IN THE DIRECTION OF CHANGE

TEAM DUNKIN': ALYSSA HILL & OLIVIA LARE **PROFESSOR PIERMARINI** 08 August 2022

MANIFESTO:

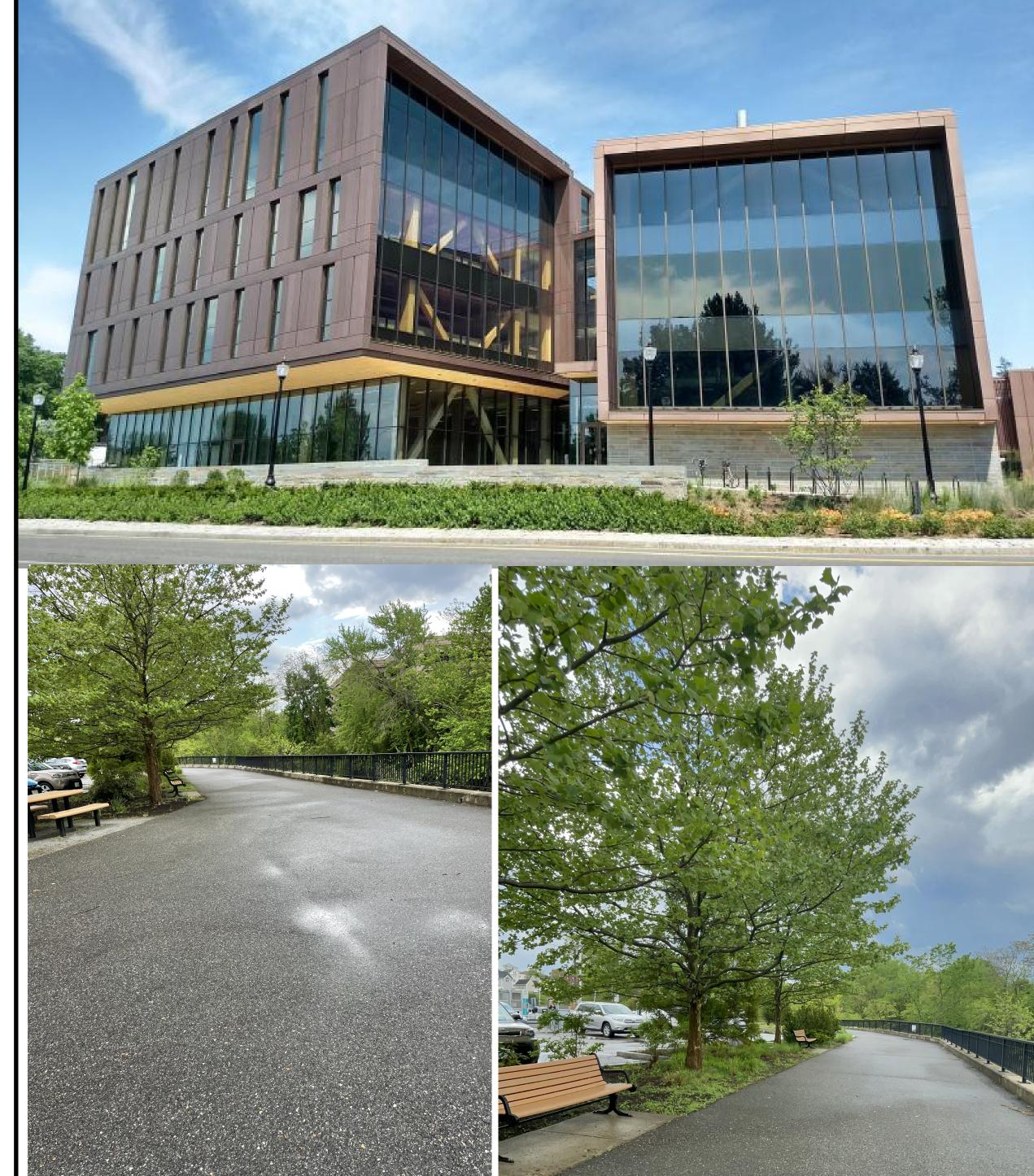
Concept:

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.



KEY:

Plaza & Multipurpose

Park & Green Space

Concord River/Canal

--- → Concord River Greenway

0' 50' 100' 200

Scale: 1" = 150'

200'

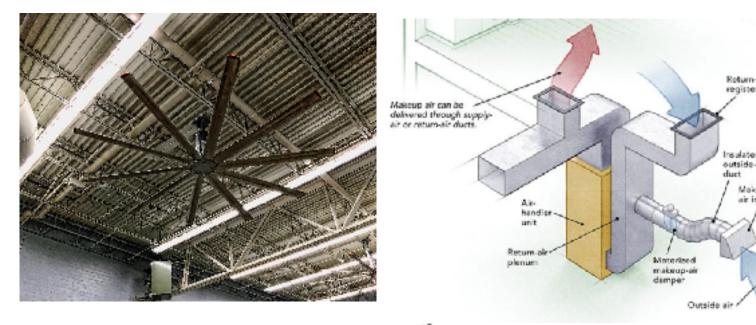
ACTIVE SYSTEM | RESEARCH

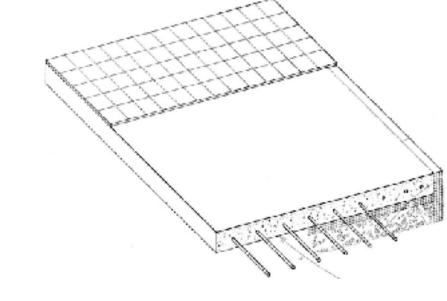
Ceiling fans helps with the cooling and ventilation thoughout the space.

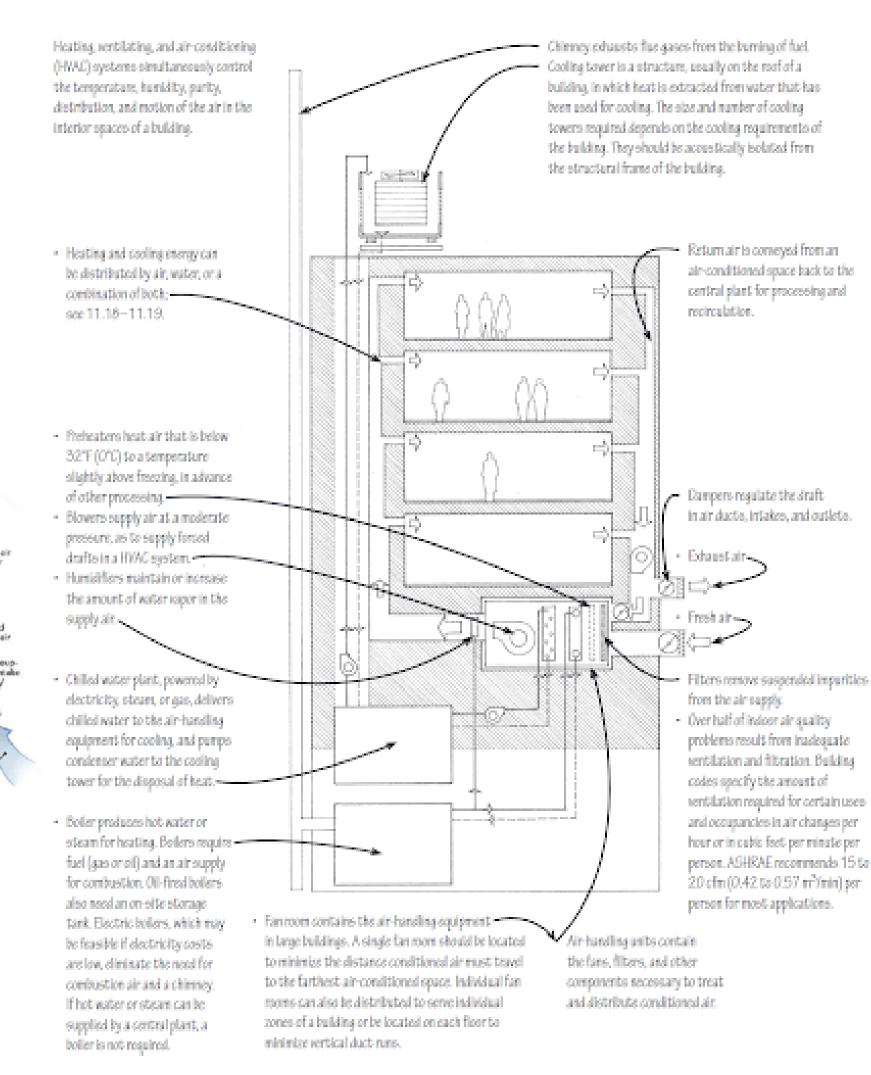
Radiant floor heating helps with the heading and cooling of an entire building.

Ductwork System - (Forced Air) -Ductwork runs up through building & can be exposed as it is distributed horizontally through the floors -Provides heating (and cooling) -Provides fresh air

-Is under thermostatic control, gives local temperature control.







Parks/Outdoor Spaces Site Plan | Physical Site Connections & Important Outdoor Spaces A. Concord River Greenway Park B. Lower Locks Plaza C. Eastern Canal Park . Kerouac Park Lowell Memorial Auditorium Greenspace **Overall Land Uses**

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SITE CONNECTIONS

PASSIVE SYSTEMS | RESEARCH

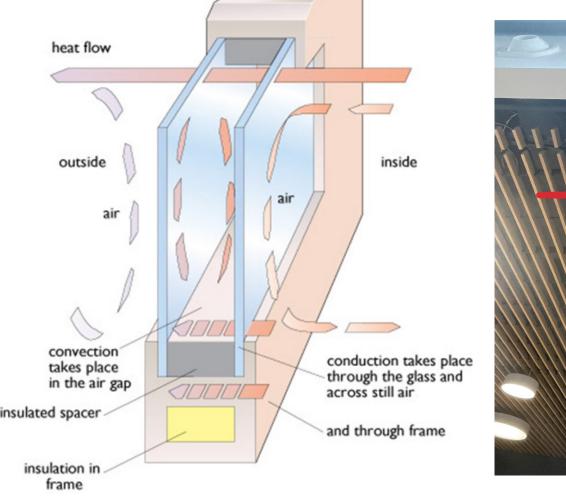
Using argon or krypton in the air space between the two panes of glass provides further insulation, as these gasses are denser than air and less likely to let heat conduct through the wall.

When 90% argon gas fill is used instead of air, the window's u-value can be improved by up to 16%. Similarly, krypton improves the u-value up to 27%.

Horizontal copper panels with open slits, to keep views to the outside as well as helping with sun shading.

Wood slat ceilings to hide duct work while still making the rom feel open it also add to the acoustics







^ Northeastern Interdisaplinary science and engineering complex



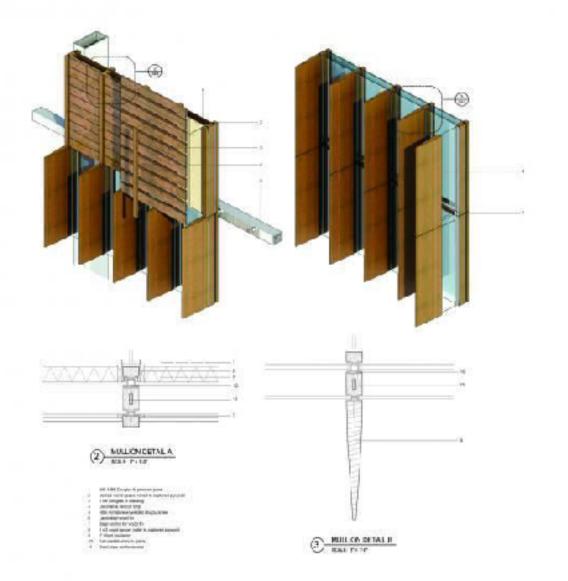
SITE

ENCLOSURE | RESEARCH

MATERIALS CHOSEN TO USE IN OUR: - Copper Panel (Oxidized and Regular) - Tinted Glass Wooden Mullians

REASONING:

Oxidized panels to match colors from the river, regular panels for rusty brick to match surrounding areas, tinted glass walls for reflection and glare reduction lined with wooden mullians at an angle for natural shading for the sun

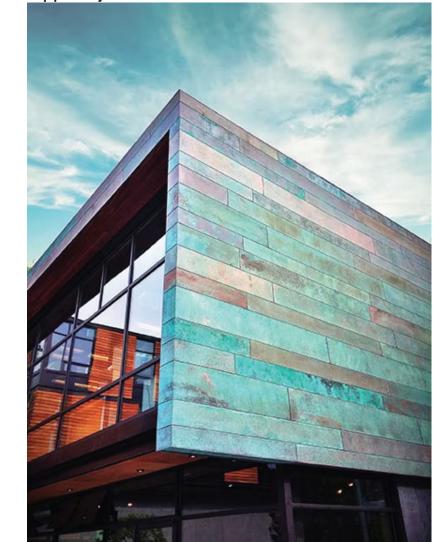




^ Oregon State University College of Forestry (OSU Forest Science Complex)



[^] Columbus Museum of Art, Margaret M. Walter Wing by DesignGroup, Columbus, Ohio - Copper by Zahne



PROGRAMMATIC GOALS TO CHANGE WITH THE TIMES | WORKING TOWARDS A SUSTAINBLE FUTURE



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



To support sustainable, low waste creative practices such as woodworking;



· · · / · / · · ·

-

and concrete surface

Projection – ½1

Thickness of footing -

Midth of fosting = 2

or frost penetrates the ground.

→ 12"(305)

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.



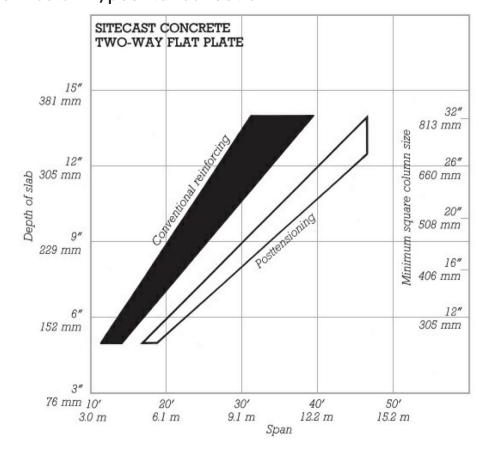
To educate the people of Lowell, and the surrounding communities, of sustainable, low waste living practices within their day-to-day lives and through the action of producing, exhibiting, and learning from others.

STRUCTURE | CONCRETE

CHOSEN TO USE IN OUR: - Floors, (Wood-Concrete Composite) - Reinforced Foundation Slab w/ Spread Footings.

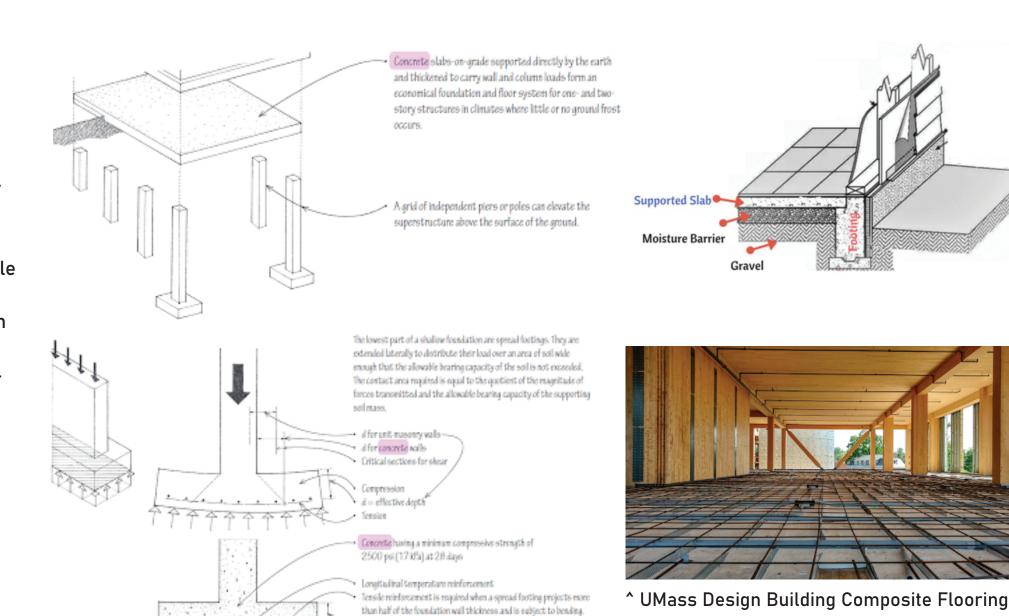
REASONING:

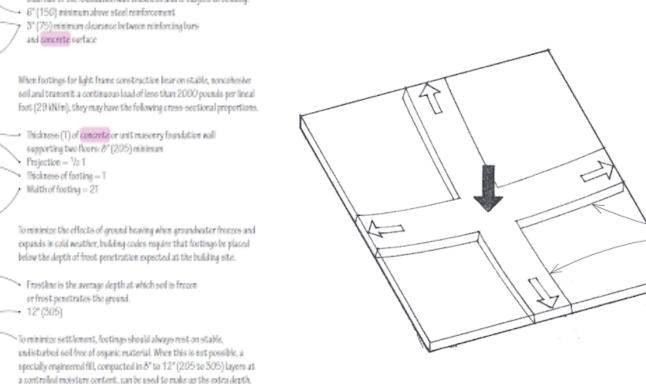
As a Plate Structure: Plate structures are rigid, planar, usually monolithic structures that disperse applied loads in a multidirectional pattern, with the loads generally following the shortest and stiffest routes to the supports. A common example of a plate structure is a reinforced concrete slab. 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

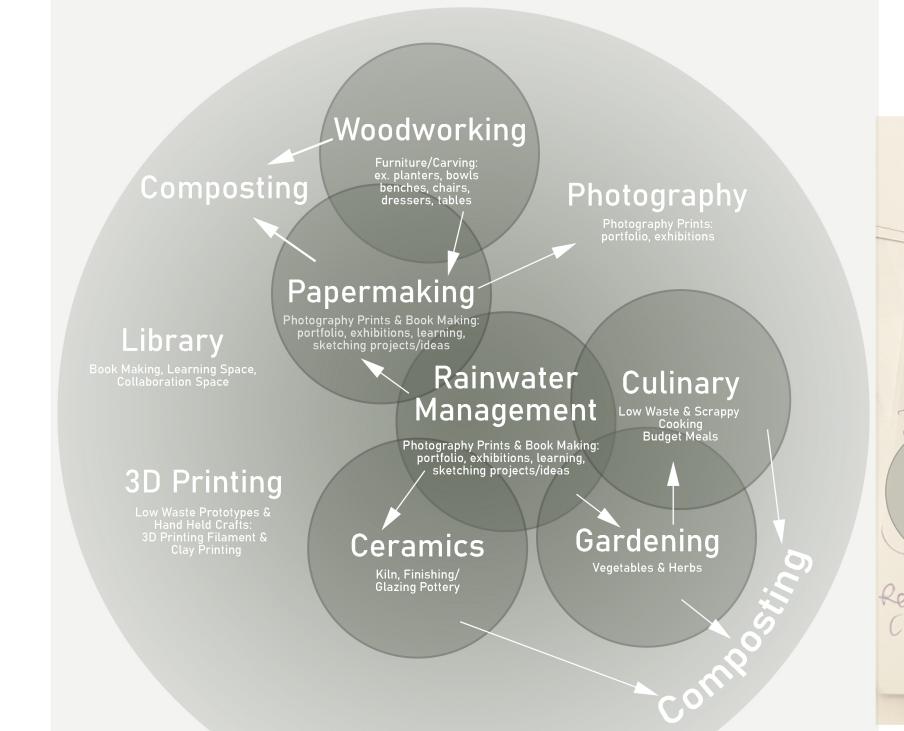
The shallow depth of the junction between the slab and the column in flat plate construction restricts the minimum column size in this system. The right-hand scale on the chart above provides minimum square column sizes for various slab thicknesses. The required minimum column sizes for this system also 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).



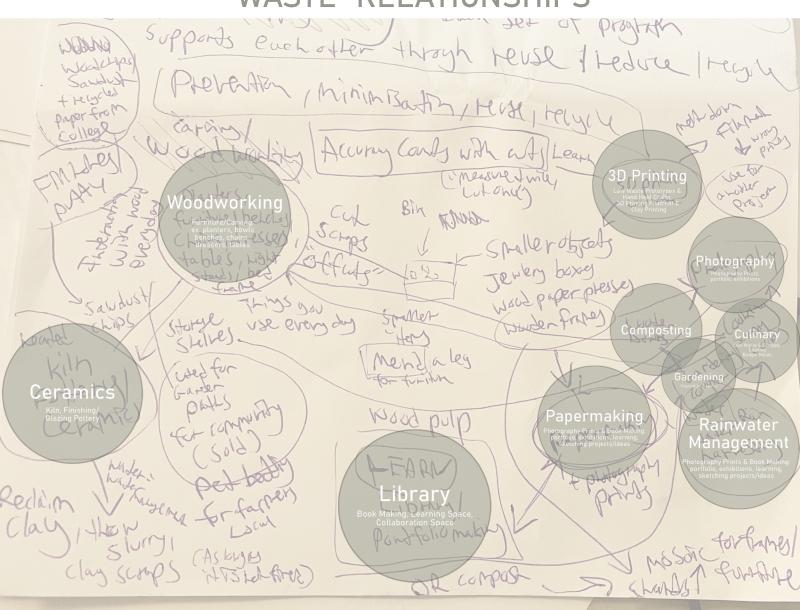


PROGRAMMATIC RELATIONSHIPS

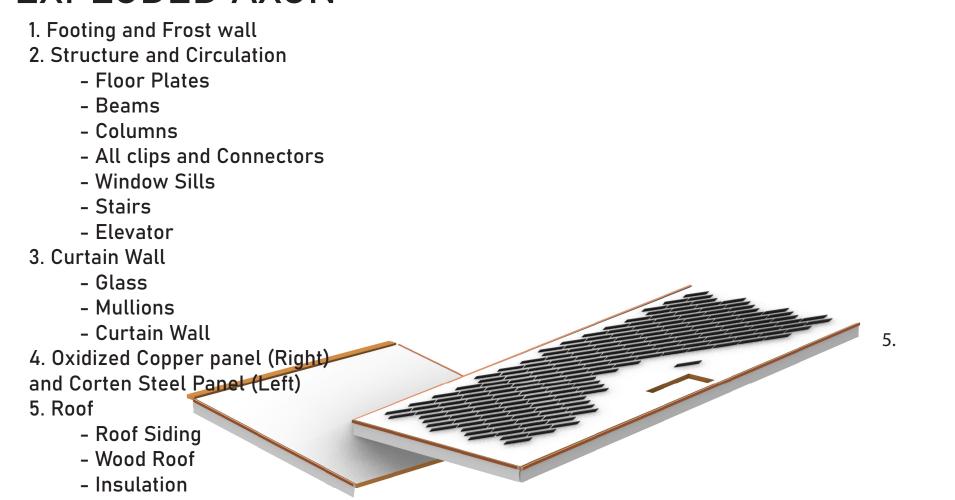
INTERCONNECTIONS BETWEEN PROGRAM: Reusing, Reducing/Minimizing, and Recycling

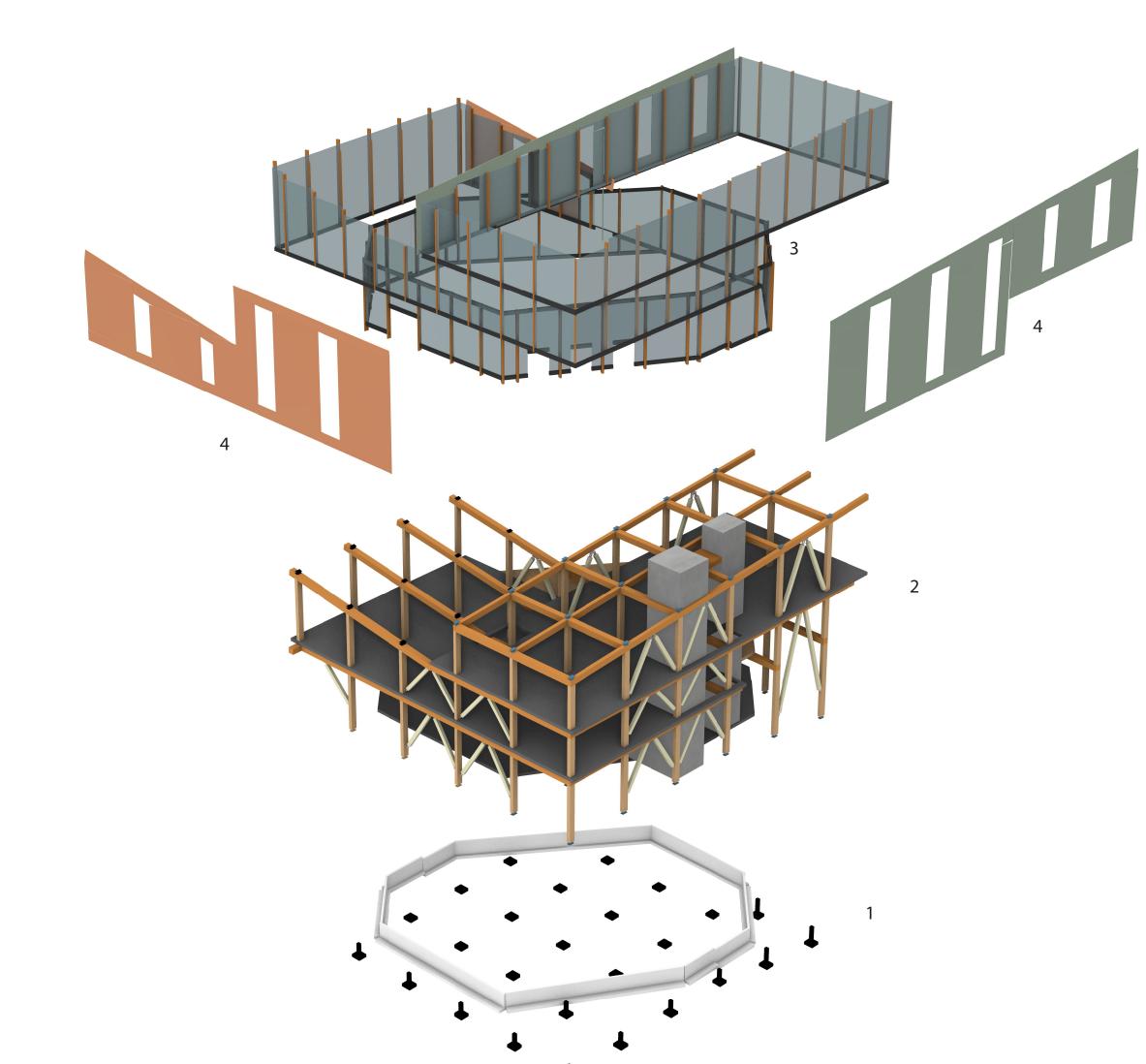


"WASTE" RELATIONSHIPS



EXPLODED AXON





Vernal Equinox 12pm - March 21 2022 MODEL



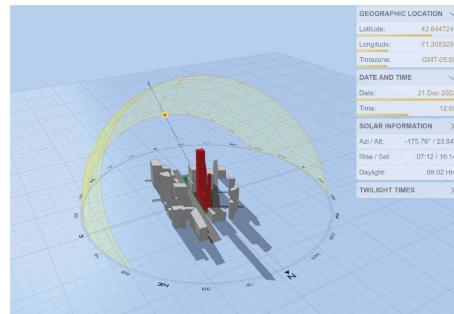
Summer Solstice 12pm - June 21 2022 MODEL



Autumnal Equinox 12pm – September 23 2022 MODEL







JN

Latitude:

Longitude:

Timezone:

Date: Time:

Daylight:

_ongitude: Timezone: DATE AND TIME Date: Time: SOLAR INFORMATION

Daylight:

GEOGRAPHIC LOCATION

Longitude: -71.305329 Timezone: GMT-05:00

23 Sep 2

12:09 H

DATE AND TIME

Date: 23 S Time:

Daylight:

TWILIGHT TIMES

SOLAR INFORMATION Azi / Alt: -171.69° / 46.99 Rise / Set: 05:33 / 17:4

Latitude:

TWILIGHT TIMES

15.19

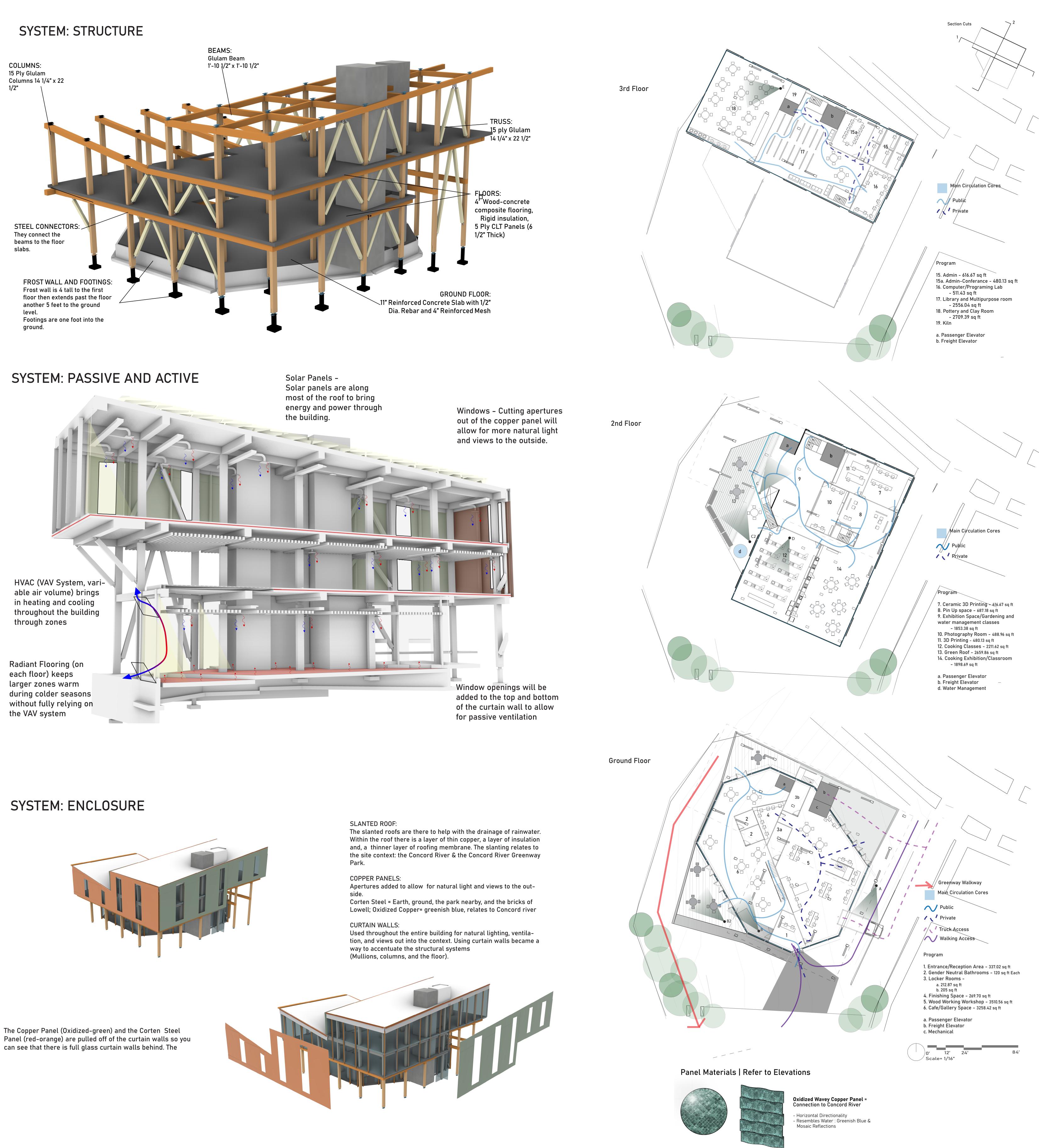
TWILIGHT TIMES

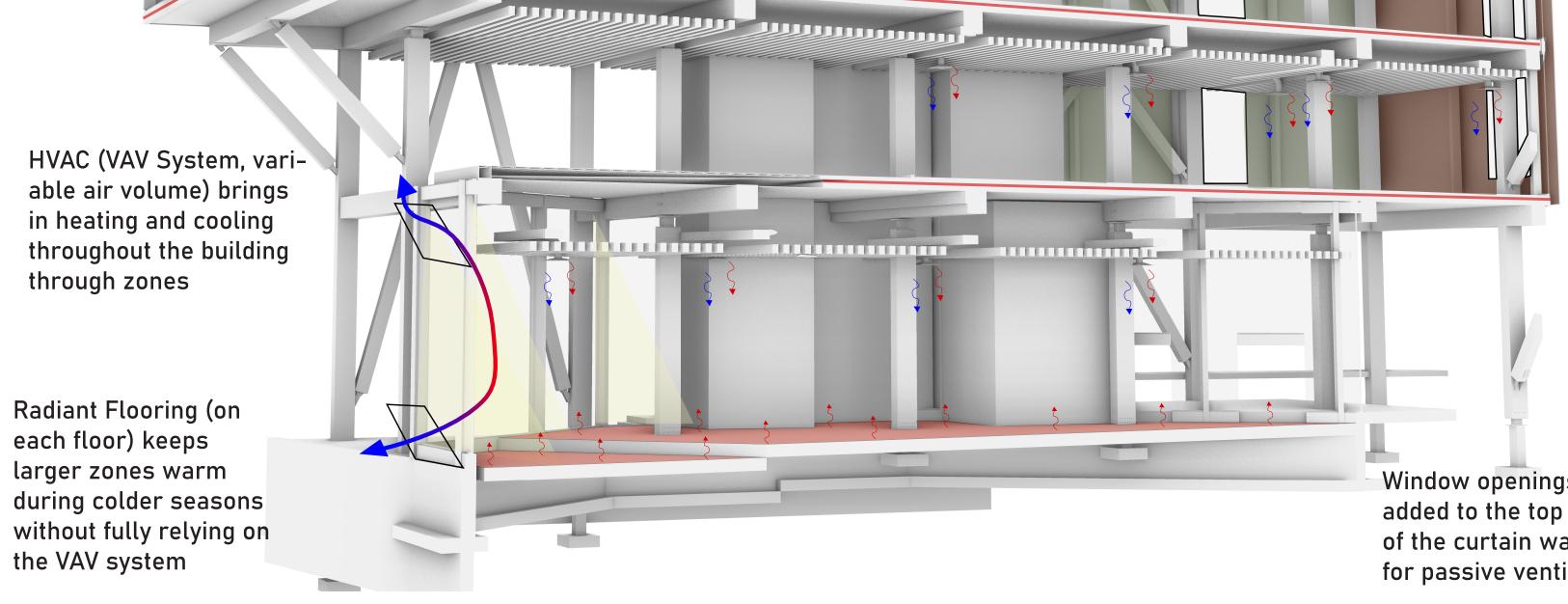
DATE AND TIME

Concord River Third Floor Conference Room 1. Mostly Admin/Offices GEOGRAPHIC LOCATION & Multipurpose Rooms 2. Conference & Multipurpose Rooms -71.30532 GMT-05:00 21 Mar 20 SOLAR INFORMATION Exhibition Space Azi / Alt: -177.33° / 47.57 Rise / Set: 05:47 / 17:58 12:11 H Admin Offices 1 Concord Riv Second Floor Azi / Alt: -171.03° / 70.61 1. Craft Spaces: Multipurpose Art & Teaching Rooms Rise / Set: 04:08 / 19:27 Painting, Drawing, Jewelery Making, Print Making, Photography 2. Design Spaces: 2a. CAD & 3D Modeling Classes: AutoCad, Solidworks, Rhino, Sketchup, & Cafe Rooftop Garden Exterior Covered Space Space Inventor, & more. 2b. Access to Adobe Suite & Video Editing Software 2c. Microsoft Suite: Excel, Word, etc. Craft Spaces Multipurposes Art Rooms Design Spaces CAD Classes & Teaching Rooms Prototypes Can Be Community Run . . . Adobe Suite <· · ·/· Microsoft Suite Concord Riv Ground Floor 1. Reception/Check In Gallery/Community Space w/ Cafe
Wood Workshop: Woodcraft/Furniture Outdoor Learning 3a. Fabrications: Laser Cutters, 3D Printing Outdoor Eating/ Space & Cafe 3b. Finishing Space 4. Outdoor Eating/Exhibition Exhibition Space Finishing Reception Wood Workshop 3D Printing Mills, Lathe, CNC & Check Ir Concord River

Greenway Park

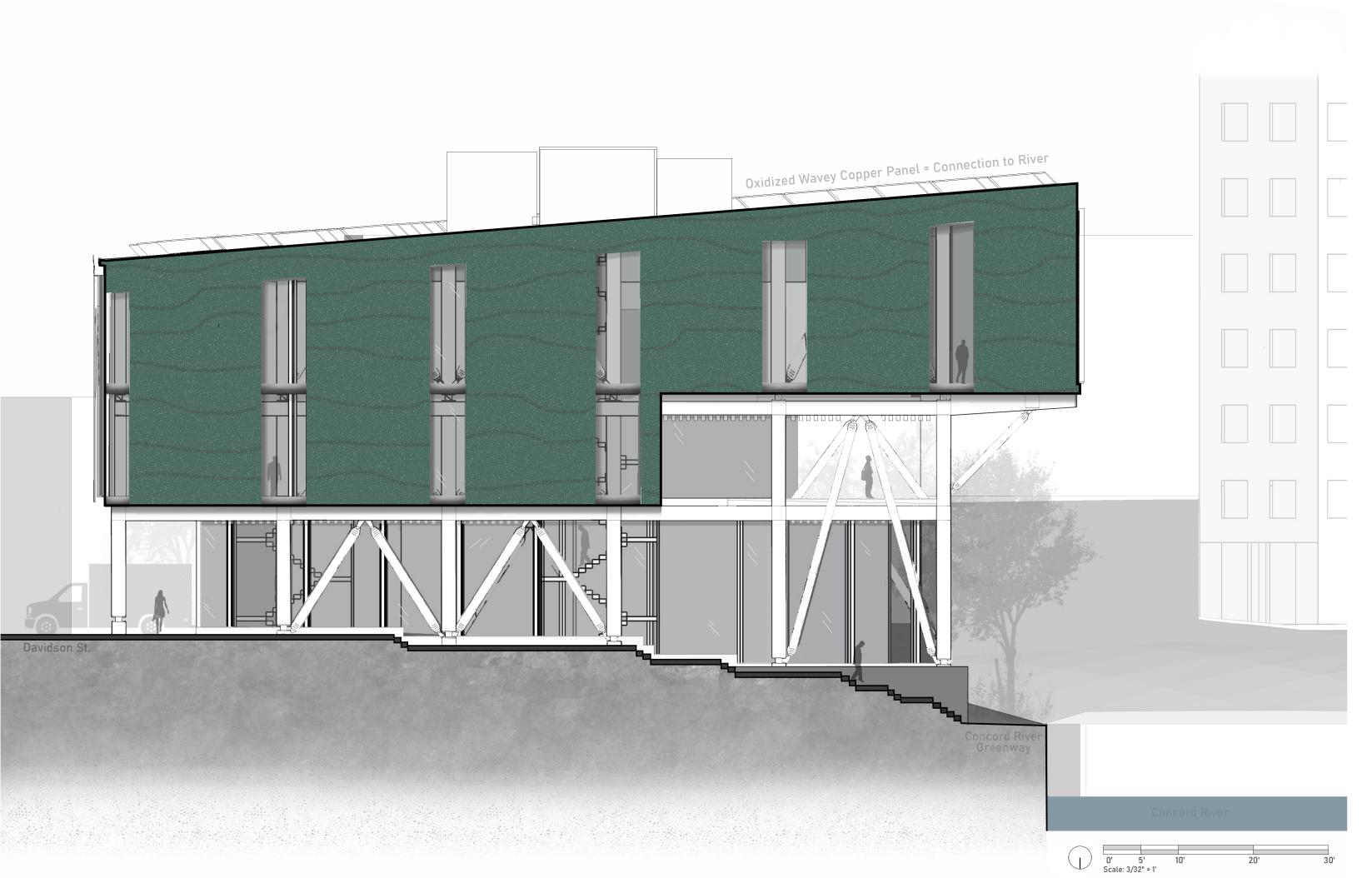
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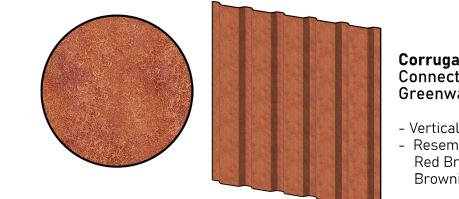


The Copper Panel (Oxidized-green) and the Corten Steel can see that there is full glass curtain walls behind. The

# **ELEVATION 1**

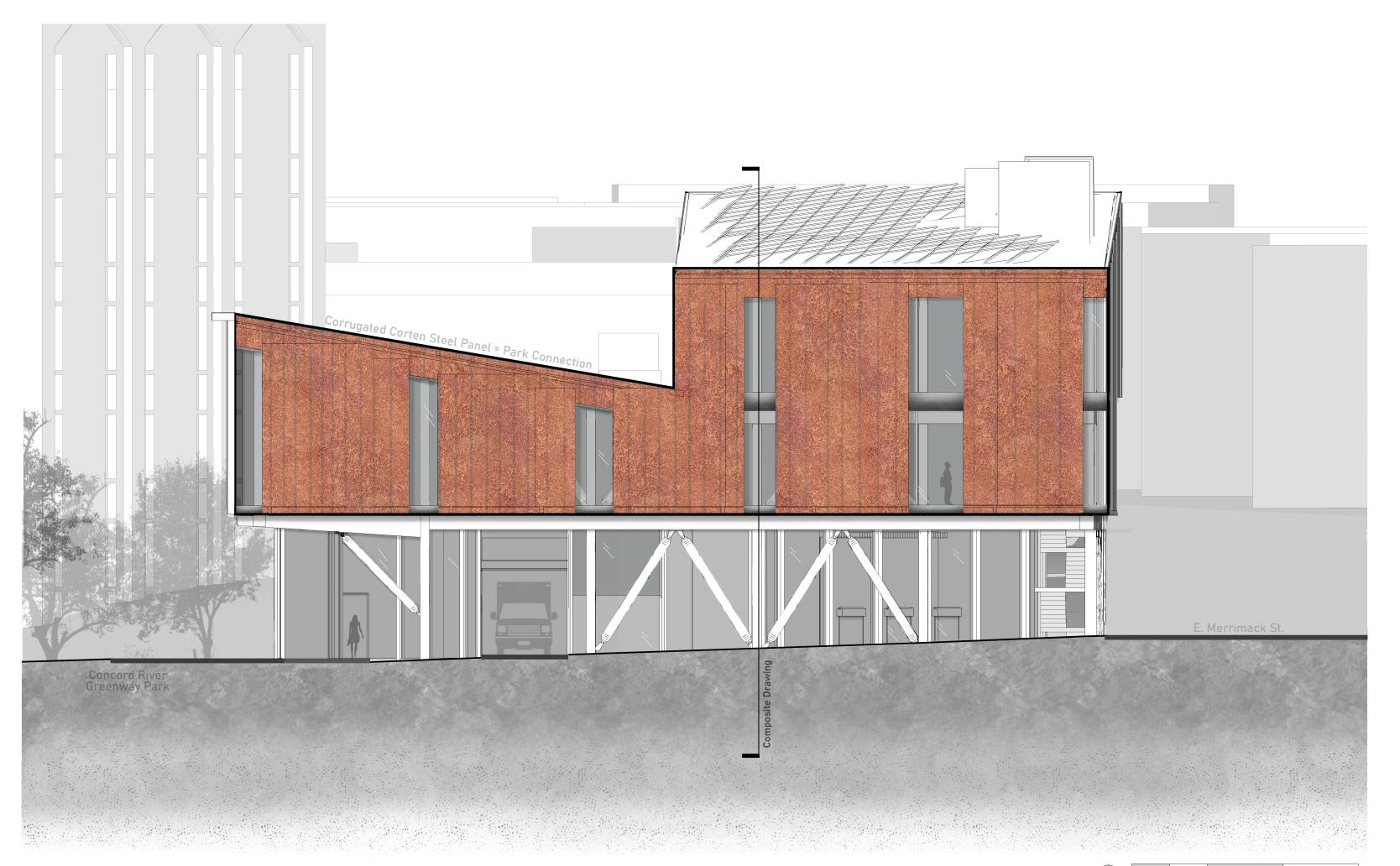


**ELEVATION 2** 



**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

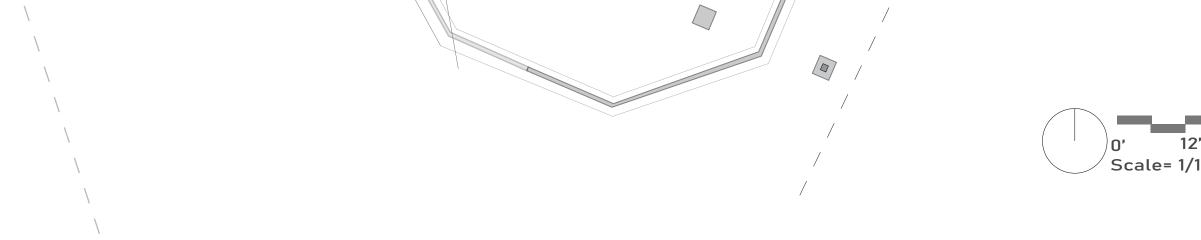


0' 5' 10' Scale: 3/32" = 1'

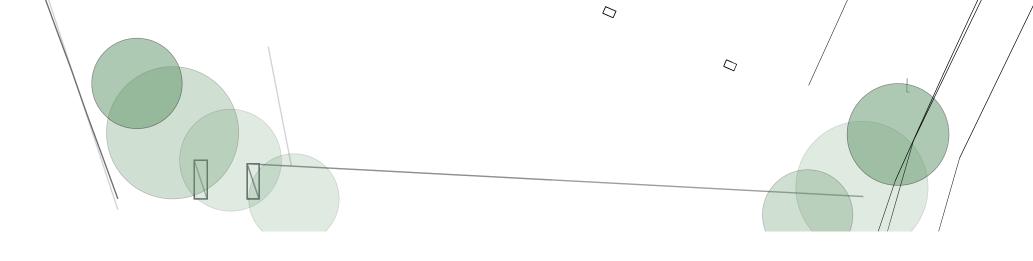


### **ROOF AND REFLECTED CEILING PLAS**

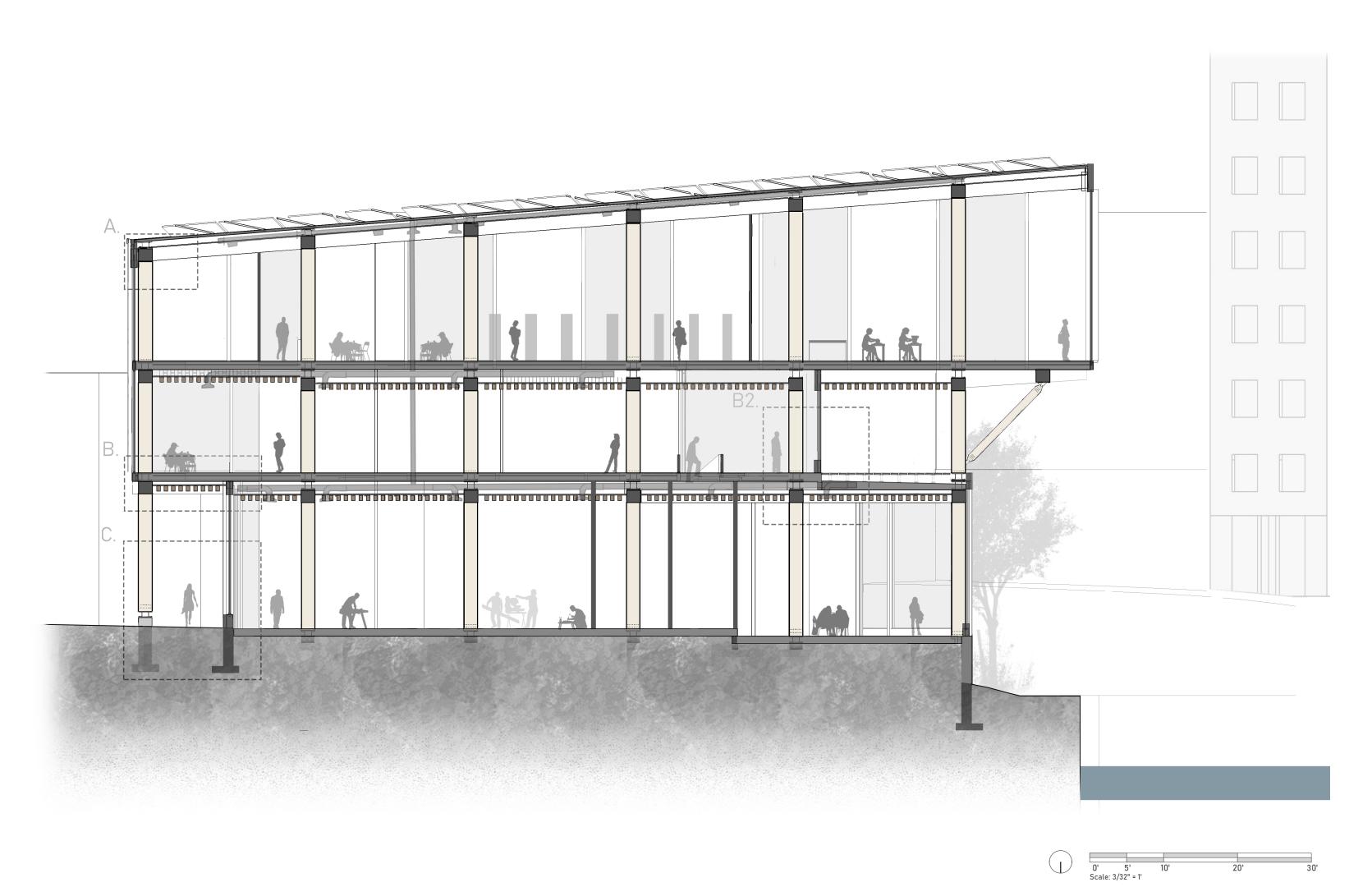




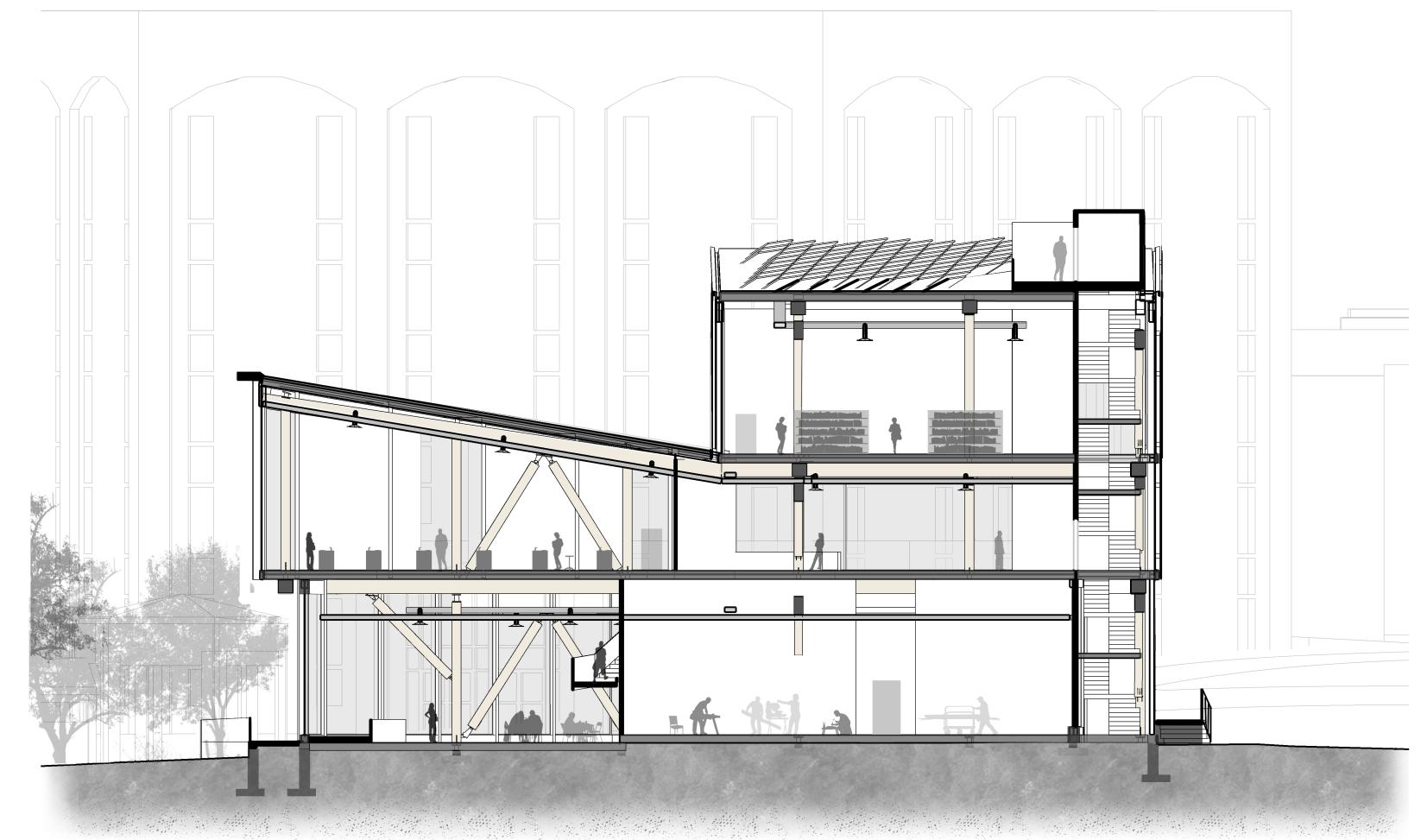




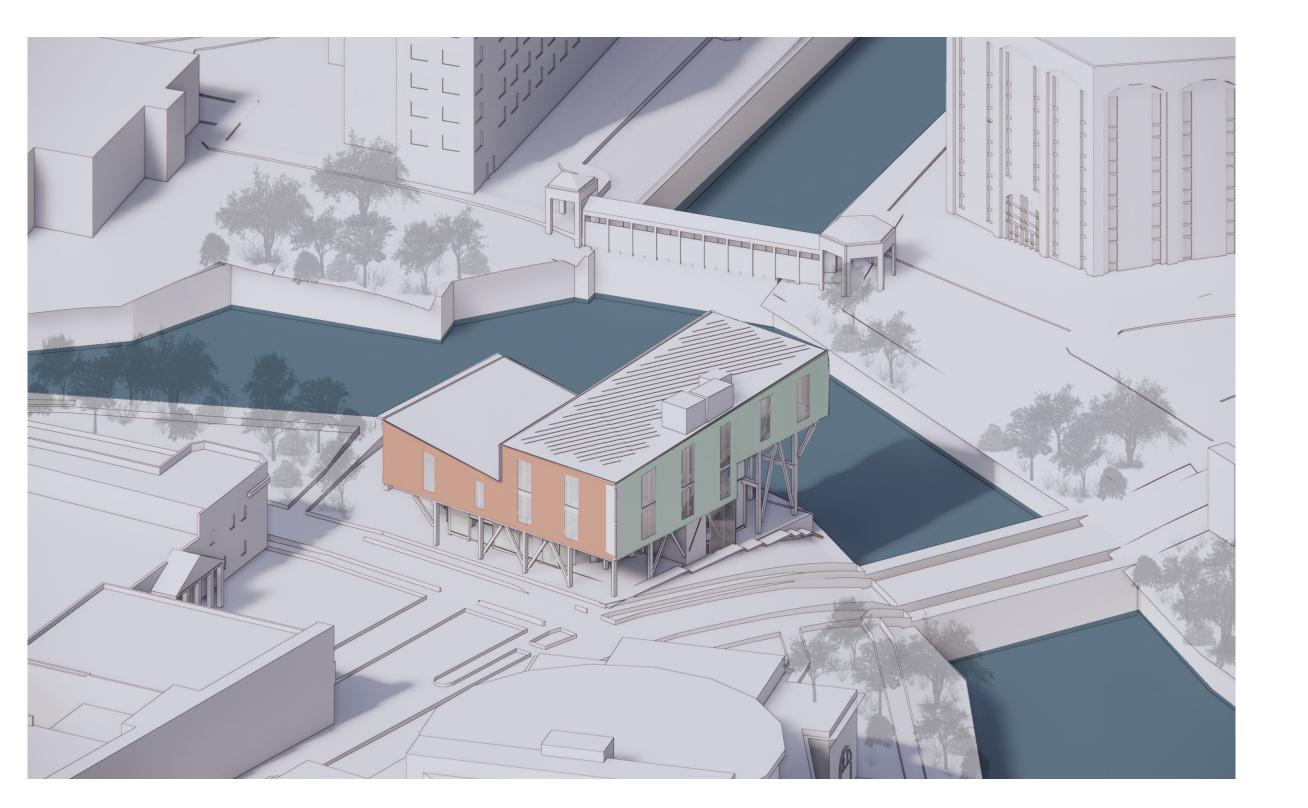
# **SECTION 1**

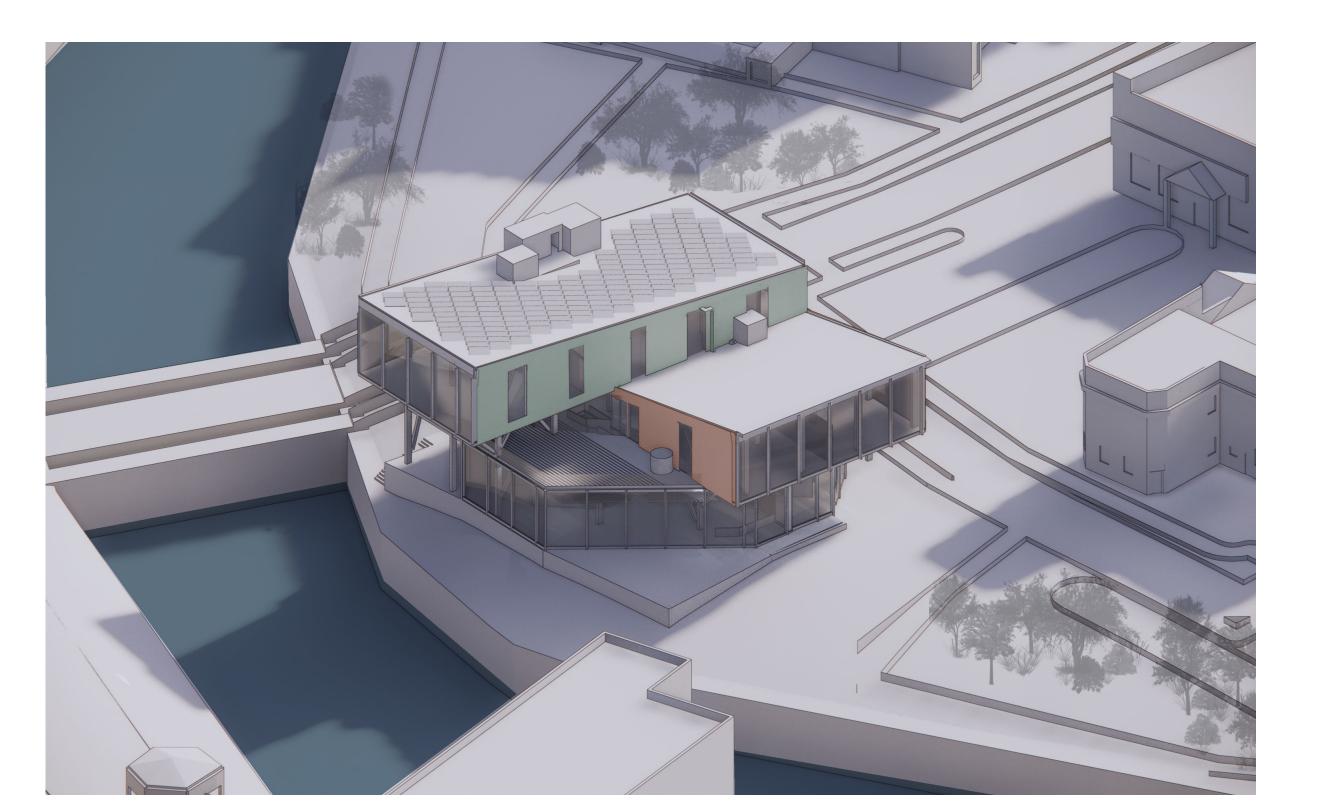


## **SECTION 2**

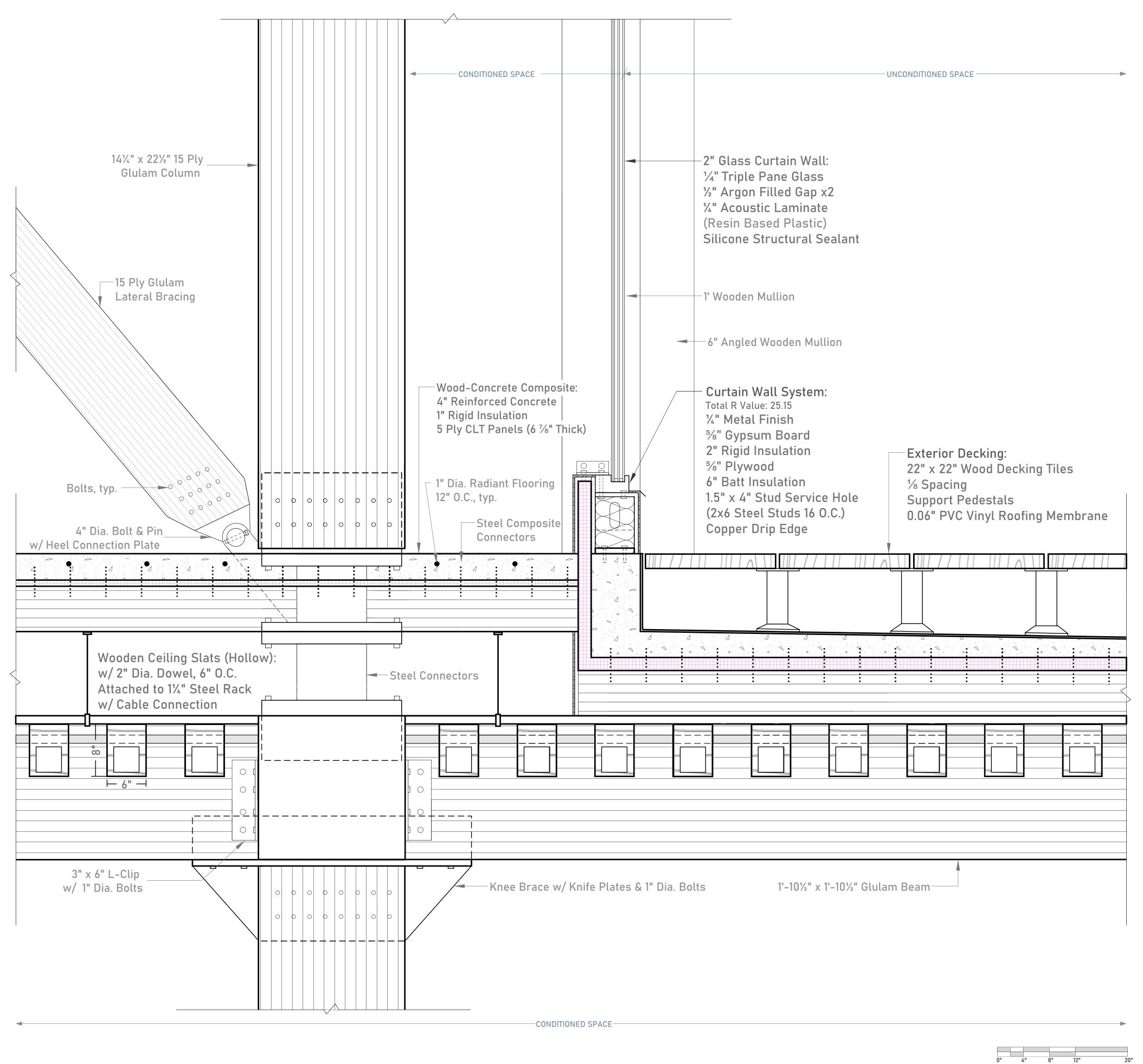


O' 5' 10' 20' 30' Scale: 3/32" = 1'





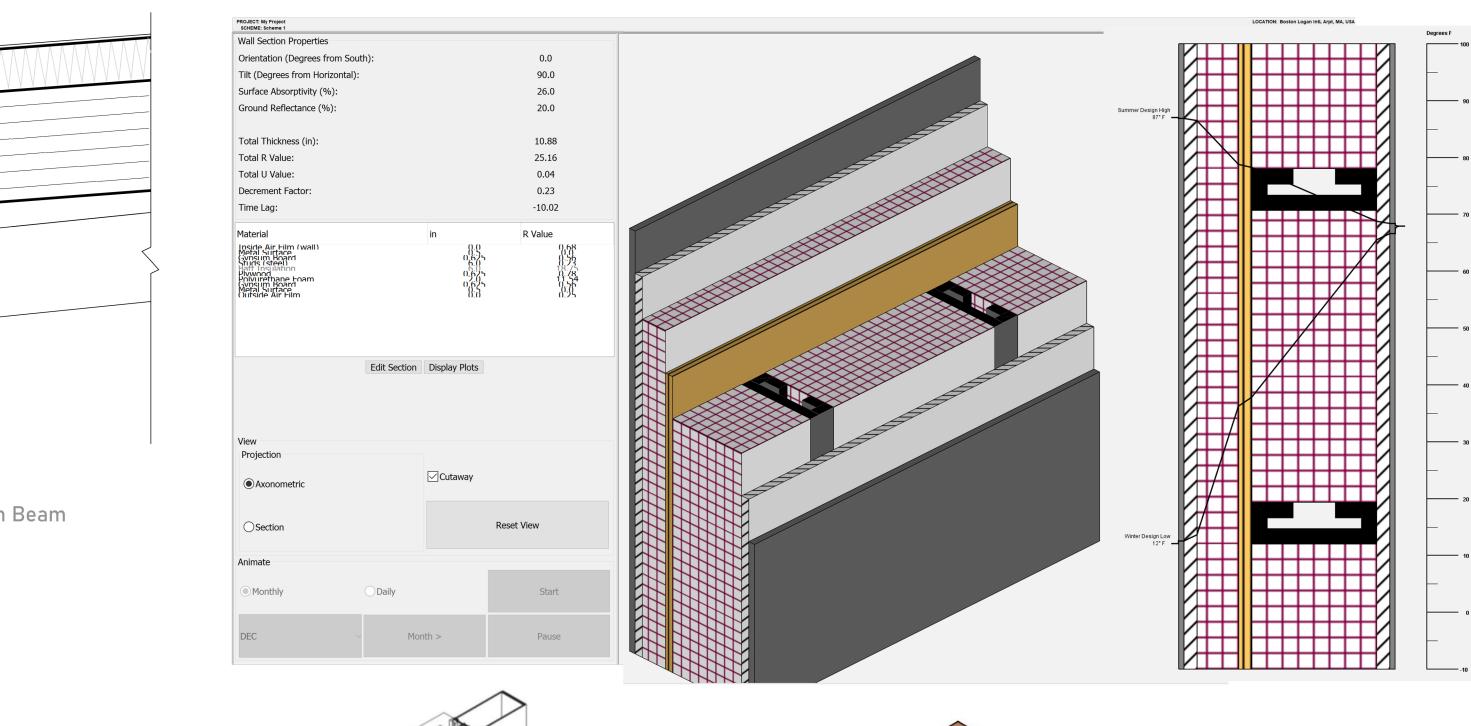
**B2. Roof Deck Connections** 





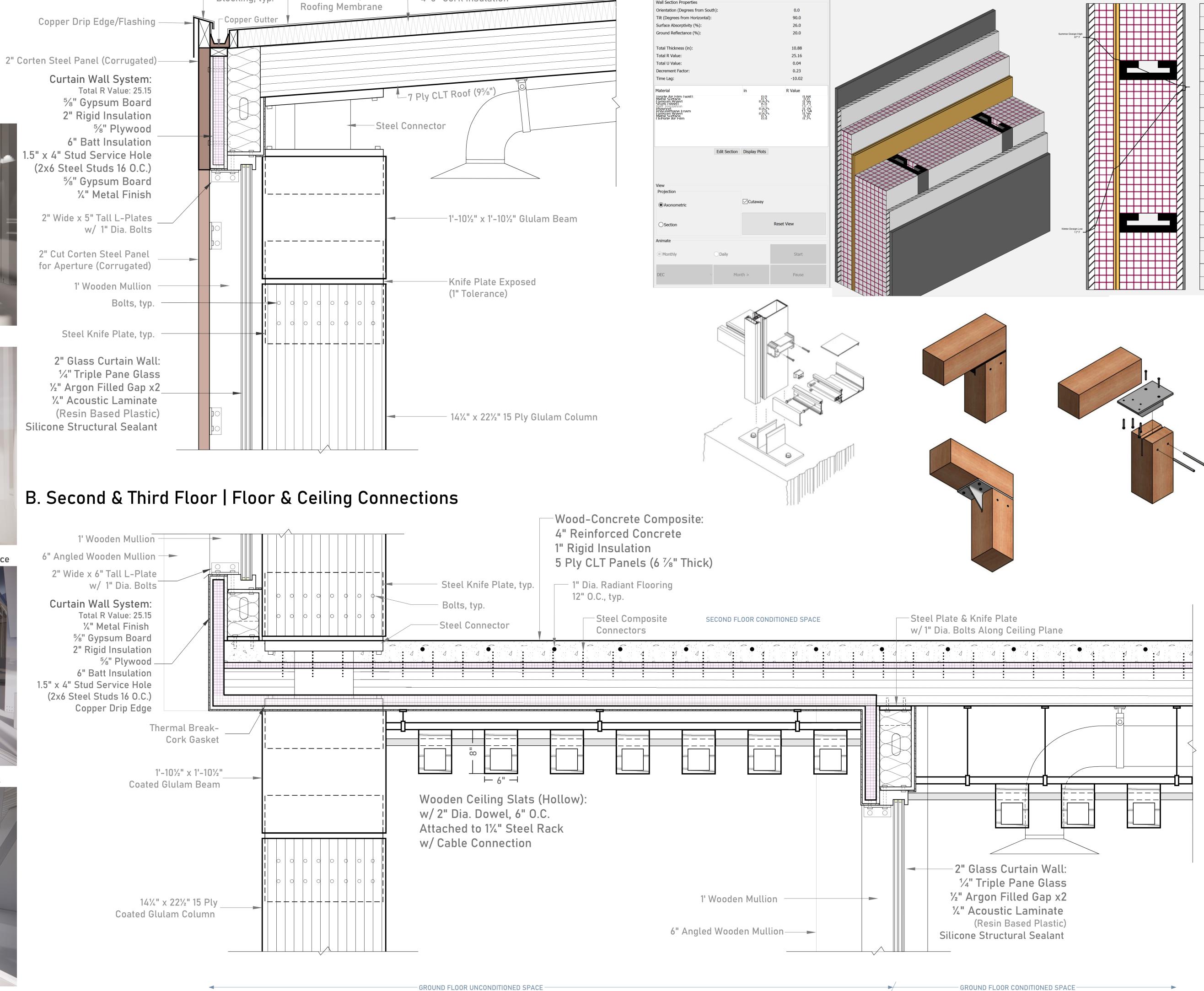
A. Roof Connections

### Using **Opaque 3.0** for R Values of Exterior Wall System Typical: exterior walls are R-13 to R-23 **Ours: ~R-25**



A. Exterior Covered Walk





B. Interior Cafe/ Gallery Space



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



C. Exhibition, Photography & Gardening/Water Management Classes



C2. Green Roof (Rainwater Management & Gardening Classes)

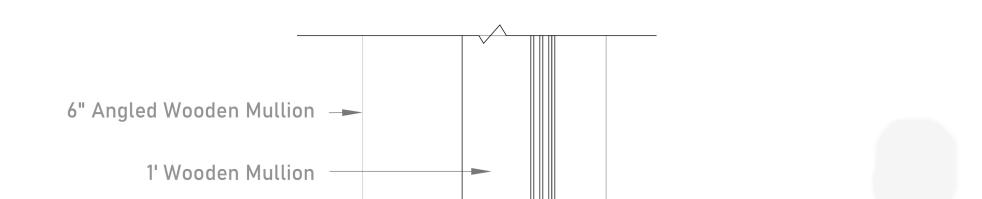


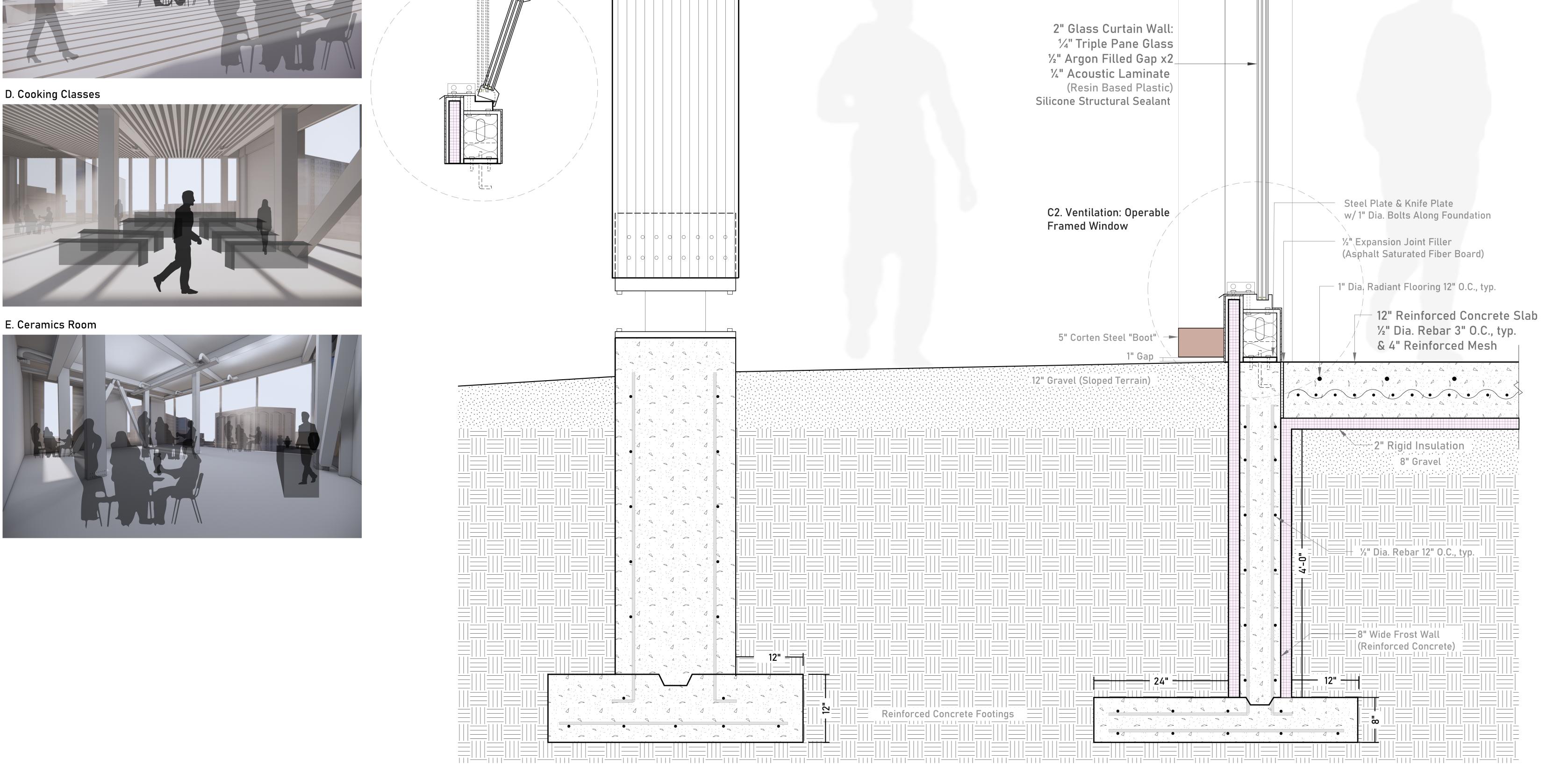
C. Ground Floor | Ground Connections C2. Ventilation: Operable Framed Window

-0.06" PVC Vinyl

-4-5" Cork Insulation

-Blocking, typ.





### Moments | Passive & Active Energy Strategies



# **Composite Drawing:** Elevation, Plan, and Section Detail

