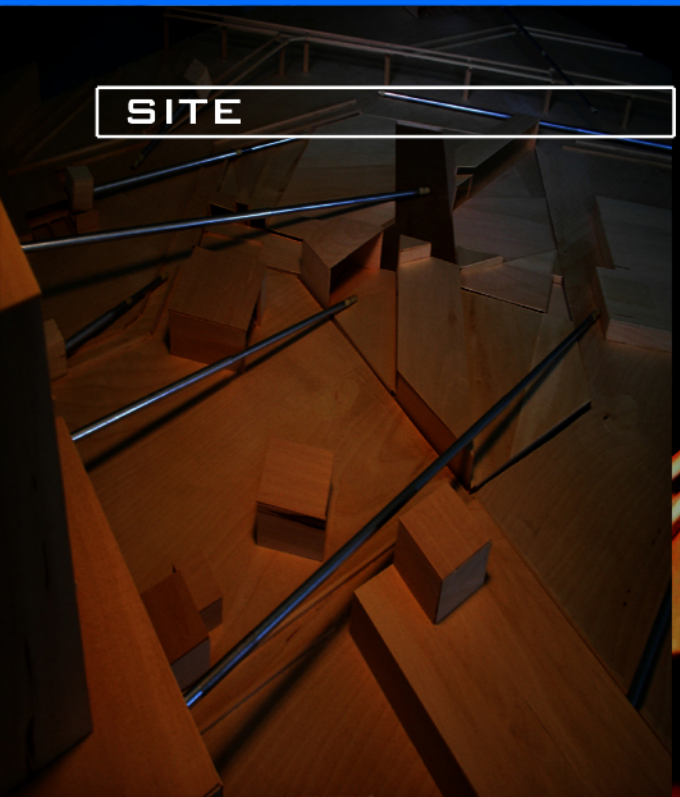
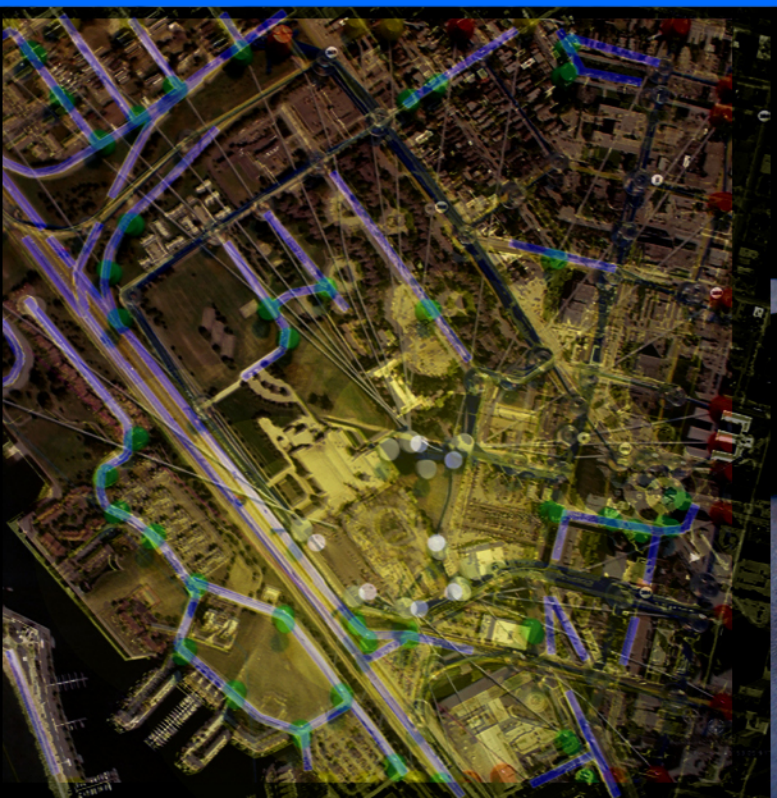
The Junior Year Spring Semester was divided into the three sections below. The first section was a group effort to analyze a site in downtown Buffalo. The second was to use information to develop an organization system. The third took both aspects and developed them into a building proposal.

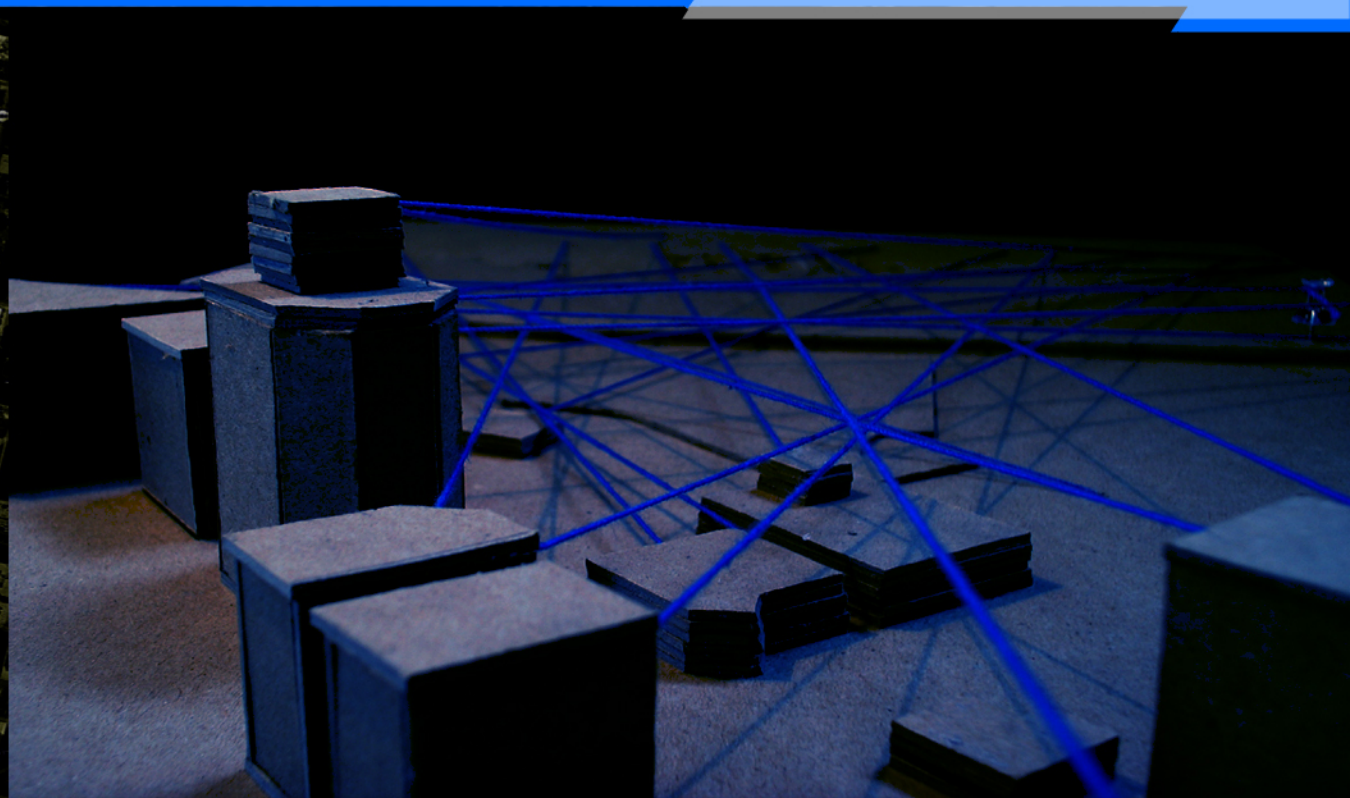
The program was given as a "research and development" center for the National Fuel Gas Company.



Following research of the former National Fuel Gas Company site in downtown Buffalo, studies of regional demographics, traffic patterns (left), and vision (right) among others were conducted.

The model on the right is a study of lines of vision across the site. The lines originate at downtown buildings surrounding the site and terminate on the shores of Lake Erie. The goal of the study was initially to use vision as a way of zoning the site but this model became a gateway to much more than zoning.

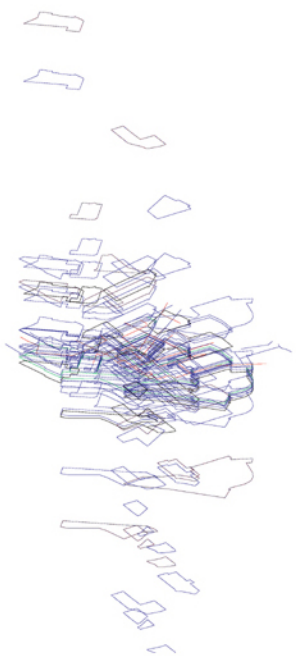


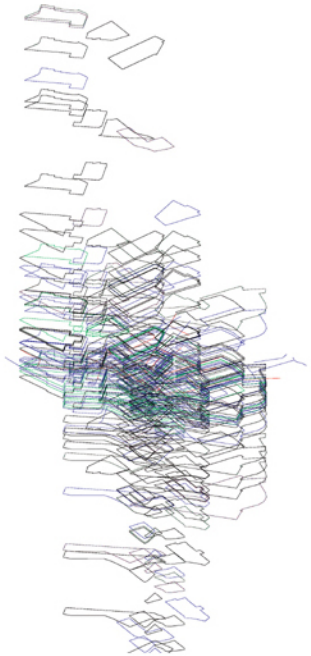


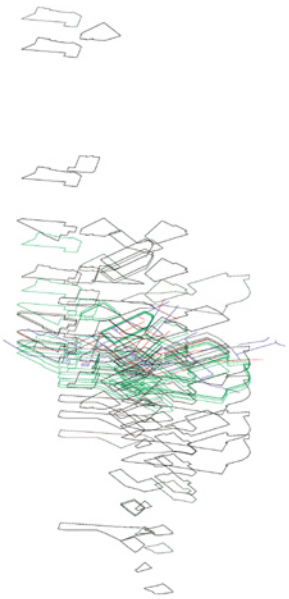
This abstraction of downtown Buffalo was devised in an effort to rid the problems of the previous model but it proved to be useful in its own new dynamic. The previous model focused on points in the downtown area that were arbitrary making any effort at determining zoning trivial.

The abstraction featured retractable, rotating arms of varying length. The site provided 156 different points, in addition to the roadways, that these arms could be placed. This was to eliminate the ambiguity of the first study by providing many possibilities and a more accurate range of vision than a straight, fixed line.

These arms became probes of the site relative to the buildings they were situated in. They informed which portions of the site could be viewed from each of the surrounding buildings and which portions of the site were in a blind spot for surrounding buildings, blocked by other buildings or highways.



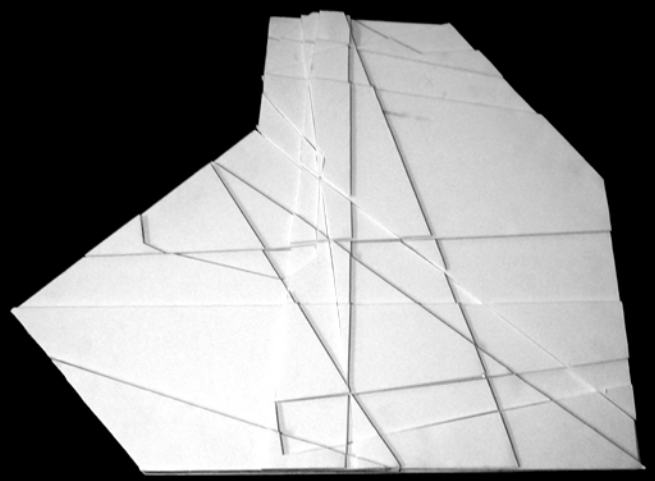




The probes marked which areas were visible by many buildings and which areas of the site were visible by fewer buildings.

Based on an earlier study of demographics (upper left), the information about vision was converted to numeric values. Areas of more common vision were at one end of the spectrum and areas of less common vision were at the opposite.

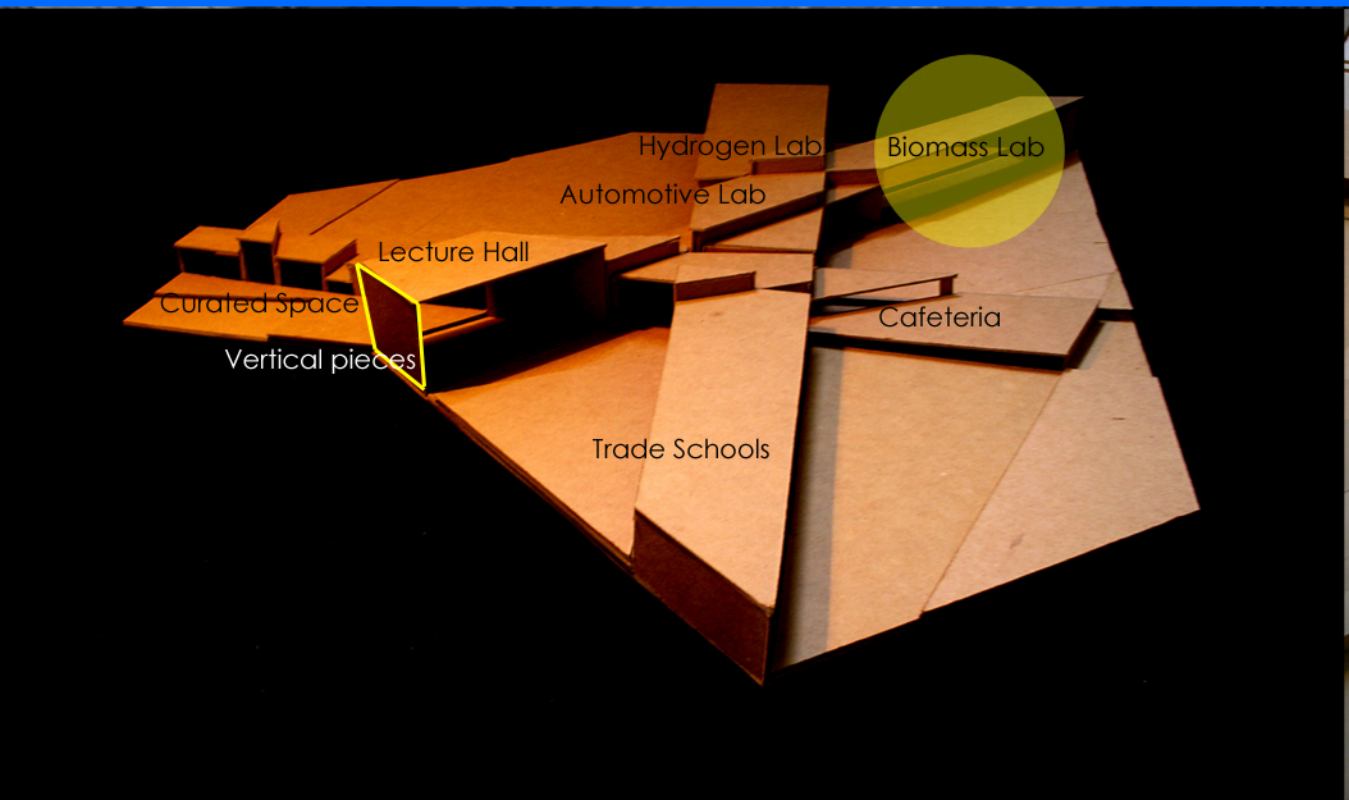
Certain swaths of land, three in particular, were noticeable as areas of significant changes in visibility. These swaths of land later become developed as built areas of the site.

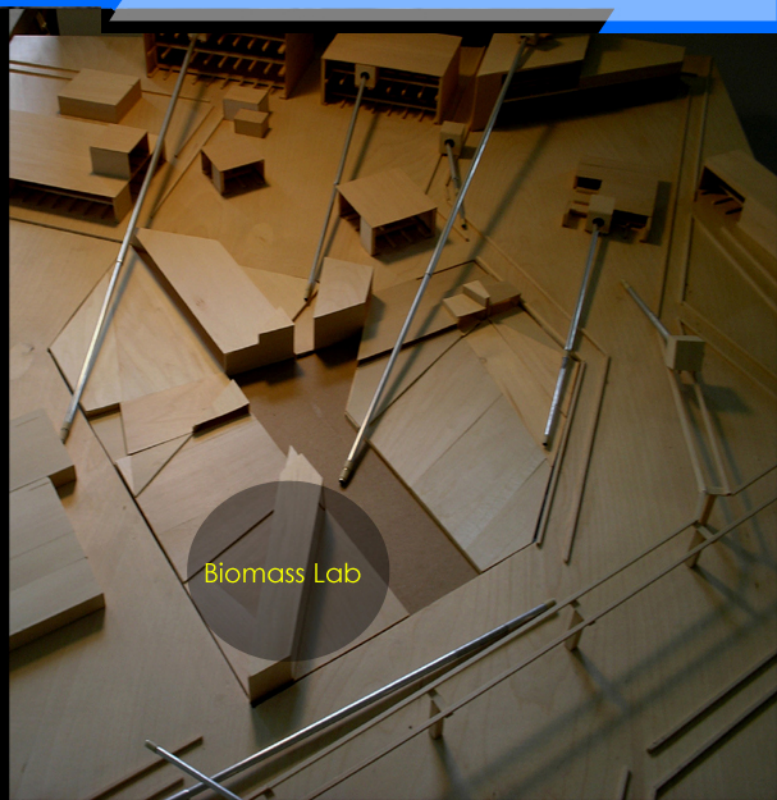


The numerical values given to the areas of vision were then given a unit value. The areas of more prominence that were to be built areas were given a unit value to reflect one floor to floor height. The areas of less prominence to become landscape were given a much lower unit value. The model on the left shows the lower areas as landscape and the higher areas as built area. The right shows the model in its context. The areas left empty are the research laboratories to be determined by other designers. The model circled is the Biomass Research and Development Center and is further developed using some of the concepts from this portion of the process.

Notice in the model on the left, the vertical dividers along the long axis for each of the three built areas. Also, notice that the areas in the other direction are left open.

The vertical pieces are along the axis so that they block vision along the axis. They are open on the sides so that the areas considered 'blind spots' (the landscape areas) are now visible to the areas within the building. The 'visible' areas (the built areas) are now in the blind spots. The built area now becomes the vantage point and it probes the rest of the site, reversing the abstraction model, thereby making the built forms a reality of the site. These forms will become the actual forms of the built areas. The vertical pieces are now a given block of vision and the open spaces are now a given abundance of vision.

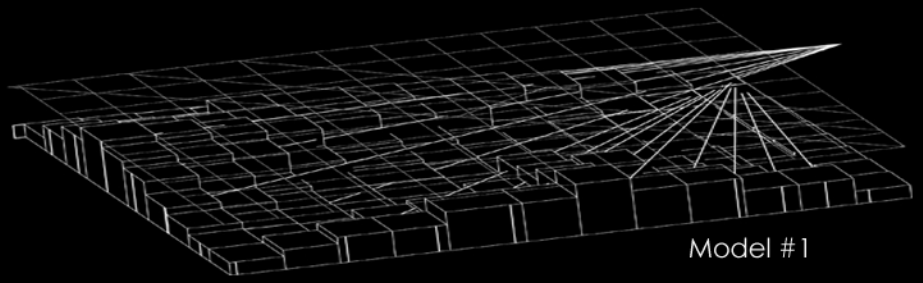




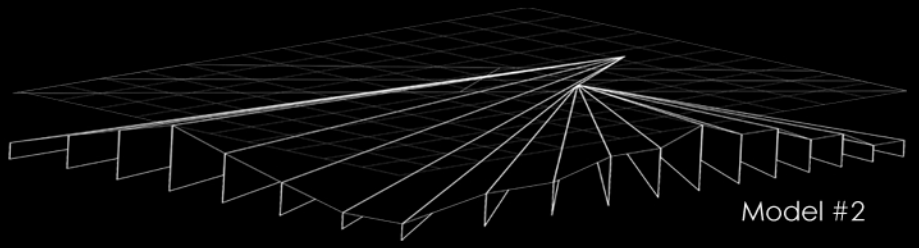
As a way of programming the 'interactive' space, the concepts from the site portion of the project were introduced to the organization portion. The angled lines and walls (cyan lines, bottom right) are the vertical pieces from the site project. Any wall in the direction of those lines must be solid. Any wall in the opposite direction must be open to vision. The yellow arrows show the vision from within the building out to the landscape areas as described in the site portion.

There were three different methods of analyzing the interactive spaces. The management work flow was defined as a 'planned interaction' because it is carried out via planned conferences and meetings. Planned spaces are organized along the grid. Employee work flow was defined as 'ad-hoc interaction' because it occurs by chance around commonly used equipment and spaces needed for similar jobs. Employees gather around equipment they use in common and through this interaction, employees can see what their colleagues are working on and offer assistance with their own research, reducing redundancy in operation and increasing efficiency. Ad-hoc spaces are organized along the angled lines shown in cyan.

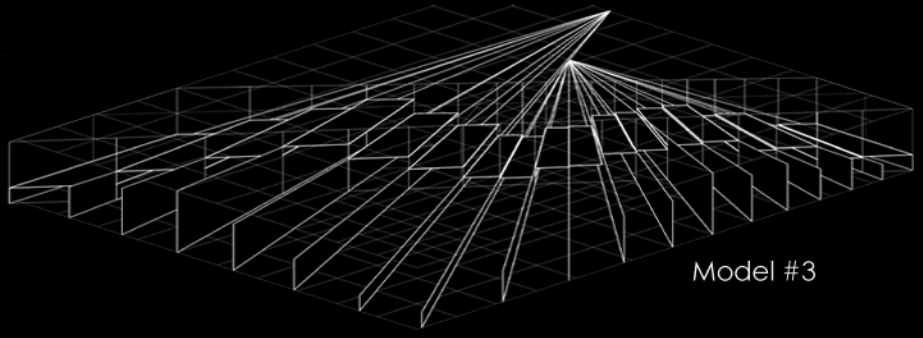
In all three models, and the fourth combination model, the angled lines were applied to a z-axis rotation to three-dimensionalize the space. Model #1 extrudes the planned spaces to the height of the curve formed by the ad-hoc spaces. Model #2 forms a surface of the curve made by the ad-hoc spaces. Model #3 forms floor plates positioned at the height of the curve formed by the ad-hoc spaces as it enters the building space. These three models literally come together in Model #4. The final building will bring the three models together in a different way.



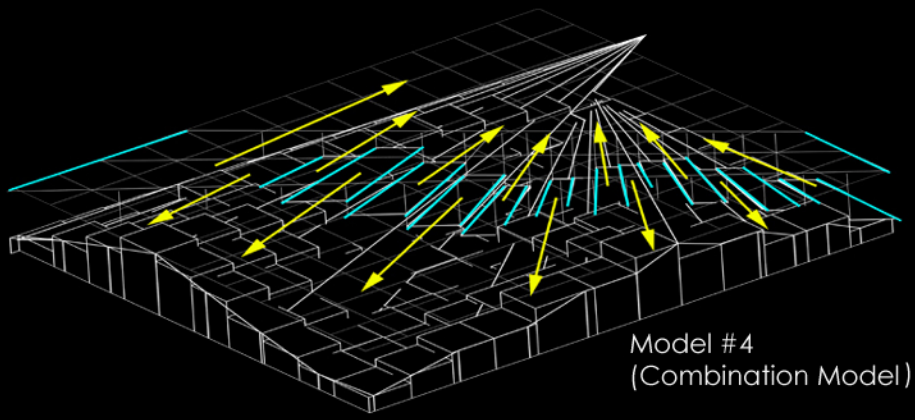
Model #1



Model #2



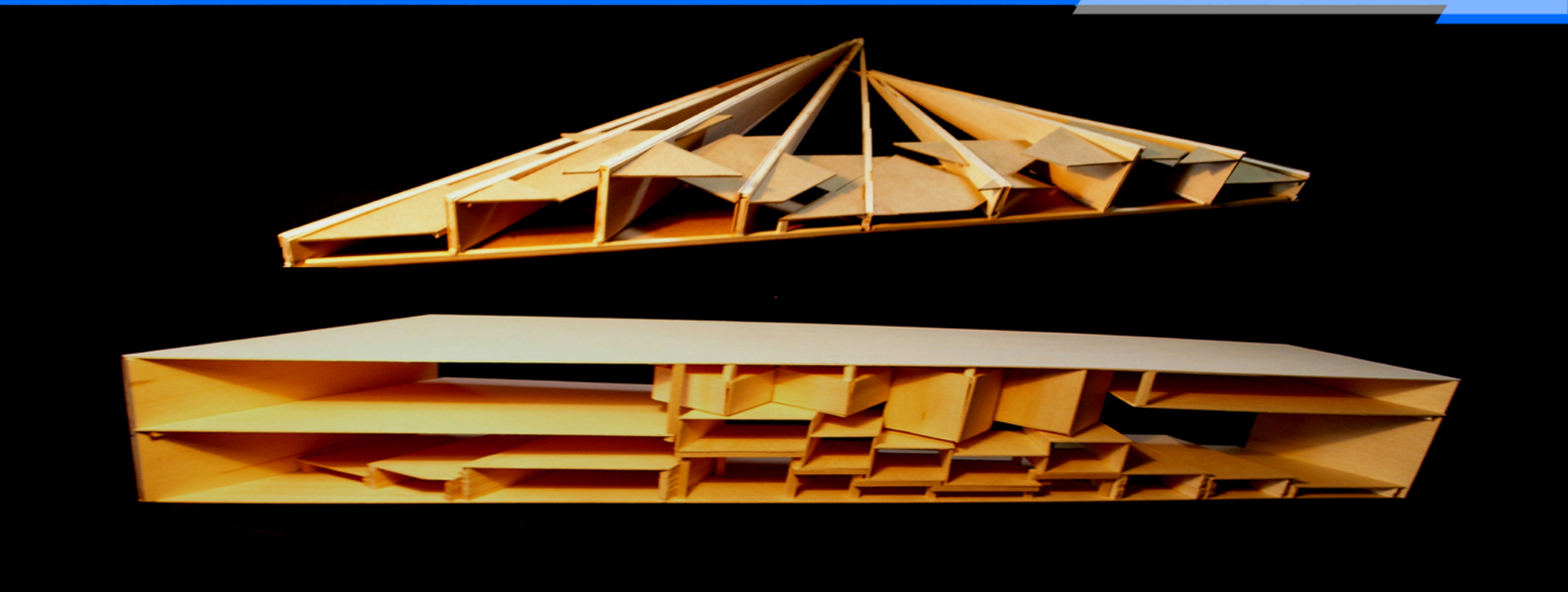
Model #3



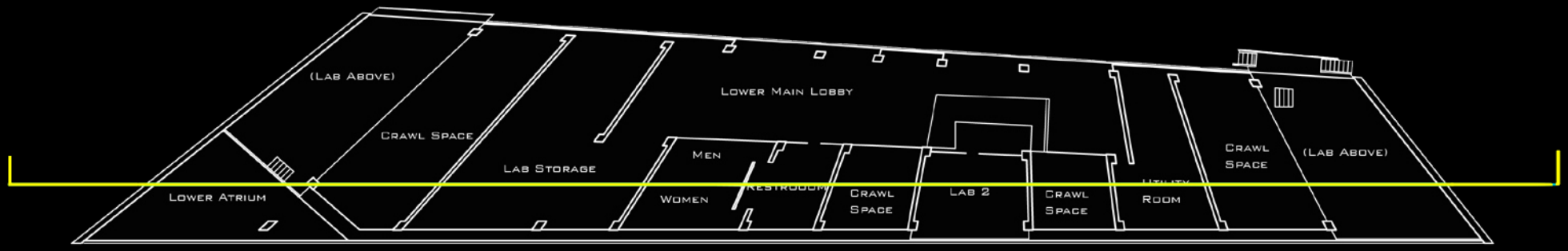
Model #4
(Combination Model)

The model on the top further emphasizes the integration ideas from the three digital models on the previous page. It shows the solid walls on the long axis, the floor plates at the level of the angle as it enters the building, and the cuts along the grid.

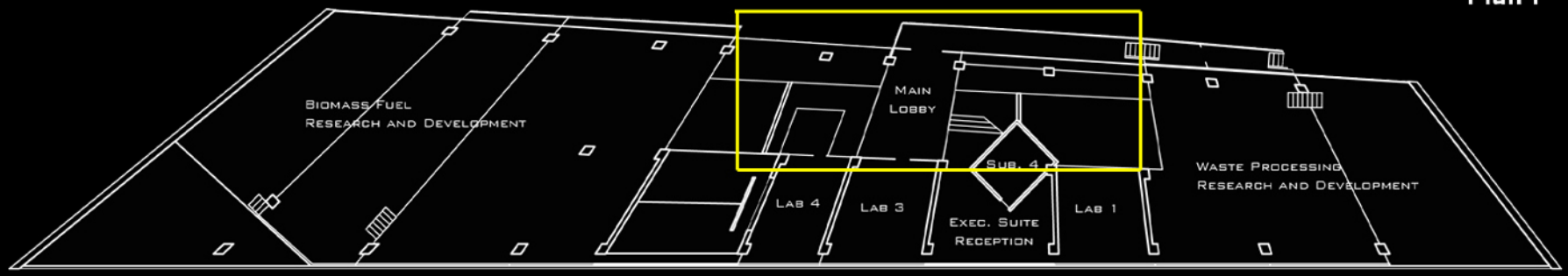
The model on the bottom is a reanalysis of the previous study and further incorporates the concepts into the building. The walls remain in the same position, removed where needed for programmatic reasons. The floor plates sit as in the previous study, some becoming enclosed as lab support spaces, some remaining open as lab spaces. Management remains aligned with the grid.



The final building uses a system of ramps for circulation between the different areas. This makes circulation part of the ad-hoc interactive space. Rather than hiding circulation within hallways confined to one floor and stairwells in one corner, circulation is provided in one large area blurring the distinction between floors.

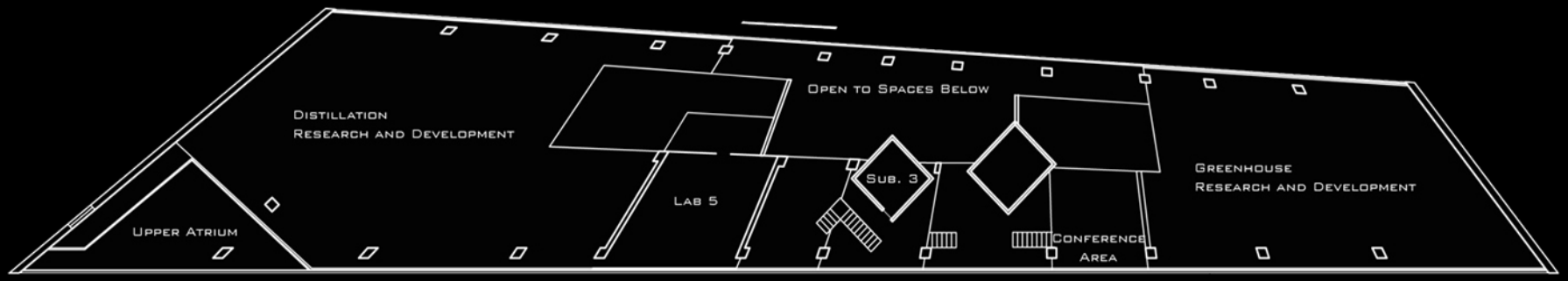


Plan 1

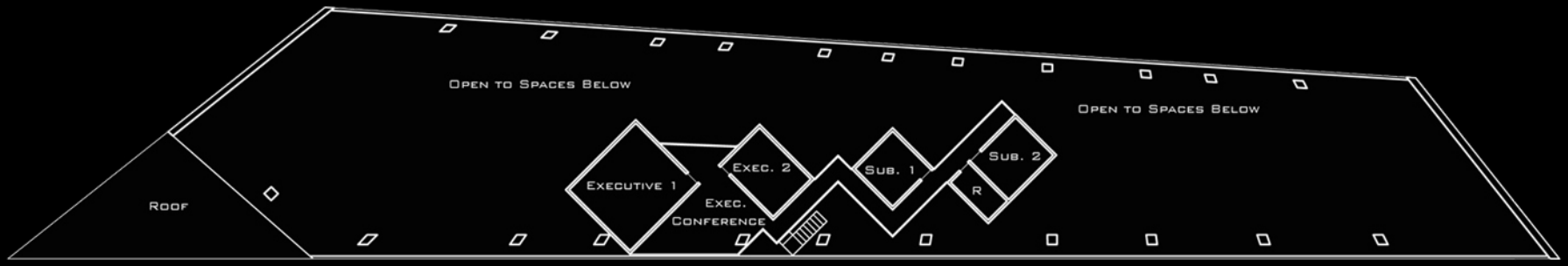


Plan 2

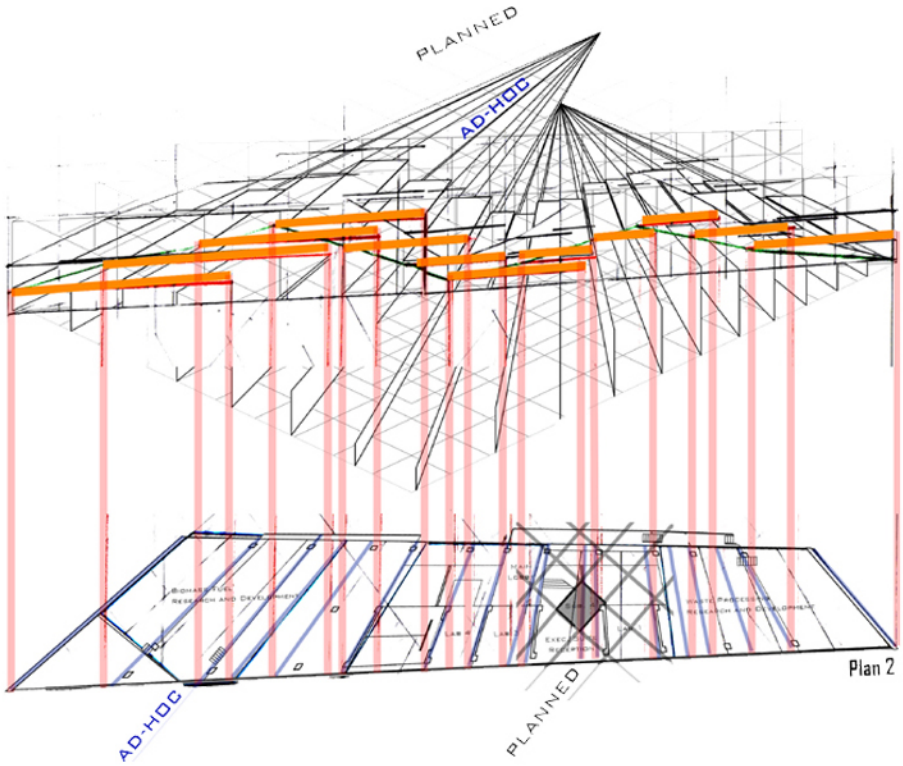
The management spaces were organized to have a suite in the spaces between them and the lab spaces. Management sits higher than other spaces so that it can have direct supervision over subordinates.



Plan 3

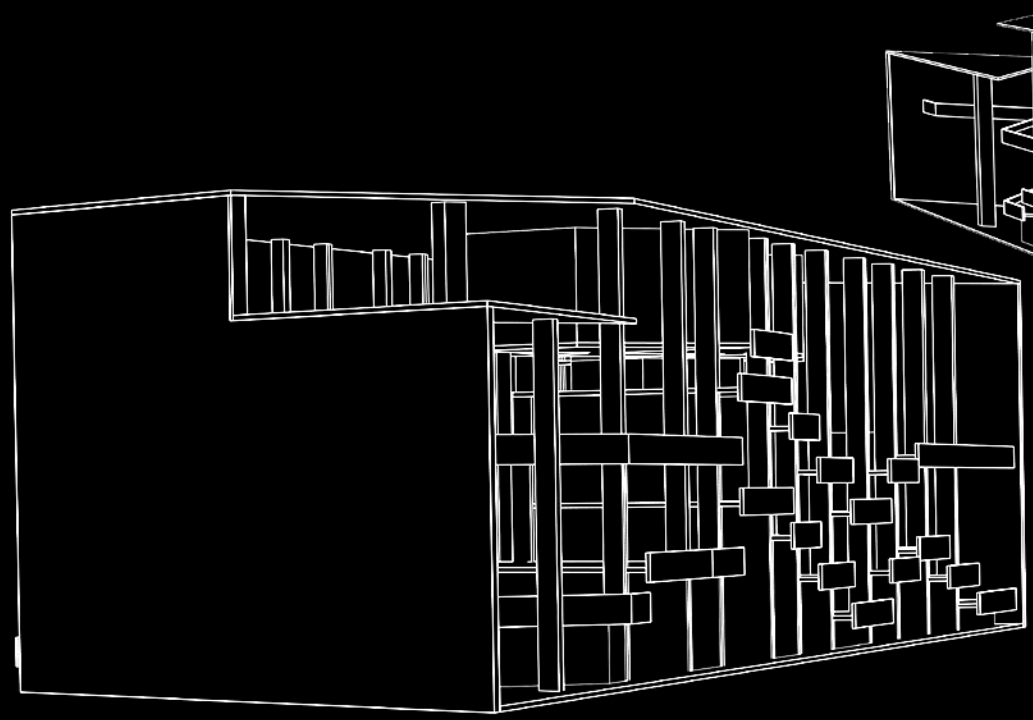


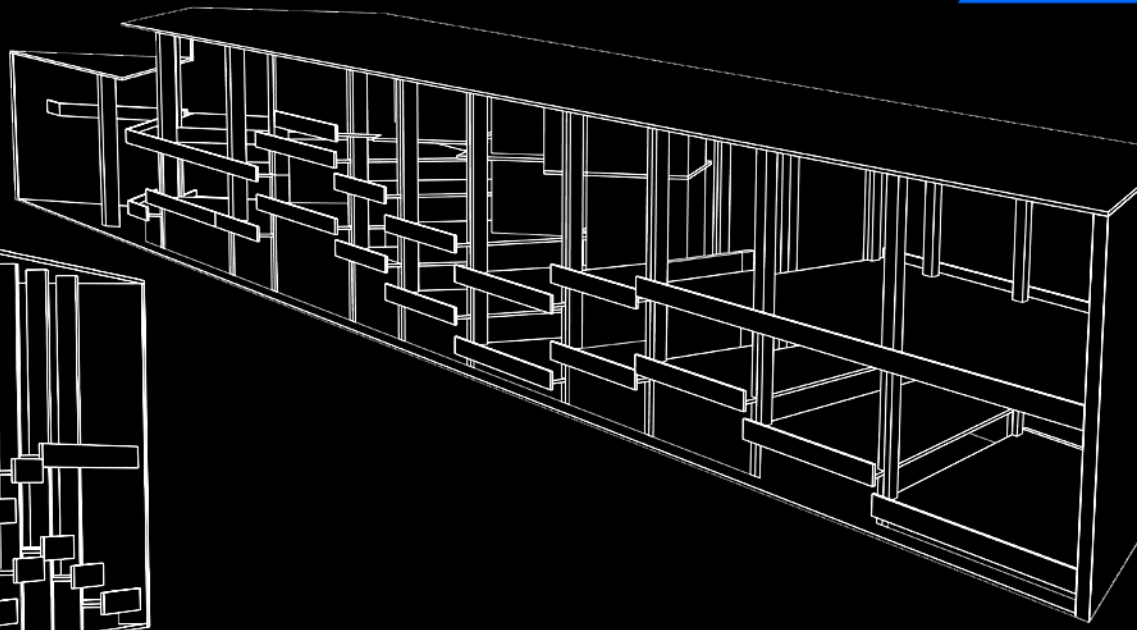
Plan 4



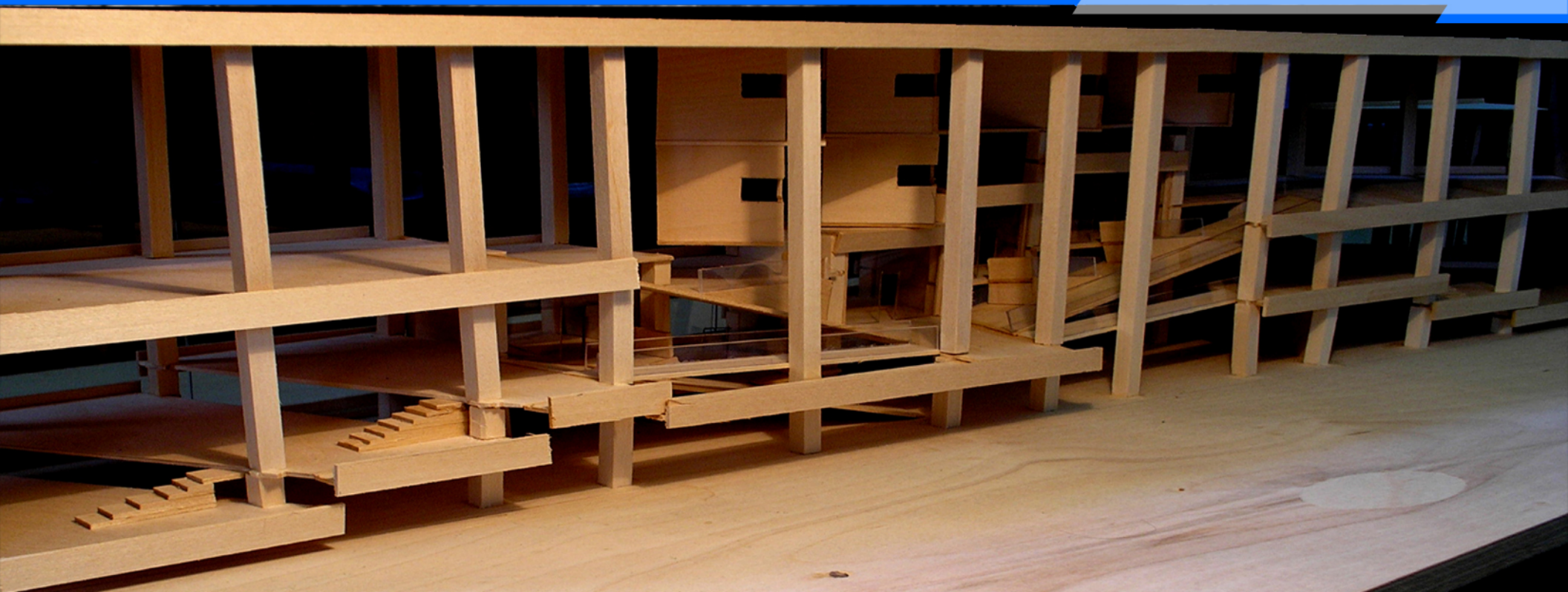
The diagram to the upper right describes the process from organization to final building by connecting an organization model with final drawings.

The levels of the floors shown in orange are easily identified in the perspective drawing below.



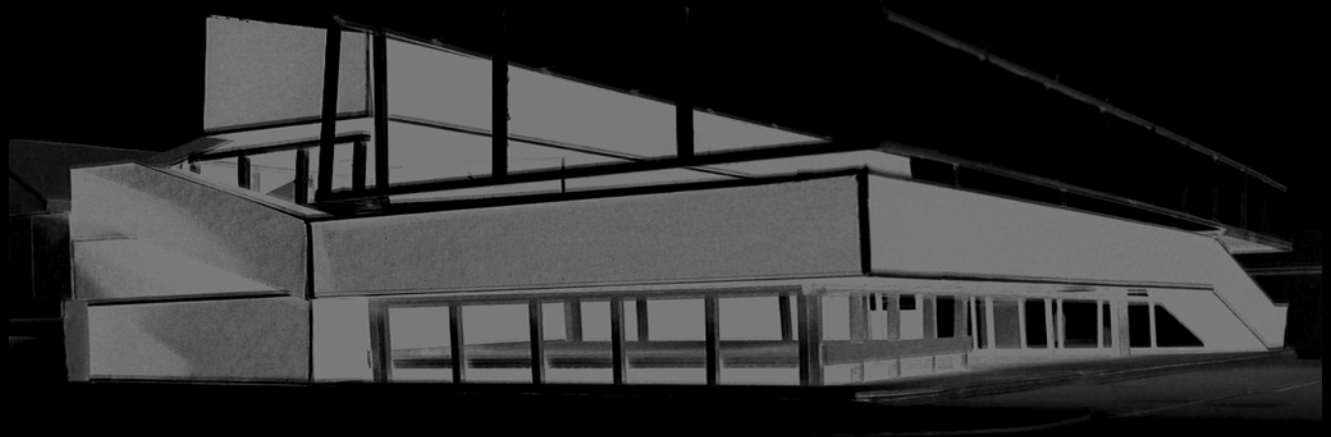


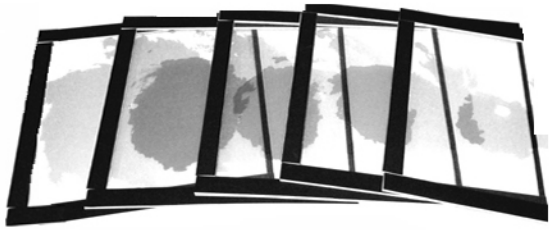
Notice in this photo the administrative spaces hovering over the spaces below. Notice the ramps used for interactive spaces. Notice the varying levels described in the previous diagrams. The columns are placed to correspond with the angles of the ad-hoc spaces highlighted in pervious sections.



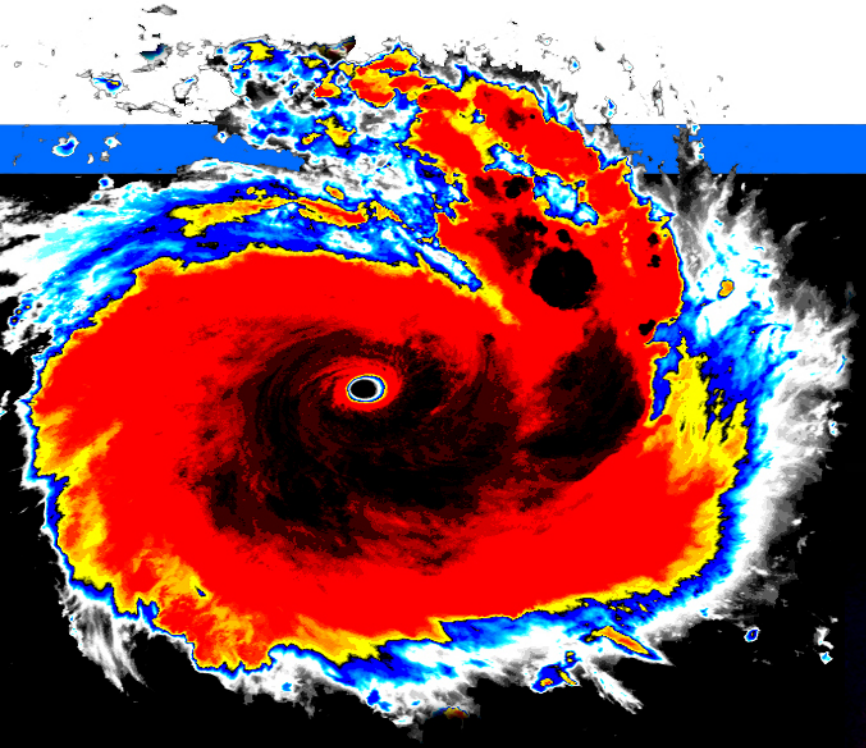
Final Model

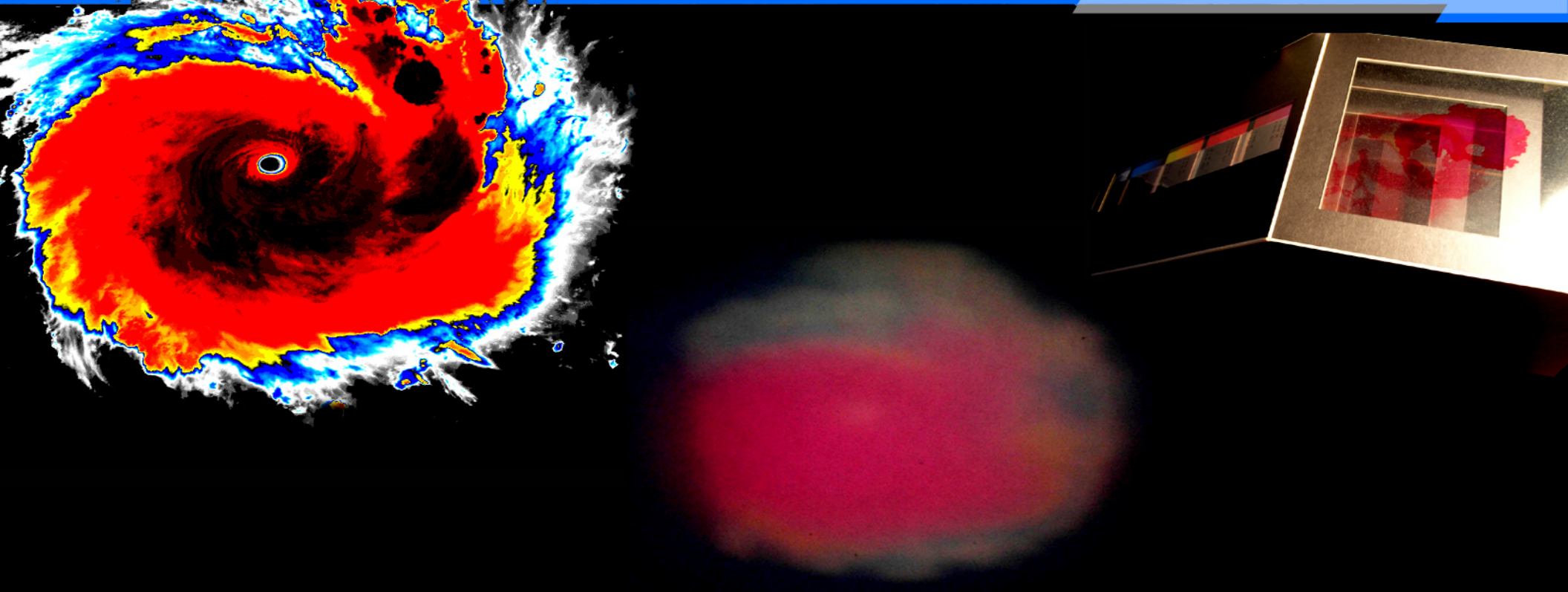
Junior Year Fall Semester was designed to explore how to accommodate bulky programs into a relatively small site. After many exercises, the goal was to program an aquatic center into a Main Street site in Northeast Buffalo.

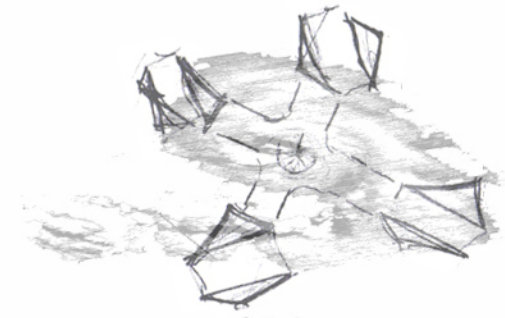


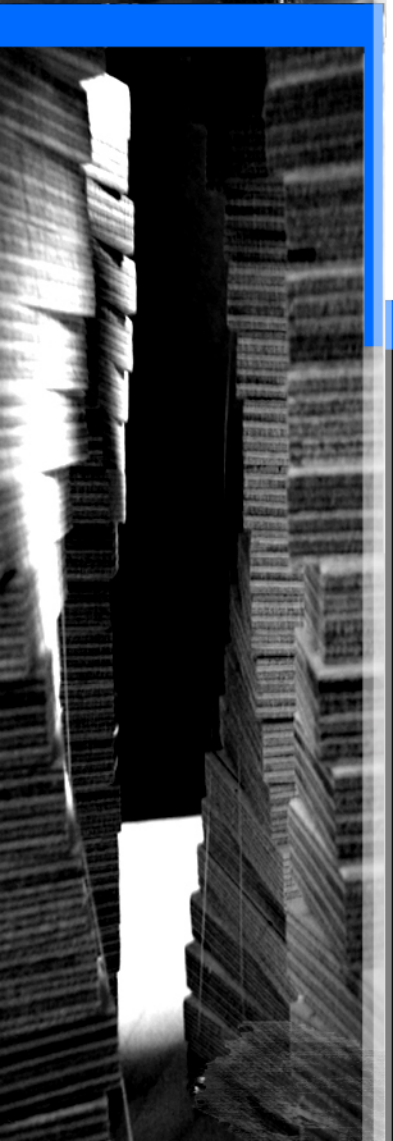


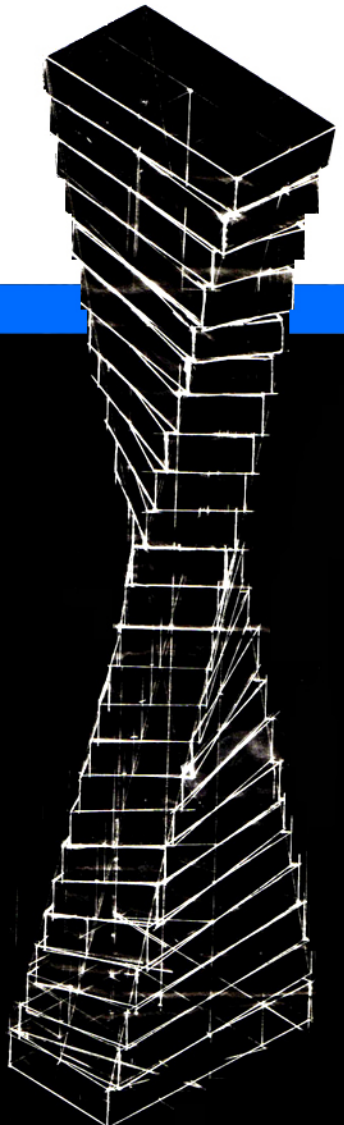
A method of operation was developed based on earlier studies of a weather pattern translated into shadows and projection. The primary process was to group portions and then reflect a certain attribute of the project. In this case, temperature groups reflect the shape of the storm in projection.











As another preliminary experiment, it was required to add structural elements to our process to allow support of a gallon of water.

ADMINISTRATIVE

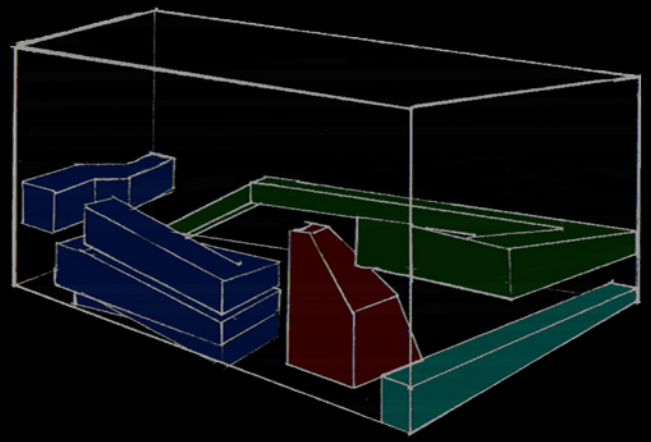
SAFETY

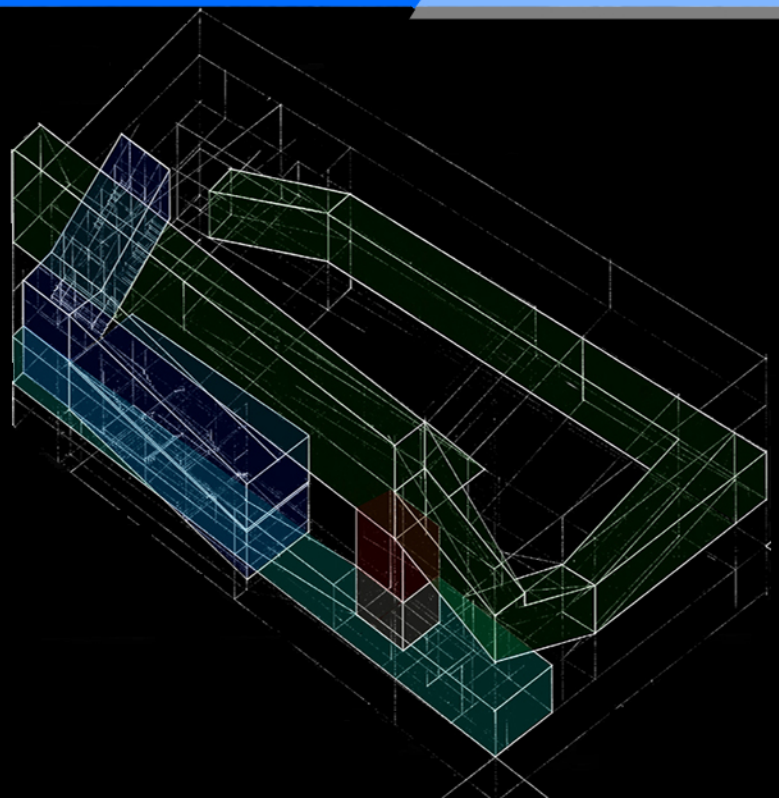
LOCKER ROOMS

SPECTATING

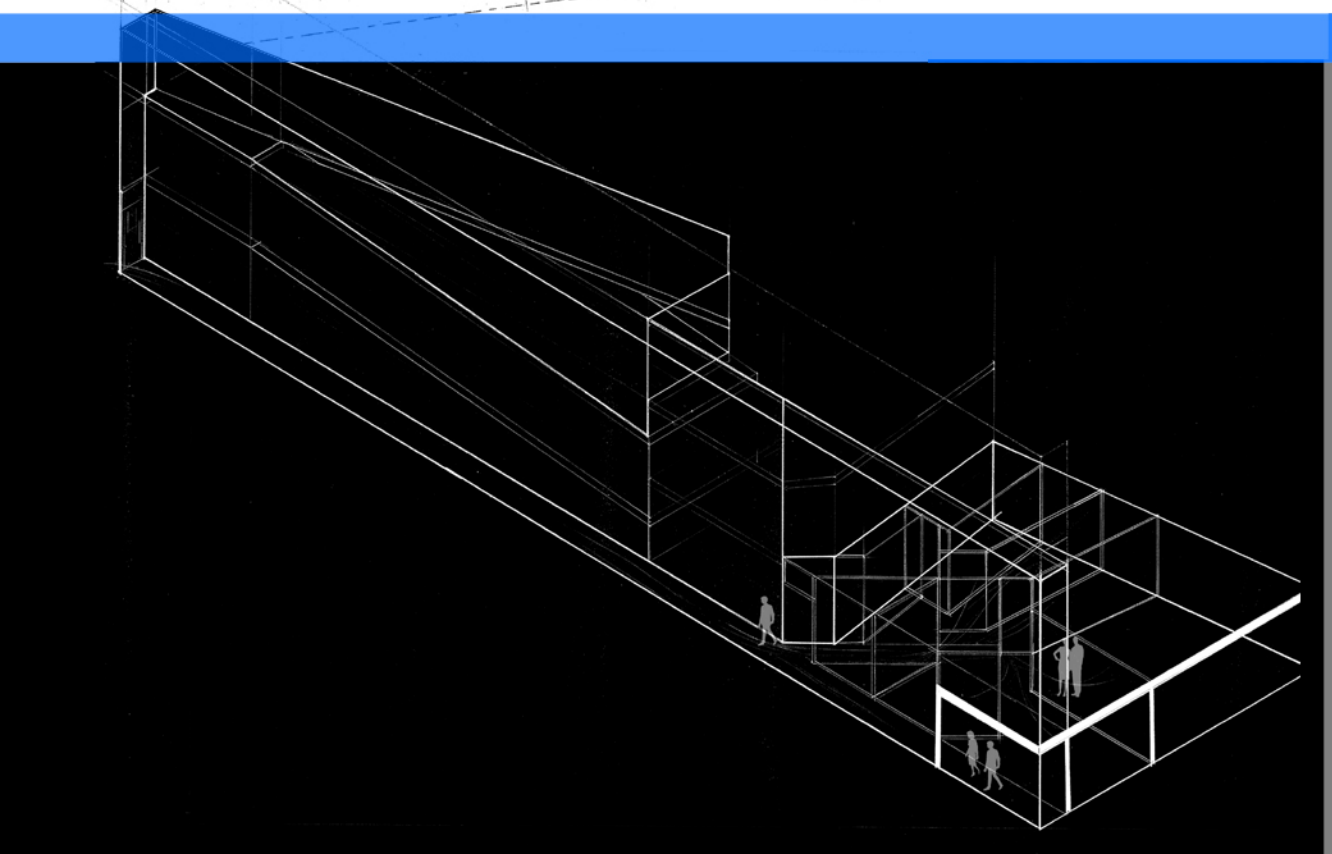
As the aquatic center is introduced, a grouping of the programmatic elements for circulation was completed. This was then mapped onto the building site. Pools had to be stacked because of their size relative to the area of the site. The programmatic elements became a "core" for each of the four general programs seen here. Once one enters a core for the specific purpose he or she continues along the path of that core until the destination is reached. Placements of cores are based on programmatic requirements modified by needs for visibility, accessibility, and clarity. Masses of the cores are dependent on each other pulling in other aspects from previous studies.

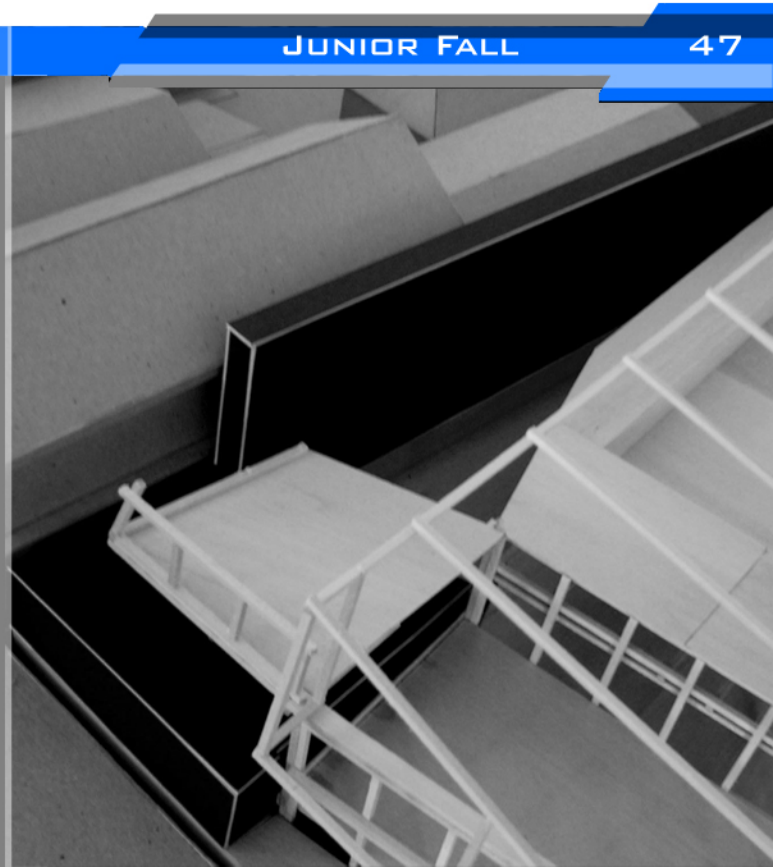
The following pages will detail each core individually. The plans shown highlight (with thick black line) the core as it exists on the floor stated. A photograph of the core alone in the model is also provided for each along with an axonometric section of the core.

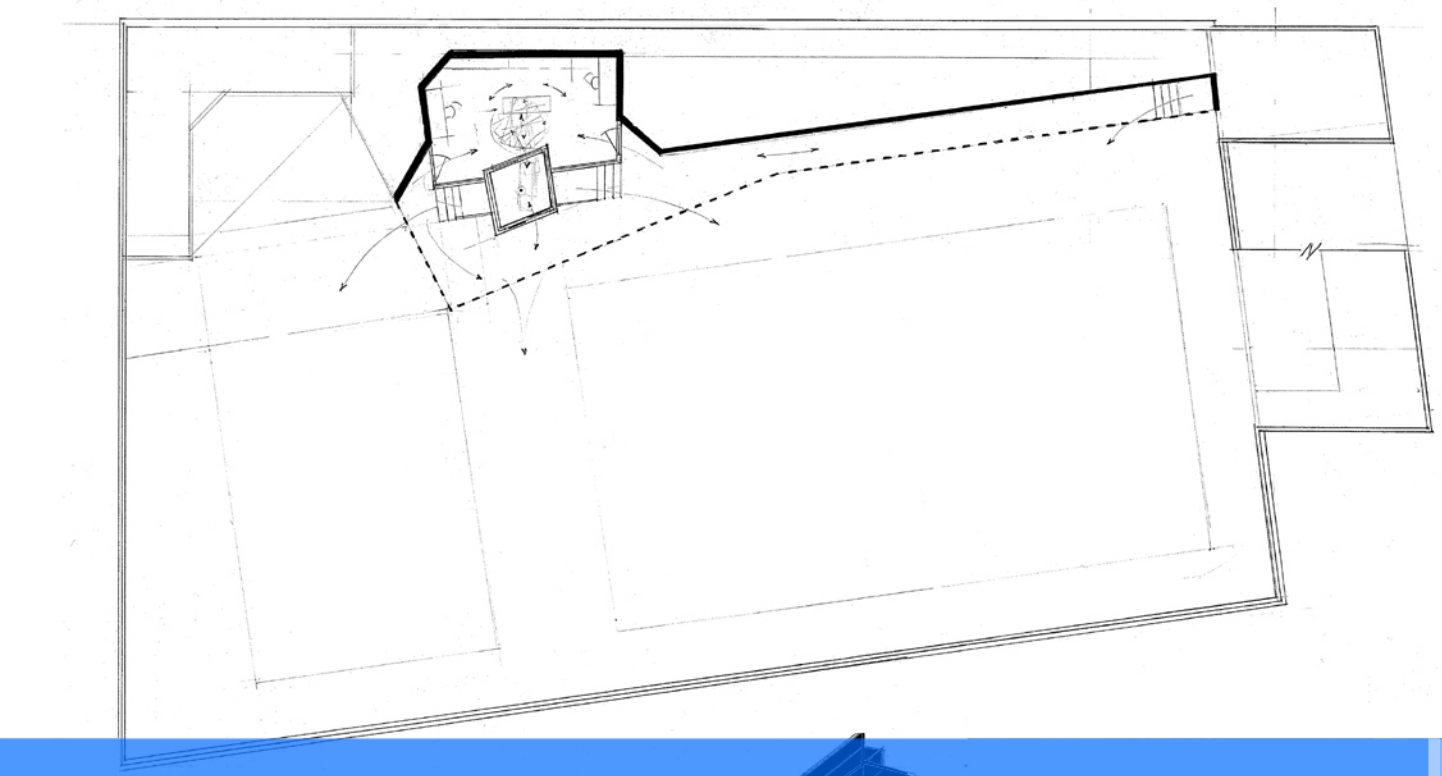




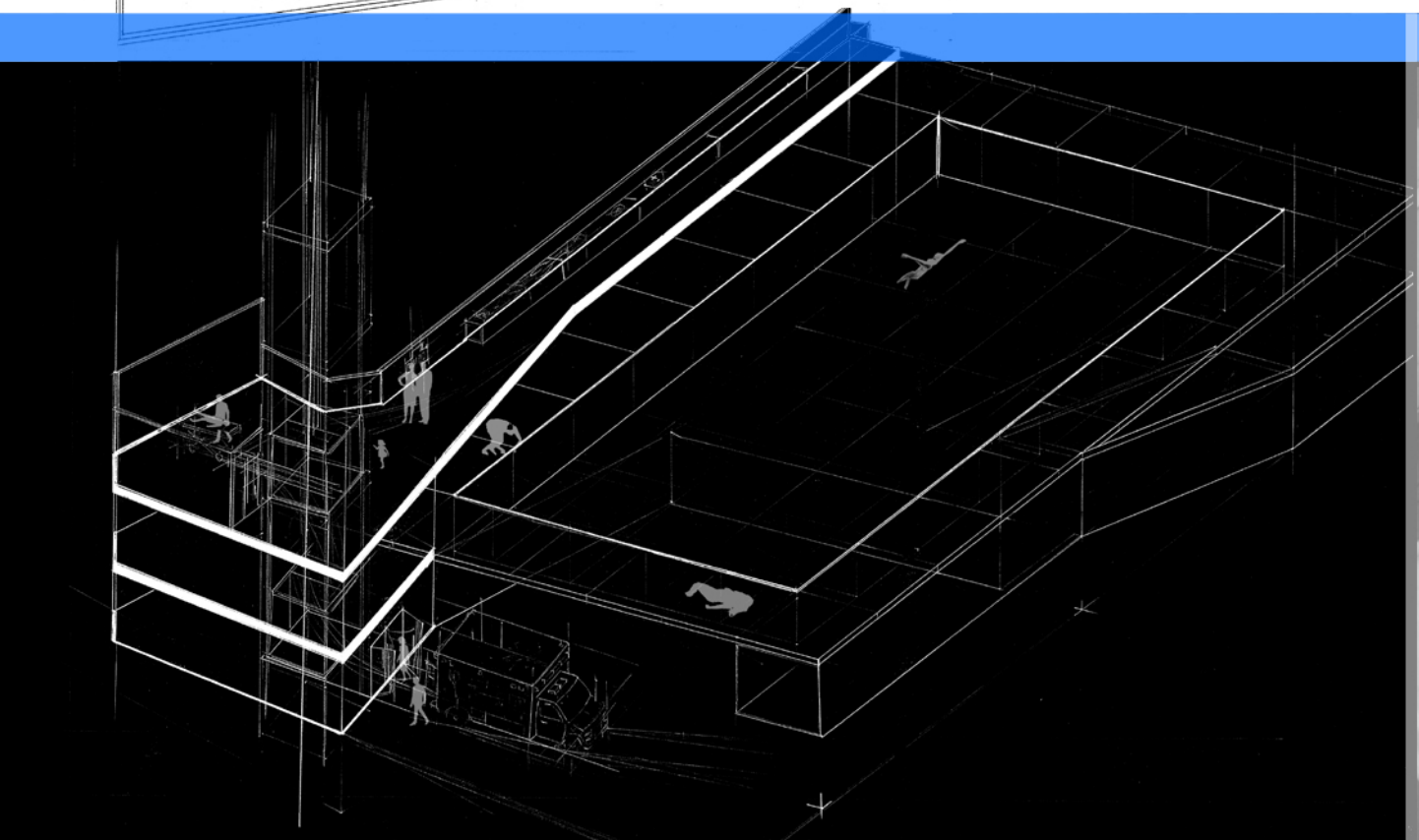
Administrative
[First Floor]

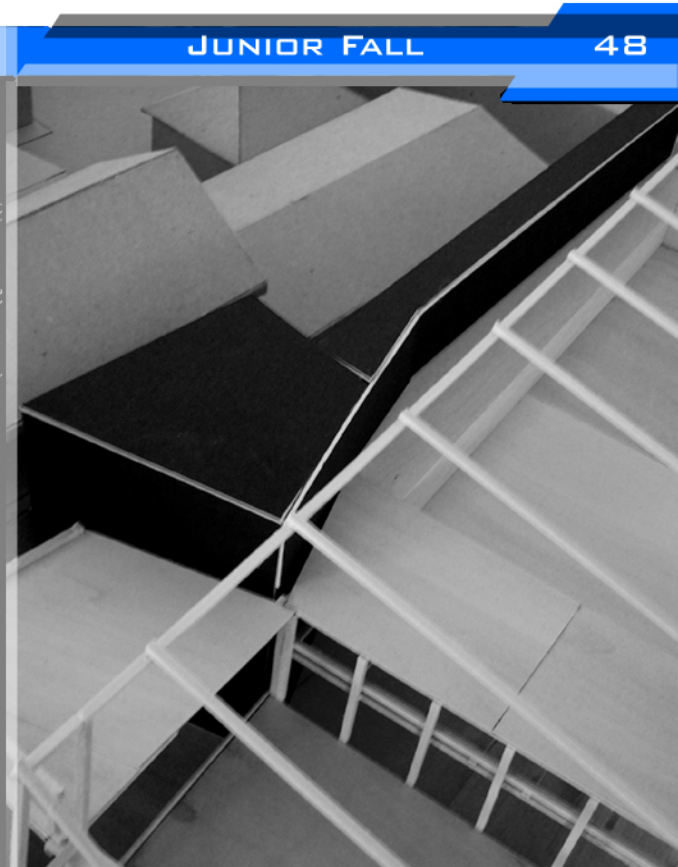


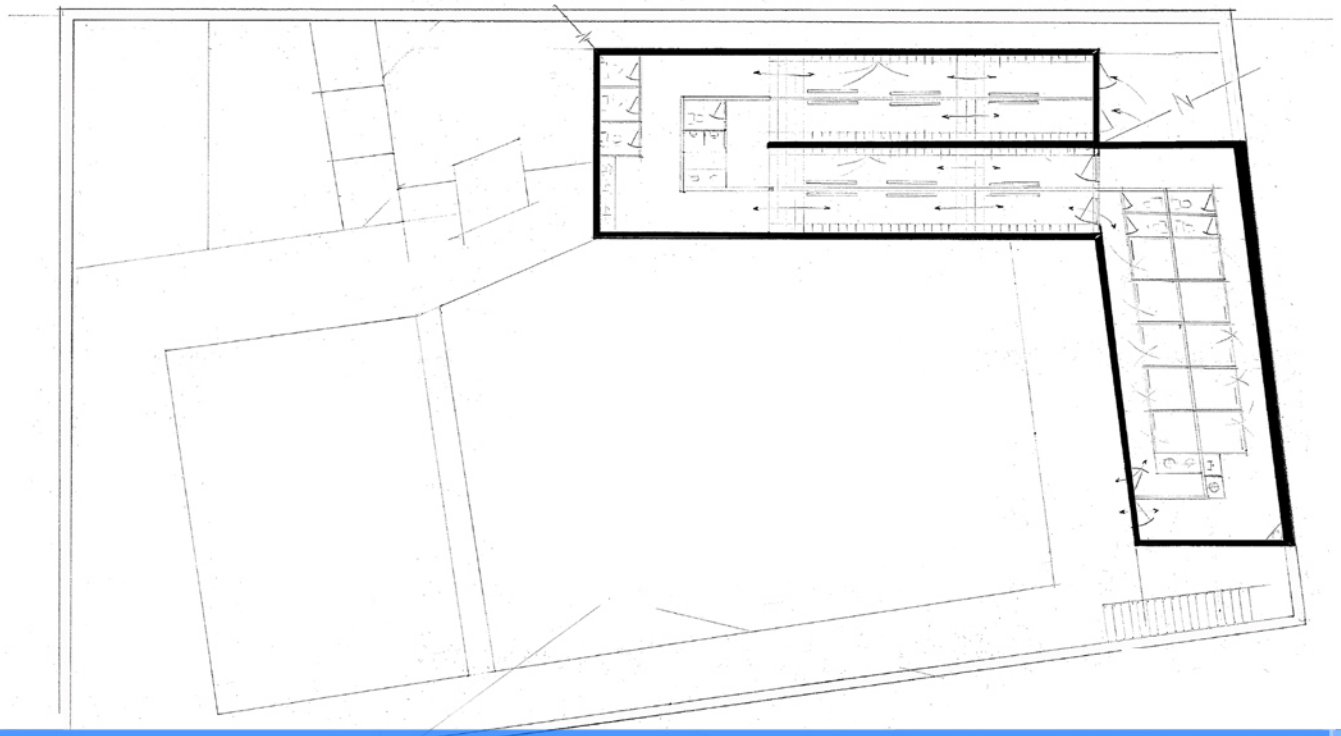




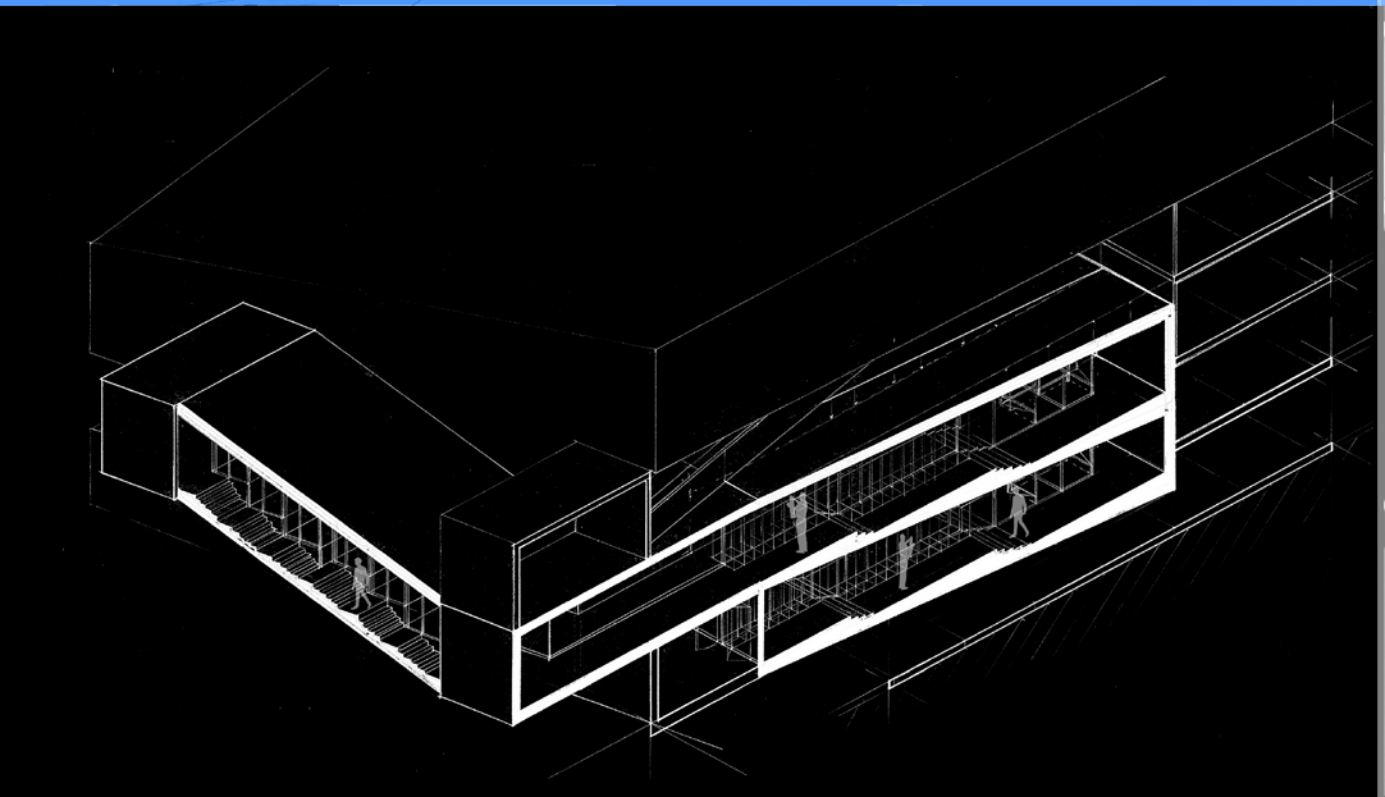
Safety
Third Floor

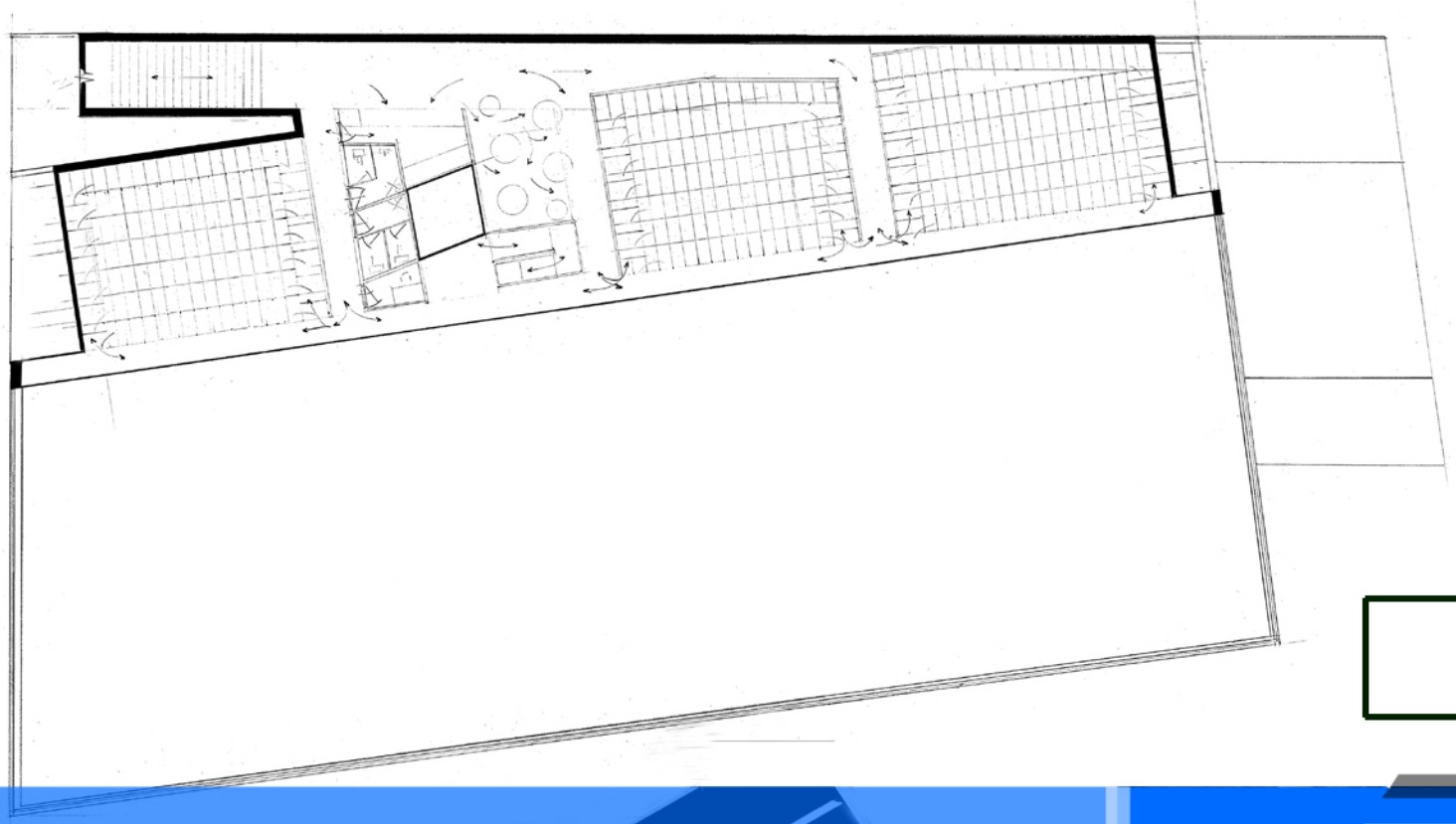
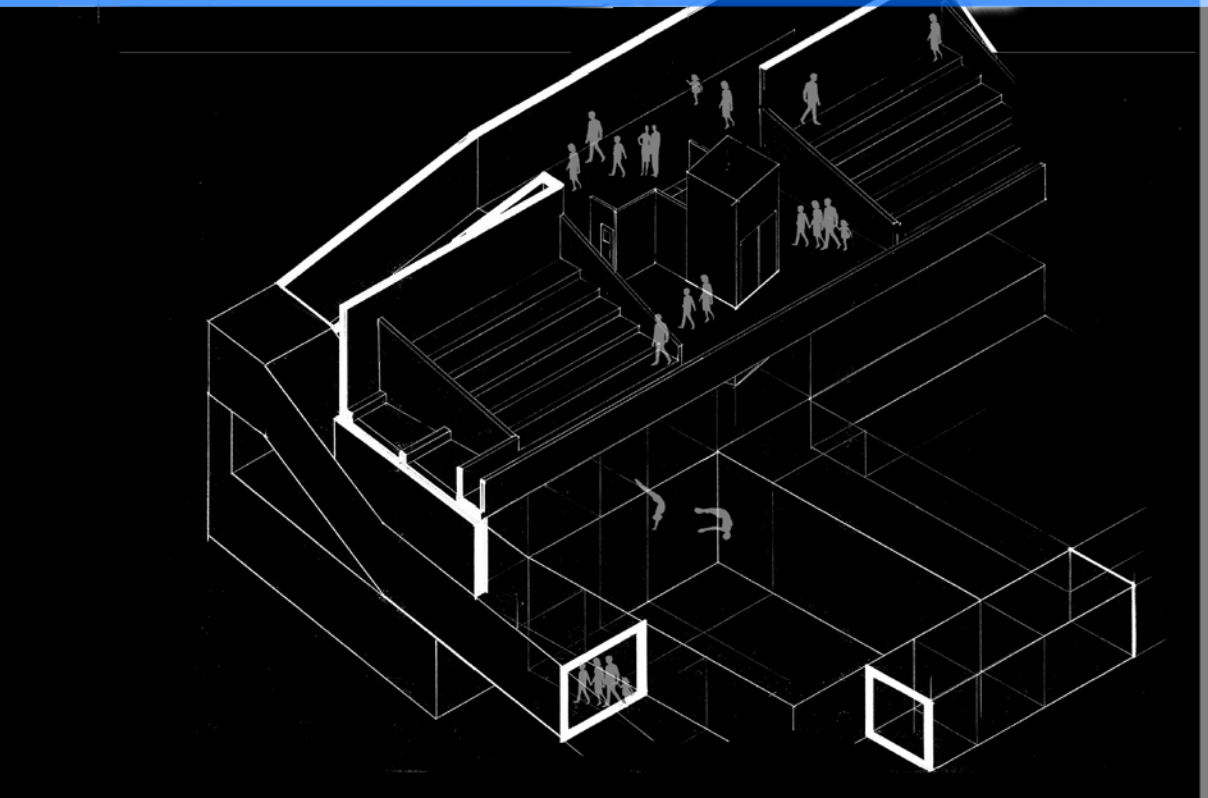
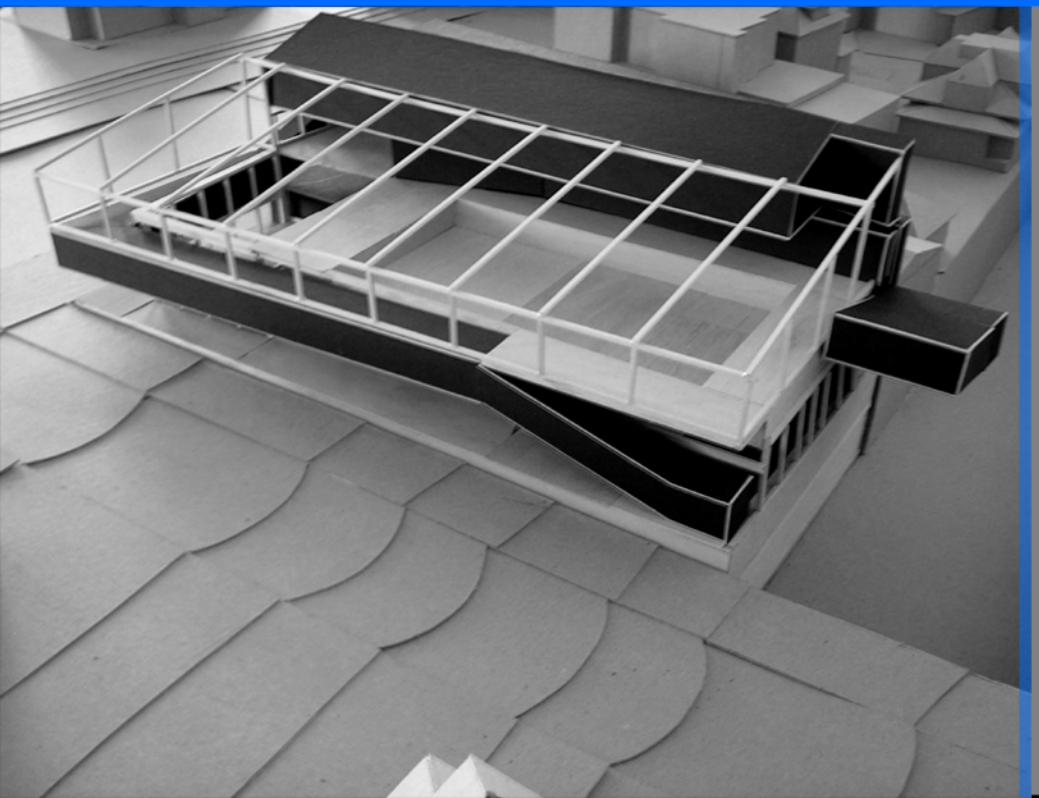
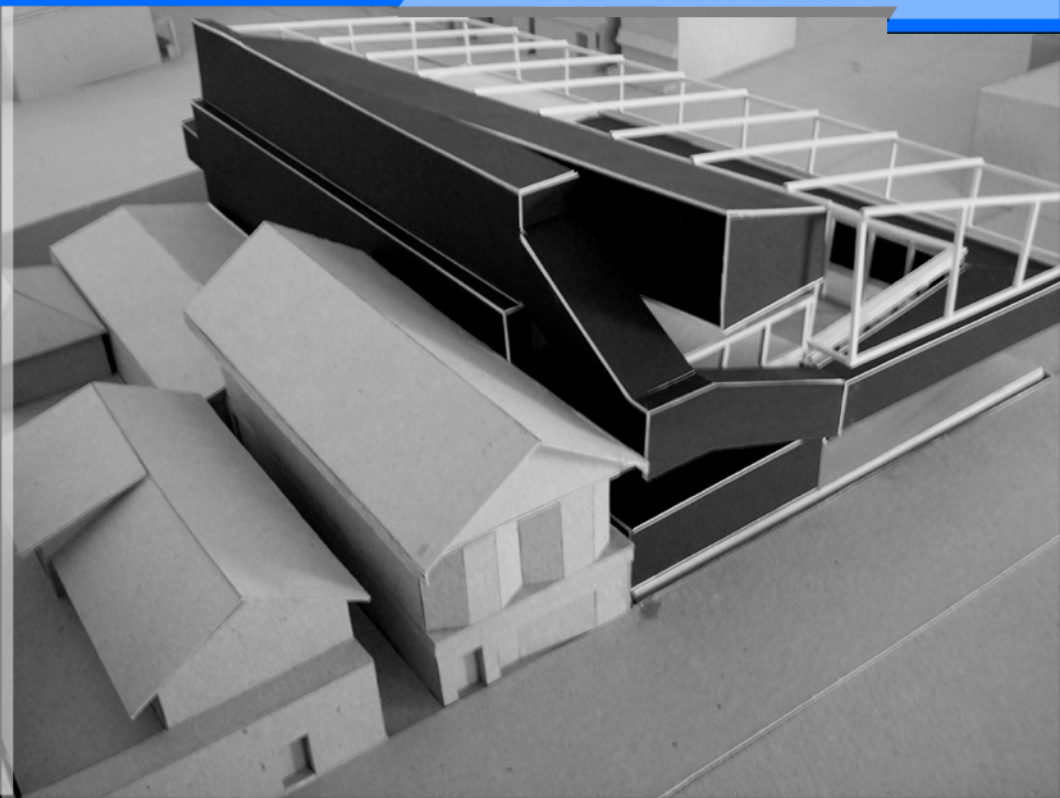






Locker Rooms
Basement





Spectating
Fourth Floor