1969, the latest in 1993. In addition to the districts, city government has designated 75 individual properties as city landmarks. Many other neighborhoods and properties are eligible for designation, and may be nominated for landmark status by an city resident.

The law that governs city-designated landmarks is Rochester's Preservation Ordinance. Under the ordinance, a property owner is responsible for getting approval for any alterations to the exterior of his or her property. Approval is required for all non-maintenance work, including any alteration, any removal of features, demolition and major landscape. Paint colors are regulated only on buildings that are individual landmarks, including those that are within preservation districts.

Brown's Race was established as a preservation district in 1990, during a transformation of the area to attract arts and culture. The early 19th century raceway, Brown's Race (named after a mill operator) that powered the flour and lumber mills still exists today. Many of the mill and industrial buildings still stand and have been re-purposed as restaurants and office space. Included in the preservation district, and connecting Brown's Race with the east side of the river is the 800 foot long Pont de Rennes pedestrian bridge.

In order for any work on structures within a preservation district to approved, the Preservation Board must issues a certificate of appropriateness. The certificate essentially verifies that the proposed work will fit with the existing and neighboring properties in terms of architectural style, etc.

The graphic on the following page illustrates the area of the project site which is designated a preservation district (City of Rochester Bureau of Zoning and Planning).

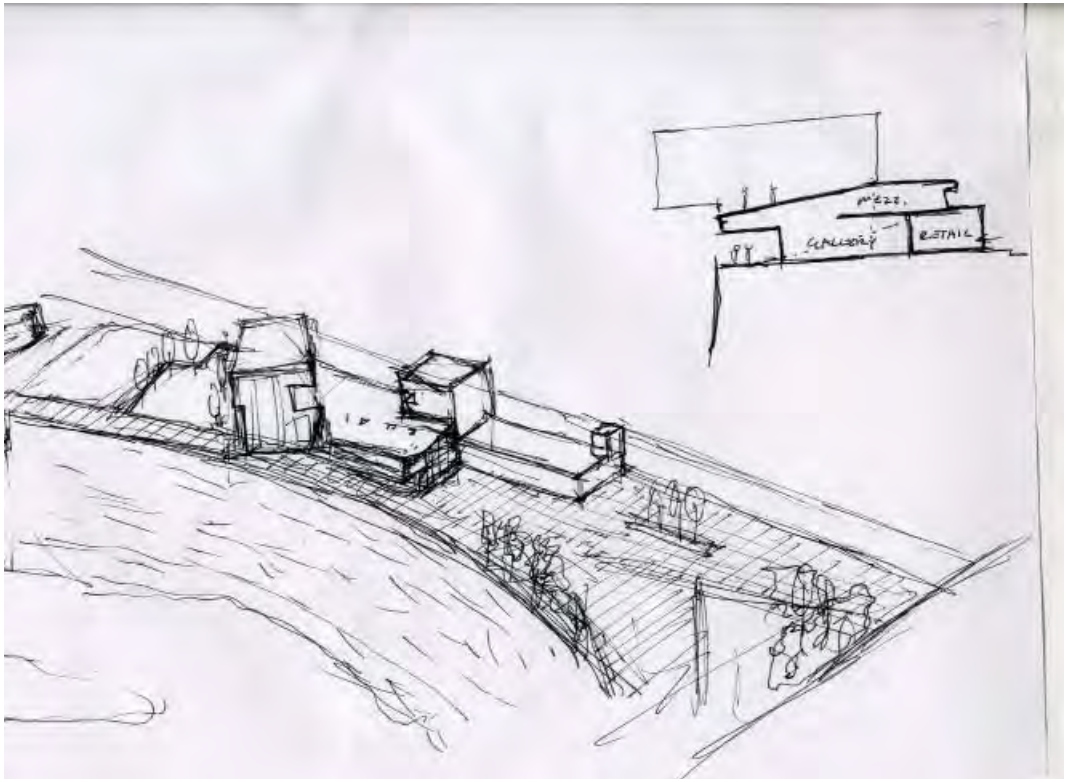
4 | "City of Rochester Zoning Codes." (City of Rochester, NY)

St Simons Terrace
Beebe Station
HIGH FALLS PARK
Vom Pl
Browns Race
Platt St
Preservation District
WXXI
State St
High Falls Garage
Commercial St
Mill St
Inner Loop
N Water St

PROCESS|

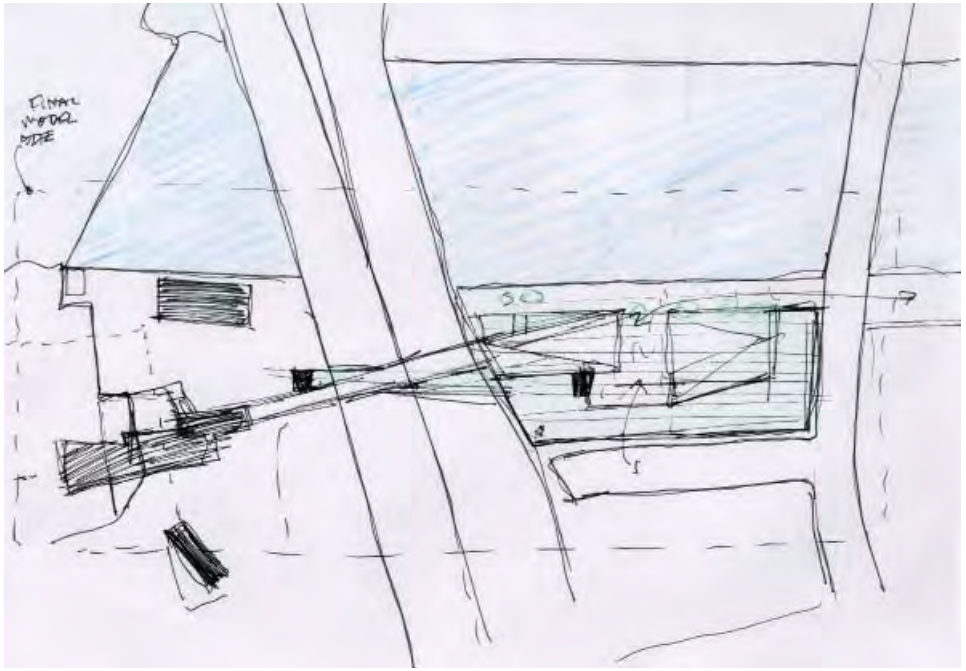
After establishing a preliminary program, I still had no idea where on the site I wanted to build the innovation hub. Brown's race was to be un-touched for the most part with the exception of new landscape features and the re-purposing and programming of the existing buildings. The two next logical locations for the innovation hub were either on the east side of the river, or cantilevering over the gorge adjacent to the existing mill building at the top-west side of the falls. The site on Andrew's Street was not initially considered.

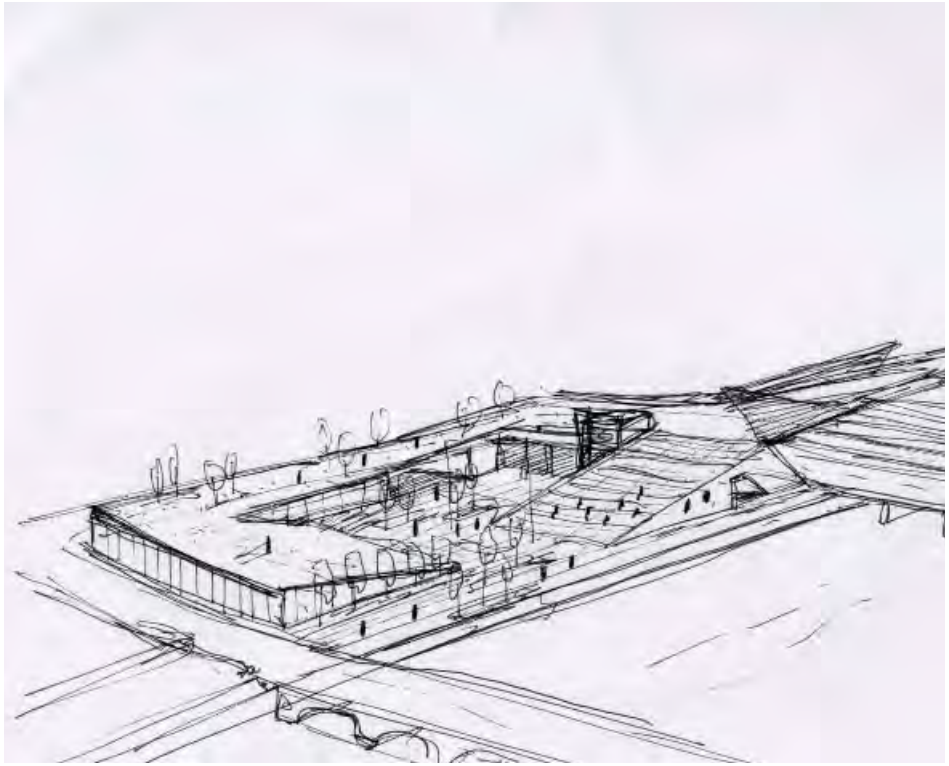
Initial design sketches explored two possible locations for the location of the innovation hub. The sketch below shows the innovation hub mixed with public program located on the east side of the river.

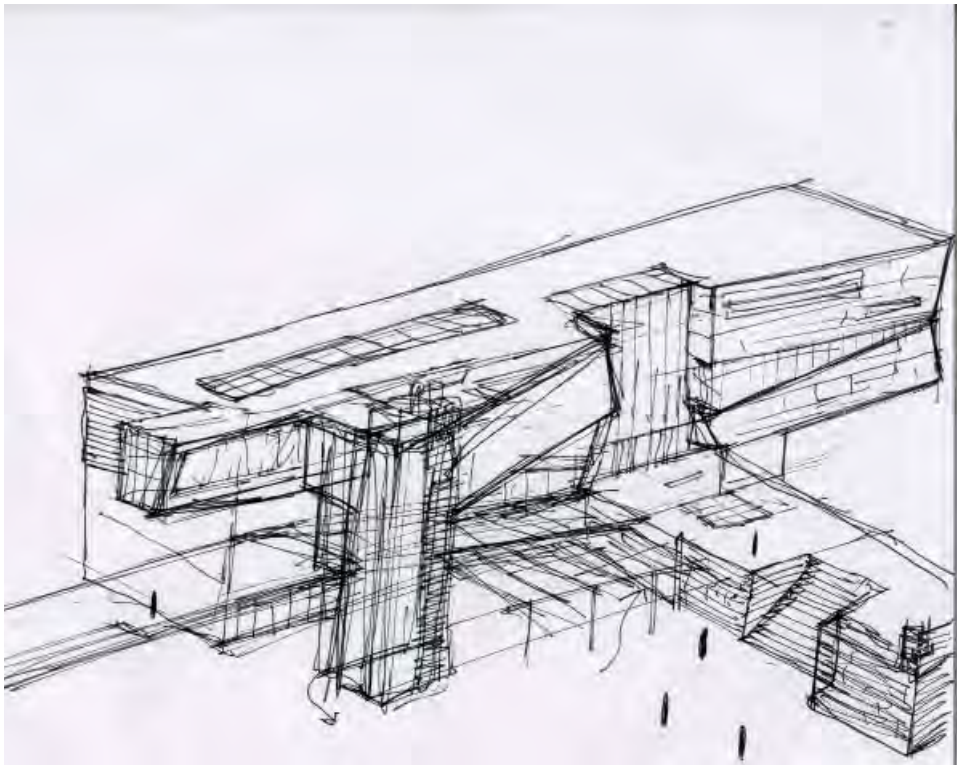


The sketches below are of a scheme that included public performance/exhibition and retail space on the Andrew's Street site that became a bridge that extended over the Inner Loop to join into the innovation hub.

Below left is the public space, below right is the innovation hub.







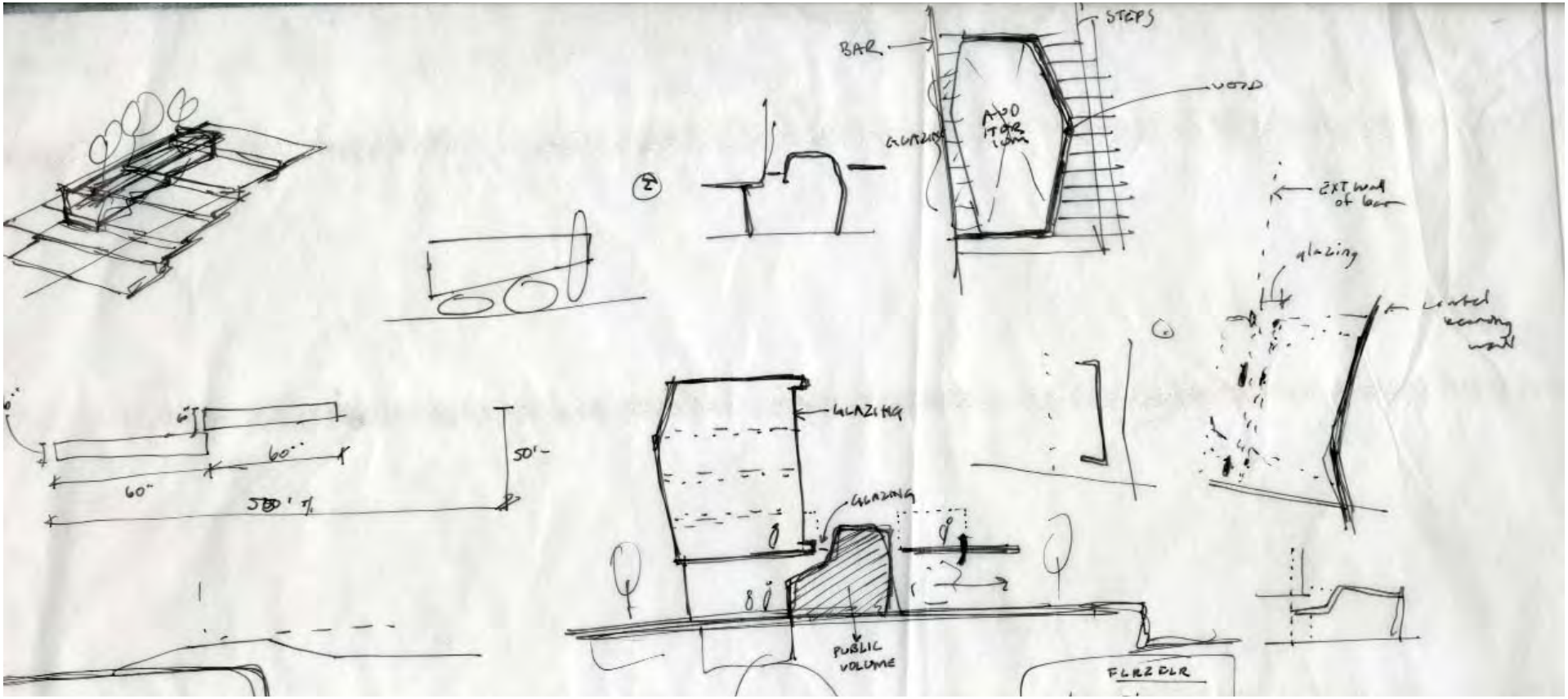
PROCESS|

After an initial review of these two schemes, it was decided that the best way to move forward would be to locate the innovation hub on Andrew's Street and have it serve as a bridge (literally and figuratively) to Brown's Race. The master plan of the remaining portion of the site would focus on creating a continuous pedestrian "ring" as well as revitalizing Brown's race and supplementing that energy on the opposite side of the river.

Due to the character of the site and scale of the project, I knew that a set of design principles would need to be established right from the beginning regardless of what the ultimate plan would be.

1) The building must respond to the architecture of the surrounding mills
2) A bridge was needed to connect the site (the existing infrastructure does not allow to pass under the Inner Loop and railroad tracks).
3) The building must play off of the metaphor of the river and the interaction of the mills with it.
4) The only impacts north of the Inner Loop would focus on landscape and pedestrian access
5) There must be an overlap and/or transparency between programs
6) The building section must be activated between floors and between programs
7) Floors must be adaptable to different uses and occupants

The sketches on the opposite page begin to demonstrate how some of these criteria began to develop.


BAR
STEPS
VOID
GLAZING
glazing
GLAZING
GLAZING
PUBLIC VOLUME
50'-
60"
60"
6"

RECLAIMED IDENTITY/ INNOV-ROC

THE INNOVATION HUB + REVITALIZATION OF HIGH FALLS | ROCHESTER, NY

04

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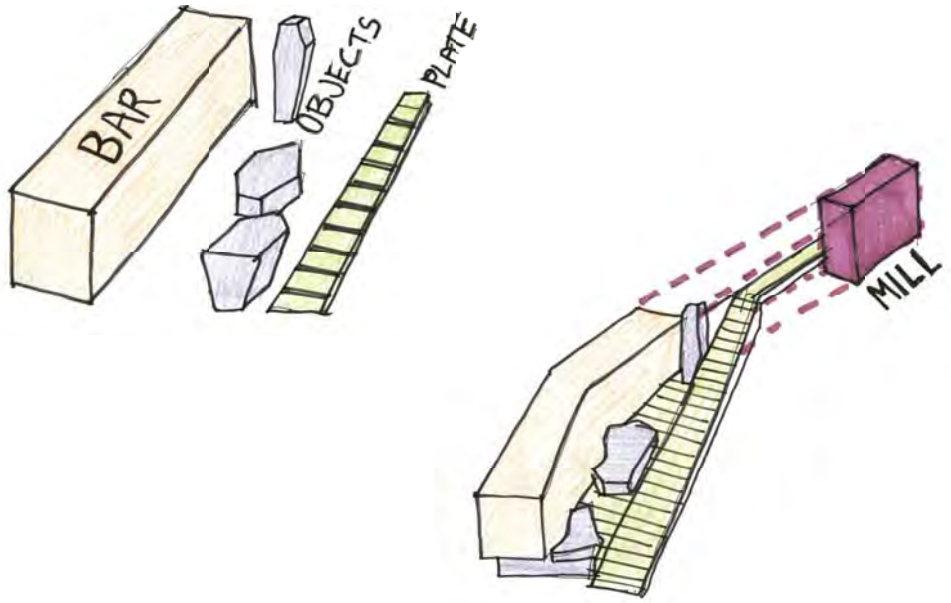
pg 48	Mid-Semester Review
pg 56	Take Away Thoughts

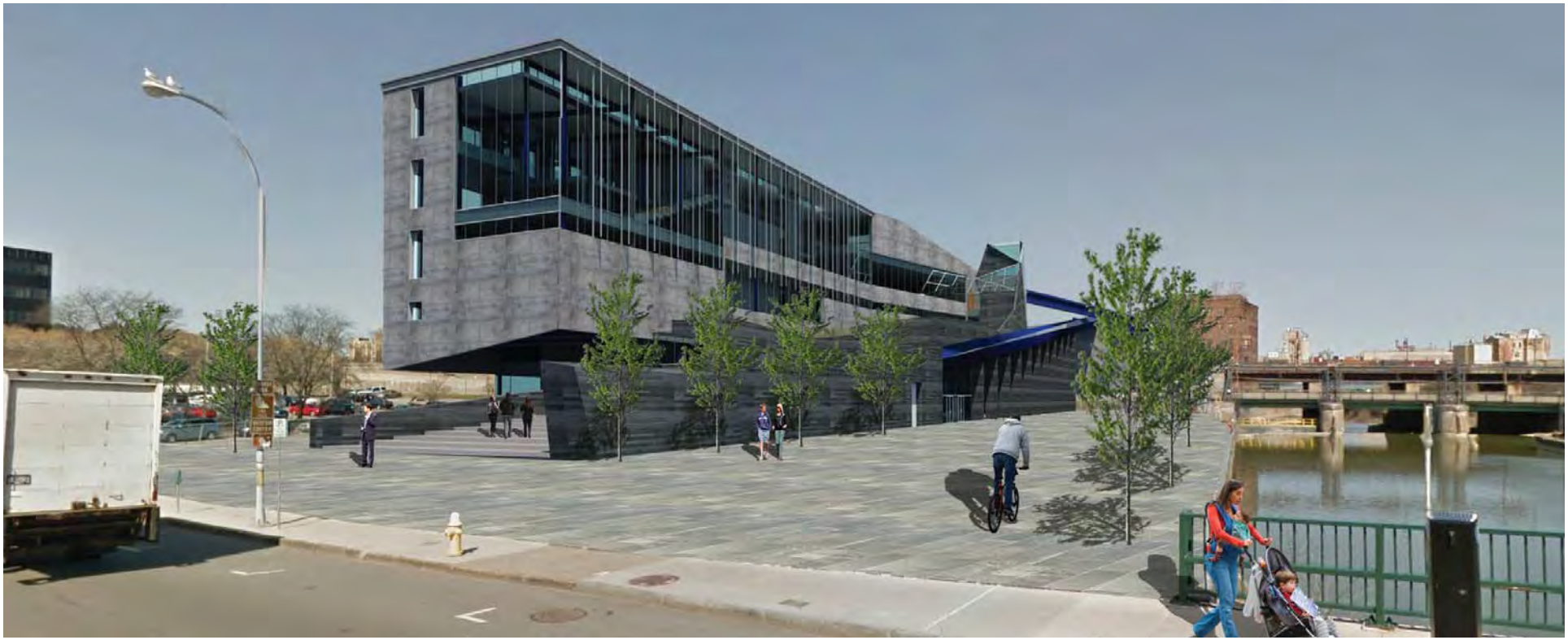
DESIGN REFINEMENT

INTRODUCTION |

The time between the first schematic site design review (September 19, 2014), and the mid-semester progress review (October 21, 2014) was spent further developing the scheme, and applying applicable building codes to the design. It was also a time to step back and examine how the inital program translated into what the building had become.

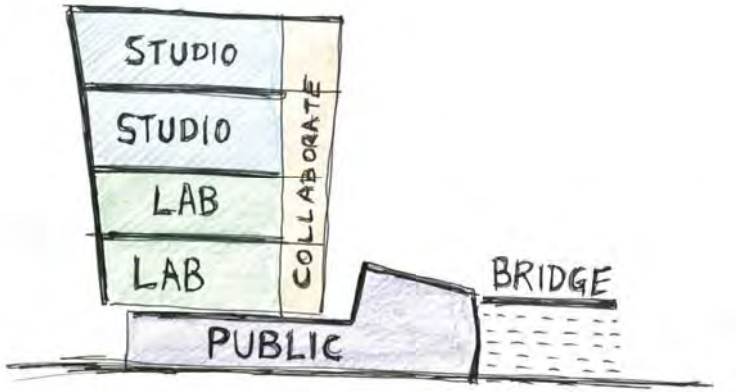
At the mid point of the semester, the thesis was progressing. The master plan addressed some of the key concerns of the site, and the innovation hub was taking form. The tectonics of the building, the relationship of each of its primary components, and the creating of space were all themes that would need further development moving towards the end of the semester.

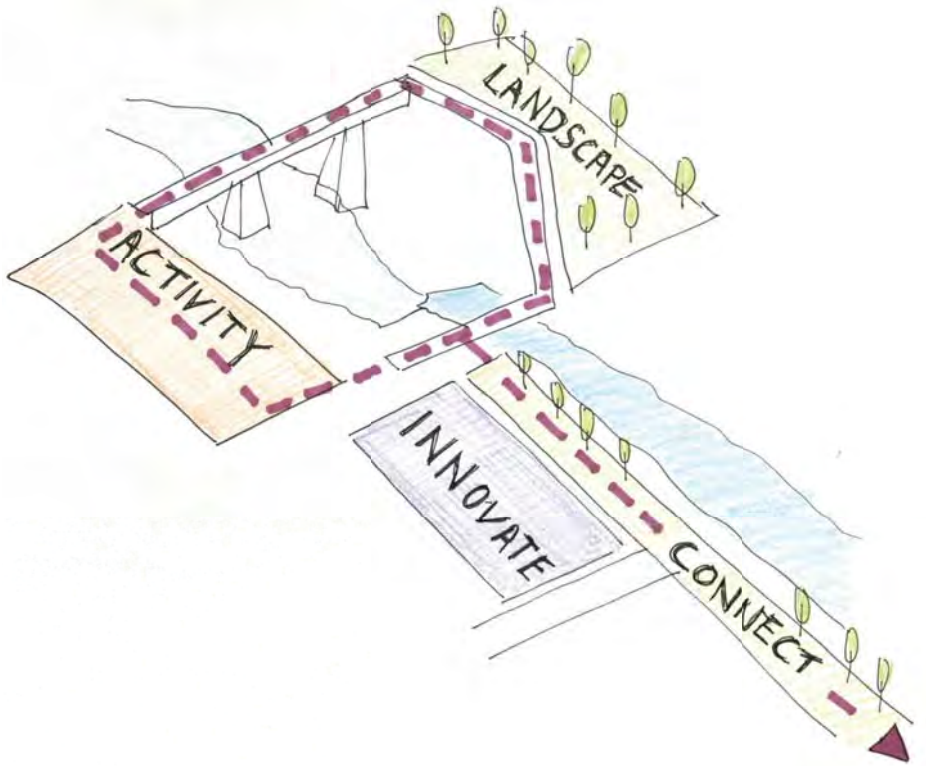




FINAL PROGRAM BREAKDOWN |

PROGRAM	OCCUPANCY TYPE	TOTAL SQUARE FOOTAGE (NET)
-Classrooms	Education/Classroom	1,616 sqft
-Auditorium	Assembly	3,640 sqft
-Atrium	Assembly	5,411 sqft
-Cafe	Assembly	1,515 sqft
-Gallery	Assembly	1,886 sqft
-Dedicated Lab	Education/Vocational	2,350 sqft
-Dedicated Manuf.	Factory/Industry	3,430 sqft
-Collaborative	Assembly	3,550 sqft
-Flexible Lab	Education/Vocational	2,505 sqft
-Flexible Manuf.	Factory/Industry	5,610 sqft
-Incubator	Business	22,130 sqft
TOTAL (net square feet)		53,643 sqft
TOTAL (gross square feet)		66, 318 sqft
EFFICIENCY		80%





OCCUPANCY TYPE	TOTAL OCCUPANTS	REQUIRED TOILET FACILITIES	PROVIDED TOILET FACILITIES
A-3	549	M: 3 wc, 2 lav F: 5 wc, 2 lav	
B	220	M: 5 wc, 3 lav F: 5 wc, 3 lav	
E	178	M: 2 wc, 2 lav F: 2 wc, 2 lav	
F	91	M: 1 wc, 1 lav F: 1 wc, 1 lav	
TOTAL	1038	M: 11 wc, 8 wc F: 13 wc, 8 lav	M: 20 wc, 12 lav F: 20 wc, 12 lav

REGQUIRED EGRESS WIDTH	PROVIDED EGRESS WIDTH
.2” per occupant (1038 occupants) = 207.6”	756”

NOTES

-Occupancy loads, fixture requirements, and egress requirements based on 2009 International Building Code (IBC) as outlined in the *Architect’s Studio Companion.*

-Occupanics of selected spaces limited to a number significantly less than what is allowed by code based on function/seating capacity, etc.

RECLAIMED IDENTITY | INNOV / ROC

THE INNOVATION HUB AND REVITALIZATION OF HIGH FALLS | ROCHESTER, NY

INTRODUCTION |

Founded on the banks of the Genesee River in 1817, Rochester quickly became one of America's first "boomtowns." Within two decades, Rochester earned its nickname of the "Flour City," as the mills that lined the Genesee made Rochester the largest flour producer in the country. The mills that powered this industry created the architectural backdrop from which the rest of the city would grow, and also formed an intimate relationship with the Genesee River, High Falls, the Erie Canal, and the entire surrounding region.

By the mid 19th century, wheat processing began to move west, following western explorers and agriculture. With this exodus came new economic opportunities that transformed Rochester in a new way. George Eastman founded Kodak in Rochester in 1888, Xerox formed in 1906, and the eye-care company Bausch & Lomb was born in Rochester. World-renown institutions of higher education rose in 1829 with the Rochester Institute of Technology (RIT), and the University of Rochester (UofR). Rochester quickly became the epicenter for high-tech and higher education.

Despite the rapid shift from a mill and manufacturing industry to a tech-centered economy in the last century, the Rochester of today hasn't kept pace with new demands. Kodak and Xerox, once the largest employers in the area are now mere shadows of what they once were. Despite RIT and U of R's prestigious standings, graduates often leave the area after graduation in search of jobs. At the same time, Rochester's population has been in steady decline since the 1970s.

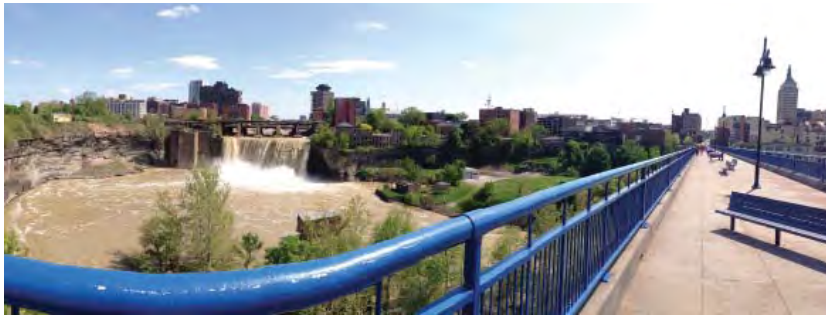
Remnants of Rochester's vibrant past and roots still exist today. Portions of the old mills that once lined the river stand as hollowed-out shells or have been re-purposed. Most have been demolished. Channels carved into the earth to divert river water can still be seen in the Brown's Race district of High Falls. Despite this rich past, the area is decayed, under-used, and under-appreciated.

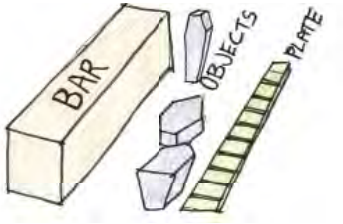
This thesis addresses two of Rochester's biggest concerns; what is the identity of a future Rochester, and how can we revitalize its past in order to preserve it for future generations. The components of the project; a master plan, and a building serve as the architectural vehicles to answer these concerns.

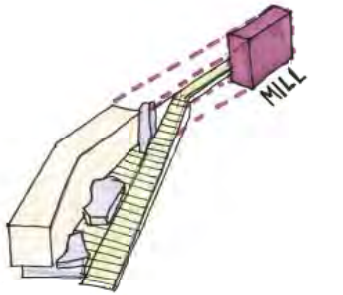
Revitalizing Rochester's mill district (Brown's Race) and the surrounding area as a new center of entertainment and commerce will attract visitors and strengthen the local economy. The creation of an "innovation hub," full of laboratory, manufacturing, and open studio space are available to students and recent graduates of local universities or those who wish to use grant money or private funds to create and innovate software and prototypes.

Rochester is far from dead. This scheme aims to give Rochester a new future, one that shadows its past of technological innovation, but in a new era. The site is one that is unique to any urban center, and is a true asset to the city, but it needs a face-lift. The two components of this project are a means of making Rochester the gem that it deserves to be.

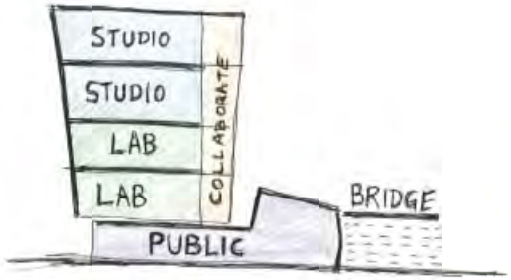
CITY PLAN W/ OUTLINED SITE| NTS







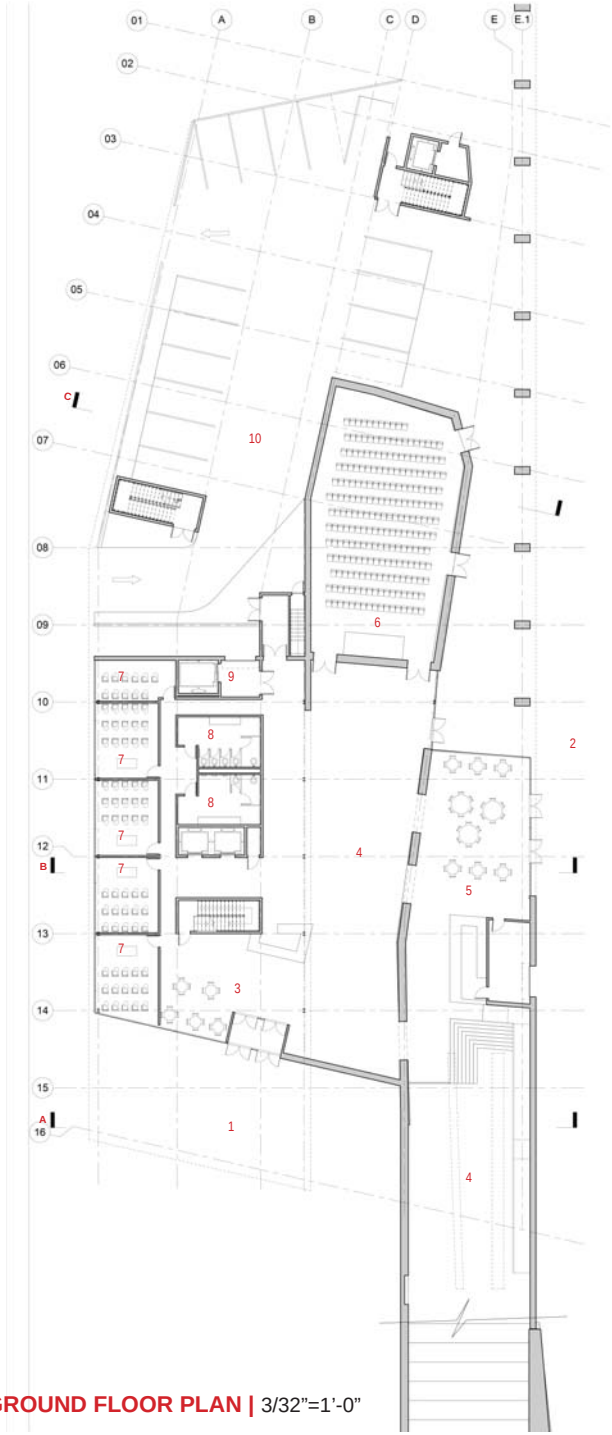
BUILDING STRATEGY |



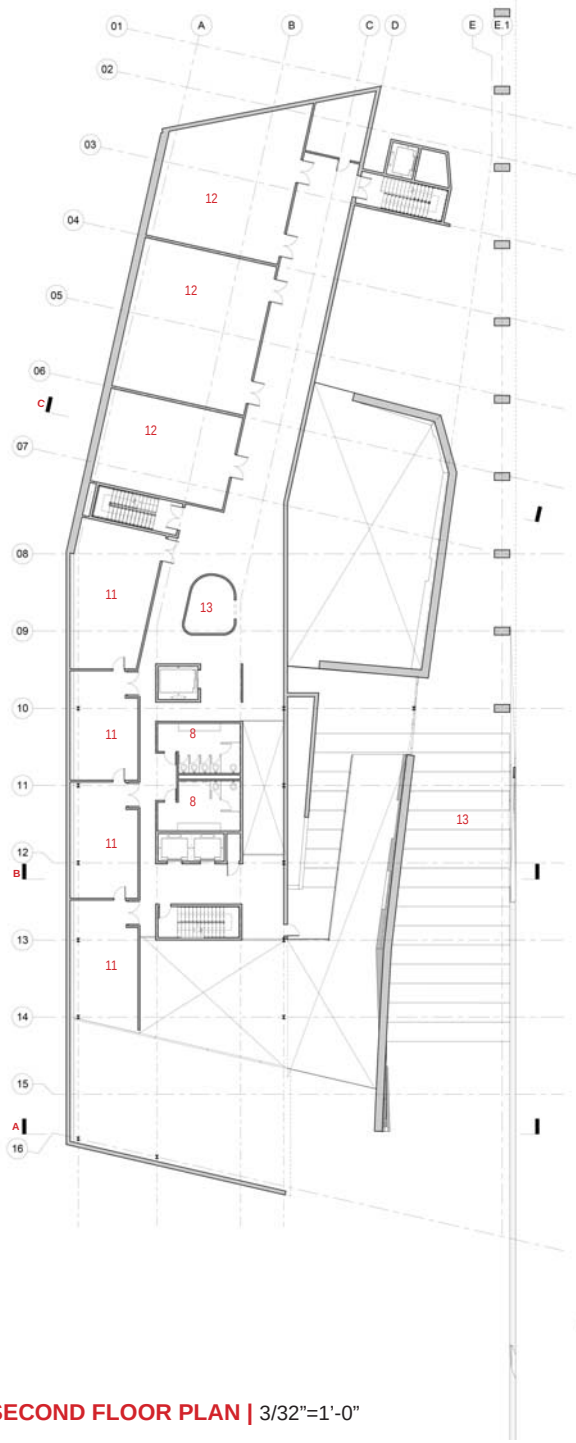
SECTION-PROGRAM STRATEGY |

PROGRAM LEGEND |

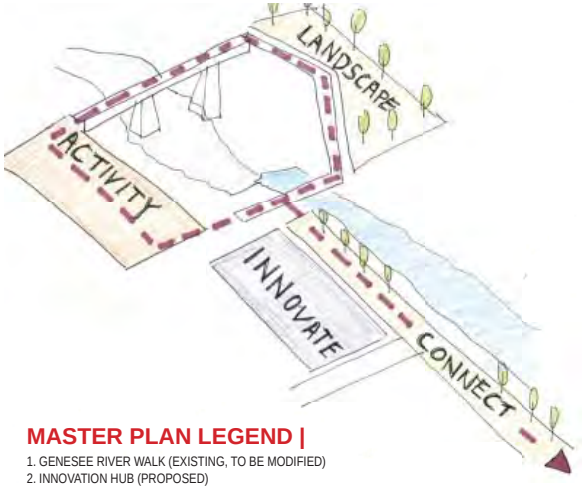
1. ENTRY PLAZA
2. RIVER PARK
3. ENTRY/LOBBY
4. GALLERY
5. CAFE/LOUNGE/MARKETPLACE
6. AUDITORIUM
7. CLASSROOM
8. RESTROOM
9. SERVICE
10. PARKING
11. DEDICATED LAB SPACE
12. DEDICATED MANUFACTURING SPACE
13. COLLABORATION POD
14. SKYBRIDGE



GROUND FLOOR PLAN | 3/32”=1’-0”



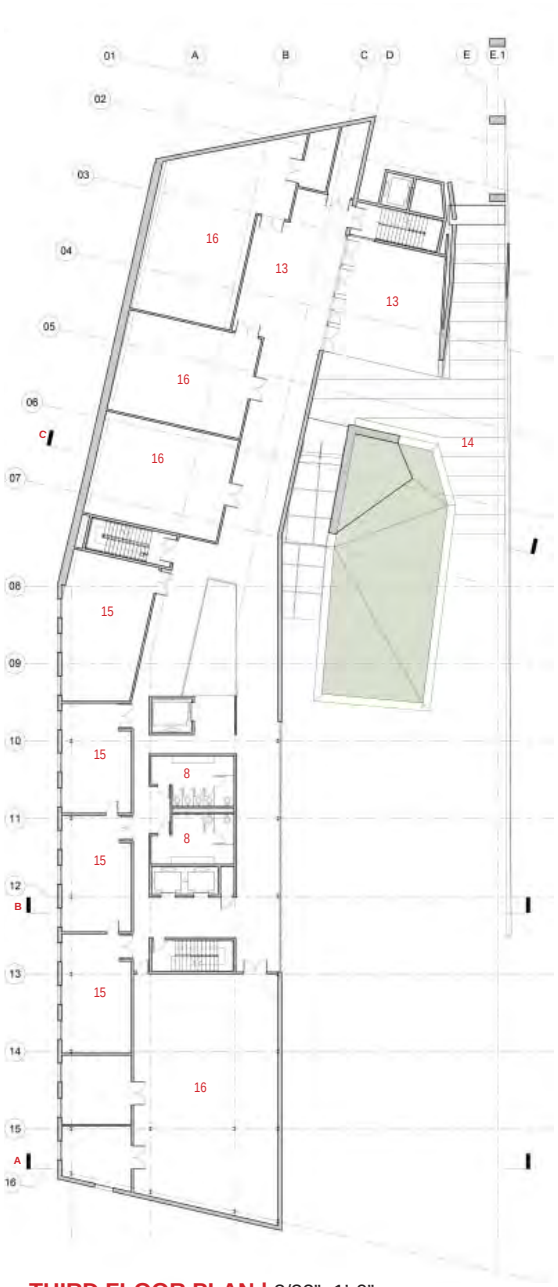
SECOND FLOOR PLAN | 3/32”=1’-0”



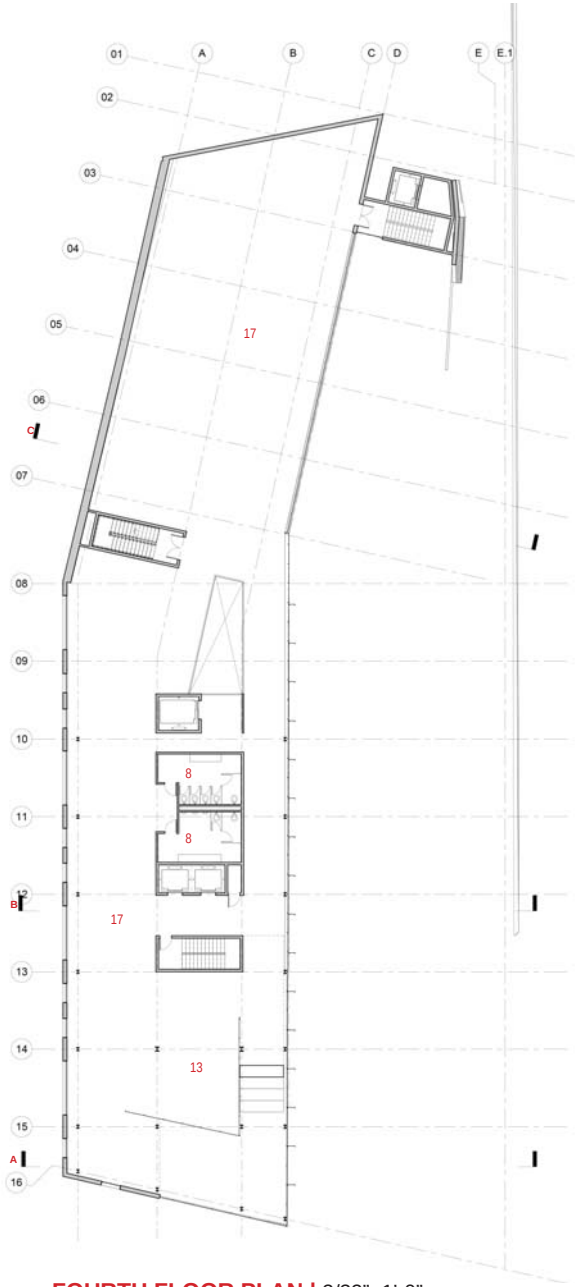
MASTER PLAN LEGEND |

1. GENESEE RIVER WALK (EXISTING, TO BE MODIFIED)
2. INNOVATION HUB (PROPOSED)
3. INNOVATION PLAZA (EXISTING PLAZA, TO BE REVITALIZED)
4. BROWN'S RACE ENTERTAINMENT DISTRICT (EXISTING, TO BE REVITALIZED)
5. GRANITE MILLS PARK PAVILIONS (EXISTING PARK, PROPOSED PAVILIONS)

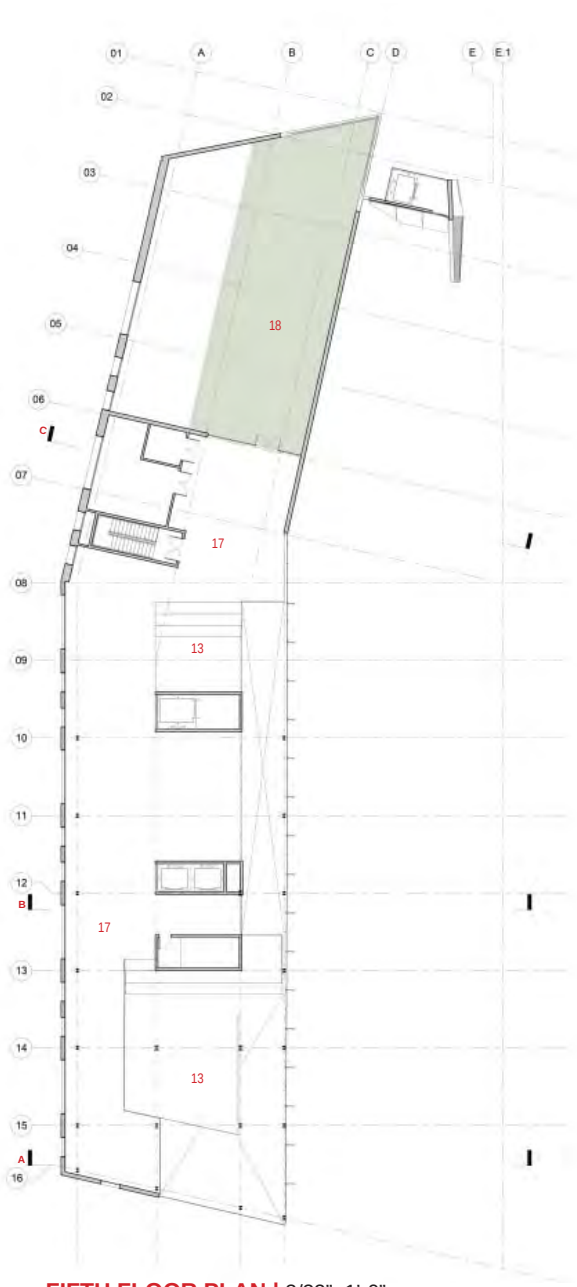
PROJECT SITE PLAN | 1"=80'-0"



THIRD FLOOR PLAN | 3/32”=1’-0”



FOURTH FLOOR PLAN | 3/32”=1’-0”



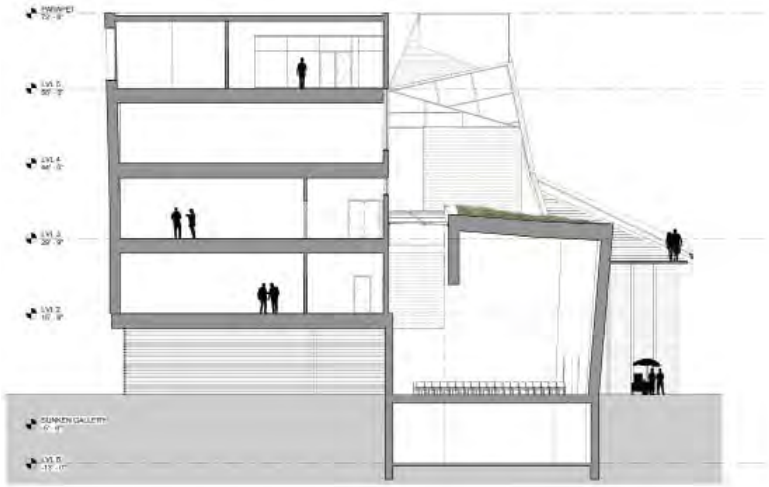
FIFTH FLOOR PLAN | 3/32”=1’-0”

PROGRAM LEGEND |

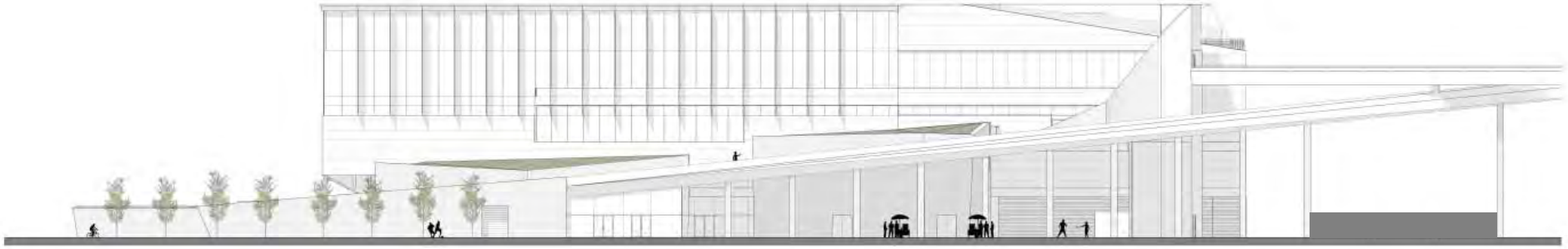
13. COLLABORATION POD
14. SKYBRIDGE
15. FLEXIBLE LAB
16. FLEXIBLE MANUFACTURING
17. OPEN STUDIO
18. ROOF GARDEN

SECTION A | 1/8”=1’-0”

SECTION B | 1/8”=1’-0”

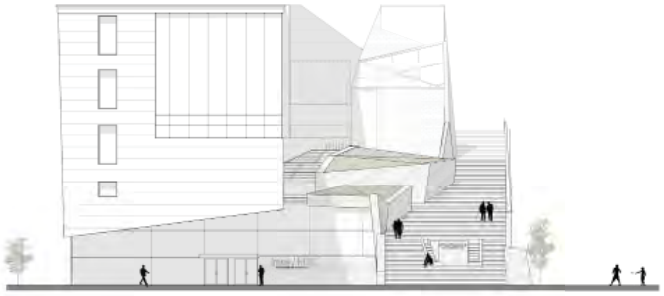


SECTION C | 1/8”=1’-0”



EAST ELEVATION | 3/32”=1’-0”

WEST ELEVATION | 3/32”=1’-0”



SOUTH ELEVATION | 3/32”=1’-0”

Welcome to the
THE LOFTS AT BROWN'S RAC
PONT DE RE NES PUB
HIGH FALLS
ANY TIME
8AM-6PM

TAKE AWAY THOUGHTS |

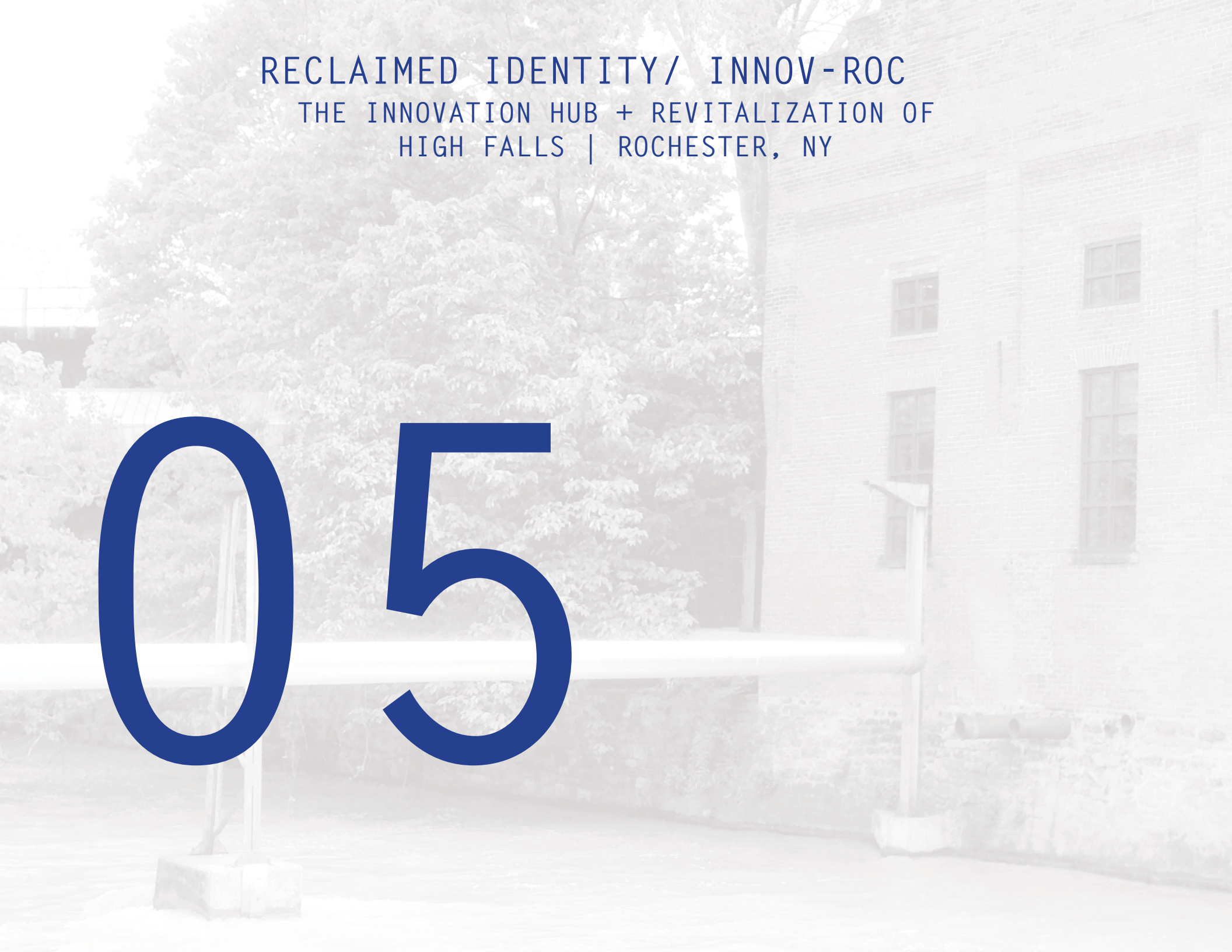
The project that was presented in at the midpoint of the semester was not the one that I had envisioned at the start. At the beginning of the semester, the vacant plot along Andrew's Street was not even considered as the location for the innovation hub.

Nevertheless, as a progress review I was very please with what was presented, and the reception of the project by the faculty and guest critics.

Moving towards the final review, the biggest challenges that would need to be addressed were a better development of the master plan (particularly north of the inner loop), the relationship of the innovation hub to Brown's Race, and a better development and clarity of the three components of the building. The relationship of the river walk to the edge of the building at this point in the project did not allow of activation of the site, or interaction between people and program, interior and exterior space.

RECLAIMED IDENTITY/ INNOV-ROC

THE INNOVATION HUB + REVITALIZATION OF HIGH FALLS | ROCHESTER, NY



05

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pg 98	Final Review Pin-up Boards
pg 106	Model Photographs

PROJECT RESOLUTION

INTRODUCTION |

The final presentation for an architecture thesis is the time when students exhibit their design skills, their work, and their architectural beliefs. It is the culmination of everything that is learned during their academic year, and the manifestation of individual's architectural ideals.

This section of the document is comprised of all of the final drawings, documentation, models, and presentation boards that were exhibited for the final thesis review. These drawings are the result of countless hours of schematic thought and sketching, computer modeling and drafting, as well as Photoshop work to prepare presentation-quality drawings. There are also numerous hours invested in a site model that captures the essence of the site, the project, and the interaction between the two.

The graphic style used for the drawings is one that I have been working to develop as my own during the years at school. Simple and clean, organized and straight-forward, the drawings serve the mouthpiece of the project and must capture what the project is without overshadowing it.

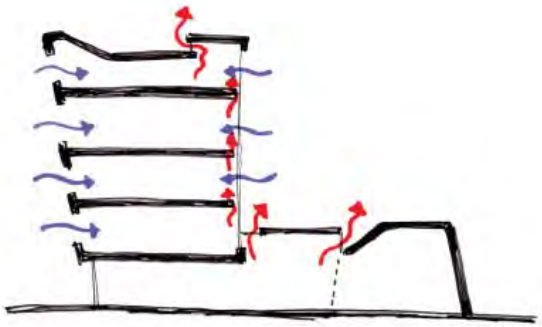
A final and comprehensive design project to me must consider and incorporate several elements; reconciliation of program, site integration, structural and mechanical systems (even at a schematic level), as well as envelope and detailing.

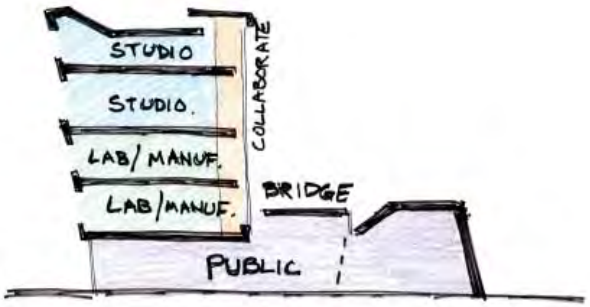
For me, the techtonics of the building; how it goes together is something that intrigues me the most when designing. In additon to design drawings, this presentation also included a structural framing axonometric drawing, and several developed wall section-details.

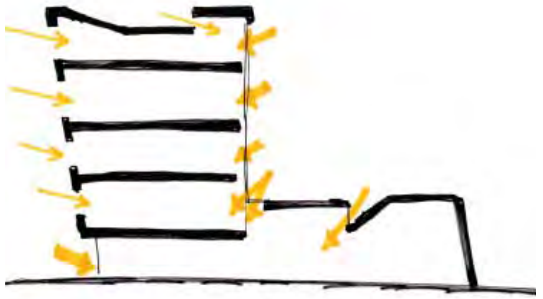
The entire project consists of two components; a master plan of Brown's Race and the surrounding area, and the innovation hub (INNOV-ROC). The master plan gives provisions and thoughts as to what and how the area can develop, while the focus of the thesis design was placed in the building and site specific to INNOV-ROC.

This building formed by three pieces; a bar, a plate, and a series of objects. How these pieces formed the final building had evolved throughout the semester, but the guiding principles and what each piece represented remained the same.

The site offered several clues such as grids/alignments, context, and infrastructure. All of these, combined with my own design aesthetic resulted in the form that you will see.



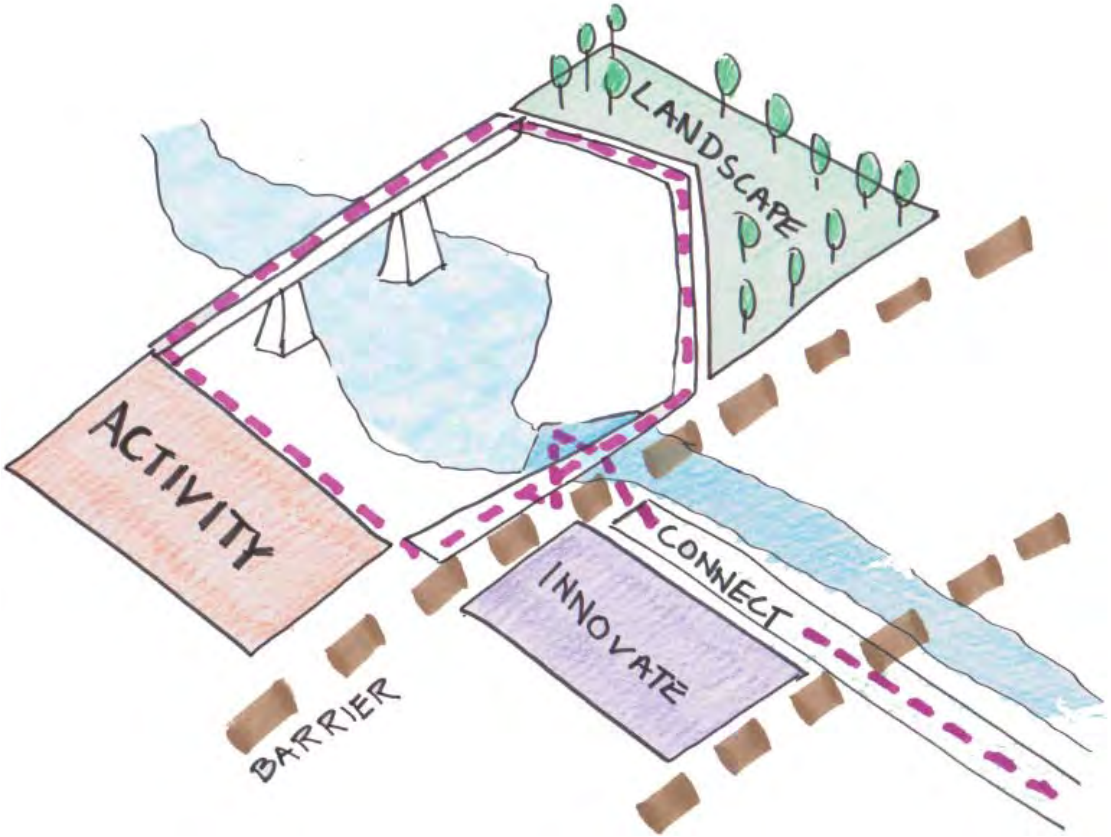


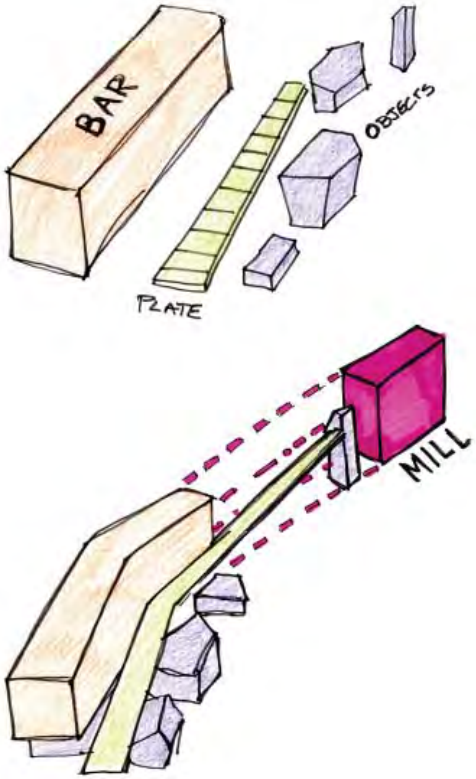


ABOVE: NATURAL VENTILATION
BELOW: SITE STRATEGY

ABOVE: SECTION/PROGRAM

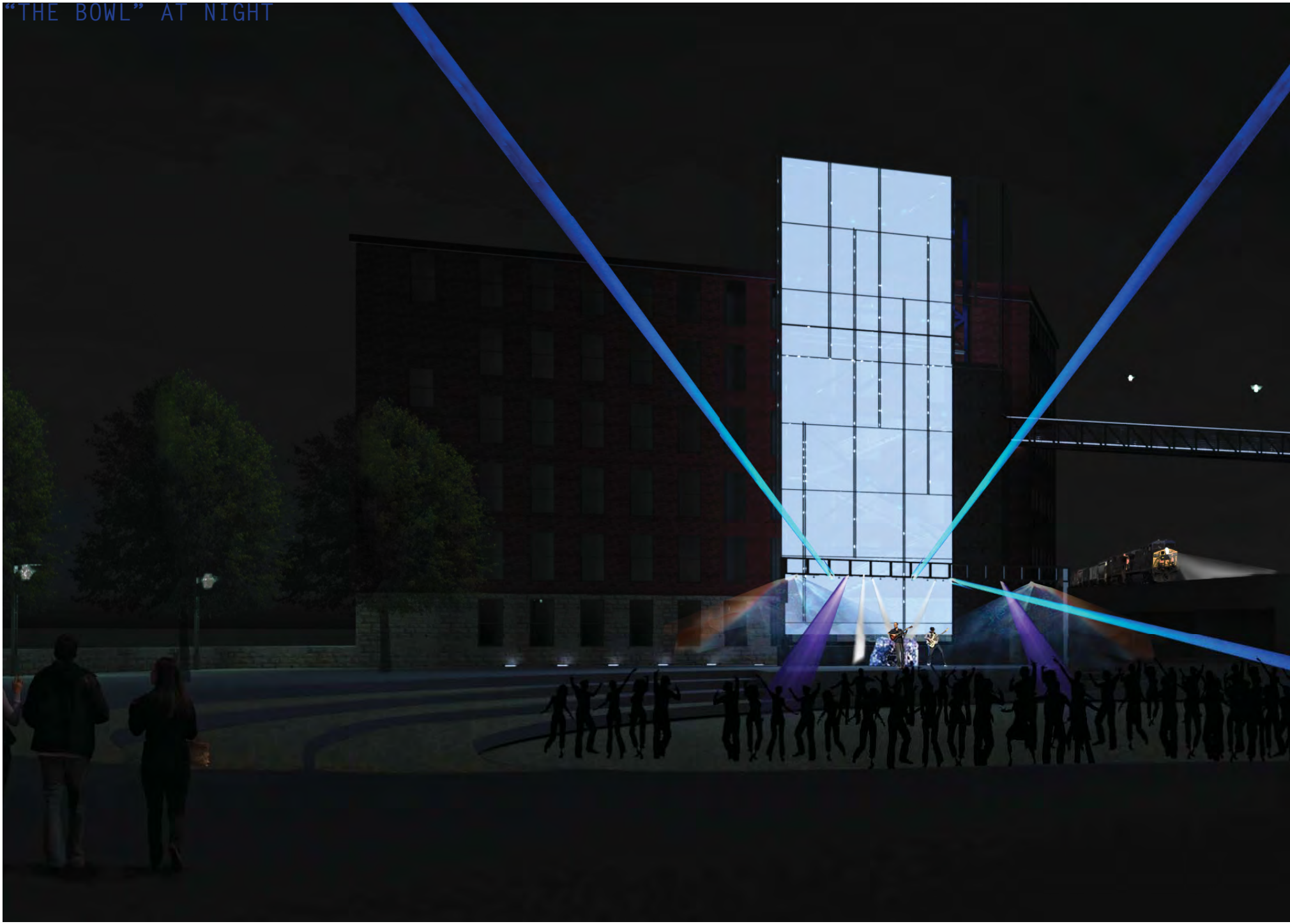
ABOVE: SECTION/DAYLIGHT
BELOW: BUILDING FORM STRATEGY

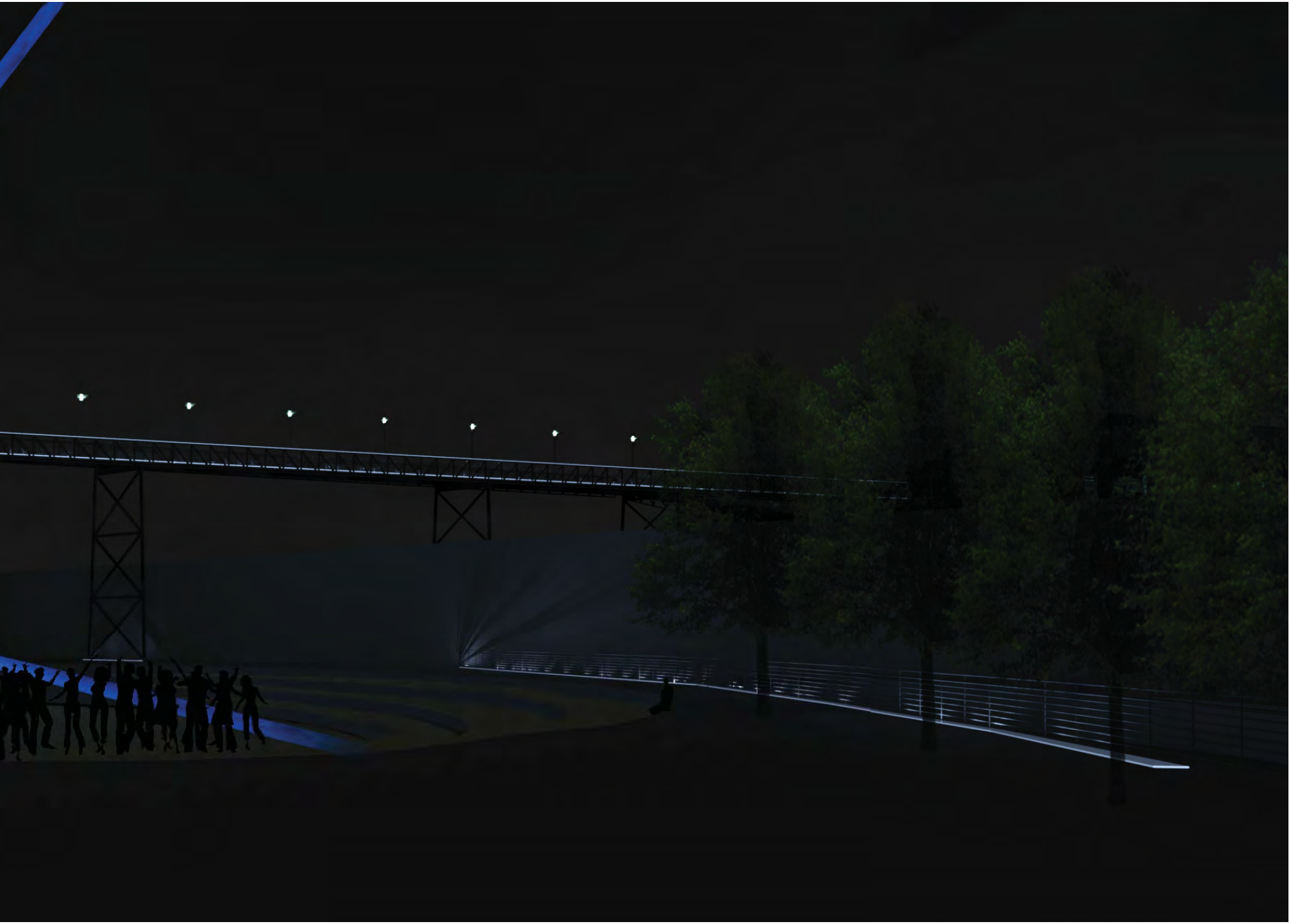




INNOV-ROC FROM ANDREWS ST

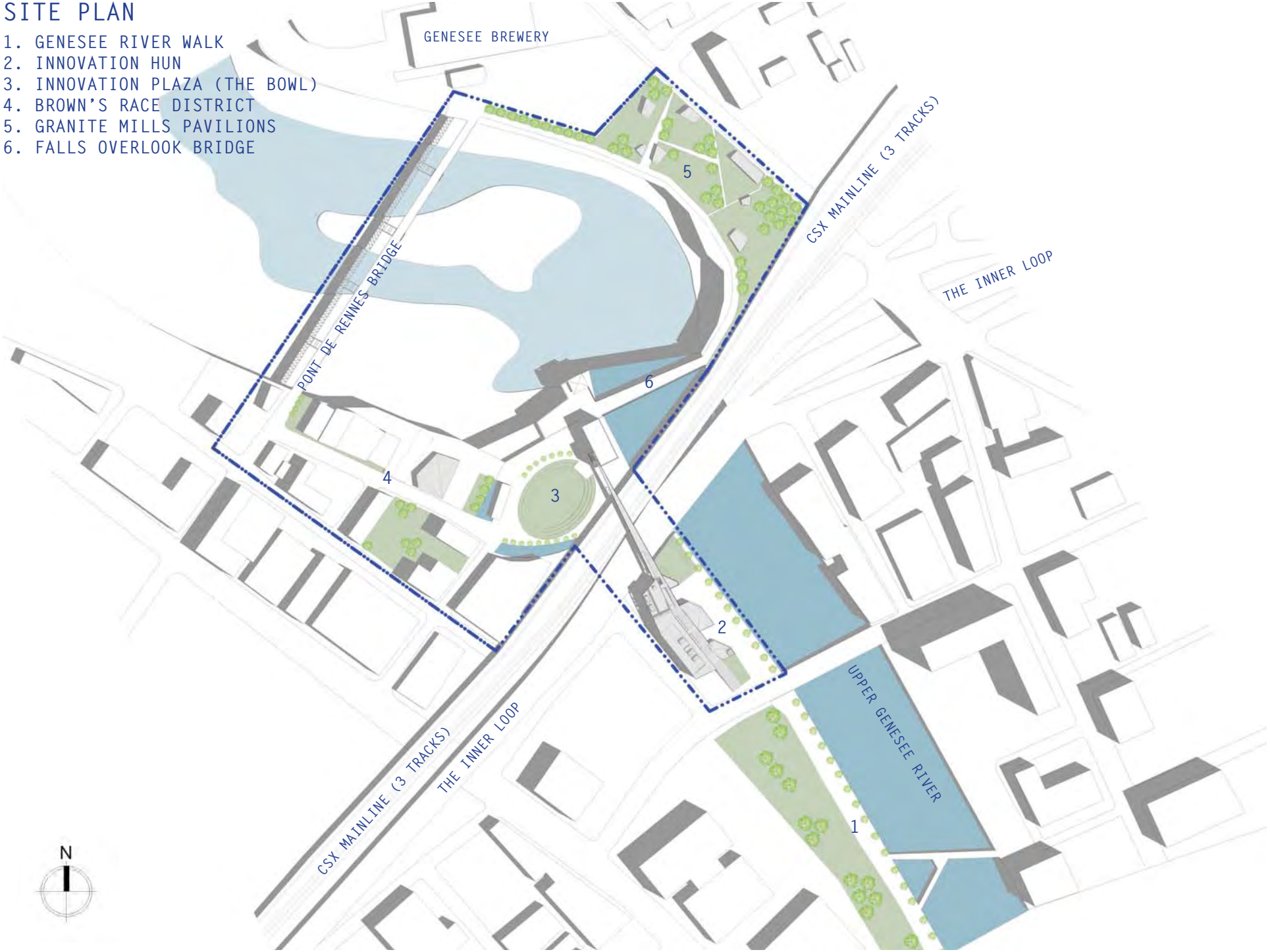
"THE BOWL" AT NIGHT

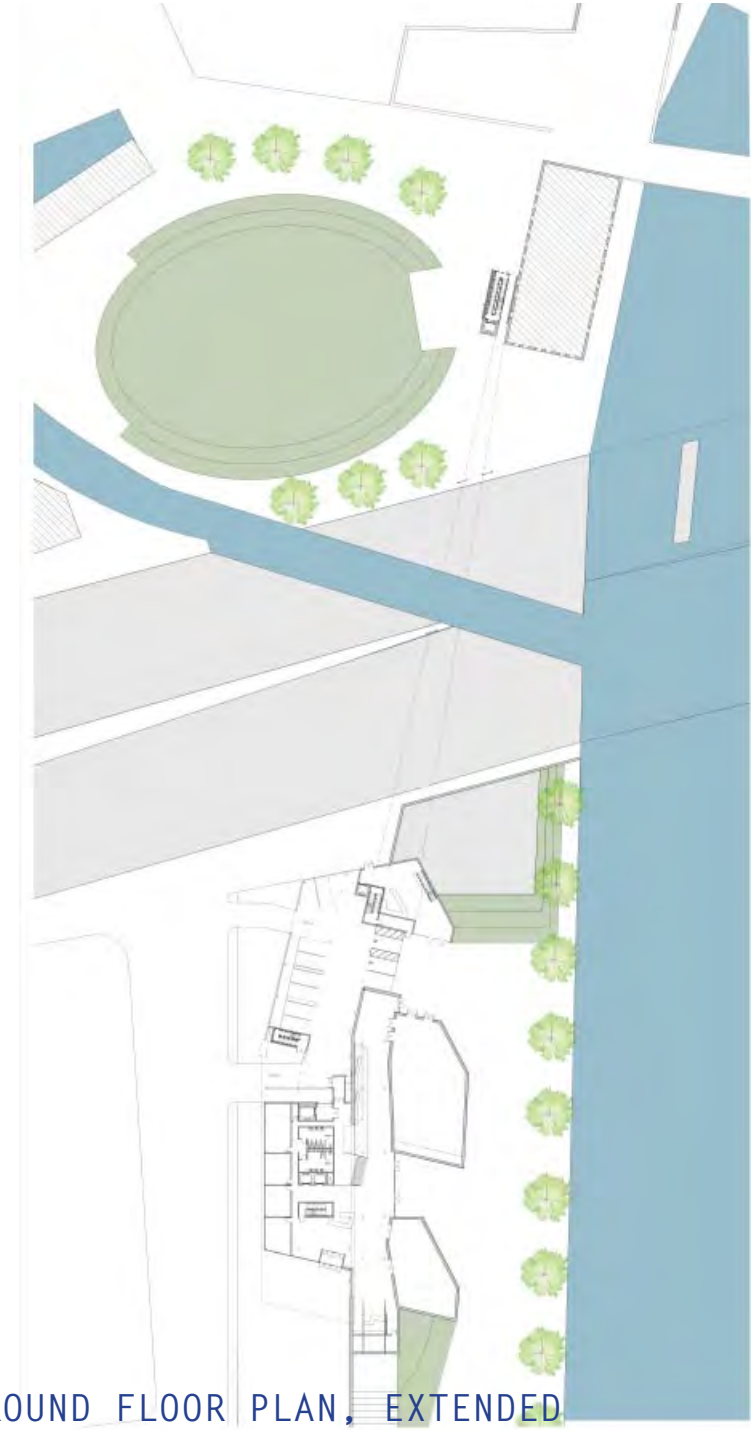




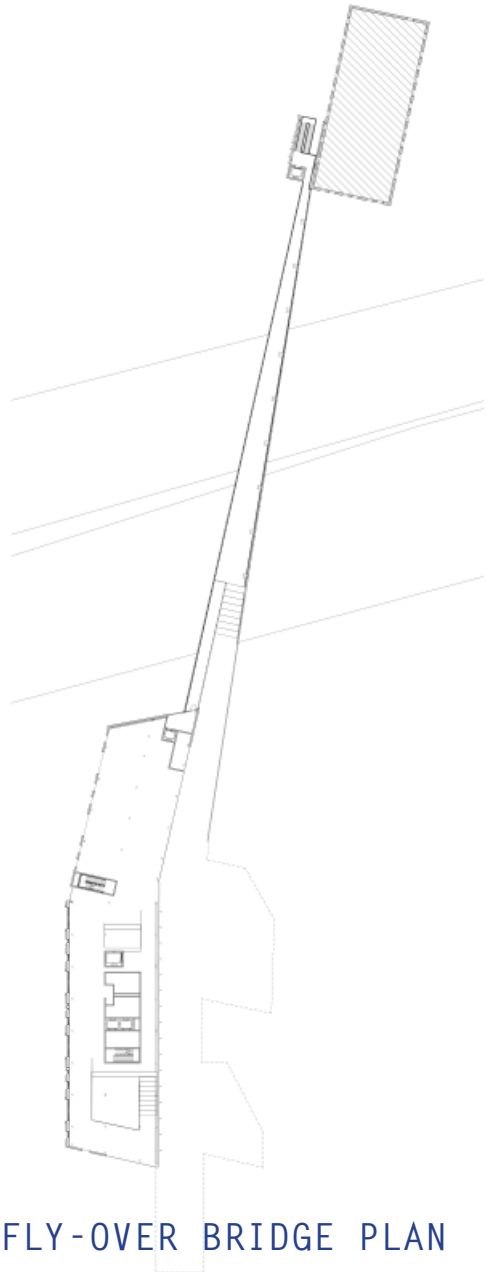
SITE PLAN

1. GENESEE RIVER WALK
2. INNOVATION HUN
3. INNOVATION PLAZA (THE BOWL)
4. BROWN'S RACE DISTRICT
5. GRANITE MILLS PAVILIONS
6. FALLS OVERLOOK BRIDGE





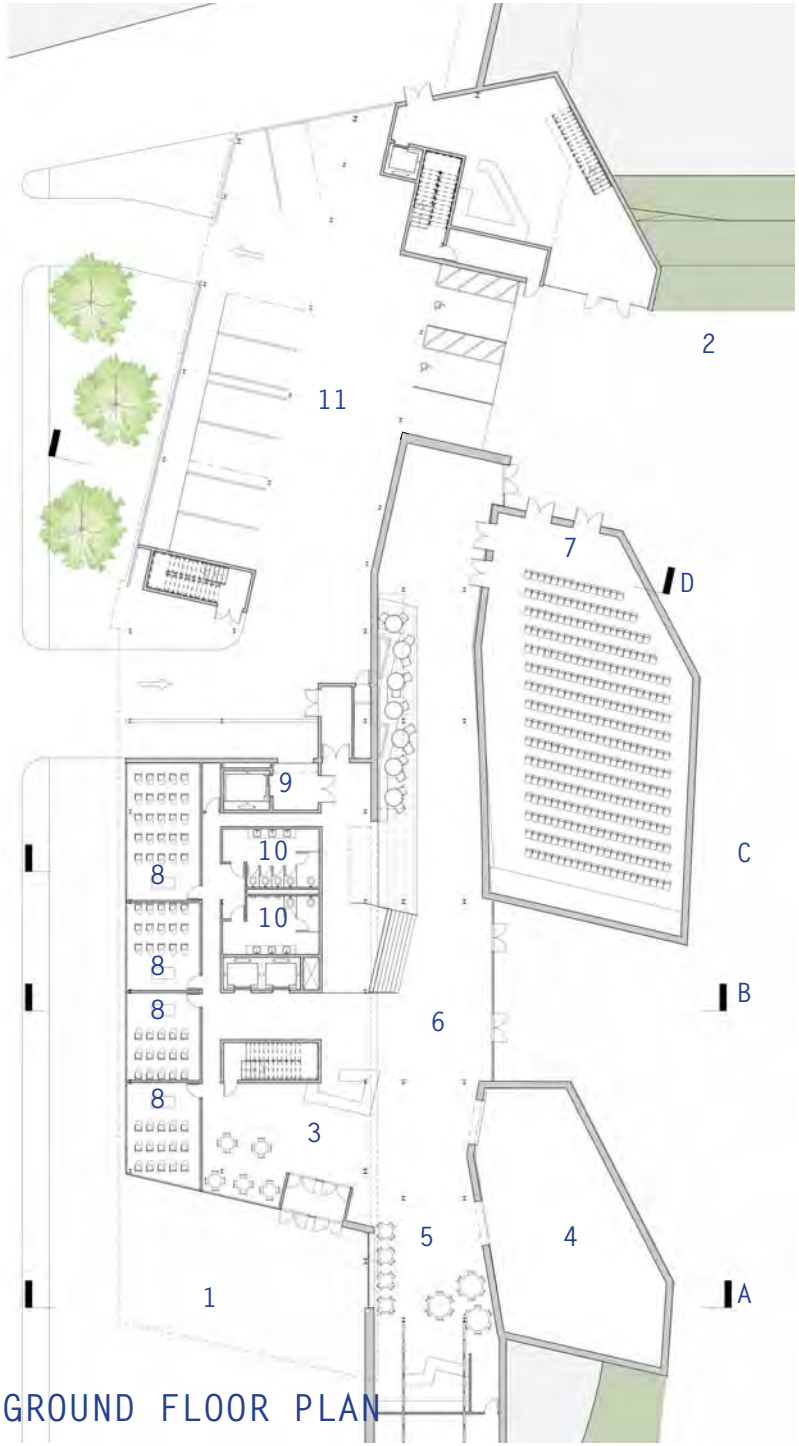
GROUND FLOOR PLAN, EXTENDED



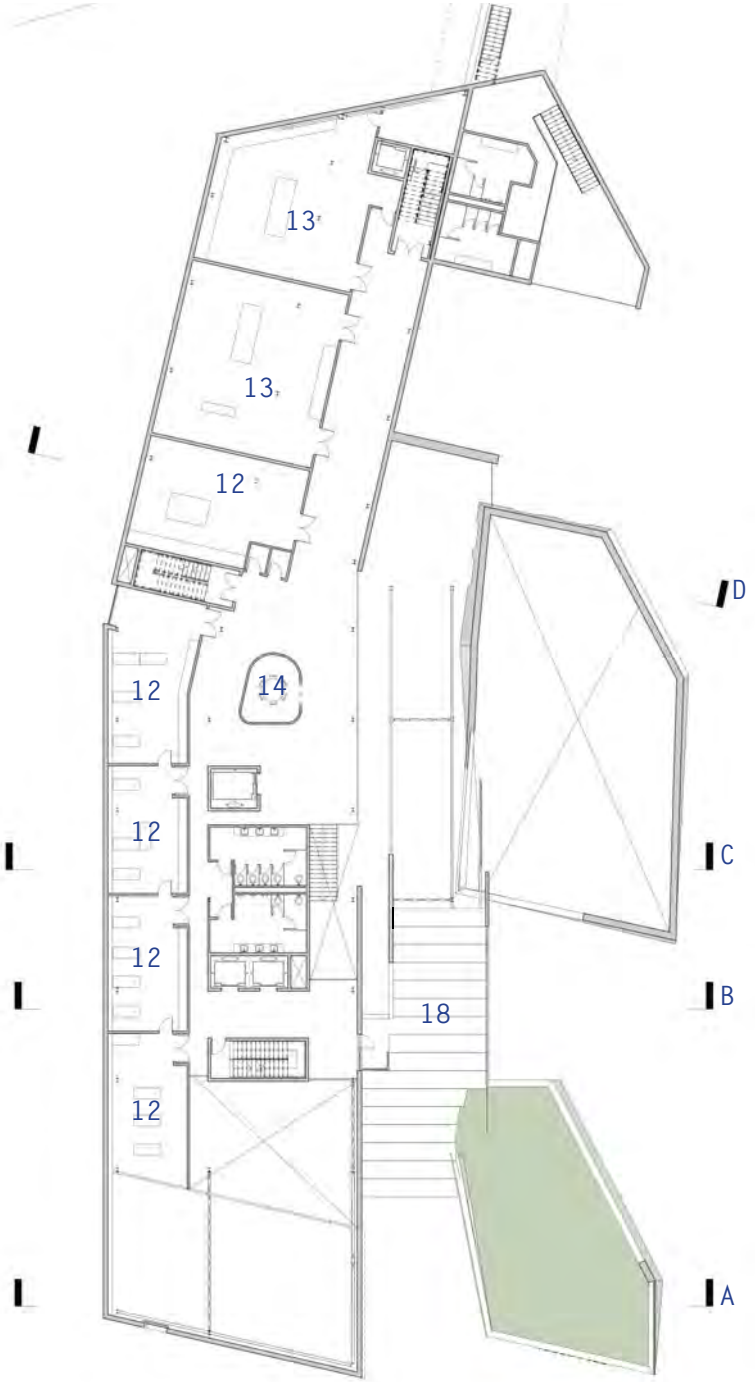
FLY-OVER BRIDGE PLAN

PROGRAM LEGEND

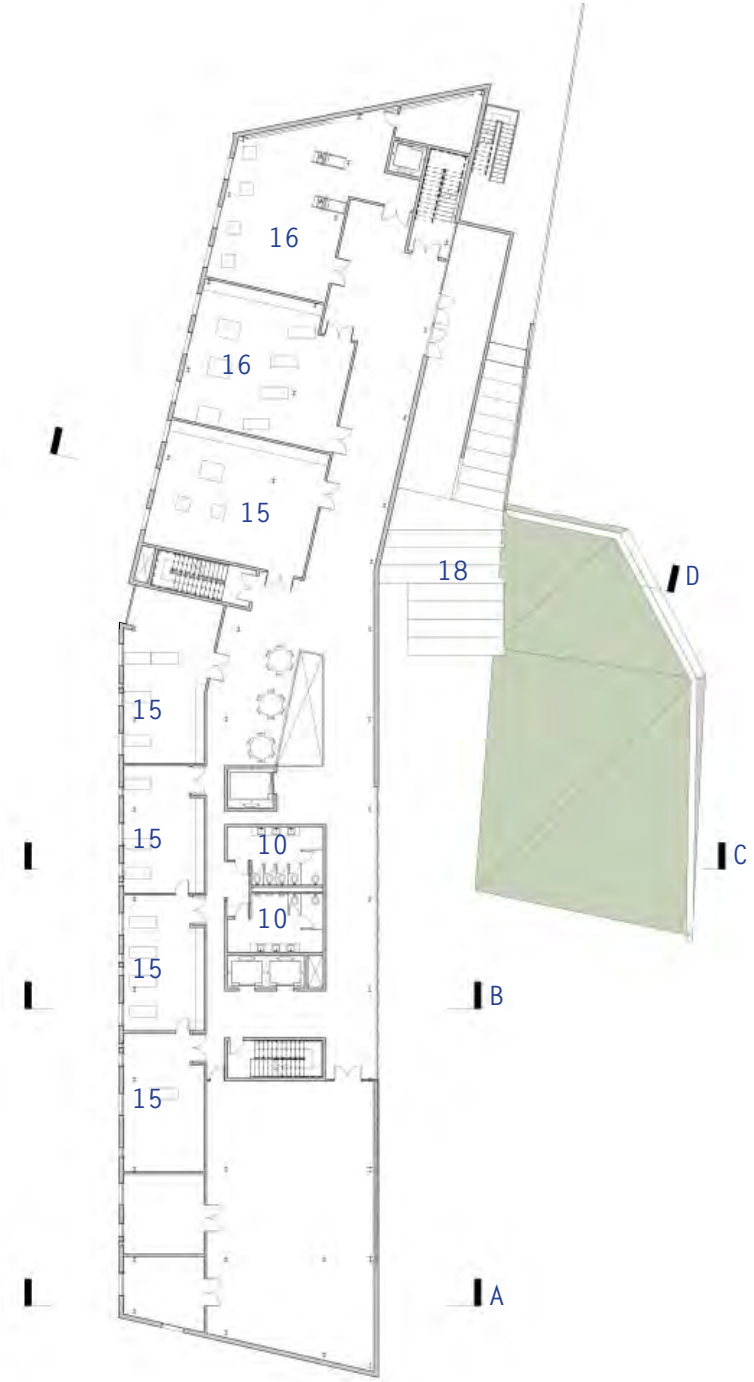
1. ENTRY PLAZA
2. FORUM
3. ENTRY/LOBBY
4. GALLERY
5. CAFE/LOUNGE
6. ATRIUM
7. AUDITORIUM
8. CLASSROOM
9. SERVICE
10. RESTROOM
11. PARKING
12. DEDICATED LAB
13. DEDICATED MANUF
14. COLLAB POD
15. FLEX LAB
16. FLEX MANUF
17. INCUBATOR
18. SKY BRIDGE



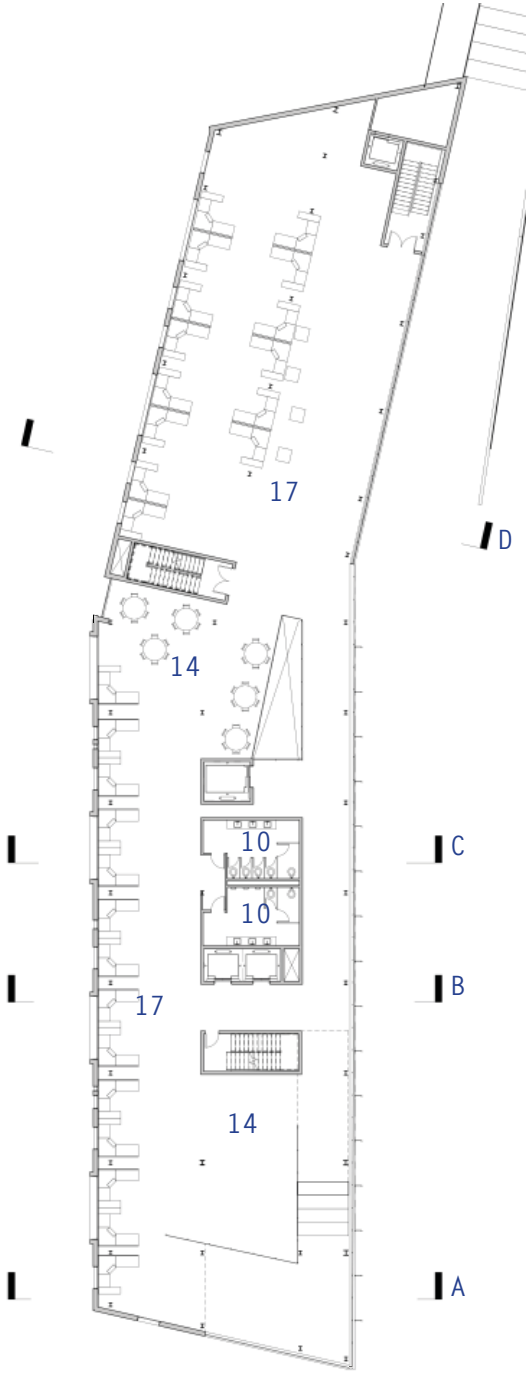
GROUND FLOOR PLAN



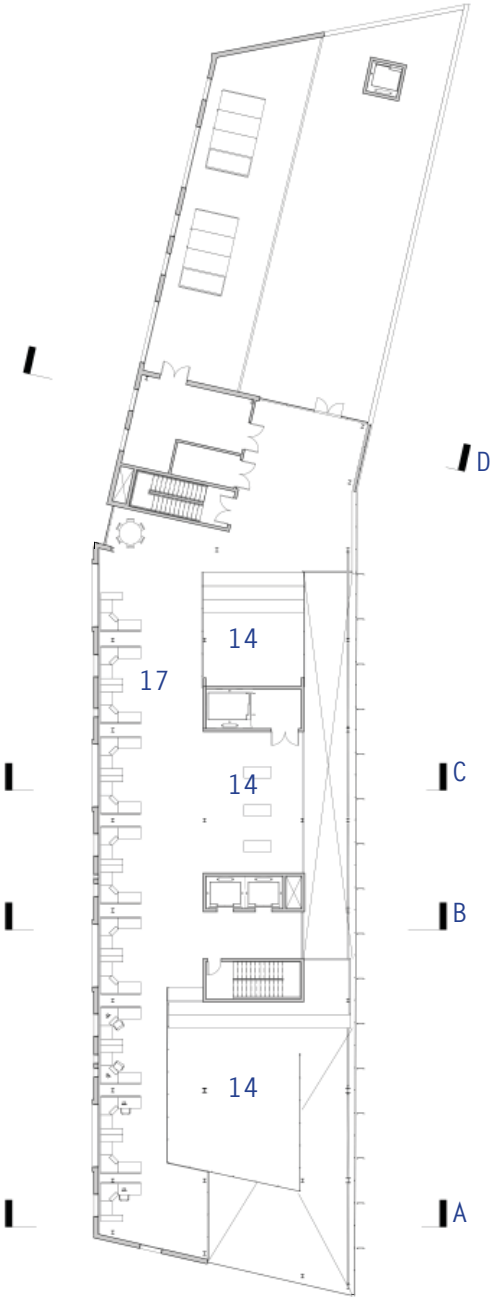
SECOND FLOOR PLAN



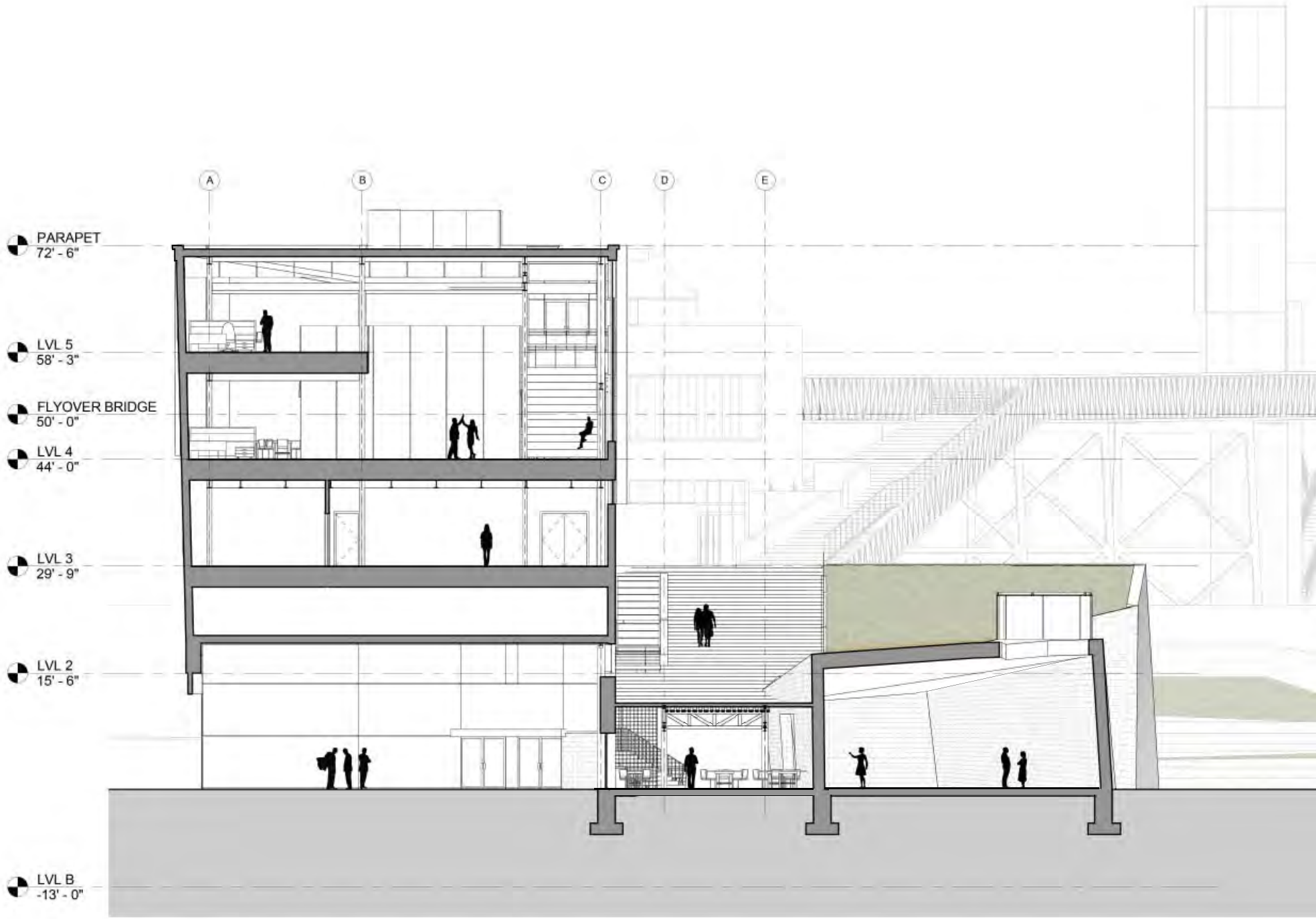
THIRD FLOOR PLAN



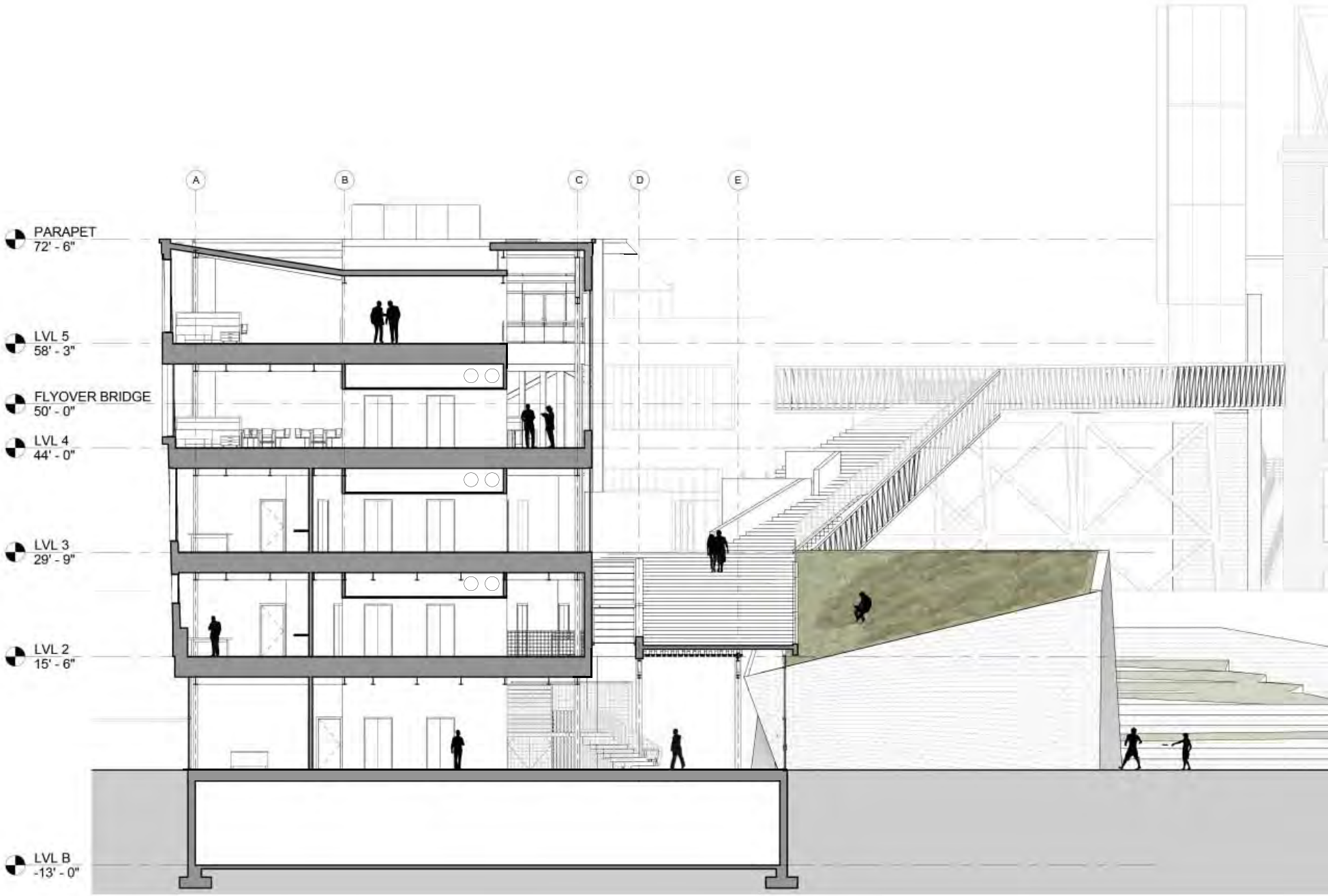
FOURTH FLOOR PLAN



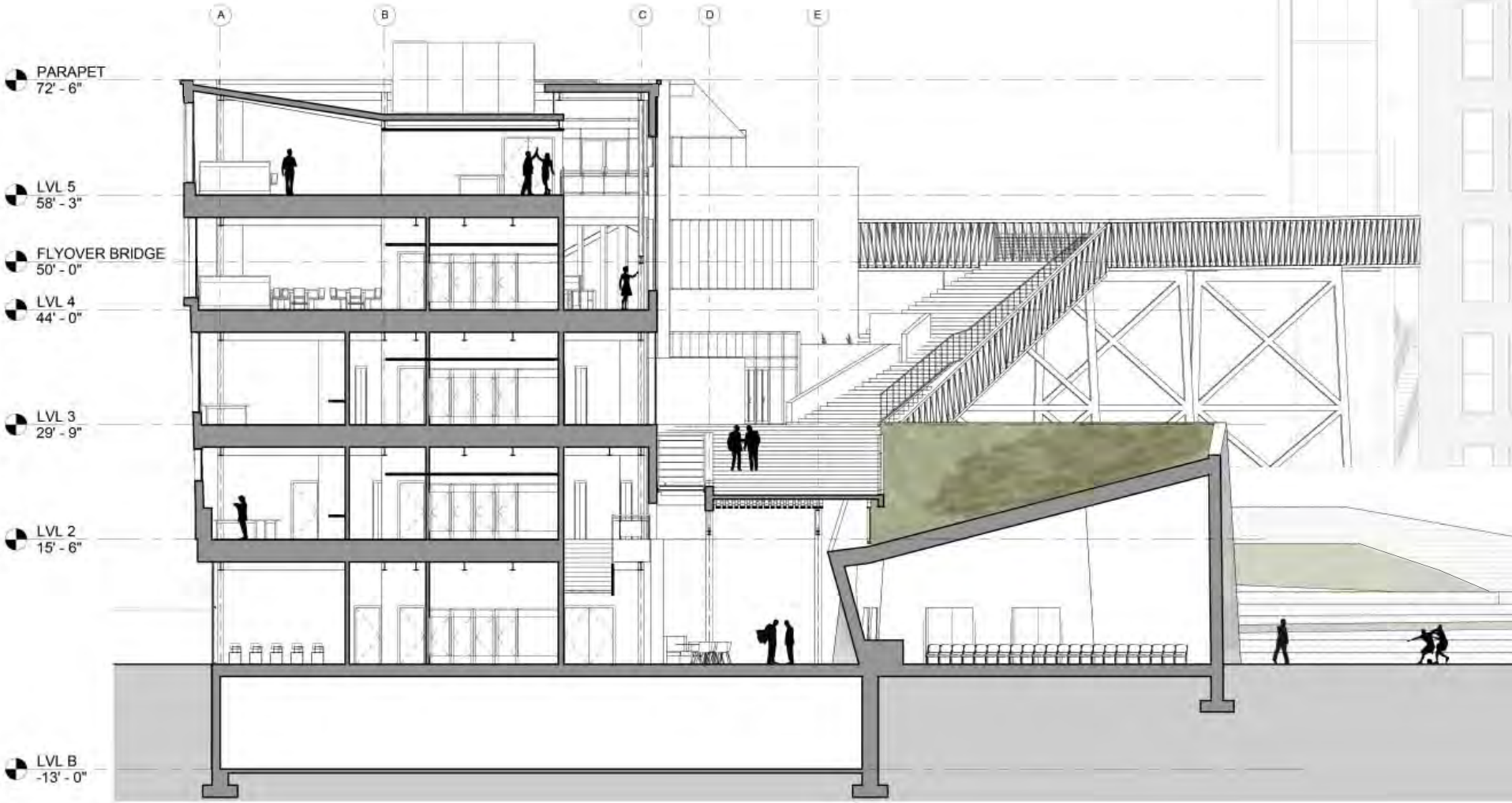
FIFTH FLOOR PLAN


A
B
C
D
E
PARAPET
72' - 6"
LVL 5
58' - 3"
FLYOVER BRIDGE
50' - 0"
LVL 4
44' - 0"
LVL 3
29' - 9"
LVL 2
15' - 6"
LVL B
-13' - 0"

SECTION A-A


A
B
C
D
E
PARAPET
72' - 6"
LVL 5
58' - 3"
FLYOVER BRIDGE
50' - 0"
LVL 4
44' - 0"
LVL 3
29' - 9"
LVL 2
15' - 6"
LVL B
-13' - 0"

SECTION B-B


A
B
C
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E
PARAPET
72' - 6"
LVL 5
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FLYOVER BRIDGE
50' - 0"
LVL 4
44' - 0"
LVL 3
29' - 9"
LVL 2
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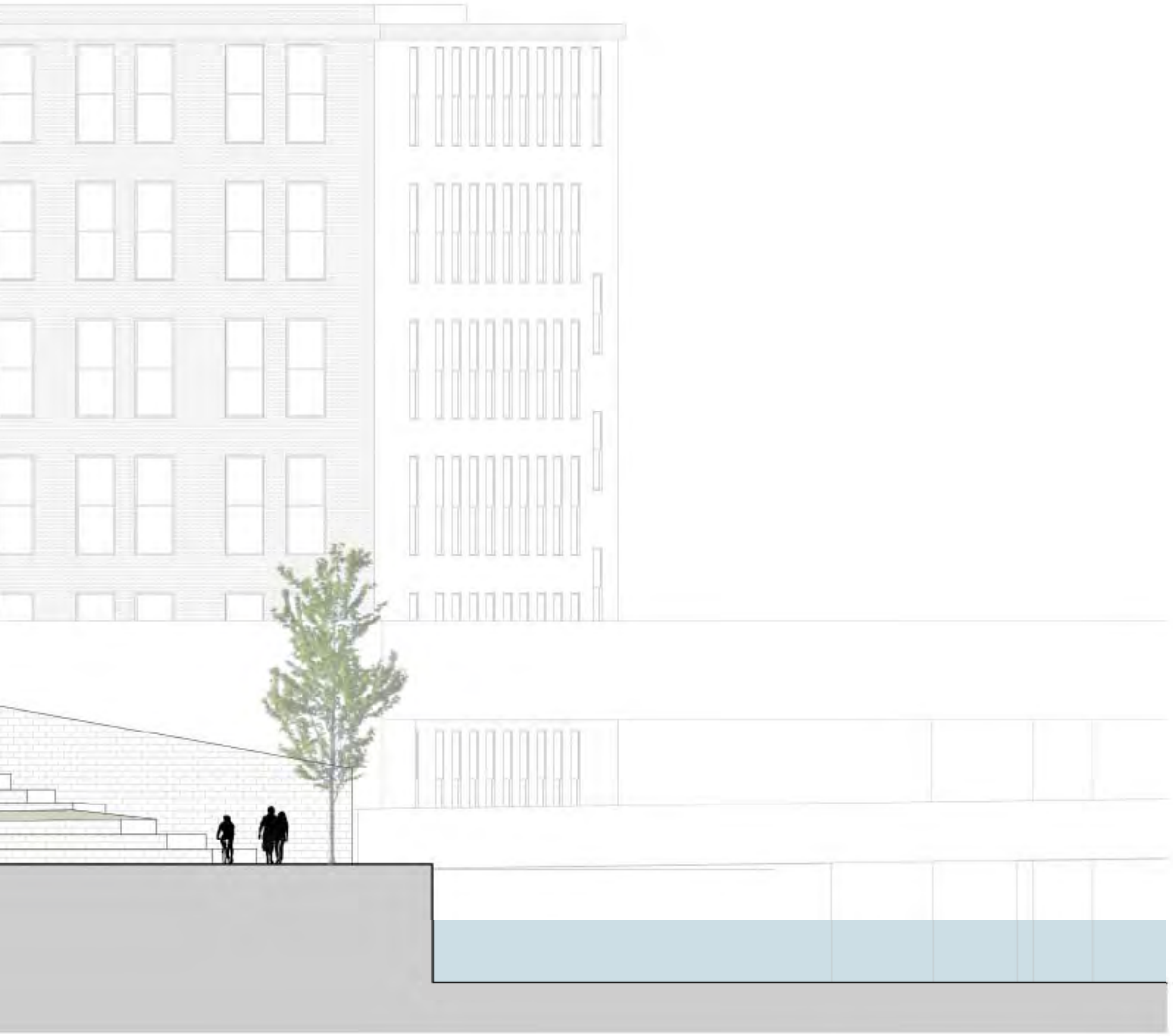
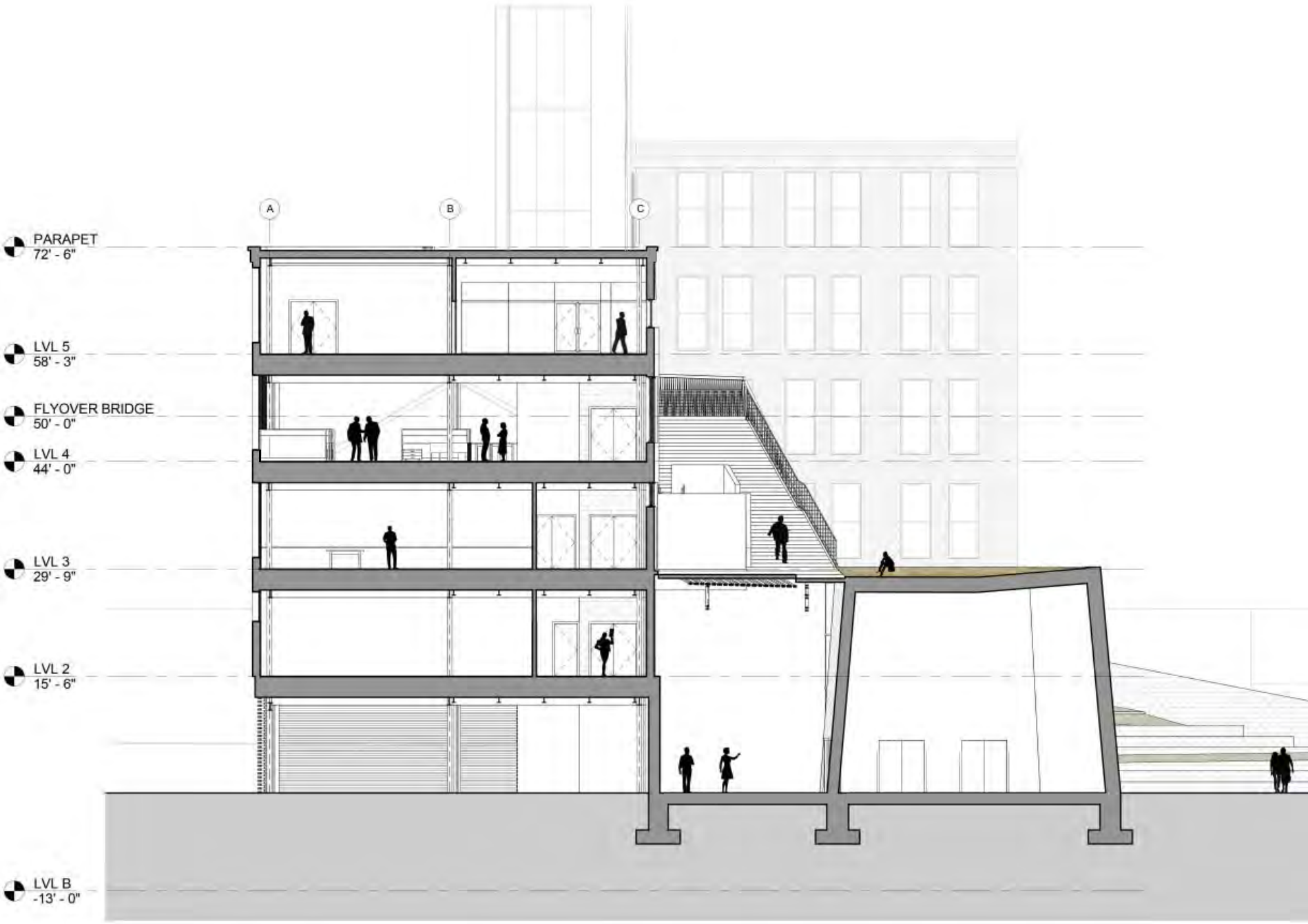
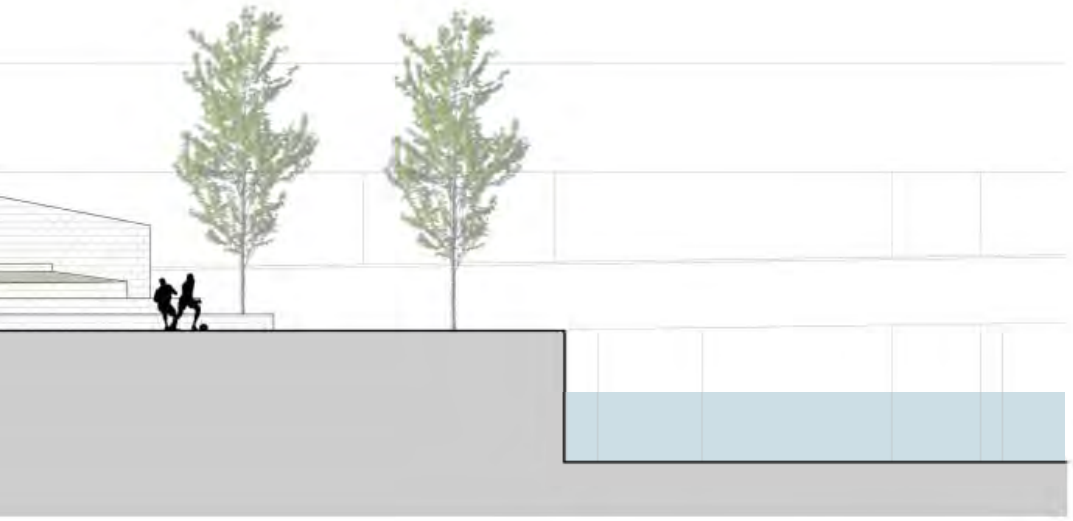
LVL B
-13' - 0"

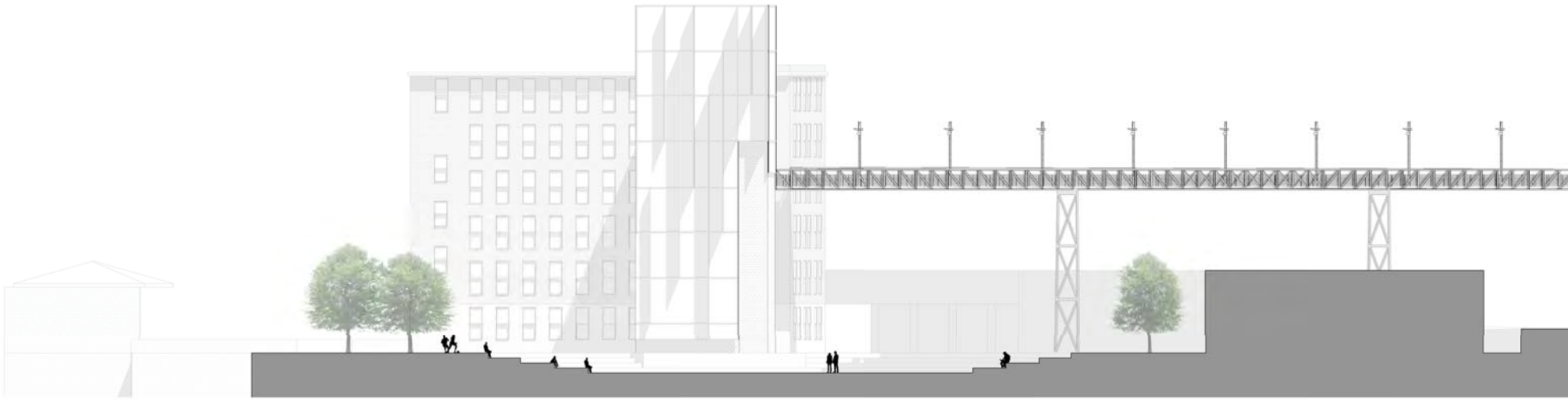


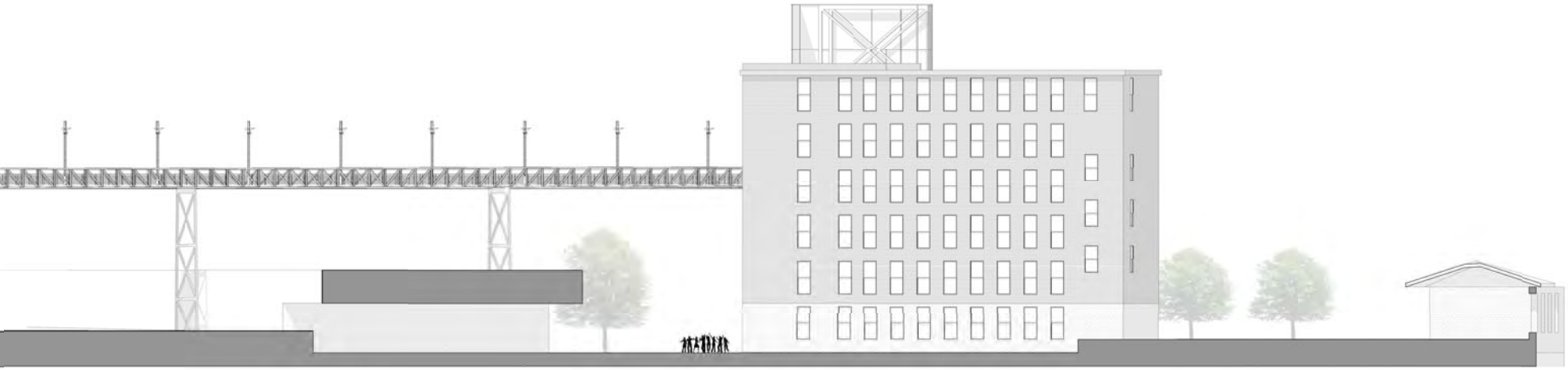
SECTION C-C


A
B
C
PARAPET
72' - 6"
LVL 5
58' - 3"
FLYOVER BRIDGE
50' - 0"
LVL 4
44' - 0"
LVL 3
29' - 9"
LVL 2
15' - 6"
LVL B
-13' - 0"



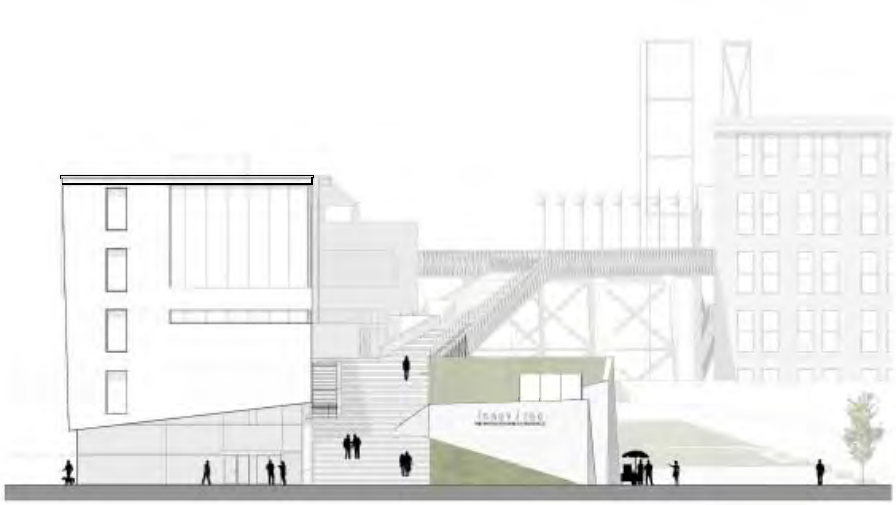
SECTION D-D



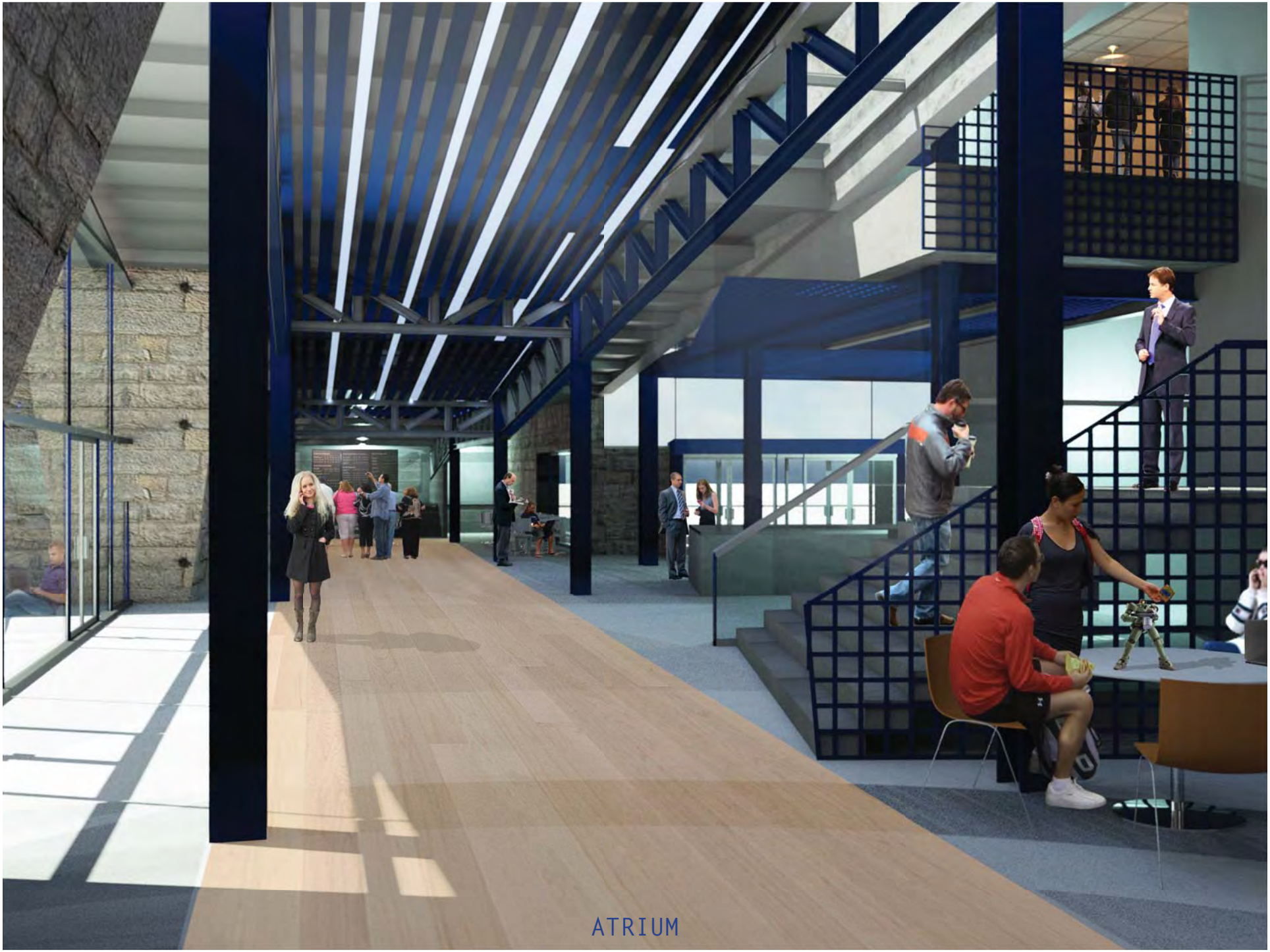


EAST ELEVATION

WEST ELEVATION

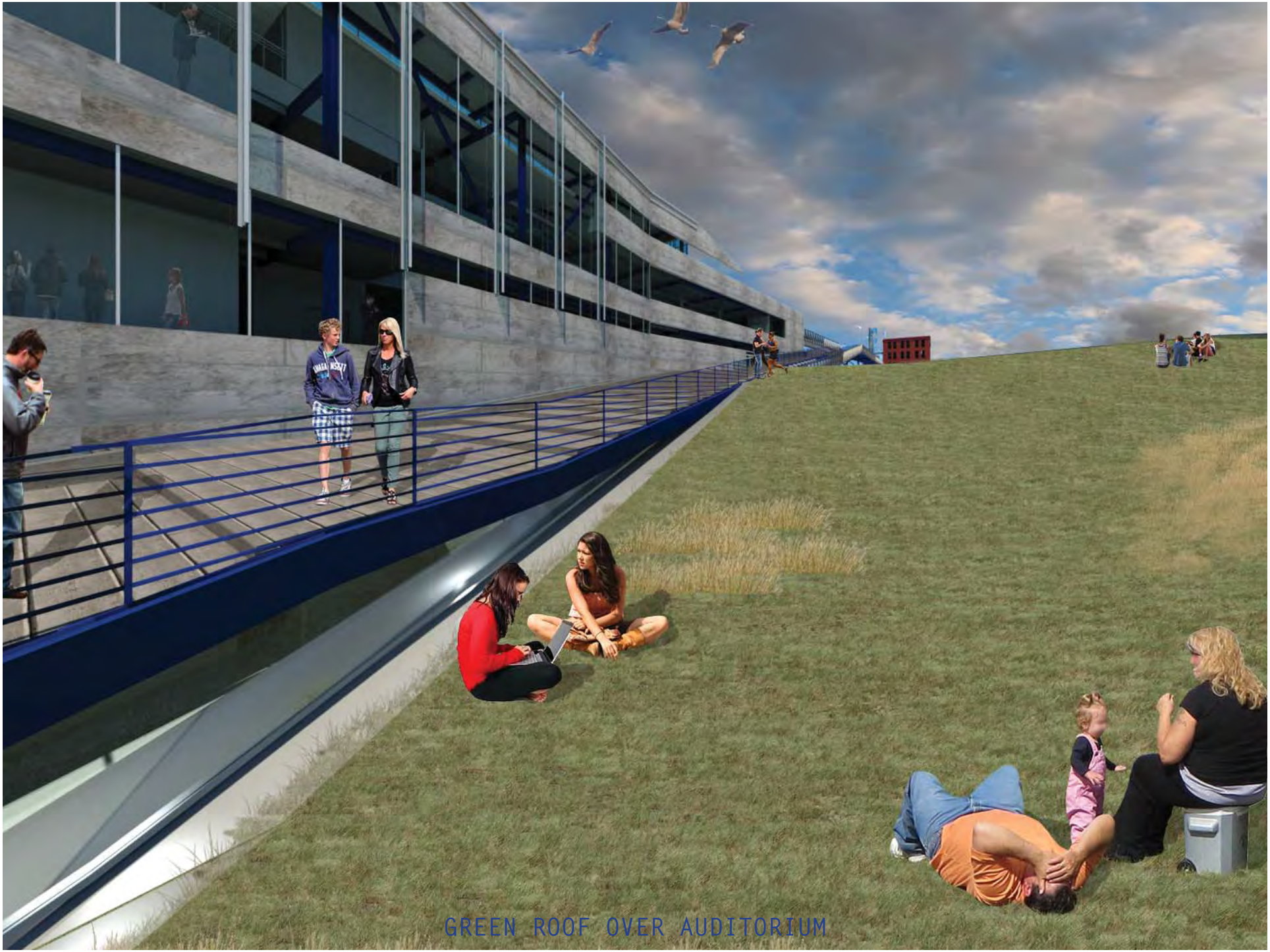


NORTH ELEVATION



ATRIUM

MAIN COLLABORATION POD

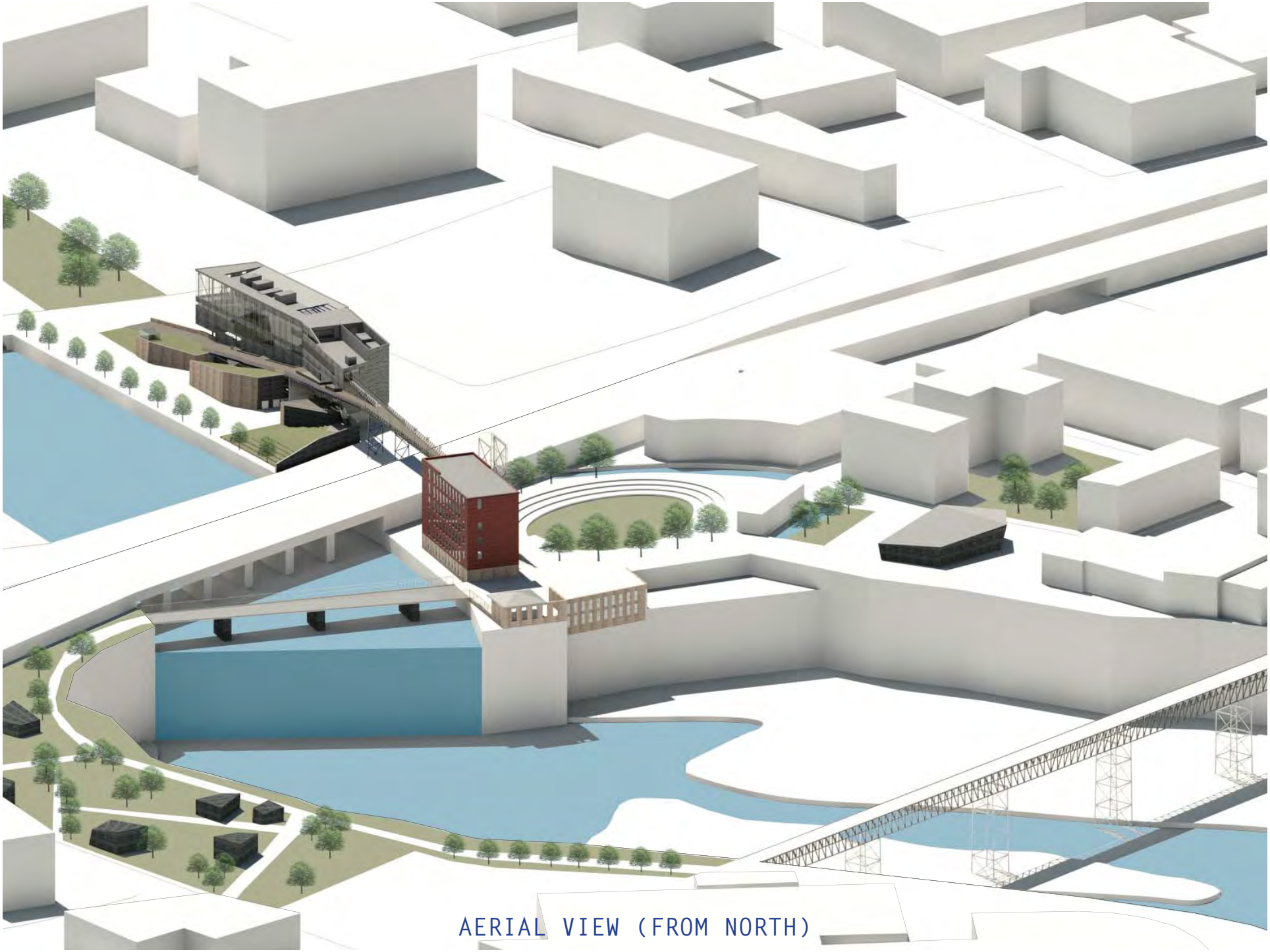


GREEN ROOF OVER AUDITORIUM

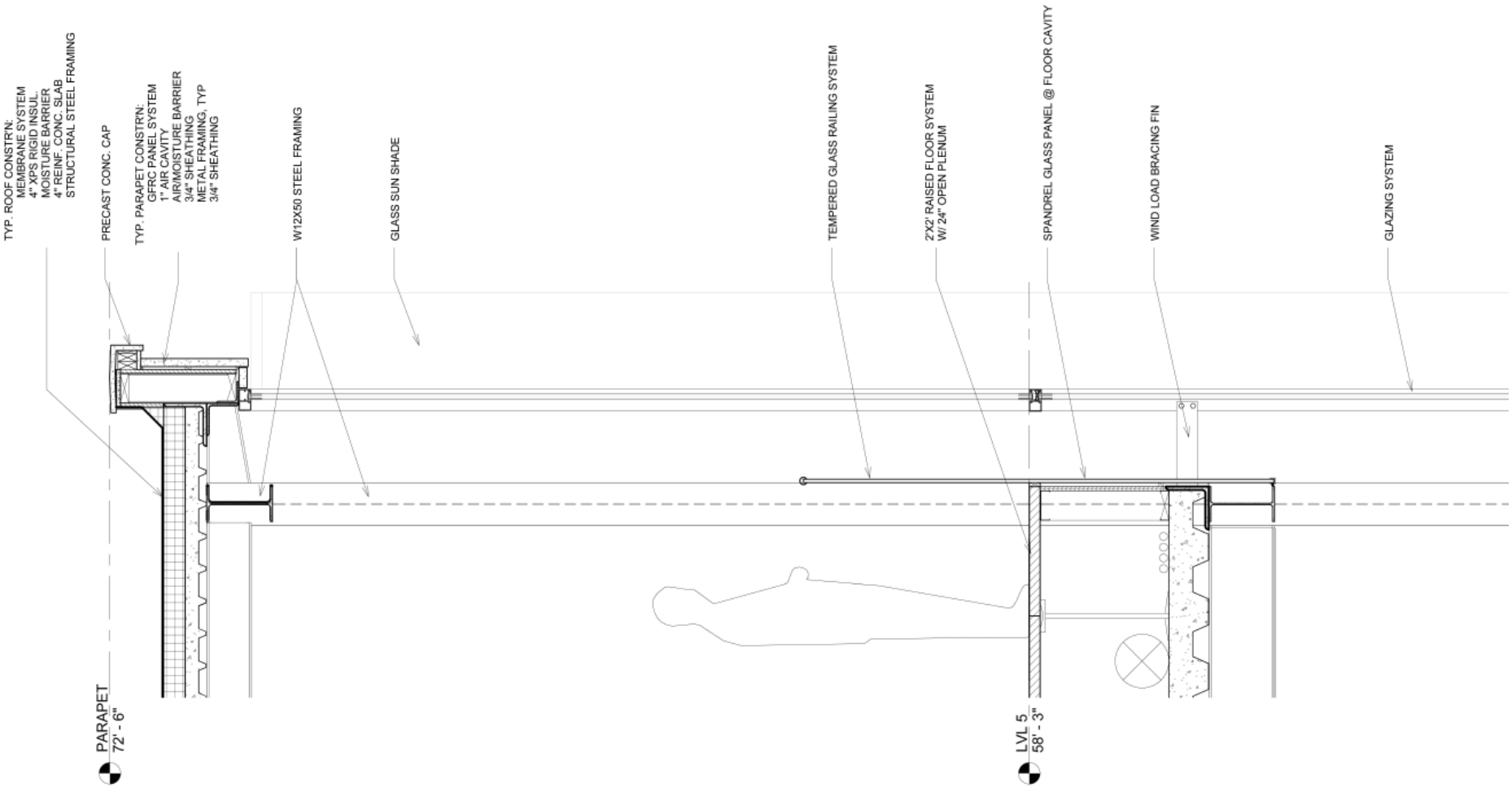
PAVILIONS + ESPLANADE, EAST SIDE

THE LOFTS AT BROWN'S RACE
PONT DE REINES PUB
Welcome to the
GENESEE RIVERWAY
HIGH FALLS

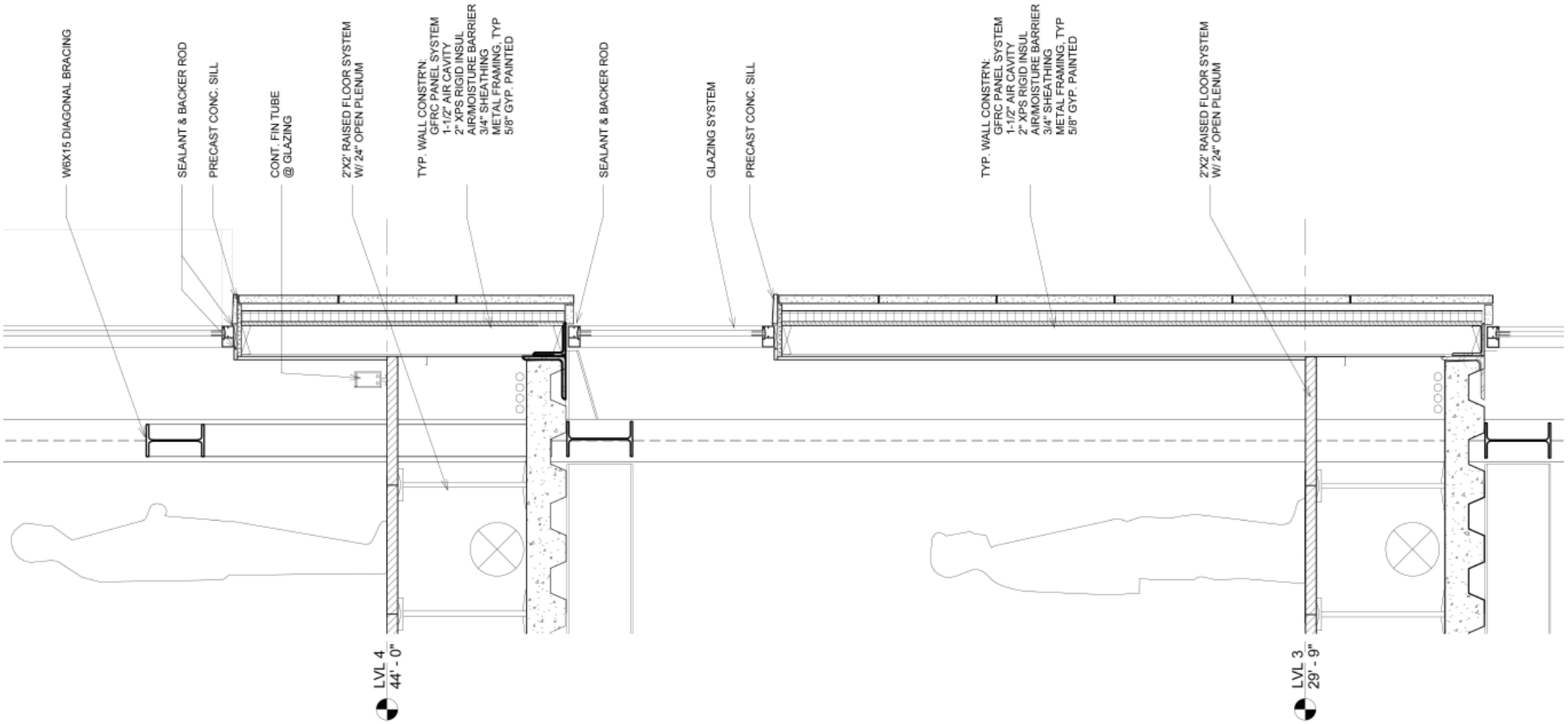
BROWN'S RACE



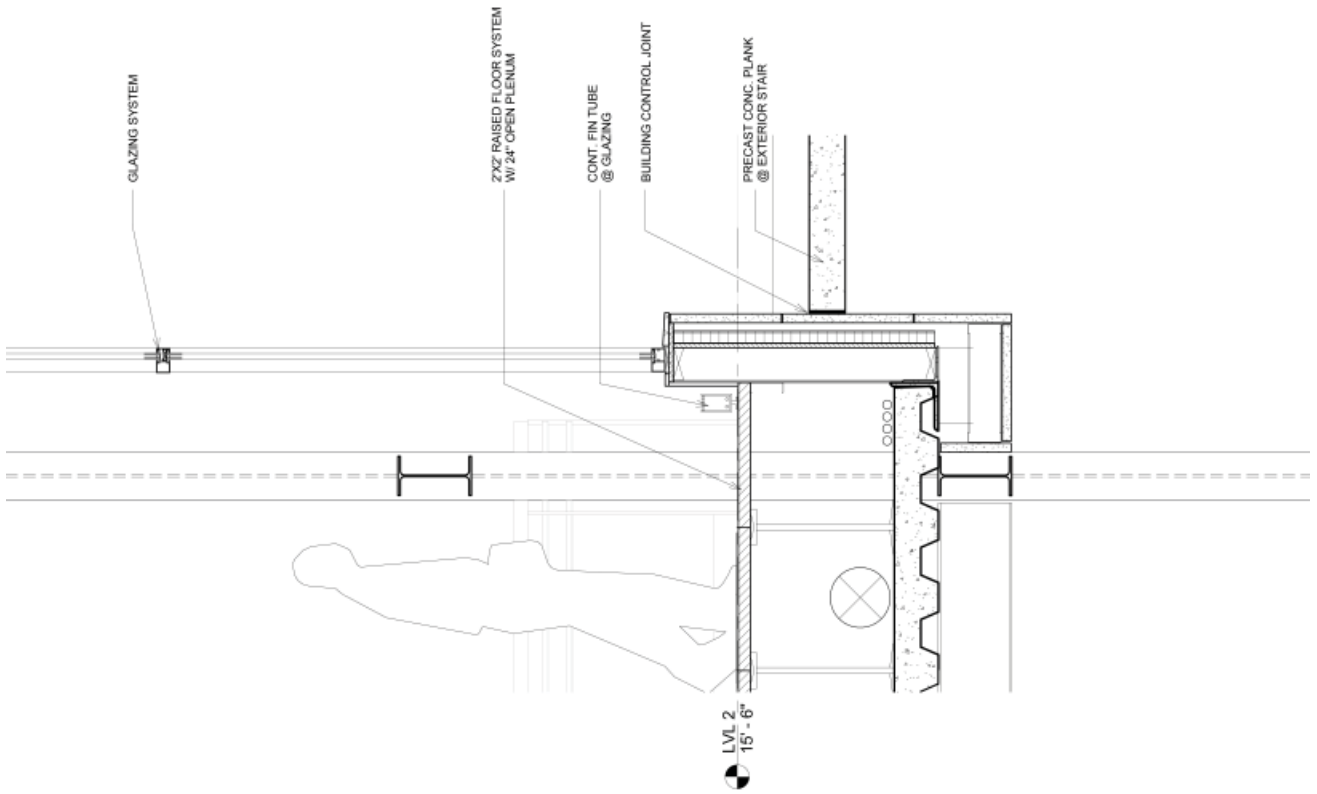
AERIAL VIEW (FROM NORTH)



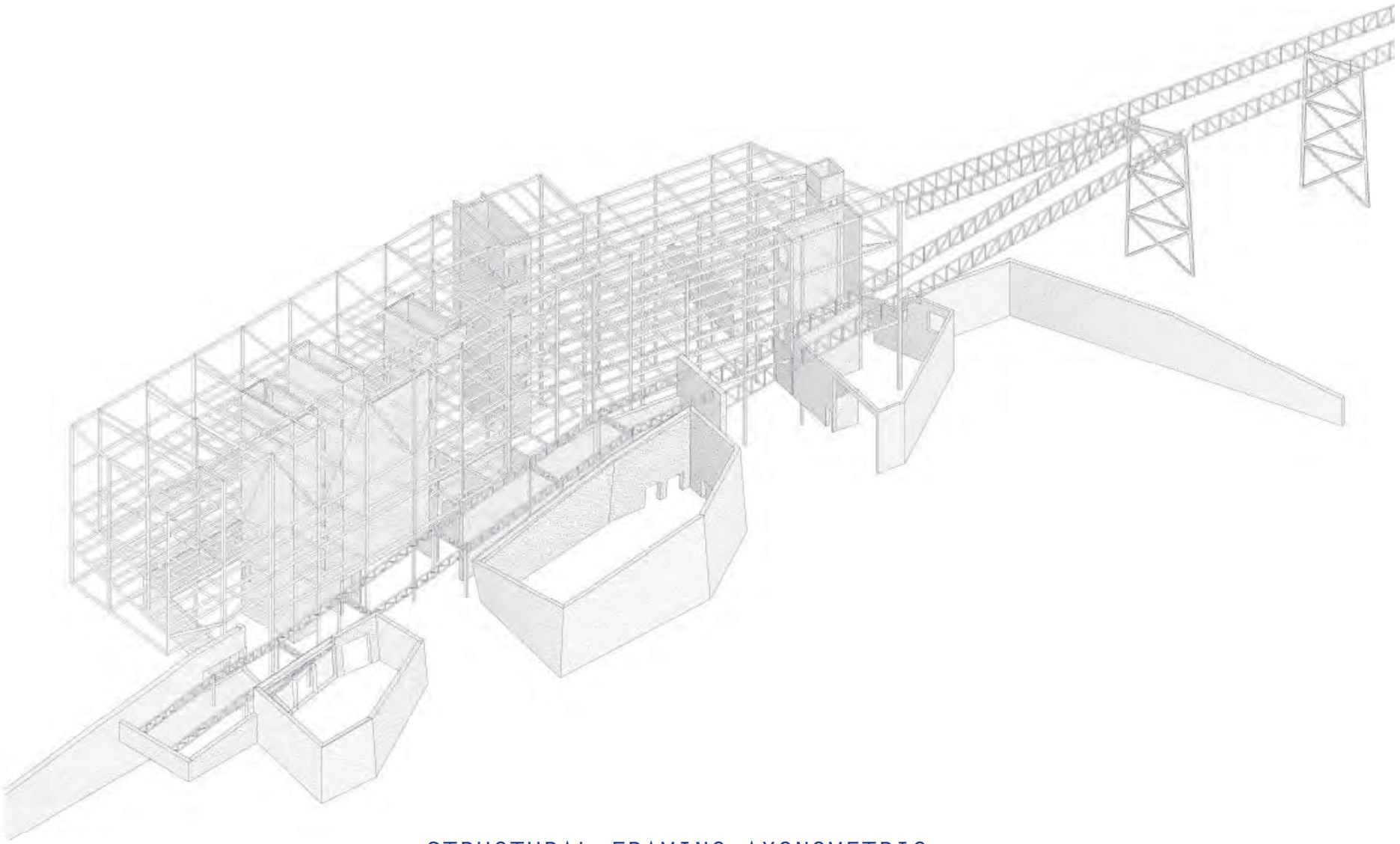
WALL SECTION-DETAIL



WALL SECTION-DETAIL

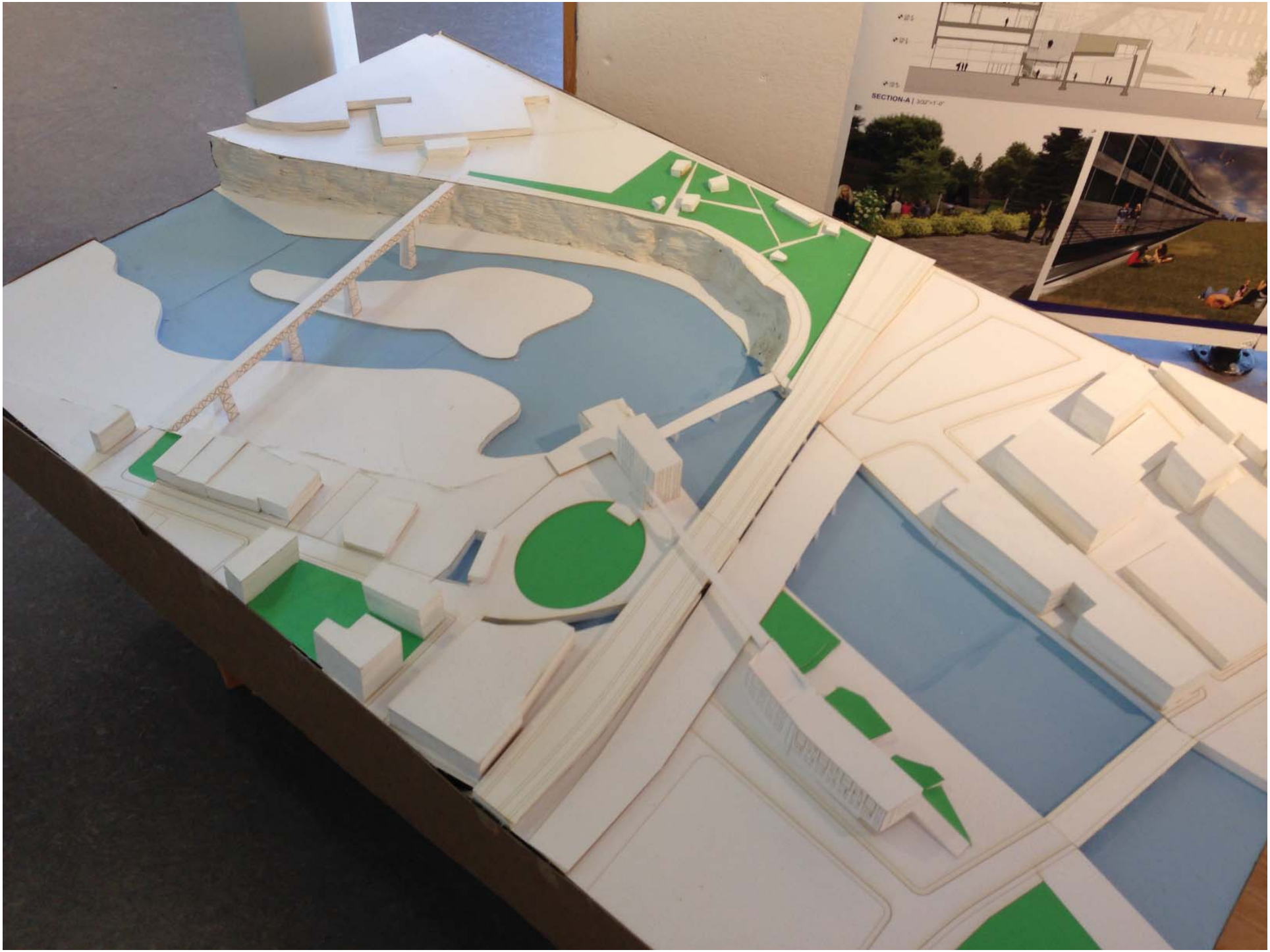


WALL SECTION-DETAIL



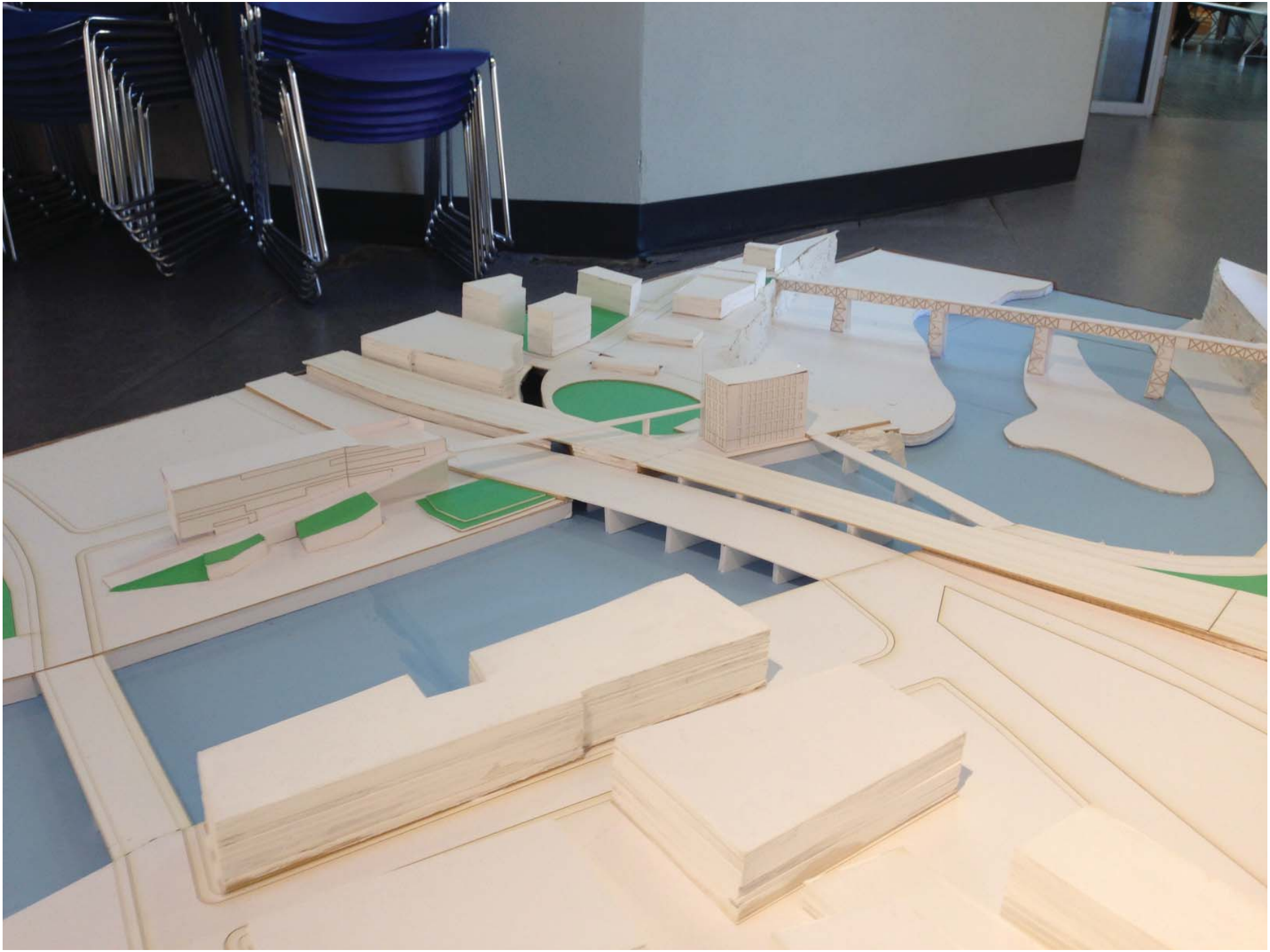
STRUCTURAL FRAMING AXONOMETRIC

RECLAIMED IDENTITY | INNOV / ROC


SECTION-A

RECLAIMED IDENTITY | INNOV / ROC
THE INNOVATION HUB AND REVITALIZATION OF HIGH FALLS | ROCHESTER, NY
JUSTIN M DUFRESNE | FALL 2014
INTRODUCTION |
PROJECT SITE
SITE PLAN LEGEND |
SITE PLAN |
N
WEST ELEVATION |
SOUTH ELEVATION |
SECTION-A |
SECTION-B |

GROUND FLOOR FLY-OVER PLAN |
BRIDGE LEVEL FLY-OVER PLAN |
WALL SECTION-CONSTRUCTION DETAILS |
FRAMING AXONOMETRIC |



RECLAIMED IDENTITY | INNOV / ROC

THE INNOVATION HUB AND REVITALIZATION OF HIGH FALLS | ROCHESTER, NY

JUSTIN M DUFRESNE | FALL 2014

INTRODUCTION |

Founded on the banks of the Genesee River in 1817, Rochester quickly became one of America's first "boomtowns." Within two decades, Rochester earned its nickname of the "Flour City," as the mills that lined the Genesee made Rochester the largest flour producer in the country. The mills that powered this industry created the architectural backdrop from which the rest of the city would grow, and also formed an intimate relationship with the Genesee River, High Falls, the Erie Canal, and the entire surrounding region.

By the mid 19th century, wheat processing began to move west, following western explorers and agriculture. With this exodus came new economic opportunities that transformed Rochester in a new way. George Eastman founded Kodak in Rochester in 1888, Xerox formed in 1906, and the eye-care company Bausch & Lomb was born in Rochester. World-renown institutions of higher education rose in 1829 with the Rochester Institute of Technology (RIT), and the University of Rochester (UofR). Rochester quickly became the epicenter for high-tech and higher education.

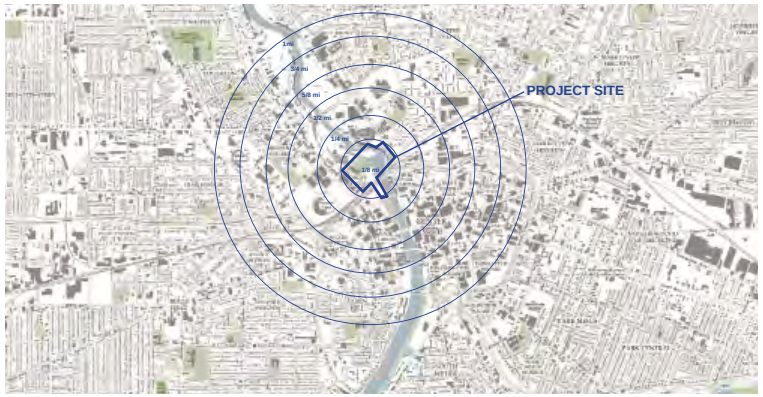
Despite the rapid shift from a mill and manufacturing industry to a tech-centered economy in the last century, the Rochester of today hasn't kept pace with new demands. Kodak and Xerox, once the largest employers in the area are now mere shadows of what they once were. Despite RIT and U of R's prestigious standings, graduates often leave the area after graduation in search of jobs. At the same time, Rochester's population has been in steady decline since the 1970s.

Remnants of Rochester's vibrant past and roots still exist today. Portions of the old mills that once lined the river stand as hollowed-out shells or have been re-purposed. Most have been demolished. Channels carved into the earth to divert river water can still be seen in the Brown's Race district of High Falls. Despite this rich past, the area is decayed, under-used, and under-appreciated.

This thesis addresses two of Rochester's biggest concerns; what is the identity of a future Rochester, and how can we revitalize its past in order to preserve it for future generations. The components of the project; a master plan, and a building serve as the architectural vehicles to answer these concerns.

Revitalizing Rochester's mill district (Brown's Race) and the surrounding area as a new center of entertainment and commerce will attract visitors and strengthen the local economy. The creation of an "innovation hub," full of laboratory, manufacturing, and open studio space are available to students and recent graduates of local universities or those who wish to use grant money or private funds to create and innovate software and prototypes.

Rochester is far from dead. This scheme aims to give Rochester a new future, one that shadows its past of technological innovation, but in a new era. The site is one that is unique to any urban center, and is a true asset to the city, but it needs a face-lift. The two components of this project are a means of making Rochester the gem that it deserves to be.

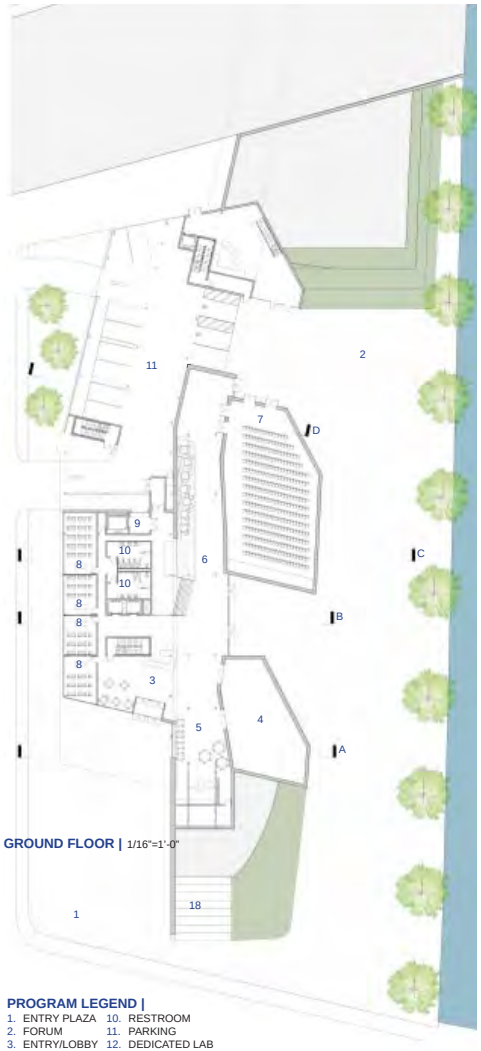


SITE PLAN | 1"=80'

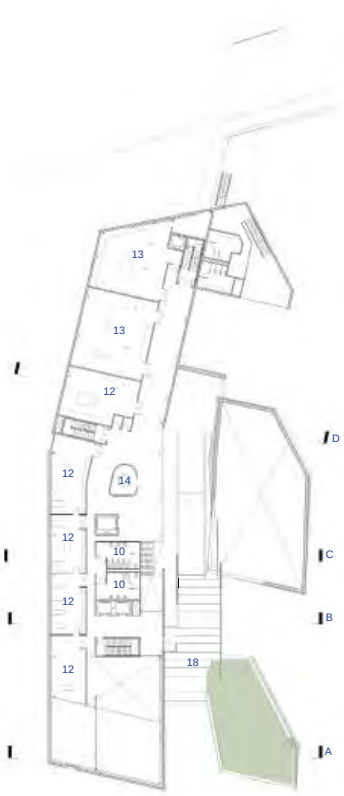
SITE PLAN LEGEND |

1. GENESEE RIVER WALK (EXISTING, TO BE MODIFIED)
2. INNOVATION HUB (PROPOSED)
3. INNOVATION PLAZA : "THE BOWL"
4. BROWN'S RACE ENTERTAINMENT DISTRICT (EXISTING, TO BE REVITALIZED)
5. GRANITE MILLS PARK PAVILIONS (EXISTING PARK, PROPOSED PAVILIONS)
6. FALLS OVERLOOK PEDESTRIAN BRIDGE (PROPOSED)

TOP LEFT BOARD

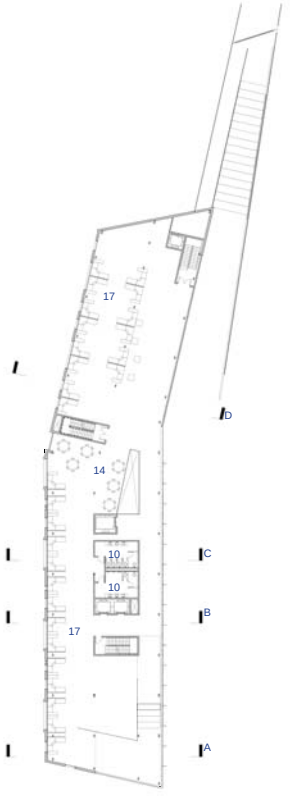


GROUND FLOOR | 1/16"=1'-0"

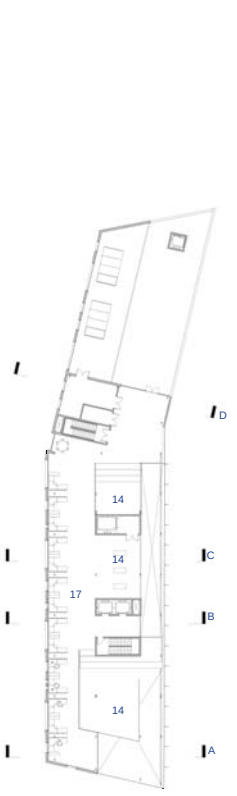


SECOND FLOOR | 1/16"=1'-0"

THIRD FLOOR | 1/16"=1'-0"



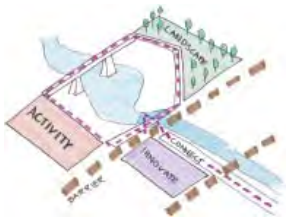
FOURTH FLOOR | 1/16"=1'-0"



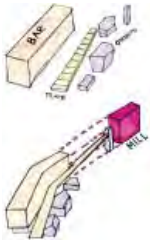
FIFTH FLOOR | 1/16"=1'-0"

PROGRAM LEGEND |

1. ENTRY PLAZA
2. FORUM
3. ENTRY/LOBBY
4. GALLERY
5. CAFE/LOUNGE
6. ATRIUM
7. AUDITORIUM
8. CLASSROOM
9. SERVICE
10. RESTROOM
11. PARKING
12. DEDICATED LAB
13. DEDICATED MANUF.
14. COLLABORATION POD
15. FLEXIBLE LAB
16. FLEXIBLE MANUF.
17. OPEN STUDIO
18. SKY BRIDGE

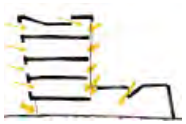


CONCEPT | SITE STRATEGY



CONCEPT | BUILDING STRATEGY

CONCEPT | NATURAL VENTILATION



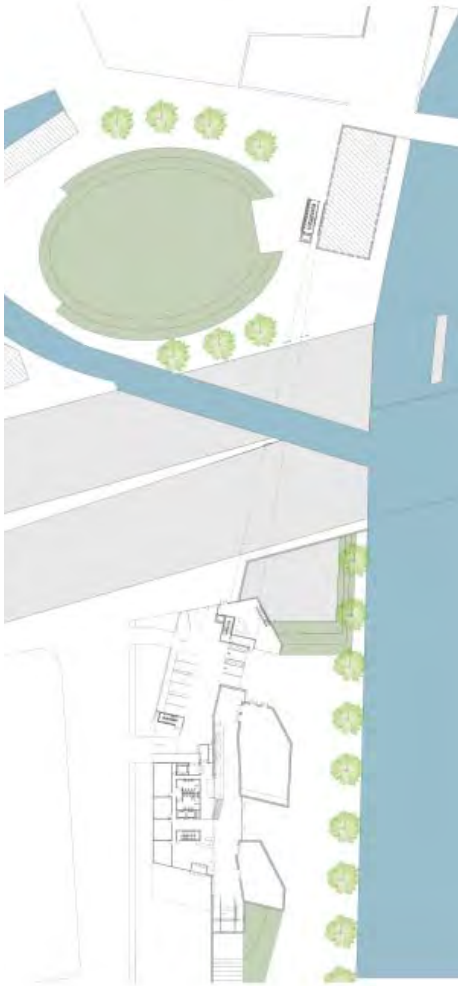
CONCEPT | DAYLIGHTING

CONCEPT | PROGRAM DISTRIBUTION

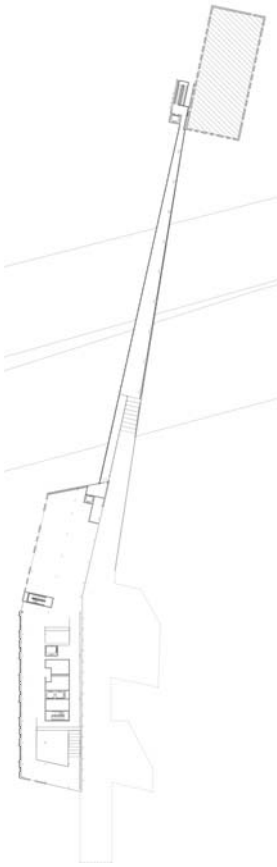
PUBLIC PROGRAM
-CLASSROOMS @ 1550 SQ FT
-GALLERY @ 1800 SQ FT
-CAFE @ 1800 SQ FT
-ATRIUM @ 4000 SQ FT
-THEATER @ 3600 SQ FT
-LOBBY @ 1000 SQ FT

INNOVATION PROGRAM
-DEDICATED LAB @ 2200 SQ FT
-DEDICATED MANUF. @ 3700 SQ FT
-FLEXIBLE LAB @ 2700 SQ FT
-FLEXIBLE MANUF. @ 6100 SQ FT
-OPEN INCUBATOR SPACE @ 13000 SQ FT
-COLLABORATION PODS @ 3400 SQ FT

TOP CENTER BOARD

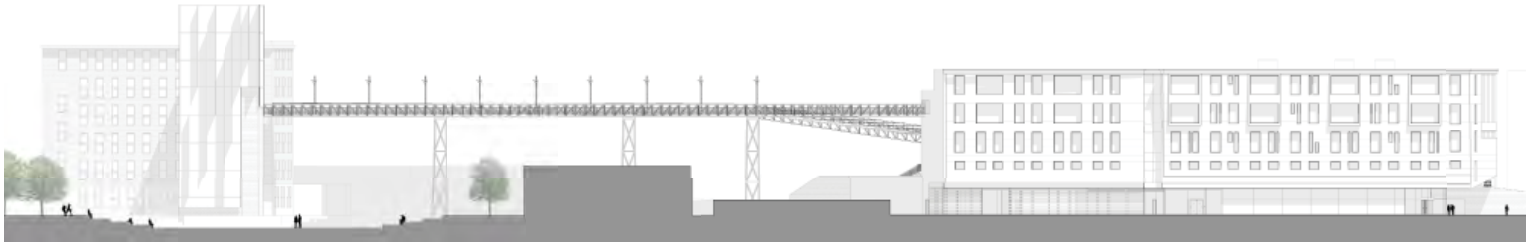


GROUND FLOOR FLY-OVER PLAN | 1"=30'



BRIDGE LEVEL FLY-OVER PLAN | 1"=30'

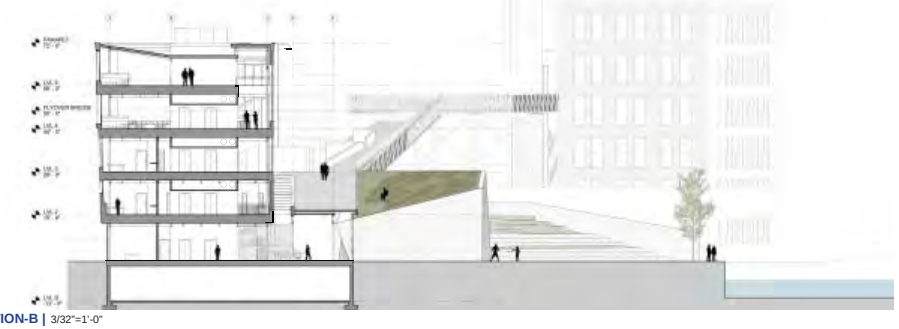
TOP RIGHT BOARD



WEST ELEVATION | 1/16"=1'-0"

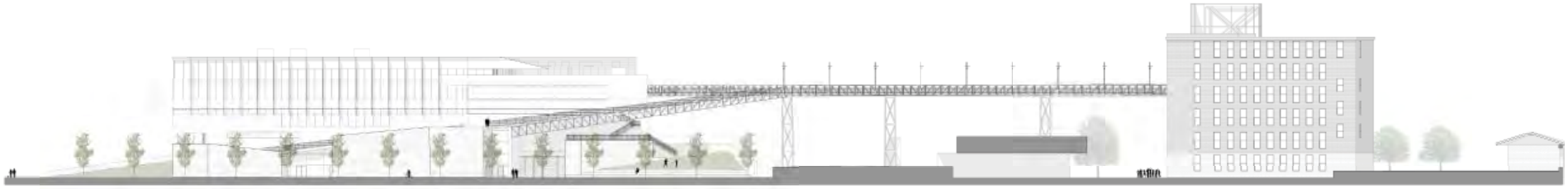
SOUTH ELEVATION | 1/16"=1'-0"

SECTION-A | 3/32"=1'-0"



SECTION-B | 3/32"=1'-0"

LOWER LEFT BOARD

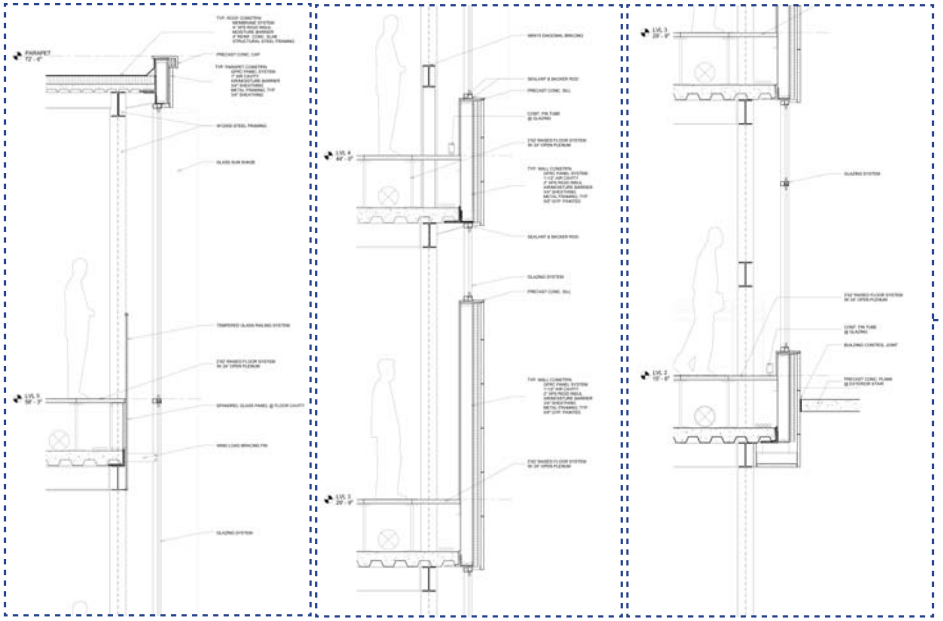


EAST ELEVATION | 1/16"=1'-0"

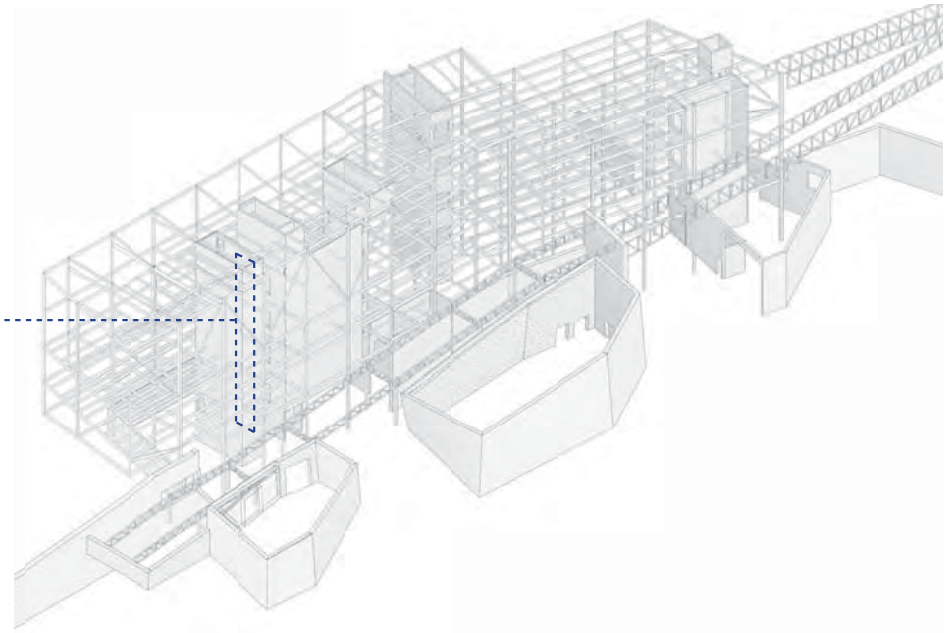
SECTION-C | 3/32"=1'-0"

SECTION-D | 3/32"=1'-0"

LOWER CENTER BOARD



WALL SECTION-CONSTRUCTION DETAILS | 3/4"=1'-0"



FRAMING AXONOMETRIC | 3/32"=1'-0"

LOWER RIGHT BOARD

RECLAIMED IDENTITY | INNOV / ROC

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JUSTIN M DUFRESNE | FALL 2014

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SITE PLAN | 1"=80'

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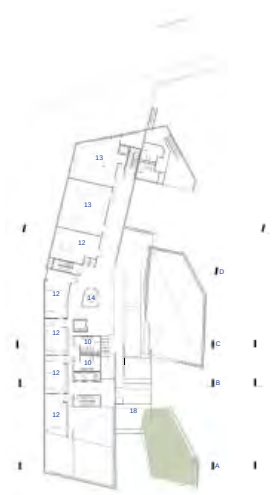
3. INNOVATION PLAZA - "THE BOWL"
4. BROWN'S RACE ENTERTAINMENT DISTRICT (EXISTING, TO BE REVITALIZED)
5. GRANITE MILLS PARK PAVILIONS (EXISTING PARK, PROPOSED PAVILIONS)
6. FALLS OVERLOOK PEDESTRIAN BRIDGE (PROPOSED)

GROUND FLOOR | 1/16"=1'-0"



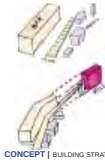
SECOND FLOOR | 1/16"=1'-0"

THIRD F

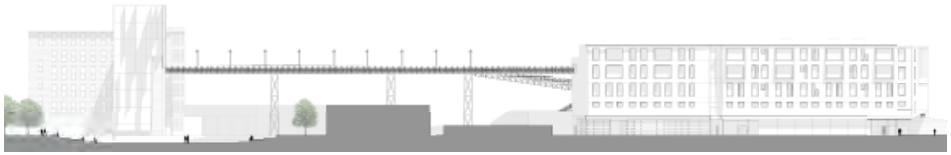
PROGRAM LEGEND |

1. ENTRY PLAZA
2. FORUM
3. ENTRY/LOBBY
4. GALLERY
5. CAFE/LOUNGE
6. ATRIUM
7. AUDITORIUM
8. CLASSROOM
9. SERVICE
10. RESTROOM
11. PARKING
12. DEDICATED LAB
13. DEDICATED MANUF.
14. COLLABORATION POD
15. FLEXIBLE LAB
16. FLEXIBLE MANUF.
17. OPEN STUDIO
18. SKY BRIDGE

CONCEPT | SITE STRATEGY



CONCEPT | BUILDING STRA

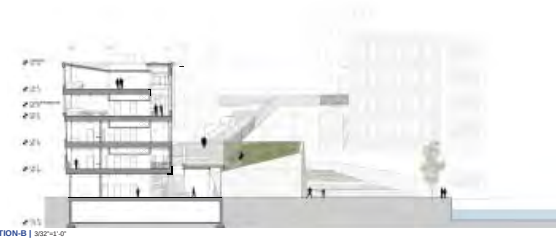


WEST ELEVATION | 1/16"=1'-0"

SOUTH ELEVATION | 1/16"=1'-0"

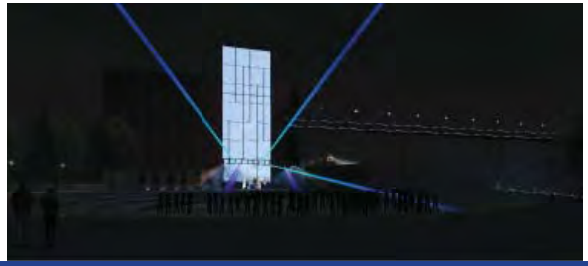
EAST ELEVATION | 1/16"=1'-0"

SECTION-A | 3/32"=1'-0"



SECTION-B | 3/32"=1'-0"

SECTION-C | 3/32"=1'-0"



FLOOR | 1/16"=1'-0"

FOURTH FLOOR | 1/16"=1'-0"

FIFTH FLOOR | 1/16"=1'-0"

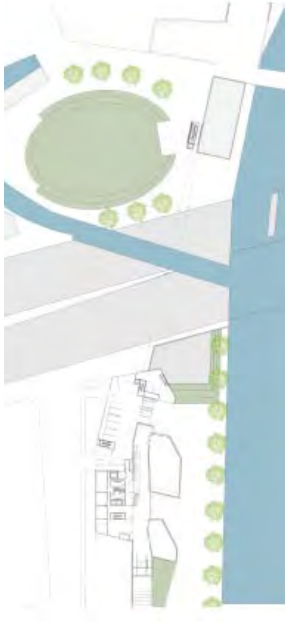
TEGY **CONCEPT |** NATURAL VENTILATION

CONCEPT | DAYLIGHTING

CONCEPT | PROGRAM DISTRIBUTION

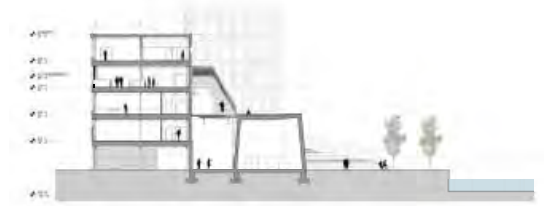
PUBLIC PROGRAM
-CLASSROOMS @ 1550 SQ FT
-GALLERY @ 1800 SQ FT
-CAFE @ 1800 SQ FT
-ATRIUM @ 4000 SQ FT
-THEATER @ 3600 SQ FT
-LOBBY @ 1000 SQ FT

INNOVATION PROGRAM
-DEDICATED LAB @ 2200 SQ FT
-DEDICATED MANUF. @ 3700 SQ FT
-FLEXIBLE LAB @ 2700 SQ FT
-FLEXIBLE MANUF. @ 6100 SQ FT
-OPEN INCUBATOR SPACE @ 13000 SQ FT
-COLLABORATION PODS @ 3400 SQ FT

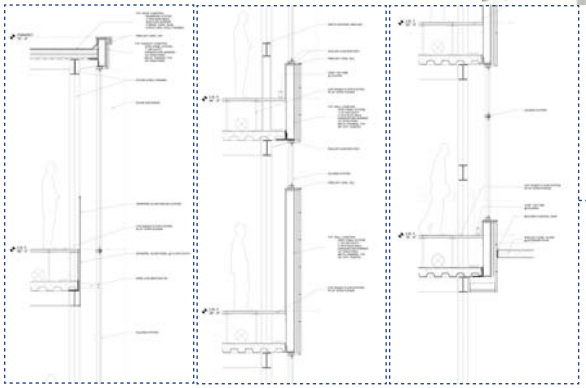


GROUND FLOOR FLY-OVER PLAN | 1"=30'

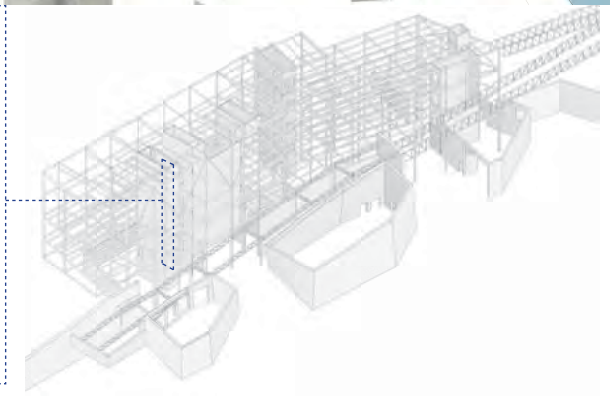
BRIDGE LEVEL FLY-OVER PLAN | 1"=30'



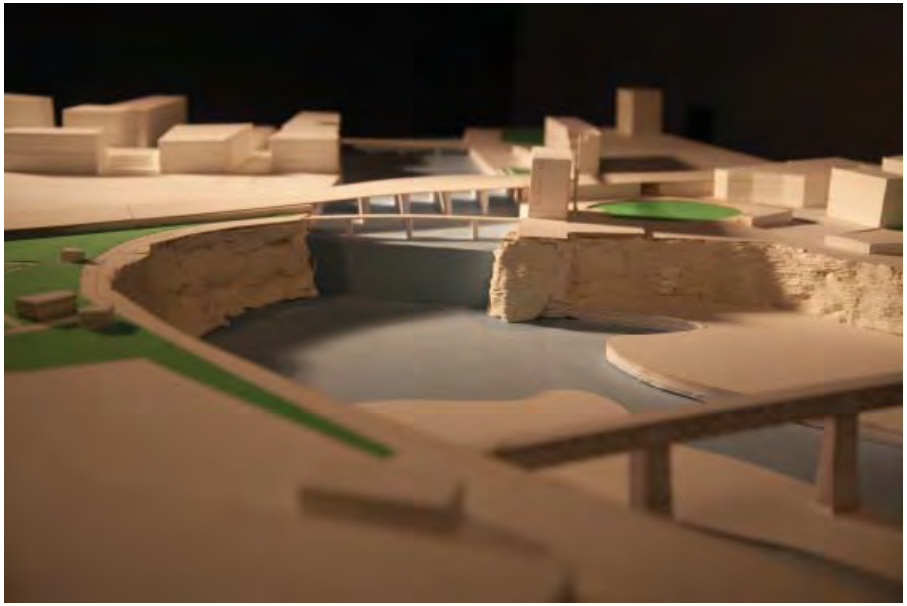
SECTION-D | 3/32"=1'-0"

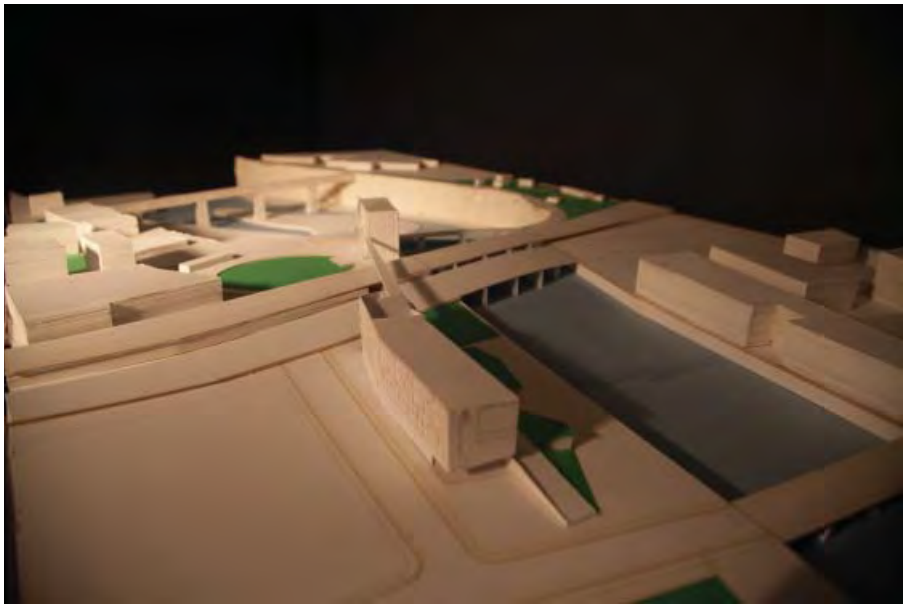


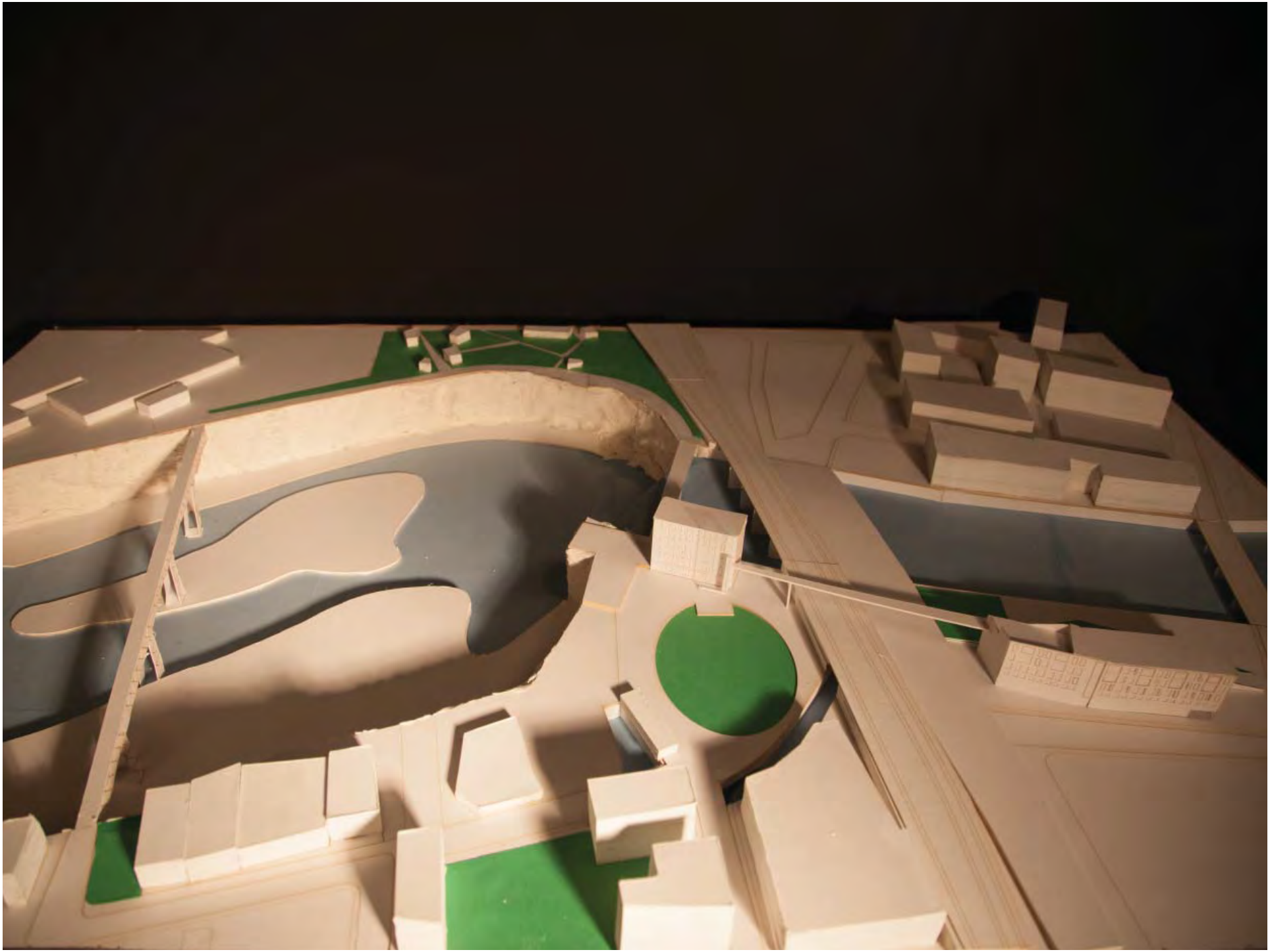
WALL SECTION-CONSTRUCTION DETAILS | 3/4"=1'-0"



FRAMING AXONOMETRIC | 3/32"=1'-0"







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pg 112 Closing Comments
pg 113 Post-Review Explorations

THOUGHTS + REFLECTIONS

CLOSING COMMENTS |

The final review was an enormous success. Overall the feedback from critics was positive and constructive, and they were extremely pleased and impressed with the resolution of the project.

Many critics expressed a desire to see further exploration of the sectional relationship of the “object pieces” of the building. More specifically, how can these objects be more transparent to express a continuity of view/ function between the building and the river walk.

This could be as simple as allowing for more glazing in spaces like the gallery that could benefit from the addition of natural light and views to the interior/exterior.

For the auditorium, sloping the floor plate could allow the opportunity for a physical connection (a bridge) from the river walk over the seating area into the atrium. There is also the opportunity for more glazing to allow for natural light to enter the space.

The idea of a stronger tie to the existing mill building at the end of the fly over bridge is another open opportunity that could be explored. Office/incubator program can be expanded into this building. Adding a restaurant or cafe to the top floor overlooking the falls would also be a fantastic way of overlapping the innovation hub program with the more entertainment-oriented program of High Falls.

Extending the fly-over bridge to cantilever over the cliff would also provide for breath-taking views that cannot be accessed from the site. This extension can also serve as an extended backdrop for performances that take place in “the bowl” or for light shows or movies that may be projected onto it, and viewed from the Pont de Rennes and surrounding cliff edges.

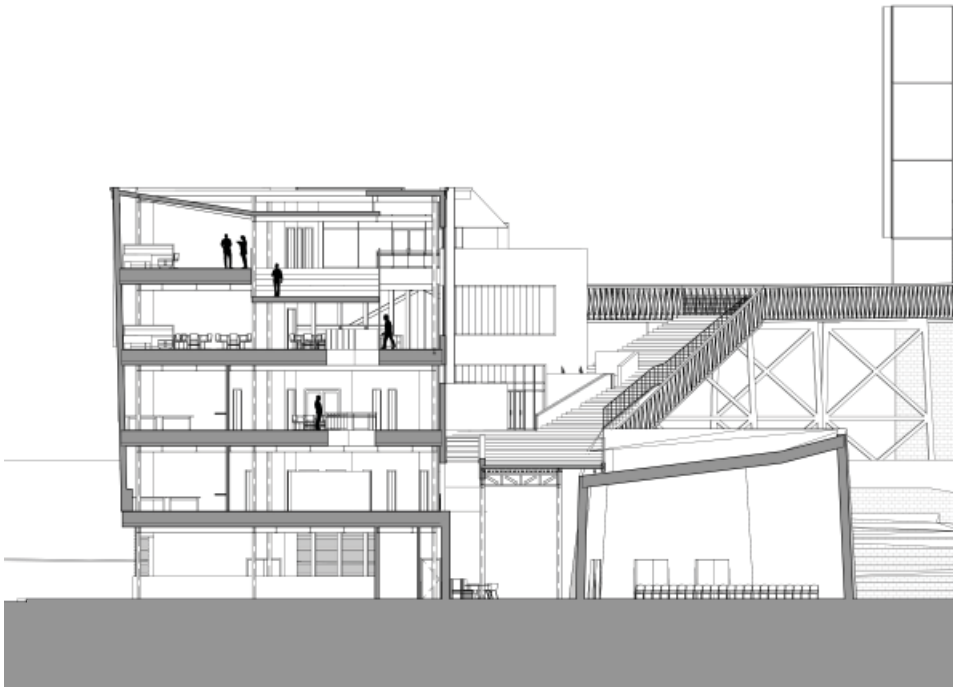
The following vignettes are the beginnings of future development based on feedback and my own personal thoughts...

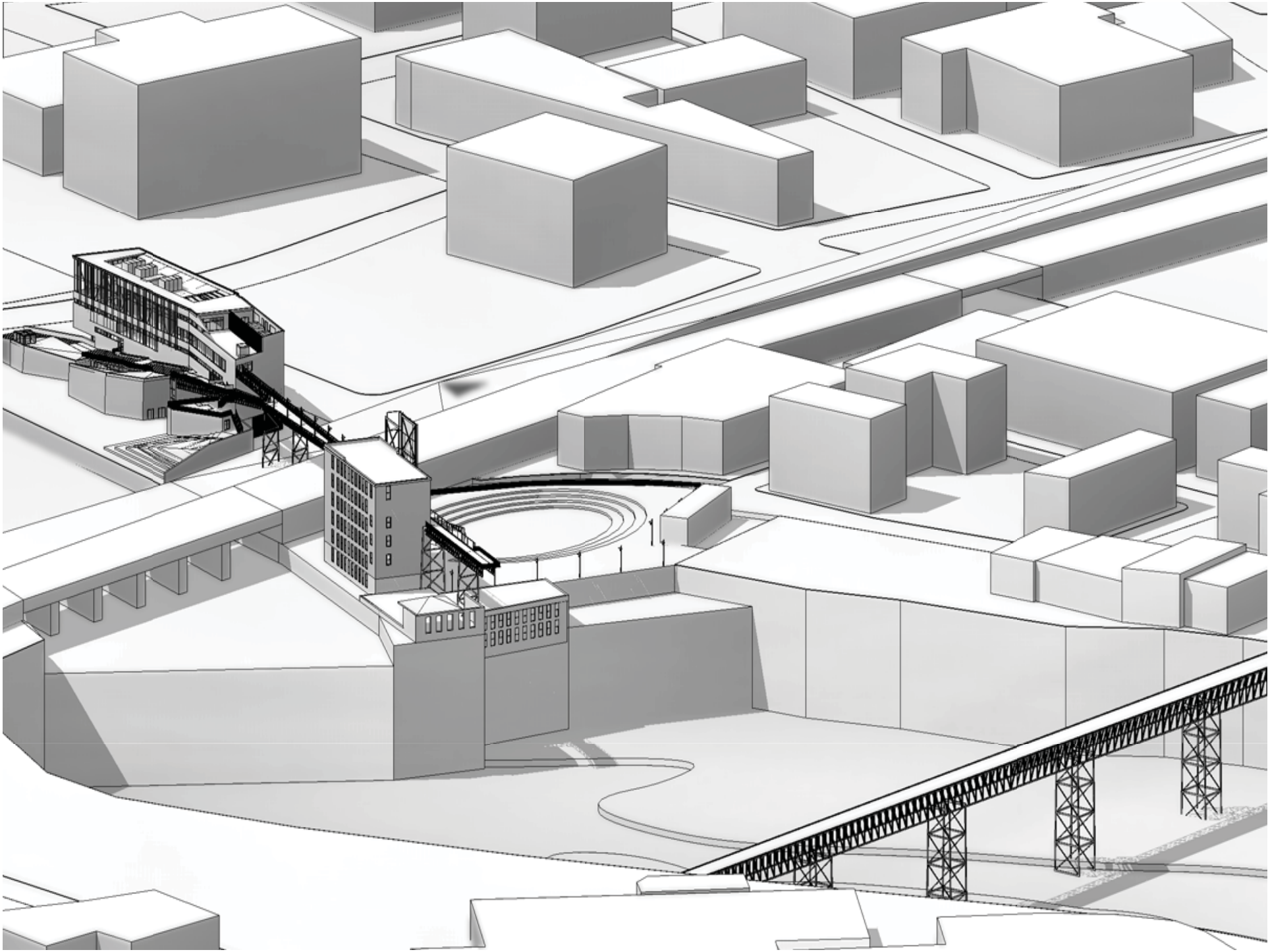
-sections/vignette of the “collaboration pods” within the incubator floors

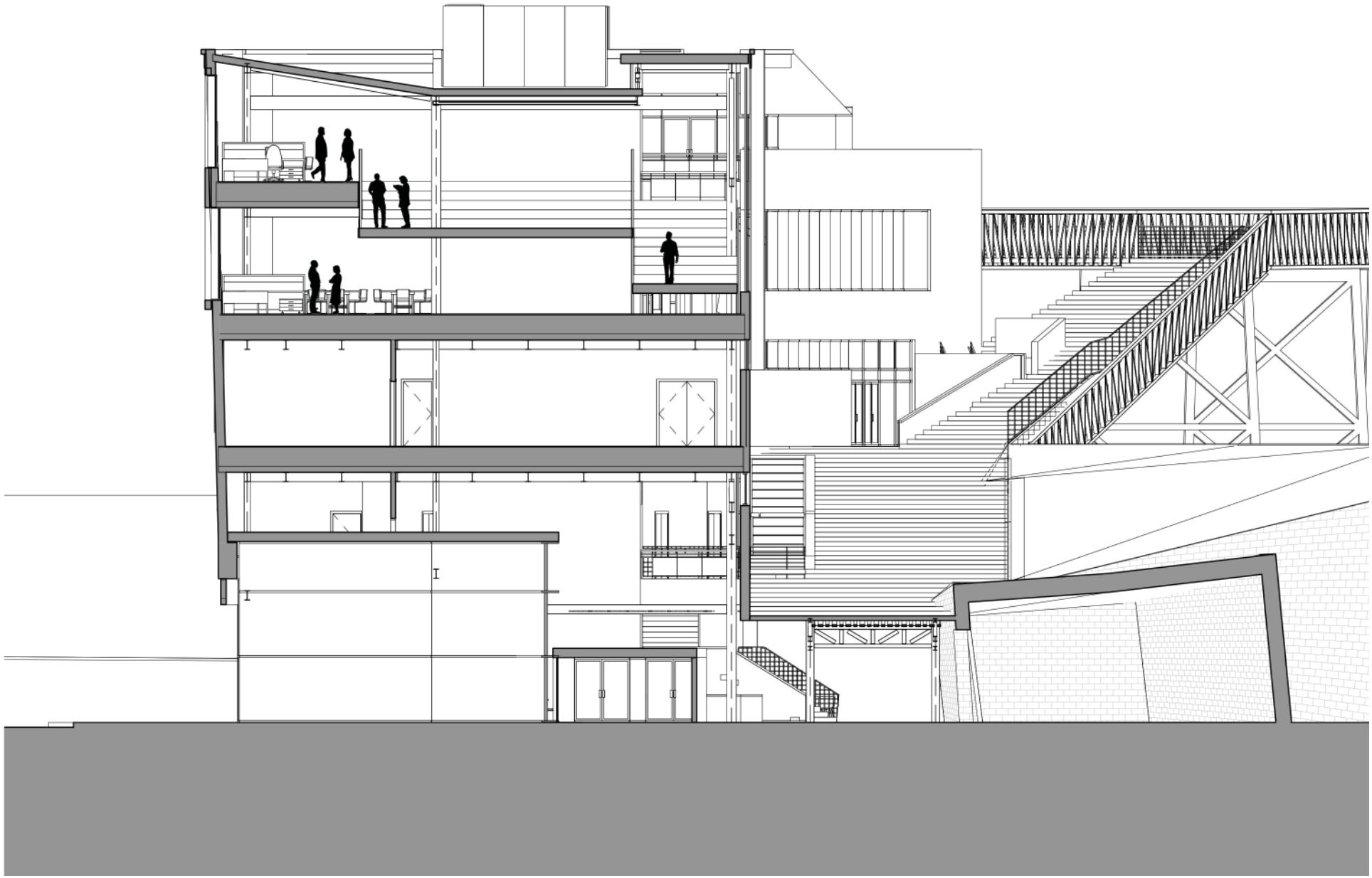
(I did not feel as though these were not adequately represented in the presentation)

-additional vignettes of the atrium space

-ground level and aerial vignette showing the potential expansion of the flyover bridge and connection to the existing building







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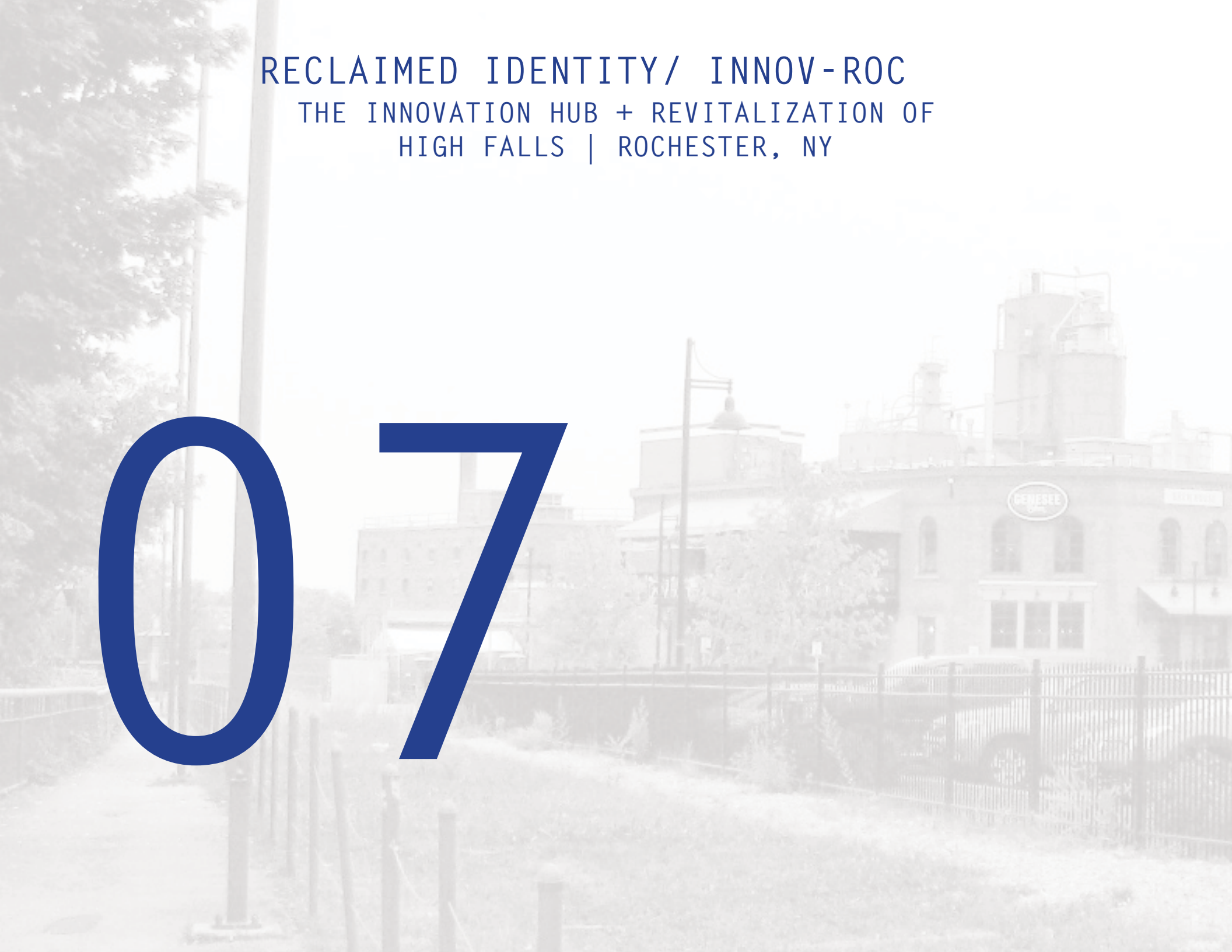

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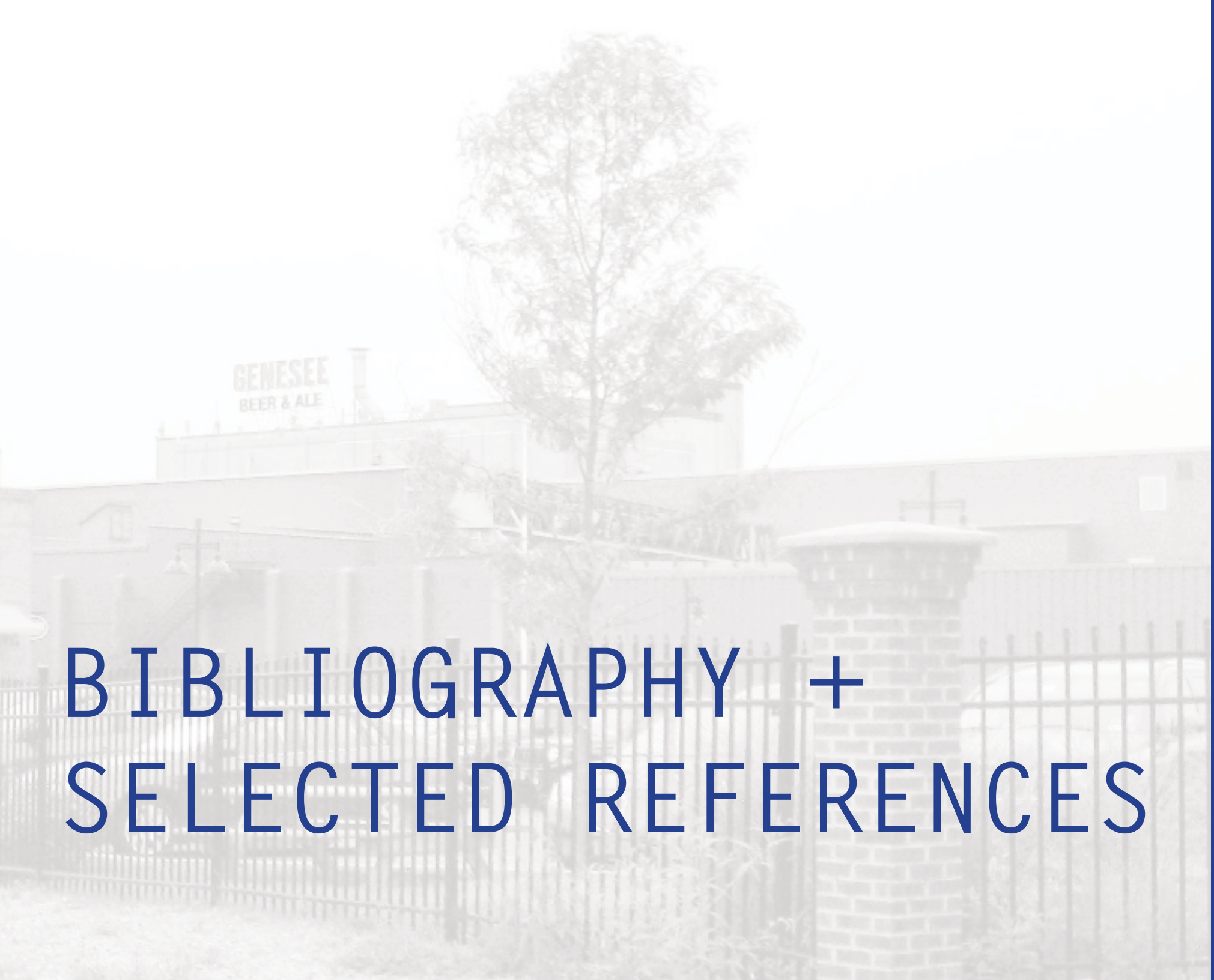

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pg ## Weather + Climate Analysis
pg ## City Zoning Ordinances
pg ## Code Review + Calculations

APPENDIX

WEATHER + CLIMATE ANALYSIS |

The site poses numerous regulatory and geological issues. The cliffs that define the walls of the gorge are shale, and this rock often runs close to the surface at the top of the gorge. Considerations of how to properly construct a foundation in these conditions must be taken into account. At the same time, potentially weakening the integrity of these gorge walls could mean a potential collapse into the river.

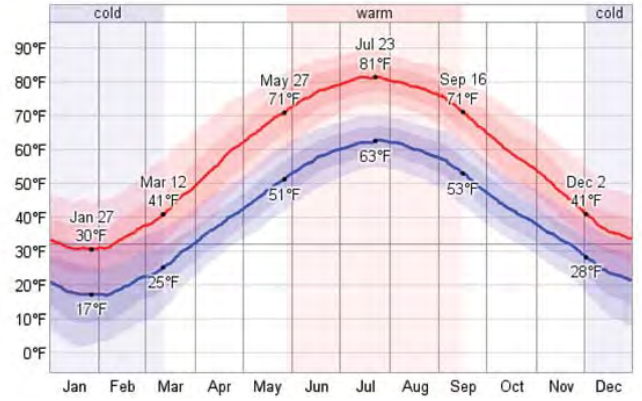
Rochester is known for its long and snowy winters. All glazing and façade constructions must perform in these conditions. While environmental conditions may warrant the building being closed-up and heated for five months of the year, the opportunity for natural ventilation whenever possible will not only make indoor air quality better, but will decrease the reliance on traditional HVAC systems.

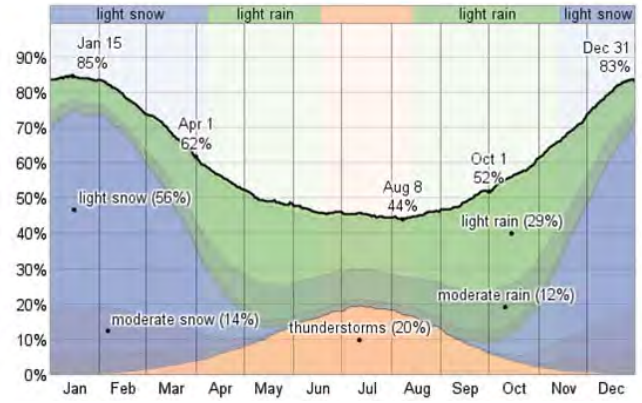
Wind and solar are not practical means of energy generation on the site, but the vast potential energy stored in the river, and the 96-foot drop of the falls can be harvested to greater extent that it is already, and can be the means for powering the re-energized High Falls, just as it did in the 19th century.

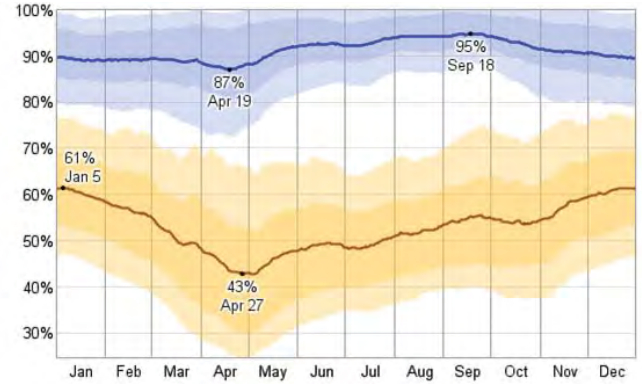
Rochester's climate is variable depending on season. With average temperatures ranging from 30 degress in January to 82 in August. Rochester receives approximately 34.5" of rain and 100" of snow annually.

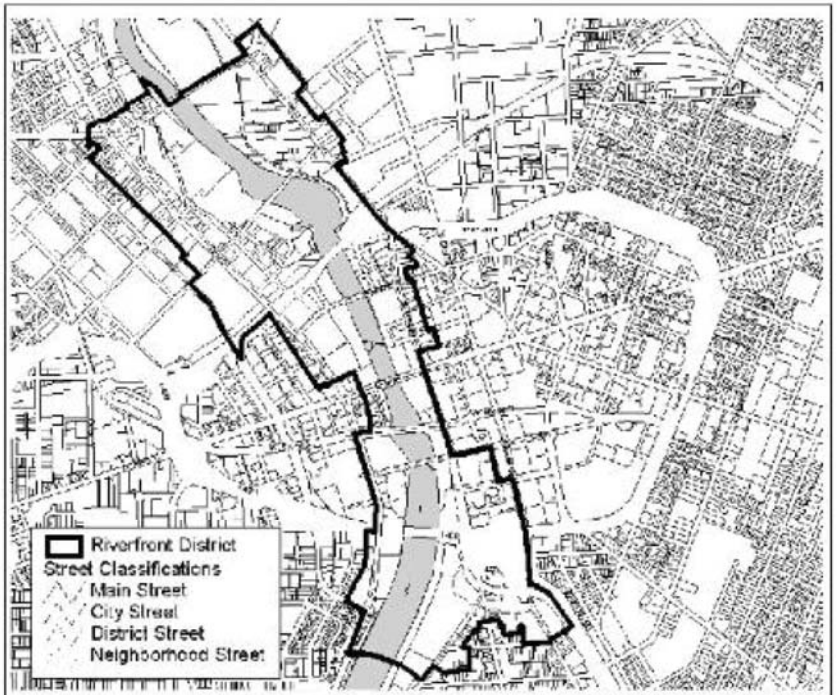
Rochester is also considerably cloudly, with 61 days per year being completely clouding, and 104 being partly cloudy. Prevailing winds come from the southwest during the summer, but shift from the north during winter.

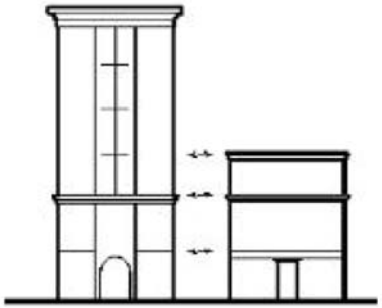
The graphs to the right show average monthly temperature, weather, and sunlight conditions for the city (generated by Ecotect).

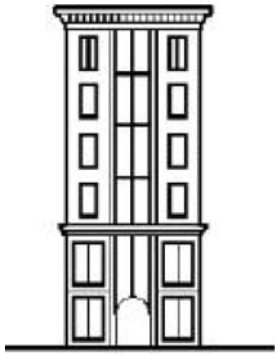


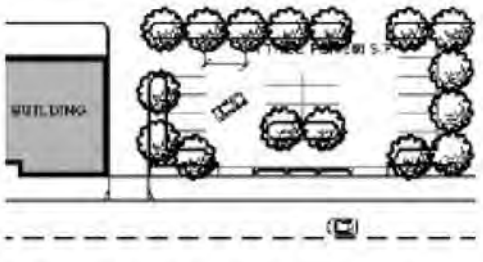


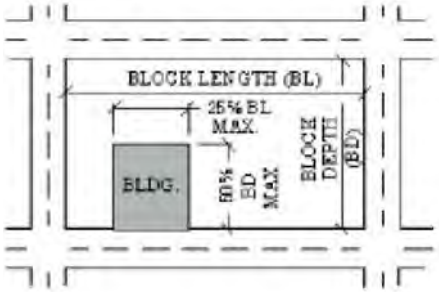


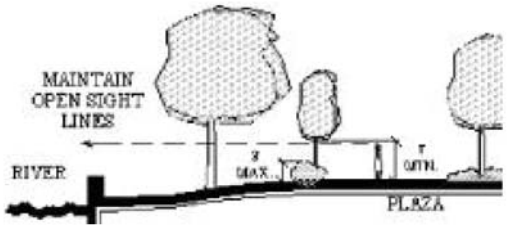

Riverfront District
Street Classifications
Main Street
City Street
District Street
Neighborhood Street

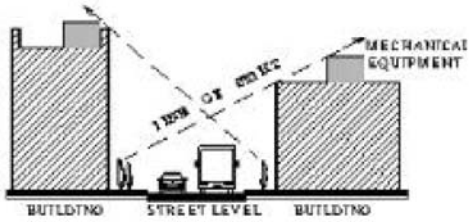


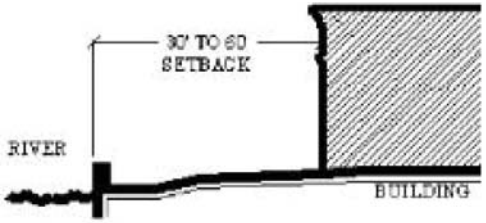



BUILDING


BLOCK LENGTH (BL)
25% BL MAX.
BLDG.
80% BD MAX
BLOCK DEPTH (BD)


MAINTAIN OPEN SIGHT LINES
RIVER
PLAZA


MECHANICAL EQUIPMENT
BUILDING
STREET LEVEL
BUILDING


30' TO 60' SETBACK
RIVER
BUILDING

RIVER
PLAZA

VERTICAL DISTRIBUTION OF SERVICES FOR LARGE BUILDINGS

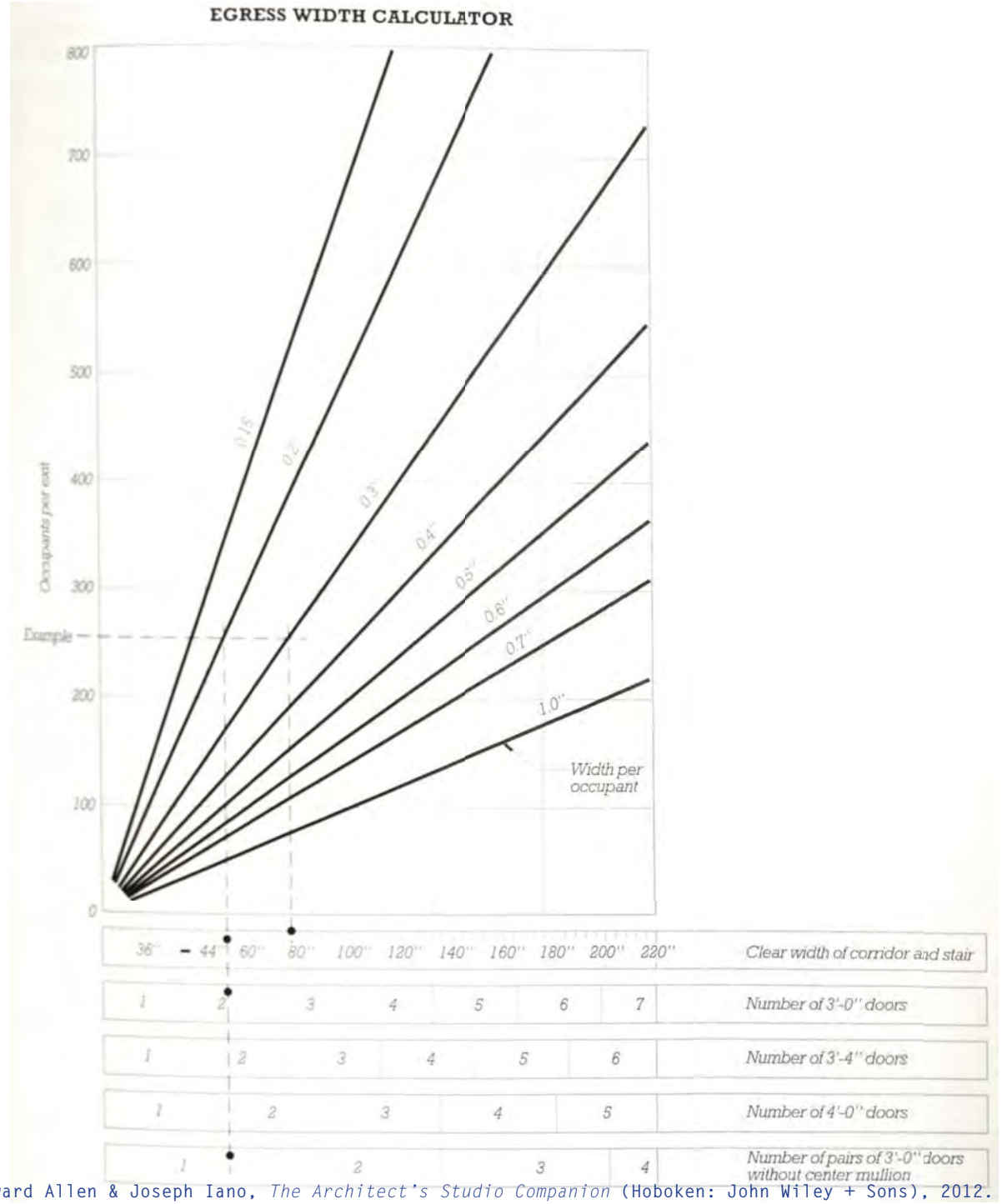
Occupancy	Water Closets	Lavatories	Drinking Fountains	Bathrooms/ Showers
A: Assembly				
A-1: Theaters, motion pictures, and performing arts facilities	Male: 1 per 125 Female: 1 per 65	1 per 200	1 per 500	None
A-2: Nightclubs, bars, taverns, dance halls	1 per 40	1 per 75	1 per 500	None
A-2: Restaurants, banquet halls, food courts	1 per 75	1 per 200	1 per 500	None
A-3: Auditoriums without fixed seating, galleries, museums, exhibition halls, museums, lecture halls, libraries, arcades, gymnasiums	Male: 1 per 125 Female: 1 per 65	1 per 200	1 per 500	None
A-3: Places of worship	Male: 1 per 150 Female: 1 per 75	1 per 200	1 per 1000	None
A-3: Passenger terminals and transportation facilities	1 per 500	1 per 750	1 per 1000	None
A-4 and A-5: Indoor and outdoor arenas with up to 1500 seats	Male, first 1500 seats: 1 per 75 Female, first 1500 seats: 1 per 40 Additional seating: Male: 1 per 120 Female: 1 per 60	Male: 1 per 200 Female: 1 per 150	1 per 1000	None
B: Business	First 50 occupants: 1 per 25 Additional occupants: 1 per 50	First 80 occupants: 1 per 40 Additional occupants: 1 per 80	1 per 100	None
E: Educational	1 per 50	1 per 50	1 per 100	None
F: Factory	1 per 100	1 per 100	1 per 400	Emergency showers and eyewash stations may be required
I: Institutional				
I-1: Residential care	1 per 10	1 per 10	1 per 100	1 per 8
I-2: Hospitals, ambulatory nursing homes (residents only)	1 per room, or Two patient rooms may share one toilet room with direct access from each room	1 per room, or	1 per 100	1 per 15
I-2: Visitors	1 per 75	1 per 100	1 per 500	
I-3: Prisons (residents only)	1 per cell	1 per cell	1 per 100	1 per 15
I-3: Reformatories, detention centers, correctional centers (residents only)	1 per 15	1 per 15	1 per 100	1 per 15
I-2 and I-3: Employee toilet facilities	1 per 25	1 per 35	1 per 1000	None
I-4: Adult and child day care	1 per 15	1 per 15	1 per 100	1
M: Mercantile	1 per 500	1 per 750	1 per 1000	None
R: Residential				
R-1: Hotels and motels	1 per sleeping unit	1 per sleeping unit	None	1 per sleeping unit
R-2: Dormitories, fraternity houses, sorority houses, boarding houses	1 per 10	1 per 10	1 per 100	1 per 8
R-2: Apartments	1 per dwelling unit	1 per dwelling unit	None	1 per dwelling unit
R-3: Congregate living facilities with 16 or fewer persons	1 per 10	1 per 10	1 per 100	1 per 8
R-3: One- and two-family dwellings	1 per dwelling unit	1 per dwelling unit	None	1 per dwelling unit
R-4: Residential care, assisted living facilities	1 per 10	1 per 10	1 per 100	1 per 8
S: Storage (not including parking)	1 per 100	1 per 100	1 per 1000	Emergency showers and eyewash stations may be required

This table was compiled from information contained in the International Building Code 2009. It does not represent an official interpretation by the organization that issues this code.

INTERNATIONAL BUILDING CODE

OCCUPANT LOADS

Use	Floor Area per Occupant
Accessory storage area	300 ft² (28 m²) gross
Agricultural buildings	300 ft² (28 m²) gross
Aircraft hangers	500 ft² (46 m²) gross
Airport terminal baggage claim	20 ft² (1.86 m²) gross
Airport terminal baggage handling	300 ft² (28 m²) gross
Airport terminal concourses	100 ft² (9.3 m²) gross
Airport terminal waiting areas	15 ft² (1.4 m²) gross
Assembly Occupancy, gaming floors	11 ft² (1.0 m²) gross
Assembly Occupancy, concentrated seating (chairs only, not fixed)	7 ft² (0.65 m²) net
Assembly Occupancy, standing space	5 ft² (0.46 m²) net
Assembly Occupancy, unconcentrated seating (tables, chairs, stages, platforms)	15 ft² (1.4 m²) net For booth seating without dividing arms, use an 18" (457-mm) width per occupant.
Bowling centers	5 occupants per lane plus 7 ft² (0.65 m²) net for other areas
Business areas	100 ft² (9.3 m²) gross
Courtrooms, other than fixed seating	40 ft² (3.7 m²) net
Day care areas	35 ft² (3.3 m²) net
Educational Occupancy, classroom areas	20 ft² (1.86 m²) net
Educational Occupancy, shops and vocational areas	50 ft² (4.65 m²) net
Exercise areas	50 ft² (4.65 m²) gross
Factories, industrial areas	100 ft² (9.3 m²) gross
Hazardous Occupancies: Groups H-1, H-2, H-3, H-4	100 ft² (9.3 m²) gross
Hazardous Occupancies: Groups H-5	200 ft² (18.6 m²) gross
Institutional Occupancy, sleeping areas	120 ft² (11.2 m²) gross
Institutional Occupancy, inpatient treatment areas	240 ft² (22.3 m²) gross
Institutional Occupancy, outpatient treatment areas	100 ft² (9.3 m²) gross
Kitchens, commercial	200 ft² (18.6 m²) gross
Libraries, reading rooms	50 ft² (4.65 m²) net
Libraries, stack areas	100 ft² (9.3 m²) gross
Locker rooms	50 ft² (4.65 m²) gross
Mechanical equipment rooms	300 ft² (28 m²) gross
Mercantile Occupancy, areas other than listed below	60 ft² (5.6 m²) gross
Mercantile Occupancy, basement and grade floor levels	30 ft² (2.8 m²) gross
Mercantile Occupancy, enclosed shopping malls	Between 30 and 50 ft² (2.8 and 4.65 m²) gross leasable area; consult the code
Mercantile Occupancy, storage, stock, and shipping areas	300 ft² (28 m²) gross
Parking garages	200 ft² (19 m²) gross
Residential Occupancy, dormitories	50 ft² (4.65 m²) gross
Residential Occupancy, general	200 ft² (19 m²) gross
Skating rinks and swimming pools, rink and pool area	50 ft² (4.65 m²) gross
Skating rinks and swimming pools, decks	15 ft² (1.4 m²) gross
Stages and Platforms	15 ft² (1.4 m²) gross
Storage	300 ft² (28 m²) gross
Warehouses	500 ft² (46 m²) gross



5 | Edward Allen & Joseph Iano, *The Architect's Studio Companion* (Hoboken: John Wiley + Sons), 2012.