

Hub and Axis

***by
Gary Hansen***

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Thesis book submitted to the faculty of Virginia Polytechnic Institute and State University in partial fulfillment of the requirements for the degree of

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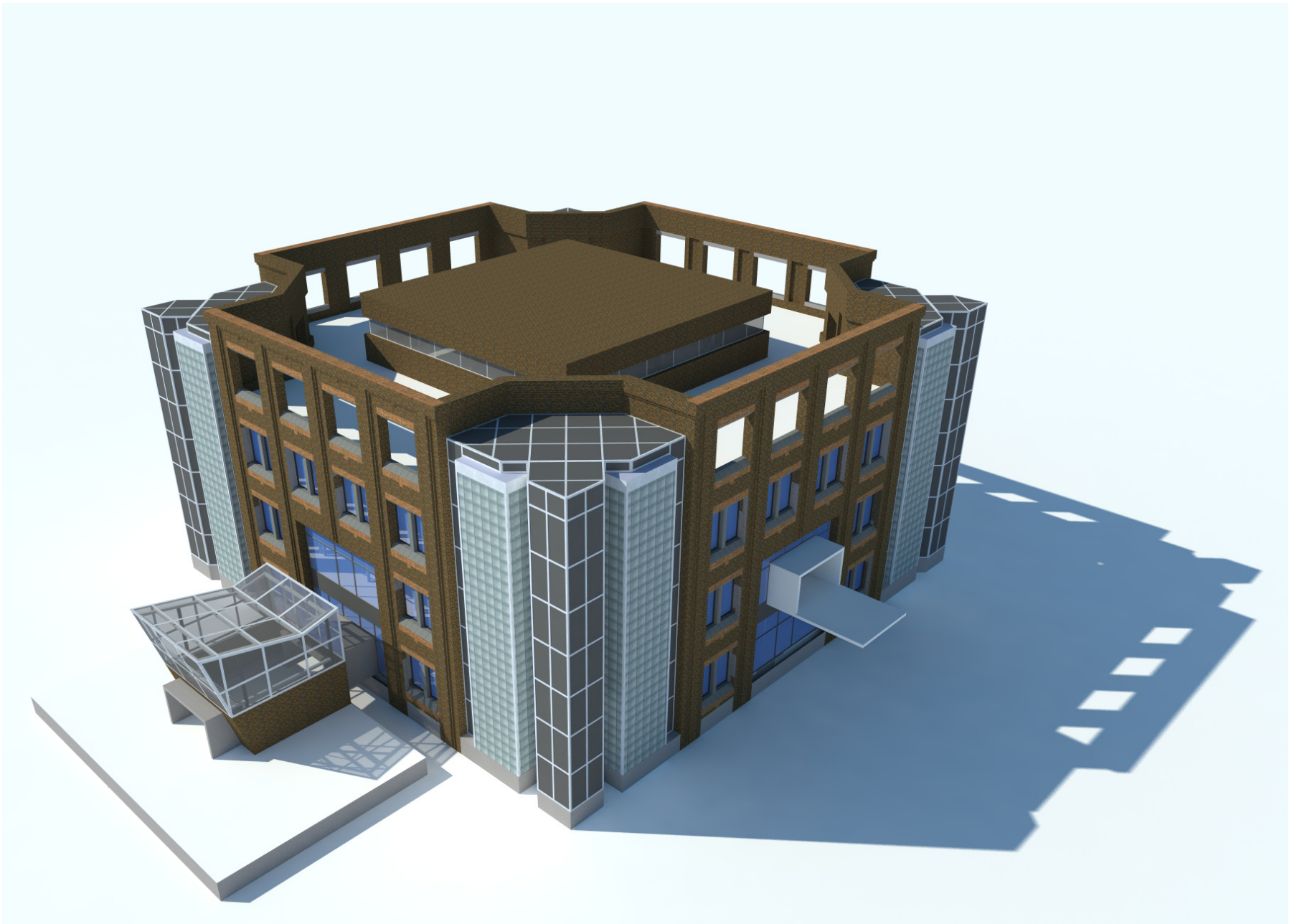
Key words: axis, hub, community center, atrium

Hub and Axis

From the very beginning, there has always been a central hub and defining axes to this building.

A hub space to draw people into the center of this building is the centripetal force. The hub space is where the axes to the building and the complex converge. It pulls people to the central building, as well as, to the center of the building.

The design also creates a centrifugal push from the center along the axes for other elements within, and outside, the building. Considerations for all movements in the design hinged on the axes generated by the hub.

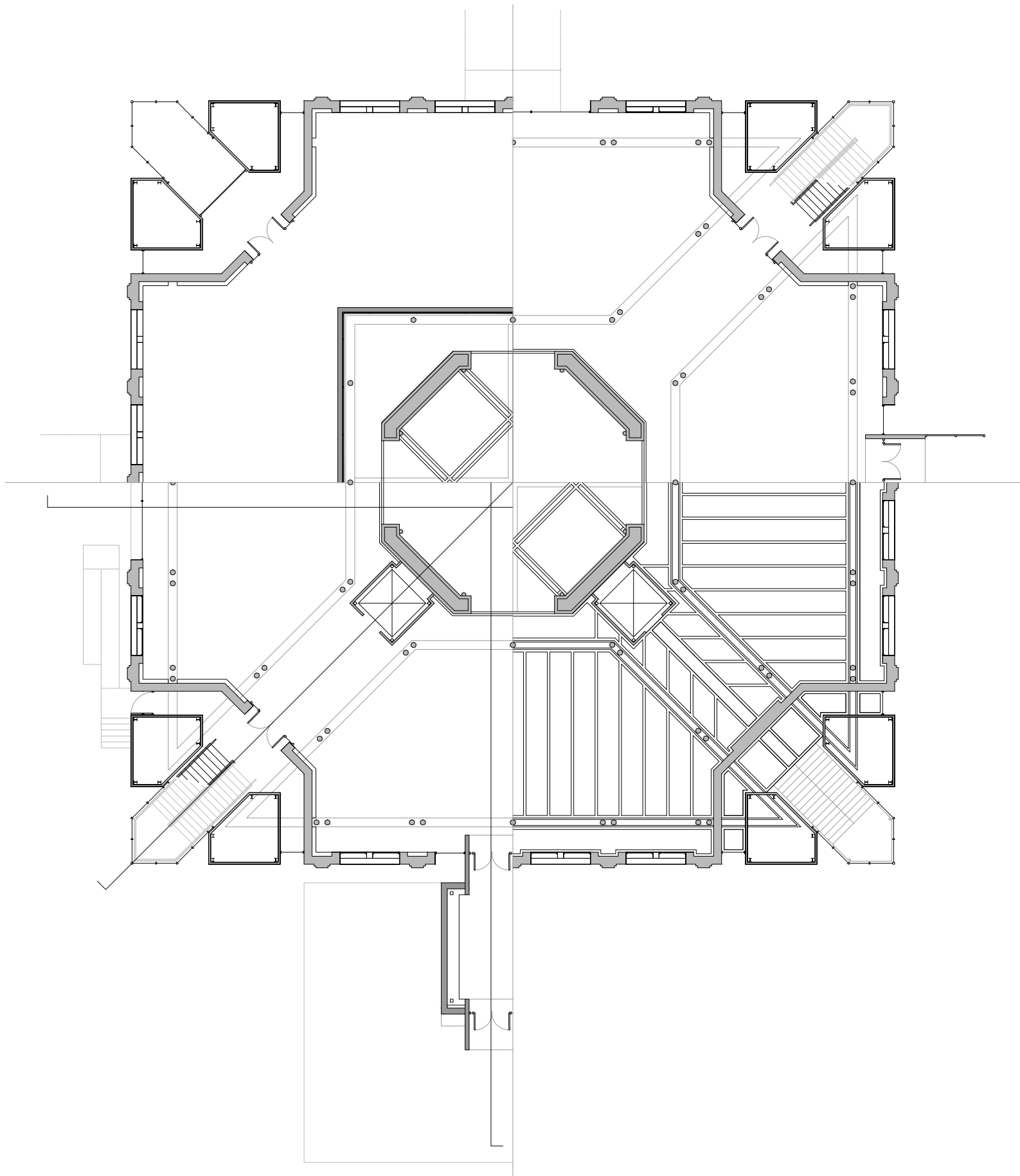


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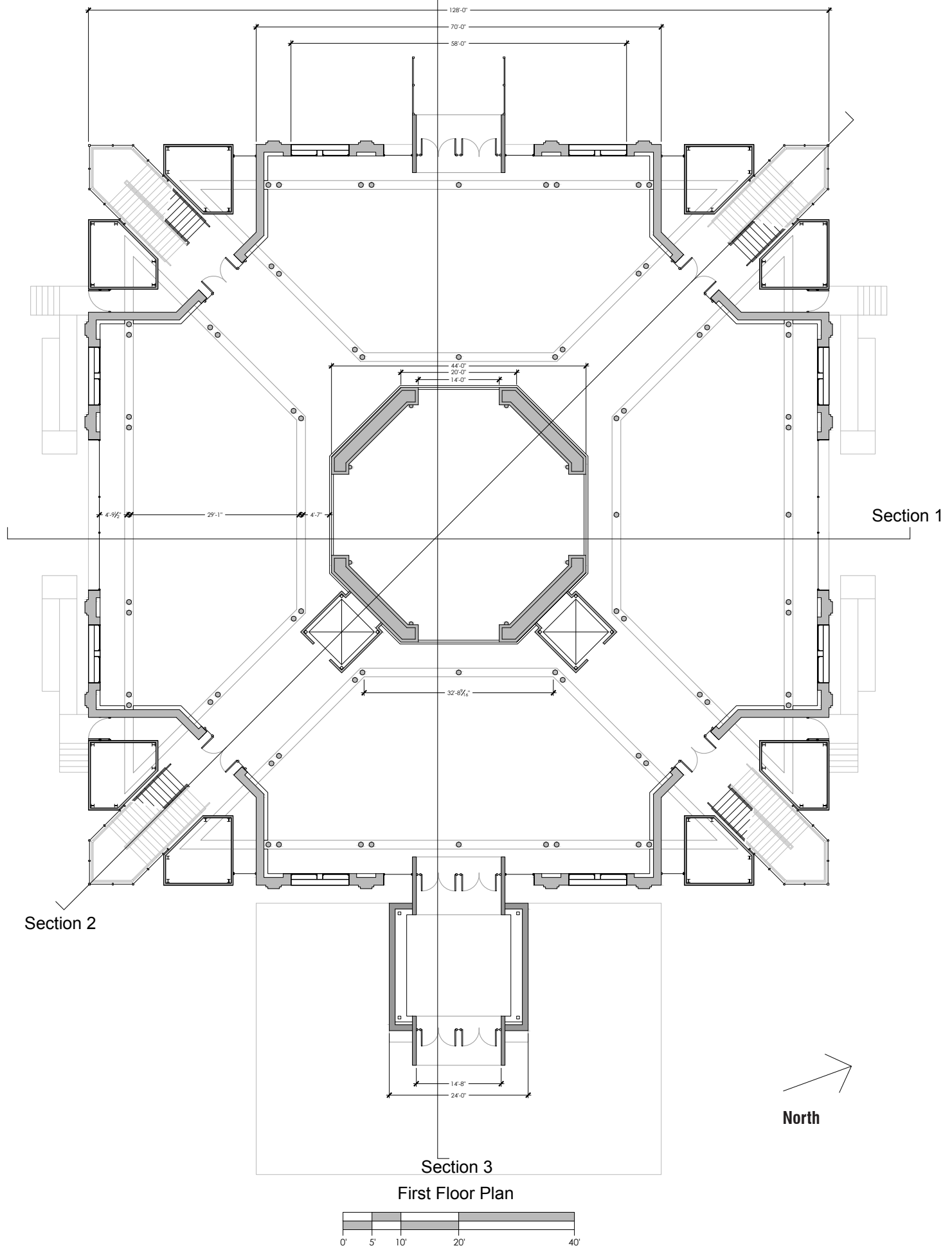
Abstract

The project is for the central building of a community center used by the communities of Blacksburg and Christiansburg. The building is a space configured as a hub that uses axes to determine entering, exiting and vertical movement. The hub configuration of the building is in concentric rings around the atrium in both space and materials. As materials were brought into the building, they enhanced the strong axial configuration and emphasized the layers surrounding the central hub space of the atrium. There are two pairs of axes in the building. The entrance axes are perpendicular to the faces of the building and provide lines of sight through it. They also establish the paths of entering and exiting the building. The diagonal axes regulate the vertical movement throughout the building.



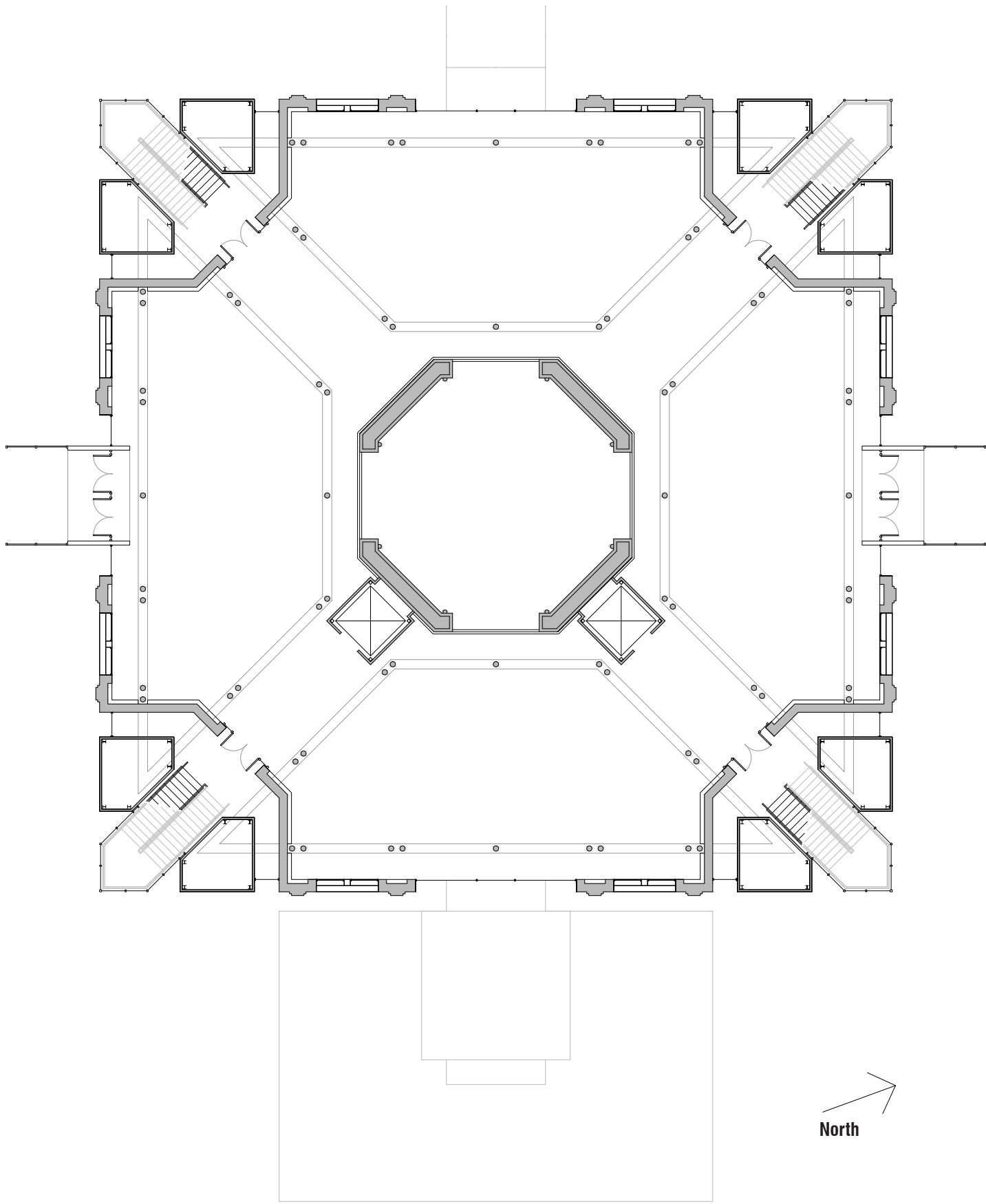
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*Dedicated to my boys, Max, Hunter, and Walker. They are a little off-center.
Just like their dad.*

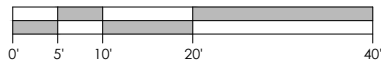


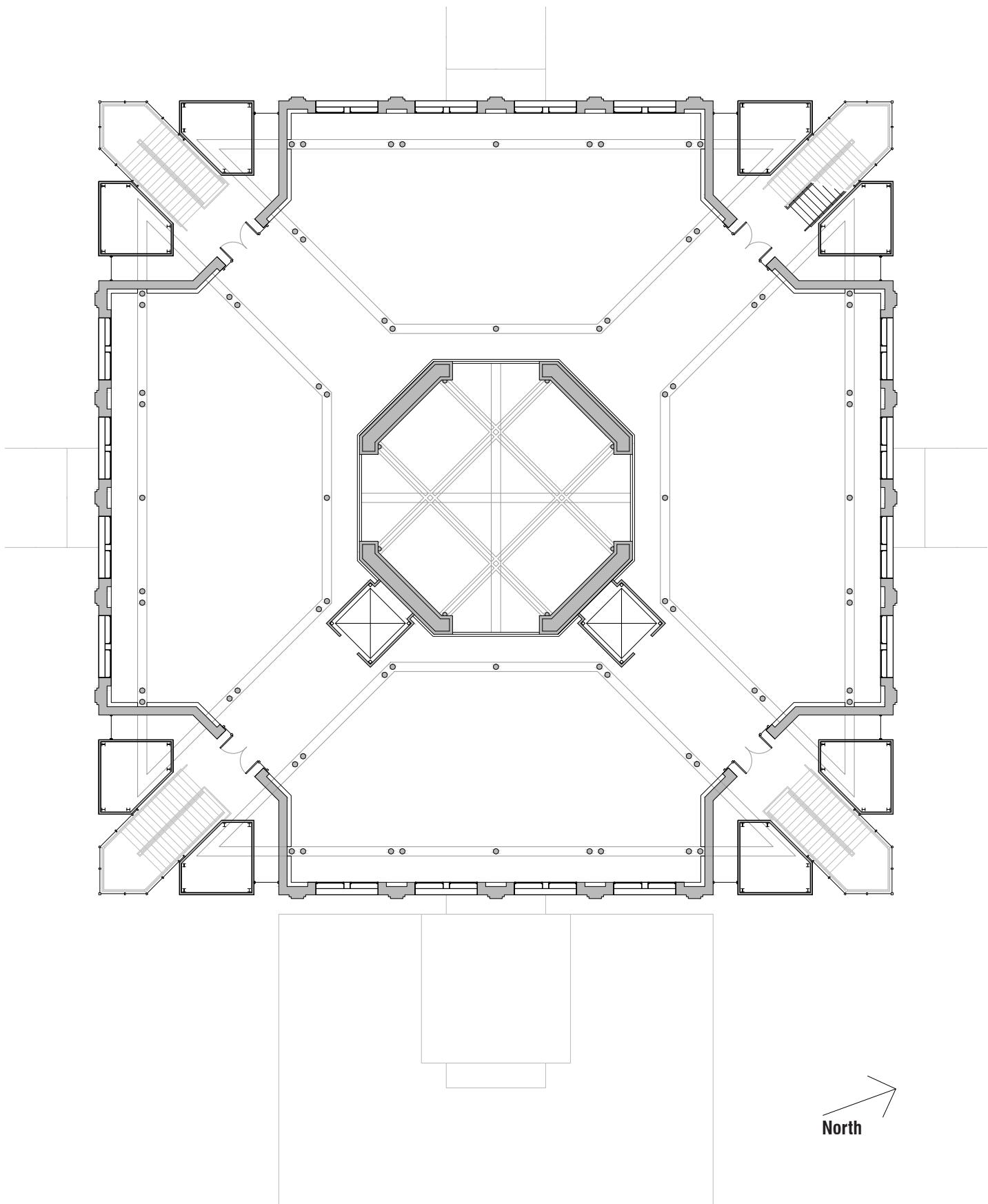
This building is the hub of the complex. The plans radiate from the central atrium. The unprogrammed space is the next ring in the hub while the entrance/exits, facade and stairs are the outer ring. The plans are based on a square with two pairs of axes. The entrance axes are where one would enter and exit the building. These axes are also expressed in the ability to see through the building through the opening of the atrium. It is also expressed

in the directionality of the cabinetry in the reflected ceiling plan. The other axes are on the diagonal. They show where the vertical movement in the building is located for both people and services. The 45 degree angle of the beams, elevators and stairs reinforce this directionality. The diagonal axes also divide the square plan into quarters giving the building four distinct unprogrammed areas on each floor facing both the facade and the atrium.

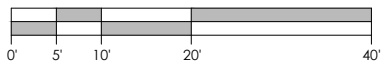


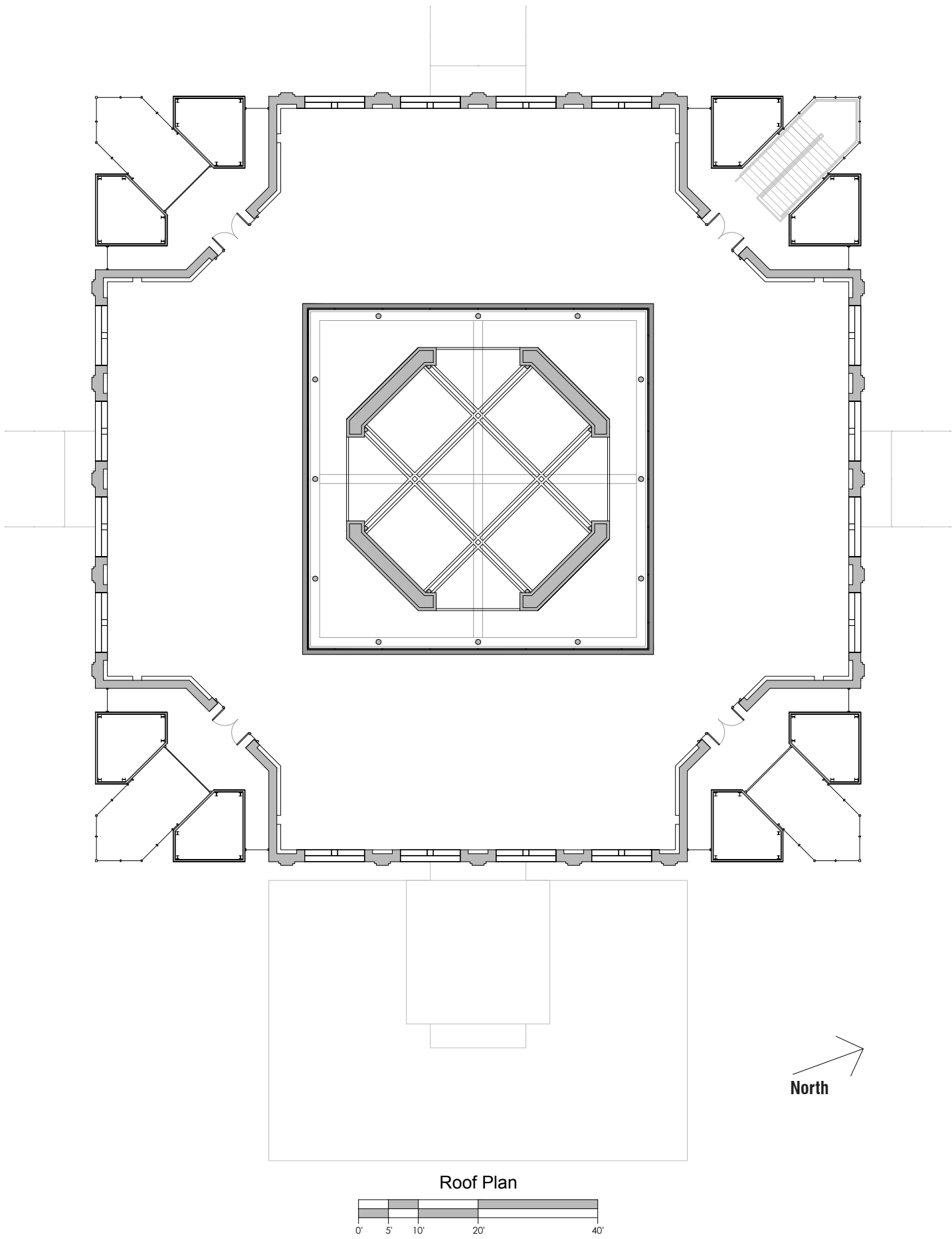
Second Floor Plan

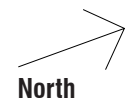
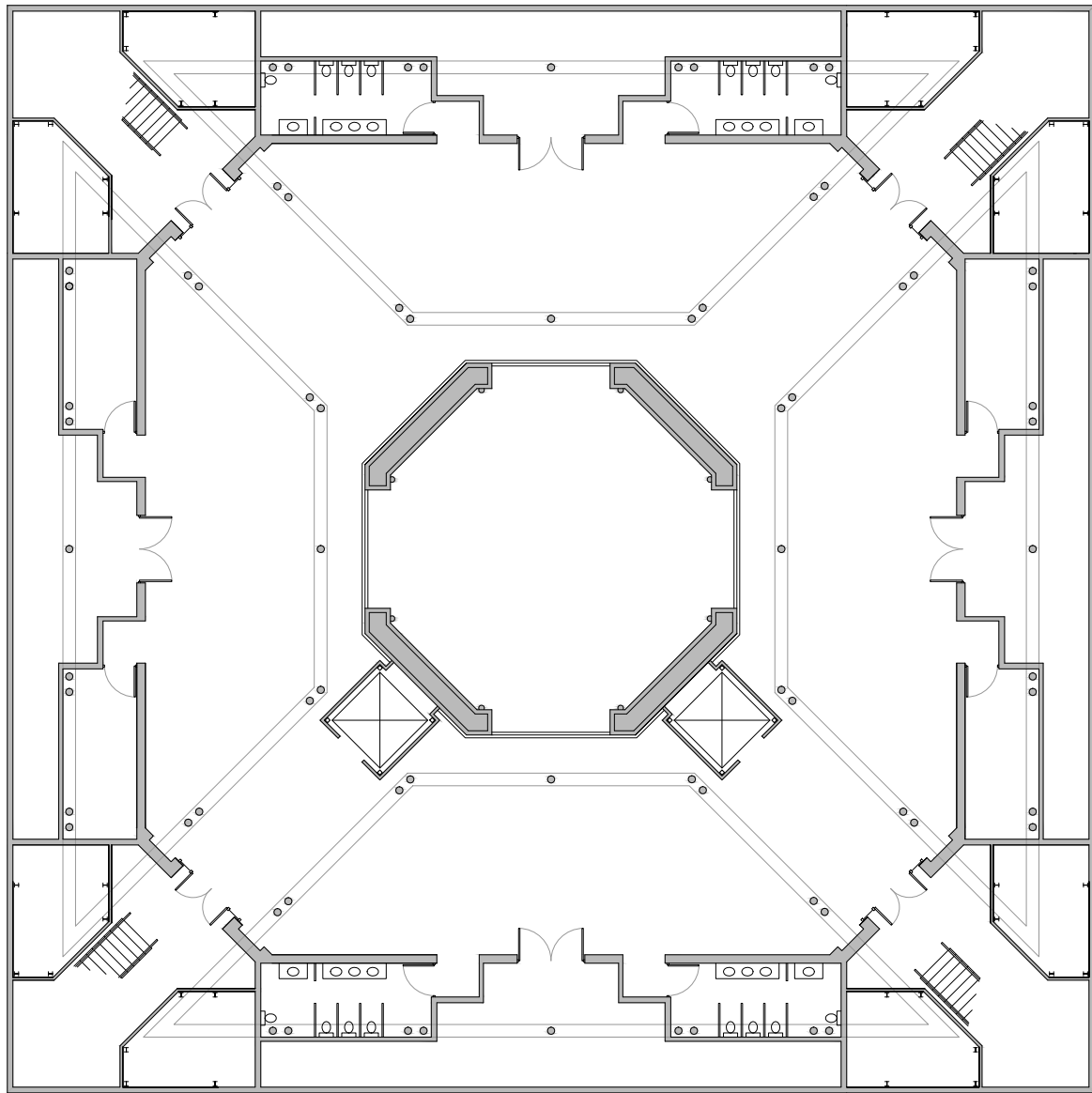




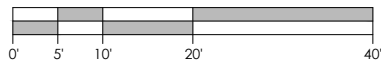
Third Floor Plan

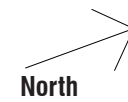
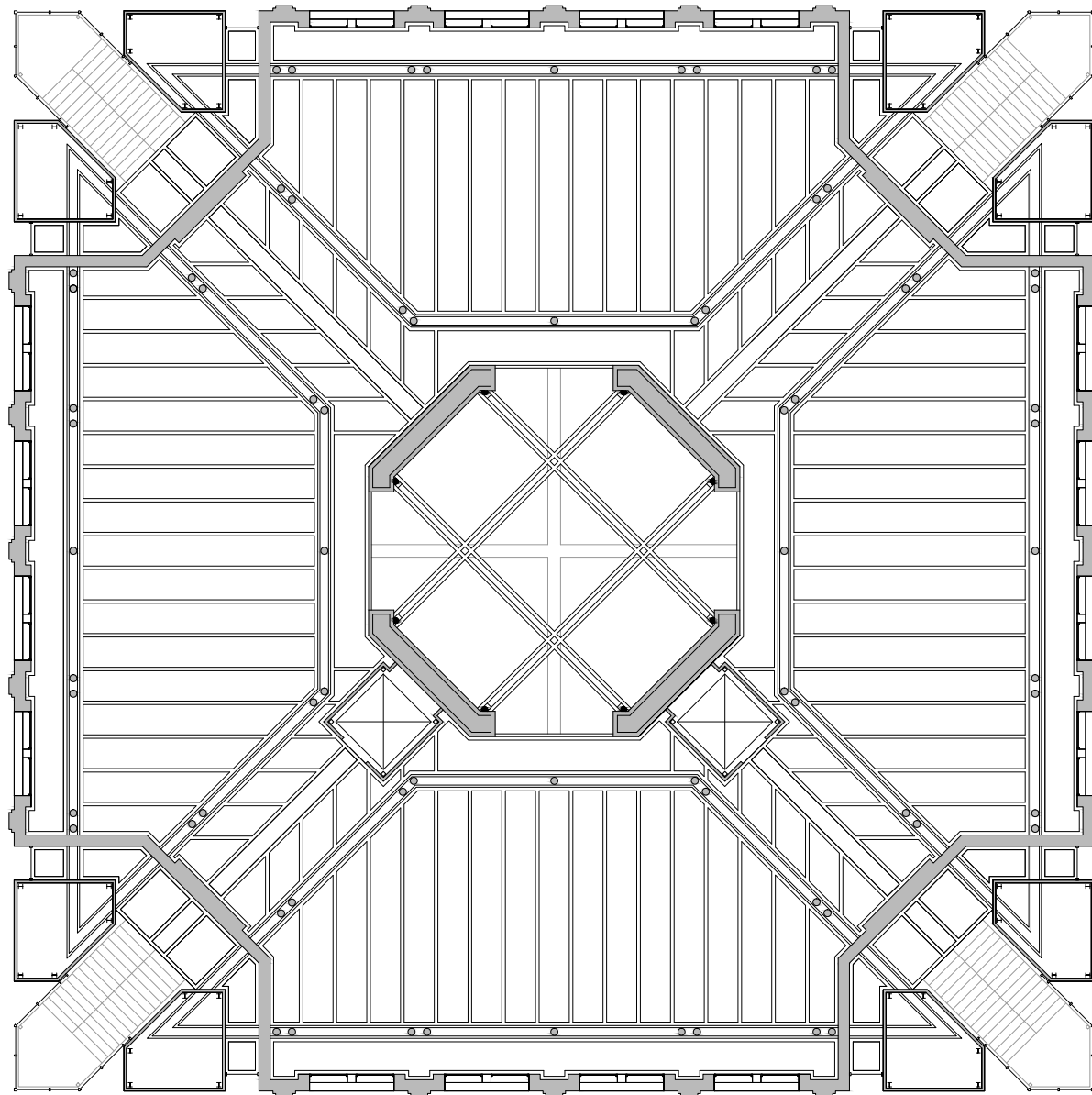




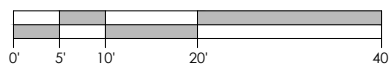


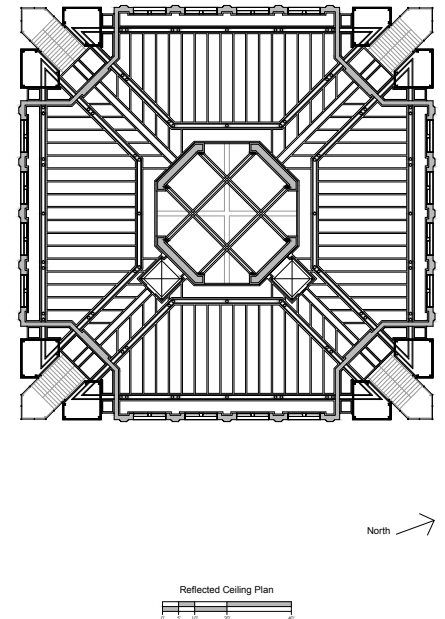
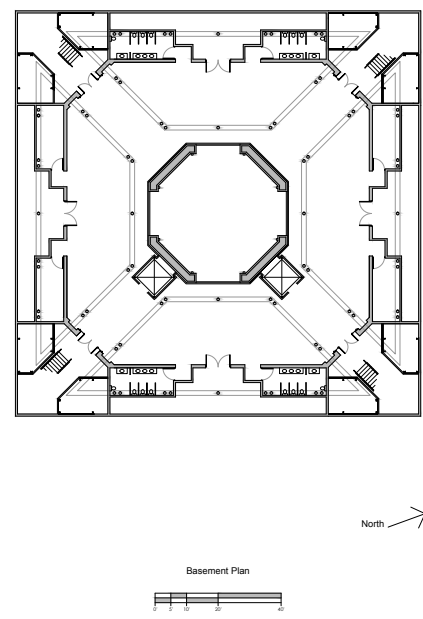
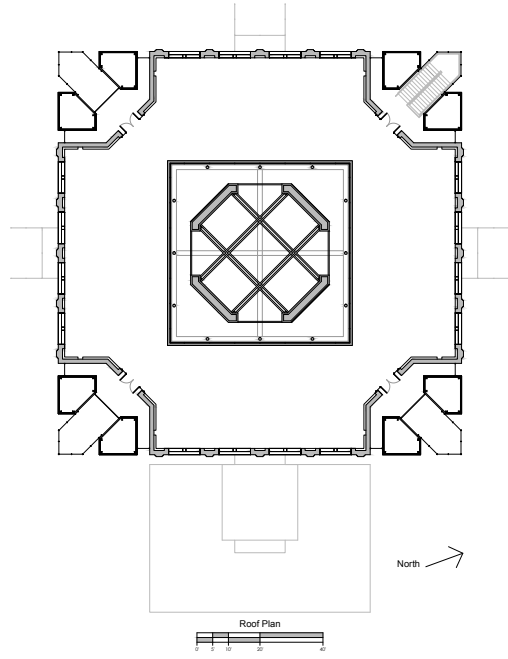
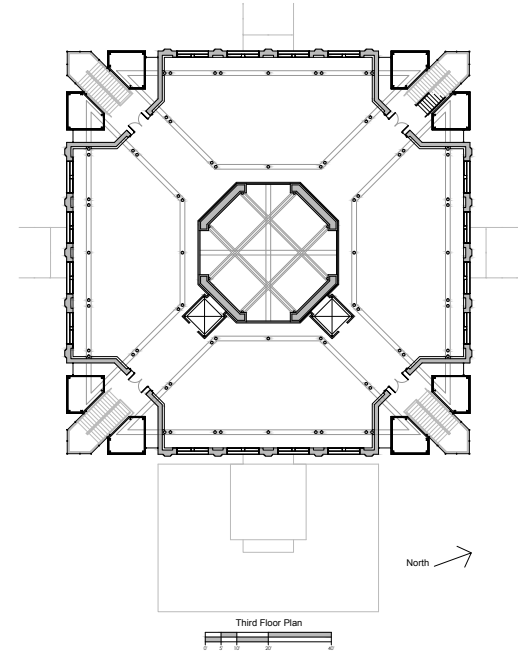
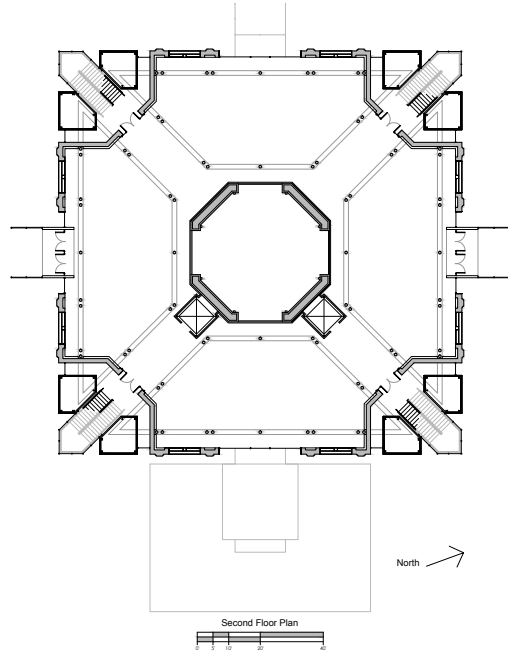
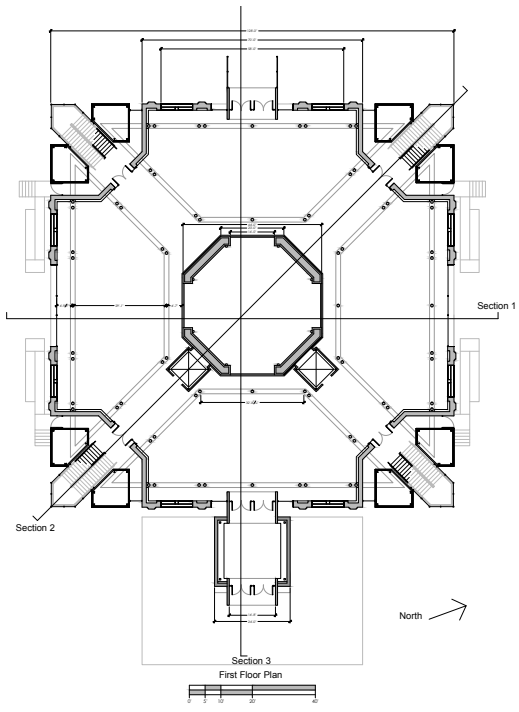
Basement Plan

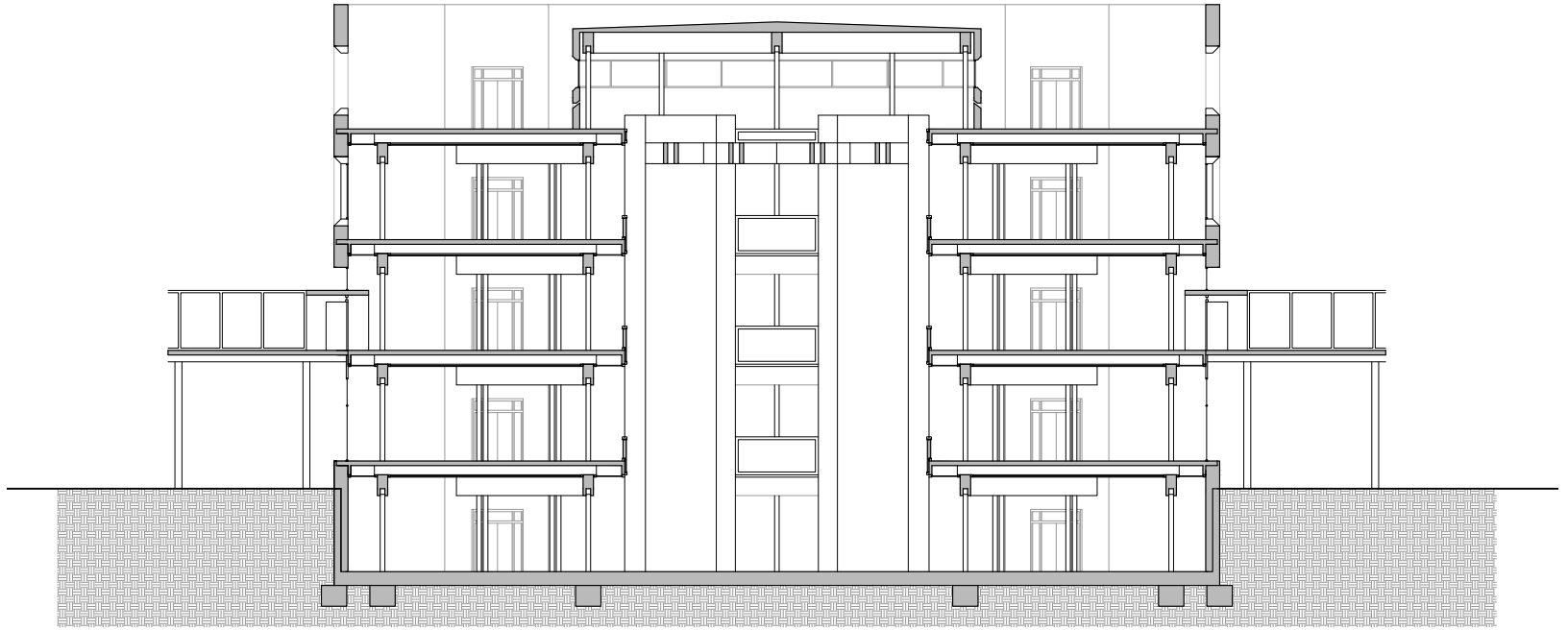




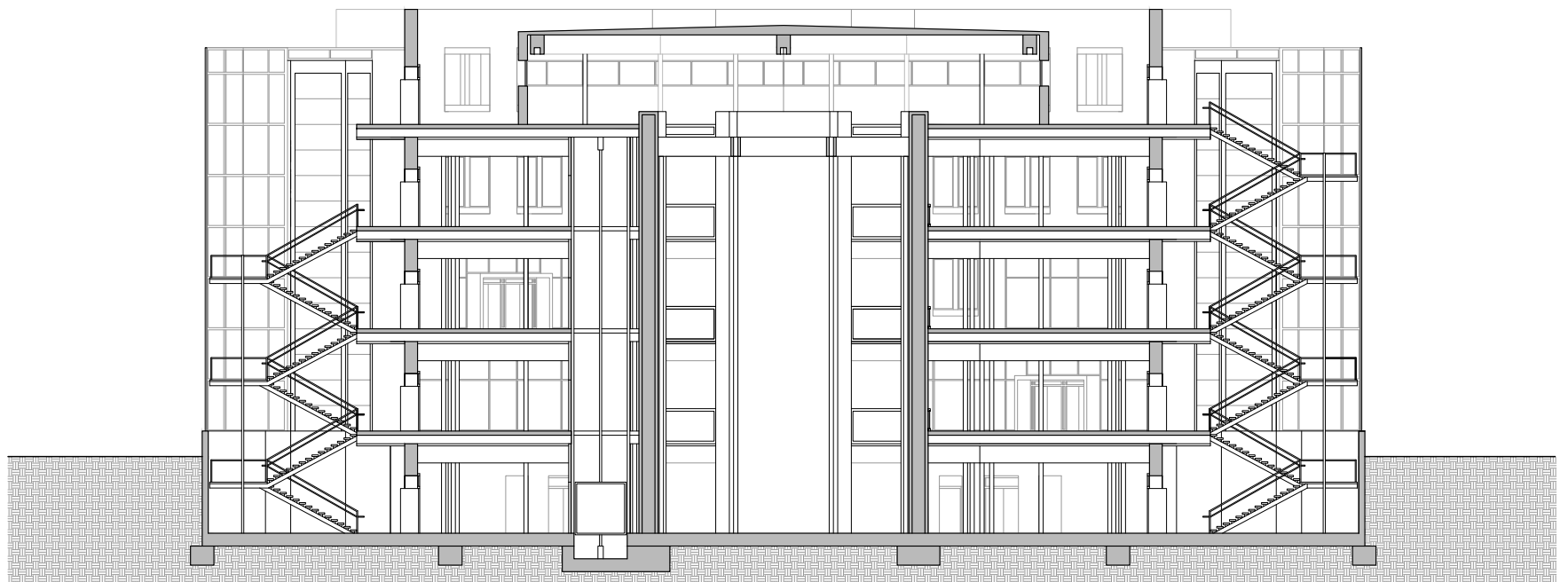
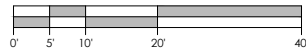
Reflected Ceiling Plan



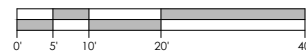




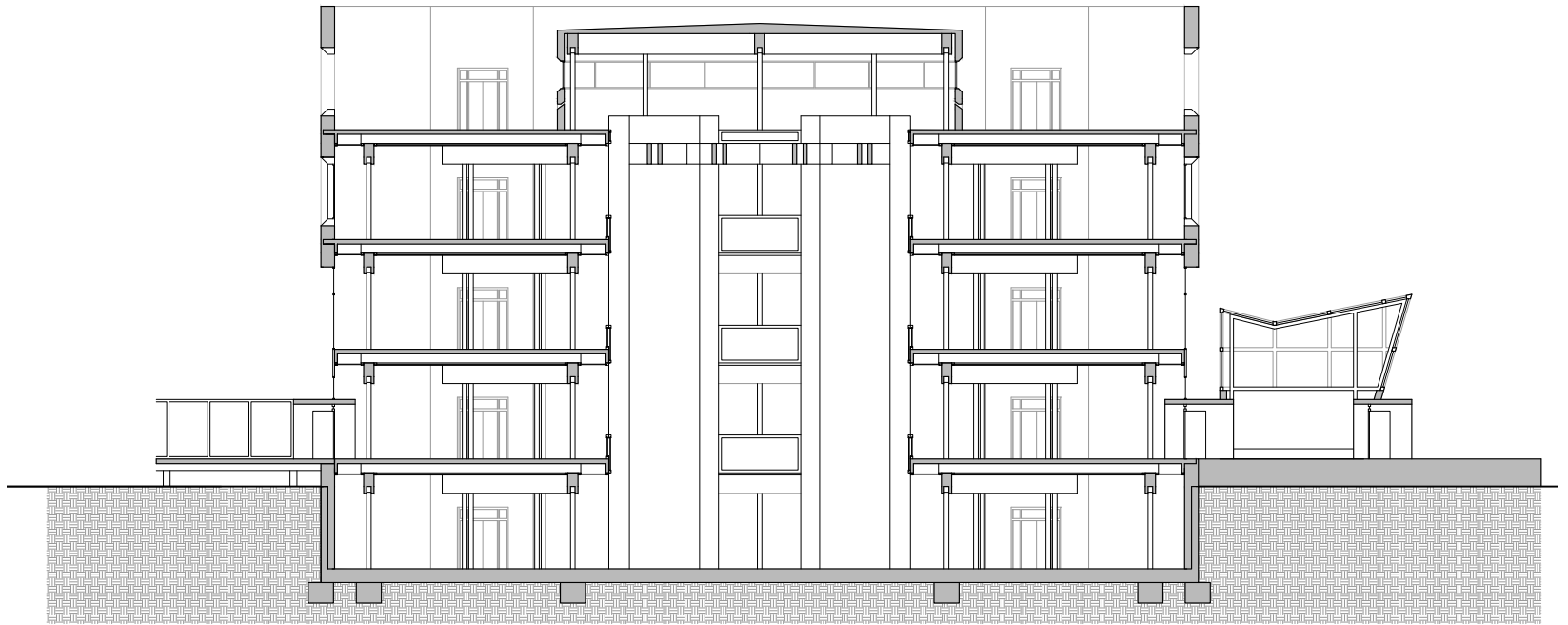
Section 1



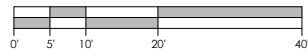
Section 2



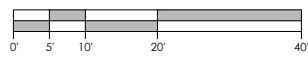
Section one and three depict the uninterrupted view in the building through the openings in the atrium and the entrance/exits of the building. Section two is a diagonal section of the building and demonstrates the cut through the stairs and the elevator and shows how the atrium is closed off to this axis.

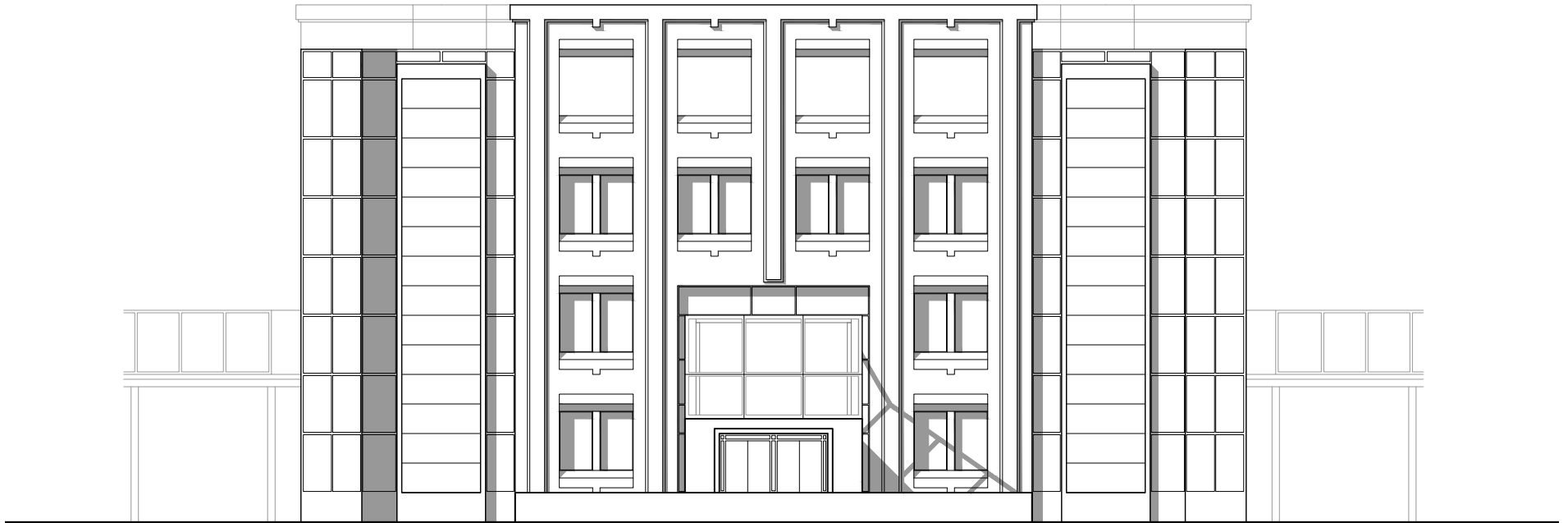


Section 3

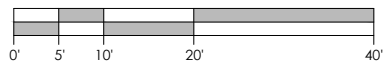


Half Section

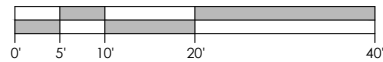




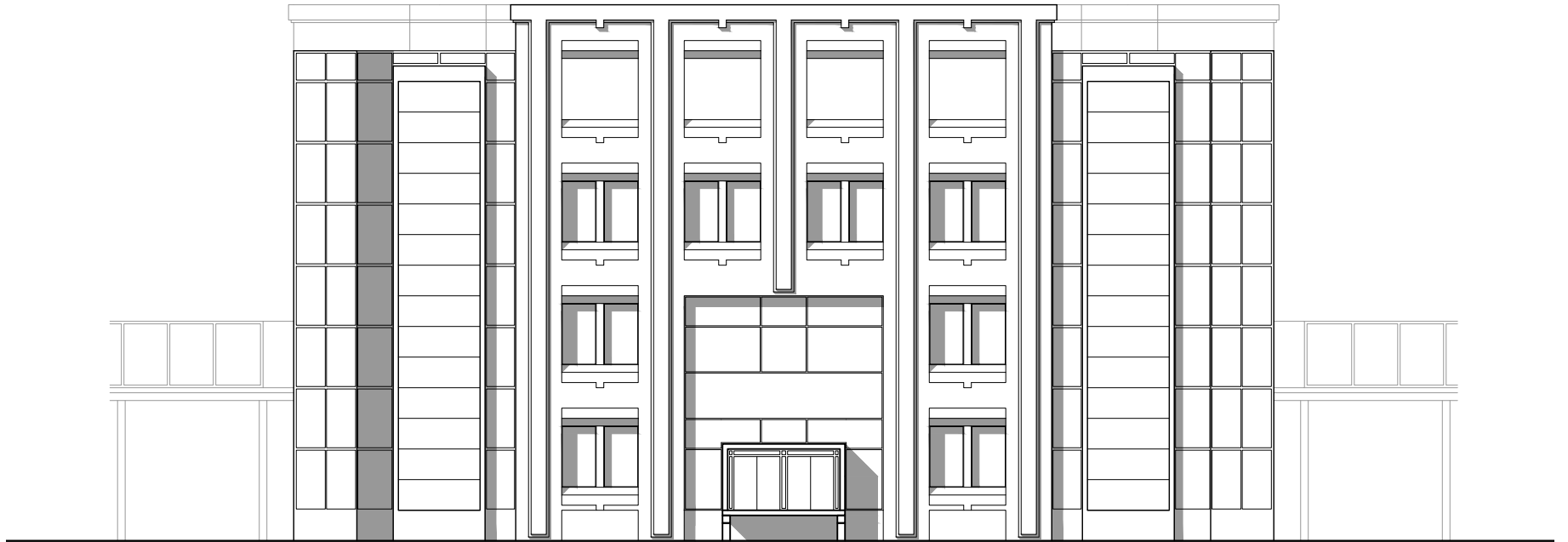
Southeast Elevation



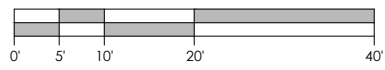
Northeast Elevation



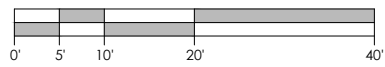
The elevations of the building have an undulating facade. The shadows were essential on the elevation. They exhibit the fluctuation and depth of areas in the building. The windows are deep set in a very thick facade and the vertical chases on the ends protrude out from the stairwells. The entrance on the southeast elevation extends out significantly from the building.

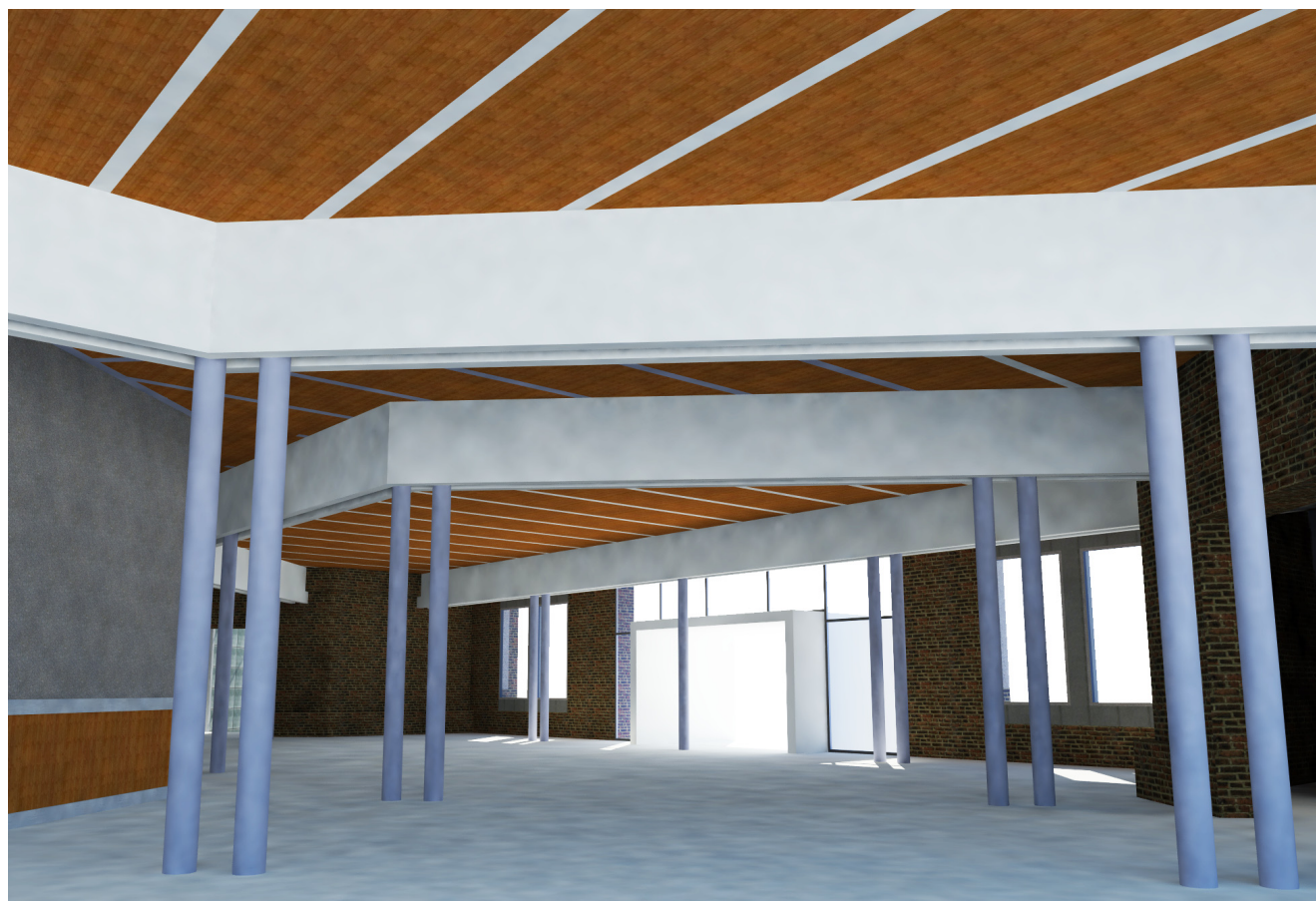
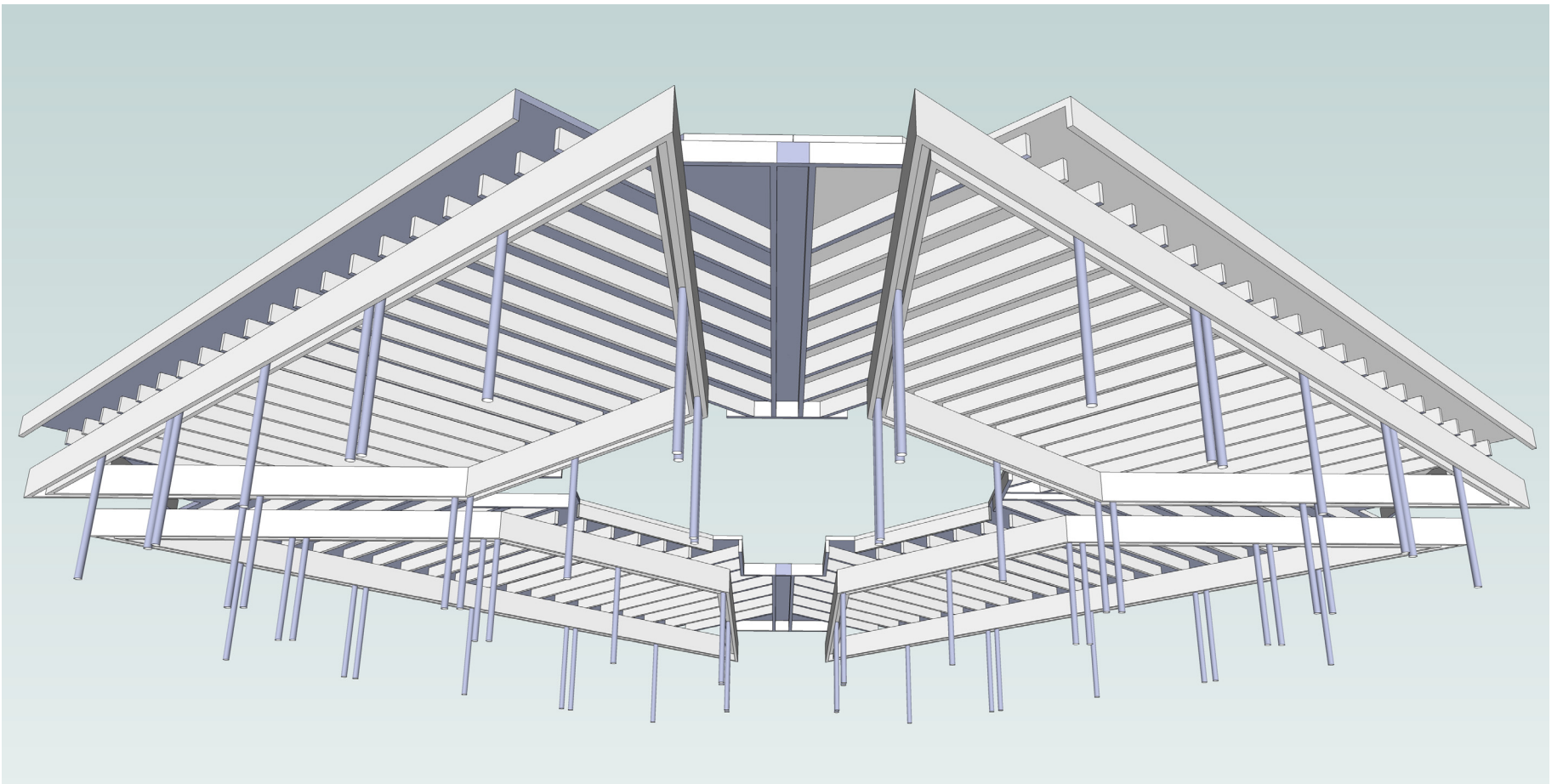


Northwest Elevation



Southwest Elevation

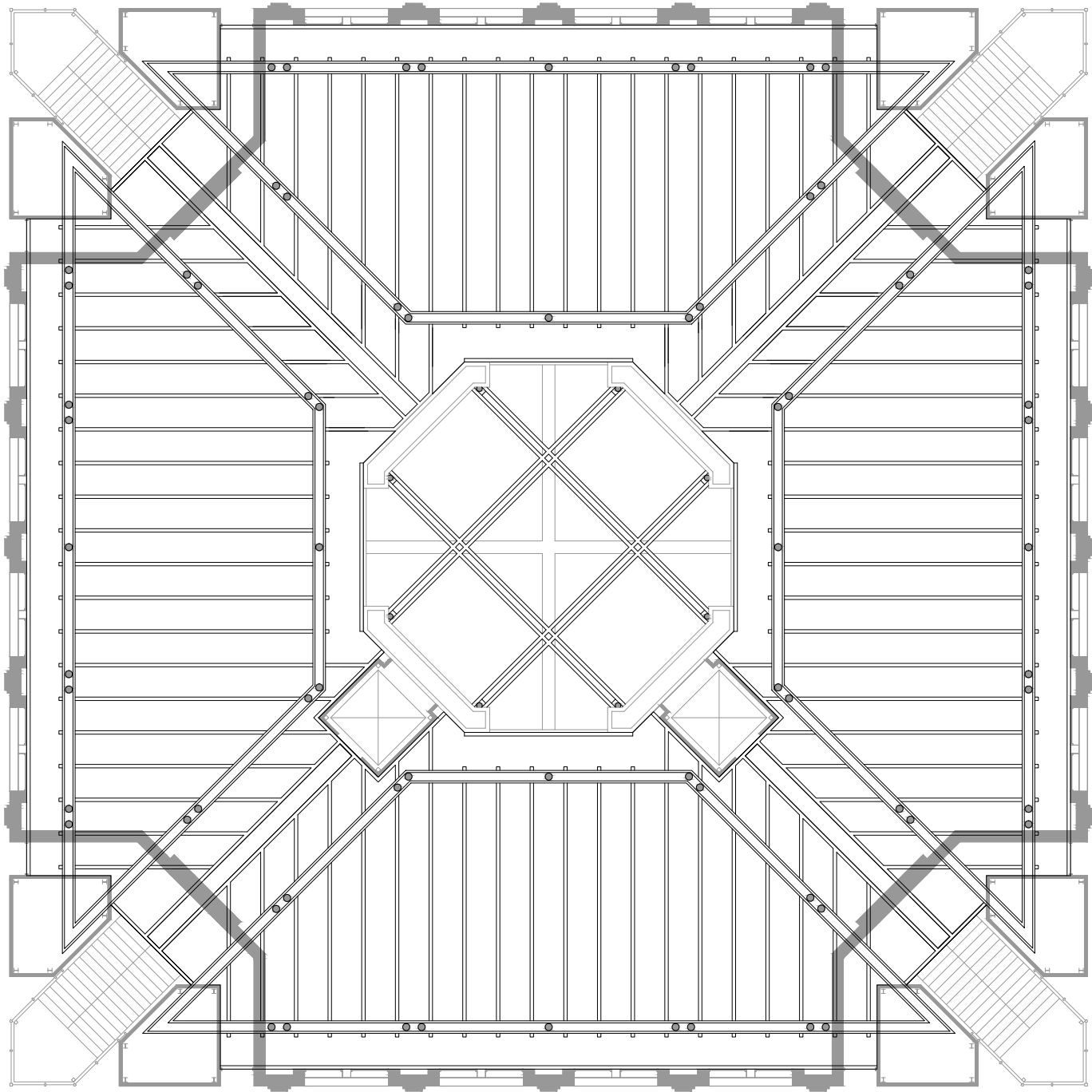


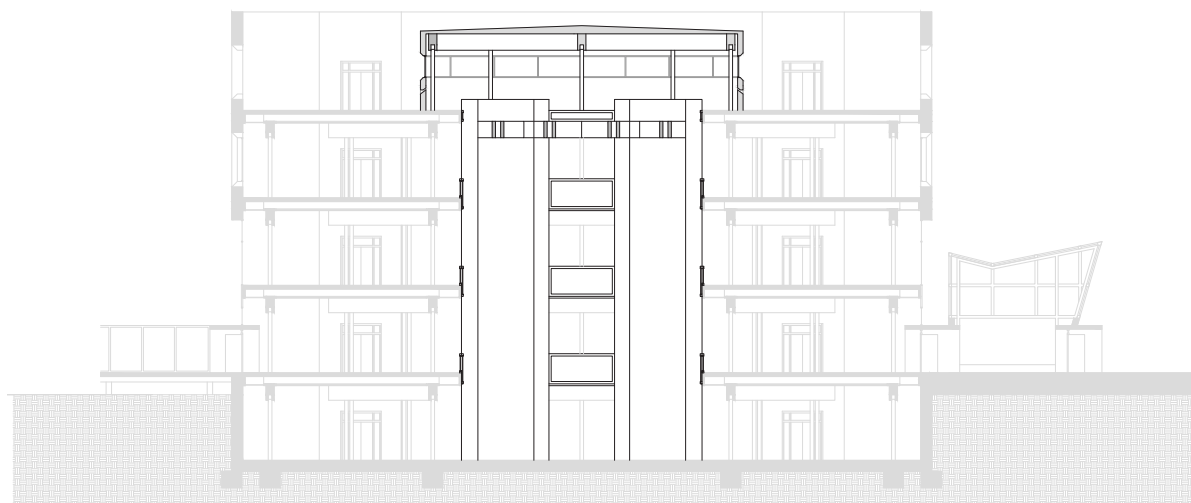


The structure of the building was designed for many different purposes. It had to enhance the directional axes through the beams, joists and columns. The beams divide the square plan into four distinct areas in the building. The structure also had to be disengaged from the walls so the brick facade could be unhindered. The joists were separated to give a place for

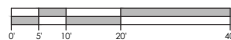
the cabinetry of the ceiling. Services run in the space between the cabinetry of the ceiling and the underside of the floor. Towards the center and at the outside of the building, the direction of the cabinetry and structure makes a 90 degree turn to connect the services with the vertical chases adjacent to the stairs.

Structure



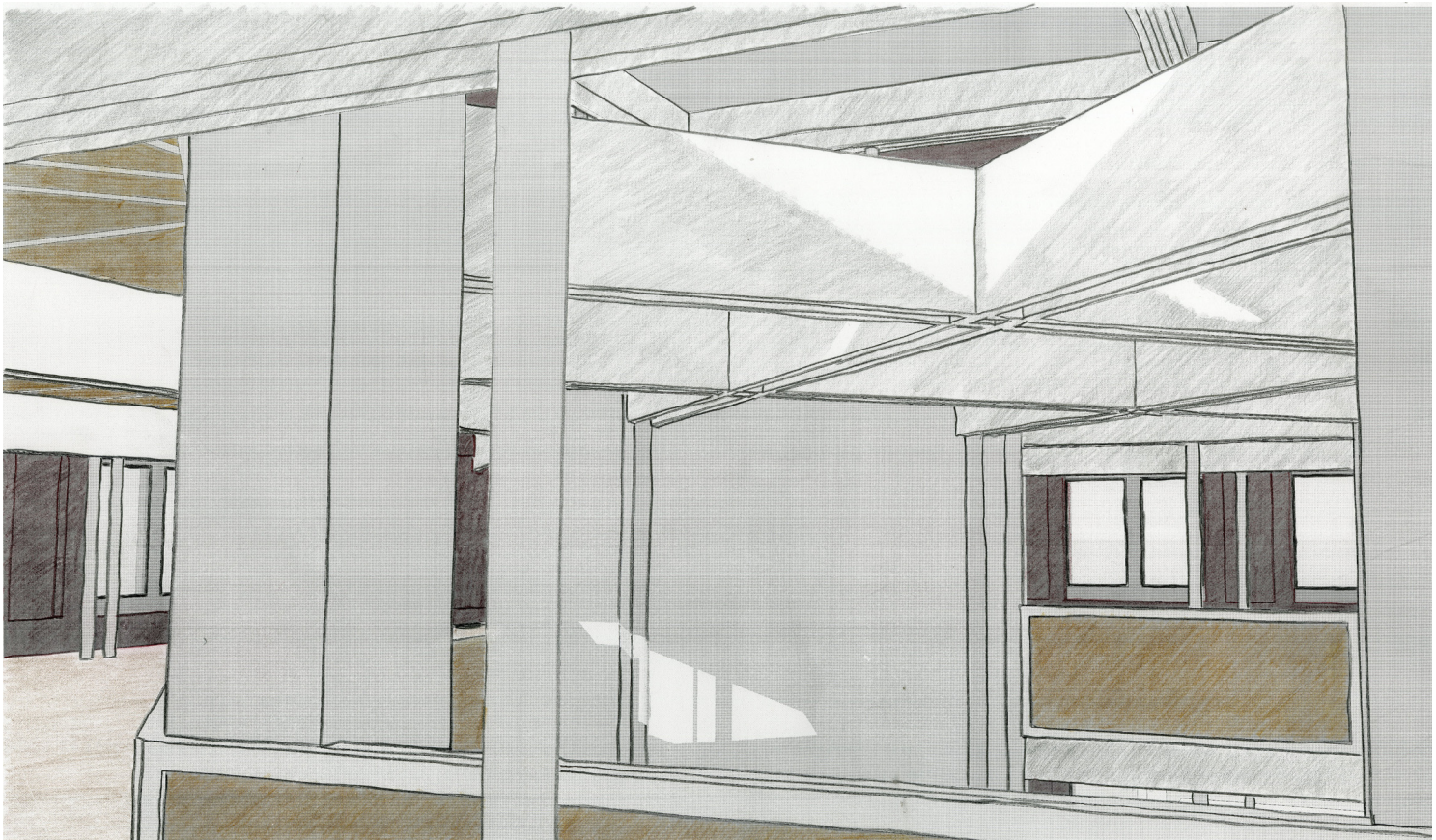
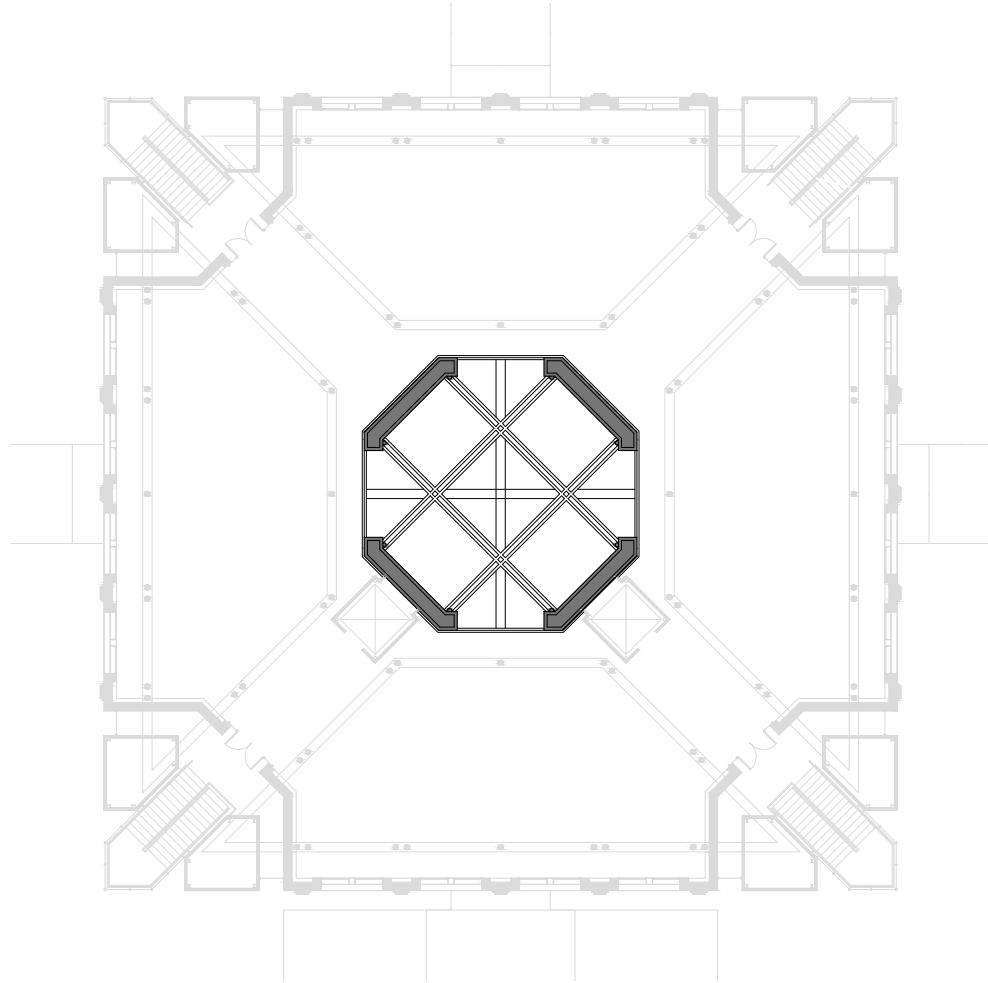


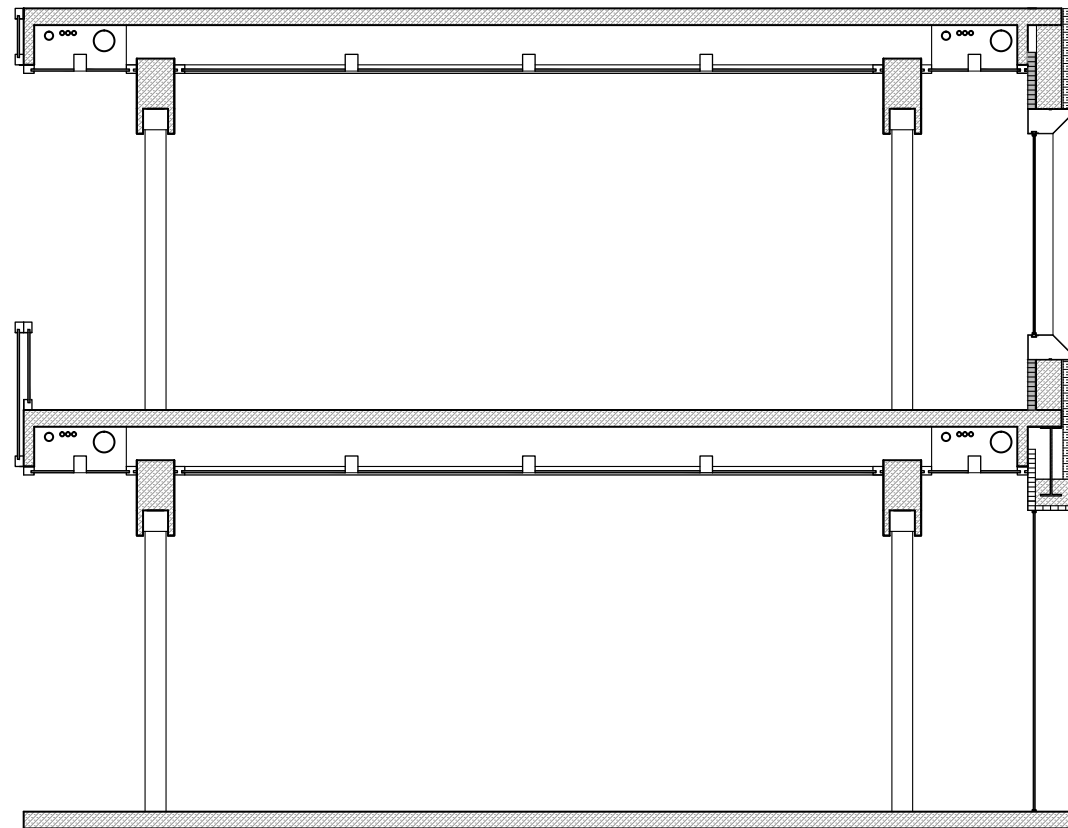
Atrium Section



The central atrium is the hub and focal point of the building. The other parts of the building radiate out in concentric rings from the atrium. It allows natural light into the center of the building. The clerestory above the atrium is pulled back six feet from the edge of the atrium to let indirect sunlight fill the atrium without excessive heat gain. The atrium is 44 feet wide and has openings that can be seen through from one side of the building to the

other. It reaches from the basement floor to the clerestory on the roof. At the third floor, the beams from the structure are extended through the top of the atrium to enhance the diagonal axis and give the sunlight from the clerestory a surface to play on. Above the diagonal beams, the structural beams of the clerestory are also visible. When seen from below, both axes in the building are represented at their center points.

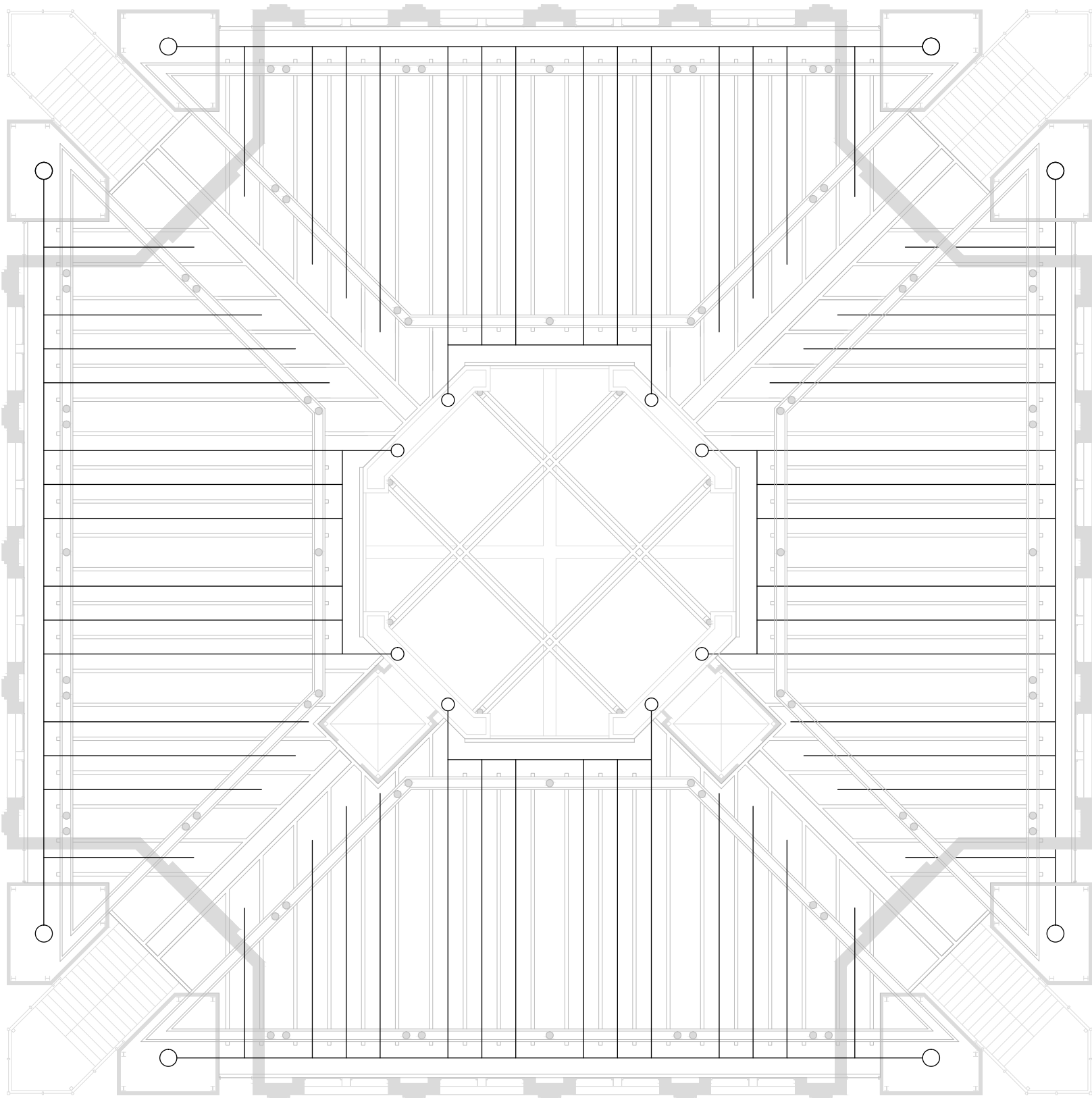


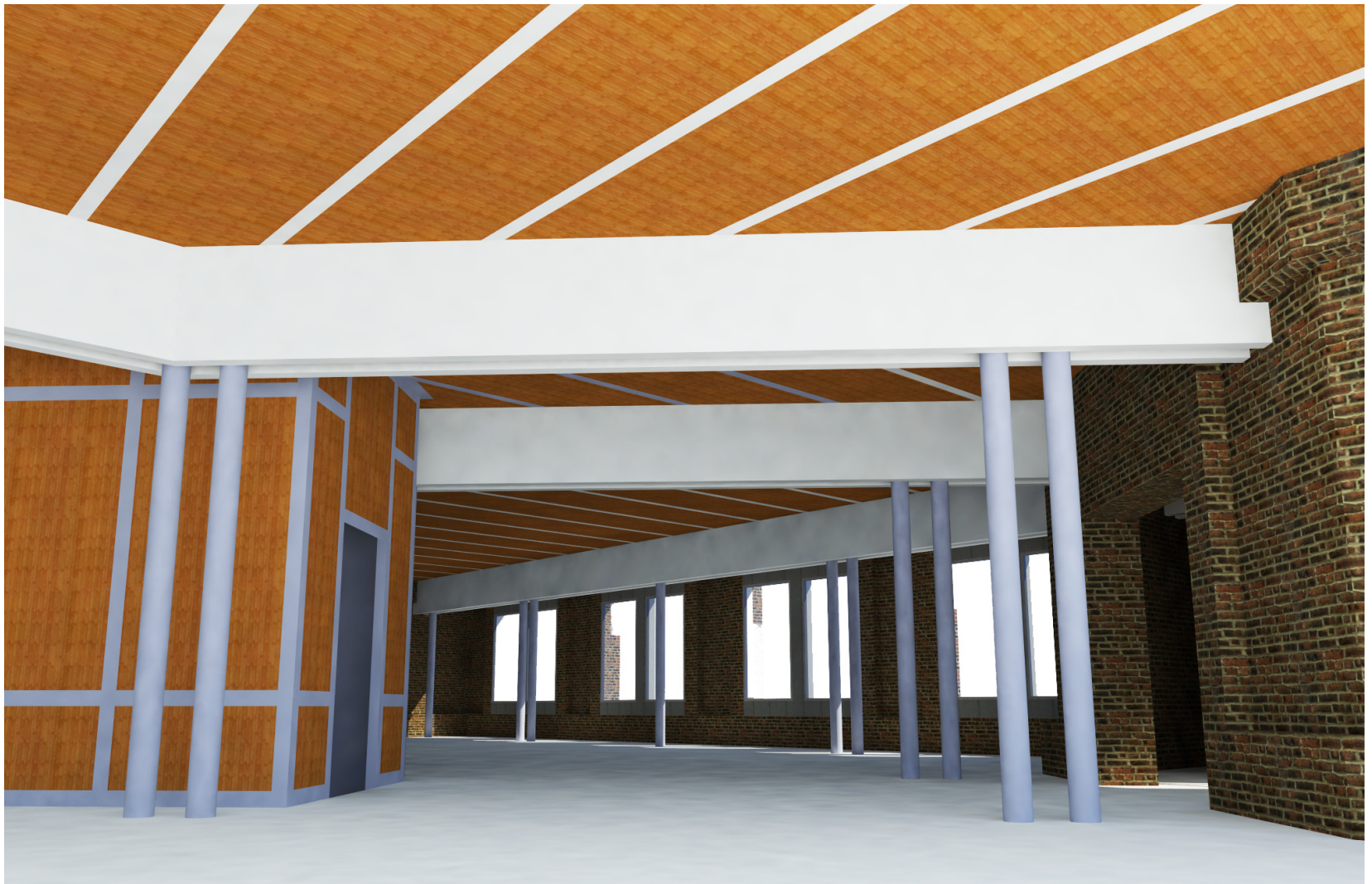


The floor system is designed in conjunction with the structural system. The floor is eight inches thick and is self-supporting between the joists. The floor contains long cylinders running horizontally throughout to deliver heated air. Concrete joists support the floor. The ceiling cabinetry attaches to these joists.

The depth of the joists provide space to run the rest of the services for the building, electrical, fire suppression and return HVAC. The floor system connects with the vertical distribution columns adjacent to the stairs and at the atrium.

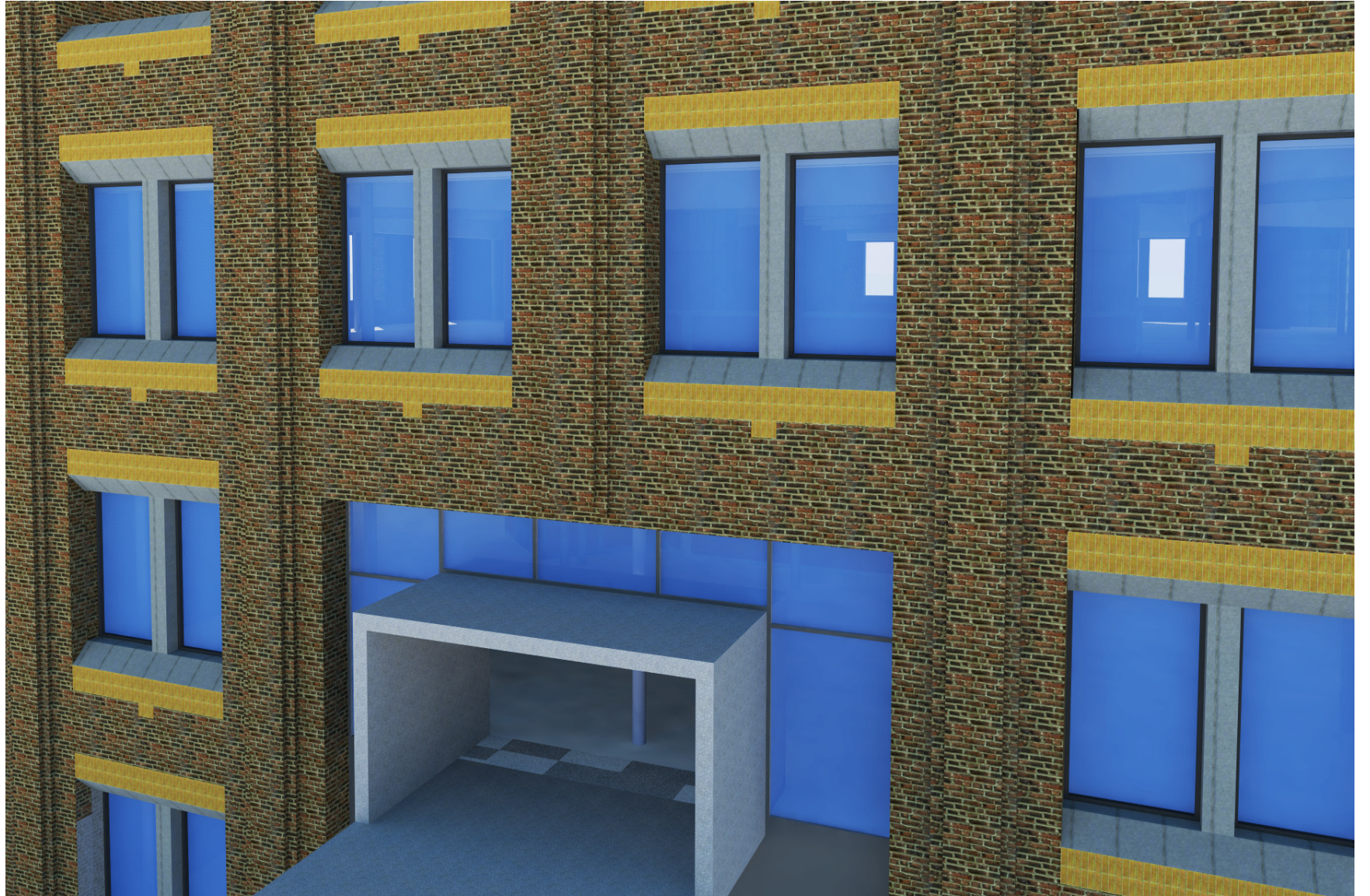
Floor system

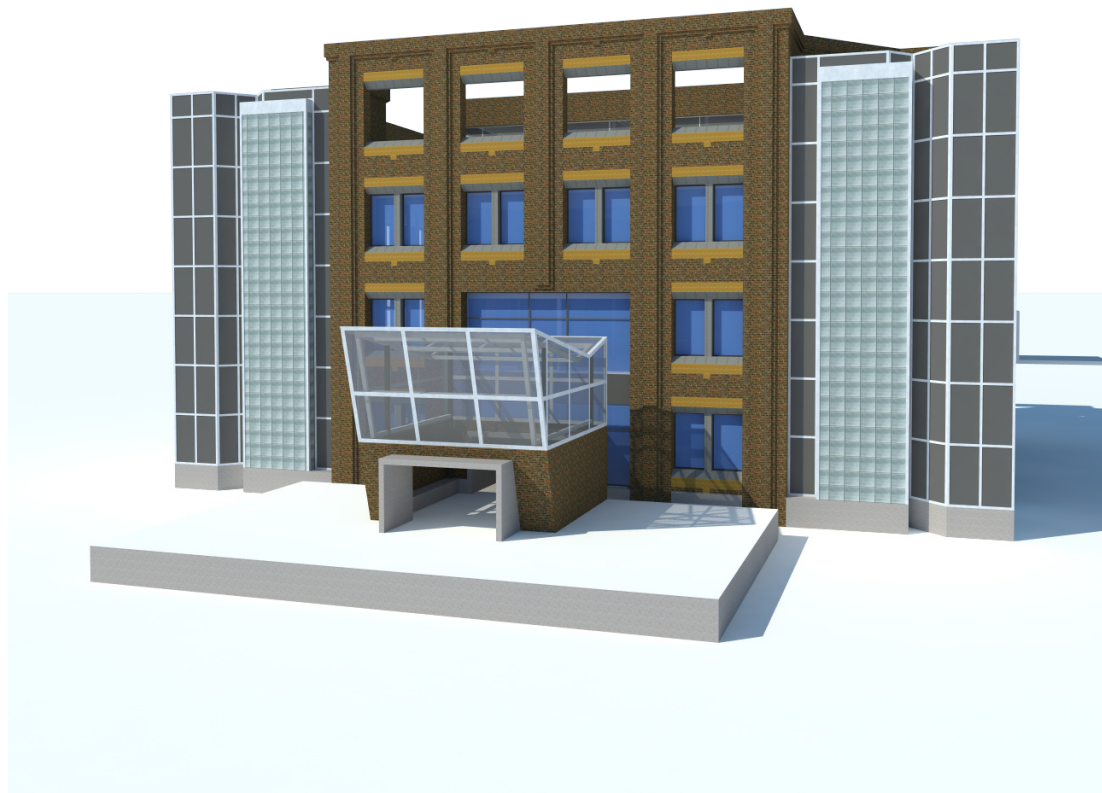
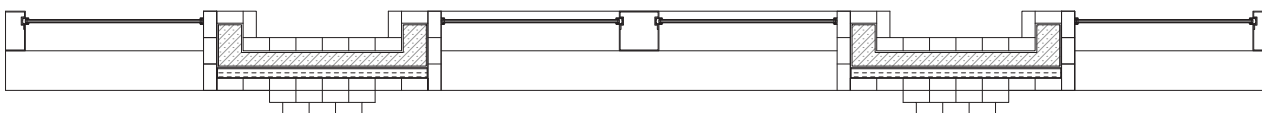
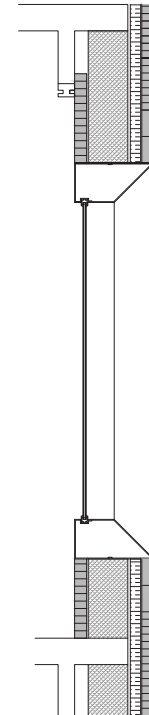
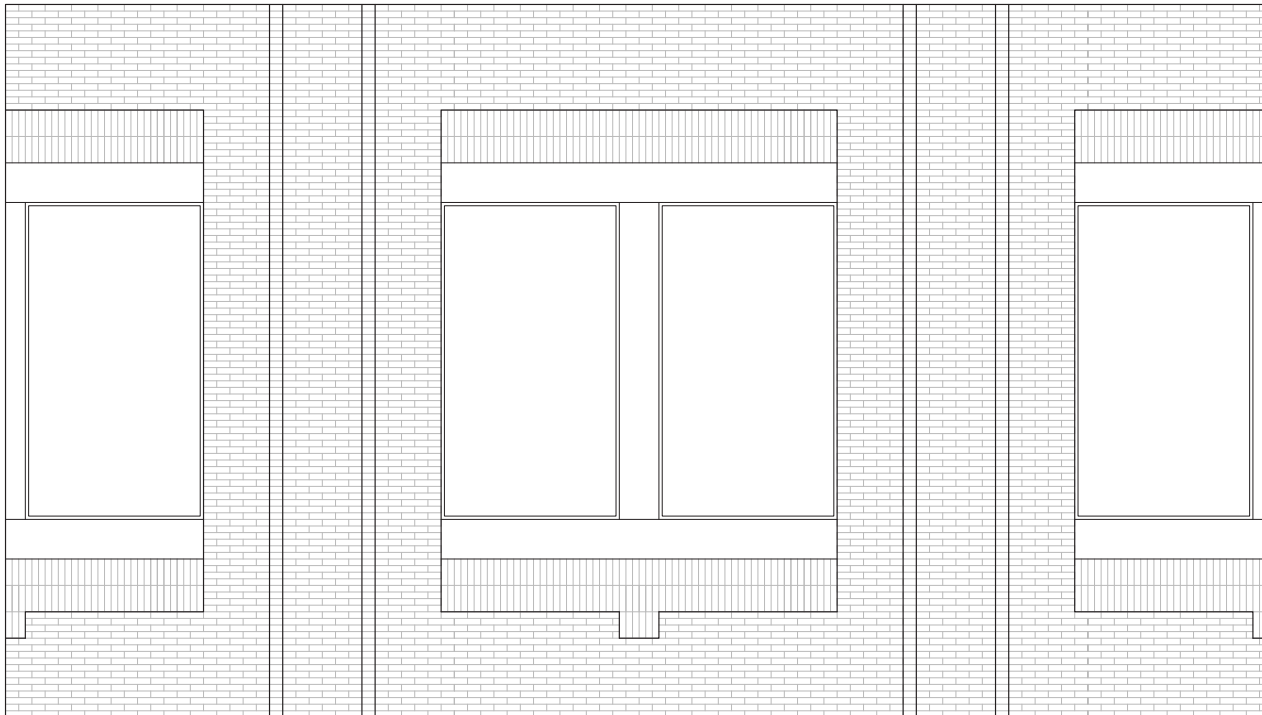




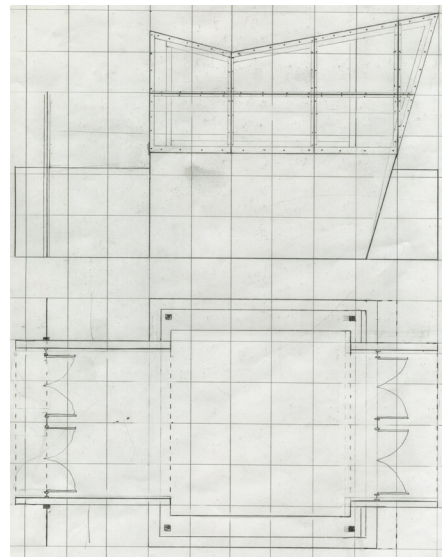
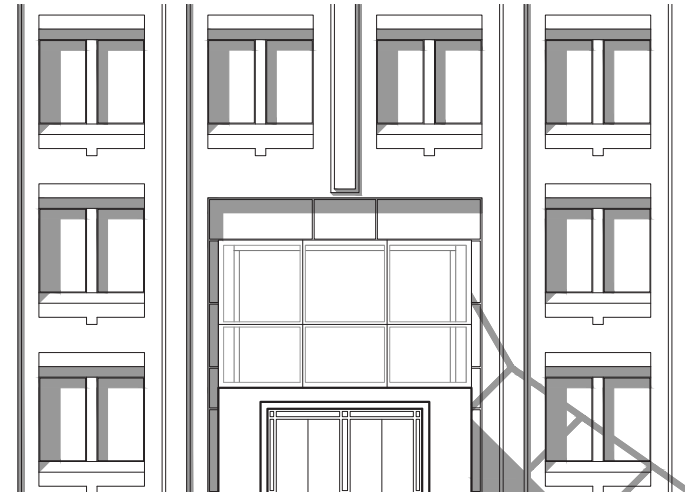
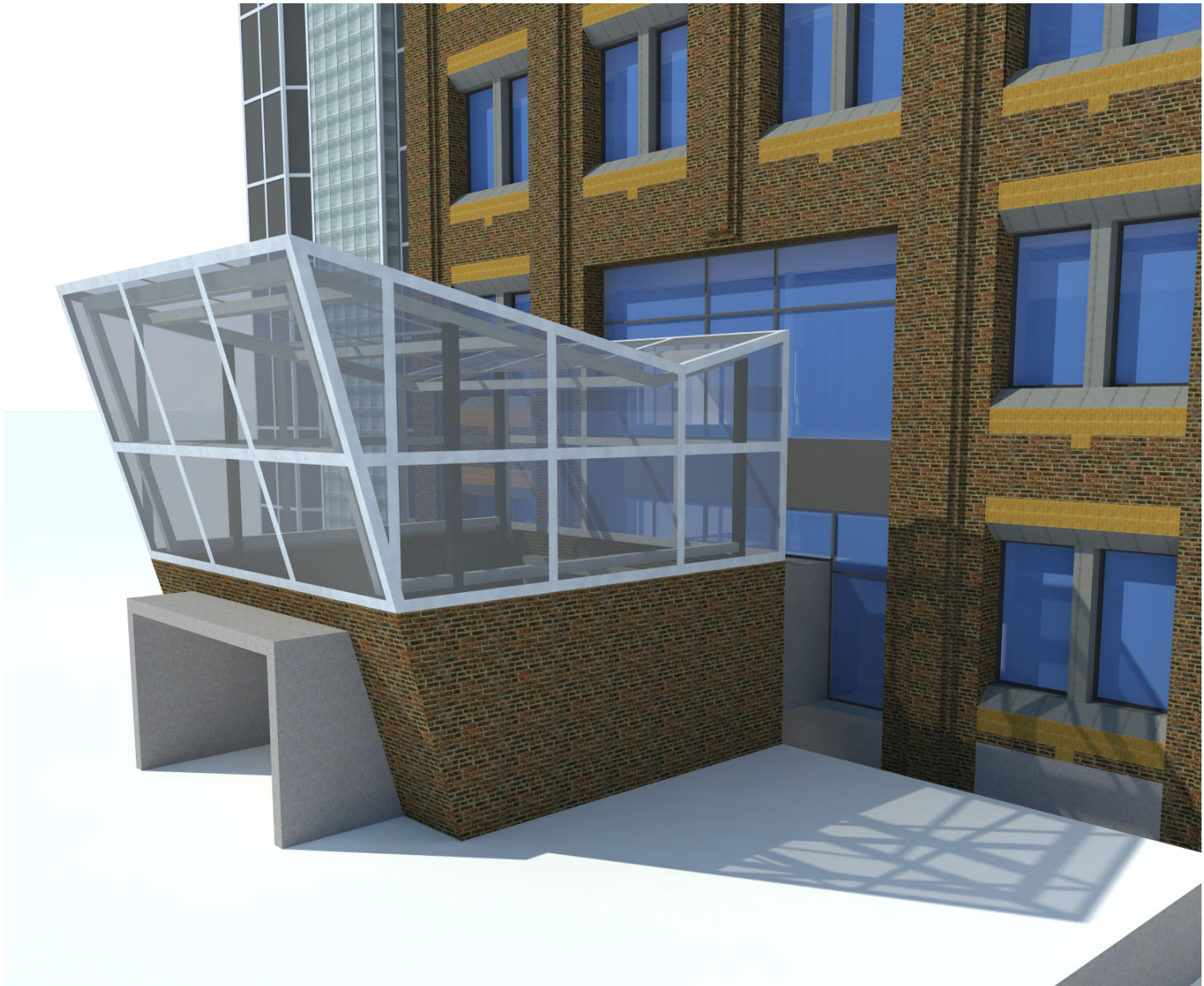
This building, from the start, had a palette of varied materials that would compliment each other. The outside is mostly brick punctured with steel cased windows. There is a feel of cabinetry in the glass and steel of the stairwells and the steel paneling of the vertical chases on the corners of the building. The dark brick of the facade wraps inside the building and

gives a rough texture to the interior walls. The smooth steel mullions holding the highly polished wood cabinetry gives a contrasting feel to the same space. In between the rough brick and the smooth cabinetry is the concrete of the structural and atrium columns providing the interior with another tactile experience.





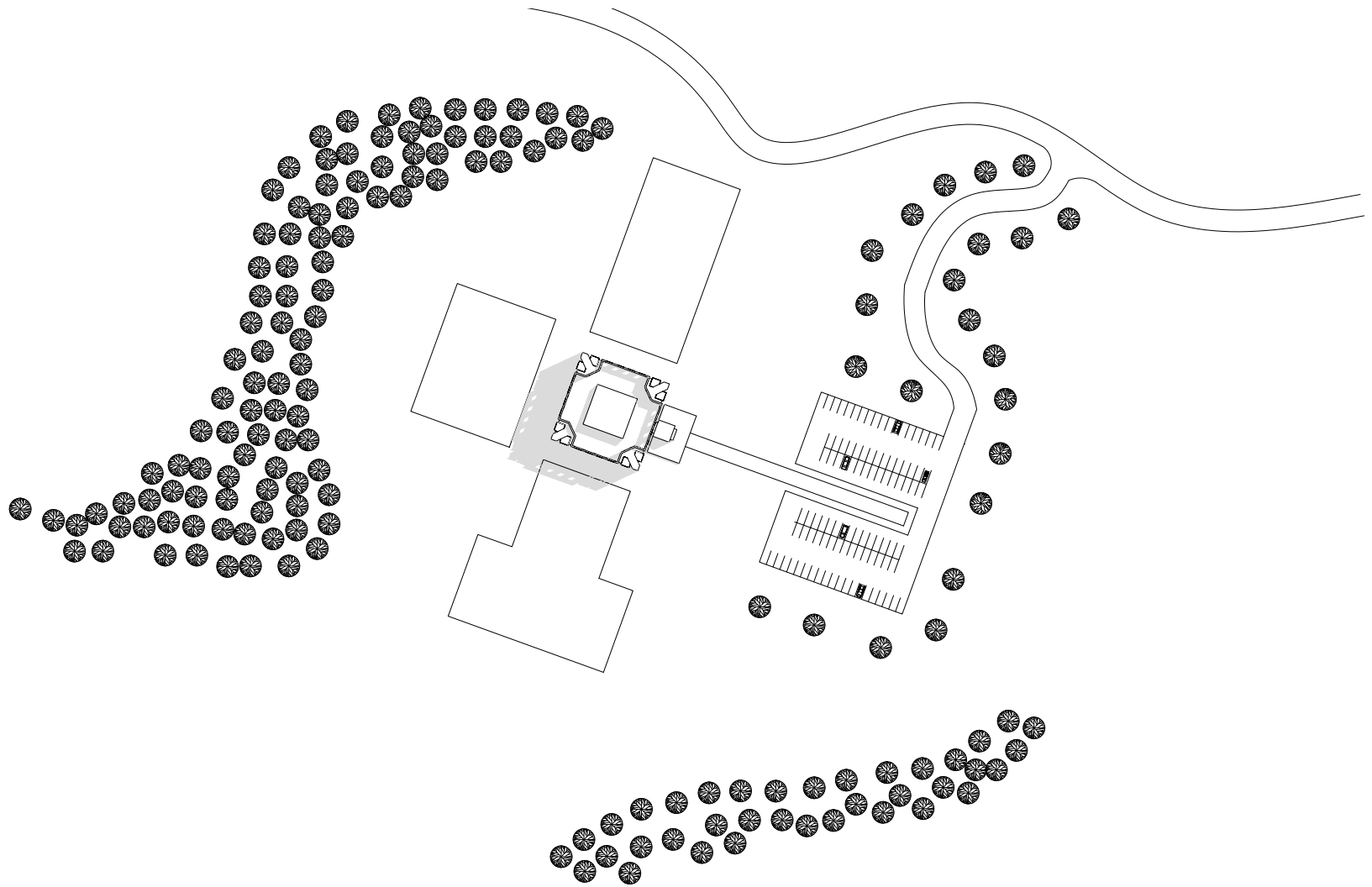
The main windows puncturing the facade are deep set to provide shading and reduce direct heat gain. The windows are 8 feet tall by 10 feet wide with a large steel casing splitting the opening. They are set at the back of a two foot thick wall. The shadows created by the deep walls and the thick casing are significant. The sill and the lintel are laid with different color brick set vertically to frame the windows even more.



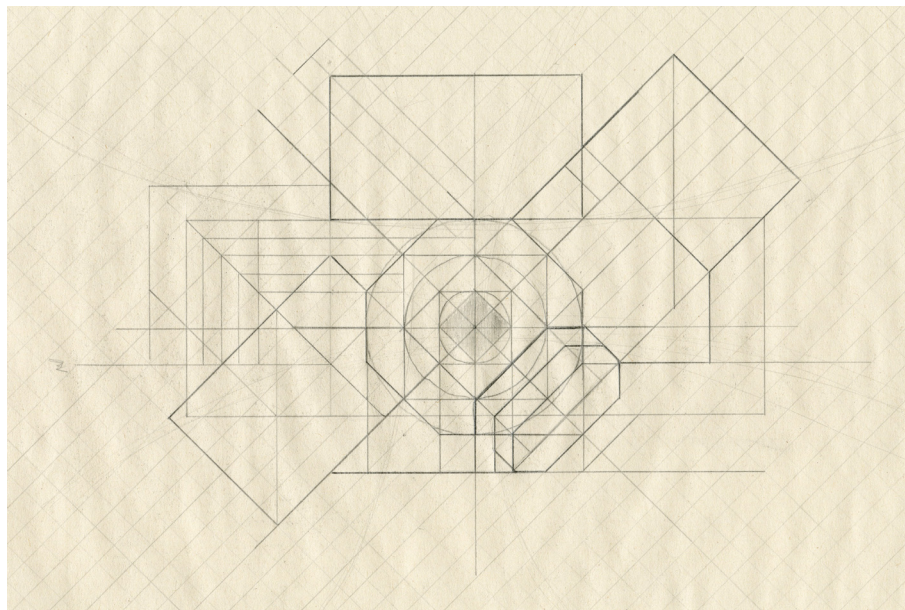
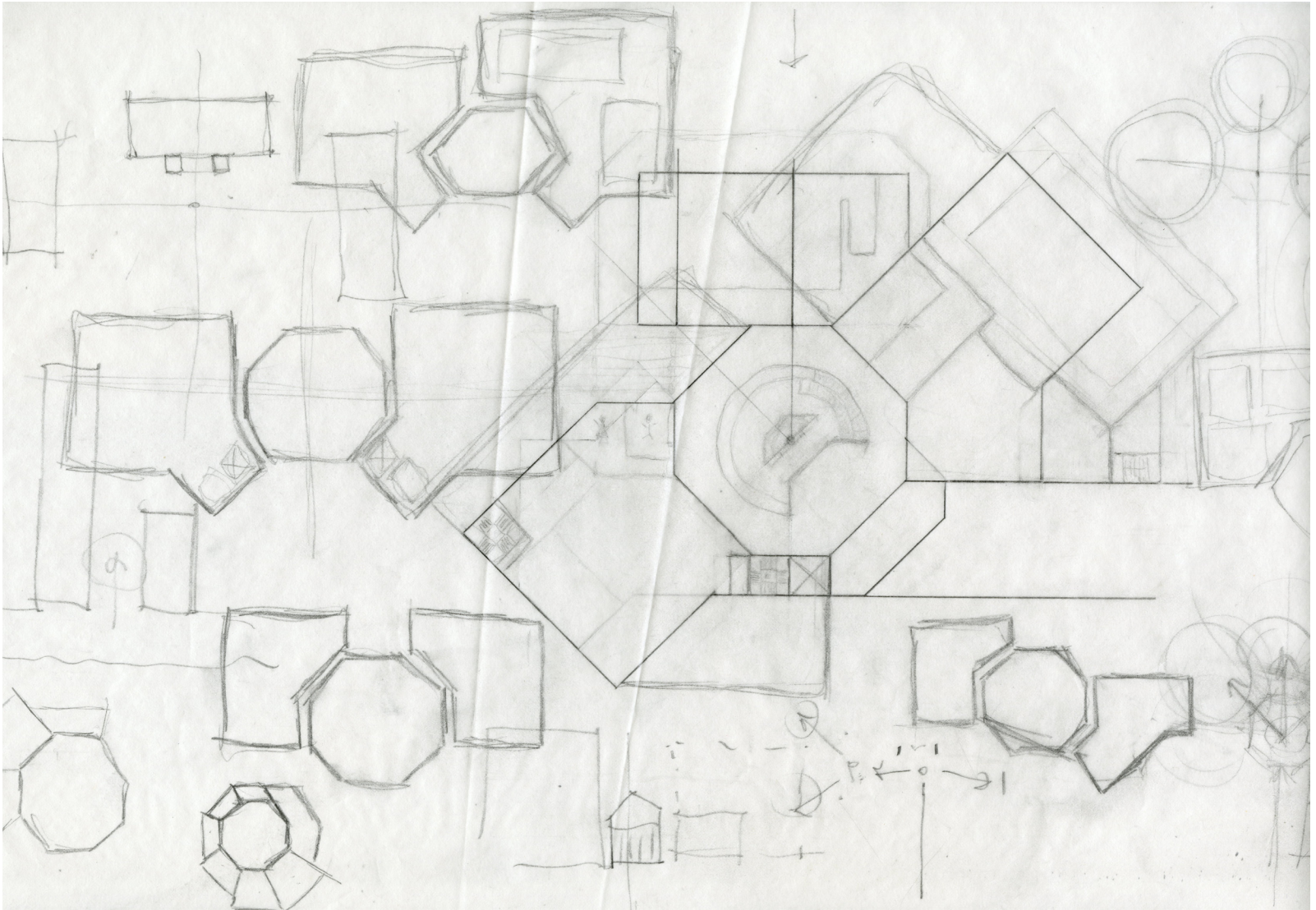
The entrance to the building has a space and feeling to itself. There are no windows in the base of the entrance so the view is directed to the building when entering or to the sky when exiting. The entrance is the first experience of the axis that runs through the building. The entrance provides an initial framed view

through the building. The structure of the entrance is steel columns and the mullions are significantly larger than any in the rest of the building. These together make a compelling shadow against the building and the ground that changes significantly as the day progresses.

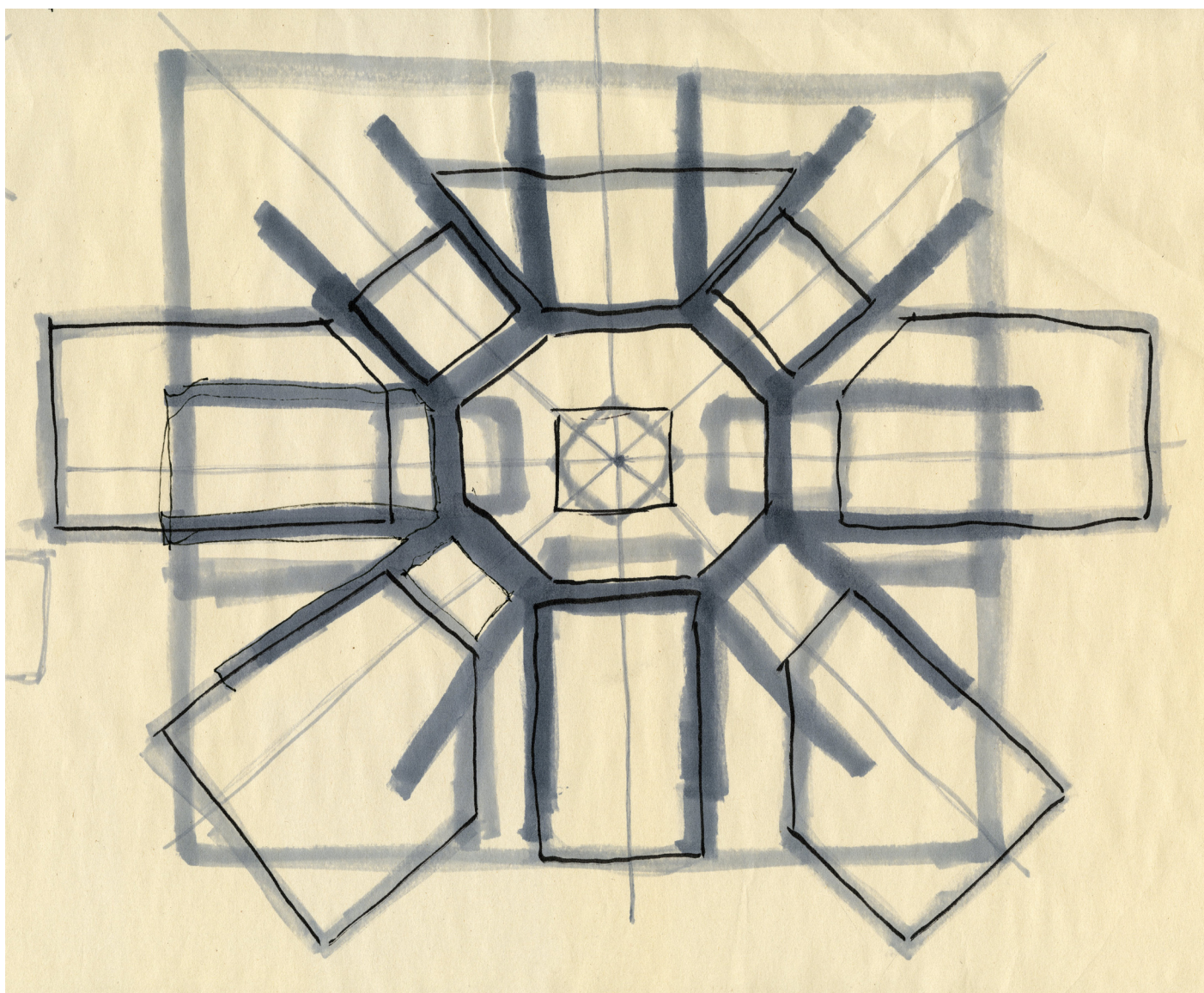
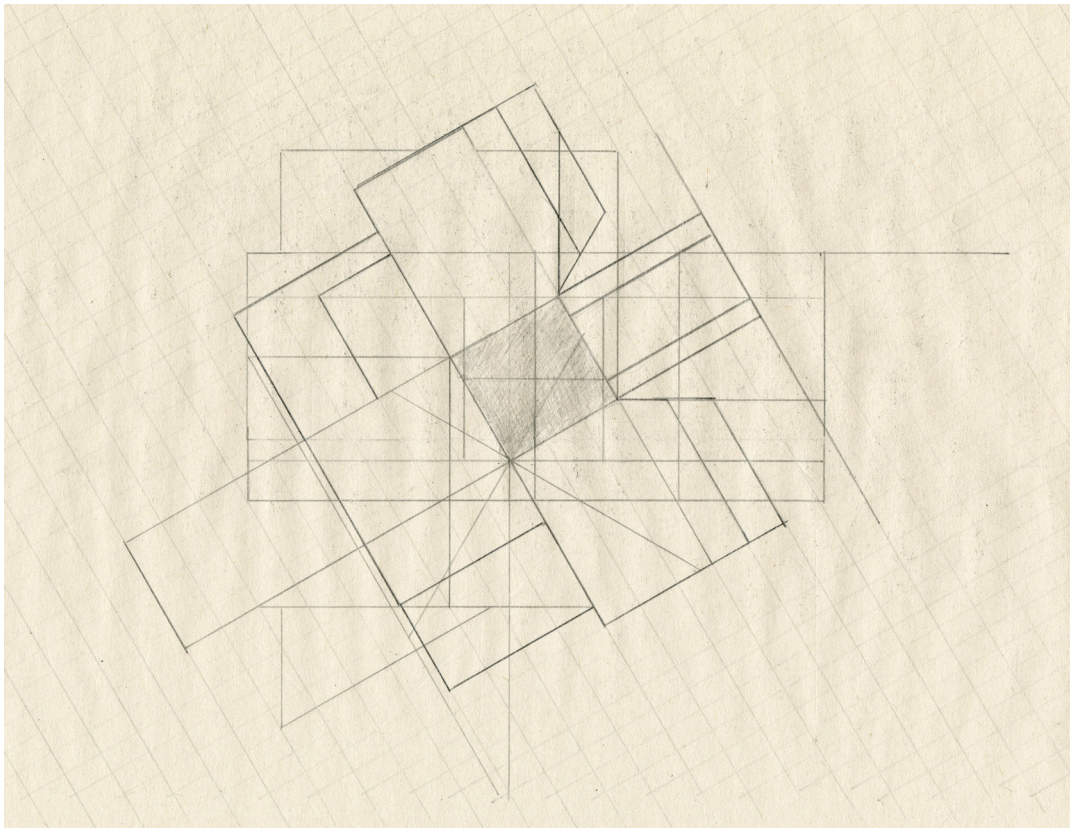


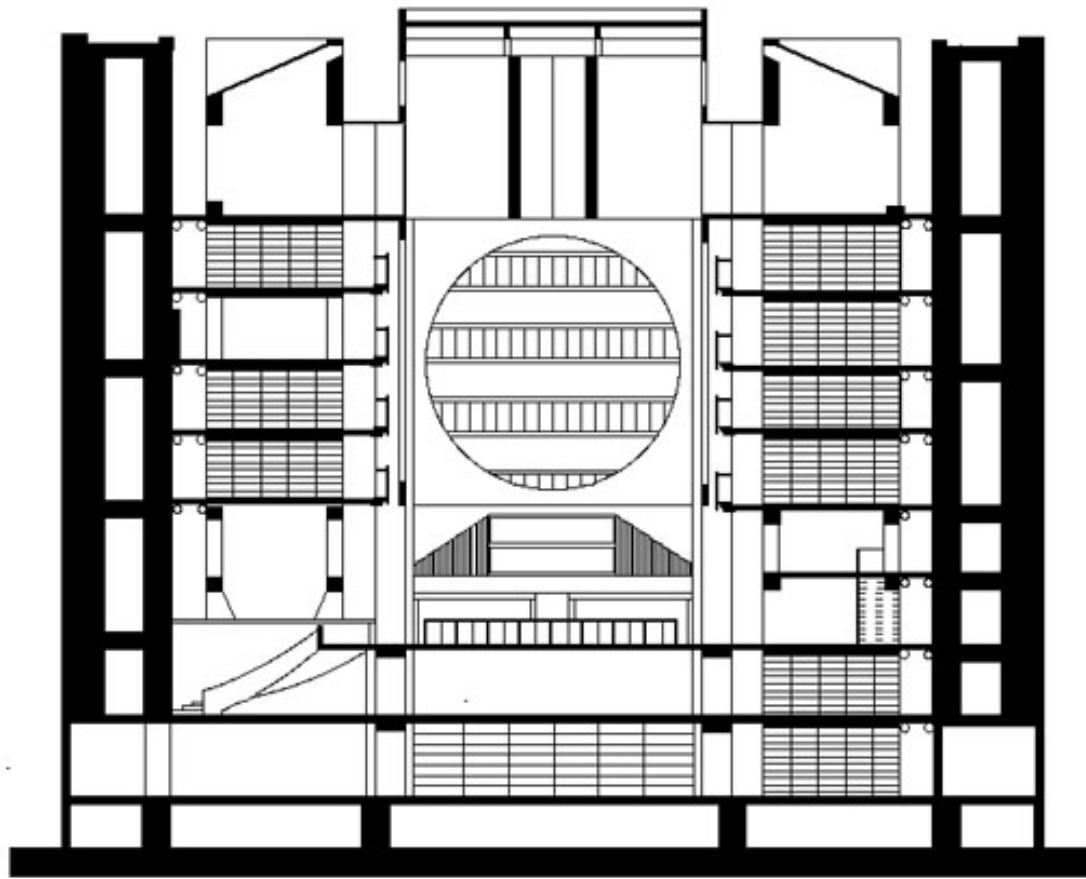


The site is between Blacksburg and Christiansburg for optimal access from both towns. It is close to many shopping and dining businesses. It is also easily accessible to the Huckleberry Trail that connects Christiansburg and Blacksburg as a walking and biking trail. It sits high on a hill with views to the mountains that surround it.



From the earliest diagrams, there was a central core in and around a building that everything else rotated about. There also was an octagon shape floating around the center for other parts of the building to respond to. The axes were present in many of the drawings as lines of sight and/or lines for other programs to build on. There were moments of cubism studied as well as crystalline forms. Bits and pieces of much of the early geometry has made it to the final product.





picture i, Exeter Libray, Louis Kahn



picture ii, Exeter Libray, Louis Kahn

Some of the early influences on this building were Louis Kahn and Mario Botta. Louis Kahn's Exeter Library atrium has a feel I was looking for on a much smaller scale. I also turned to him for help with the blending of the different materials he achieved in both

Exeter and the Yale British Art Center. I also studied Mario Botta's public buildings. The Administration Building in Lugano, Switzerland suggested the deep set windows on the facade and the development of the geometry around my stairs.



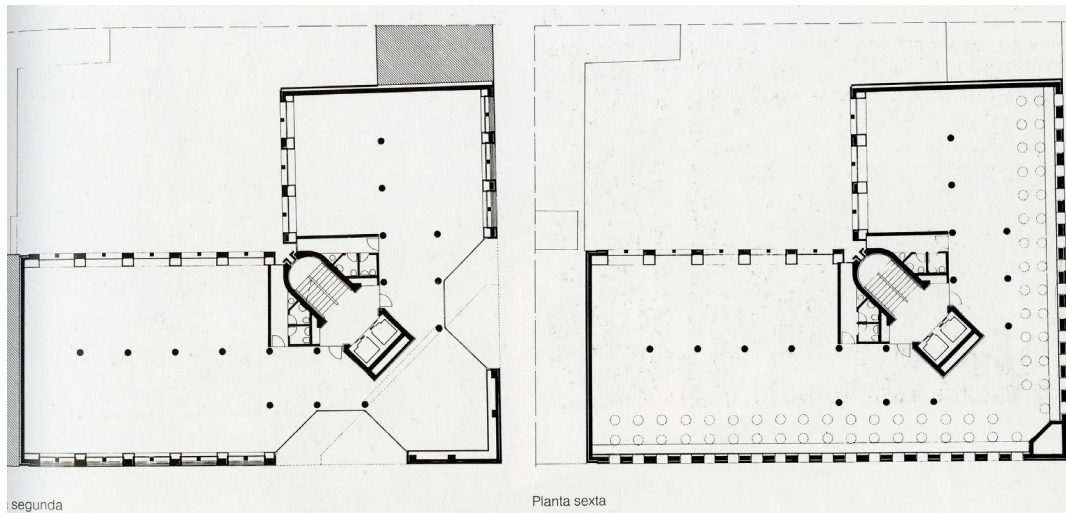
picture iii, Yale British Art Center, Louis Kahn



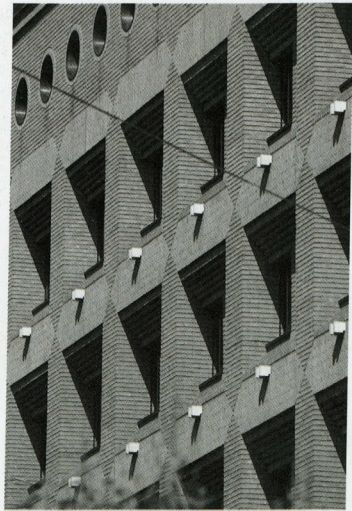
picture iv, Yale British Art Center, Louis Kahn



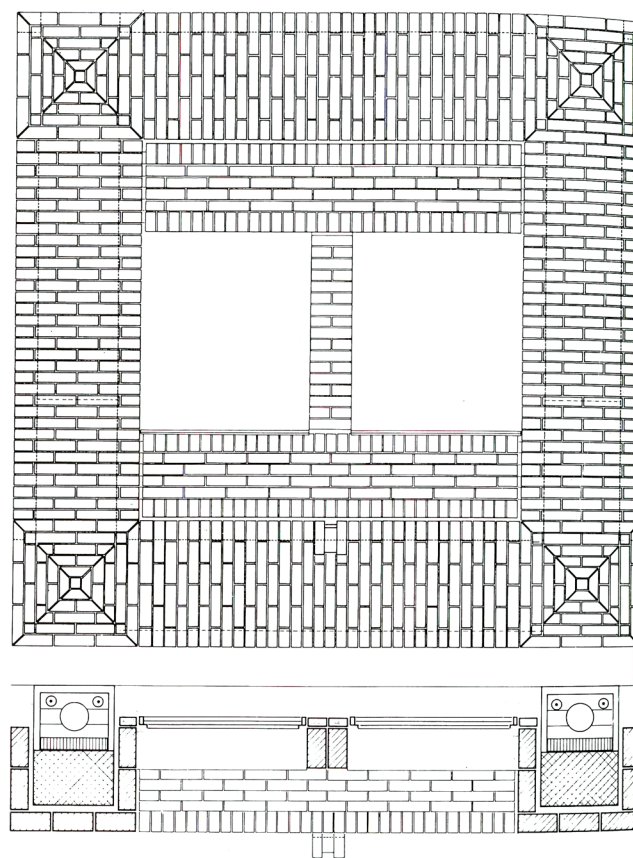
picture v, Administration Building, Mario Botta



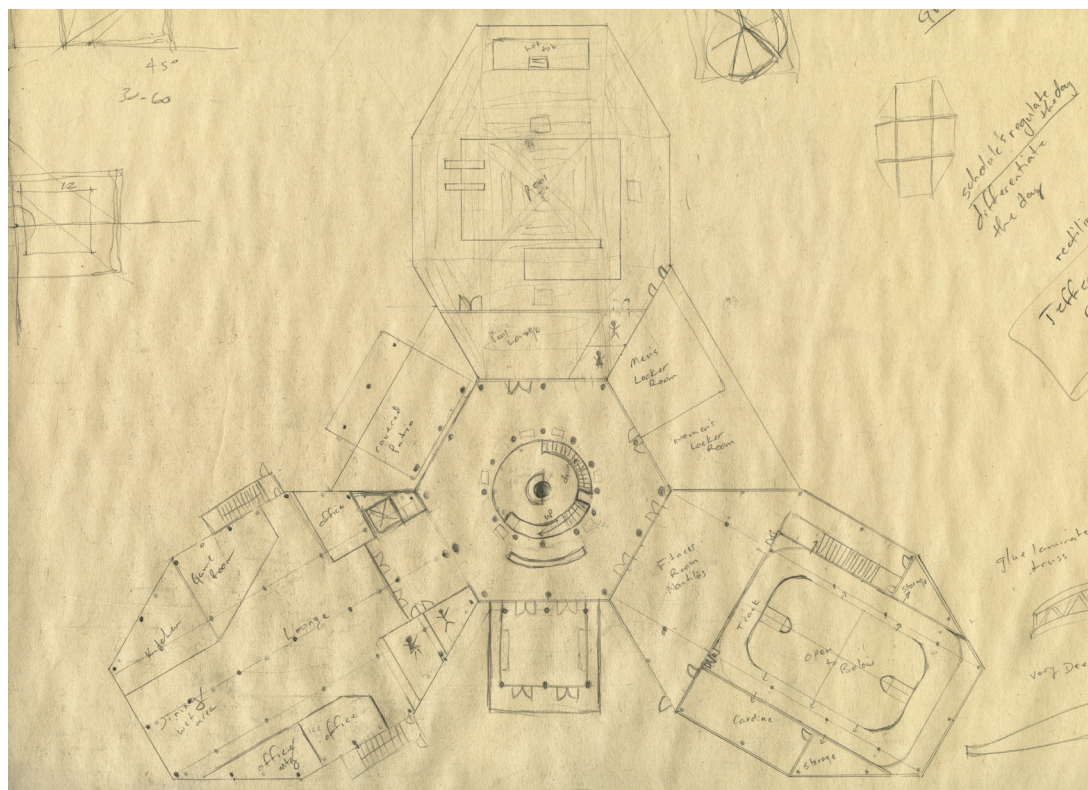
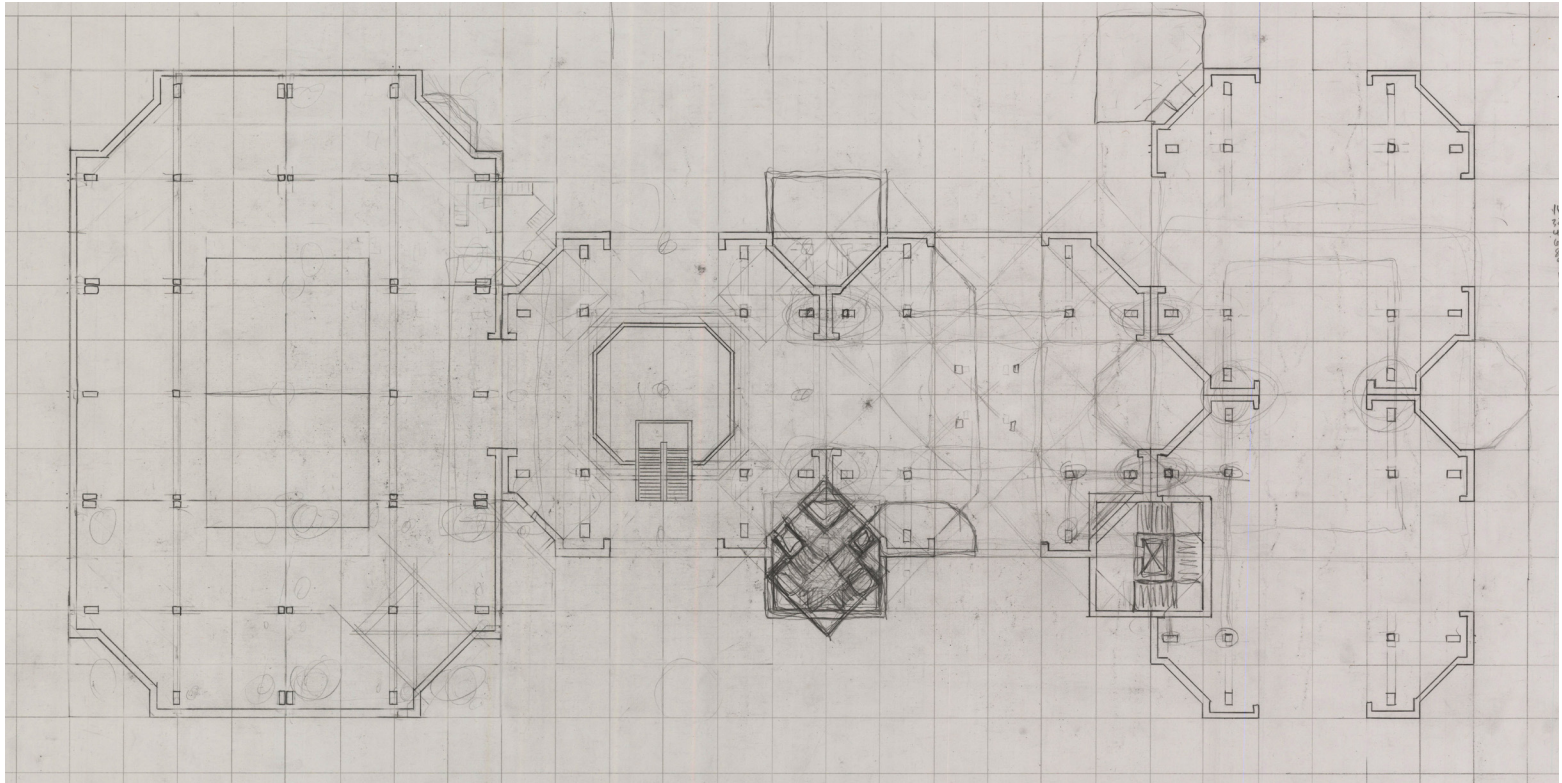
picture iv, Administration Building, Mario Botta



picture vii, Administration Building, Mario Botta

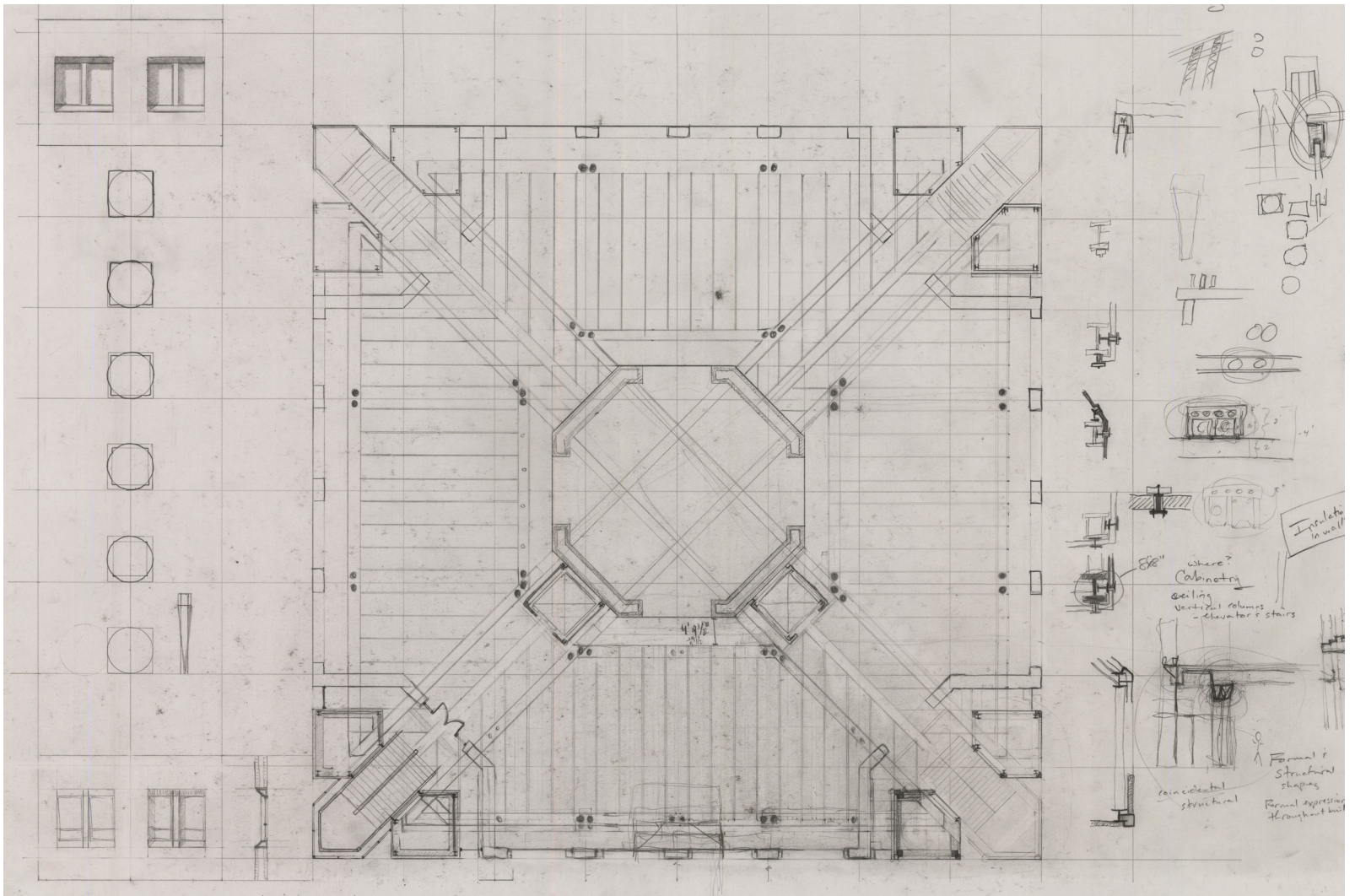


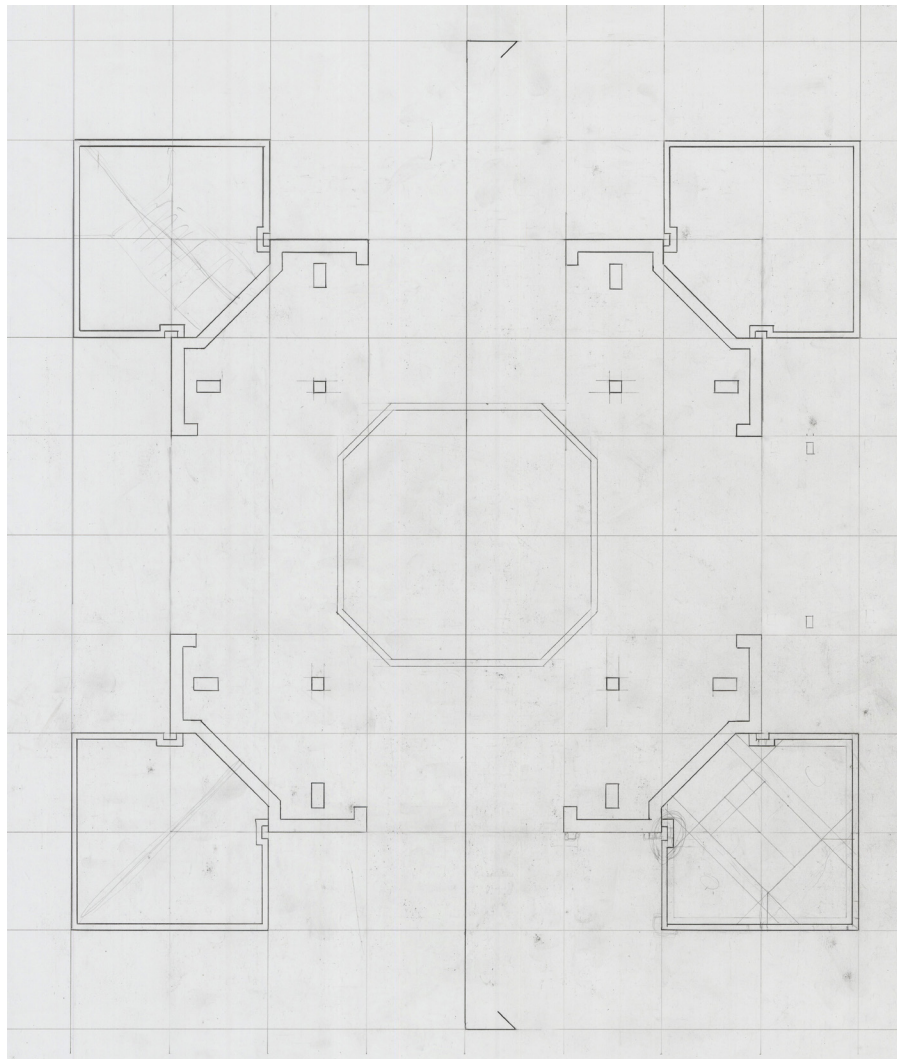
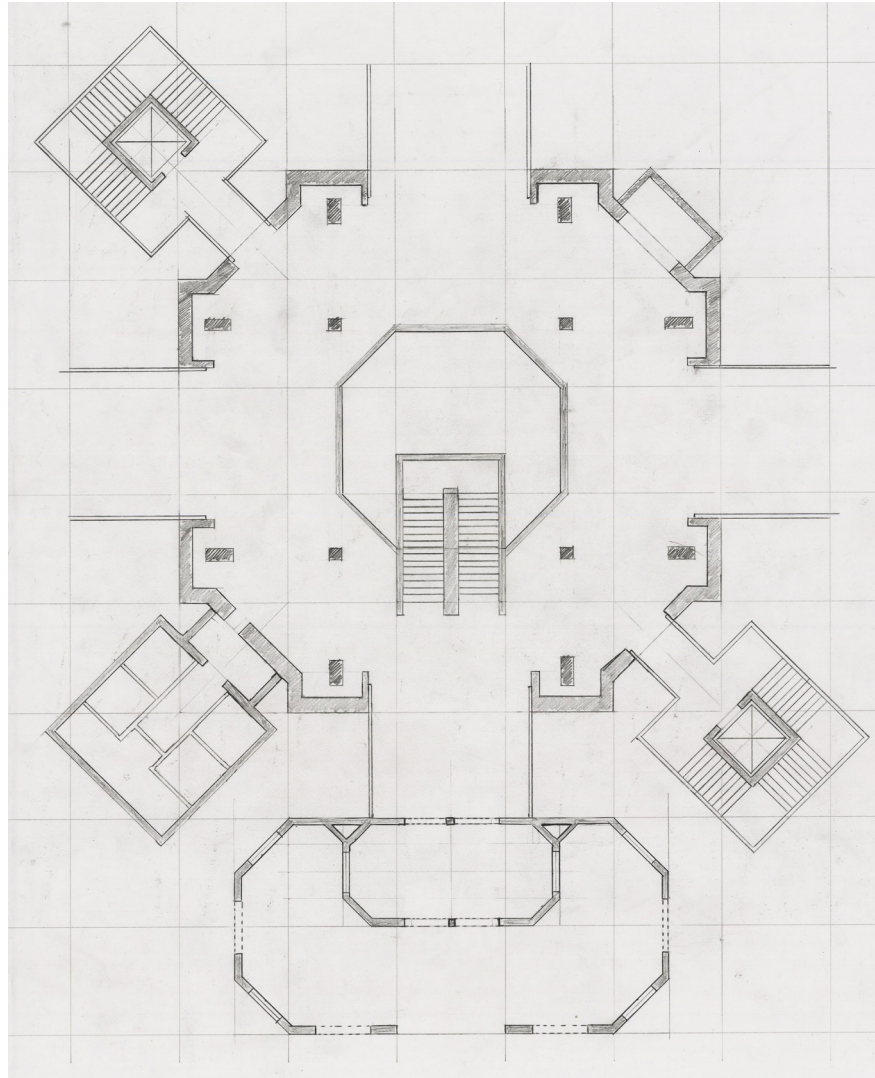
picture viii, Administration Building, Mario Botta

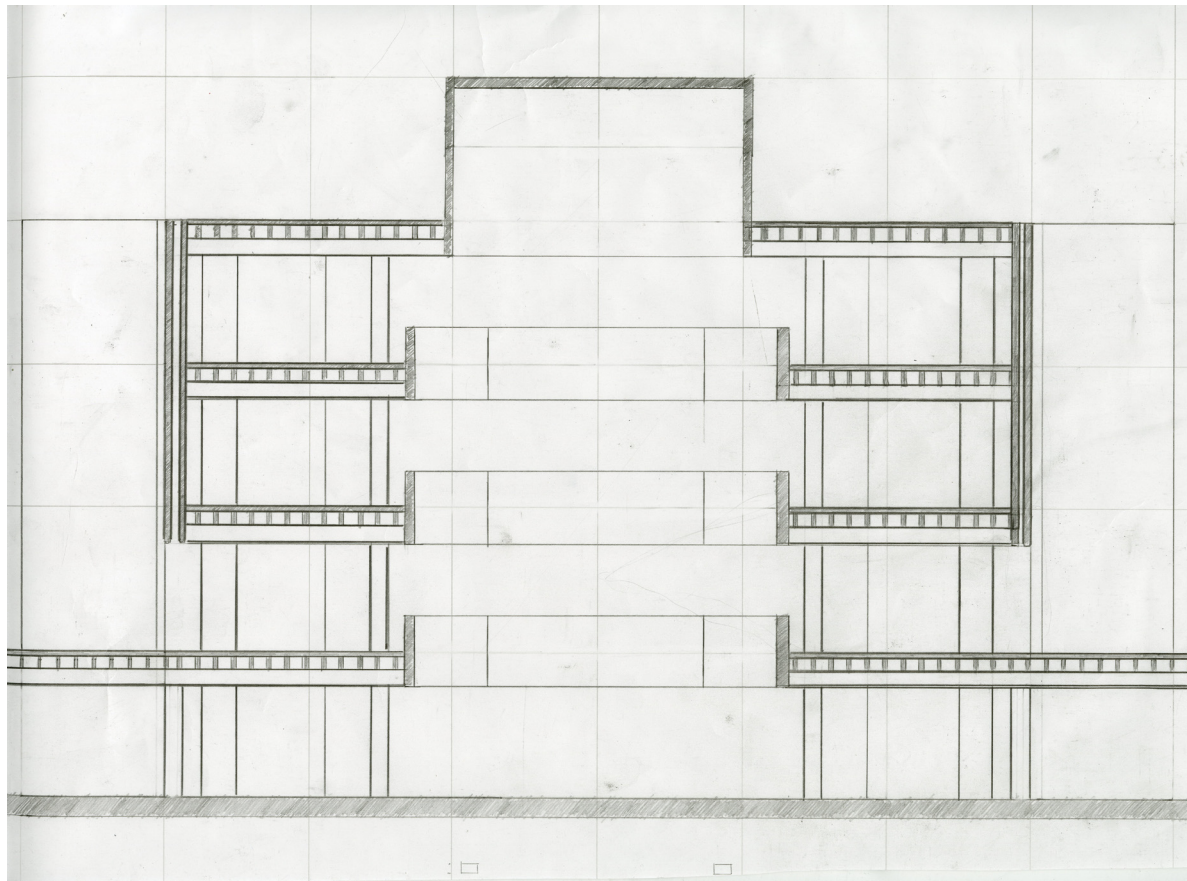
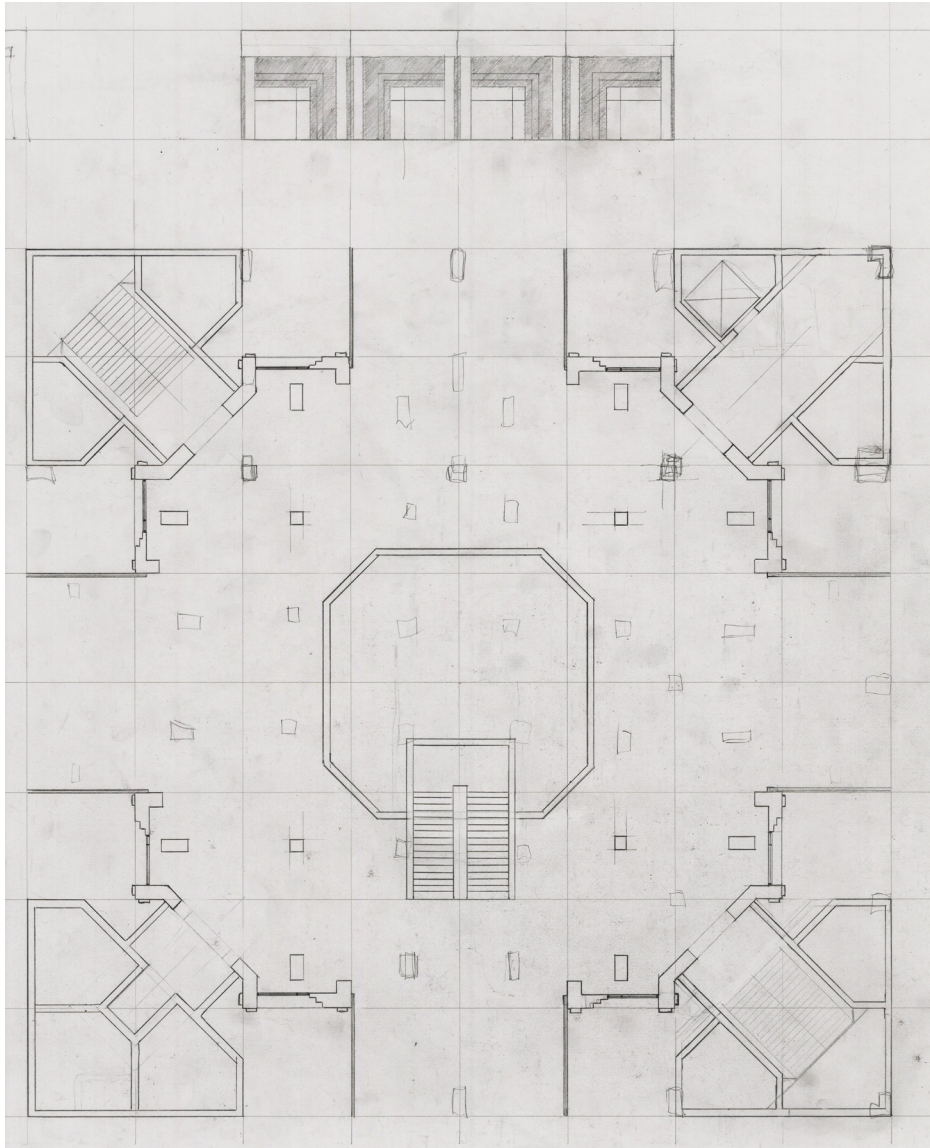


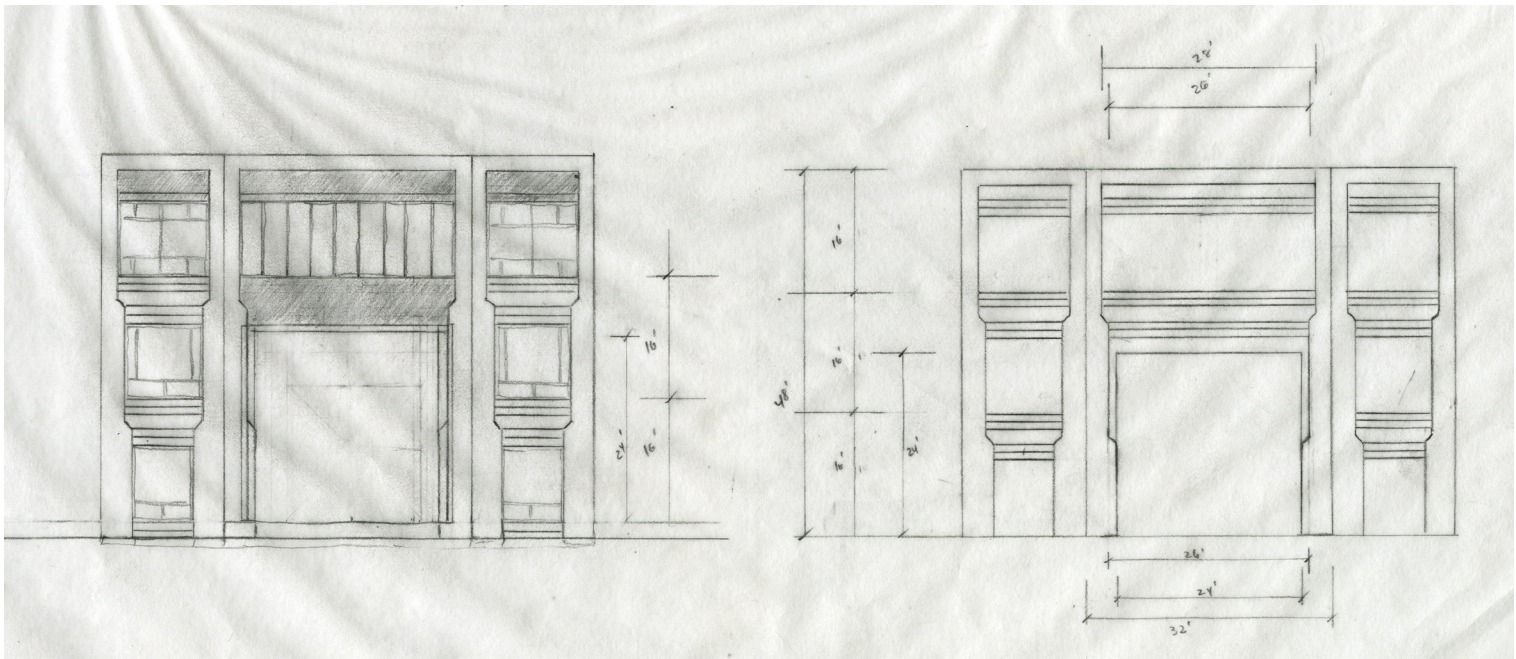
This building went through many significant changes in plan, section and elevation. Early drawings had all the programs in one building. As the project developed, the program was distributed among several buildings and the project focused on the central hub. The unprogrammed center building as an entrance and a vehicle to other buildings stayed constant throughout the process. The project stayed plan-driven for a long time and only did it start to make more sense when I brought the plans to elevations and sections. There

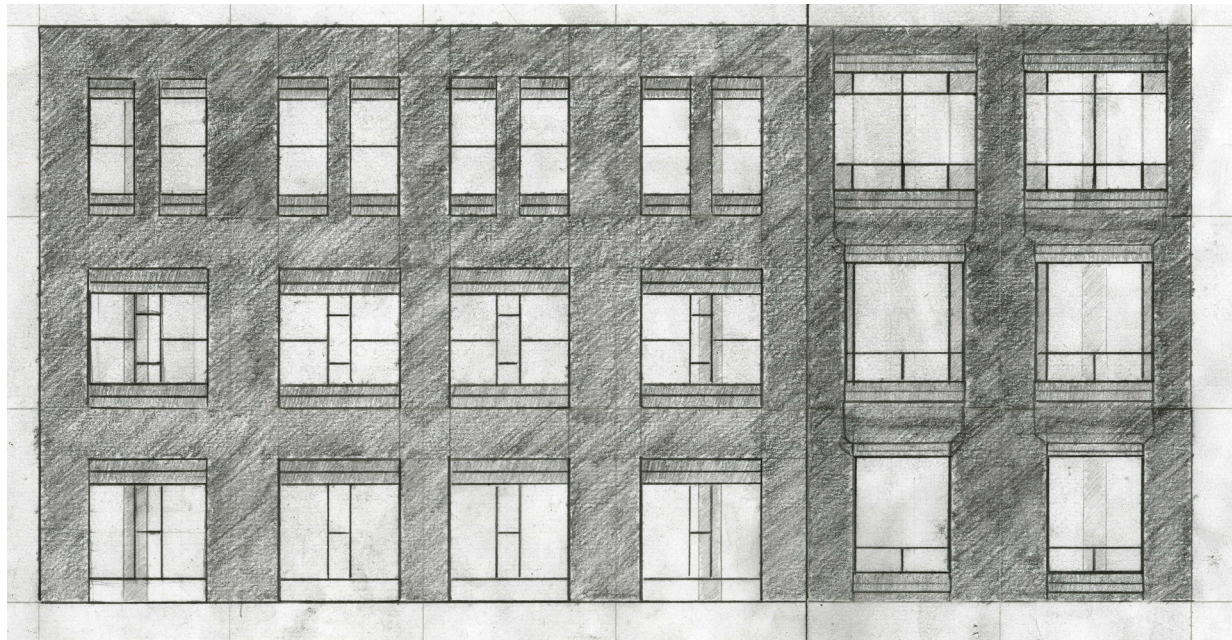
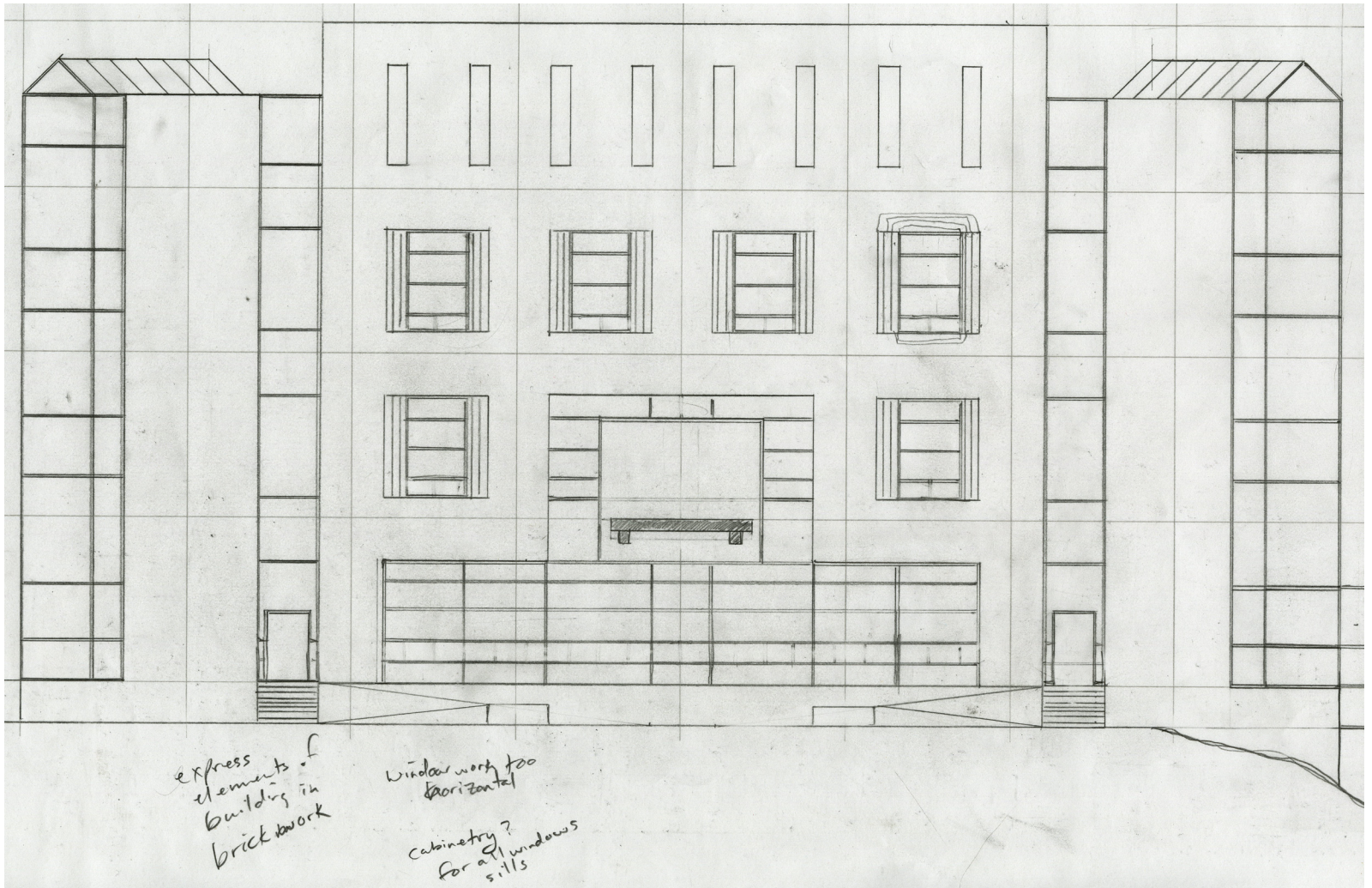
I found where the building was truly lacking and started making more studies in the facade and section to see how it would speak to the plan. The strong form of the cube came and went. The plan stayed octagonal for so long looking for the crystalline feeling. It finally took on the more square shape as I let the walls and atrium influence the octagon. It took a long time figuring out the intricacies of the floor and structure and how it would influence the rest of the building.

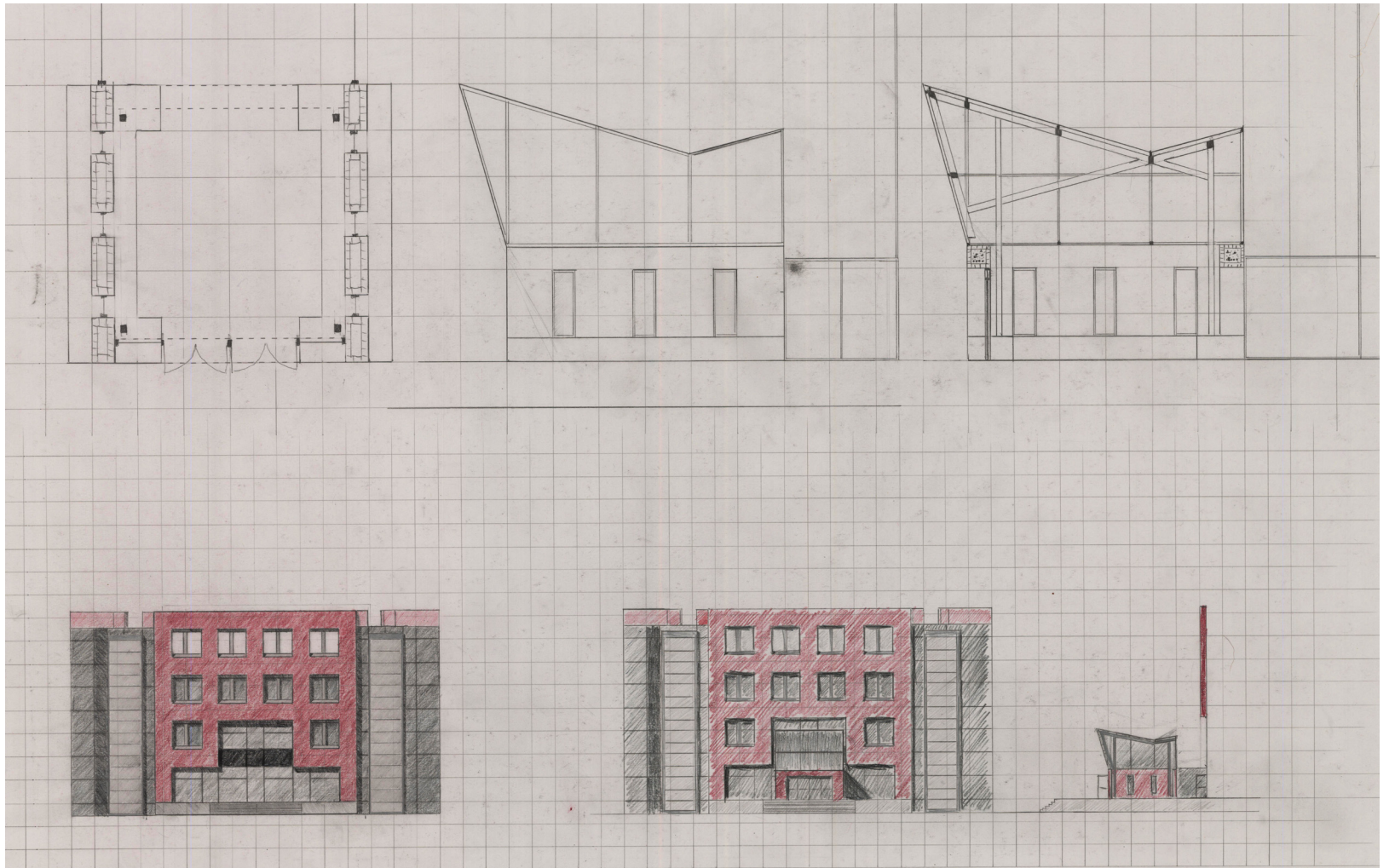
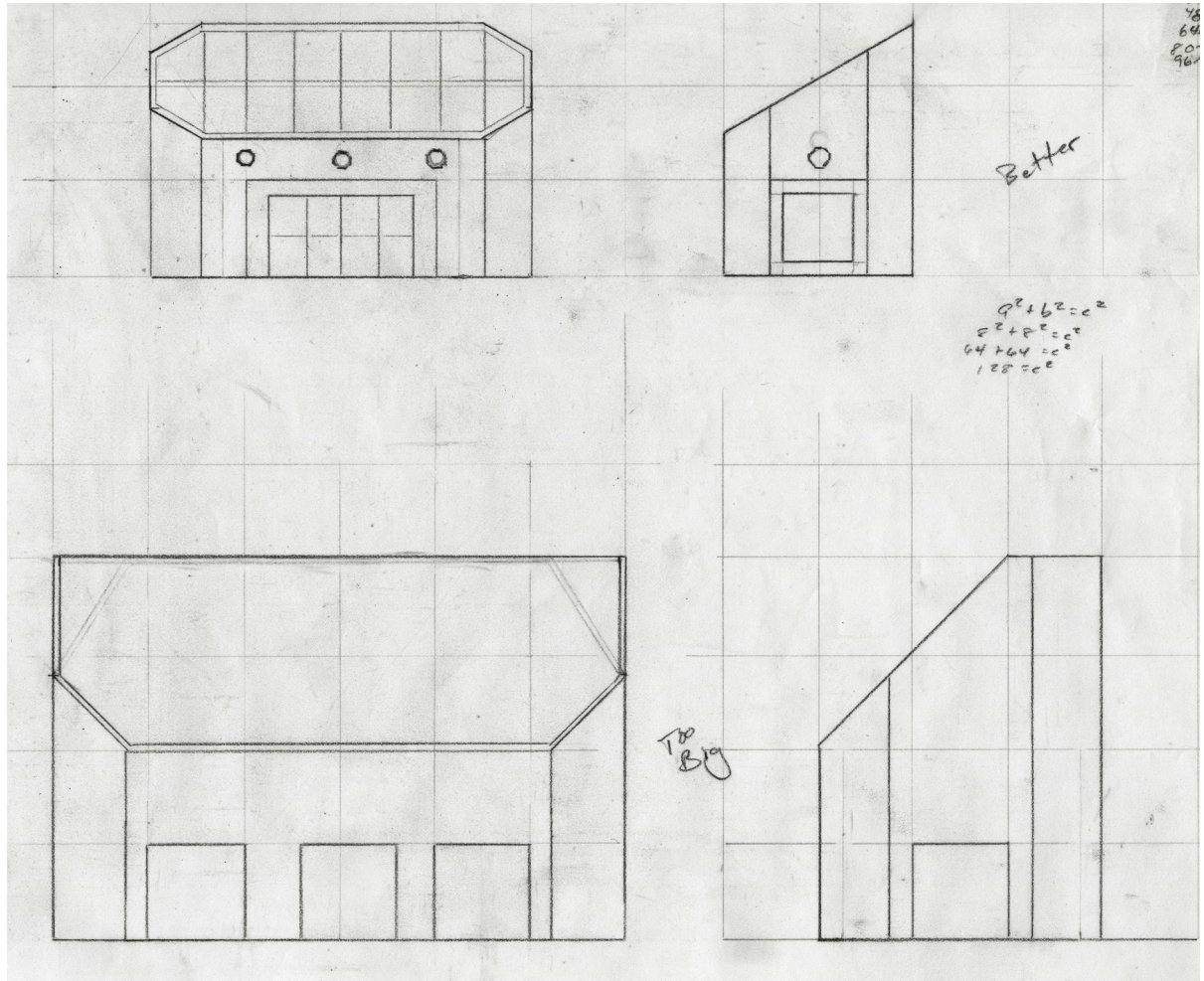


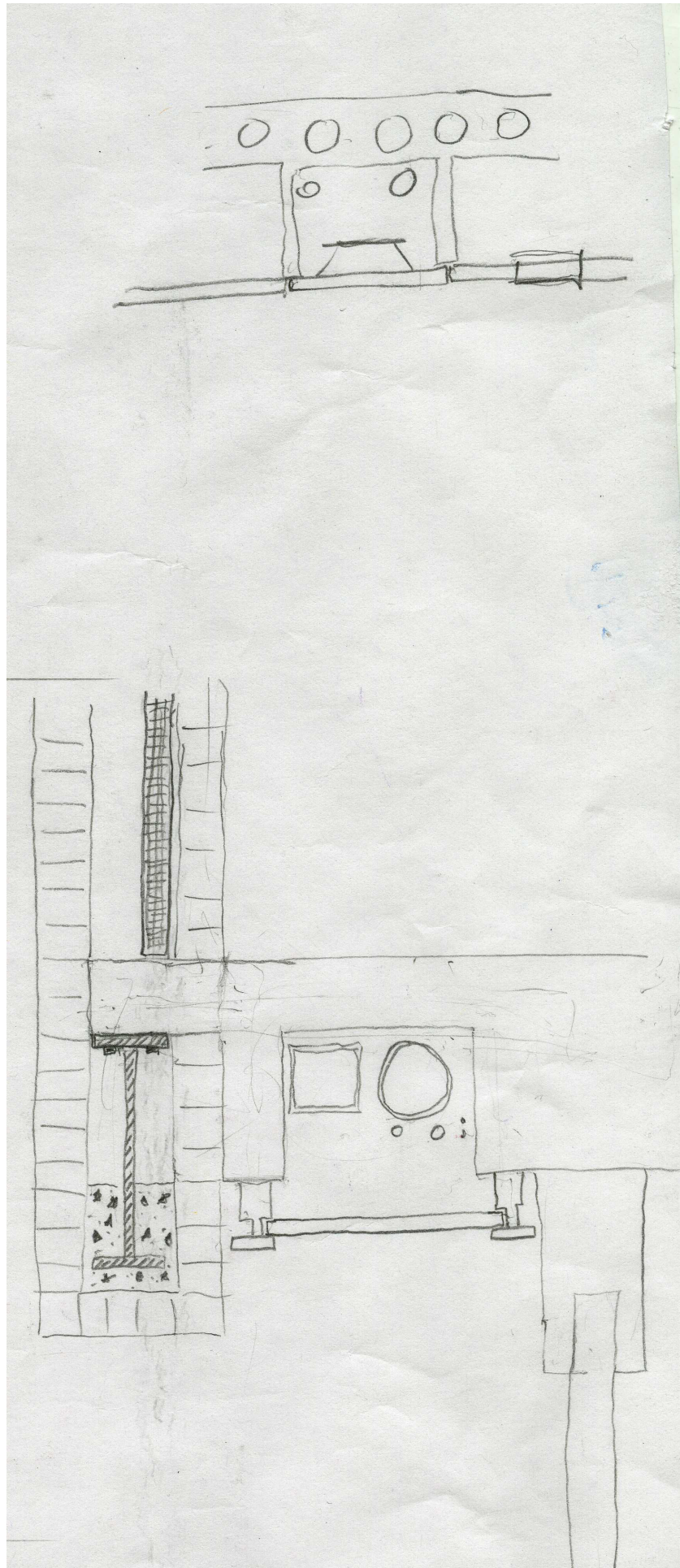












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