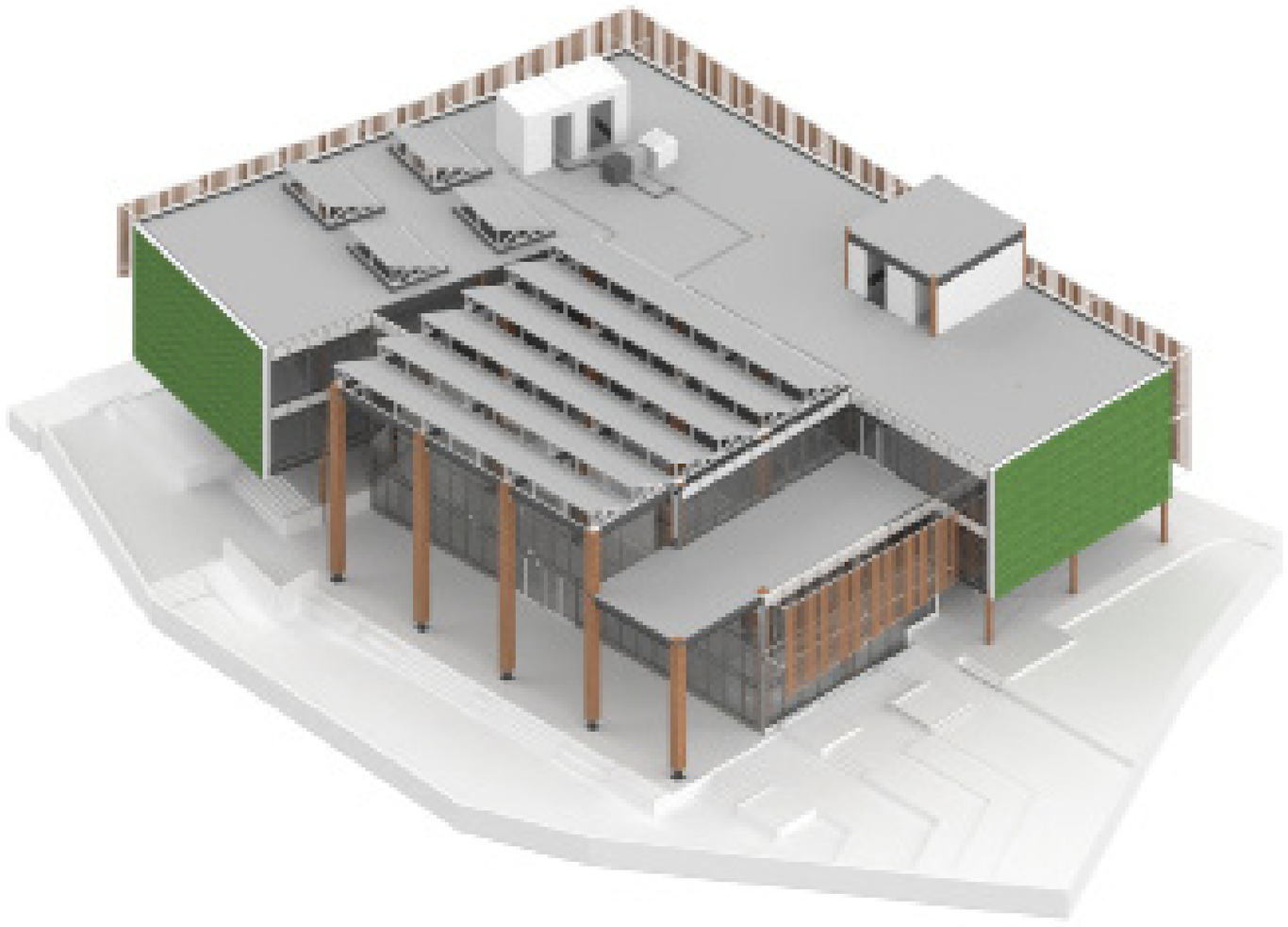


LOWELL MAKERSPACE PROJECT

Francesca Mazzarella Damasco,
Analisa Lowe, and Amber Vuong

OUR GOALS

When beginning the design process, there were a few aspects we wanted to incorporate and accomplish within our project. The first would be considering the environmental impacts of each material while also maintaining the aesthetics we had in mind. Ultimately, we had decided on using a combination of materials that appear within the structure and enclosure to achieve those aesthetics.

OUR GOALS:

1. Structure to be exposed to express the craftsmanship to the maker space users

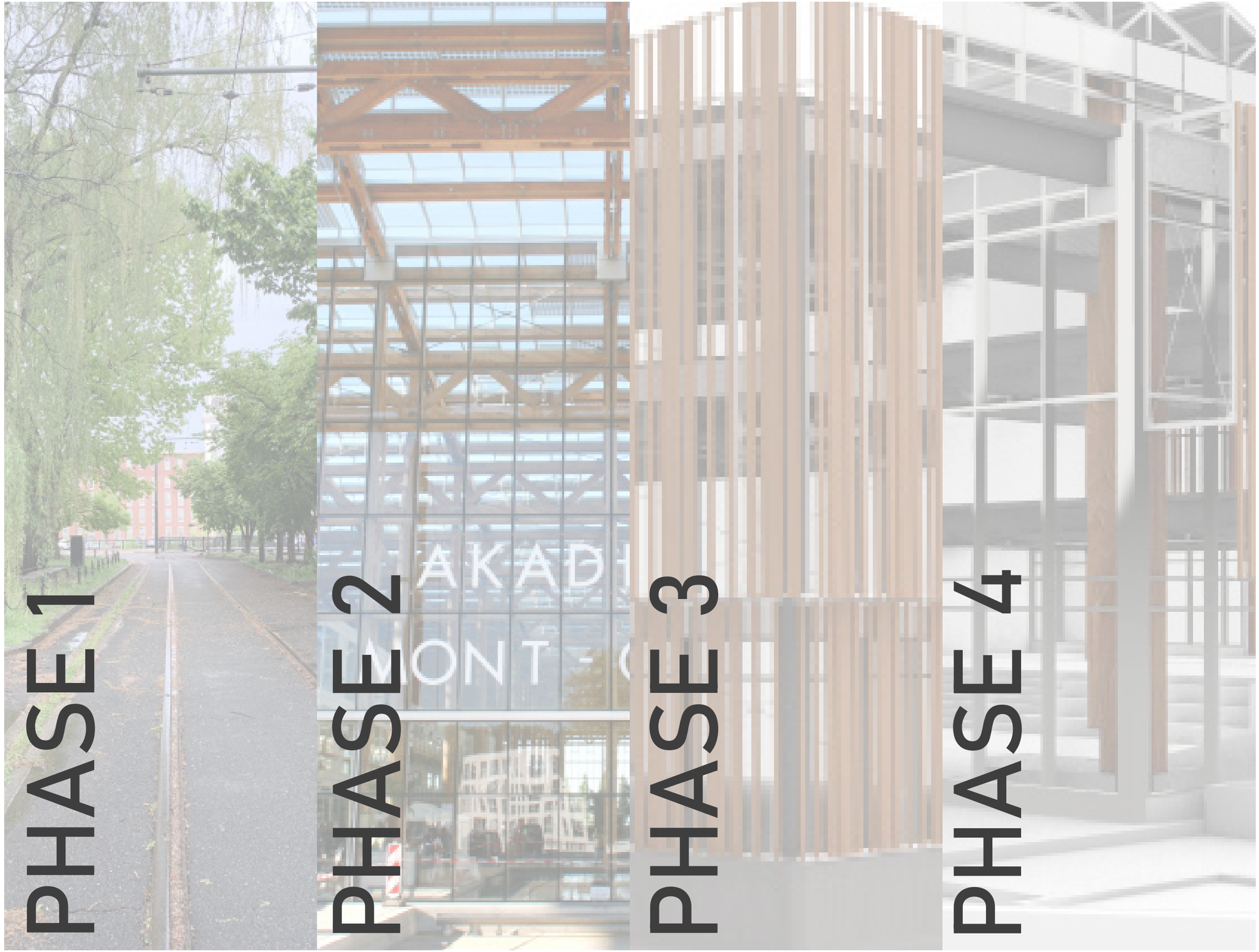
2. Be able to create longer spans

3. Permit longevity

4. Make the active systems that are needed as low profile as possible so it doesn't impact the look of the exposed structure

5. Use the facade to naturally shade the interior spaces

6. Create apertures that allow for natural ventilation



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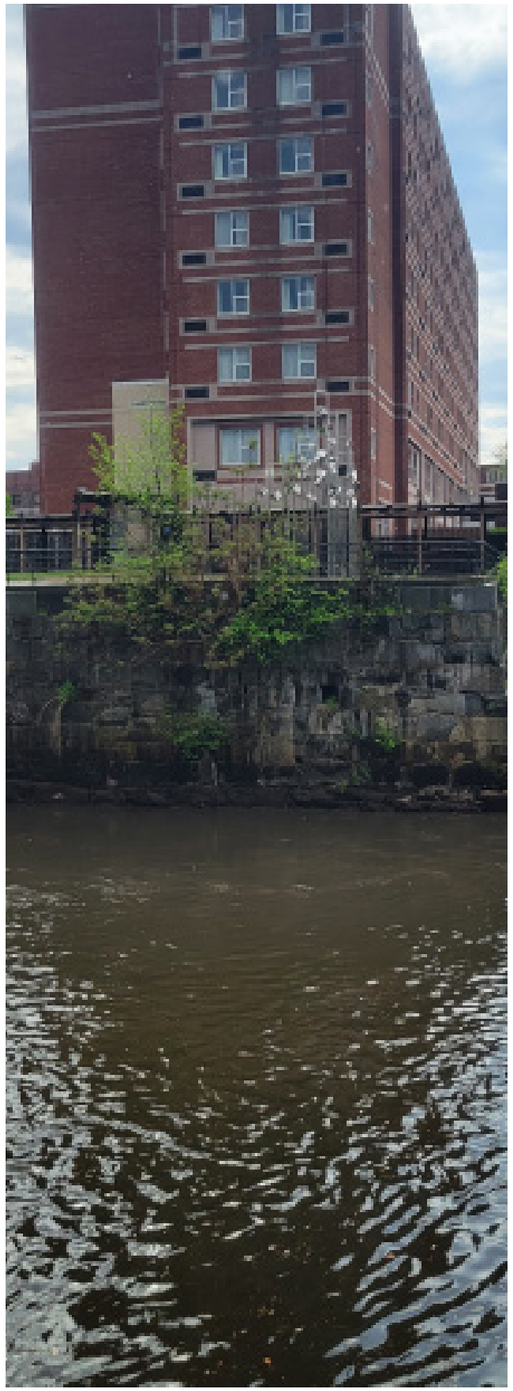
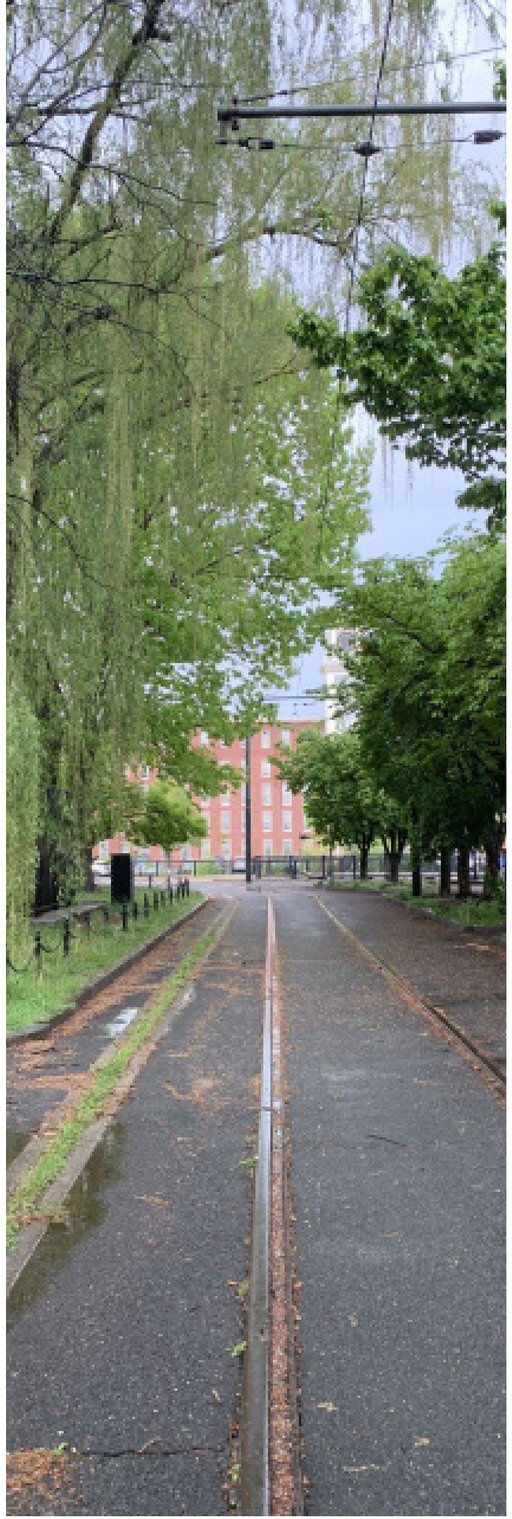
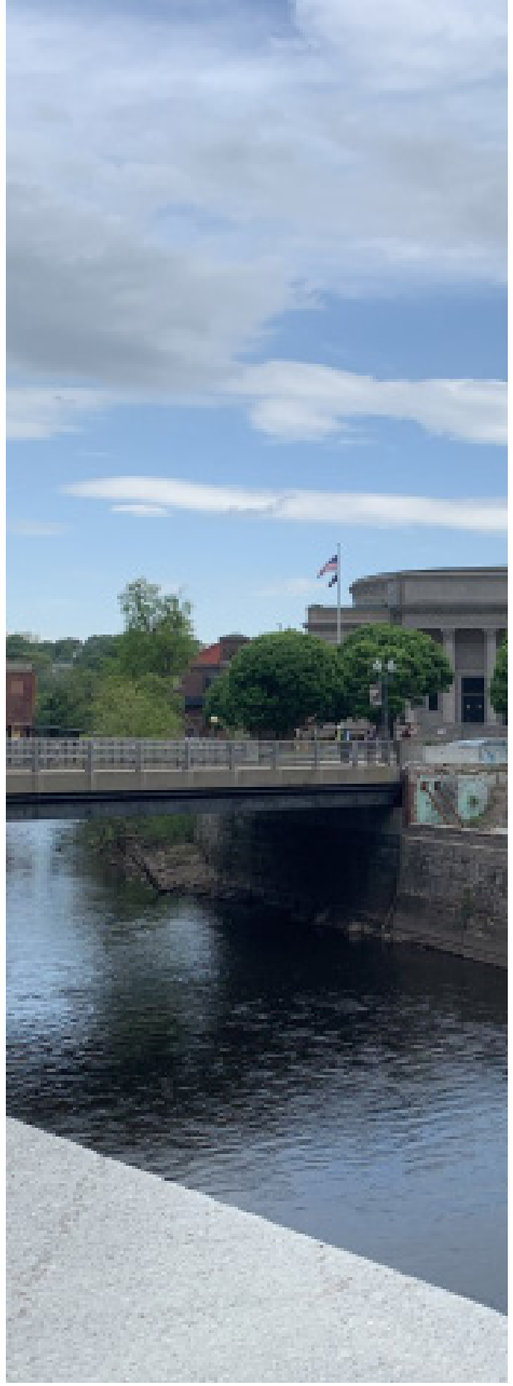
PHASE 1

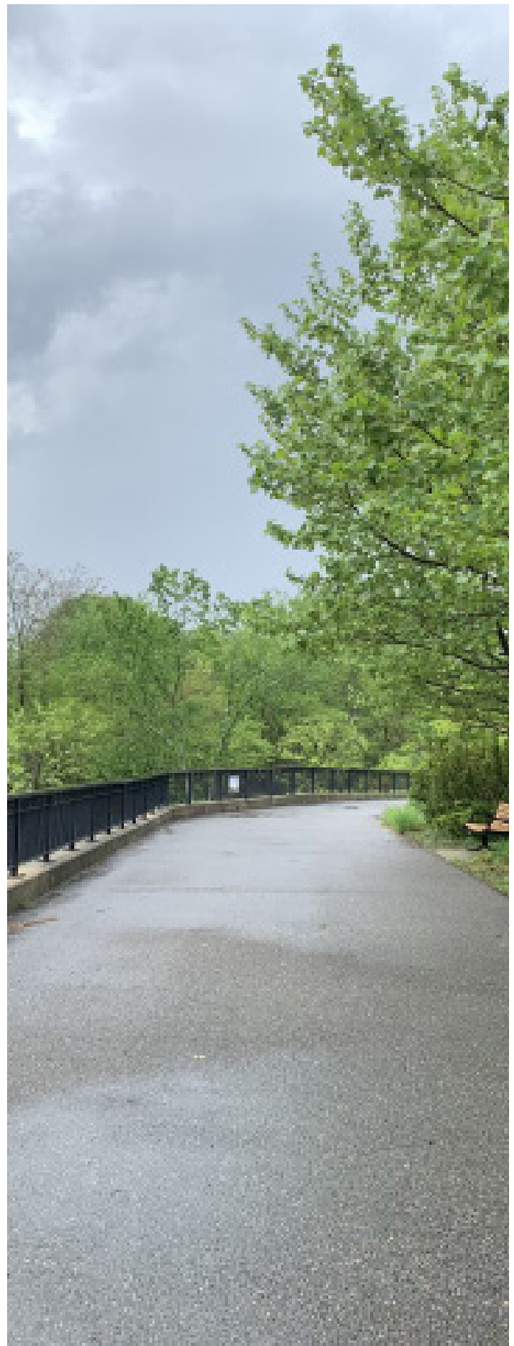
SITE CONTEXT DOCUMENTATION
AND ANALYSIS





SUMMARY





Next to the Concord River and surrounded by the Middlesex Community College and Lowell Memorial Auditorium lies the site of the makerspace. It is located in Lowell, MA which has been historically known to be an industrial town. Many buildings were used as mill factories and have left traces of its past through the use of brick seen on the facades.

Localized Transportation Infrastructure

Site

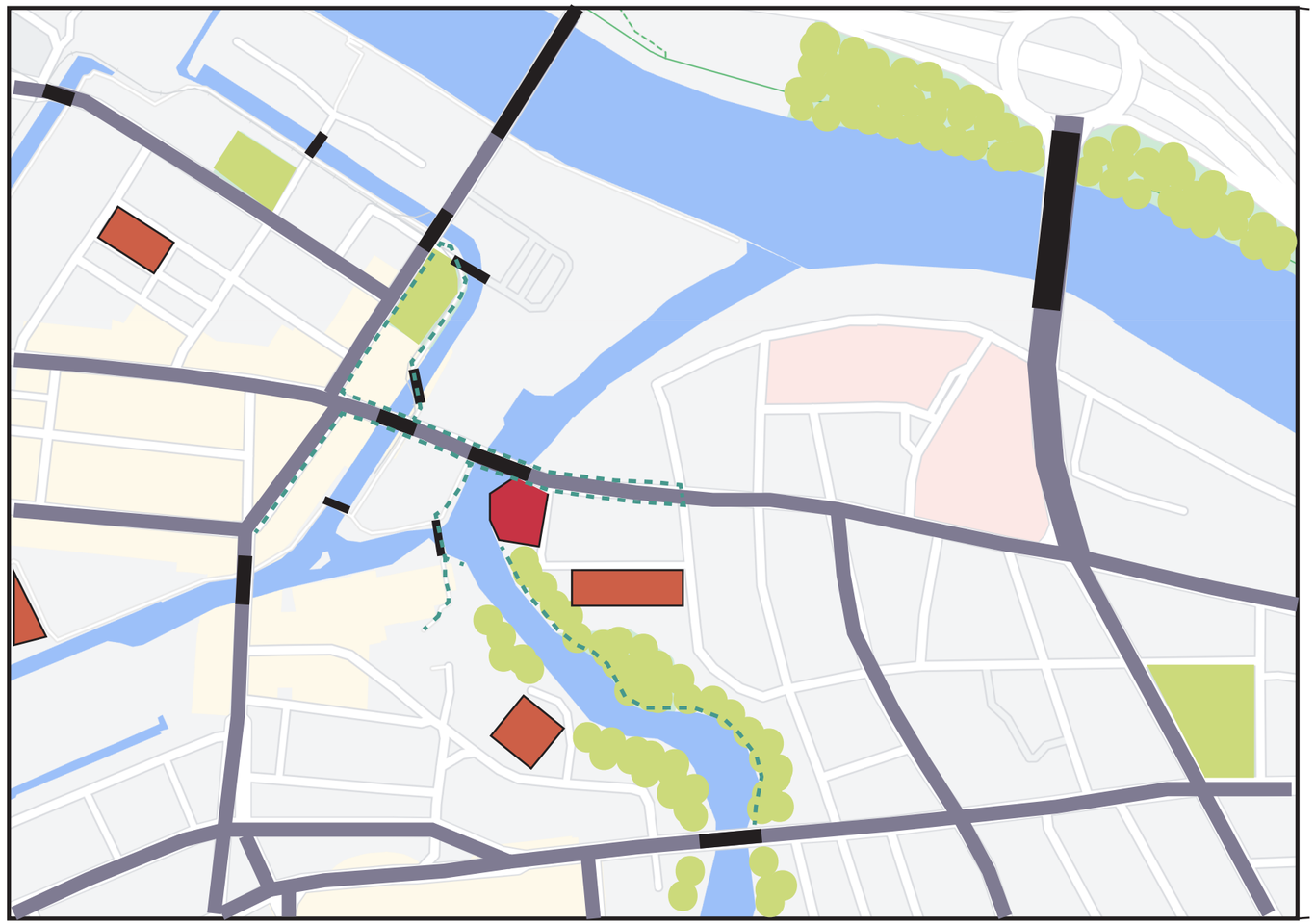
Parking Spaces

Bridge Crossing

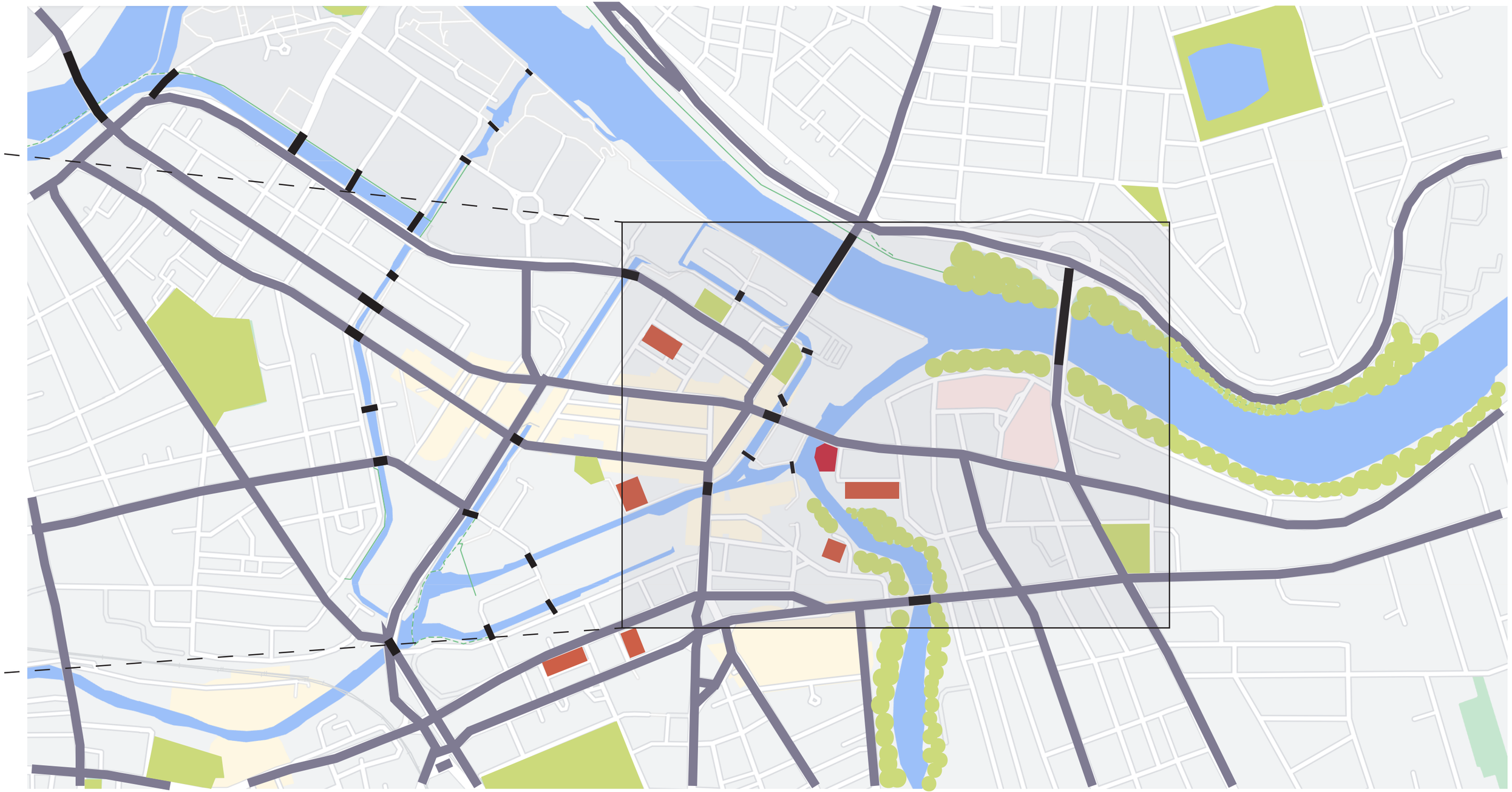
Pedestrian Routes

Green Areas

Main Streets



ARCH 3500 STUDIO 06 - SUMMER 2022



ARCH 3500 STUDIO 06 - SUMMER 2022

Risk, Resiliency, Enviorment and Climate

The environment is changing every day. As we watch the temperature rise, the polar ice caps melt. Everything is changing the environment that we live in and one day will leave behind for the further generations. Some of the changes we are seeing are causing some potentially serious effects. Rising sea levels, new weather patterns, and stronger storms. As the atmosphere warms there is more evaporation causing there to be more water available when it rains, warmer oceans cause more intense flooding from hurricanes and storms, and the risen sea level increases the risk of flooding in low-lying areas.

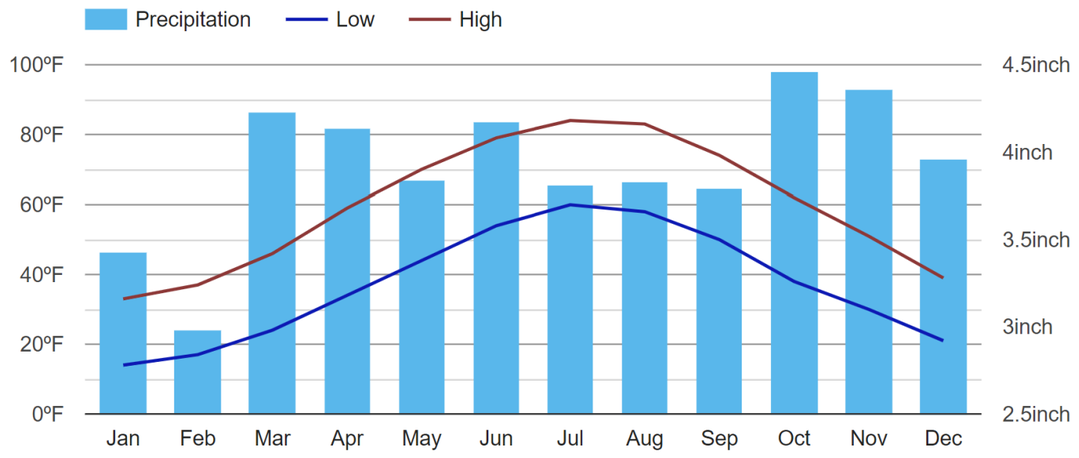
Weather:

Lowell MA is Located in the Dfb - Humid Continental Mild Summer, which means it is Wet All Year. Lowell will get roughly 48 inches of rain and have 128.3 rainy days annually, which is rainier than most places in Massachusetts. Similar to the rain stats the snow is pretty similar, the annual snowfall is 56 inches making it one of the snowiest places in Massachusetts.

Seismic activity and extreme weather:

Lowell does get earth quakes but not extreme ones. Lowell lies within an area that the expected number of damaging earthquakes is between 10- 20 over the span of 10,000 years. Meaning Lowell is not in extreme danger when it comes to earthquakes. Lowell's biggest risk is flooding given it is so close to many waterways. Water levels can change very quickly given there is a low of rain in a short period of time. The likelihood of flooding is much higher than most other natural disasters in this area.

Lowell Climate Graph - Massachusetts Climate Chart



Lowell Flood Risk

Residential **Major Risk**
3,406 out of 17,592 homes

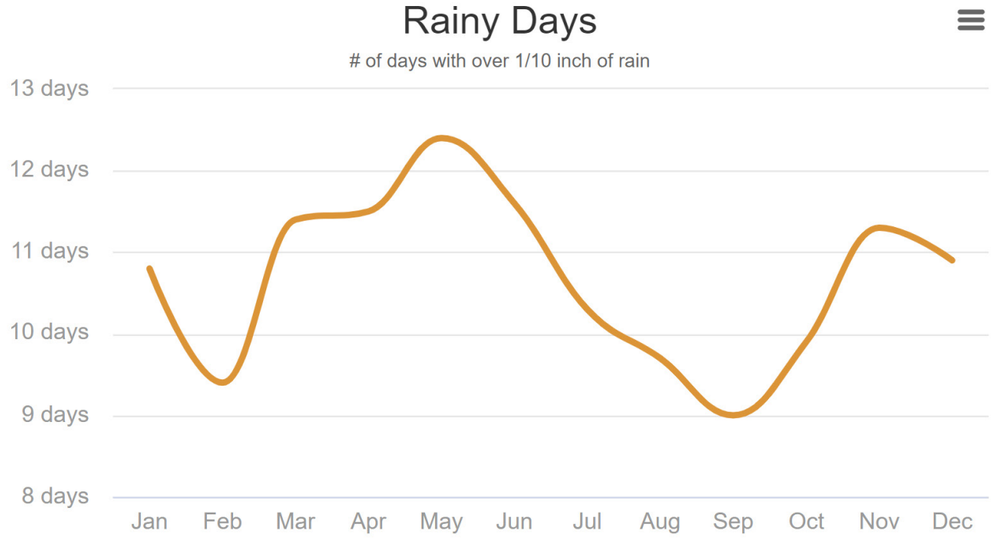
Road **Major Risk**
111 out of 319 miles of roads

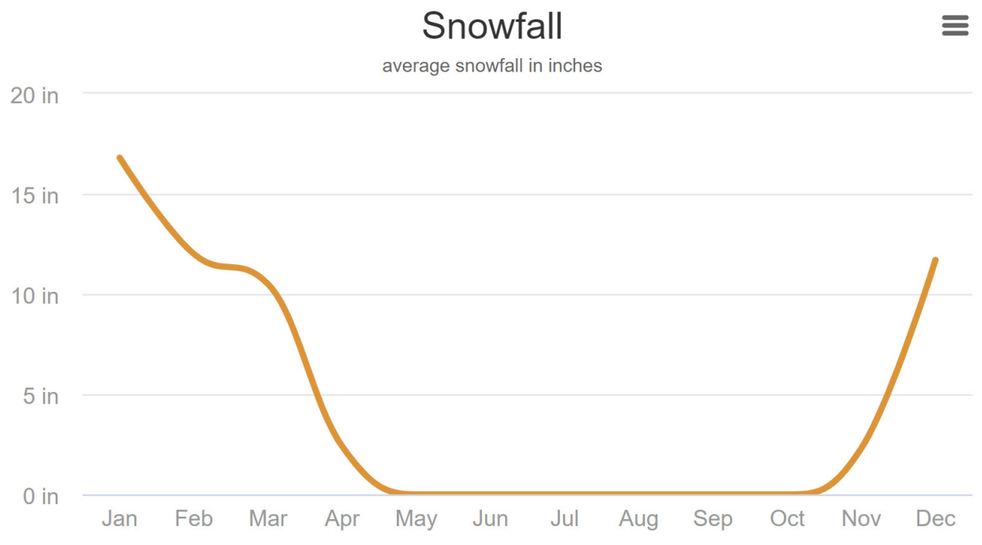
Commercial **Severe Risk**
413 out of 1,018 commercial properties

Critical Infrastructure **Major Risk**
8 out of 28 infrastructure facilities

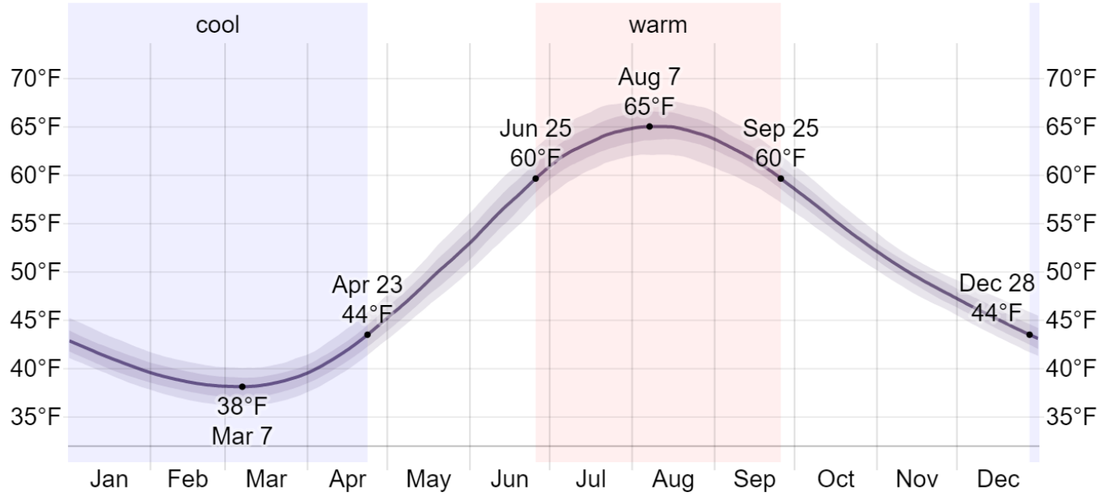
Social Facilities **Moderate Risk**
33 out of 121 social facilities

Minimal Minor Moderate Major Severe Extreme

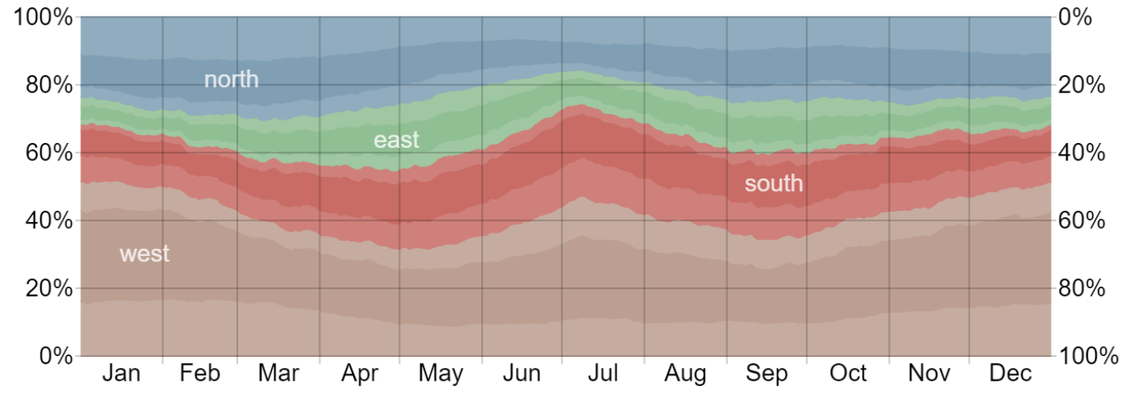




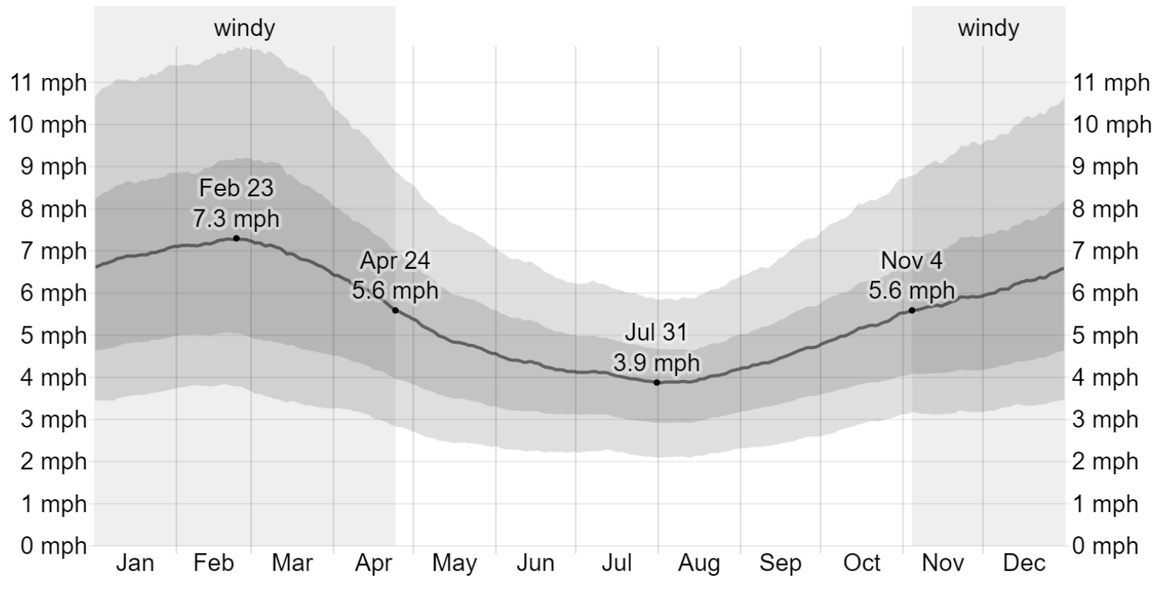
Average Water Temperatures



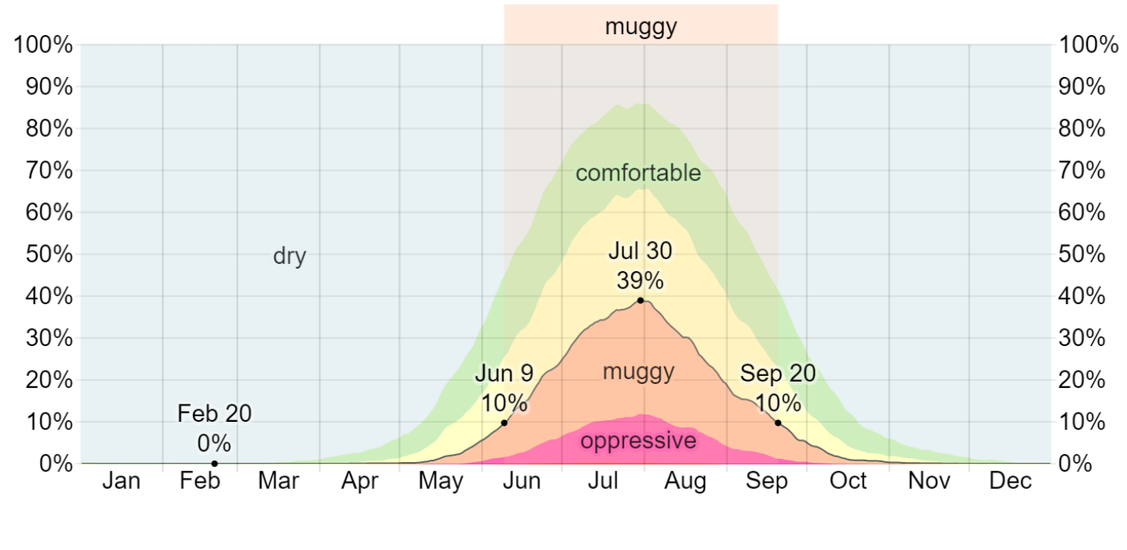
Wind Direction



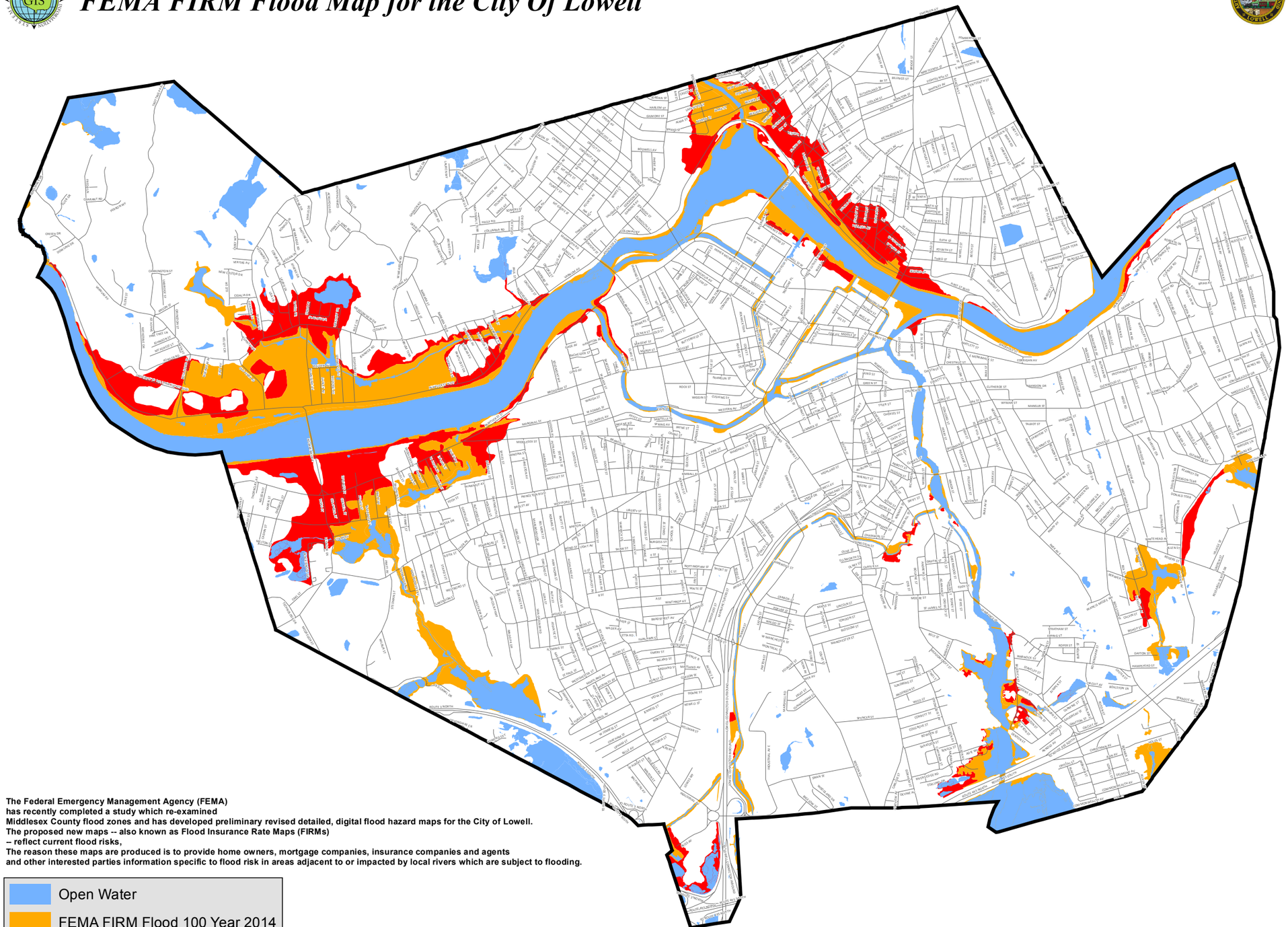
Average Wind Speed



Humidity Comfort Levels



FEMA FIRM Flood Map for the City Of Lowell



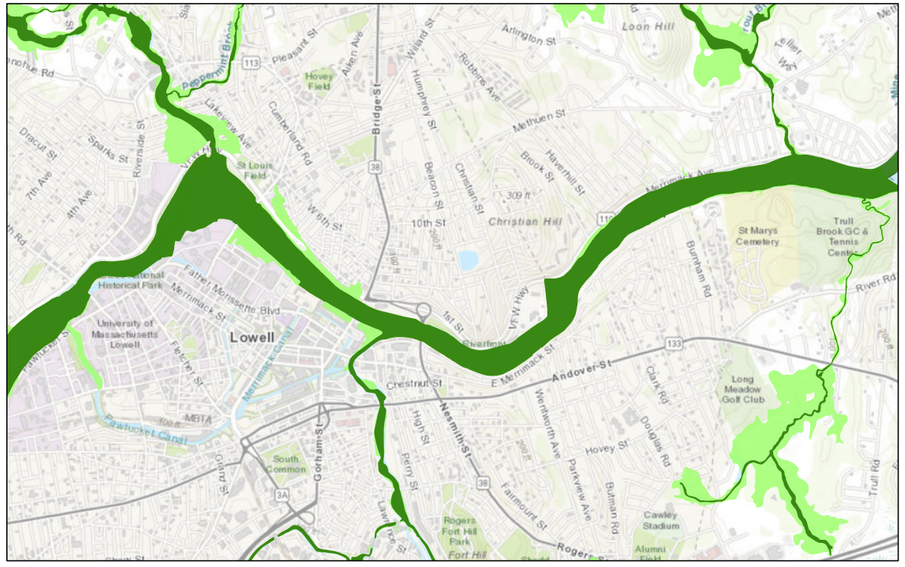
The Federal Emergency Management Agency (FEMA)
has recently completed a study which re-examined
Middlesex County flood zones and has developed preliminary revised detailed, digital flood hazard maps for the City of Lowell.
The proposed new maps -- also known as Flood Insurance Rate Maps (FIRMs)
-- reflect current flood risks,
The reason these maps are produced is to provide home owners, mortgage companies, insurance companies and agents
and other interested parties information specific to flood risk in areas adjacent to or impacted by local rivers which are subject to flooding.

- Open Water
- FEMA FIRM Flood 100 Year 2014
- FEMA FIRM Flood 500 Year 2014

Flood Plain effective July, 7, 2014

1 inch = 3,000 feet

Former 100 year flooding map



May 19, 2022

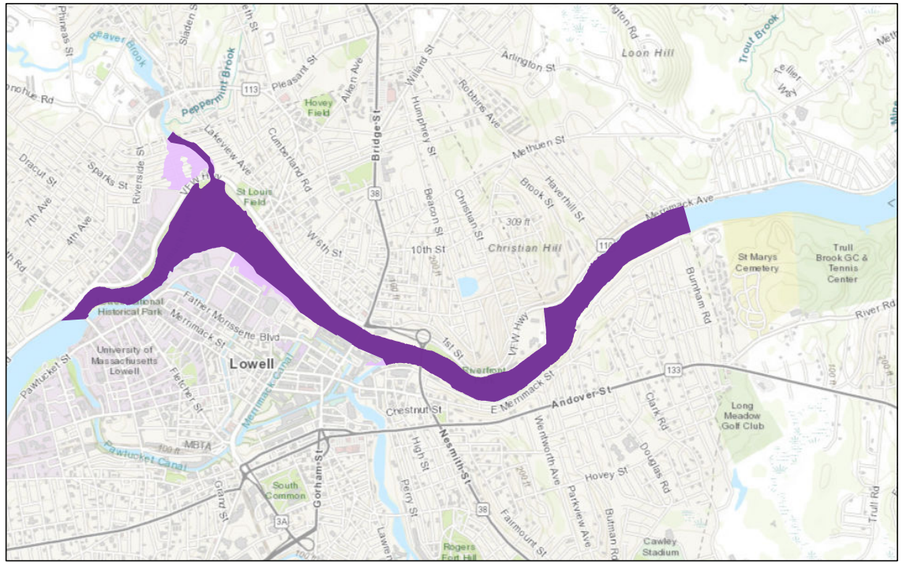
1:36,112

0 0.23 0.45 0.9 mi

0 0.35 0.7 1.4 km

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri

NEW flooding map



May 19, 2022

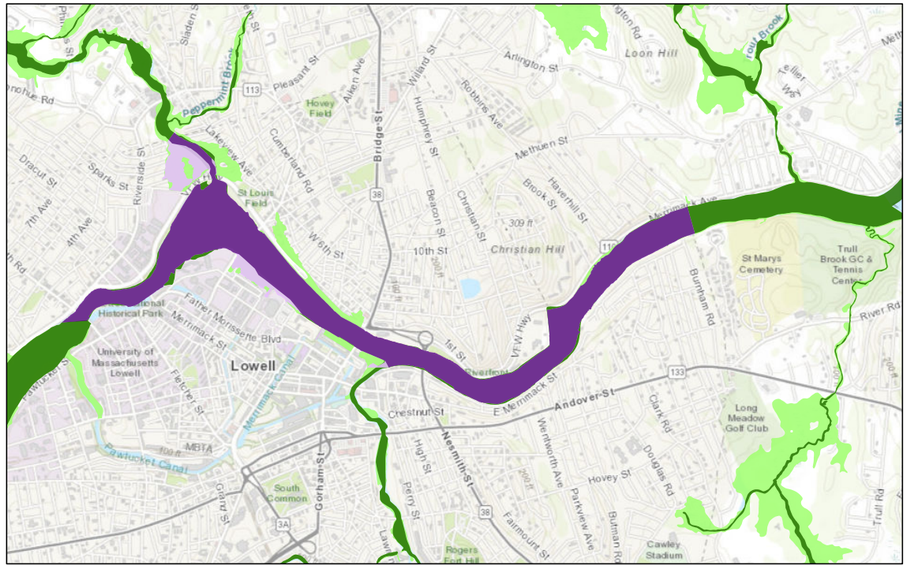
1:36,112

0 0.23 0.45 0.9 mi

0 0.35 0.7 1.4 km

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri

ALL flooding map



May 19, 2022

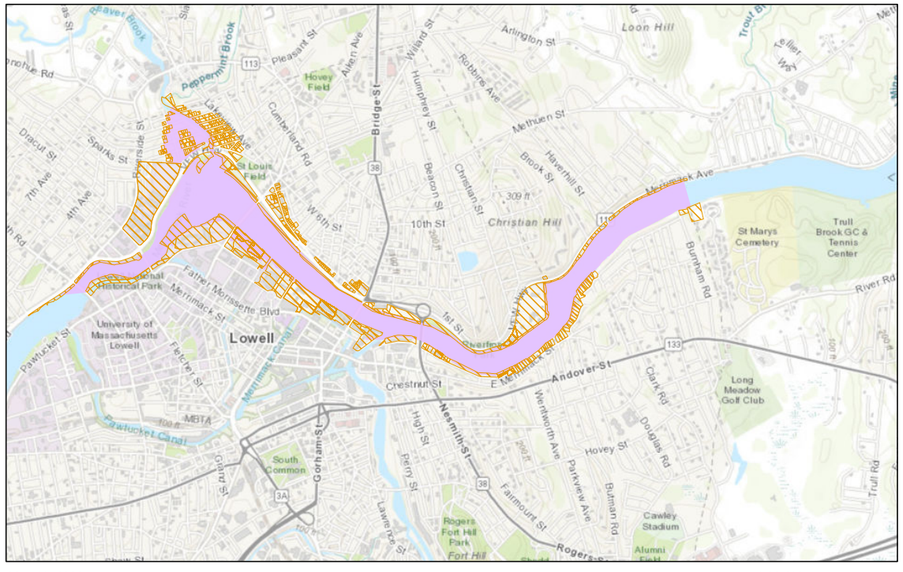
1:36,112

0 0.23 0.45 0.9 mi

0 0.35 0.7 1.4 km

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri

flooding map



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MAJOR LAND USES & REGIONAL PLANNING

SUBURBAN DISTRICTS (SSF)

TRADITIONAL NEIGHBORHOOD DISTRICTS (TSF, TTF, TMF, TMU, NB)

URBAN DISTRICTS (USF, UMF, UMU, DMU)

SPECIAL PURPOSE DISTRICTS (INST, HCD)

INDUSTRIAL DISTRICTS (LI)

SITE

GREEN SPACES

SSF: Suburban Neighborhood Single Family

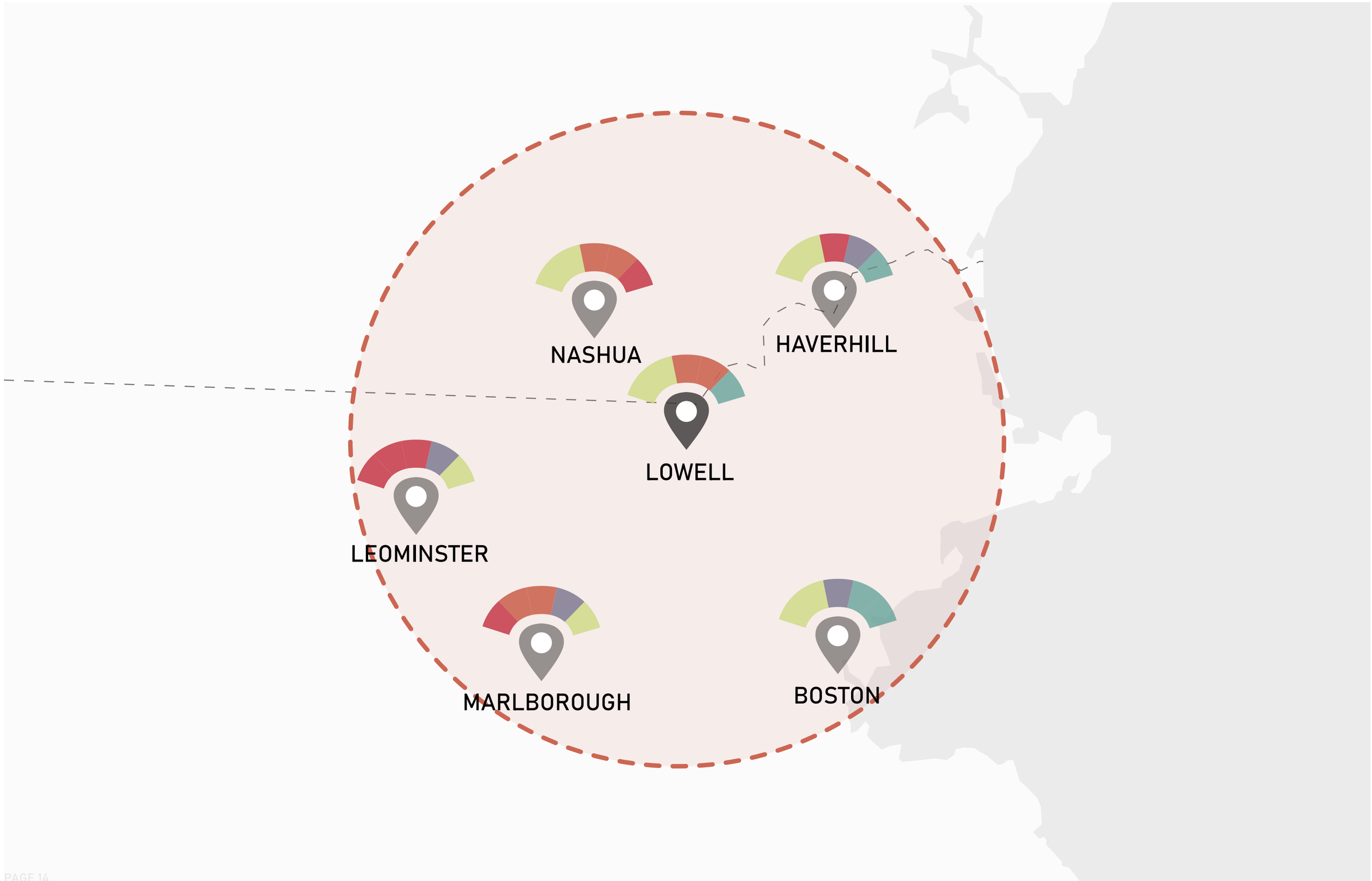
TSF: Traditional Neighborhood Single Family
TTF: Traditional Neighborhood Two Family
TMF: Traditional Neighborhood Multi Family
TMU: Traditional Multi-Use District
NB: Neighborhood Business District

USF: Urban Neighborhood Single Family
UMF: Urban Neighborhood Multi Family
UMU: Urban Mixed-Use District
DMU: Downtown Mixed-Use District

INST: Institutional Mixed-Use District
HCD: Hamilton Canal District

LI: Light Industry, Manufacturing, & Storage

1/750" = 1'-0"


NASHUA
HAVERHILL
LOWELL
LEOMINSTER
MARLBOROUGH
BOSTON

MAJOR INDUSTRIES WITHIN 40 MINUTES REGION

HEALTH CARE

TECHNOLOGY

MANUFACTURING

BUSINESS

HIGHER EDUCATION

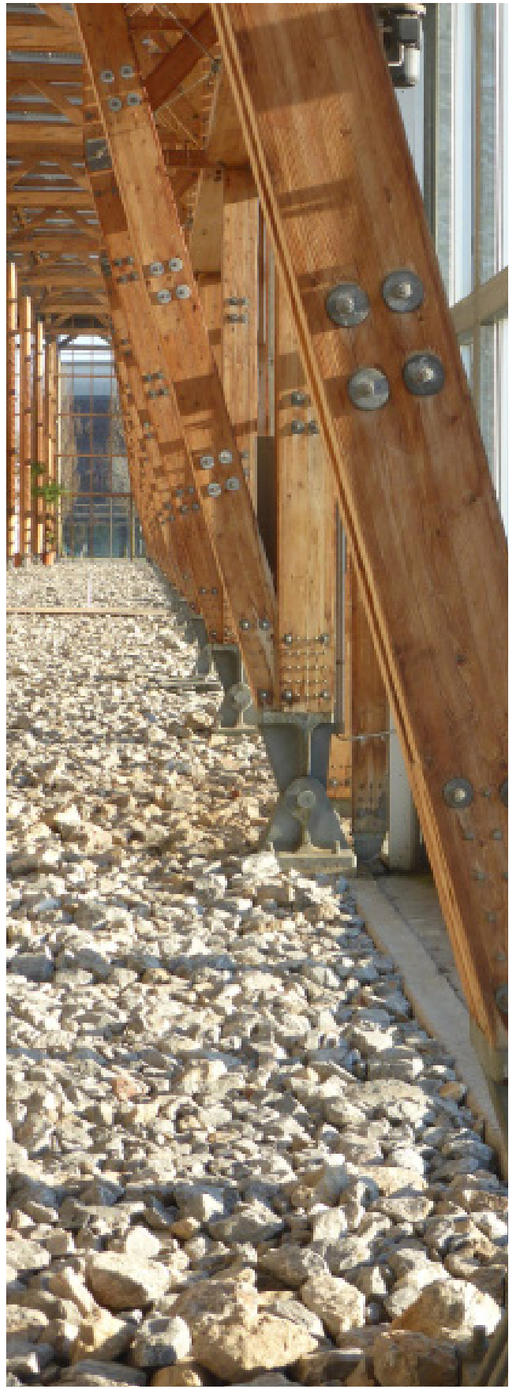
40 MINUTES RADIUS FROM LOWELL

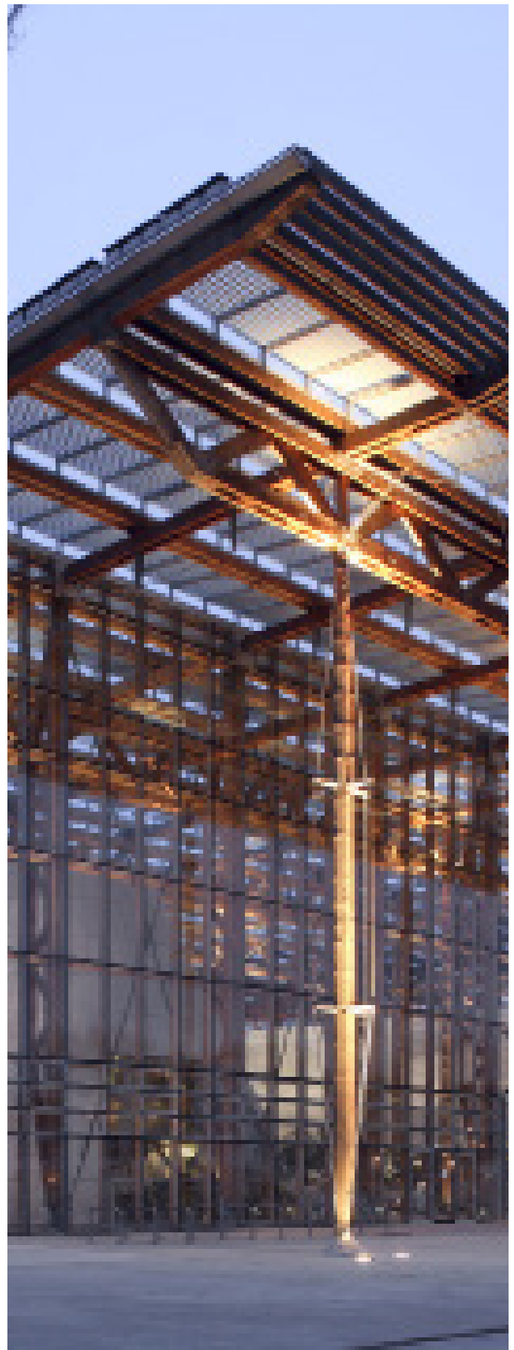
The city of Lowell contributes to the regional economy with industries including several health care facilities, technology, and higher education such as the University of Massachusetts Lowell.

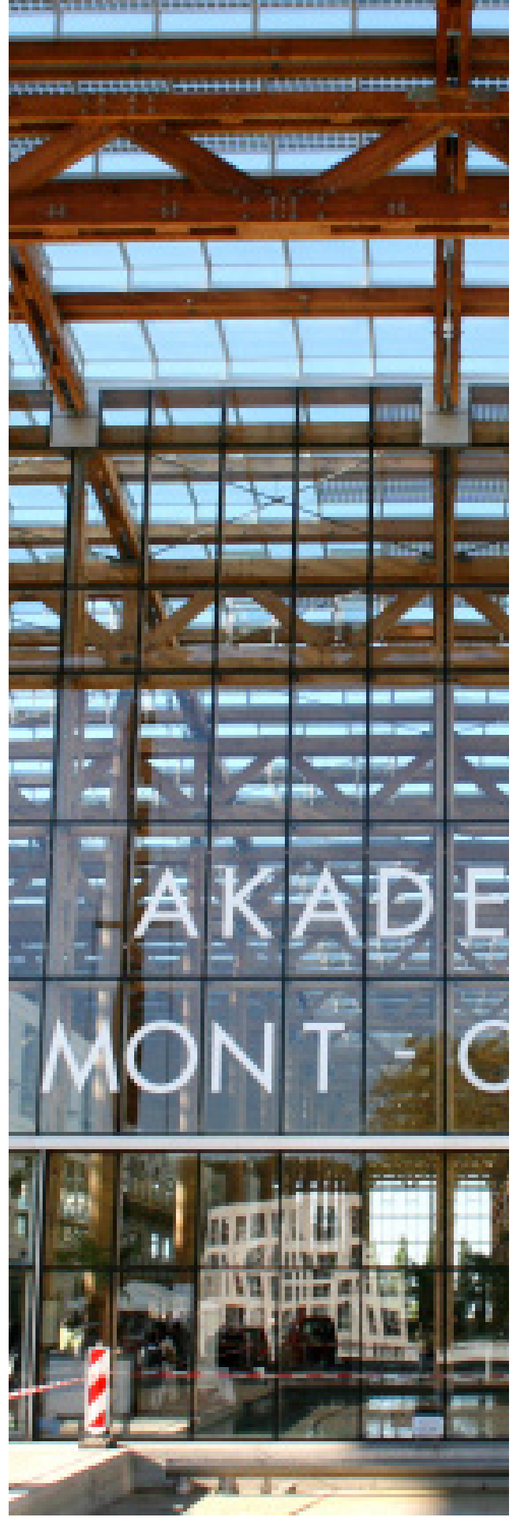
The surrounding cities are listed for comparison.

PHASE 2

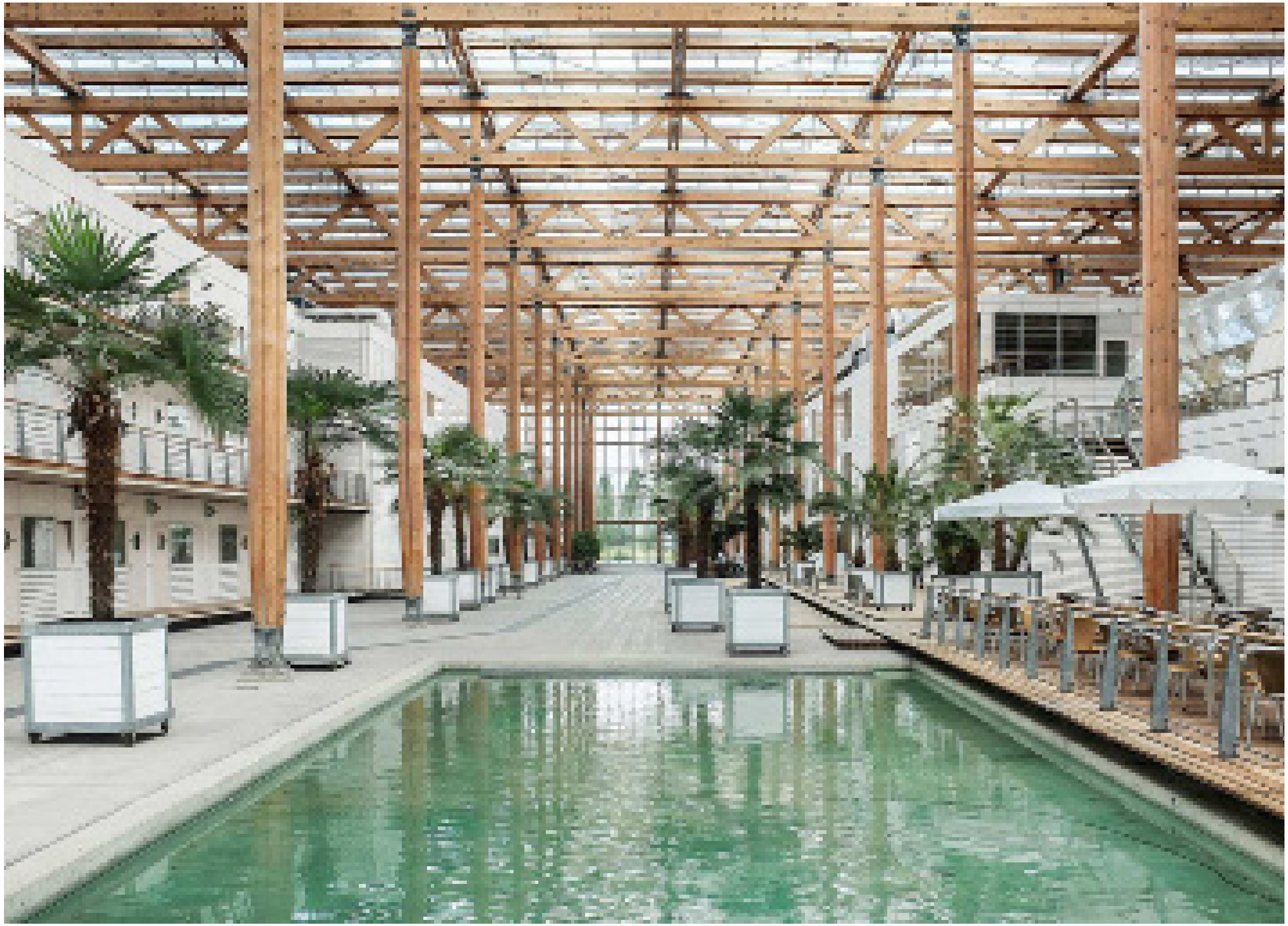
PRECEDENT ANALYSIS & INITIAL CONCEPTS







ACADEMY MONT-CENIS



LOCATION: Herne, Germany

ARCHITECTS: Jourda & Perraudin Architects with HHS Planer + Architekten AG

DATE OF CONSTRUCTION: Started in 1996, completed in 1999

The Academy Mont-Cenis is part of a regeneration master plan for the former industrial region. It was created as an advanced training academy with a guesthouse, library, offices, meeting rooms, administrations, restaurants, sports hall, multipurpose room.

The academy is enveloped in with a transparent glass skin supported by timber frames and ancient pine wood columns, beams and trusses. It encloses two linear building structures that are divided by a common space with waterways and greenery supported by the mediterranean microclimate that the greenhouse creates.

Solar photovoltaic cells are installed on the roof panels and produce the electric energy used within the academy such as the motorized openings designed in the curtaineall which provides natural ventilation.

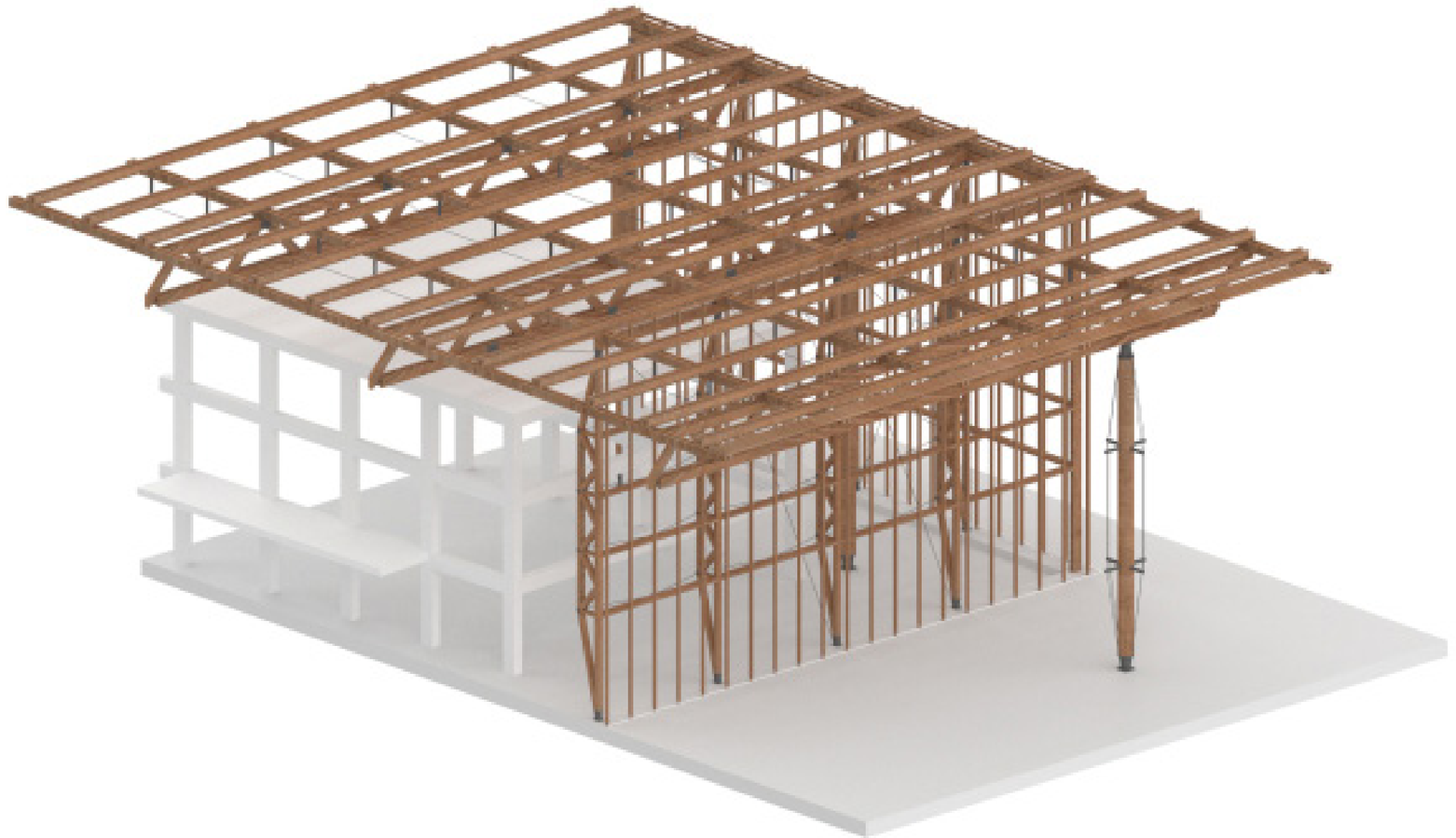
STRUCTURE

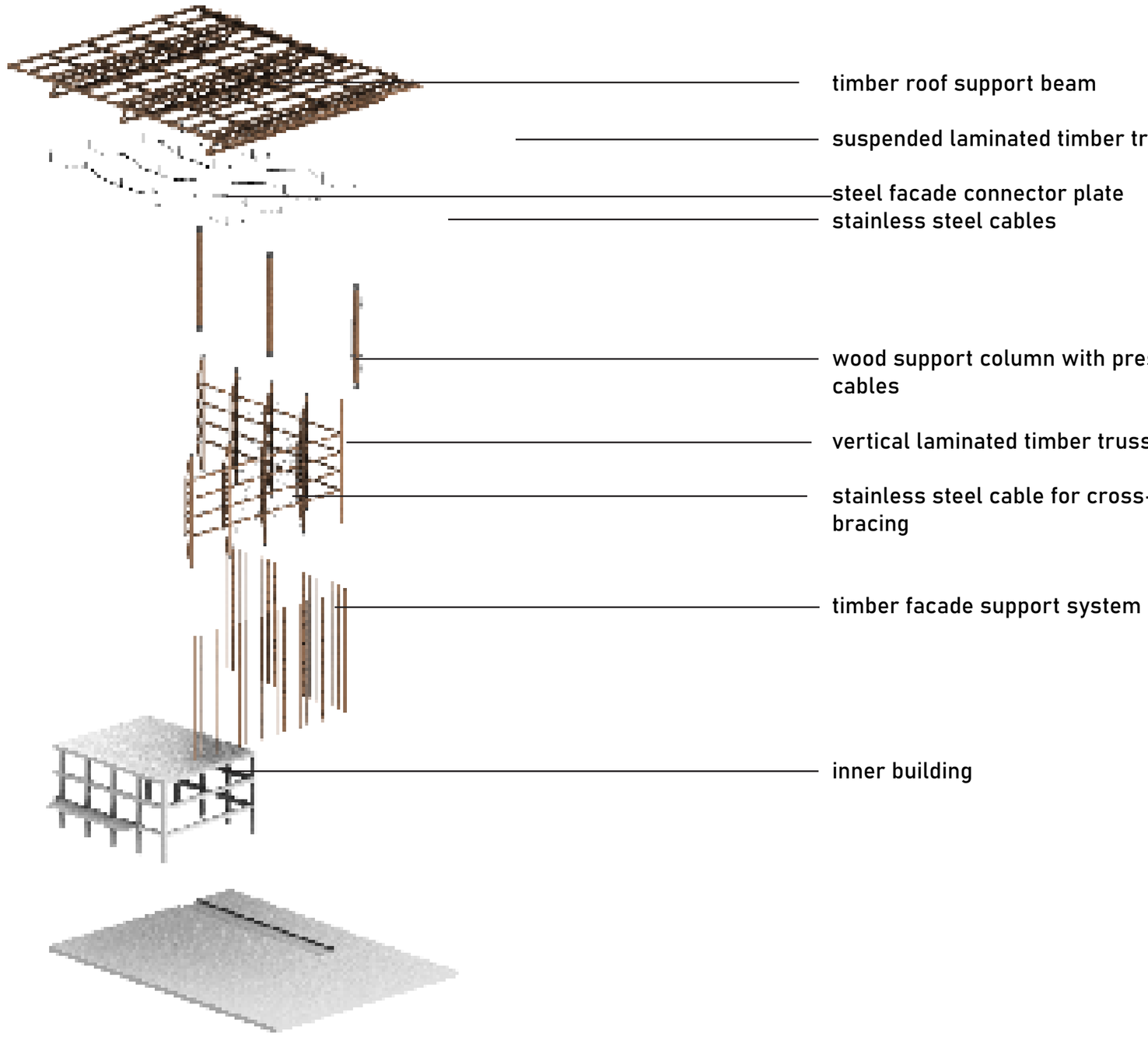
The interior structure can be seen from the exterior of the building. The wooden posts and ceiling structure above the entrance extends from the interior structure to the exterior.

Due to the fact that the distance in the canopy is greater, mixed mechanisms have been incorporated into the posts or columns with steel braces that increase the resistance of vertical loads. This mixed system is similarly repeated several times in the building as can be seen on the roof.

The glass envelope is supported by timber poles and spanned by laminated wood trusses. The independent interior buildings, divide in two linear structures between a common space, can be built as interior spaces, with simplicity in construction and materials, protected from the external environment.

The measurement of the building totals to about 180m in length (590ft) and 16m tall (50ft)



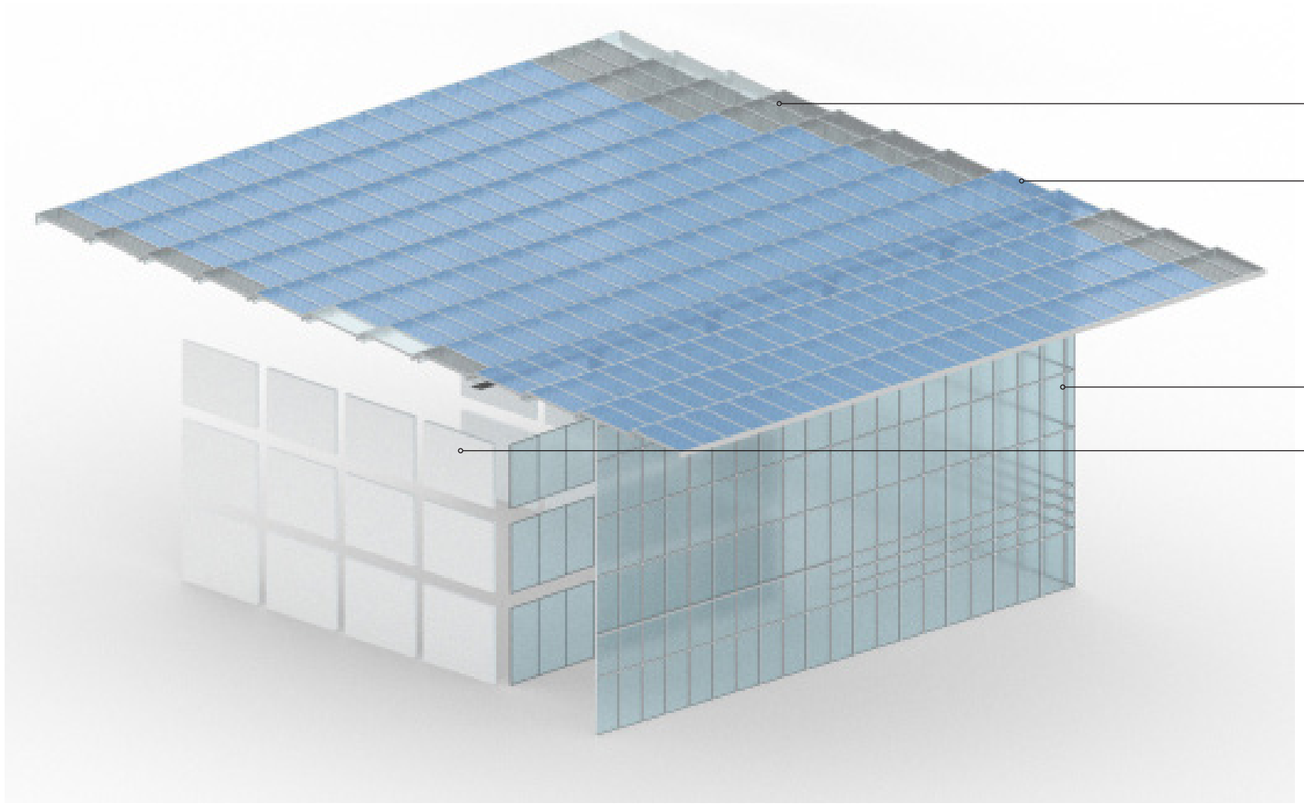

timber roof support beam
suspended laminated timber truss
steel facade connector plate
stainless steel cables
wood support column with pressed cables
vertical laminated timber truss
stainless steel cable for cross-bracing
timber facade support system
inner building

ENCLOSURE

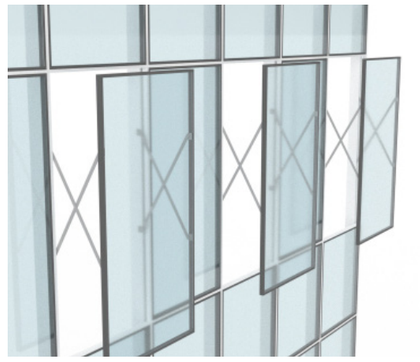
The timber structure is enclosed by a glass envelope consisting of glass panels forming curtain walls around the academy as well as the roof. Within some of the panels are photovoltaic cells that have been integrated into the majority of the roof and west facade.

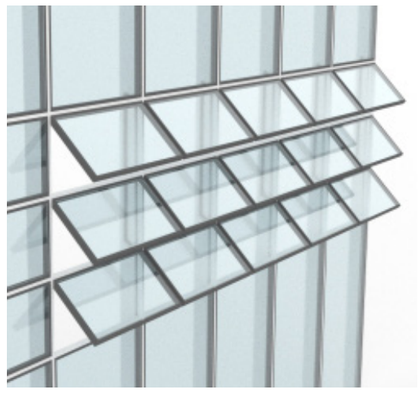
These photovoltaic cells are designed to prevent a greenhouse effect by acting as a shading device while preserving energy. They are able to produce twice as much energy than the building consumes (750,000 kwh).

The curtain walls are made up of a column of modules that are repeated throughout the facades. Each column of panels consists of a standard unit that is altered in size (height). Some of the panels on the lower and upper portion of the walls are motorized windows allowing for natural ventilation.

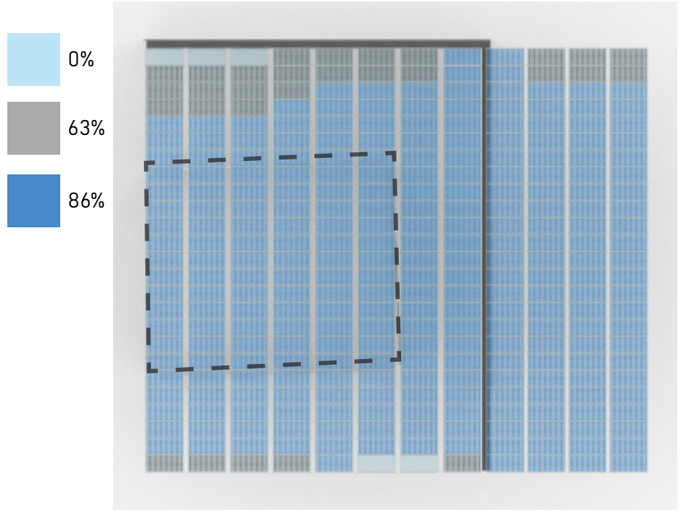


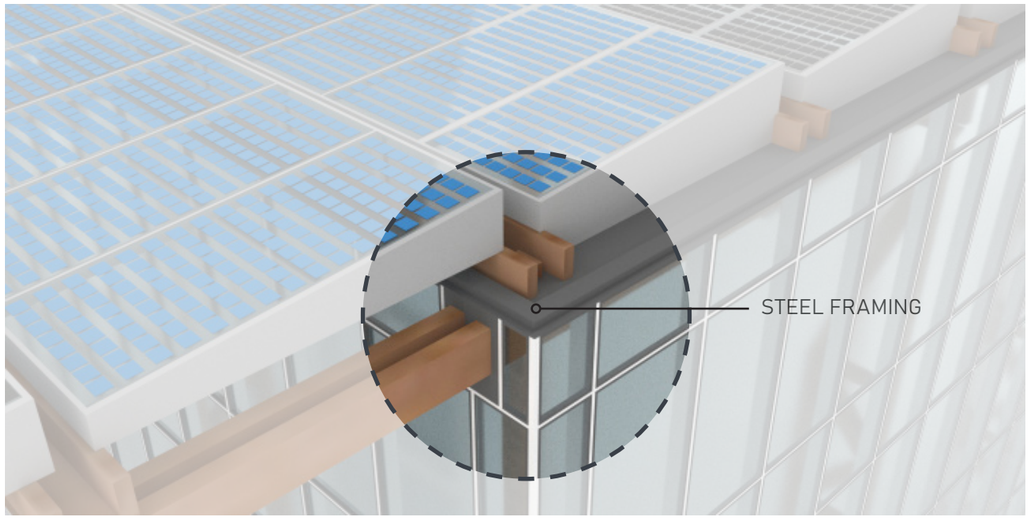
MOTORIZED WINDOWS



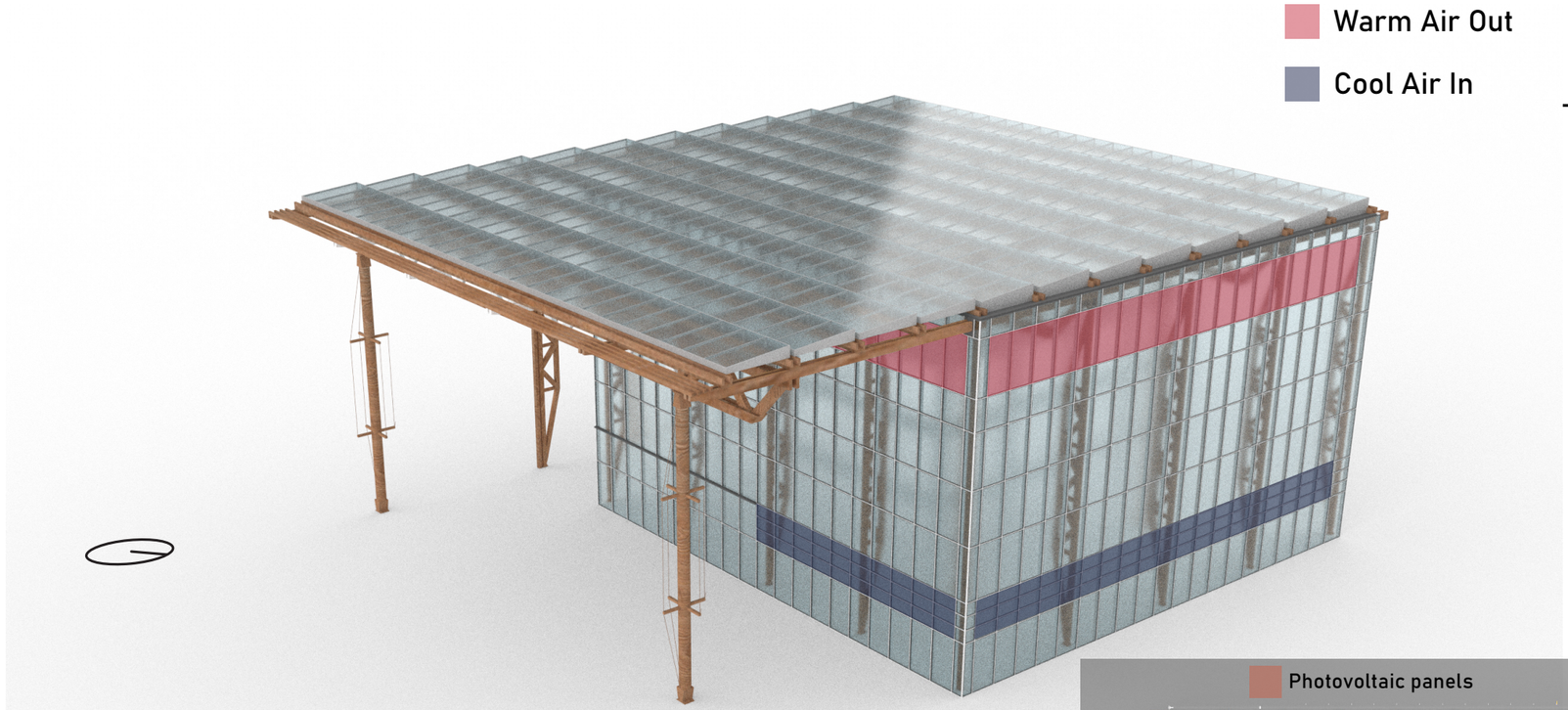


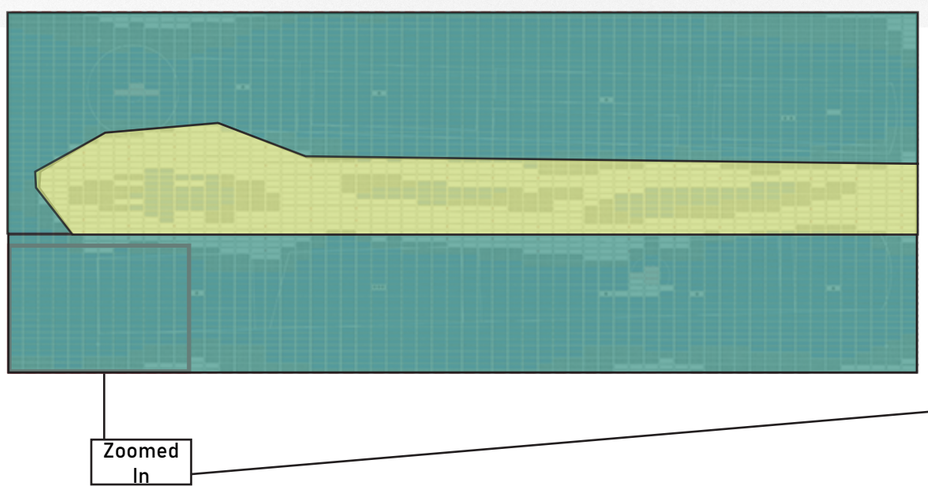
LIGHT DENSITY





Passive Systems





ENVIRONMENTAL CONTROLS

Passive Systems:

Built with many passive systems to do a majority of the heavy lifting when it comes to heating and cooling the space. This is what makes it possible for the building to produce double the energy it uses to run it. It takes advantage of its entirely glass enclosure by making it so windows open at multiple locations going up the wall allowing for cool air to go in and the warm air to get pushed up and out the upper windows. During summer time, the photovoltaic cells together with sun shading and deciduous trees along the east facade provide shade and prevent the glass box from being heated up to the point of discomfort.

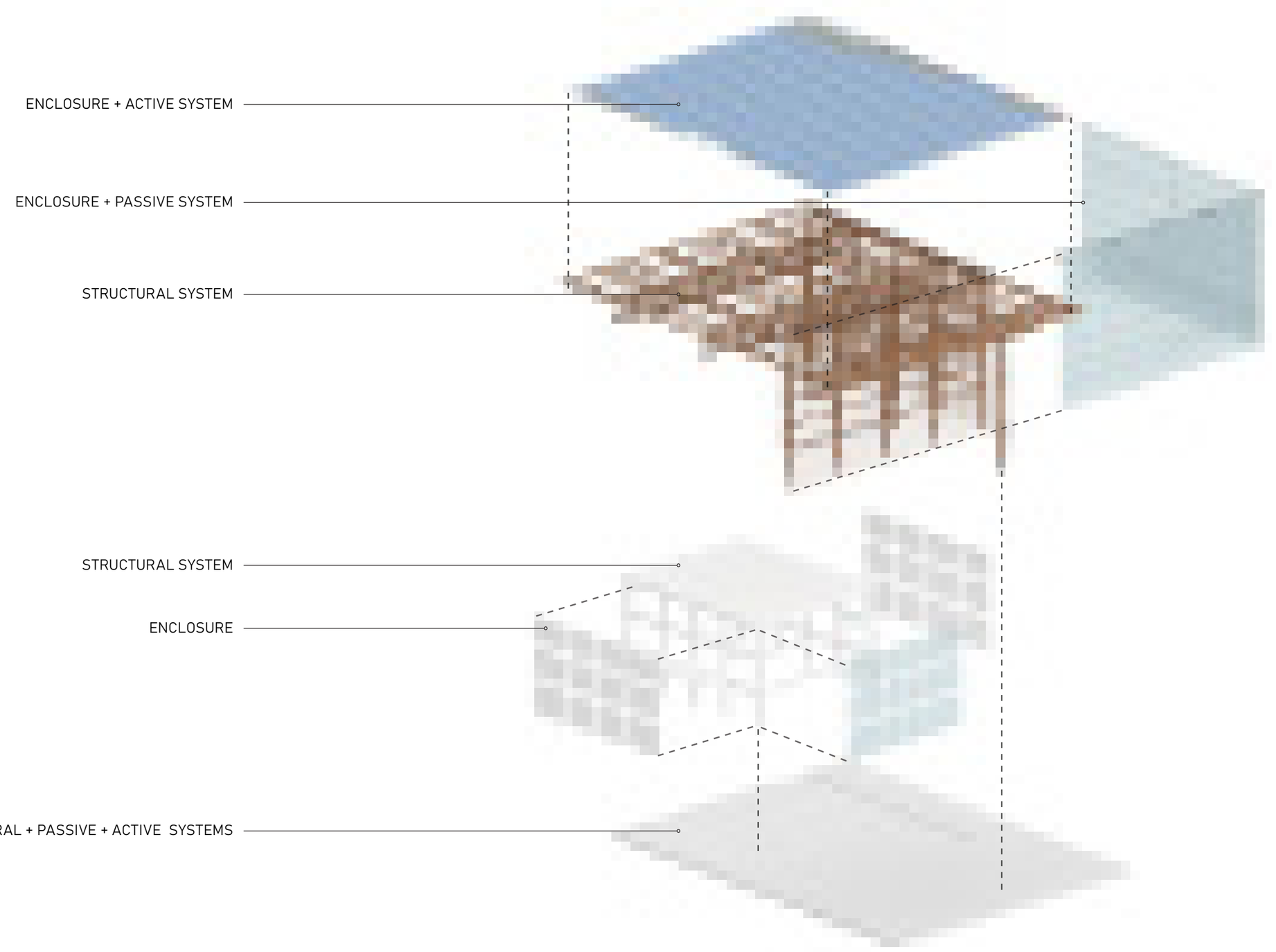
Active Systems:

The Heating and cooling system uses geothermal energy to heat and cool the space to assure it remains at a comfortable temperature. This geothermal system runs 10ft under the building. All of the systems in this building have to be run underground due to the glass structure of the exterior.

Lighting:

When it comes to lighting given all of the enclosure is glass it has very good day lighting. The photovoltaic cells shade a majority of the building. They are placed in such a way that there is more sunlight available where there is not a building below. Similar to the rest of the systems any artificial light is wired from the ground going up to ground level in which there is added light. The way the solar panels are laid out on the roof allows for more light to be available along the main circulation space in between the two interior buildings.

COMPOSITE


ENCLOSURE + ACTIVE SYSTEM
ENCLOSURE + PASSIVE SYSTEM
STRUCTURAL SYSTEM
STRUCTURAL SYSTEM
ENCLOSURE
STRUCTURAL + PASSIVE + ACTIVE SYSTEMS

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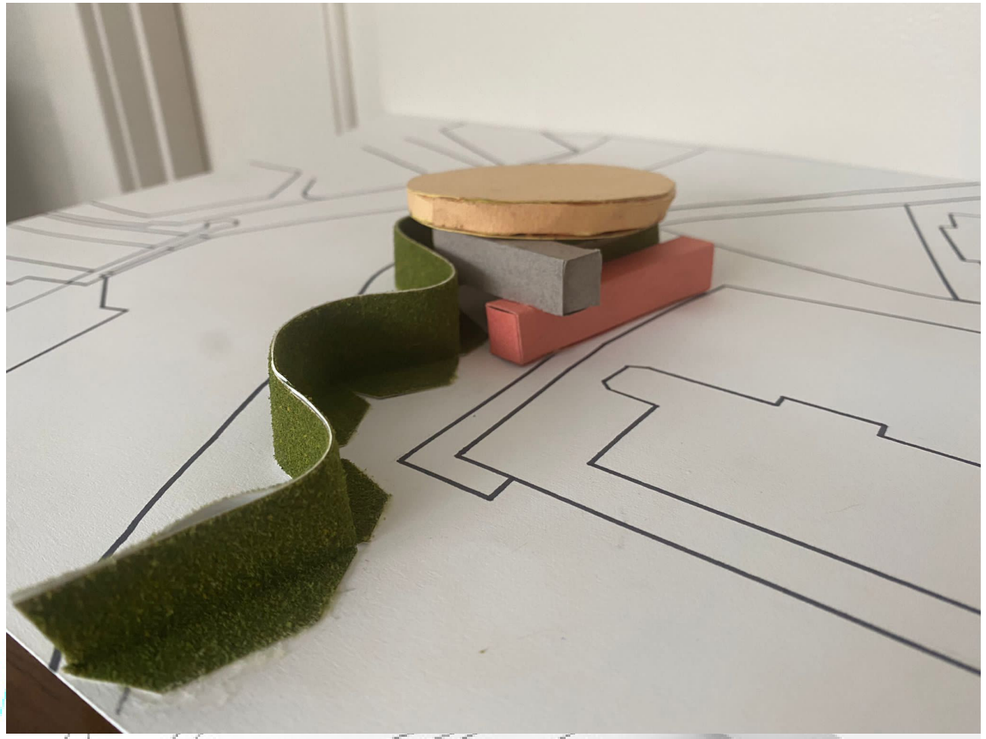
https://www.herne.de/Kultur-und-Freizeit/Tourismus/Sehensw%C3%BCrdigkeiten/Akademie-Mont-Cenis/#translate

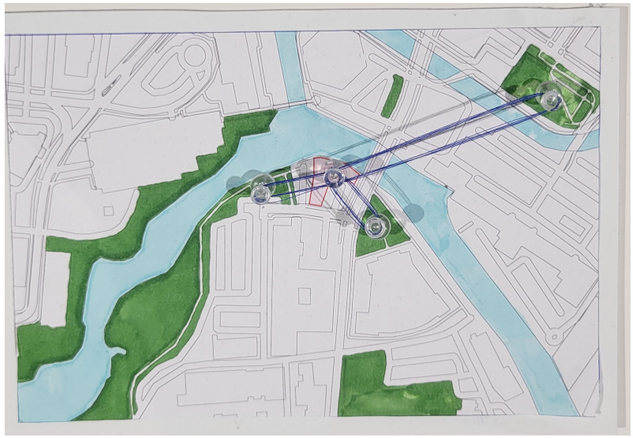
https://advance.lexis.com/document/?pdmfid=1516831&crid=c14c5d7d-cc90-4924-a158-1040ee9b23ac&pddocfullpath=%2Fshared%2Fdocument%2Fnews%2Furn%3AcontentItem%3A3Y73-FS70-0091-N1X6-00000-00&pdcontentcomponentid=143850&pdteaserkey=sr0&pditab=allpods&ecomp=szznk&earg=sr0&prid=827a4778-28e2-4b8d-9344-0775e061ac91

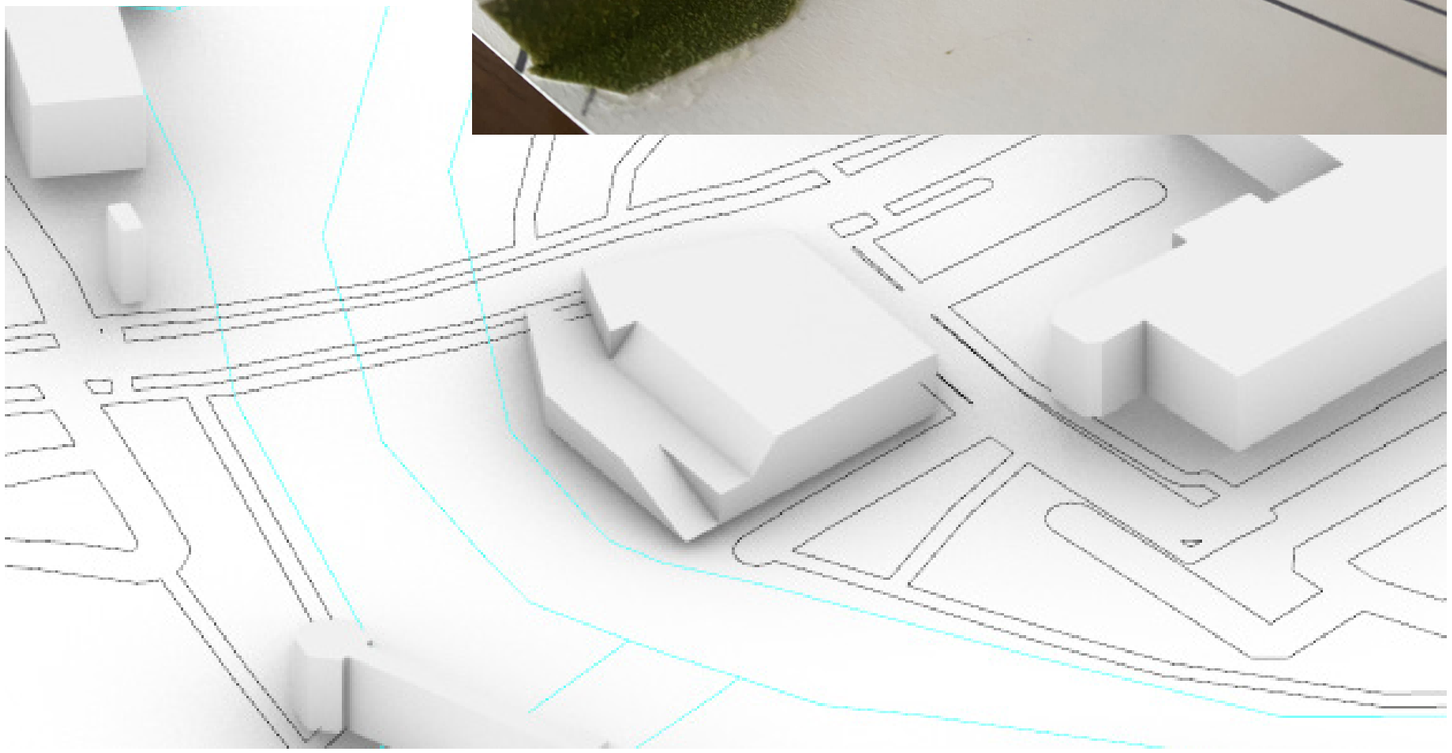
INITIAL CONCEPT

Our intial concept involved tying in with the Concord River Greenway Park and extending it into the site.

One of the ways we explored this concept was through circulation and implementing ramps that allow users to walk onto the building.

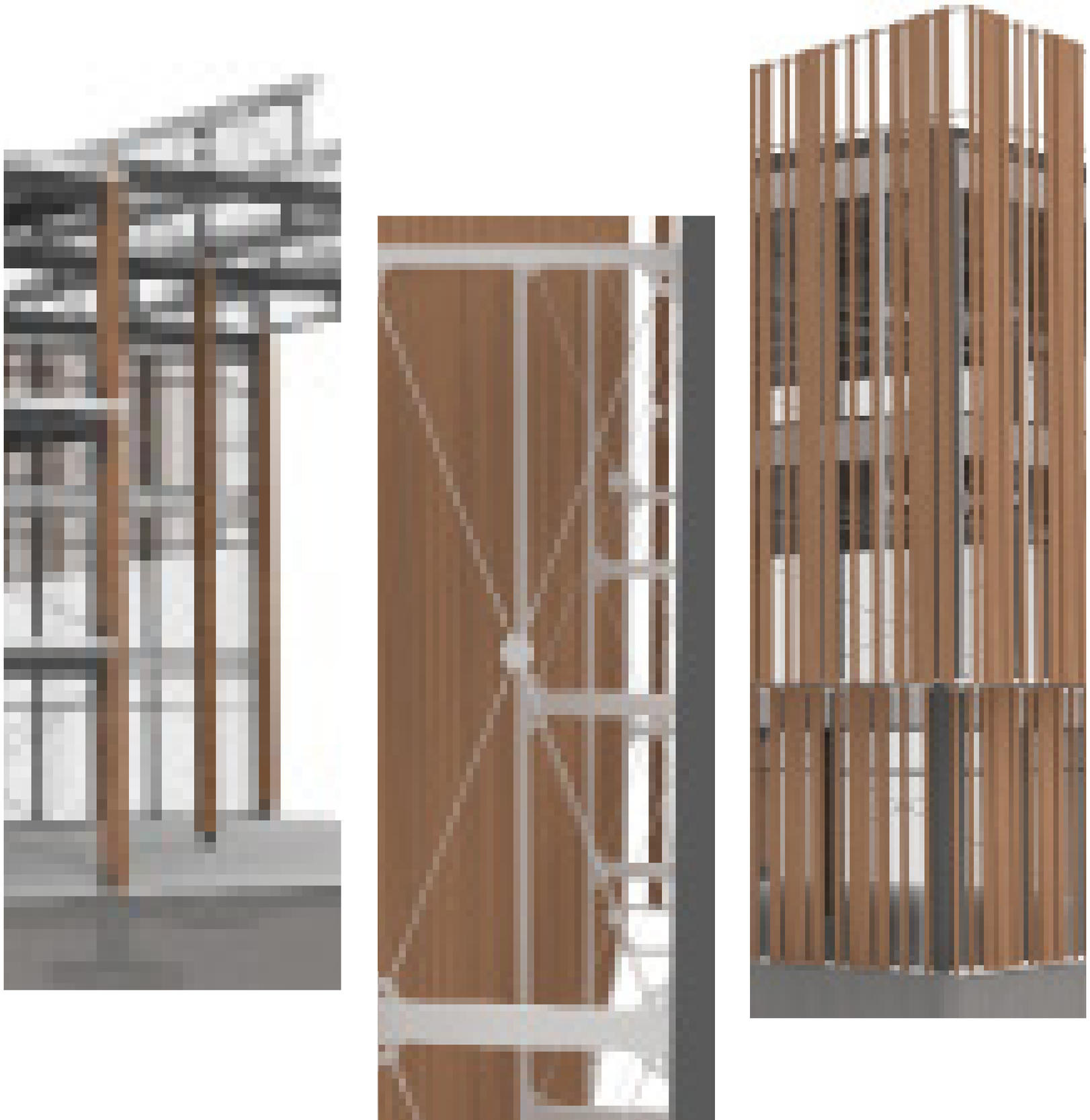


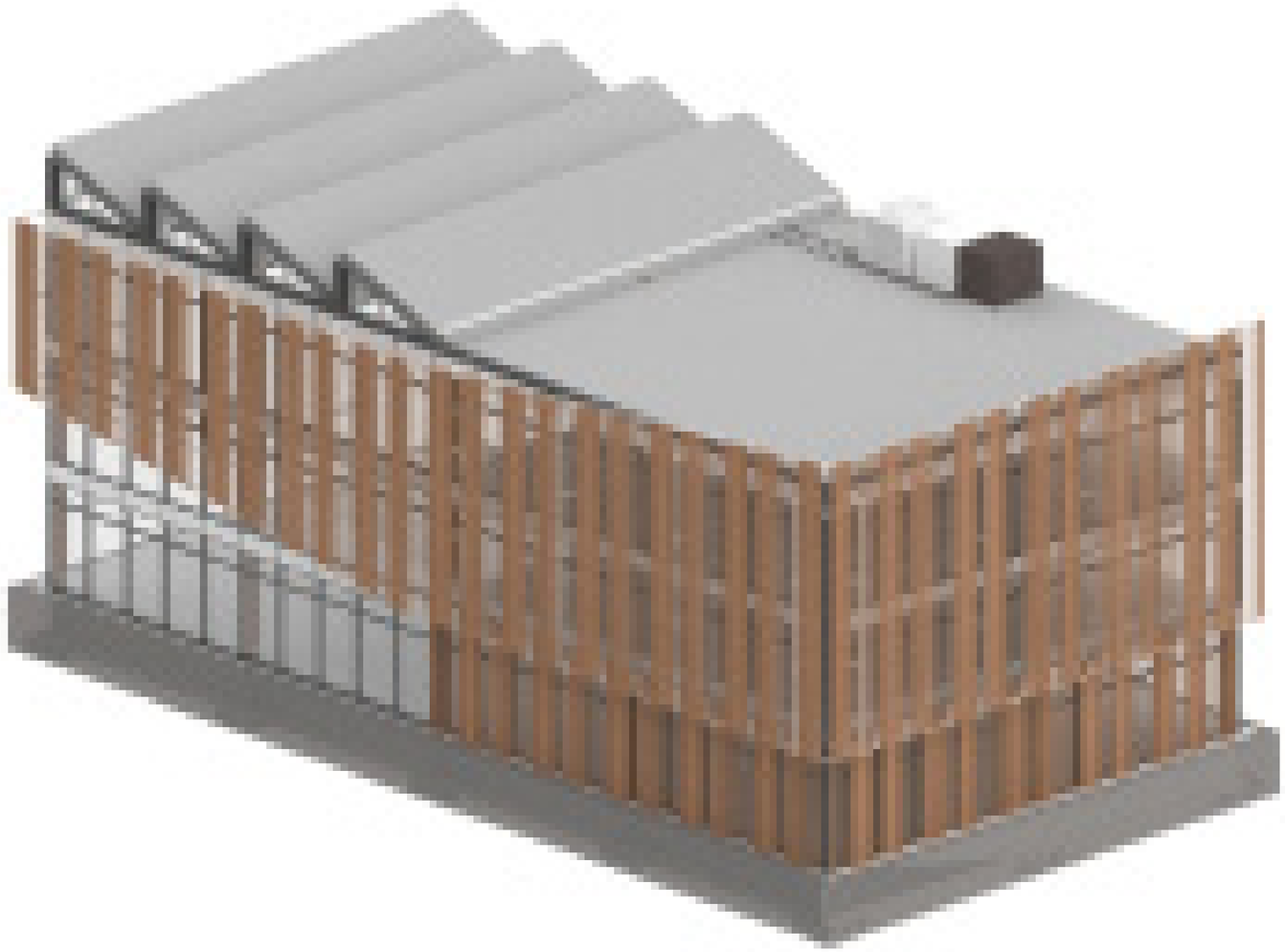




PHASE 3

PROTOTYPE DESIGN





WOOD

DESCRIPTION:

Typically constructed into 2 forms; wood light framework & heavy timber

~ Both can be combined w/ masonry (to increase fire resistance and load capacity)

Platform frame- low-rise residential buildings, small commercials, good for irregular forms; small framing members

Heavy- good fire resistance, high load capacity, low-rise commercial/industrial buildings and residential; solid wood or glue-laminated, large members

TYPICAL SPAN RANGES:

Joists: 10'- less than 20'

Solid beams: 10'-32'
Glue Laminated Beams: 10'-100'

Heavy Trusses: 30'-200'

LIVE LOAD SPAN RANGES:

Light-Medium Loads (Platform Frame)

Light-Very Heavy Timber)

LATERAL LOAD SYSTEM:

Braced frame- Strap bracing
Shear wall- Panel sheathing

ENVIRONMENTAL IMPACTS:

Positive: Wood is a natural resource

Waste such as bark, trim and sawdust can be used for other purposes like fertilizer
Takes less energy to
Produce wood

Stores carbon ~ produces fewer greenhouse gasses than concrete or steel

Recyclable

Negative: the decay or burning of wood releasing all CO2 that was absorbed

EXAMPLES:

Academy Mont Cenis

Lightweight Framework of an apartment complex in Boston

Lightweight Framework (Trusses) of a barn

CONCRETE

DESCRIPTION:

Framing systems is determined by the required spans and magnitude of the in-service loads; One-way solid slab, Two way flat slab

One-way- apartments and hotels; supported by bearing walls, columns, beams and girders

Two-way- strengthens the column-to-slab, for heavier loads, longer spans, and increase resistance to lateral forces

TYPICAL SPAN RANGES:

One-way Joists: 15'-35'

Beams: 10'-75'

LIVE LOAD SPAN RANGES:

Light and Heavy Loads (1-way solid slab)

Medium and Very Heavy Loads (2-way slab)

LATERAL LOAD SYSTEM:

Rigid frames, shear walls

ENVIRONMENTAL IMPACTS:

Positive: recyclable
Negative: cement (one of the materials that makes up concrete) emits 7% of all greenhouse gasses world wide

EXAMPLES:

STEEL

EXAMPLES:


Pomona College, Studio Art Hall


Boeing Hub Expansion


Light Steel Framework

DESCRIPTION:

2 Types: (heavy) Structural Framing & Lightweight Framing
~rapid loss of strength at high temperatures thus, must be concealed behind fire-resistant materials or assemblies
~Noncombustible, can be used where wood can't

Lightweight Steel Framing- cold formed, low-rise buildings,

Conventional Frame- single story to tall buildings, supports variety of cladding systems (curtain walls, stone, masonry); hot-rolled steel
~ typically used with sitecast concrete

TYPICAL SPAN RANGES:

Light-weight Joists: 10'-30'
Open-Web Joists: 10'-150'

Beams: 10'-75'

Heavy Trusses: 30'-300'

Suspension: 75'- over 500'

LIVE LOAD SPAN RANGES:

Light-Medium Loads (Light-weight Framing)

Medium and Very Heavy loads (Conventional Frame)

LATERAL LOAD SYSTEM:

Rigid frames, shear walls, braced frames

ENVIORMENTAL IMPACTS:

Positive: waste or residue of slag (material collected from the top of molten steel), are sold to construction industries ~ won't directly be in landfills

Recyclable

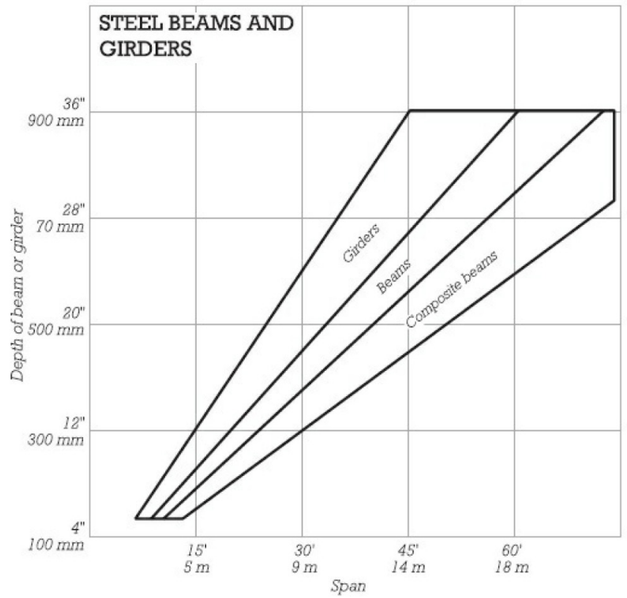
Negative: coke (carbon material used to make steel) production is a major pollution source of steel production

Water is used to cool coke which contaminates the water, however, the pollutant can be mostly filtered out

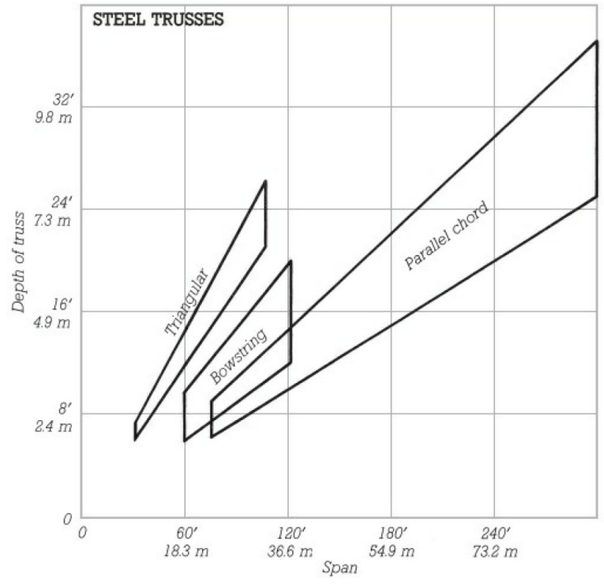
Emits lots of carbon emissions during production ~big contributor to global warming (1 ton of steel = 1.8 ton of CO2)

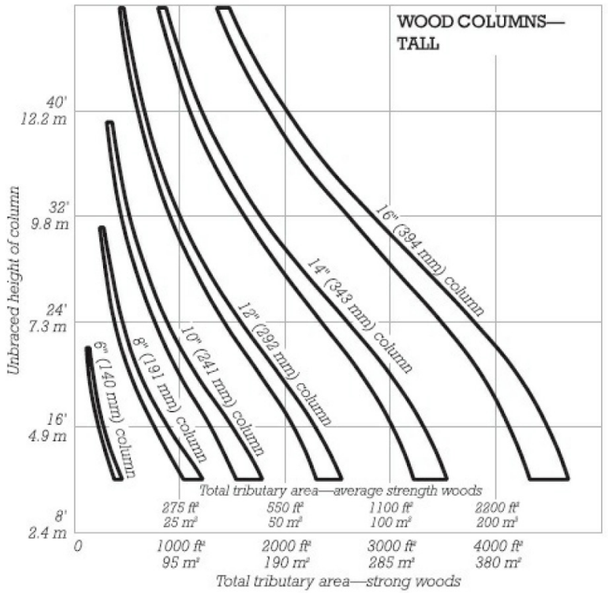
DESIGN GOALS
1) Allow for the structure to be exposed to express the craftmanship to makerspace users
2) Be able to create longer spans = less columns
3) Permit longevity

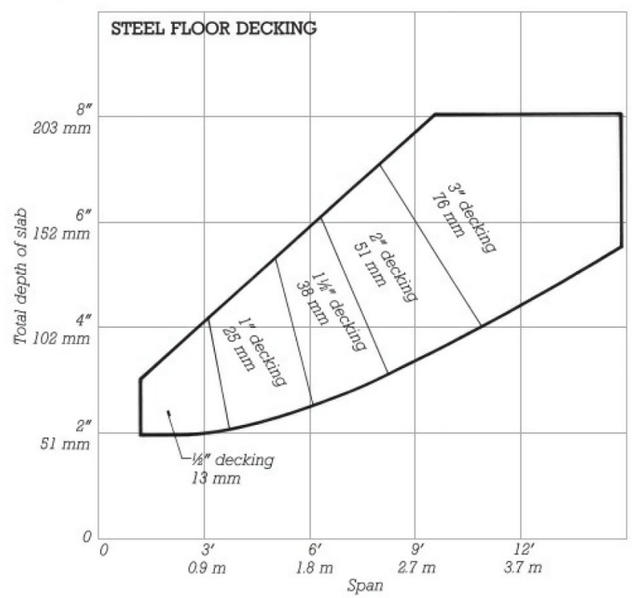
	PROS	CONS
WOODEN STRUCTURAL SYSTEM	✓ Heavy timber framing is a great way to expose the structure because it's **high-fire resistant** ✓ Heavy wood trusses can **minimize the use** of columns and load bearing walls **Allow** for any **modifications** to the building over time **Emphasizes the concept** of the makerspace in which relates to the surrounding nature	Must be kept dry to prevent rot
STEEL STRUCTURAL SYSTEM	✓ Steel framing and trusses can **minimize** the use of columns and load bearing walls **Noncombustible**, meaning it can be implemented where wooden structure cannot Can **minimize** dead load and **strengthen** structure through cables ✓ **Permits** longer spans in beams	When in contact with fire/high temperatures, steel looses it's strength which will requrie the use of a fire-resistant finish
SITE-CAST CONCRETE STRUCTURAL SYSTEM	✓ Any concrete system can be exposed because of it's **high-fire resistant** characteristics Allows for more **flexibility** within column placements Can **minimize** floor slab thickness	Has a **long** curing time Does **not** allow for versitility



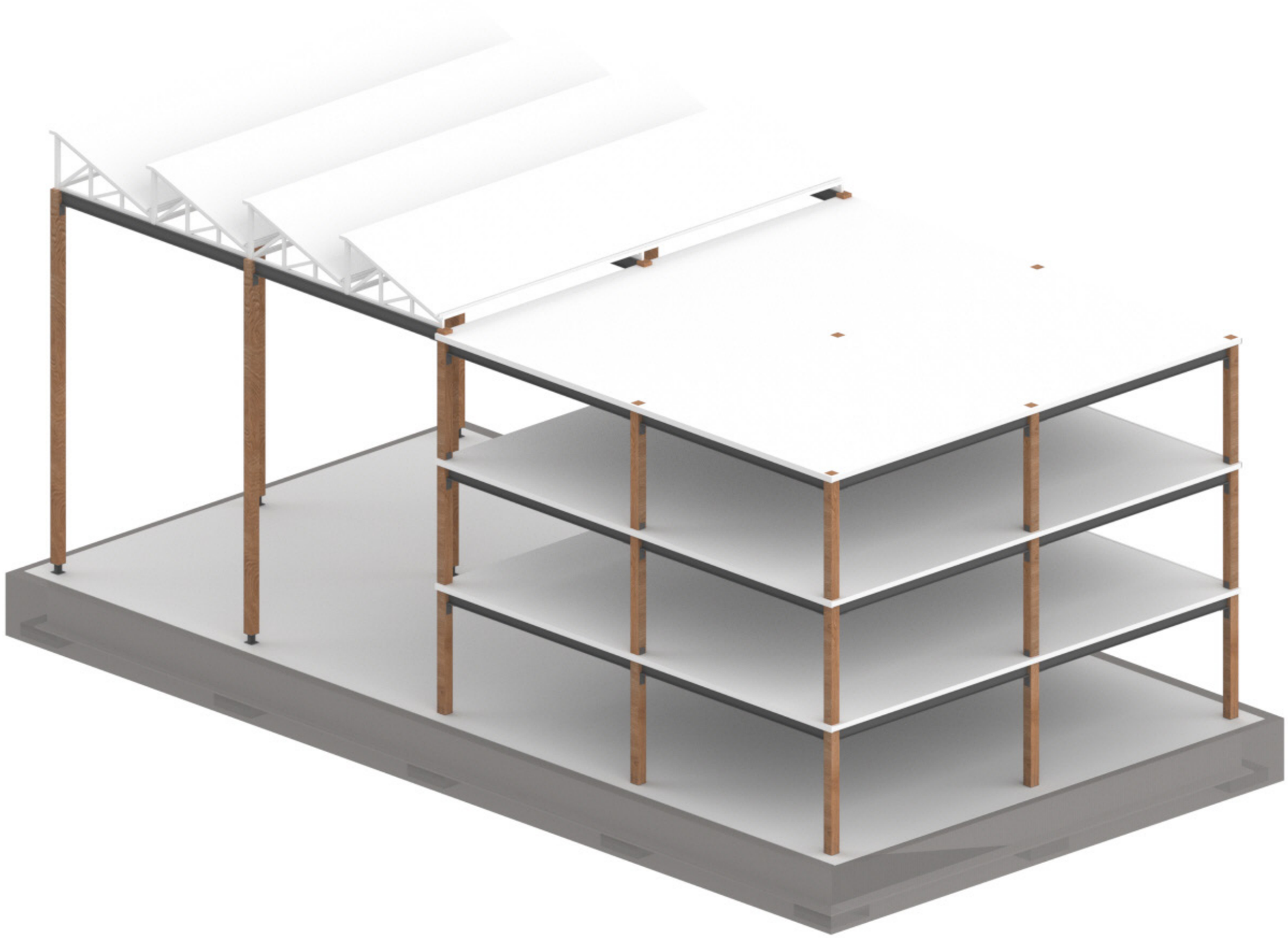
STRUCTURAL STEEL TRUSSES







STRUCTURE AXON



ENCLOSURE:

Curtain Wall

DESCRIPTION:

Outer covering consisted of a thin frame with glass. Purpose is to protect users from outer environmental forces. Non-structural, meaning it doesn't carry any loads except for its own weight.

LOCATION IS RELATIONSHIP TO THE STRUCTURE:

Hangs and supported by the steel or concrete structural frame of the building. Connected by structural tees, brackets, and welded plates

MATERIAL CHARACTERISTICS:

Metal frame with vision glass or opaque spandrel units or thin panels of concrete, stone, masonry, or metal

EXAMPLES:

One Congress Tower, Boston MA

Interdisciplinary Science and Engineering Complex

Academy Mont Cenis

Rainscreen

EXAMPLES:


Skyway Library Dri-Design


Central Fleet Building

DESCRIPTION:

A rainscreen is an exterior cladding infrastructure that sits away from a building's outside wall's weather-resistant barrier, creating an air cavity directly behind the cladding that helps to protect the buildings important weather-resistant barrier.

LOCATION IS RELATIONSHIP TO THE STRUCTURE:

Hangs and supported by the steel or concrete structural frame of the building. Connected by structural tees, brackets, and welded plates. Hangs off the structure pushed back from the main structure

MATERIAL CHARITERISTICS:

The cladding panels can be made from different materials such as aluminum, zinc, copper and stainless steel

Mill Woods Library

Store Front

DESCRIPTION:

Designed as “flush glaze” with no projecting stops. Intended to be single span structures, with anchors at the head and sill only.
Can be bought as pre-fabricated frames reducing field labor and keep cost relatively low.
The system can become overloaded to weather exposure so, typically limited in height.

LOCATION IS RELATIONSHIP TO THE STRUCTURE:

The frames are installed between and anchored to the building structure.
The glass is typically held in place using glazing gaskets and snap in glass stops.

MATERIAL CHARACTERISTICS:

Composed predominantly of extruded aluminum framing and insulating glass units (IGUs).

EXAMPLES:

Wooden Fins:

Glulam timber fins and cladding, the Melbourne-based firm selected white cypress, a native species favored for its durability and natural resistance to pests

Final lengths range from 20 feet to 31 feet; depths vary between 11.8 inches and 23.6 inches.
“At the end of the day,” says project architect Daniel Rafter, “we were able to exceed the requirements by working with the achievable depths available in the glue-laminated products.”

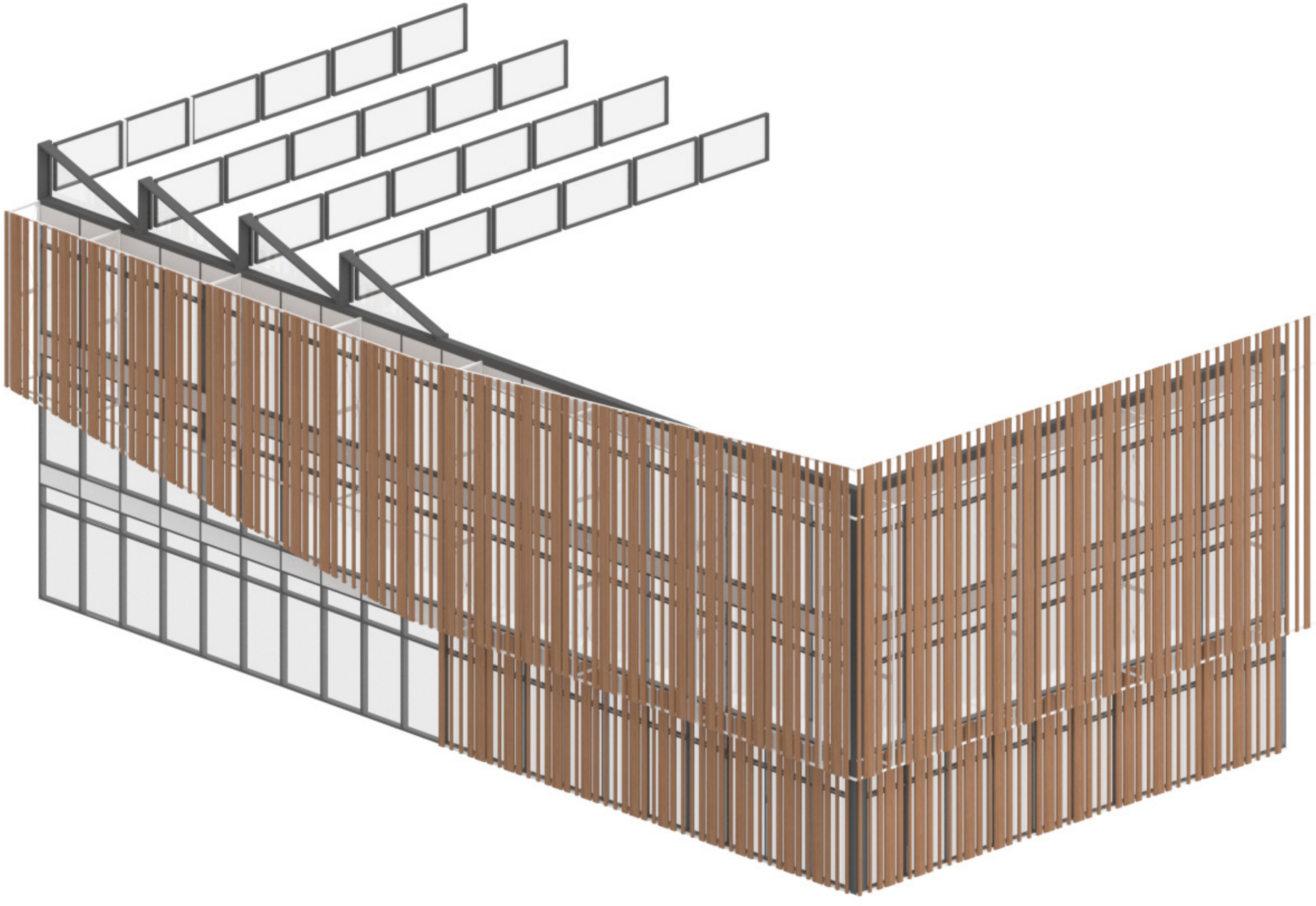
Typical wood timber can be available in lengths up to 24ft

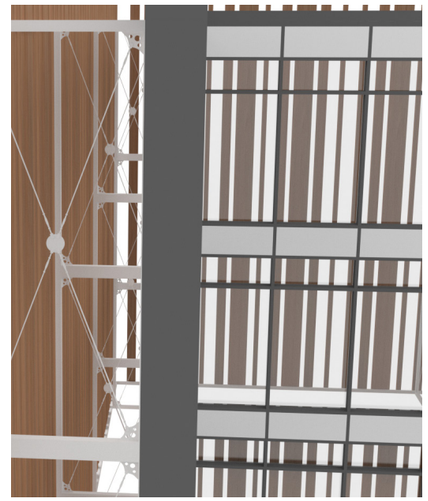

Regional Court and Industrial Tribunal in Montmorency

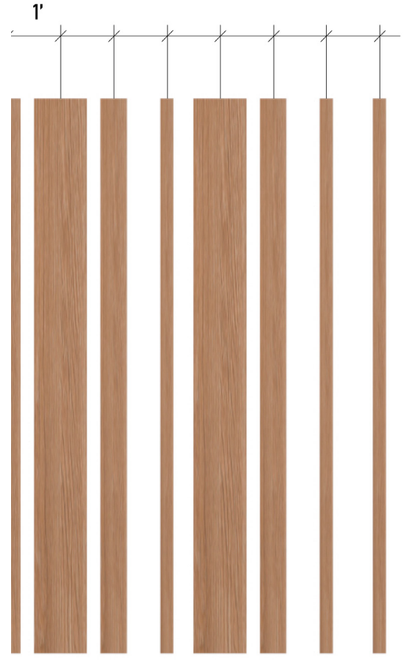

Academy of Advanced Studies, Jerusalem


Nexus Wallan GP SuperClinic


BCC Bank Caraglio

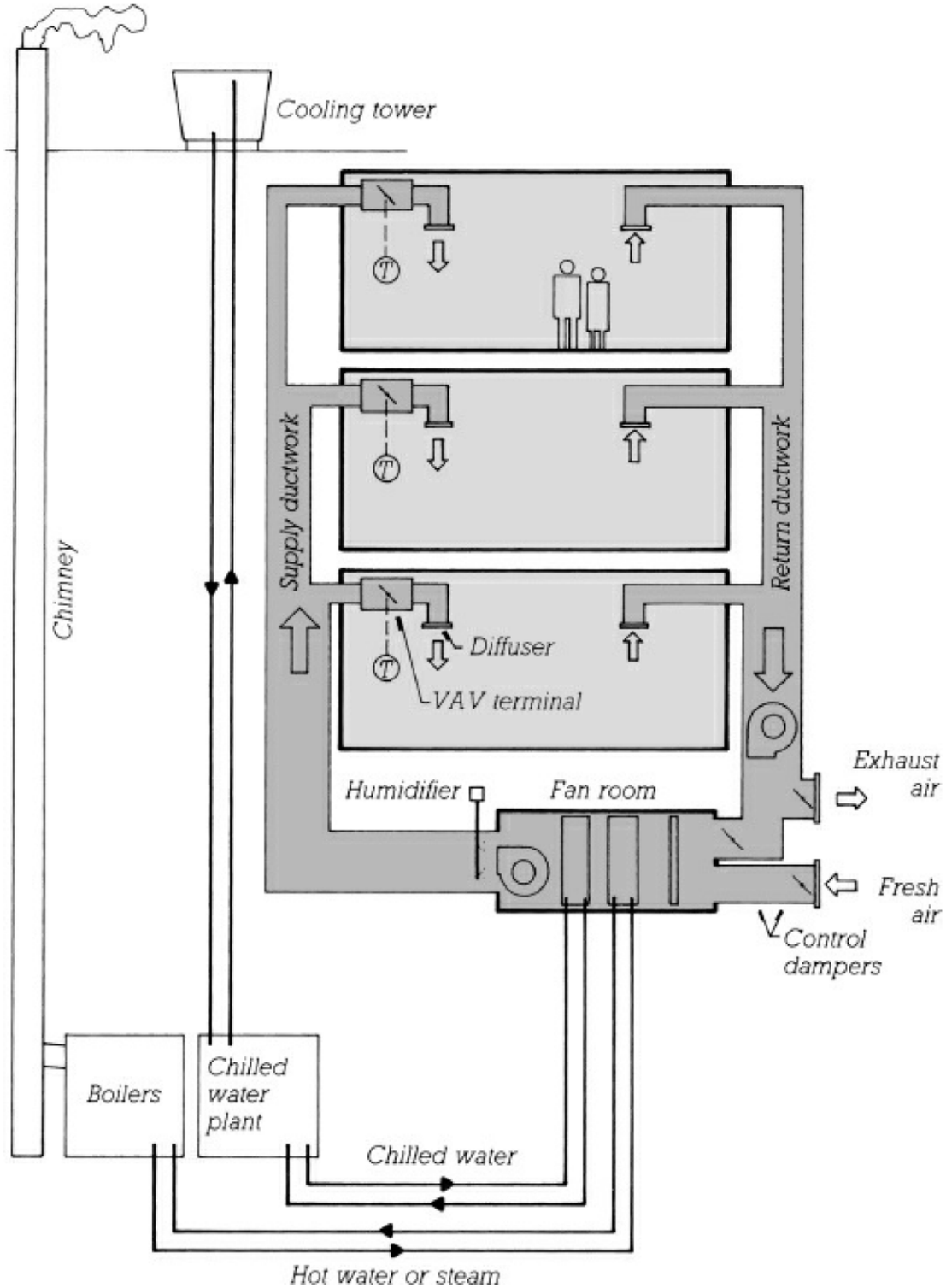





1'

ENERGY: ENVIORMENTAL CONTROLS & LIGHTING

VARIABLE AIR VOLUME (VAV)



DESCRIPTION:

Air is conditioned (mixed with a percentage of outdoor air, filtered, heated or Cooled, and humidified or dehumidified) at a central source then distributed to each of the occupied spaces within the building. Each zone has a thermostat that monitors and determines the volume of air pushed into the space.

TYPICAL APPLICATIONS:

Most common and widely used system for heating and cooling large buildings

ADVANTAGES:

This system offers a high degree of local temperature control at moderate cost. It is economical to operate and virtually self-balancing.

DISADVANTAGES:

VAV is limited in the range of heating or cooling demand that may be Accommodated within a single system. When one area of a building needs Heating while another needs cooling, a VAV system cannot serve both areas Without help from a secondary system.

CENTRAL ALL-WATER SYSTEMS: FAN-COIL TERMINALS

DESCRIPTION:

Hot and chilled water is piped to the fan coil terminal, a fan draws air from the room and outside filters it. The air then gets blown across the coils and back into the room.

TYPICAL APPLICATIONS:

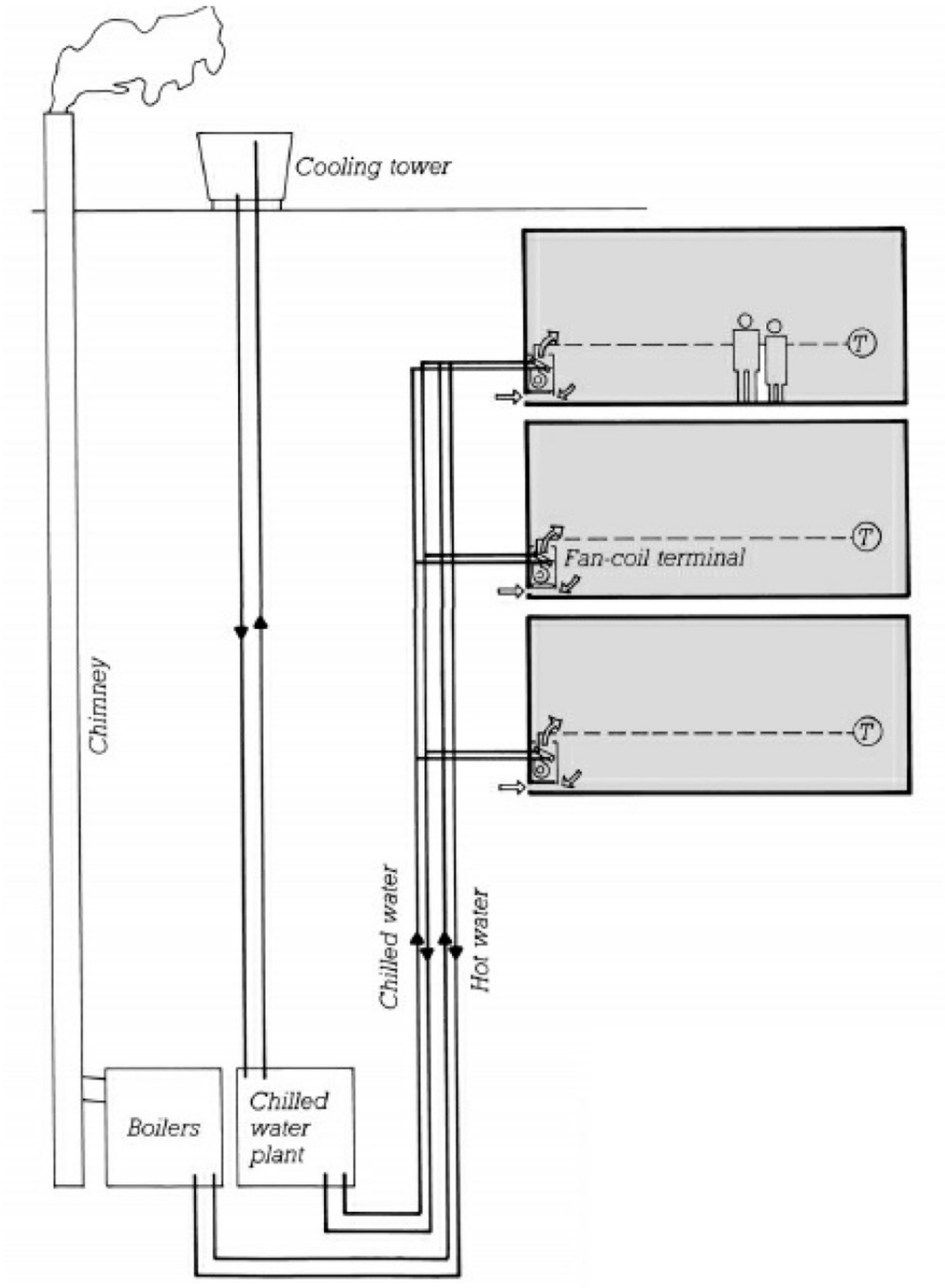
These systems are well suited for buildings with many zones, all located on Exterior walls, such as schools, hotels, motels, apartments, and office buildings.

ADVANTAGES:

No fan rooms or duct work spaces are required in the building. The temperature Of each space is individually controlled. Installed costs are low.

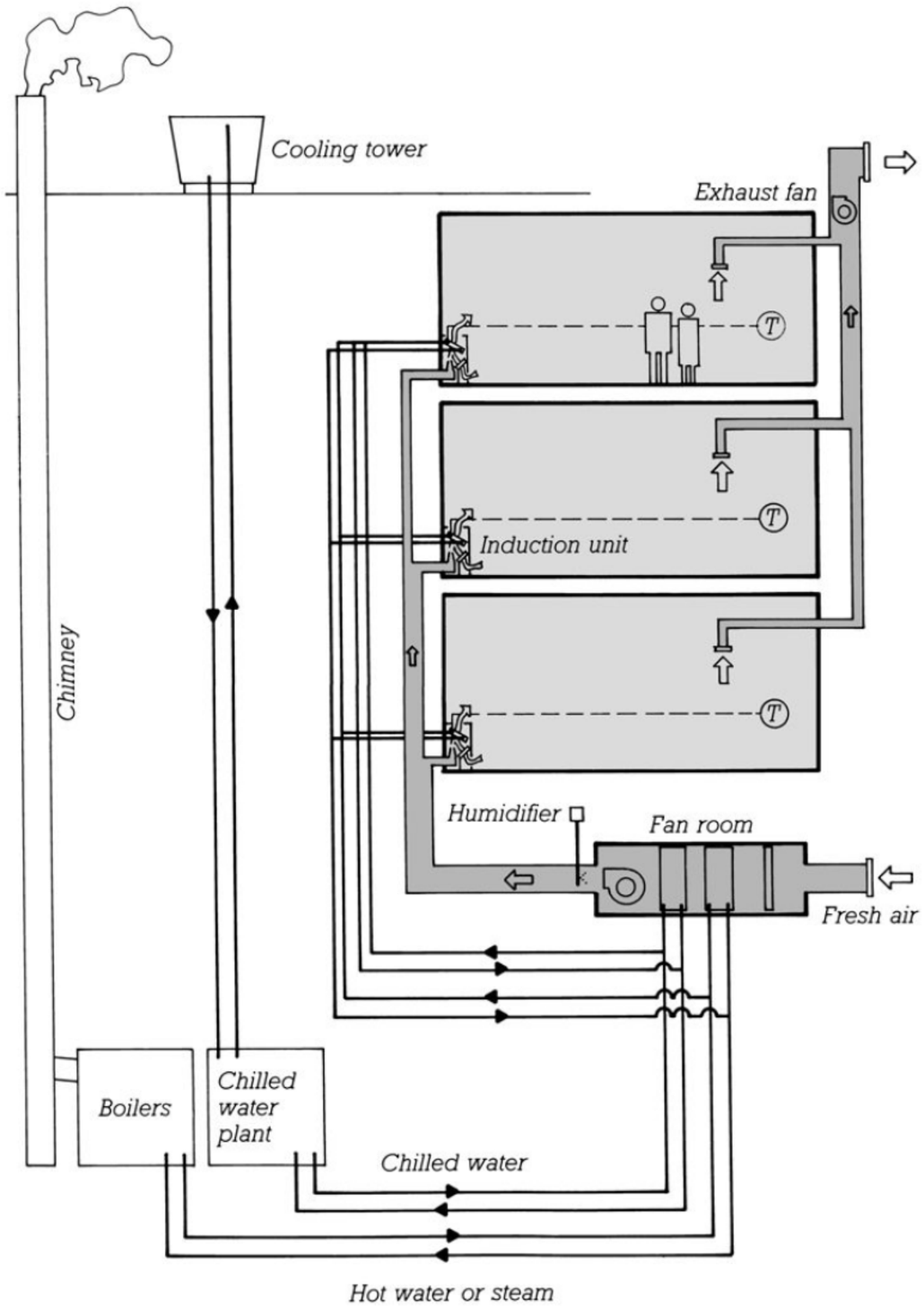
DISADVANTAGES:

Humidity cannot be closely controlled. Fan-coil units may generate more noise Than centralized air-handling systems. Maintenance of the units must take place
Within the occupied space of the building.



FAN-COIL TERMINAL SYSTEM

AIR-WATER INDUCTION SYSTEM



AIR-WATER INDUCTION SYSTEM

DESCRIPTION:

Fresh air is heated or cooled, filtered, and humidified or dehumidified at a central source and circulated in small high-velocity ducts to the occupied spaces of the building.

TYPICAL APPLICATIONS:

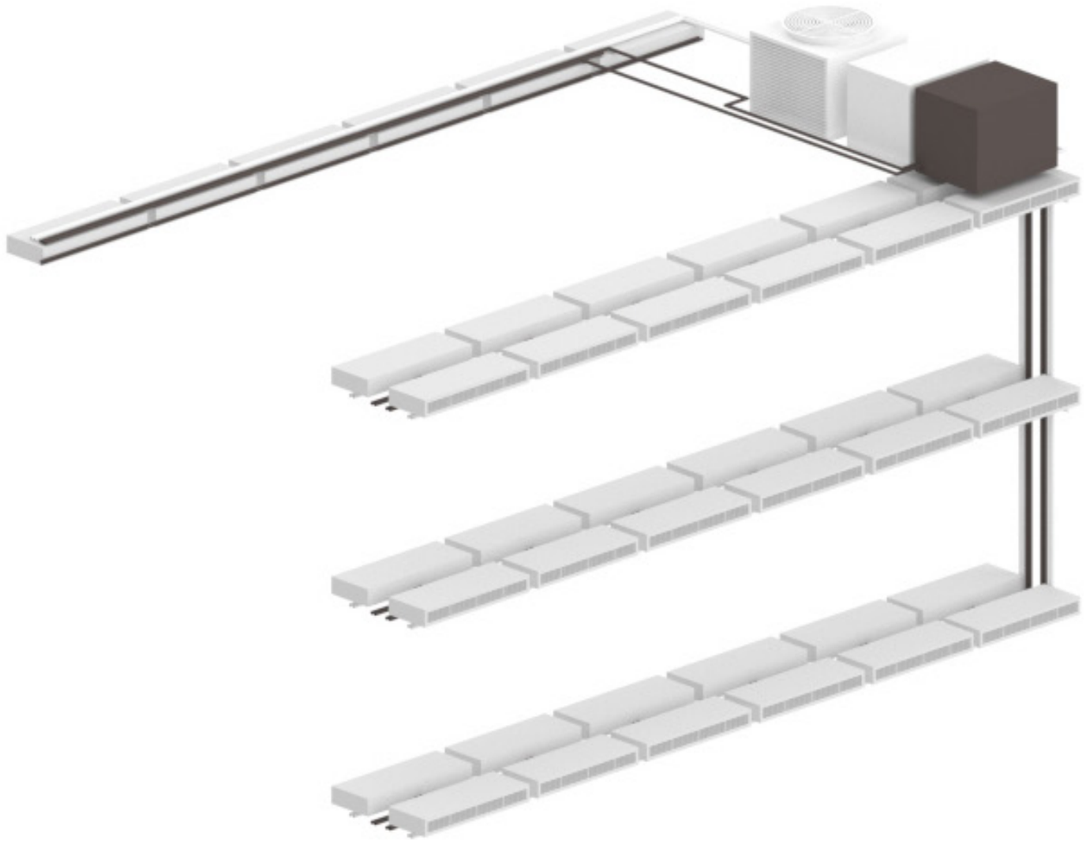
Most common and widely used system for heating and cooling large buildings

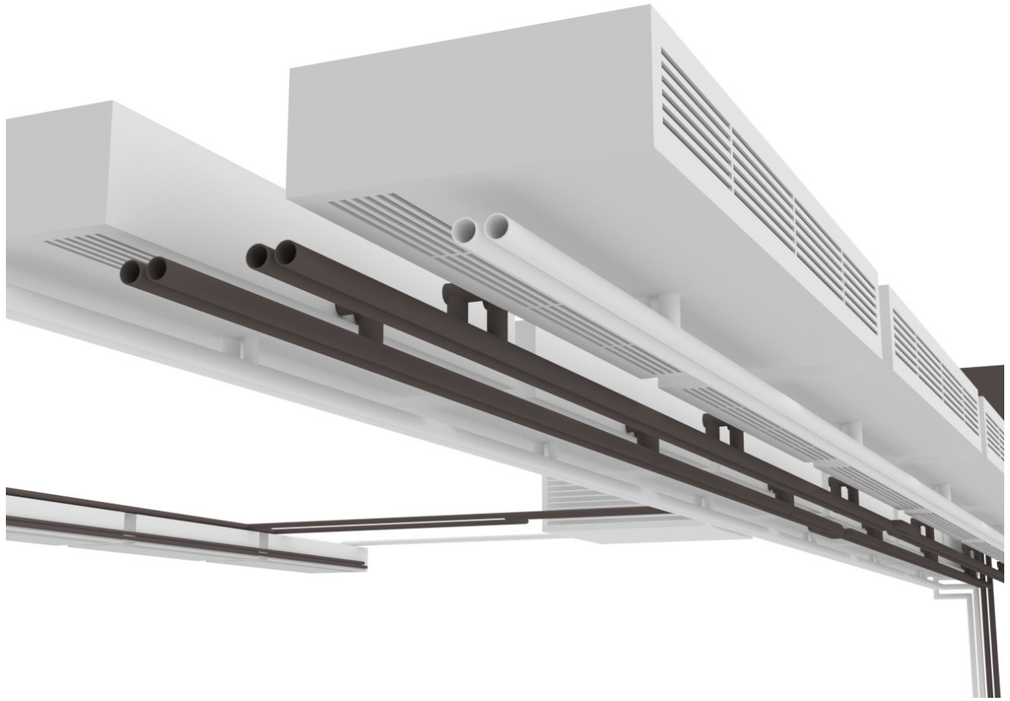
ADVANTAGES:

This system offers good local temperature control. Space requirements for ductwork and fans are less than those all-air systems. There are no fans in the occupied spaces.

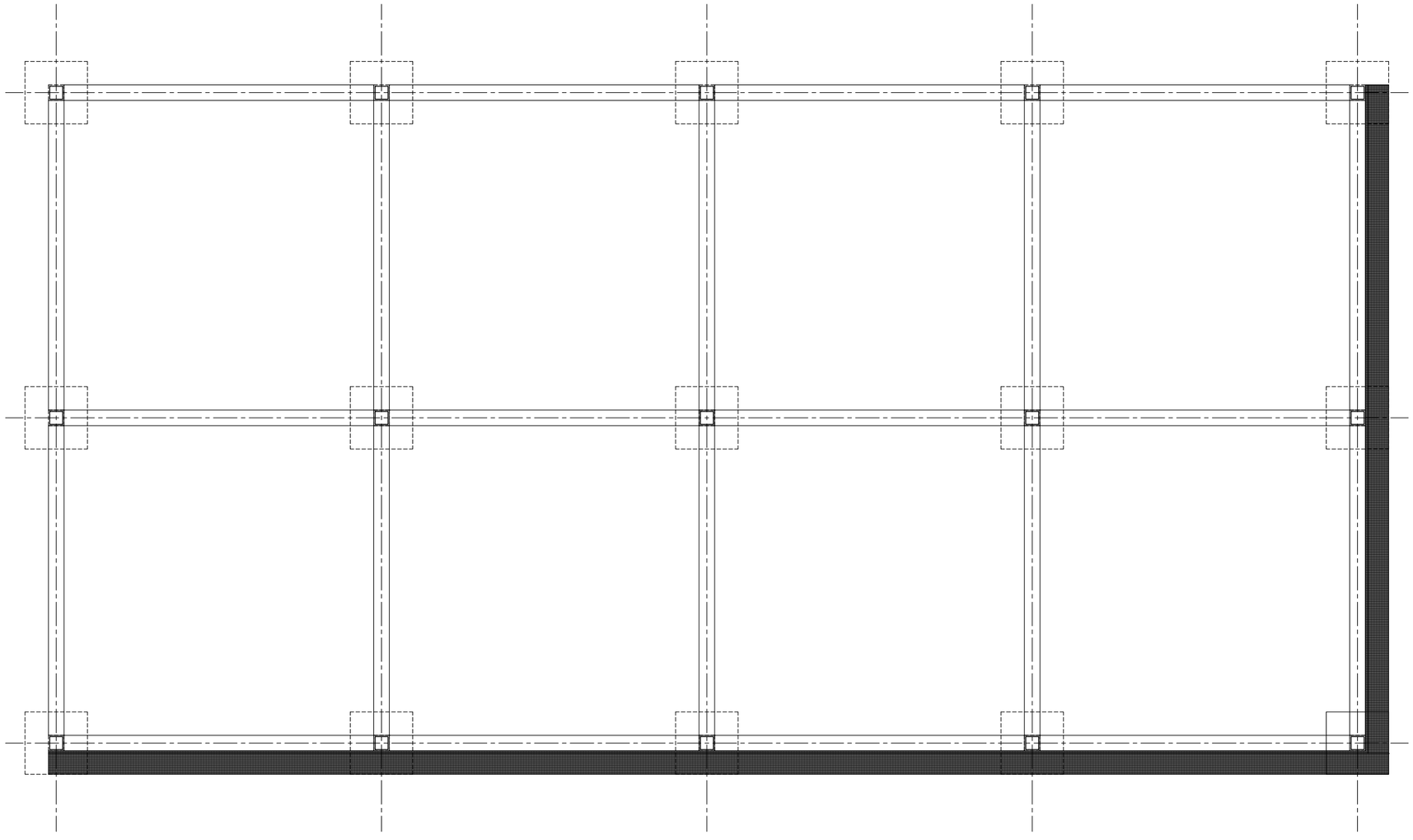
DISADVANTAGES:

This is a relatively complicated system to design, install, manatin, and manage. It tends to be noisy, and it is very efficient in its use of energy. Humidity cannot be closely controlled. It is rarely designed or specified today.





PLAN: FOOTINGS

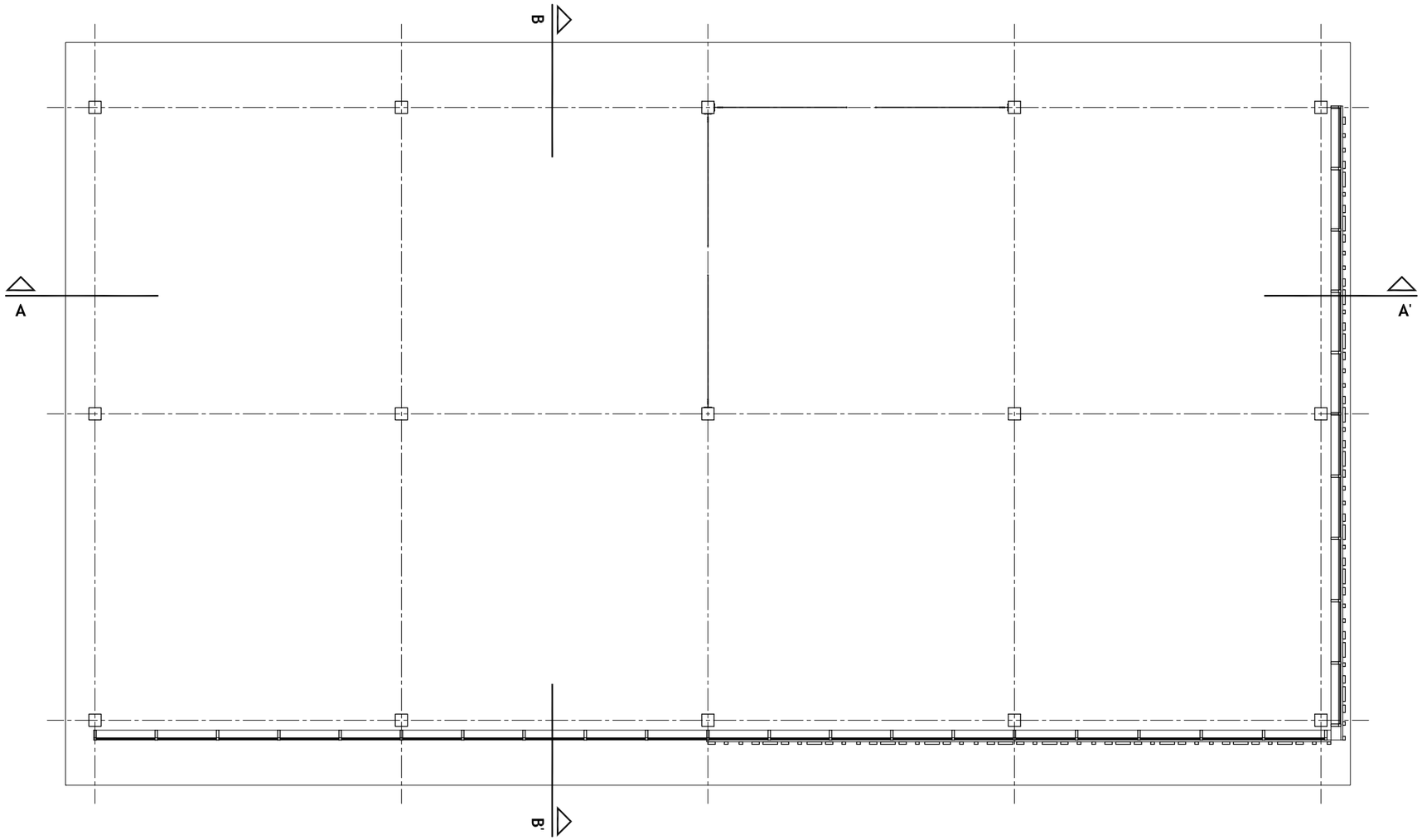


FOOTING STRUCTURE PLAN

0 5' 20'

SCALE: 1/8

PLAN: GROUND FLOOR

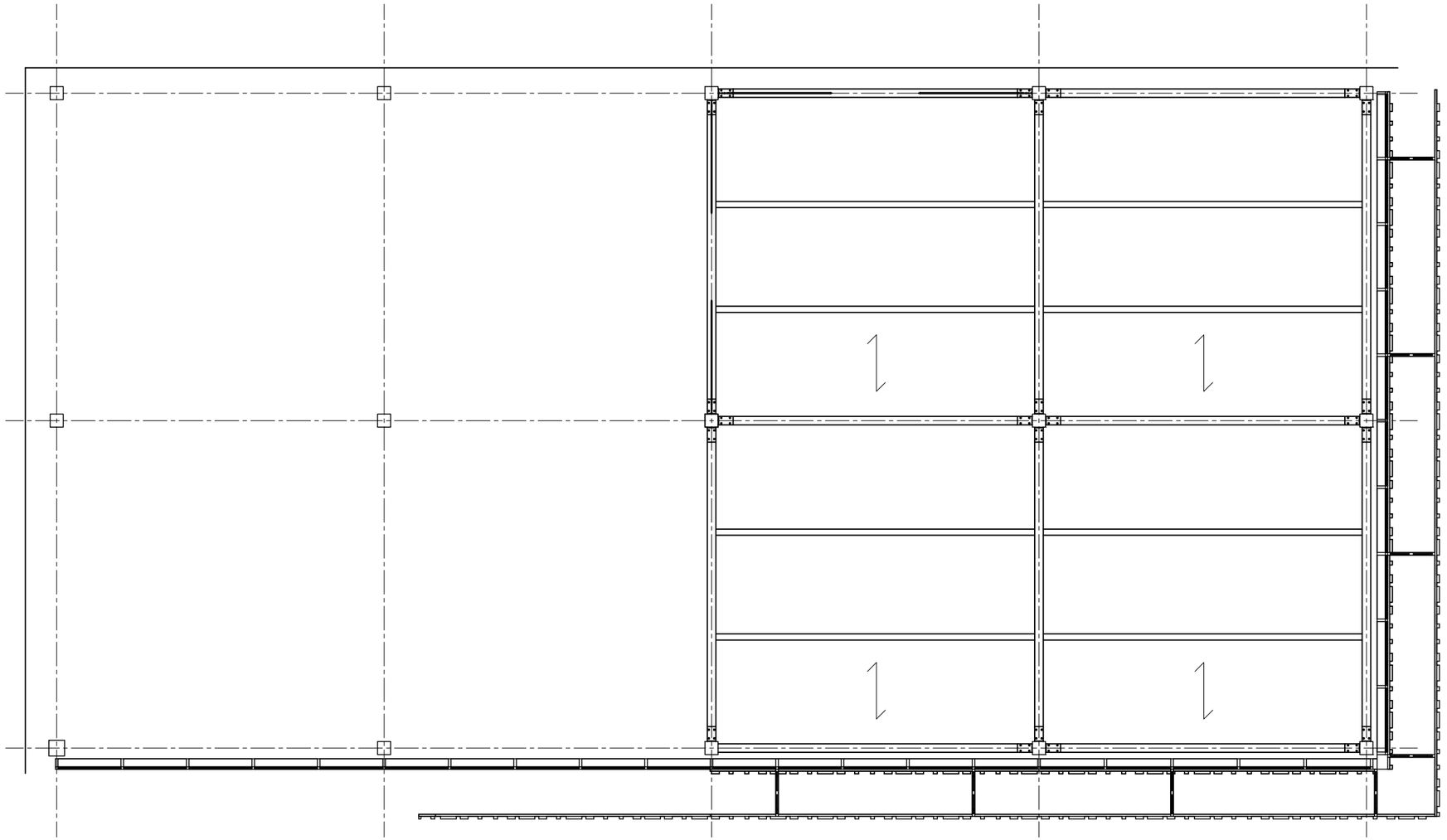


GROUND FLOOR PLAN

0 5' 20'

SCALE: 1/8

PLAN: FIRST FLOOR

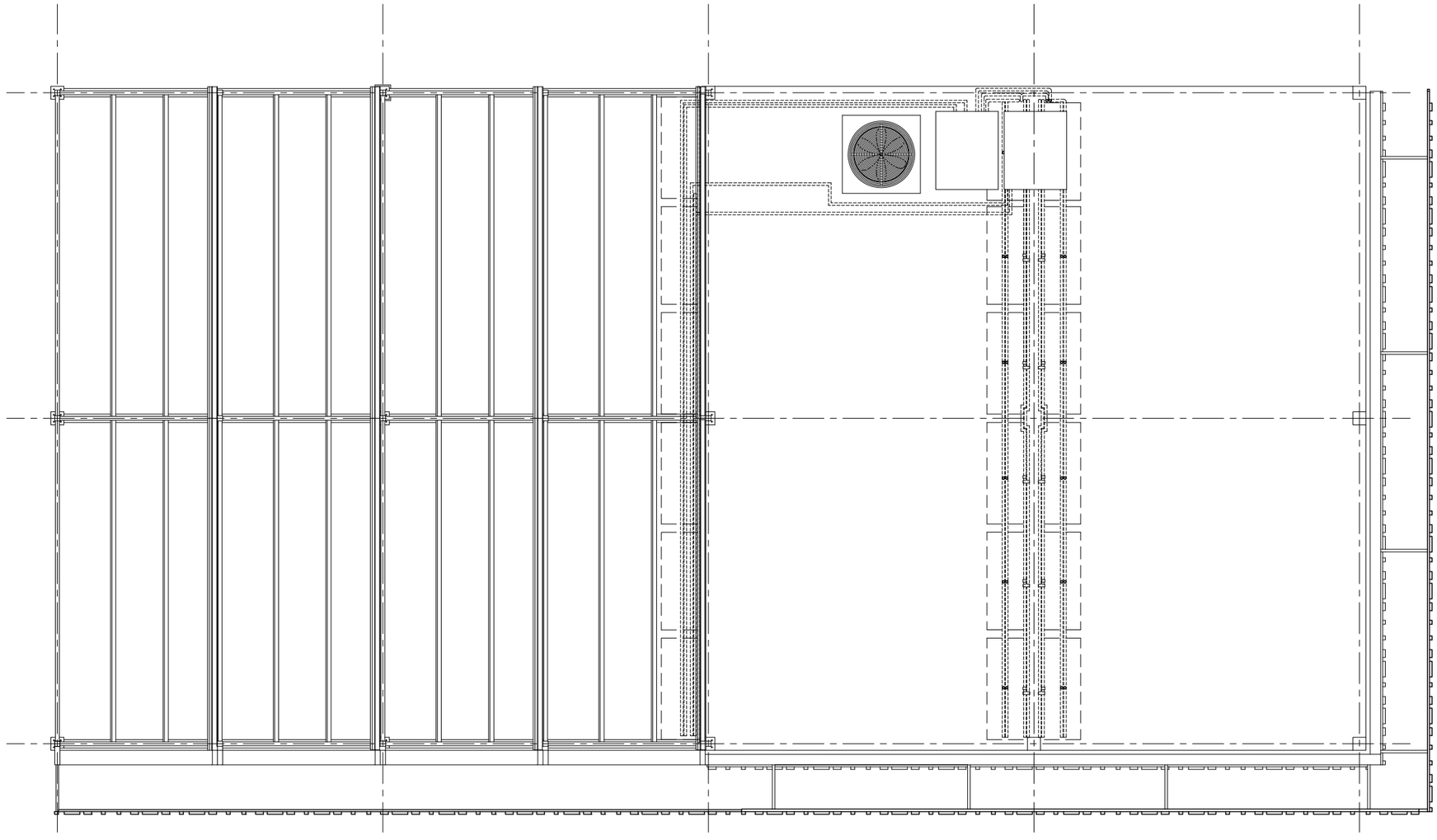


FIRST FLOOR PLAN

0 5' 20'

SCALE: 1/8

PLAN: ROOF

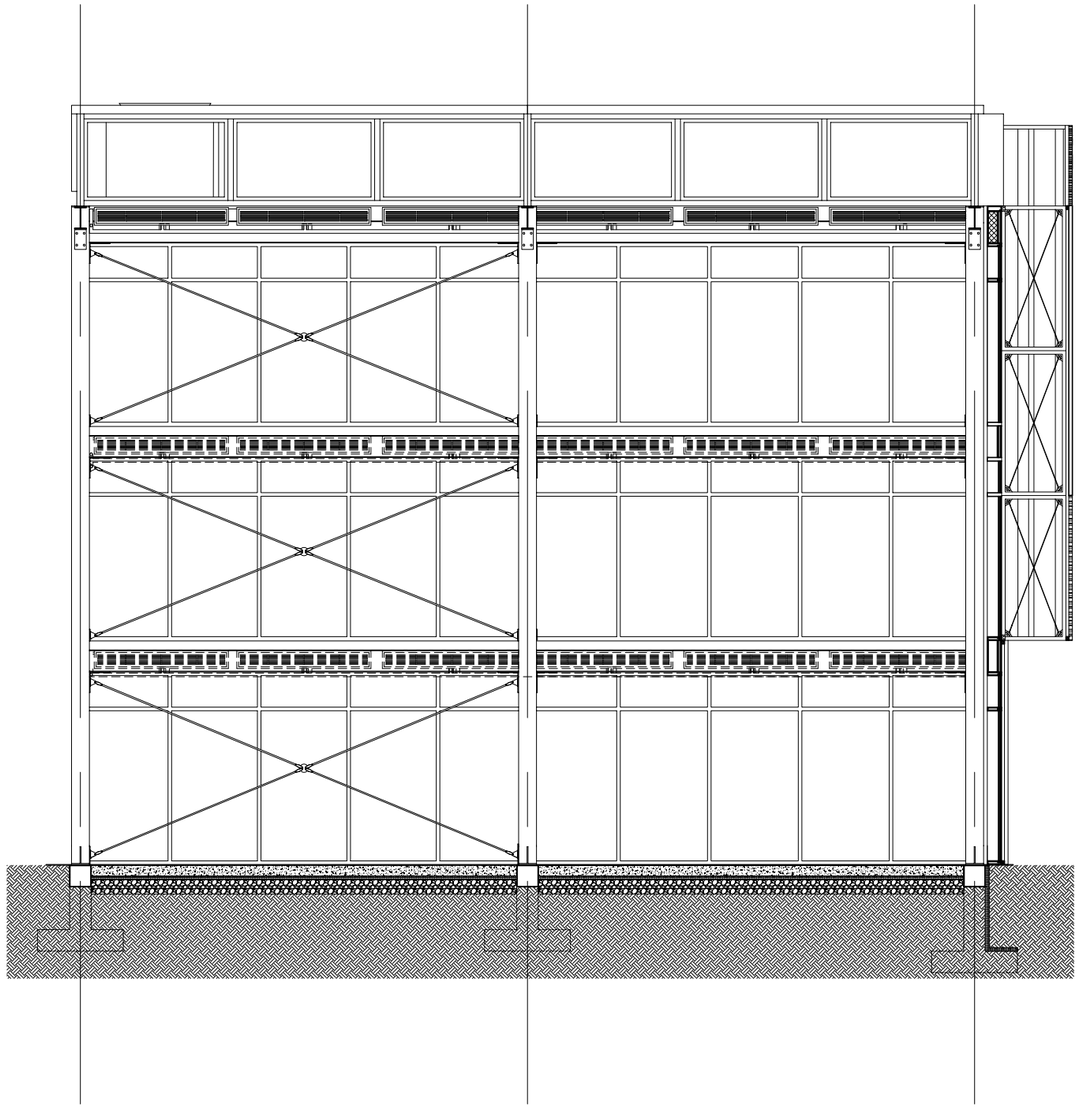


ROOF PLAN

0 5' 20'

SCALE: 1/8

SHORT SECTIONS

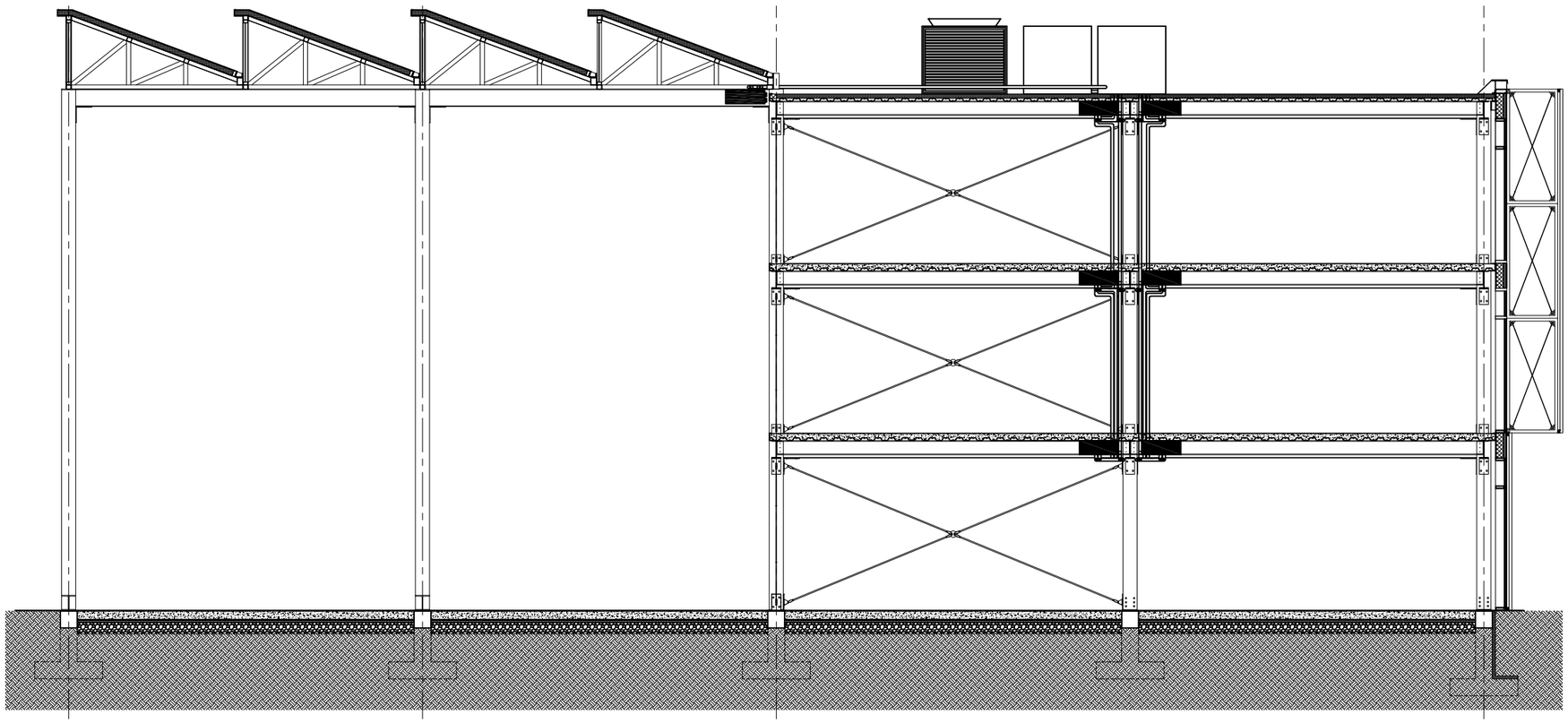


SECTION B

0 5' 20'

SCALE: 1/8

LONG SECTION

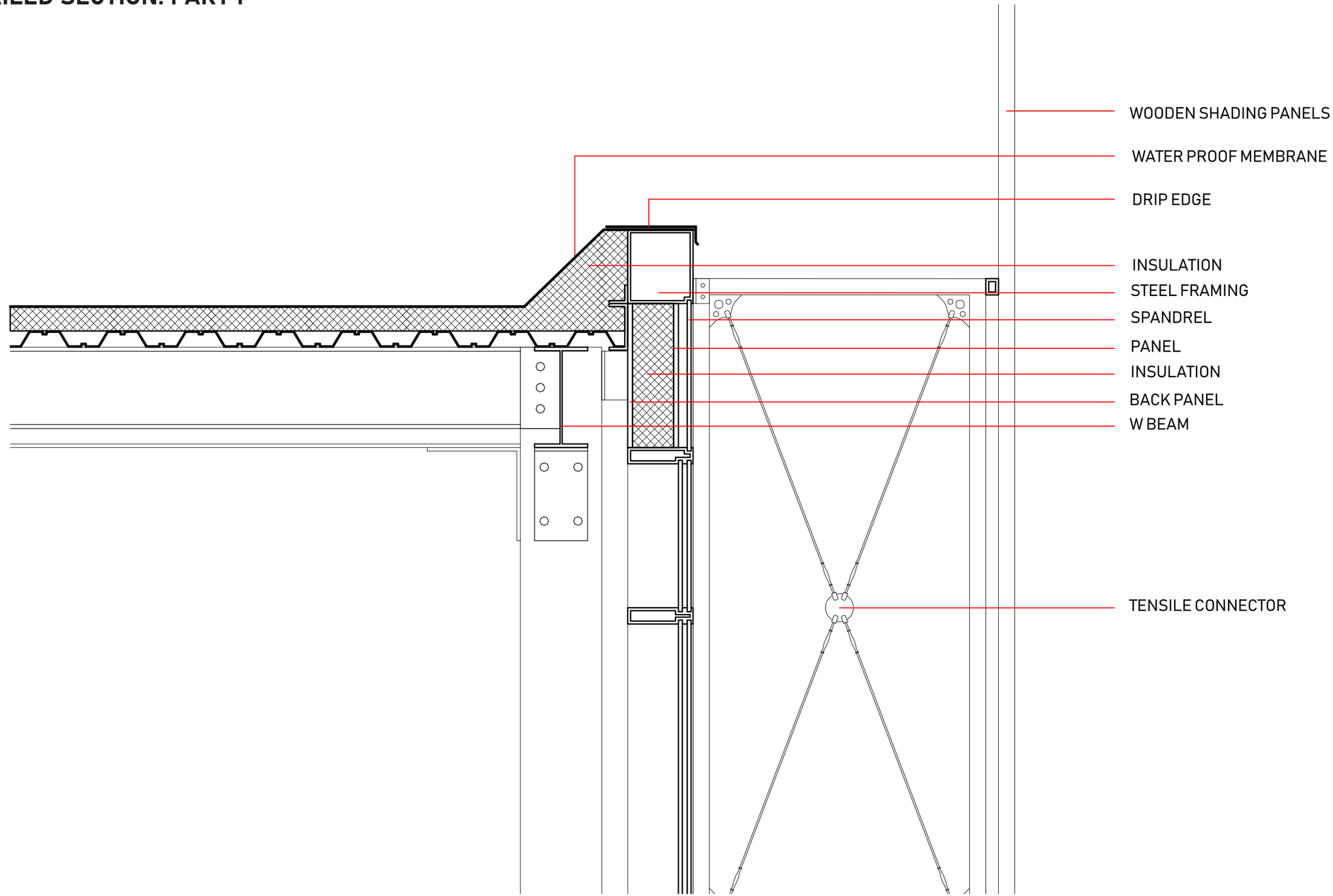


SECTION A

0 5' 20'

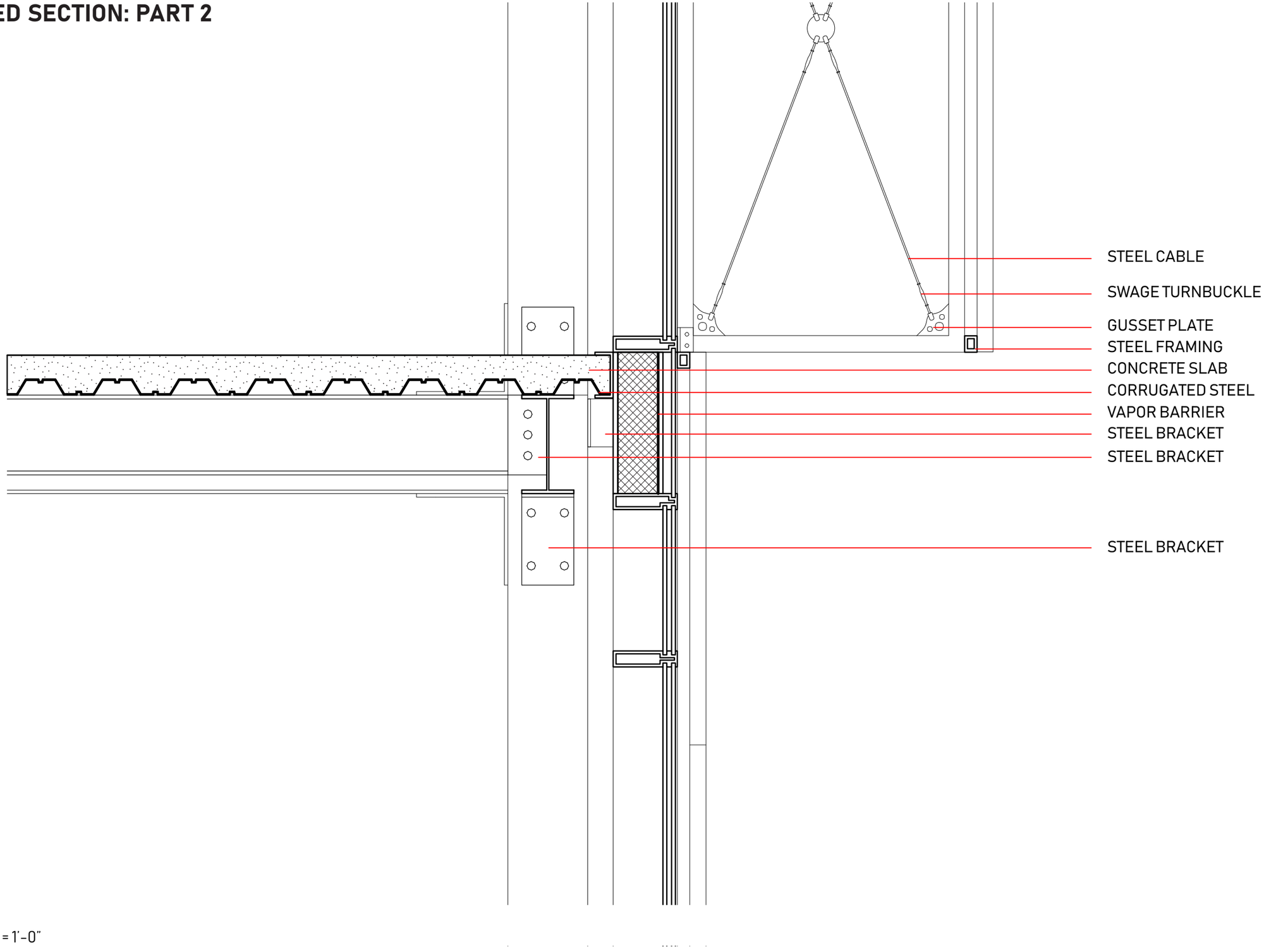
SCALE: 1/8

DETAILED SECTION: PART 1



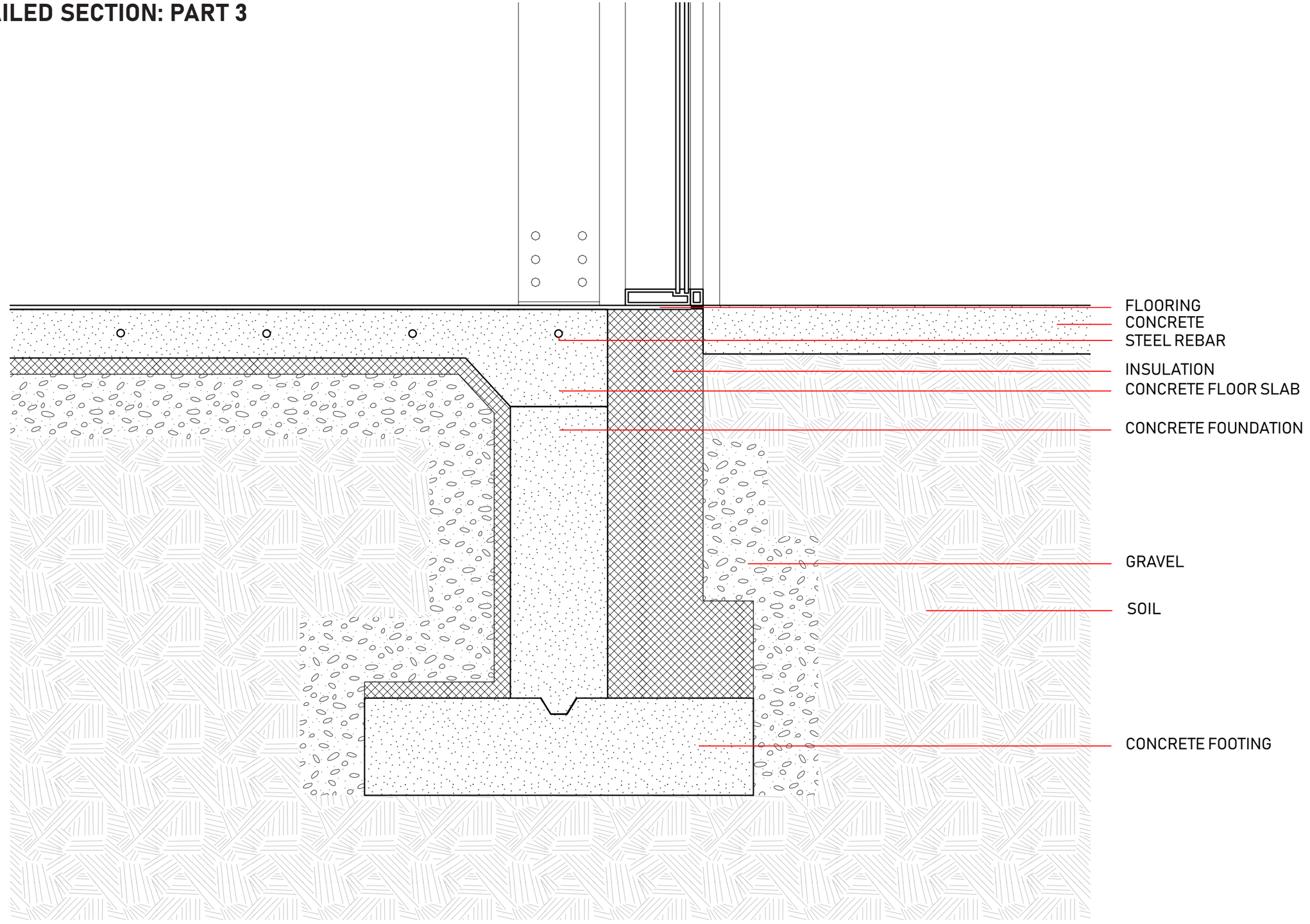
SCALE: 1" = 1'-0"

DETAILED SECTION: PART 2



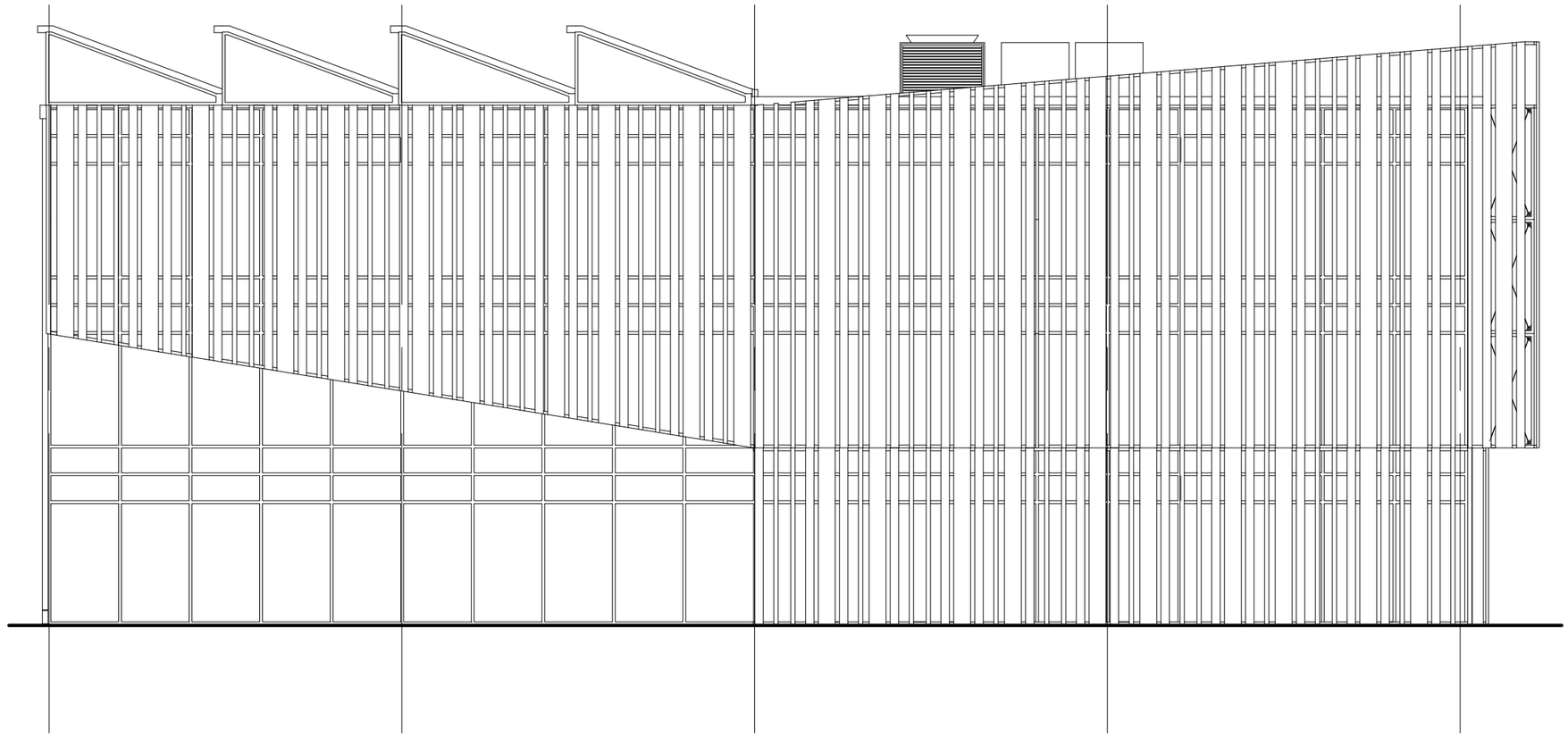
SCALE: 1" = 1'-0"

DETAILED SECTION: PART 3



SCALE: 1" = 1'-0"

LONG ELEVATION

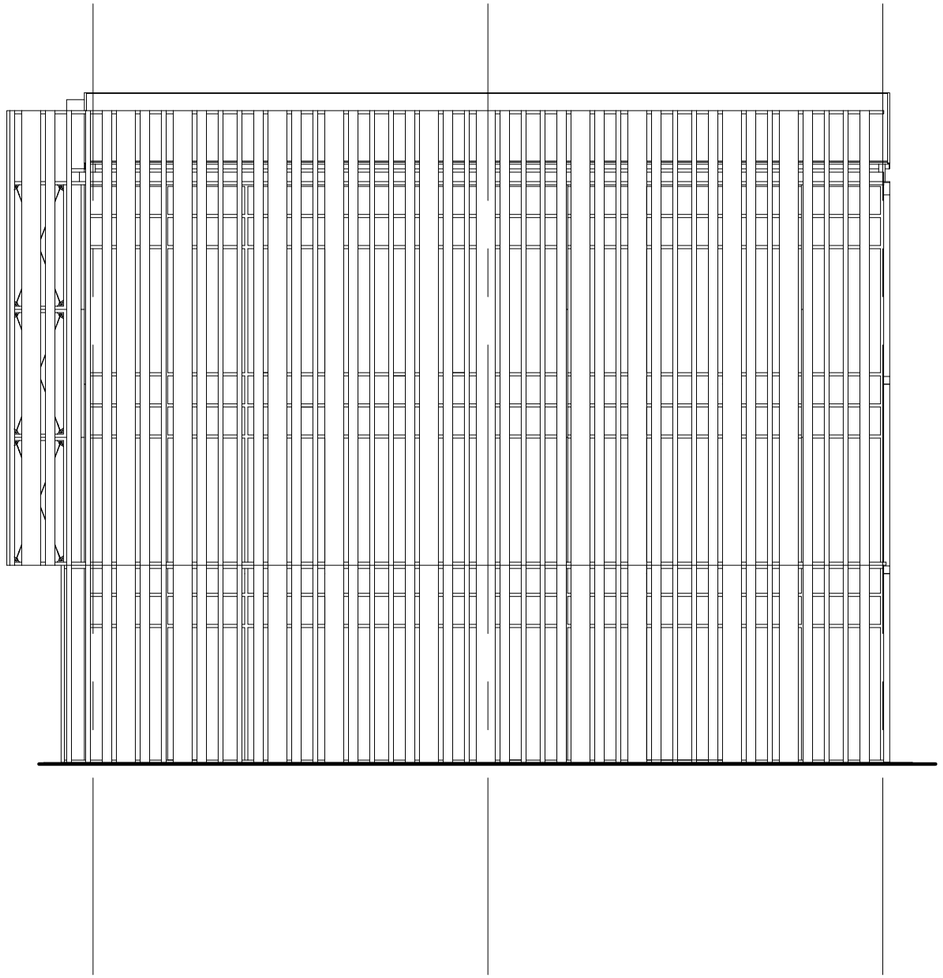


LONG FACADE

0 5' 20'

SCALE: 1/4

SHORT ELEVATION

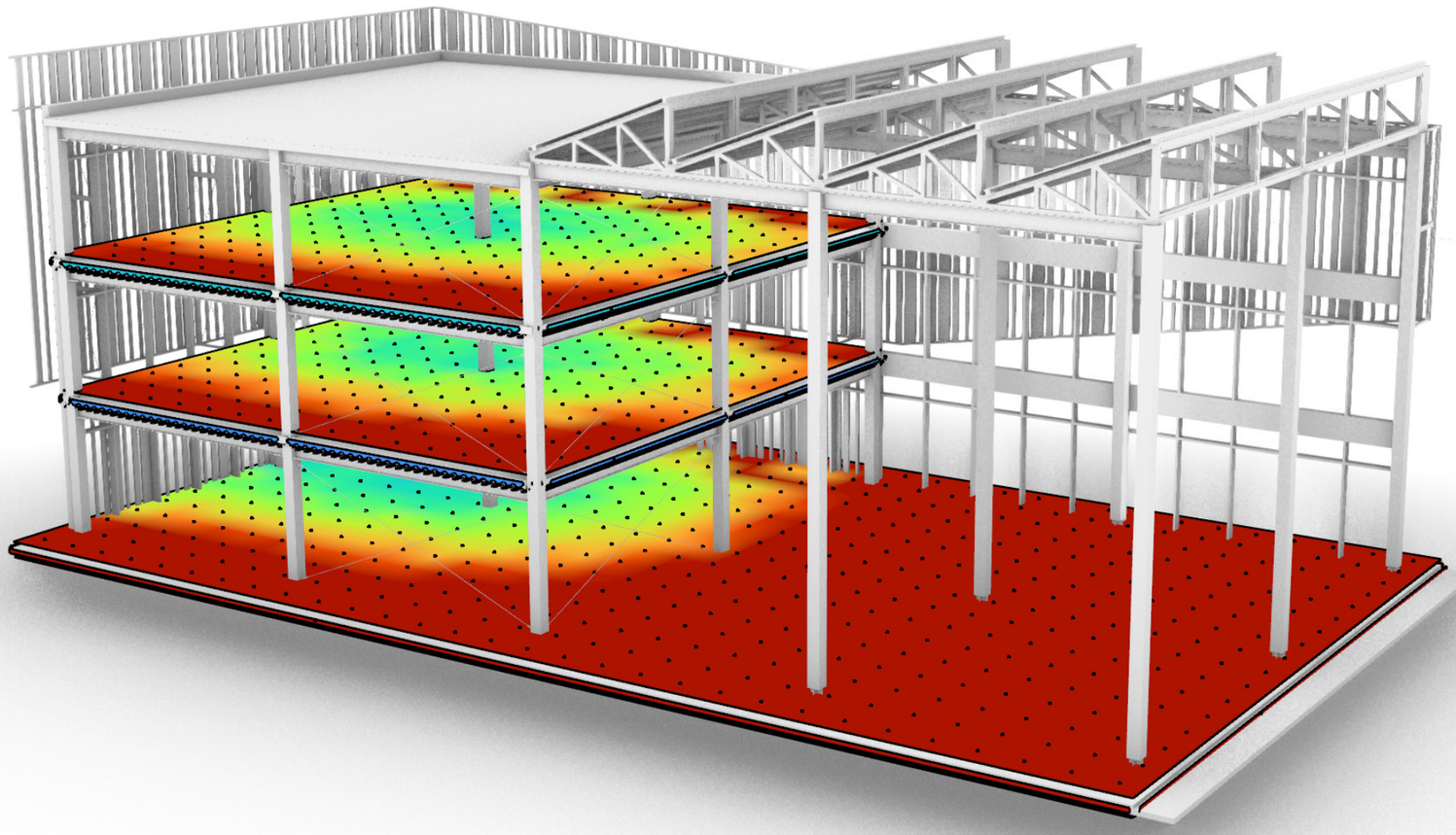


SHORT FACADE

0 5' 20'

SCALE: 1/4

CLIMATE STUDIO: DAYLIGHTING



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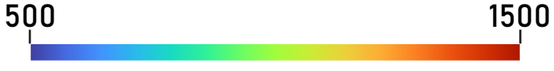
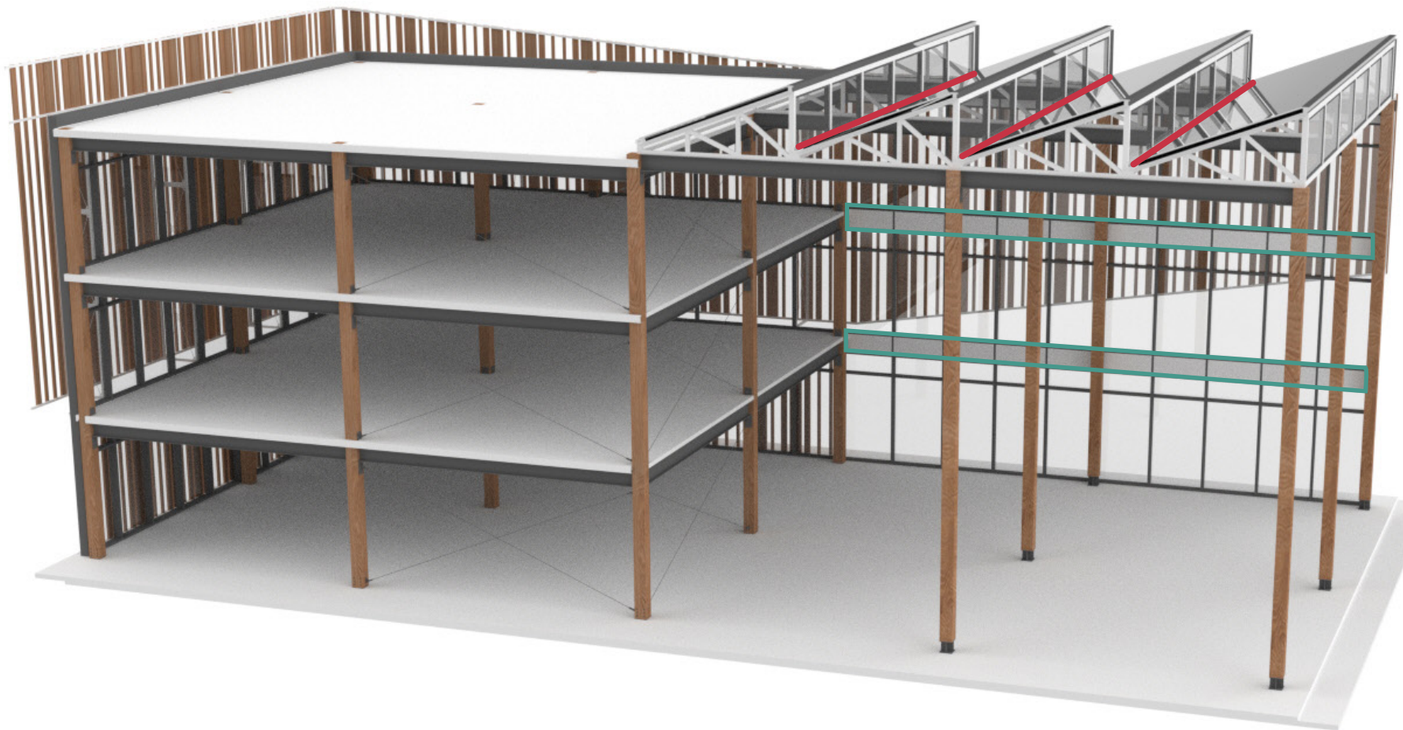
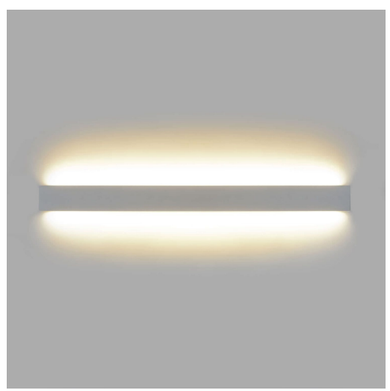


LIGHTING DIAGRAM

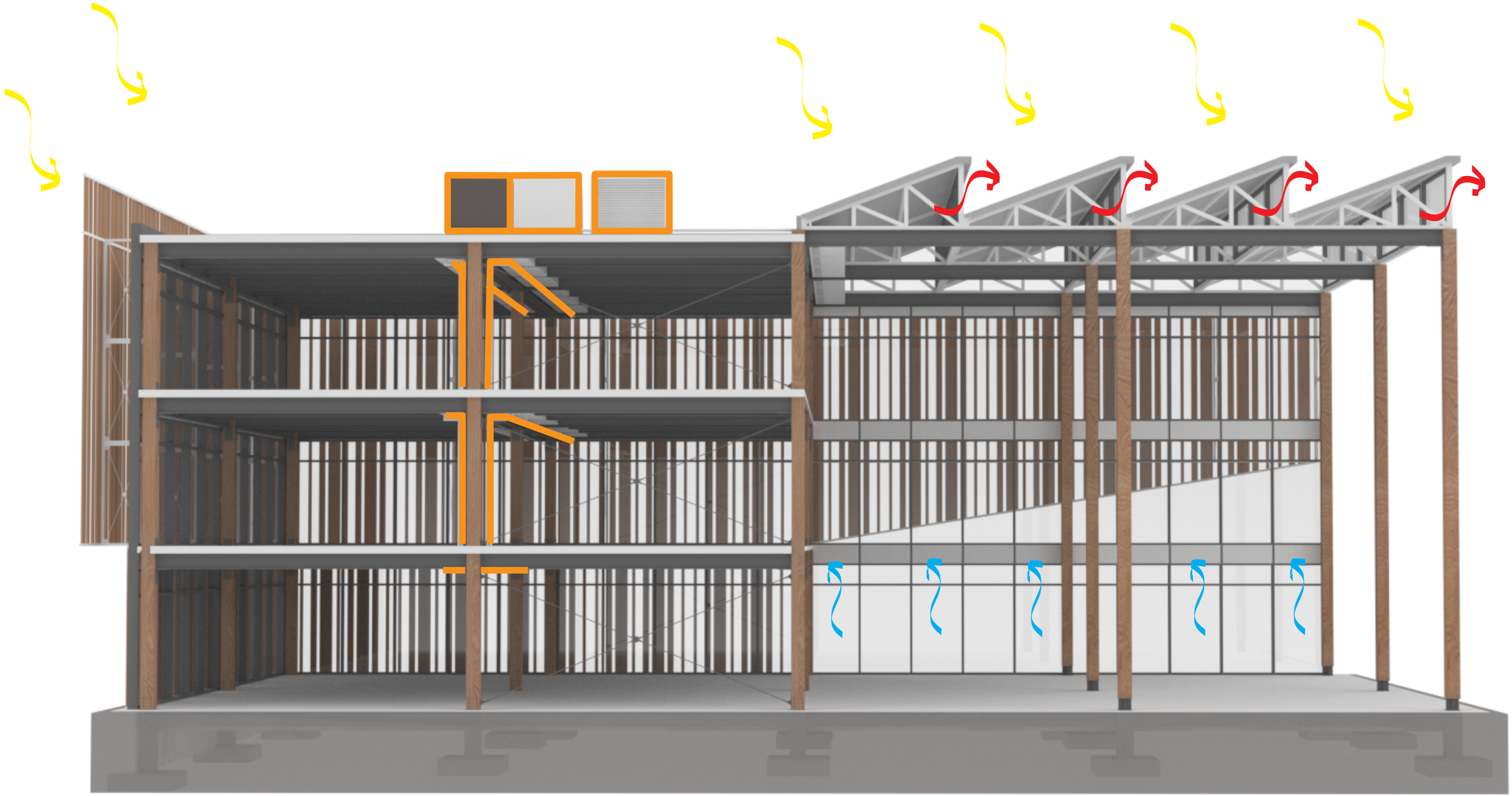


A SPOTLIGHT STYLE LIGHT LOOKING UP AT AN ANGLE INTO THE SHED ROOFS OF THE STRUCTURE IN WHICH WOULD REFLECT DOWN INTO THE LARGE OPEN SPACE BELOW

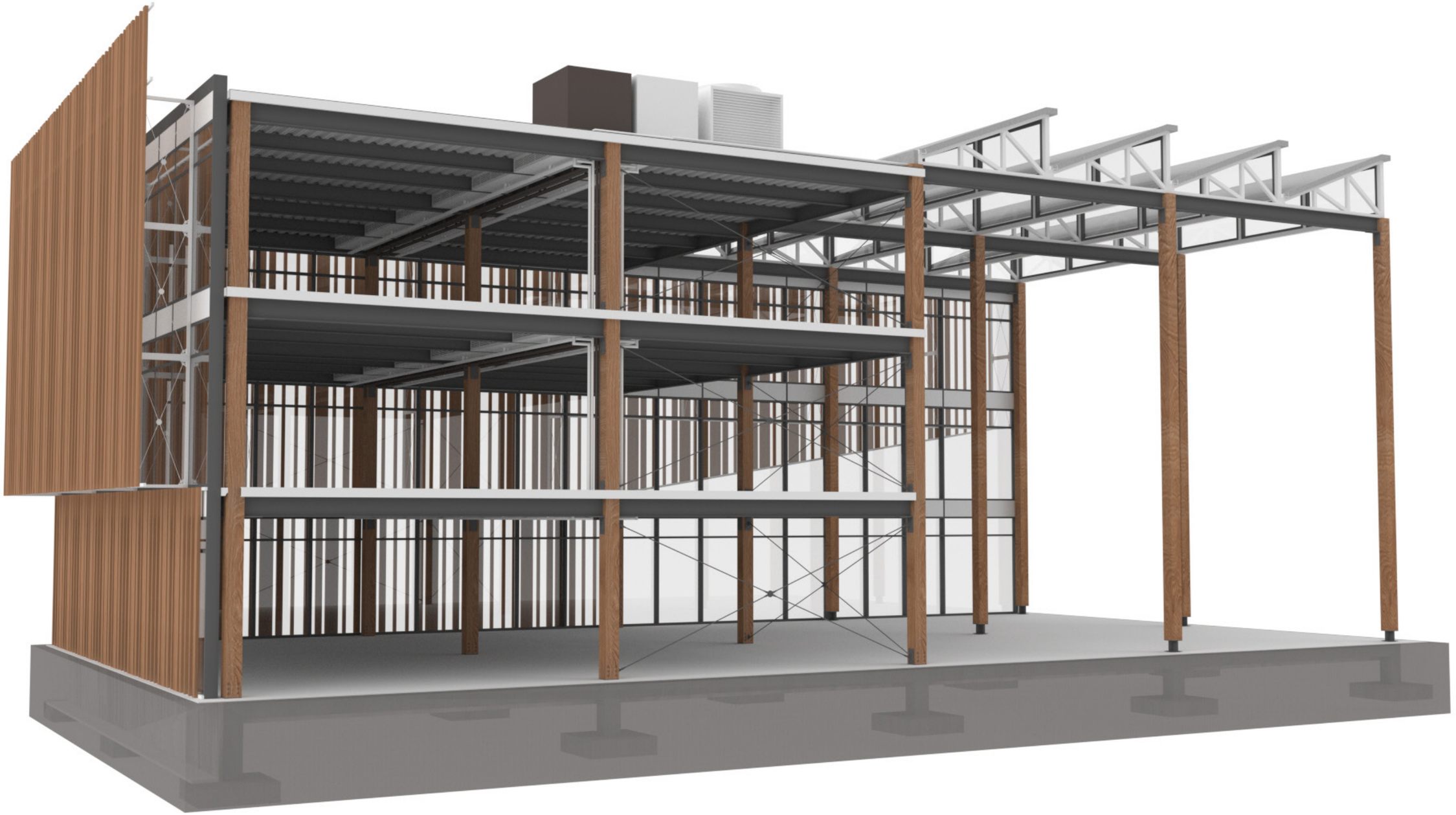
A WALL MOUNTED LIGHT SIMILAR TO THE ONES PICTURED HERE, THE GOAL IS TO ATTACH THEM TO THE BACK OF THE SPANDRELS AND PROJECT LIGHT BOTH UP AND DOWN LIGHTING THE LARGE ATRIUM TYPE SPACE.



PASSIVE AND ACTIVE SYSTEMS DIAGRAM

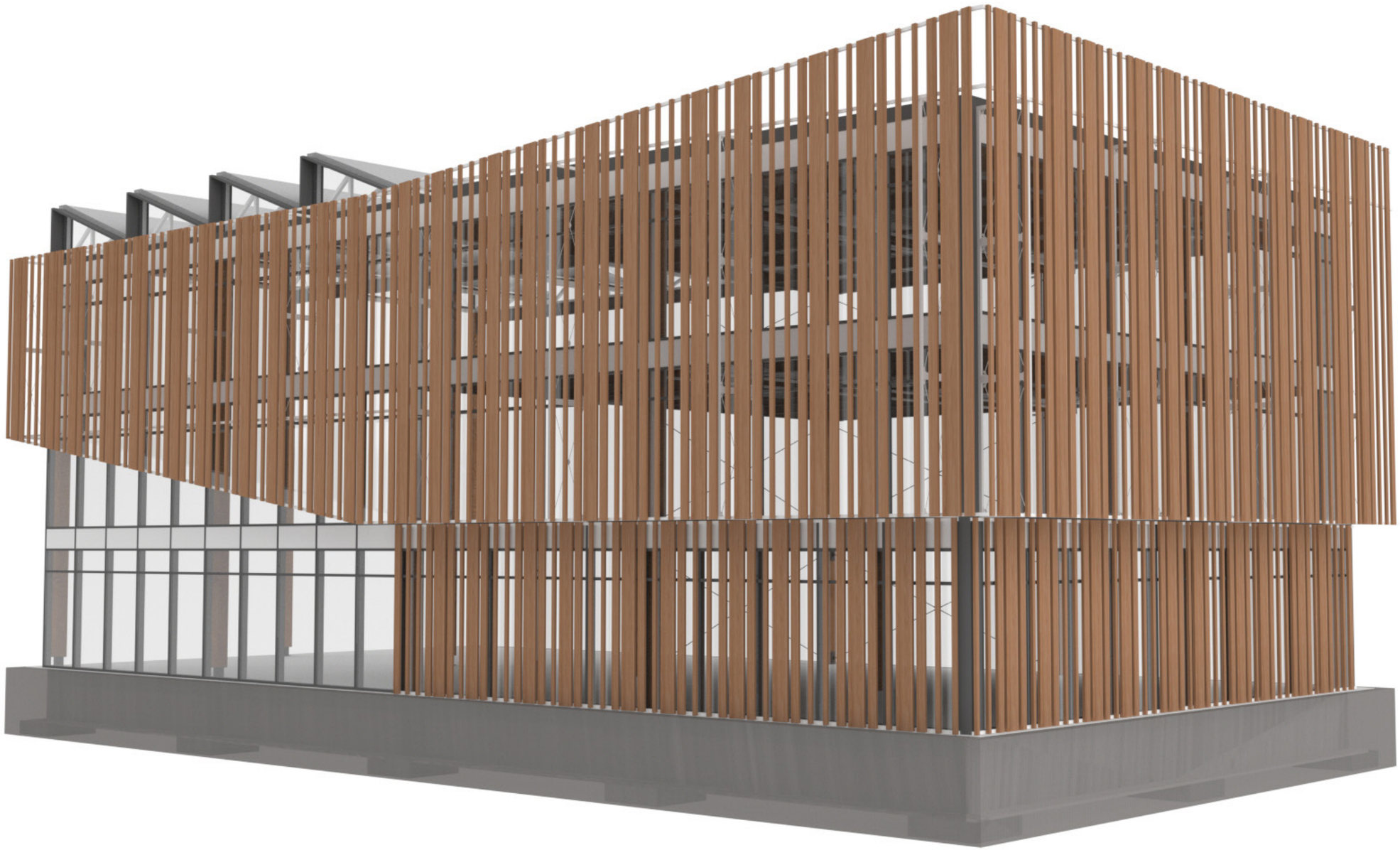


PERSPECTIVE 1



PERSPECTIVE 2

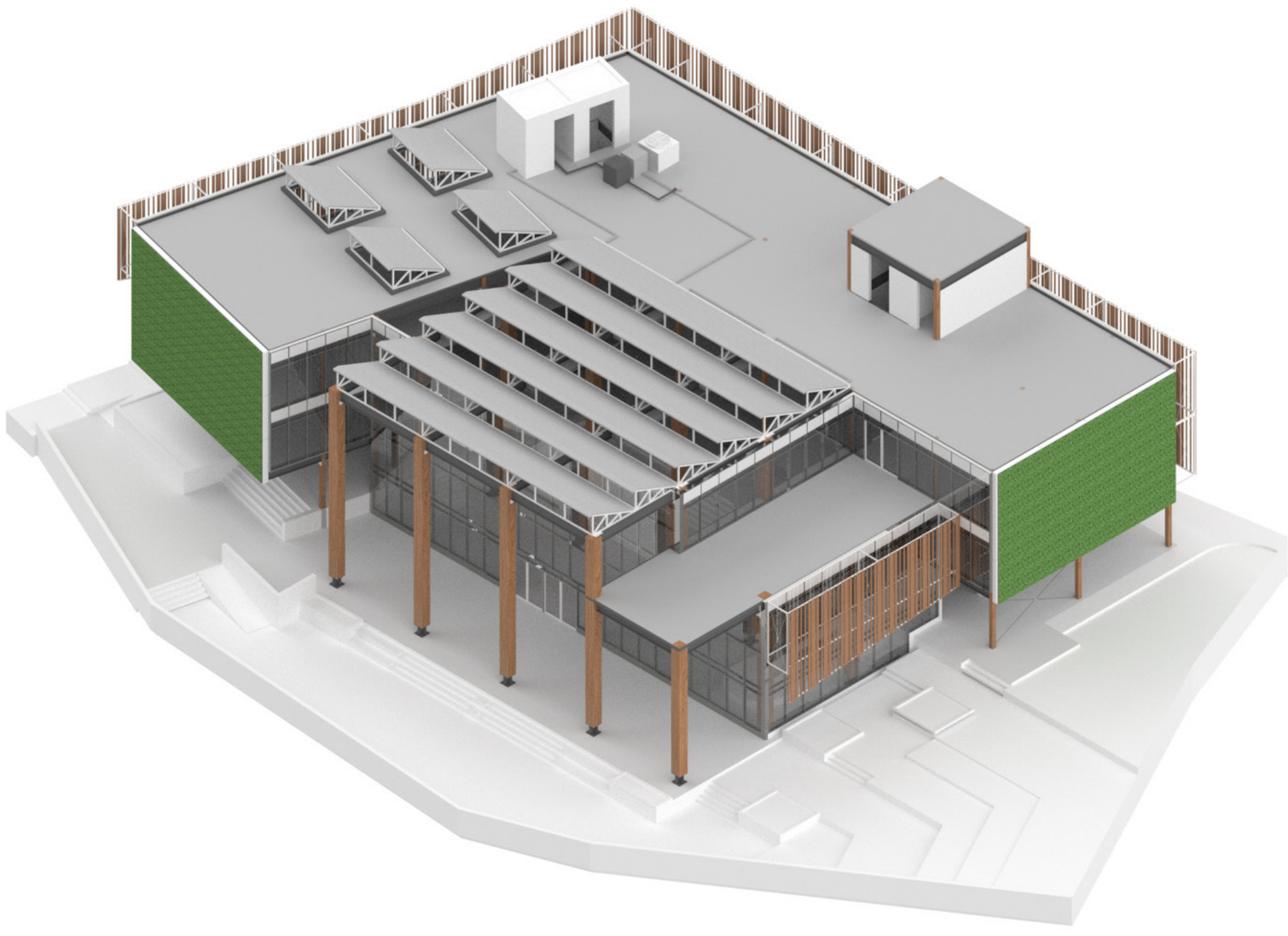
PERSPECTIVE 3



PHASE 4

INTEGRATED DESIGN PROPOSAL

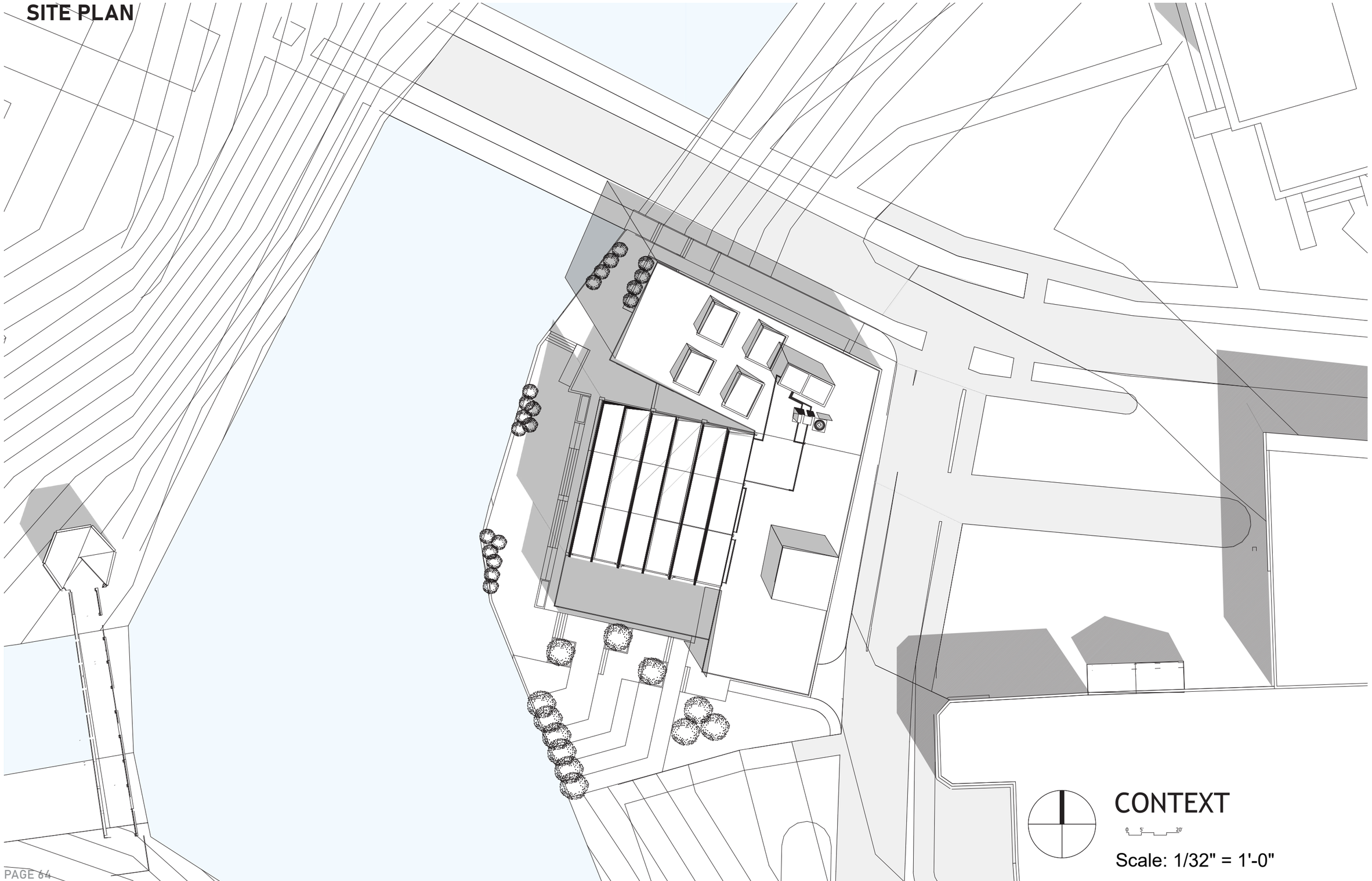
CONCEPT



The initial concept of the makerspace was to create a connection to the greenway and in ways extend it throughout the site.

For this final integration, we still continued with this concept by designing a makerspace that emcompasses the nature of the greenway. We achieved this by implementing natural elements into the facades of the building as well as creating programs that centralized around the arts and craft of gardening.

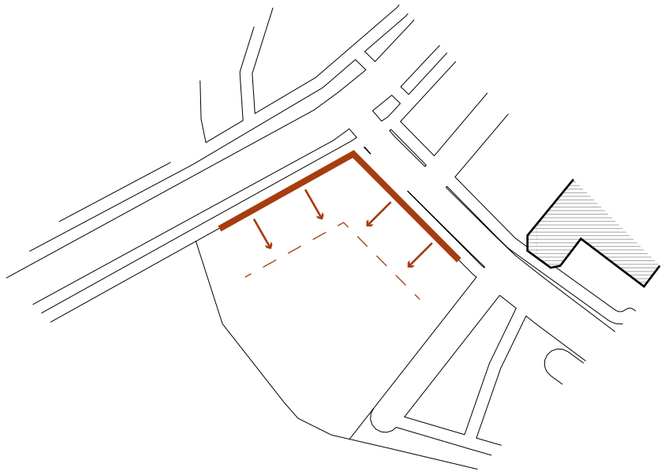
SITE PLAN

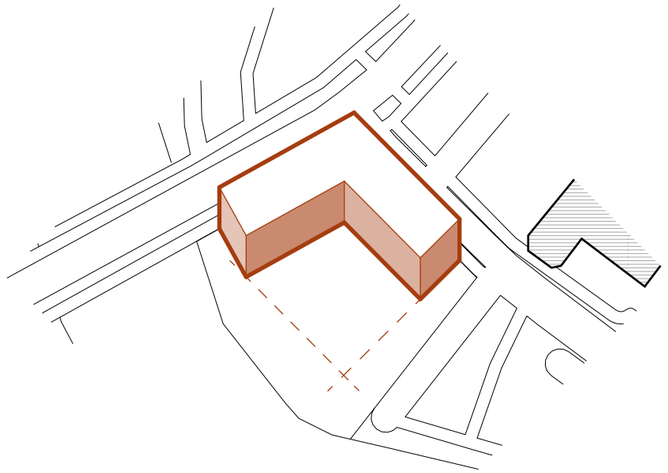


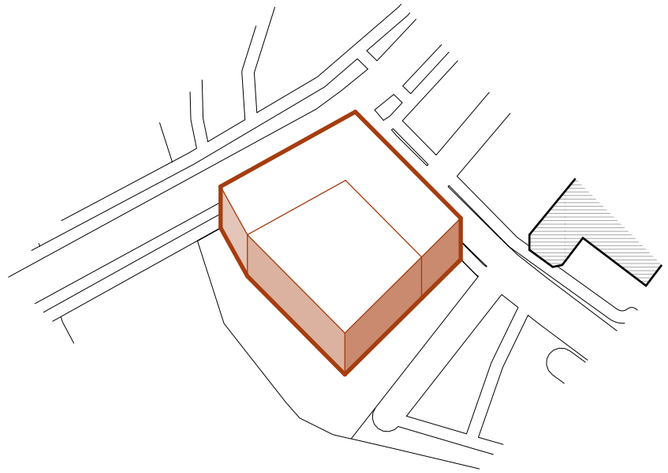
CONTEXT

0 5' 20'

Scale: 1/32" = 1'-0"

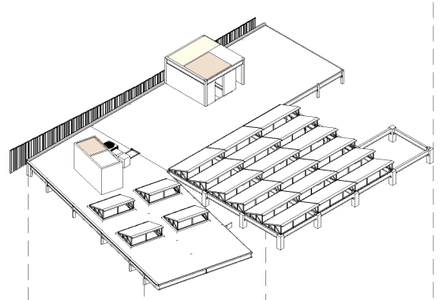






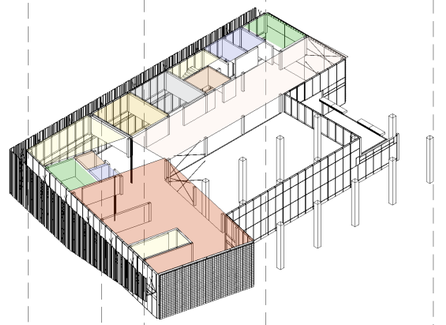
PROGRAM

Focusing on the craft side of gardening includes making pottery/ceramins for plants as well as growing plants in nuseries that could repurposed into other crafts like soap making and painting



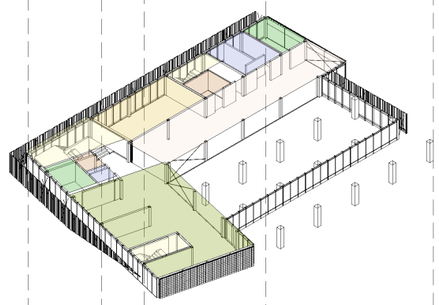
ROOF FLOOR PLAN

Service Areas
-Stairs
-Elevator
Mechanical Room



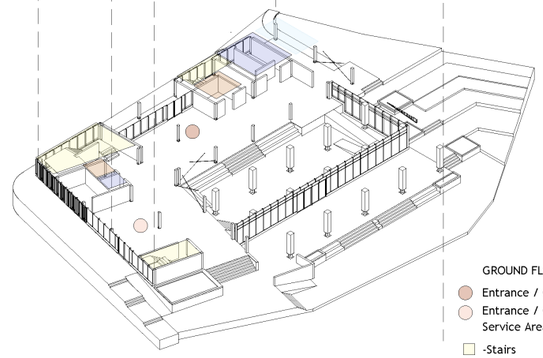
THIRD FLOOR PLAN
Nursery
Open Workshops
Soap Workshop
Classroom
Storage

Service Areas
-Stairs
-Elevators
-Bathrooms

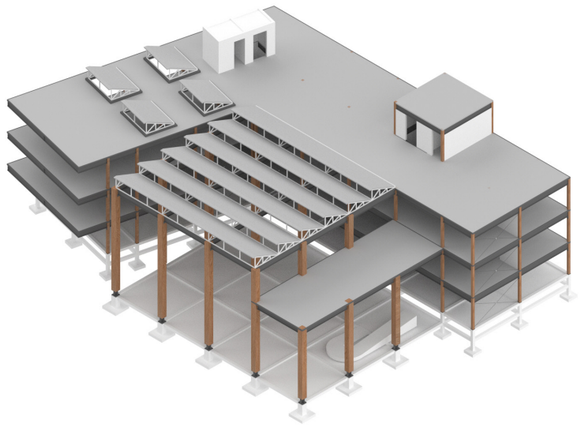


SECOUND FLOOR PLAN
Ceramics
Open Workshops
Conference Room
Storage

Service Areas
-Stairs
-Elevator
-Bathrooms

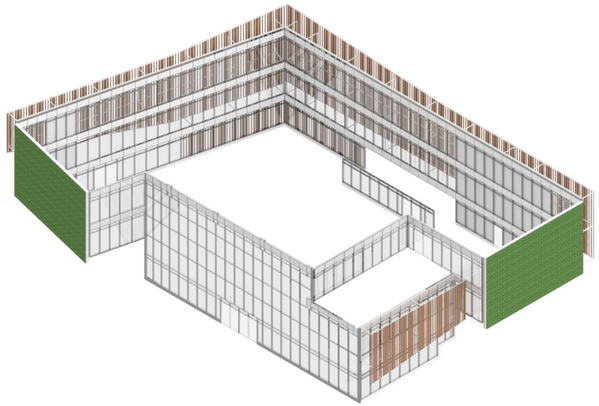


GROUND FLOOR PLAN
Entrance / Gift Shop
Entrance / Cafe
Service Areas
-Stairs
-Elevator
-Bathrooms
-Truck Entrance



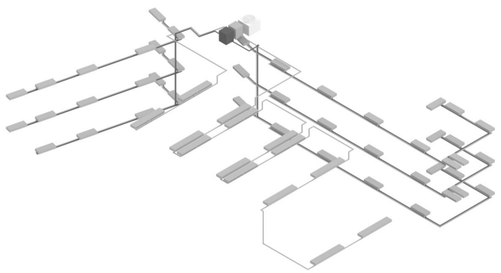
STRUCTURAL

- Wooden Columns
- Steel Beams and Brackets
- Corrugated Aluminum Decking
- Concrete Floor Slab
- Steel Trusses



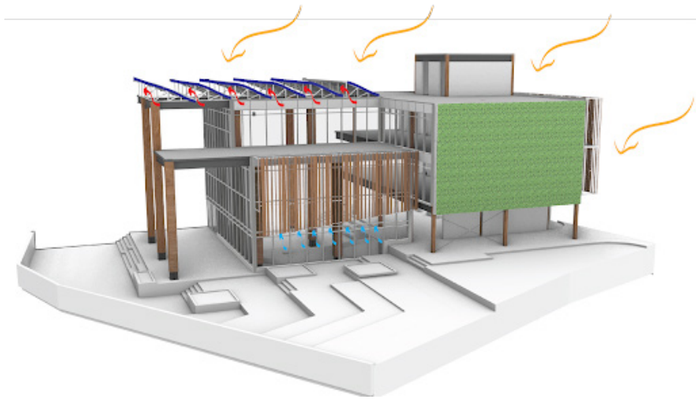
ENVELOPE

- Double Glazing Curtain Wall
- Living Green Wall
- Wooden Shading Devices



ACTIVE

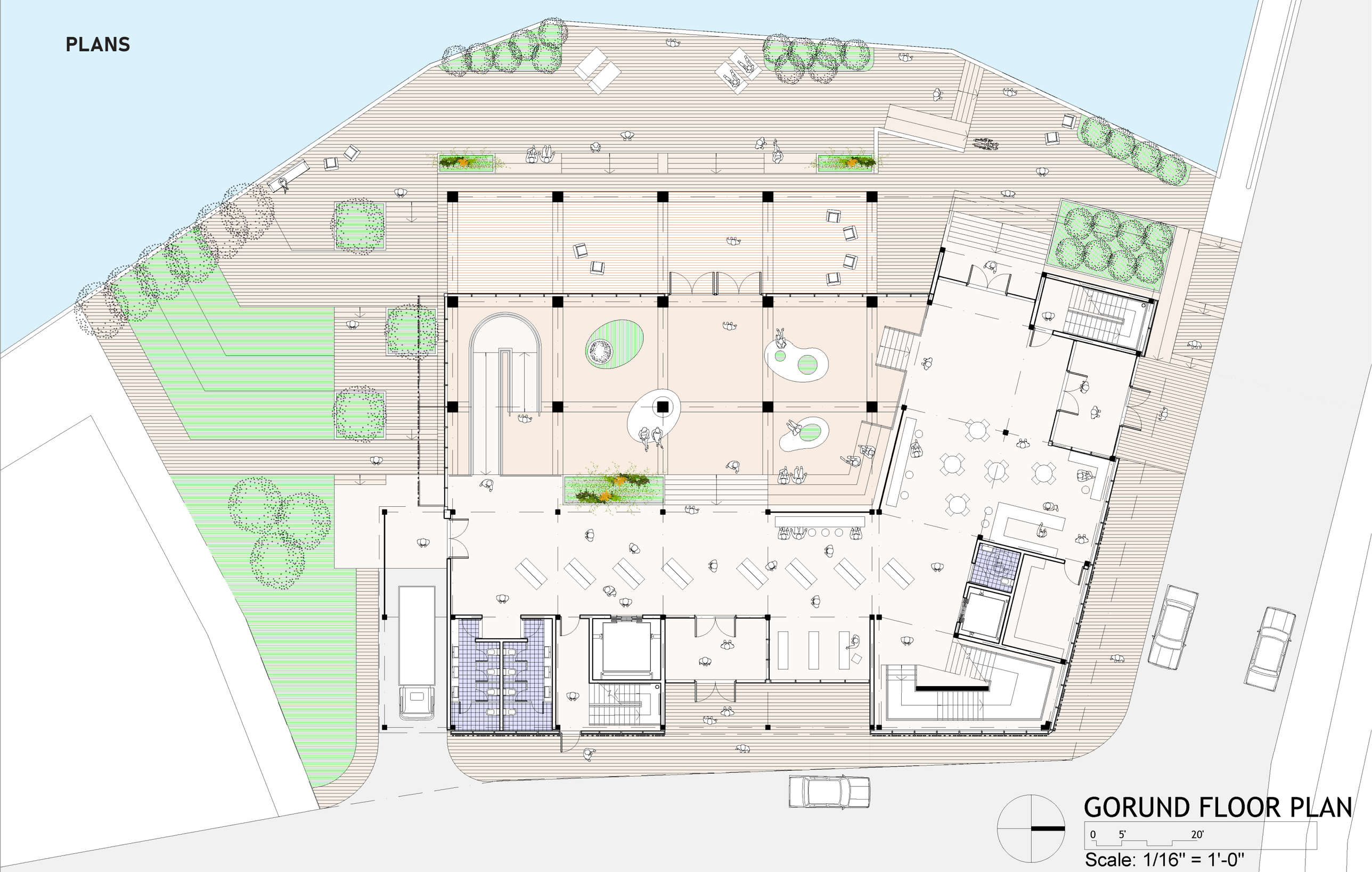
- Central All-Water Systems: Fan-coil Terminals



PASSIVE

- Sun Shading
- Natural Ventilation
- Solar Panels
- Window Openings in Curtain Walls and Roof

PLANS



GORUND FLOOR PLAN

0 5' 20'

Scale: 1/16" = 1'-0"

SECOND FLOOR PLAN

0 5' 20'

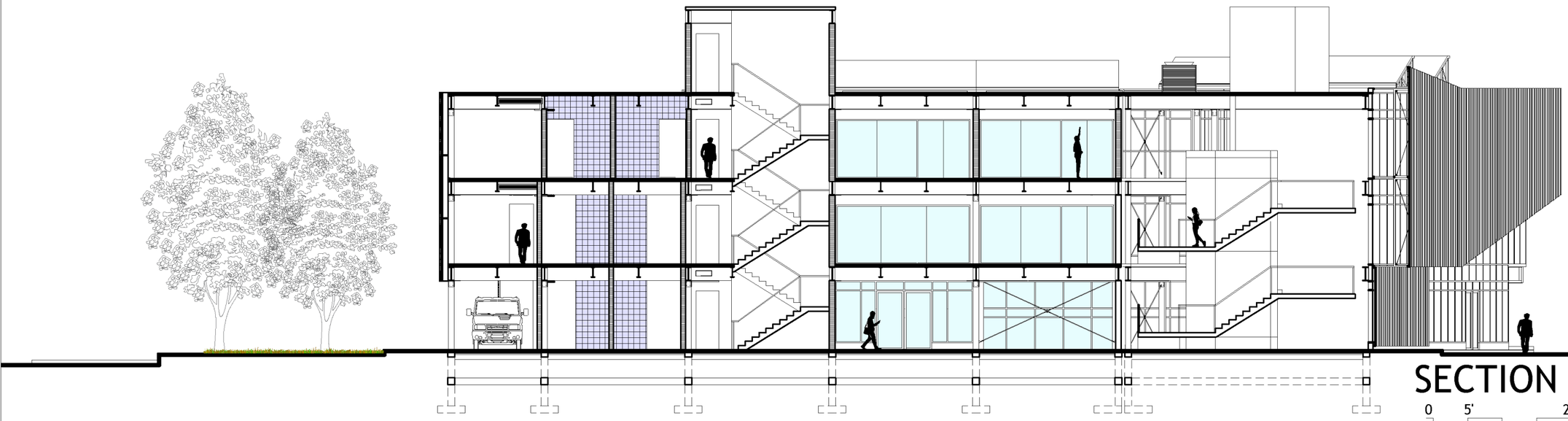
Scale: 1/16" = 1'-0"

THIRD FLOOR PLAN

0 5' 20'

Scale: 1/16" = 1'-0"

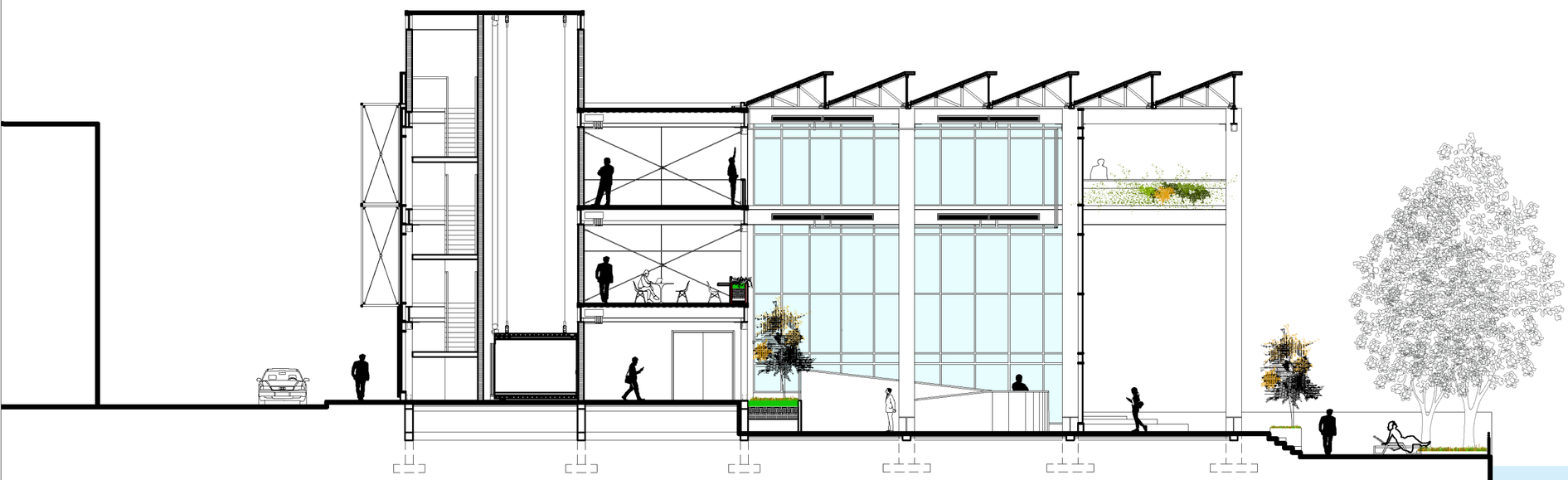
SECTIONS



SECTION A-A'

0 5' 20'

Scale: 1/16" = 1'-0"

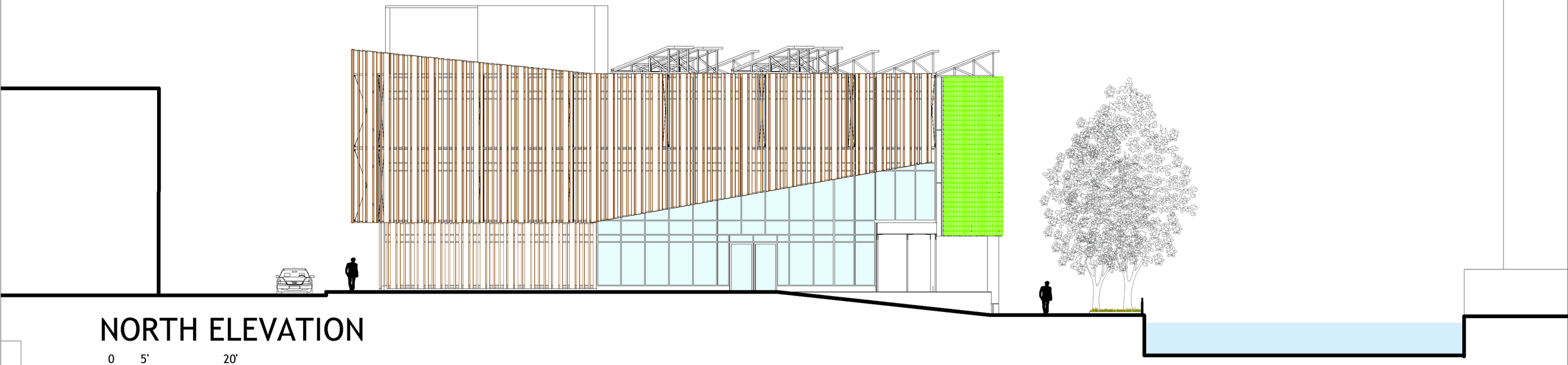


SECTION B-B'

0 5' 20'

Scale: 1/16" = 1'-0"

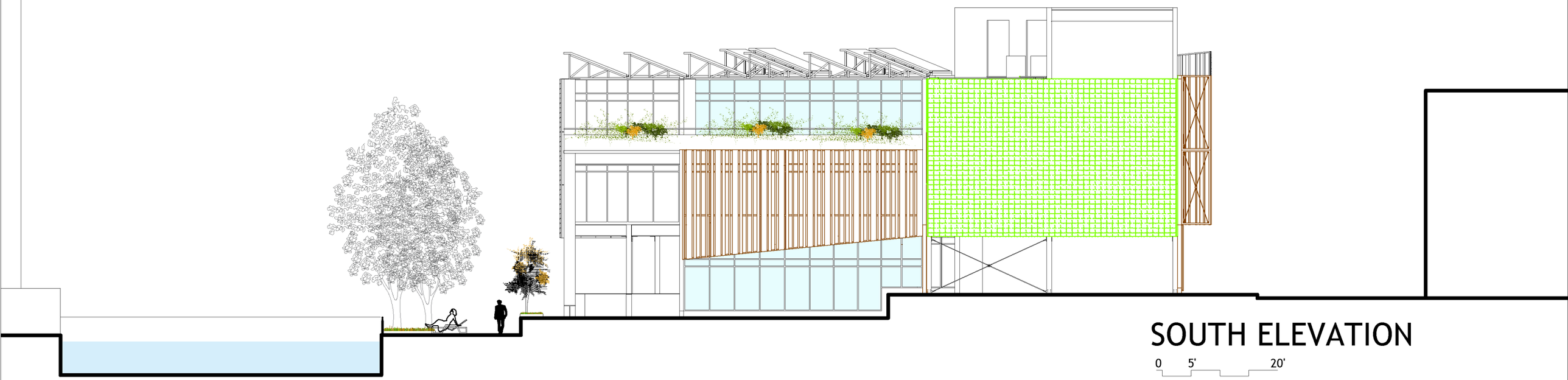
ELEVATIONS



NORTH ELEVATION

0 5' 20'

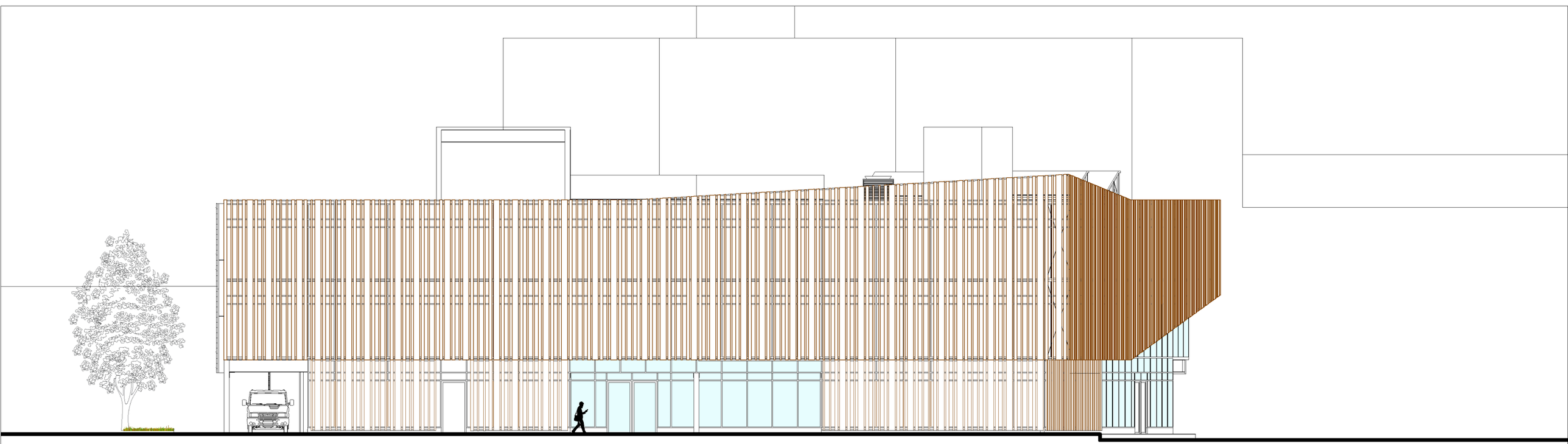
Scale: 1/16" = 1'-0"



SOUTH ELEVATION

0 5' 20'

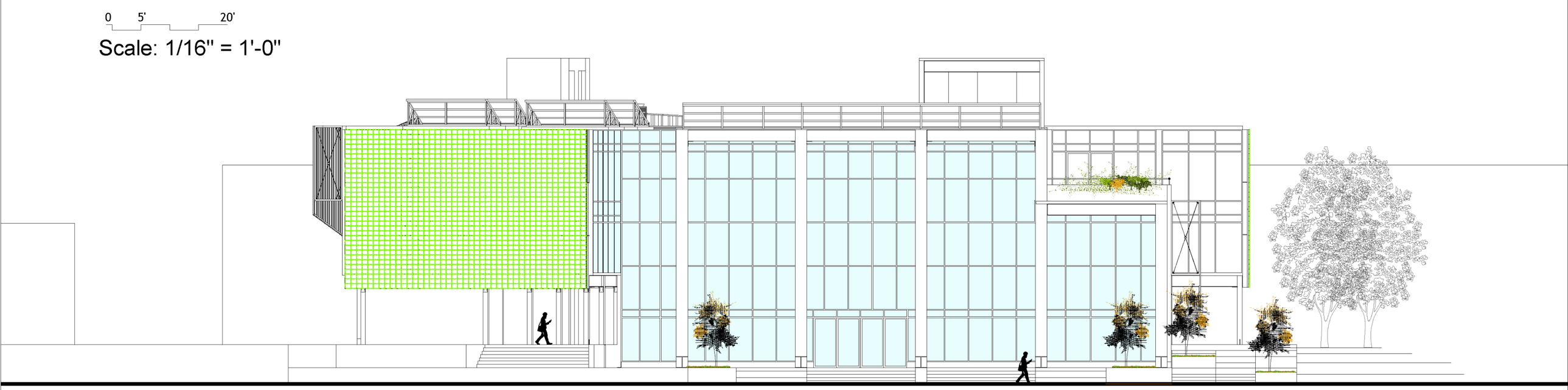
Scale: 1/16" = 1'-0"



EAST ELEVATION

0 5' 20'

Scale: 1/16" = 1'-0"

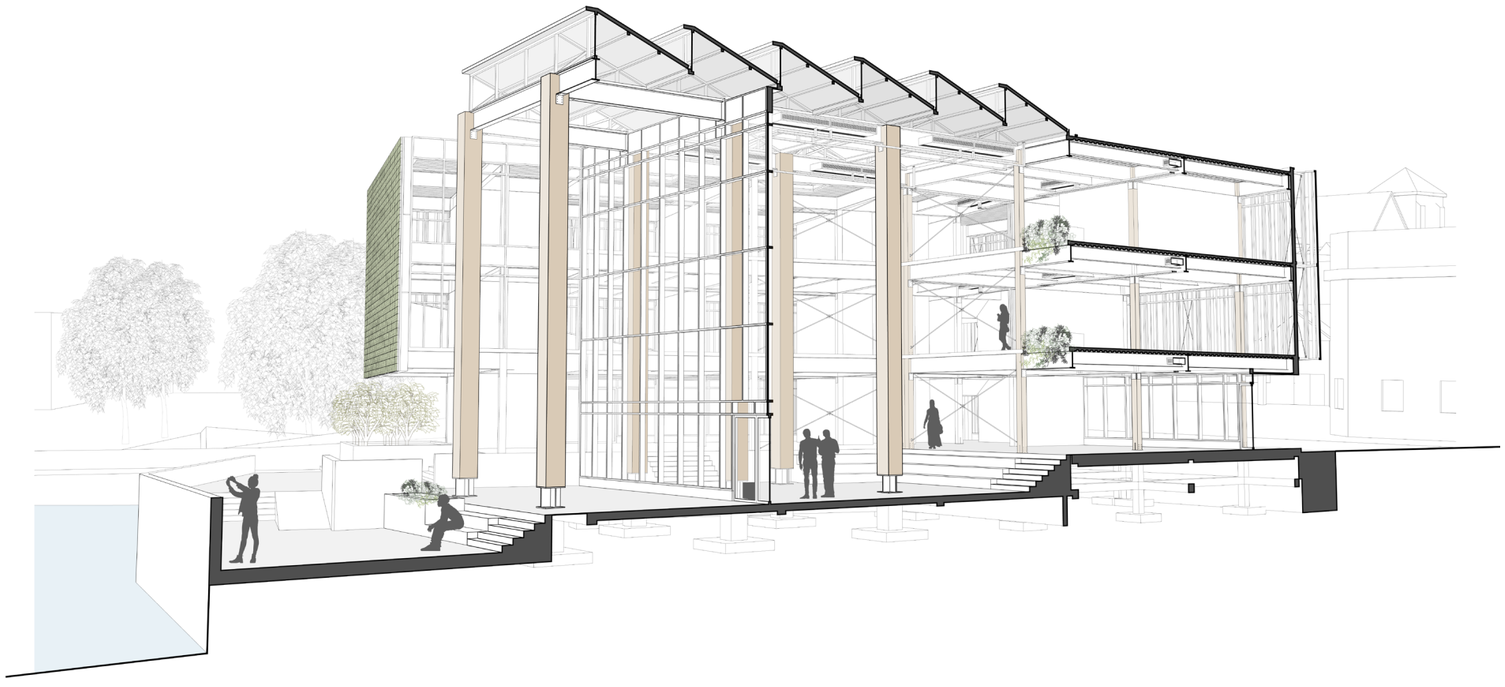


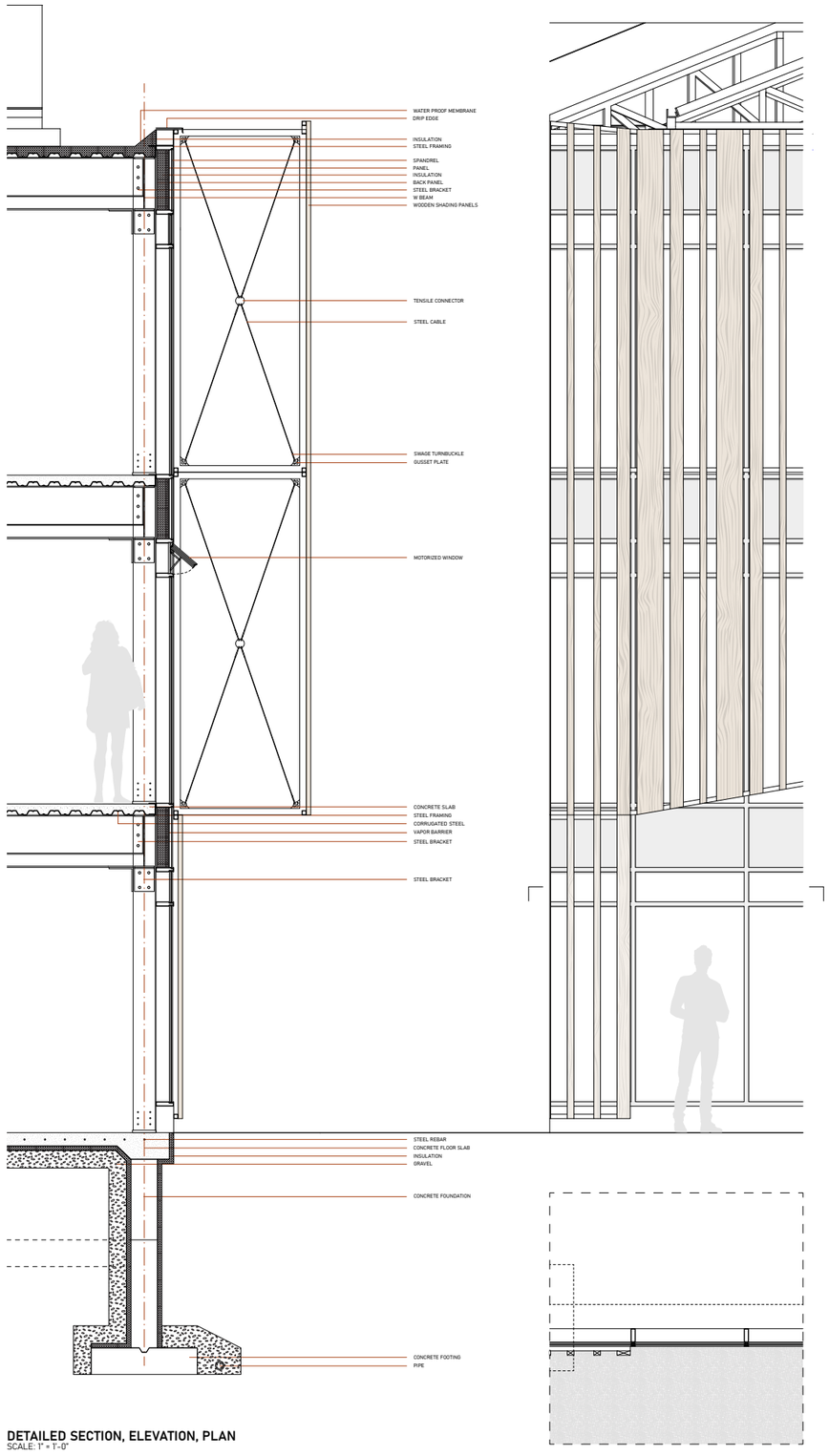
WEST ELEVATION

0 5' 20'

Scale: 1/16" = 1'-0"

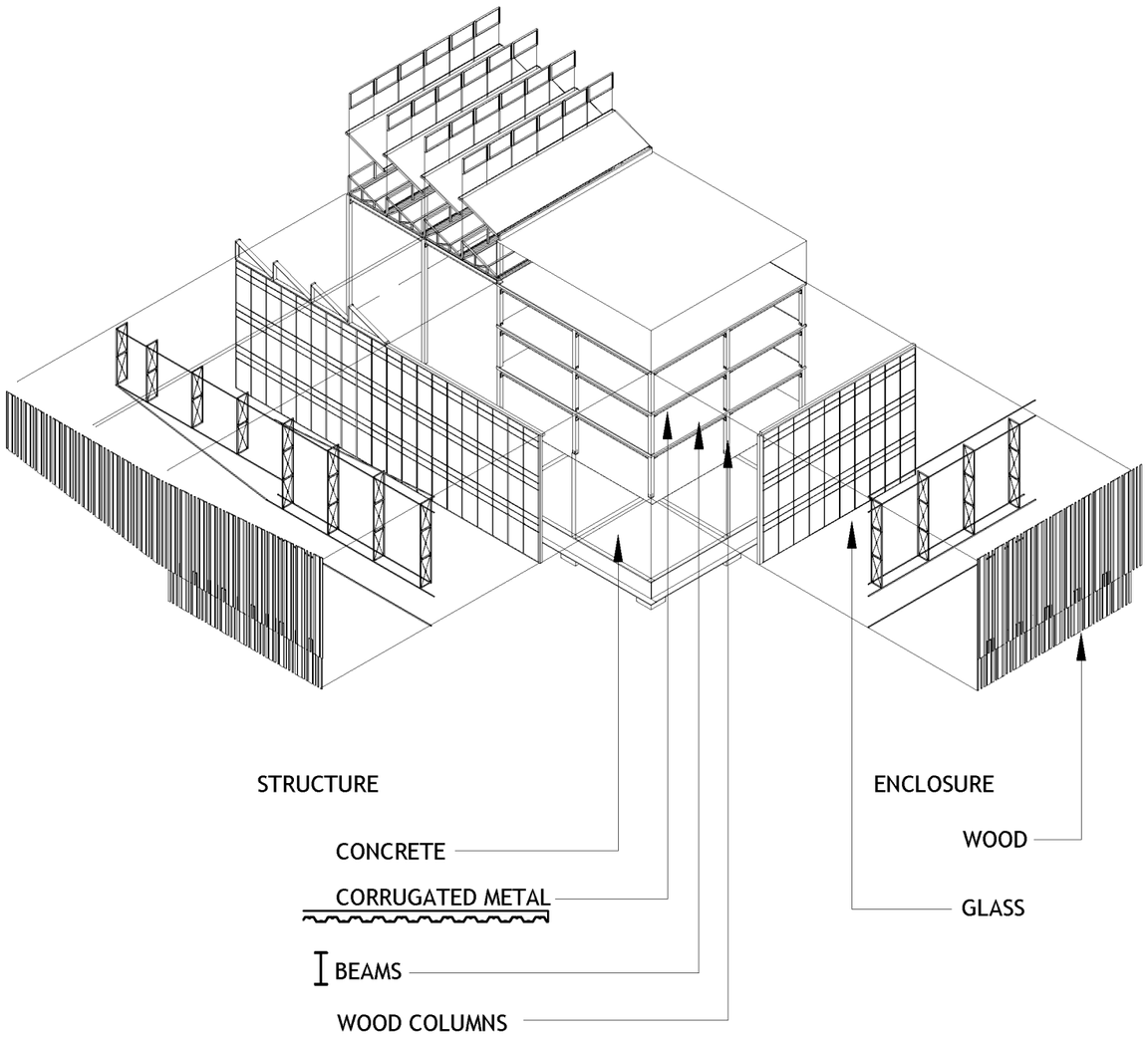
SECTIONAL PERSPECTIVE & DETAILED WALL SECTION





DETAILED SECTION, ELEVATION, PLAN
SCALE: 1" = 1'-0"

EXPLODED AXON

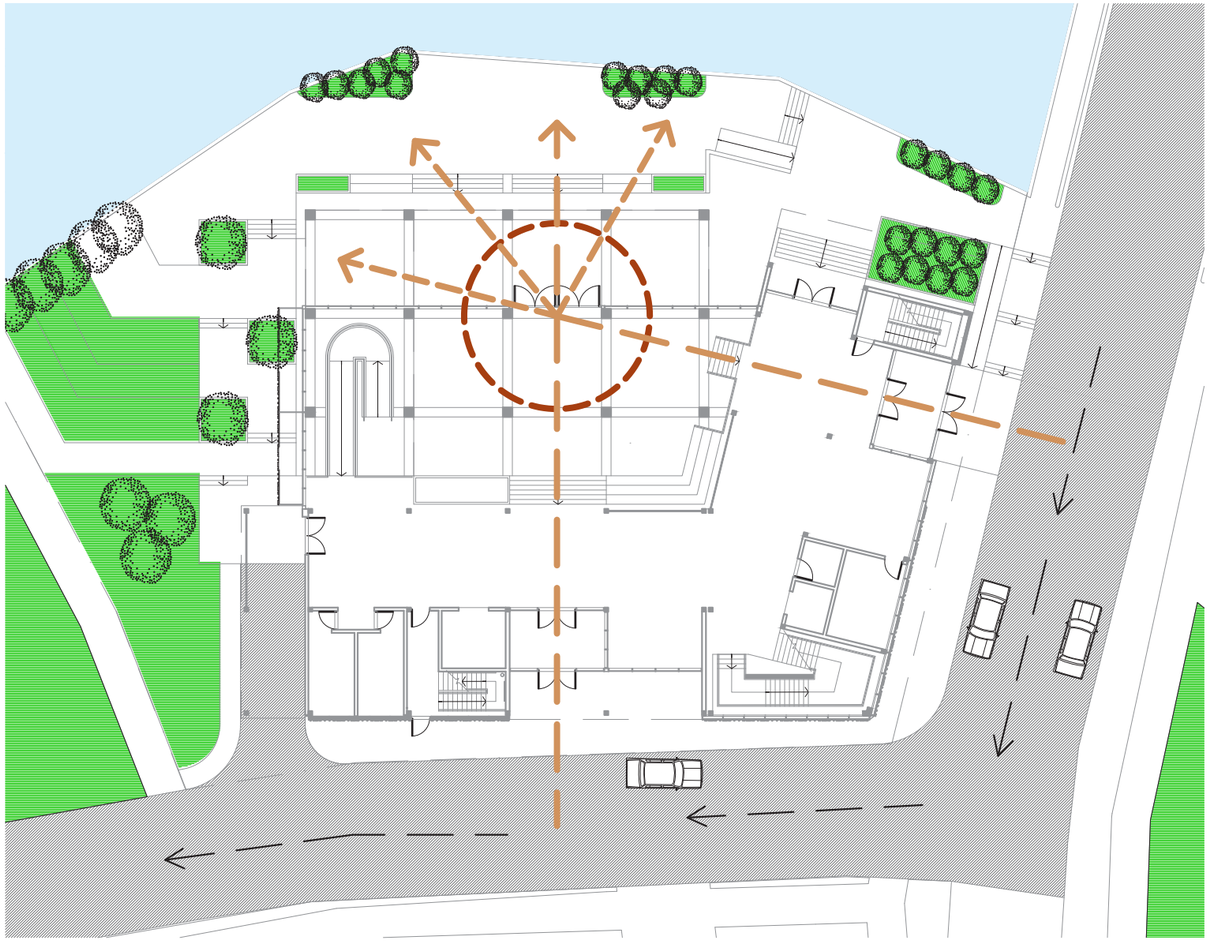


SYSTEMS

0 5' 20'

Scale: 1/32" = 1'-0"

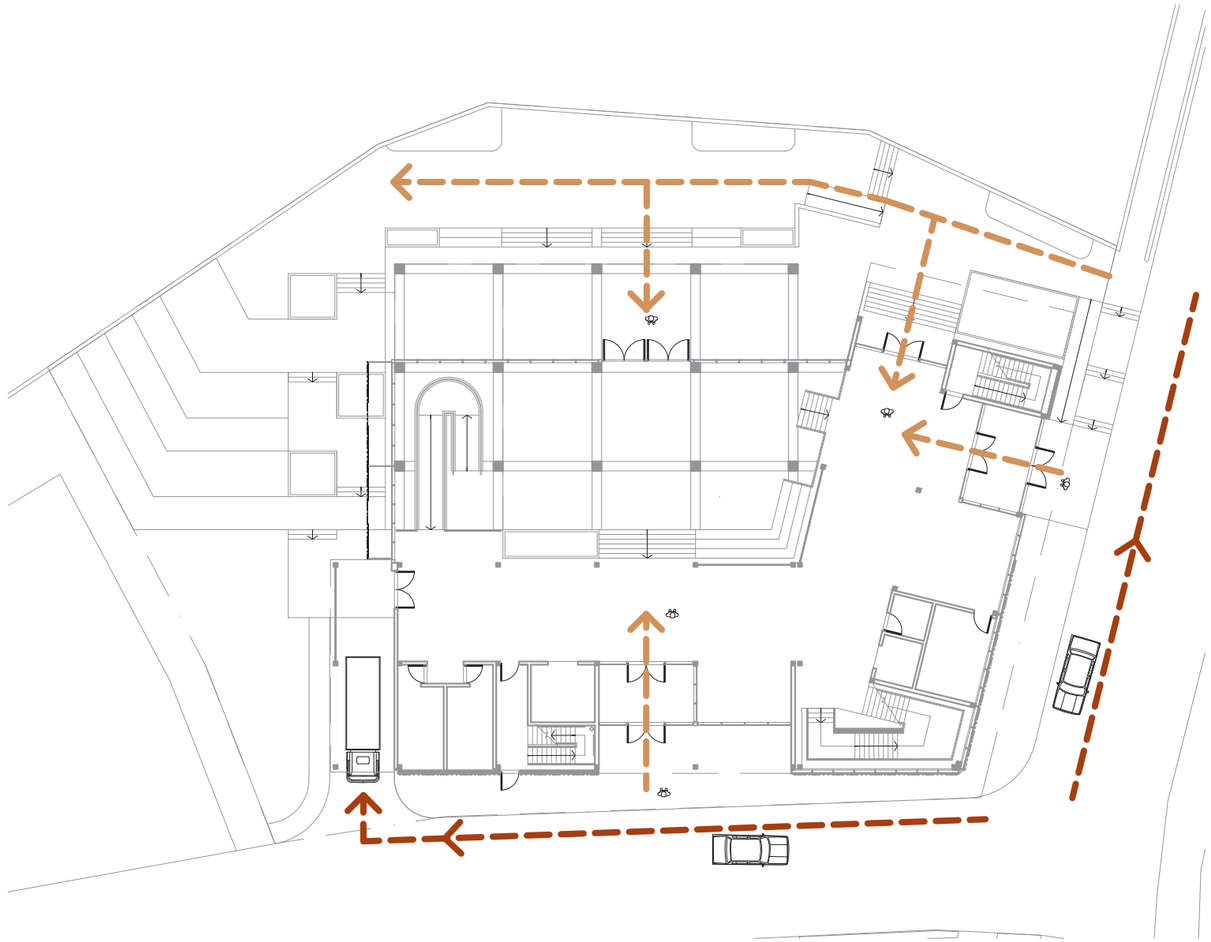
DIAGRAMS



URBAN DIAGRAM

0 5' 20'

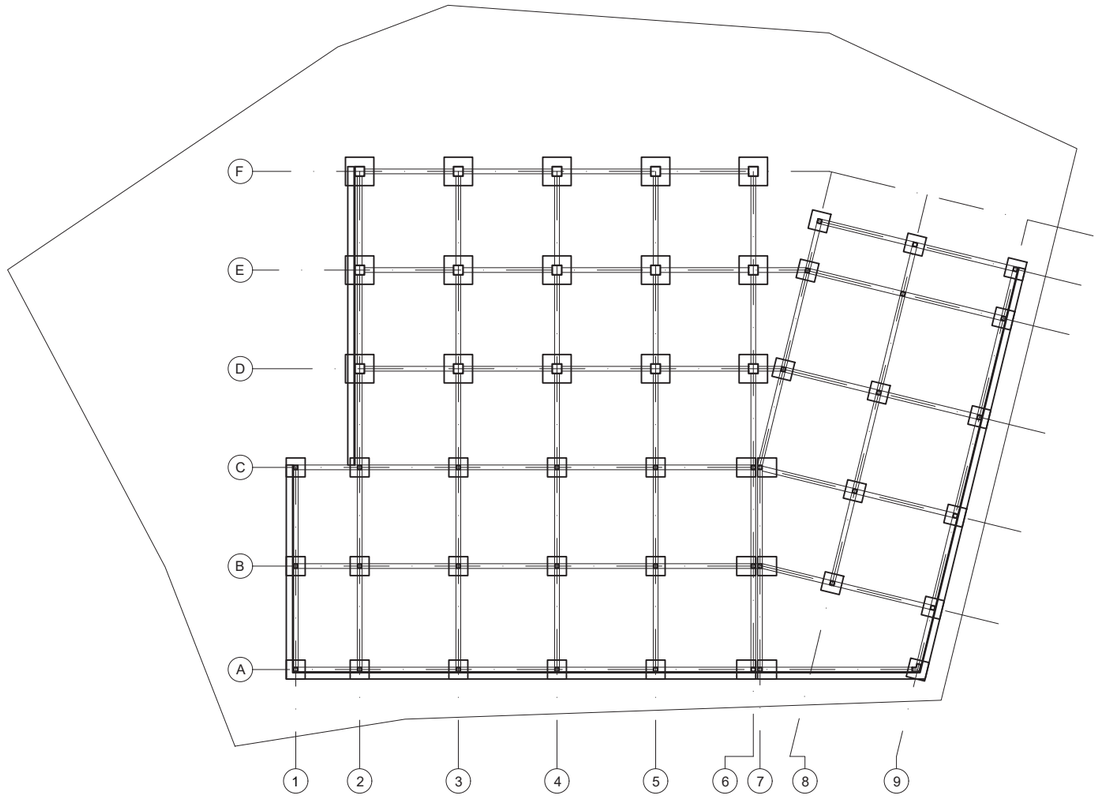
Scale: 1/32" = 1'-0"



ENTRANCES

0 5' 20'

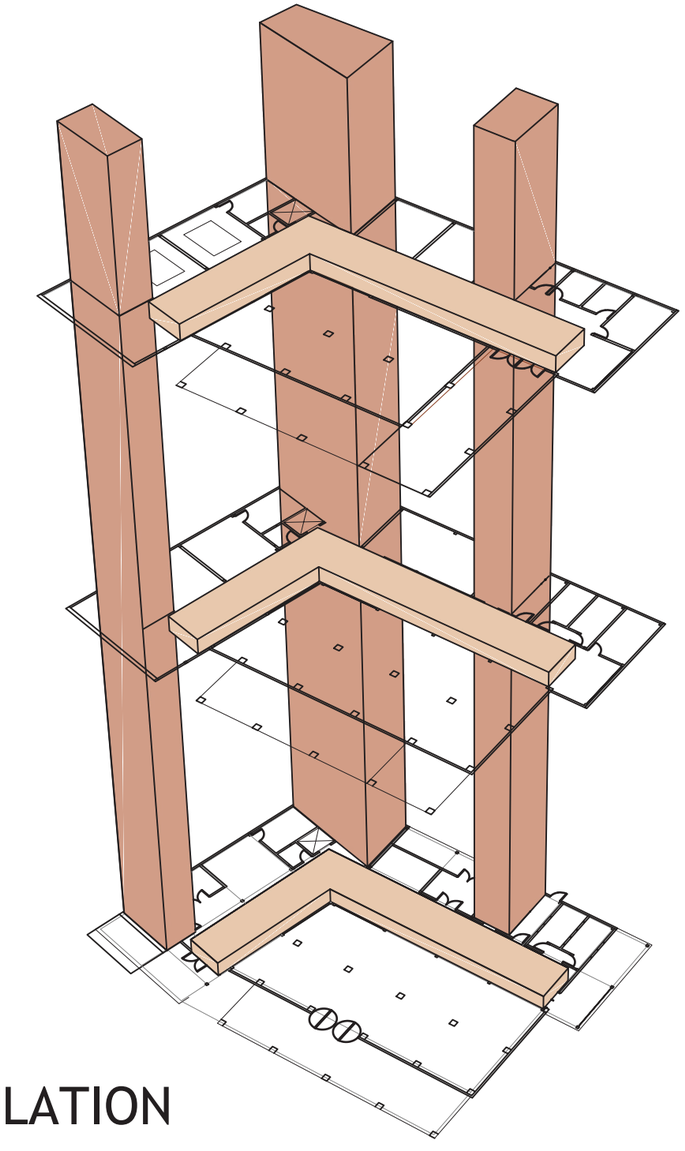
Scale: 1/32" = 1'-0"



FOOTINGS

0 5' 20'

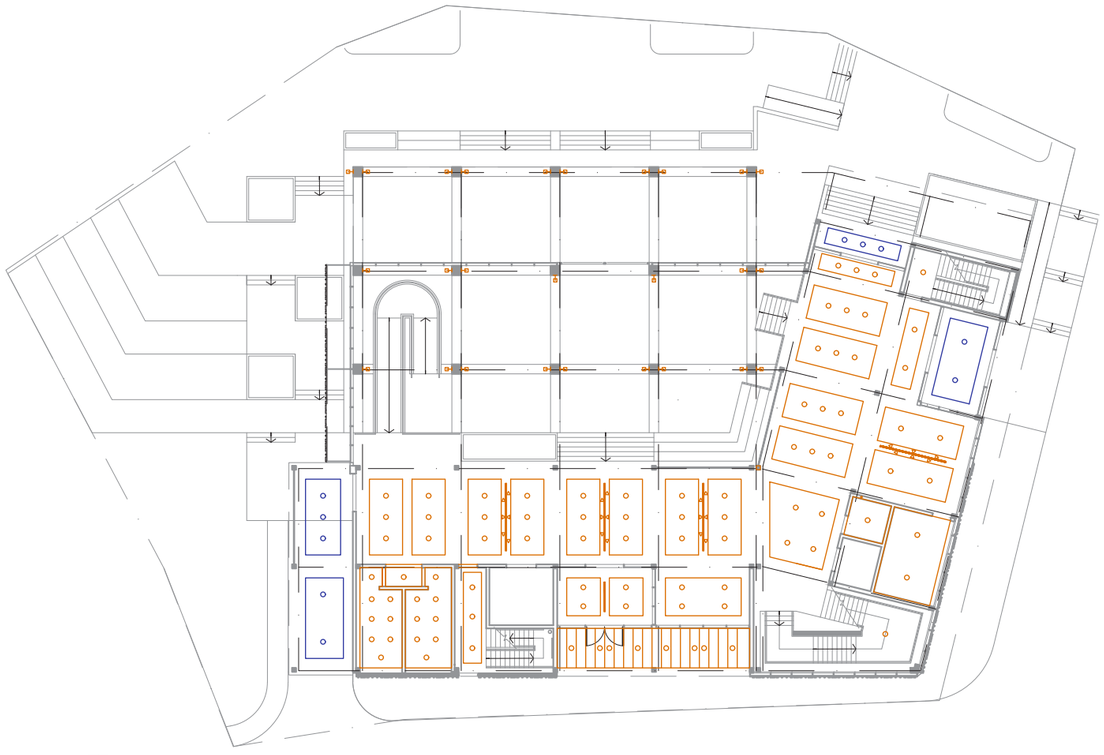
Scale: 1/32" = 1'-0"



CIRCULATION

0 5' 20'

Scale: 1/32" = 1'-0"



GROUND FLOOR PLAN-LIGHTING

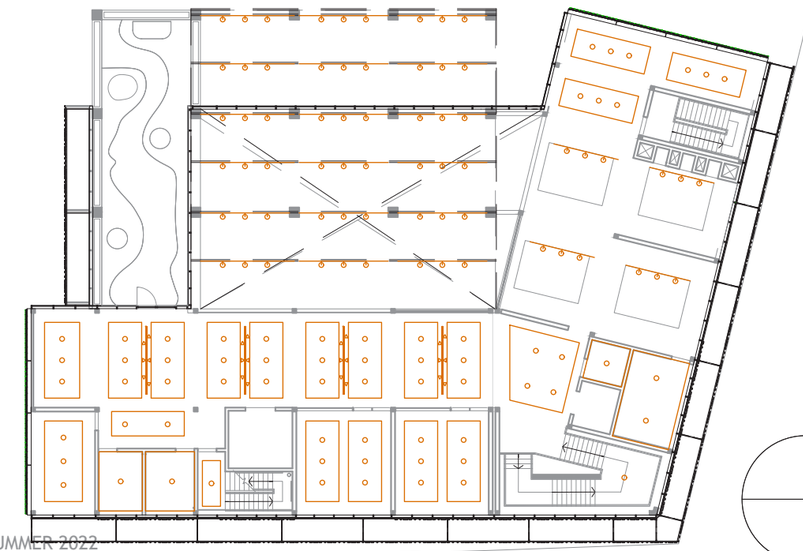
0 5' 20'

Scale: 1/32" = 1'-0"

SECOND FLOOR PLAN-LIGHTING

0 5' 20'

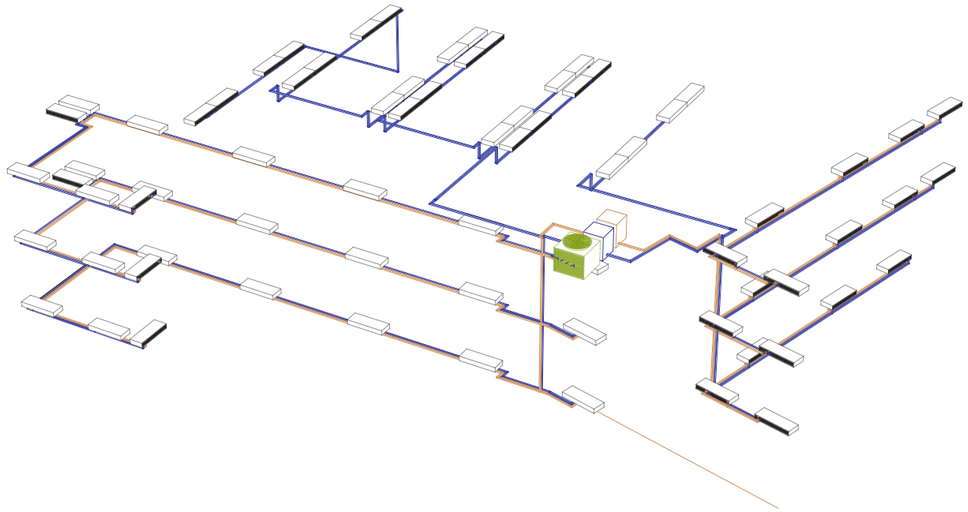
Scale: 1/32" = 1'-0"



THIRD FLOOR PLAN-LIGHTING

0 5' 20'

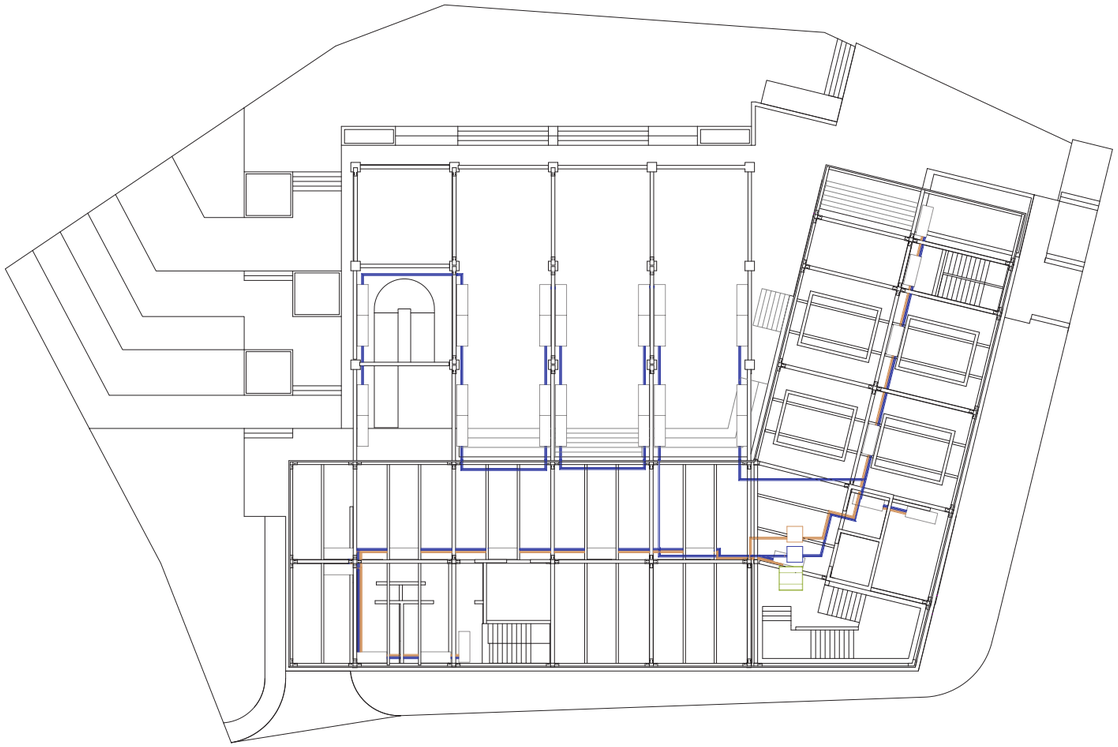
Scale: 1/32" = 1'-0"



ACTIVE SYSTEM

0 5' 20'

Scale: 1/32" = 1'-0"

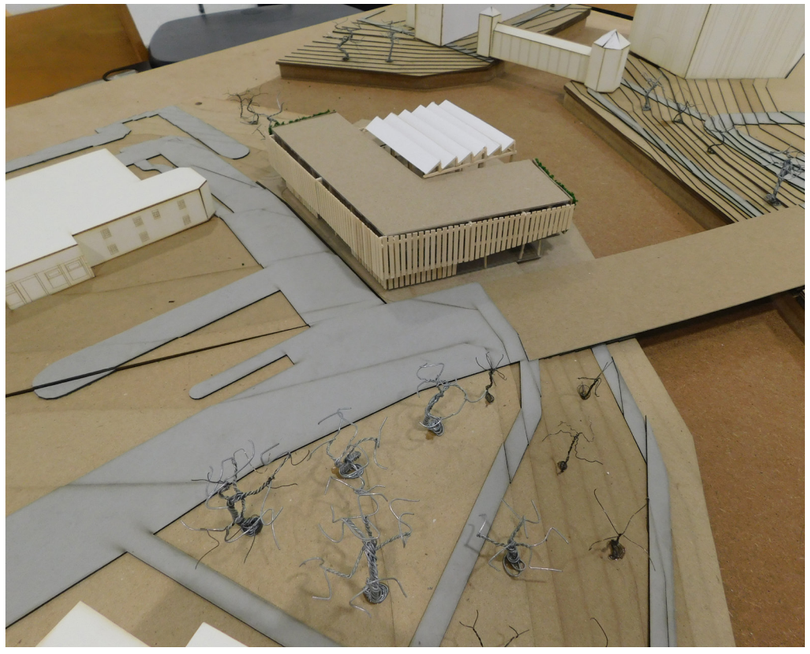


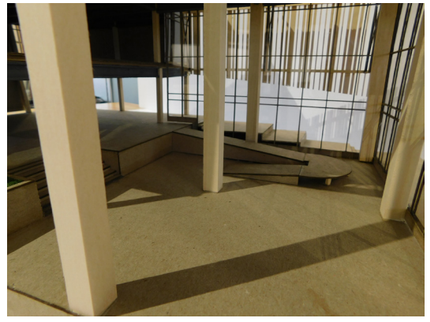
STRUCTURE AND HVAC

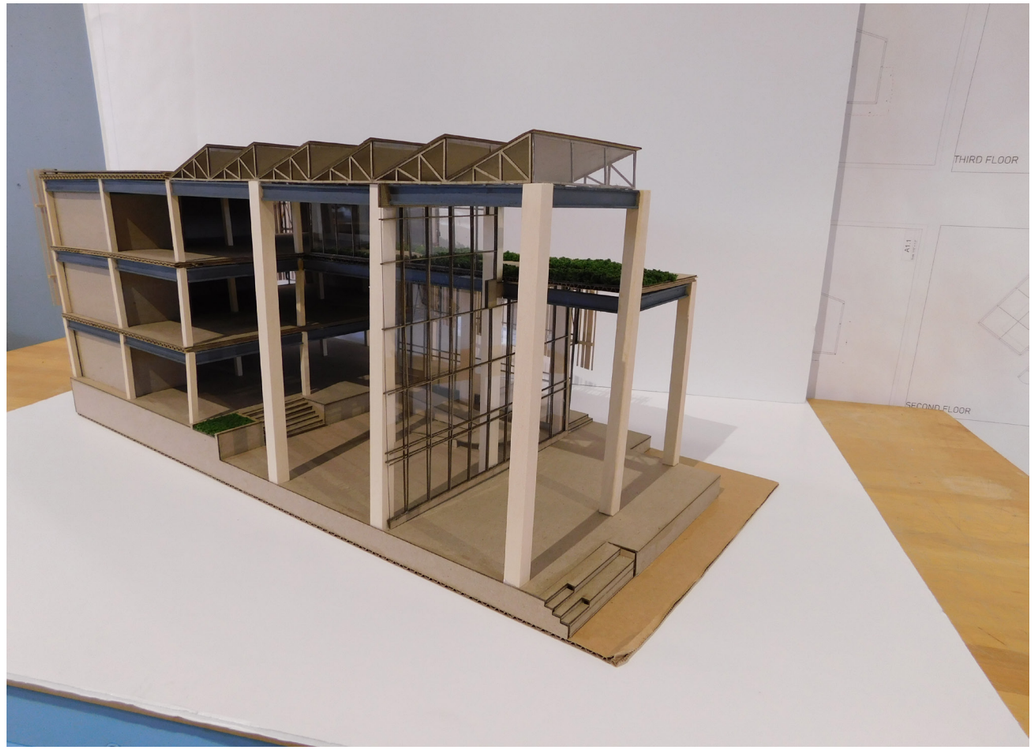
0 5' 20'

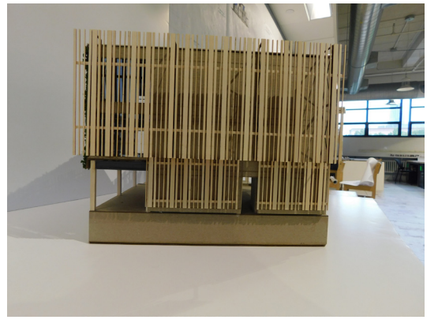
Scale: 1/32" = 1'-0"

PHOTOS OF PHYSICAL
MODELS









PHOTOS OF PHYSICAL
MODELS