

NEW YORK INSTITUTE OF TECHNOLOGY

School of Architecture
& Design



NAAB SC.6 Compliance Portfolio

ARCH 401 FALL 2024

MADELINE METZLER 1298479

Faculty Name: JANET FINK

Campus: MANHATTAN

Grading Compliance Portfolio

ARCH 401 B.ARCH Design 5

ARCH 401 Design 5 is a semester-long comprehensive design of a building of moderate complexity. Students are introduced to how decisions are made to address user needs and accessibility, evaluate energy performance and incorporate structure and material into a responsive form with a complete building envelope strategy. In addition, the program and site require students to understand contour, excavation and retaining of earthwork, and long-span structural systems.

The ‘integrated design’ studio is organized where students produce work developed to a high degree of completeness and formal resolution. The studio starts with analyzing similar precedents and reviewing passive strategies that determine the early schematic design ideas, followed by incorporating active environmental systems appropriate to the site’s climate and orientation-specific conditions.

The student work demonstrates the integration of active and passive environmental systems in comprehensive building sections. Appropriate modeling software and presentation drawings show comprehension of building performance and analysis.

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SC.6 Building Integration—How the program ensures that students develop the ability to make design decisions within architectural projects while demonstrating integration of:

- building envelope systems and assemblies,
- structural systems,
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Overall Rendered Exterior View(s)

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LIGHT FROM THE LARGE INTERIOR COURTYARD BRINGS YOU INSIDE THE MAIN LOBBY AND ORDERS YOU UP AND AROUND THE TREES WITHIN THE CENTER COURTYARD TO COLLECT A STORY AND NESTLE INTO THE ARCHES AND EXTERIOR WALLS. BOOKCASES FOLLOWING THE ABOVE STRUCTURE TO FRAME BEAUTIFUL EXTERIOR VIEWS CONCEPTUALLY DRIVEN BY THE DESIGN STIPULATION OF 40% OF THE THROUGH LOT BE 'OPEN TO THE SKY'. THE INTERIOR CIRCULATION IS MAINLY DEFINED BY LOOPS AND CIRCULATION ZONES LEAVING THE EXTERIOR LANDSCAPE TO BE FREE OF SYMMETRY OR REPEATING PATHS ALLOWING THERE TO BE MORE DISCOVERY AND PRIVACY. THE KIDS ENTRANCE ON THE OTHER SIDE FOLLOWS THE SAME RULE SET AT HALF THE SCALE WITH A FAÇADE OF WINDOWS THAT HINT AT THE PROGRAM BEHIND THEM. THE PROJECT UTILIZES OPEN CONCEPT PROGRAMS MESHING WHATS NORMALLY DIVIDED INTO ROOMS IS FREE FLOWING ON THE FIRST FLOOR ALLOWING YOU TO MOVE AROUND THE COURTYARD EITHER THROUGH THE PERIODICAL AND CAFE OR THE MEDIA AND YOUNG ADULT AREA ALL SPACES PROMOTE CONNECTIVENESS WITHIN THE COMMUNITY.



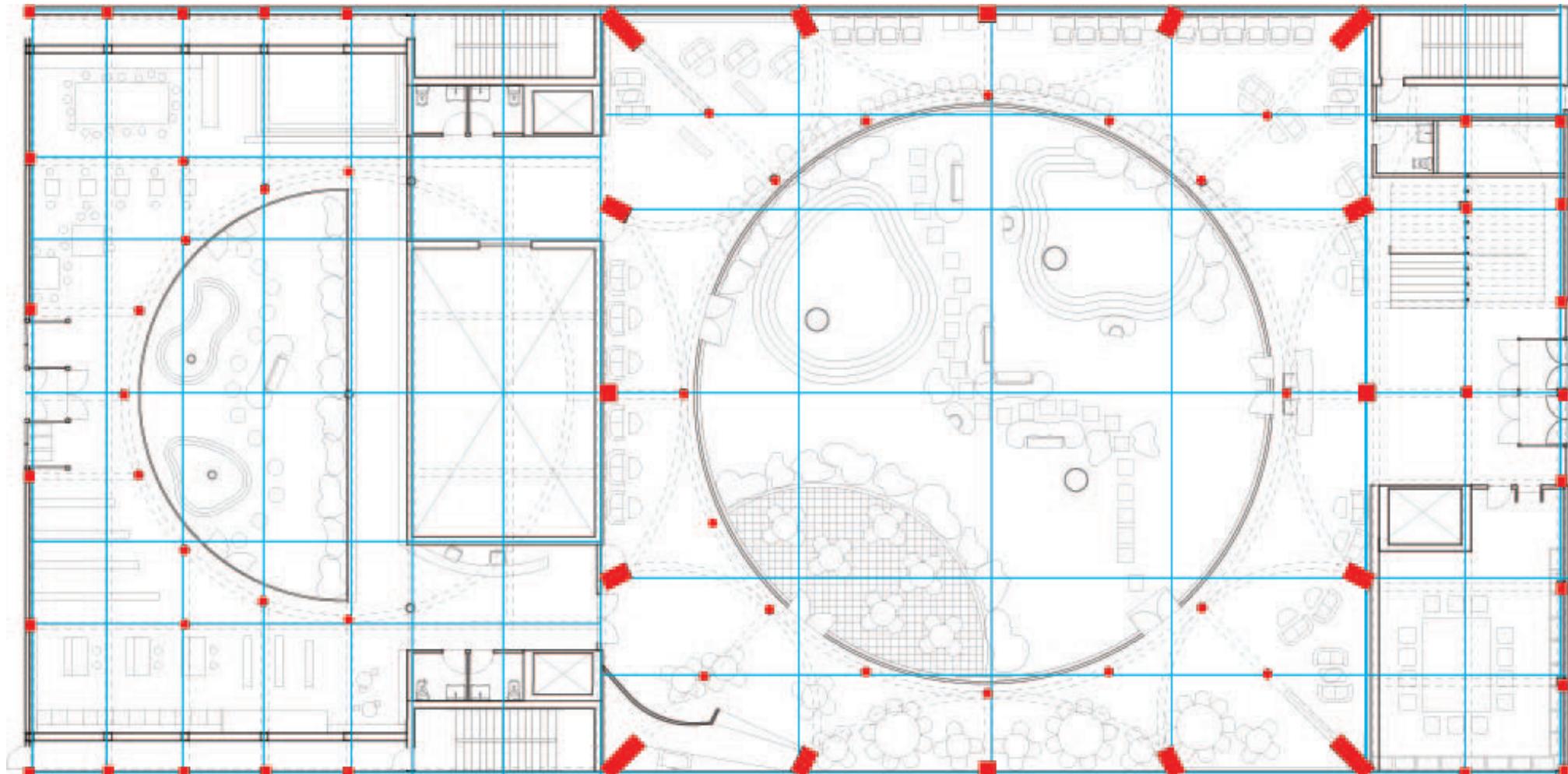
Overall Rendered Interior View

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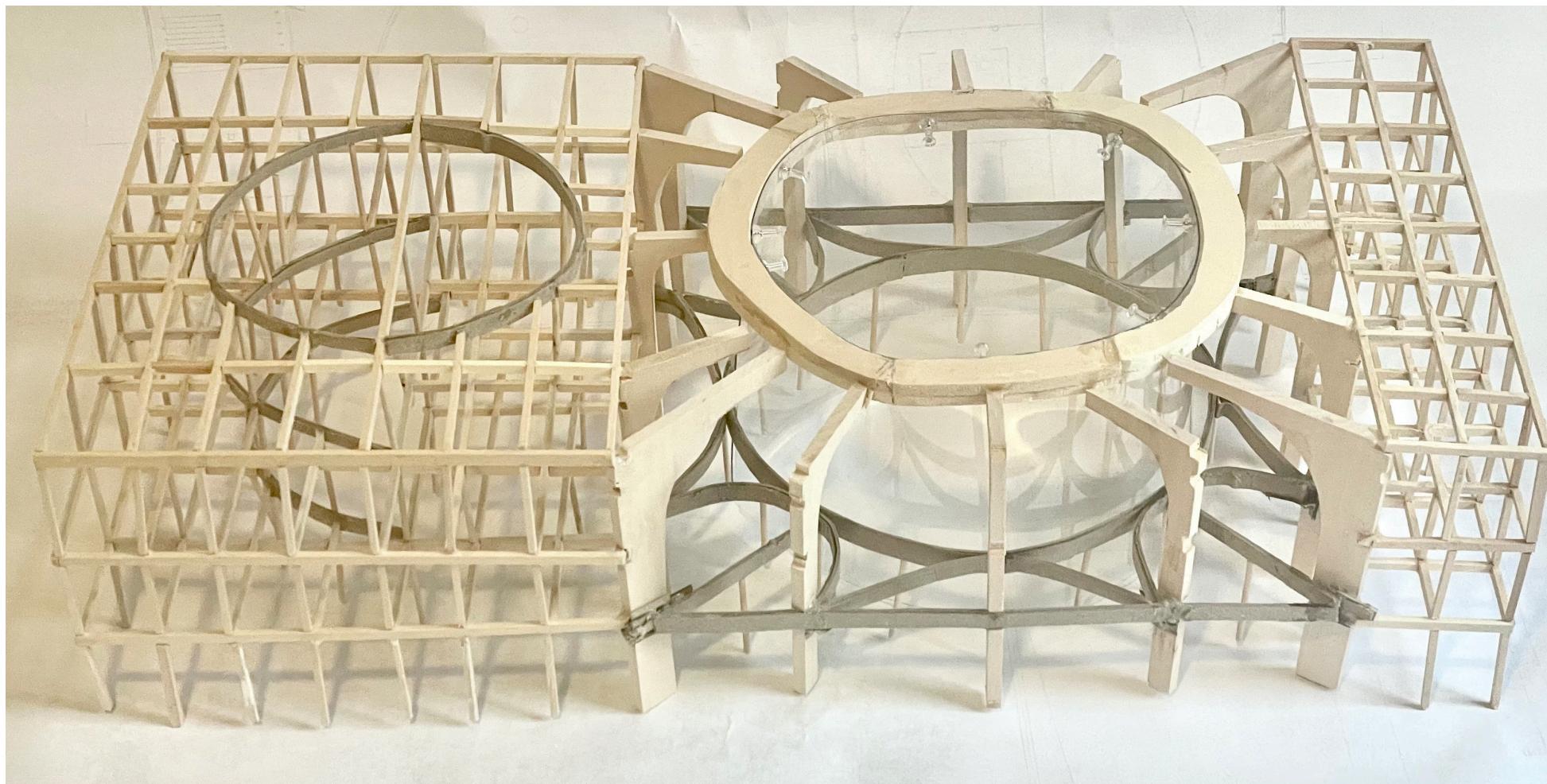
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Structural Diagram - Plan

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Structural Model

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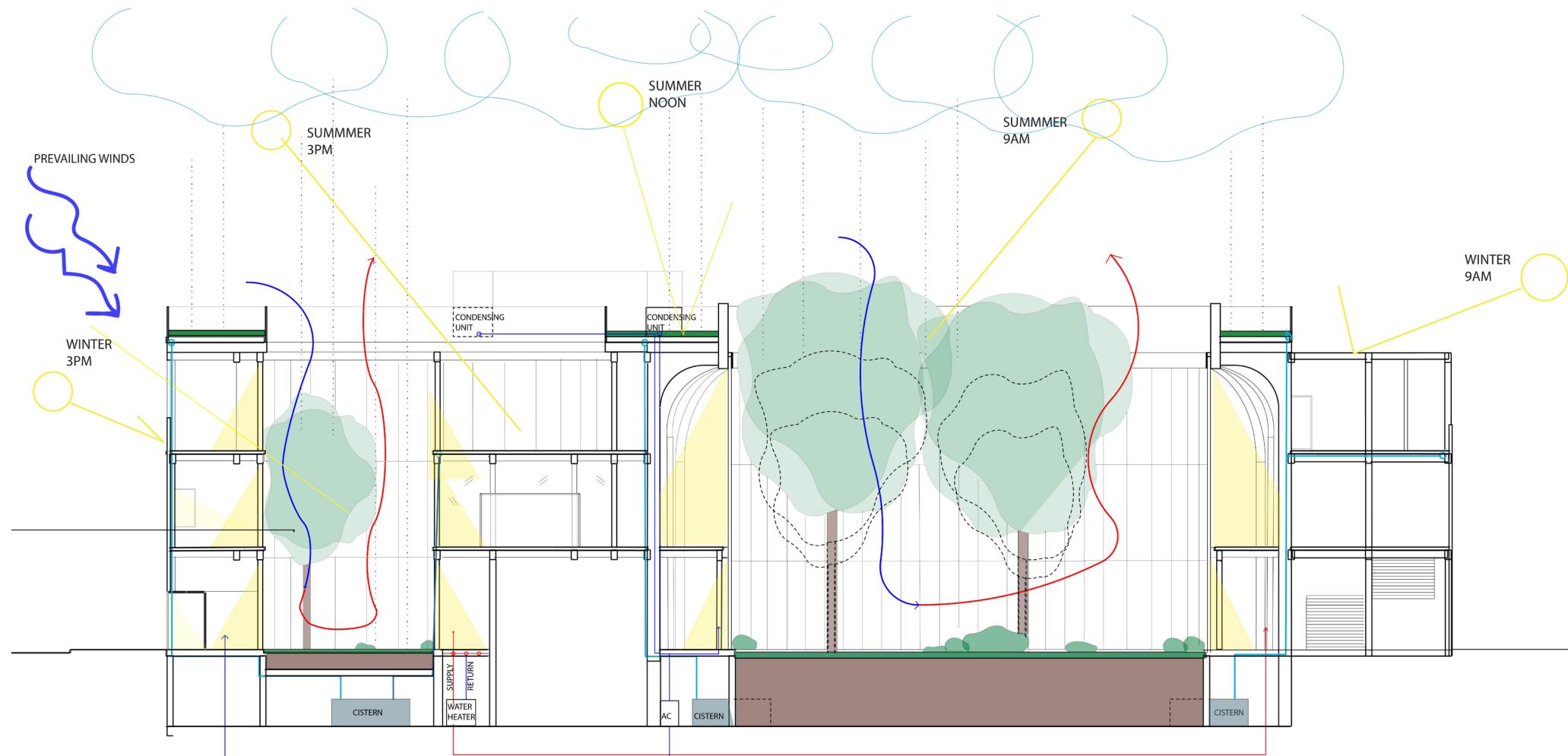
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Drawings demonstrate the ability to integrate a structural system as part of the overall design strategy and into the building envelope. Drawings of the assembly show competency in defining plausible structural systems with sizing for spans of the chosen material.



Comprehensive Building Section



Wall Section Drawing

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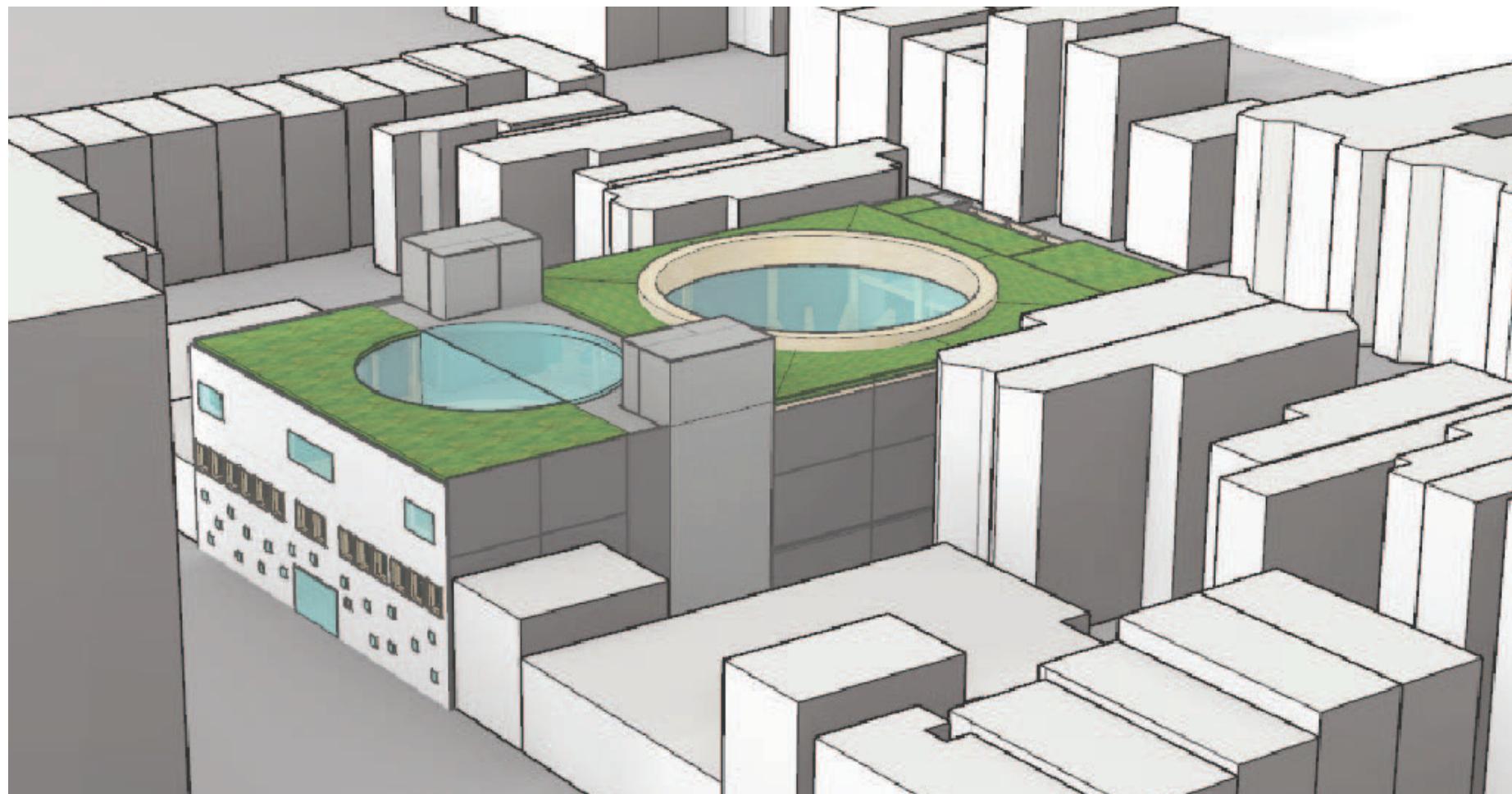
Comprehensive drawing demonstrates the ability to integrate concepts and components of a building envelope with environmental control systems, including documenting plausible solar studies, day-lighting, and illumination systems.



Wall Section Drawing

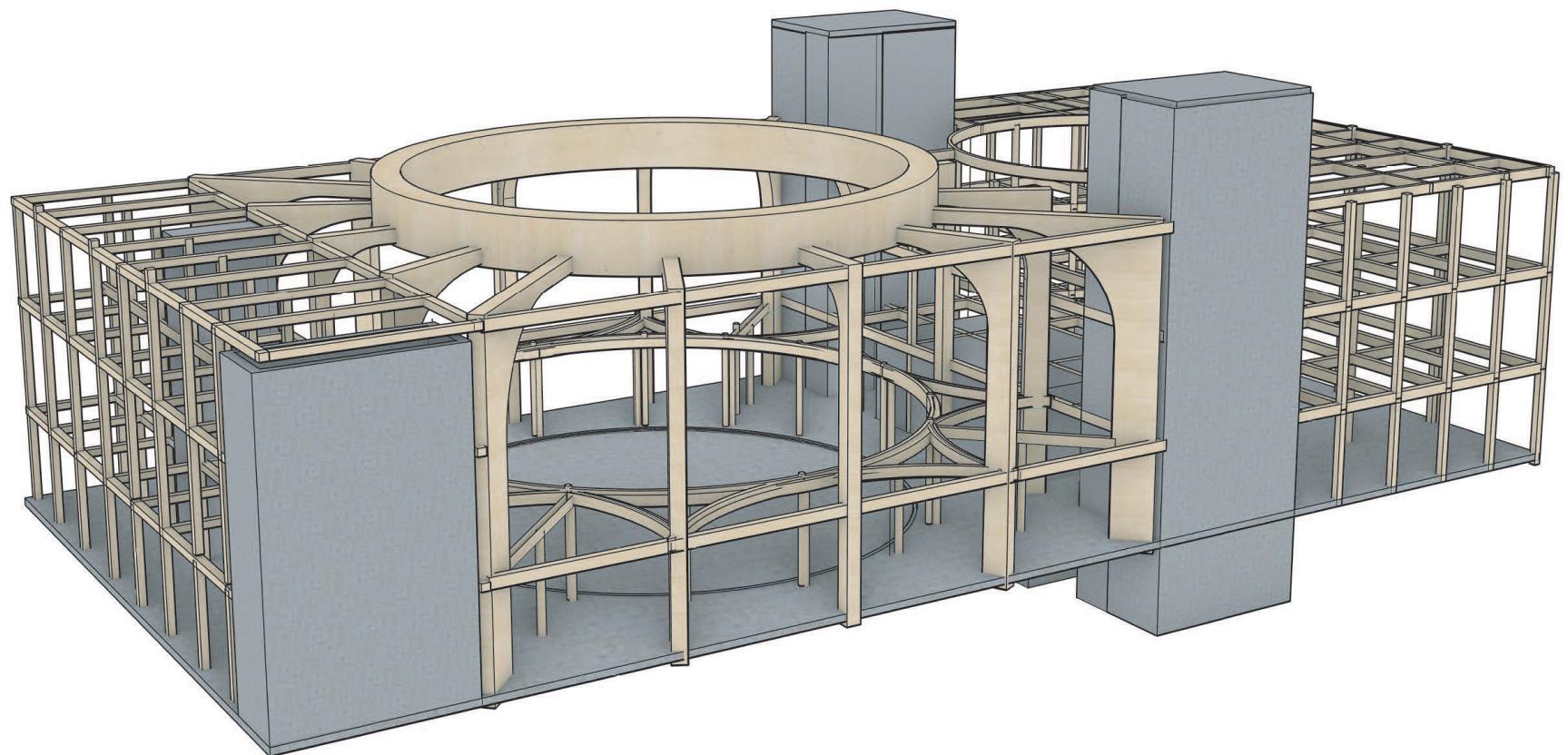
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Digital Model



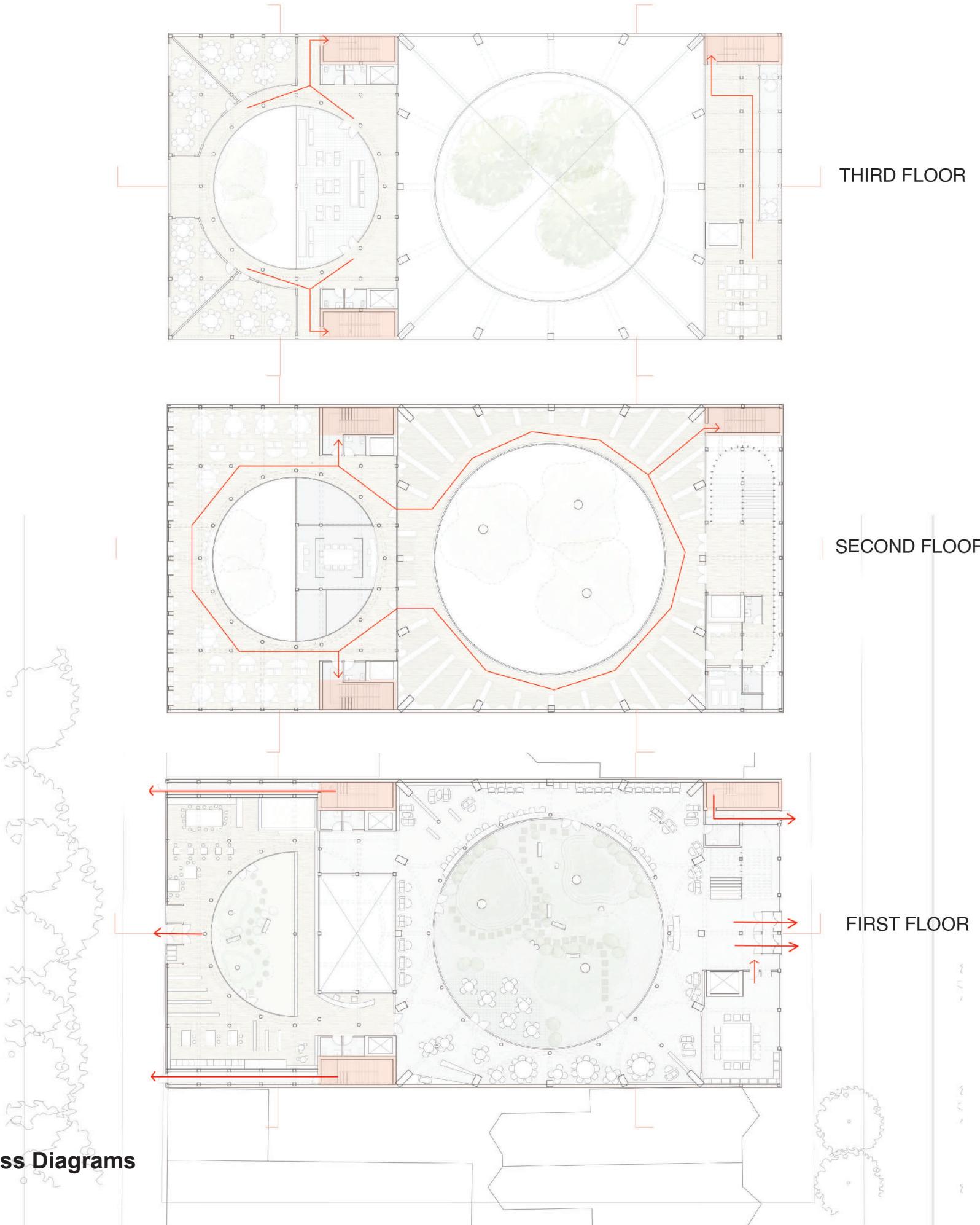
Physical Model(s)

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The drawings demonstrate the ability to design a plausible roof and structural system.

Egress Diagrams

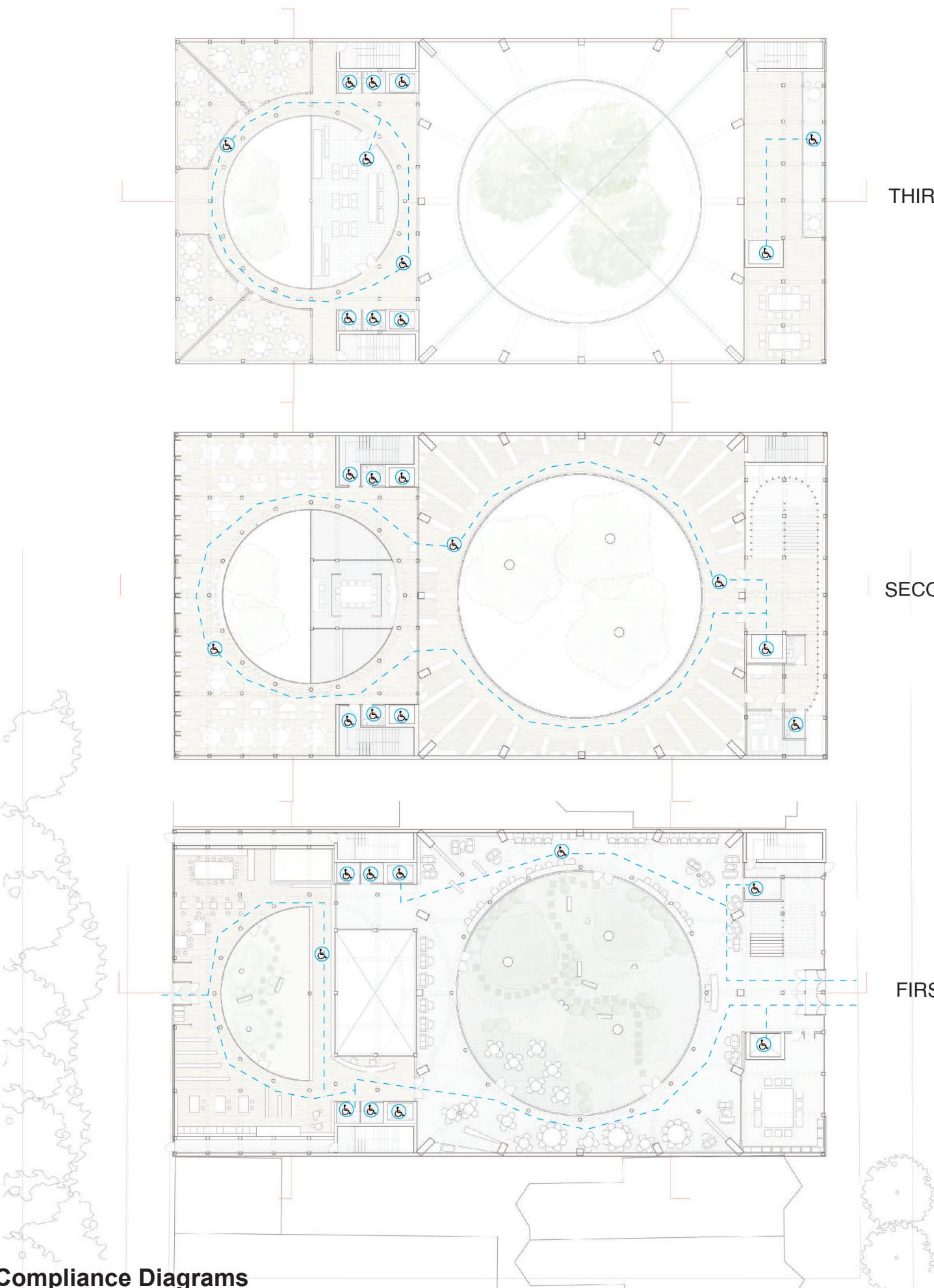


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Comprehensive drawing demonstrates the ability to integrate concepts and components of a building envelope with environmental control systems, including documenting plausible solar studies, day-lighting, and illumination systems.

Plausible environmental systems with passive site specific considerations.



ADA Compliance Diagrams

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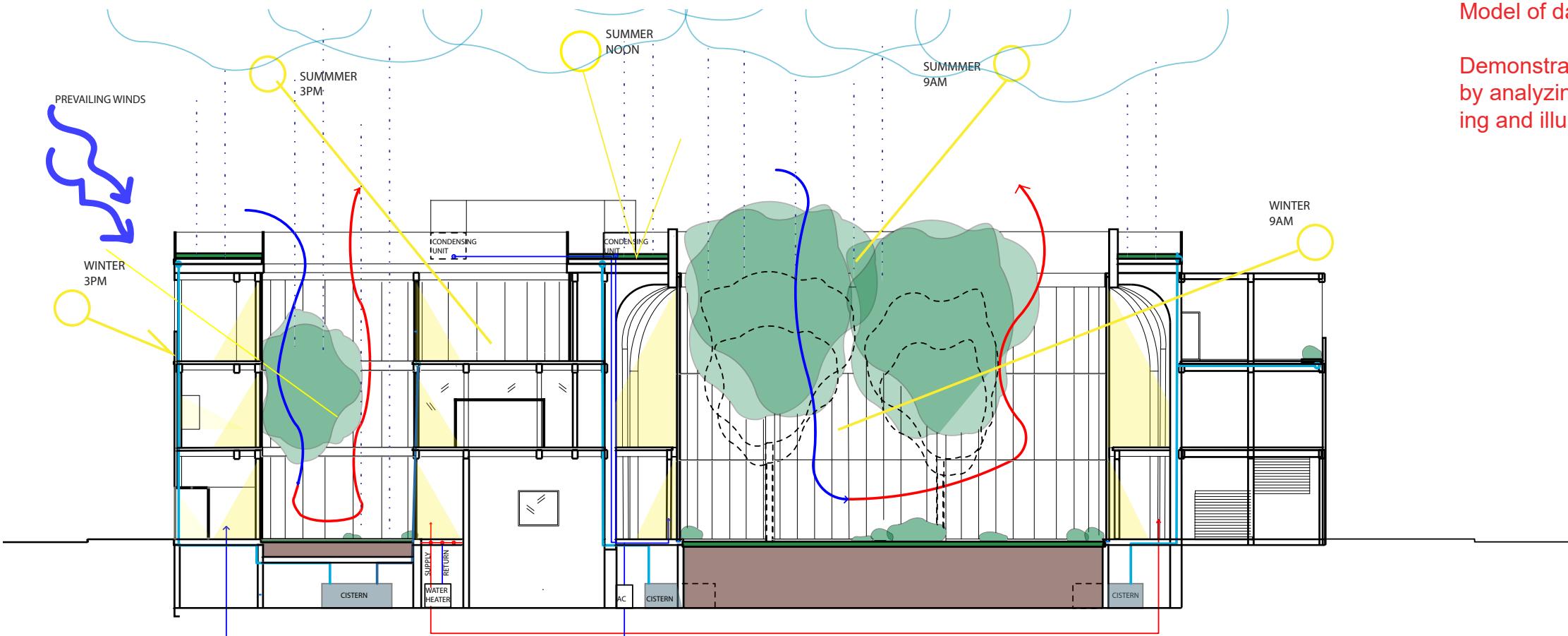
- building envelope systems and assemblies,
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The drawings demonstrate the ability to solve an appropriate code-compliant egress system.

Compliant travel routes to exits (fire safety + public assembly)
Compliant fire stairs (fire safety + public assembly)

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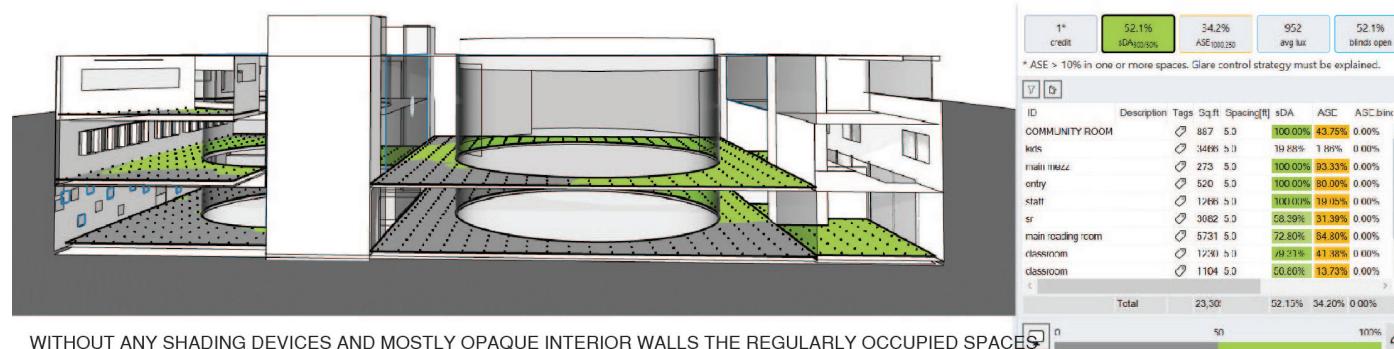
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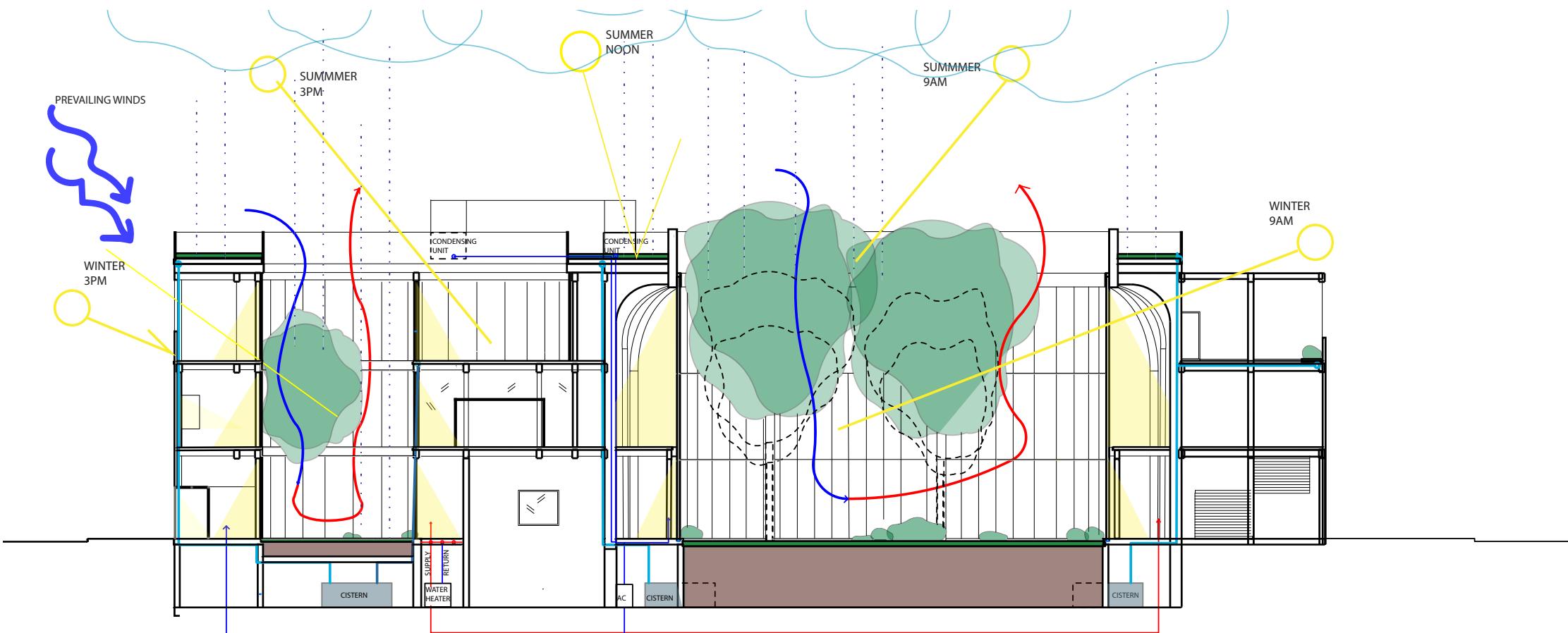
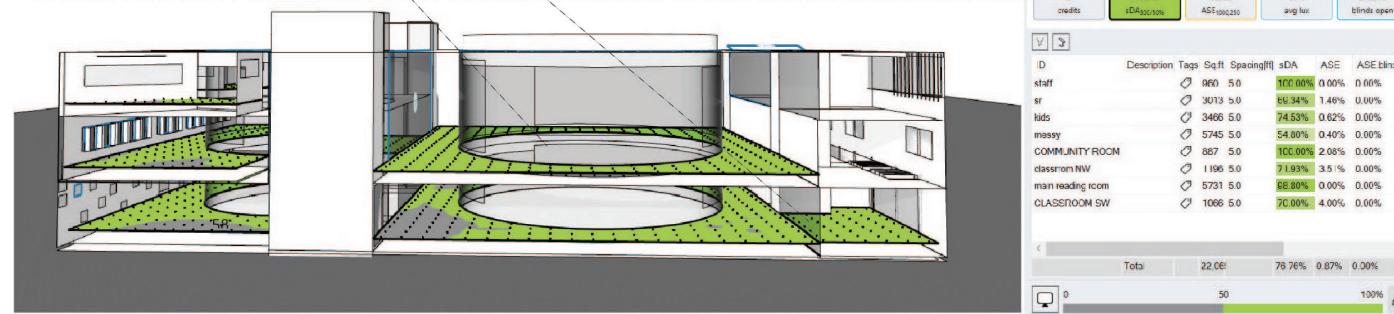
Model of daylighting and solar radiation comprehensive plans.

Demonstrates ability to synthesize building form and material strategy by analyzing and documenting the integration of a plausible daylighting and illumination system.

5.0- LEED 4.1 DAYLIGHT AVAILABILITY COMPLIANT DESIGN



WITHOUT ANY SHADING DEVICES AND MOSTLY OPAQUE INTERIOR WALLS THE REGULARLY OCCUPIED SPACES DIDN'T AVERAGE A HIGH ENOUGH sDA TO MEET LEED4.1 AS WELL AS WAY TOO MUCH GLARE. I BEGAN TO EXPERIMENT WITH REFLECTIVE STRIPS ALONG THE INTERIOR COURTYARD GLASS TO REFLECT MORE LIGHT INTO THE FIRST FLOOR PROGRAM SPACES AS WELL AS CREATE A MORE EVEN DAYLIGHT DISTRIBUTION EVERYWHERE. AS WELL AS MAKING PARTITION WALLS THAT DON'T REQUIRE PRIVACY GLASS AND WAS ABLE TO COME TO A PRETTY GOOD RESULT JUST FOCUSING ON SHADING FOR COMFORT AND CONTROLLING LIGHT.



Climate Analysis and Environmental Control Systems

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Drawing demonstrates the ability to integrate components of a building section, including plausible building envelope for each assembled system.

8.0- OPTIMIZED LOW ENERGY DESIGN

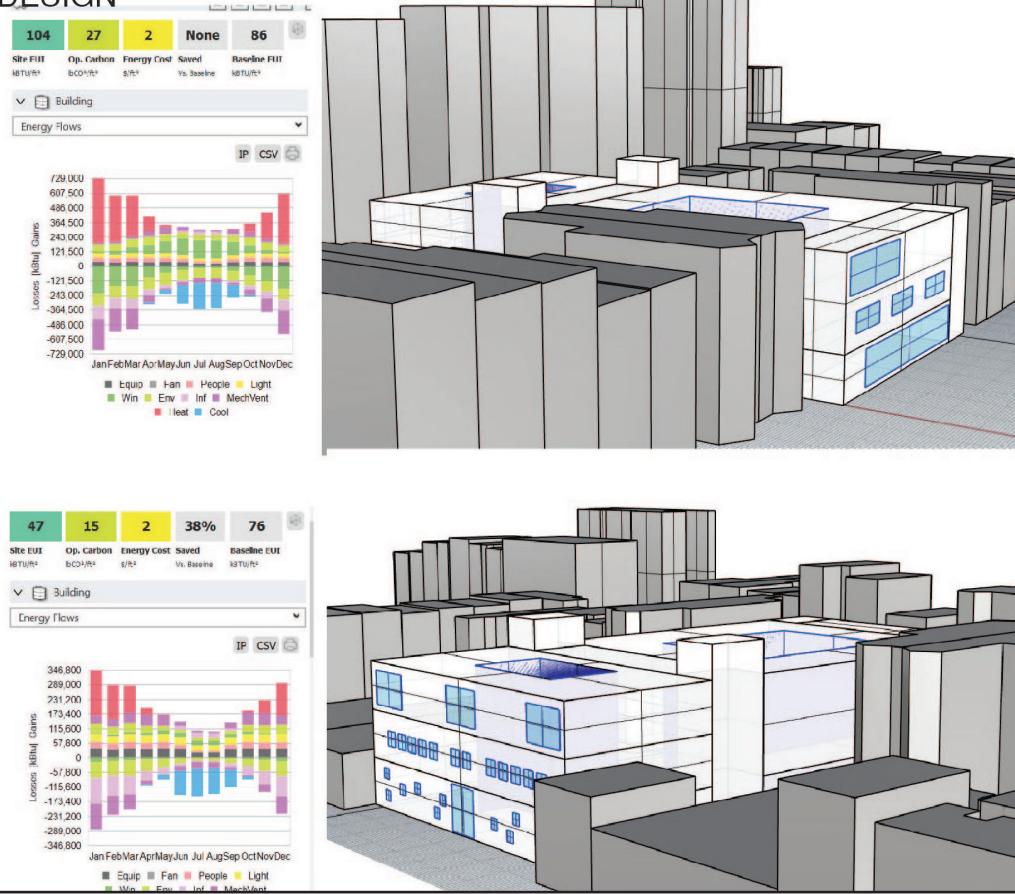
TO COMPLETE THE THERMAL ANALYSIS FOR MY DESIGN IN CLIMATE STUDIO I HAD TO SIMPLIFY THE GEOMETRY INTO STRAIGHT SURFACES WITH THE SAME SQUARE FOOTAGE, BUT I WAS STILL ABLE TO ACHIEVE A COMPARABLE RESULT.

I STARTED THE PROCESS WITH THE TEMPLATE 90.1 LIBRARY USE TYPE. I BEGAN THE OPTIMIZATION PROCESS BY SEPERATING THE ZONES INTO SENSIBLE OCCUPANCY NUMBERS/ INFILTRATION NUMBERS.

THEN UTILIZED THE PROJECT SPECIFIC FACADE ENVELOPE ASSEMBLY AS WELL AS CUSTOM WINDOWS FOR SPECIFIC FACADES/AREAS OF THE PROJECT. AS WELL AS ADDING ACCURATE FRAMES/SHADE FOR THE WINDOWS PER THE SDA/GLARE STUDY.

FINALLY I CREATED SPECIFIC LIGHT AND ENERGY SCHEDULES FOR THE DIFFERENT ZONES AS WELL AS SCHEDULES SPECIFIC TO THE ELECTRIC NEEDS OF THAT SPACE WHICH FOR MANY WAS VERY LITTLE/CHANGES SEASONALLY.

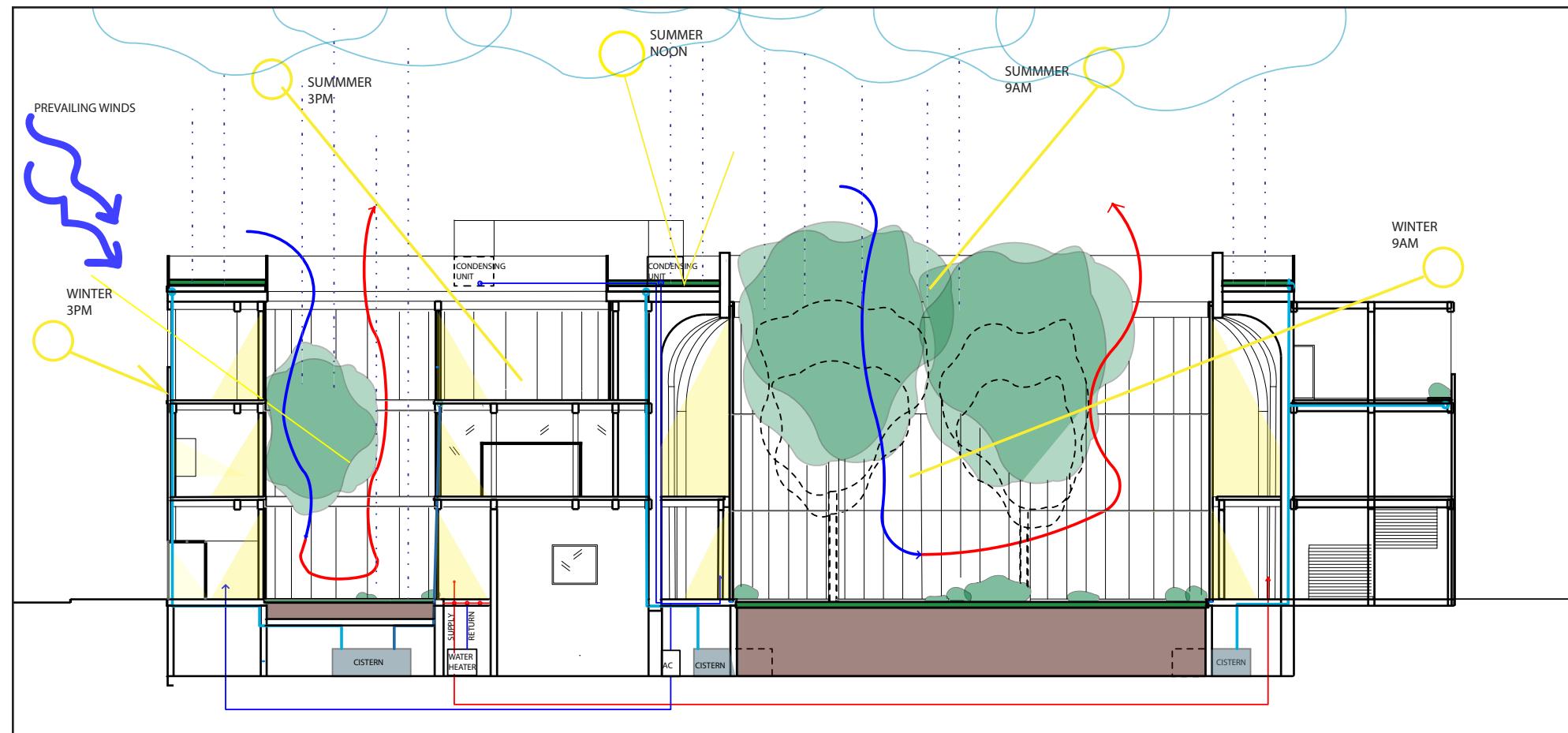
ALSO MESSED AROUND WITH DIFFERENCE BETWEEN BOILER AND ELECTRIC HEATING SYSTEMS AND INFILTRATION/VENTILATION NEEDS, YIELED SIMILAR RESULTS.



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