

The Well Tempered Building;

A Music Conservatory

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requirements for the degree of:

Master of Architecture

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The Well Tempered Clavier

Sarah Shipp

abstract

To Bach, the Circle of Fifths was the language of the universe. Similar to the constellations used to understand the sky, the Circle of Fifths is a visualization device to understand the fundamental concepts of key signatures, which are the foundation for music. The Circle of Fifths is a guide for writing music because its structure helps compose and harmonize melodies, build chords, and move to different keys within a composition.

The Octave is the most significant key signature because it completes the circle of fifths. The Octave, if in perfect tune will create an overtone, which is a tune unable to be created on its own. The movement through the Circle of Fifths led to a contemplation described by Pythagoras as “Music of the Spheres” or meeting between heaven and earth, between spiritual and material realms.

The Well Tempered Building uses the Circle of Fifths as the underlying geometry for the foundation of the conservatory. Proportions from the Circle of Fifths, including the Octave, shaped the conservatory making the musicians, audience, sound, light, water and air tuned to each other.



Concept sketch of the Music Conservatory's Foundation - based on the Circle of Fifths

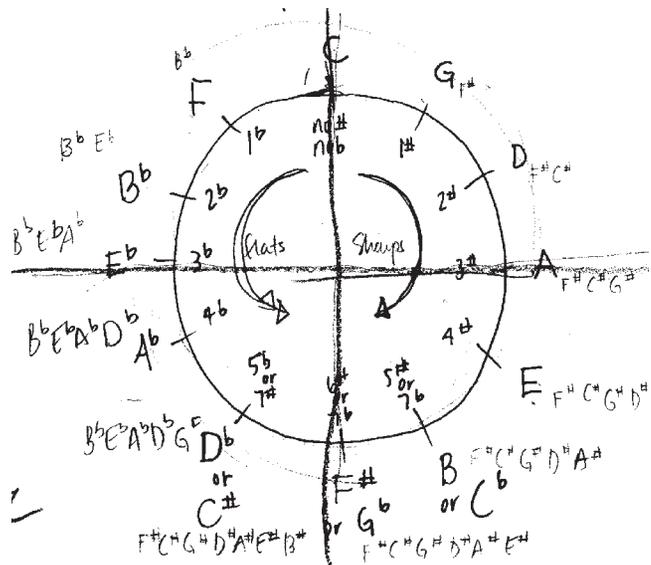
acknowledgements

thank you for love and support

Mom, Dad, Rachel

**thank you for never ending
inspiration and dedication**

Paul Emmons
Caren Yglesias
Marco Frascari
Jaan Holt



Circle of Fifths sketch

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Concept sketch of the Music Conservatory's Foundation -
based on the Circle of Fifths.

site

Charleston, South Carolina is a composition, kept in tune by the rhythm of the city grid, with layers of notes in the form of gardens, porches and graveyards. The cobblestone streets and brick sidewalks slow time and people to the pace of the city. The light twinkling through the live oak trees compose a choreography of shadows while the wind blowing through the marshes into Charleston create overtones through the streets.

The Music Conservatory is located slightly off the beaten path spanning between Queen and Chalmers Street, perpendicular to the busier, Church and Meeting Streets. Queen Street is dotted with art galleries, gardens, restaurants and houses. The Music Conservatory is also in the same block as the Historic Dock Street Theatre, the first building designed for theatrical use in America.



Cobblestone Street



Circular Congregational Church - Meeting Street



House with Side Entry



Marsh in Charleston

The theatre and plaza of the Music Conservatory is oriented in the north-south direction with the theatre backdrop facing north allowing consistent light on stage. The practice rooms oriented in the east-west direction protect the music rooms from the intense Charleston sun.

Traditionally in Charleston, houses are raised on a platform to avoid water and occasional flooding. The main plaza descends into the ground and is able to accept water as well as being an inviting place for the public. The nature of the conservatory immersed in the ground keeps the air cool despite the humid Charleston temperature.

The main plaza mimics a Charleston shotgun house in that it is the length of the site, long and slender, which allows prevailing breezes to travel unobstructed through the site. Charleston shotgun houses are one room deep for maximum airflow through the house. The Music Conservatory also draws air from a park across the street, into the Conservatory's foundation to cool in the caverns, which is then released through the cavities in the theatre's brick walls and slots between the plaza steps.



Path off of Queen Street



House on Chalmers Street



Brick walls surrounding site

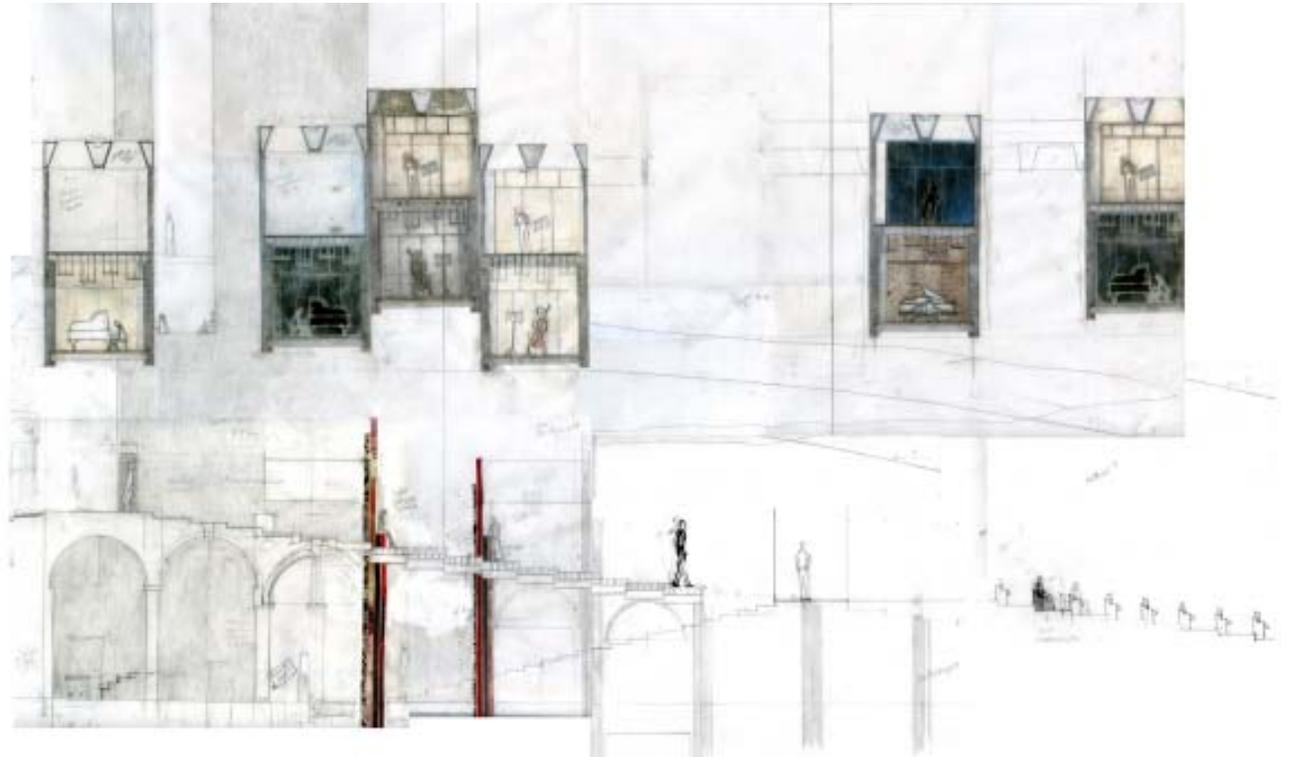


Graveyard in Charleston

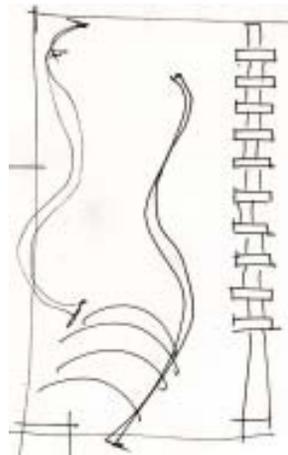
program

Walking down the cobblestone street, lined with hundred-year-old live oak trees and shotgun houses, music can be heard before the conservatory comes into view. The main entrance to the conservatory is an outdoor plaza, which is a series of steps descending gracefully into the earth. As one enters the plaza, the sound from the waterfall framing the stage blurs the city noises while the music above in the practice rooms becomes in focus. The plaza separates the practice rooms and the curving brick theatre wall. Students enter on a side door and ascend through circular stairs to practice rooms suspended over the plaza.

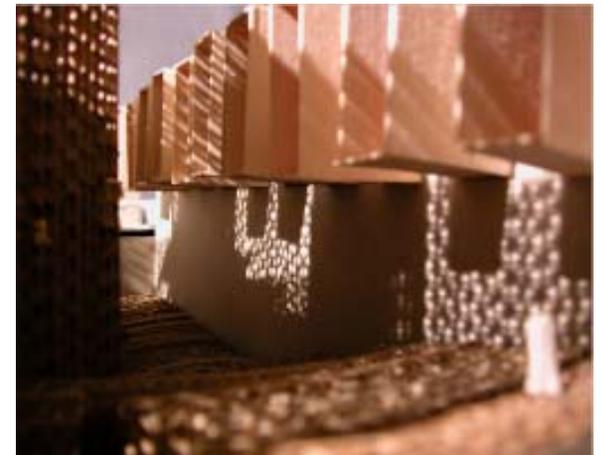
Two curving brick walls enclose the theatre and juxtapose the consistent rhythm of the practice rooms, suggesting freedom supported by structure. The curving brick walls with specific openings for air and light, cast dramatic shadows onto the stage and audience. The water steps frame the backdrop of the stage and become an integral part of the performance. The roughness of the curved brick walls that surround the theatre disperse unwanted reflections. The music conservatory is composed of expressed material and form, as well as the presence of air, light, sound and water.



Sketch of Section through Practice Rooms



Plan Sketch



Study Model

thesis

Tempo (Latin)

time

weather

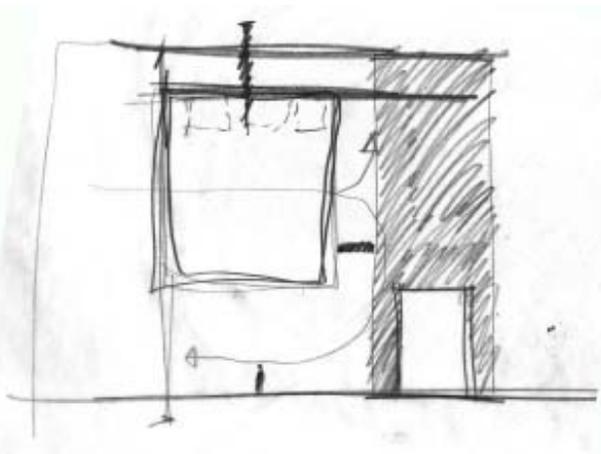
rhythm



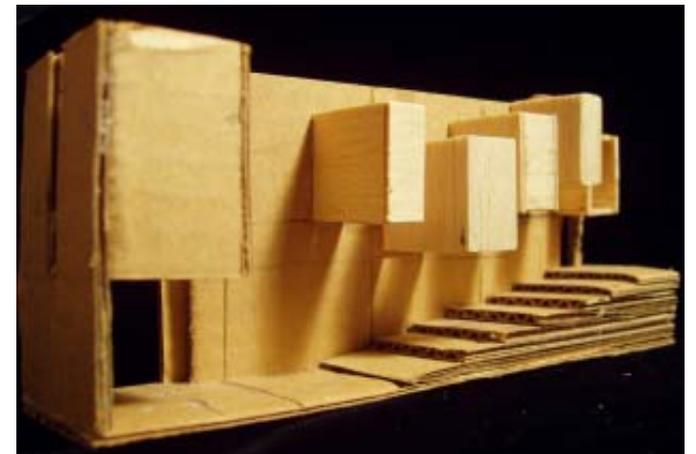
The music conservatory is a well-tempered building designed to be a living and breathing part of Charleston. The idea for the well tempered building is from Bach's piano exercises "The Well Tempered Clavier".

The clavier existed before the piano and was extremely sensitive to temperature changes and humidity. Bach composed "The Well Tempered Clavier" piano exercises based on the movement through the Circle of Fifths. These exercises were intended to make certain the clavier was in tune.

What if the tempo of Charleston tuned the conservatory with the movement of people, air, water and sound?



Sketch of Suspended Practice Rooms



Study Model

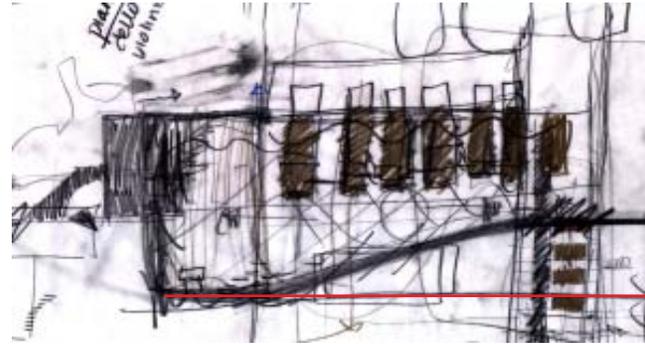
sketches

Proportions of music from the Circle of Fifths, including the octave, shaped the conservatory making the audience and musicians movement musical and tuned to each other.

The foundation of the conservatory is based from the movement through key signatures of the circle of fifths. The circle of fifths is a visualization device to understand the fundamental concepts of key signatures, the foundation of music. The foundation caverns become a visualization device for musicians to understand key signatures, and also support the structure of the conservatory by intersecting octaves.

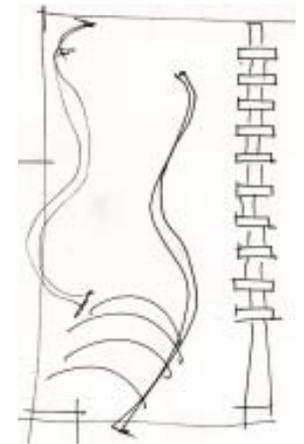
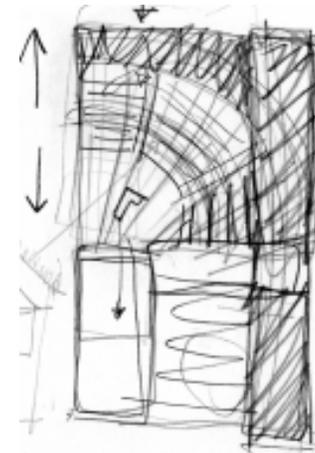
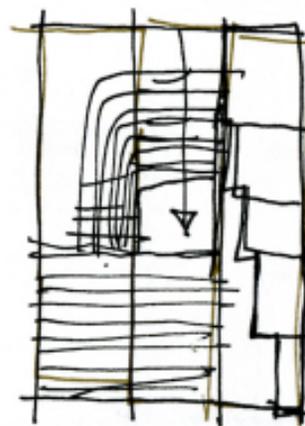
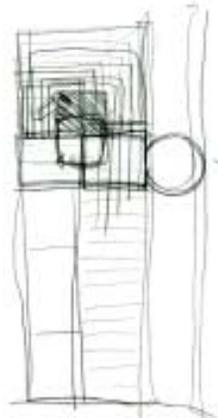
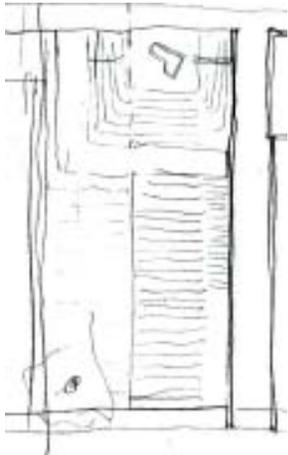
The Octave is the most significant key signature because it completes the circle of fifths. The Octave, if in perfect tone will create an overtone, which is a tone unable to be created on its own. The movement through the Circle of Fifths led to a contemplation described by Pythagoras as "Music of the Spheres" or meeting between heaven and earth, between spiritual and material realms.

The conservatory acts as the realm of architecture between the earth and spirit.



Theatre Hall Lobby
Foundation Caverns

Section Sketch

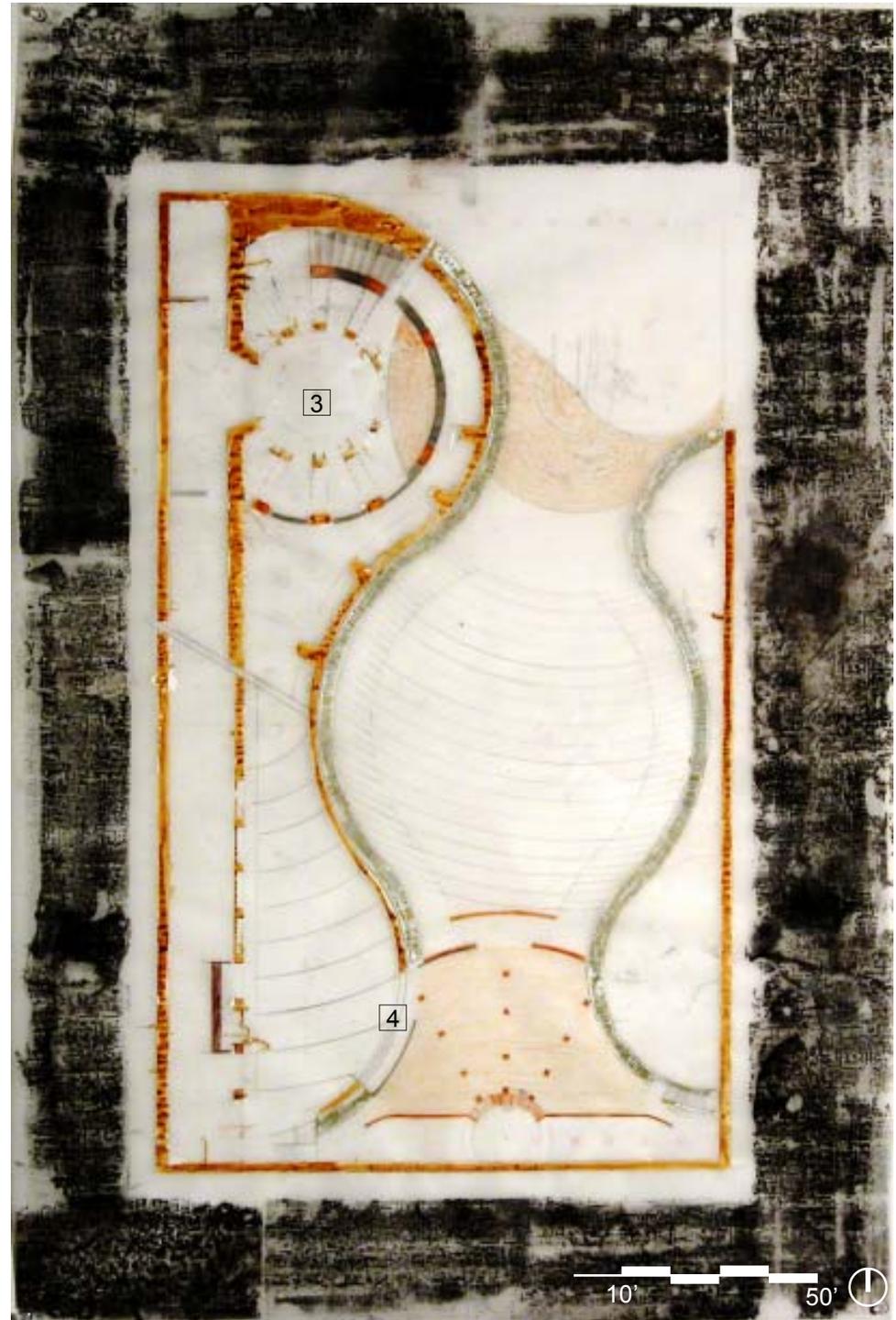


Concept Plan Sketches



1. The conservatory's foundation is based from the movement through the Circle of Fifths, the foundation of music.

2. The performer enters through a back staircase and prepares for a performance in the caverns.



3. The audience can have dinner before a performance in the restaurant below

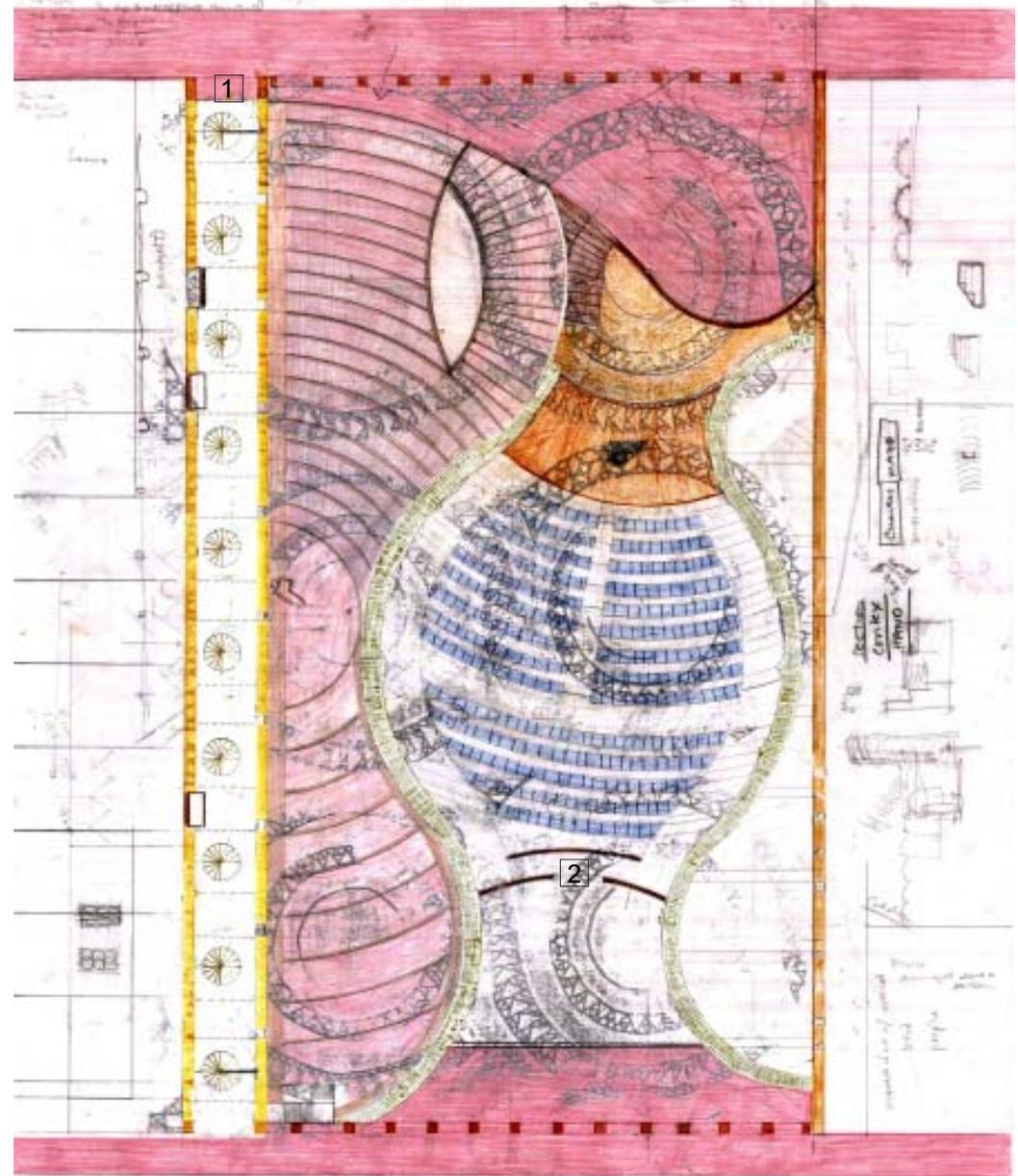
4. At the end of the plaza steps is a connected outdoor lobby area. Opening the large lobby doors connects the indoor and outdoor lobbys.

plans

movement of people

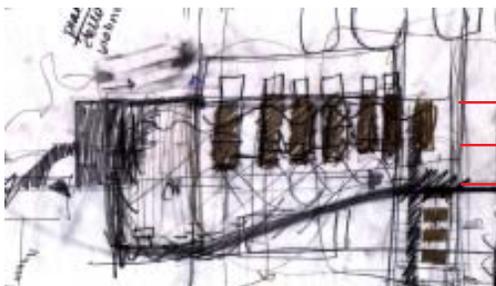
The movement through the Circle of Fifths is used to regulate the placement of the plan based on the key signature from Chopin's *Fantaisie-Improptu* for the piano. In this piano piece, the left hand plays a constant tempo while the right hand plays a musical composition suggesting improvisation.

Similar to Chopin's *Fantaisie-Improptu*, the theatre is enclosed with two curving brick walls that juxtapose the consistent rhythm of the practice rooms, suggesting freedom supported by structure.



1. Similar to a Charleston Shot Gun house type, the entrance for the student is on the side of the building. Upon entering there are 10 circular staircases the practice rooms above.

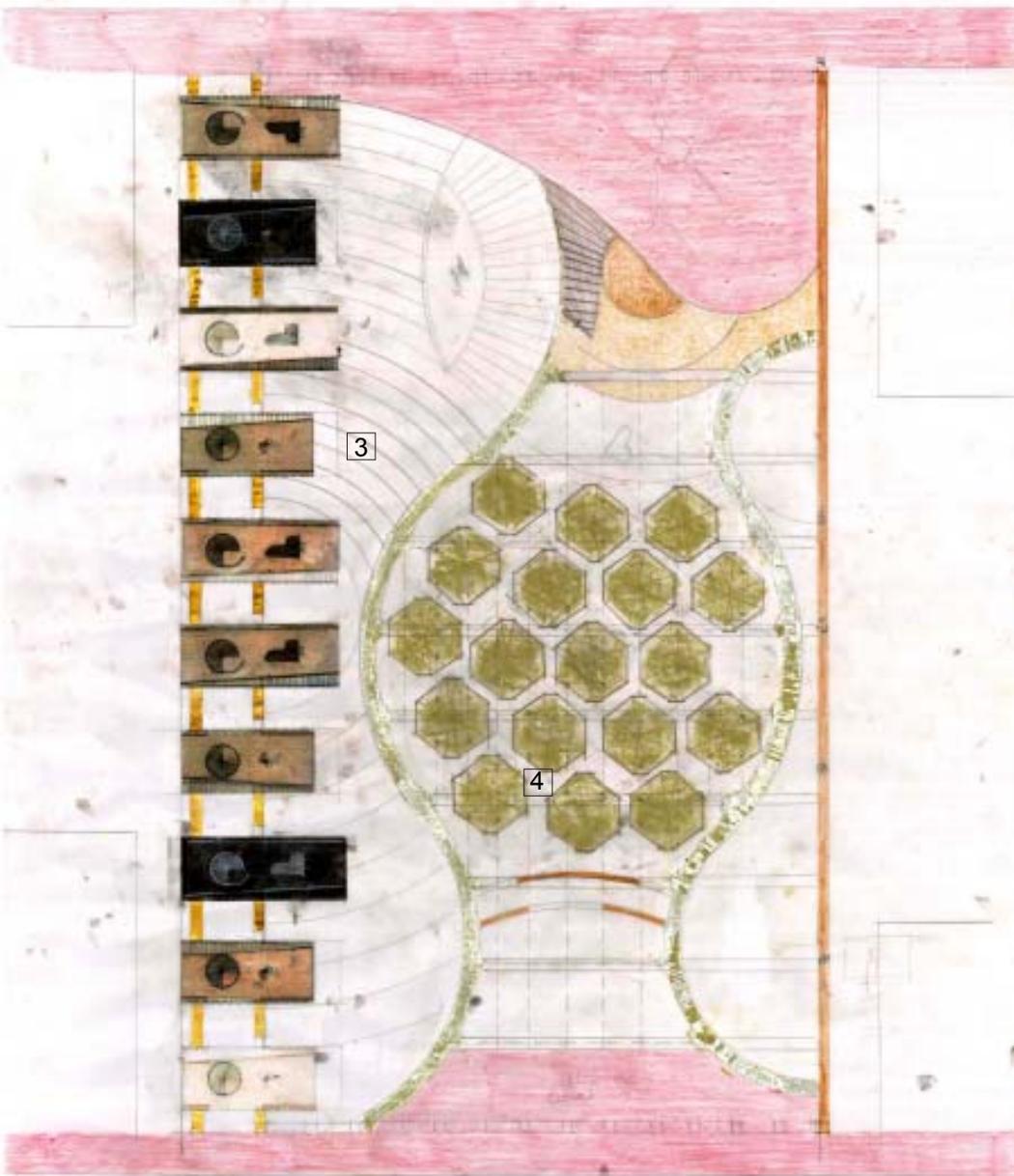
2. Entering into the theatre, the stage is framed by water steps. The water steps can be choreographed to the needs of the performance, simple/quiet movement or dance with the music of the performer.



Roof Terrace

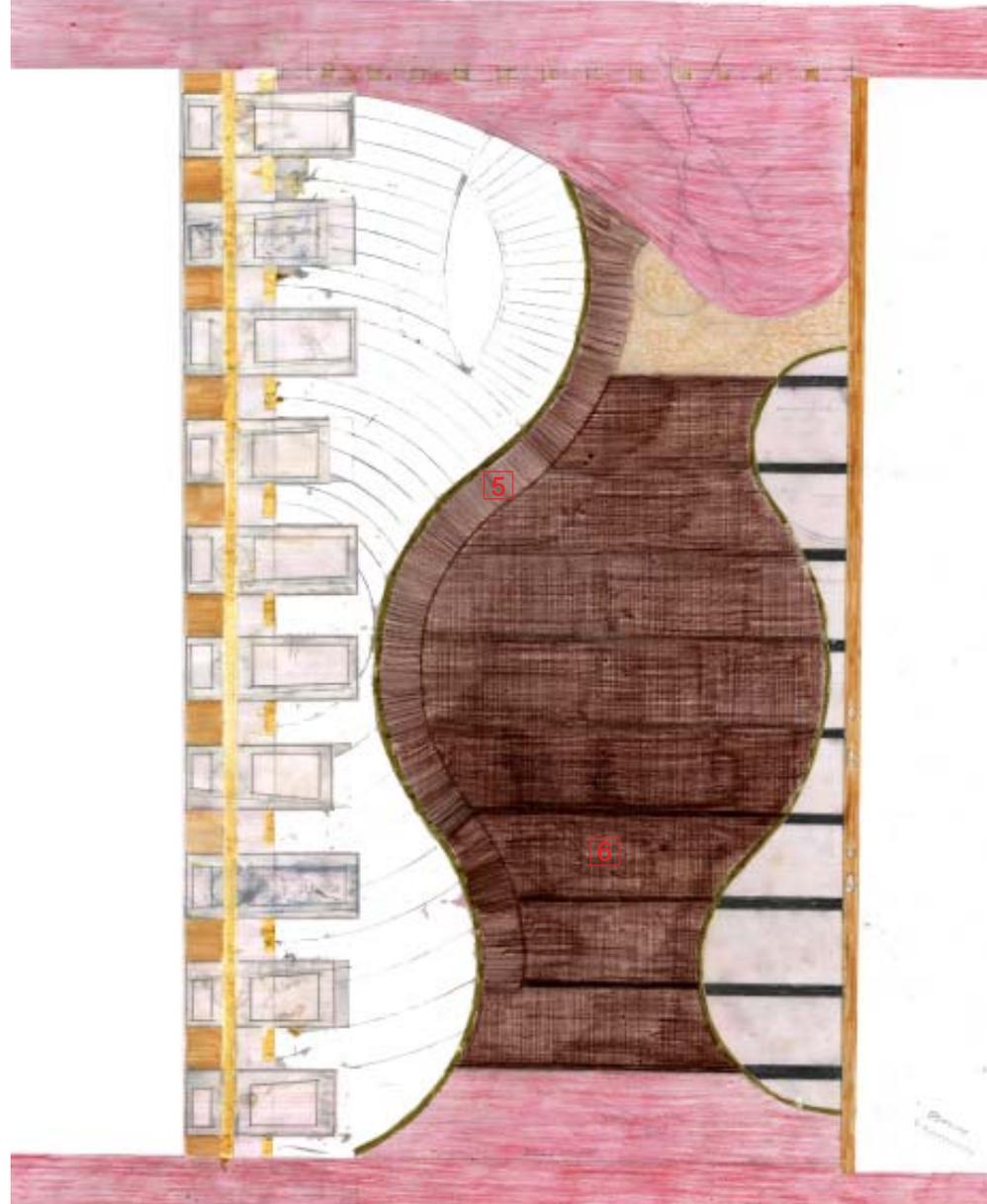
Suspended Music Rooms

Entrance: Street Level



3. For a performance the audience descends down the plaza steps. Above them are cantilevered practice rooms. To the left is one of the curving brick walls that enclose the theatre.

4. The audience takes a seat. Above them are acoustical panels hanging from the ceiling.



5. The public can use the conservatory plaza, roof terrace and restaurant year round. To go up to the roof terrace, a staircase hugs the side of the curved brick wall, floating above the water steps.

6. In the evening the public spaces, such as the roof terrace and plaza, are places to watch stars or listen to music coming from the practice rooms or theatre.

drawing construction

movement of air and light

Layers of Materials:

Vellum Paper

gesso

watercolor

oil pastel

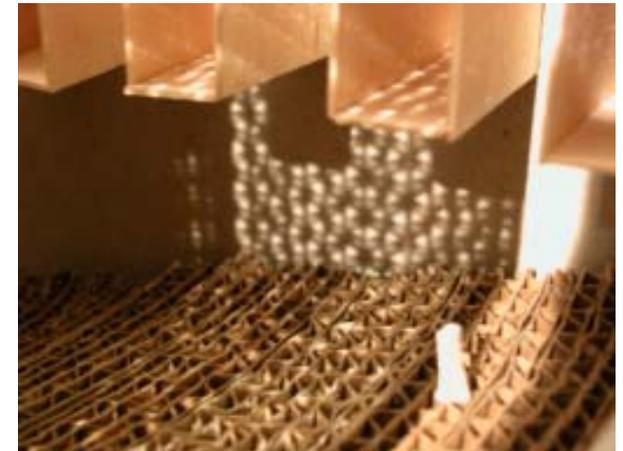
graphite

acrylic paint

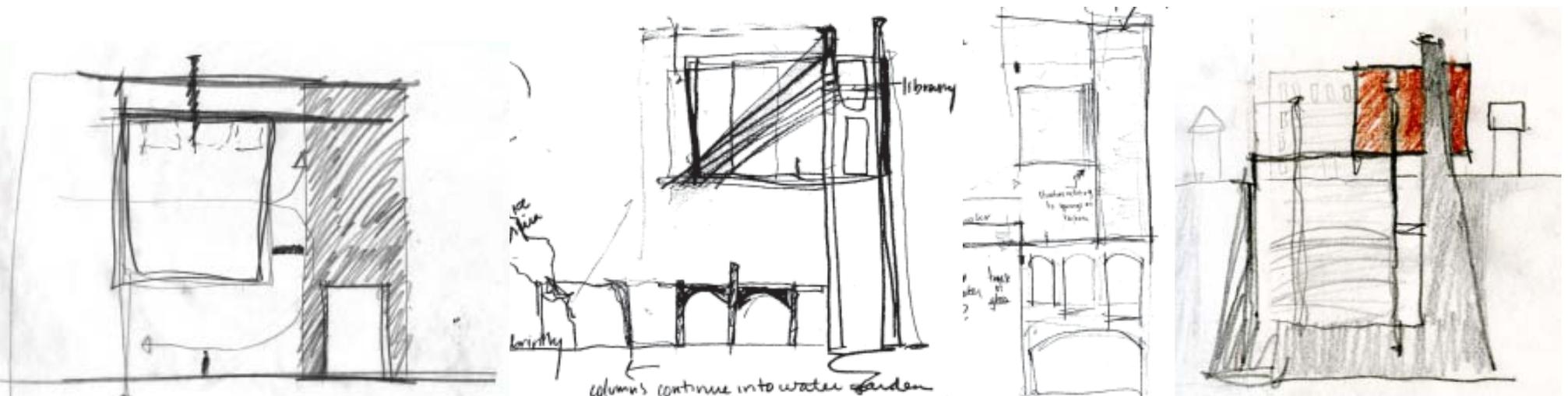
The layers of drawing materials play with movement and transformation on the paper as well as represent the movement of water, air, light and materials used to build the conservatory.



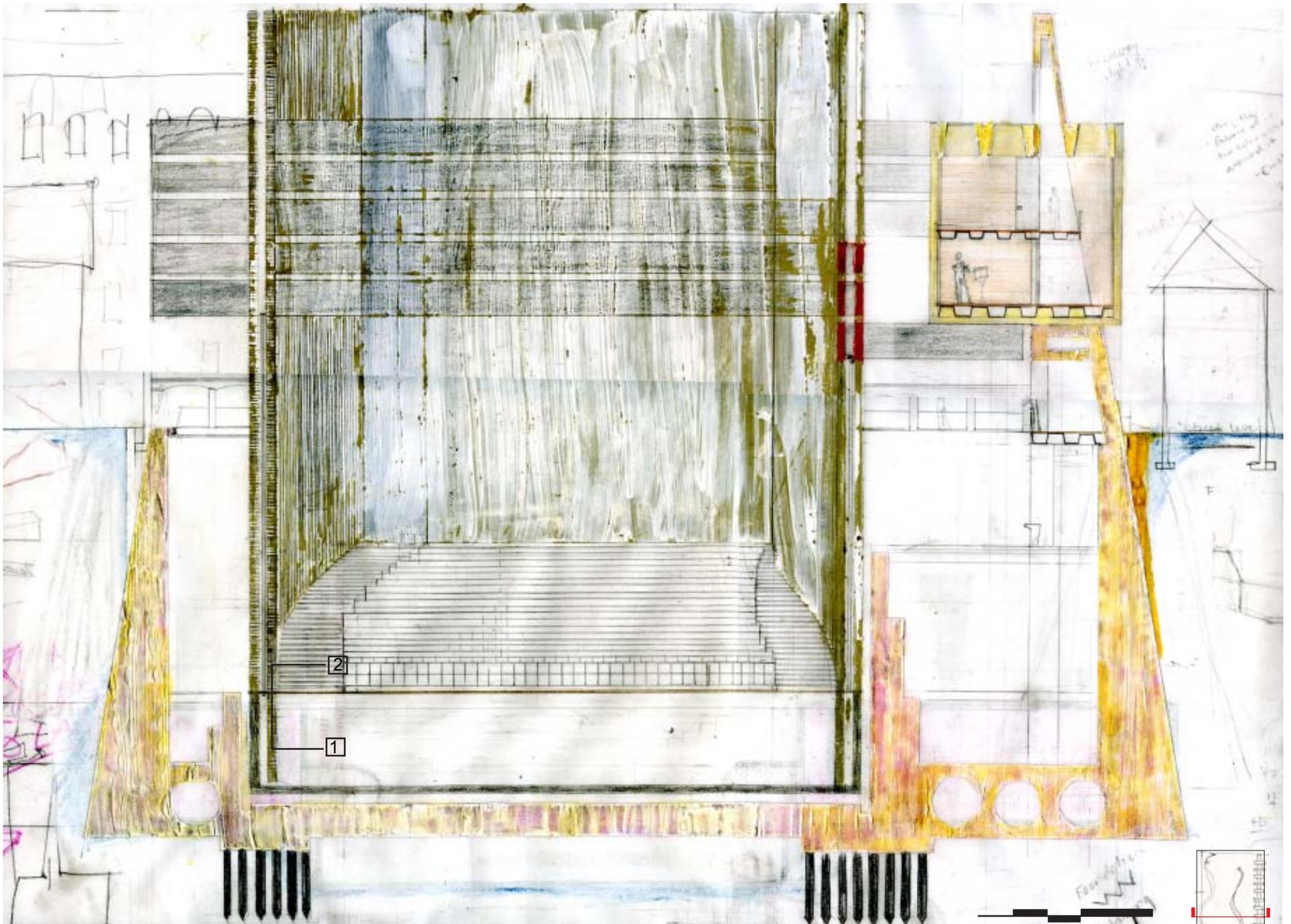
Brick Wall in Charleston, South Carolina



Study Model: Plaza View with Shadows of Brick



Concept Section Sketches



1. Prevailing Charleston breezes move fresh air through the building. In addition, air from a park across the street is drawn into the foundation and cools in the caverns.

2. The cooled air is released through the cavities in the brick walls and slots between the plaza steps. The nature of the conservatory immersed in the ground keeps the air cool despite the humid Charleston temperature.

drawing construction

movement of water

Layers of Materials :

Vellum Paper

gesso

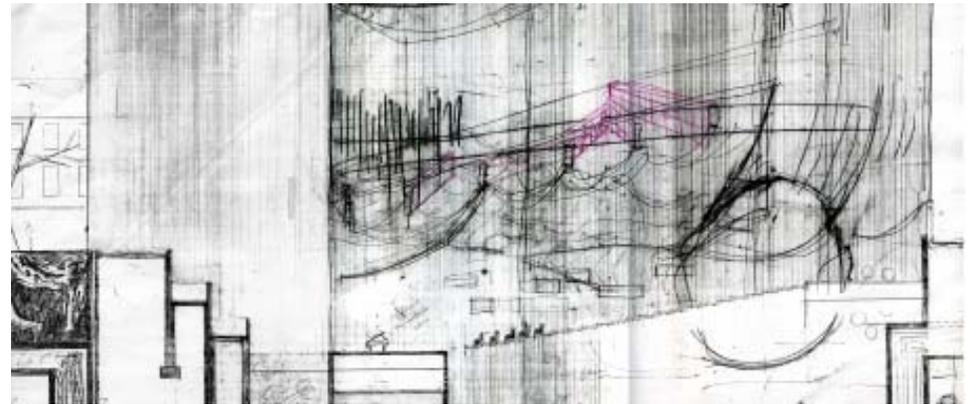
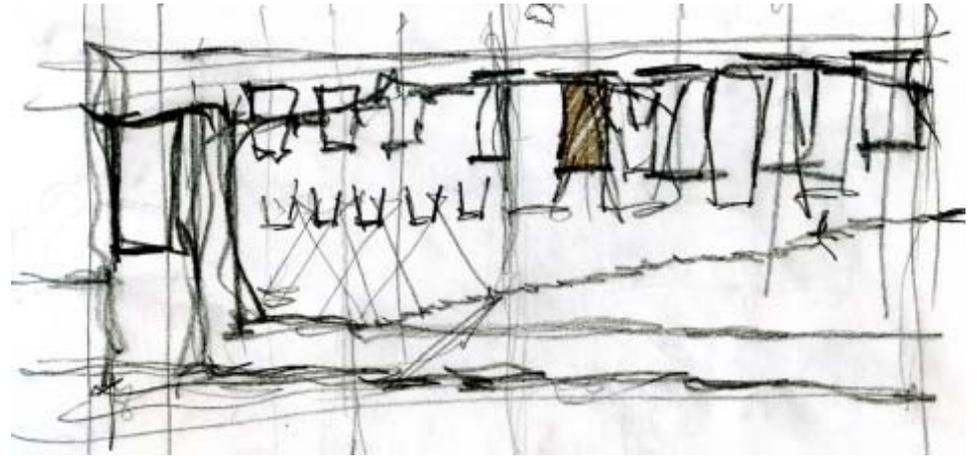
watercolor

oil pastel

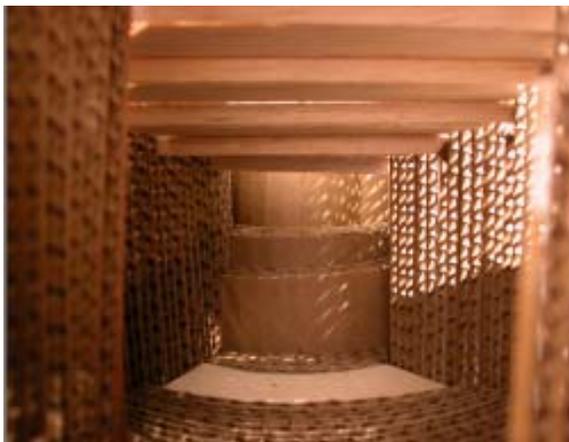
graphite

acrylic paint

With the conservatory immersed in the ground, water is accepted as part of the movement of the conservatory. The roof terrace and plaza drain into the water steps before re-circulating back into the city. The reflections from the water steps, similar to the shadows through the bricks, dance along the ceiling and seats of the theatre.



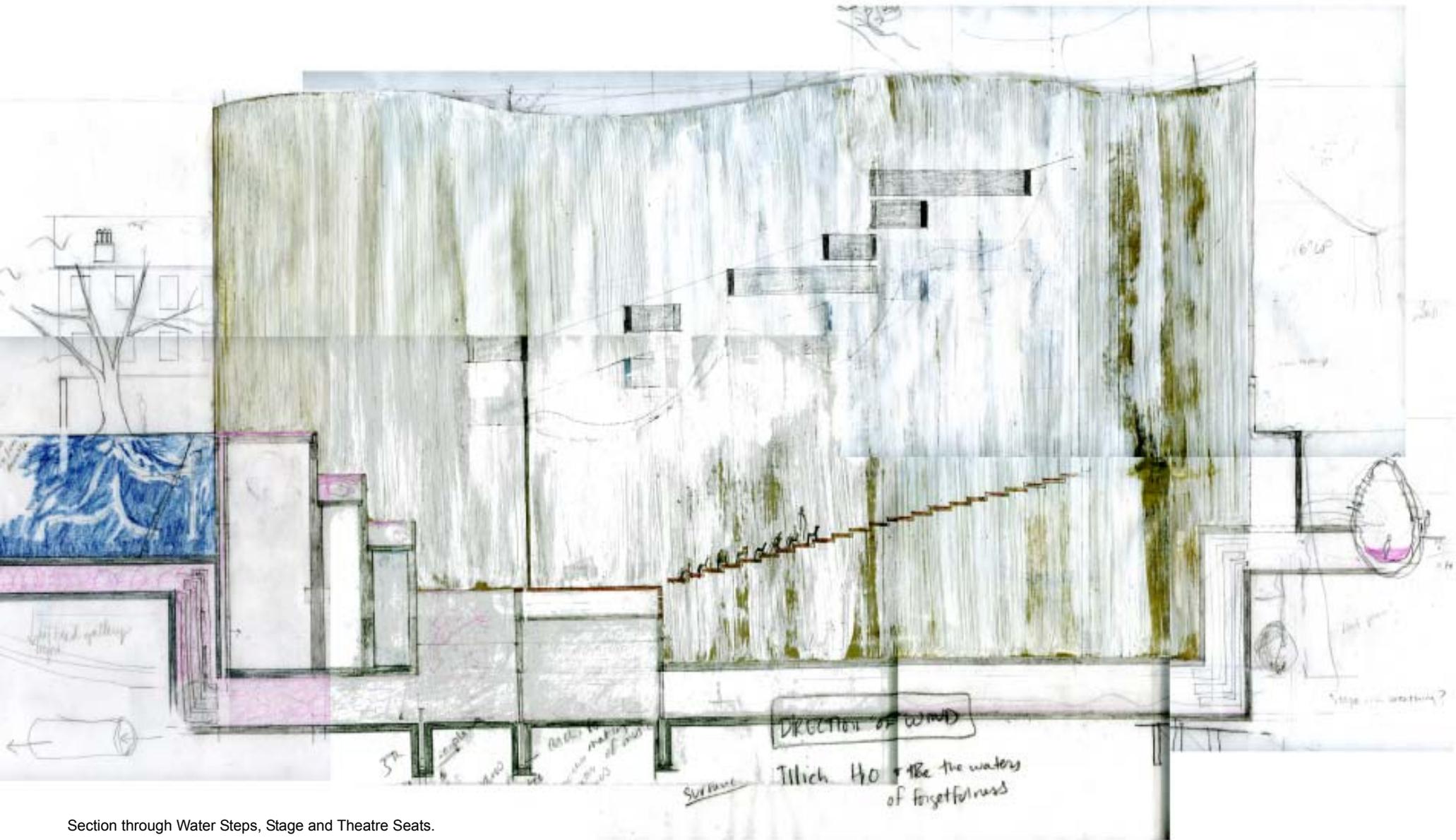
Section through Water Steps, Stage and Theatre Seats



View of Stage framed by Water Steps

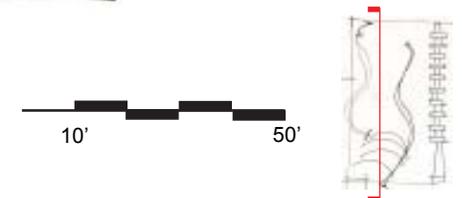


Section through Plaza Steps with Practice Rooms above



Section through Water Steps, Stage and Theatre Seats.

The stage is framed by water steps, which collect water from the building roof and plaza steps before re-circulating back into the city. The foundation level is meant to act like a bathtub, with the capability to fill and drain water as needed.

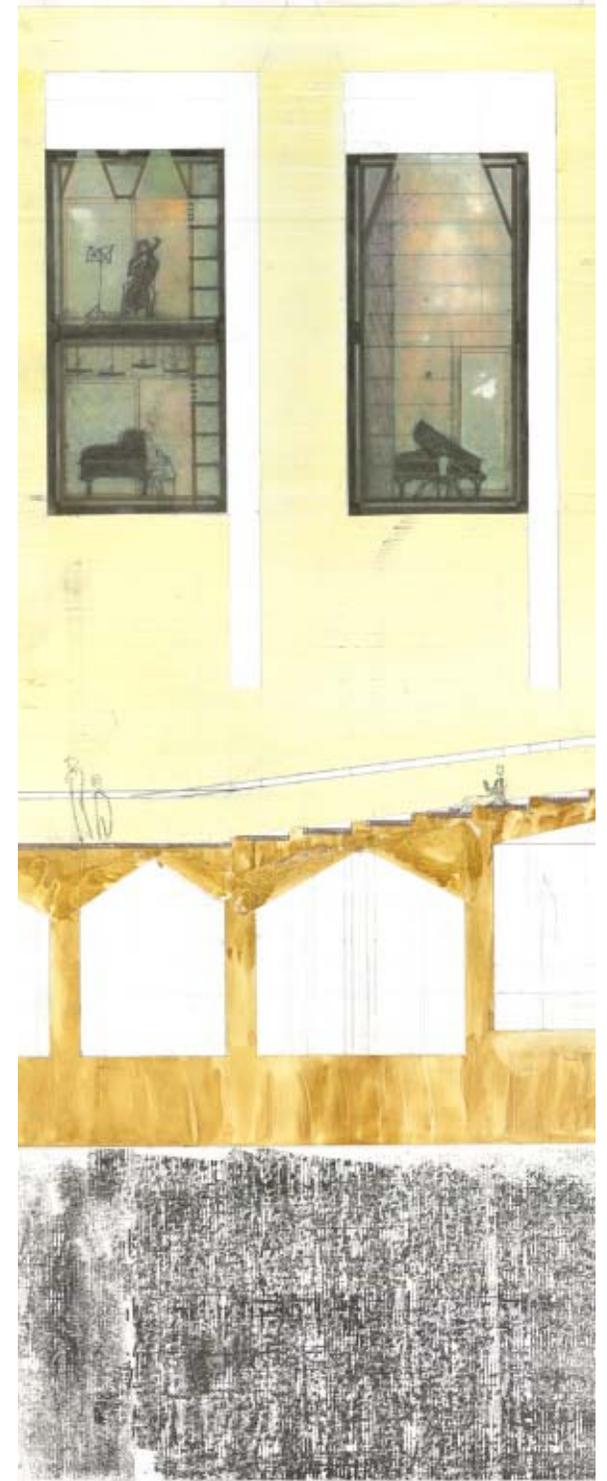


building construction

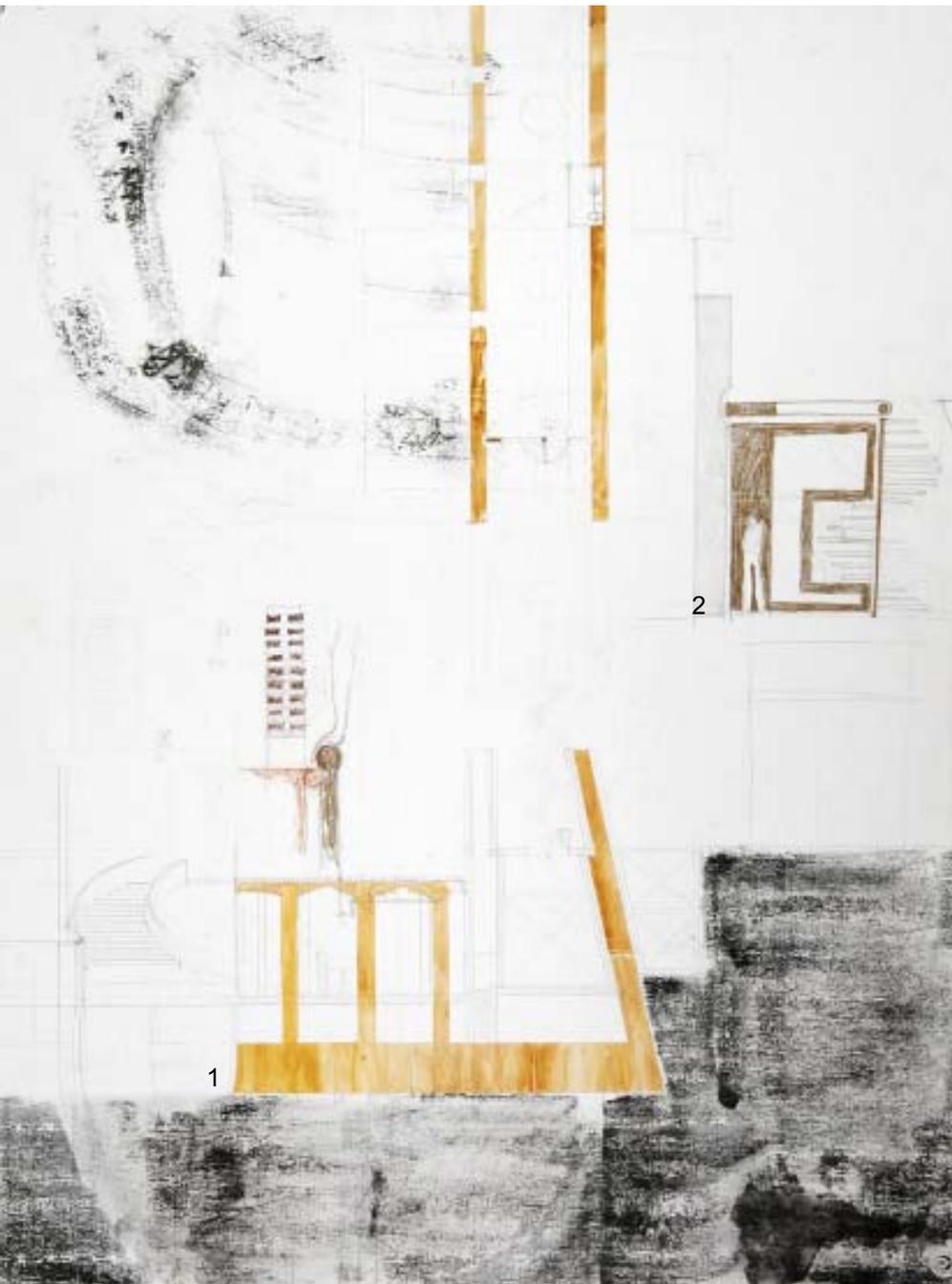
The vaulted concrete foundation is poured below street level with steps for the plaza and theatre to descend into the earth. The concrete foundation also shapes and supports the curved brick walls of the theatre and supports the suspended practice rooms. The practice rooms are shipping containers that hold acoustical mahogany panels. The practice rooms are completed off site, shipped to the site and lowered into the wall.



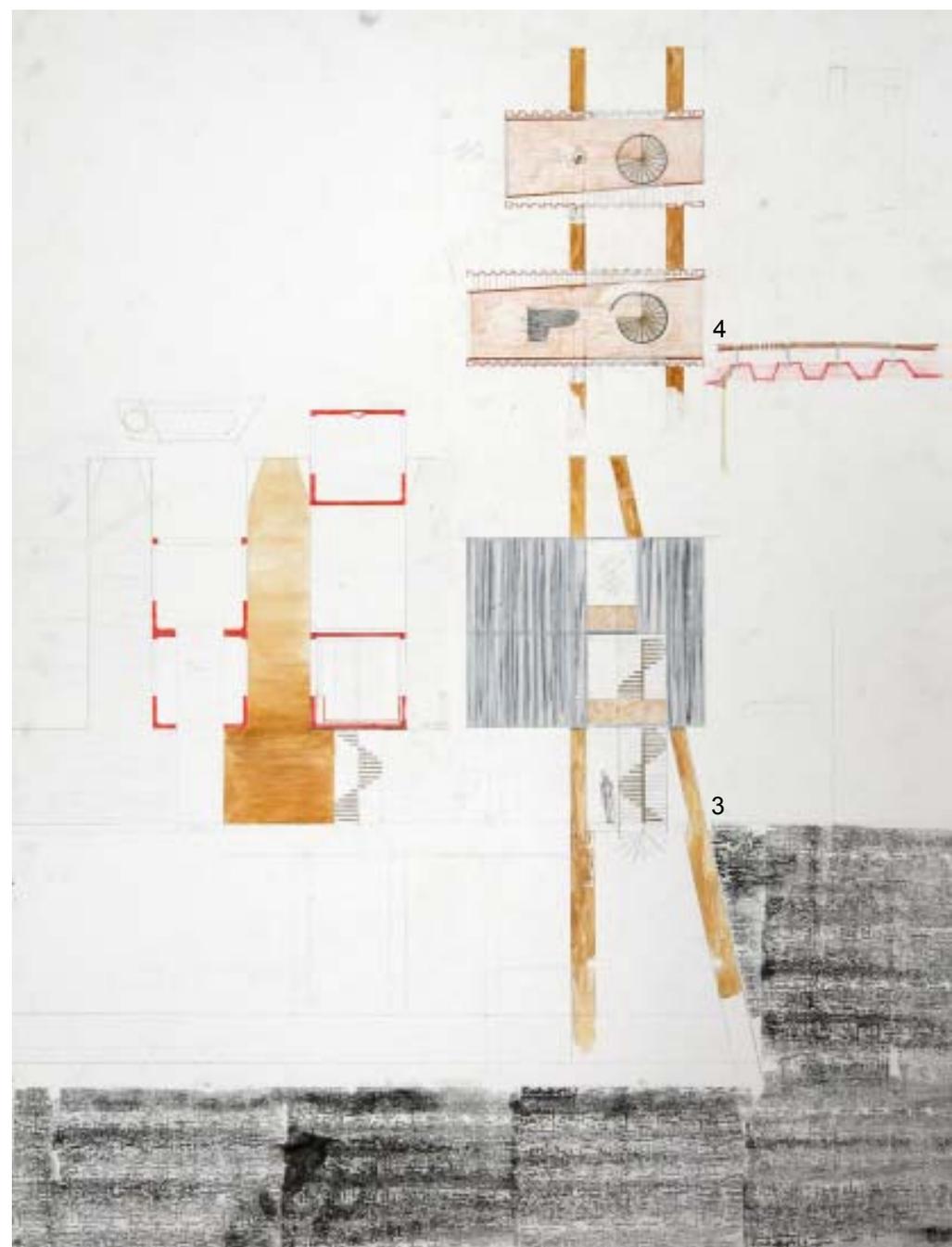
Section through Stage and Water Steps



Section through Plaza Steps and Practice Rooms



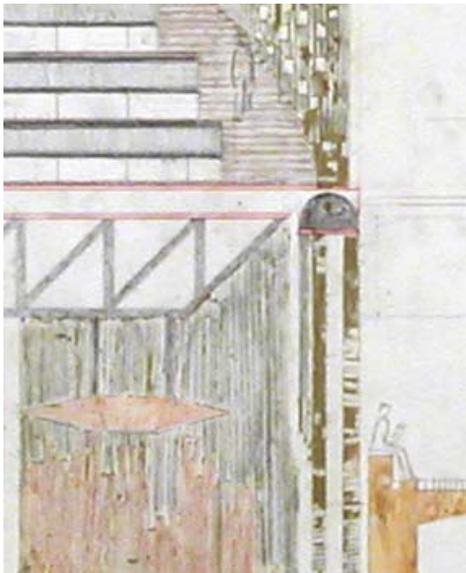
1. Section through Foundation Caverns
 2. Detail of Door into Practice Hall



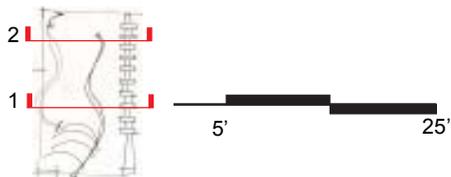
3. Elevation of Suspended Practice Rooms
 4. Plans of Practice Room with Circular Staircases

detail sections

Entering into the theatre, the stage is framed by water steps which collect water from the building before being re-circulated back into the city. Above the audience hang acoustical panels from steel I-beams. The brick walls extend up to frame the roof terrace. The public spaces can be used at night to watch stars on the roof terrace or enjoy listening to music from the practice rooms while sitting on the plaza.



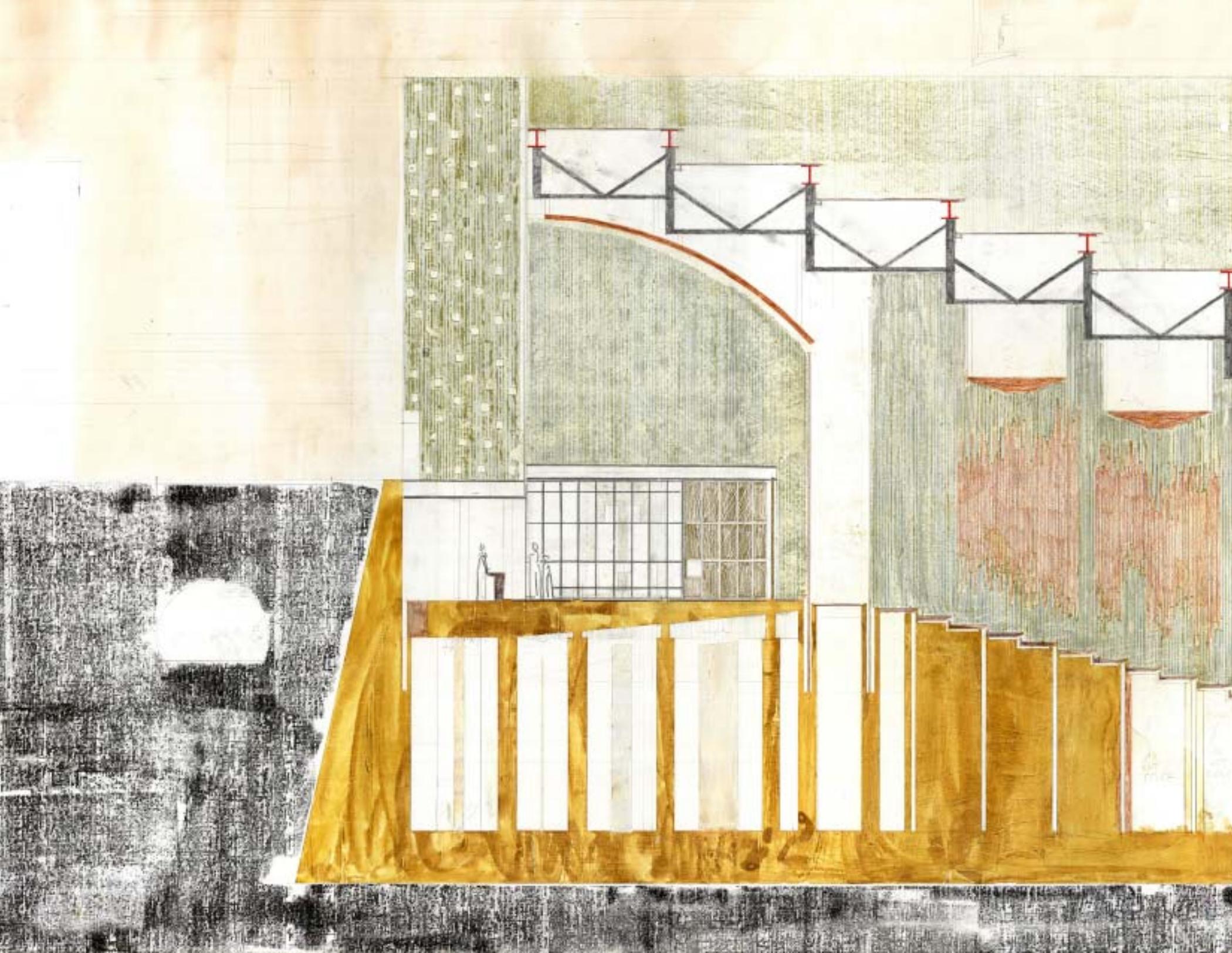
Detail of Theatre Roof Structure, Brick Cavity and Vierendeel Truss



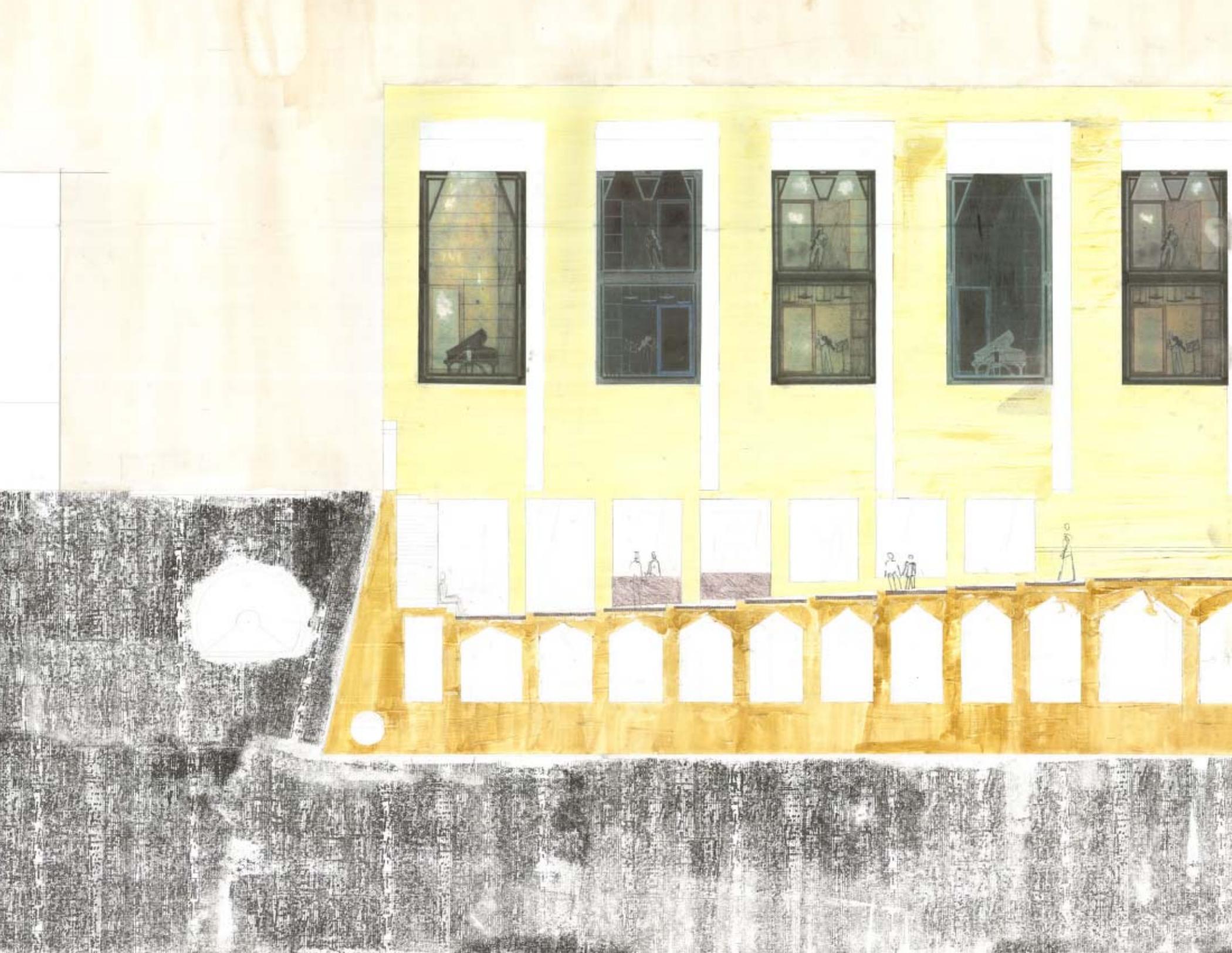
1. Section through Stage, Roof Terrace and Suspended Practice Room



2. Section and Plan through Theatre Lobby and Plaza
Next Two Pages: Sections through Theatre and Plaza







plaza section



bibliography and image credits

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MAP ON PAGE 1 & 2. GIS map of Charleston County, South Carolina. From 1992 Black & White Orthography. Charleston County GIS: Permitting, Licensing & Property Department (accessed October 23rd, 2003) [Public Domain]

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