



# Measurement Technologies Labs – Long Meadow Circle

November 5, 2021

Perkins&Will

## Introductions



**Tony Layne**

AIA, LEED AP

**Project Principal**



**Eric West**

AIA, LEED AP,  
Fitwel Ambassador

**Project Manager**



**Greg Kingsley**

PhD, PE

**Structural Engineer**



**Anne Smith**

CID, IIDA

**Interior Project  
Designer**



**Doug Pierce**

AIA, LEED Fellow,  
RELi AP

**Project Architect**

# Agenda

01.

Team

02.

Innovation  
& Workplace

03.

Approach

04.

Napkin Sketches

05.

Q&A



# “Doing Well by Doing Good”

— Measurement Technology Laboratories

**“We shape our buildings;  
Thereafter they shape us.”**

— Sir Winston Churchill

# Let's set the bar for innovative, healthy, sustainable, 21<sup>st</sup> century space!

- Mass Timber
- Sustainability
- Regulatory Overlay

Framehouse →



# Team

# Perkins&Will

## Areas of Practice —

Workplace

Change Management

Civic

Cultural

Health

Higher Education

Hospitality

K-12 Education

Medical Education

Science and Technology

Sports and Recreation

Urban Design

Local Studio  
World Lab  
2,300+ professionals

**95 Brands that Matter, 2021**  
*FastCompany*

**#2 Architecture Firm, 2020**  
*Architectural Record and Interior Design Magazine*

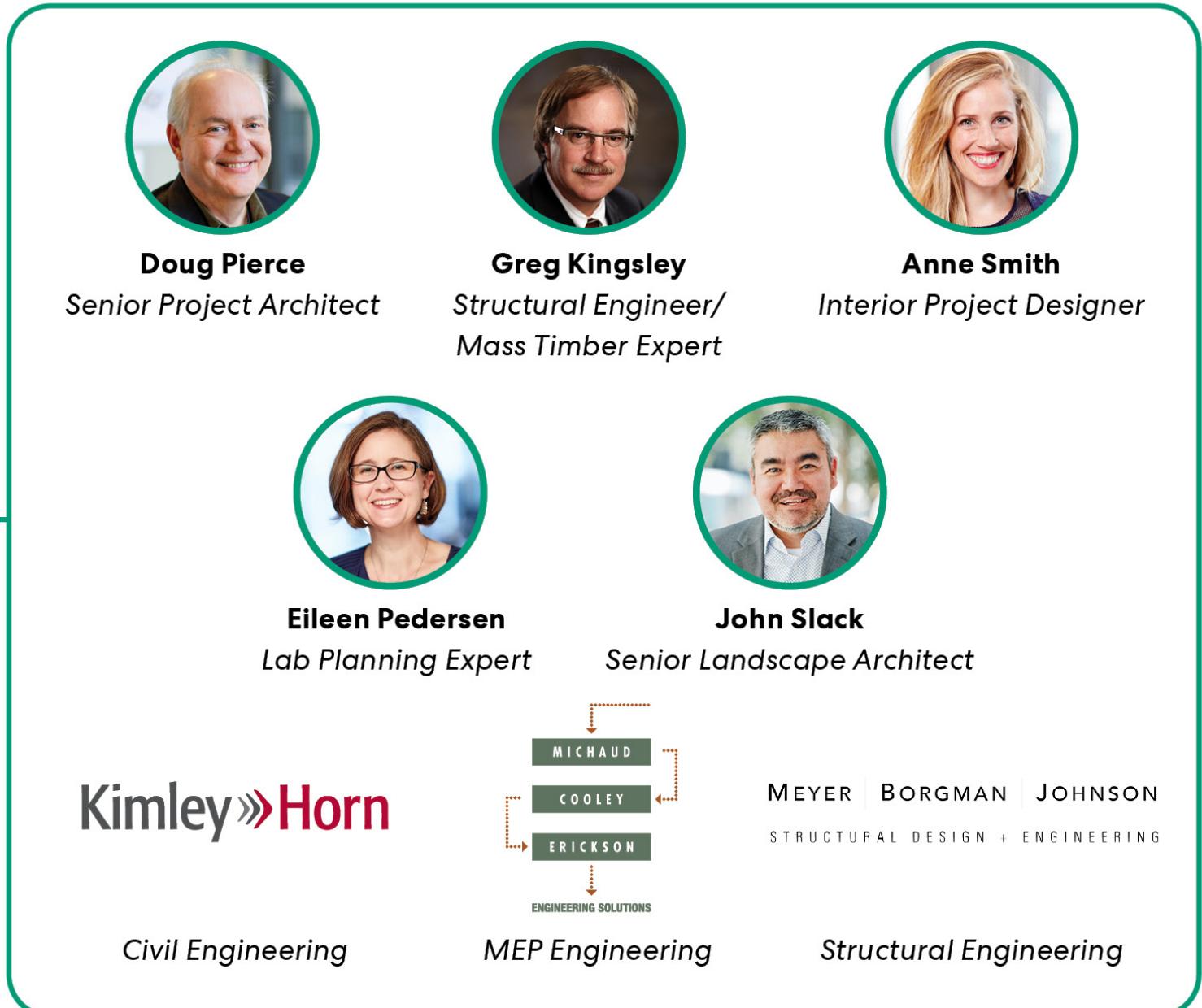
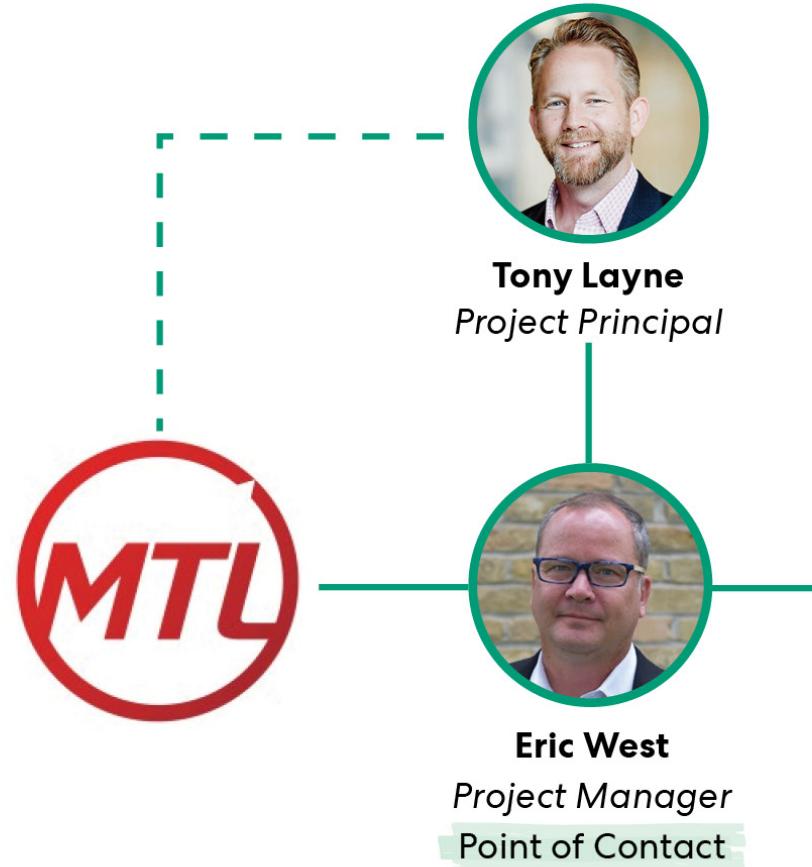
**Firm Award, 2019**  
*AIA Minnesota*

**Most Innovative Companies in Architecture, 2018**  
*FastCompany*



Perkins&Will's Minneapolis Studio

## Team Organization





**Eric West**

AIA, LEED AP,  
Fitwel Ambassador

**Project Manager**

**Single Point of Contact**





**Greg Kingsley**  
PhD, PE

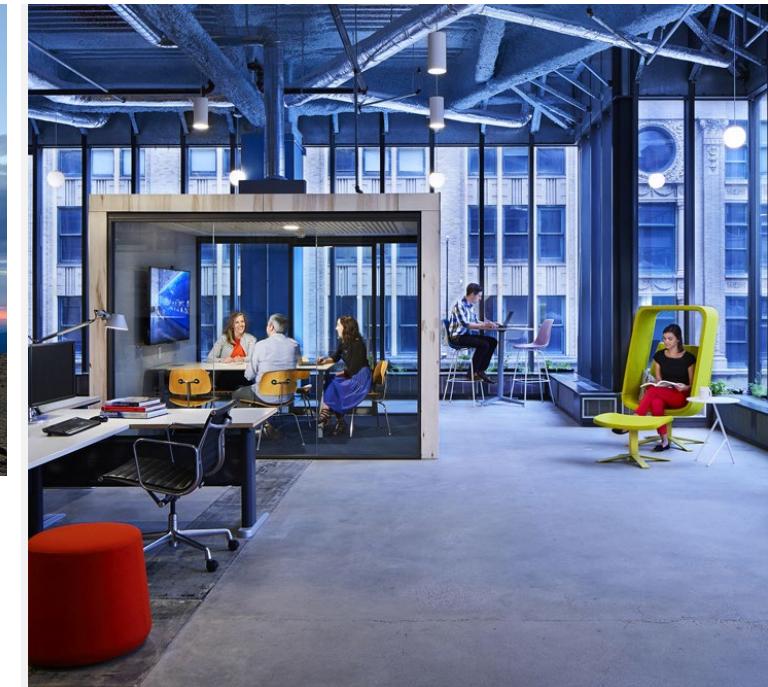
**Mass Timber Expert &  
Structural Engineer**





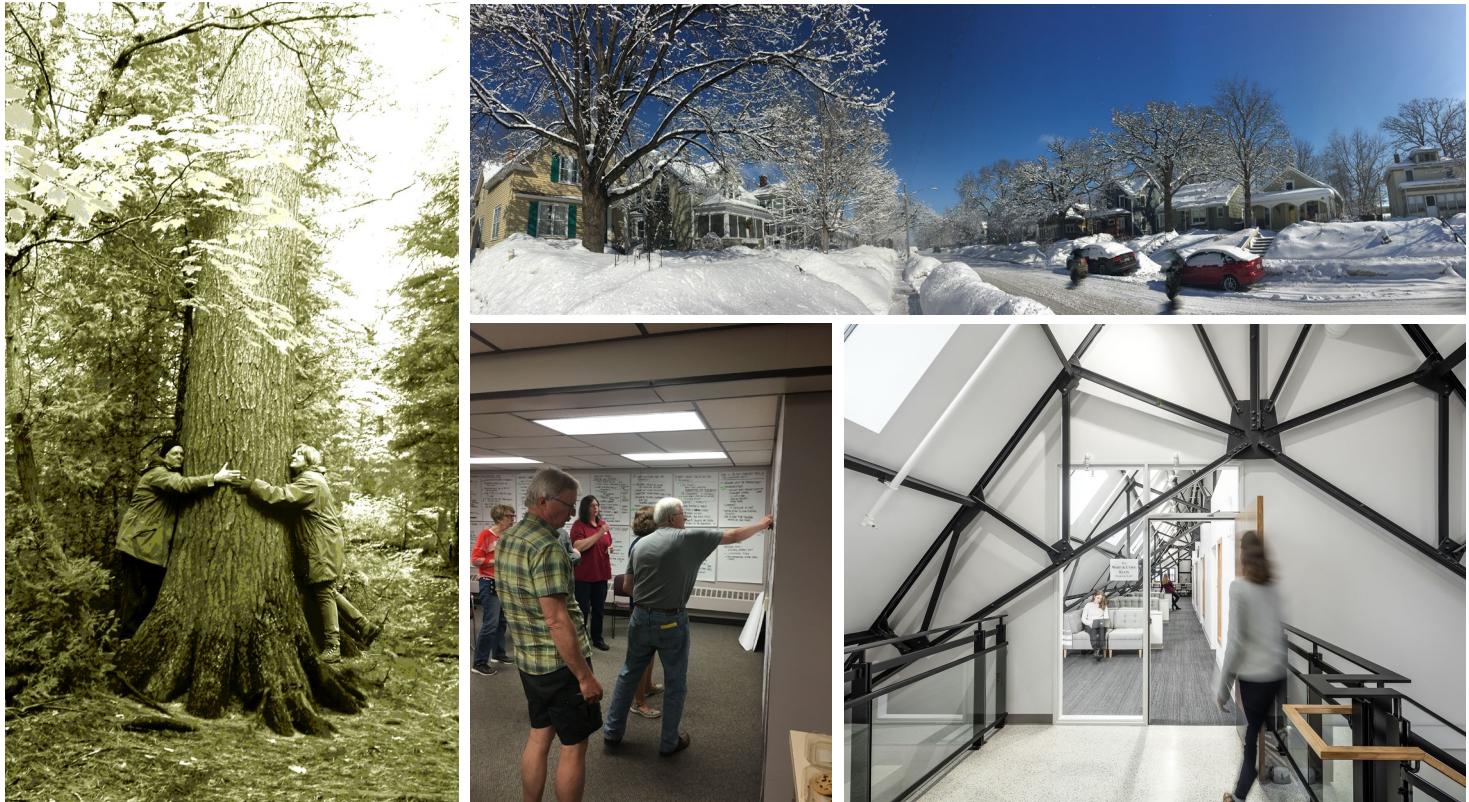
**Anne Smith**  
CID, IIDA

**Interior Project Designer**





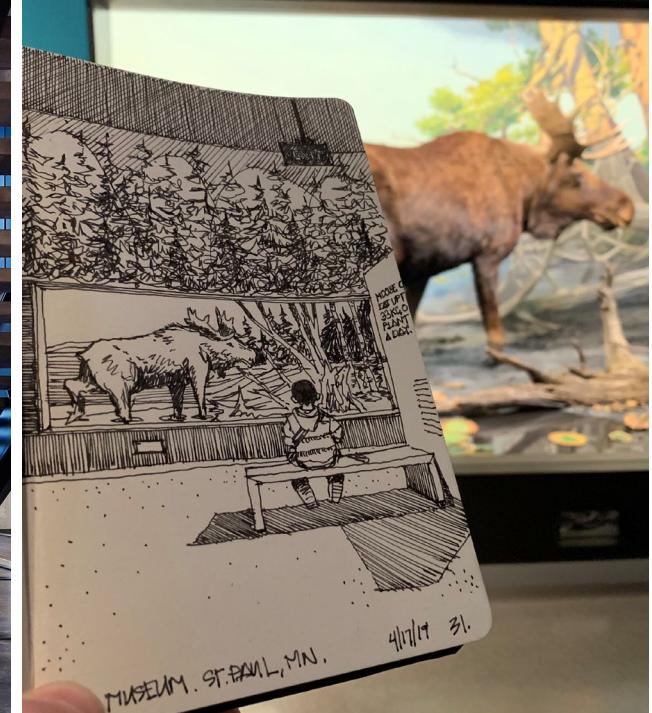
**Doug Pierce**  
AIA, LEED Fellow, RELi AP  
**Project Architect**





**Tony Layne**  
AIA, LEED AP

**Project Principal**

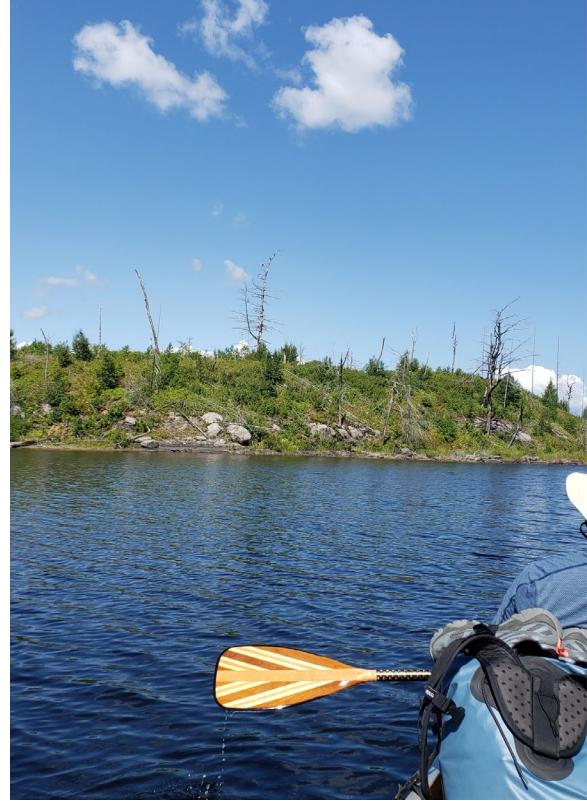




**John Slack**

PLA, OALA, ASLA, LEED AP  
ND, RELi AP

**Landscape Architect  
and Urban Planner**





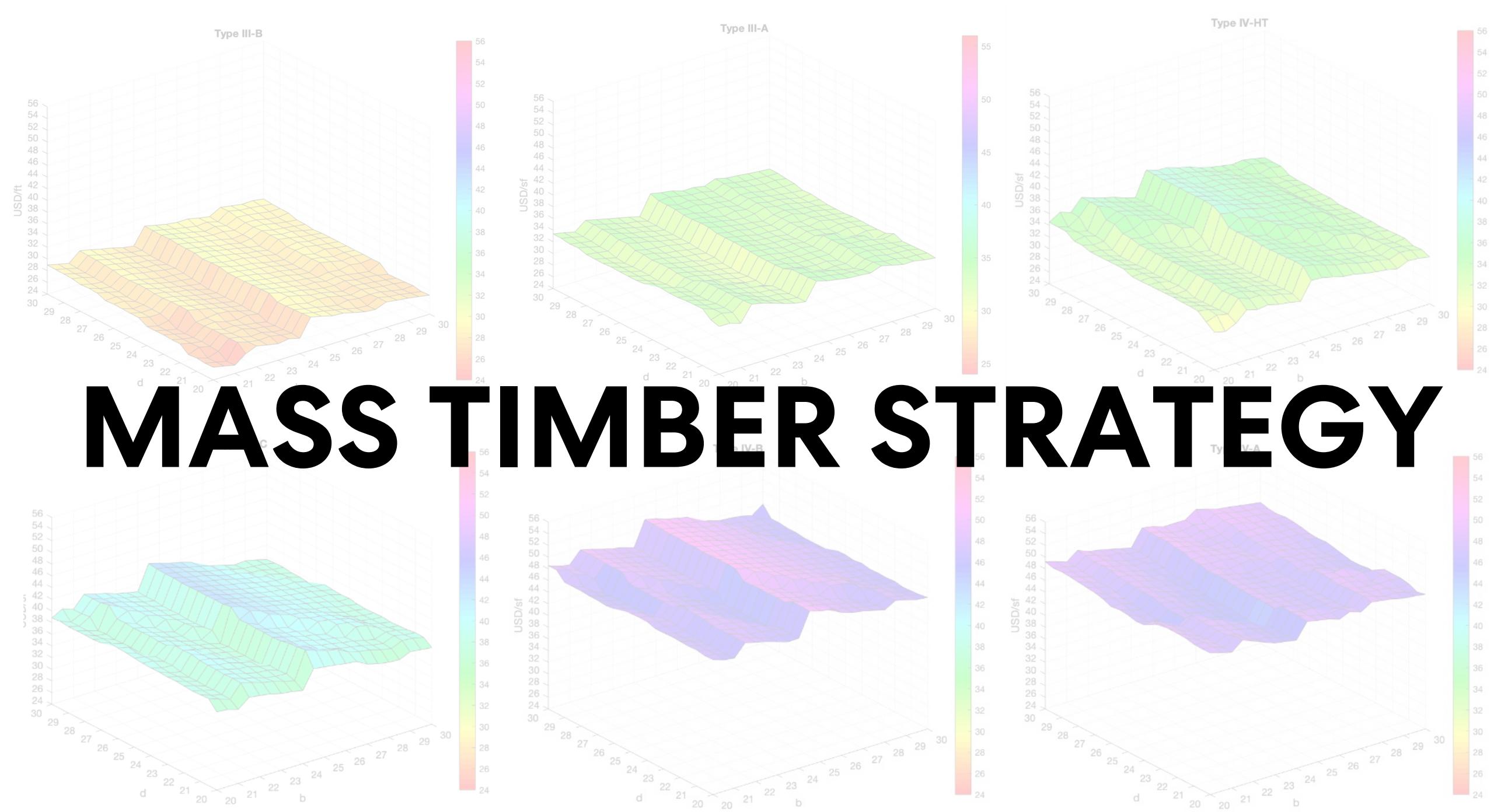
**Eileen Pedersen**  
AIA, LEED AP BD+C

**Senior Lab Planner**



**Partner early with key contributors  
and create a shared goal.**

# Innovation & Workplace



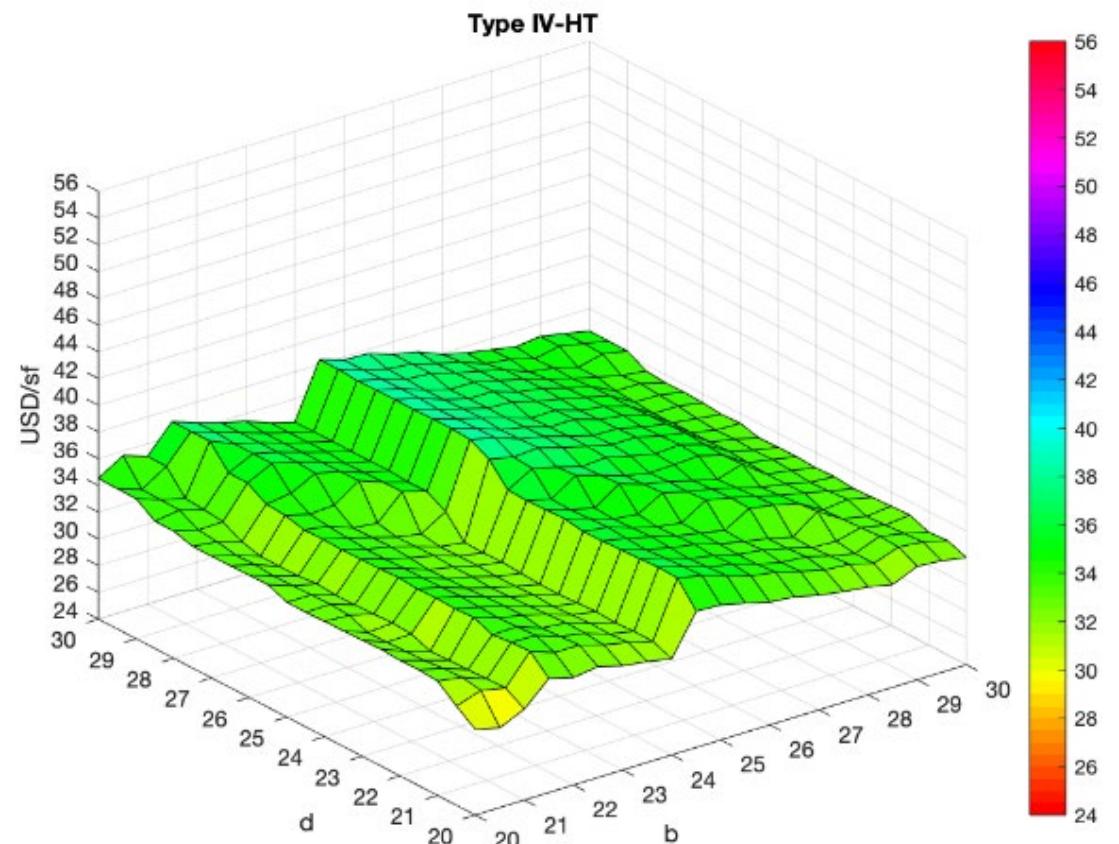
## Mass Timber Cost Optimization

1. Minimize wood fiber (material cost)
2. Minimize connection material and cost
3. Design for manufacturing and assembly (DFMA)
4. Design for speed of construction
5. Design for MEP systems early



## Mass Timber Cost Optimization

1. **Minimize wood fiber (material cost)**
2. Minimize connection material and cost
3. Design for manufacturing and assembly (DFMA)
4. Design for speed of construction
5. Design for MEP systems early



## Index of 106 connection typologies by KL&A

### Mass Timber Cost Optimization

1. Minimize wood fiber (material cost)

2. **Minimize connection material and cost**

3. Design for manufacturing and assembly (DFMA)

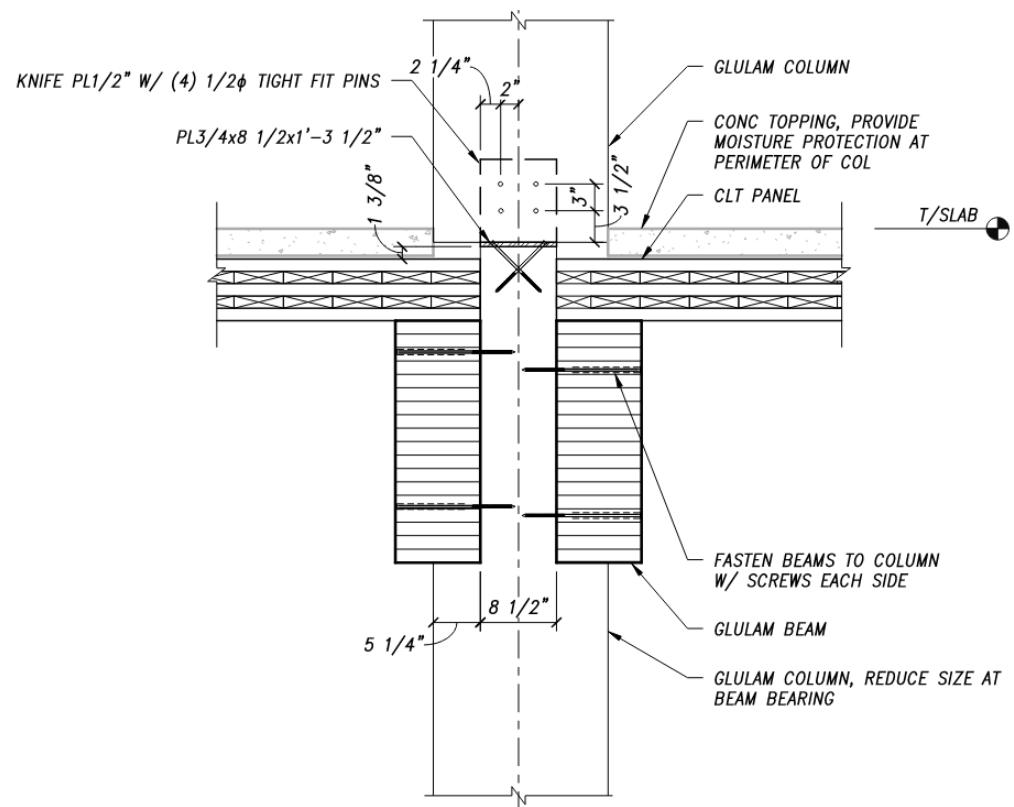
4. Design for speed of construction

5. Design for MEP systems early

### WoodWorks Index of Mass Timber Connections

This index is a compilation of connections used in mass timber construction. Mass timber elements are solid wood pieces with inherent fire resistance due to their mass, as defined in the 2021 International Building Code (IBC). Examples of mass timber include but are not limited to cross-laminated timber (CLT), dovetail-laminated timber (DLT), nail-laminated timber (NLT), glue-laminated timber (GLT), mass plywood panels (MPP), and structural composite lumber (SCL) products such as laminated veneer lumber (LVL) and laminated strand lumber (LSL). Mass timber can be used as structural floors, roofs, walls, columns and/or beams. The examples in this index illustrate a broad spectrum of connections for use in mass timber construction. Depending on the unique constraints of each project, the connection choice made by the designer may be influenced by aesthetics, load carrying capacity, fire-rating requirements, quality assurance requirements, cost and/or constructability. The purpose of the index is to facilitate the designer's selection of project-appropriate connections.

The index includes structural and architectural connections created for WoodWorks by **KL&A Engineers & Builders** and **Oz Architecture** in cooperation with **Swinerton Builders**. For information on these firms and their mass timber projects, follow the links above to view their profiles on the WoodWorks Innovation Network.

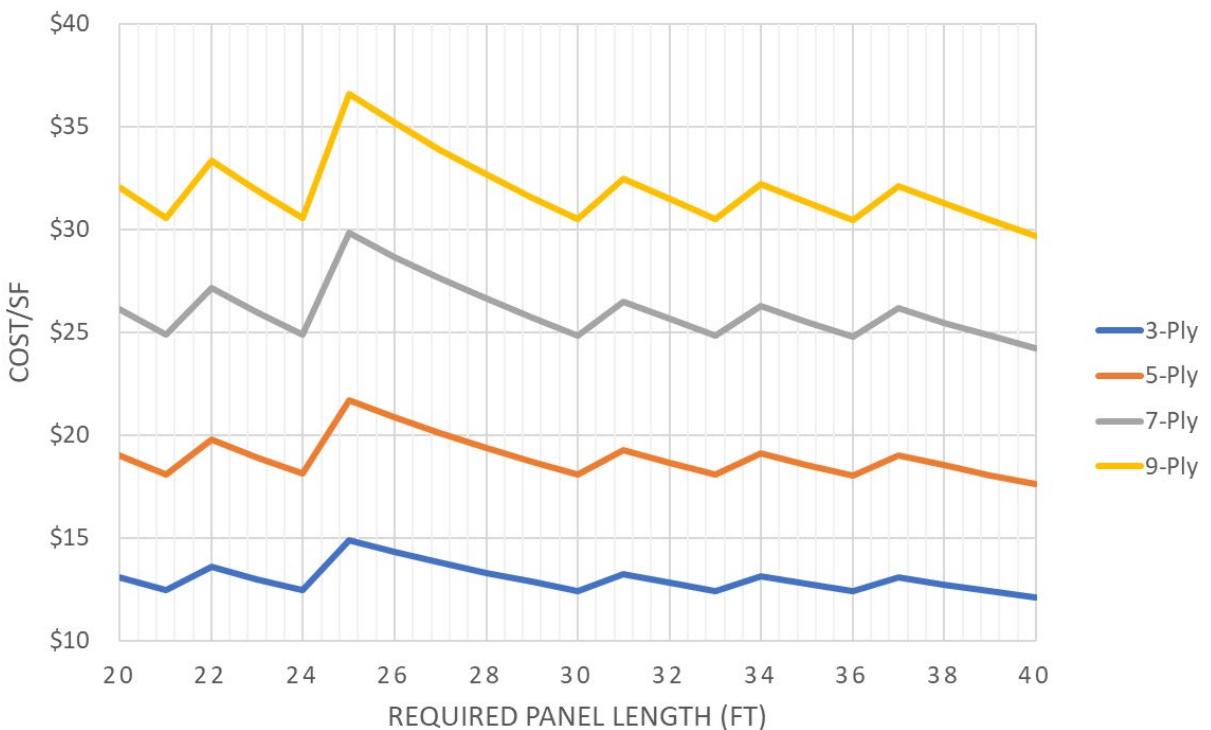


## Mass Timber Cost Optimization

1. Minimize wood fiber (material cost)
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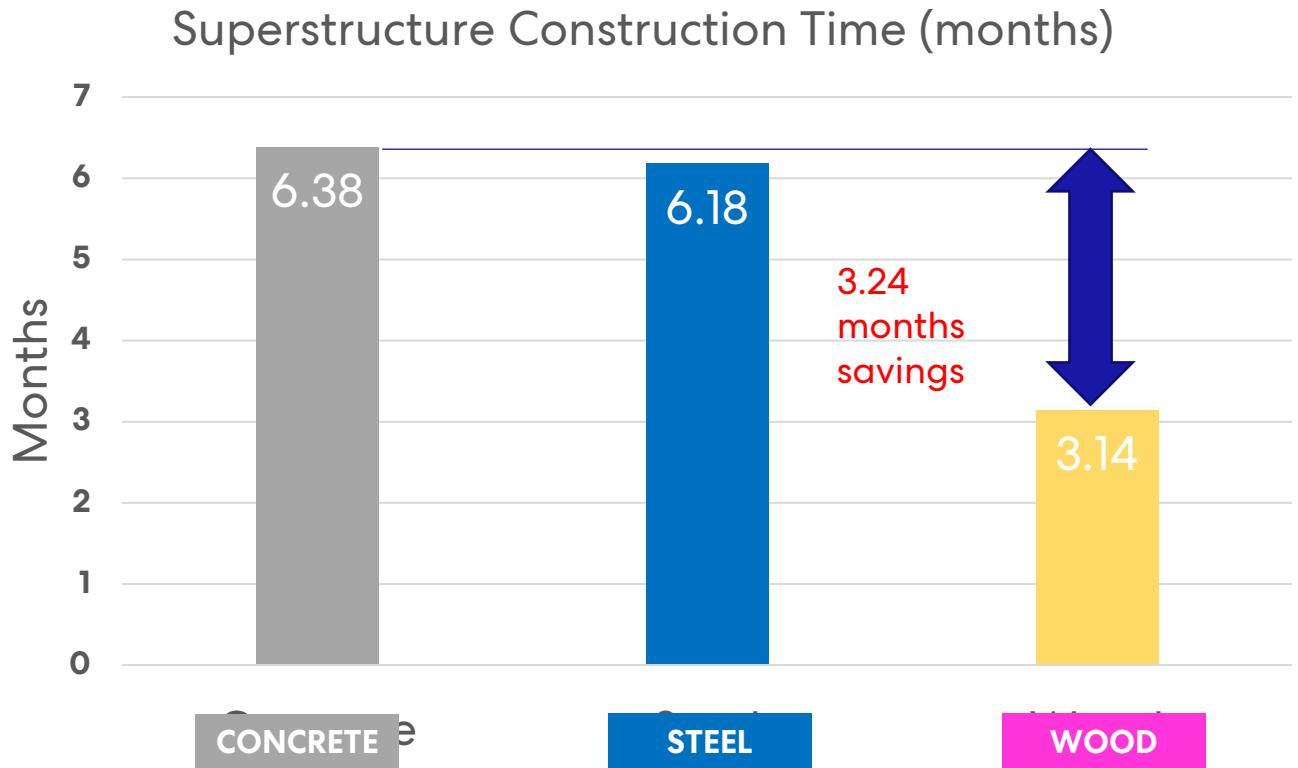
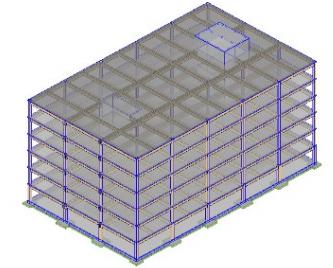


Effect of required length vs pressed length for CLT



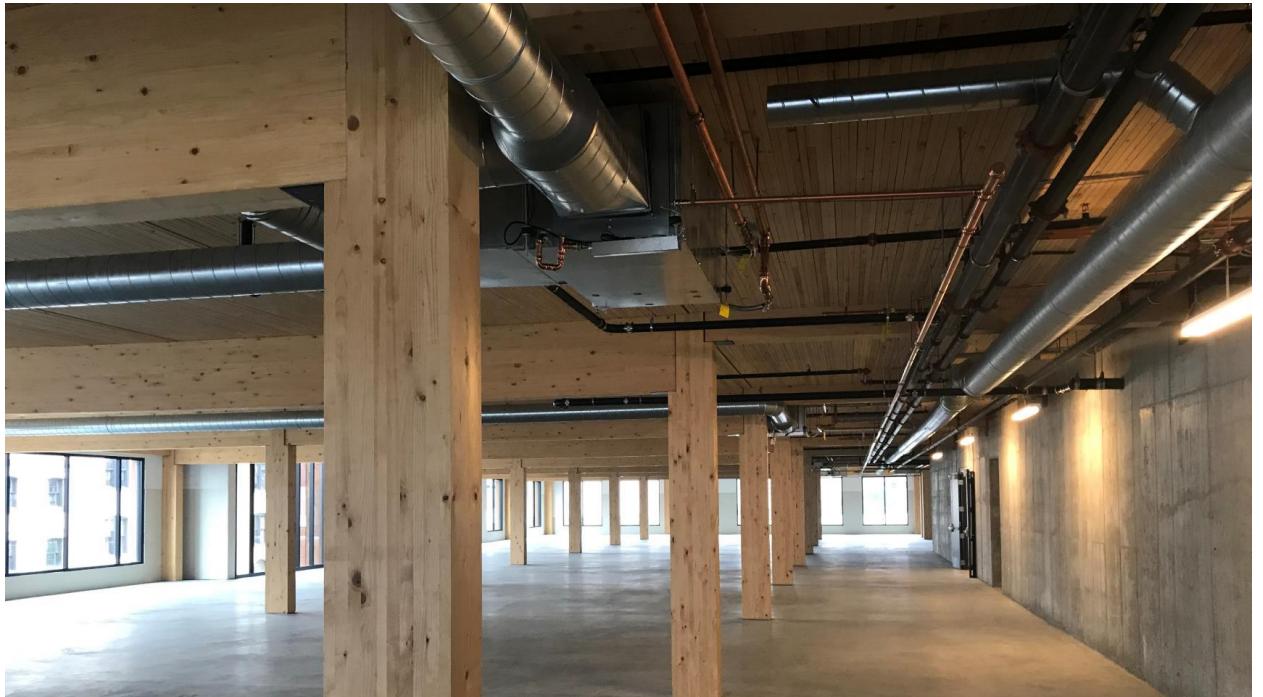
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## Mass Timber Cost Optimization

1. Minimize wood fiber (material cost)
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3. Design for manufacturing and assembly (DFMA)
4. Design for speed of construction
5. **Design for MEP systems early**



# Platte 15



— Platte Fifteen, Denver, CO KL&A

Photo Credit: JC Buck

<https://info.thinkwood.com/platte-fifteen-life-cycle-assessment>



## Platte Fifteen Life Cycle Assessment

JULY 2021



Platte Fifteen | O'Brien Architecture  
Photo courtesy: JC Buck

### Authors

KL&A Engineers and Builders  
Adolfson & Peterson



# Life Cycle Assessment: Platte 15

# A Carbon Marketplace for Buildings

*x* aureus  
earth

Building Project



Corporate  
Buyer



# Carbon Credits

# Platte 15



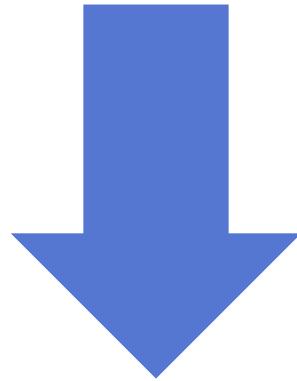
# Platte 15



# Platte 15



**Bring on trade partners as soon as  
you are comfortable.**



**Operational Efficiency**

**\$700,000 / year**

Consolidated Campus efficiencies  
(Energy, Water, Staffing and Transportation savings)

**Square Footage + Headcount**

Current State:

**380,000 SF**

**1,860 Headcount**



Future State:

**355,000 SF**

**2,356 Headcount**



**6.5% Reduction  
26.6% Increase**

**Land O'Lakes Headquarters →**



## Whole Systems Design Process Saved...

### Process

\$470,000 first cost savings

- Through testing different mechanical systems early in design. Project was able to optimize cost, annual energy savings, and operability so that best system was selected

### Incentives

\$200,000 one-time rebate to the Owner

- The project utilized Xcel's Energy Design Assistance program

### Conservation

\$150,000 annual savings

- Design of a hard-working, uncomplicated high efficiency HVAC, lighting and plumbing system

### Productivity

\$1.6 million annual savings

- Calculated from research, estimated annual productivity improvements for employees from access to views and daylight, increased ventilation & fresh air, and the use of healthier low to no-VOC materials.



**The new workplace  
is human centric.**

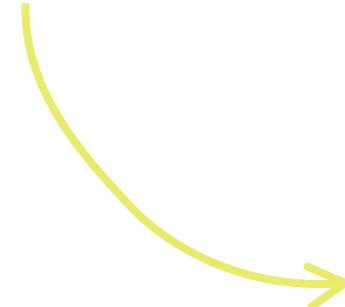


**It's about creating an  
experience-driven,  
resilient workplace.**

**It's about a place  
people *want* to be.**



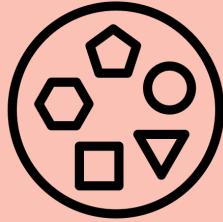
**A dynamic and responsive environment that engages the physical, emotional, intellectual, and aspirational elements of work.**



# Story of the Future



**Engaged in  
community**



**Inclusive**



**Flexible**



**Healthy**



**Sustainable**

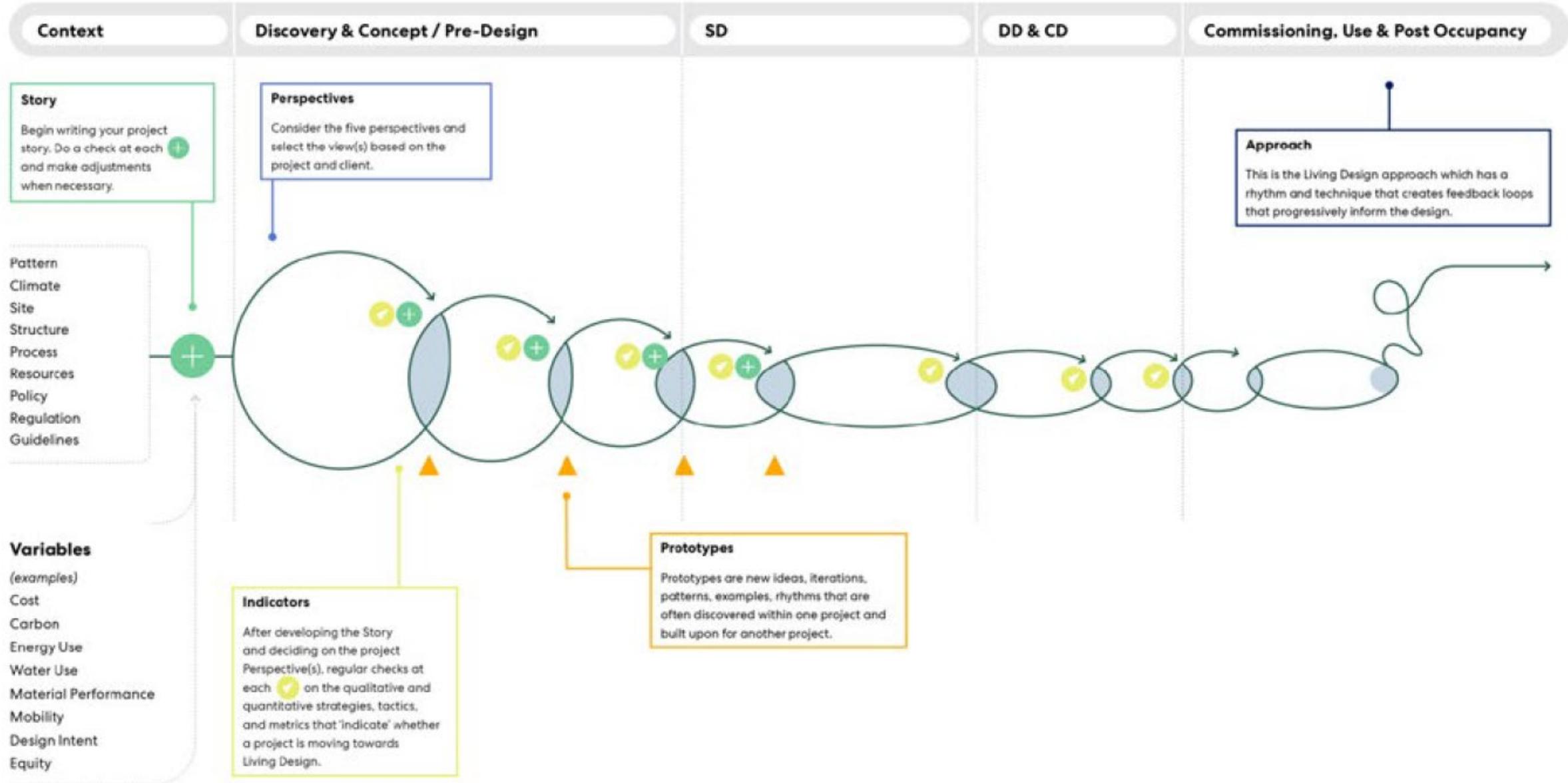


**Resilient**

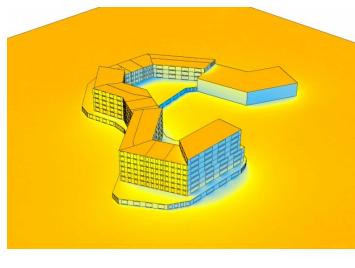
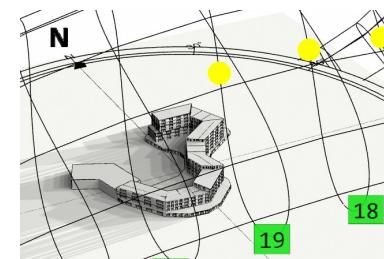
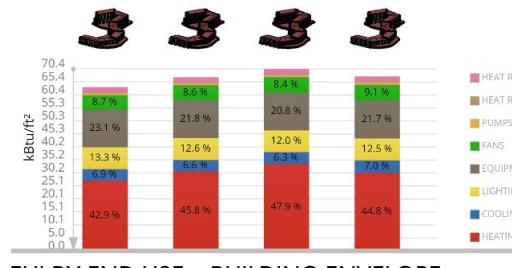
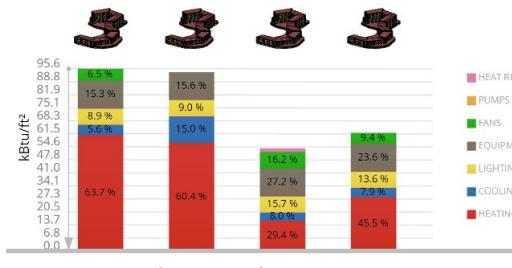
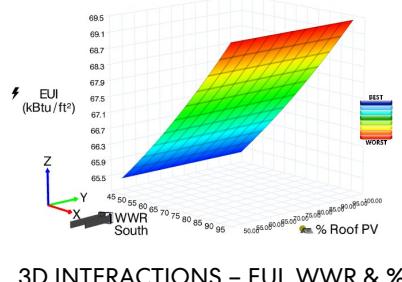
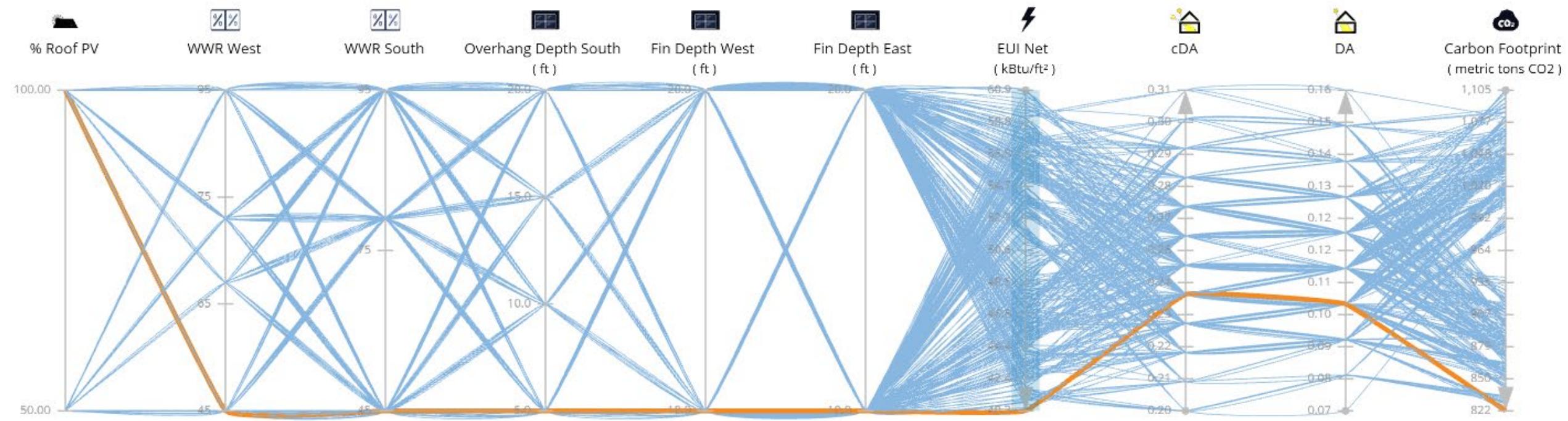
Create an environment that engages  
the whole person.

# Approach

# Living Design - Project Approach



# SPEED - Simulation Platform for Energy Efficient Design



# LEED Cost Analysis

Whole Systems Life Cycle Economic Analysis



Payback Scenarios		Operations	Productivity 1.5% / Yr	Outreach	Externalities	TOTAL
<b>Baseline</b>	1 yr	\$140,110	\$1,607,001	\$181,000	\$584,000	<b>\$2,521,111</b>
<b>Private - Owner Occupied</b>	3 yrs	\$433,066	\$4,967,080	\$559,453	\$1,805,086	<b>\$7,764,684</b>
<b>Institutional / Public - Typical</b>	7 yrs	\$1,073,588	\$12,713,586	\$1,386,906	\$4,474,878	<b>\$19,648,957</b>
<b>Institutional / Public - Long</b>	10 yrs	\$1,606,204	\$20,095,918	\$2,074,962	\$6,694,906	<b>\$30,471,990</b>
Half Life Major Systems	20 yrs	\$3,764,808	\$50,015,253	\$4,863,538	\$15,692,299	\$74,335,898
<b>Full Life of Major Systems</b>	40 yrs	\$10,564,471	\$144,261,983	\$13,647,628	\$44,034,336	<b>\$212,508,417</b>

~2024

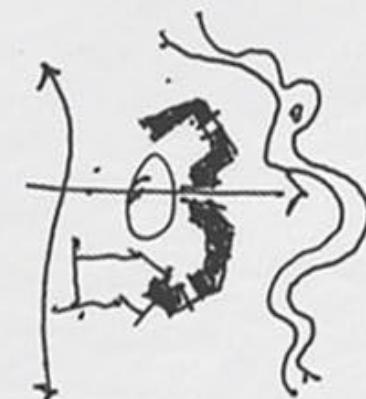
Examples:  
Dedicated Outside Air System  
LED Lighting  
Daylight Dimming

Examples:  
Increased Ventilation  
Open views  
Low-VOC materials

Examples:  
Water Conservation  
Pollinator Education

Example:  
Water Quality Value

**Take a whole systems approach to  
design and decision making.**



## MTL Project Drivers

- Mass Timber
- Sustainability
- Importance of Site
- Biophilia & Wellness
- Community & Amenities

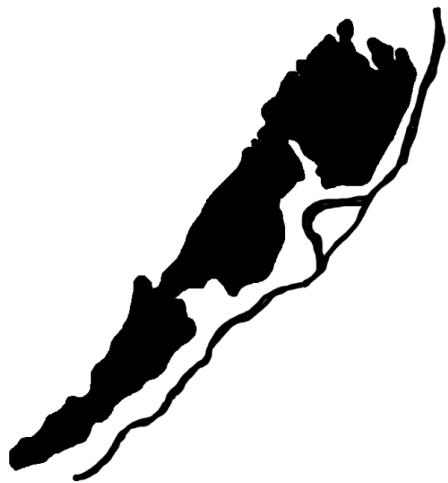
Van Dusen Botanical Gardens →



## Project Inspiration



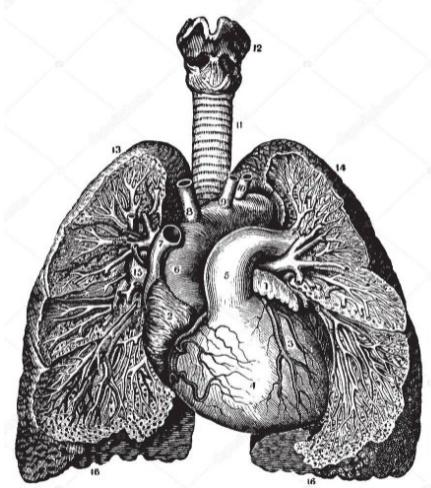
↑ MTL PT47P Filter



↑ Meadow Lake & Minnesota  
River figure ground study



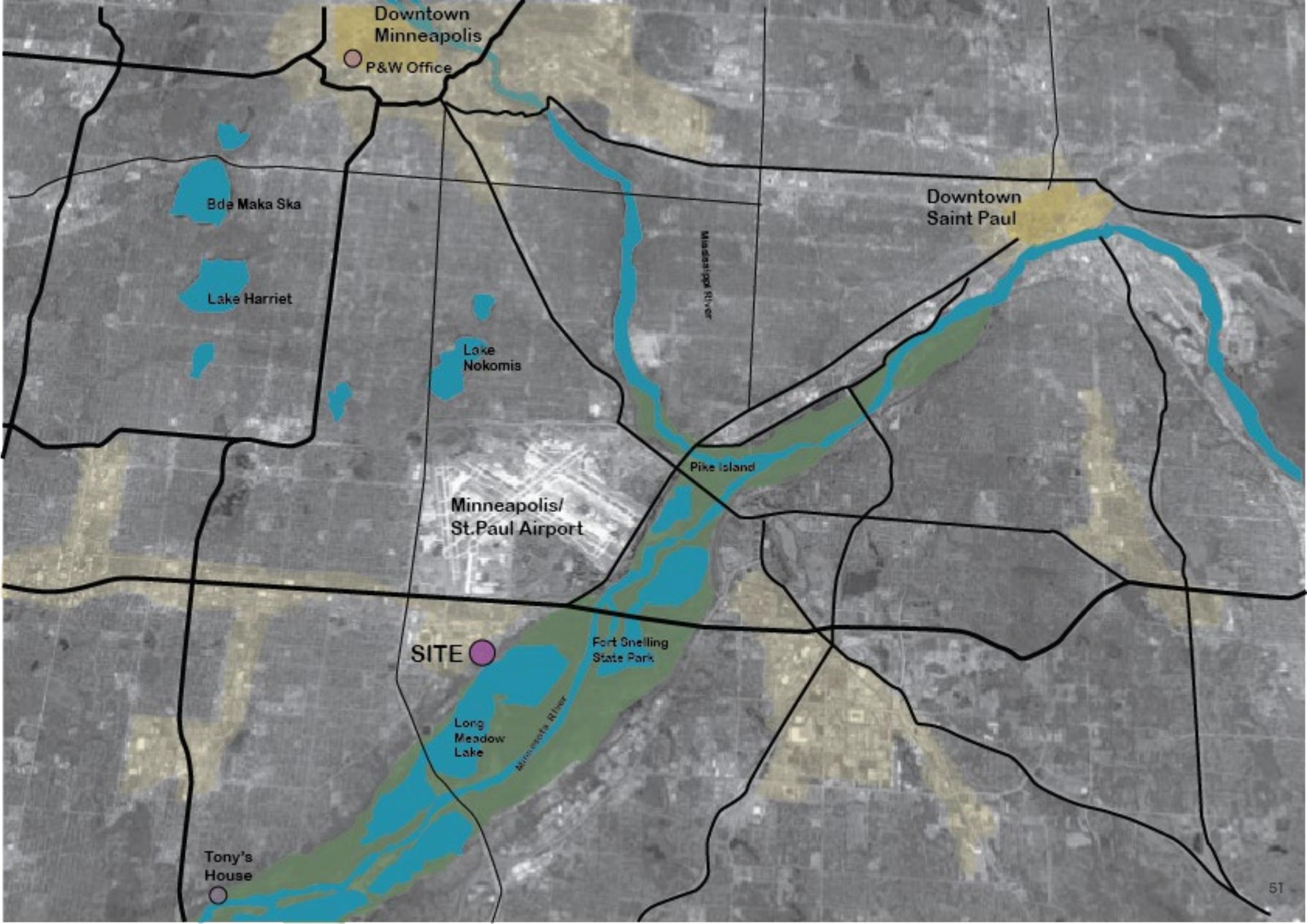
↑ Tree ring woodcut



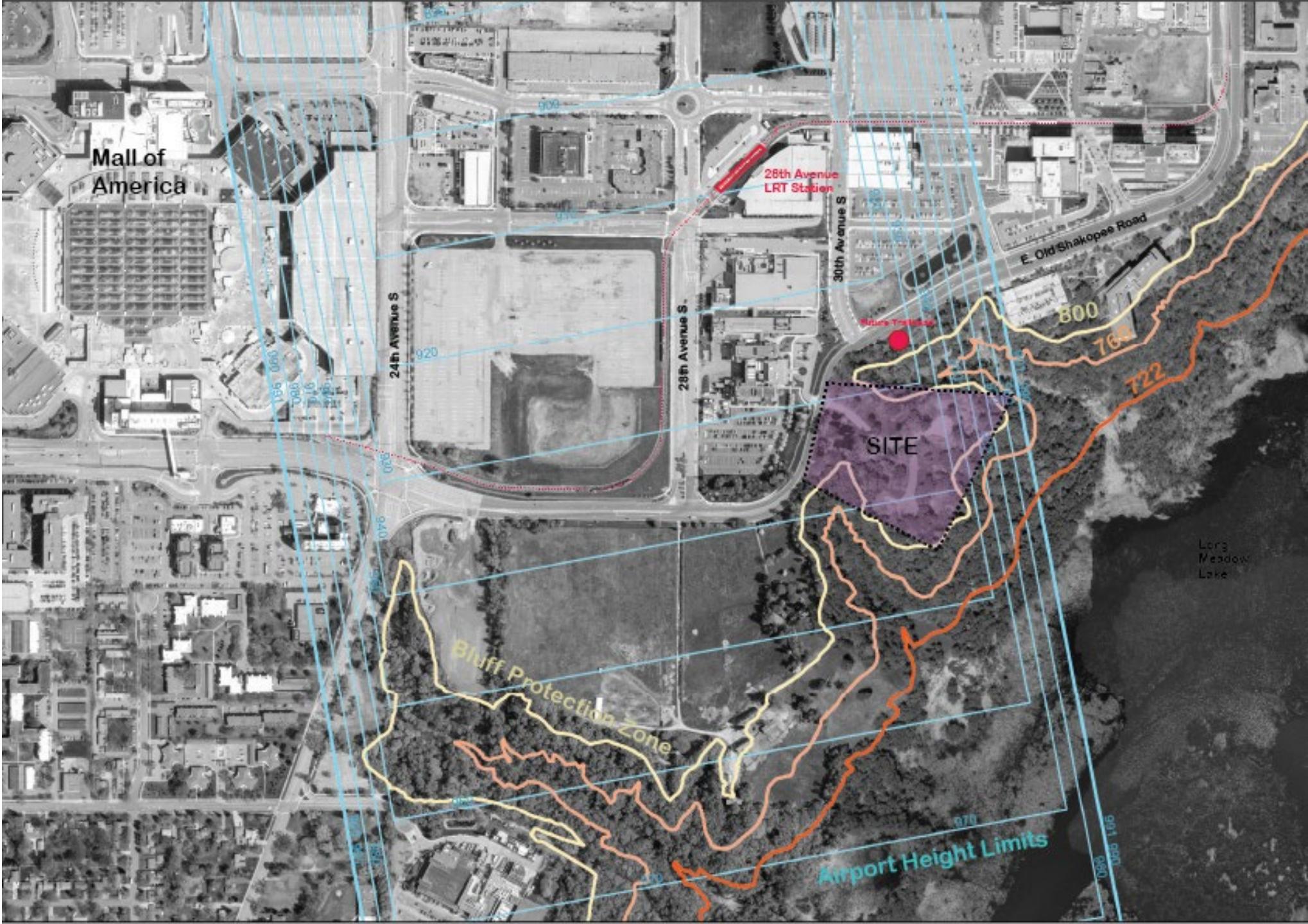
↑ View of relative position of  
the lungs to the heart

## Site Analysis

Site Analysis  
Urban Context →



## Site Analysis



## Site Analysis

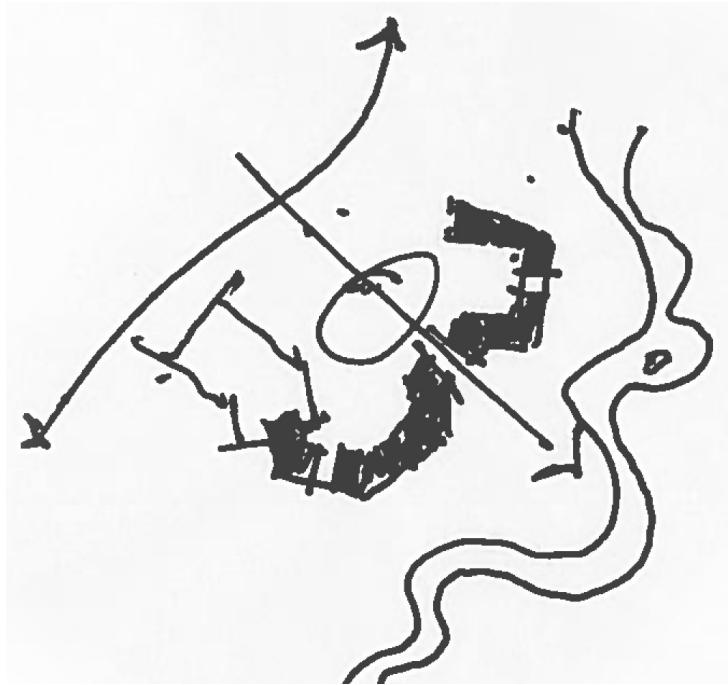


Site Analysis  
Sustainability & Ecosystems →

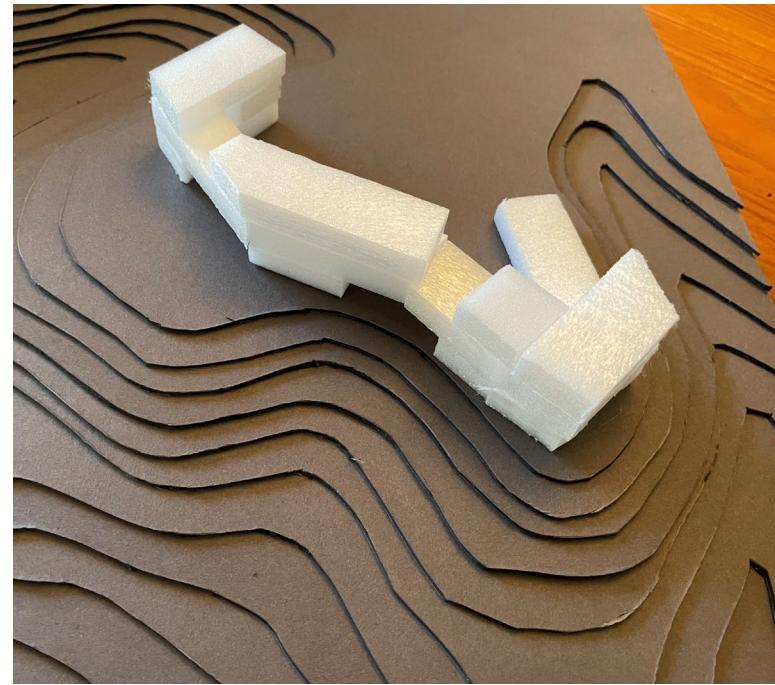
## Concept Testing

Concept Model Options →





↑ Concept Partii



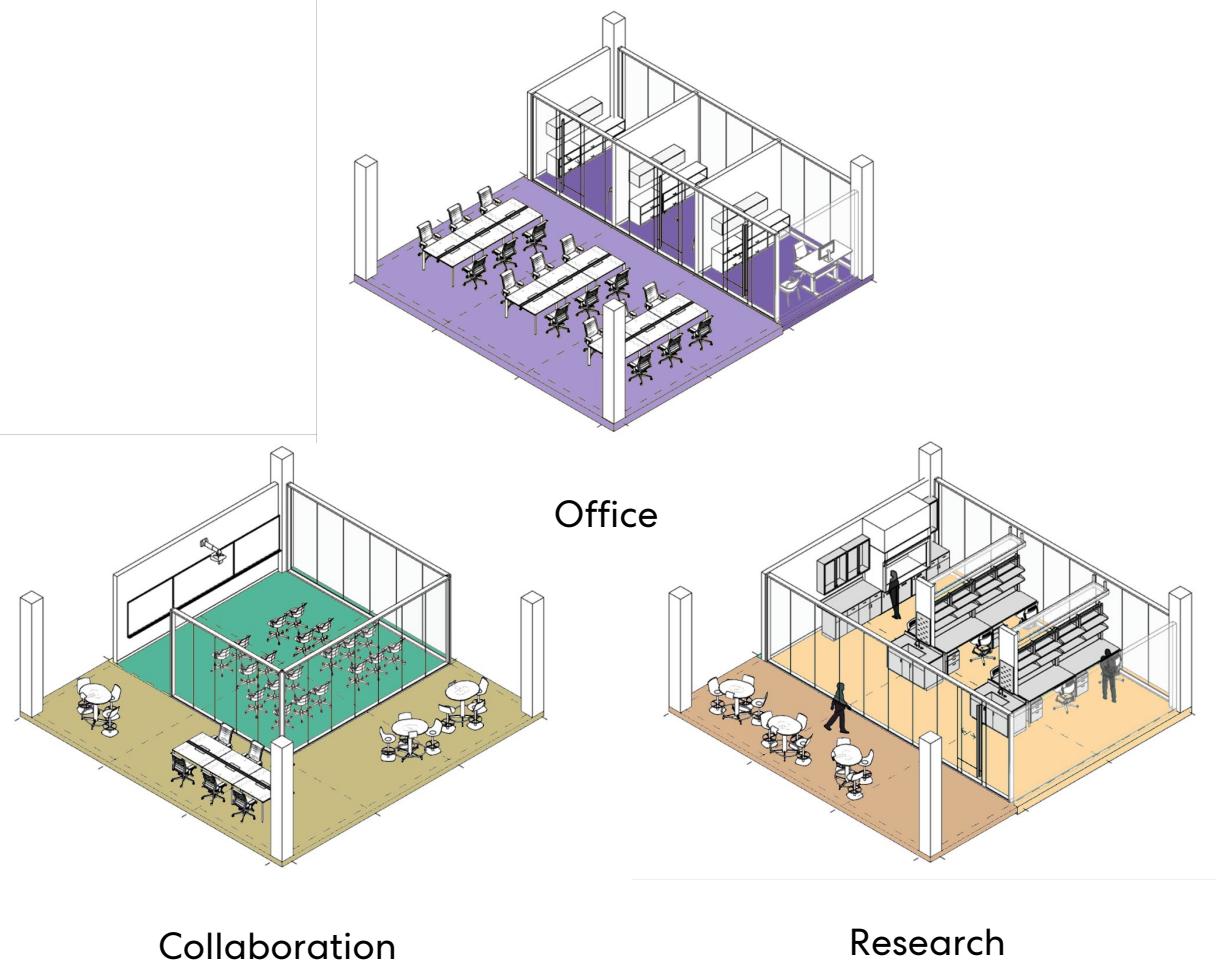
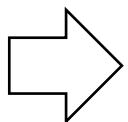
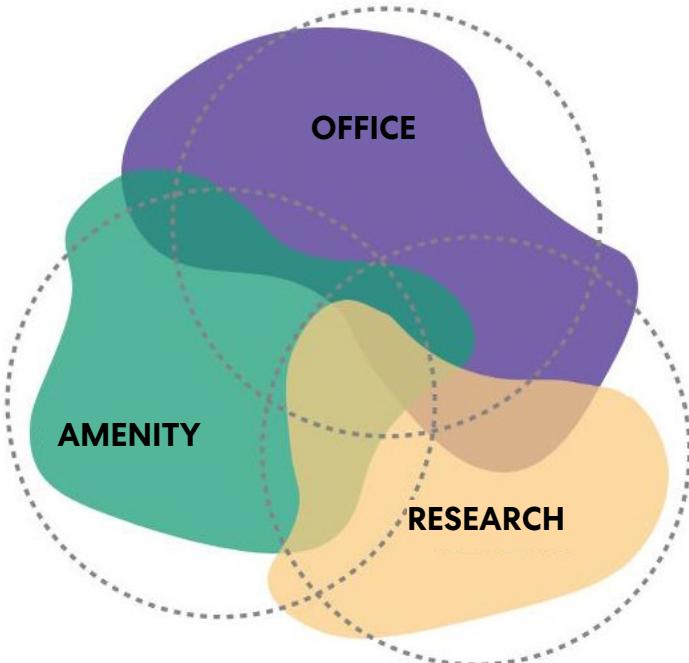
↑ Concept Massing Model

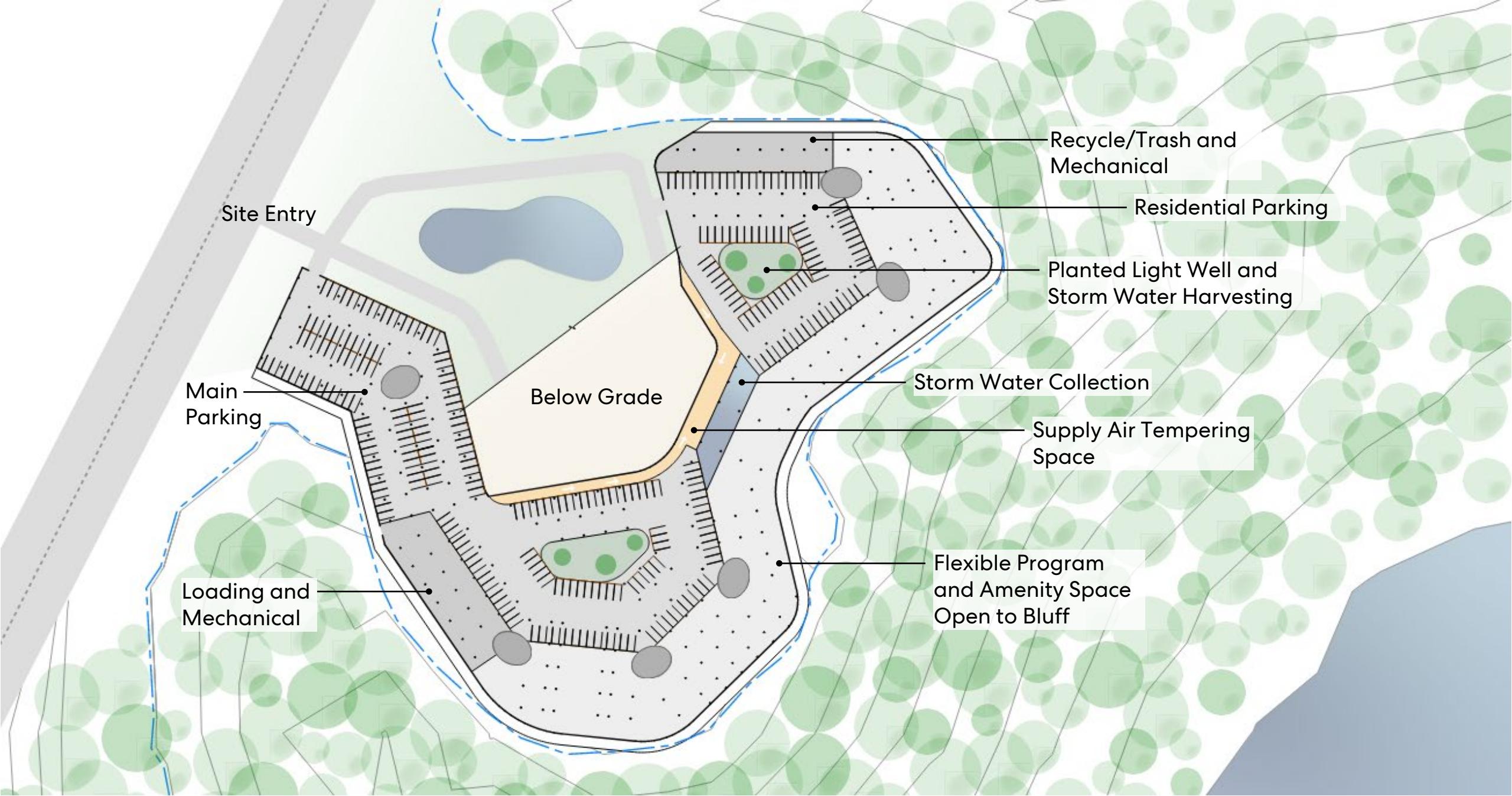


↑ Typical Level Plan

## Planning Approach

Create an adaptable framework that works with building structure and systems, and identify synergies and areas of overlap between major program elements to create an adaptable work environment.

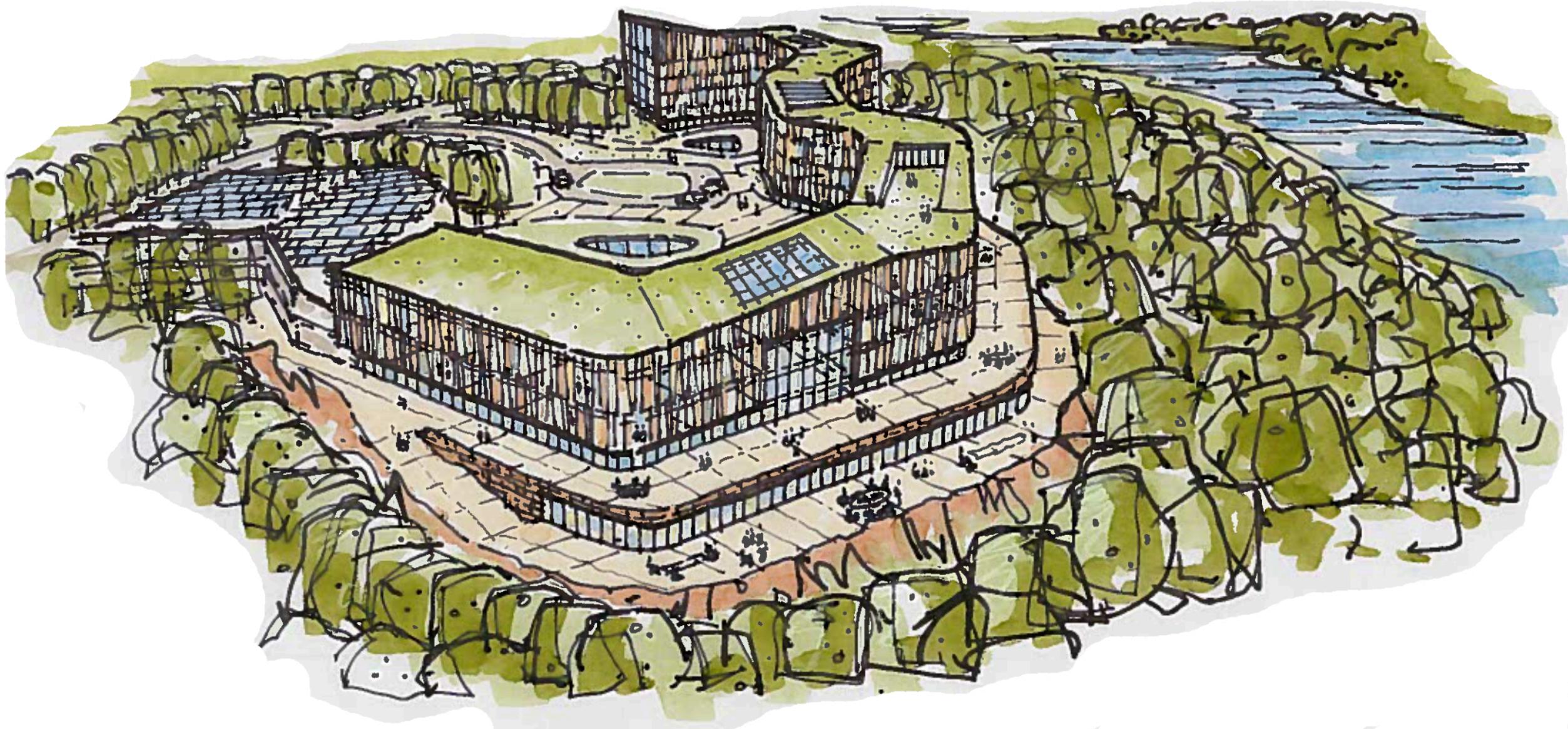




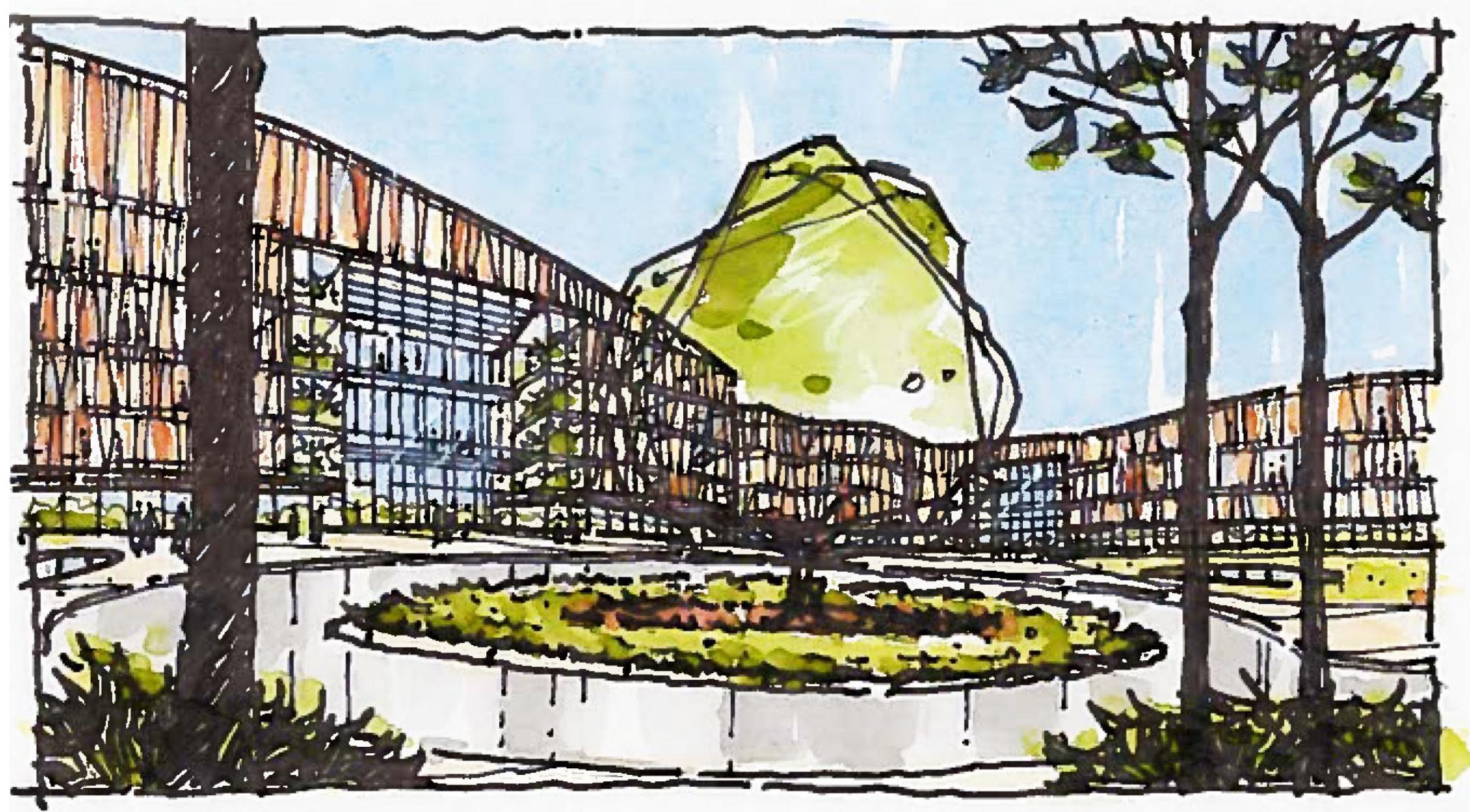
↑ Plinth Level Plan



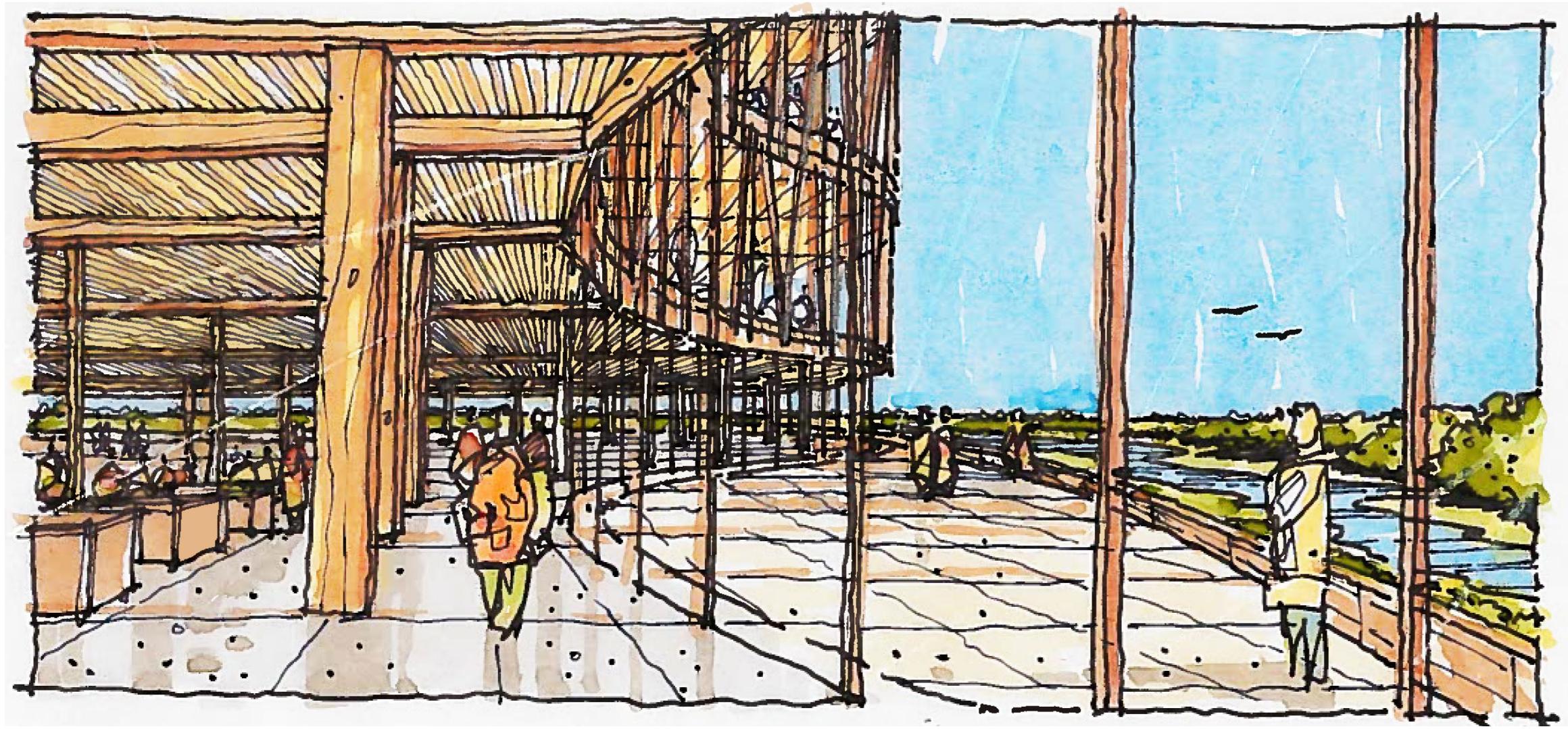
↑ South Elevation



↑ Bird's Eye View looking North

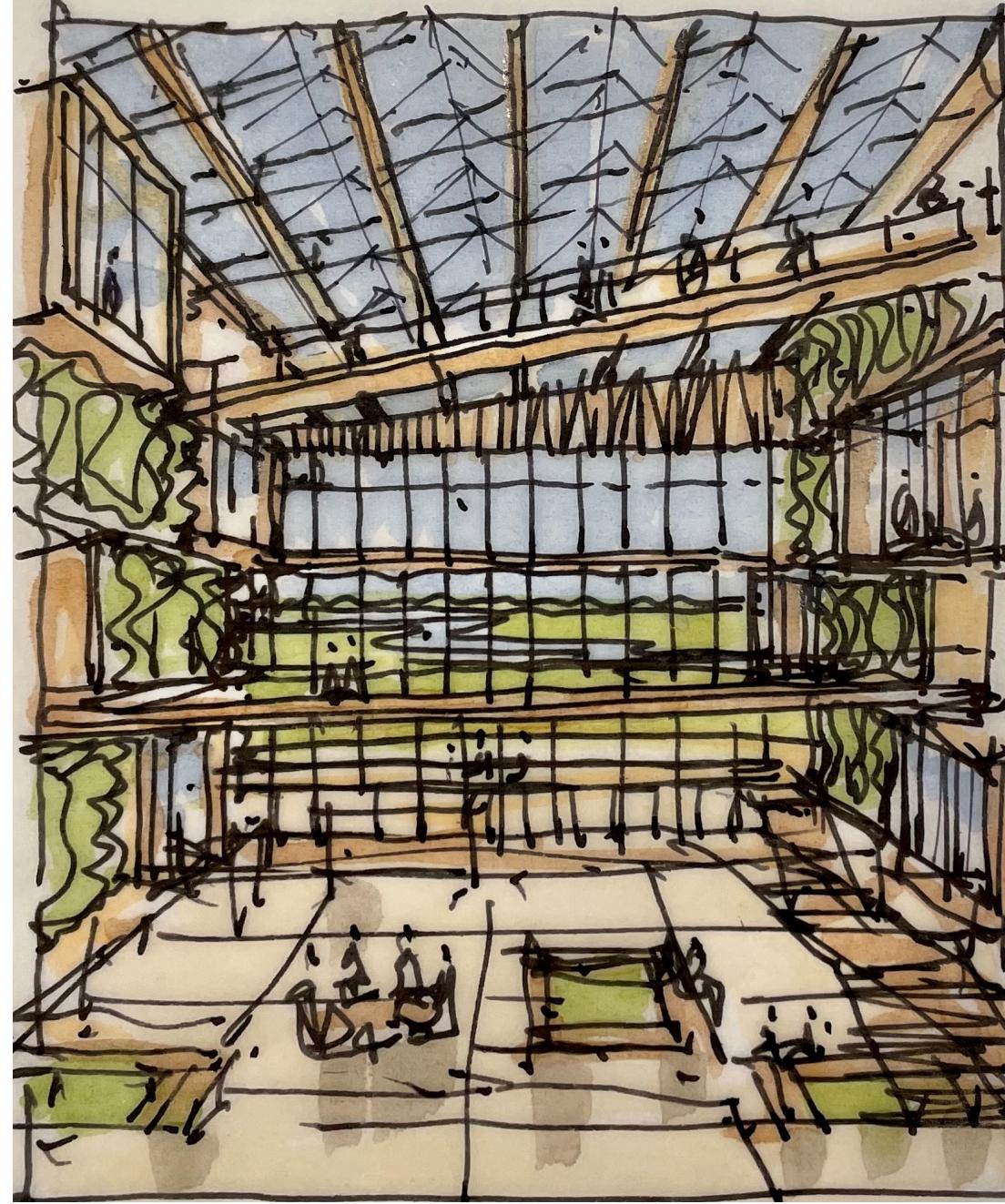


↑ Entry Perspective



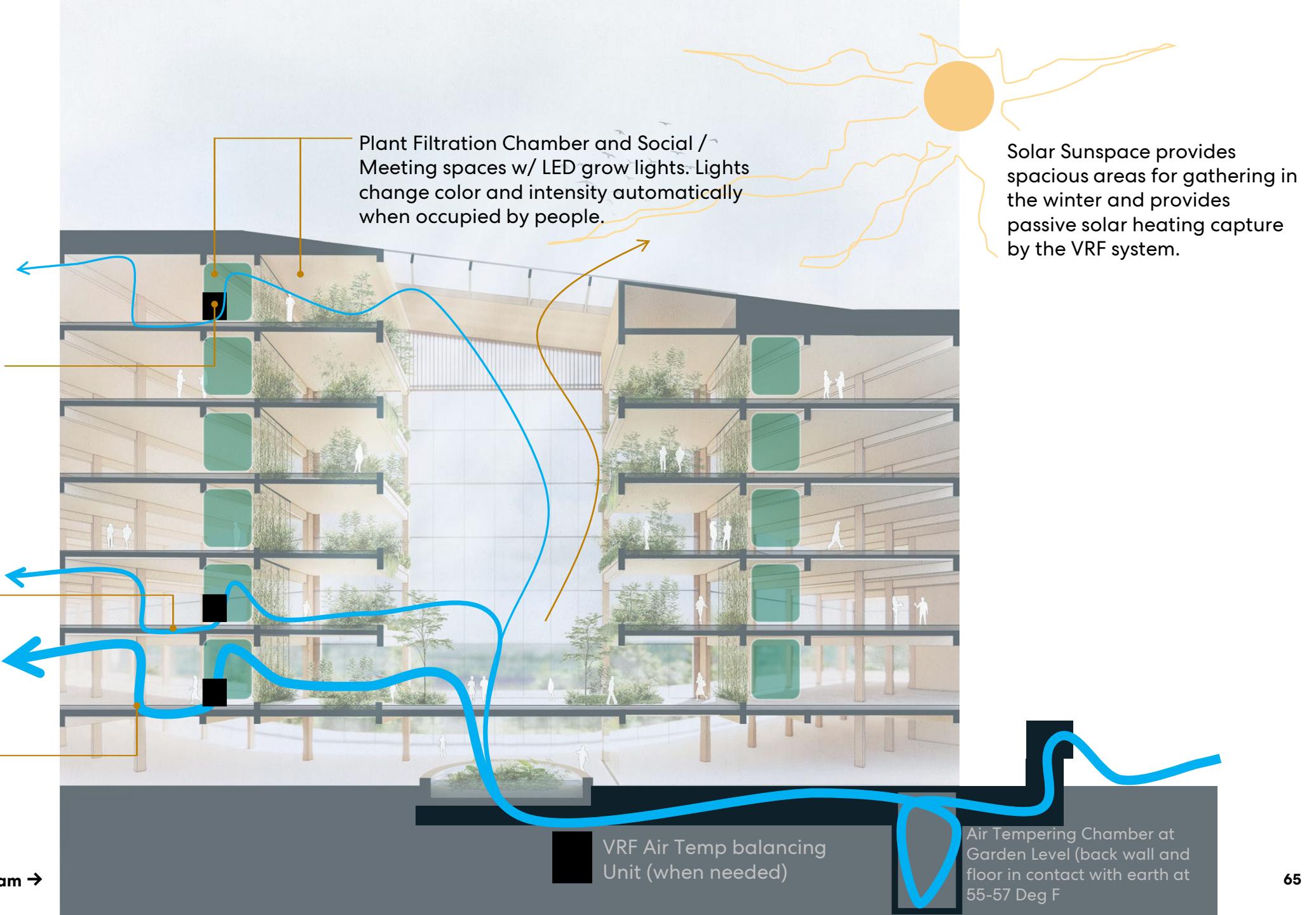
↑ Workplace Perspective at Terrace

Atrium Perspective →

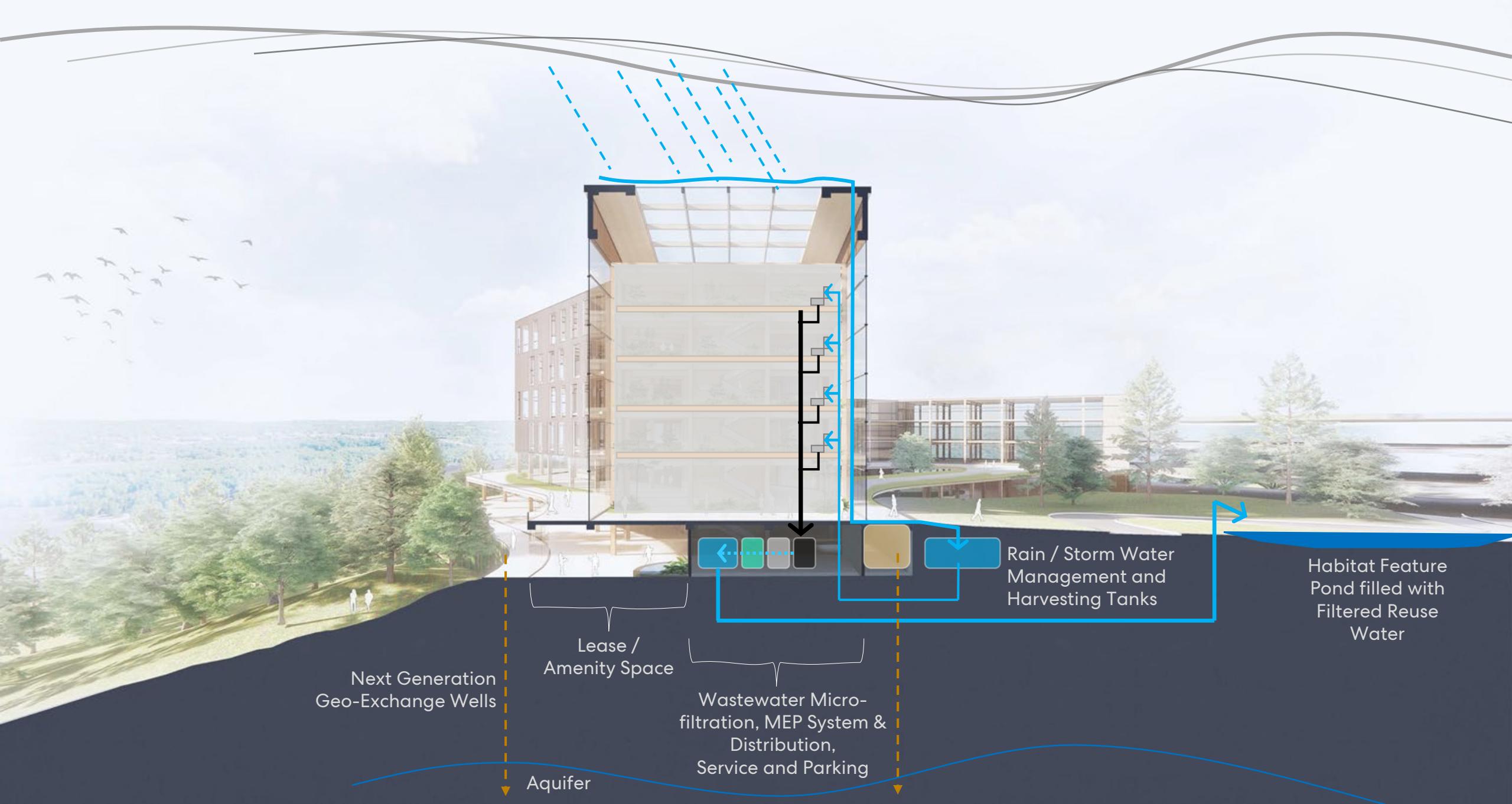




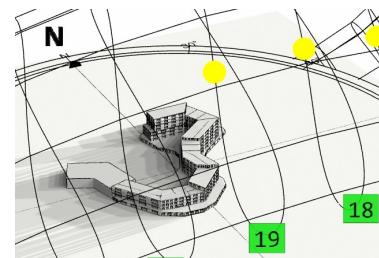
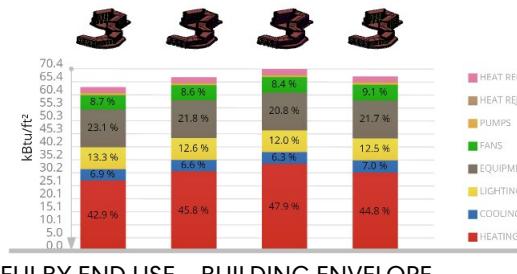
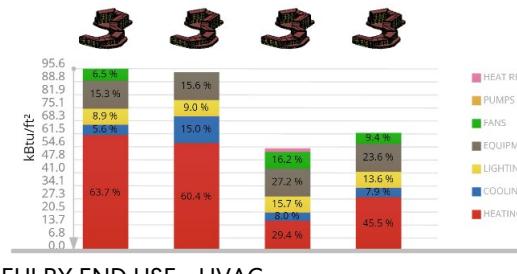
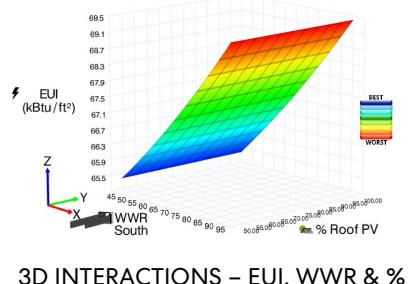
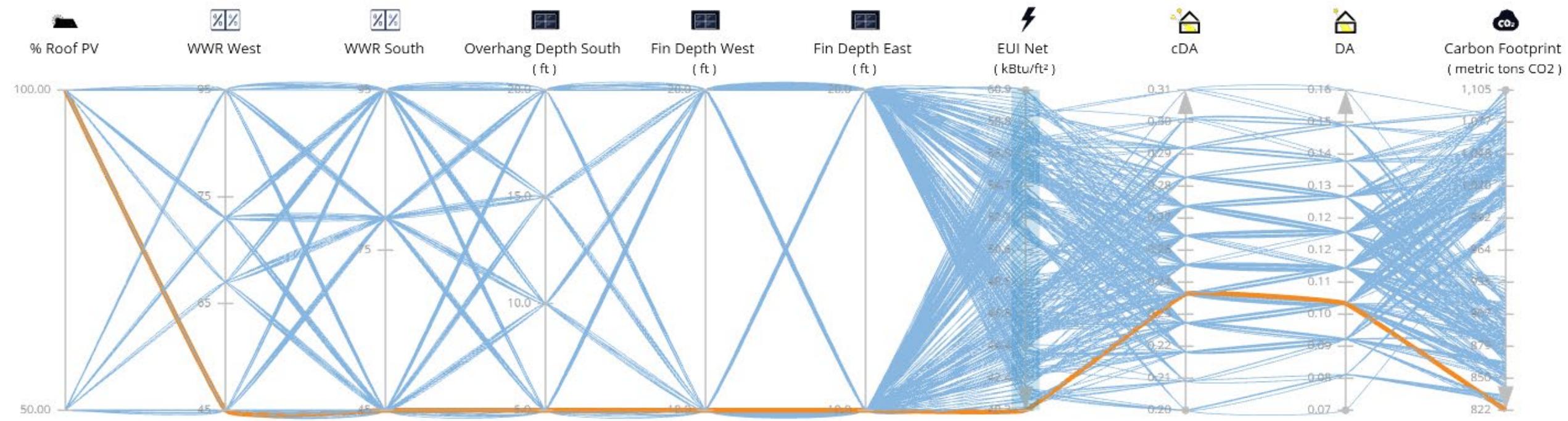
Atrium Section →







# SPEED - Simulation Platform for Energy Efficient Design



## **Basic Amenities**



**Bike Storage and Showers**



**Wellness and Mother's Rooms**



**Fitness Facilities**



**Auditorium**



**On-Site Childcare**



**Dining Options**



**Coffee Shop-Barista**



**Outdoor spaces**

## Expanded Amenity Options



**Drop in Doggie Daycare**



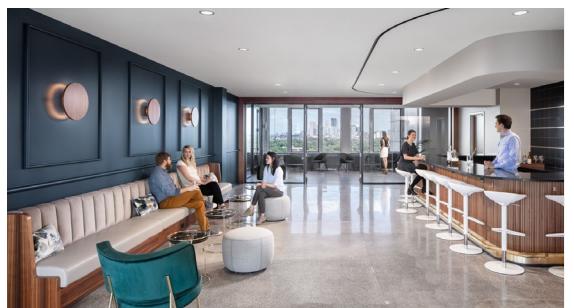
**Reservable Kitchen**



**Maker spaces**



**Music Room**



**Pub**



**Media Suite**



**Incubator / coworking**



**Bike Repair**

# Programming



**Concierge-Event Planning**



**Farmers Markets and Food truck**



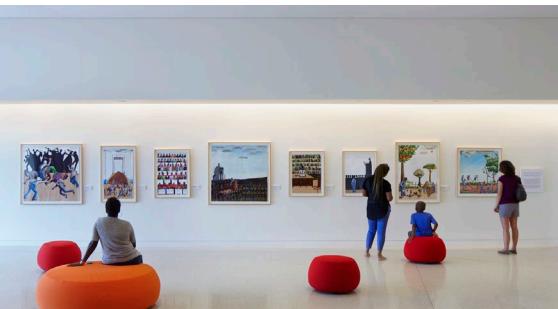
**Live Events**



**Convenience market and take-home food**



**Happy Hours**



**Art Exhibits**



**Pop-up food vendors in cafeteria**



**Fitness classes / training**

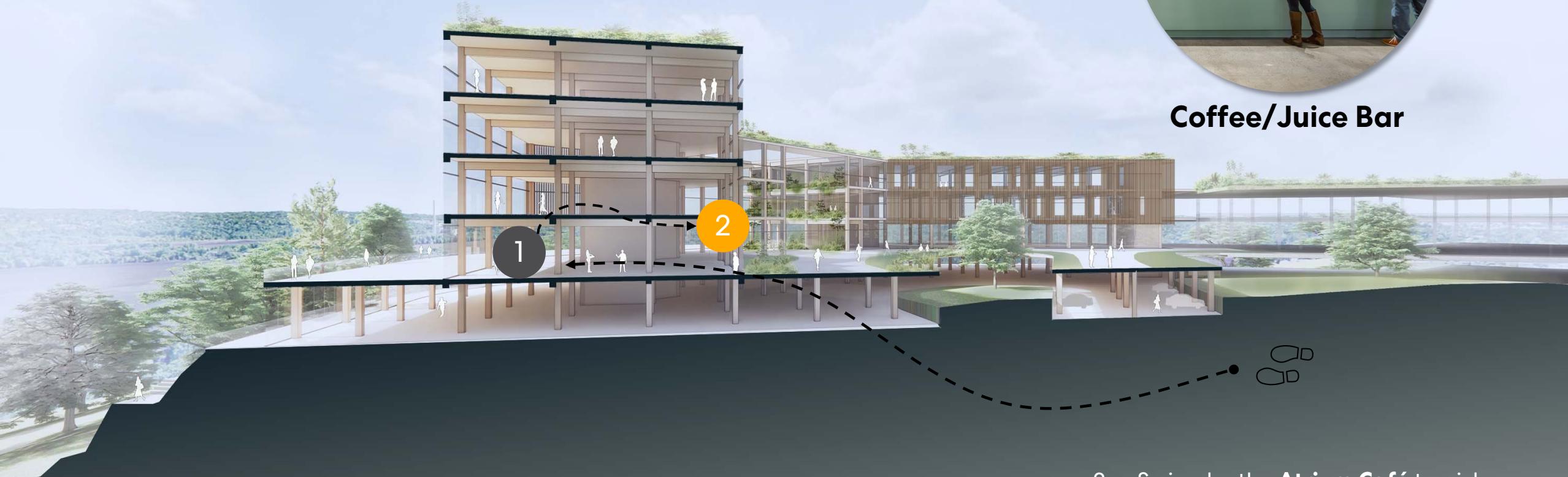
## Journey Map



**Yoga**

1. Arrive at work, go to the **Wellness Center** and do some yoga to energize for the day. Check the screen for the week's class schedule.

## Journey Map



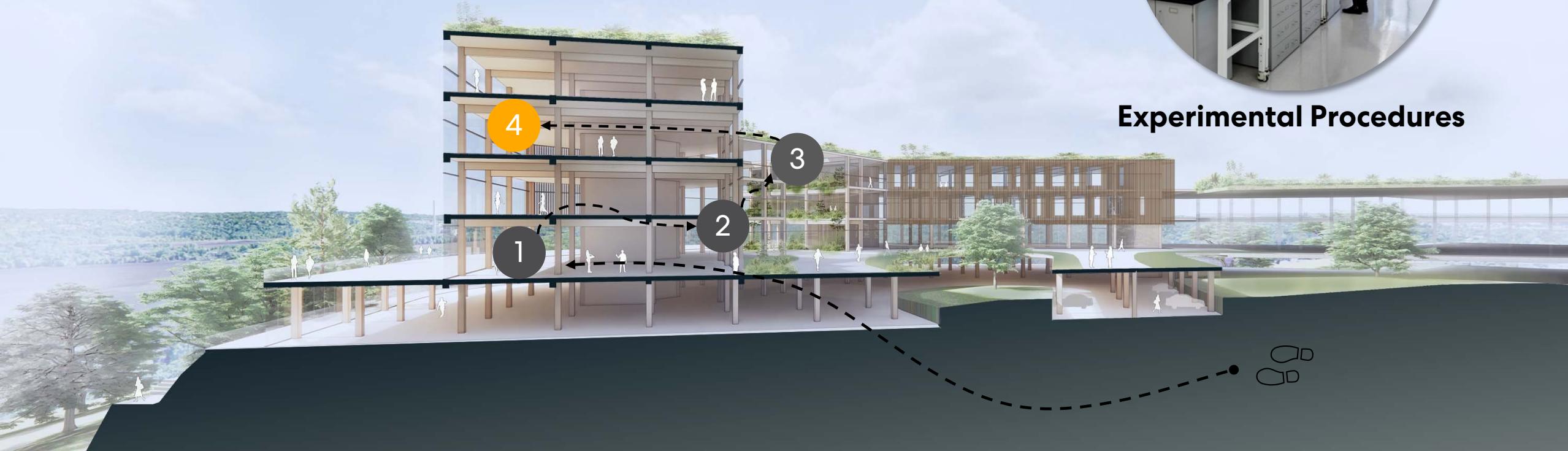
**Coffee/Juice Bar**

2. Swing by the **Atrium Café** to pick up coffee featuring local coffee roasters on the way upstairs. Order lunch for later on building app.

# Journey Map



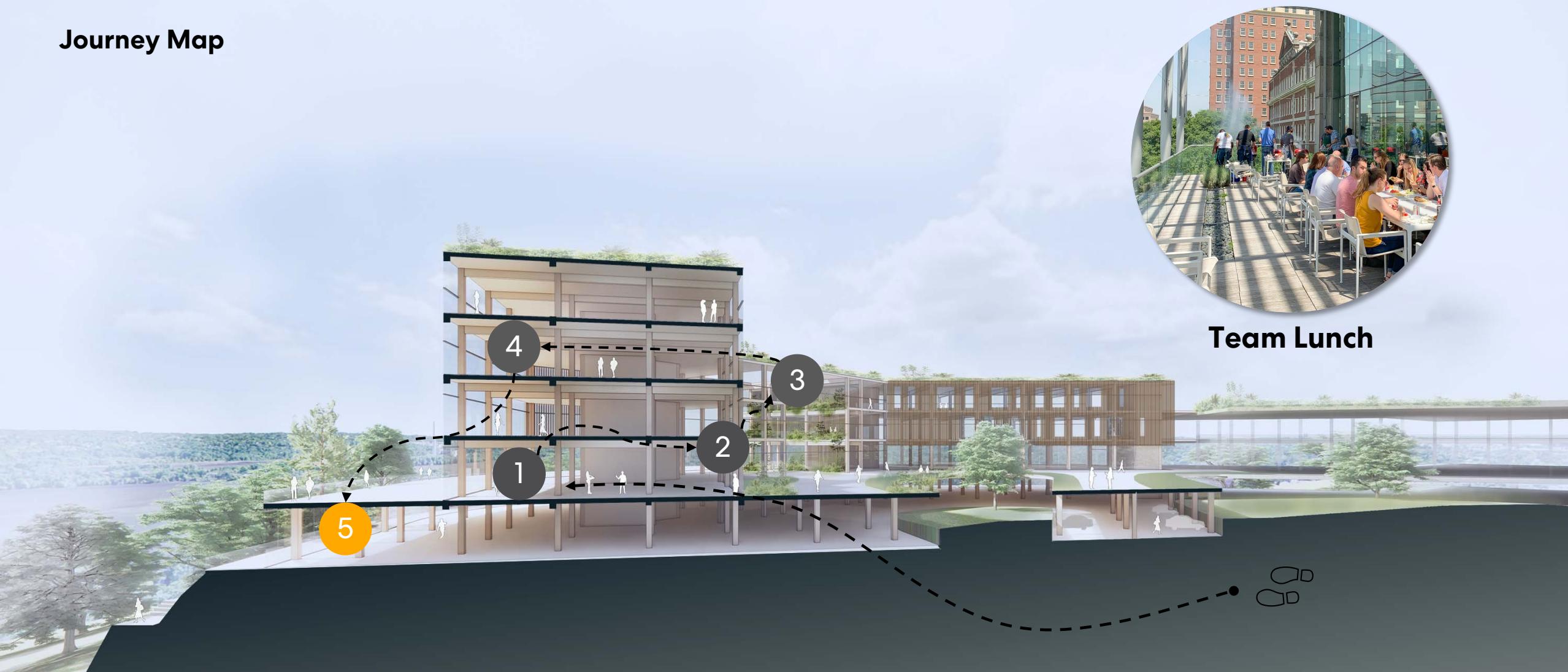
## Journey Map



### Experimental Procedures

4. In the **lab**, run through experimental procedures, set up equipment, and run experiments.

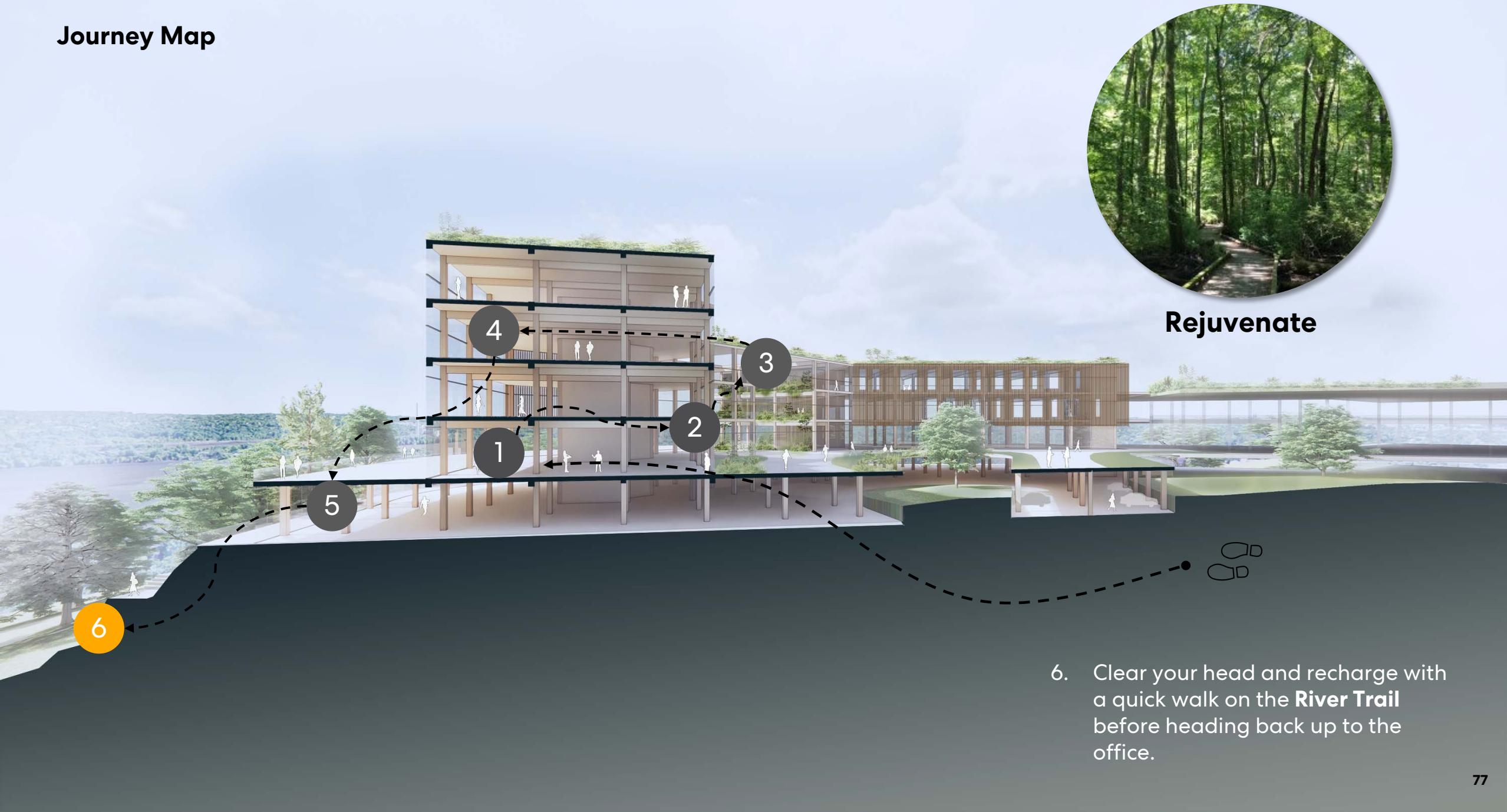
## Journey Map



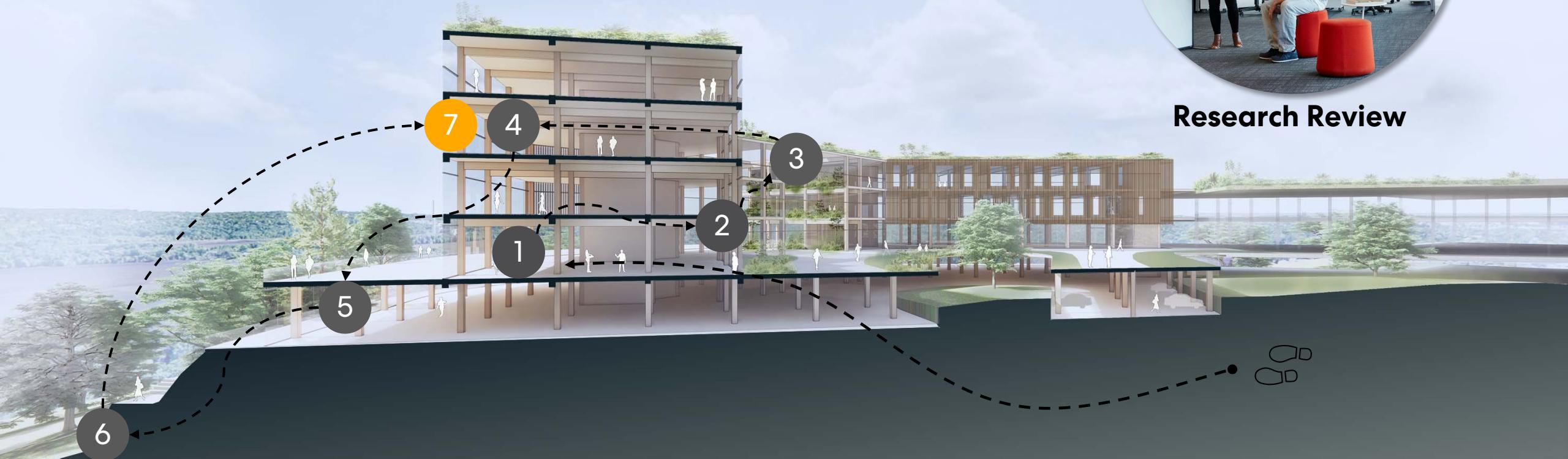
**Team Lunch**

5. Reconnect with team and enjoy the programming on the **patio** over lunch from a local pop-up in the cafeteria.

## Journey Map



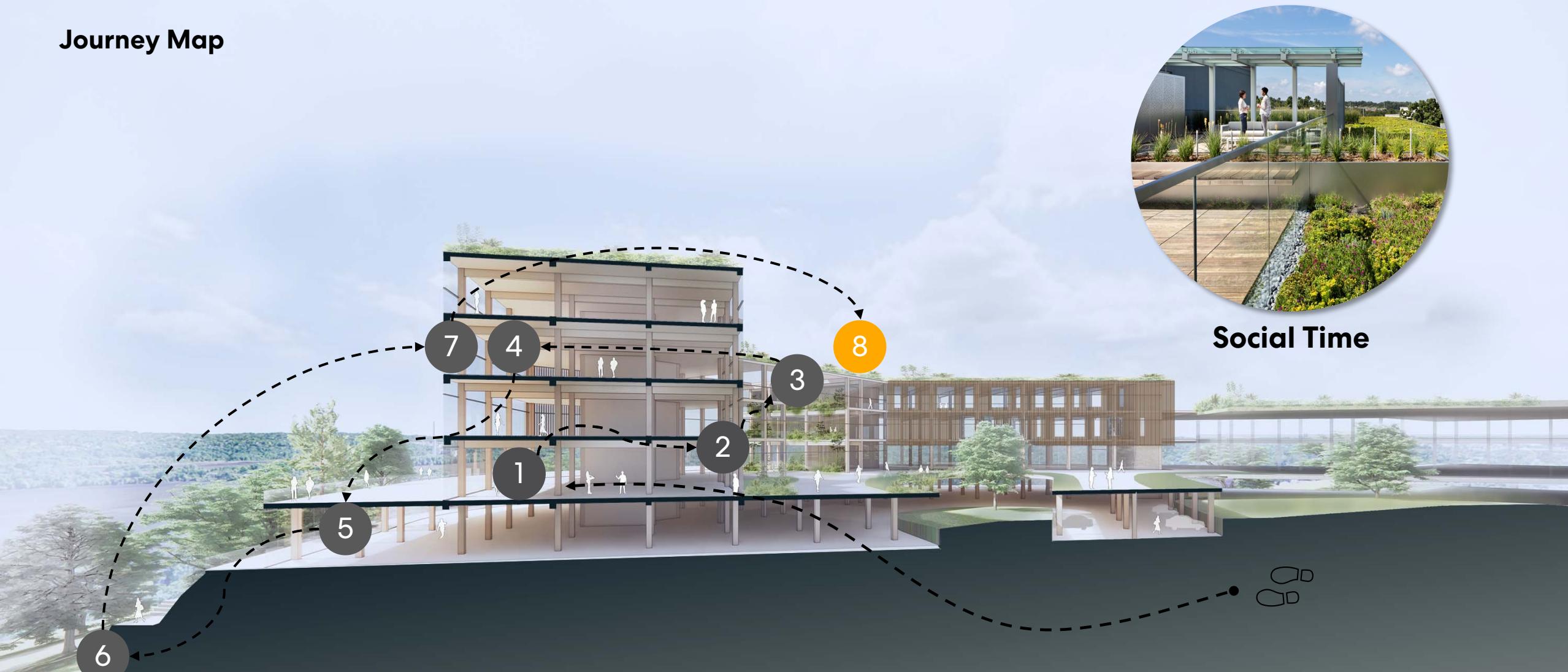
## Journey Map



### Research Review

7. Check-in with supervisor in touchdown zone of the open **office** to discuss experiment results and next steps. Pivot to nearby focus area for remainder of day.

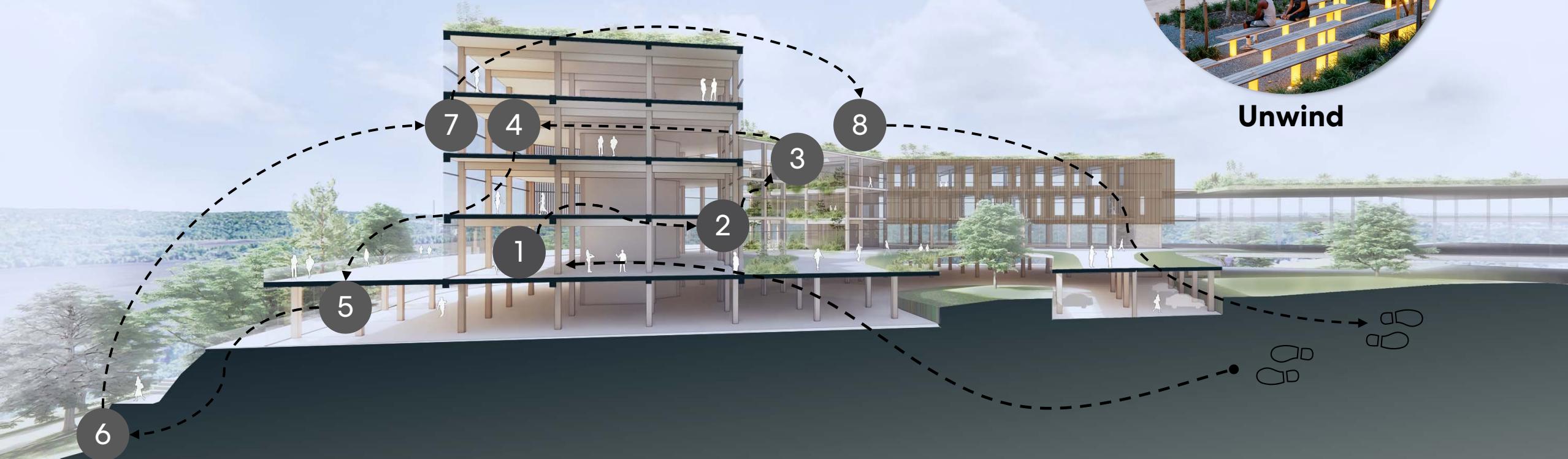
## Journey Map



**Social Time**

8. Meet up with colleagues from other neighborhoods at the **Rooftop Lounge**, exchange ideas, and come up with MTL's next big innovation.

## Journey Map



**Unwind**

... pick up CSA box on the way out the door and take the scenic route through the **gardens** as you head home, ready to take on the day tomorrow



↑ Bluff Perspective looking Northwest

# Let's set the bar for innovative, healthy, sustainable, 21<sup>st</sup> century space!

- Mass Timber
- Sustainability
- Regulatory Overlay

Framehouse →





# Thank you!

— Scan to access more information, a copy of our proposal, and this interview deck.

Website: [perkinswillmin.github.io/mlt-at-longmeadowcircle](https://perkinswillmin.github.io/mlt-at-longmeadowcircle)

