

LOH

Nolan Loh

*B.A. Art & Design
B.S.E. Civil Engineering
M. Architecture candidate*

Nolan Loh

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Holding degrees in Architecture, Art & Design and Civil Engineering, I strive to utilize a multidisciplinary approach to design. I hope to work as a designer, develop my technical understanding of architecture and explore sustainable and computational design practices.

Selected professional experience

GOETTSCH PARTNERS

Architectural Intern *Chicago, IL* 05/18 - 08/18
Developed trident column cladding and riverwalk facade details for bulletin issued for 56-story core & shell office tower in downtown Chicago. Responsible for substantial edits and quality checks of entire CD set after changes to tower height late in CD phase. Owned development of shading analysis tool to be used internally with Grasshopper and Ladybug plugin. Tool displays solar radiation reaching building facades to help clients visualize impact of shading device design iterations on energy use. Worked with team to produce conceptual design presentations and tenant pitches for core and shell office tower in Chicago, IL.

UNIVERSITY OF CINCINNATI

Graduate assistant - Interior design skills course *Cincinnati, OH* 01/18 - 04/18
Lectured class of third-year interior design students on topics ranging from color theory, Photoshop and Illustrator techniques to portfolio design. Worked with students individually to develop their understanding of course concepts, software and studio projects.

GENSLER

Architectural Intern, Fall semester *Chicago, IL* 08/17 - 12/17
Closely collaborated with Regional Design Leader on series of large mixed-used projects in early design stages. Leveraged diverse skill set including modeling, scripting, rendering and drawing to accommodate range of project needs and meet tight deadlines. Given agency to realize designs from sketches to final deliverables by developing ideas, setting and executing course of action and presenting to clients. Supported multidisciplinary team repositioning a suburban mall into a mixed-use center as sole member responsible for production. Interpreted ideas from principals and design directors of analytics, branding, planning and architecture to create a cohesive visual framework used in client presentation. Created conceptual design of Aon Center southern plaza entry tower across from Millennium Park. Design was selected by client for pricing.

Architectural Intern, Winter semester *Chicago, IL* 01/17 - 04/17
Produced CDs for renovations of over fifty stores. Revised drawings based on building department comments, and developed detail drawings demonstrating compliance with ADA guidelines to meet building department requirements for stores in California. Created planning department submissions that constructed narratives describing value of the store renovations to the communities.



Selected academic work

- 06 | Thesis: Buildings as urban climate infrastructure
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- 24 | Fallingwater section

Selected professional work

- 28 | Tower riverwalk detail drawings
- 32 | Urban intervention
- 34 | Reimagining America's malls

Education

- University of Cincinnati** *Cincinnati, OH* 2015 - Present
Master of Architecture - class of 2019
- University of Michigan** *Ann Arbor, MI* 2010 - 2015
Dual-degree: BSE Civil Engineering, BA Art & Design
Graduated *summa cum laude*
Dean's List (13 times), University Honors (8 times)
- University of Utrecht** *Utrecht, Netherlands* Summer 2012
Studied Dutch art history, Dutch history and culture

Skills

- Expert:** Rhino, Illustrator, Photoshop, InDesign, Grasshopper
- Proficient:** Revit, Bluebeam Revu, V-Ray, AutoCAD, Excel, SketchUp, Ladybug/Honeybee, DesignBuilder/EnergyPlus
- Beginner:** Karamba, RISA-3D, Mastercam, CATIA, VisualAnalysis

Selected awards

- 32nd Architecture in Perspective Competition 2017
Juror's Student Award of Excellence
One of three students to receive juror's award from the American Society of Architectural Illustrators.
- Trans-Siberian Pit Stops Competition 2016
Student Award for international competition hosted by Bee Breeders
Recognized in ArchDaily article for student award
- College Media Business & Advertising Award 2015
3rd place: group promotion category awarded to production staff
- Associated Press Advertising Awards 2014
4th Place: brochure/rate card category
- College News Design Contest 2012
2nd Place: information graphics category
- UM Detroit ID Contest 2011
1st Place: winning logo design for UM Detroit Center building

Selected academic work

Buildings as urban climate infrastructure

A framework for designing building forms and facades to mitigate urban heat

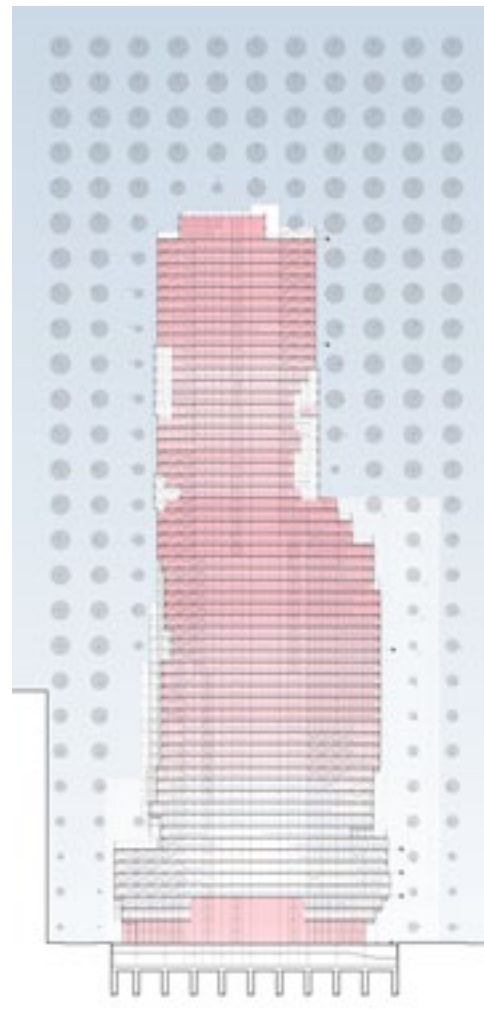
M.Arch thesis, 2018 - 2019
Case study set in Chicago, IL

Problem

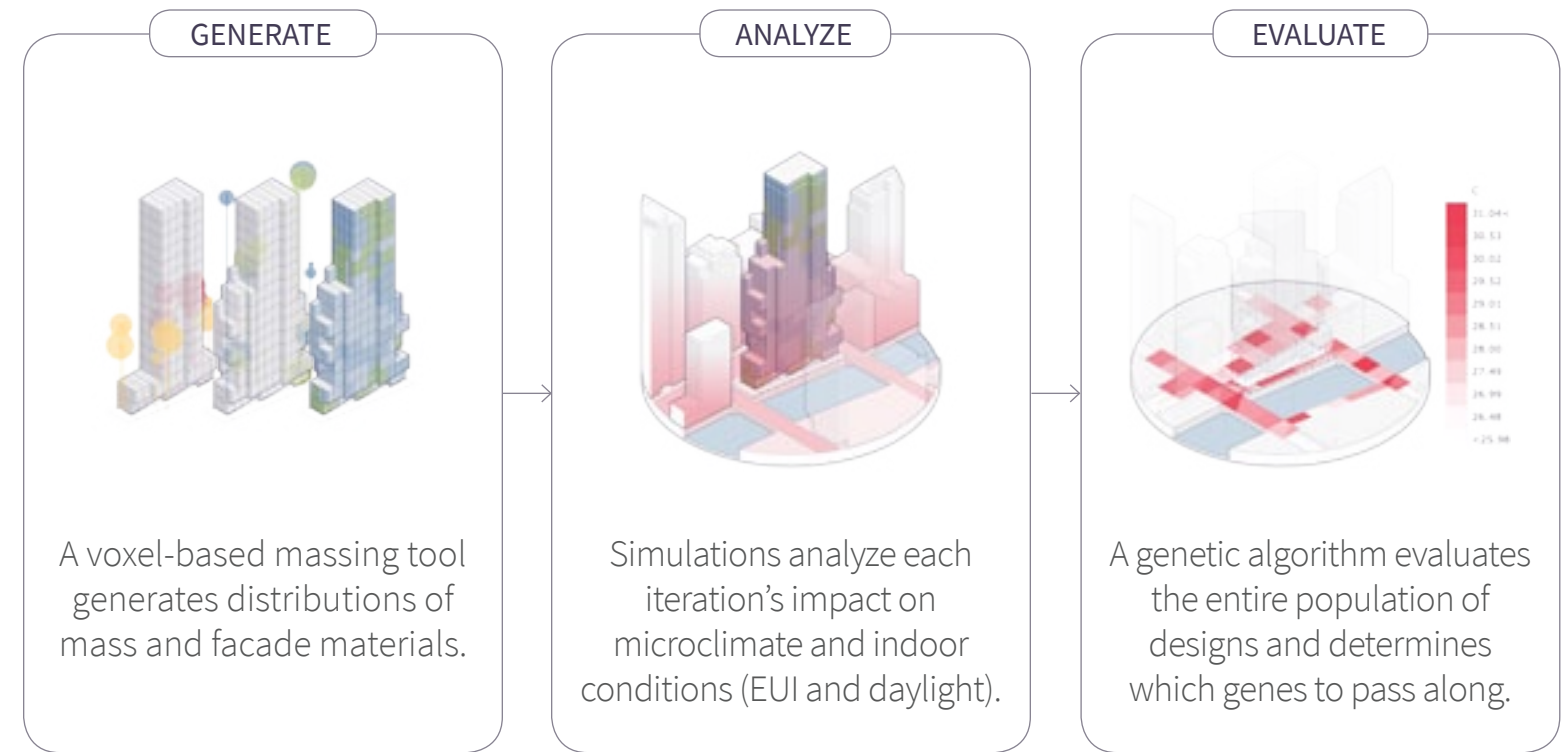
Building forms and facades contribute to the urban heat island effect, but methods to design buildings that mitigate urban heat are limited.

Thesis statement

A novel architectural design framework built around a massing tool and evolutionary search algorithm is proposed to balance indoor and outdoor environmental conditions and demonstrate the potential for buildings to act as urban climate infrastructure by mitigating heat in dense urban environments.

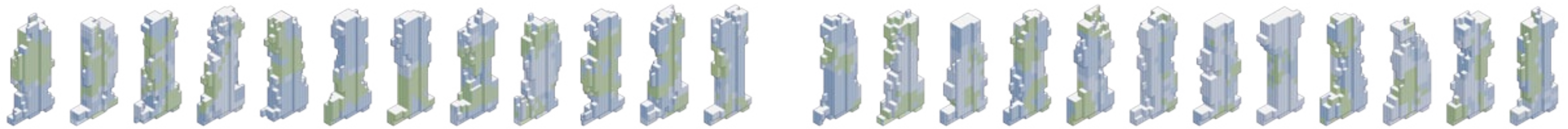


Proposed workflow



The proposed framework expands upon existing early-stage architectural design methods to balance considerations of indoor and outdoor environments by integrating a voxel-based massing tool, facade strategies for mitigating urban heat, environmental feedback mechanisms and an evolutionary search algorithm.

Application of the framework was demonstrated by developing an alternative design for a 50+ story core and shell office tower in downtown Chicago. During the hottest week of the year, the case study found that microclimate conditions, EUI and daylighting were all improved compared to the reference tower.



VOXEL CHARACTERISTICS

Voxel characteristics influence appearance and spatial qualities of generated forms.

SEARCH SPACE

Region that voxels can occupy account for site conditions and building form restrictions.

STARTING FORM

Initial form could be first pass at design or be used to influence the direction of the search.

CONTROL POINTS SCULPT FORM

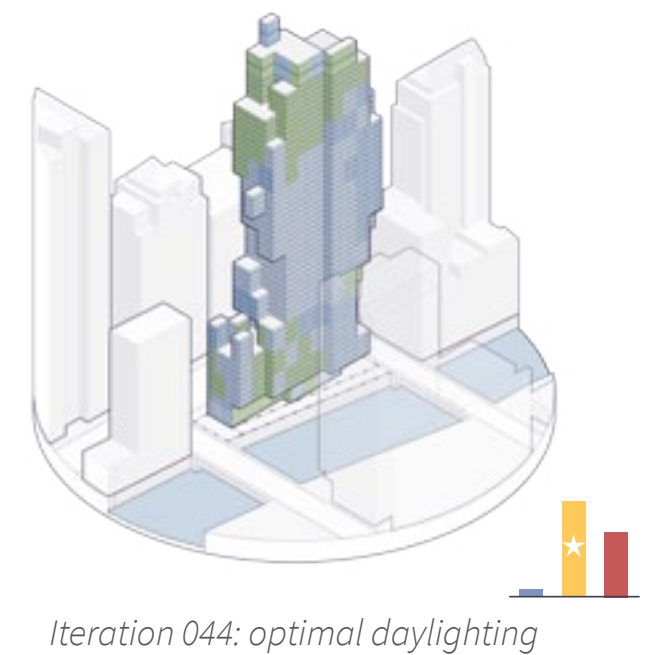
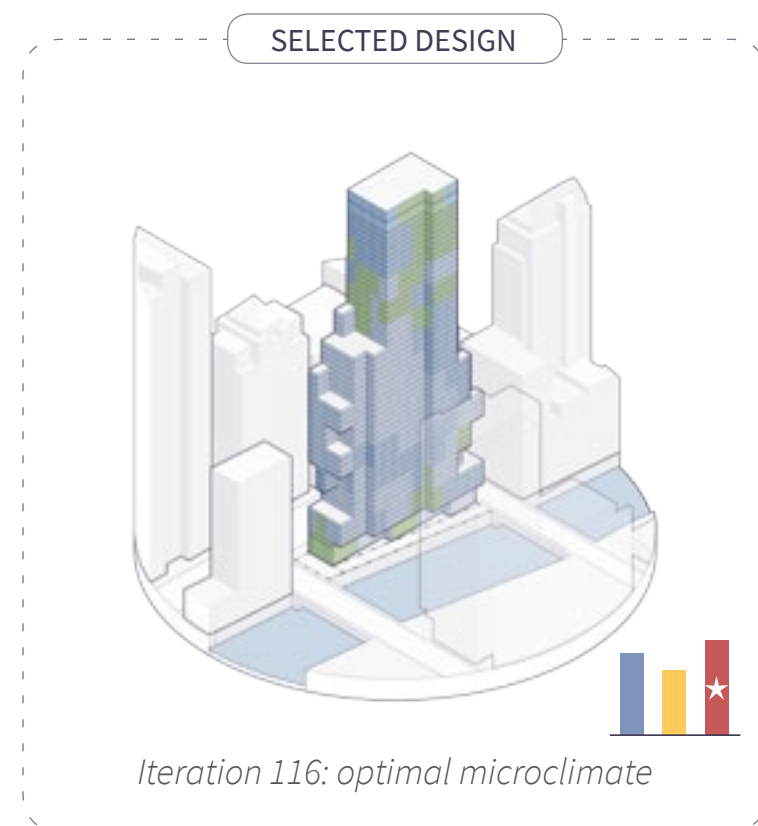
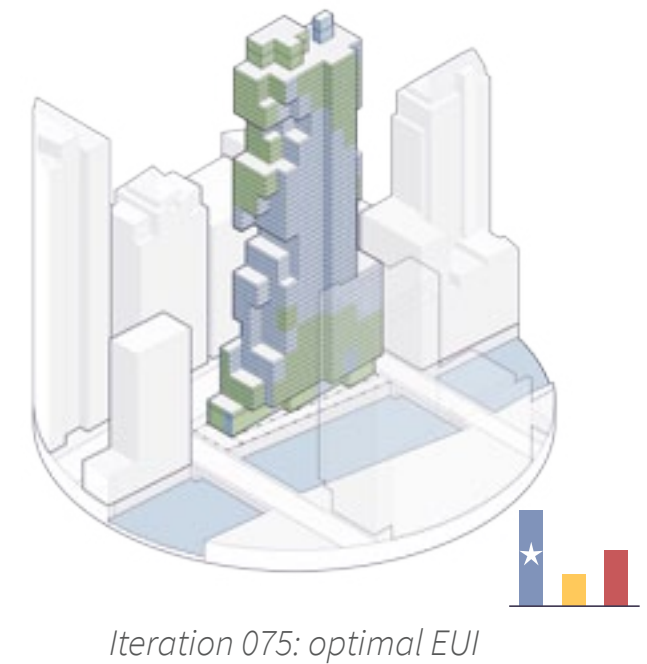
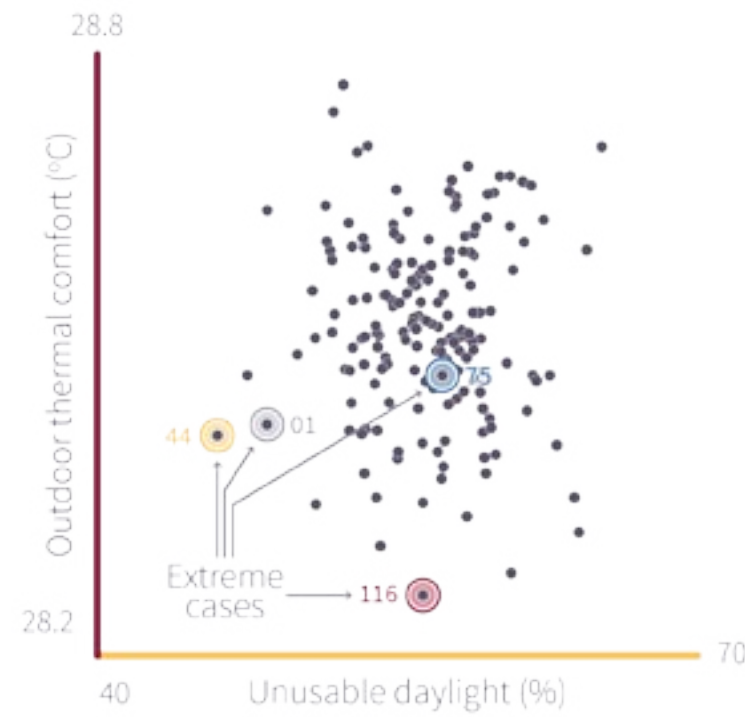
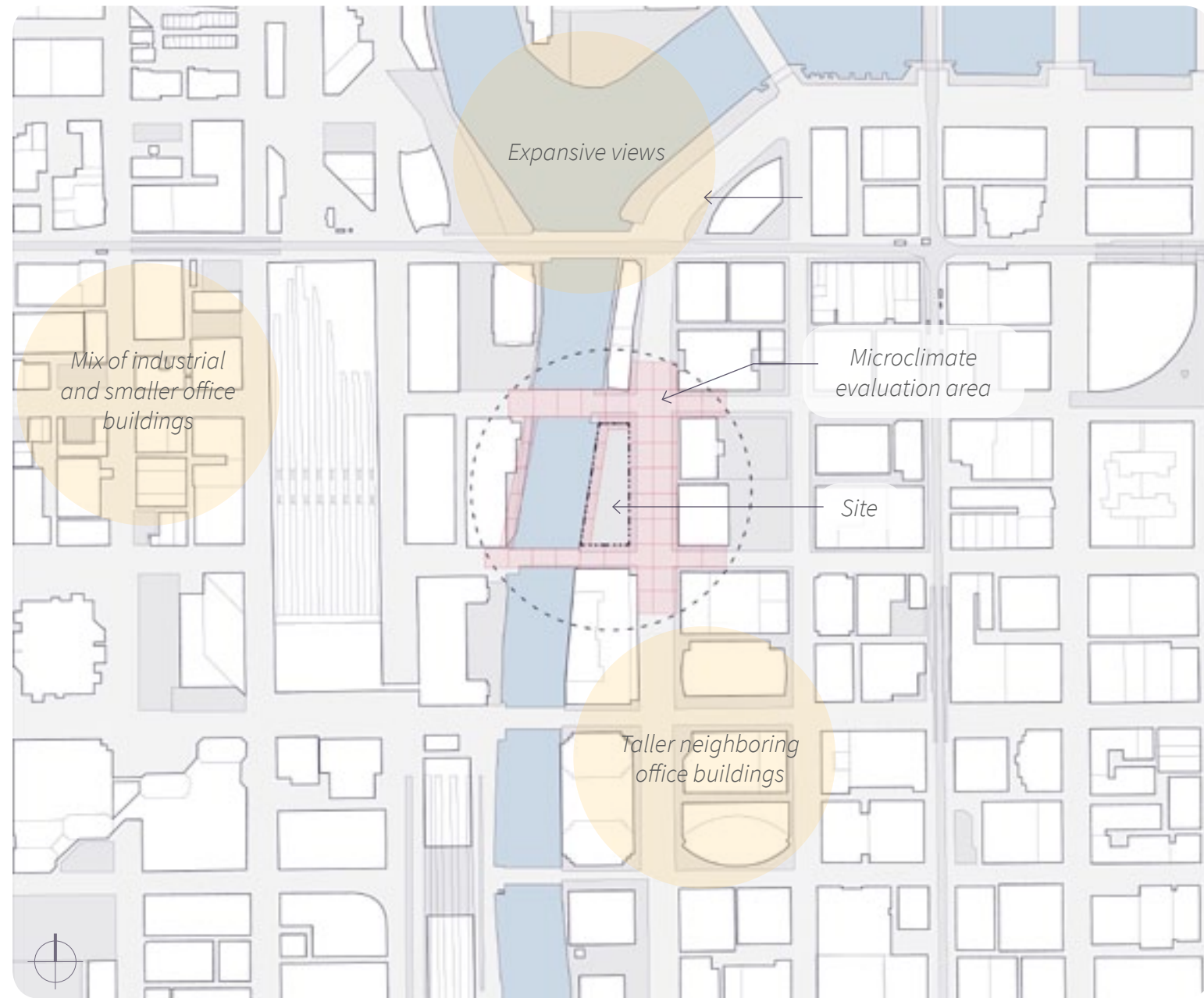
Parameter-generated control points sculpt starting form to meet floor area target and facilitate flexible formal search that can produce a variety of massing strategies.

CONTROL POINTS DISTRIBUTE FACADE TYPES

Parameter-generated control points distribute facade types to voxels to explore facade strategies for mitigating UHIs and improving indoor environment conditions.

← User input prior to running script →

← Iterative massing tool →



SELECTED SITE

The asymmetric site bordering the Chicago River gives the script unique conditions to respond to and presents dense urban environment with an intense UHI.

BUILDING PROGRAM

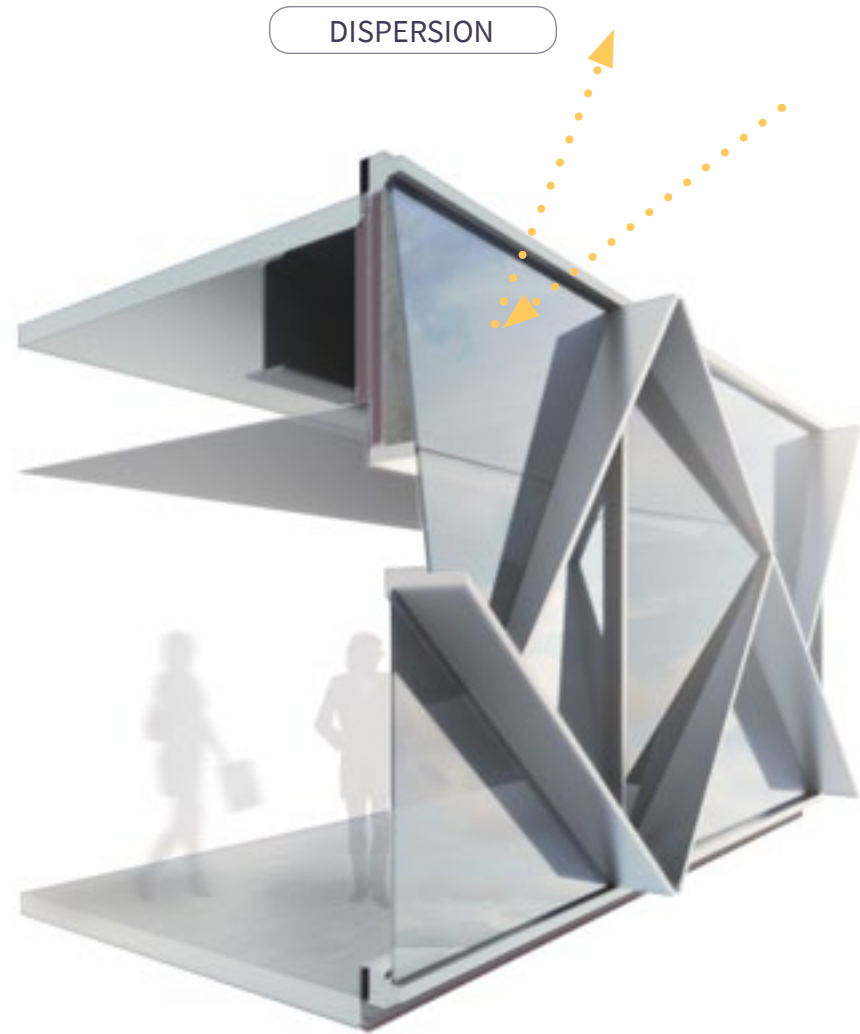
The case study develops an alternative design for a 50+ story core and shell office tower with retail and tenant amenities in the podium.

CASE STUDY RESULTS

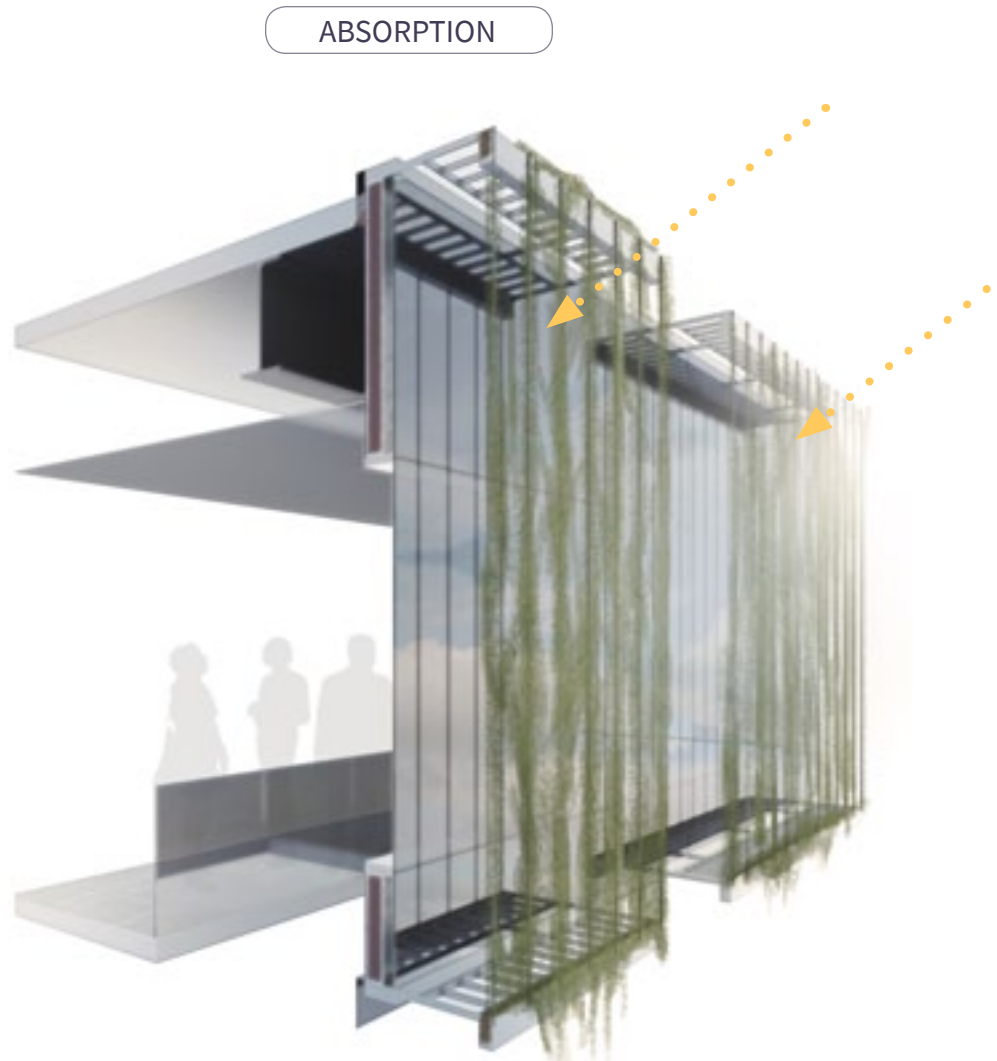
During the hottest week of the year, the generated designs improved microclimate conditions by up to 1.26°C (4.3%), EUI up to 0.79 kWh/m² (15.6 %) and unusable daylight up to 50.90%.

Interpreting the facade

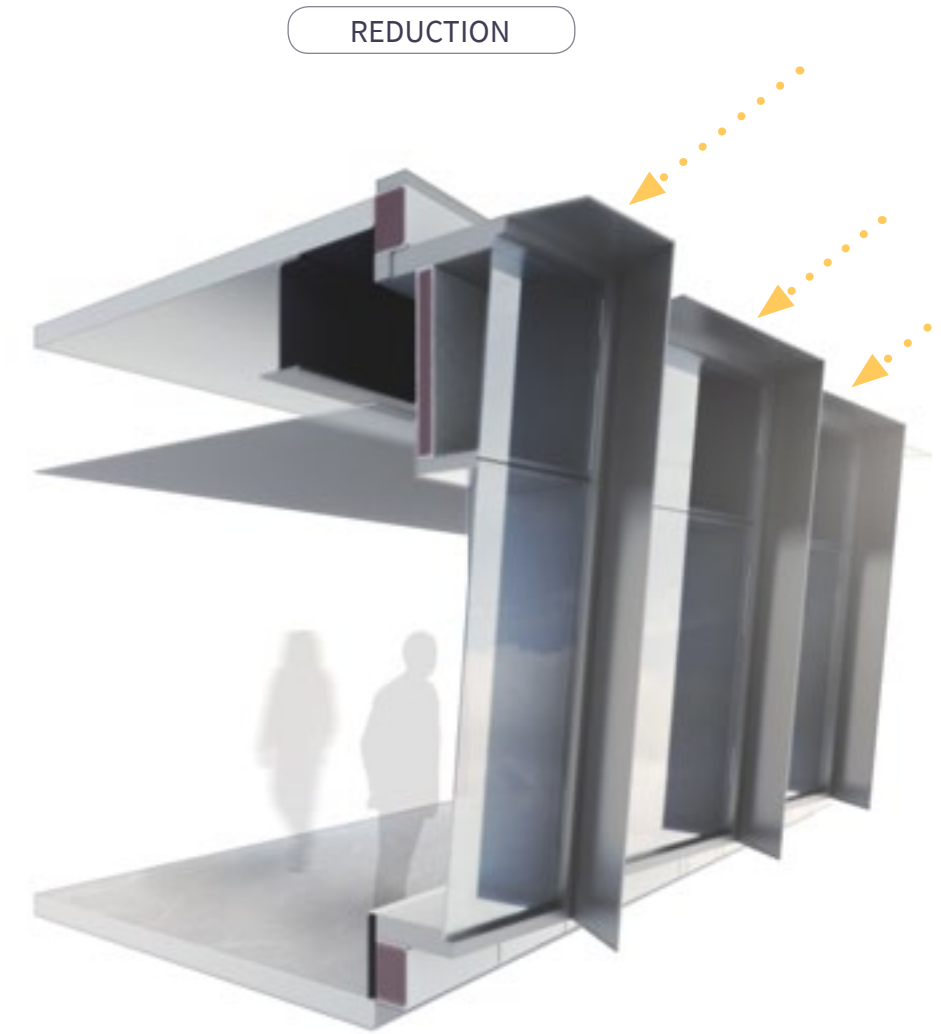
The three facade types distributed by the script were assigned specific goals based off their location on the tower and relationship with environmental processes.



Primarily used in areas that receive high levels of solar radiation. Angled panes of glass control reflections to direct radiation back into the atmosphere rather than at other buildings.



Primarily used in areas that receive high levels of solar radiation. Facade type associated with openings in slabs to establish atria throughout the top of the tower. Climbing vegetation absorbs radiation in the summer without completely blocking light from entering the atria behind the facade.

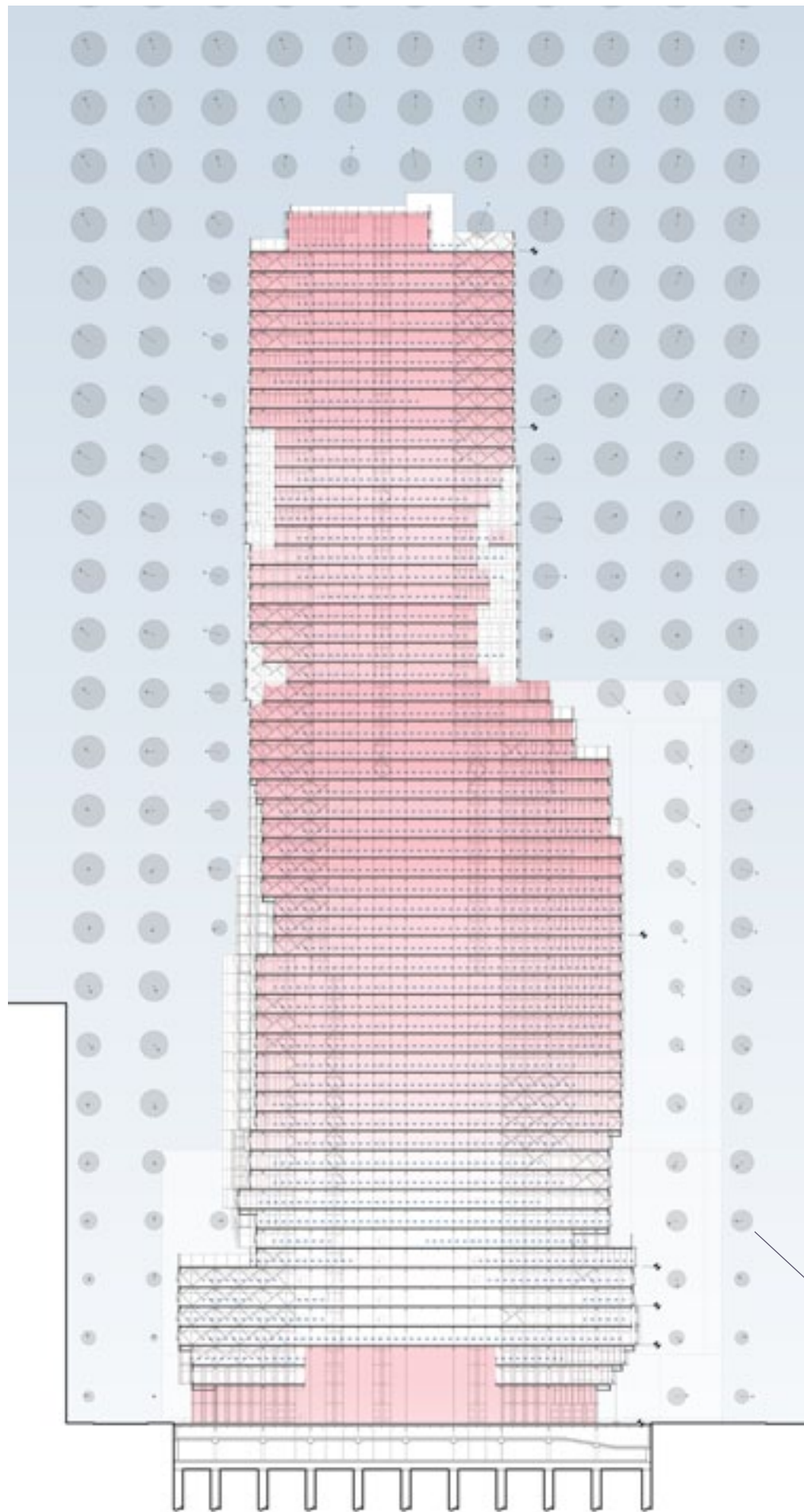


Used in areas of low solar radiation. Protruding angled glazing minimizes energy use and closely controls daylight levels within the office spaces.



VIEW FROM THE SOUTHWEST

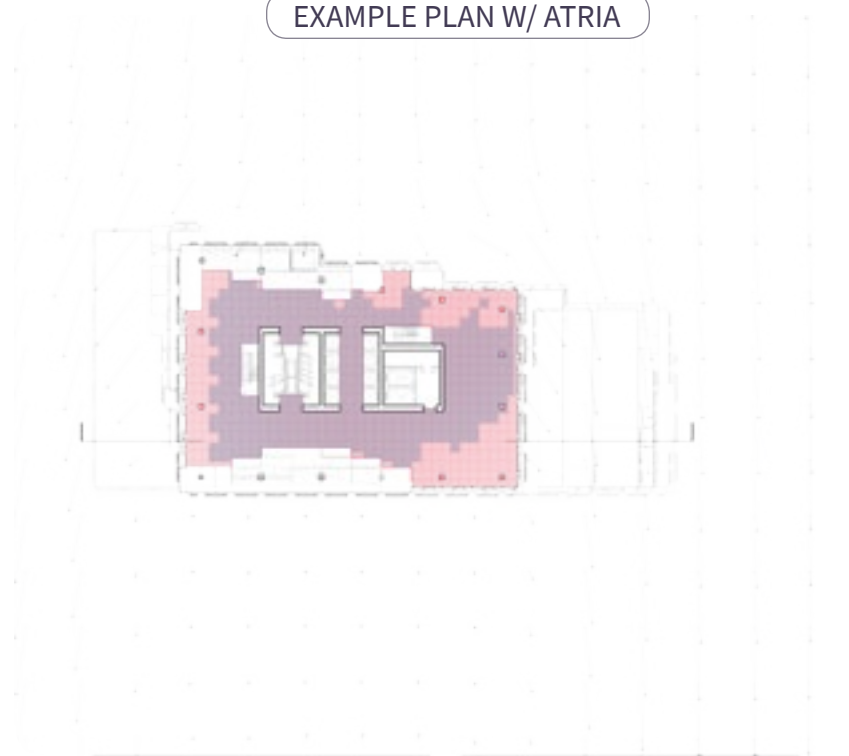




ATRIA

Atria associated with green facade utilize the stack effect to improve natural ventilation and lower energy consumption. The atria also add to the sectional experiences within the tower and create opportunities to bring vegetation to the interior.

EXAMPLE PLAN W/ ATRIA

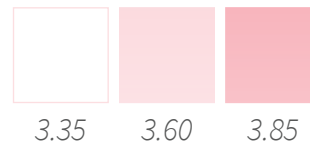


Wind (m/s)



Size of circle = wind speed
Arrow indicates angle relative to coming out of page

EUI (kWh/m²)



Simulated during the hottest week of the year

Usable daylight (%)



Simulated at 9 a.m. on July 13



The Enclosure

Integrating systems, user-experiences and performance

Cincinnati, Ohio - 2017

Prompt

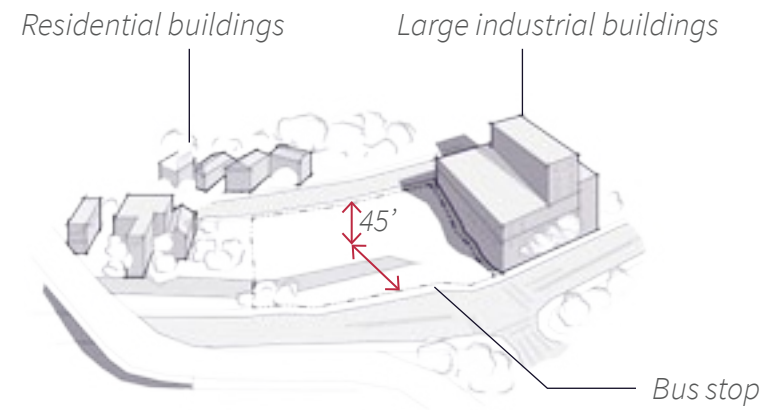
Design a brewery, restaurant and bar, and small museum for a given site in Cincinnati, Ohio.

Challenges

Located in semi-abandoned area with large elevation changes and mix of residential and historic industrial buildings,

Goals

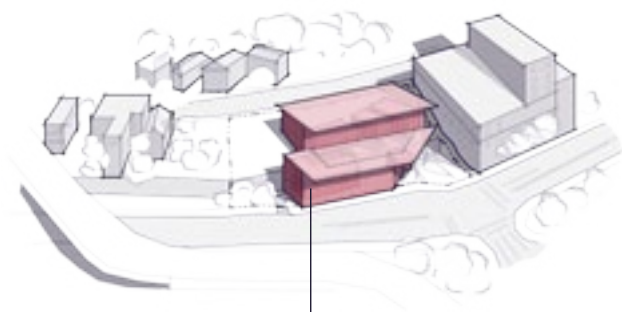
Create various experiences and scales that embody unique neighborhood and create a destination.



Restaurant and museum elevated off ground to minimize excavation and match residential scale

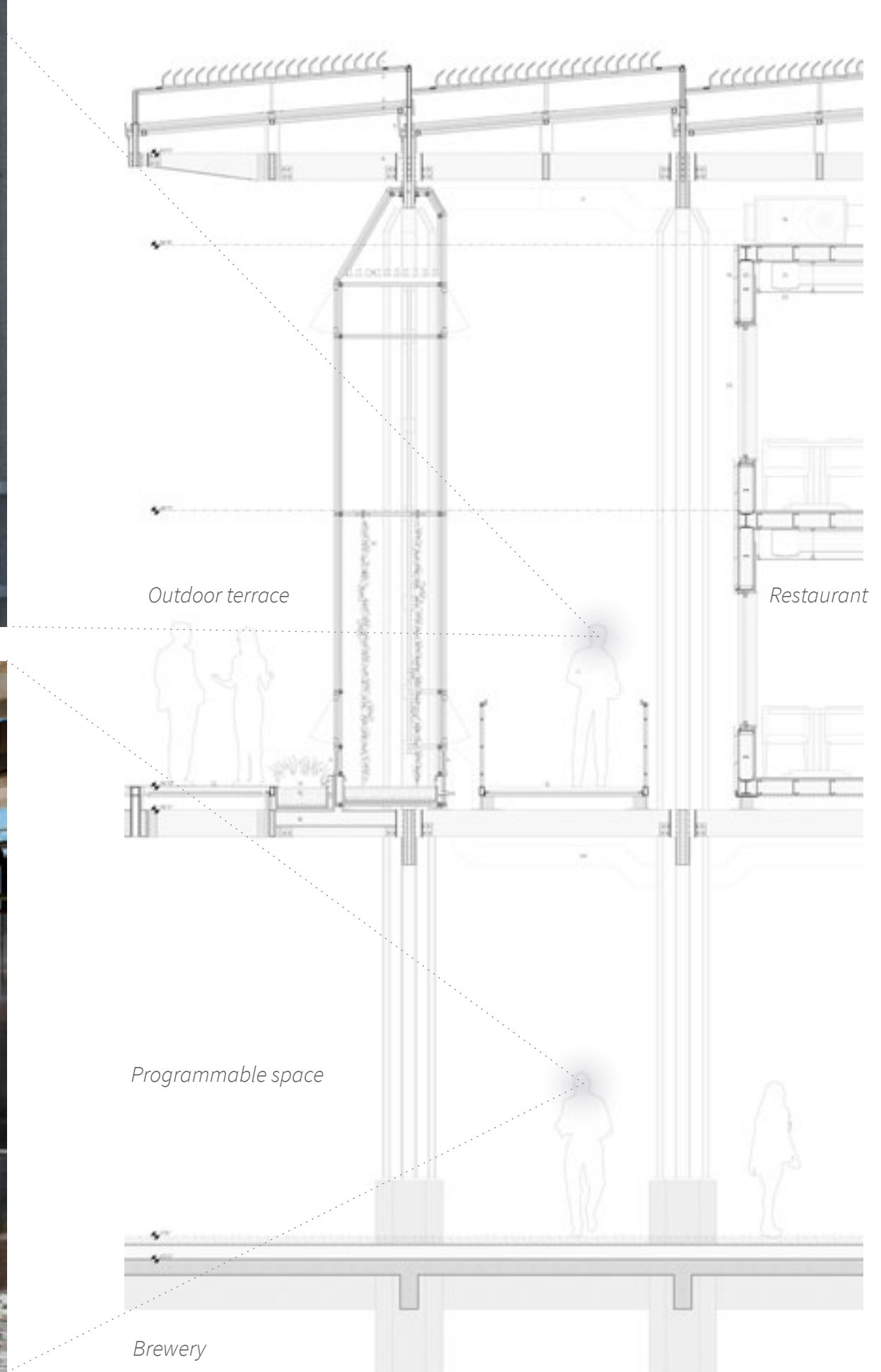


Brewery embedded into retaining wall becoming "foundation" of operation



Double-skin facade enclosure matches industrial scale and creates programmable spaces to increase foot traffic

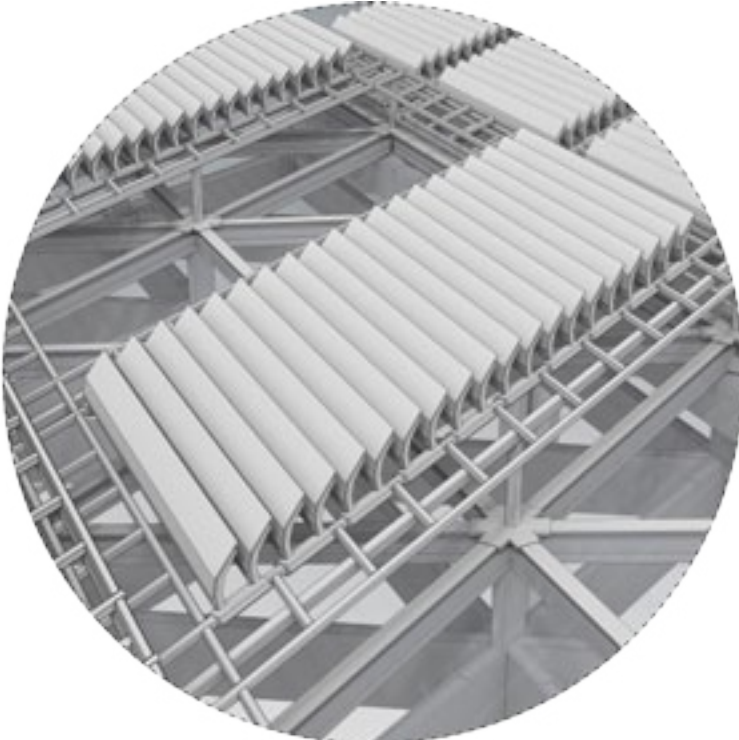




GUTTER SECTION



SHADING DEVICES



STRUCTURE CONNECTIONS

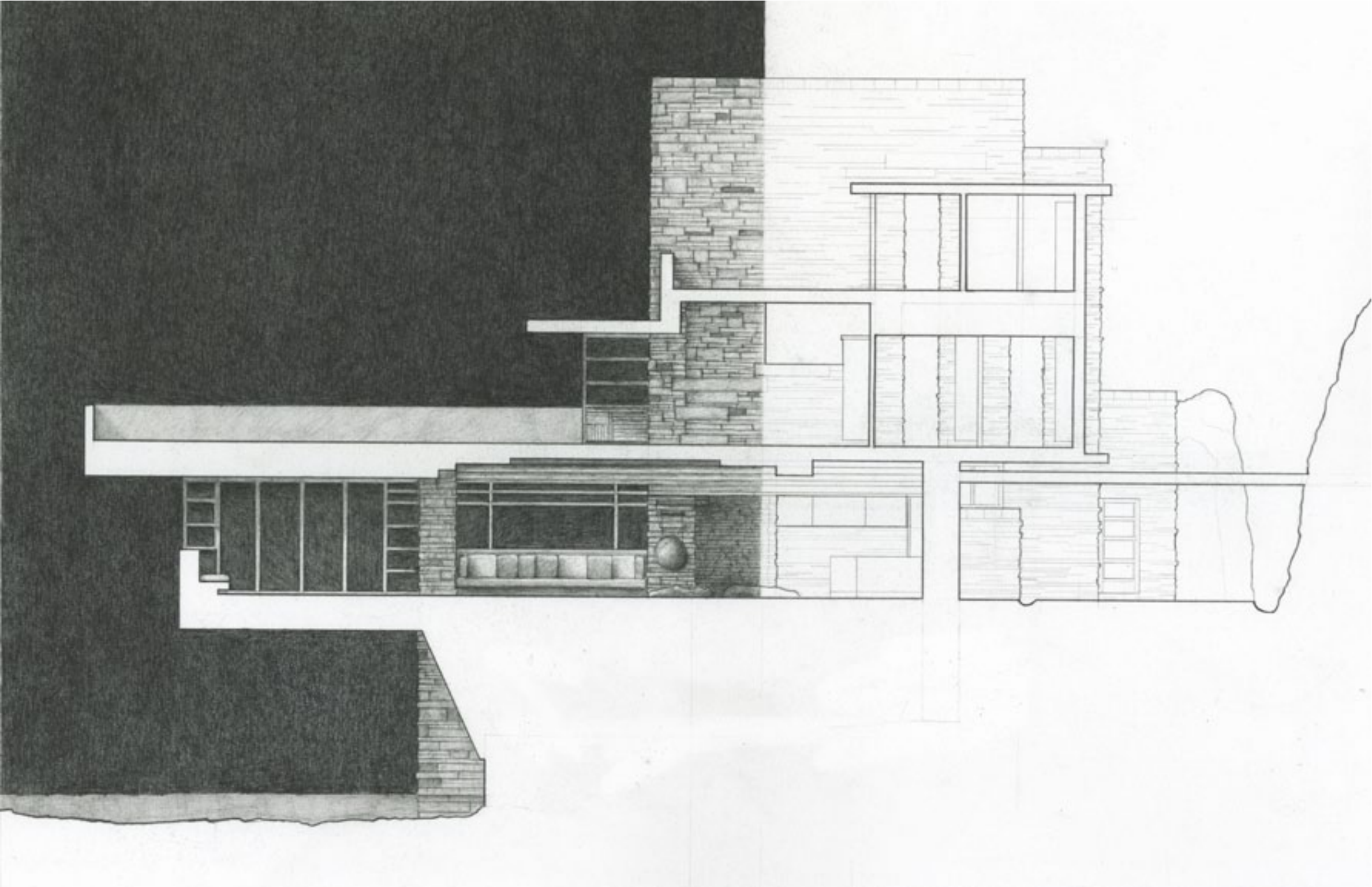


Fallingwater section

Graphite rendering

2017

American Society of
Architectural Illustrators
Juror's Award of Excellence



Selected professional work

Chicago, IL - 2018
 Core and shell office tower
 construction document phase

Task

Develop riverwalk cladding and trident column cover details in Revit for bulletin.

Challenges

Complex geometries at trident seams and along riverwalk. Column cover design must hide connections while trying to simplify on-site assembly.

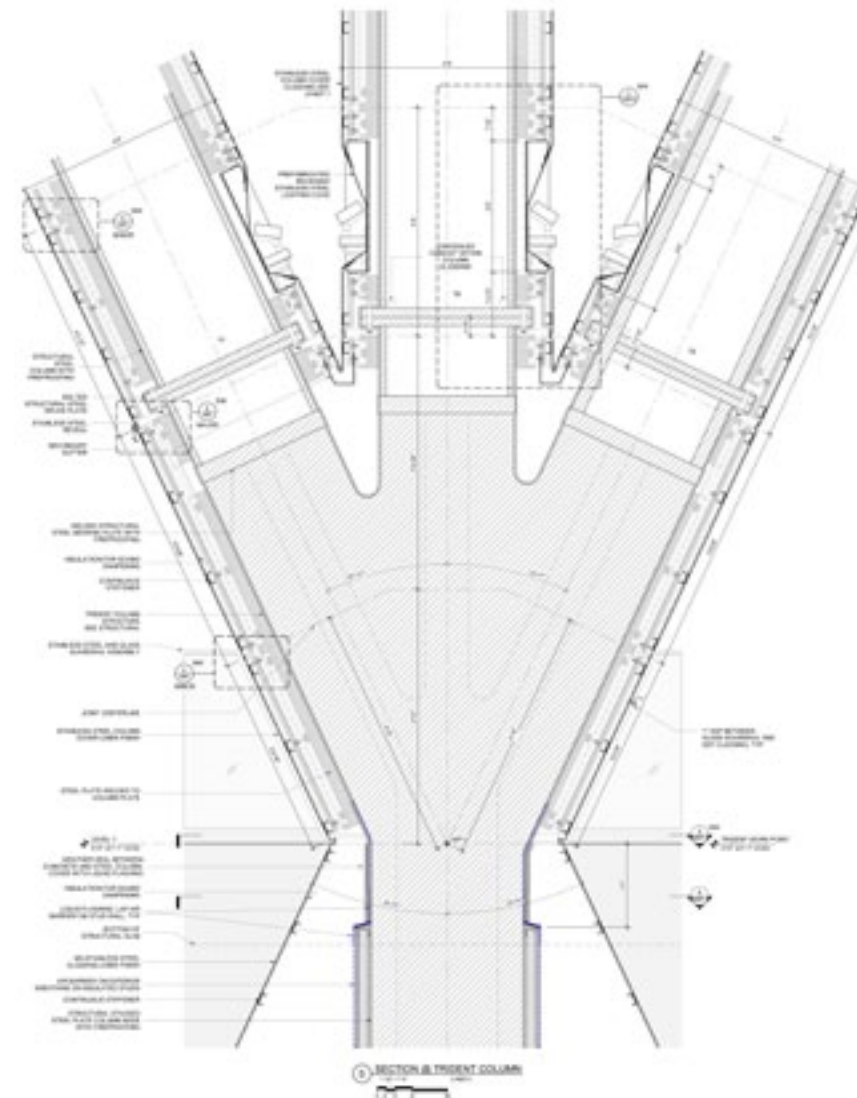
Role

Collaborated with designer and facade specialist to prepare bulletin. Referenced sketches and existing drawings to develop cladding details.

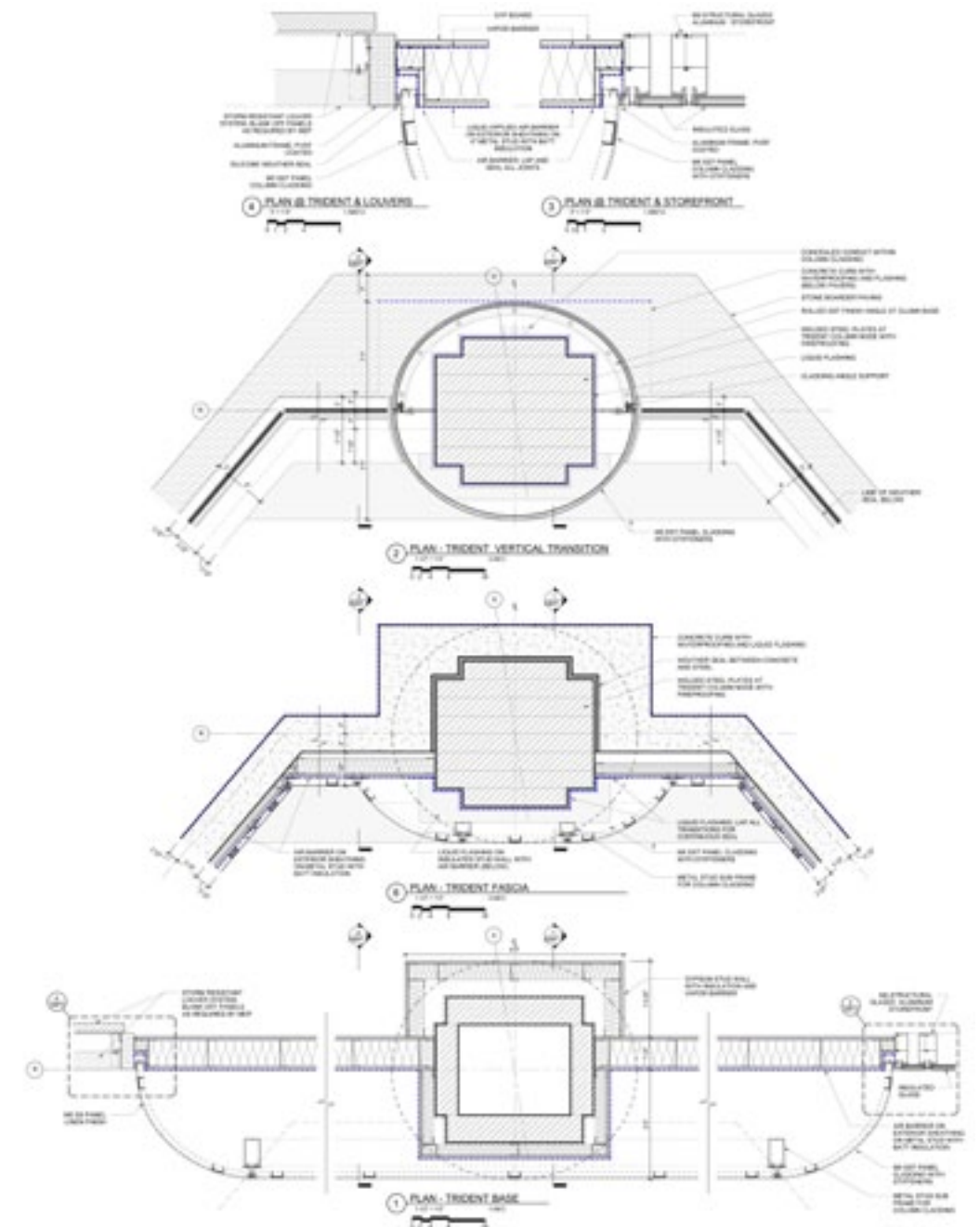
TRIDENT COLUMN COVER



Renders by others.



Role: drew section based off sketches and discussions with supervisor.

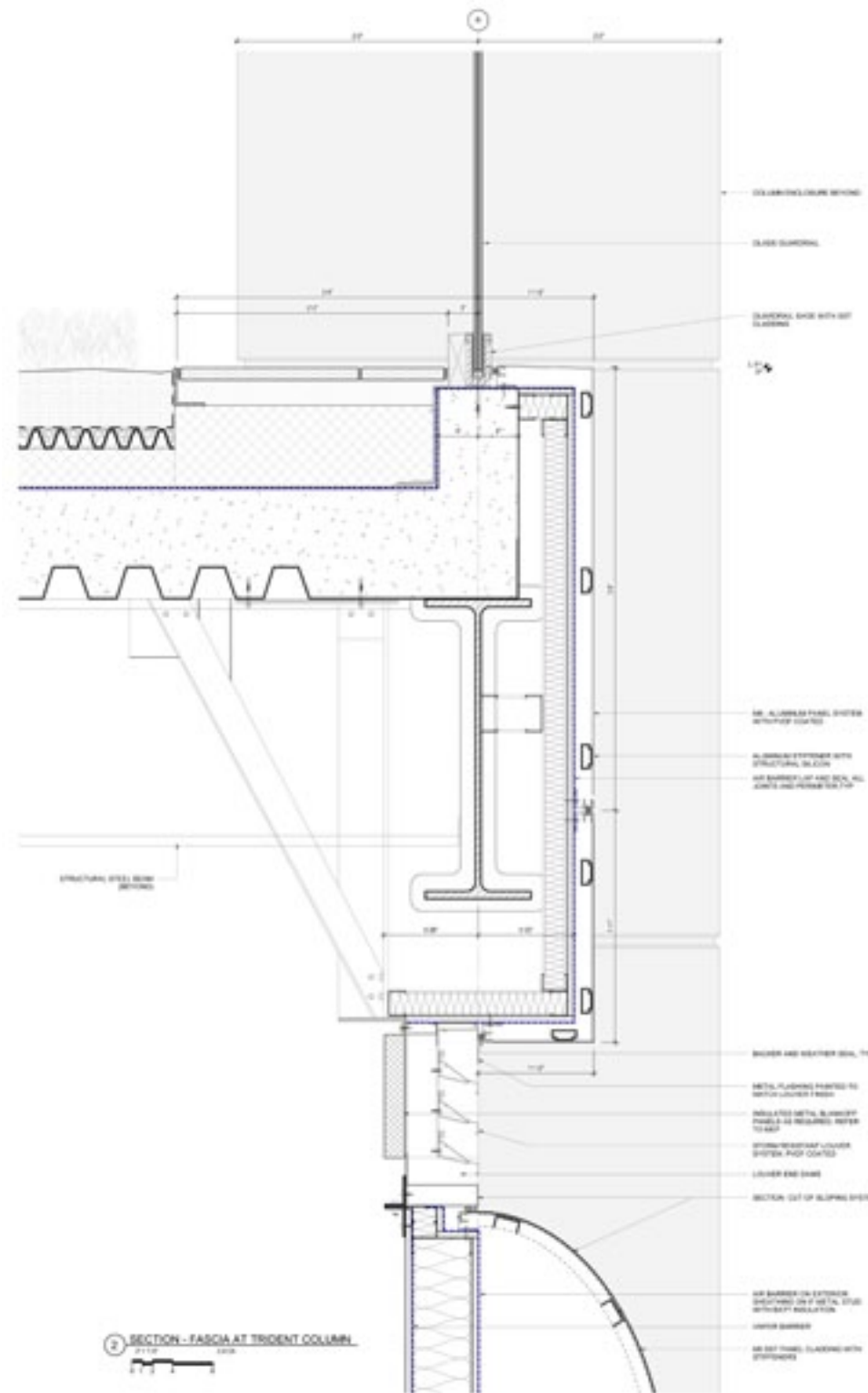


Role: completed plan drawings started by others.

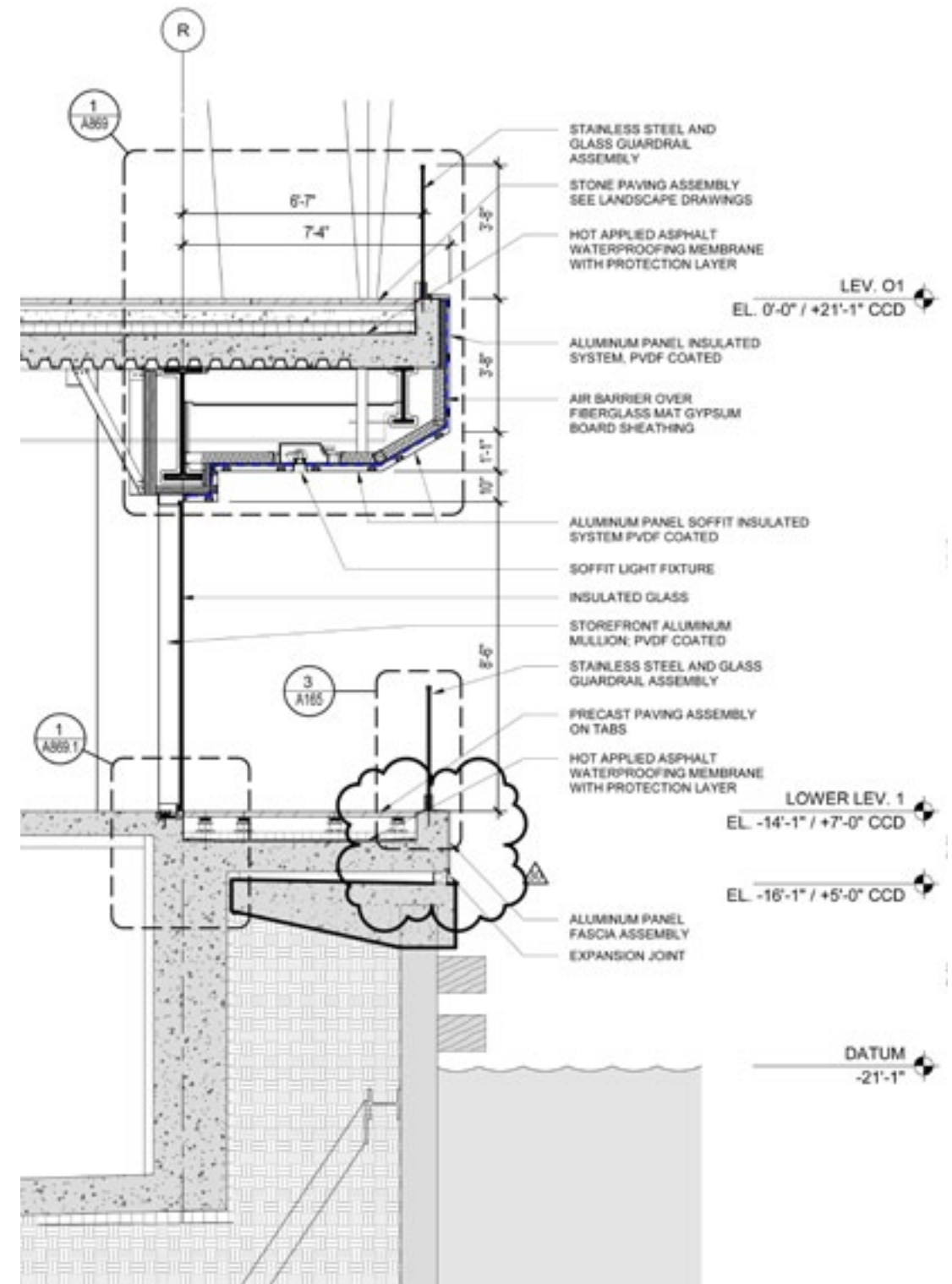
RIVERWALK CLADDING



Renders by others.



Role: drew section by reinterpreting other's drawings.



Role: edited section to match new details.

Gensler

Creating urban experiences through architectural intervention



Role: modeling/rendering/design development. Image editing by others.

Greater Chicago Area, IL - 2017
Large mixed-use: hospitality, retail, food & beverage, residential



Role: modeling/rendering/design development/image editing/assisting with drone photography.

Task

Design preliminary massing, site plan and facade strategies for 1+ million SF mixed-use center adjacent to suburban mall.

Challenges

Given three weeks to develop massing, facade strategies and produce images to present to city to begin planning department process.

Role

Worked in team as primary modeler/renderer, assisted with massing development and conceptual facade design.

Minneapolis, Minnesota - 2017
Large mixed-use: hospitality, retail, food & beverage, residential

Task

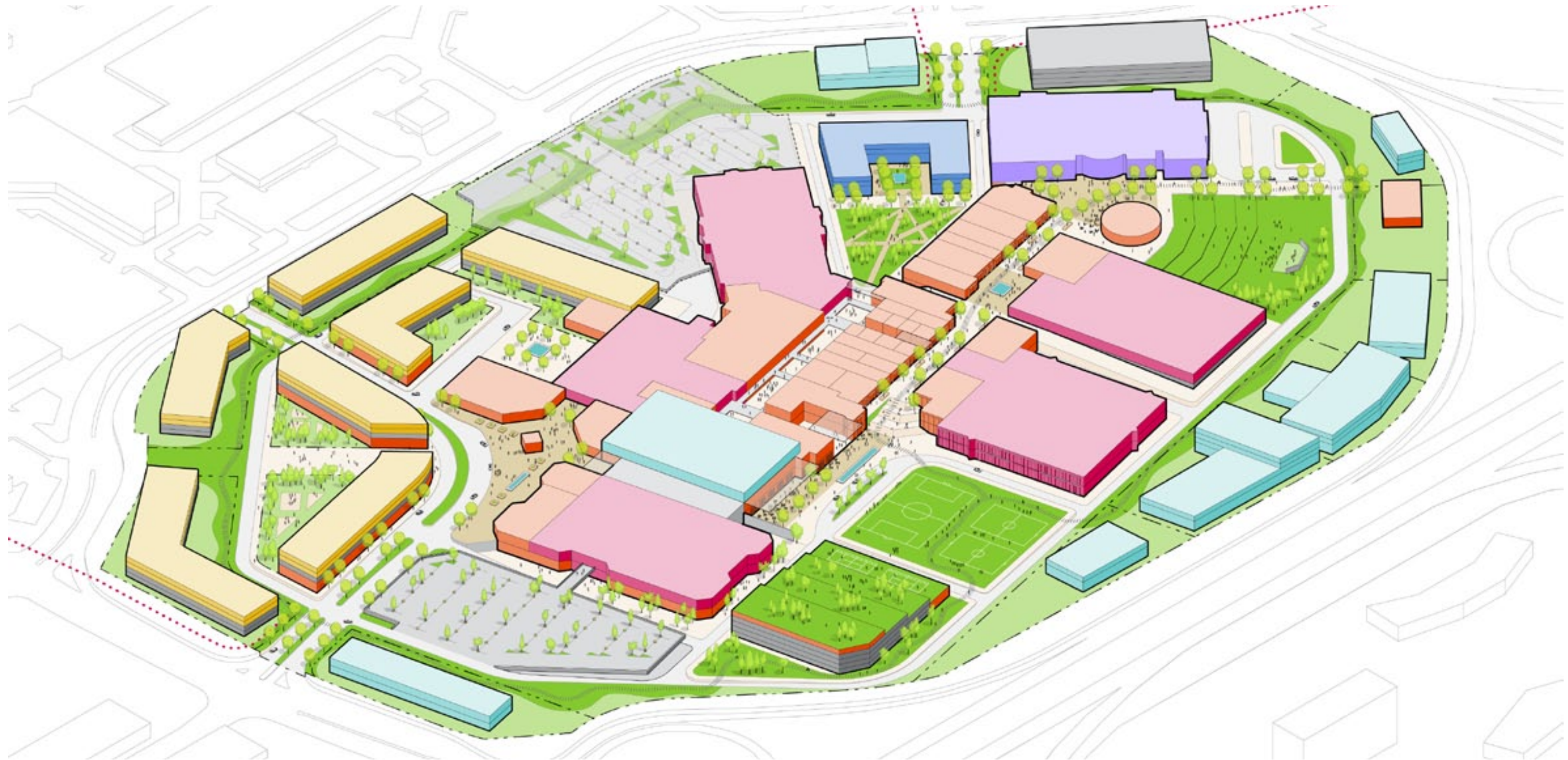
Develop principles/scenarios to right-size and future proof suburban mall outside of Minneapolis.

Challenges

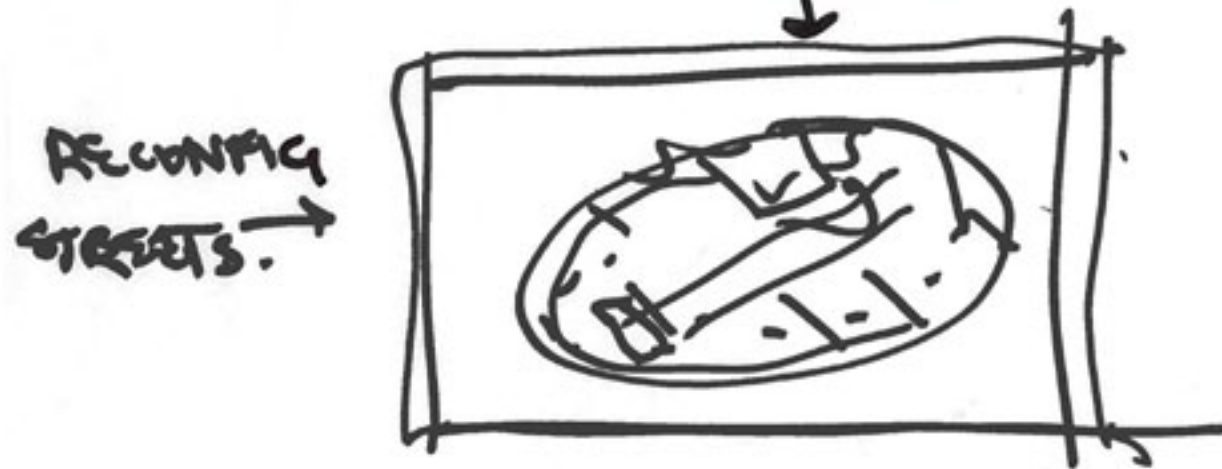
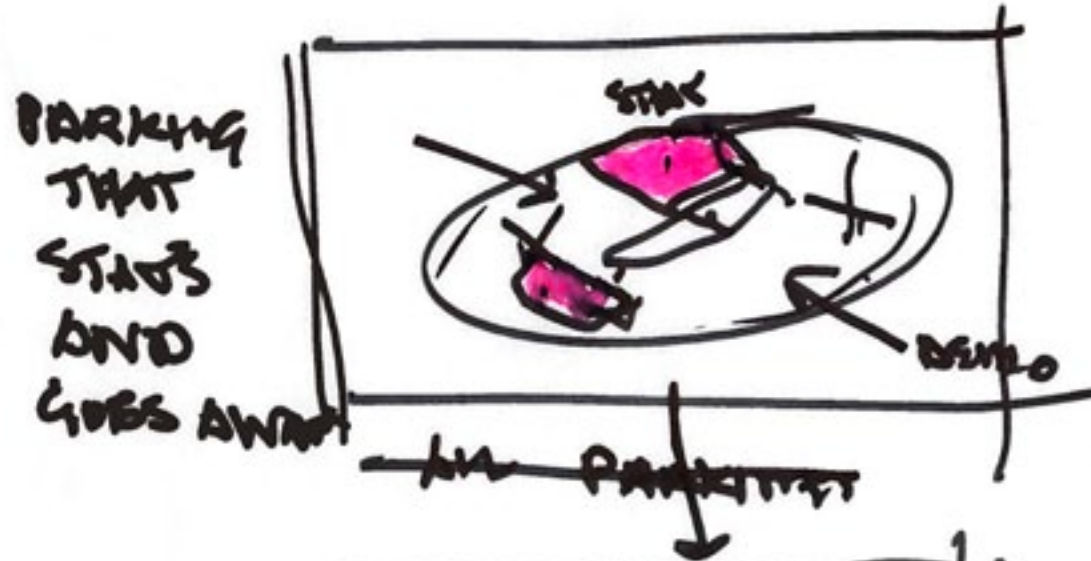
Needed to create series of diagrams that functioned as an animation of the scenarios and principles.

Role

Sole team member working on production. Collaborated with multi-disciplinary team to refine ideas and develop proposal.



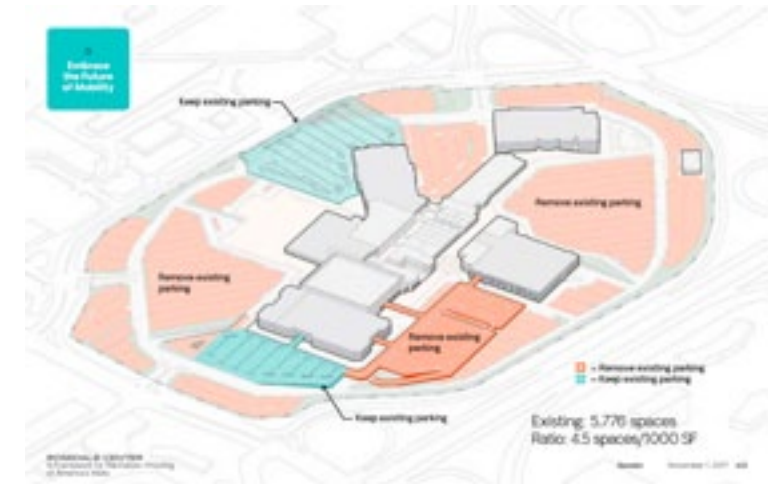
Role: modeling/rendering/image editing on all deliverables.



"Existing parking: 4.5 spaces/1000 SF"

"Parking that stays and goes away"

"Reconfiguring the streets"





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