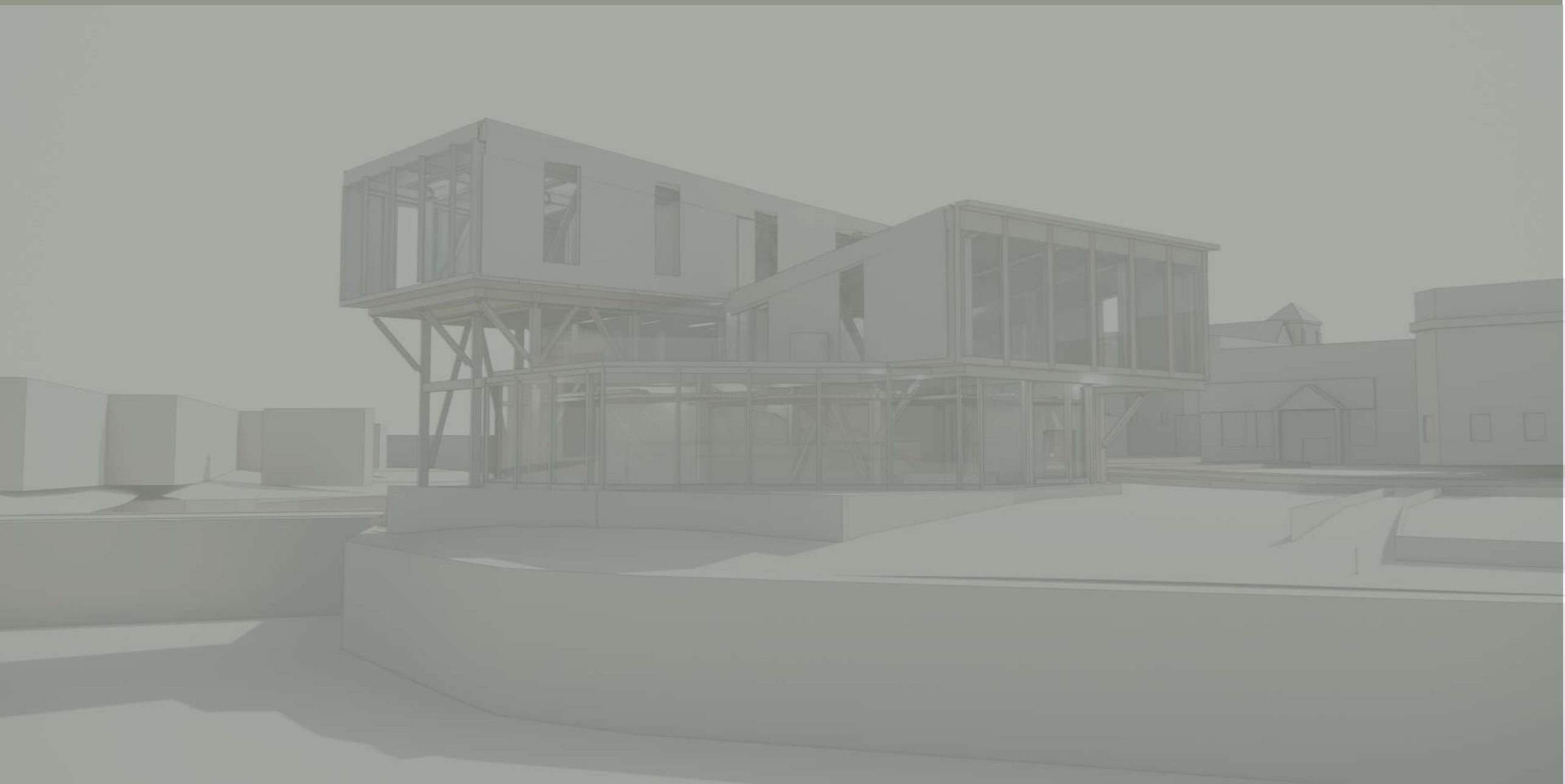
PORTFOLIO SUMMER 2022

Team Dunkin': Alyssa Hill & Olivia Lare
Professor Piermarini
11 August 2022

TABLE OF CONTENTS

PHASE 1
Site Analysis



SITE VISIT

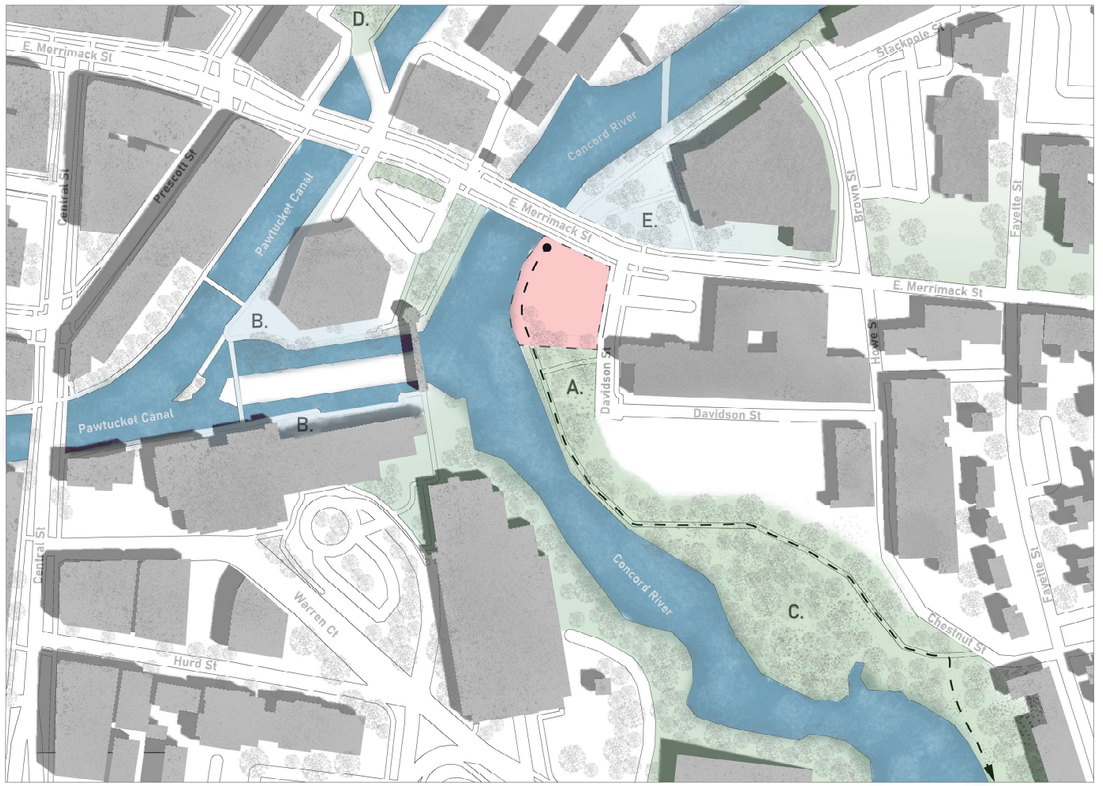
Site Analysis

With the site located off the **Concord River**, in close proximity to the **Concord River Greenway Park**, and marks the end of the **Concord River Greenway**, it was important that our form connects and directly interacts with its context. The river marks Lowell's industrial past, while the park and greenway mark new beginnings and relationships to nature- a noticeable contrast to Lowell's past.

The ground floor and exterior spaces must **activate this relationship to the existing green fabric.** It must respond to the local level, through bringing people in, and marking comfortable places to spend outdoors while creating something new.

Upper layers must respond to the overall urban scale- we analyzed the **Concord River and the Greenway Park as two seperate cultural nodes that defined Lowell and the site**. How could our form start to interact and connect to its context? Visual relationships to these spaces as well as being physically connected became equally important as we moved into the next design phase.

Parks and Outdoor Spaces



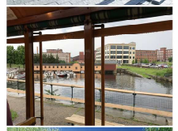
KEY:

Parks/Outdoor Spaces

A. Concord River Greenway Park

B. Lower Locks Plazas

C. Eastern Canal Park

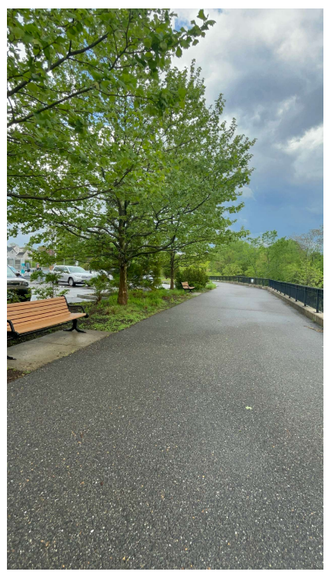


D. Kerouac Park

E. Lowell Memorial Auditorium Greenspace

Overall Land Uses

- Plaza & Multipurpose
- Park & Green Space
- Concord River/ Canal
- Concord River Greenway



PHASE 2
Precedent Study

UMASS AMHERST DESIGN CENTER

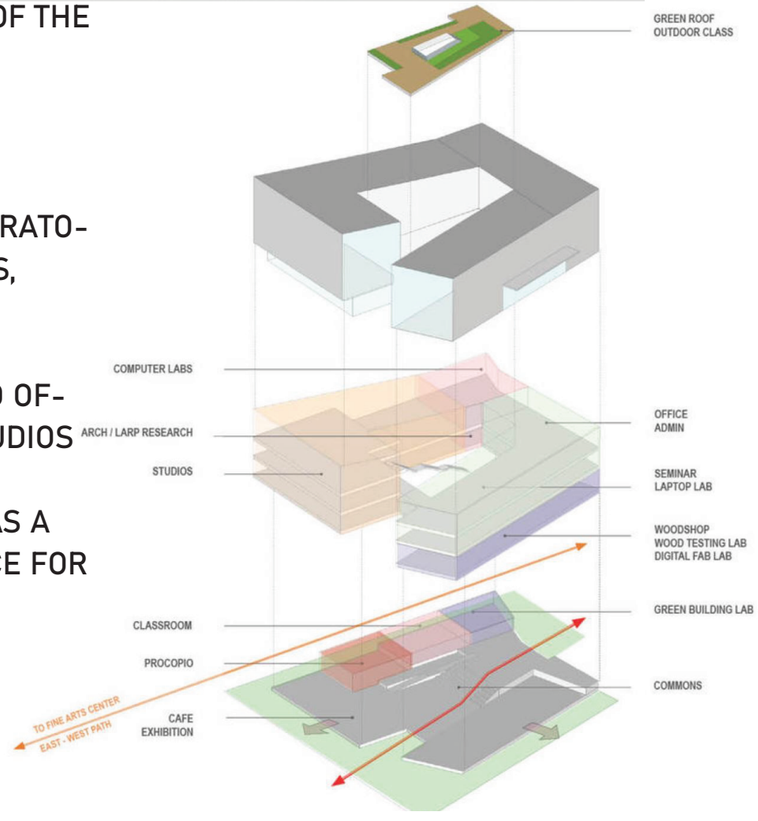
AMHERST, MA USA
LEERS WEINZAPFEL ASSOCIATES
EQUILIBRIUM CONSULTING SIMPSON GUMPERTZ AND HEGAR (EOR)
AUGUST 2015 TO JANUARY 2017

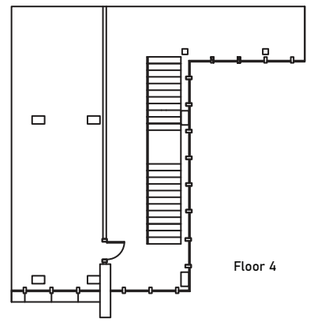
"THE GOAL FOR THE JOHN W. OLVER DESIGN BUILDING AT THE UNIVERSITY OF MASSACHUSETTS AMHERST WAS TO CREATE AN INNOVATIVE AND INSPIRED BUILDING THE VISIBLY DEMONSTRATES ENVIRONMENTALLY SENSITIVE DESIGN. THE RESULTS IS ONE OF THE MOST ADVANCED MASS TIMBER BUILDINGS IN THE UNITED STATES, A FOUR-STORY, 87,500-SQUARE-FOOT STRUCTURE THAT EXEMPLIFIES THE UNIVERSITIES COMMITMENT TO SUS-TAINABILITY AND, THROUGH GENERATIONS OF STUDENTS WHO WILL LEARN WITHIN ITS WALLS, THE FUTURE OF THE BUILT ENVIRONMENT."

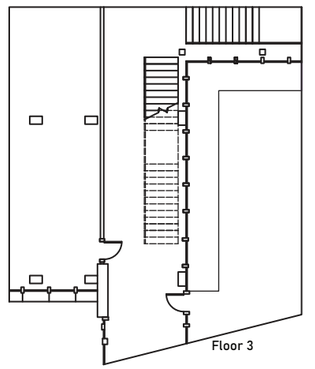
FIRST FLOOR: EXHIBITION AND LECTURE SPACE, LABORATO-RIES, FABRICATION AND MATERIALS TESTING SHOPS, DINING AND CLASSROOM SPACE

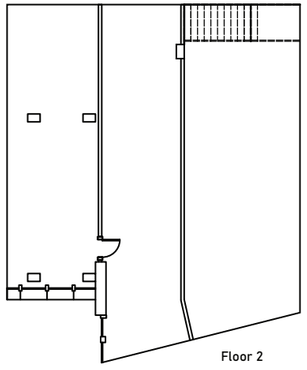
SECOND AND THIRD FLOOR: STUDIOS, CLASSROOMS AND OF-FICES, AND **THE SMALLER FOURTH FLOOR** CONTAINS STUDIOS

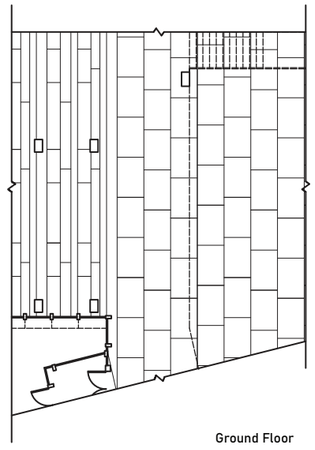
ABOVE THE ATRIUM: A GREEN ROOF THAT FUNCTIONS AS A PUBLIC COURTYARD AND OUTDOOR LEARNING SPACE FOR STUDENTS STUDYING URBAN LANDSCAPES.

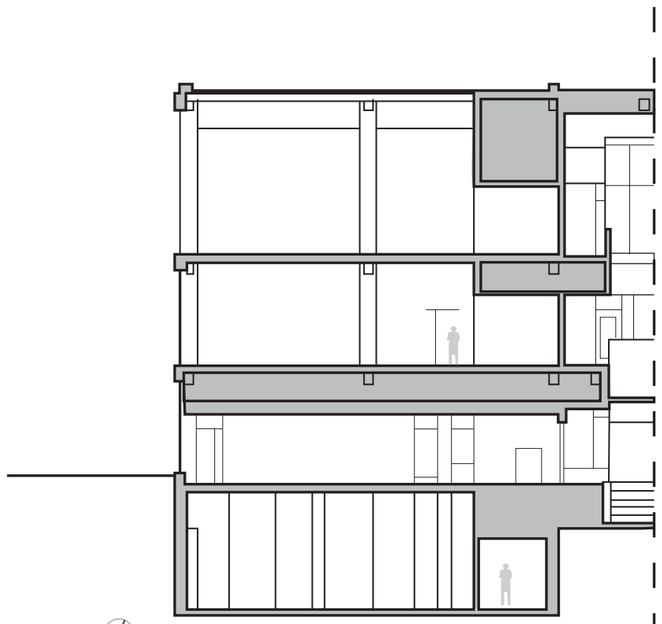








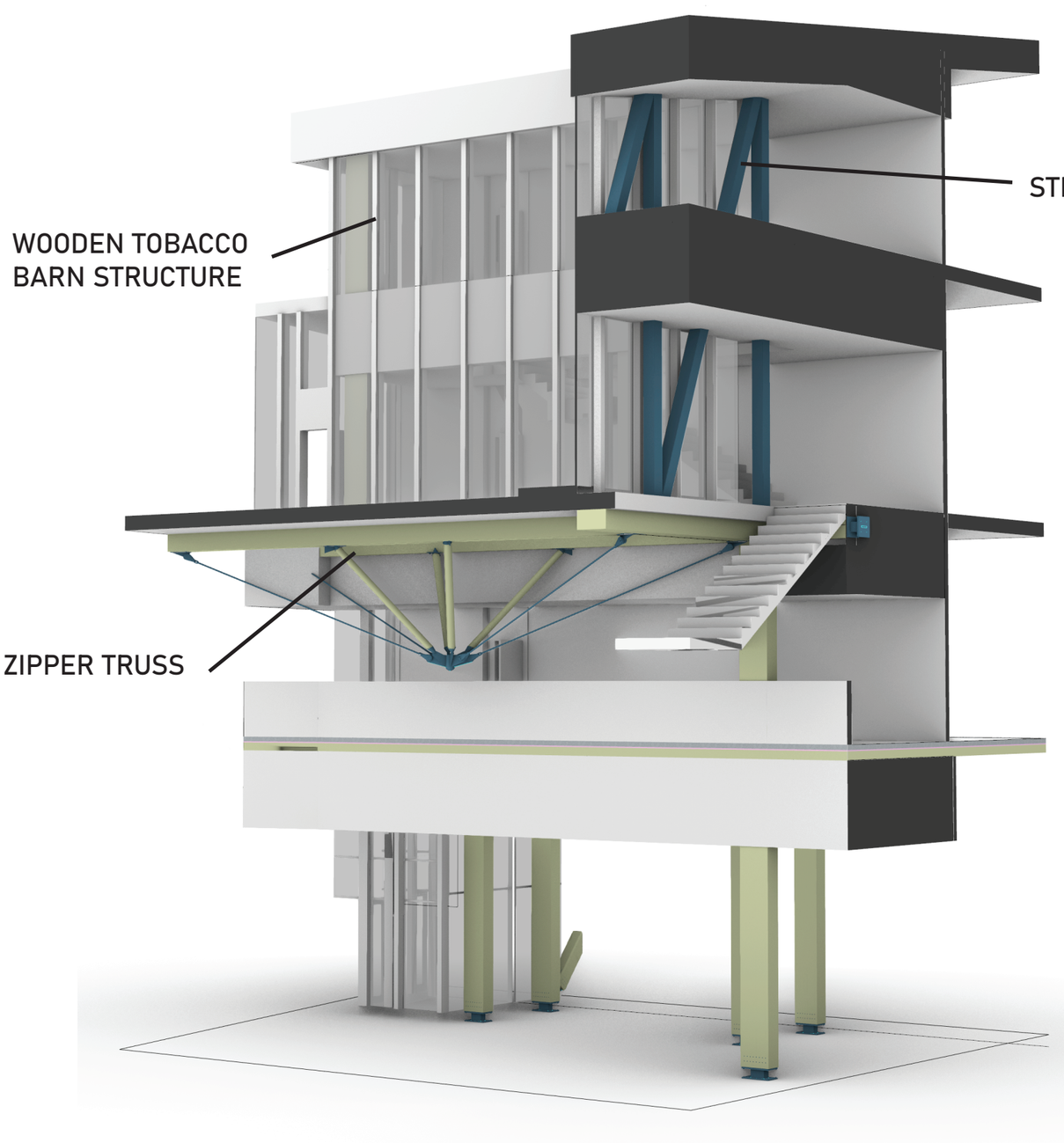


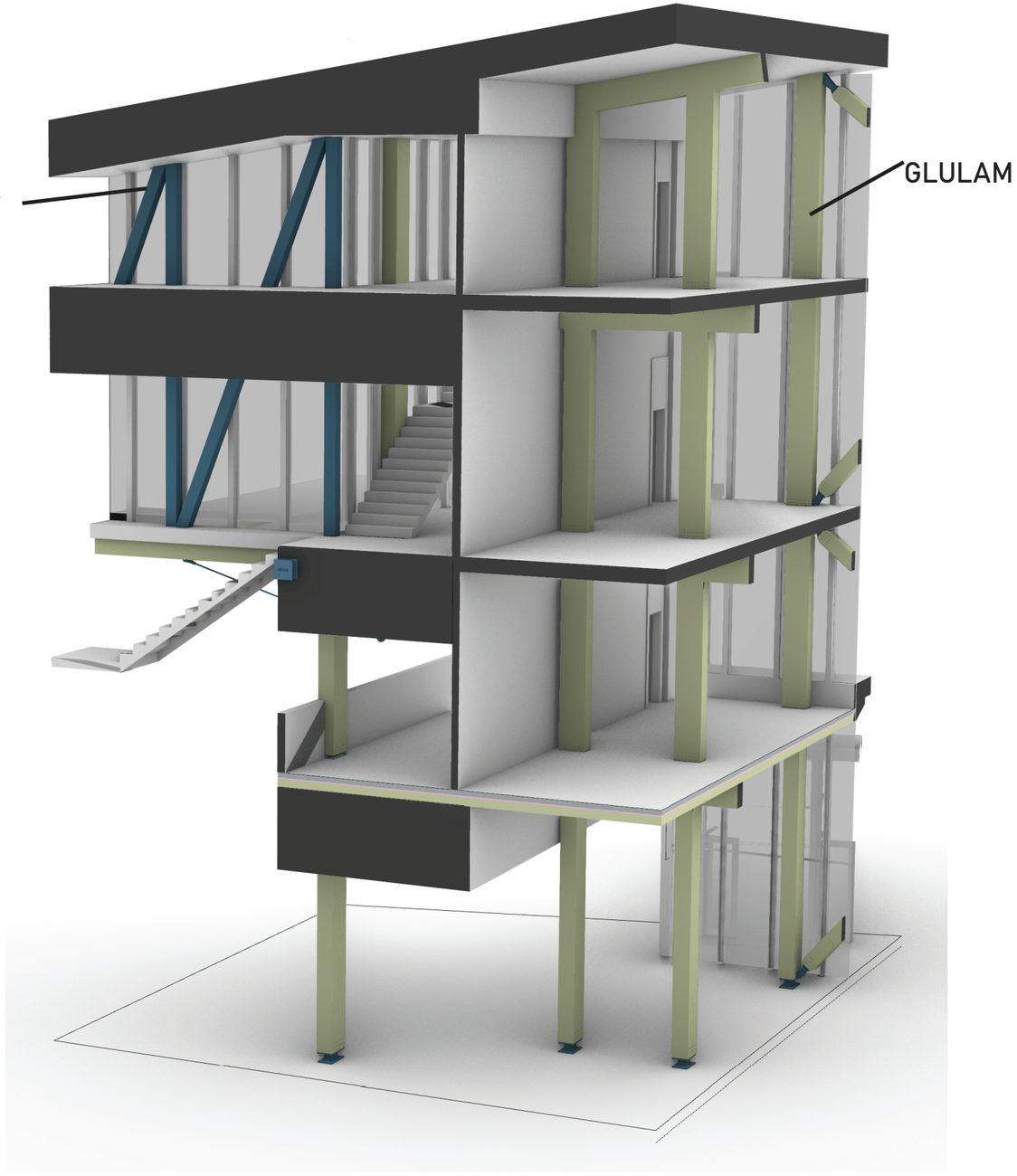


STRUCTURE

MAIN STRUCTURAL SYSTEMS:

- GLULAM (GLUED-LAMINATED TIMBER
- WOODEN TOBACCO BARN STRUCTURE (TO HOLD THE FACADE)
- ZIPPER TRUSS
- STEEL TRUSS





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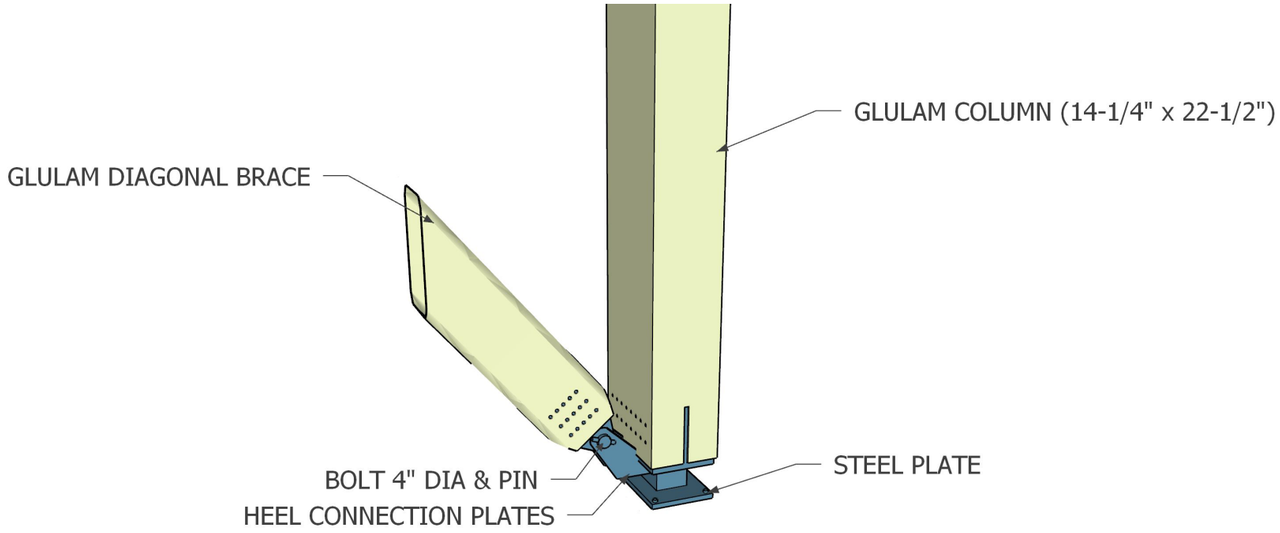
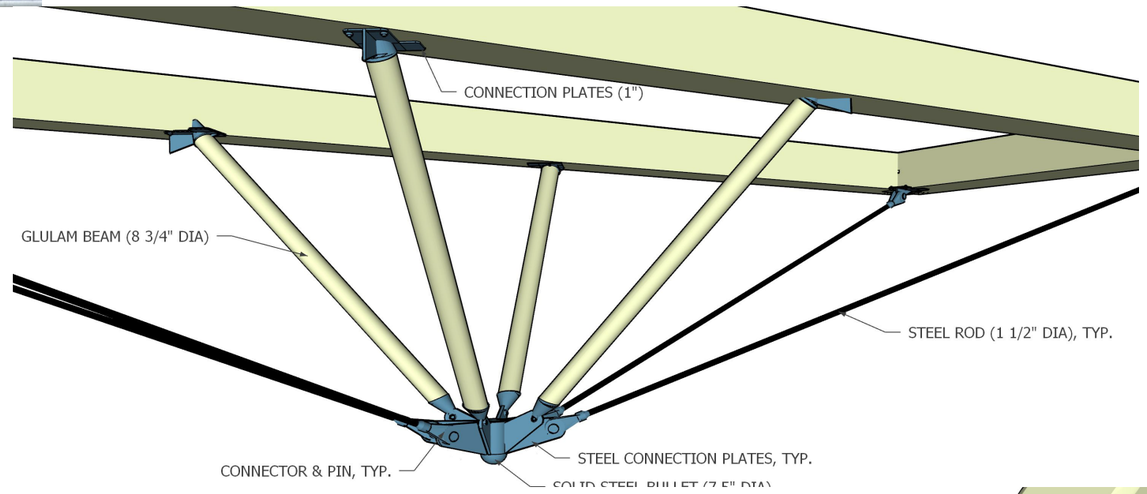
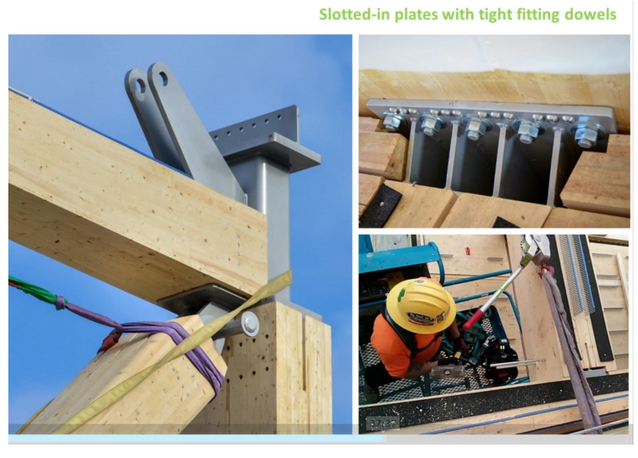
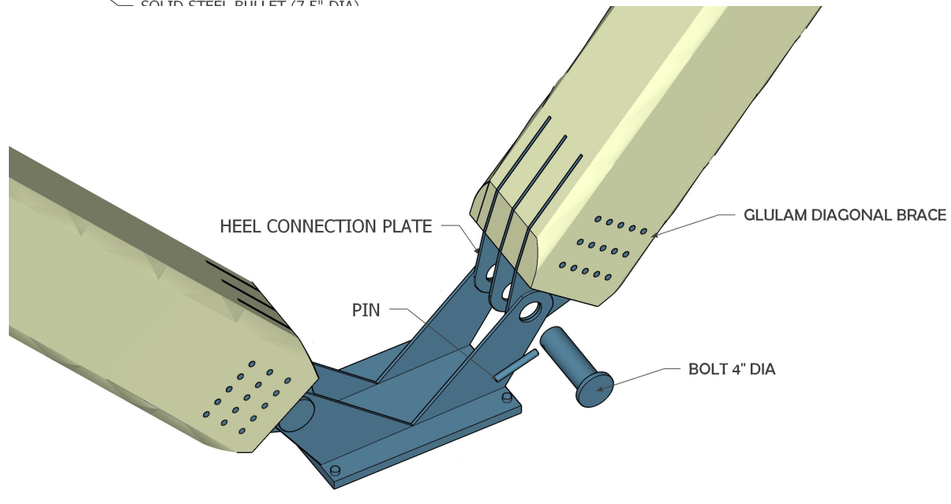


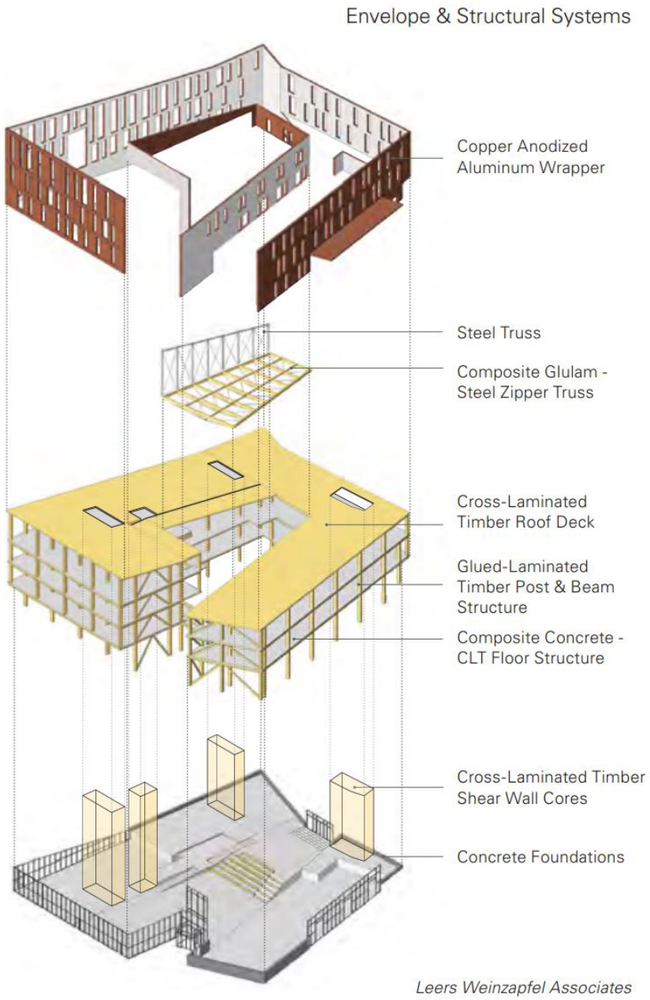


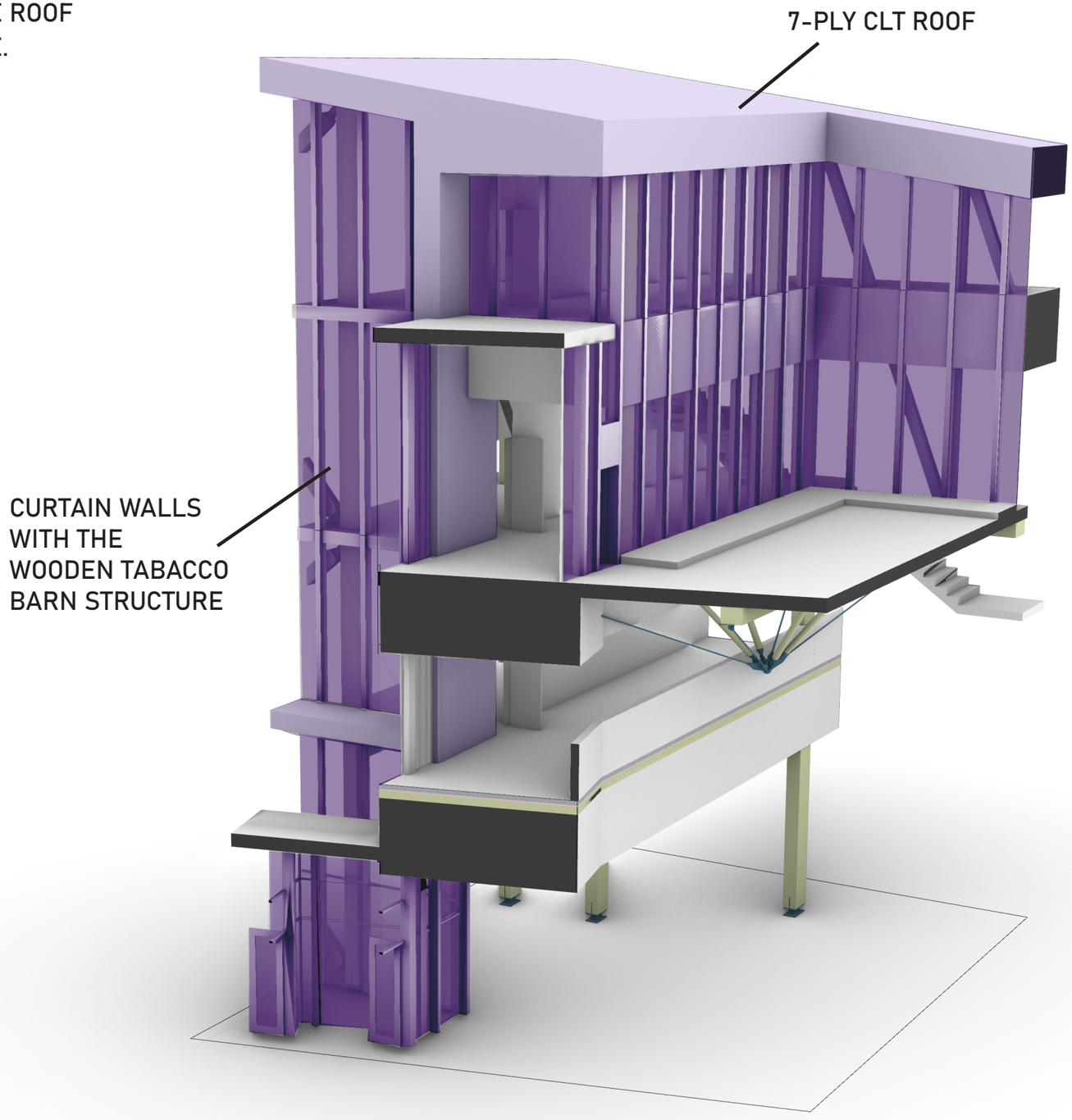




ENCLOSURE

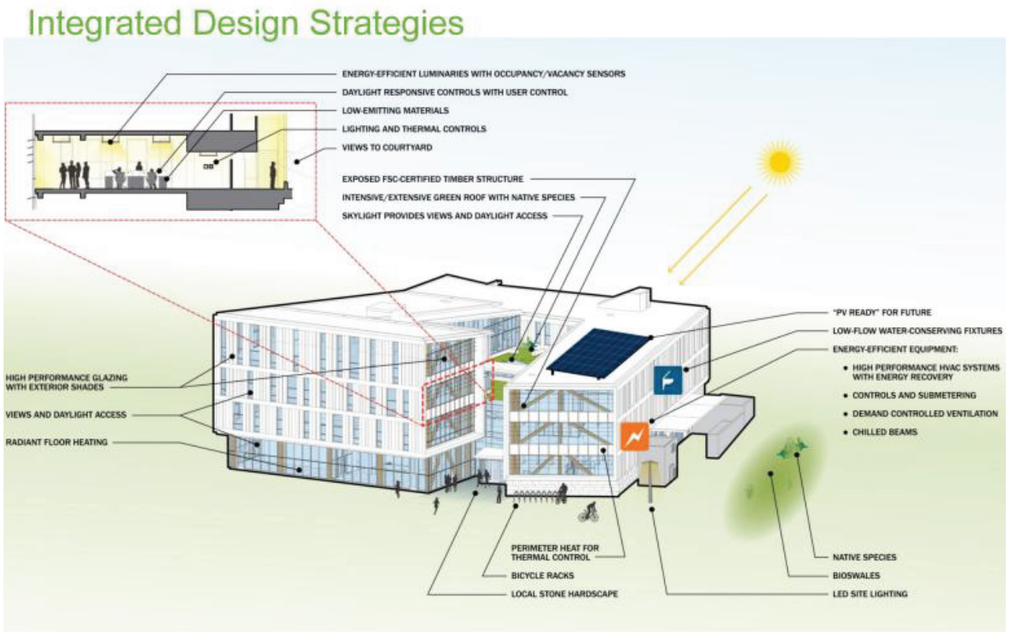
THE MAIN ENCLOSURE OF THE BUILDING IS MADE OF CURTAIN WALLS. IN THE UMASS DESIGN CENTER THERE IS A STRUCTURAL SYSTEM, CALLED THE WOODEN TABACCO BARN STRUCTURE ALONG WITH THE ROOF PLANE THAT HELPS HOLD UP THE REST OF THE STRUCTURE.

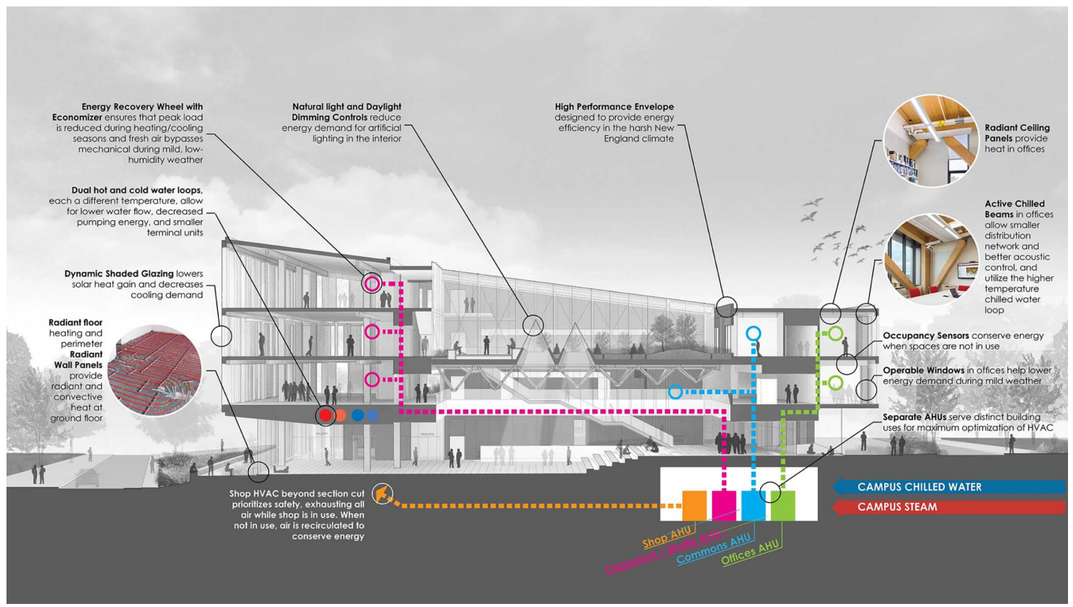


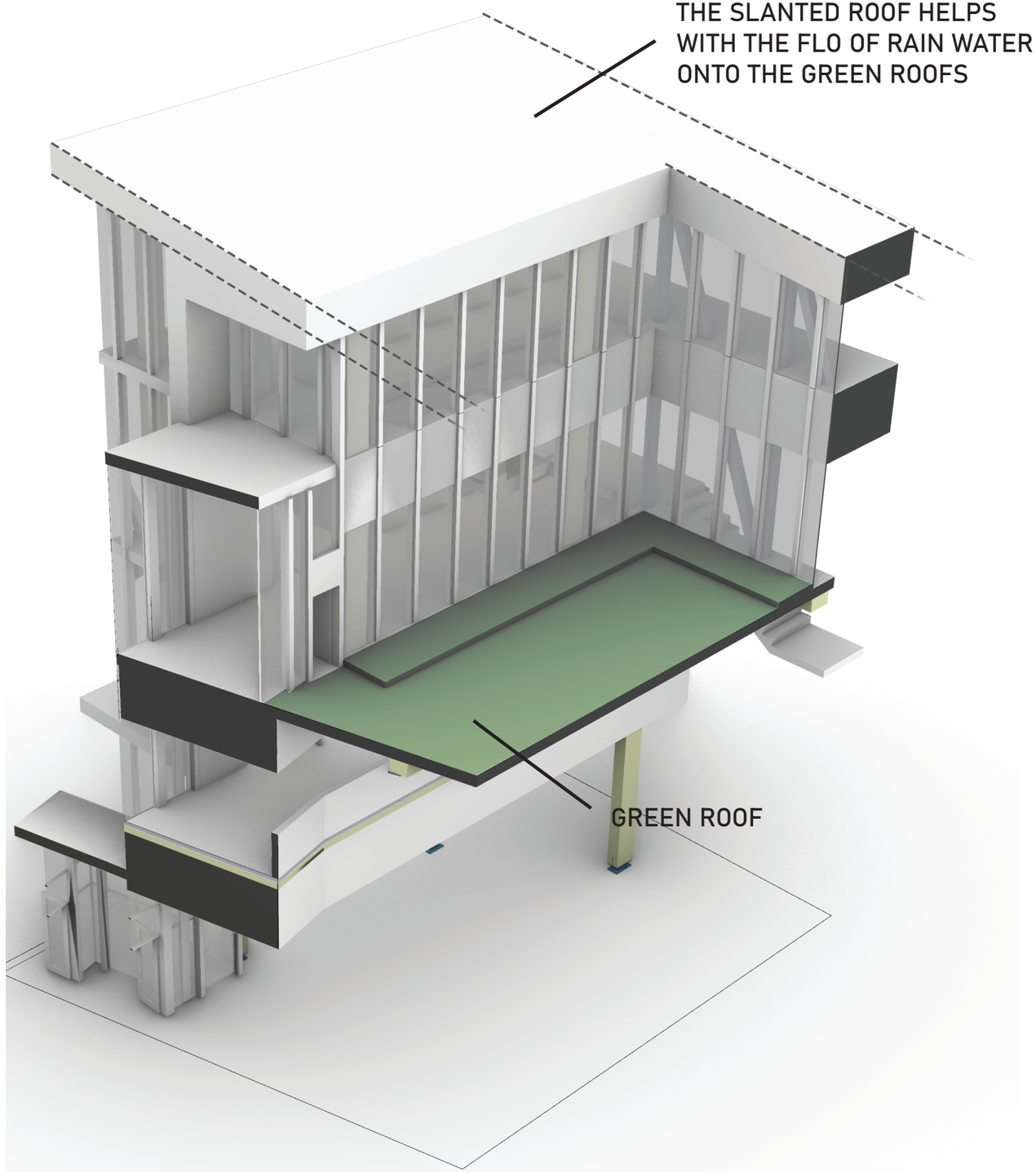


ENVIRONMENTAL CONTROL SYSTEMS

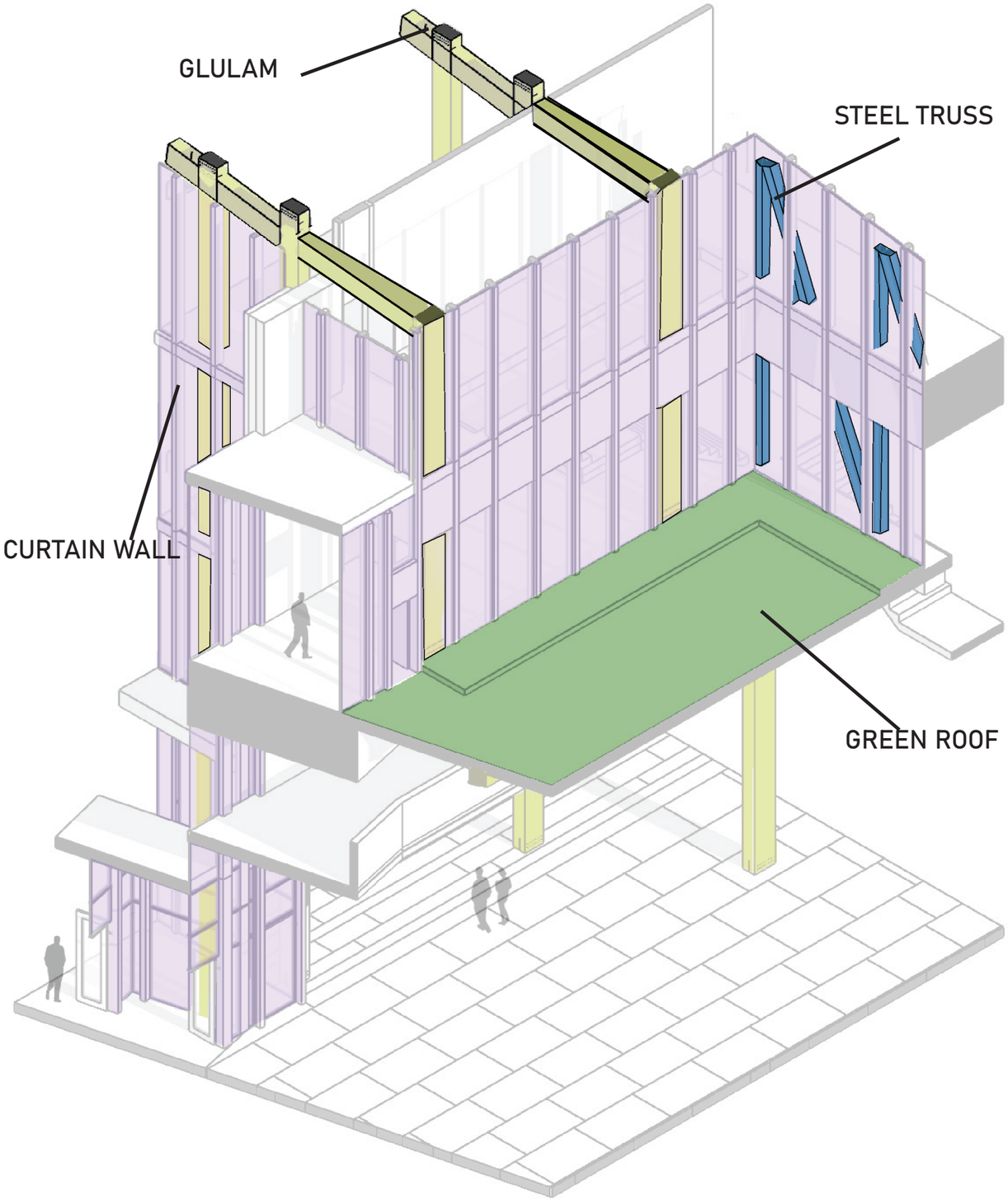
THE SUSTAINABILITY FEATURES ARE: LED LIGHTING, MOTION SENSORS, AMPLE DAYLIGHTING, ELECTRO-TINTING GLASS, HEAT RECOVERY, ROOF GARDENS, BIOSWALES, RAIN GUARDENS, LOW FLOW FAUCETS, PUBLIC TRANSPORTATION ACCESS, ALONG WITH THE WOOD STRUCTURE.

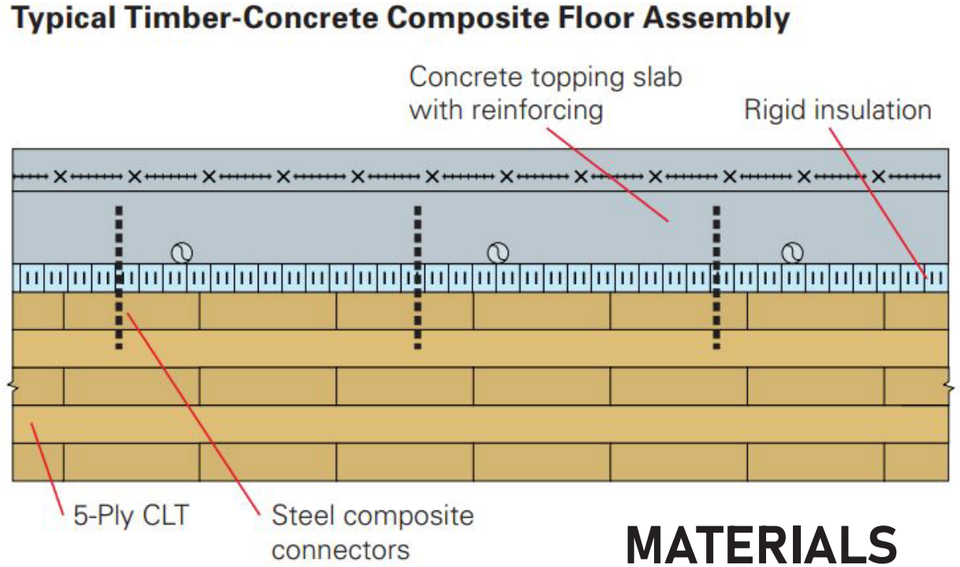




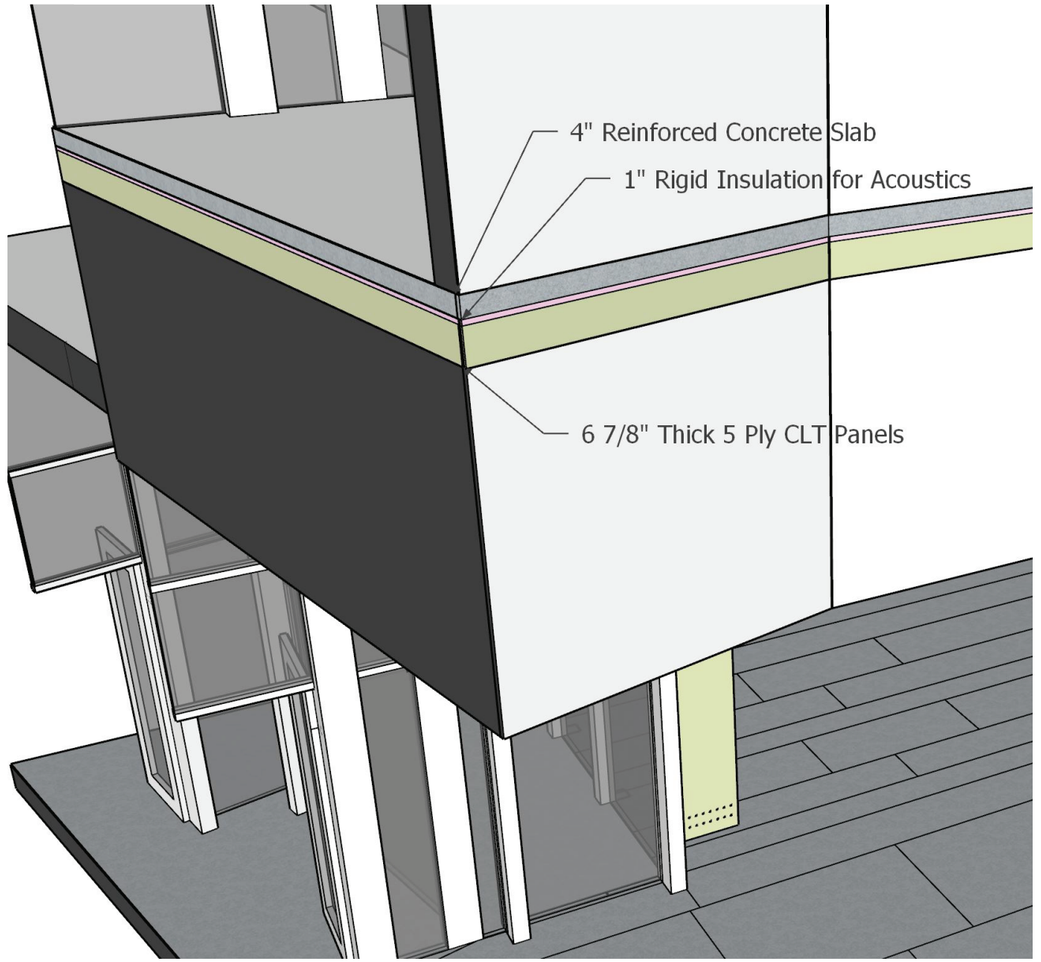


HOW EVERYTHING WORKS TOGETHER

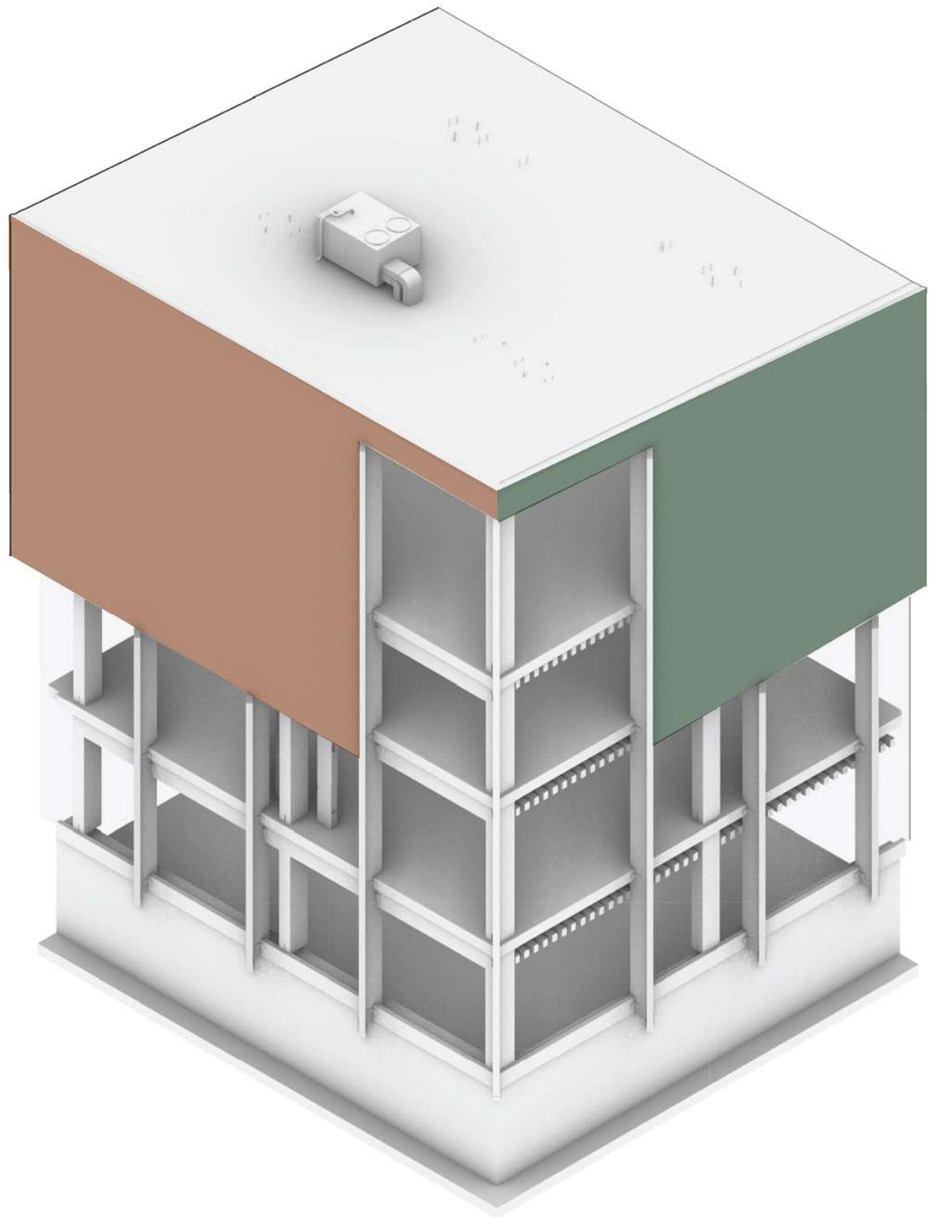




MATERIALS



PHASE 3
PROTOTYPE



MANIFESTO

CONCEPT

With the site located off the **Concord River** and in close proximity to the **Concord River Greenway Park**, our form begins to connect and interact with its context.

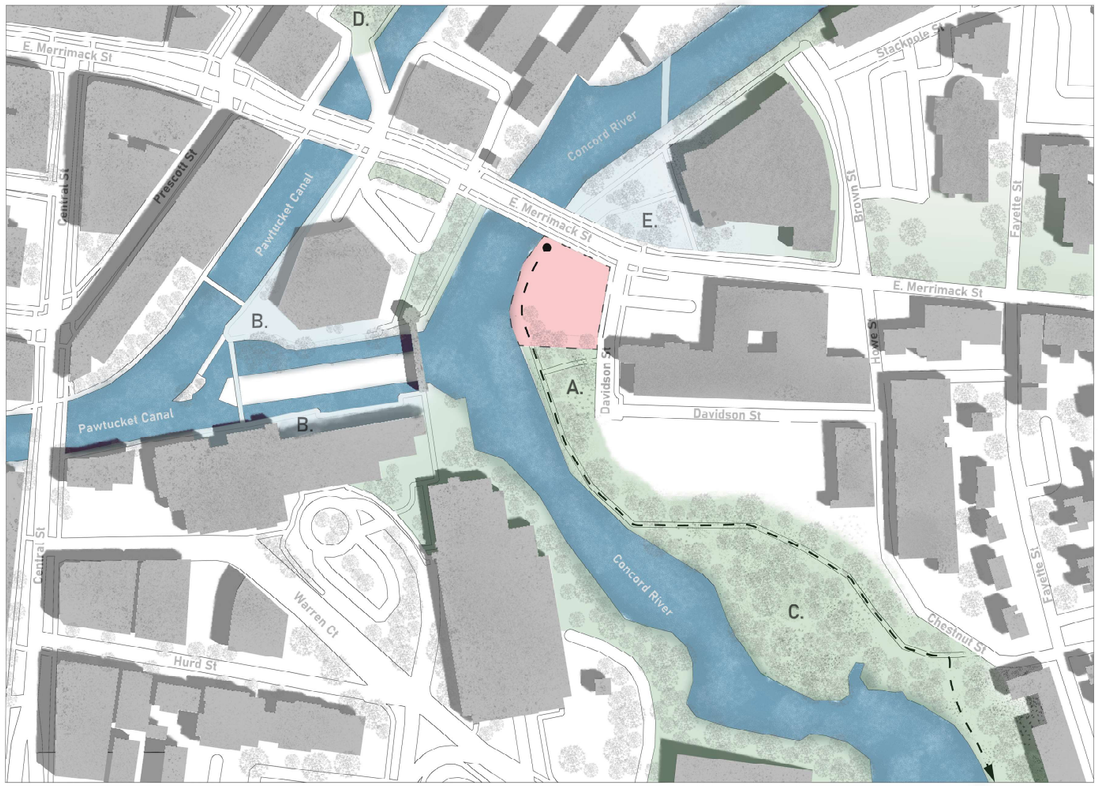
One main volume on the ground floor acts as the main public space- connecting the Lowell community through the act of creating. **The two main upper forms** pivot on this main volume pointing towards the park and river as important cultural nodes. With the use of our **vast spanning structural system**, collaboration spaces become uninterrupted. With our **enclosure**, views out into Lowell framed by large shading devices create a comfortable learning environment.

Structure: The structure is made up of 3 main components: concrete, wood and steel. This hybrid of materials enables our structure to span far distances without breaking the space where people create and collaborate. The structure is exposed to those who walk by and those who occupy the spaces.

Enclosure: The enclosure was designed with the intent to create a well- lit environment with plenty of views out into the neighboring context, as well as framing/accentuating the structure to those who occupy. Angled mullions act as a shading device along with the tinted glass that captures bright glares creating a comfortable environment to design in. Copper panels allow for privacy, while also supporting views to the outside through specific punctured apertures (will be a future exploration).

Passive/Active Systems: Along with passive design elements to create comfort through shading devices, the maker space uses a VAV system, windows that open to passively ventilated spaces, and a radiant floor so that the main heating system is used primarily for cooling, cutting costs. The Roof is angled so there is an easy flow for the rainwater to fall off the roof. The dual VAV HVAC system has two main ducts that go throughout the building bringing cool and hot air in and out with a thermostat to increase comfort.

Parks and Outdoor Spaces



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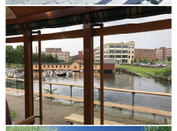

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E. Lowell Memorial Auditorium Greenspace

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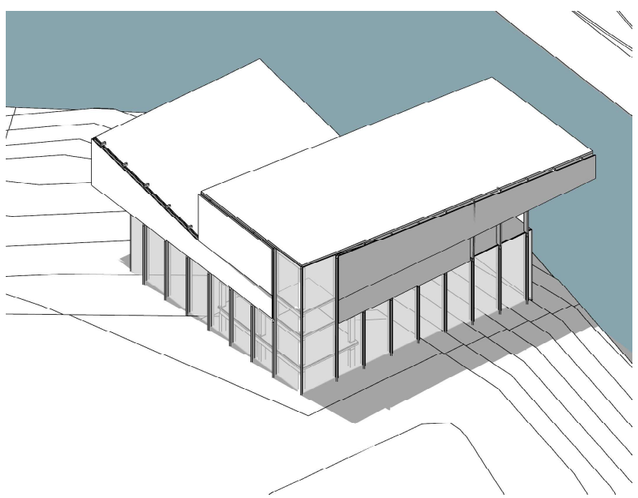
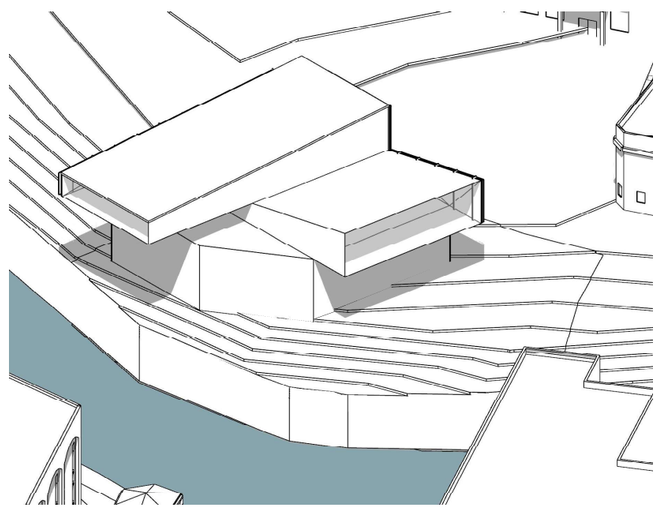
- Plaza & Multipurpose
- Park & Green Space
- Concord River/ Canal
- Concord River Greenway





PRECEDENT STUDY | UMass Amherst Design Center by Leers Weinzapfel Associates

Quick Facts About the Precedent:
CLIENT: University of Massachusetts (Umass)
LOCATION: Amherst, Massachusetts [551 N. Pleasant St. in Amherst, MA 01003]
SIZE: 87,500 square feet / four stories
TOTAL COST: $52 million
CONSTRUCTION COST: $36 million
STARTED: August 2015 COMPLETED: January 2017
CONSTRUCTION TYPE: IV (Heavy Timber) 10% steel

Why We Chose This Precedent:
The angle & pointing towards specific moments in its context, glass & views on extrusions, connection between ground and above & a solution to spanning over 80 feet (truss system).

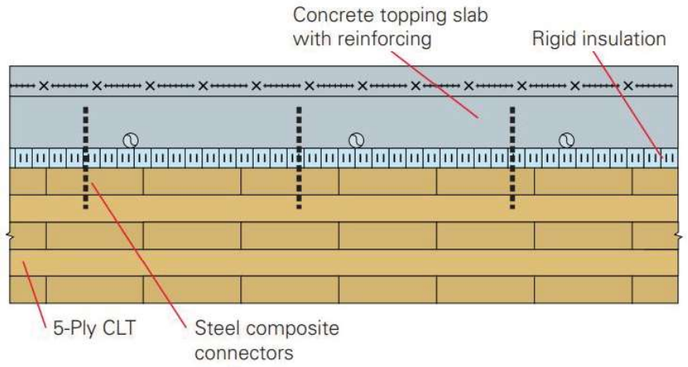
What Was Carried Over to Our Project:
The UMass Amherst Design Center **utilizes a hybrid of concrete, wood, and steel as its structure**: incredibly strong, can span longer distances, with less columns and more open space. Structure is exposed for educational purposes.

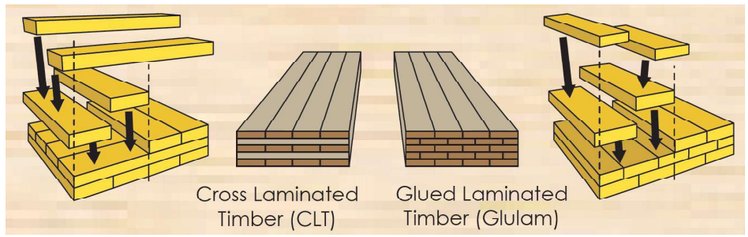
CONCRETE:
Floors & Base Structure: Wood-Concrete Composite; Reinforced Foundation Slab; Spread Footings

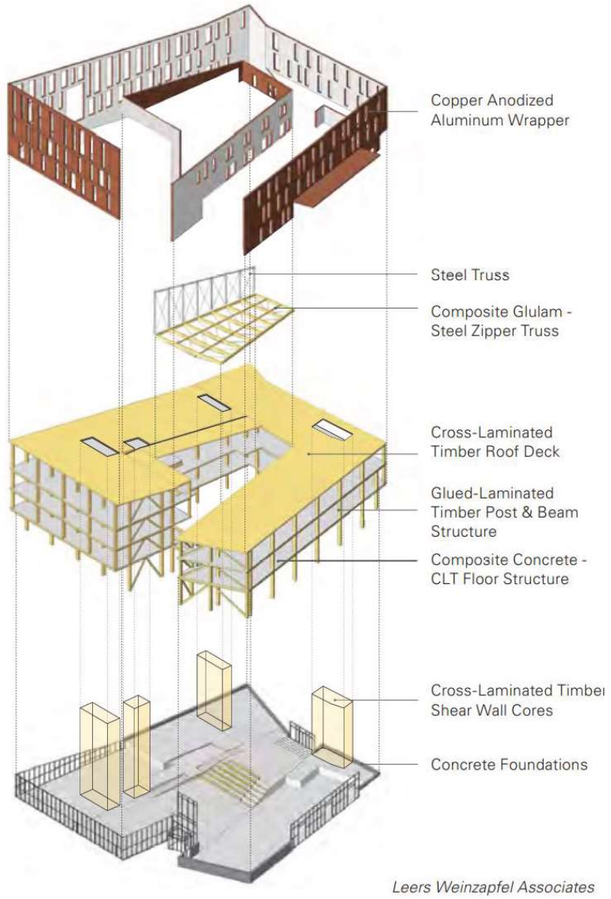
WOOD:
Cross Laminated Timber & Glulam-Glued Laminated Timber: Glulam Beams & Columns; Curtain Wall System (Mullions)

STEEL:
Any Cantilevering Edge; Hardware/Connections

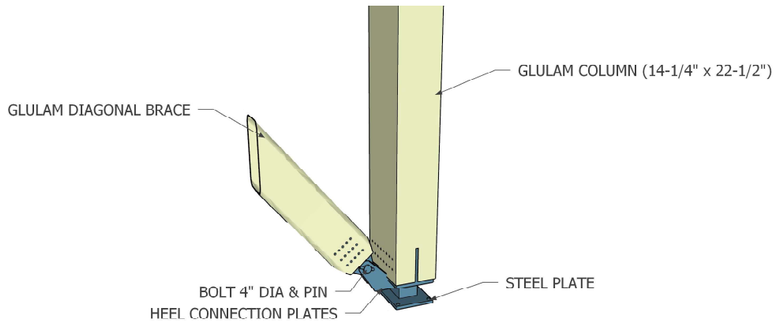
Typical Timber-Concrete Composite Floor Assembly







Leers Weinzapfel Associates



What is the Difference Between CLT & Glulam?

CLT is used for surfaces such as walls, floors, and floor separation.

Glulam is primarily used for the loadbearing frame in a building such as rafters, beams, or columns.

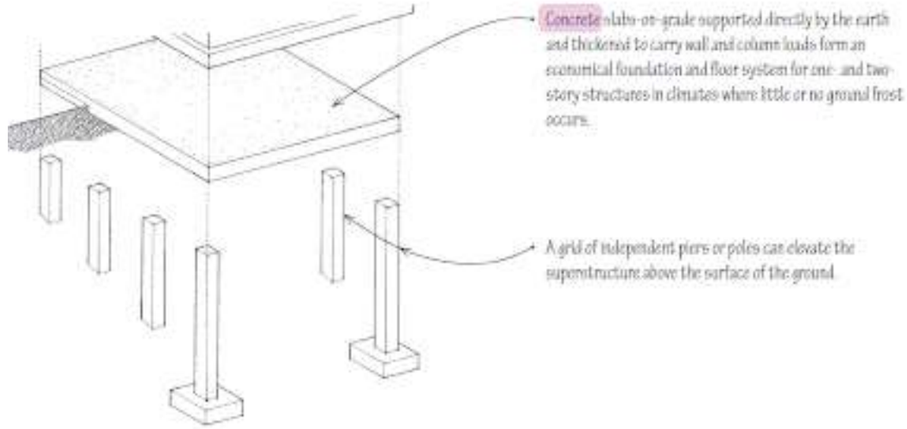
STRUCTURE | CONCRETE

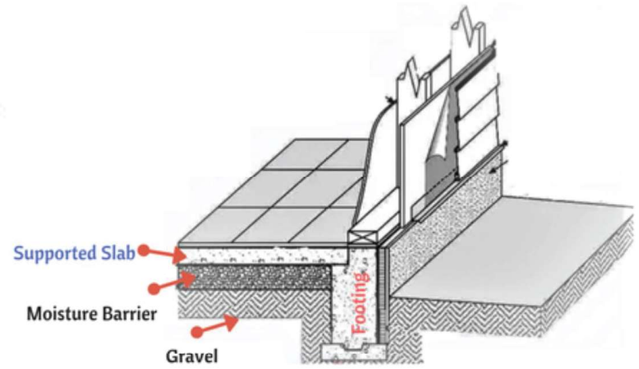
CHOSEN TO USE IN OUR:

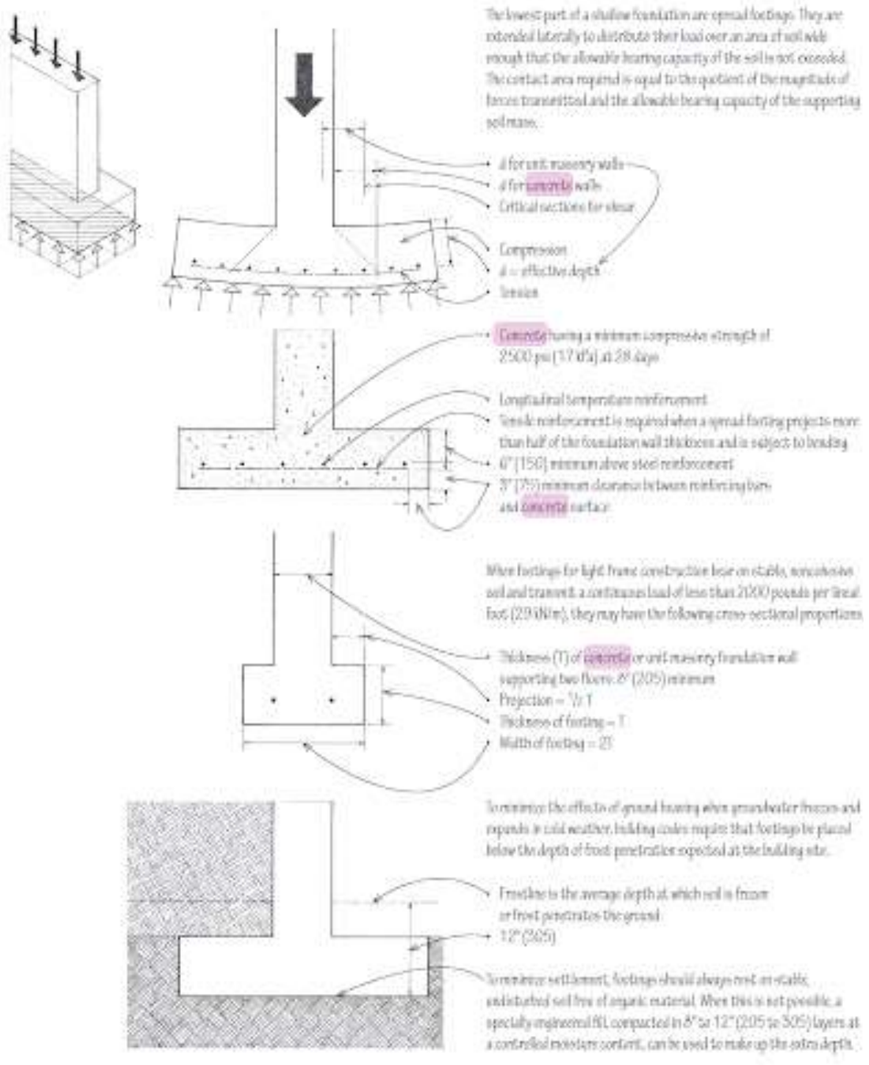
- Floors, (Wood-Concrete Composite)
- Reinforced Foundation Slab w/ Spread Footings.

REASONING:

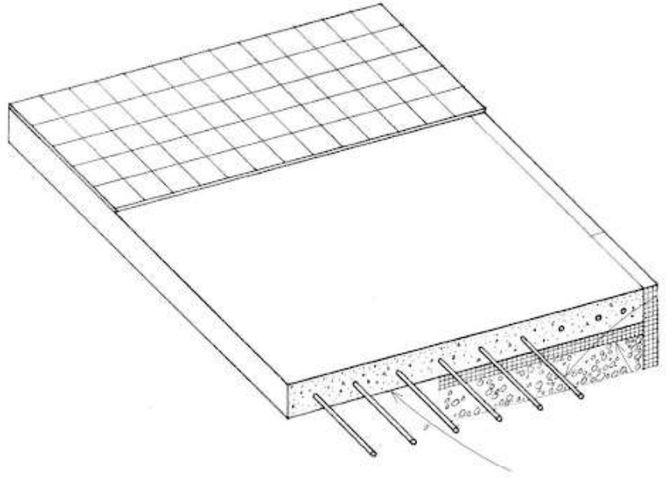
As a Plate Structure: Plate structures are rigid, planar, usually monolithic structures that disperse applied loads in a multidirectional pattern, with the loads generally following the shortest and stiffest routes to the supports. A common example of a plate structure is a reinforced concrete slab. It acts as a flat, deep beam that transfers lateral loads to the footings then to the ground. With a timber and steel combo, concrete is able to fill in the gaps to create a strong continuous plane/ connection from column/post to foundation.

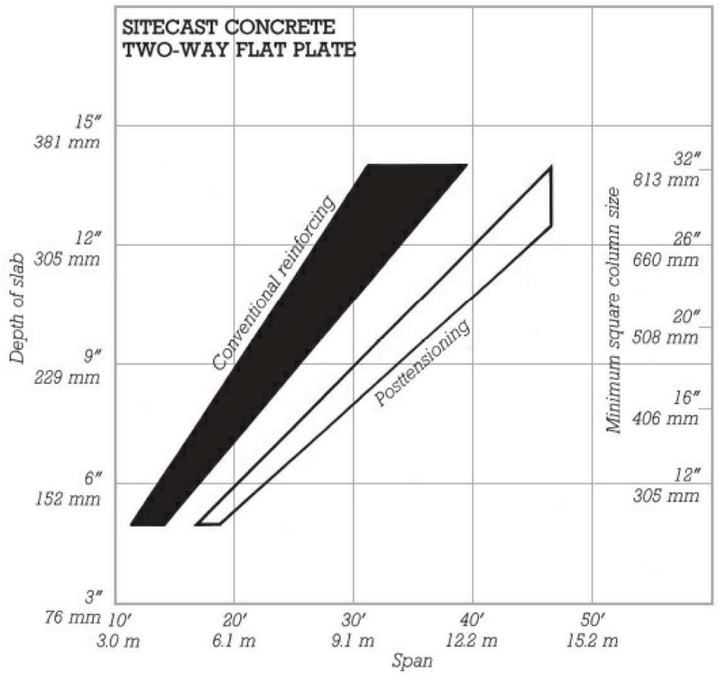






^ UMass Design Building Composite Flooring





COLUMN SIZES FOR FLAT PLATE CONSTRUCTION

The shallow depth of the junction between the slab and the column in flat plate construction restricts the minimum column size in this system. The right-hand scale on the chart above provides minimum square column sizes for various slab thicknesses. The required minimum column sizes for this system also depend on the applied loads on the structure. For light loads, reduce the indicated column size by 2 in. (50 mm). For heavy loads, increase the column size by 2 to 4 in. (50 to 100 mm).

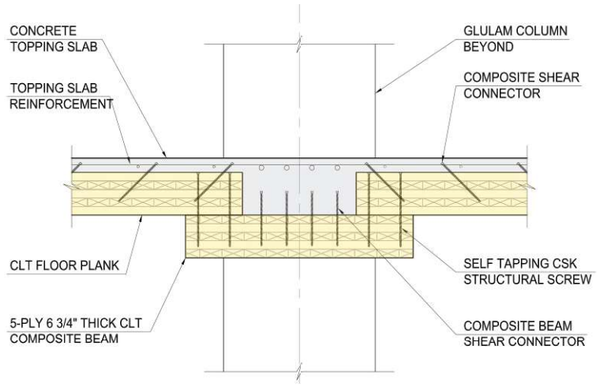
STRUCTURE RESEARCH | WOOD

CHOSEN TO USE IN OUR:

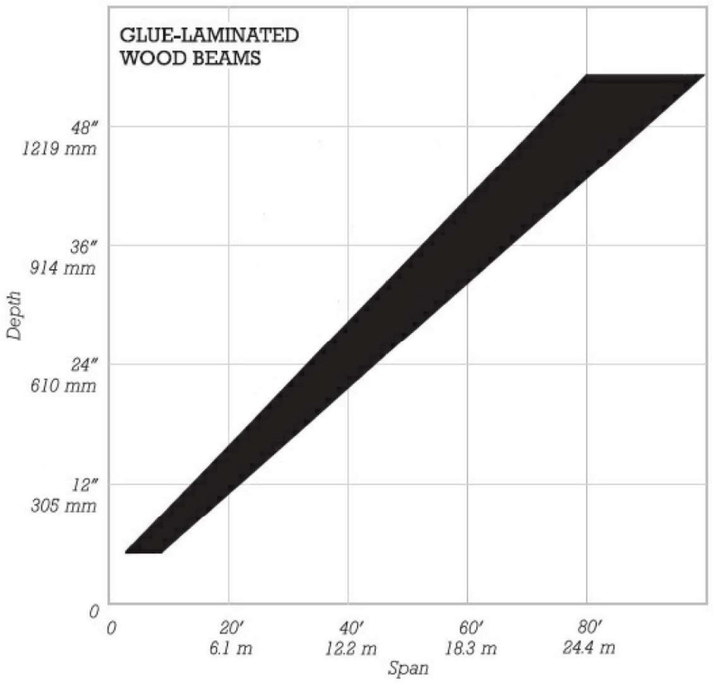
- Glulam Beams and Columns (Glued-Laminated Timber)
- Truss Design
- Curtain Wall System

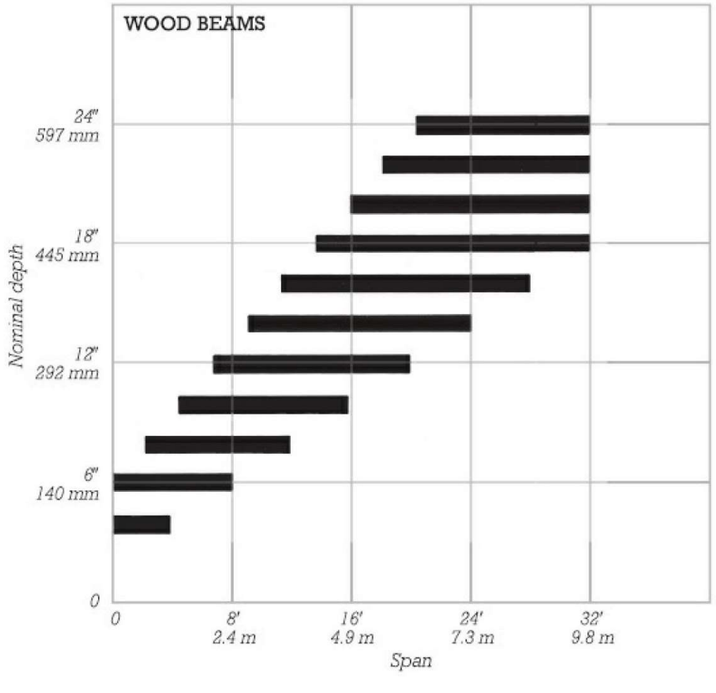
REASONING:

In general, working with wood saves energy, cuts build/ installation time, is naturally resistant to heat, helps the environment by trapping CO2 with little waste. Wooden trusses have built- in openings that could provide space for exposed HVAC & other mech. systems; they can span a much larger distance than standard beams giving us the ability to design open spaces for more collaboration between spaces; wood as a denser material, acts as an insulator while steel does not; incredibly versitile in terms of shape as well as aesthetics; and is sound absorbant- important for the acoustics in a loud environment (workshops, public spaces, etc.).



^ MX_SI's addition to the Serlachius Museum Gösta (Facade)





^ Oregon State University College of Forestry (OSU Forest Science Complex)

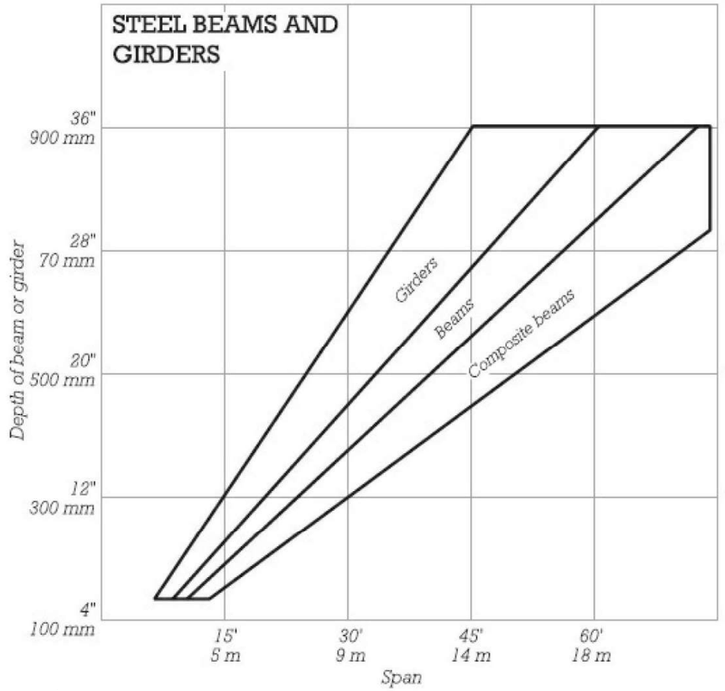
STRUCTURE RESEARCH | STEEL

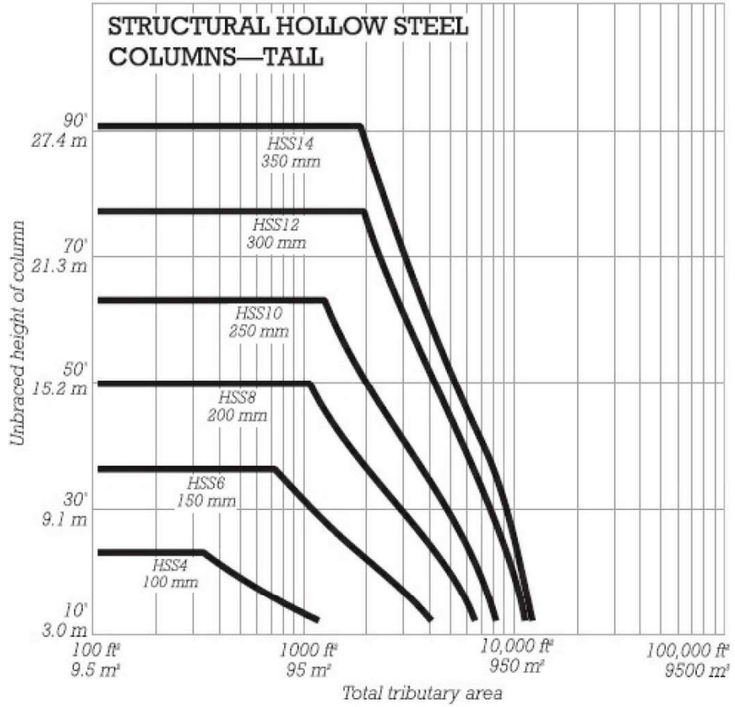
CHOSEN TO USE IN OUR:

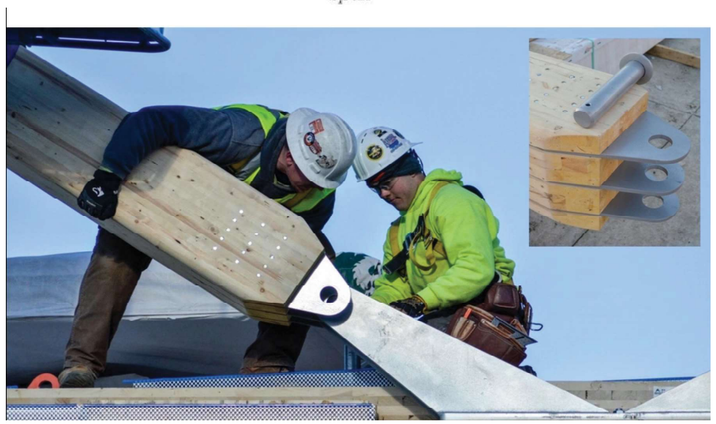
- Used With Any Major Cantilevering Edge
- Used as Hardware, Pieces that Connect Columns, Concrete, and Beams
- Used inside of Glulam Beams & Columns

REASONING:

Steel can be used as a strong cantilever. Using steel as hardware & connector pieces meant for high strength as it is great in tension and compression as is wood (with the grain).







< Umass Design Building - Construction Steel Arm

^ Fay Jones School of Architecture and Design

< House In Sèvres- Colboc Franzen & Associés

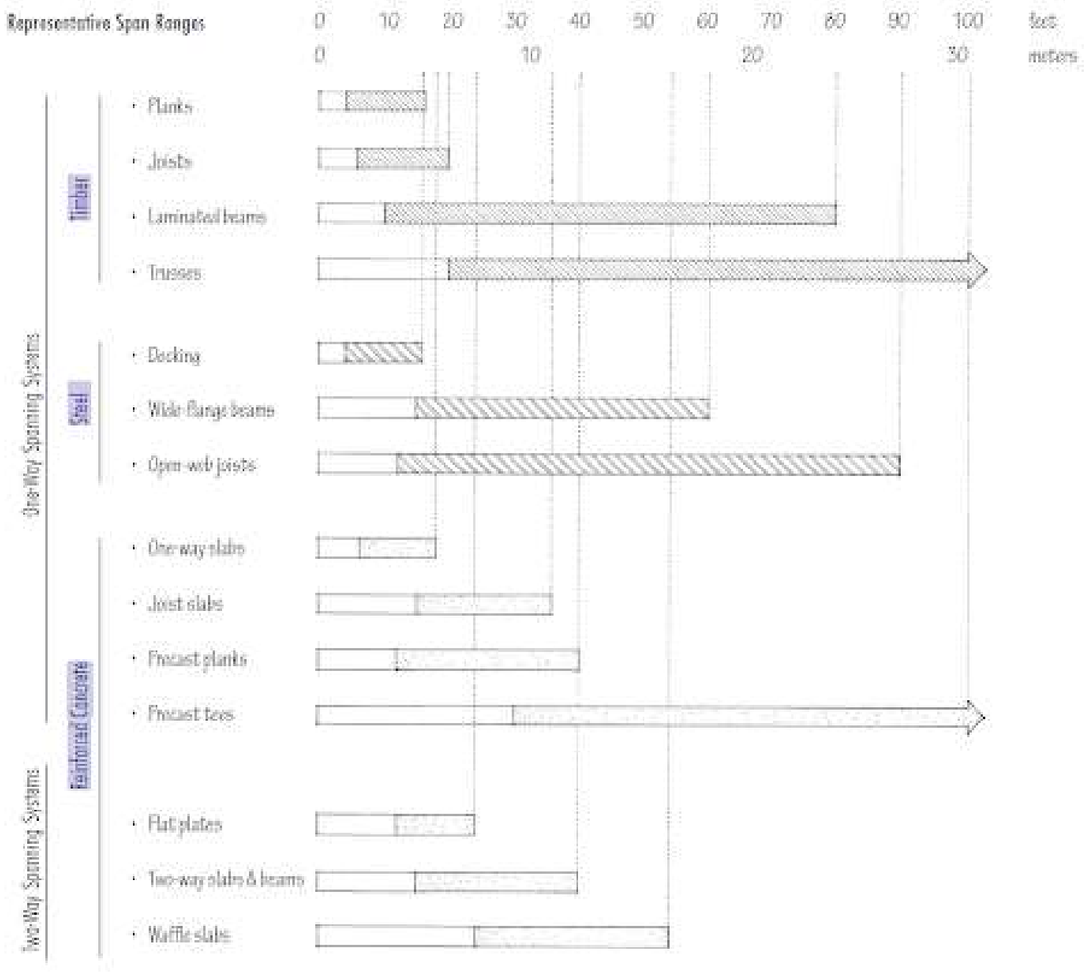
STRUCTURE RESEARCH | HYBRID: CONCRETE, WOOD, STEEL

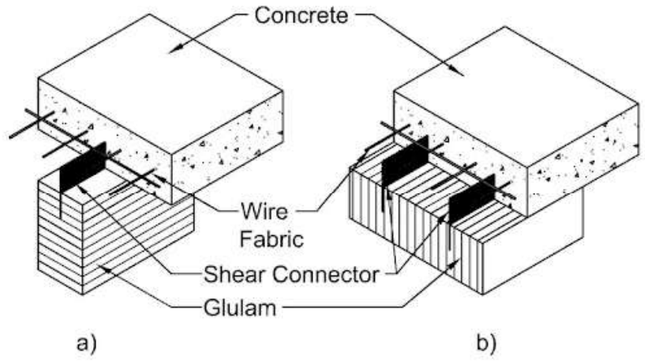
CHOSEN TO USE IN OUR:

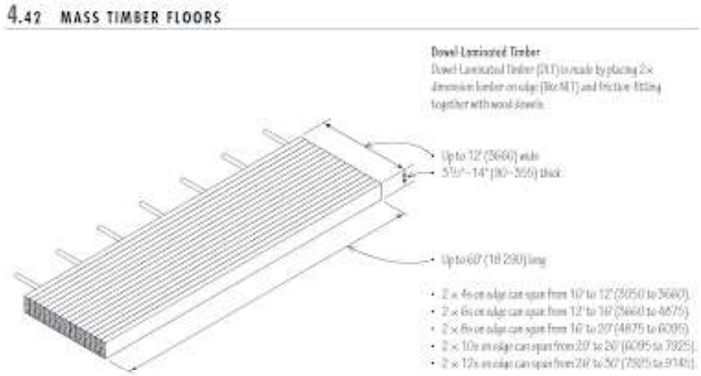
- Wood-Concrete Composite Flooring
- Glulam/Steel Columns & Beams
- Some Sort of Truss (like the Zipper Truss)

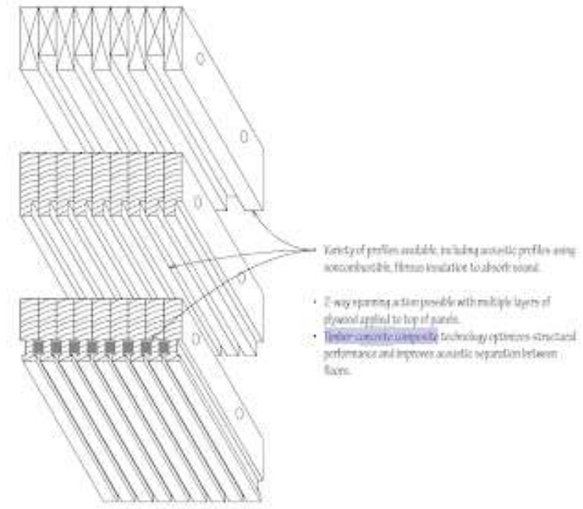
REASONING:

Incredibly strong, and can span longer distances, less columns & more open space!

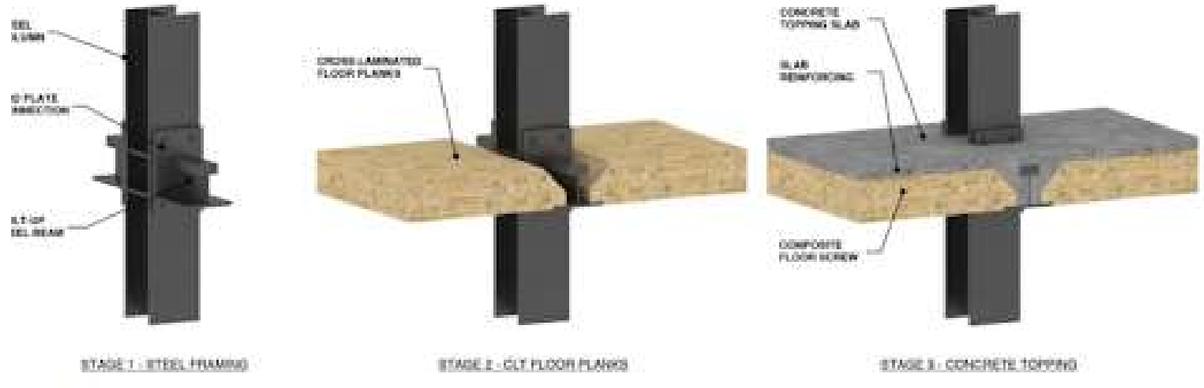








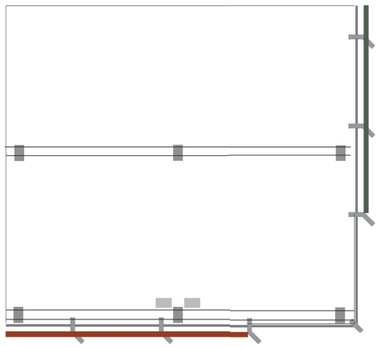
posite mass-timber floor system with steel structure

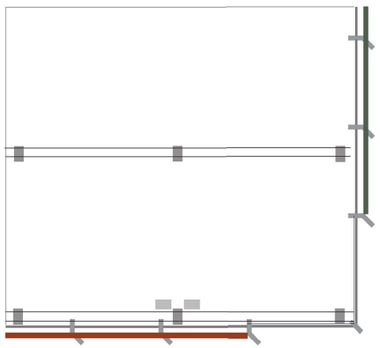


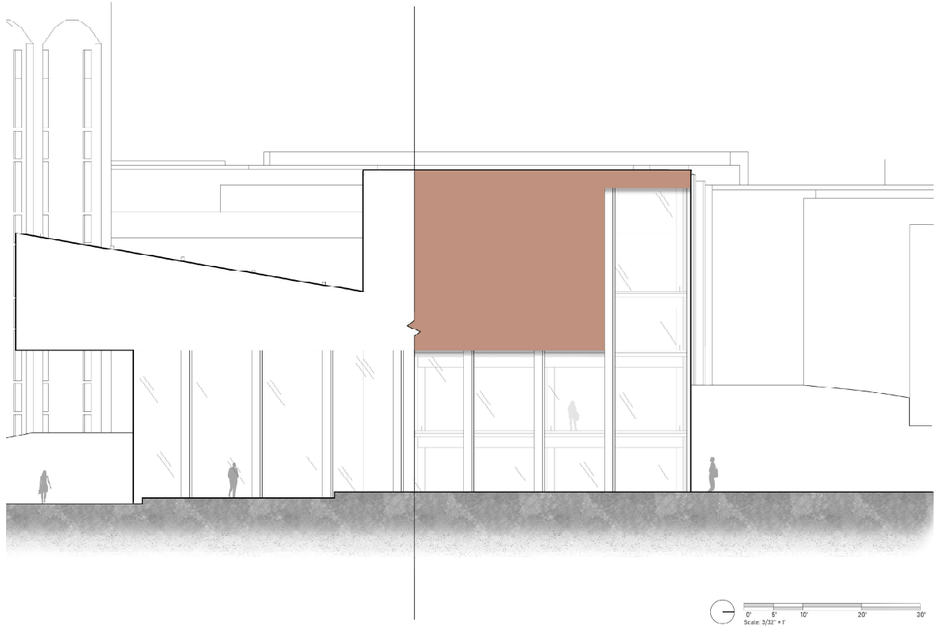
...rtesy Benton Johnson / SOM

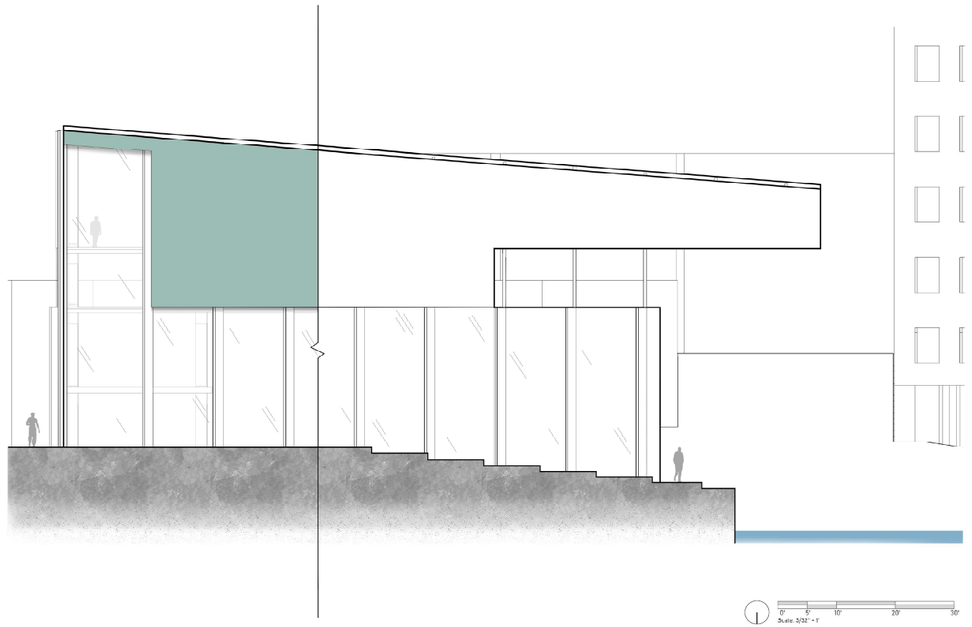
Floor to column and beam connection

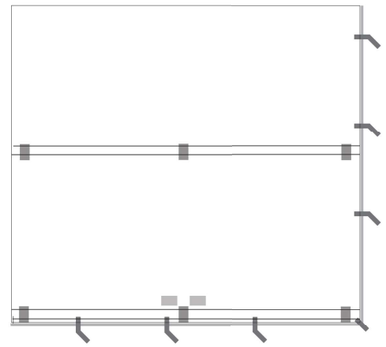
PLANS, ELEVATIONS, SECTIONS

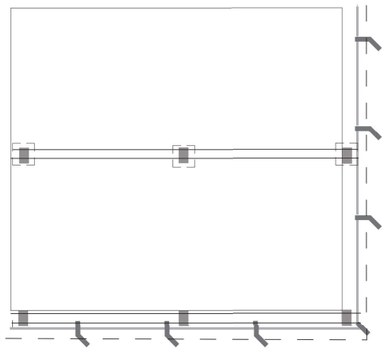


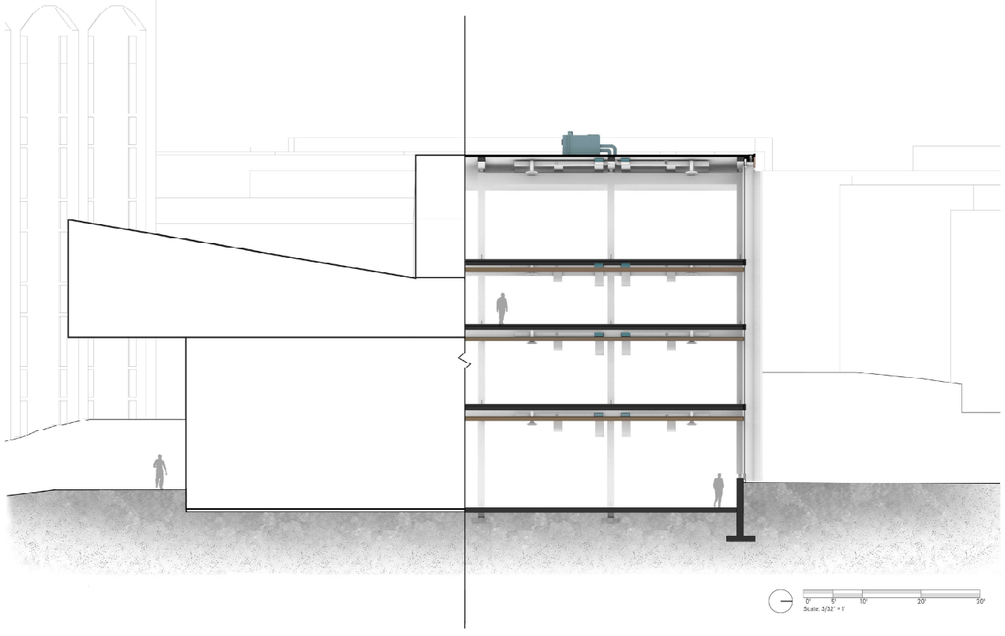


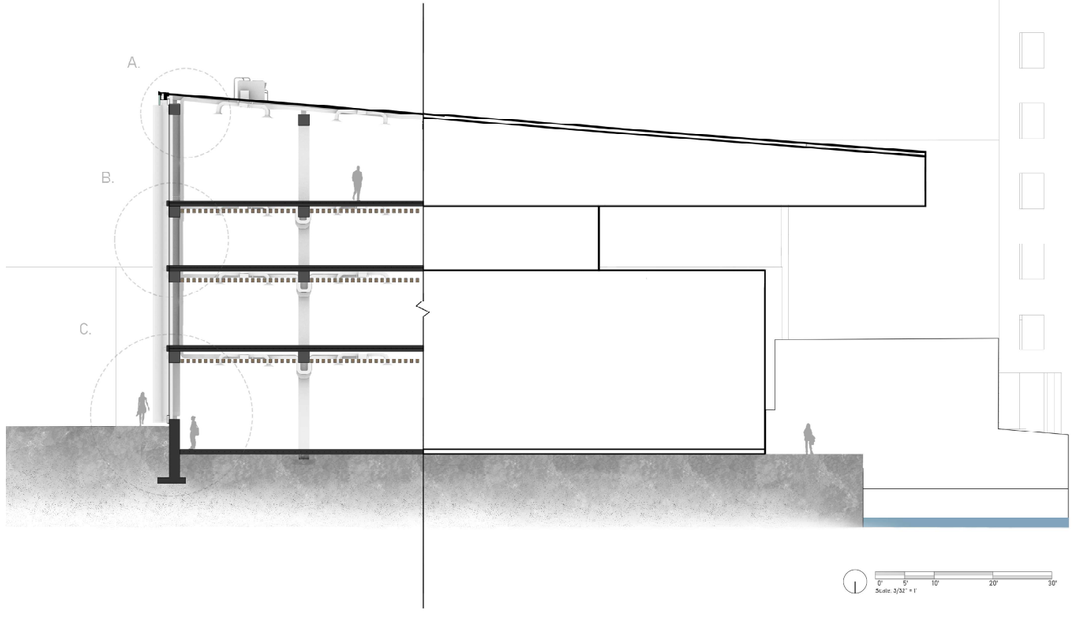




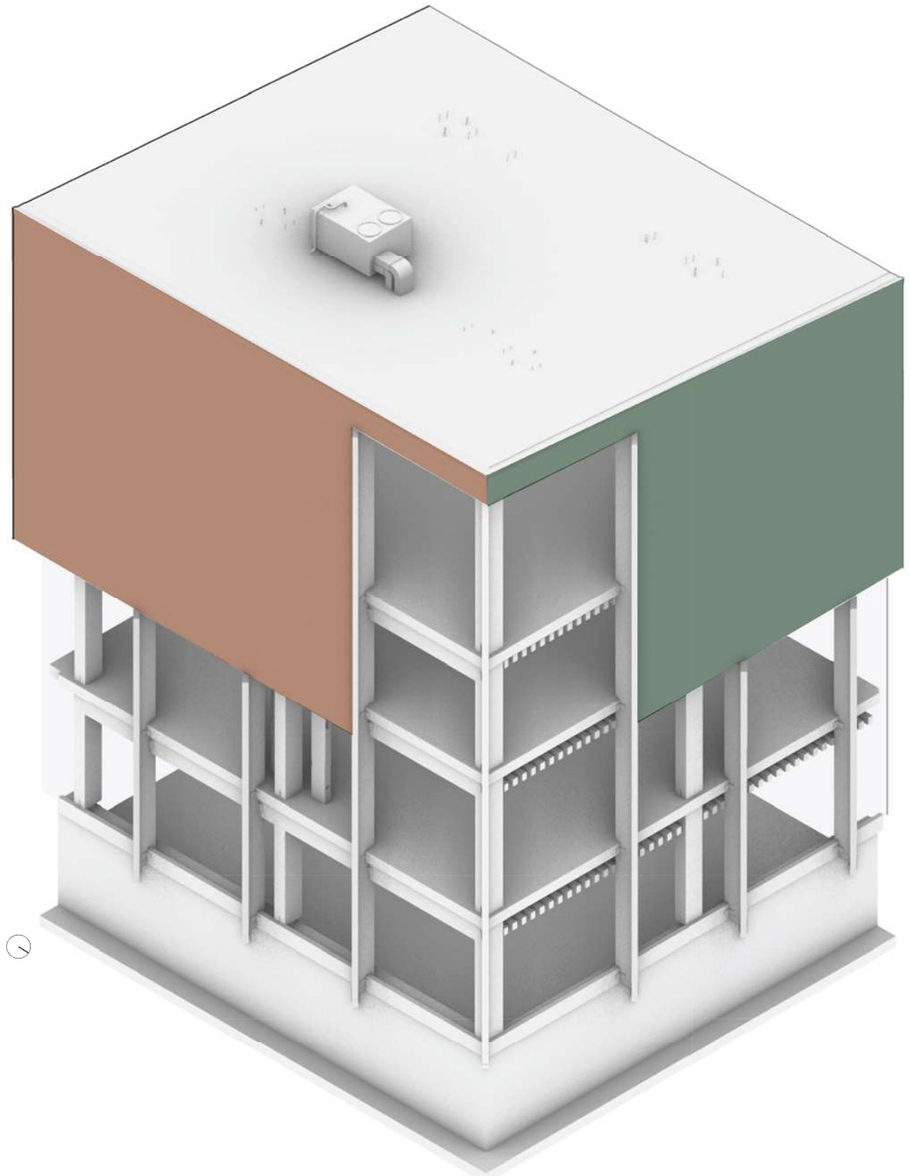


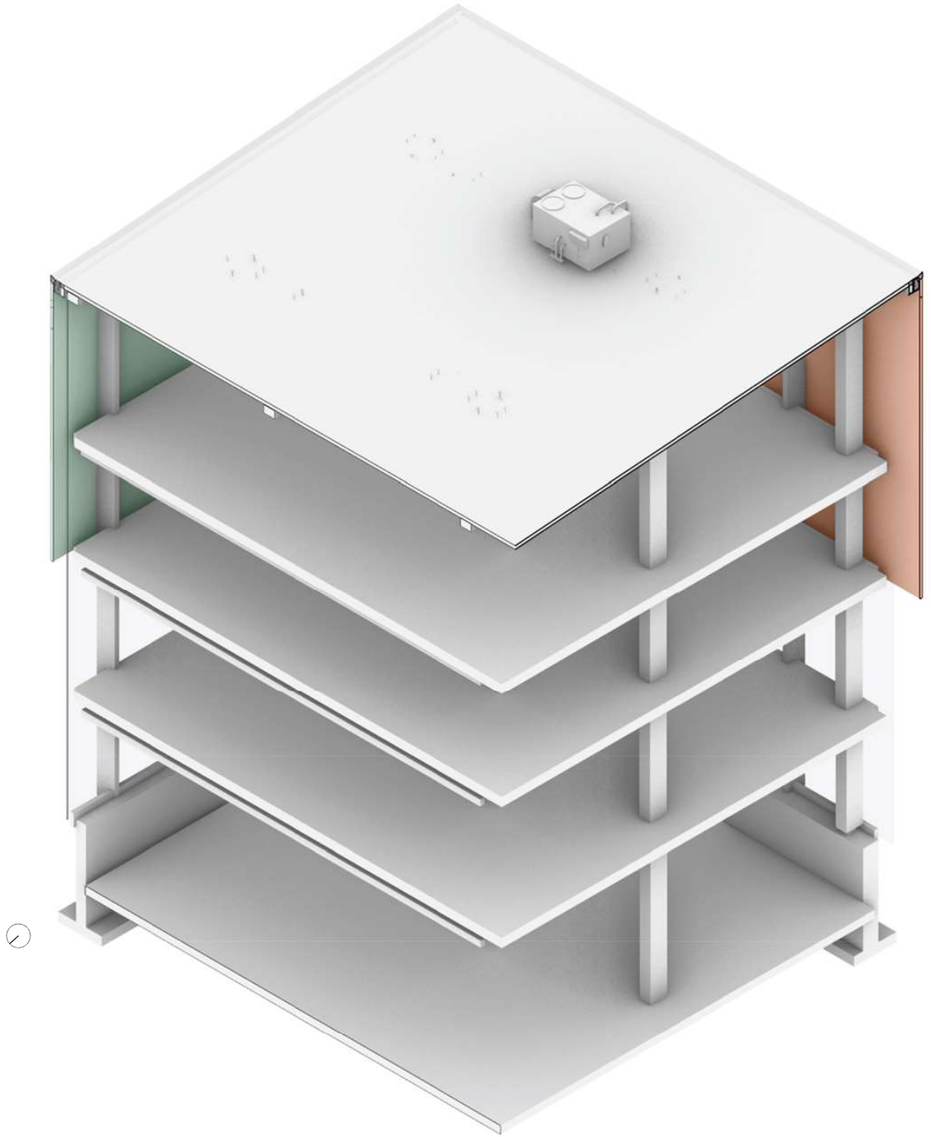






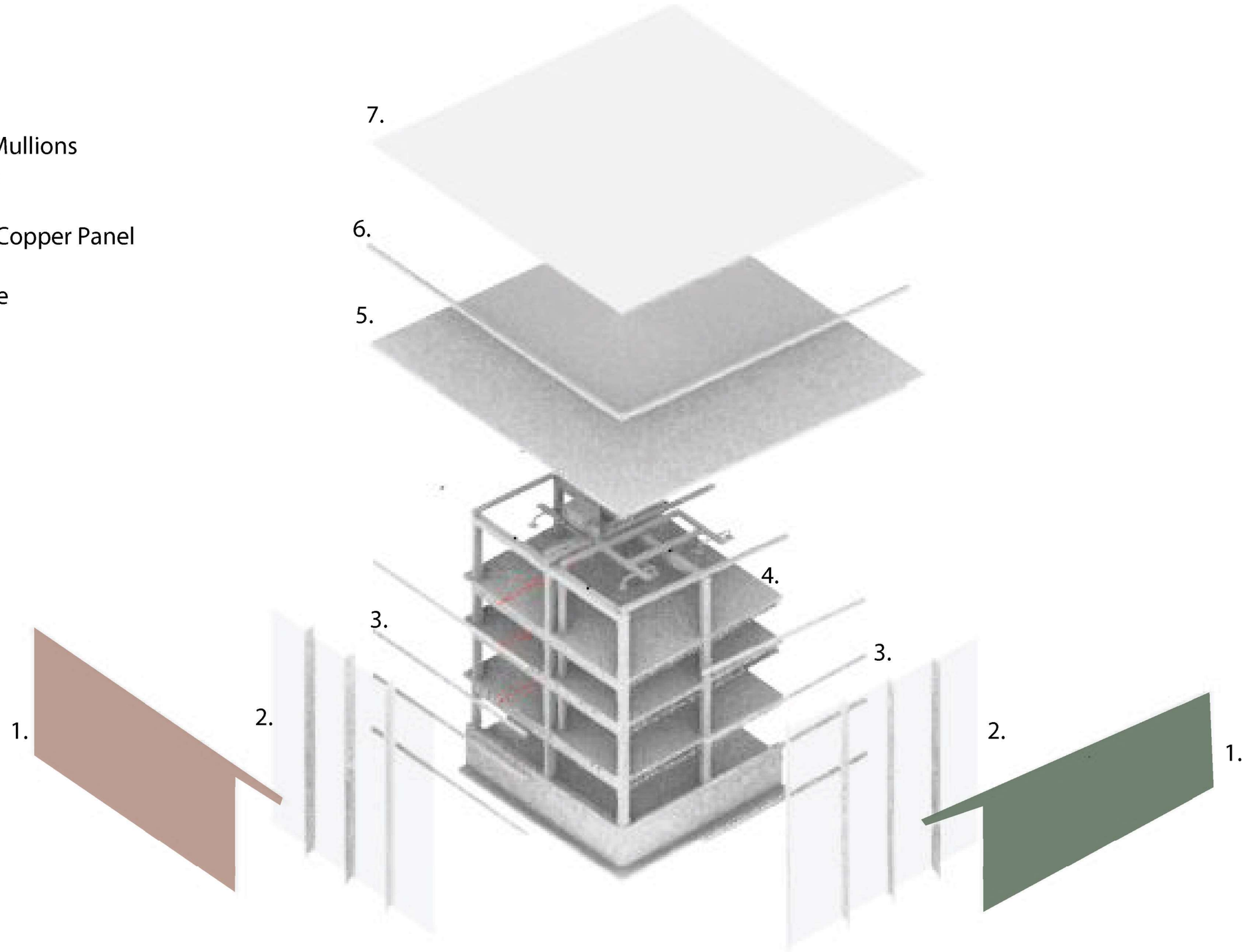
DIGITAL MODEL | Overview Axons



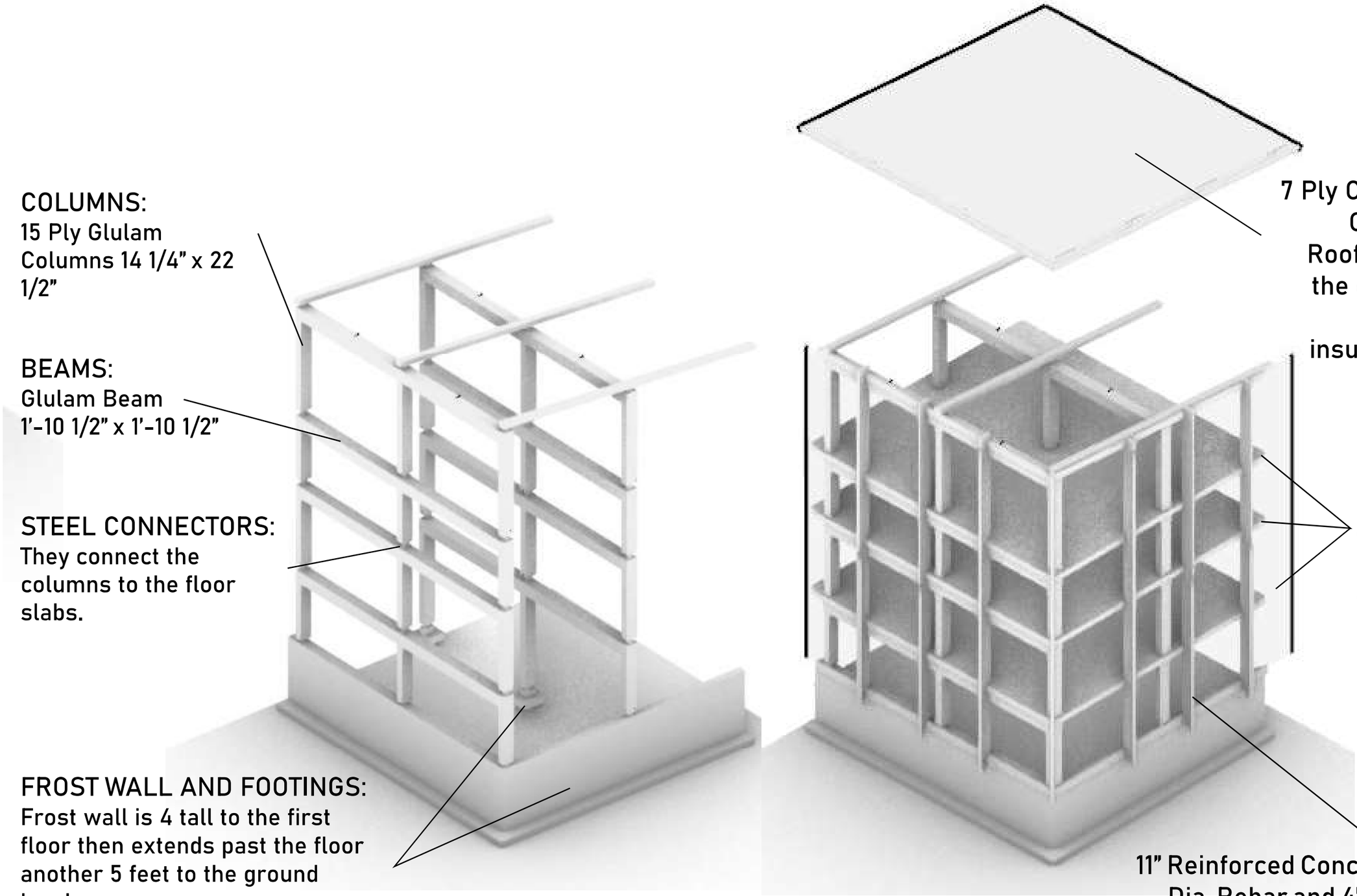


EXPLODED AXON

KEY:
1. Copper Panels
2. Windows and Mullions
3. Window Frame
4. Main Structure
5. Insulation and Copper Panel
6. Roof Siding
7. Roof Membrane



SYSTEM | Structure



COLUMNS:
15 Ply Glulam
Columns 14 1/4" x 22 1/2"

BEAMS:
Glulam Beam
1'-10 1/2" x 1'-10 1/2"

STEEL CONNECTORS:
They connect the columns to the floor slabs.

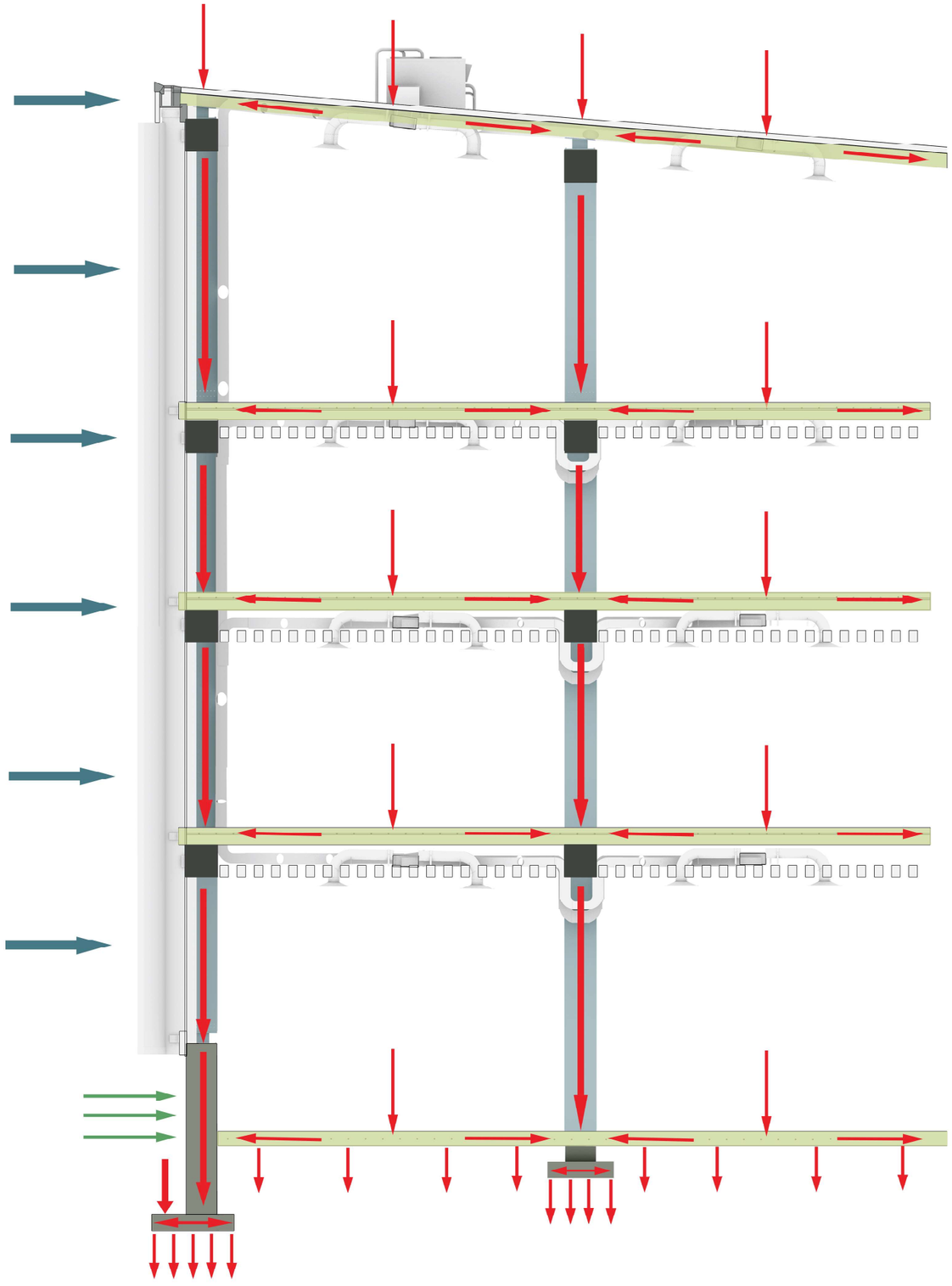
FROST WALL AND FOOTINGS:
Frost wall is 4 tall to the first floor then extends past the floor another 5 feet to the ground level.
Footings are one foot into the ground.

ROOF :
7 Ply CLT Roof (9 1/2"), 4-5" Cork Insulation, 0.06" Roofing Membrane. Then the edge is composed of typical blocking a 2" insulation, and a copper drip edge/flashing.

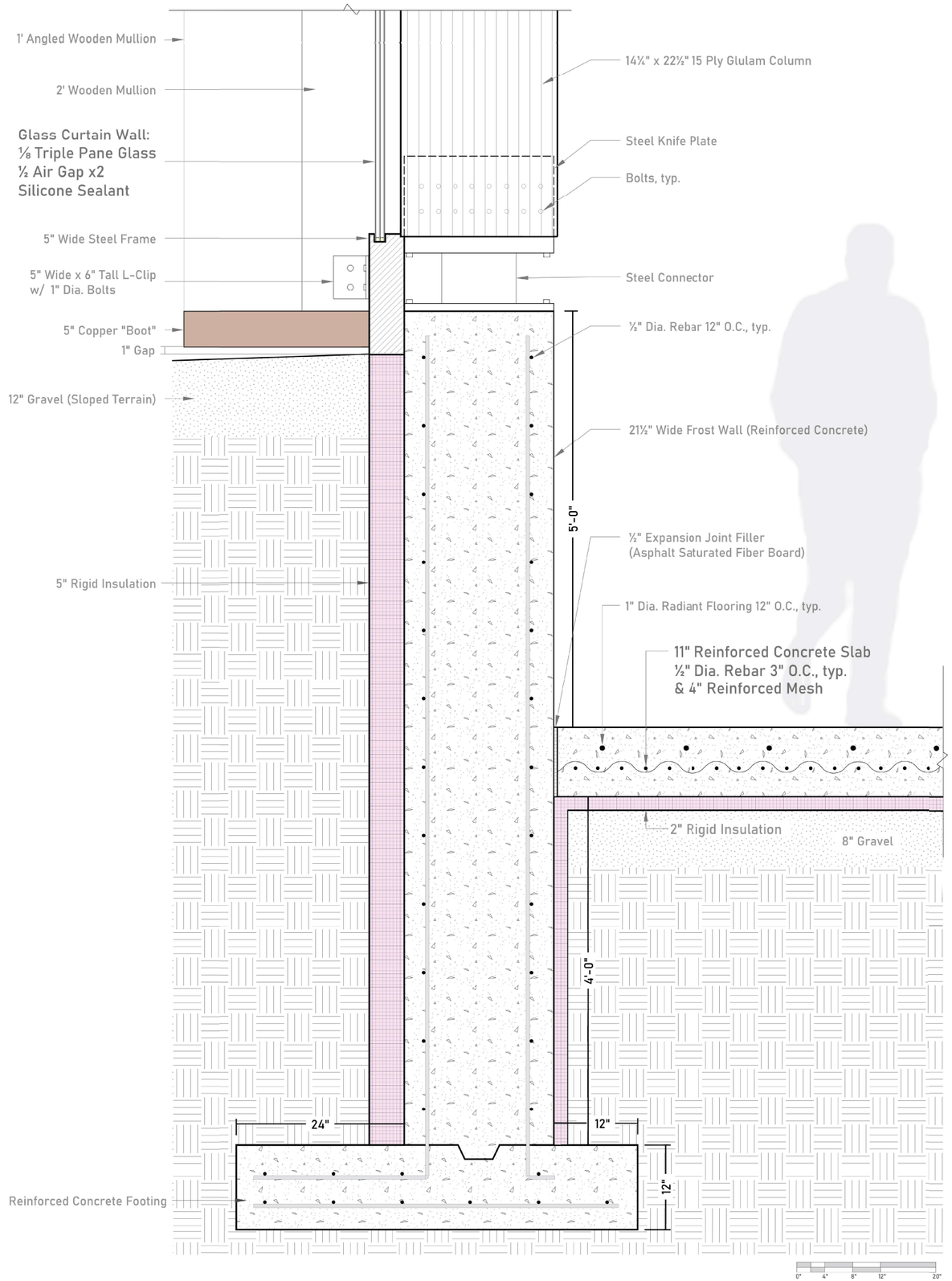
FLOORS:
4" Wood-concrete composite flooring, 1" Rigid insulation, 5 Ply CLT Panels (6 1/2" Thick)

GROUND FLOOR:
11" Reinforced Concrete Slab with 1/2" Dia. Rebar and 4" Reinforced Mesh

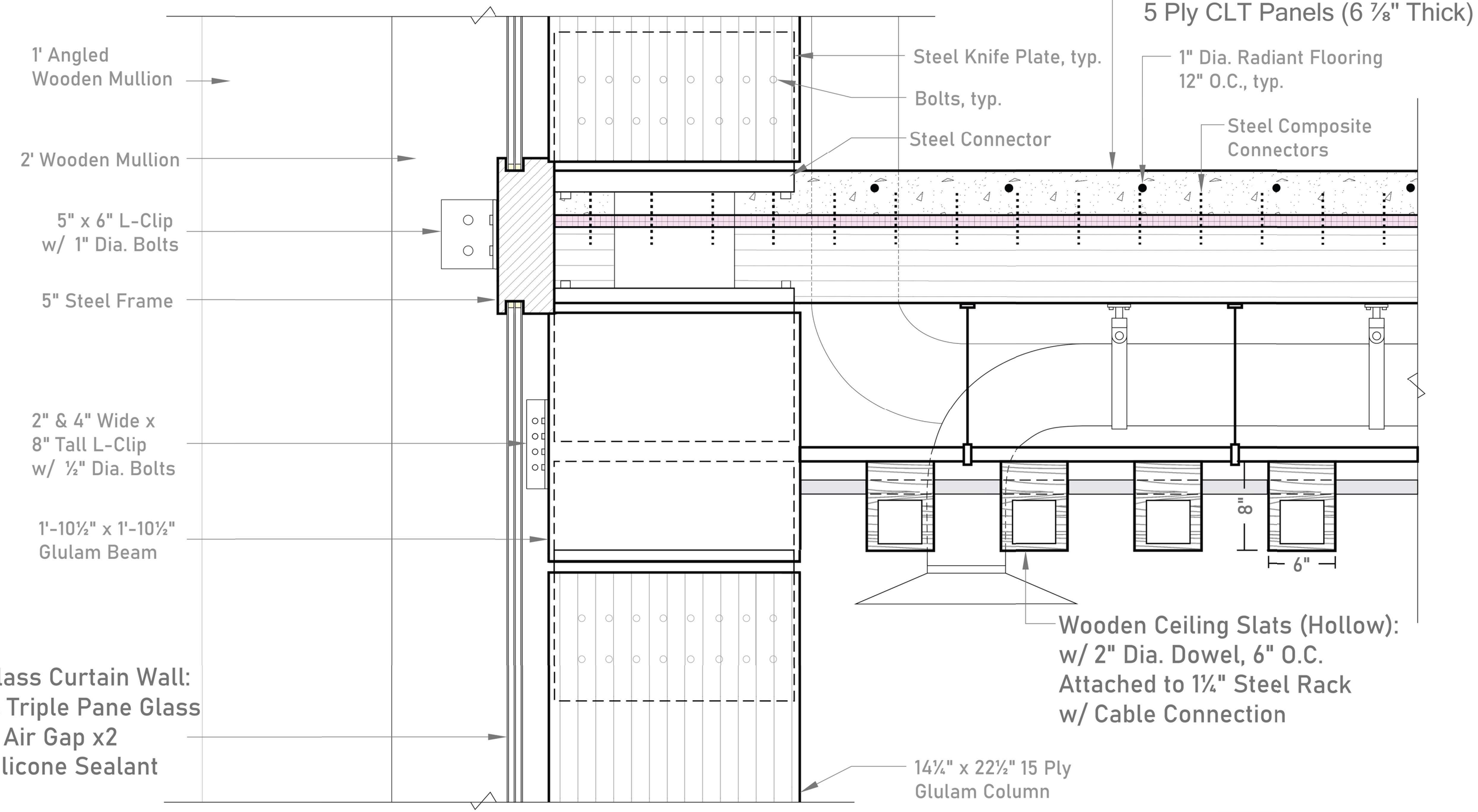
SYSTEM | Structure: Load Diagram & Components



C. Ground Floor | Ground Connections



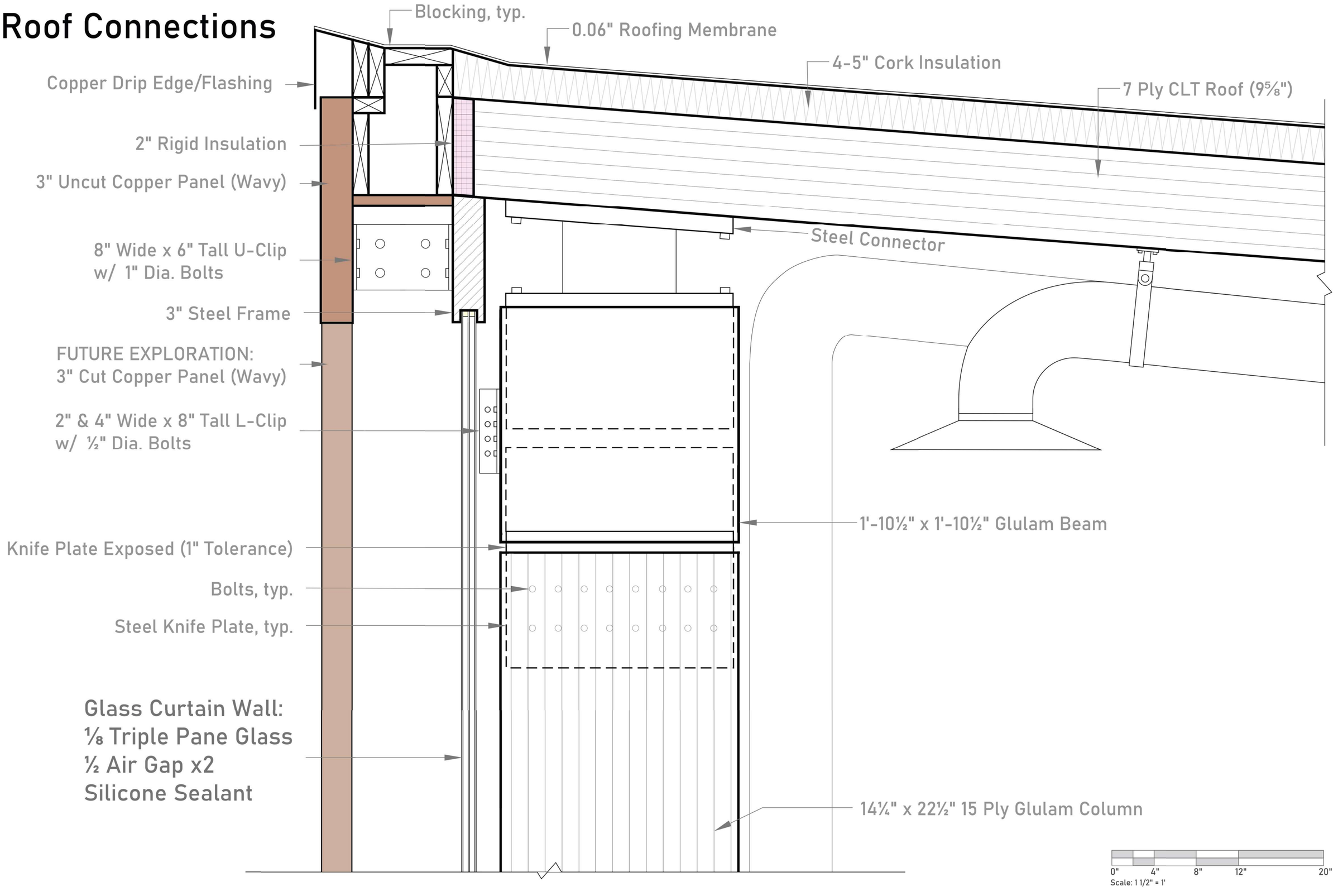
B. Second & Third Floor | Floor & Ceiling Connections



0" 4" 8" 12" 20"

Scale: 1 1/2" = 1'

A. Roof Connections



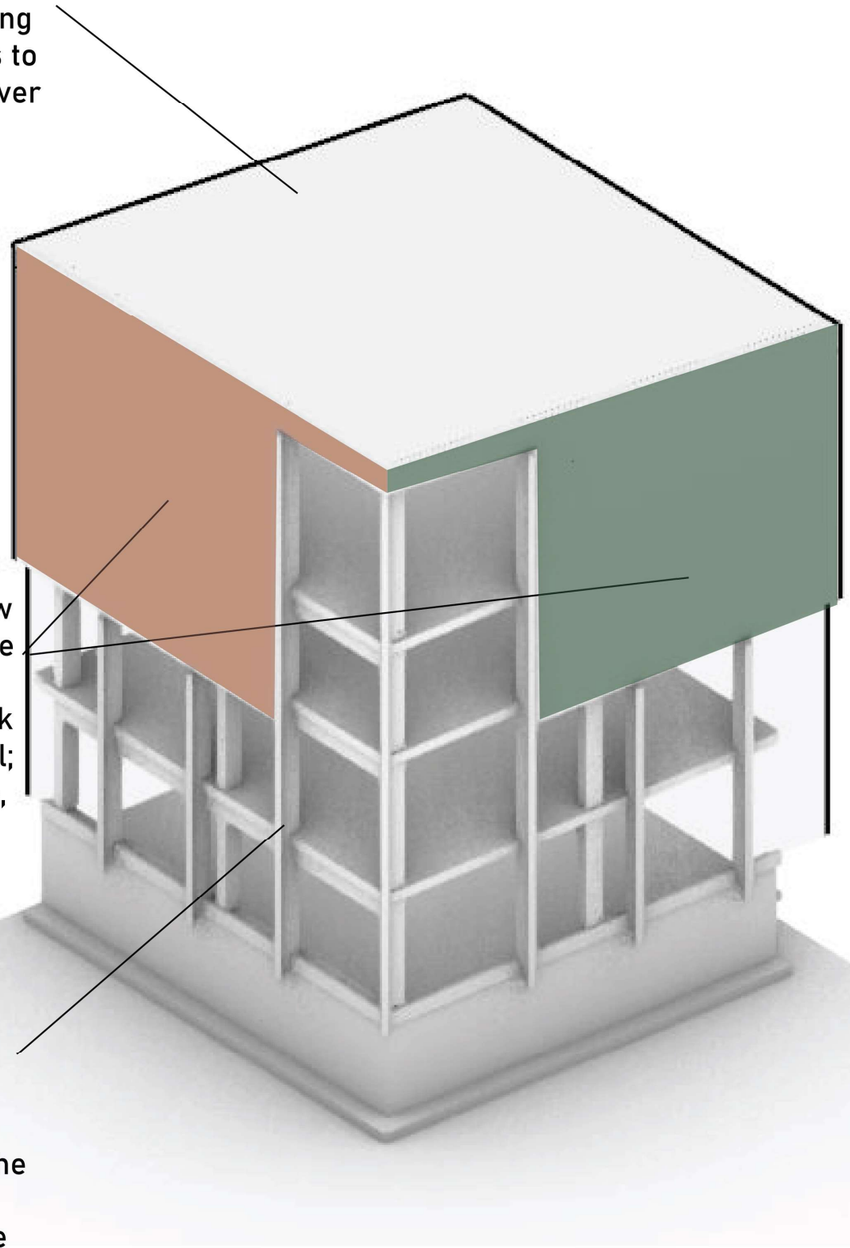
0" 4" 8" 12" 20"

Scale: 1 1/2" = 1'

SYSTEM | Enclosure & Solar Analysis

SLANTED ROOF:

The slanted roofs are there to help with the drainage of rainwater. Within the roof there is a layer of thin copper, a layer of insulation and, and a thinner layer of roofing membrane. The slanting relates to the site context: the Concord River & the Concord River Greenway Park.



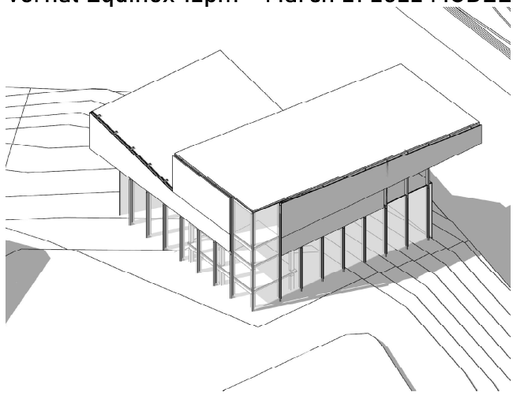
COPPER PANELS:

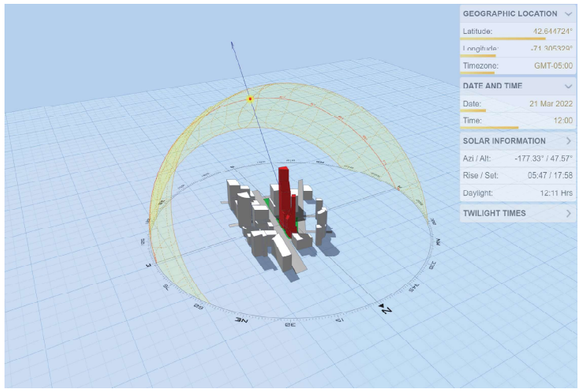
There Future exploration: Apertures will be added to allow for natural light and views to the outside.
Copper = Earth, ground, the park nearby, and the bricks of Lowell;
Oxidized Copper= greenish blue, relates to Concord river

CURTAIN WALLS:

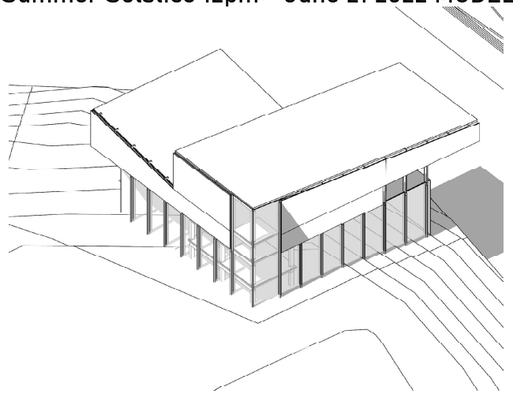
Used throughout the entire building for natural lighting, ventilation, and views out into the context. Using curtain walls became a way to accentuate the structural systems (mullions, columns, and the floor).

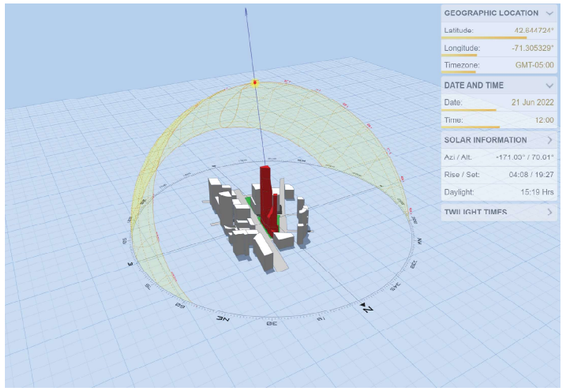
Vernal Equinox 12pm - March 21 2022 MODEL



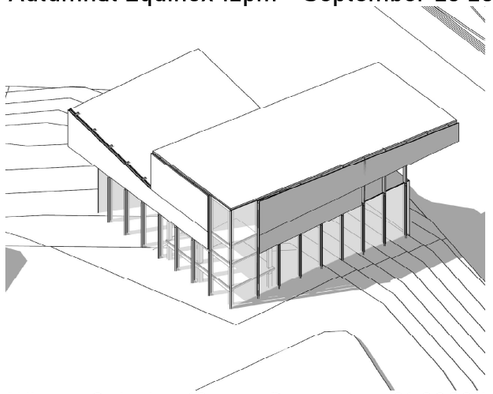


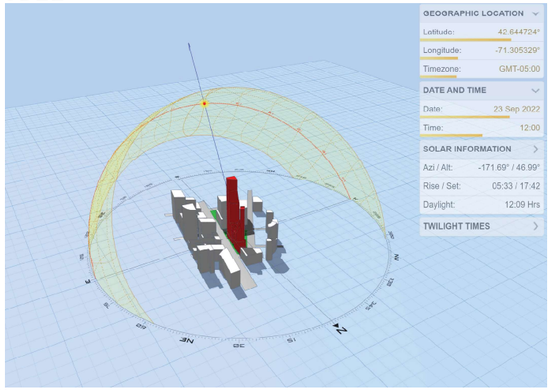
Summer Solstice 12pm - June 21 2022 MODEL



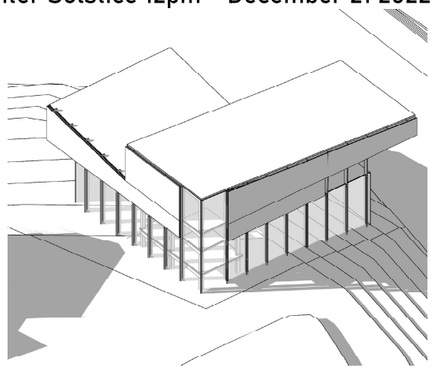


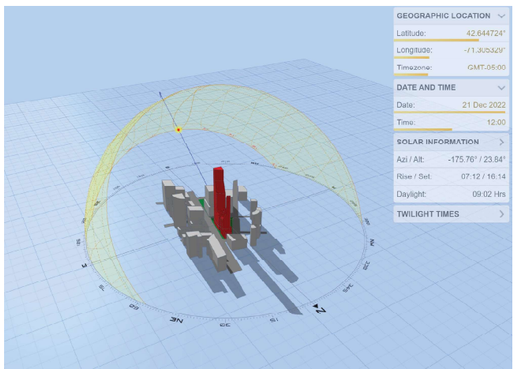
Autumnal Equinox 12pm - September 23 2022 MODEL





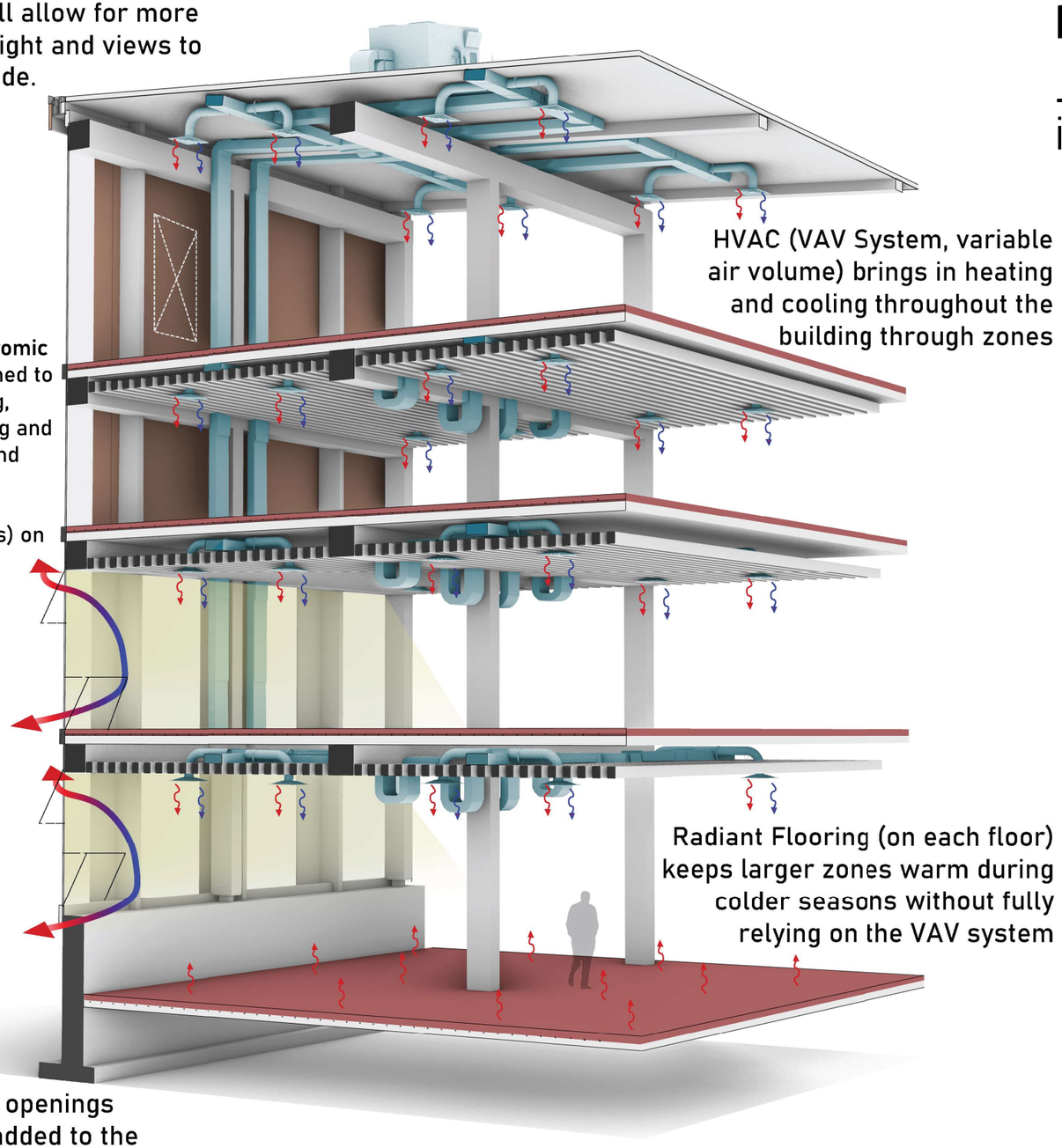
Winter Solstice 12pm - December 21 2022 MODEL





SYSTEM | Passive & Active Design Strategies

Future Exploration: Cutting apertures out of the copper panel will allow for more natural light and views to the outside.



HVAC (VAV System, variable air volume) brings in heating and cooling throughout the building through zones

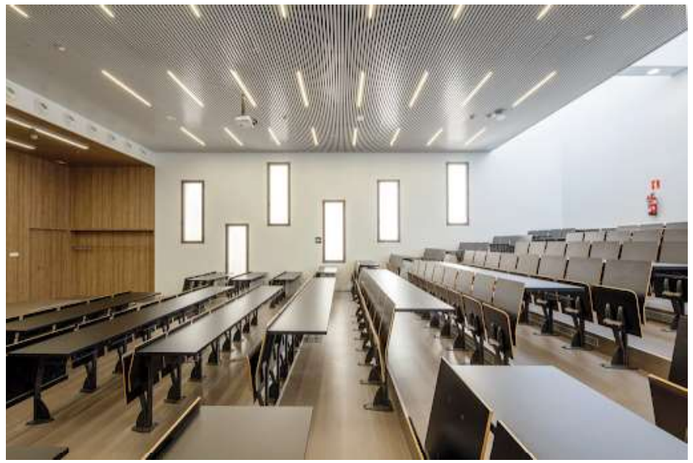
Uses Electrochromic Glazing – designed to address shading, minimize heating and cooling loads, and helps add to the shading devices (angled mullions) on the exterior.

Radiant Flooring (on each floor) keeps larger zones warm during colder seasons without fully relying on the VAV system

Window openings will be added to the top and bottom of the curtain wall to allow for passive ventilation

Electric Lighting

-LED Strips in between slats



PHASE 4B IN THE DIRECTION OF CHANGE

SITE VISIT

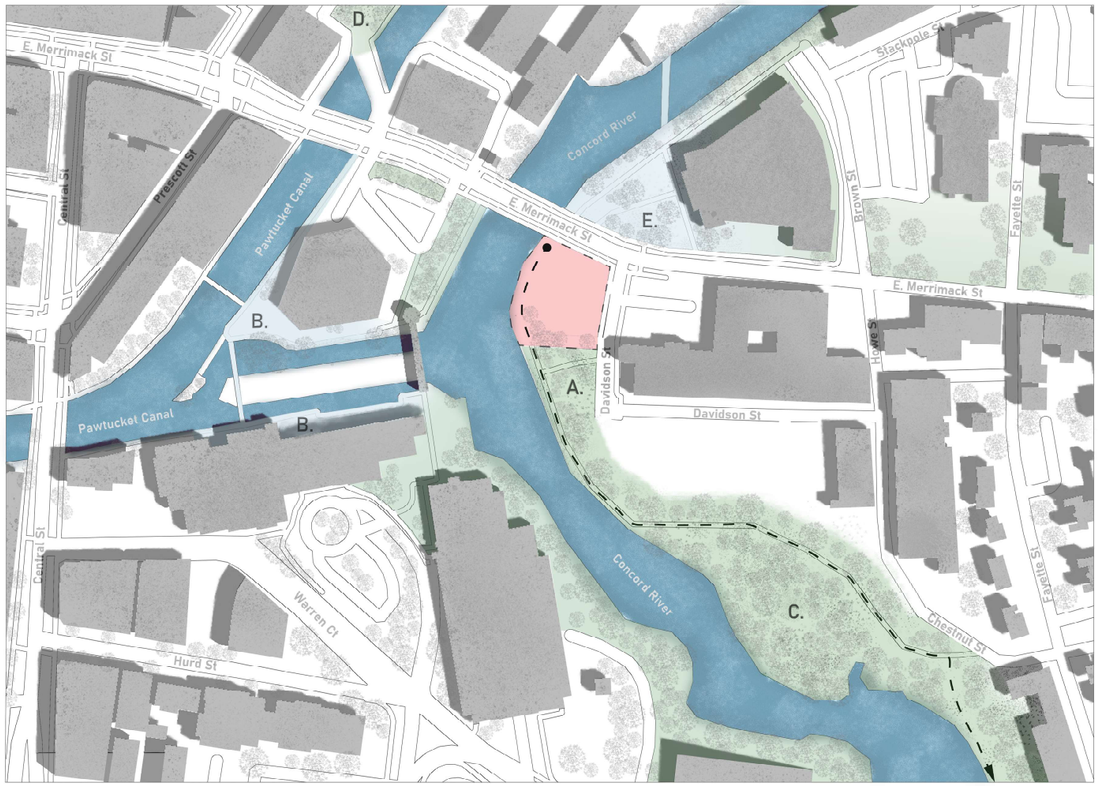
Site Analysis

With the site located off the **Concord River**, in close proximity to the **Concord River Greenway Park**, and marks the end of the **Concord River Greenway**, it was important that our form connects and directly interacts with its context. The river marks Lowell's industrial past, while the park and greenway mark new beginnings and relationships to nature- a noticeable contrast to Lowell's past.

The ground floor and exterior spaces must **activate this relationship to the existing green fabric.** It must respond to the local level, through bringing people in, and marking comfortable places to spend outdoors while creating something new.

Upper layers must respond to the overall urban scale- we analyzed the **Concord River and the Greenway Park as two seperate cultural nodes that defined Lowell and the site**. How could our form start to interact and connect to its context? Visual relationships to these spaces as well as being physically connected became equally important as we moved into the next design phase.

Parks and Outdoor Spaces



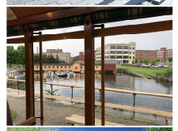
KEY:

Parks/Outdoor Spaces

A. Concord River Greenway Park

B. Lower Locks Plazas

C. Eastern Canal Park

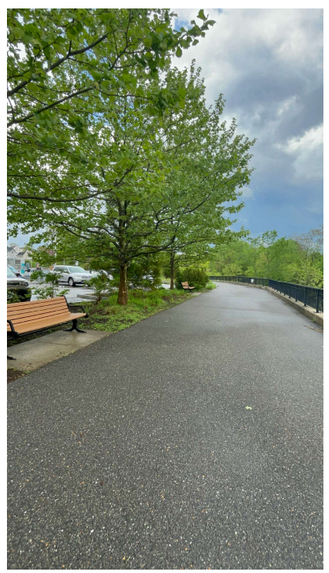


D. Kerouac Park

E. Lowell Memorial Auditorium Greenspace

Overall Land Uses

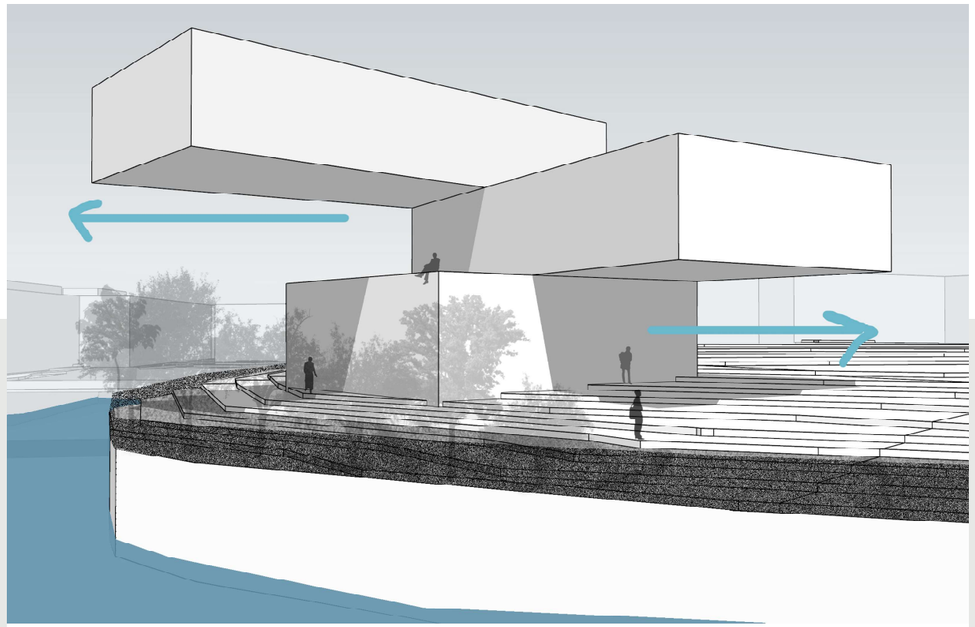
- Plaza & Multipurpose
- Park & Green Space
- Concord River/ Canal
- Concord River Greenway

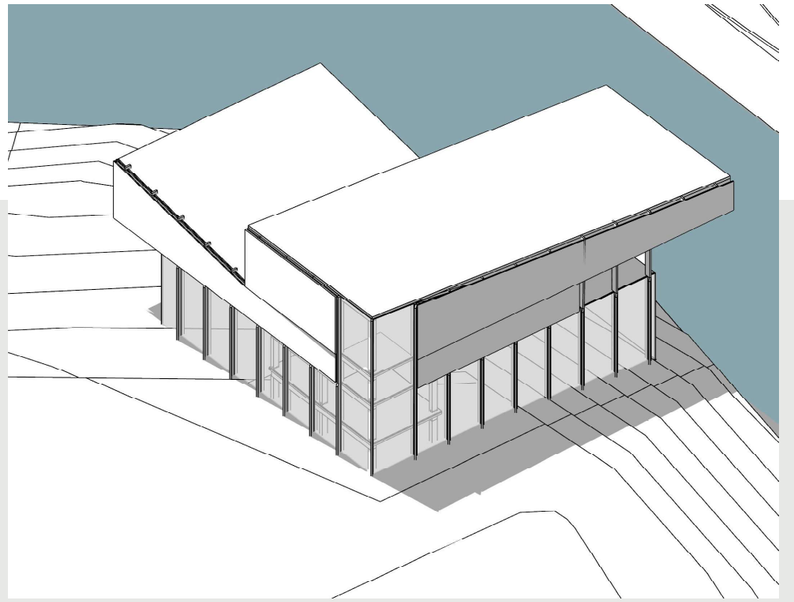


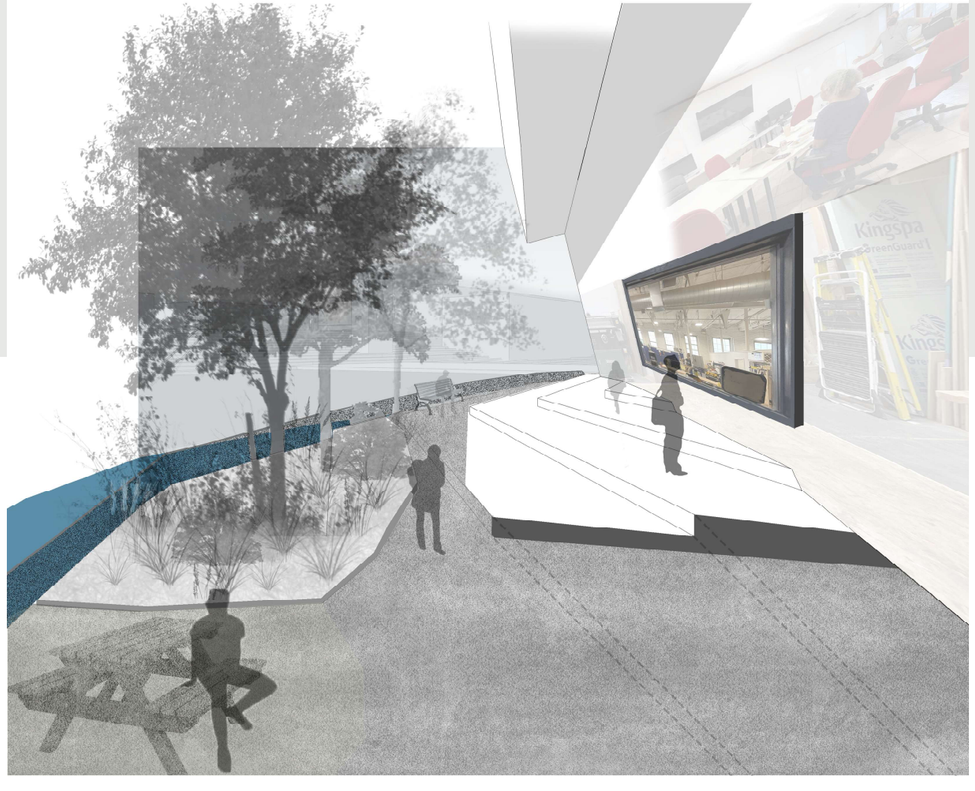
DESIGN CHARETTE | Site Connections & First Forms

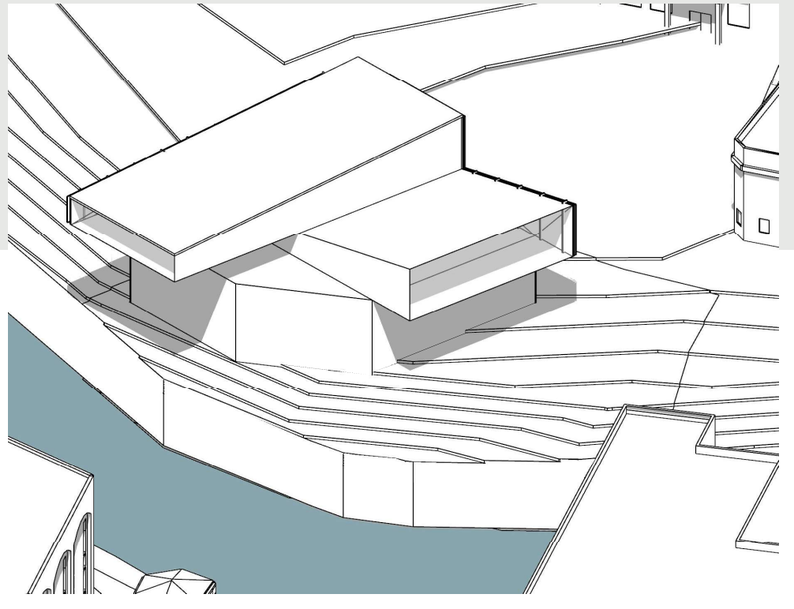
BEGINNING CONCEPT:
With the site located off the **Concord River** and in close proximity to the **Concord River Greenway Park**, our form begins to connect and interact with its context.
One main volume on the ground floor acts as the main public space- connecting the Lowell community through the act of creating.
The two main upper forms pivot on this main volume pointing towards the park and river as important cultural nodes.

Access & circulation will start to break apart the ground floor as more iterations are created.









PRECEDENT STUDY | UMass Amherst Design Center by Leers Weinzapfel Associates

Quick Facts About the Precedent:
CLIENT: University of Massachusetts (Umass)
LOCATION: Amherst, Massachusetts [551 N. Pleasant St. in Amherst, MA 01003]
SIZE: 87,500 square feet / four stories
TOTAL COST: $52 million
CONSTRUCTION COST: $36 million
STARTED: August 2015 COMPLETED: January 2017
CONSTRUCTION TYPE: IV (Heavy Timber) 10% steel

Why We Chose This Precedent:
The angle & pointing towards specific moments in its context, glass & views on extrusions, connection between ground and above & a solution to spanning over 80 feet (truss system).

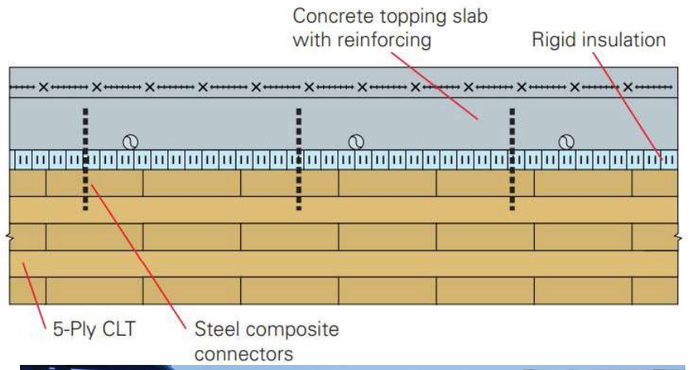
What Was Carried Over to Our Project:
The UMass Amherst Design Center **utilizes a hybrid of concrete, wood, and steel as its structure**: incredibly strong, can span longer distances, with less columns and more open space. Structure is exposed for educational purposes.

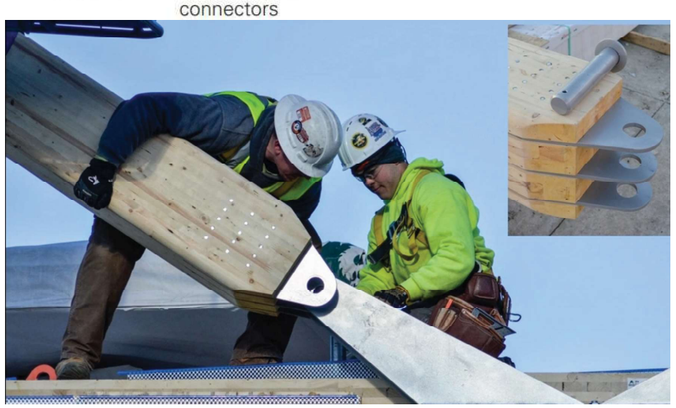
CONCRETE:
Floors & Base Structure: Wood-Concrete Composite; Reinforced Foundation Slab; Spread Footings

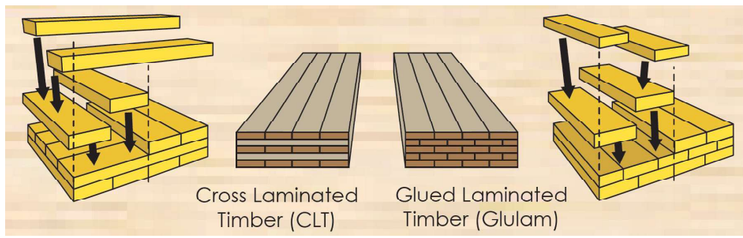
WOOD:
Cross Laminated Timber & Glulam-Glued Laminated Timber: Glulam Beams & Columns; Curtain Wall System (Mullions)

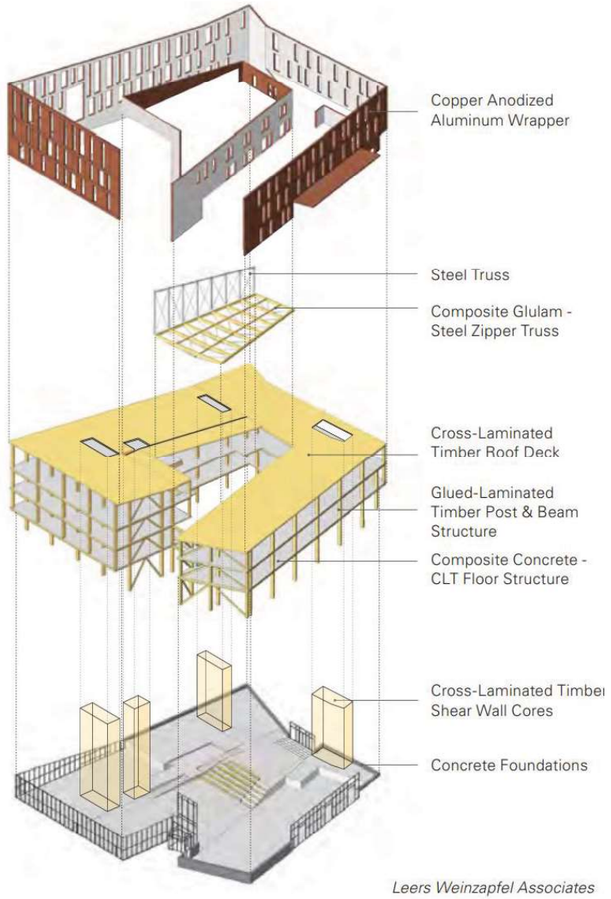
STEEL:
Any Cantilevering Edge; Hardware/Connections

Typical Timber-Concrete Composite Floor Assembly

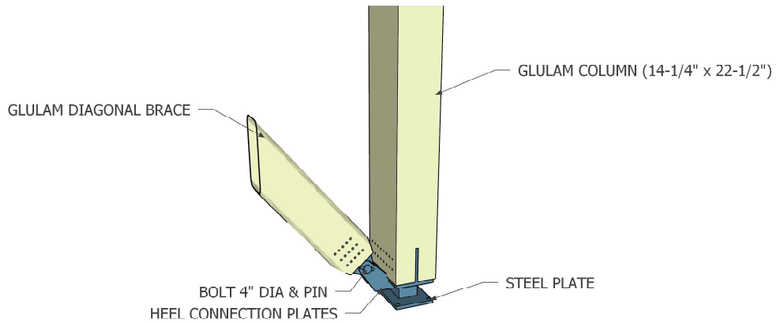








Leers Weinzapfel Associates



What is the Difference Between CLT & Glulam?

CLT is used for surfaces such as walls, floors, and floor separation.

Glulam is primarily used for the loadbearing frame in a building such as rafters, beams, or columns.

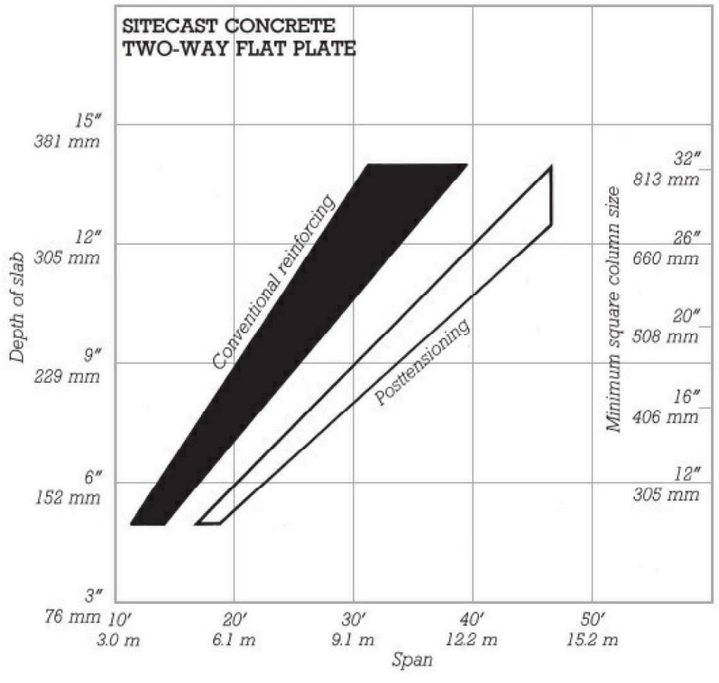
STRUCTURE | CONCRETE

CHOSEN TO USE IN OUR:

- Floors, (Wood-Concrete Composite)
- Reinforced Foundation Slab w/ Spread Footings.

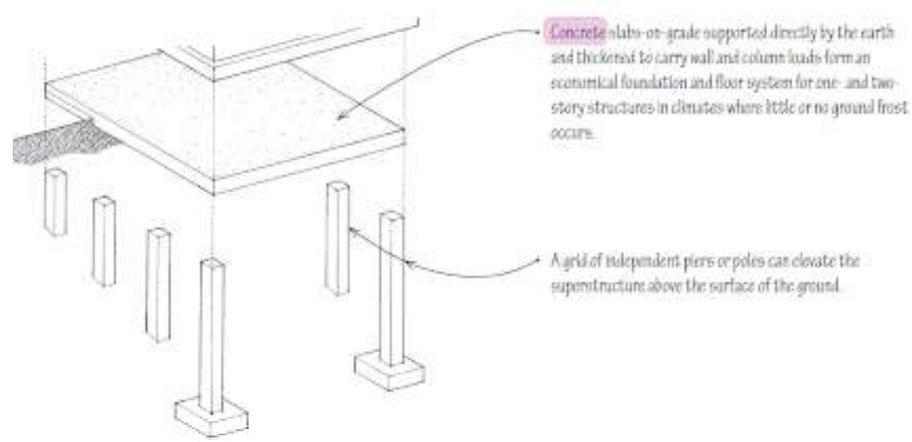
REASONING:

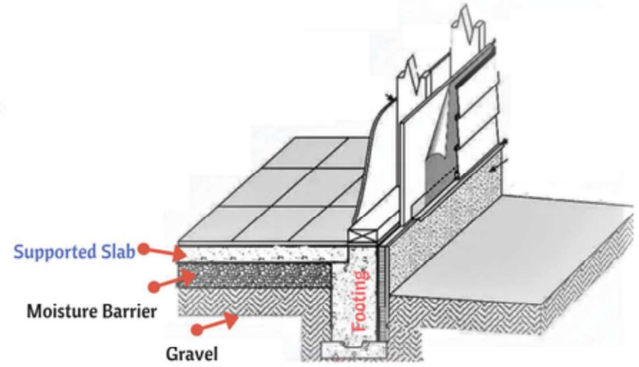
As a Plate Structure: Plate structures are rigid, planar, usually monolithic structures that disperse applied loads in a multidirectional pattern, with the loads generally following the shortest and stiffest routes to the supports. A common example of a plate structure is a reinforced concrete slab. It acts as a flat, deep beam that transfers lateral loads to the footings then to the ground. With a timber and steel combo, concrete is able to fill in the gaps to create a strong continuous plane/ connection from column/post to foundation.

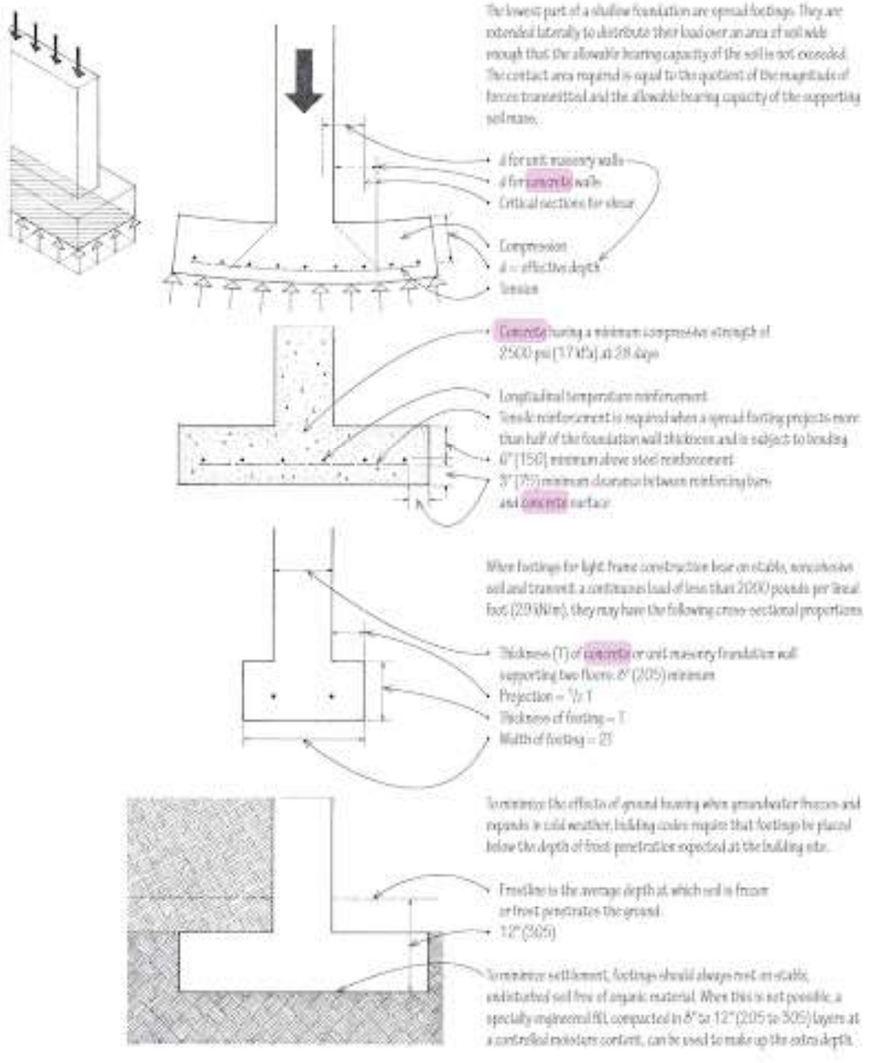


COLUMN SIZES FOR FLAT PLATE CONSTRUCTION

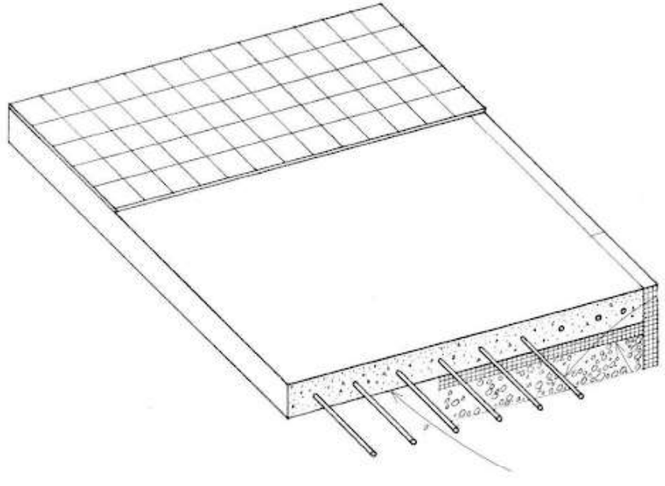
The shallow depth of the junction between the slab and the column in flat plate construction restricts the minimum column size in this system. The right-hand scale on the chart above provides minimum square column sizes for various slab thicknesses. The required minimum column sizes for this system also depend on the applied loads on the structure. For light loads, reduce the indicated column size by 2 in. (50 mm). For heavy loads, increase the column size by 2 to 4 in. (50 to 100 mm).







^ UMass Design Building Composite Flooring



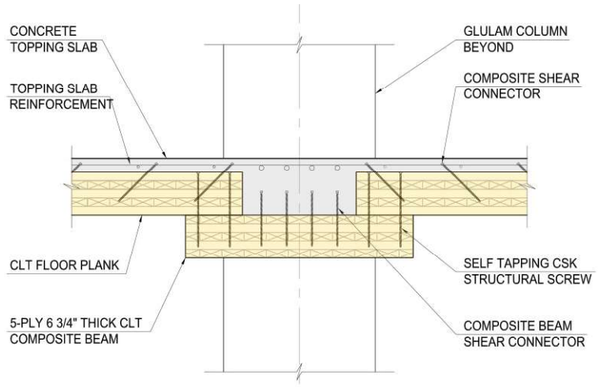
STRUCTURE RESEARCH | WOOD

CHOSEN TO USE IN OUR:

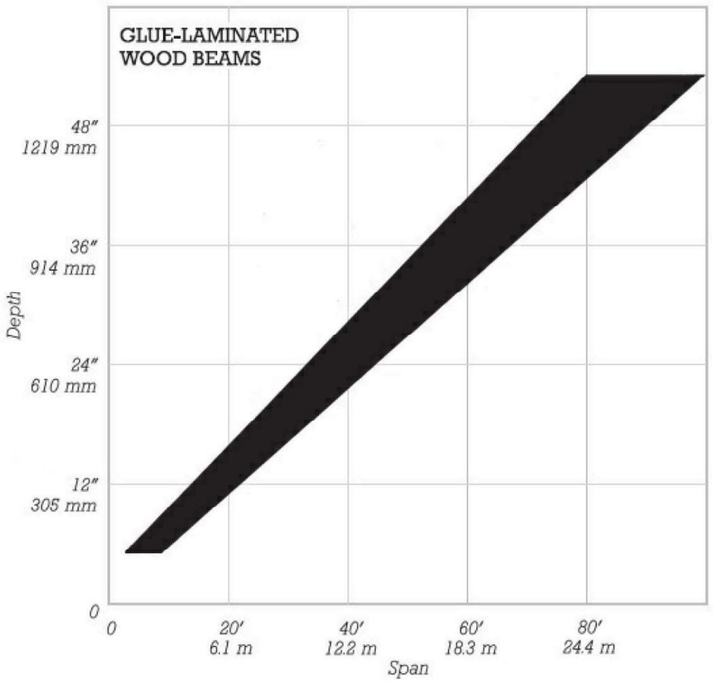
- Glulam Beams and Columns (Glued-Laminated Timber)
- Truss Design
- Curtain Wall System

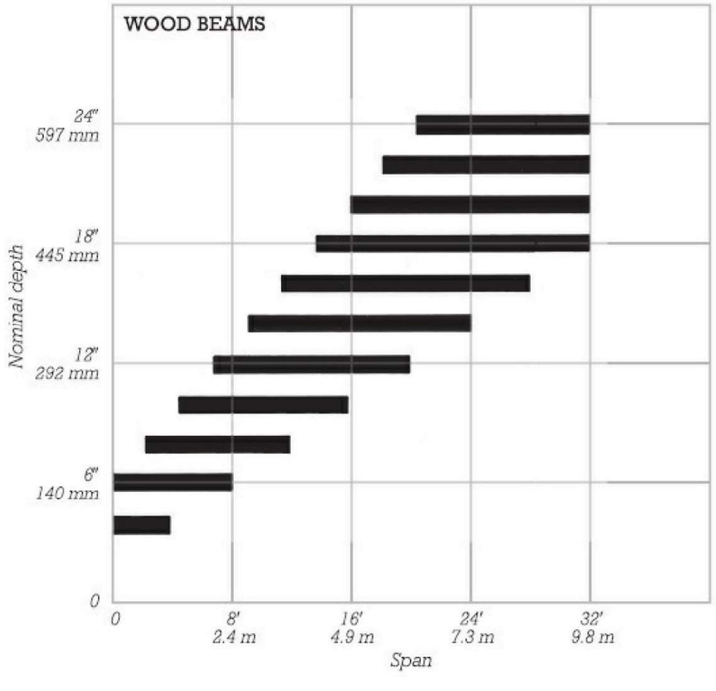
REASONING:

In general, working with wood saves energy, cuts build/ installation time, is naturally resistant to heat, helps the environment by trapping CO2 with little waste. Wooden trusses have built- in openings that could provide space for exposed HVAC & other mech. systems; they can span a much larger distance than standard beams giving us the ability to design open spaces for more collaboration between spaces; wood as a denser material, acts as an insulator while steel does not; incredibly versitile in terms of shape as well as aesthetics; and is sound absorbant- important for the acoustics in a loud environment (workshops, public spaces, etc.).



^ MX_SI's addition to the Serlachius Museum Gösta (Facade)





^ Oregon State University College of Forestry (OSU Forest Science Complex)

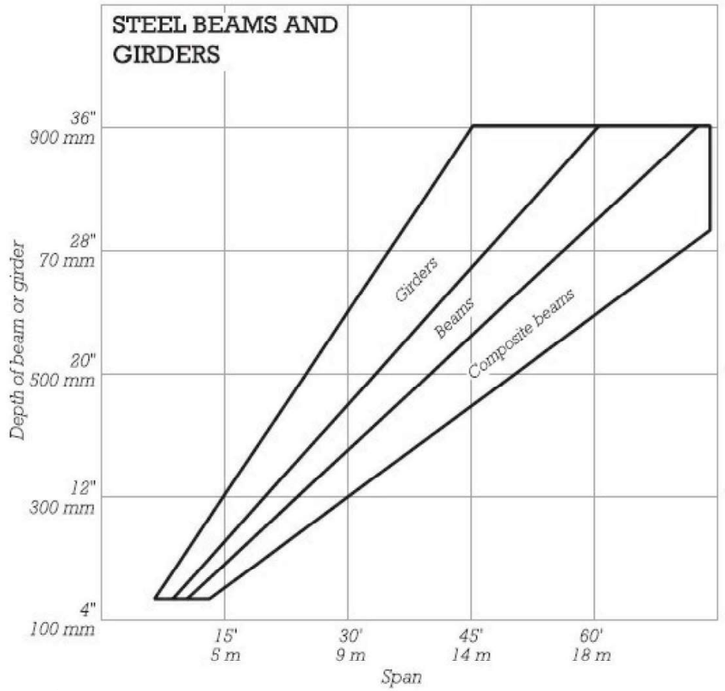
STRUCTURE RESEARCH | STEEL

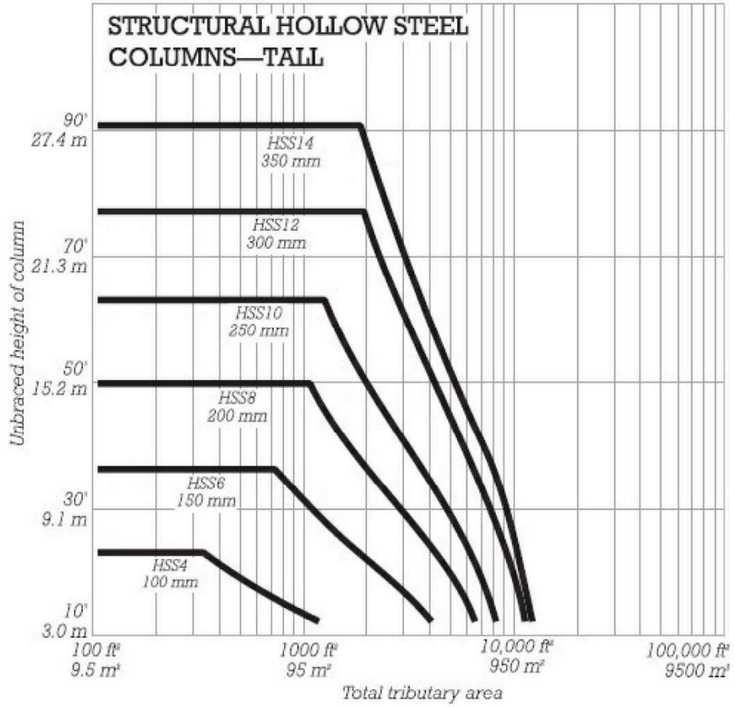
CHOSEN TO USE IN OUR:

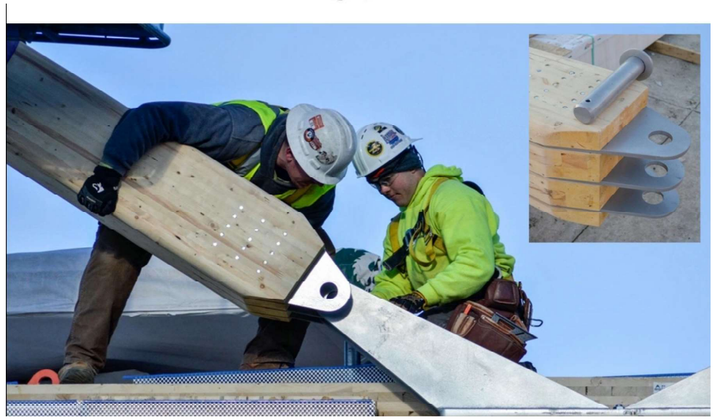
- Used With Any Major Cantilevering Edge
- Used as Hardware, Pieces that Connect Columns, Concrete, and Beams
- Used inside of Glulam Beams & Columns

REASONING:

Steel can be used as a strong cantilever. Using steel as hardware & connector pieces meant for high strength as it is great in tension and compression as is wood (with the grain).







< Umass Design Building - Construction Steel Arm

^ Fay Jones School of Architecture and Design

< House In Sèvres- Colboc Franzen & Associés

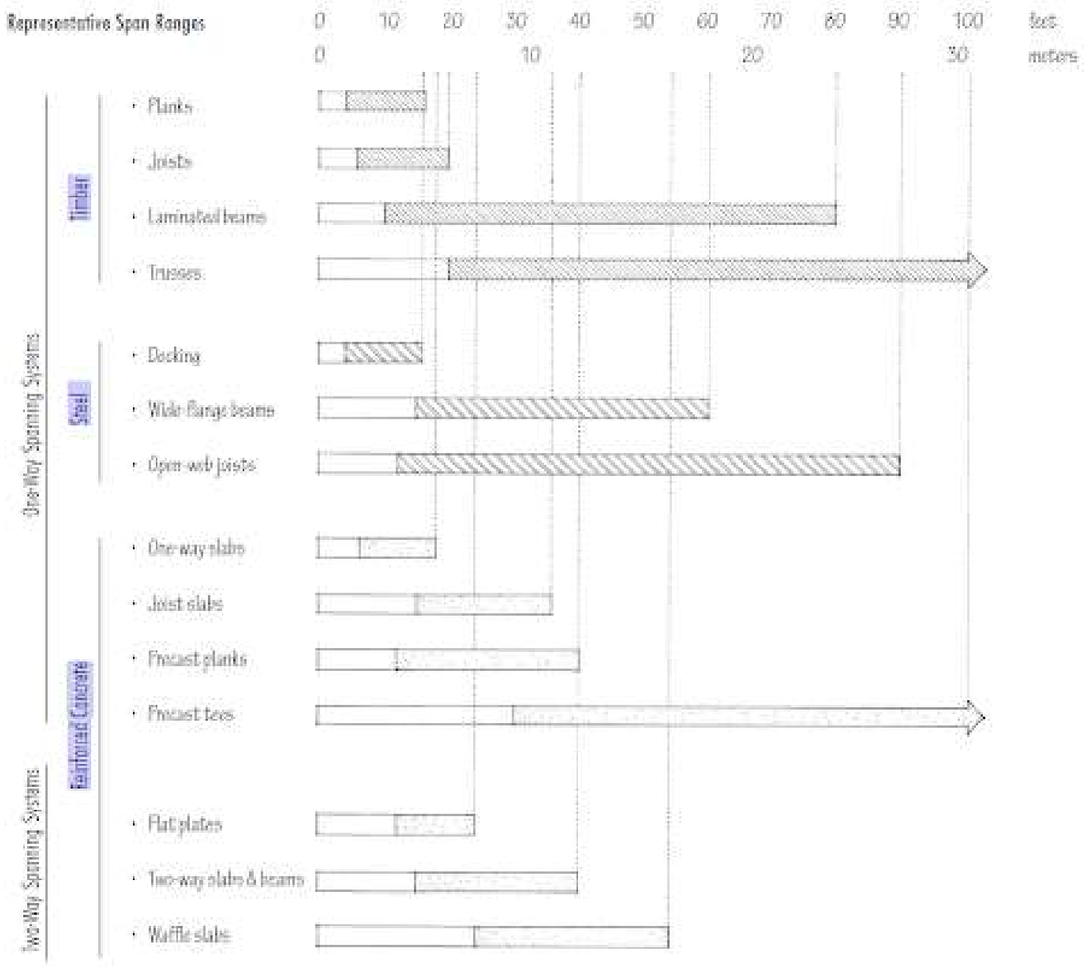
STRUCTURE RESEARCH | HYBRID: CONCRETE, WOOD, STEEL

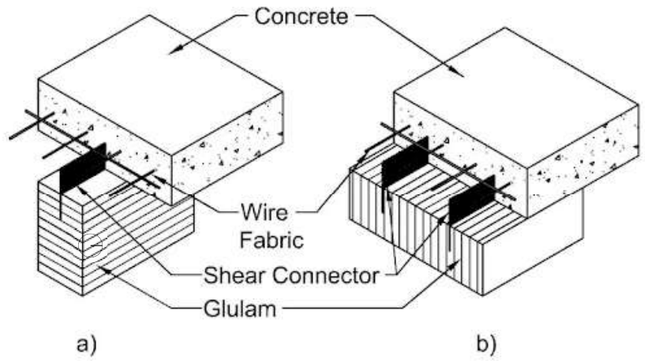
CHOSEN TO USE IN OUR:

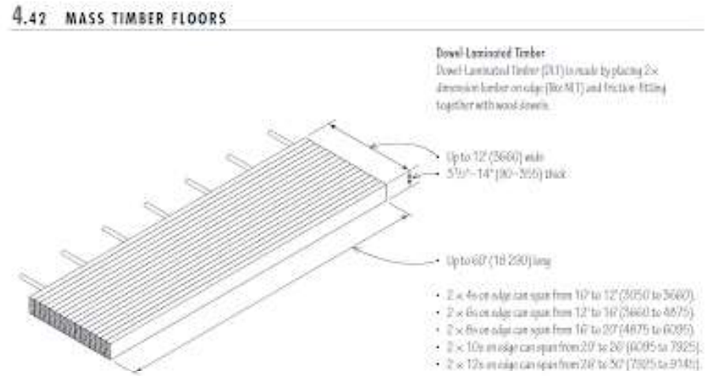
- Wood-Concrete Composite Flooring
- Glulam/Steel Columns & Beams
- Some Sort of Truss (like the Zipper Truss)

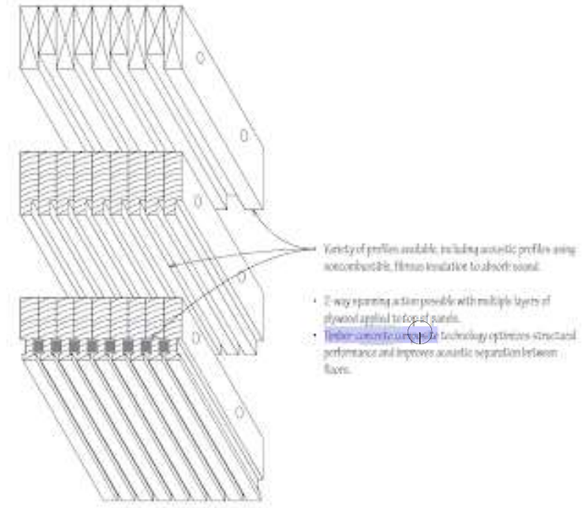
REASONING:

Incredibly strong, and can span longer distances, less columns & more open space!

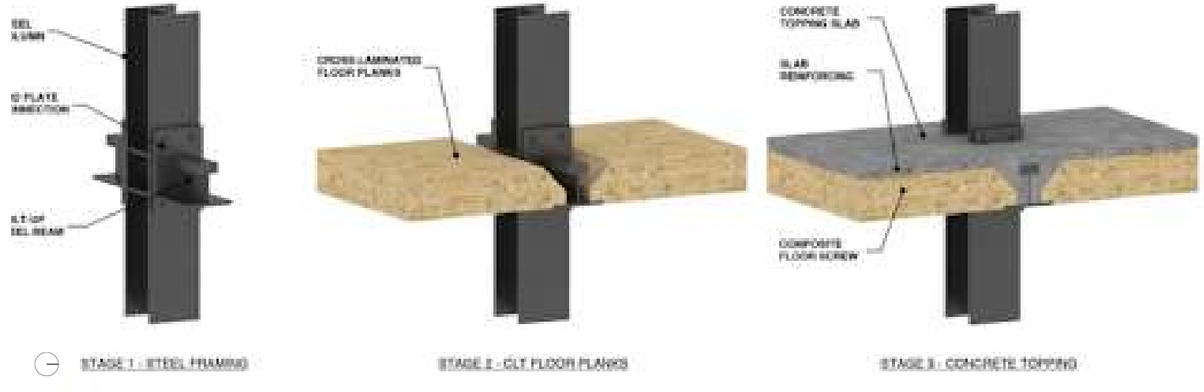








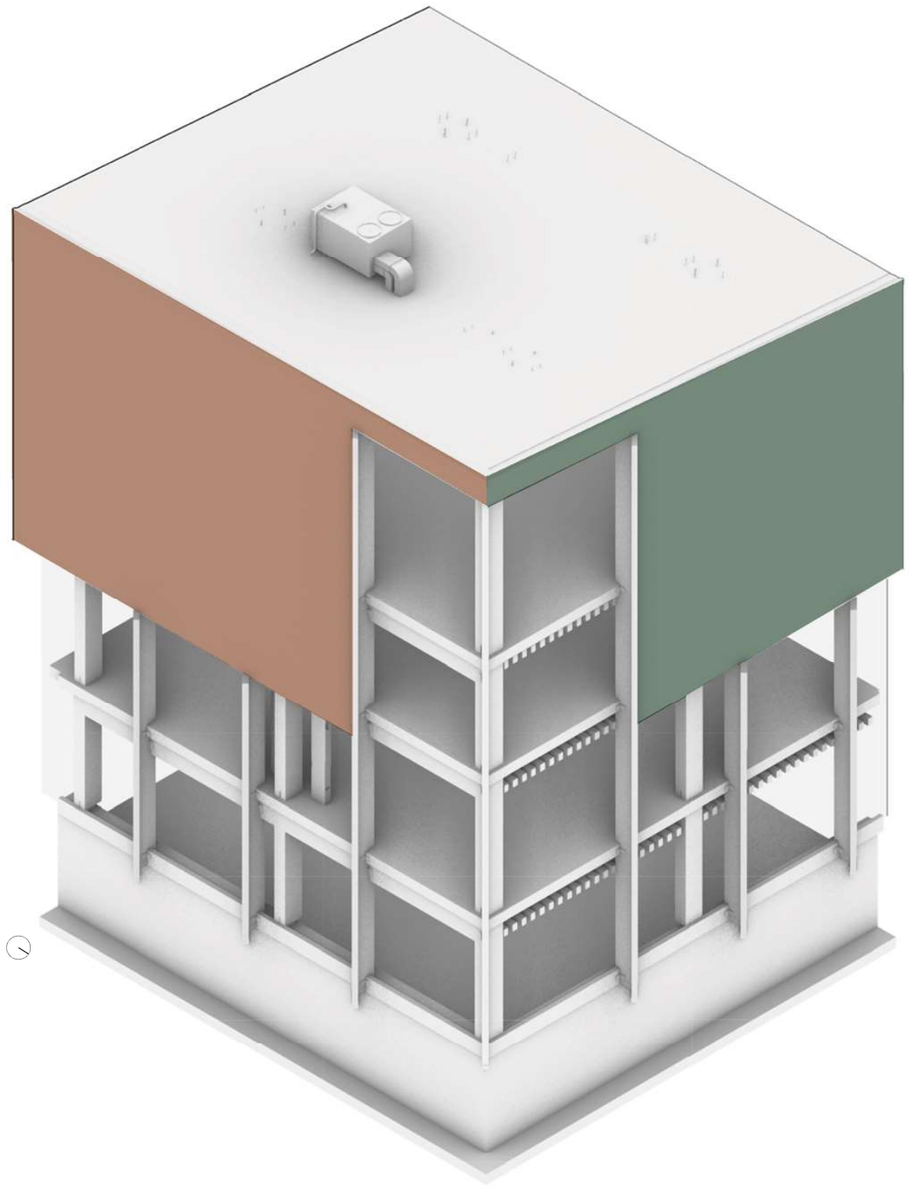
posite mass-timber floor system with steel structure

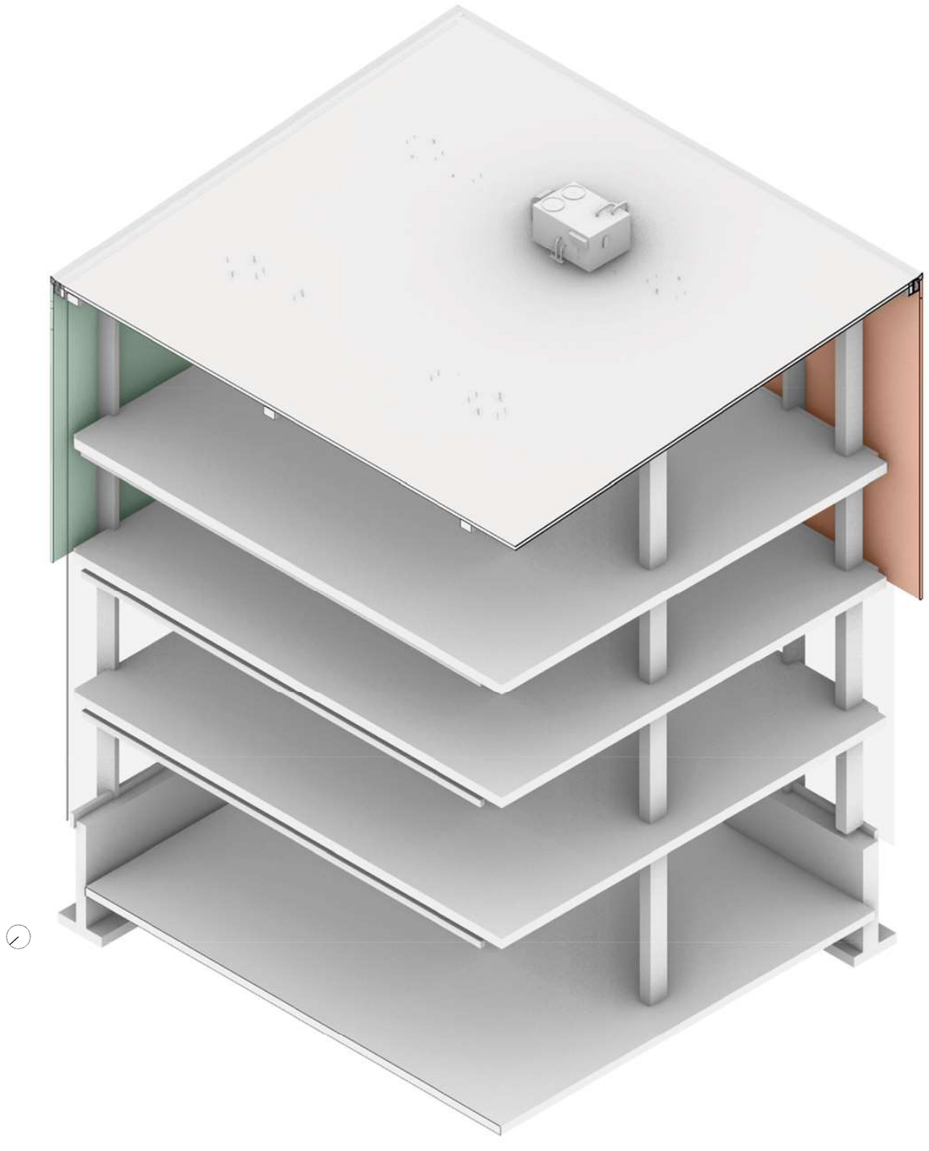


...rtesy Benton Johnson / SOM

Floor to column and beam connection

PROTOTYPE- DIGITAL MODEL | Overview Axons





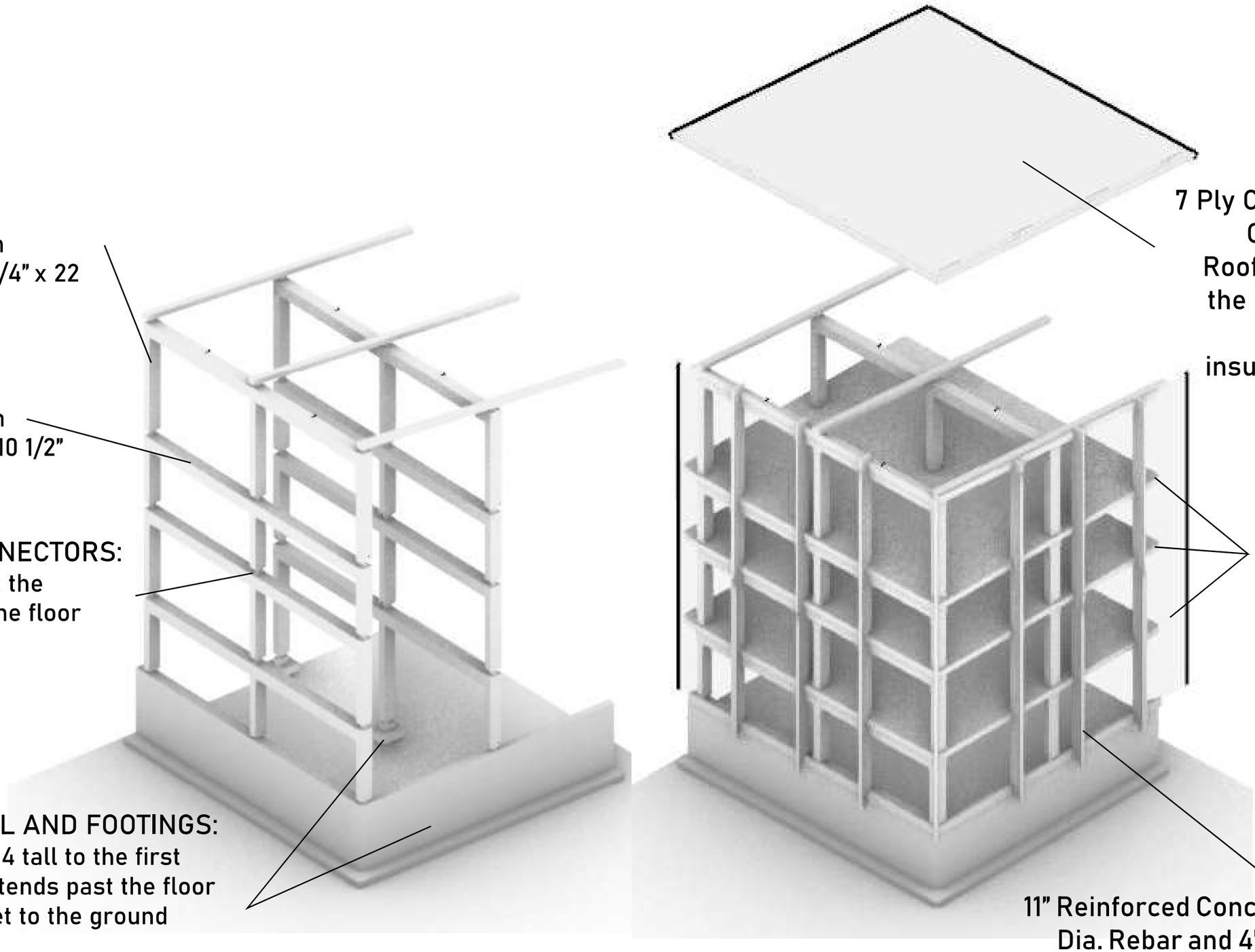
SYSTEM | Structure

COLUMNS:
15 Ply Glulam
Columns 14 1/4" x 22 1/2"

BEAMS:
Glulam Beam
1'-10 1/2" x 1'-10 1/2"

STEEL CONNECTORS:
They connect the columns to the floor slabs.

FROST WALL AND FOOTINGS:
Frost wall is 4 tall to the first floor then extends past the floor another 5 feet to the ground level.
Footings are one foot into the ground.



ROOF :
7 Ply CLT Roof (9 1/2"), 4-5" Cork Insulation, 0.06" Roofing Membrane. Then the edge is composed of typical blocking a 2" insulation, and a copper drip edge/flashing.

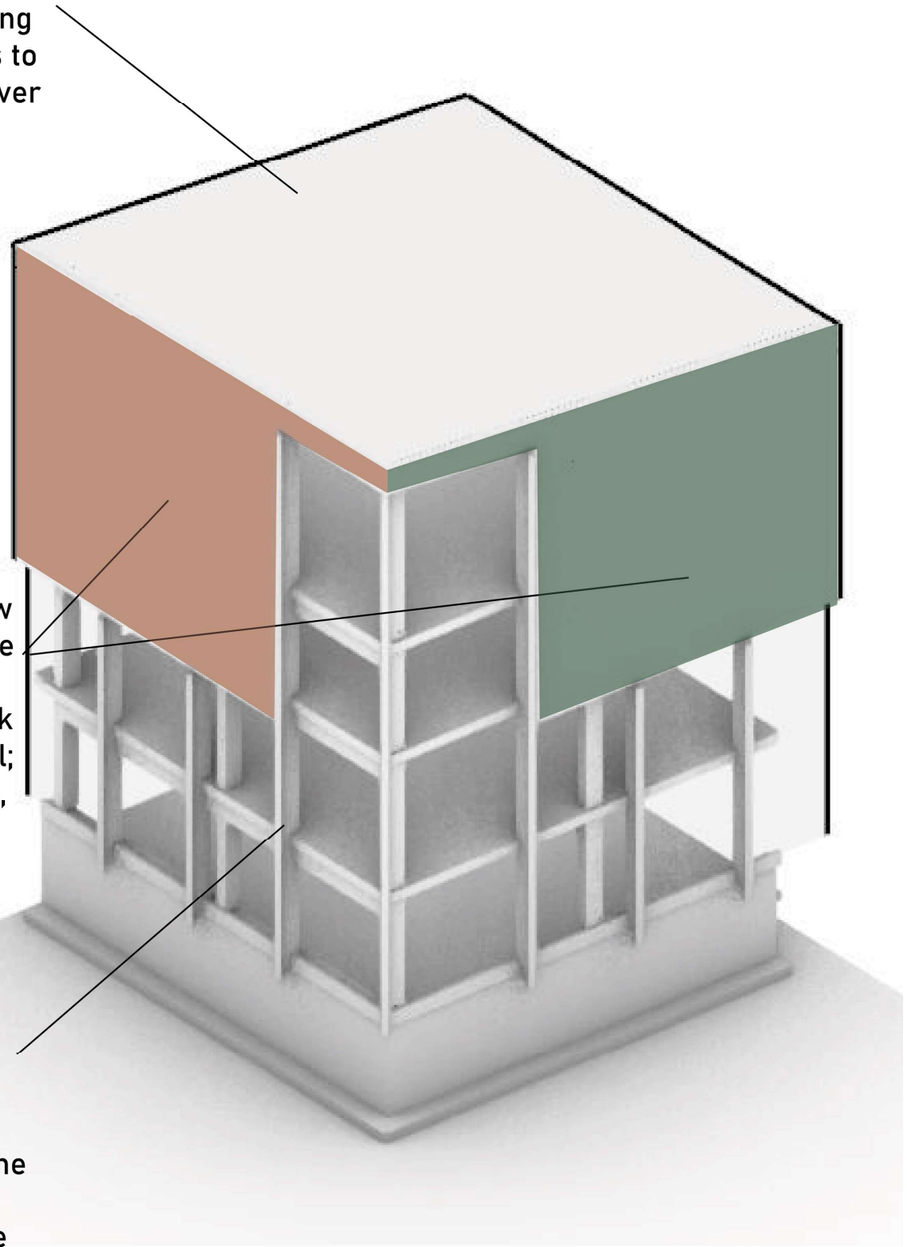
FLOORS:
4" Wood-concrete composite flooring, 1" Rigid insulation, 5 Ply CLT Panels (6 1/2" Thick)

GROUND FLOOR:
11" Reinforced Concrete Slab with 1/2" Dia. Rebar and 4" Reinforced Mesh

SYSTEM | Enclosure & Solar Analysis

SLANTED ROOF:

The slanted roofs are there to help with the drainage of rainwater. Within the roof there is a layer of thin copper, a layer of insulation and, and a thinner layer of roofing membrane. The slanting relates to the site context: the Concord River & the Concord River Greenway Park.



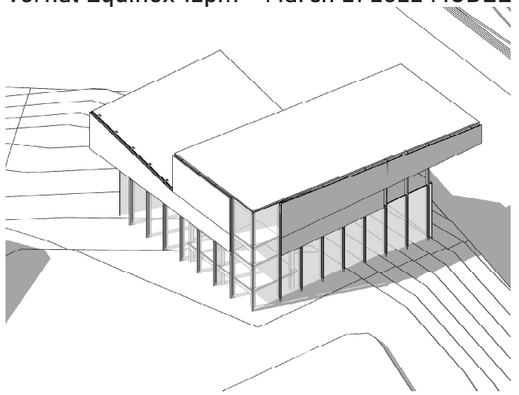
COPPER PANELS:

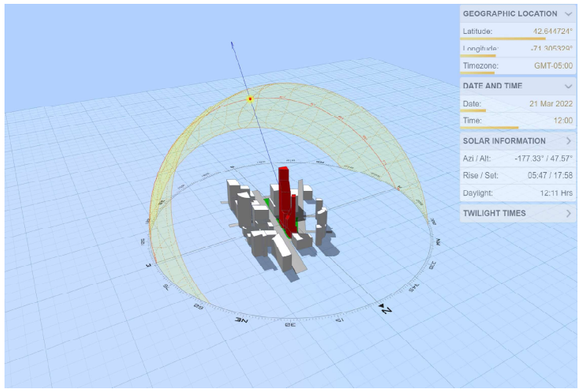
There Future exploration: Apertures will be added to allow for natural light and views to the outside.
Copper = Earth, ground, the park nearby, and the bricks of Lowell;
Oxidized Copper= greenish blue, relates to Concord river

CURTAIN WALLS:

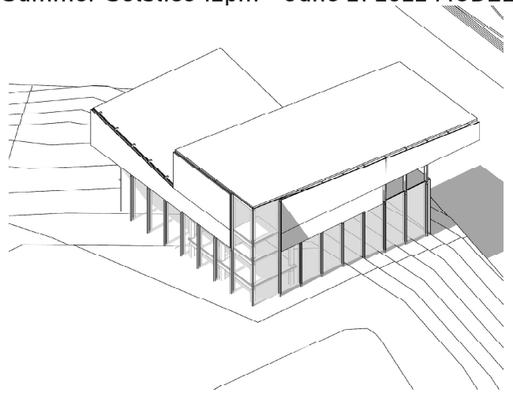
Used throughout the entire building for natural lighting, ventilation, and views out into the context. Using curtain walls became a way to accentuate the structural systems (mullions, columns, and the floor).

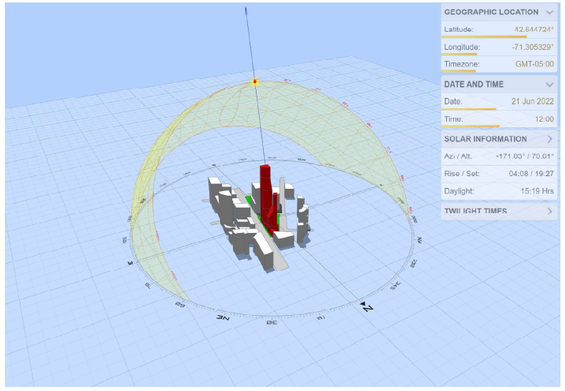
Vernal Equinox 12pm - March 21 2022 MODEL



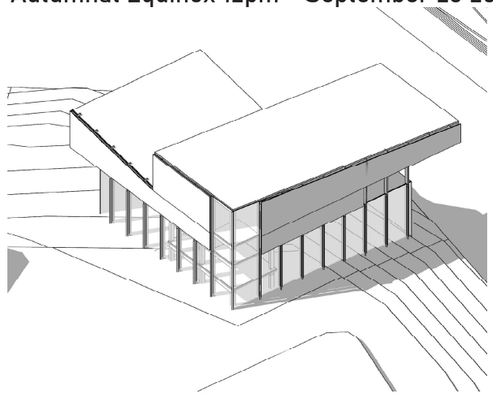


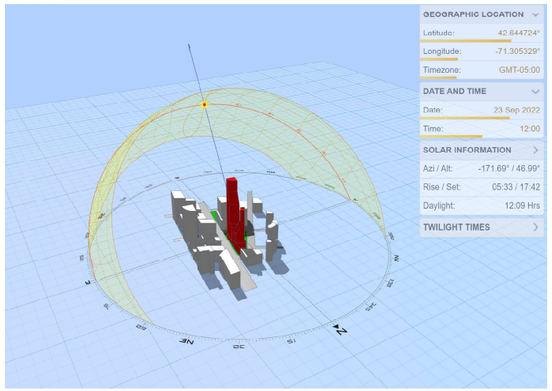
Summer Solstice 12pm - June 21 2022 MODEL



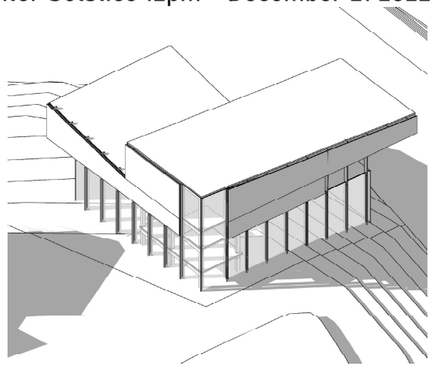


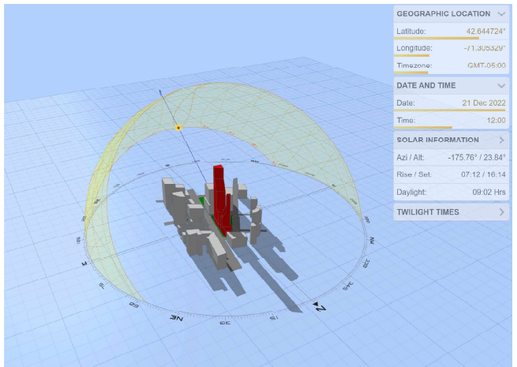
Autumnal Equinox 12pm - September 23 2022 MODEL



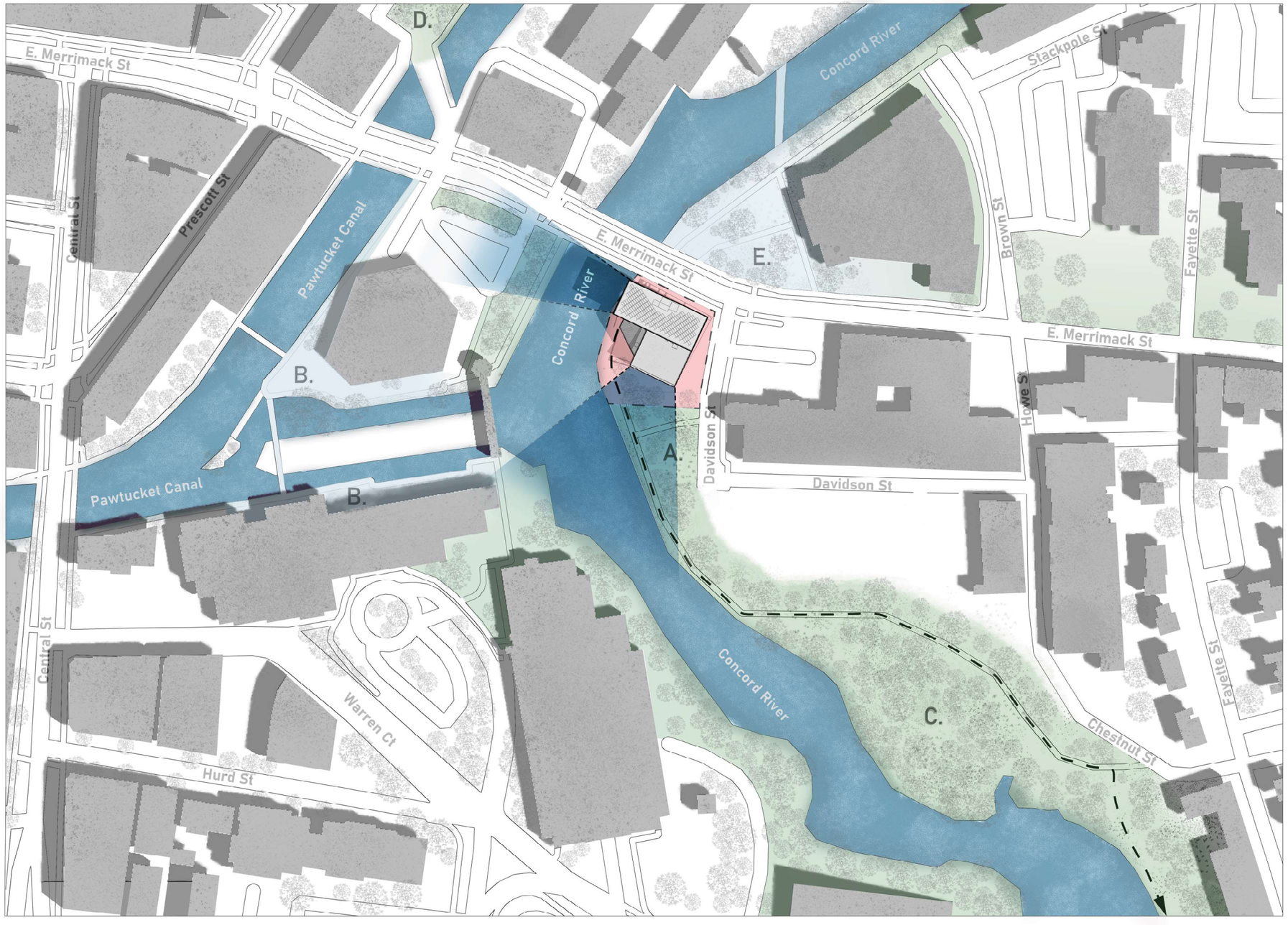


Winter Solstice 12pm - December 21 2022 MODEL





Site Plan | Physical Site Connections & Important Outdoor Spaces



SITE

SITE CONNECTIONS

0' 50' 100' 200'

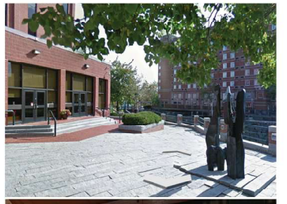
Scale: 1" = 150'

KEY:

Parks/Outdoor Spaces

A. Concord River Greenway Park

B. Lower Locks Plazas



C. Eastern Canal Park

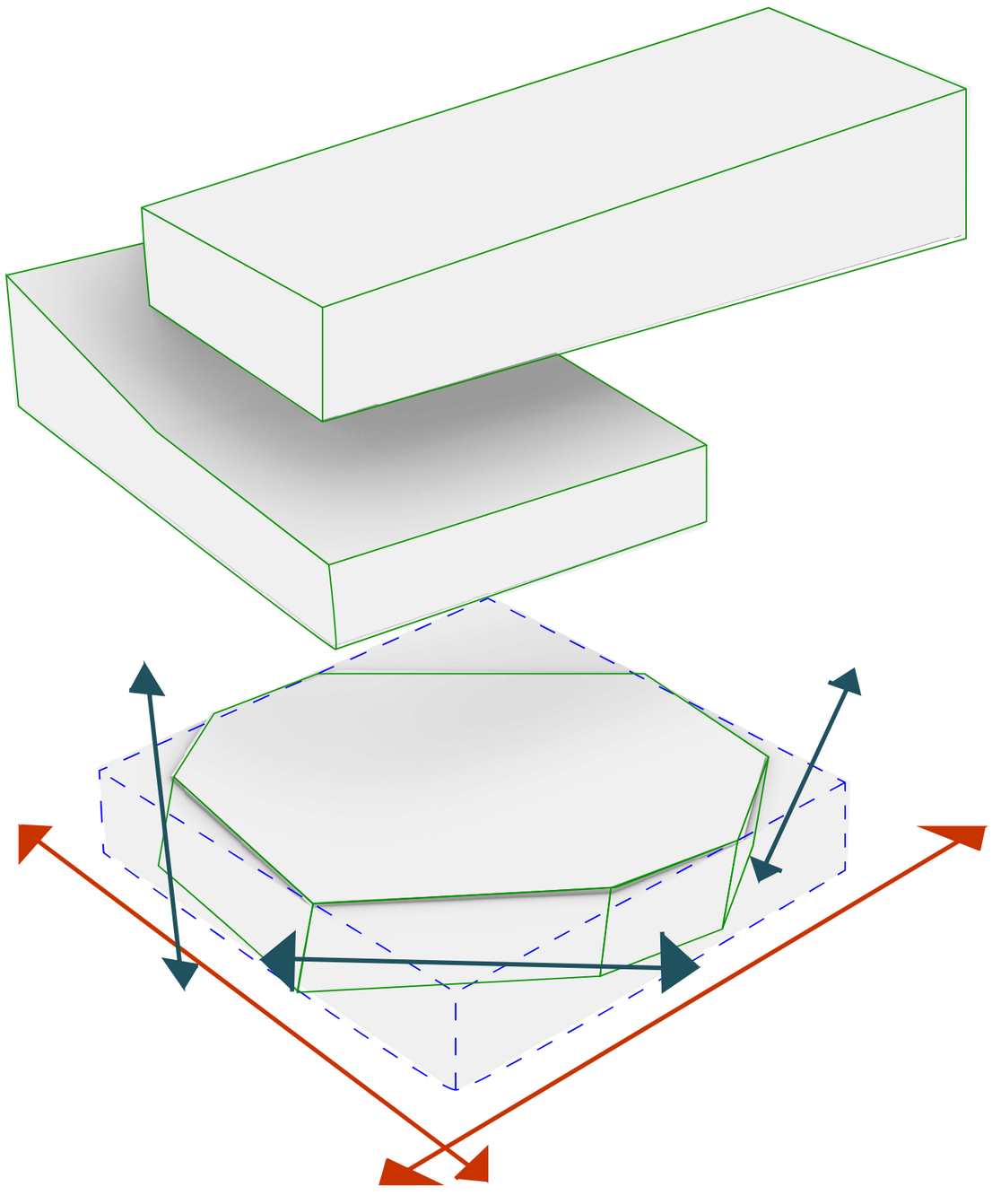
D. Kerouac Park

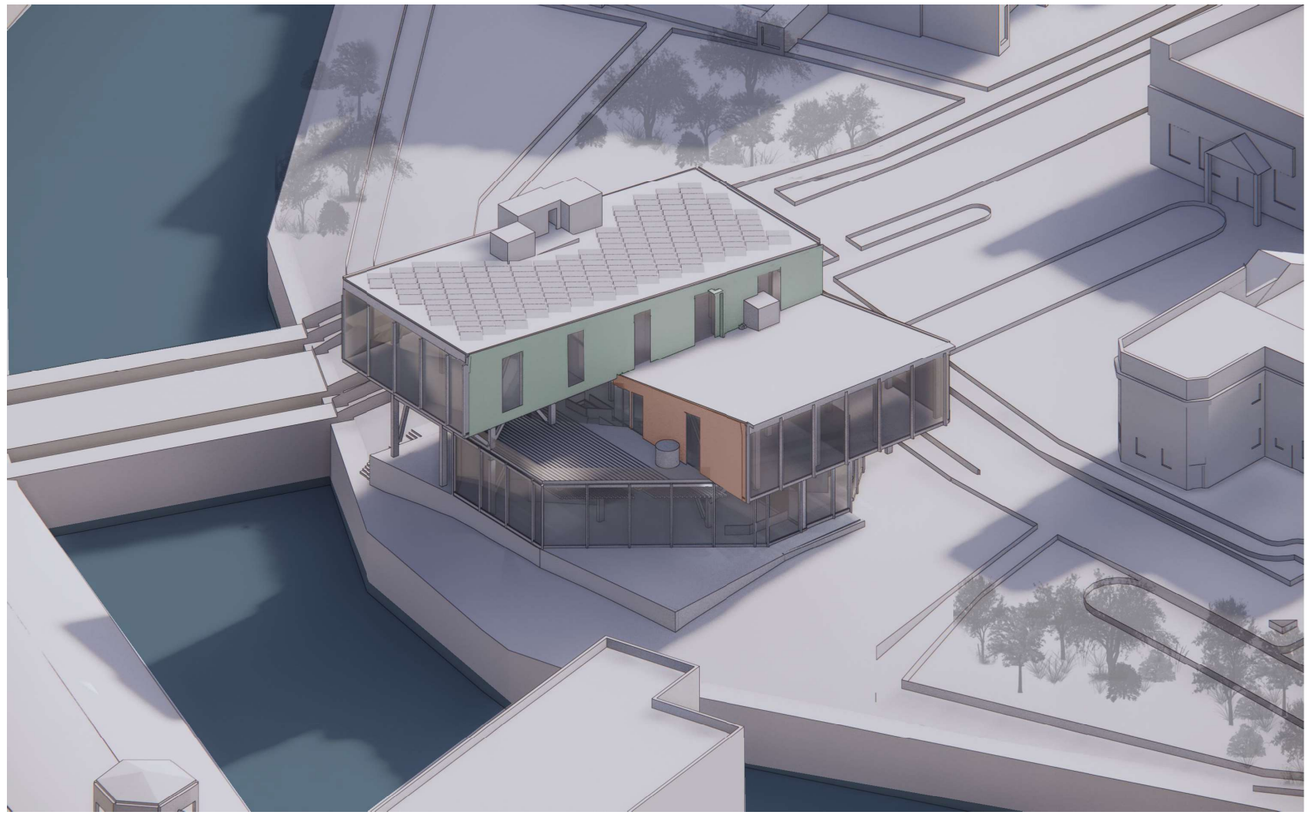
E. Lowell Memorial Auditorium Greenspace

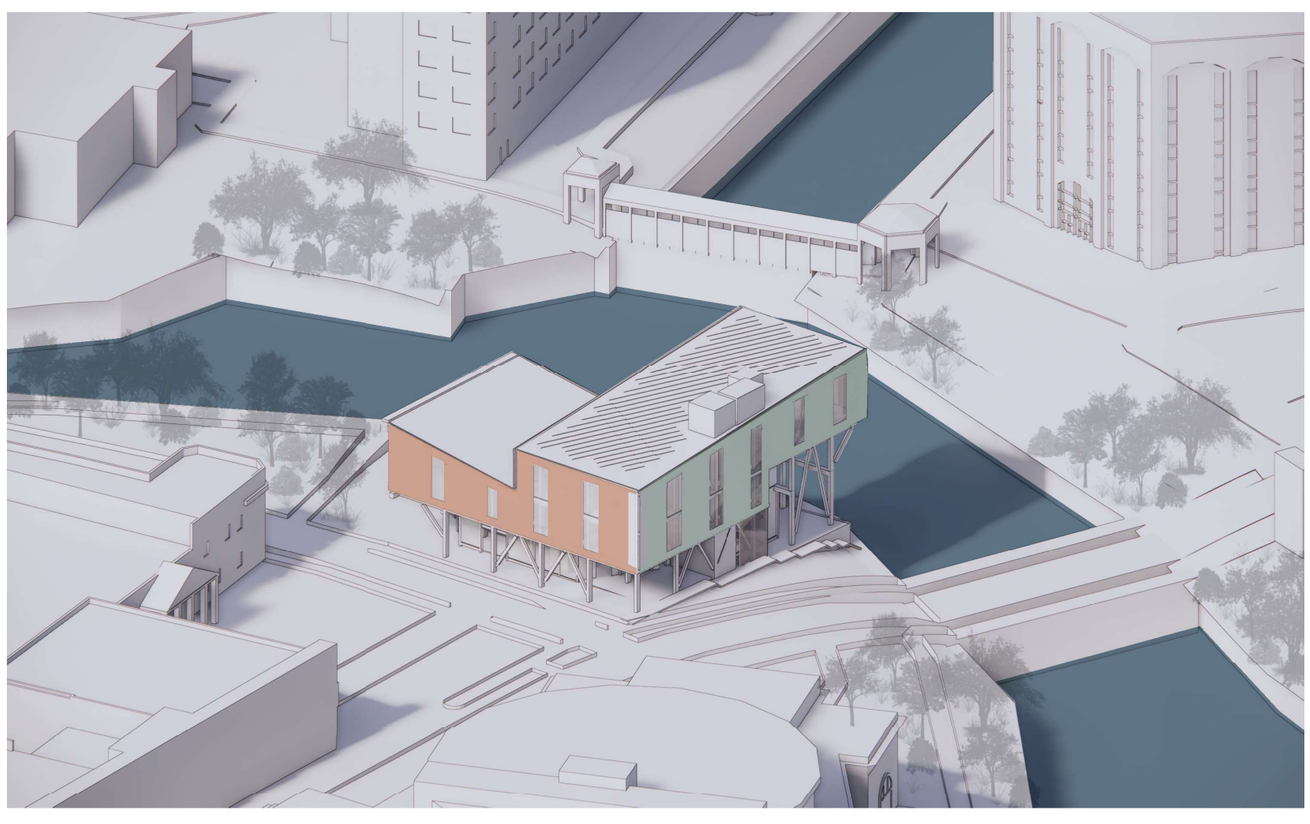
Overall Land Uses

- Plaza & Multipurpose
- Park & Green Space
- Concord River/ Canal
- Concord River Greenway

PHASE 4B | Final Form







PROGRAMMATIC GOALS

TO CHANGE WITH THE TIMES | WORKING TOWARDS A SUSTAINBLE FUTURE

In Relation to the Macro Context
The Location/Site:

To relate back to **Lowell's industrial roots** with an advancement/ improvement in sustainable technologies and practices due to current **sustainable conditions** and concerns.

In Relation to the Meso Context
The Building:

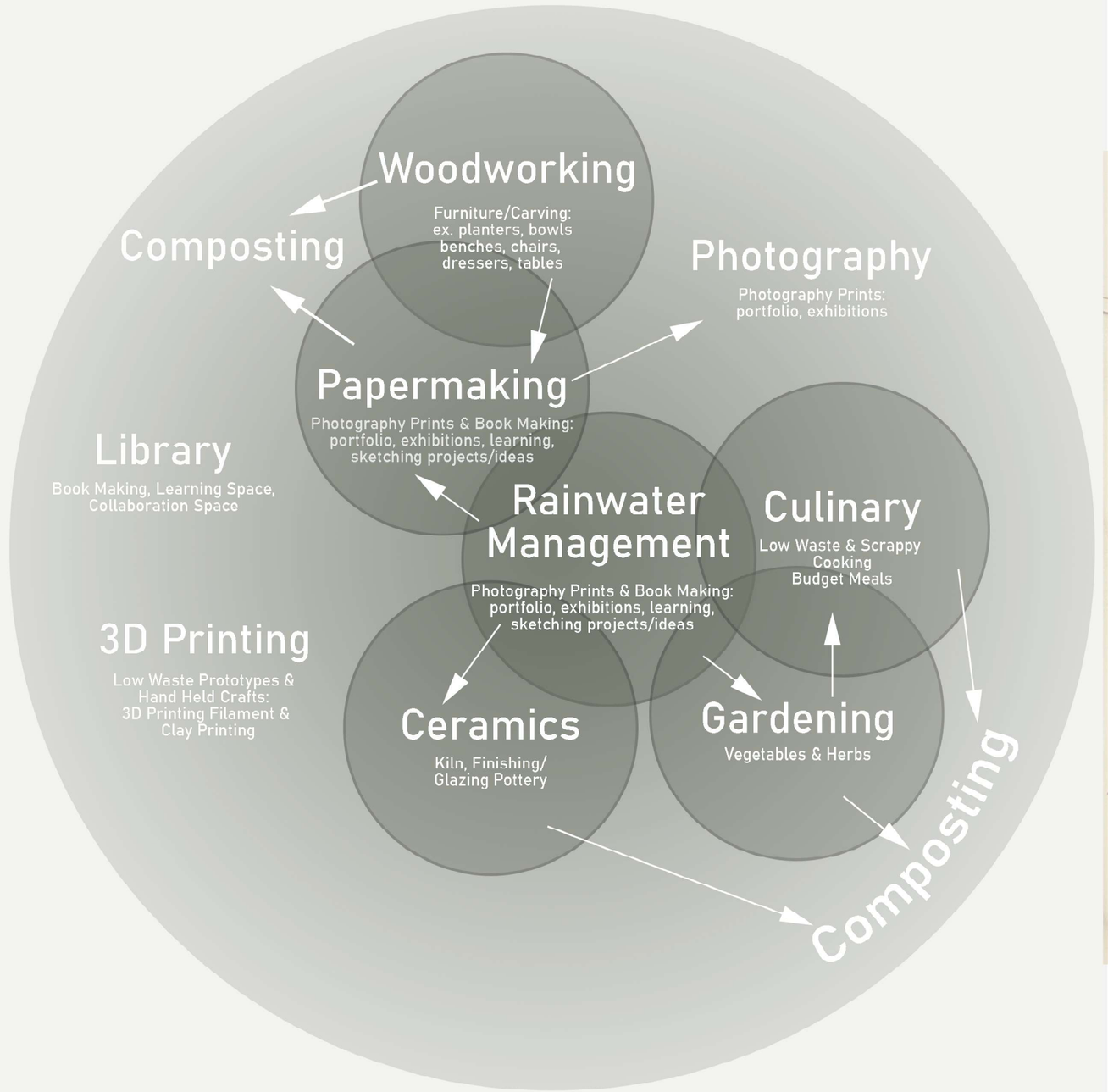
To support sustainable, low waste creative practices such as **woodworking; ceramics; 3D printing; gardening, rainwater management, compositing; paper making; photography, portfolio creating; and culinary/scrappy cooking courses**. Each set of programming becomes interconnected and supported through the act of reusing, reducing/minimizing, and recycling.

In Relation to the Micro Context
The Users:

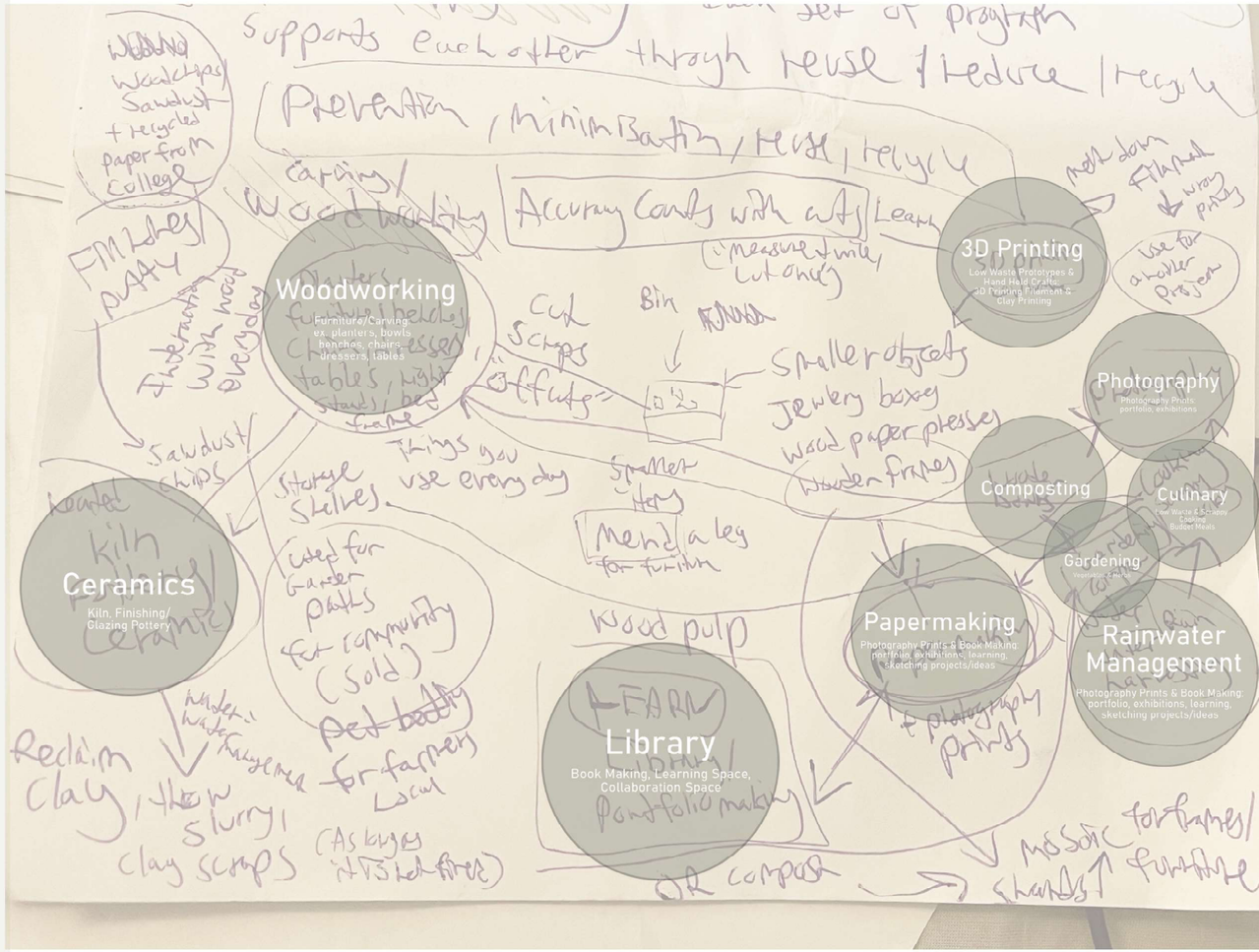
To educate the people of Lowell, and the surrounding communities, of sustainable, low waste living practices within their day-to-day lives and through the action of producing, exhibiting, and learning from others.

PROGRAMMATIC RELATIONSHIPS

INTERCONNECTIONS BETWEEN PROGRAM: Reusing, Reducing/Minimizing, and Recycling



"WASTE" RELATIONSHIPS



PLANS | Ground Floor

Ground Floor

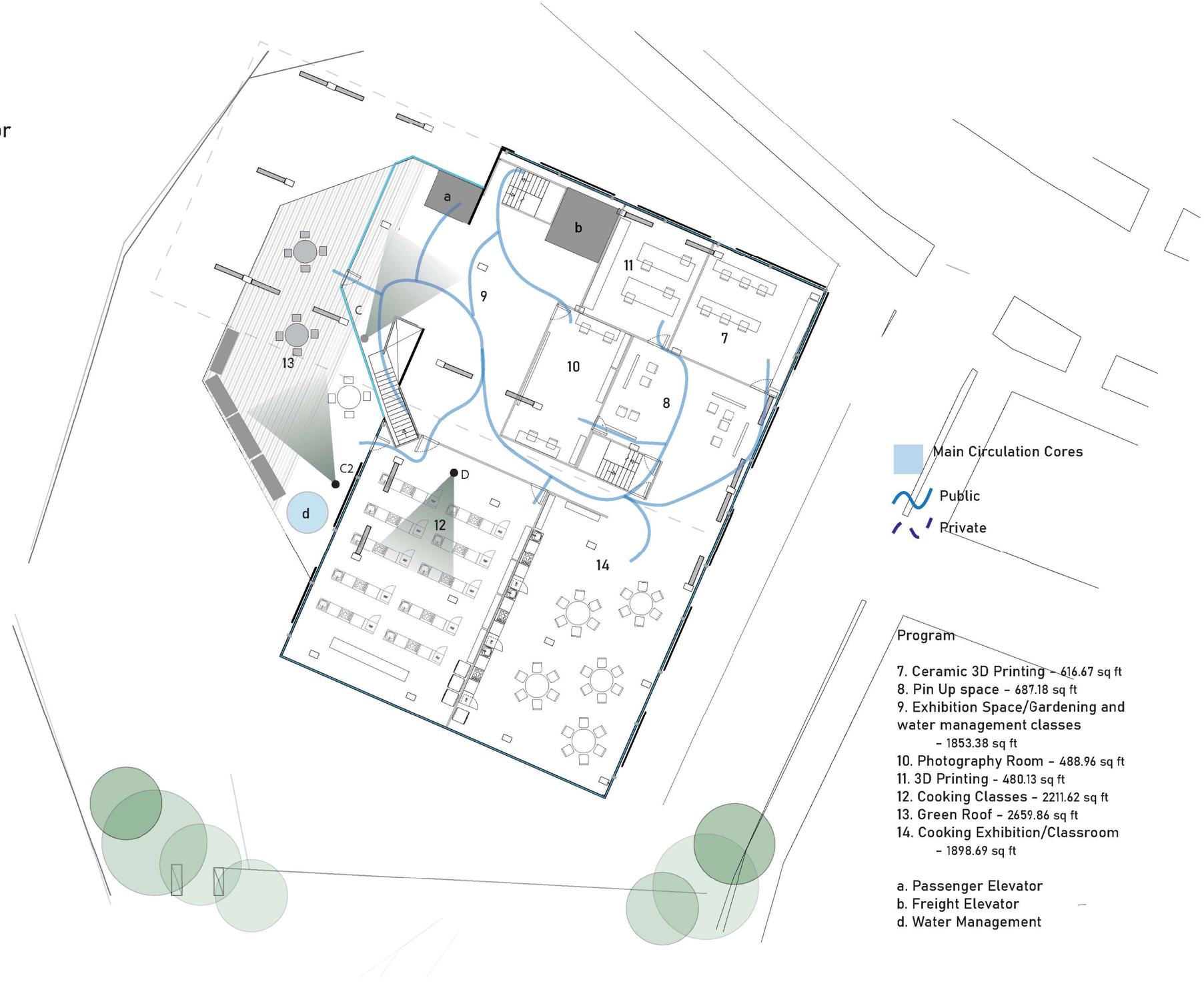
Program

1. Entrance/Reception Area - 337.02 sq ft
2. Gender Neutral Bathrooms - 120 sq ft Each
3. Locker Rooms -
    a. 212.87 sq ft
    b. 205 sq ft
4. Finishing Space - 269.70 sq ft
5. Wood Working Workshop - 3510.56 sq ft
6. Cafe/Gallery Space - 3258.42 sq ft

a. Passenger Elevator
b. Freight Elevator
c. Mechanical

PLANS | Second Floor

2nd Floor



Main Circulation Cores

Public

Private

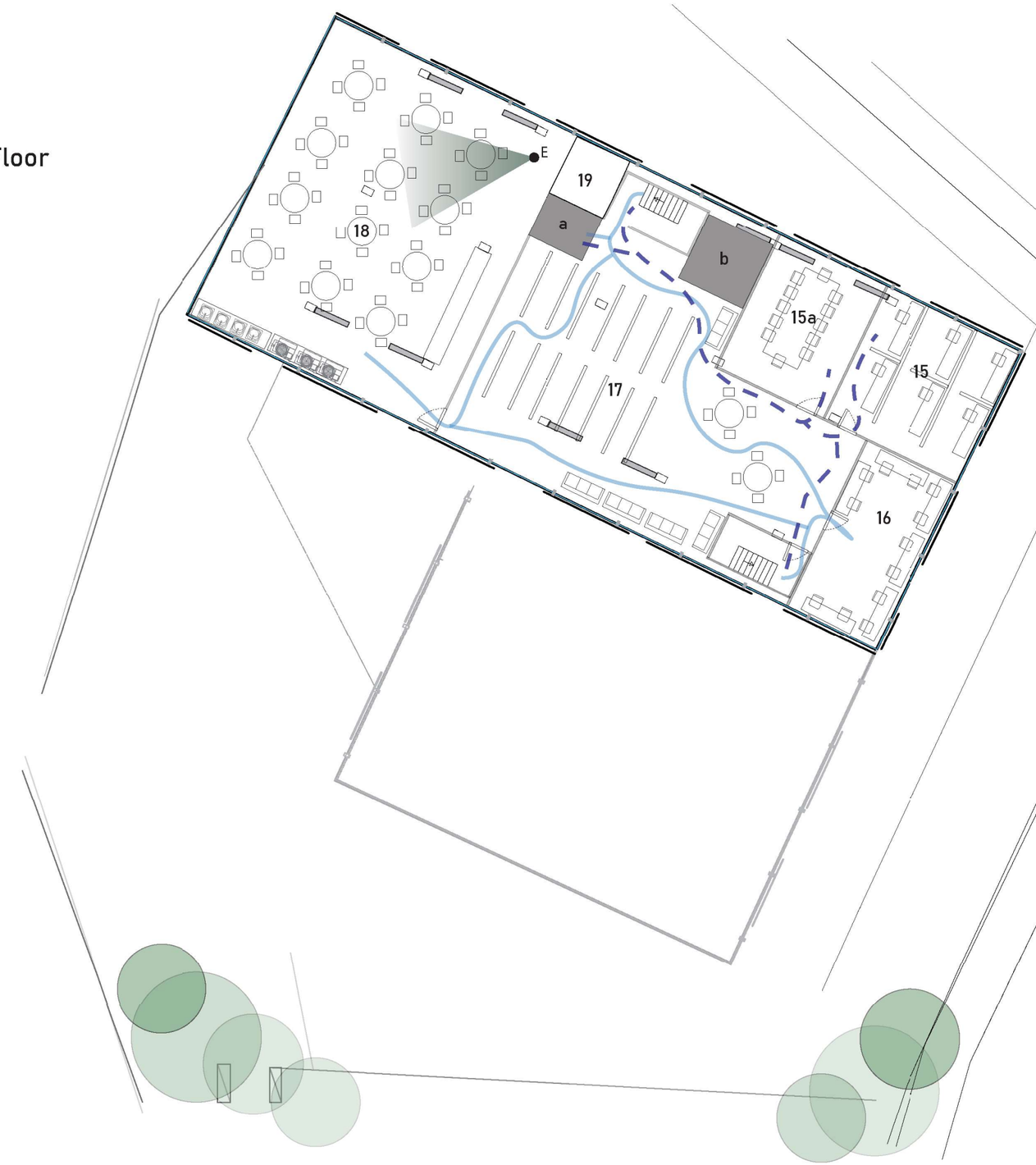
Program

7. Ceramic 3D Printing - 616.67 sq ft
8. Pin Up space - 687.18 sq ft
9. Exhibition Space/Gardening and water management classes
   - 1853.38 sq ft
10. Photography Room - 488.96 sq ft
11. 3D Printing - 480.13 sq ft
12. Cooking Classes - 2211.62 sq ft
13. Green Roof - 2659.86 sq ft
14. Cooking Exhibition/Classroom
   - 1898.69 sq ft

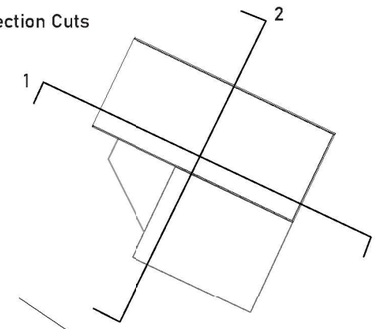
a. Passenger Elevator
b. Freight Elevator
d. Water Management

PLANS | Third Floor

3rd Floor



Section Cuts



Main Circulation Cores

Public

Private

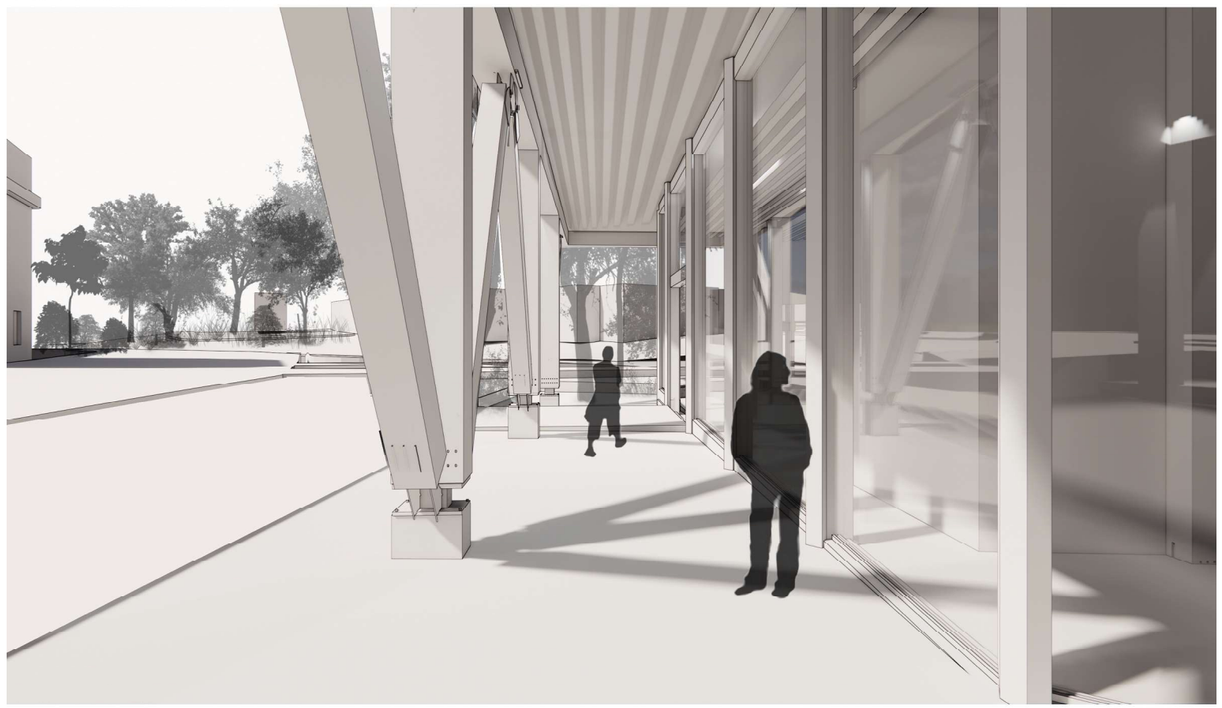
Program

15. Admin - 616.67 sq ft
15a. Admin-Conferance - 480.13 sq ft
16. Computer/Programing Lab
- 511.43 sq ft
17. Library and Multipurpose room
- 2556.04 sq ft
18. Pottery and Clay Room
- 2709.39 sq ft
19. Kiln

a. Passenger Elevator
b. Freight Elevator

PERSPECTIVE VIEWS OF SPACES

A. Exterior Covered Walk



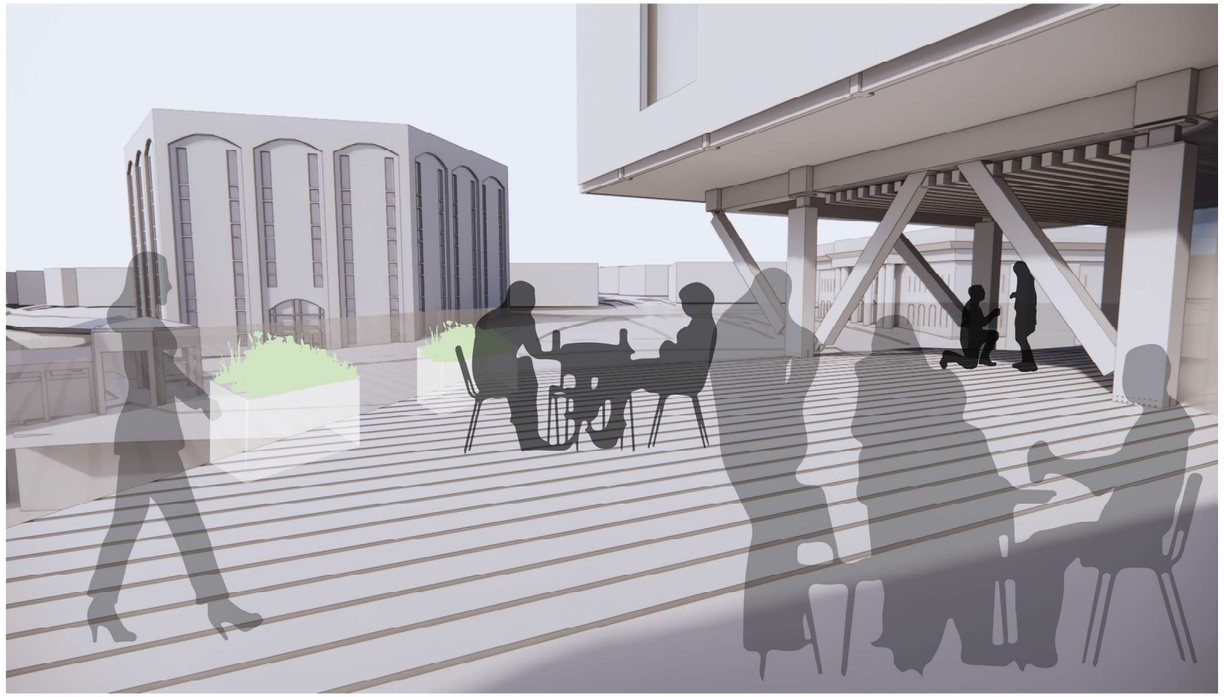
B2. Mixed Use Outdoor Space: Eating, Collaboration, Gallery, Learning Space

B. Interior Cafe/ Gallery Space

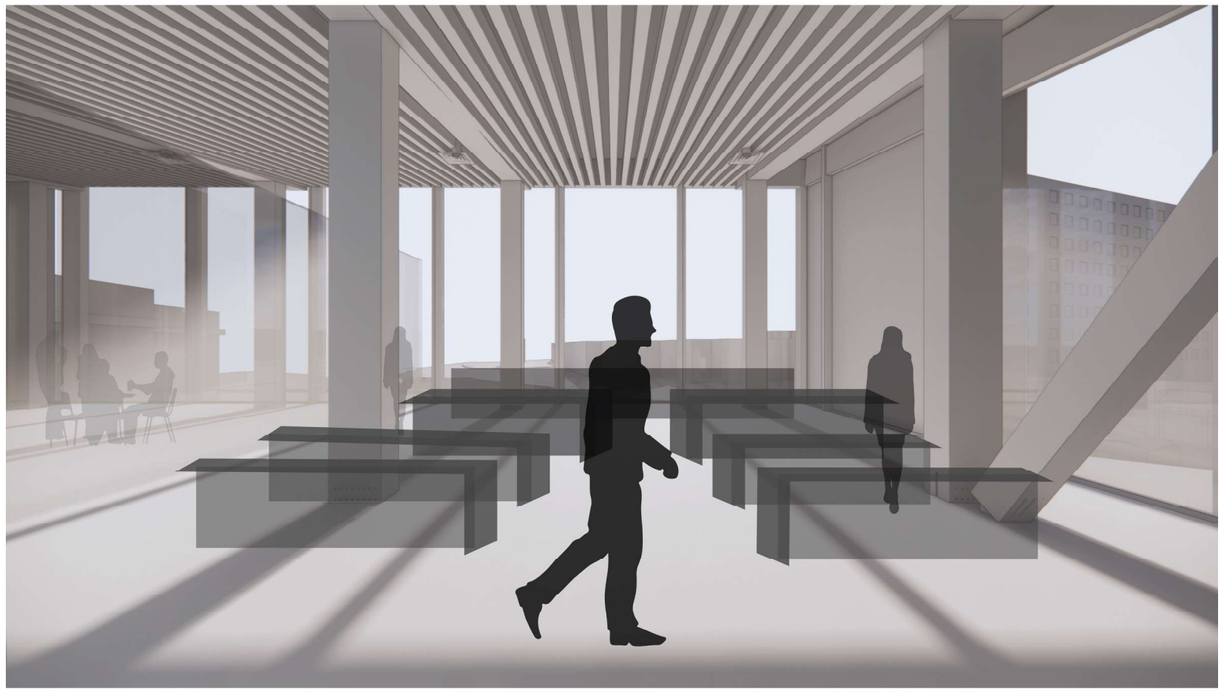
C. Exhibition, Photography & Gardening/Water Management Classes

PERSPECTIVE VIEWS OF SPACES CONT.

C2. Green Roof (Rainwater Management & Gardening Classes)

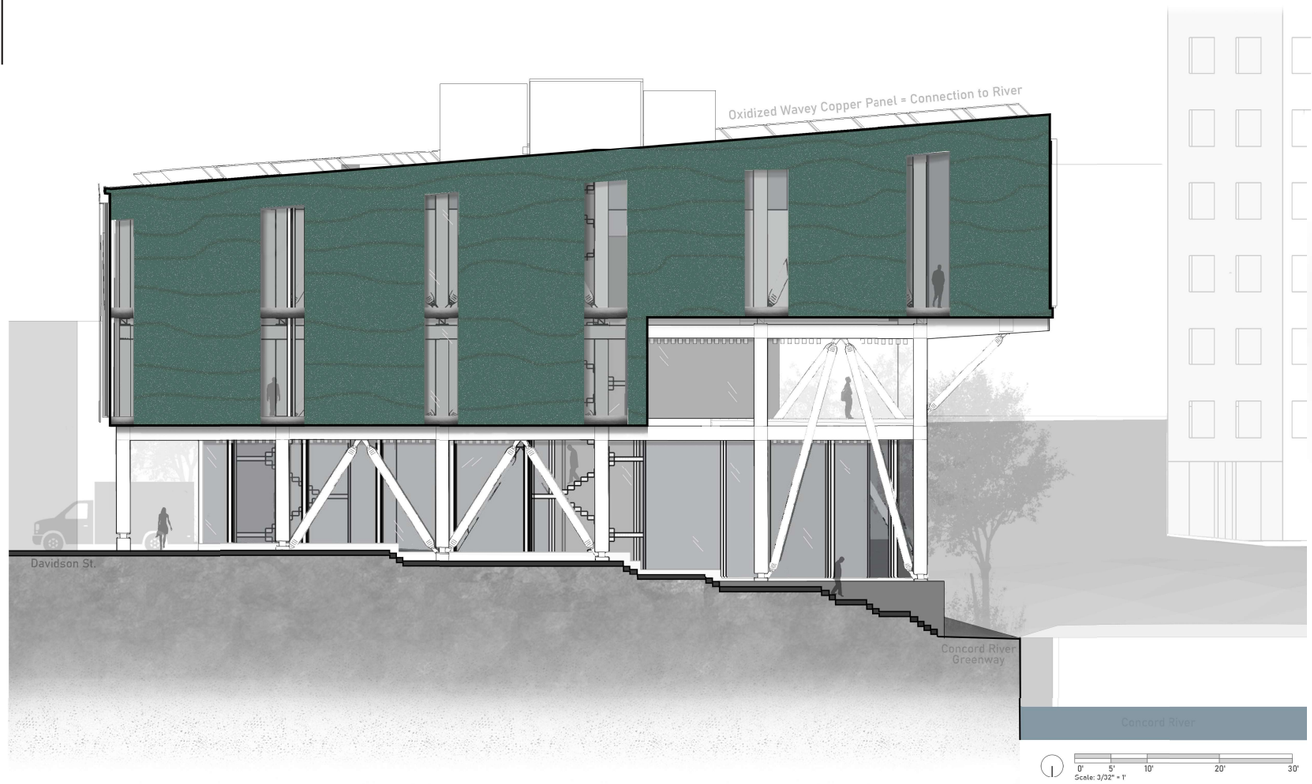


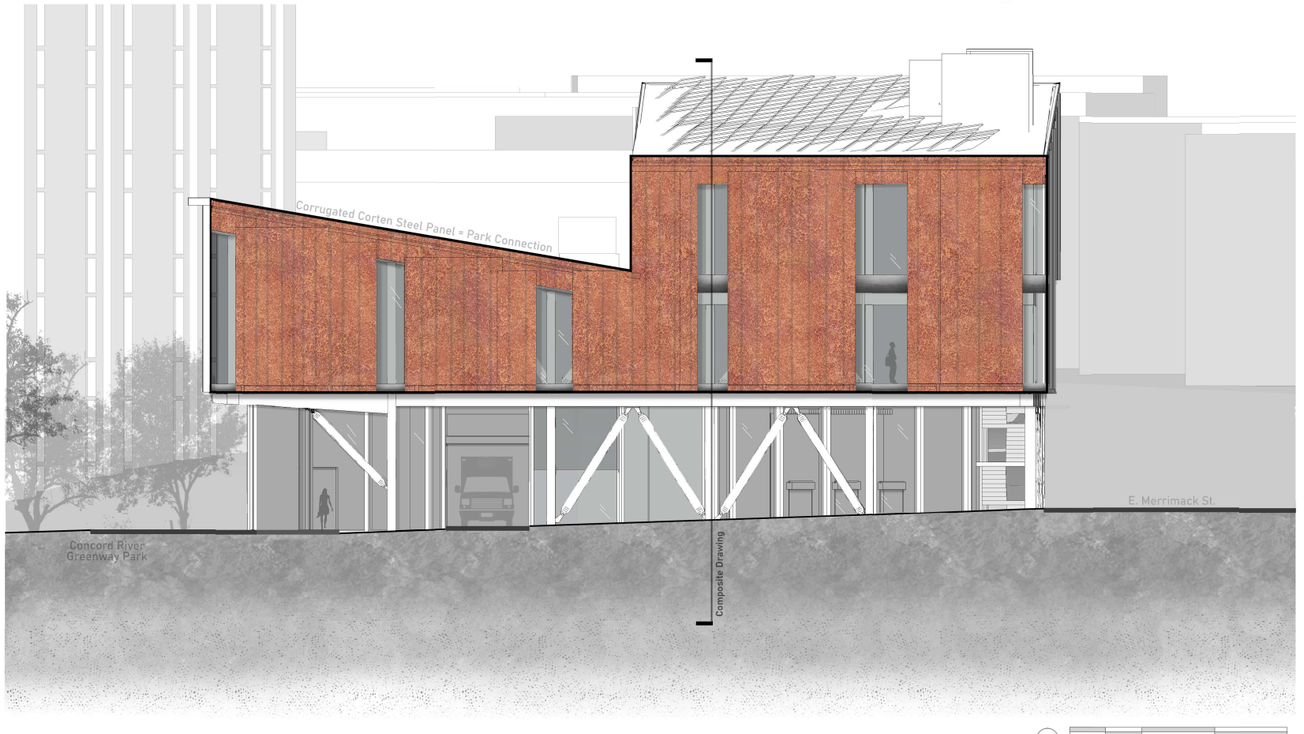
D. Cooking Classes



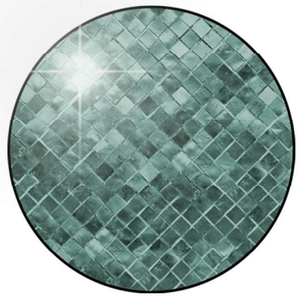
E. Ceramics Room

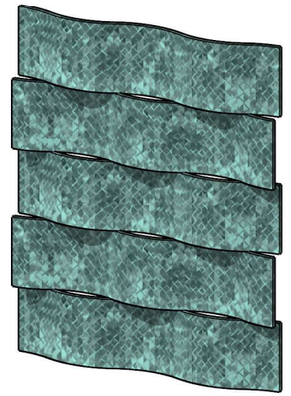
ELEVATIONS | Connection to Site Through Materials





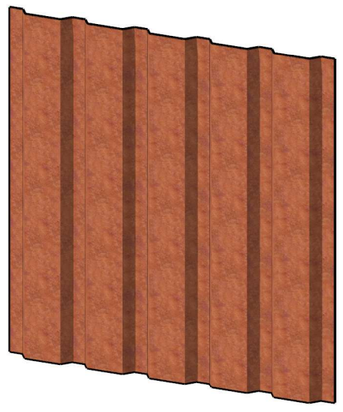
Panel Materials | Refer to Elevations





Oxidized Wavey Copper Panel =
Connection to Concord River

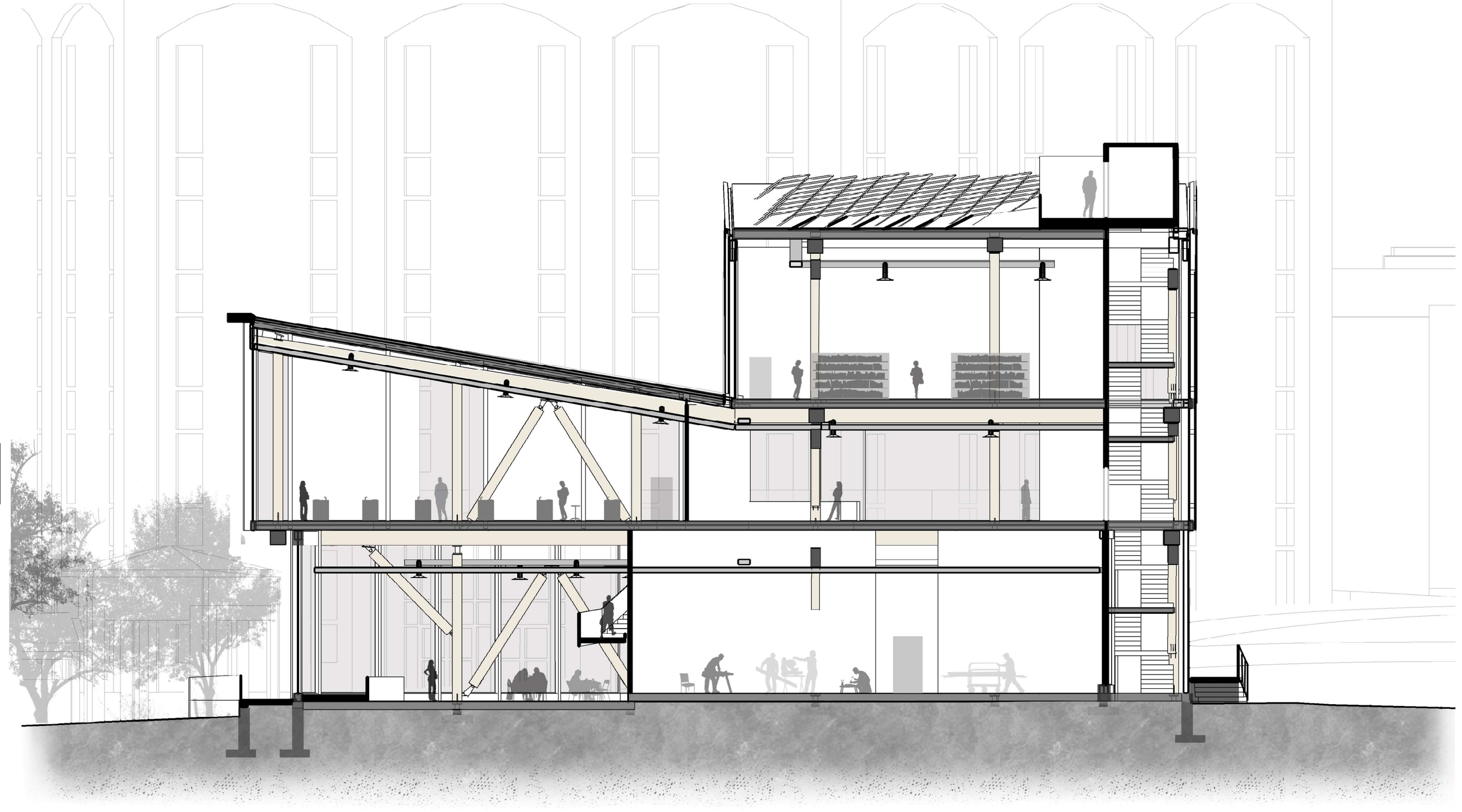
- Horizontal Directionality
- Resembles Water : Greenish Blue & Mosaic Reflections



Corrugated Corten Steel Panel =
Connection to Concord River Greenway Park & the Greenway

- Vertical Directionality
- Resembles Ground, Bark, Trees and Red Brick of Lowell : Brownish Red Tones

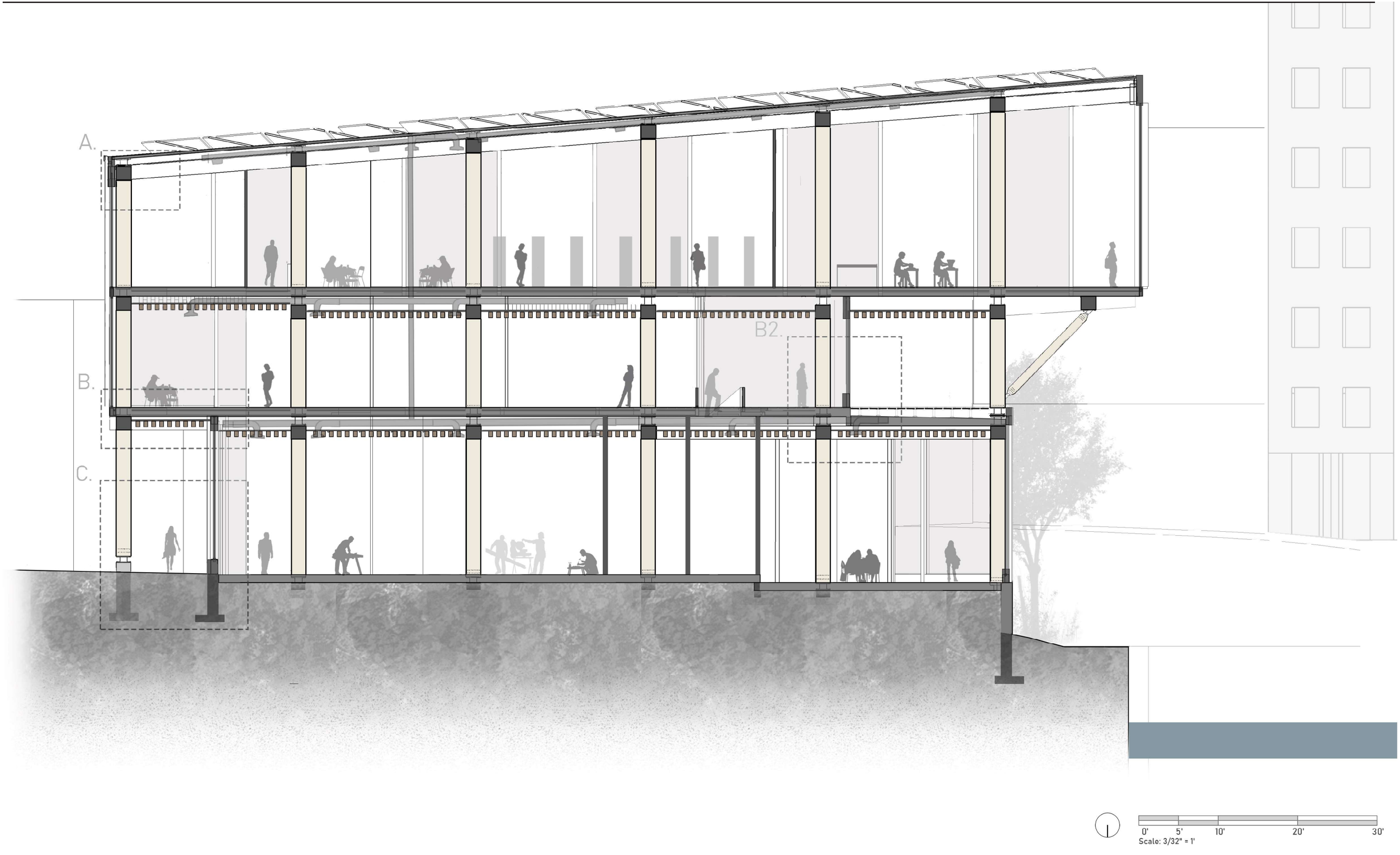
SECTIONS | Vertical Connections (Program)



0' 5' 10' 20' 30'

Scale: 3/32" = 1'

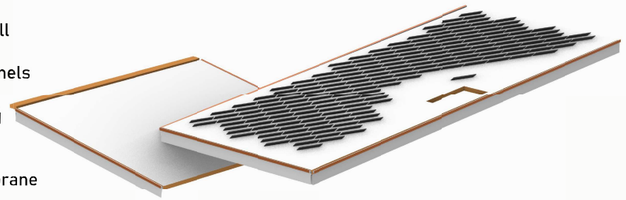
SECTIONS | Vertical Connections (Program) & **Detail Connections**



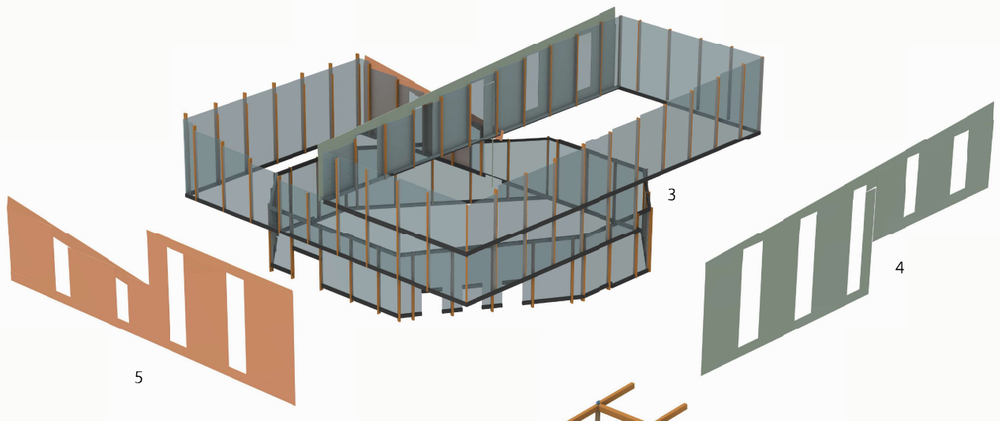
SYSTEMS | Intro to Systems, a Deeper Analysis

EXPLODED AXON

1. Footing and Frost wall
2. Structure and Circulation
   - Floor Plates
   - Beams
   - Columns
   - All clips and Connectors
   - Window Sills
   - Stairs
   - Elevator
3. Curtain Wall
   - Glass
   - Mullions
   - Curtain Wall
4. Copper Panels
5. Corten Steel Panels
6. Roof
   - Roof Siding
   - Wood Roof
   - Insulation
   - Roof Membrane



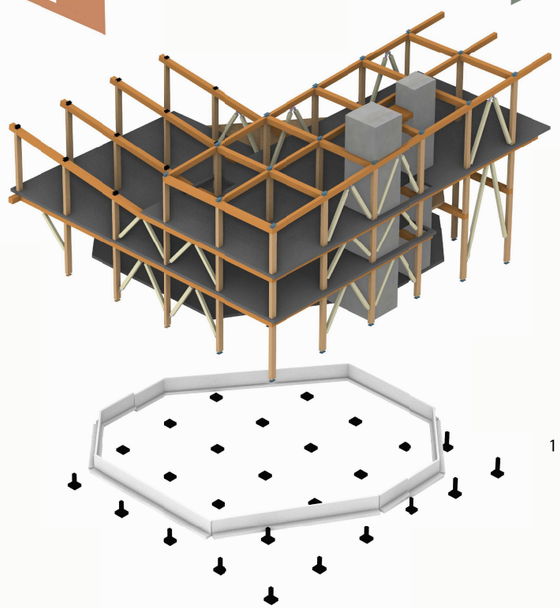
6.



3

4

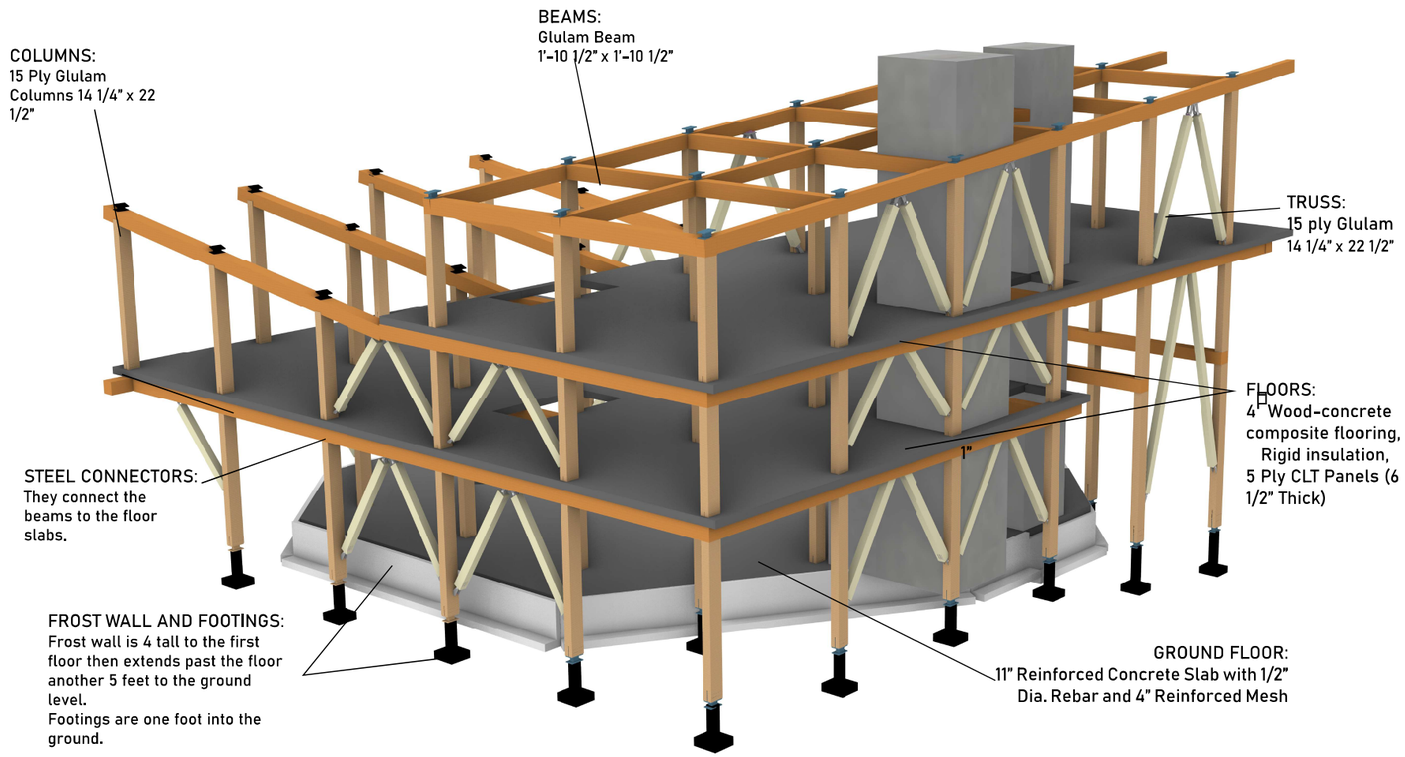
5

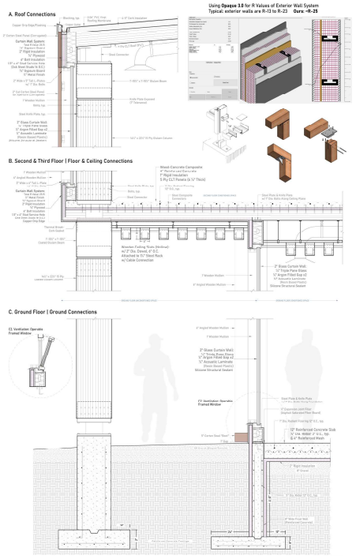


2

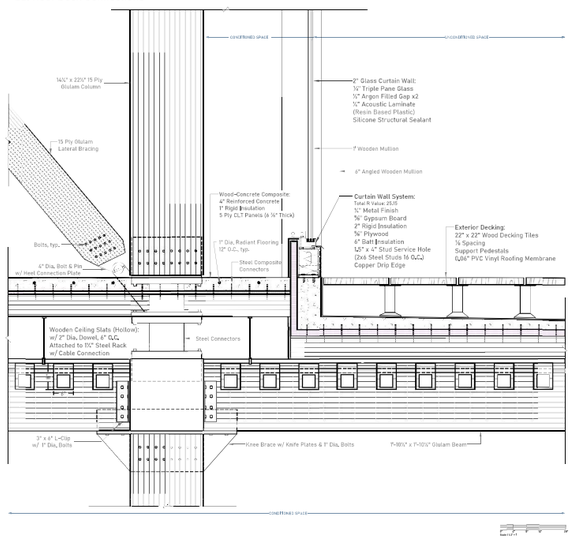
1

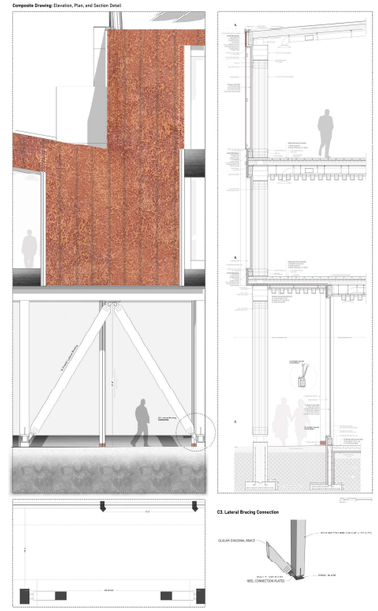
SYSTEM: STRUCTURE



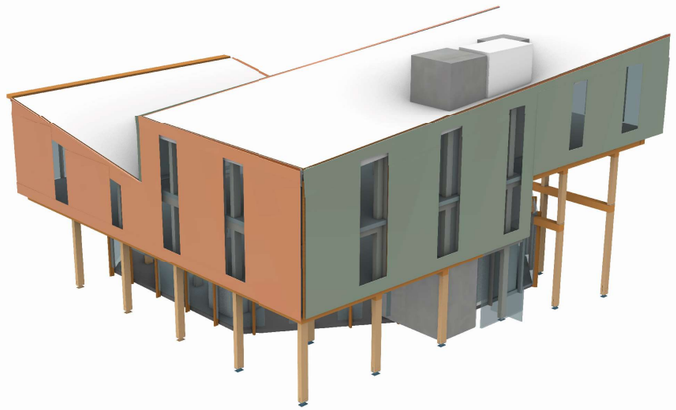


Refer to Boards!*





SYSTEM: ENCLOSURE

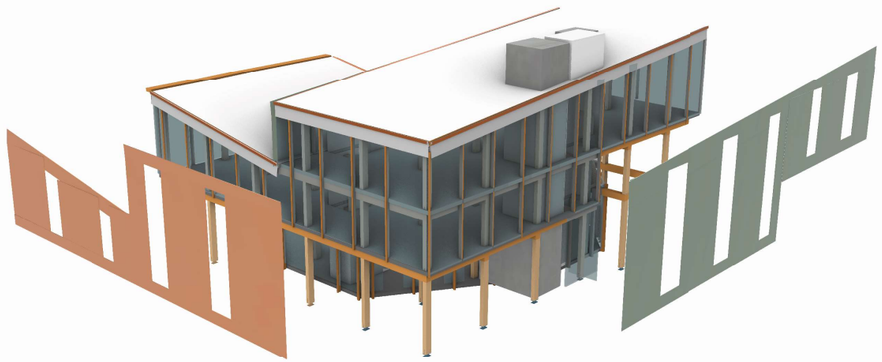


SLANTED ROOF:
The slanted roofs are there to help with the drainage of rainwater. Within the roof there is a layer of thin copper, a layer of insulation and, a thinner layer of roofing membrane. The slanting relates to the site context: the Concord River & the Concord River Greenway Park.

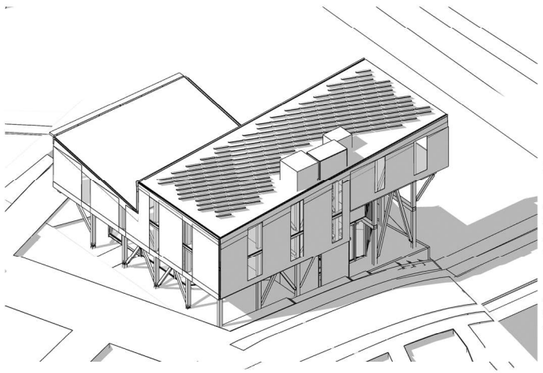
METAL PANELS:
Apertures added to allow for natural light and views to the outside.
Corten Steel = Earth, ground, the park nearby, and the bricks of Lowell; Oxidized Copper= greenish blue, relates to Concord river

CURTAIN WALLS:
Used throughout the entire building for natural lighting, ventilation, and views out into the context. Using curtain walls became a way to accentuate the structural systems
(Mullions, columns, and the floor).

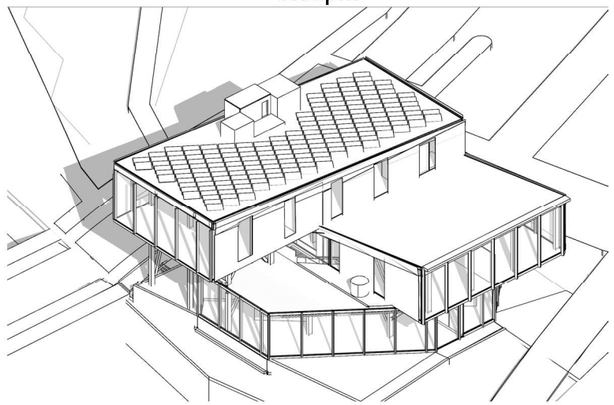
The Metal Panels are pulled off of the curtain walls so you can see that there is full glass curtain walls behind. The cutouts in the Panels are in line with the columns as well.



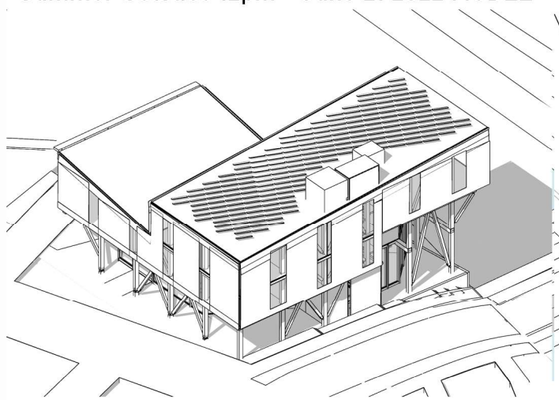
Vernal Equinox 12pm - March 21 2022 MODEL



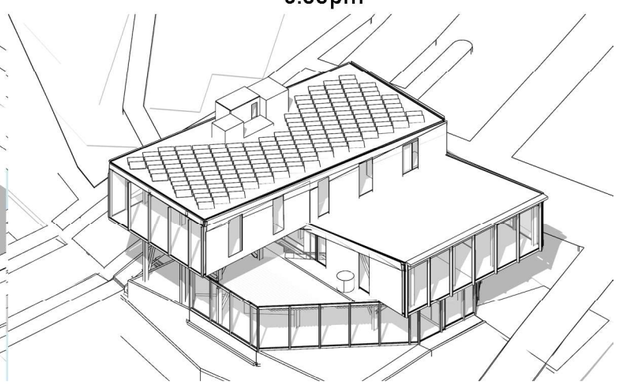
5:00pm



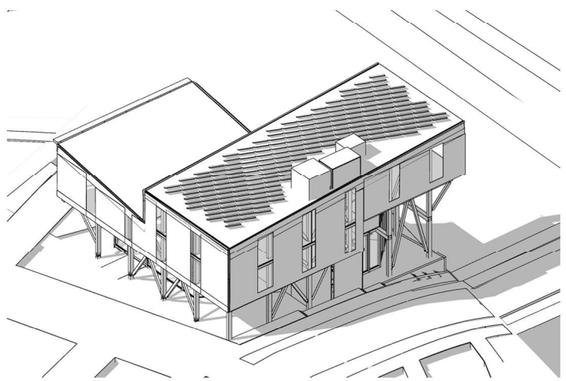
Summer Solstice 12pm - June 21 2022 MODEL



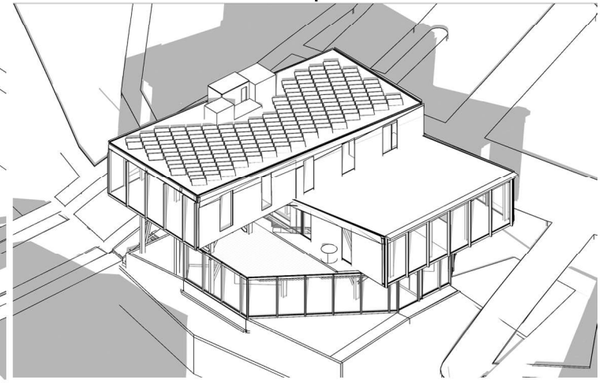
6:00pm



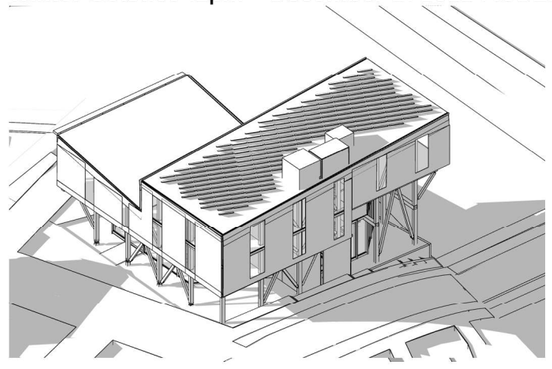
Autumnal Equinox 12pm - September 23 2022 MODEL



6:00pm



Winter Solstice 12pm - December 21 2022 MODEL

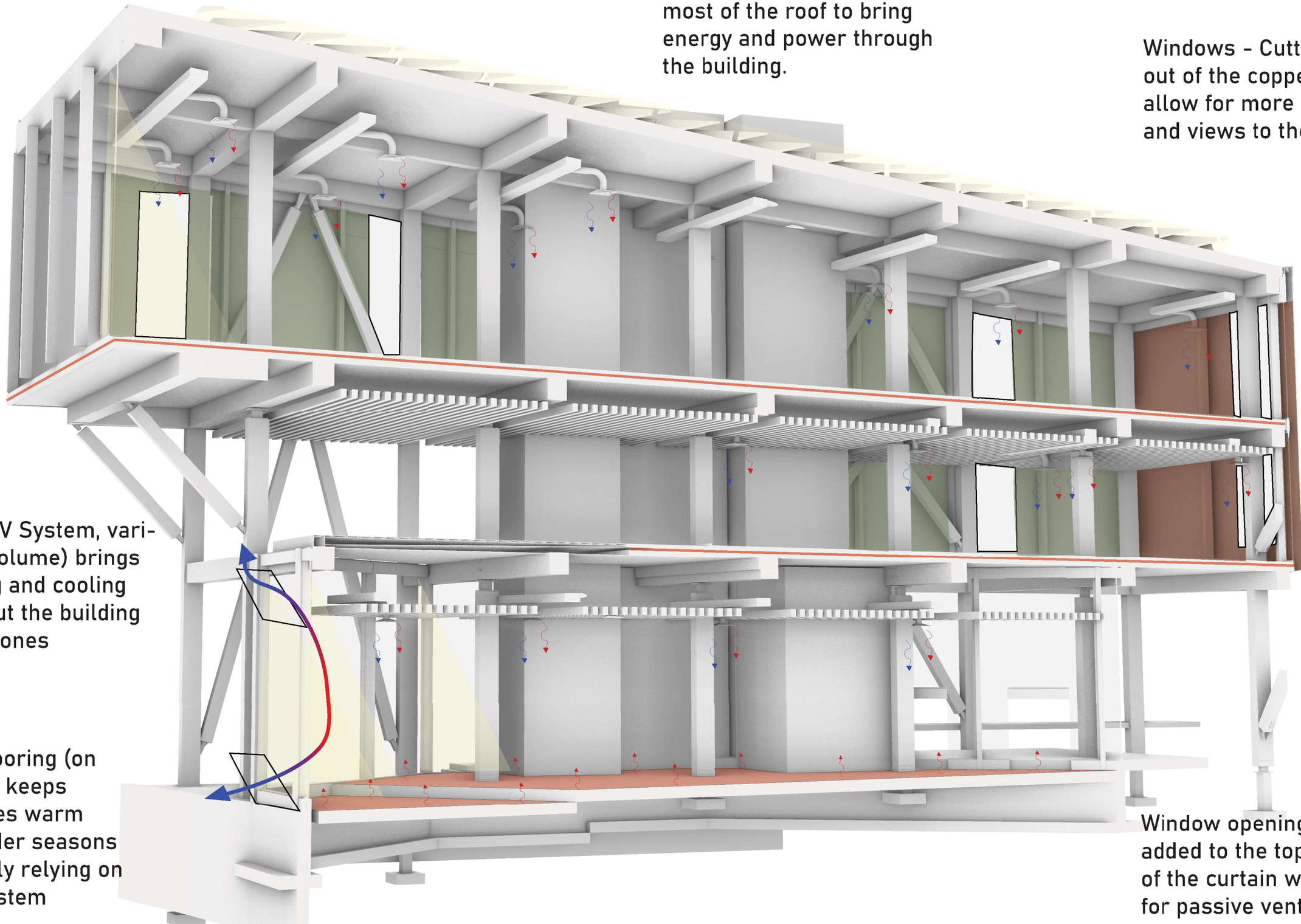


3:00pm

SYSTEM: PASSIVE AND ACTIVE

Solar Panels -
Solar panels are along most of the roof to bring energy and power through the building.

Windows - Cutting apertures out of the copper panel will allow for more natural light and views to the outside.



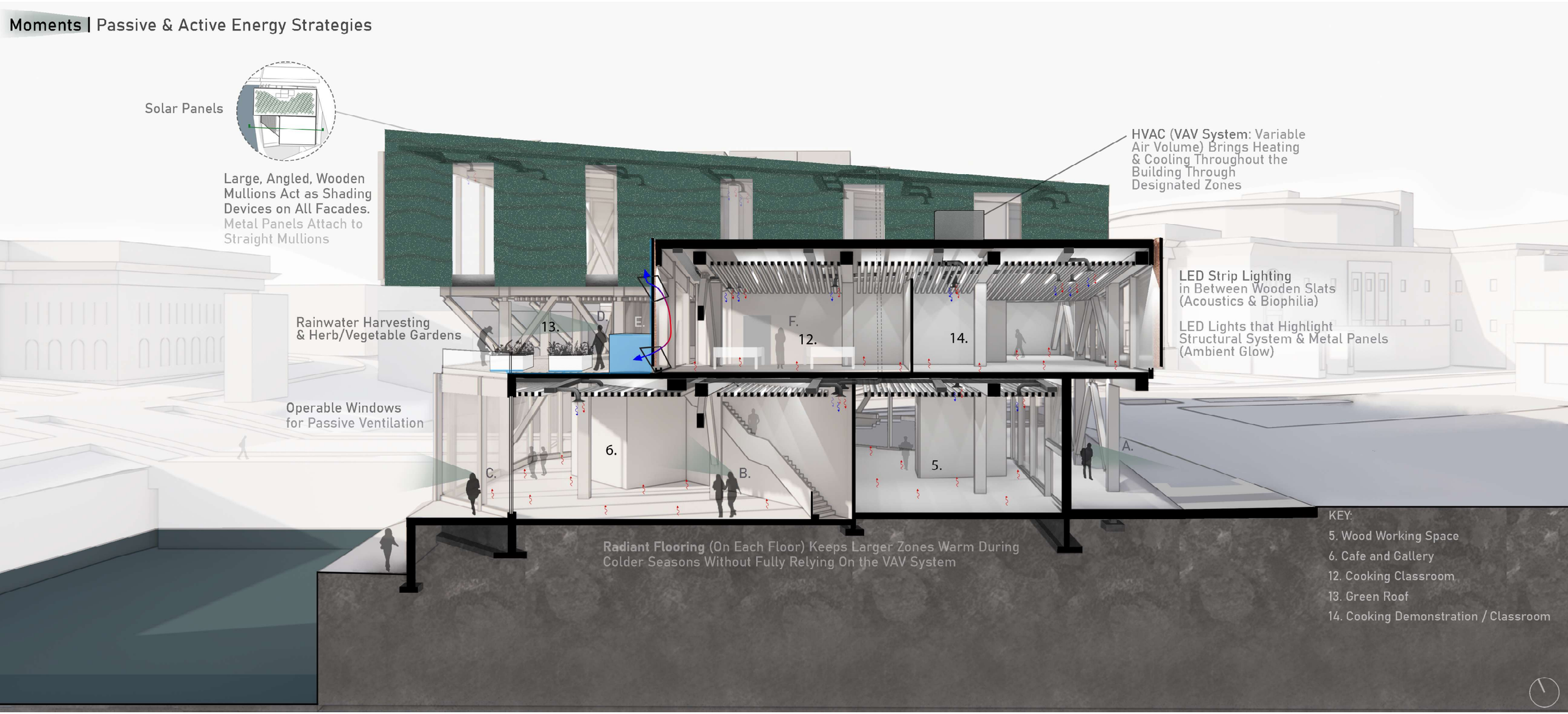
HVAC (VAV System, variable air volume) brings in heating and cooling throughout the building through zones

Radiant Flooring (on each floor) keeps larger zones warm during colder seasons without fully relying on the VAV system

Window openings will be added to the top and bottom of the curtain wall to allow for passive ventilation

SECTION PERSPECTIVE | Collaboration of Systems, a Part of a Larger Whole

Moments | Passive & Active Energy Strategies



THANK YOU!

ALYSSA & OLIVIA
RUN ON DUNKIN'