



Rivers Edge:



An Adult
Participatory
Net Zero
Community

IAN J. SCHIMKE



Visiting my grandparents in 2015

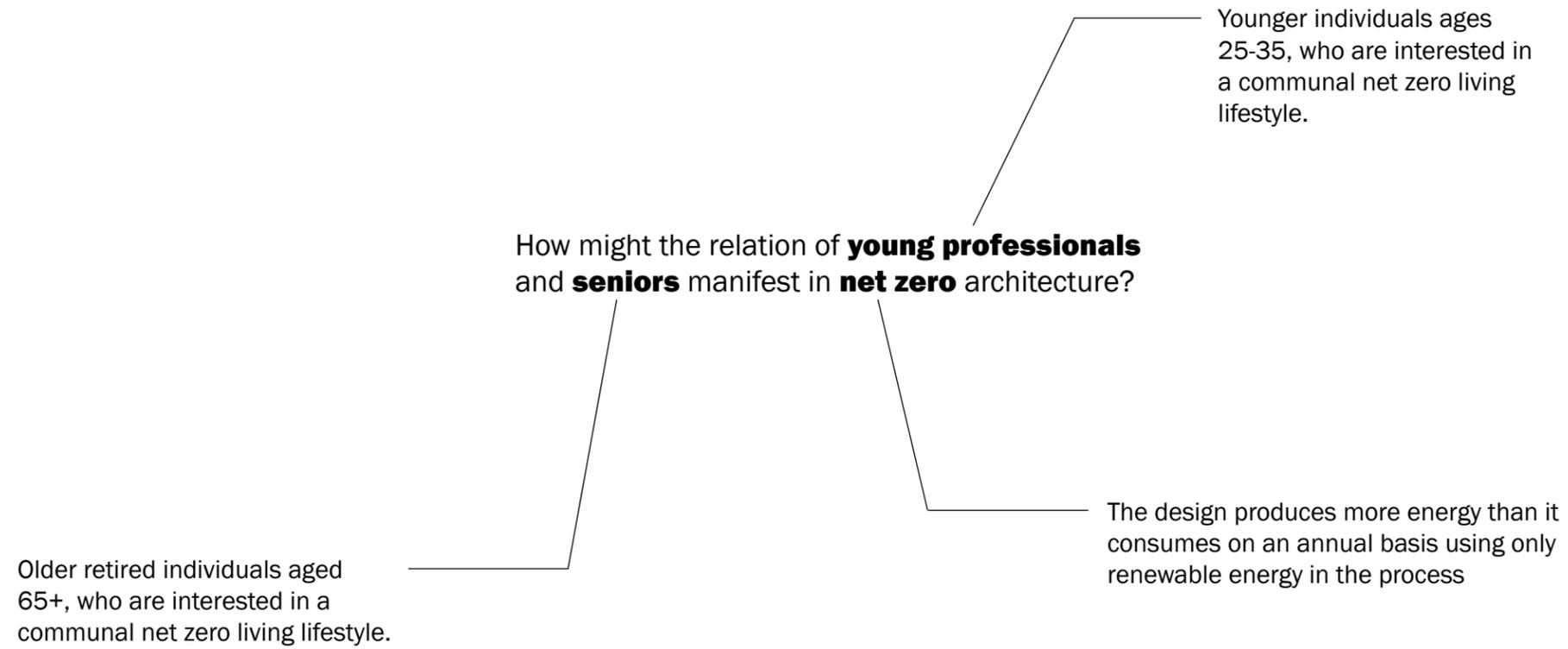


Problems concerning senior living

- 1** As we age our world slowly becomes smaller and smaller. Because of this we tend to confine ourselves to our dwellings and interact less with society.
- 2** For some seniors the cost of living during retirement can be a major concern. “Affordability is the single biggest challenge facing the senior living industry for consumers, sponsors, and their design teams.” (Eastman 141).
- 3** Not all individuals, who we consider as seniors, are ready to live with only other seniors. Most seniors claim to feel younger than their actual age.

Possible design solutions

- 1** A strong sense of **community** that fosters **interactive engagement**.
- 2** A **net zero** energy design that will help eliminate several costly expenses for residents as well as building owners, while also keeping residents actively engaged through net zero activities.
- 3** Provide the option of living within a **multigenerational** community.





1. Research Question	2. System of Inquiry	3. Strategies	4. Tactics	5. Philosophy/ Theory	6. Role of Design/ Architecture
How might the relation of young professionals and seniors manifest in net zero architecture?	Emancipatory: There are multiple realities, but they are overlapping developed through history, social, cultural and empowerment identity.	Qualitative: (socio/cult/ anthr) Simulation: (computer modeling) Holistic Case Studies	Literature Review: (books or articles on net zero design and senior design) Personal Interviews: (telephone interviews with experts in the field of senior living and net zero design) Simulations: (net zero energy modeling, is the design on track?)	Eco-Social Design + Resilient Design (little bit of both)	The anticipated design intends to be a participatory design solution to the increasing senior population within a time of social change.

		Community Living	
		Senior (65+)	Young Professional (25-35)
		Active Aging	Environmental Advocate
Net Zero Design	Pedagogical	A Promote active aging through building education	B Promote environmental advocacy through building education
	Performance	C Promote active aging through the performance of the building	D Promote environmental advocacy through the performance of the building
	Comfort	E Promote active aging through building comfort	F Promote environmental advocacy through building comfort



1. Literature Review : I read through several literature sources on the topics of senior living and net zero to become more familiar with each. While reading I wrote down specific quotes that I believe helps bring forth the importance of my research question.

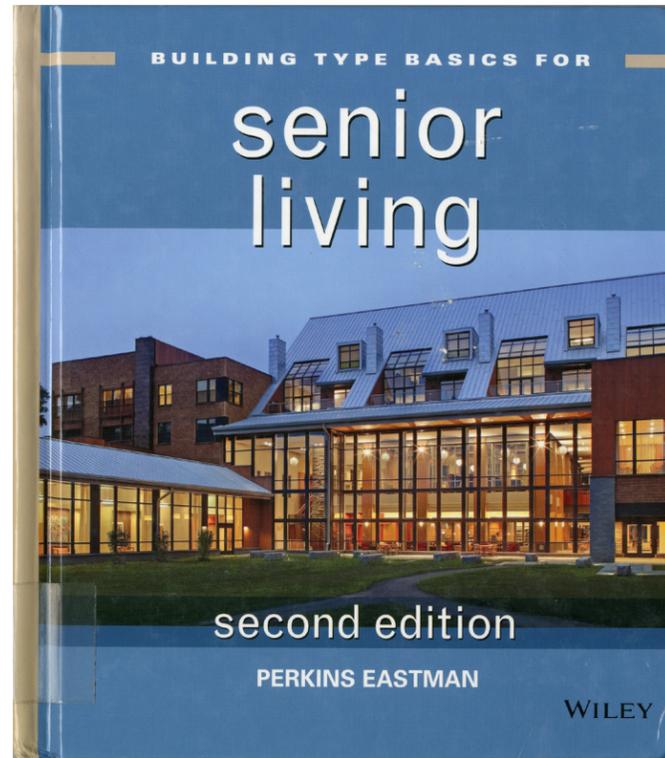
2. Personal Telephone Interviews : I interviewed individuals who have experience in senior living design and or net zero design. I interviewed a mix of individuals including, architects and senior living facility CEO's. During each 30-40 minute interview I asked each individual about senior living design trends, net zero design integration and the possibility of incorporating young professionals into the program.

3. Case Studies : Four case studies were chosen based on their relevance to senior living, net zero or context.

4. Simulation : I conducted a simple energy analysis of the proposed design concept through an Autodesk service called Green Building Studio. This simple simulation presented to me the total annual electrical energy consumption and cost of electrical energy.

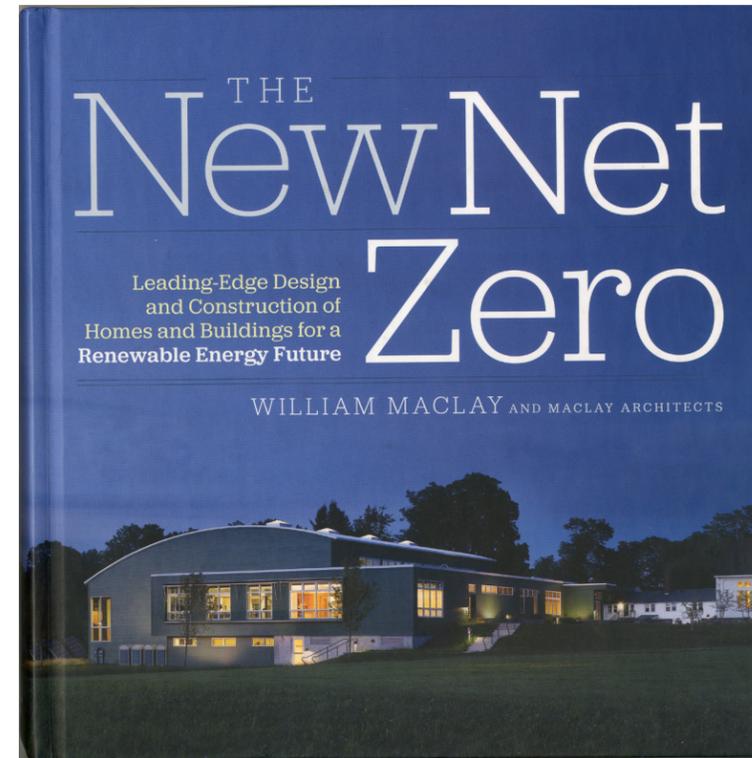
Literature Readings





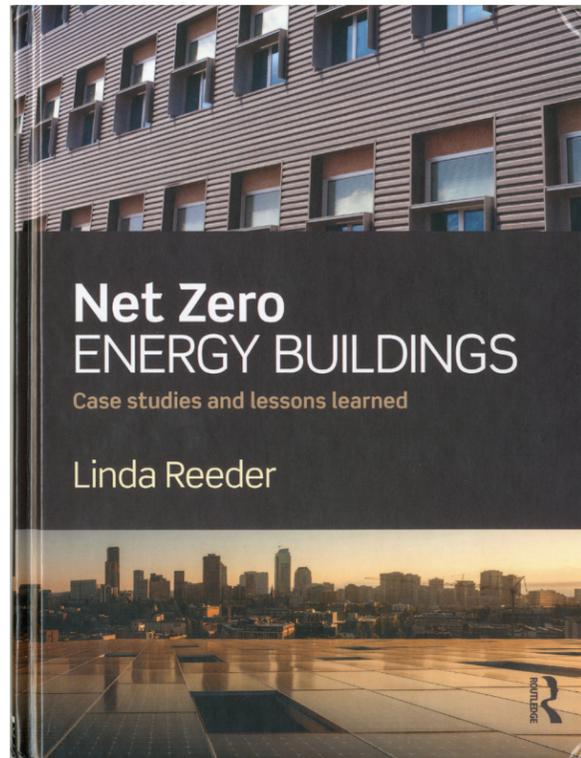
Top Take Aways

- **“According to the U.S. Census, 13 percent of the population-over 40 million people-is 65 or older. That represents an increase of more than 5 million since the 2000 Census and makes this the fastest-growing age group: 15 percent per decade.” (Eastman 2).**
- “It is often said that the value and meaning of a civilization can be documented from the record it leaves in the form of architecture, and that the true measure of the compassion and civility of a society lies in how well it treats its frail older people.” Regnier 1994, p. vii. (Eastman 5)
- “Because people are remaining healthy longer, they are able to age in place, relying on community-based services and family to meet their needs for healthcare and services. They are therefore accessing senior housing and care options later-often after they are very old and frail. This has reduced the demand for assisted living apartments in some markets, as they cater to healthier individuals who now choose to stay at home and access care services brought to them.” (Eastman 125).
- “One of the myths about older adults is that they want to be segregated with people their own age, enjoying views of the countryside. In fact, most would prefer to stay in their own community...” (Eastman 129).



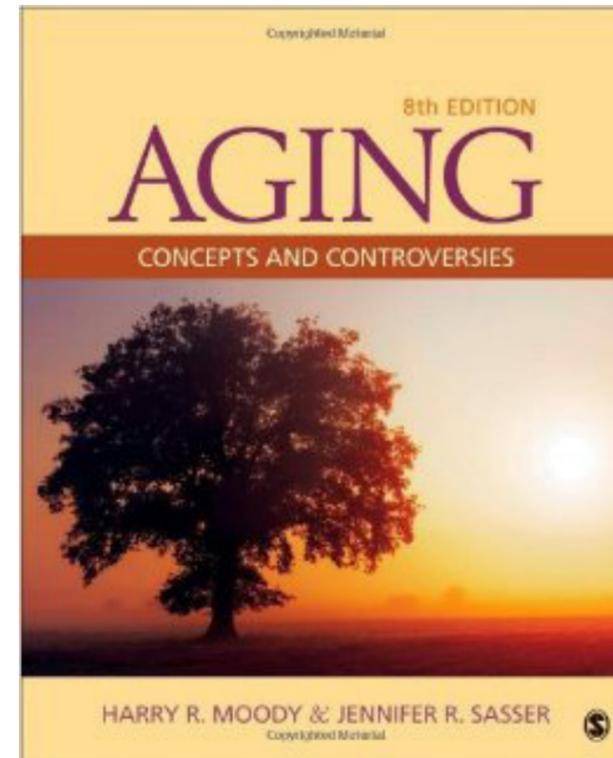
Top Take Aways

- **“In 2011 the world consumption of energy was 522 quads, and our nonrenewable reserves were more than seventy times greater than world energy consumption. So theoretically, if demand does not go up, we have seventy years of nonrenewable energy.” (Maclay et al 8).**
- “Is there a similar issue with renewable supply? No. In fact, renewable could produce more than 7,000 times as much power as is needed at today’s world consumption levels-every year, forever.” (Maclay et al 8).
- “Net zero Project. This accounts for projects where some or all of the renewable providing energy to the building are located beyond the confines of the building property.” (Maclay et al 23).
- “Net zero property. A building qualifies as net zero property if all the renewable used to cover the building’s consumption are located within the confines of the project property.” (Maclay et al 23).
- “Net zero footprint. To meet this classification, all of the renewable used to cover the buildings loads must reside within the footprint of the building itself, most often on the roof of the building.”(Maclay et al 23).



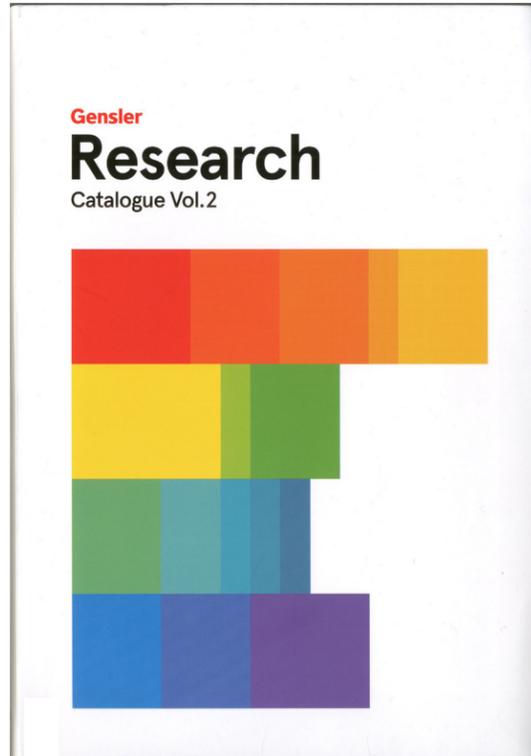
Top Take Aways

- “Knowing how to live sustainably doesn’t necessarily make people want to live sustainably. Knowledge helps but it can’t trump desire.” (Reeder 237).
- **“Paisano Green Community is different from a net zero energy office or school, DeSousa said. It is a truly democratic building. Nearly everyone who lives and works on the site has a hand in determining how it performs.” (Reeder 238).**
- “It is helpful to educate users in the project goals and the design strategies used to achieve them. This can help occupants understand the impact of their actions on the building’s success. Occupants will also need to learn how to operate the building efficiently.”(Reeder 253).
- “Not surprisingly, most users are unwilling, or would be unhappy, to sacrifice their comfort for a building’s energy efficiency.” (Reeder 253).
- “Occupants moving into a net zero energy building might need time to adjust to differences compared to a conventional building.” (Reeder 254).
- “The difference in residential buildings is that the residents behave as they wish, without an employer or organizational culture to influence them.” (Reeder 255).



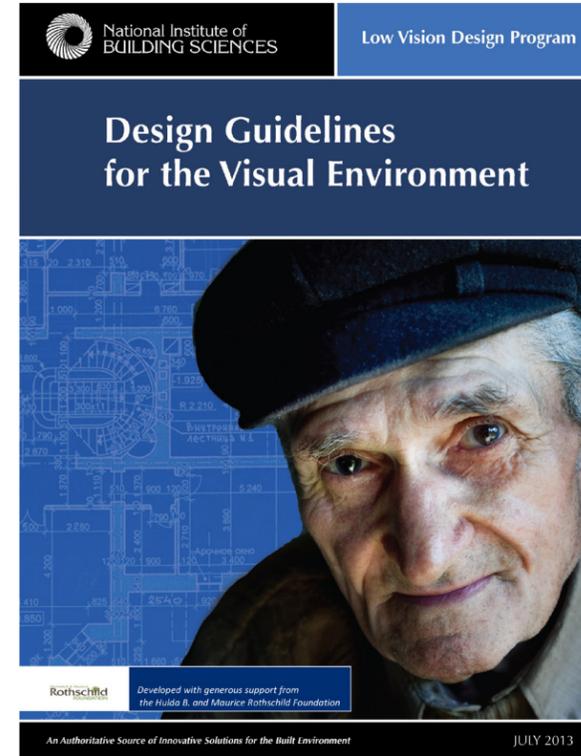
Top Take Aways

- “One of the earliest attempts to explain the position of old age in modern society is the disengagement theory of aging (Cumming & Henry 1961). The disengagement theory looks at old age as a time when both the older person and society engage in mutual separation, as in the case of retirement from work.” (Moody & Sasser 10).
- “At the opposite pole from the disengagement theory is the activity theory of aging, which argues that the more active people are, the more likely they are to be satisfied with life.” (Moody & Sasser 12).
- “The continuity theory aging makes a similar point, noting that as people grow older they are inclined to maintain as much as they can the same habits, personality, and style of life they developed in earlier years (Costa & McCrae, 1980).” (Moody & Sasser 12).
- **“One role well suited to older people in such an environment might be mentoring, or guiding the next generation in the capacity of teacher, coach, or counselor (Neikrug, 2000). Older adults who are serving as mentors, however, still have to develop up-to-date skills and attitudes if their advice is to be respected by younger workers.” (Moody & Sasser 17).**
- “Creativity and wisdom depend on cognitive development over the life course. Whether our society cultivates such qualities among older people will depend, in the end, on creating more imaginative policies and institutions.” (Moody & Sasser 27).



Top Take Aways

- **“Today’s 50- and 60- year-olds don’t see themselves as “old” and don’t view aging as a time of physical decline.” (Jernigan, Johnston, McAlister & Lin 182).**
- “Connectivity - The ability to maintain relationships with neighbors, coworkers, family, friends, and community members-both in-person and online.” (Jernigan, Johnston, McAlister & Lin 184).
- “Choice - Living in a location that fits one’s particular preferences, participating in activities that one chooses, and makes one’s own decisions about health-care.” (Jernigan, Johnston, McAlister & Lin 184).
- “Independence - Relying on others as little as possible for personal care and getting around, including use of public transportation, ride-sharing, and walking.” (Jernigan, Johnston, McAlister & Lin 184).
- “Wellness - Not only staving off disease but also managing long-term illness to lead to a productive and fulfilling life.” (Jernigan, Johnston, McAlister & Lin 184).
- **“If and when a move is required, this population is seeking a different type of aging community. Stress urban living with “active aging” amenities.” (Jernigan, Johnston, McAlister & Lin 184).**



Top Take Aways

- **Reduce as much glare as possible.**
- Stay away from highly polished surfaces.
- **Allow time for the eyes to adjust to new levels of light. (dark to light and light to dark).**
- The need for contrast between surfaces helps seniors with vision impairments.



Top Take Aways

- “Resilience is a necessity. It’s also life enhancing, reinforcing connections that define the human experience.” (Gensler Design Forecast (2017) 41).
- **“Climate change is making resilience more urgent and underscoring the impact we have on the environment. It is the great challenge of our time; it’s also our greatest opportunity.” (Gensler Design Forecast (2017) 41).**
- “When you address climate change, you are really opening the door to quality of life, and asking: How can design strengthen culture and community and enhance people’s lives?” (Gensler Design Forecast (2017) 41).
- “Resilience takes imagination. It springs from place and evolves our history” (Gensler Design Forecast (2017) 41).

In new model, Hopkins house has students, seniors living together

By MARA KLECKER, STAR TRIBUNE
June 13, 2016 - 8:54 PM

On a table near the door of the historic Hopkins home sat two stacks of rental applications: one for “older adult,” the other for “younger adult.”

The home, called Stepping Stones, is being reserved for the first time for one senior citizen and two college students or recent graduates. It’s part of a pilot program run by the senior housing nonprofit Augustana Care, and the hope is that the three roommates will live together in the recently renovated home, sharing meals and going grocery shopping, all while learning from someone at the other end of the age spectrum.

“Our society seems to be missing opportunities to allow both generations to benefit from each other,” said Mary Jo Thorne, Augustana Care’s regional housing director. “We need less technology use and more porch-sitting and storytelling. We’ve lost that concept.”

Though a few, similar intergenerational living programs have popped up in Europe in recent years, the model is new to the U.S., Thorne said.

The idea came out of a conversation last year when Augustana Care CEO Tim Tucker came to Thorne, seeking a creative solution for the newly acquired house adjacent to Augustana Care’s Chapel View campus.

Since 2009, Augustana has welcomed students and young adults into one of its Minneapolis apartment complexes, putting 20-somethings next door to 100-year-old residents. The model offered affordable housing to students who got to hear stories of the “good old days” while changing a light bulb or opening jars for their senior neighbors.

“We wanted to take it a step further and put them under one roof,” said Chapel View Housing Director Kelly Morgan. The Stepping Stones model “is new, creative and mutually beneficial. It’s only one house for now, but we hope to expand it in the metro area and watch it grow from there.”

The house has three levels with upstairs bedrooms, so Thorne said the senior renter will need to be mobile on stairs. For the younger applicants, priority will given to those going into fields relating to older adults, such as geriatrics, nursing or social work.

Top Take Aways

- “Our society seems to be missing opportunities to allow both generations to benefit from each other.”
- **Seniors don’t see themselves as old people, and sometimes are not necessarily ready to hang out with only old people.**
- “Students will be responsible for helping their older roommate with housecleaning, laundry and shopping. The three must get together for at least two shared meals per week.”



MARCH 10, 2017 19

THE LIST

LIST MAKER

Downtown living isn't just for the young and the restless

BY PATRICK REHKAMP
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Older adults seeking senior living options now can look in downtown Minneapolis near the Guthrie Theater.

Shoreview-based Ecumen opened Abiitan Mill City in December, which is the only senior living building in the downtown Minneapolis core (there are facilities in the nearby Loring Park and Elliot Park neighborhoods).

Abiitan has a full bar and restaurant open to the public, it's within easy walking distance of several Minneapolis attractions and amenities, and it has roughly 130 units available to seniors. Another feature is a woonerf, a roadway that will connect it to the Mississippi River parkway that is expected to be completed in 2019.

Several years ago, Ecumen wanted to build another facility. The senior living operator asked potential residents what they might like and the answer was pretty clear.

"It started with focus groups, [and the response was for something] in the Mill City area," said Ben Taylor, spokesman for Ecumen. "So coming out of that [came] the concept of urban senior living."

For aging seniors, driving can be problematic, so the ability to walk to places for



Abiitan Mill City residents Carole and Doug Baker Sr. (in picture at left) and Joyce Field (at right). Ecumen opened the downtown Minneapolis senior living facility in December.

errands is appealing. Others like being able to walk to sporting events, countless restaurants, public transit and fine arts attractions that are downtown.

Carole and Doug Baker Sr. moved into Abiitan several weeks ago and enjoy the fact that they're not isolated, which can be a problem in suburban senior living facilities.

"Carole [has] a bunch of friends down here," Doug said. (Editor's note: The Bakers son is Ecolab Inc. CEO Doug Baker Jr.)

Abiitan residents also have a variety of social activities available to them. Event coordinators arrange speakers on foreign arts and current events.

"This afternoon, a professor from [St. Catherine University is coming] to talk about China," said Joyce Field, another resident who moved in several weeks ago. "Intellectually, I have found this place to be very good."

Abiitan, which is located at 428 S. Second St., has roughly 85 independent living units and 48 memory care units. The size of units range from studios to more than 2,000 square feet. About 30 spots are occupied.

Taylor said Ecumen hasn't marketed the building aggressively because the facility just opened, and getting all parts of the structure online was step one.

Prices are comparable with other Ecumen locations (roughly \$2,500 a month), but the refundable deposit isn't cheap - it ranges from \$80,000 to \$338,500.

While crime, especially at night, is an issue in parts of downtown, the Mill City neighborhood is relatively safe and the building is secured. Abiitan is also Ecumen's only location with a full liquor license, which will help build a sense of community since the bar is open to anyone.

"It's truly a unique concept," Taylor said. "Here, we knew with this location it really integrates [with the existing neighborhood]."

Top Take Aways

- Ecumen asked their residents where they like a new facility to be build and the answer was clear, downtown within an urban setting.
- **“For aging seniors, driving can be problematic, so the ability to walk to places for errands is appealing. Others like being able to walk to sporting events, countless restaurants, public transit and fine arts attractions that are downtown.”**
- “Carole and Doug Baker Sr. moved into Abiitan several weeks ago and enjoy the fact that they’re not isolated, which can be a problem in suburban senior living facilities.”
- “Abiitan has a full bar and restaurant open to the public, its within easy walking distance of several Minneapolis attractions and amenities, and it has roughly 130 units available to seniors.”

Telephone Interviews





Rhys MacPherson
(Senior Associate)
Minneapolis, MN



Top Take Aways

- Took one year to sort out the building systems at The Rose.
- Located within the central courtyard of The Rose is a large community garden for all residents to use.
- The Rose used solar thermal as a renewable energy resource billboard.



Jon Rewer
(President & CEO)
Moorhead, MN



Top Take Aways

- Always thought there are some parallels between millennial and seniors.
- Target market 70's and 80's.
- More one bedroom and two bedroom, fewer studio and three bedroom.
- Difficult for customers to justify the extra cost of something like net zero.
- Discounted rent for young professional by helping senior residents.



Joseph Vigil
(Founding Partner)
Boulder, CO



Top Take Aways

- Workshop8 proposed the idea of going net zero for Paisano Green Community senior housing.
- Residents that moved into Paisano Green Community didn't know how their heating and cooling worked.
- Paisano Green Community residents are not engaged in the net zero design.
- Seniors living at Paisano Green Community are not necessarily interested in net zero, because they don't have to pay for their energy bill. The housing authority pays for utilities.
- Important to educate the residents on how to save energy.
- Every residential unit at Paisano has a south facing view to let in as much natural light as possible.



Joyce Palhamus
(Board of Directors, Firm
Leader, Healthcare Design,
Office Leader, Senior Living)

San Francisco, CA



Top Take Aways

- Tried placing seniors near younger kids in years past, didn't work as planned.
- Both younger professionals and seniors are interested in the same kinds of amenities. Both are searching for similar environments.
- Seniors are interested in an active lifestyle.
- As you age your world gets smaller.
- How can you make small dwellings cost effective, yet feel like home?
- Corridors can never be too short or never too long. A variety of destination lengths promotes health and wellness.



Alexis Denton

(Healthcare Interiors,
Senior Living)

San Francisco, CA



Top Take Aways

- Gerontology: the study of aging. Four subsets of gerontology - physiology, psychology, sociology & public policy.
- The three plagues of the elderly, loneliness, helplessness, and boredom.
- Aging in your own home can be isolating. Can be less social.
- Seniors are interested in walkable urban environments. Less interested in an isolated location.
- Its all about what is marketable.



Elizabeth Ann Fetner

(Executive Director)

Plymouth, MN



Top Take Aways

- Seniors are looking for an opportunity to maintain their independence as long as possible.
- Eight dimensions of wellness, emotional, physical, environmental, financial, occupational, social, spiritual.
- Provide residents with several amenities.
- Elder not the preferred term.



Steve Leone
(Principal)
Trenton, NJ



Top Take Aways

- Immersed himself in a senior living community for 24hrs and found it to be more of an emotional realization.
- Open rooms, greater visibility and shorter distances has a positive impact on keeping people engaged.
- Cost implication of net zero will always come up.
- We strive for an intergenerational approach. Helps learning through both generations.
- Friends of Philadelphia, a mixed use population with 30 year olds intermingled with seniors and it works beautifully.

Case Studies





Paisano Green Community Senior Housing

Location: El Paso, TX

Architects: WORKSHOP8



“Paisano Green Community is the **first NetZero**, fossil fuel free, LEED Platinum, **affordable senior housing** project in the United States. This 73 unit project is built on a 4.2 acre site, adjacent to the major border crossing between El Paso, Texas, and Juarez, Mexico. The design goals of the project were to create a place sensitive community for elderly residents that would **promote healthy living** and an environment encouraging the development of interpersonal relationships, all within a well designed set of energy efficient **high performance** buildings and grounds.”
(hacep.org)



The Rose

Minneapolis, MN

Architects: MSR



“The Rose is a **high performance multi-family housing** development in Minneapolis, MN. It contains **42 market rate** and **48 affordable dwelling units** for people earning less than 50% AMI (Area Median Income) including some efficiency apartments for formerly homeless individuals transitioning to independent living. There are one, two and three bedroom configurations that will enable a broad community of residents to live here. Residents will enjoy the **5,000-square-foot community garden** and the 70-foot-wide **courtyard** between the two buildings – both spaces contain **areas for play and socializing**. “The building has been designed using the **Living Building Challenge** (LBC) as a guide,” says Paul Mellblom, AIA, MSR Design’s Principal.” (architectmagazine.com)



Eltheto Housing and Healthcare Complex

The Netherlands

Architects: 2by4-architects



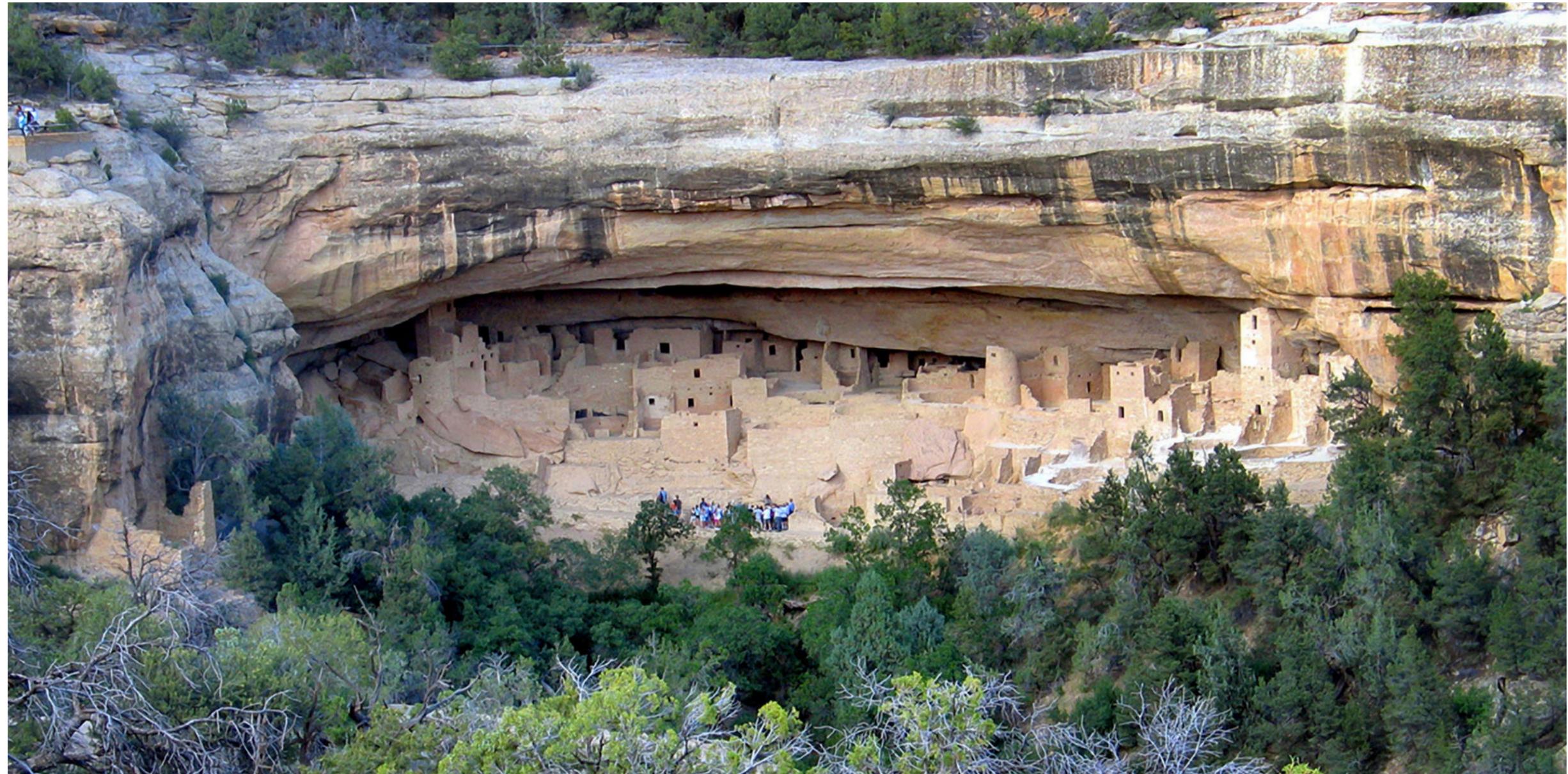
“In the small town of Rijssen 2by4-architects designed the new healthcare and housing complex ‘Eltheto’ **for elderly people**. Until recently elderly people were seen as a group that functions outside of modern society and are only in need of care. The contemporary healthcare centers and housing for elderly people are still designed according to his idea. Over the past decennia this resulted in a range of introvert buildings where the main focus is healthcare instead of the **quality of life itself.**” (archdaily.com)



Mesa Verde Cliff Dwellings

Mesa Verde, CO

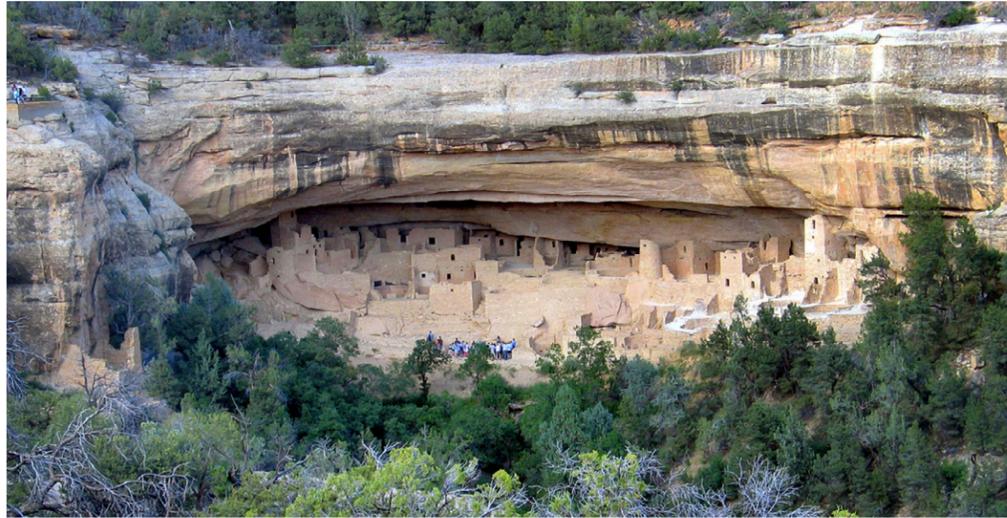
Architects: Ancestral Puebloans



“The cliff dwellings of Mesa Verde are some of the most notable and best-preserved ruins in the North American continent. Sometime during the late 1190s, after primarily living on the mesa top for 600 years, many Ancestral Puebloans began living in pueblos they built **beneath the overhanging cliffs**. The structures ranged in size from one-room storage units to villages of more than 150 rooms. While still **farming the mesa tops**, they continued to **reside in the alcoves, repairing, remodeling, and constructing new rooms** for nearly a century. By the late 1270s, the population began migrating south into present-day New Mexico and Arizona. By 1300, the Ancestral Puebloan occupation of Mesa Verde ended.” (visitmesaverde.com)



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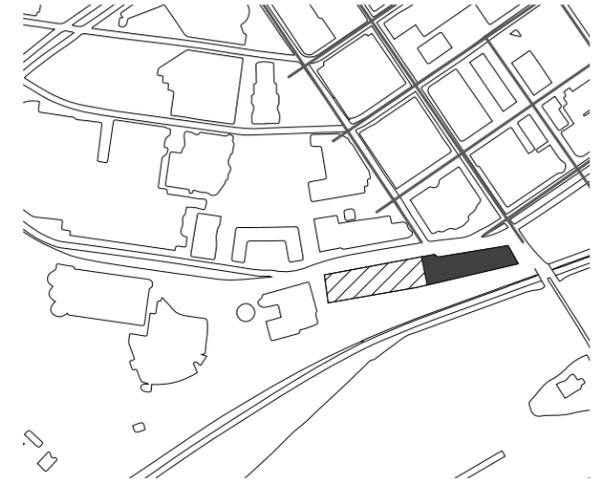
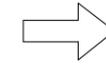
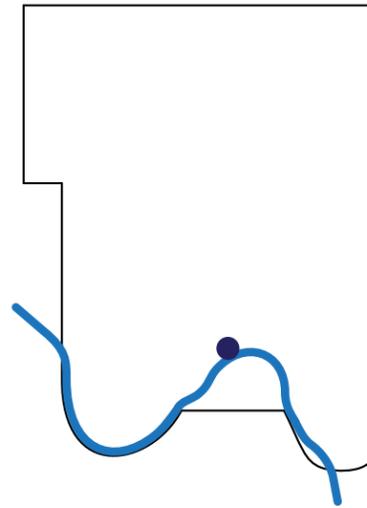
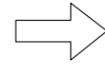
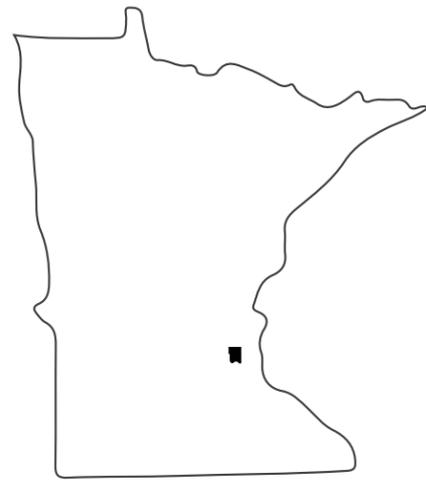
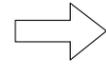
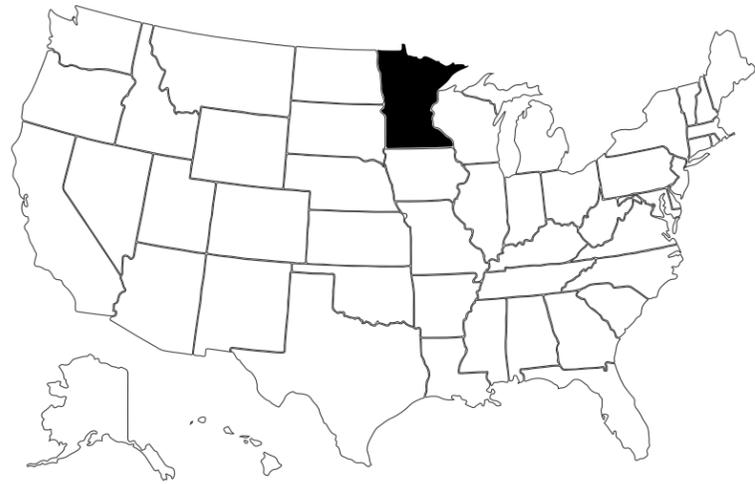
Rivers Edge:



An Adult
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Site Information





Minnesota within the US

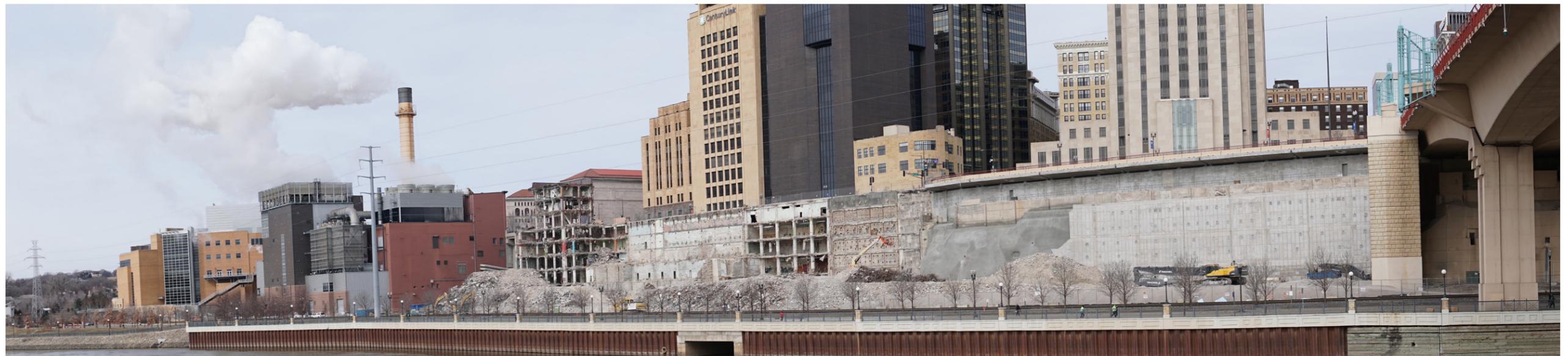
Ramsey County within MN

Downtown St. Paul within Ramsey County

Proposed site location within downtown St. Paul



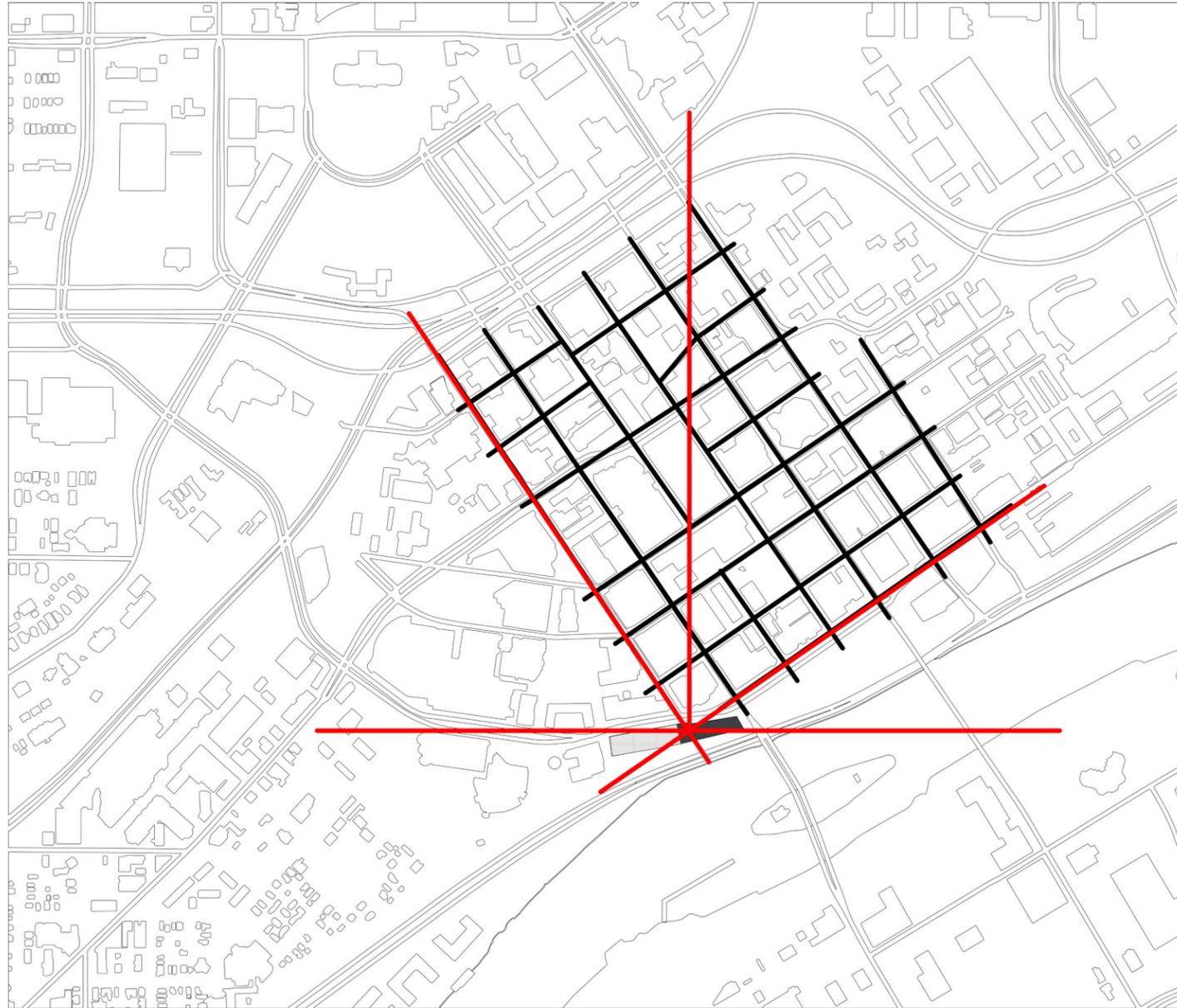
Site location October 2016



Site location March 2017



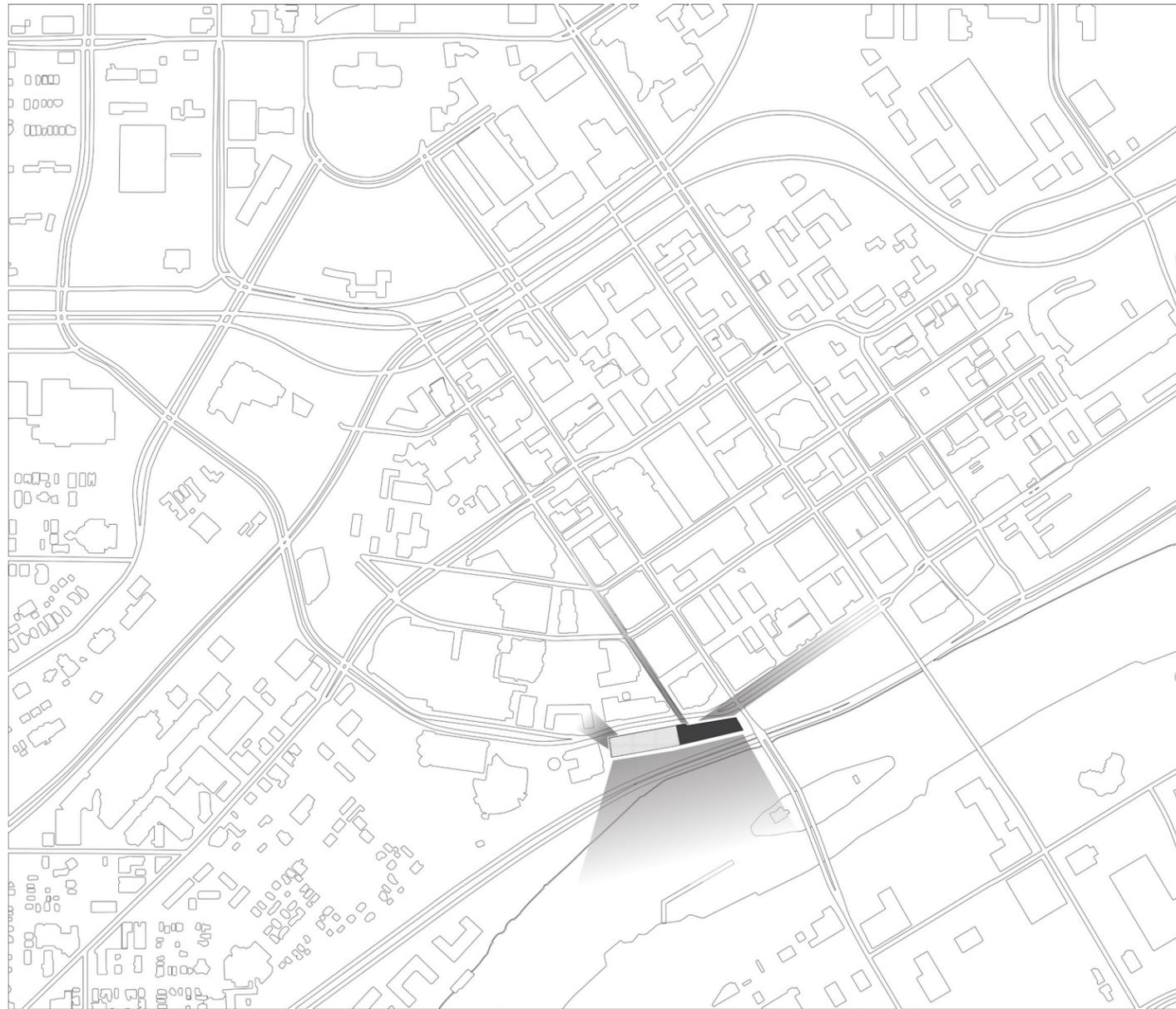
Nearby neighboring context photo study



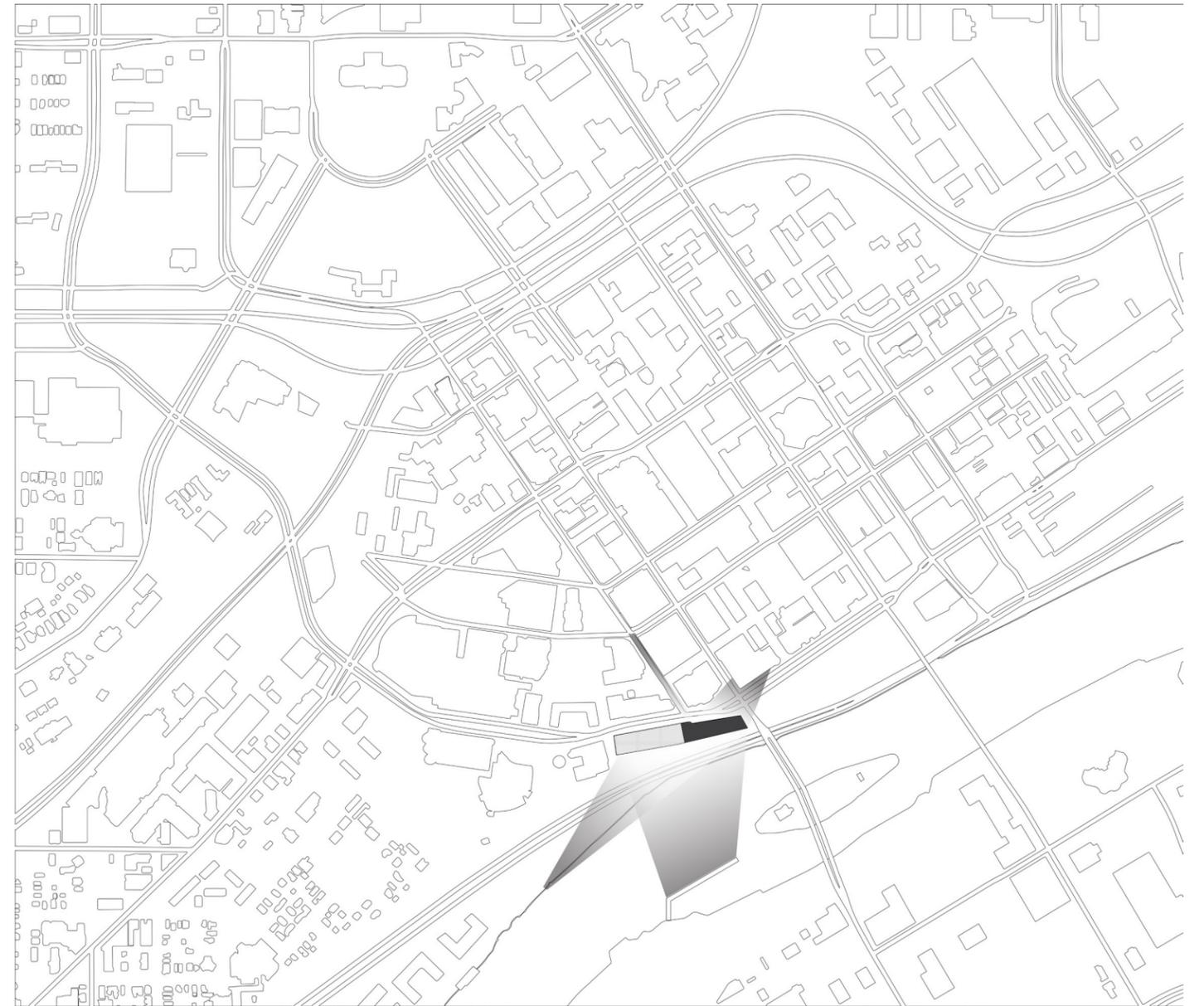
City grid analysis



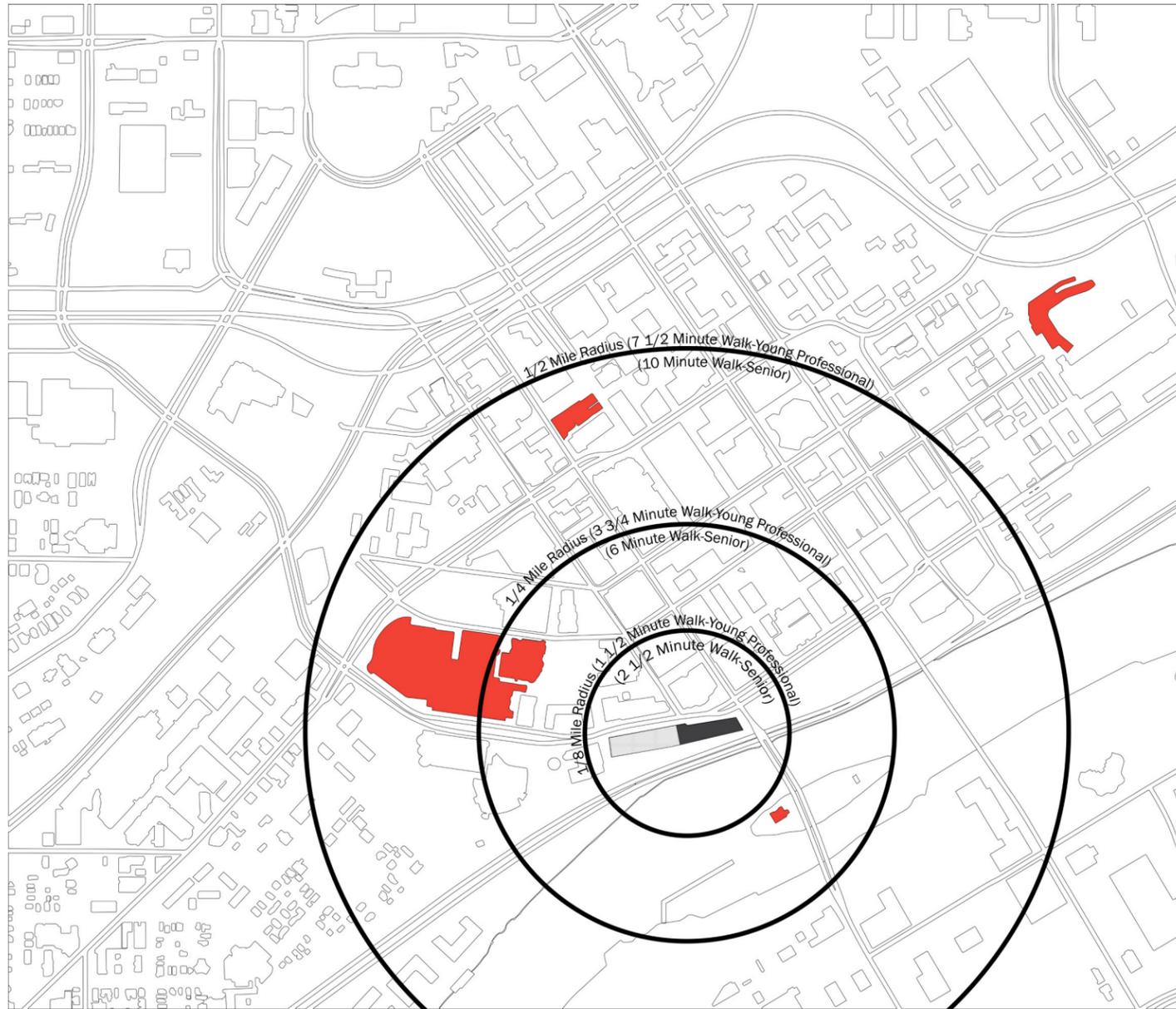
Major axis near site



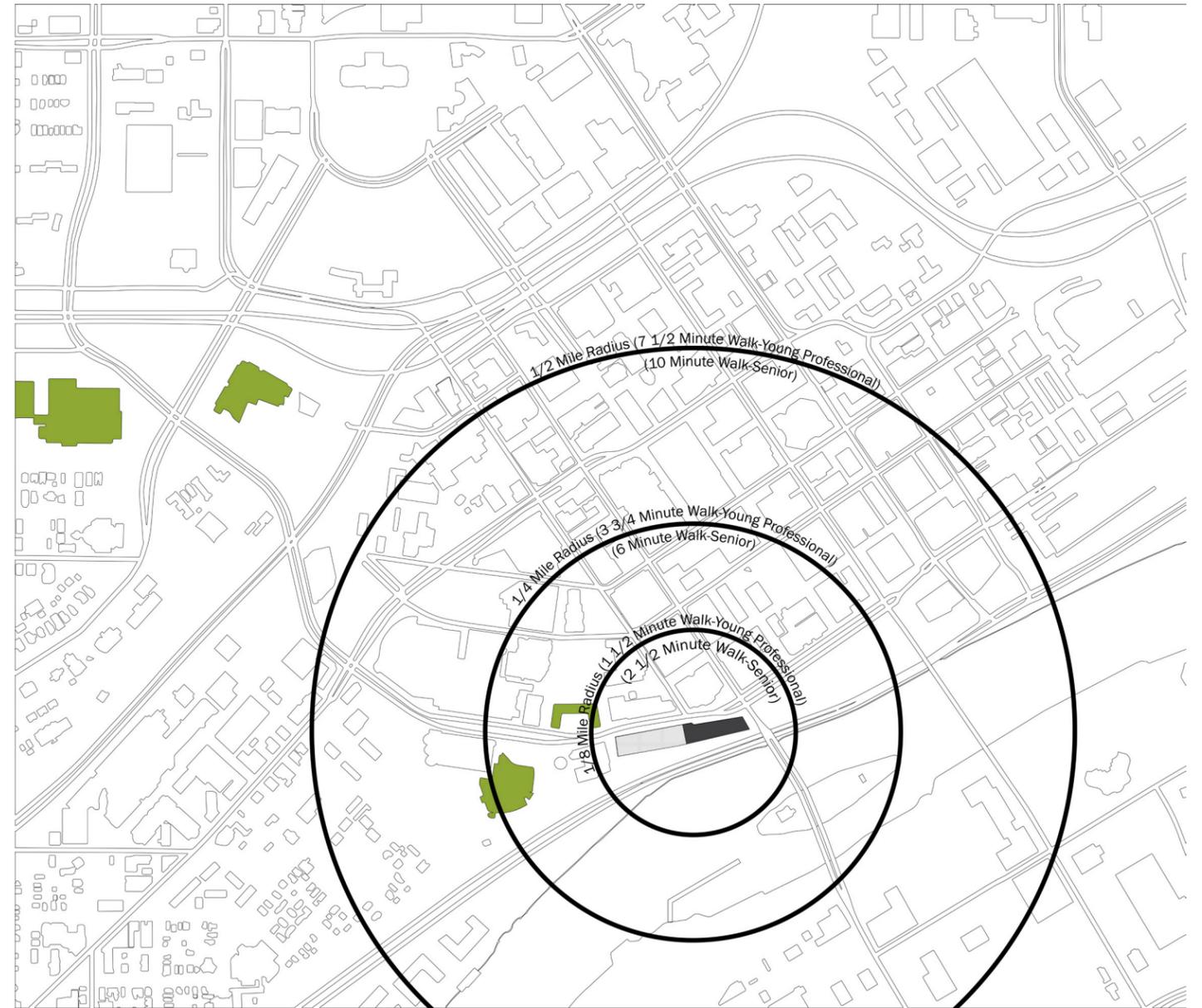
Views from the site



Views to the site



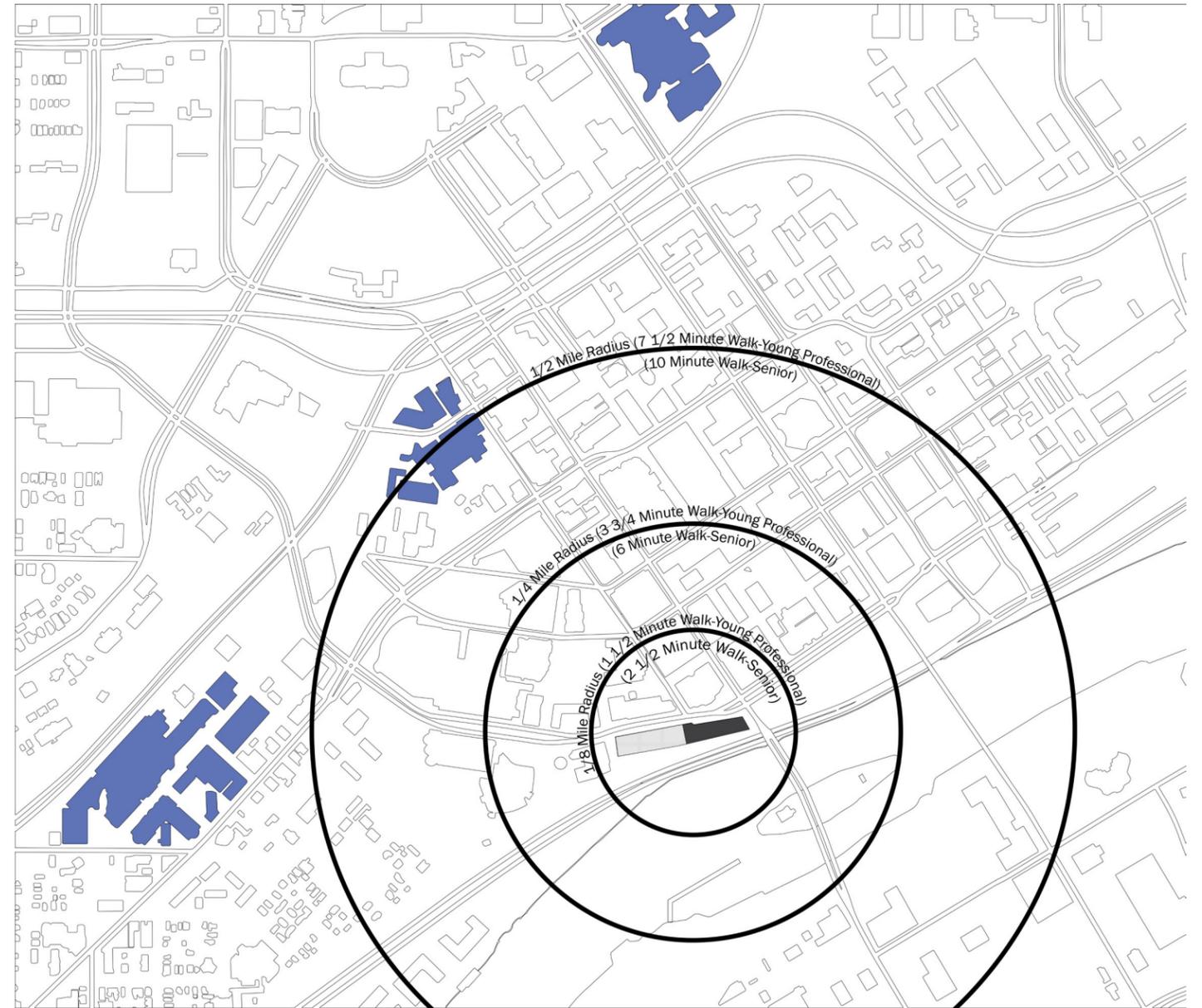
Entertainment



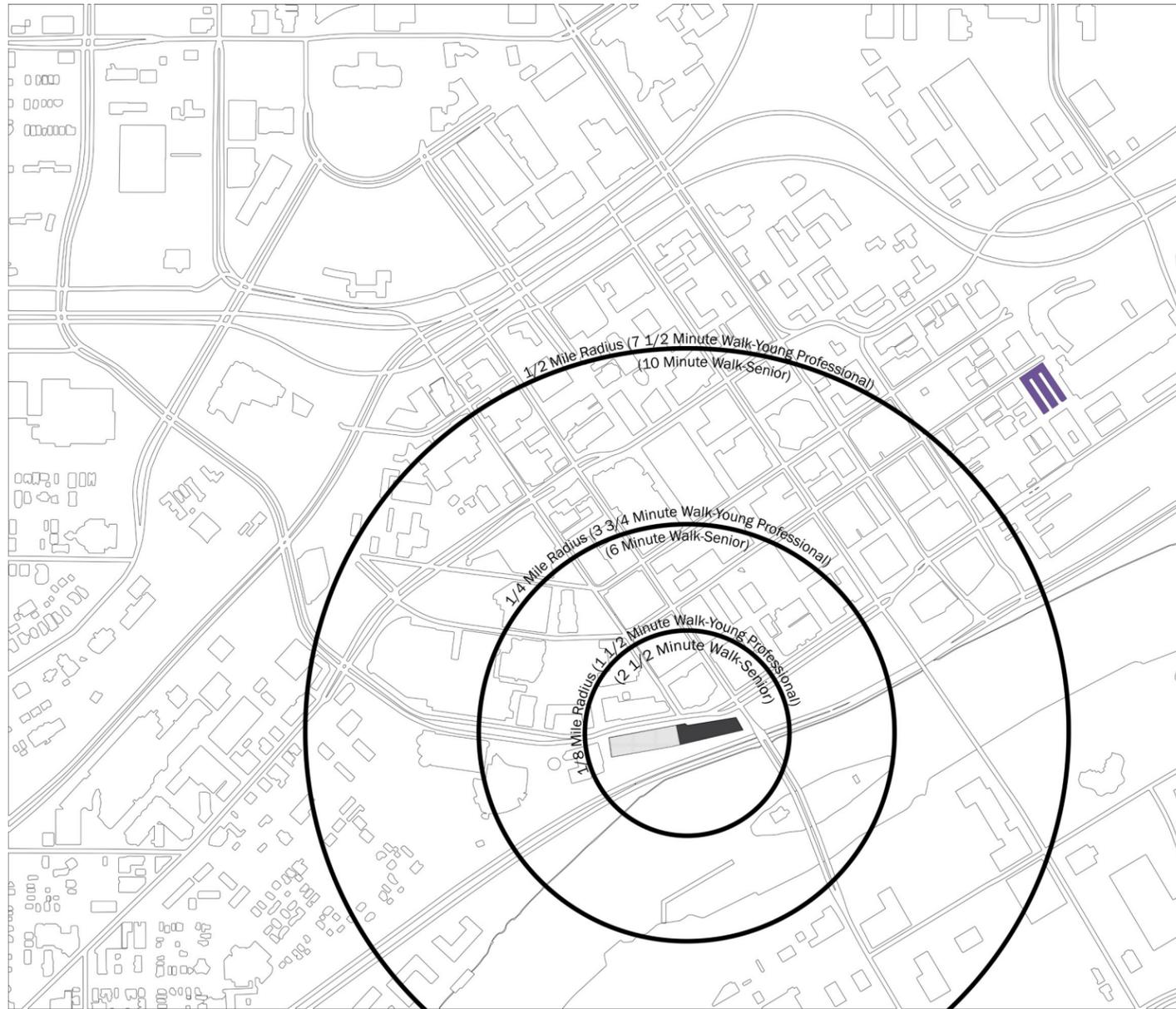
Education



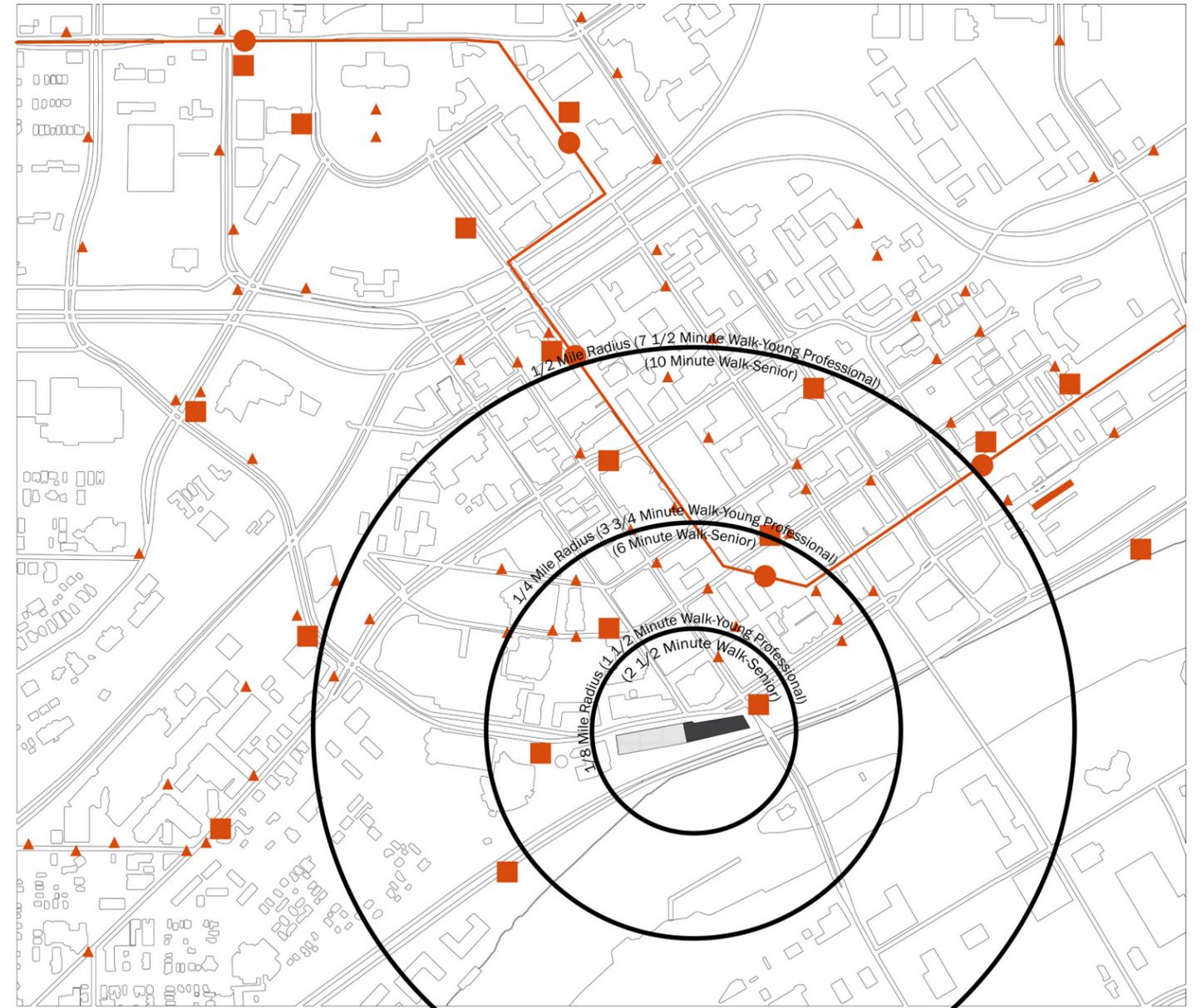
Parks



Healthcare



Farmers market



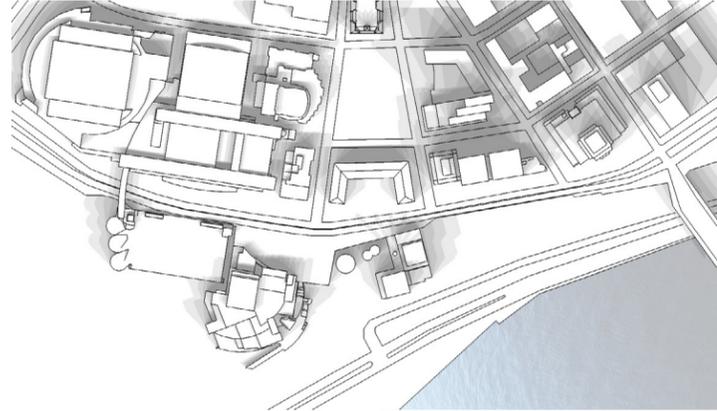
Public transit



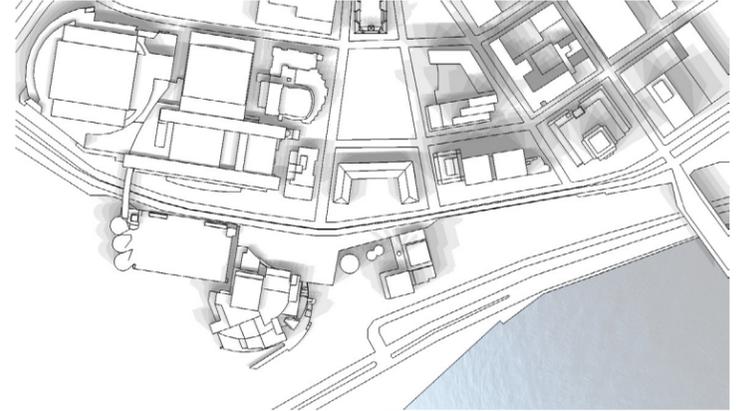
Jan. 21st 9am-3pm



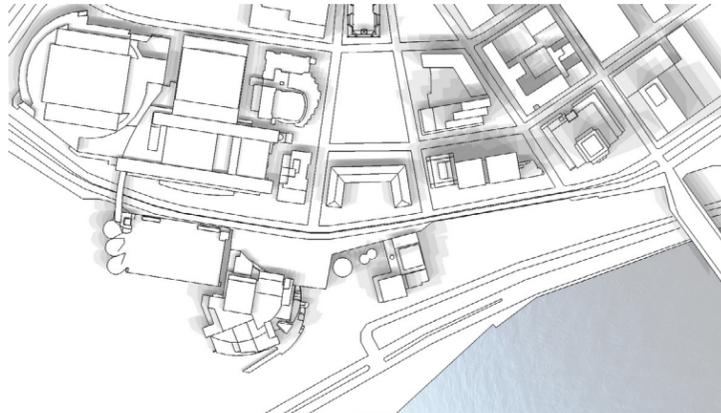
Feb. 21st 9am-3pm



Mar. 21st 9am-3pm



April 21st 9am-3pm



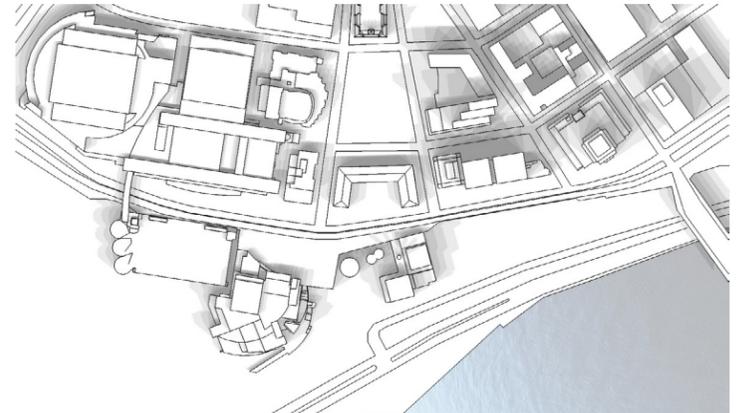
May 21st 9am-3pm



June 21st 9am-3pm



July 21st 9am-3pm



Aug. 21st 9am-3pm



Sept. 21st 9am-3pm



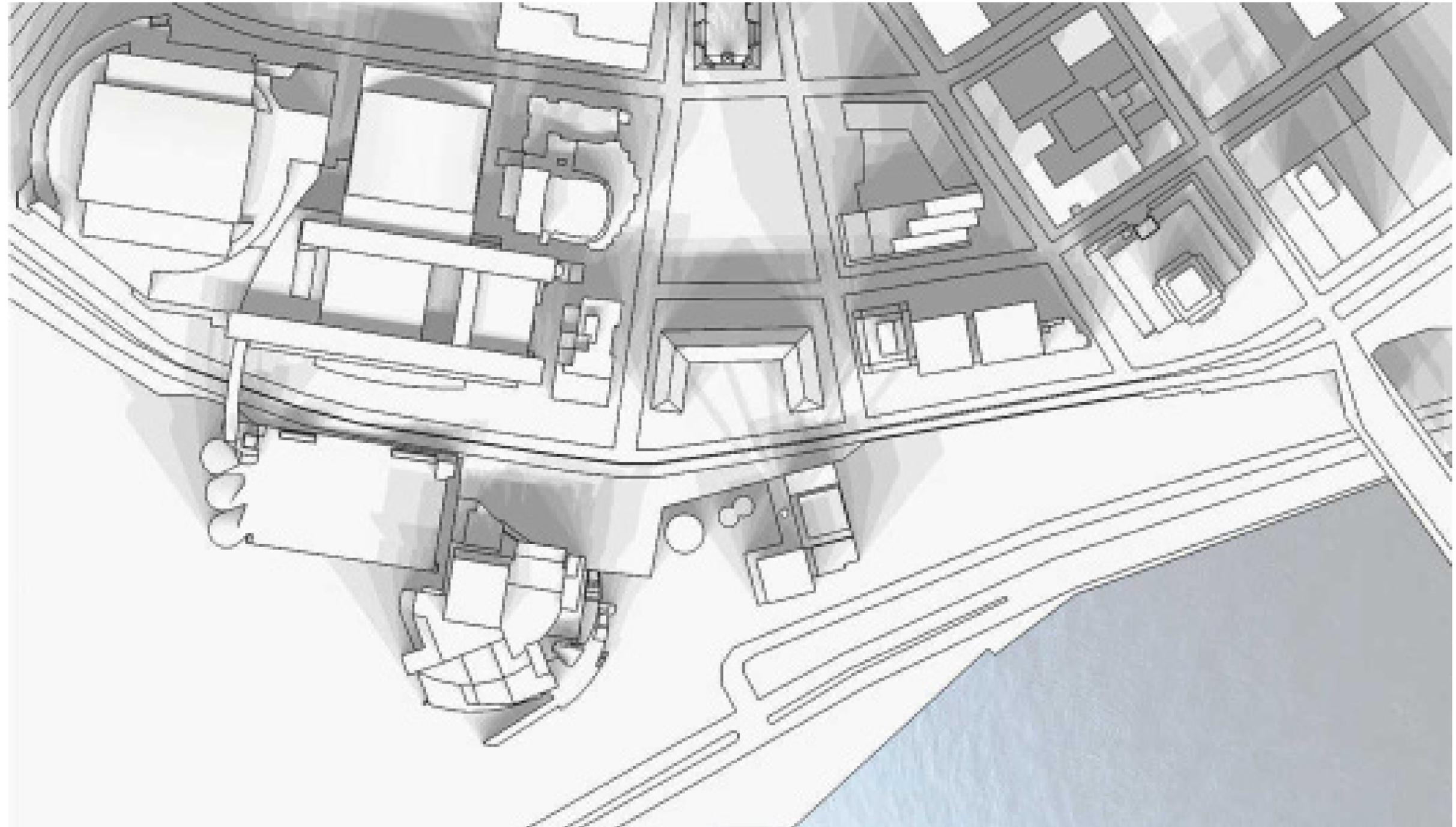
Oct. 21st 9am-3pm



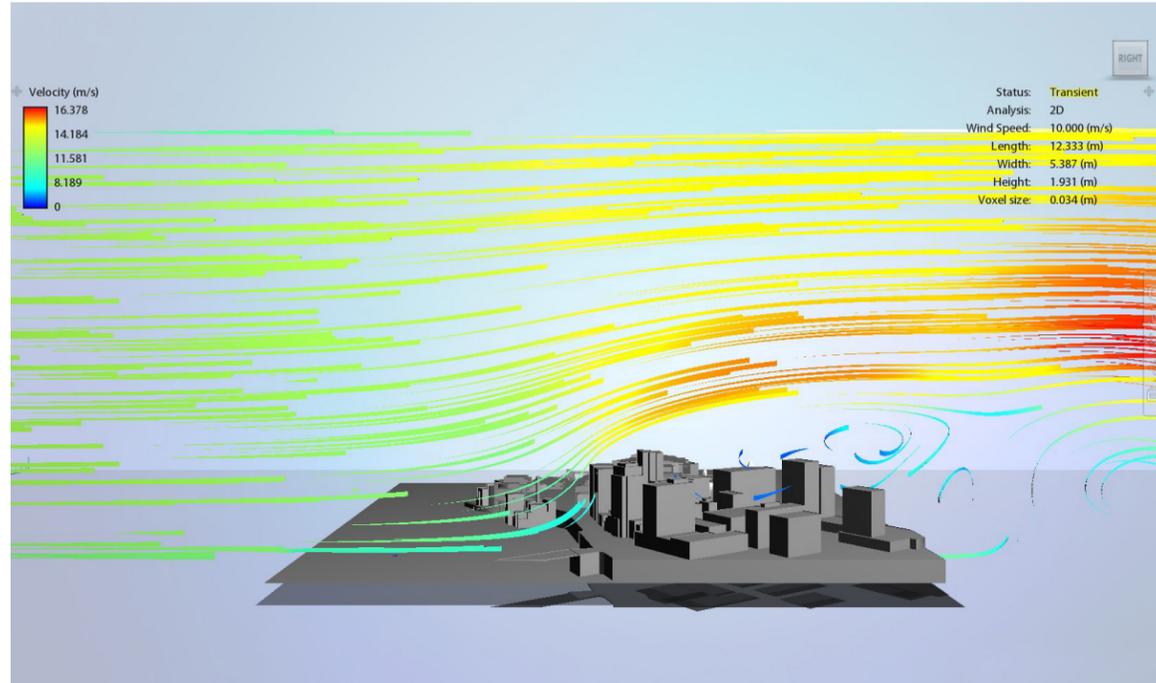
Nov. 21st 9am-3pm



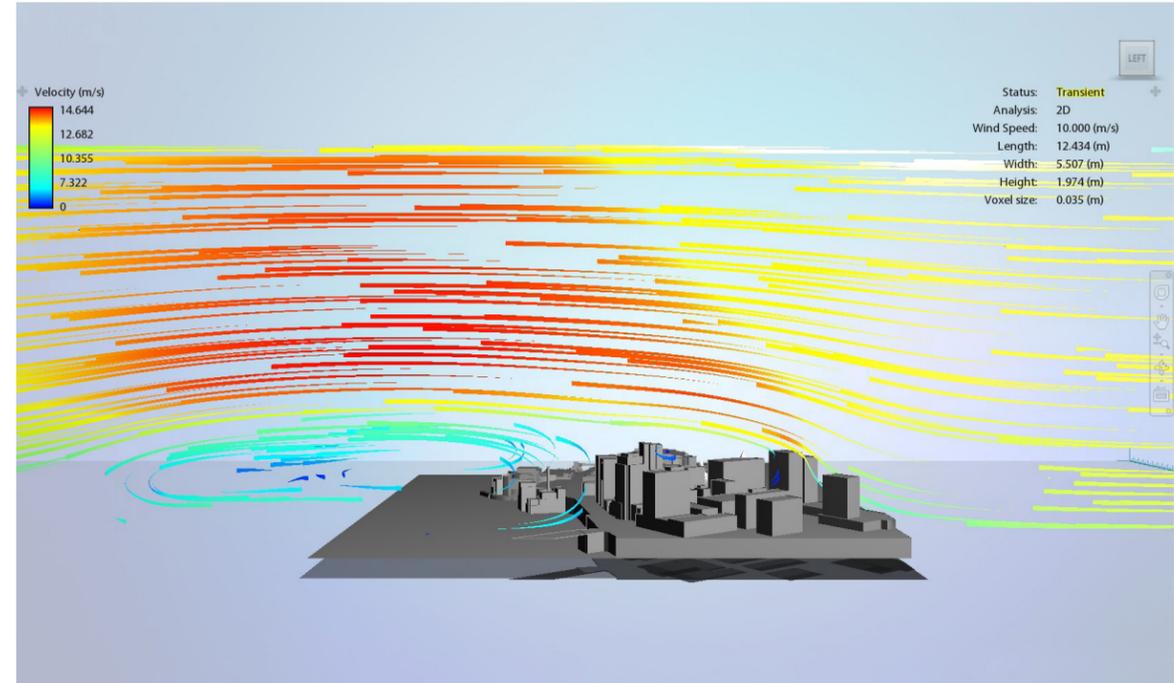
Dec. 21st 9am-3pm



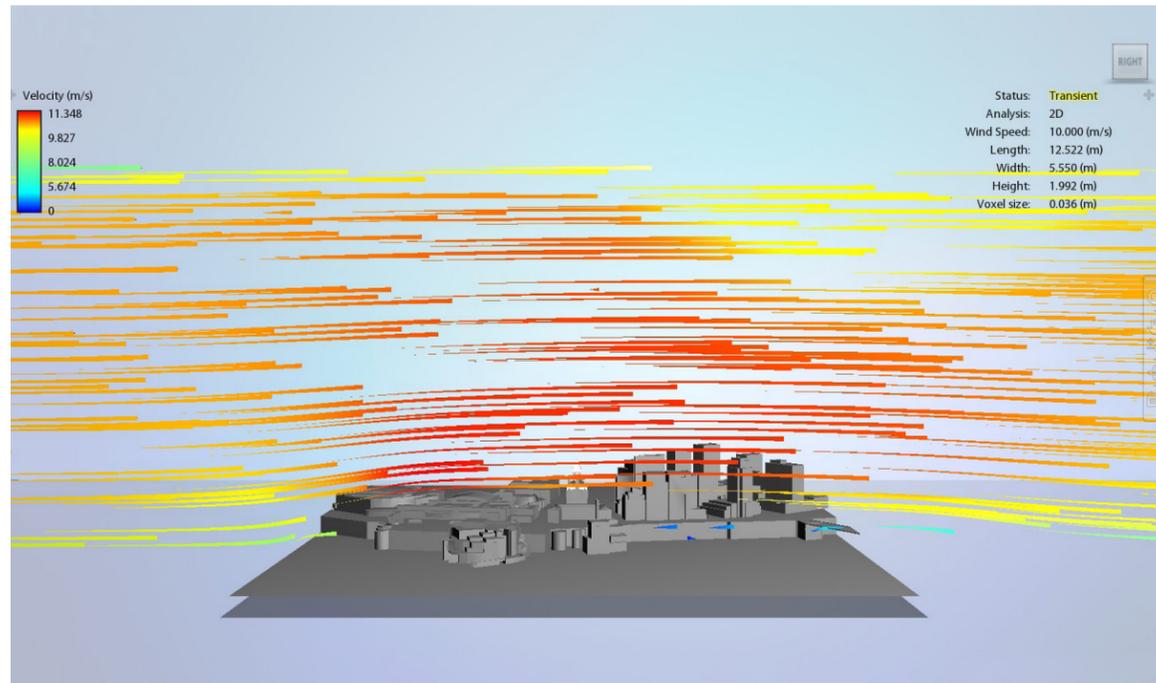
Solar sun study of existing site condition



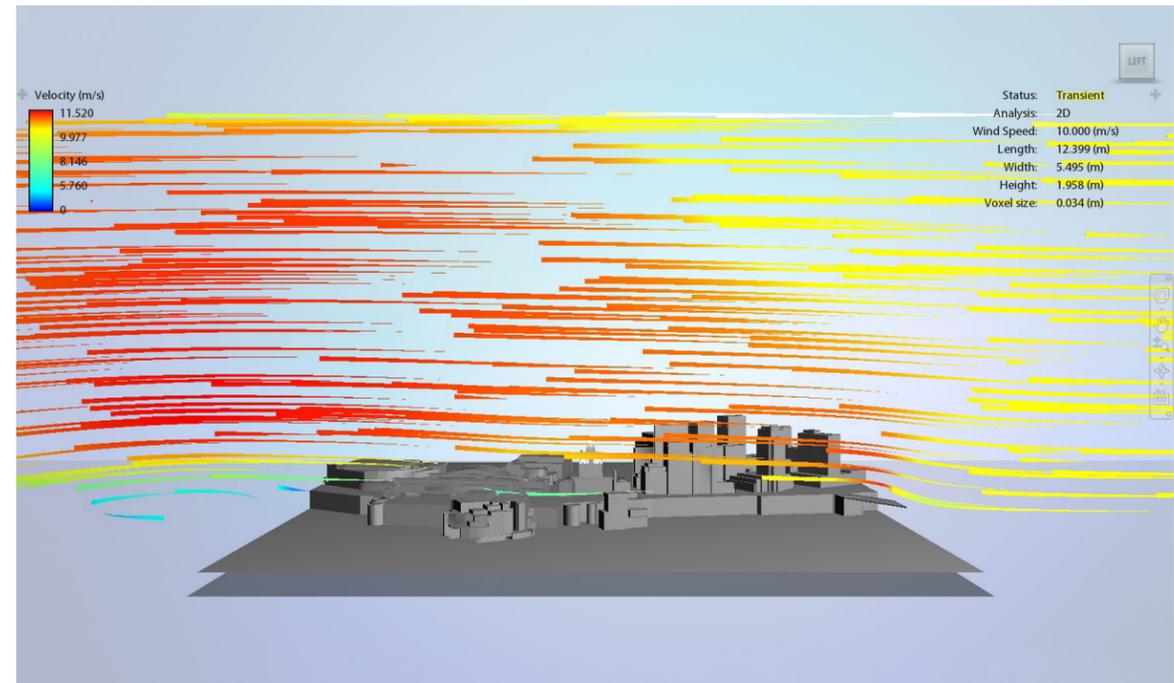
Southward wind through existing site



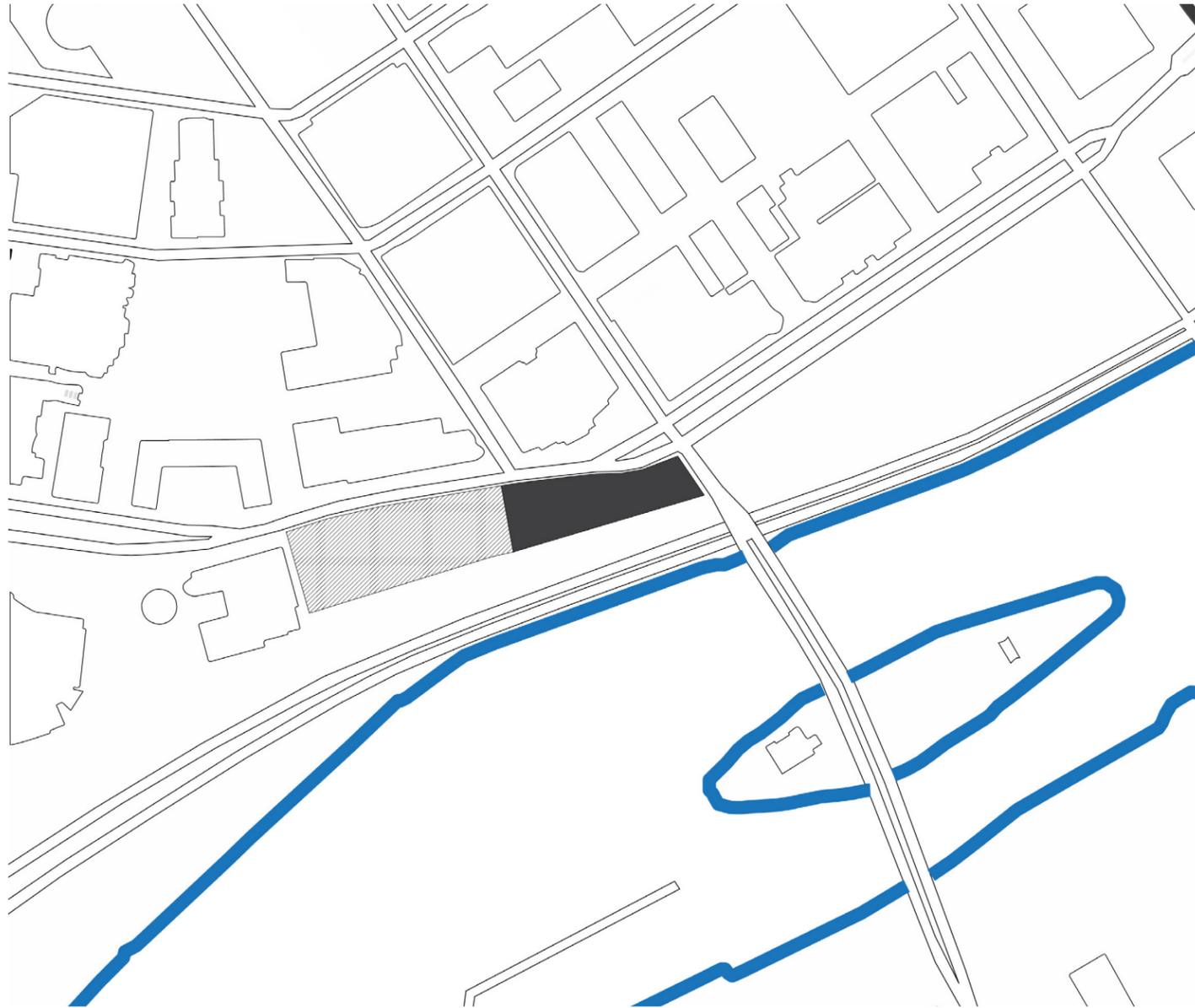
Northward wind through existing site



Westward wind through existing site



Eastward wind through existing site



Site area not flooded



100 year flood area

Proposed Design Concept

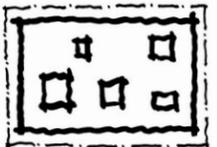




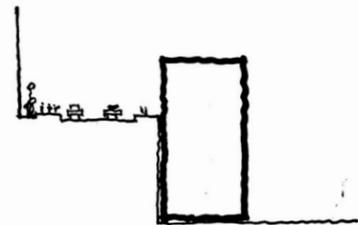
◦ Boundary geometry as a generator of building form.



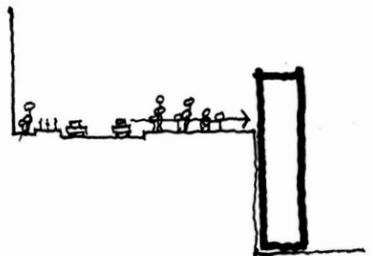
◦ Fill site with building & create controlled courts within.



◦ Building at boundary to contribute to street scale



◦ Building set back to create vista from street.



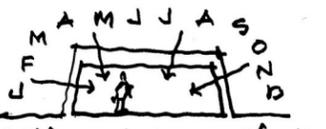
◦ Day-night use.



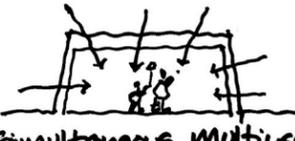
◦ Different times of day.



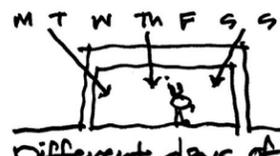
◦ Different times of the year.



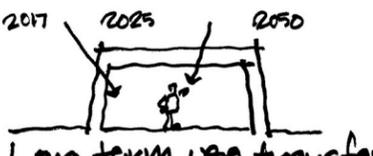
◦ Simultaneous multiuse



◦ Different days of the week.



◦ Long term use transfer.



◦ Similar uses.



◦ Different uses.



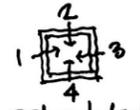
◦ Similar people using



◦ Different people using



◦ Scheduled uses



◦ Free use



◦ Strong entry invitation



◦ Reserved invitation



◦ Avoid glare of sun reflection



◦ Protect from summer sun & allow winter sun.



◦ Give roof decks to public walk.



◦ Allow mild morning sun & shield from harsh afternoon sun.



◦ Visual access to front court from road.



◦ Allow hot air up & out.



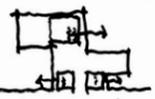
◦ Ventilation for all spaces



◦ Give space to street & neighborhood.



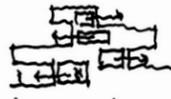
◦ Extend inside functions to exterior residual.



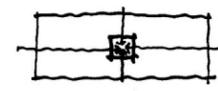
◦ Develop into entry forms.



◦ Use for visual enjoyment.



◦ Access piers



◦ Transition through court.



◦ Under canopy



◦ Walk by facade, then enter.



◦ Along tree lined axis.



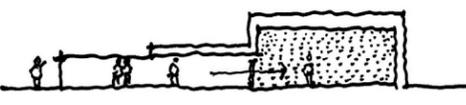
◦ Through grove of trees.

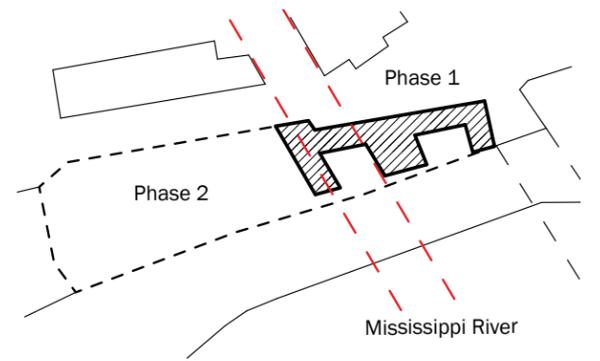
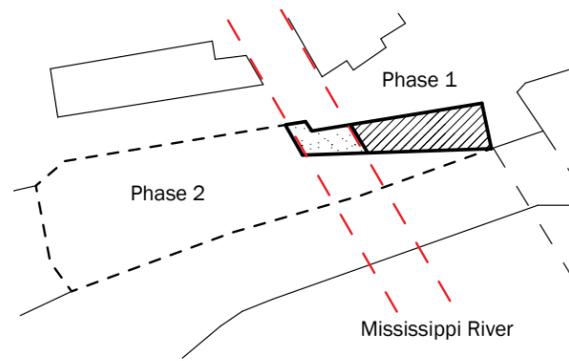
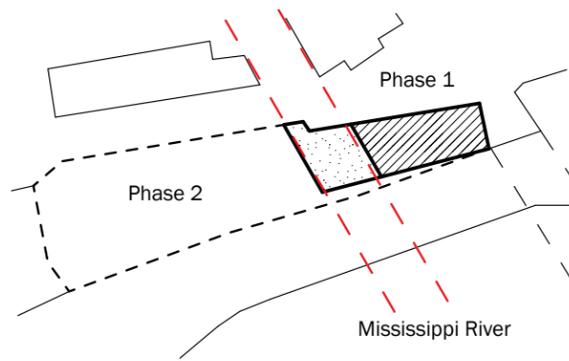
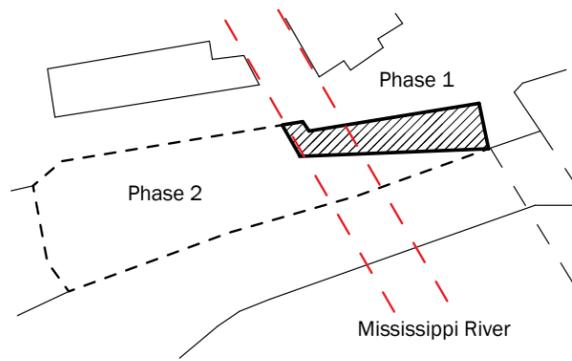
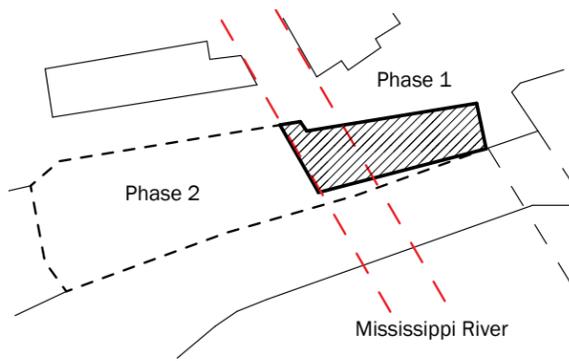
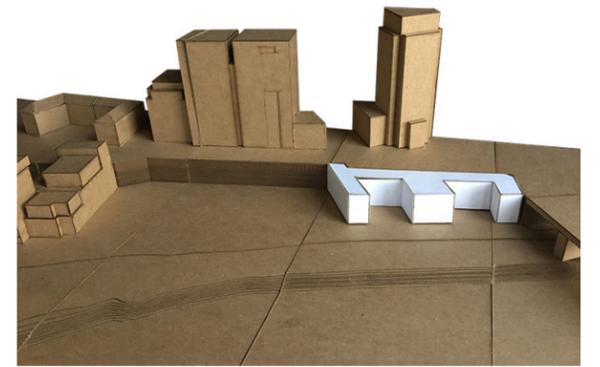
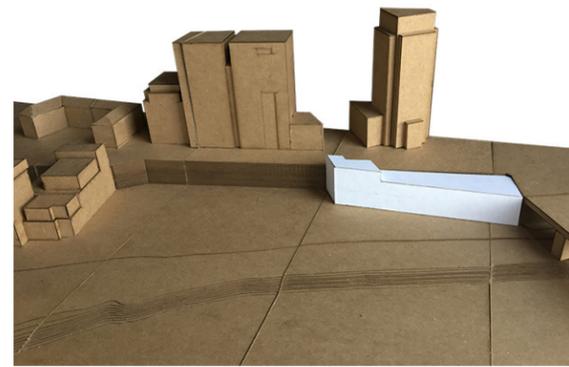
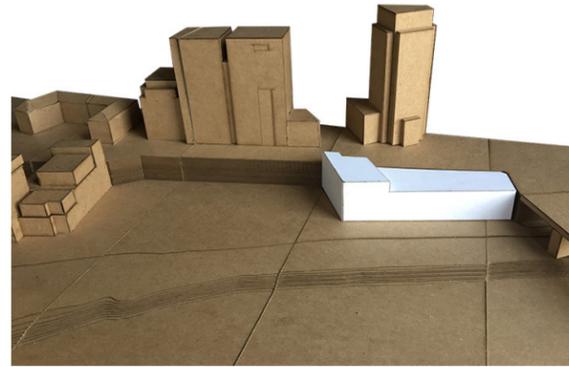
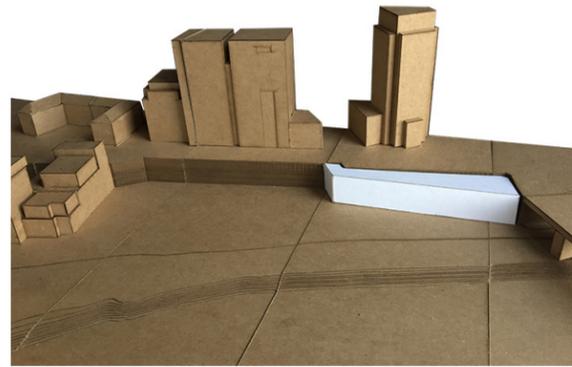
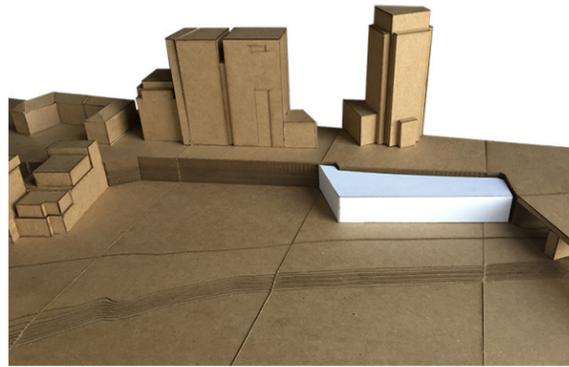


◦ Abrupt out to in transition.



◦ Entry transition outside the building.





Using the property boundary to generate a building form.

Using the property boundary to generate a building form.

Using the property boundary to generate a building form.

Using the property boundary to generate a building form.

Using the property boundary to generate a building form.

South facade is parallel with major north south transportation axis.

South facade is angle to face true south.

South facade is parallel with major north south transportation axis.

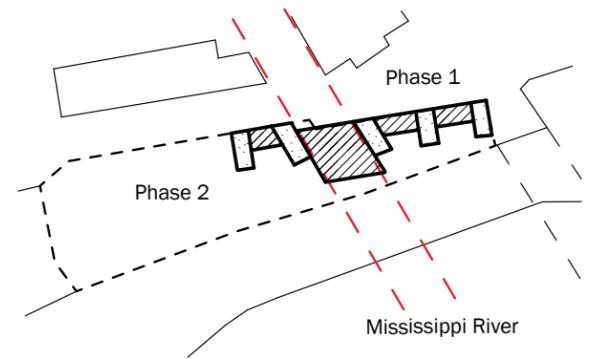
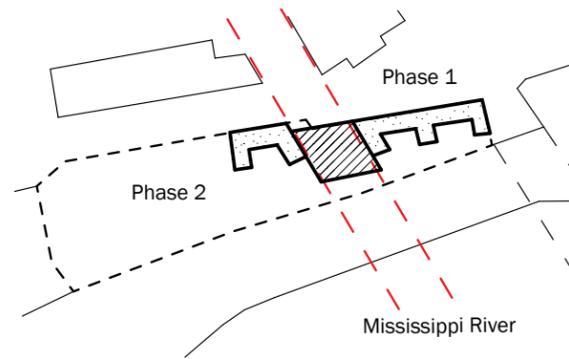
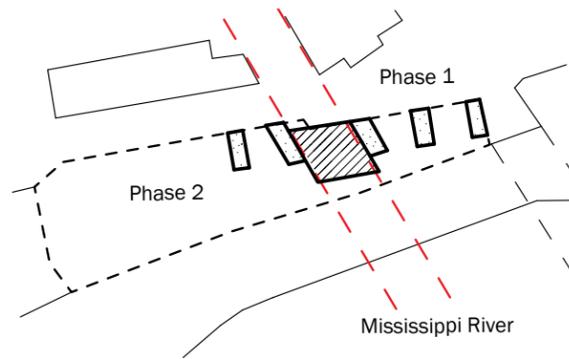
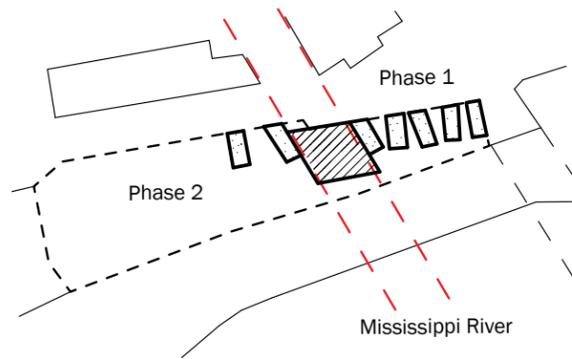
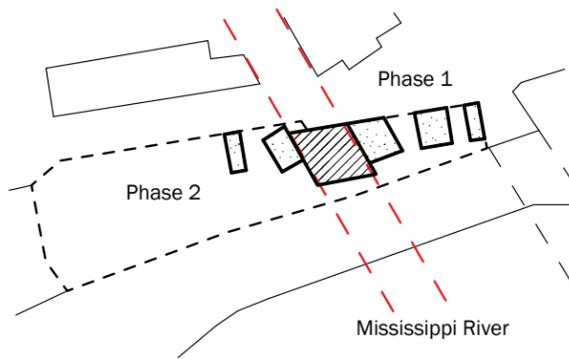
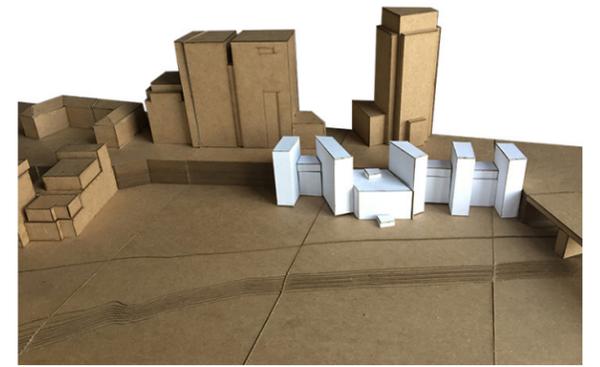
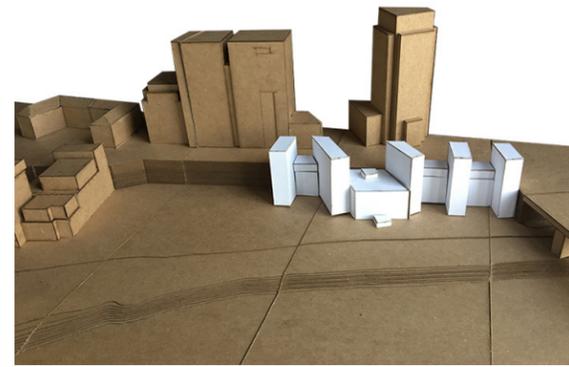
South facade is angle to face true south.

South facades are parallel with major north south transportation axis.

Adding a sense of hierarchy at end of street axis.

Adding a sense of hierarchy at the end of street axis.

Experimenting with subtracting space to create courtyards.



Using the property boundary to generate a building form.

Using the property boundary to generate a building form.

Using the property boundary to generate a building form.

Using the property boundary to generate a building form.

Using the property boundary to generate a building form.

Experimenting with breaking up the solid building form.

Multi story community hub with street level public/community plaza located in line with street axis

Multi story community hub with street level public/community plaza located in line with street axis

Multi story community hub with street level public/community plaza located in line with street axis

Multi story community hub with street level public/community plaza located in line with street axis

Multi story community hub with street level public/community plaza located in line with street axis

Single and double loaded towers connected through interior atriums.

Single loaded towers connected by interior atriums.

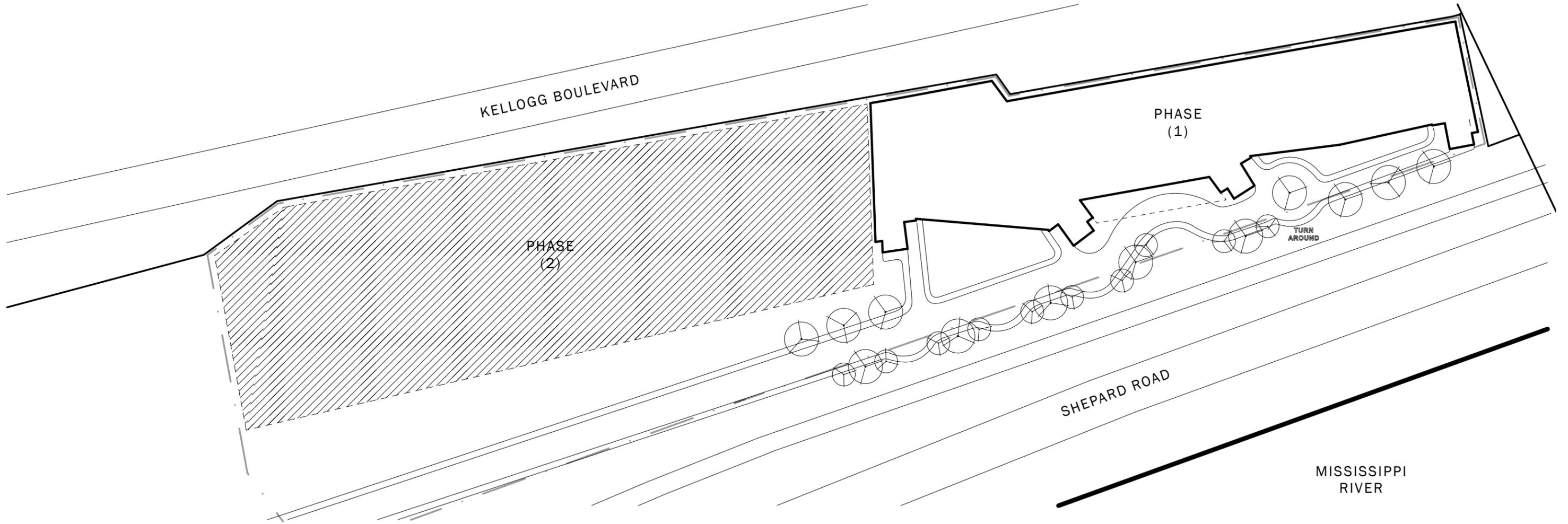
Single loaded towers creating view windows between.

Single loaded towers with view windows filled in with connecting space.

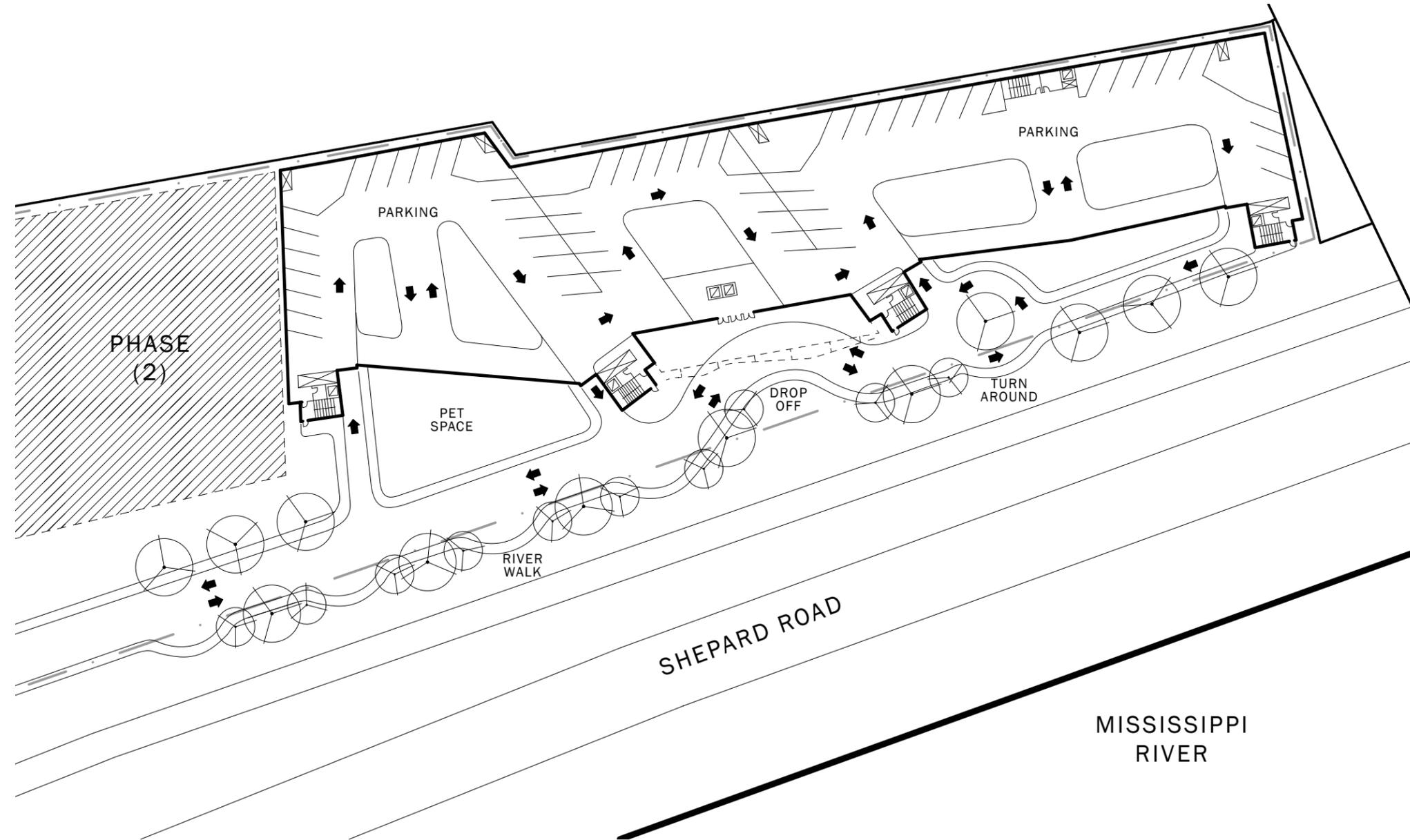
Single loaded towers with view windows and connecting space.



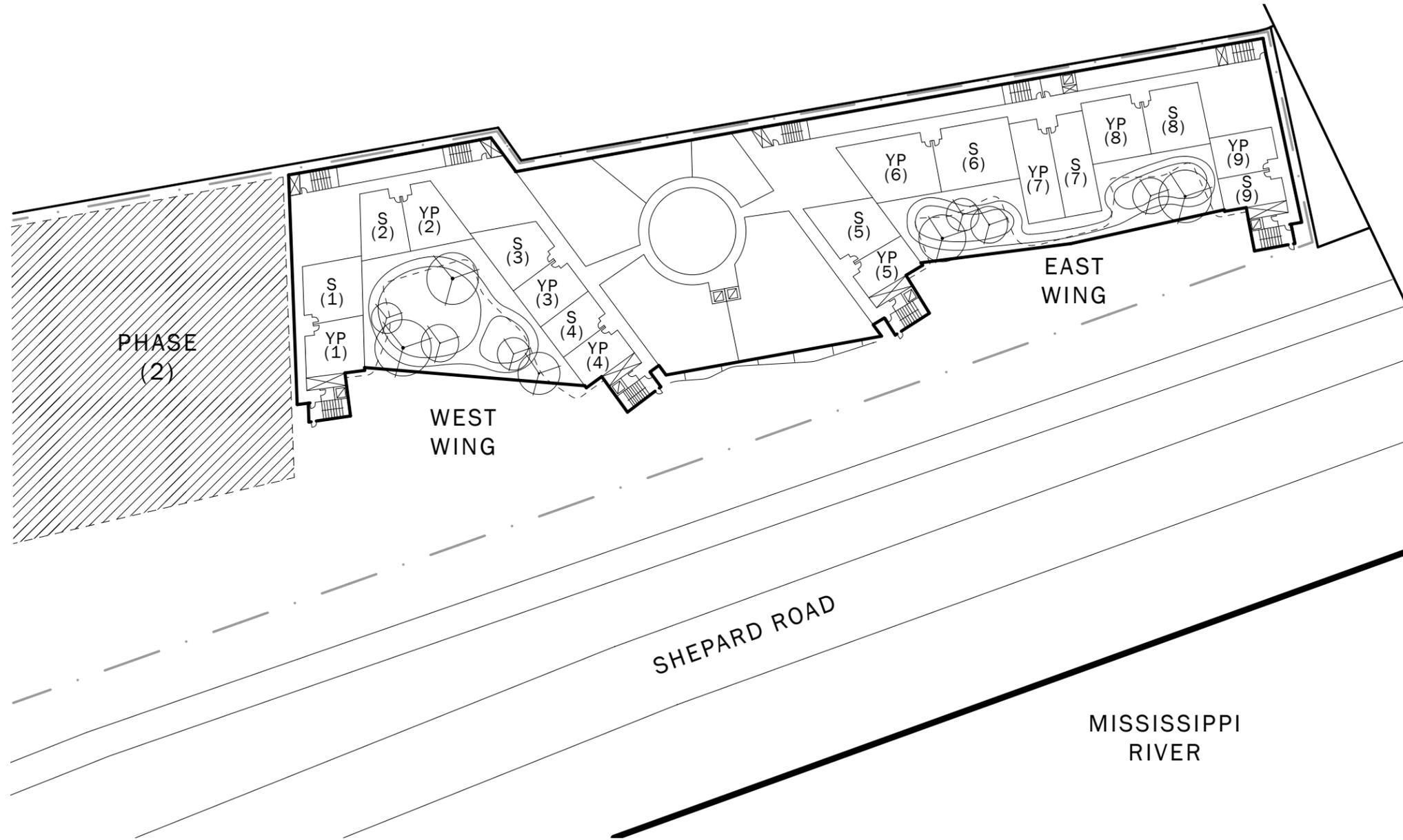
Contextual model design thinking video



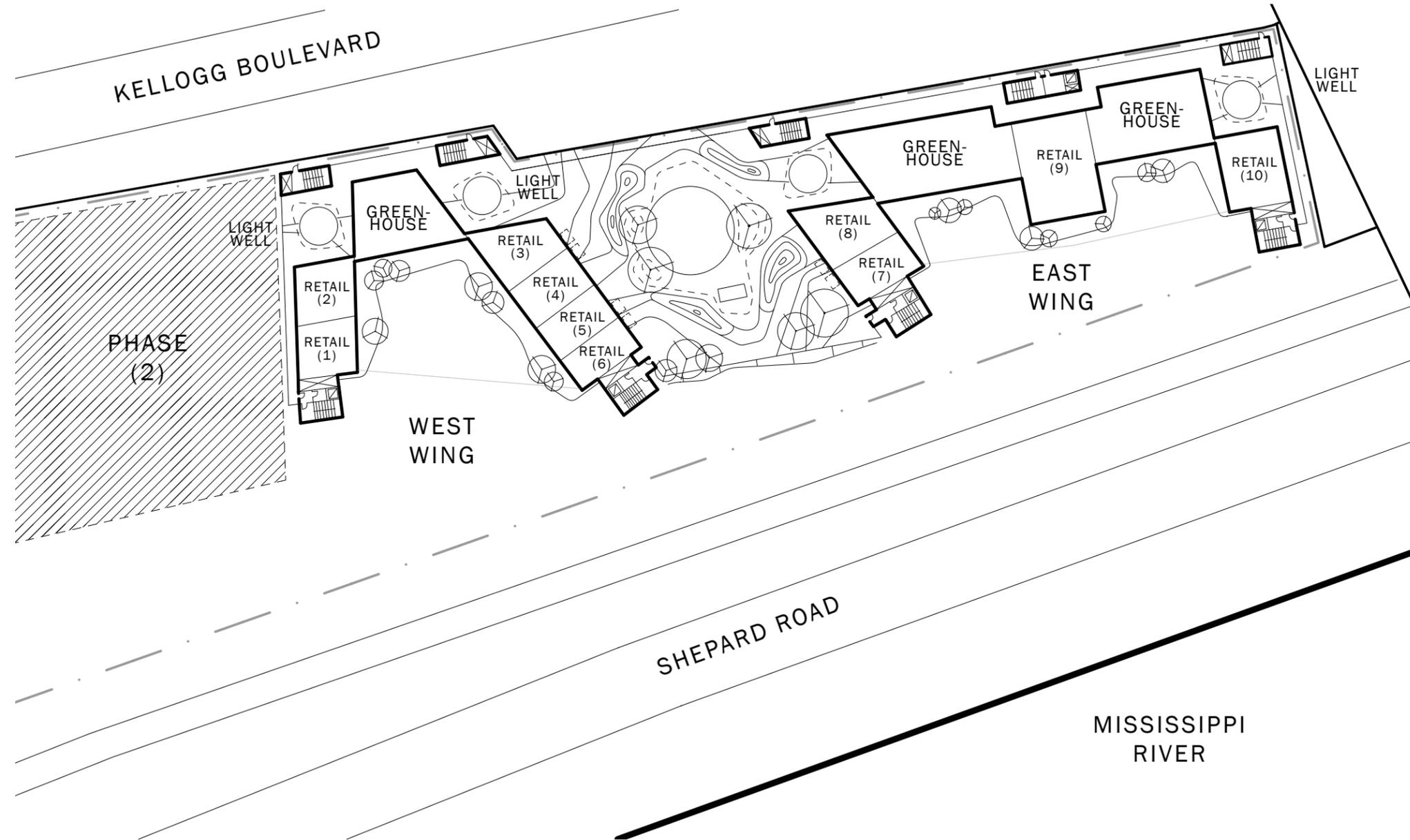
Site Master Plan (Phase 1 & Phase 2)



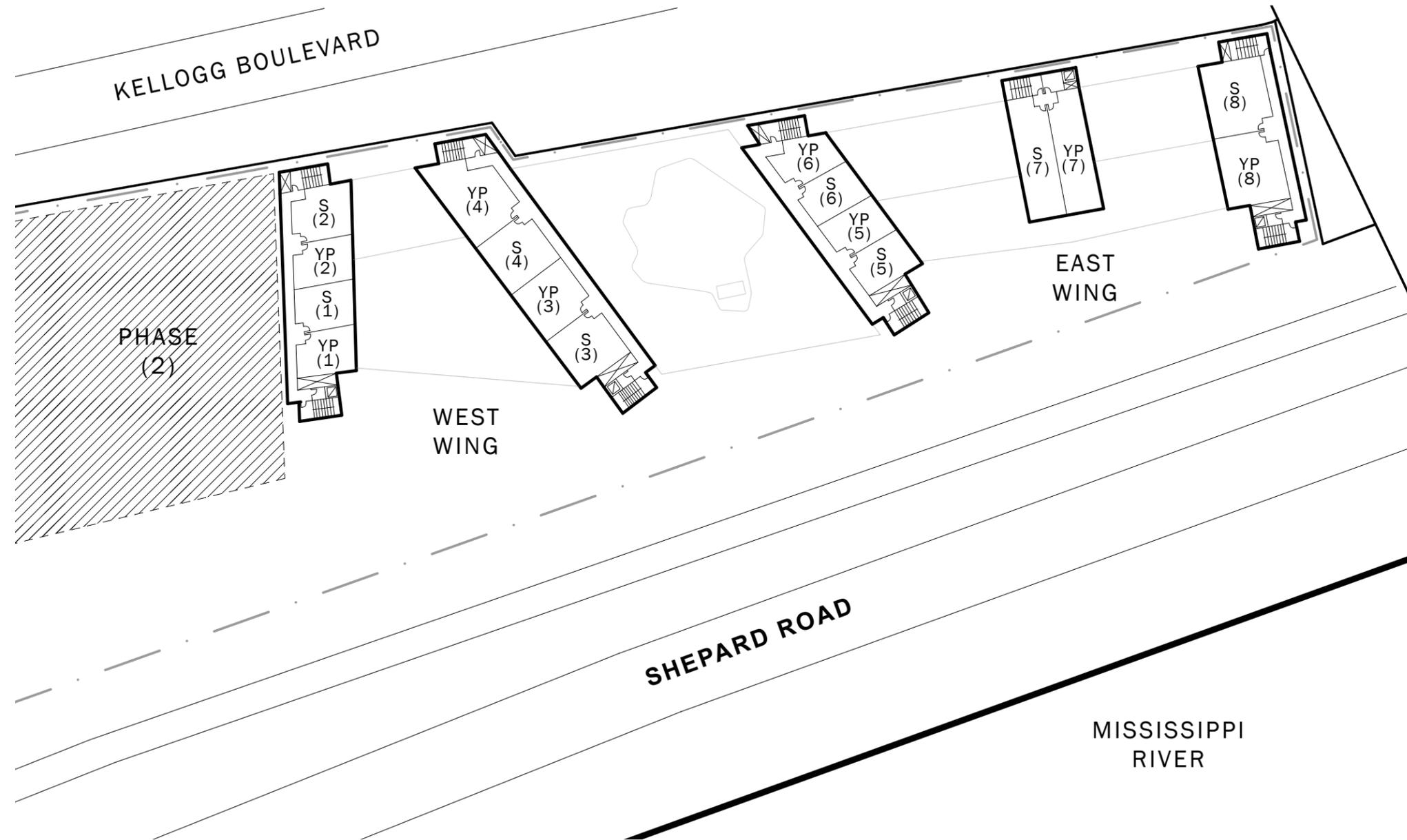
Ground Floor - Floor 3



Floor 4 - Floor 7



Floor 8 - Floor 9



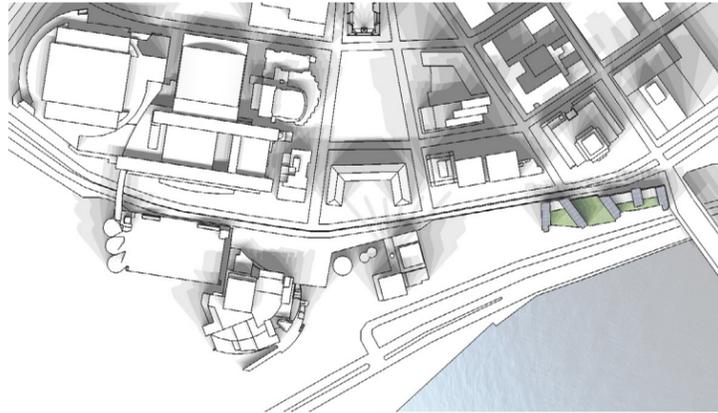
Floor 10 - Floor 11



Proposed Design Concept : Building Impact On Context



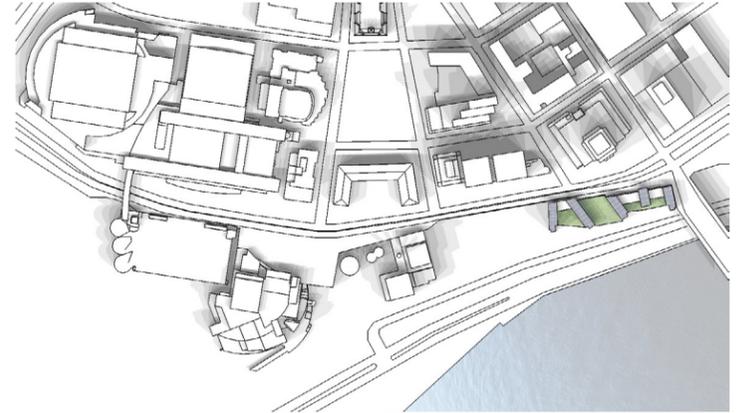
Jan. 21st 9am-3pm



Feb. 21st 9am-3pm



Mar. 21st 9am-3pm



April 21st 9am-3pm



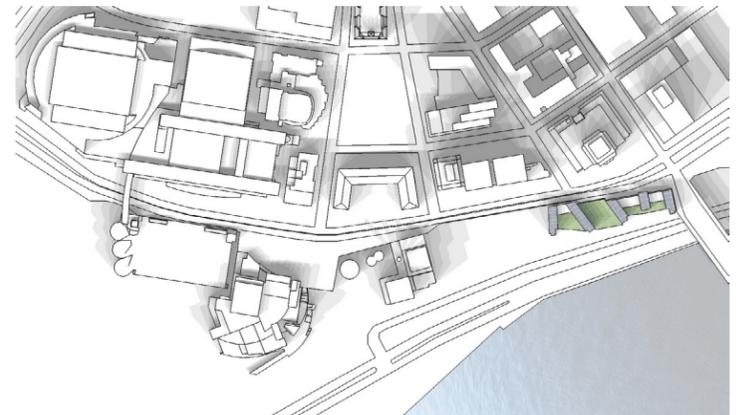
May 21st 9am-3pm



June 21st 9am-3pm



July 21st 9am-3pm



Aug. 21st 9am-3pm



Sept. 21st 9am-3pm



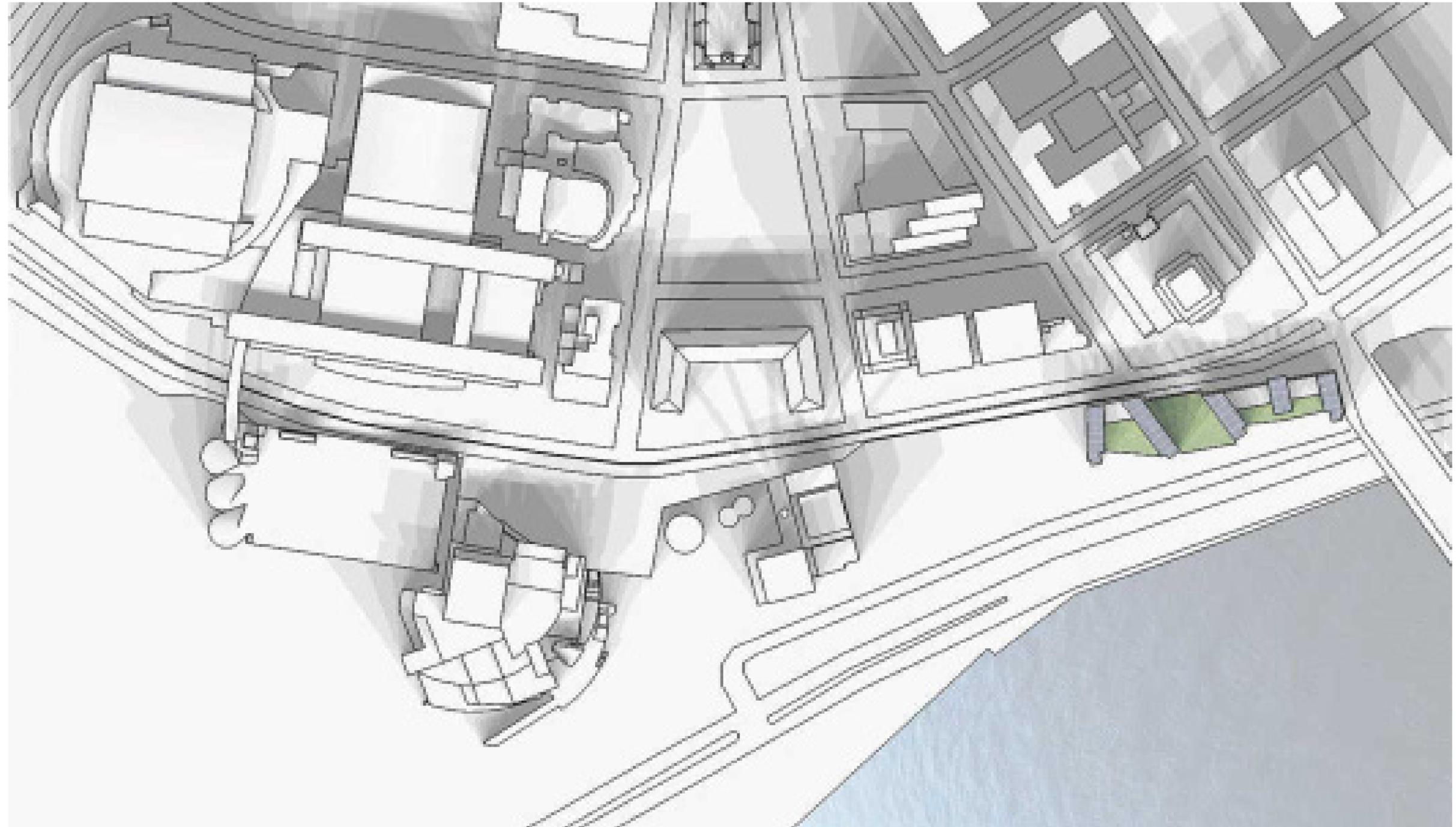
Oct. 21st 9am-3pm



Nov. 21st 9am-3pm



Dec. 21st 9am-3pm



Solar sun study of proposed design concept within context



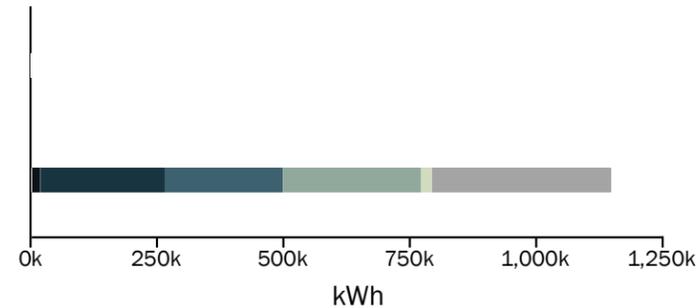
My Projects > Ian Schimke NDSU Architecture Thesis

- Run List
- Run Charts
- Project Defaults
- Project Details
- Project Members
- Utility Information
- Weather Station

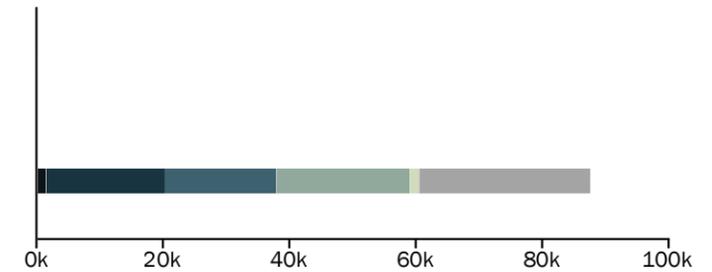
Actions		Display Options														
Name	Date	User Name	Floor Area (ft²)	Energy Use Intensity (kBtu/ft²/year)	Electric Cost (/kWh)	Fuel Cost (/Therm)	Total Annual Cost ¹			Total Annual Energy ¹			Compare	Potential Energy Savings <small>Beta</small>		
							Electric	Fuel	Energy	Electric (kWh)	Fuel (Therm)	Carbon Emissions (tons)				
Project Default Utility Rates																
Project Default Utility Rates																
Base Run																
<input type="checkbox"/>	Thesis Net Zero Test.xml	4/10/2017 9:29 AM	NDSUARCH25	160,546	84.4	\$0.08	\$0.72	\$87,446		\$87,446	1,146,087			1,546.5		

- Area Lights
- Ext Usage
- Misc Equip
- Space Cooling
- Vent Fans
- Pumps Aux

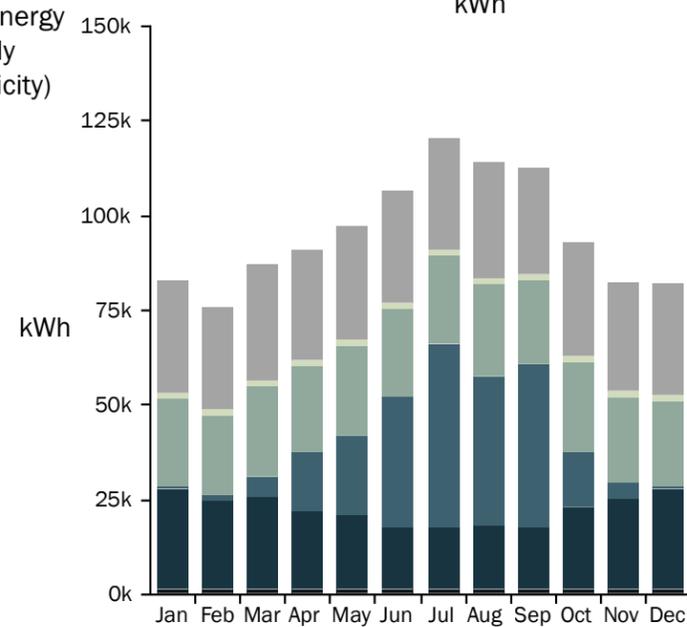
Total Energy Annually (Electricity)



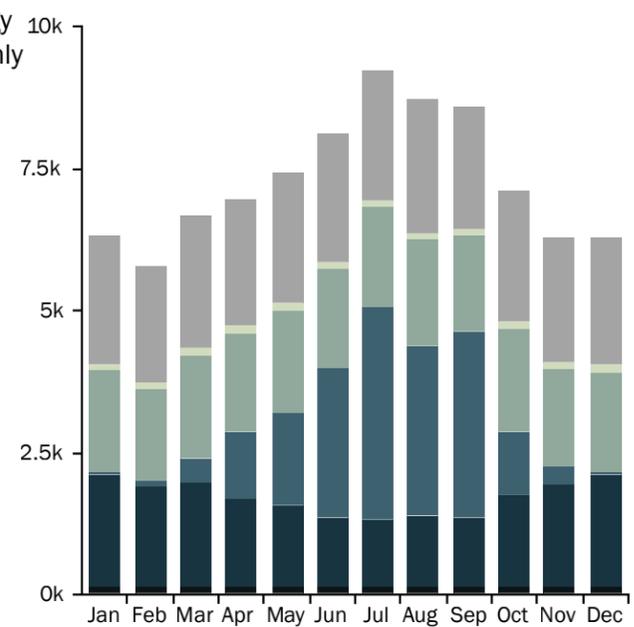
Total Energy Cost Annually (Electricity)



Total Energy Monthly (Electricity)



Total Energy Cost Monthly (Electricity)





Run Name: Thesis Net Zero Test.xml

Energy and Carbon Results

US EPA Energy Star

Water Usage

Photovoltaic Analysis

LEED Daylight

3D VRML View

Export and Download Data Files

Design Alternatives

Project Template Applied: [Ian Schimke NDSU](#)

Building Type: MultiFamily

Electric Cost: \$0.08 / kWh

Utility Data Used: [Project Default Utility Rates](#)

[Architecture Thesis_default](#) ⓘ

Floor Area: 160,546 ft²

Fuel Cost: \$0.72 / Therm

Location: St Paul, MN 🌤️

1 Base Run



2 Design Alternative

Energy, Carbon and Cost Summary

Annual Energy Cost \$156,787

Lifecycle Cost \$2,135,435

Annual CO₂ Emissions

Electric 987.2 tons

Onsite Fuel 559.3 tons

Large SUV Equivalent 140.6 SUVs / Year

Annual Energy

Energy Use Intensity (EUI) 84 kBtu / ft² / year

Electric 1,146,087 kWh

Fuel 96,437 Therms

Annual Peak Demand 307.5 kW

Lifecycle Energy

Electric 34,382,610 kWh

Fuel 2,893,097 Therms

Assumptions ⓘ

Create a [Design Alternative](#) to improve your building performance.

Carbon Footprint

Base Run Carbon Neutral Potential ⓘ

Annual CO₂ Emissions tons

1 Base Run 1,546.5

Onsite Renewable Potential -1.4

Natural Ventilation Potential -390.2

Onsite Biofuel Use -559.3

Net CO₂ Emissions 595.6

Net Large SUV Equivalent: 54.1 SUVs / Year

Assumptions ⓘ

Electric Power Plant Sources in Your Region

Fossil 77 %

Nuclear 15 %

Hydroelectric 3 %

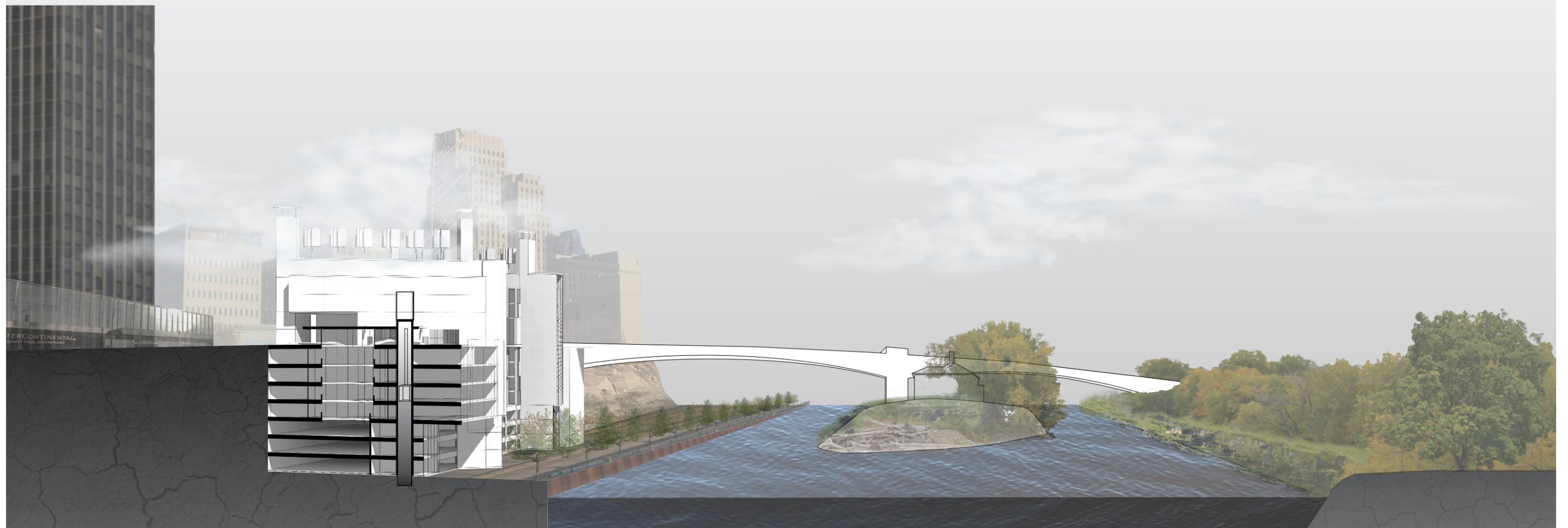
Renewable 4 %

Other 0 %

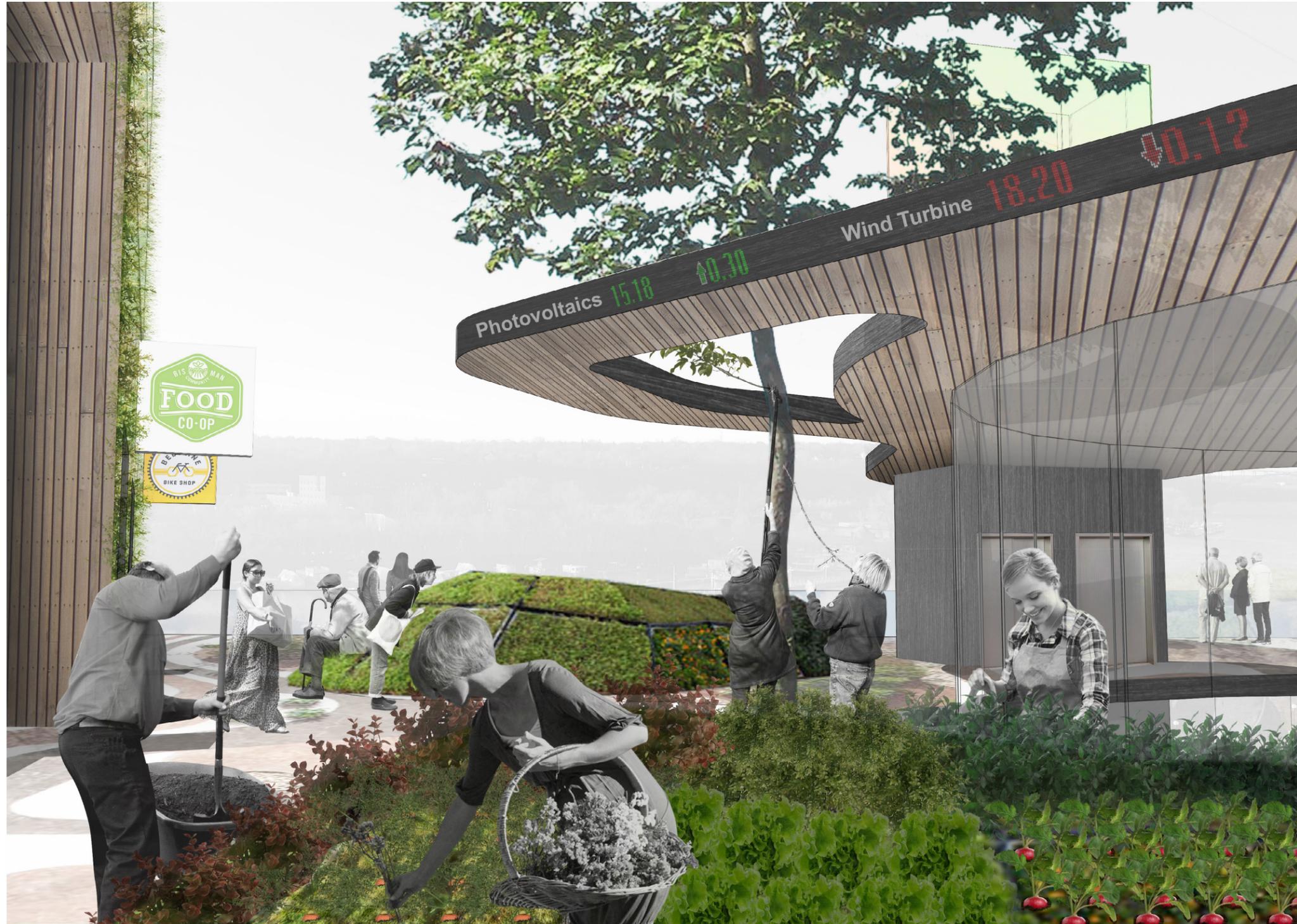
Assumptions ⓘ



Exterior perspective looking north from dock on Mississippi River



Site & building section looking west towards Wabasha Bridge & Raspberry Island



Residents and public picking vegetables in the community public plaza



Residents tending to plantings in the community greenhouses



Residents giving tour of community kitchen



Young Professional continuing their education on the latest net zero principles



How might the relation of **young professionals** and **seniors** manifest in **net zero** architecture?

- 1** Within a **public** setting young professionals and seniors work together within the public plaza at the several community retail shops and tending to the public vegetable berms.
- 2** Within a **semi-public** setting young professionals and seniors find themselves working together in the community greenhouses. Tending to, experimenting with, and gathering vegetables and vegetation for the community residents.
- 3** Within a **semi-private** setting young professionals and seniors can be seen giving tours to the public or sharing meals in the residents community kitchen.
- 4** Within a **private** setting young professionals and seniors can gather to chat about life and tell stories, or they can use these more intimate spaces to continue their education on communal living and the latest net zero principles.

Thank You For Coming

