

# Rhythmic Layering

## The Baladi Project

Kristin Moye

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

Master of Architecture  
In  
Architecture

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ABSTRACT

This thesis began with a program, the belly dance studio; the dance inspired the architecture through the translation of Arabic music into physical measurement as well as less tangible attributes that shaped the final design. There was an attempt to find a link between dance and architecture. Both dance and architecture can be physical representations of something less tangible. In the raqs sharqi, the Egyptian solo dance, the drummer creates a rhythm, normally improvised at the performance, and the dancer then follows the drummer in improvising her dance to the rhythm. Thus, this thesis proposes that a drum rhythm could possibly be translated into physical measurements that could then order physical objects. By performing the same function as dance, architecture can embody the dance.

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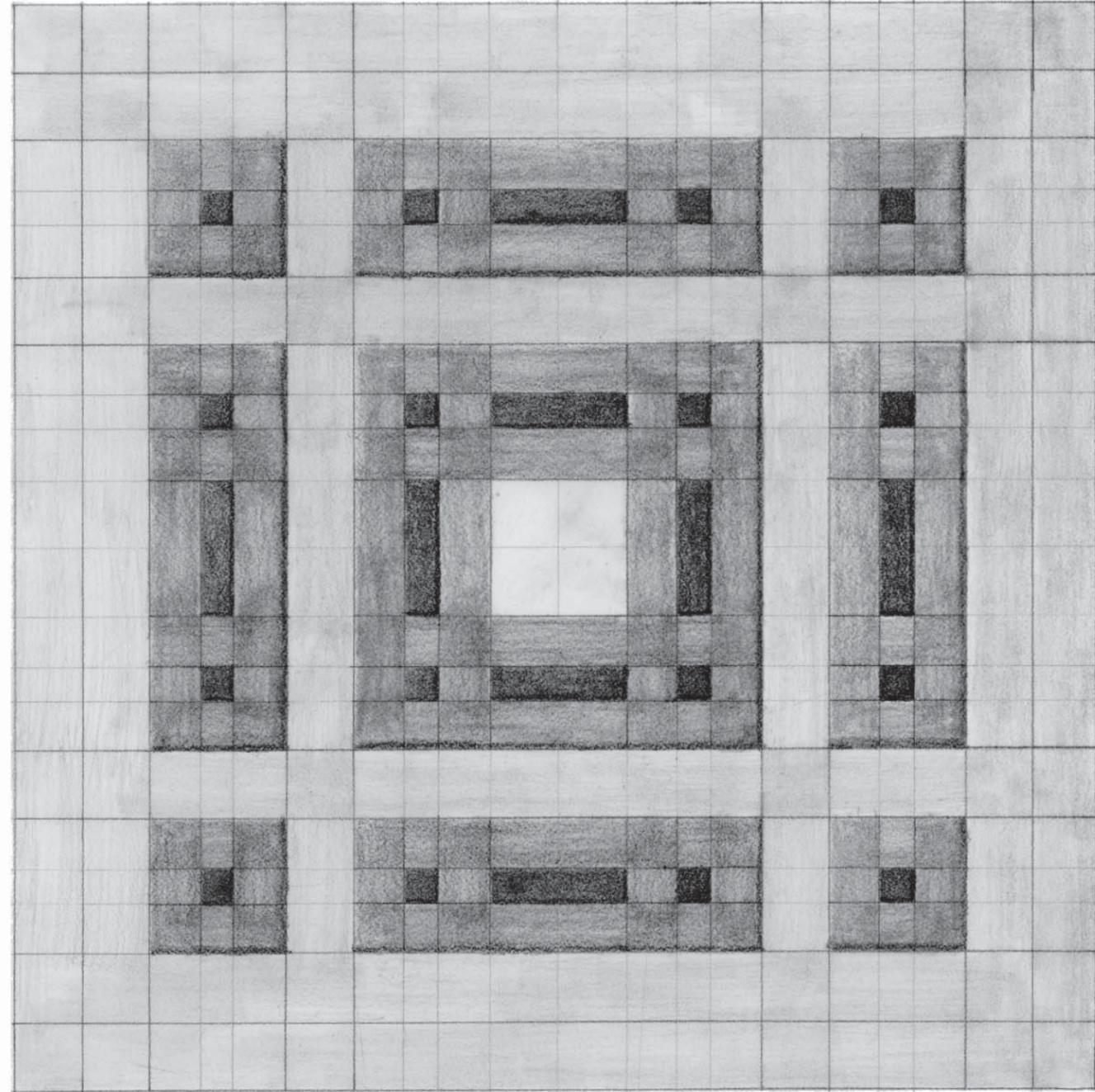
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Part One:  
The Baladi Studies



## Baladi Studies

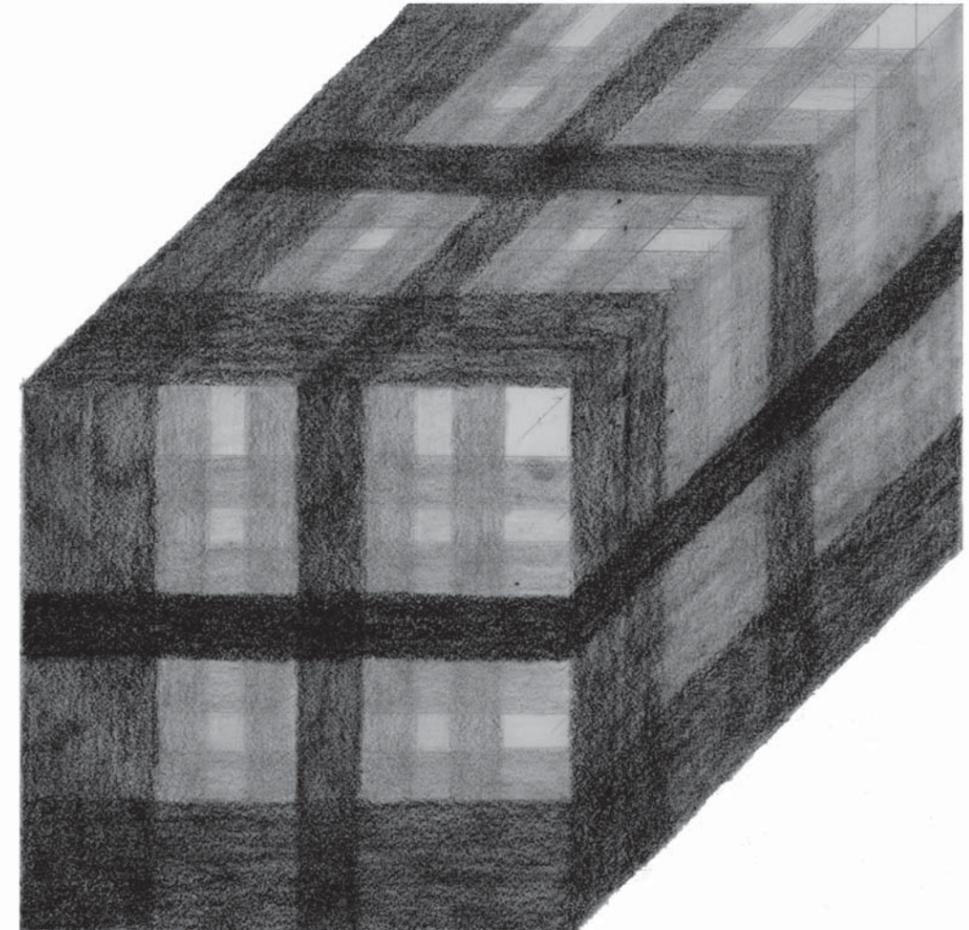
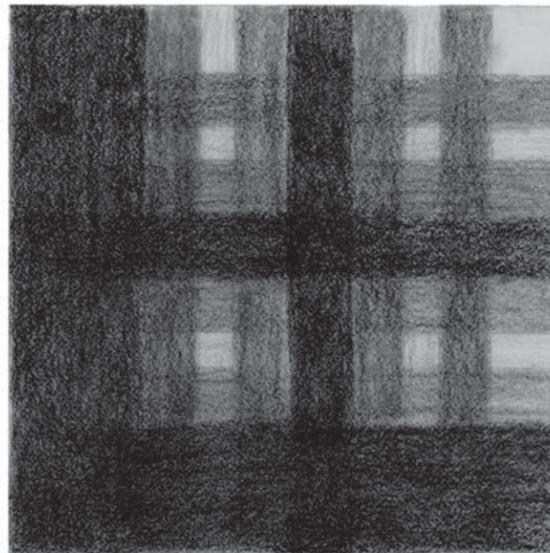
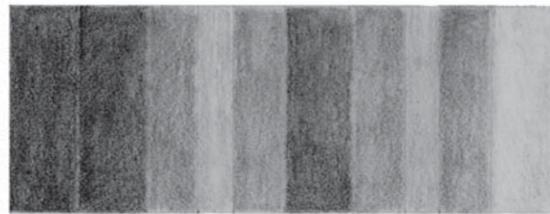
The first study drawings made are graphic investigations of the baladi rhythm. The lengths of the beats are given physical measurement rather than a measurement of time. From there, the pattern is extended into 2 and 3 dimensions.

In the second set of study drawings, depth is added in order to provide a more spatial reading of the objects. The different kinds of beats, dum, tek, and ka, are given their own layers that do not intersect with the layers of other beats.

Before the baladi studies were done, elevation studies were used to decide the composition of a facade, first using 3' squares arranged in sets of 8 in imitation of the 8 count applied to music in order to choreograph dance.

The second set of facades use the rhythm studies as an ordering system. One focuses on the lines of the rhythm and thickens them to create mullions, the other focuses on the measurement of the rhythms in units of distance rather than time, these measurements then become the frames in the drawing.

The latter method of manifesting the rhythm was then applied to an early building configuration. The long, thin building volume was chosen before the studies were done resulting in a superficial application of the layers; therefore this building volume was discarded in order to allow the study of the rhythm and layering to dictate the architectural design in all of its aspects.



## Baladi Studies

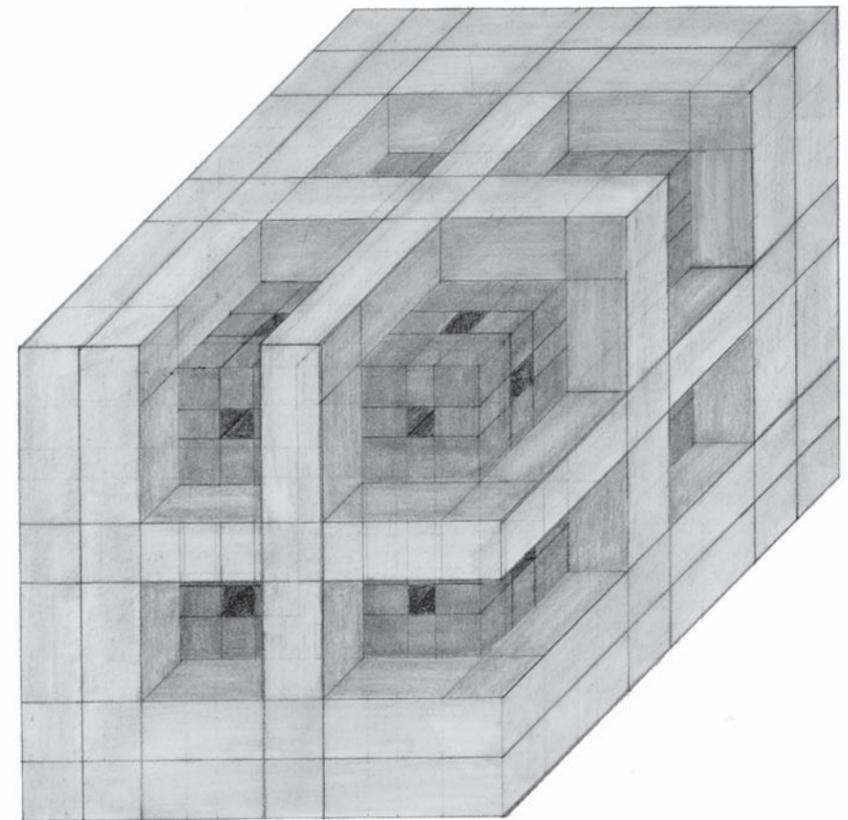
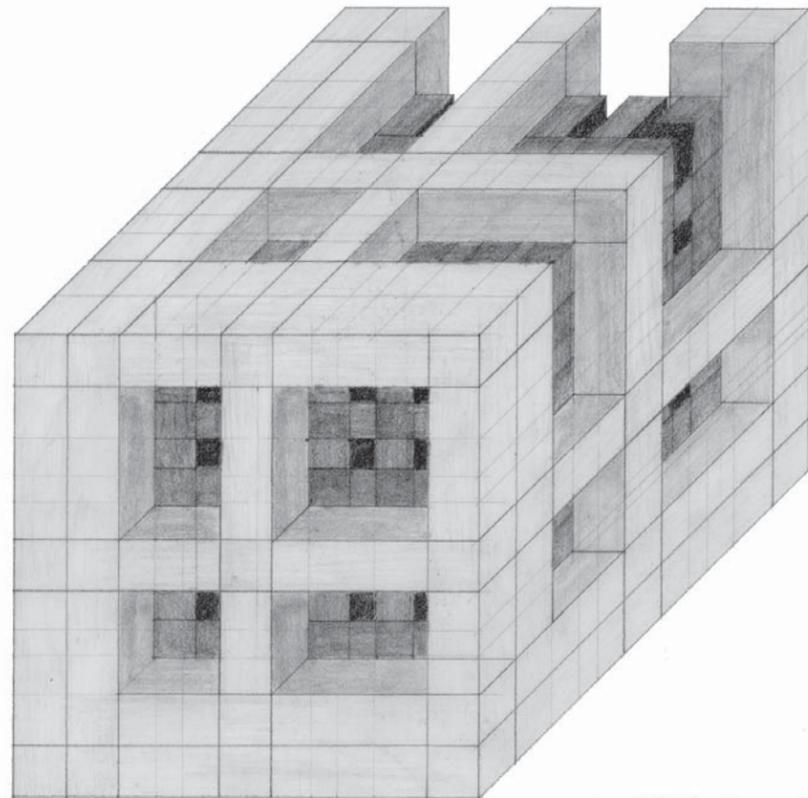
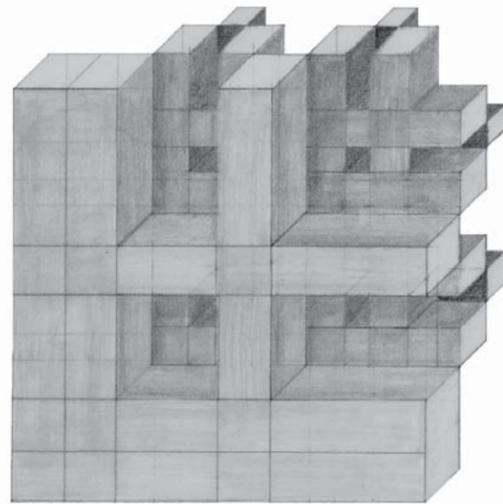
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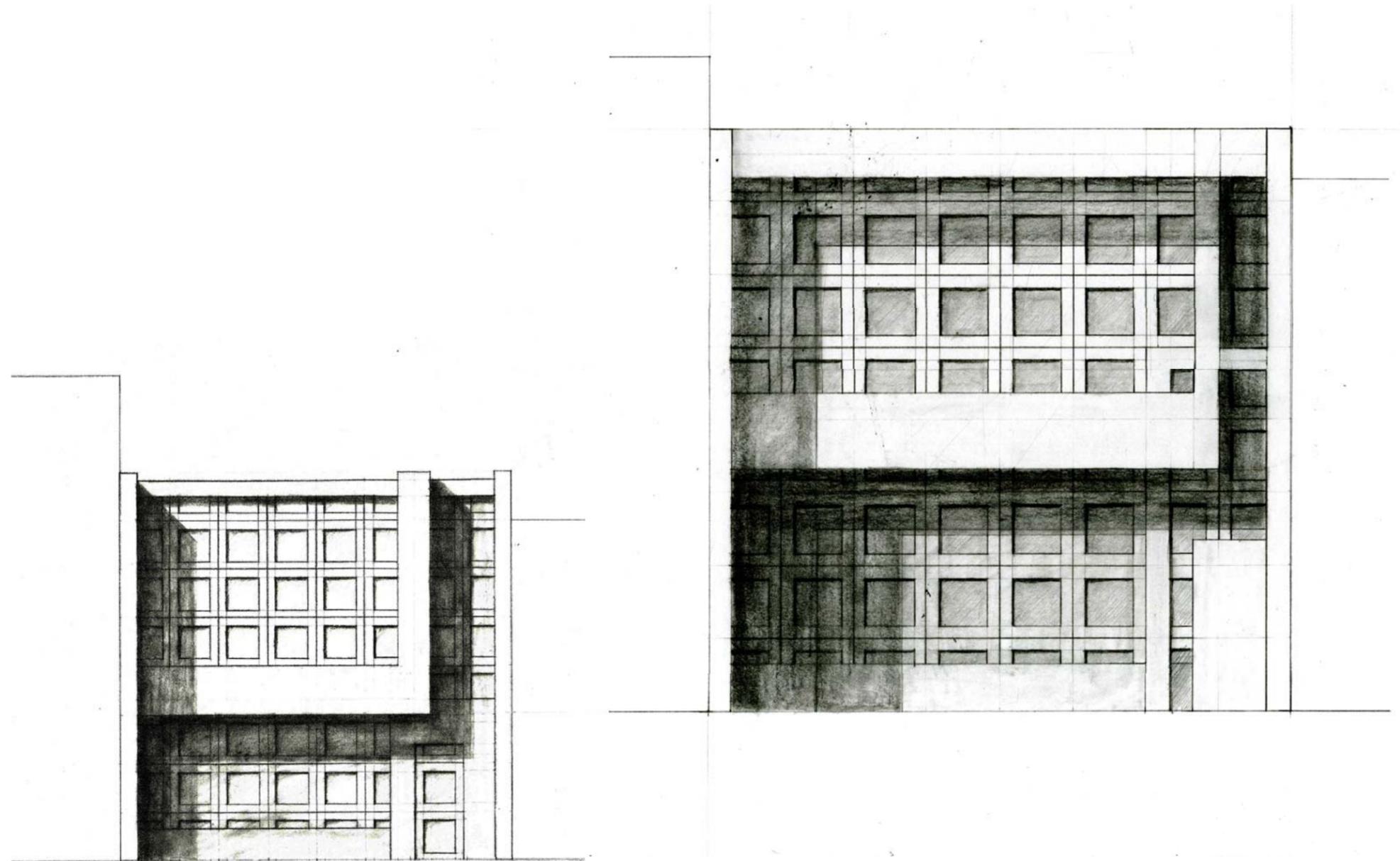
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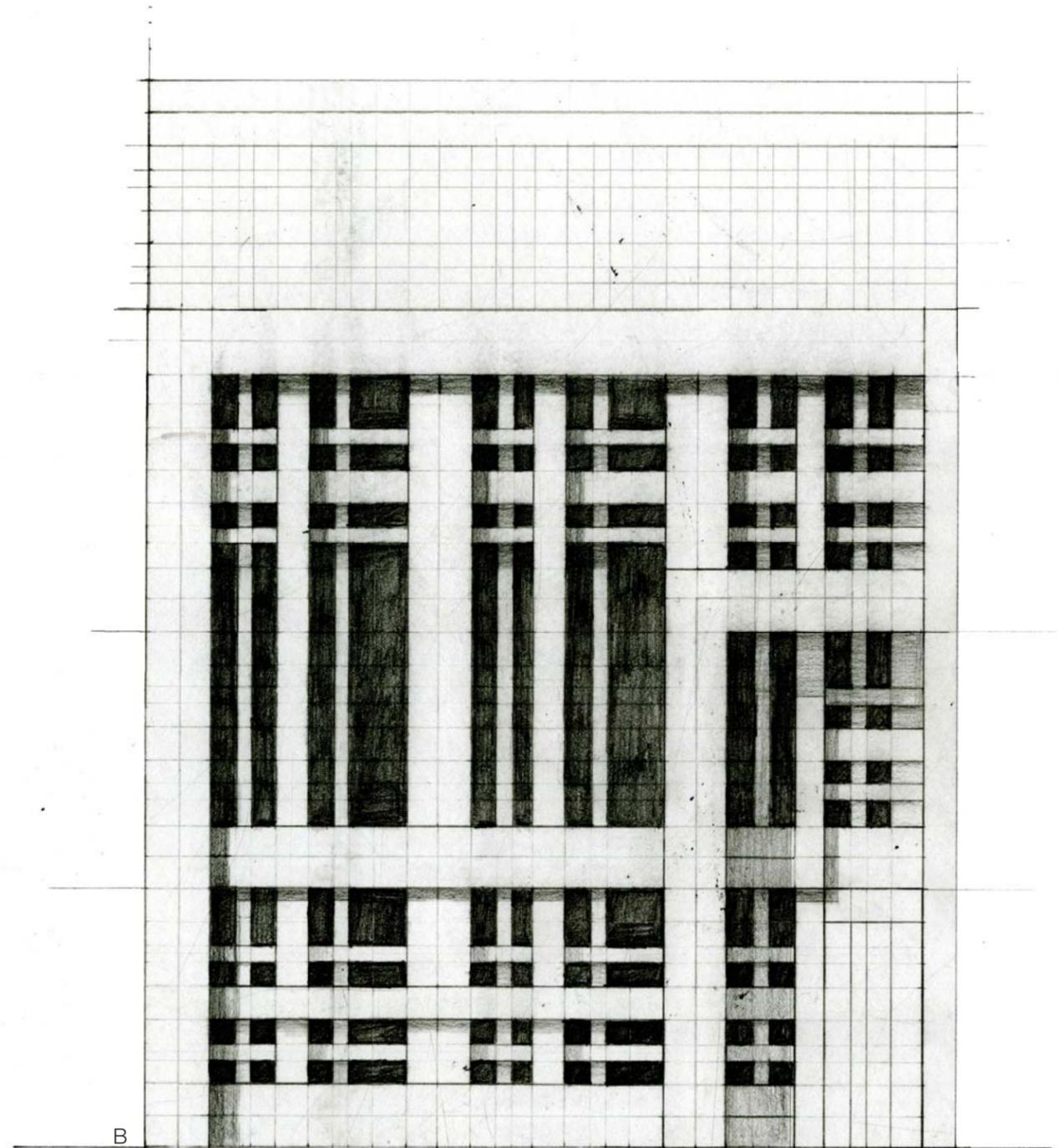
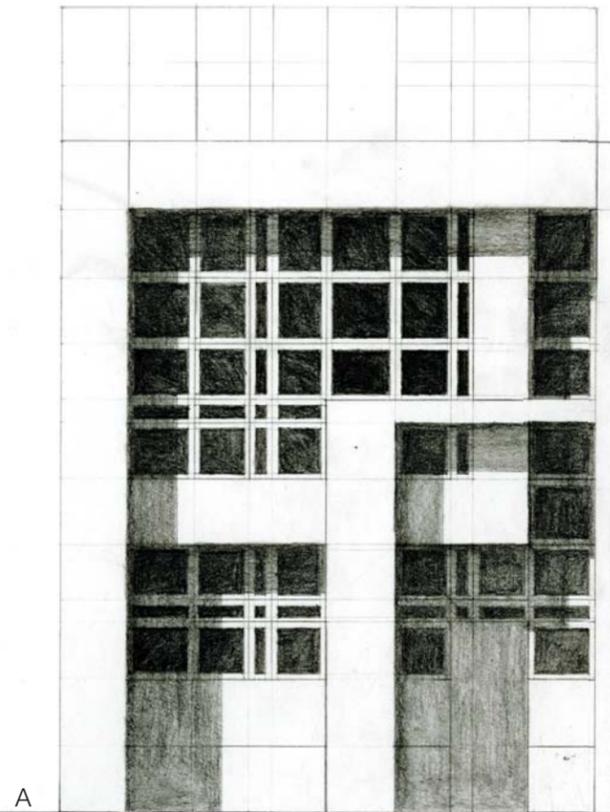
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Facade A focuses on the lines of the rhythm and thickens them to create mullions, B focuses on the measurement of the rhythms in units of distance rather than time, these measurements then become the frames in the drawing.

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## Building Scheme 1

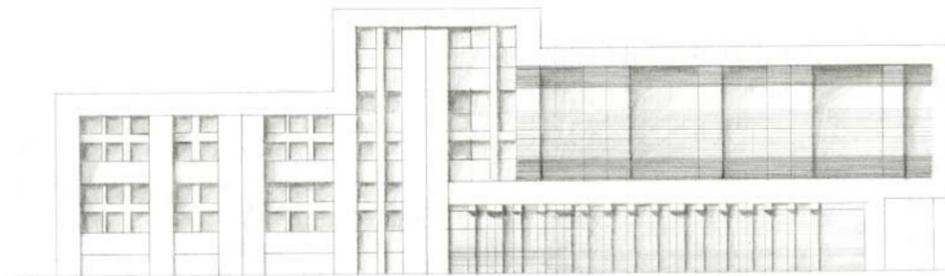
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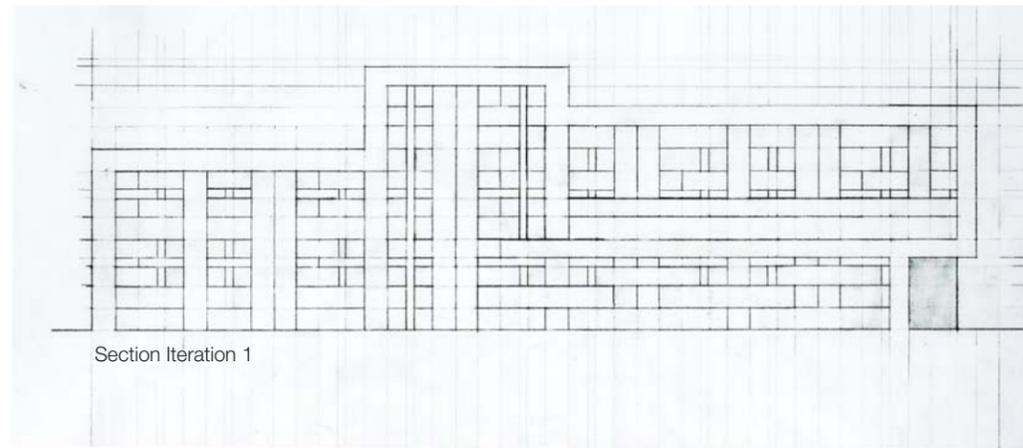
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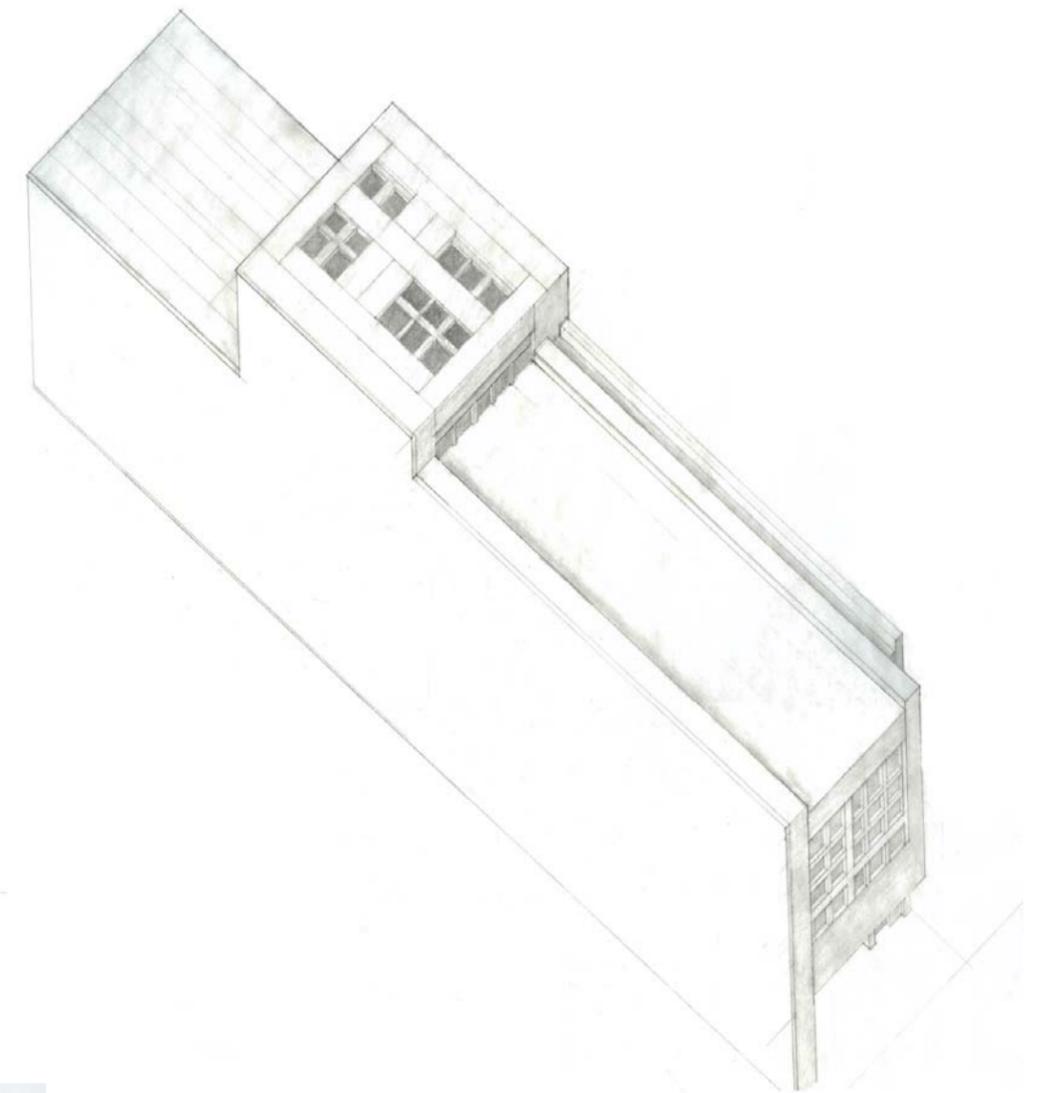
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Section Iteration 2



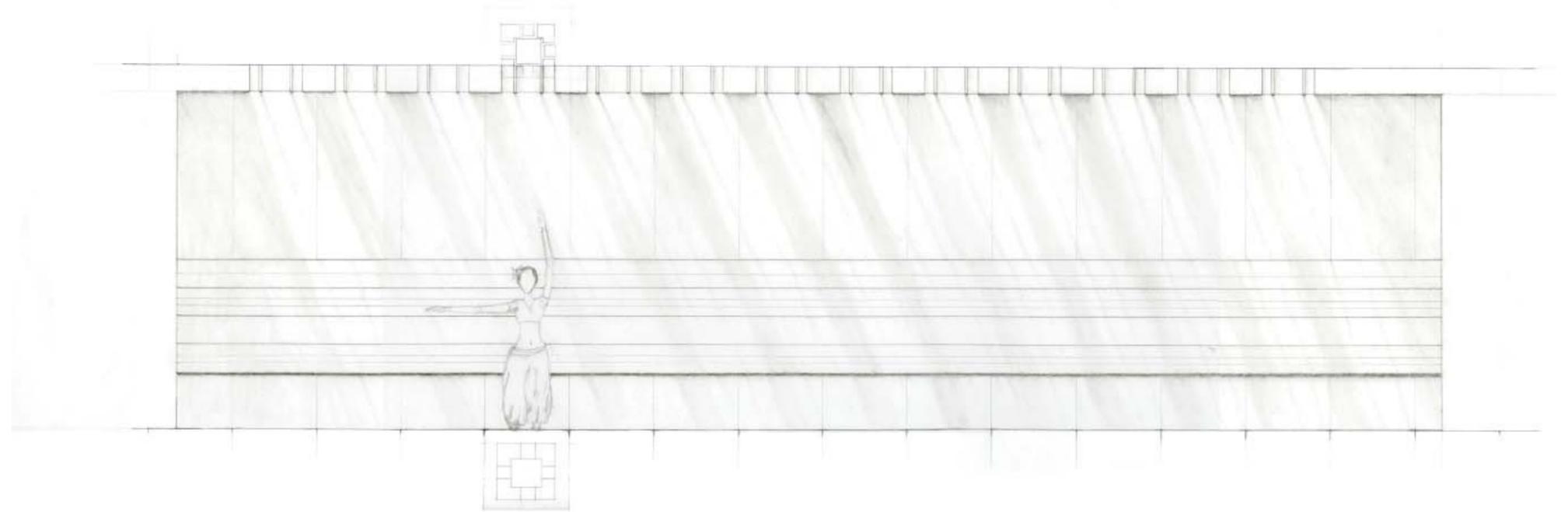
Section Iteration 1



Oblique Projection developed from sections

### Dance Studio Scheme 1

The dance studio designed for the first building scheme is characterized by skylights laid out using the baladi rhythm; they are intended to be reminiscent of the small punched out skylights found in many Middle Eastern buildings. The light and shadow fall upon a wall that has long horizontal strips mounted to it, they also follow the baladi in their varying widths. The strips begin at below hip level and then continue up until just past the average height of a dancer. The horizontal lines are intended to create a datum line that is visible to the dancer in the mirrors, the line gives a reference for the body that can be used in teaching certain moves that are meant to follow the horizon; for example, the chest slide is the movement of ones chest from left to right and right to left, the move is performed correctly when the chest appears to move independently of the rest of the body along the horizontal plane. Below the dancer's feet are 3' x 3' tiles that are also a reference for the body, particularly when learning. In addition, they allow the dancers to easily arrange formations and create accurate spacing when the size of a performance venue is known.

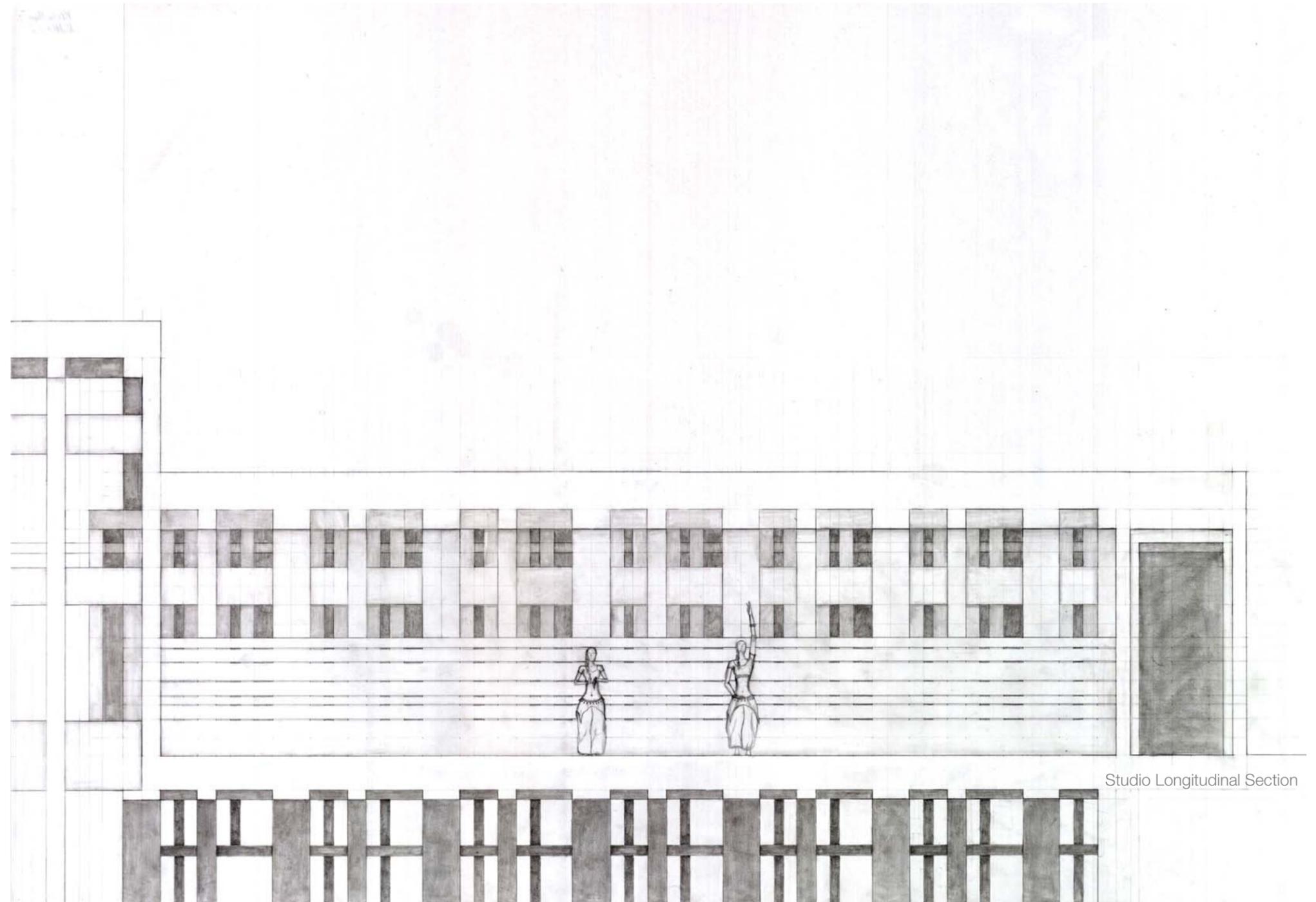


## Building Scheme 2

The second building iteration began with the section of the studio, this was an attempt to allow the building to grow out from the studio, it was also a chance to expand the use of the Baladi rhythm.

The skylights are eliminated from the studio space, but not forgotten. Behind the datum line slats are columns that fall in line with the Baladi rhythm where one dum equals one foot. Behind the columns is the corresponding horizontal dums that then create framing for holding windows that enclose the dance space, an opening can be seen to the right of the dancers, this becomes a hallway that wraps around the back of the studio and ends to the far left. The medium gray shades visible between the columns are the columns that enclose the hallway. To the left, there is an atrium that opens all the way to the basement floor. The visible basement floor is only half underground, the half seen opens to the outside.

The unshaded second drawing explored the placement shape of lighting and mirrors in the studio, the mirrors being the tall jagged edged rectangles to the left of the dancer. The hallway described earlier is seen to the right as it extends into the atrium, which can be seen rising up above the height of the studio and a second unknown space beyond. A sketched diagram for the plan is drawn in the lower left of the ground field. Throughout this scheme, only one scale of the baladi pattern is used, one that rather overwhelms the dancers within.



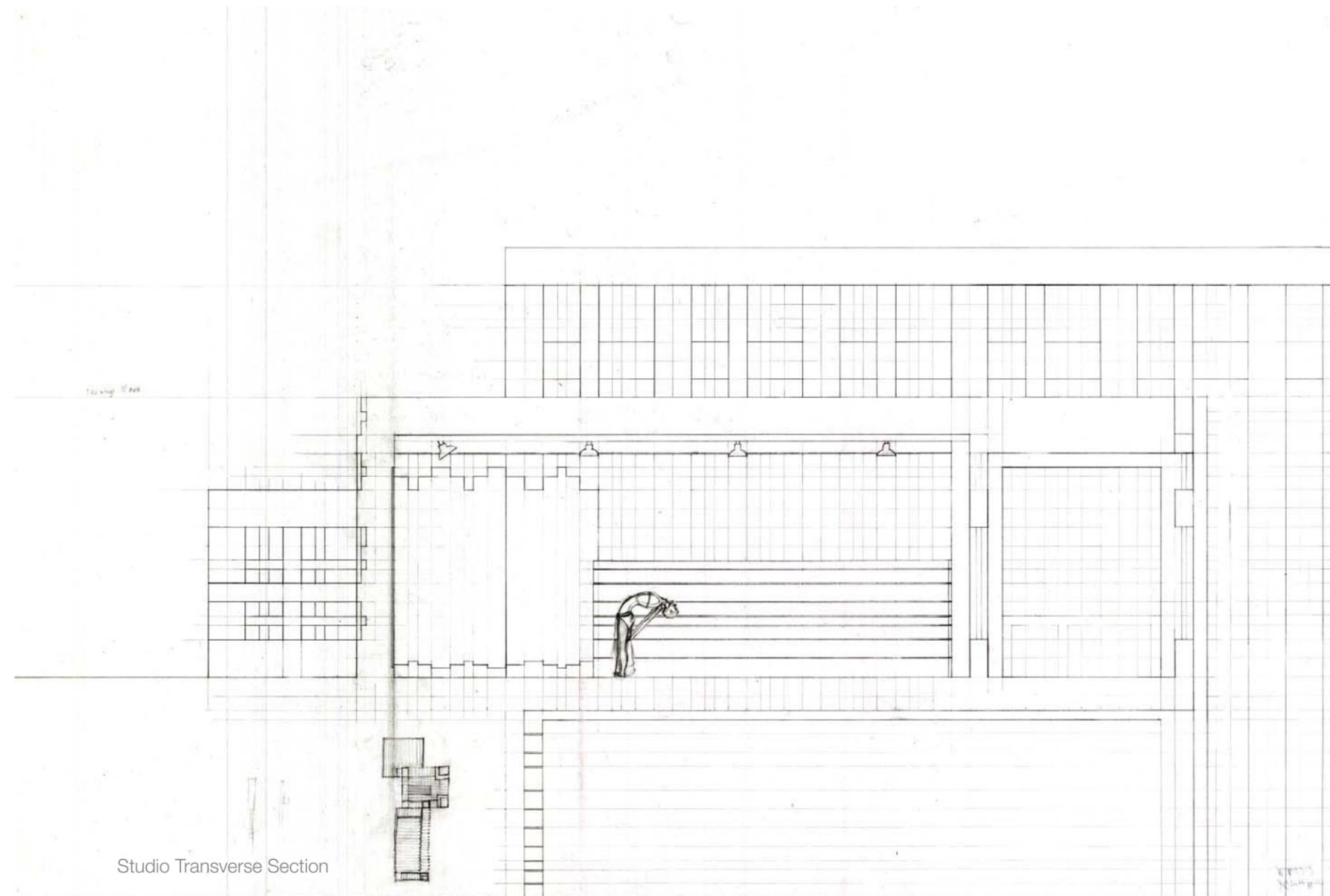
Studio Longitudinal Section

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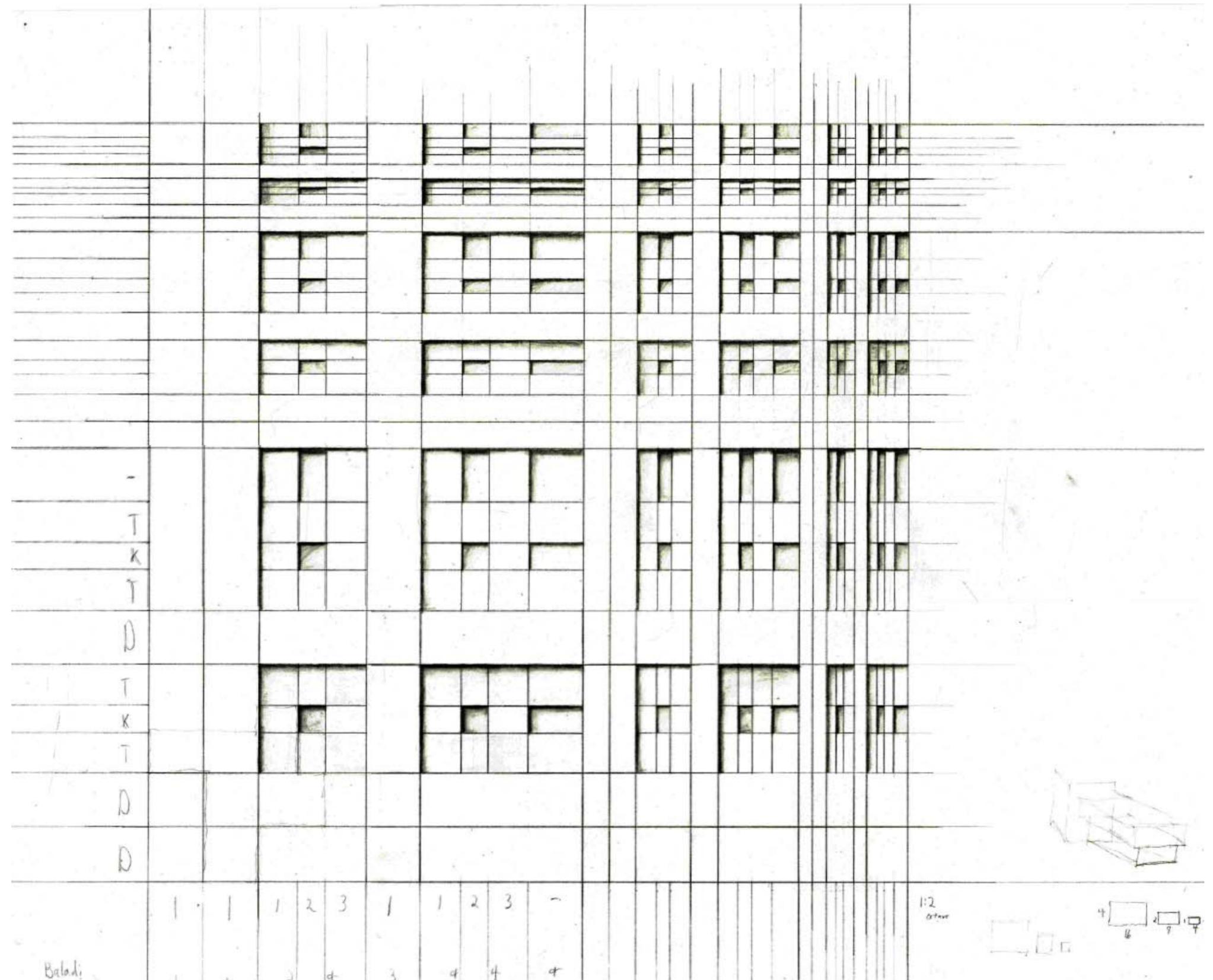
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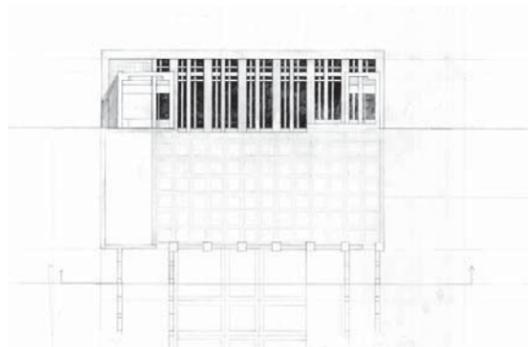
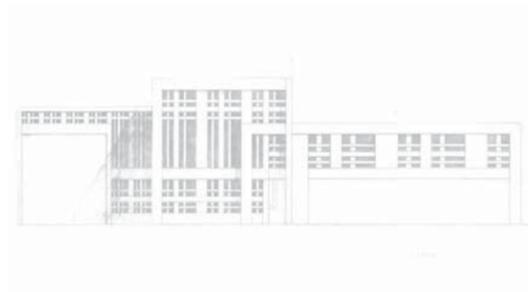
## Baladi Scale Study

The baladi rhythm is originally explored at only one scale. In a building, however, multiple scales should be addressed particularly if there will, by necessity, be rooms of varying scales. The rhythm is then drawn at three different scales in both the y-axis and the x-axis of the drawing, allowing the different scales to intersect with one another. Along the left hand side of the drawing, the letters DDTKTDTKT are written, they represent the words dum tek and ka that are the building blocks of spoken drum rhythms.

They correspond with their matching space on the the gride. Along the bottom of the grid, the numbers that are also used to describe the baladi rhythm are arranged with the corresponding space on the x-axis. The measurements chosen are D=6", D=1', and D=2'. These are chosen because they are the closest in size to the human being, they are still physically inhaitable, placing a person within the rhythm itself.



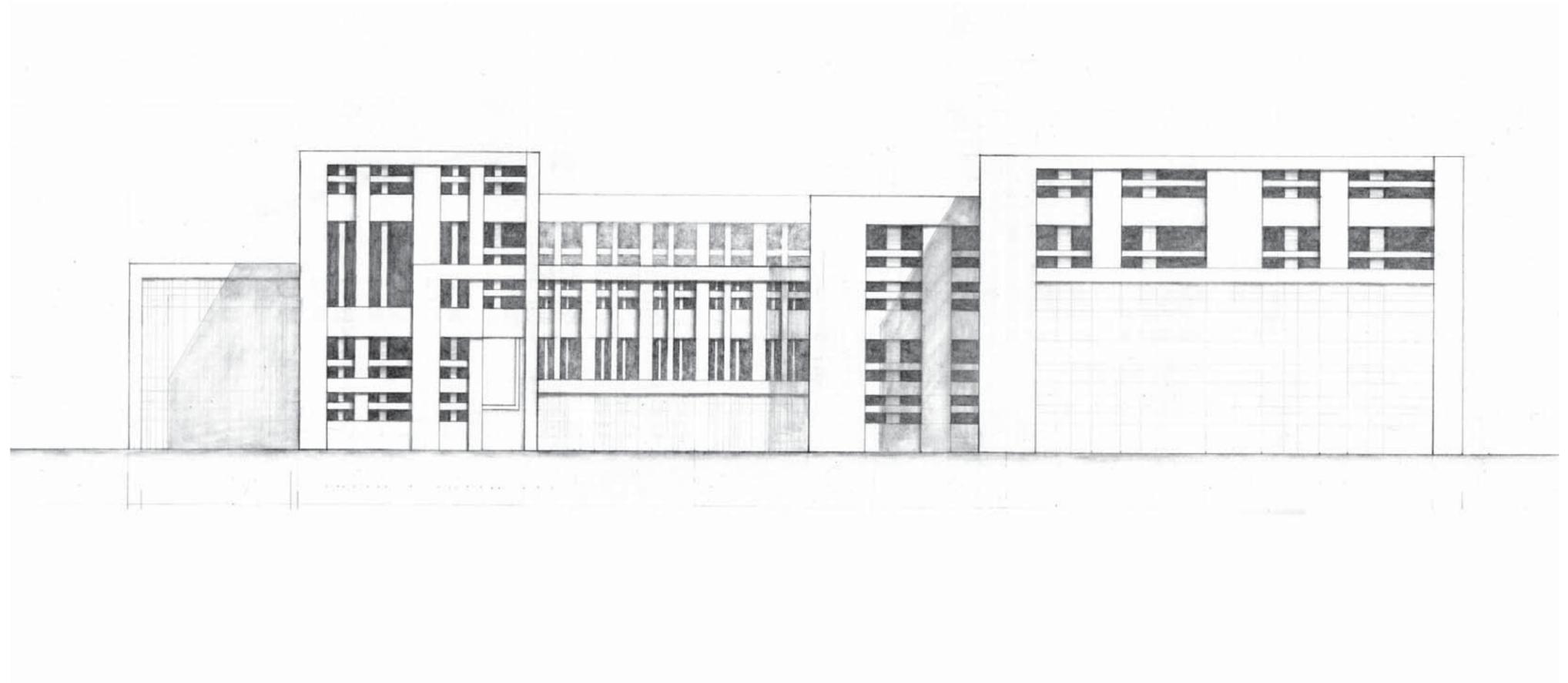
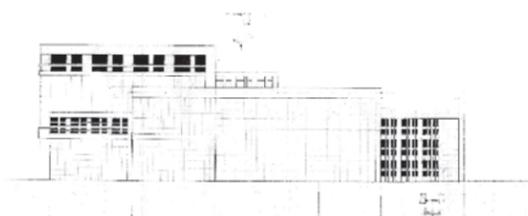
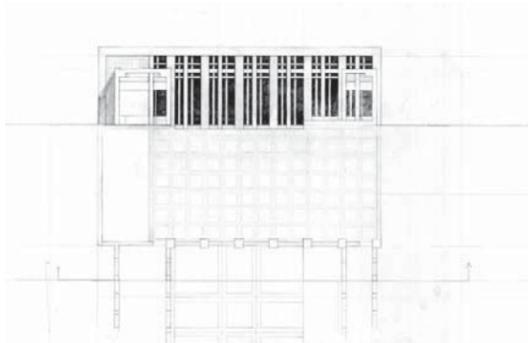
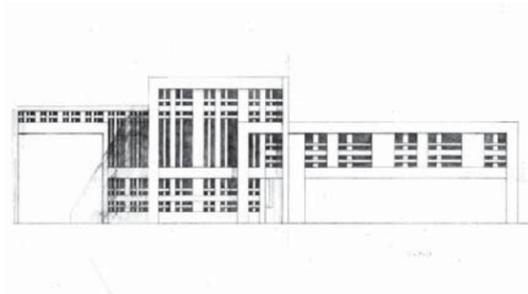
## Elevation Studies 2



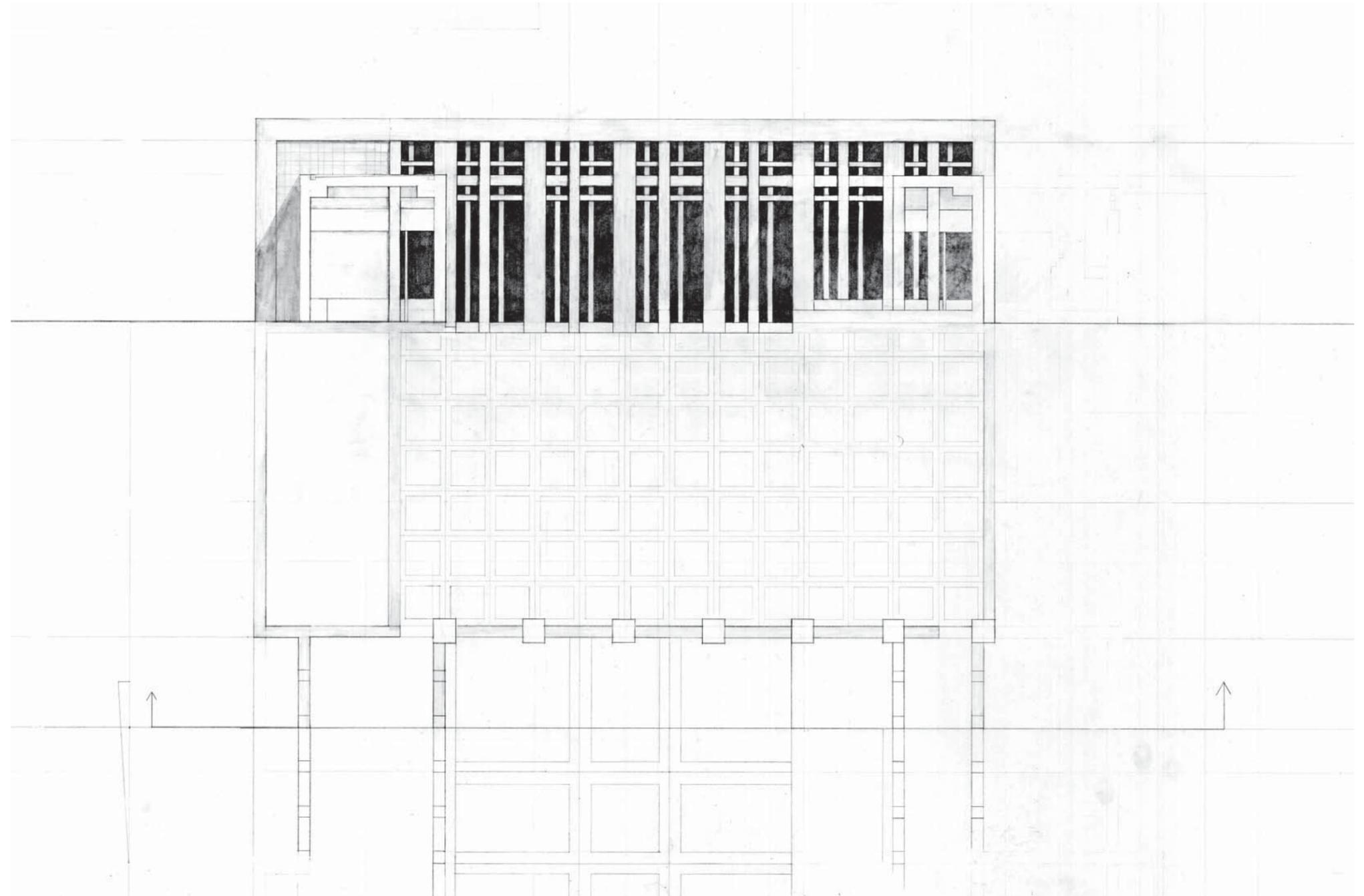
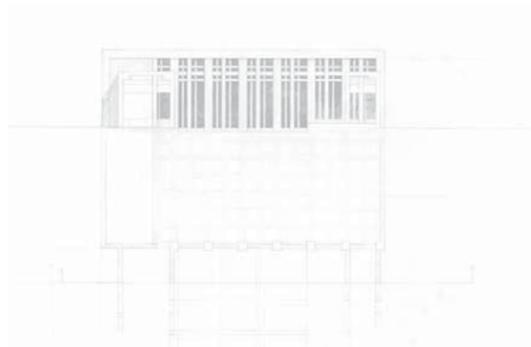
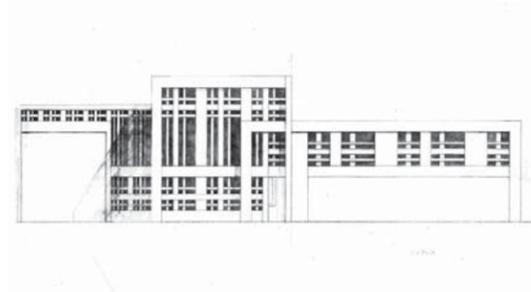
16 x 35 x 24

A second set of Elevation studies are used to explore the use of the rhythm at the chosen three different scales. Also, a third building scheme is being built that would incorporate the rhythm in the plan as well as the facade. Yet, the use of this method creates a very spread out building with very little layering, a key element in the success of the facade.

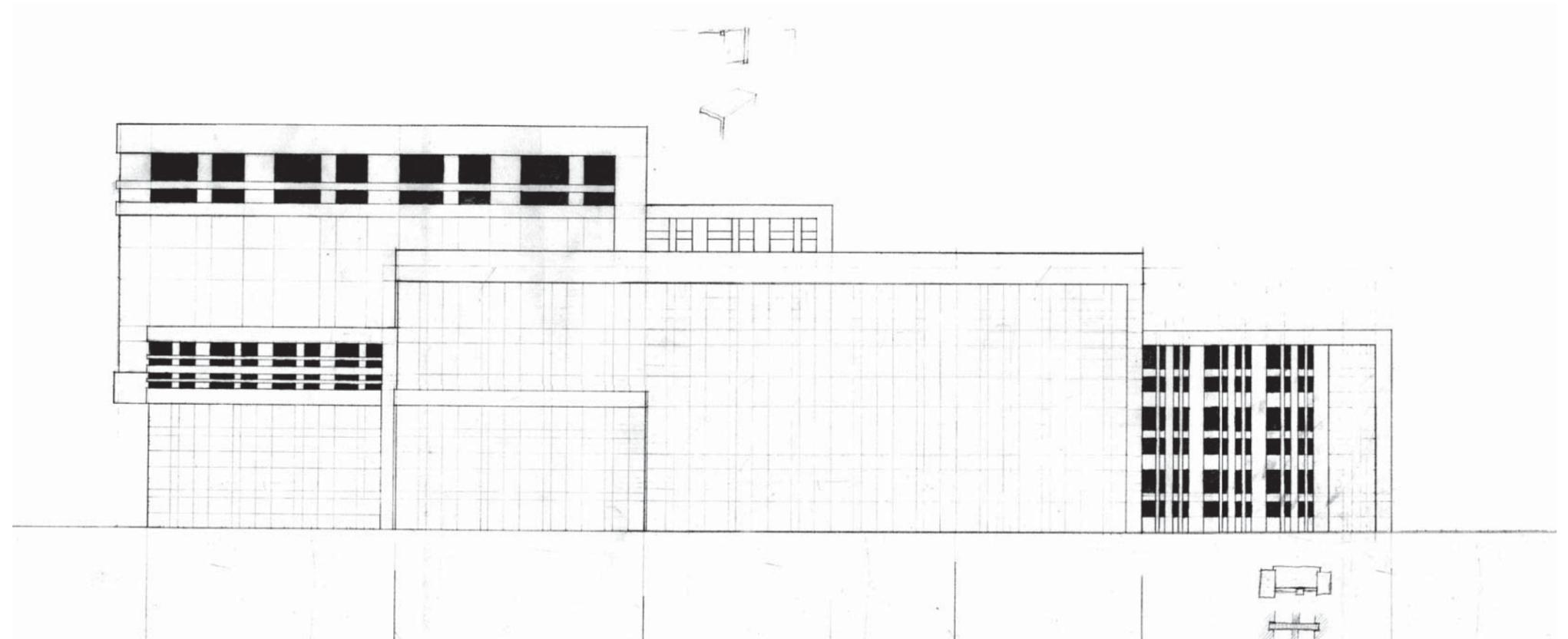
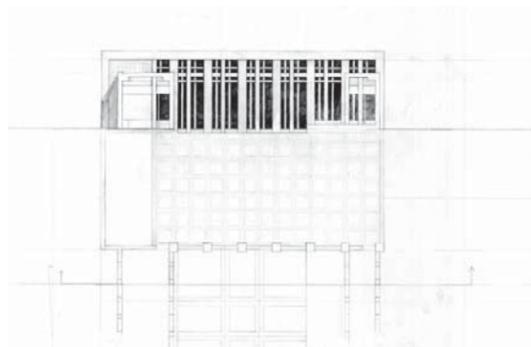
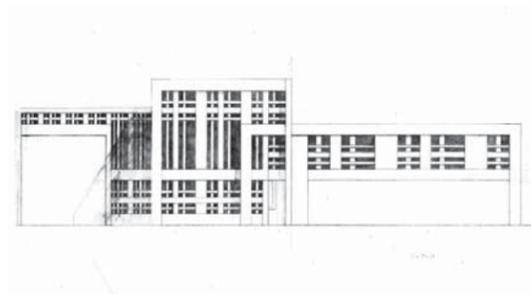
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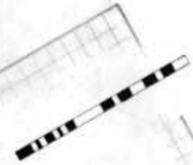
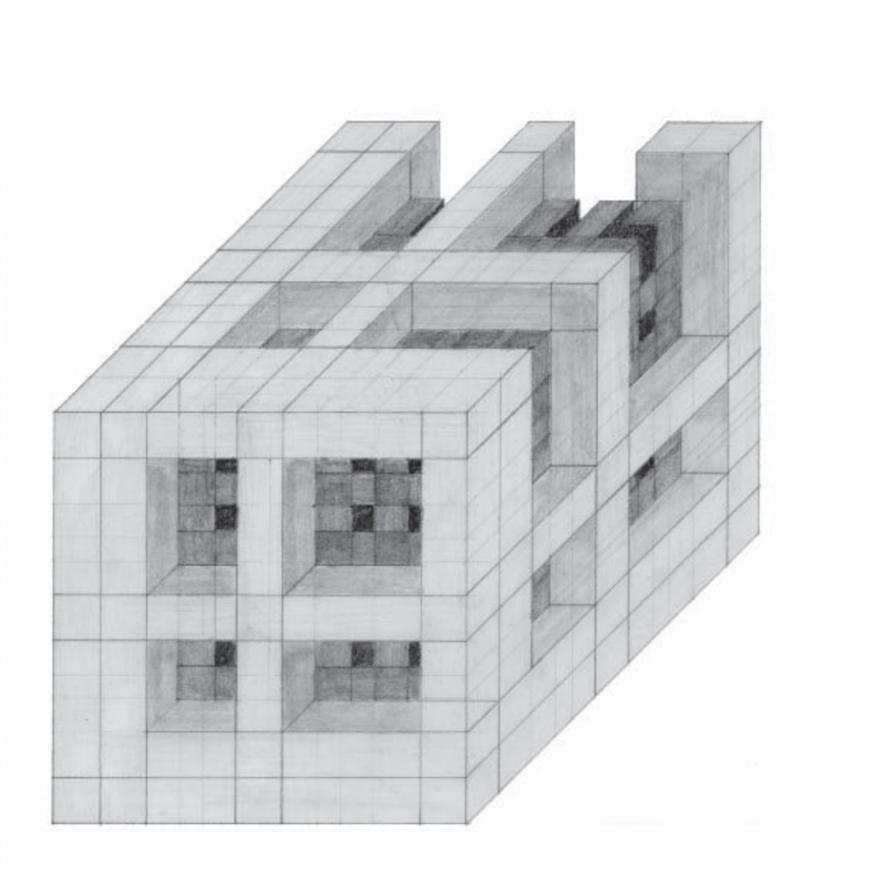
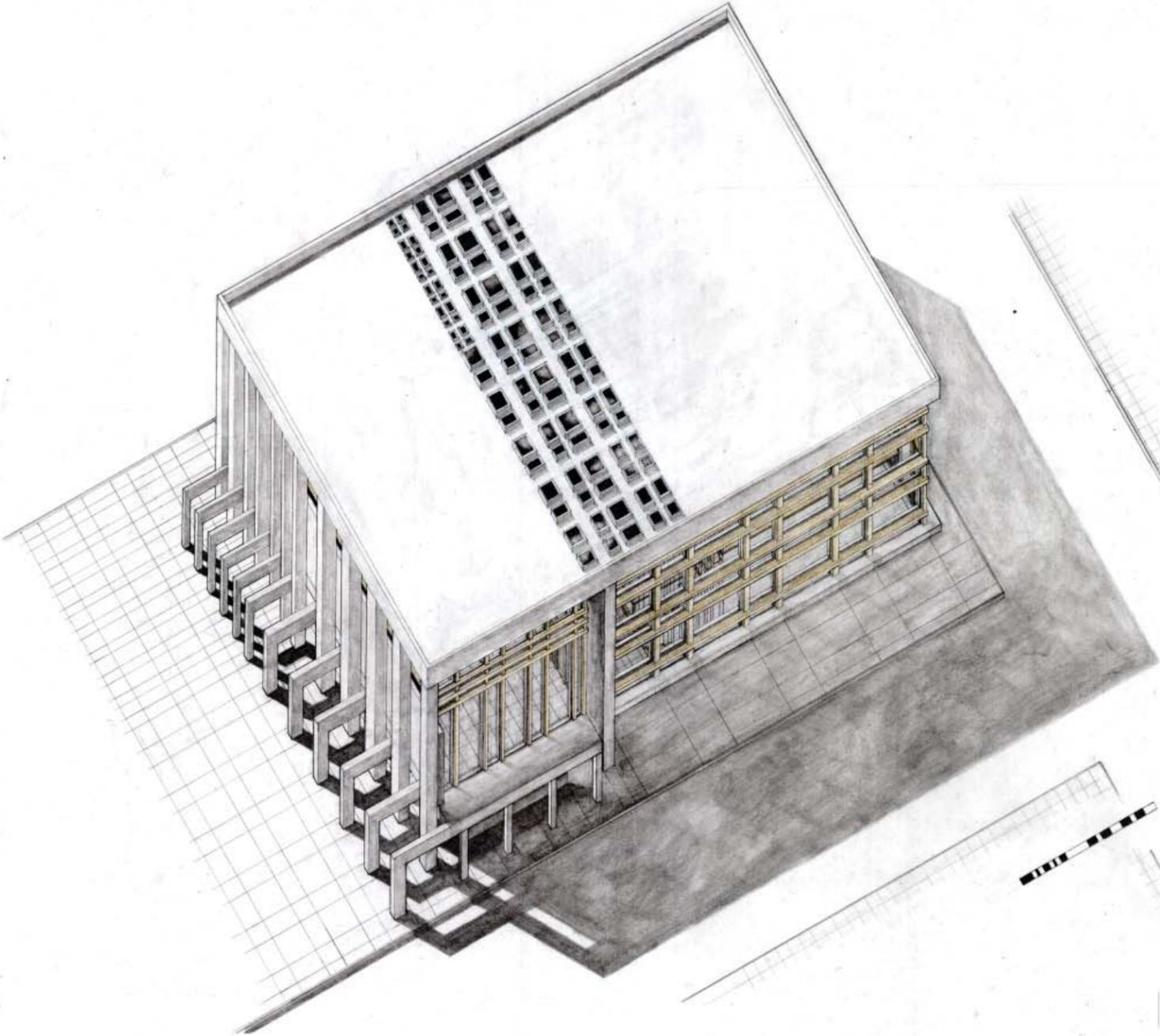
Elevation Studies 2



Elevation Studies 2



Part Two:  
The Baladi Studio

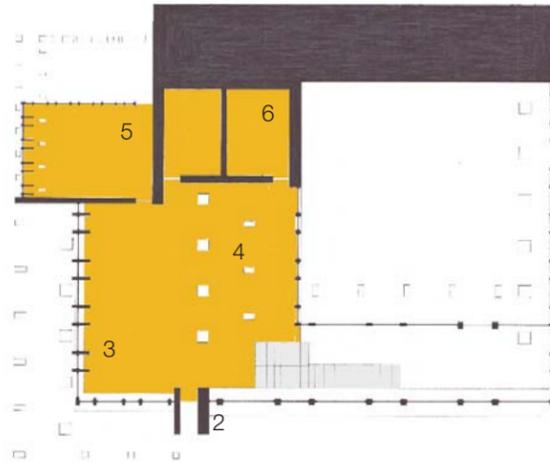


## Diagrams

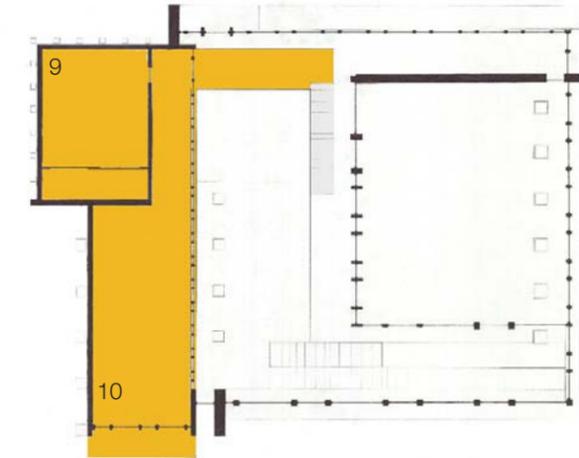
The belly dance studio has four floors, a basement, 1st, 2nd, and 3rd floor. None of the floors cover the entire area enclosed by their walls because they are half floors.

Each floor is approximately 6' above the last, from finished floor to finished floor. Because of this, the floors visually overlap for someone inhabiting the space of any one of them.

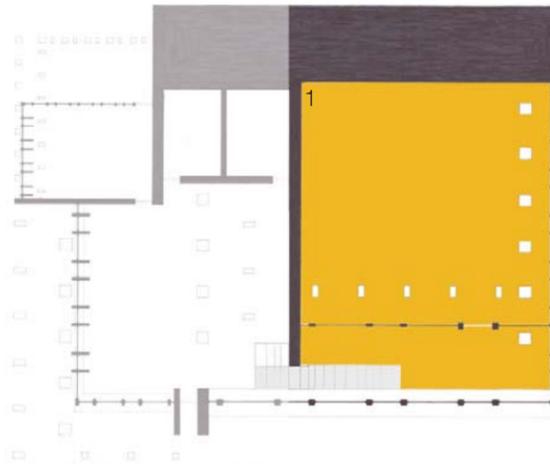
The building can be entered on either the 1st floor or the second floor. The 1st floor is on ground level and there is a ramp along the back side of the 2nd floor that leads to a second entrance. To the left of the entrance is the shop, where costume pieces, music, and jewelry are sold. Directly ahead are the restrooms. Turning past the columns on the right there are two stairways directly ahead, one on the right leading down to the basement and one on the left leading to the 2nd floor. There are individual boards for each stair and they are supported by cables that create a screen around them. On the second floor, the hafla room takes up most of the floor, but there is a generous walkway around leading to the 3rd floor stair and the 2nd entry.



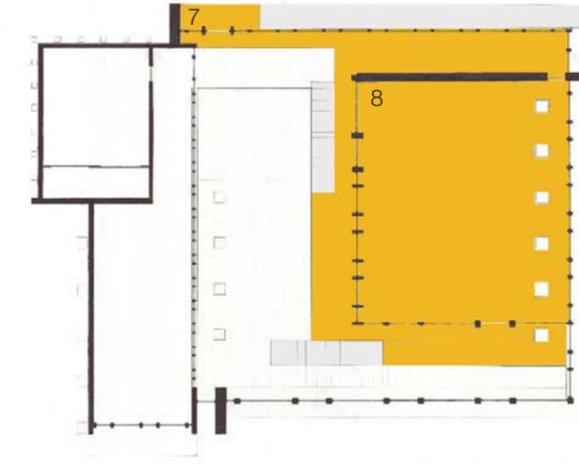
1st Floor



3rd Floor



Basement



2nd Floor

### Basement

1. Large Dance Studio

### 1st Floor

2. Entrance

3. Store

4. Atrium

5. Office

6. Bathrooms

### 2nd Floor

7. Entrance

8. Hafla Room

### 3rd Floor

9. Changing Room

10. Small Dance Studio

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### 3rd Floor

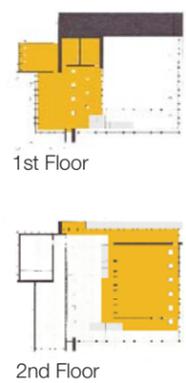
9. Changing Room
10. Small Dance Studio

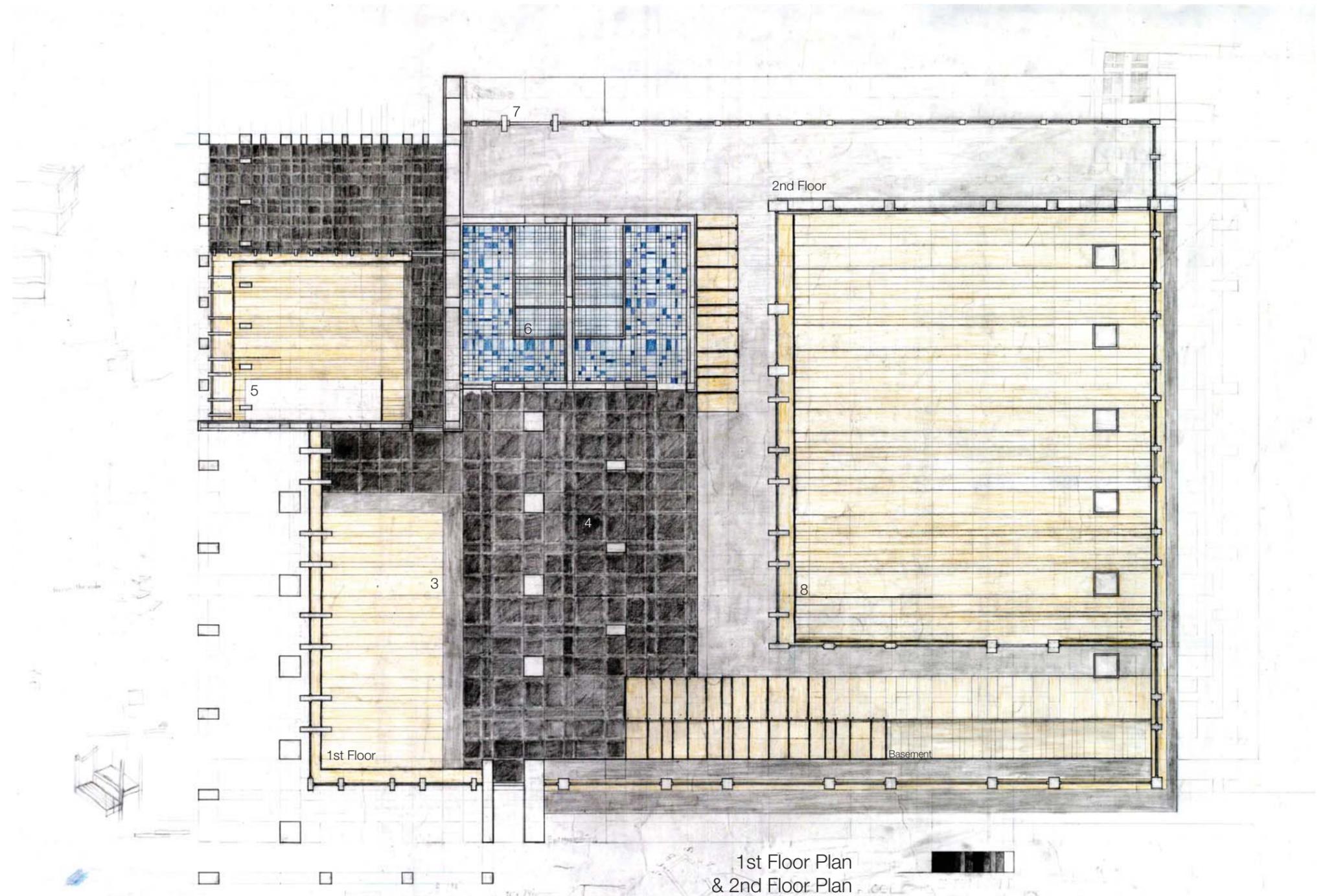


Section Diagram

## Plans and Sections

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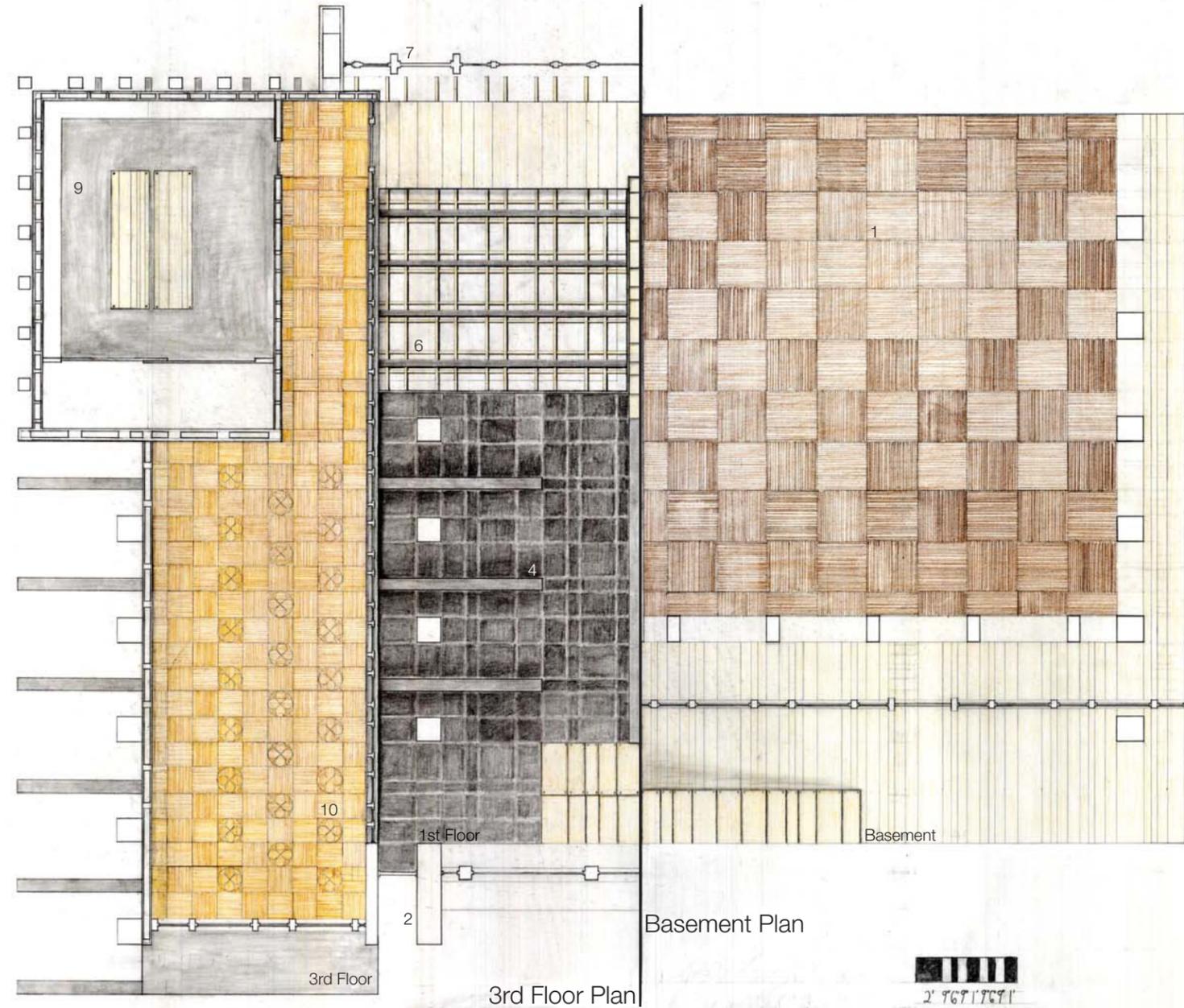
Concrete tiles are used around entries and outdoor spaces while softer wood flooring is used to define rooms within each floor. Wood is also used for the stairs to separate them from the concrete floors they spring from.

## Plans and Sections



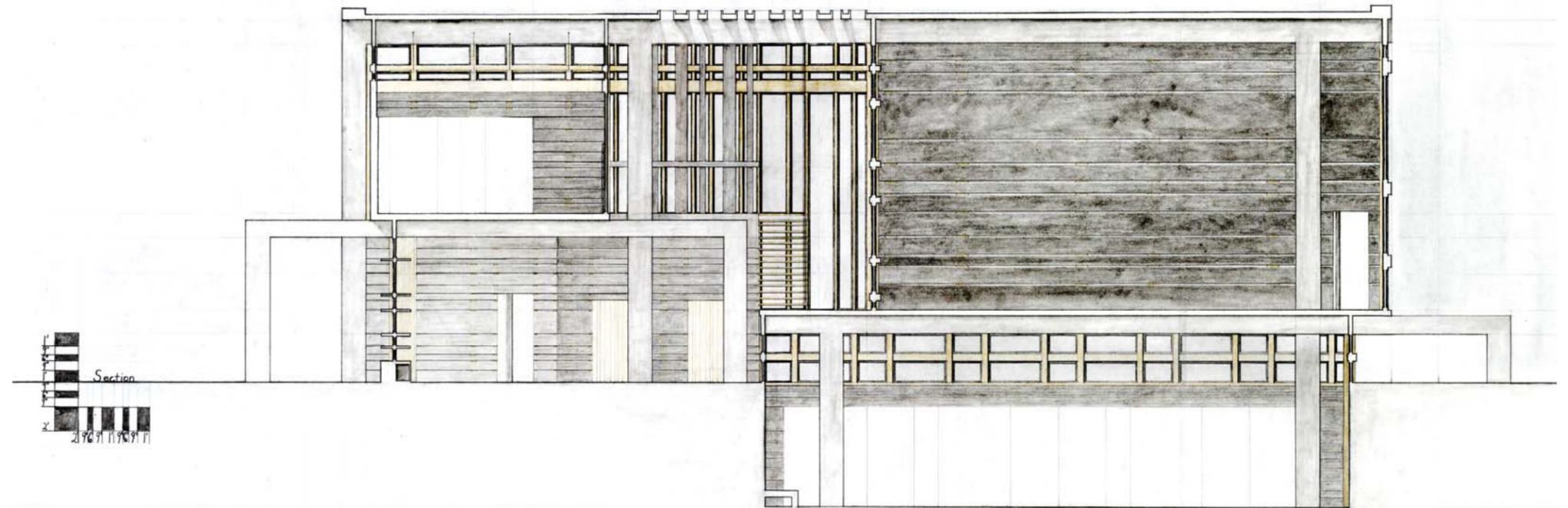
The stairs to the 3rd floor run along the wall of the 1st floor restrooms. At the top they are met by a wooden walkway that overlooks the layered screens of the bathroom ceiling as well as the open first floor. The walkway leads to the entrance to the small studio. Inside, there is a hallway running past a changing room entrance and then into the studio. The wall looking out onto the rest of the building is wooden frames holding glass windows., the opposite wall is covered in mirrors until about 10' high, from there the wall is clerestory windows with no visible support for the ceiling. The larger dance studio is located in the basement under the hafla room and it is visible to the first floor through windows between the first and second floor.

Cork tiles cover the dancing surfaces for a soft warm texture on the bare feet of the dancers.



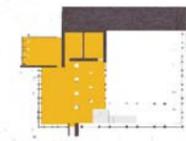
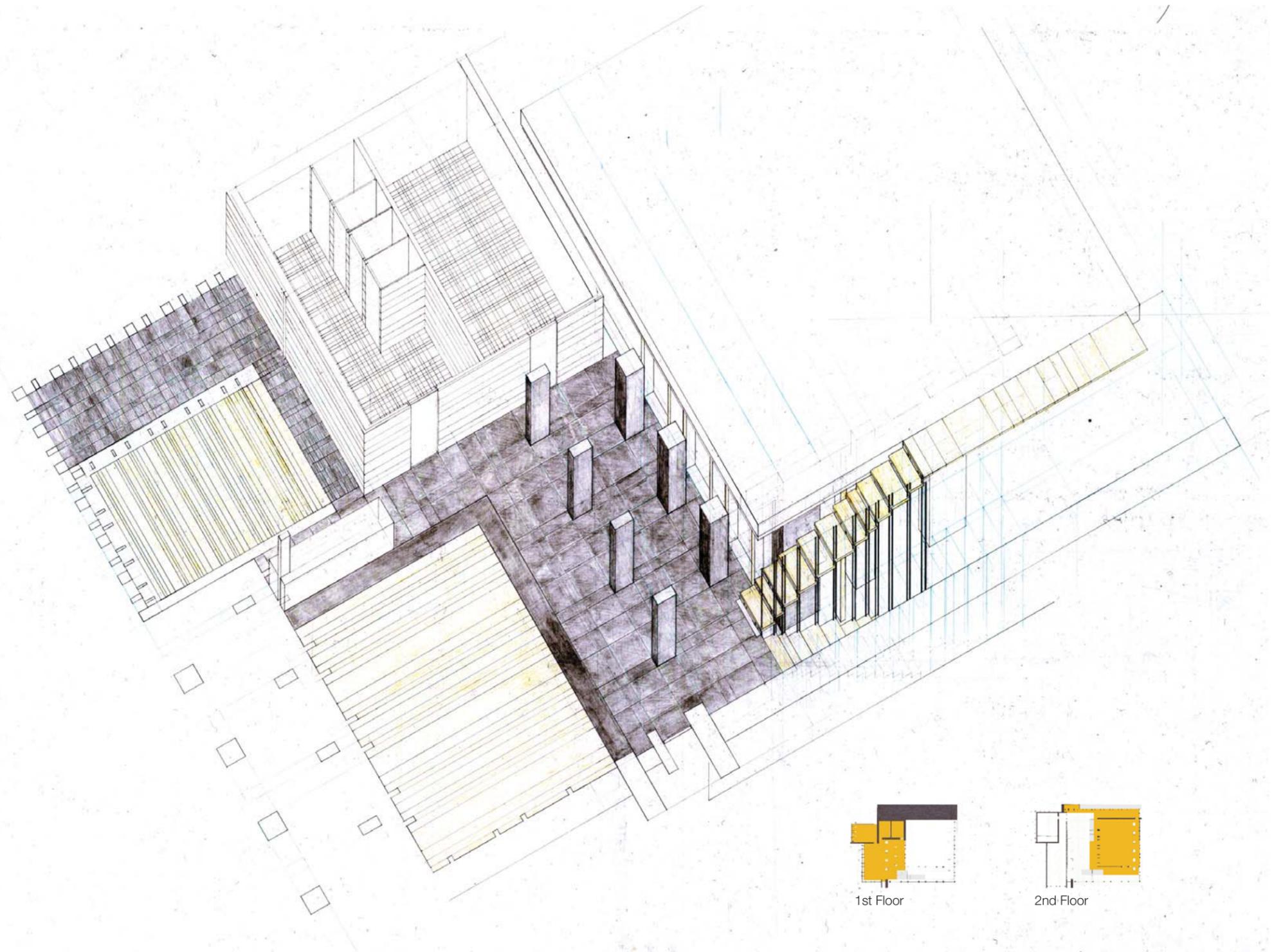
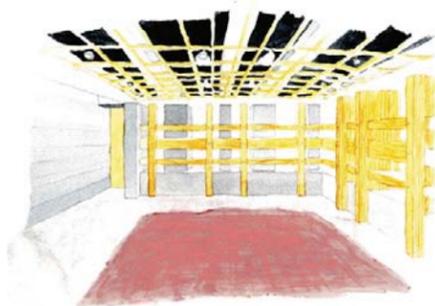
## Plans and Sections

The section shows the many overlapping layers within the building. First are the columns and beams of the 2nd and 3rd floors, then the columns and beams of the ceiling. Beyond are the open and opaque walls enclosing the rooms. The opaque walls are strips separated by a small gap, between the strips is a framework wall not unlike the visible ones, that holds glass that is either clear or frosted depending on the privacy of the room within. The frame walls are the farthest away and enclose the majority of the building.

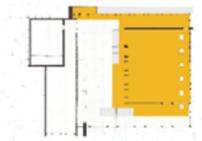


## Plans and Sections

The drawing shown is incomplete but instrumental in showing some of the spatial qualities of the 1st floor and how it interacts visually and spatially with the 2nd floor. The cut is taken at the finished second floor, about 6'. Accompanying this drawing are two perspectives, one taken from the shop looking towards the columns, the other taken from the shop looking towards the street facing windows and the entrance.



1st Floor

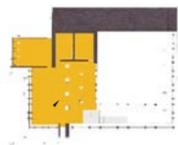
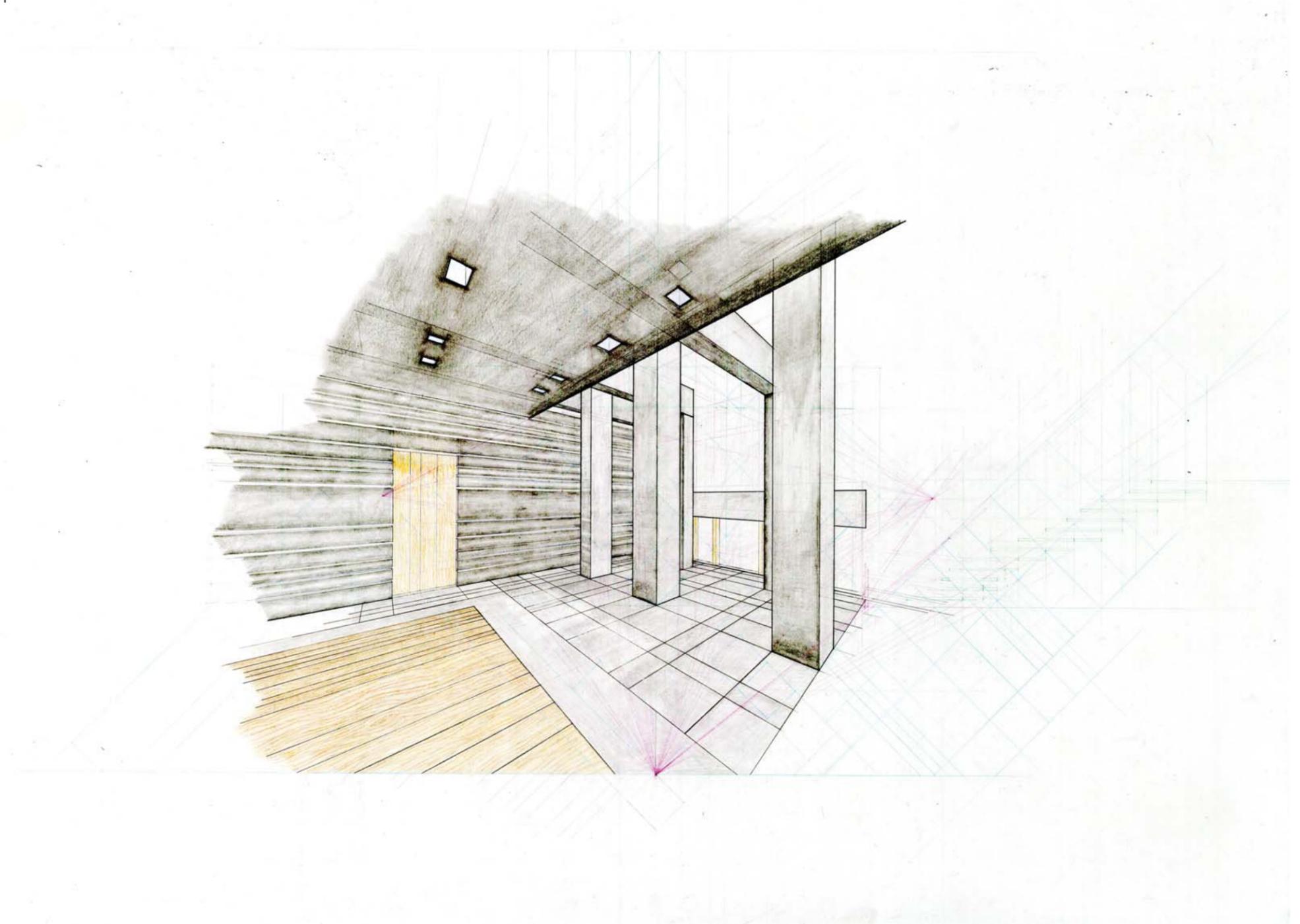


2nd Floor

## Descriptive Drawings

This perspective is taken from the shop space on the first floor, looking towards the bathrooms and the second floor. The intention of the drawing is to highlight the columns and beams as architectural elements that are allowed to define the atrium space.

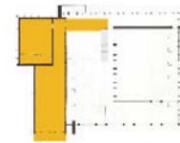
## Perspective



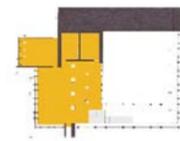
✓ Perspective taken from this location on the 1st Floor

## Descriptive Drawings

The section is taken through the 1st and 3rd floor toward the front of the building, or the side with the 1st floor entrance. A portion of the floor plan and ceiling plan are included to give an idea of the materials and elements used in the rooms. On the first floor is a view of the frames that both hold the windows and become shelves to hold the merchandise. Upstairs is the smaller dance studio before the windows were moved to the opposite wall. In the final design the wall seen is actually solid and covered in mirrors up until the top most windows. It is apparent that the boards on the wall in the studio, while fewer than in the final design, do in fact align with the dancer at the chest and hips, the two most important moments of isolation and movement used in belly dance.

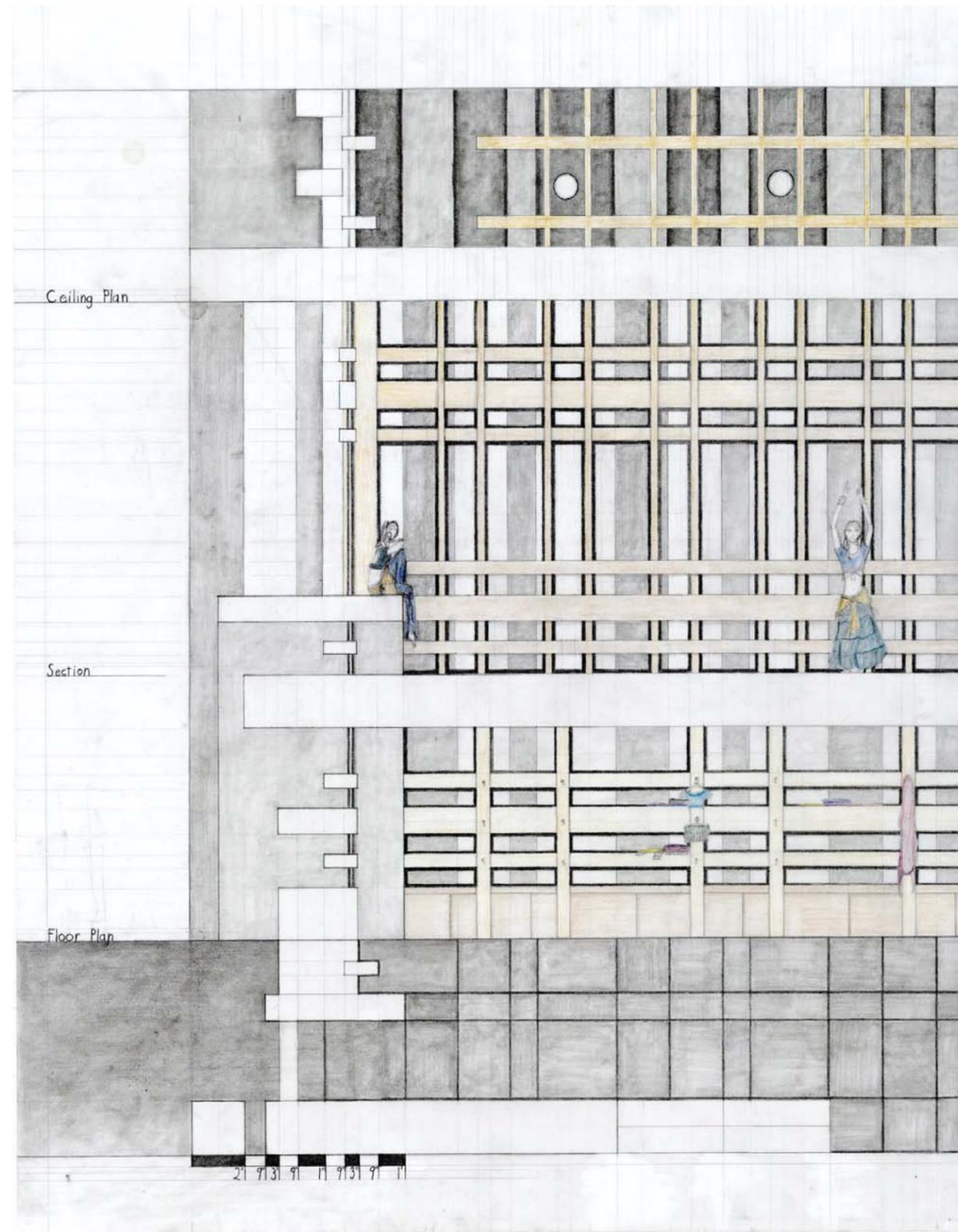


3rd Floor



1st Floor

## Unfolded Section

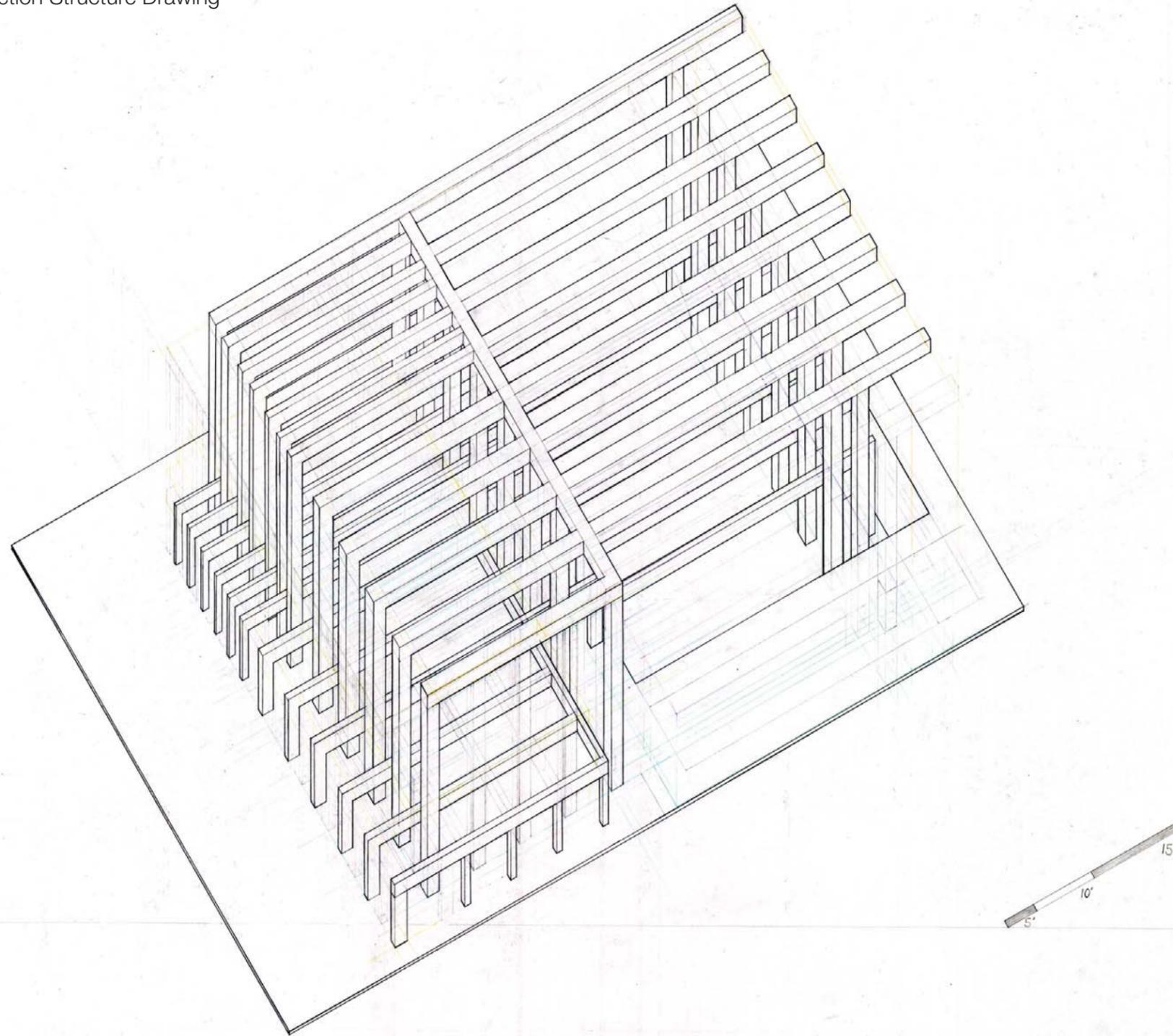


## Descriptive Drawings

The structure of the building is multiple independent sets of concrete columns and beams that are placed along the baladi pattern. Each floor is held up by a different set of columns, except for the 1st floor and the basement which are on foundations. There are three rows of columns that support the roof, each are 2'x2' and fall on the dum-dum moments in the baladi grid. The second and third floors are supported by two sets of columns at 1'x1' or 1'x2', at least one side of the column falls on the singular dum beat in the baladi grid. The beams of the second floor extend past the columns supporting the roof. The columns supporting these beams are placed at the ends of the beams. The layering of the structure adds to the layered qualities found throughout the building.

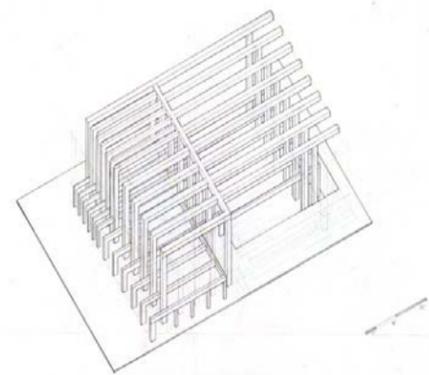


## Oblique Projection Structure Drawing

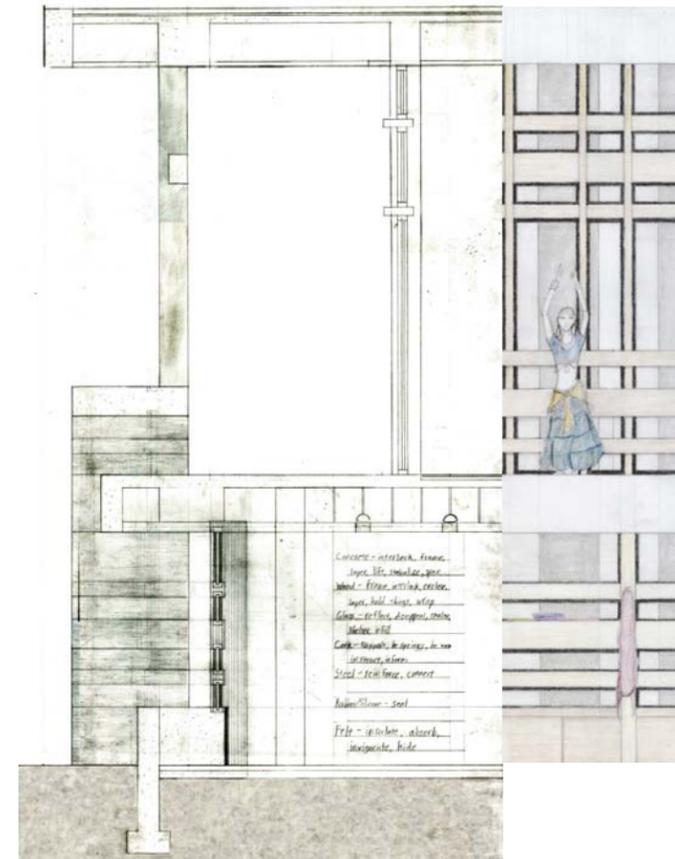


## Descriptive Drawings

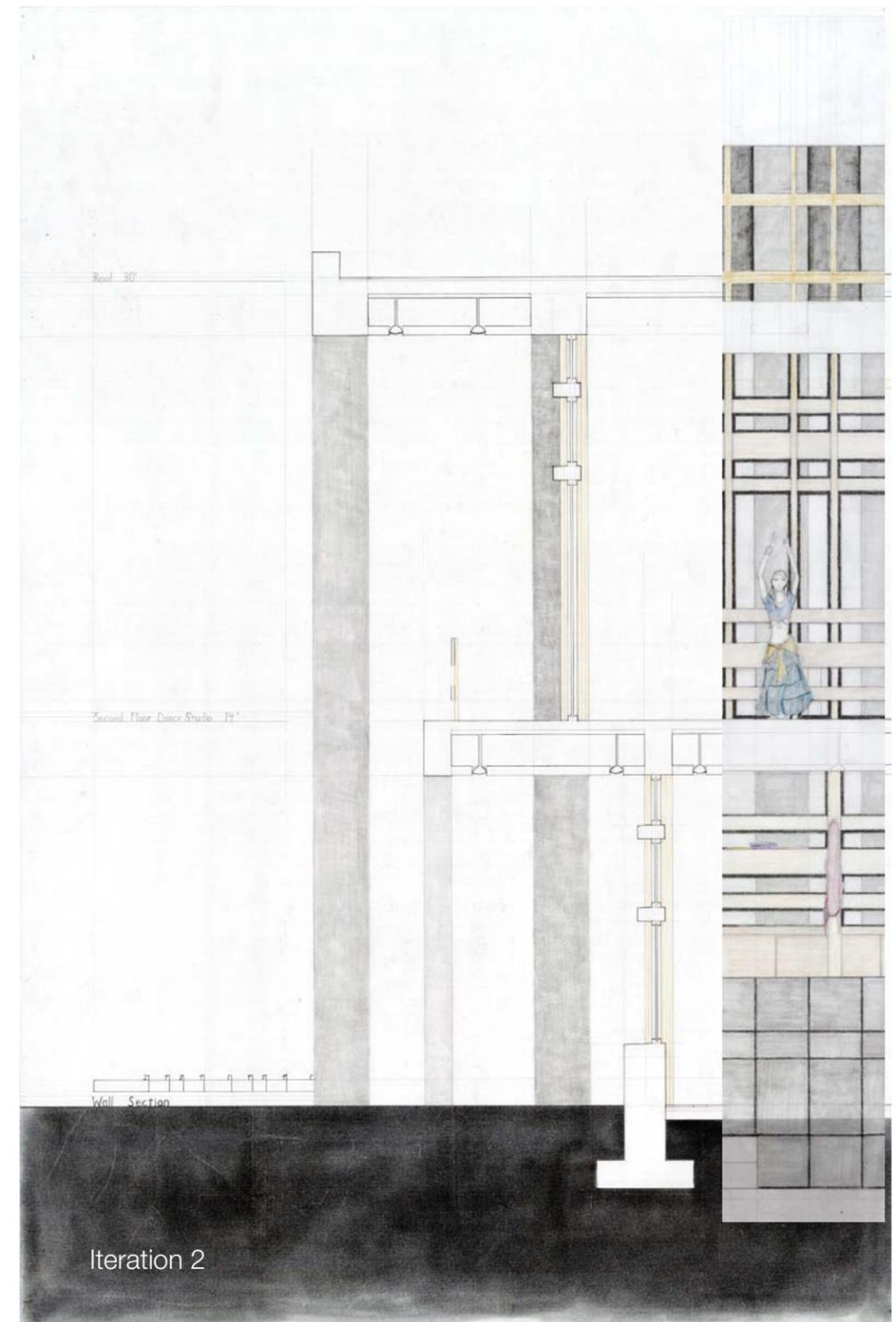
The wall section is taken through the wall of the 1st and 2nd floor next to where the 1st floor entrance is located. The section shows the horizontal pieces of the wooden infill frame and the windows and window frames the frame holds. The frames and windows are separated from the concrete structural columns and only interact with the floors and ceilings of the building. The architectural elements dictated by the rhythm are separated pulled apart and layered so that the rhythm is inhabitable by the occupants of the building.



## Wall Sections

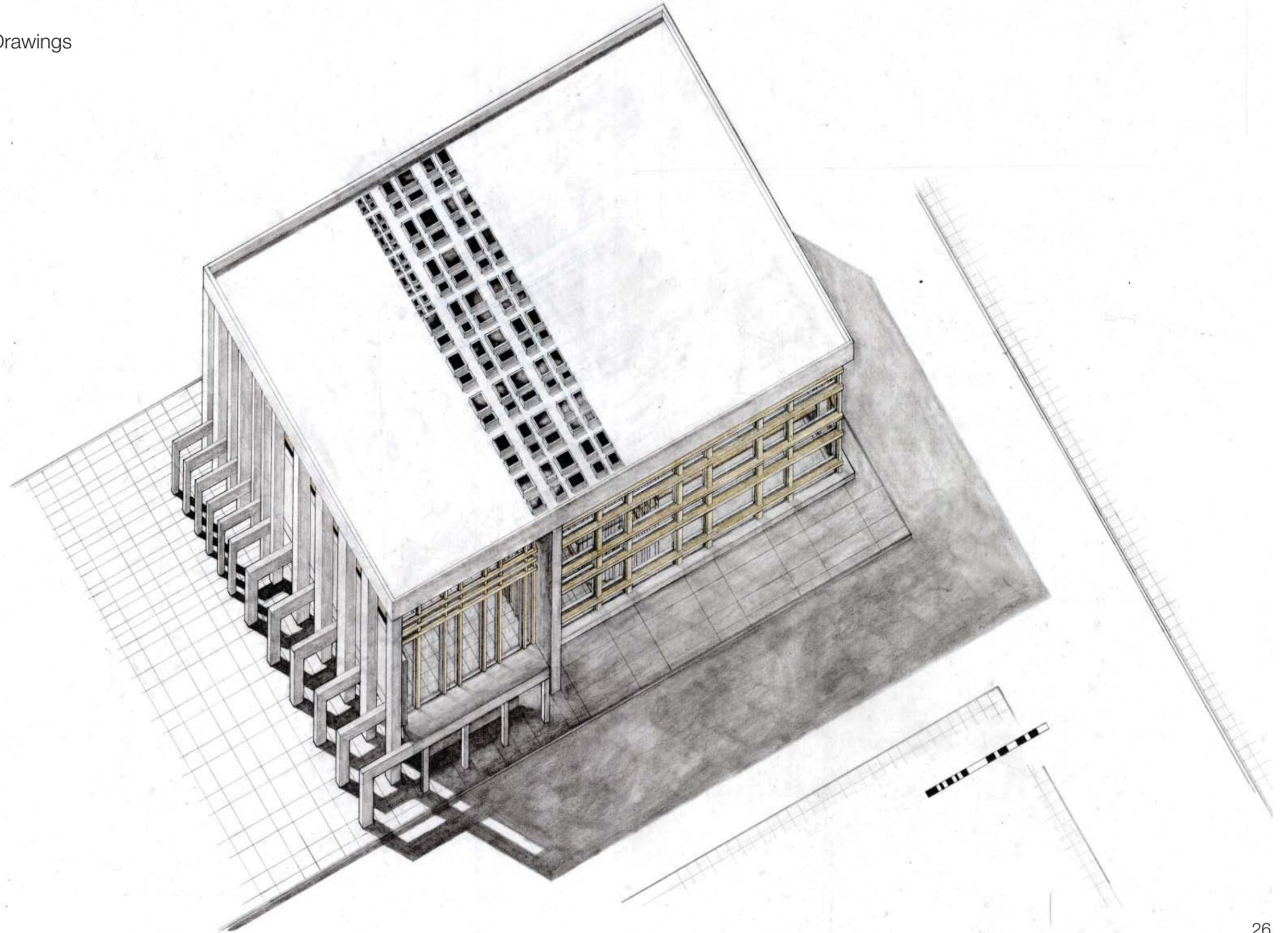


Iteration 1



Iteration 2

Descriptive Drawings



## Works Cited

All images were made by the author.