



VCU

Virginia Commonwealth University
VCU Scholars Compass

Theses and Dissertations

Graduate School

2012

The Revitalization of Pump House Park: An Adaptive Reuse of an Historic Industrial Landmark

Tugman Jacqueline
Virginia Commonwealth University

Follow this and additional works at: <https://scholarscompass.vcu.edu/etd>



Part of the [Art and Design Commons](#)

© The Author

Downloaded from

<https://scholarscompass.vcu.edu/etd/2793>

This Thesis is brought to you for free and open access by the Graduate School at VCU Scholars Compass. It has been accepted for inclusion in Theses and Dissertations by an authorized administrator of VCU Scholars Compass. For more information, please contact libcompass@vcu.edu.

**PUMP
HOUSE**

I believe in the quest for discovering things I do not already know.
I design with intention to defy the predictable.

The following photographs were taken during visits to the Pump House. I attempted to capture the grand elegance of the exterior and contrasting gritty industrial nature of the interior.

The Pump House has survived as a ruin for longer than it pumped water to the city and held dances in the open-air ballroom. People are still in awe of its powerful, physical presence from the outside, but the vacant interior remains closed to visitors. It is in need of a new purpose. This thesis explores how new life can be brought to the Pump House and its surrounding park.



Front view, feeder canal low water.
The four openings on the side under the dance hall fed water into the pump room.



abandoned industrial parts



Inside Pump Room, detail. Water now seeps through the 10' thick granite wall separating the pump room from the feeder canal. Scars in the granite indicate where the massive pumps and turbines were held.



feeder canal at normal water level



Turbine intake pipe. This is one of three intake points where water once generated turbines.



Pump House back view. This photo was taken standing on the towpath of the overgrown and forgotten James River canal, created at the end of the 18th century.



Pump Room. This room housed giant turbines and pumps. Water came in through the large pipes, fueling turbines that pumped water to a city reservoir through the smaller, center pipe. Water from the turbines exited under the platform in the right of the photo into the Kanawha Canal in the back of the Pump House.



Dance Hall, detail. The dance hall level has been exposed to the elements and the plaster and lathe is beginning to decay.

The Revitalization of Pump House Park

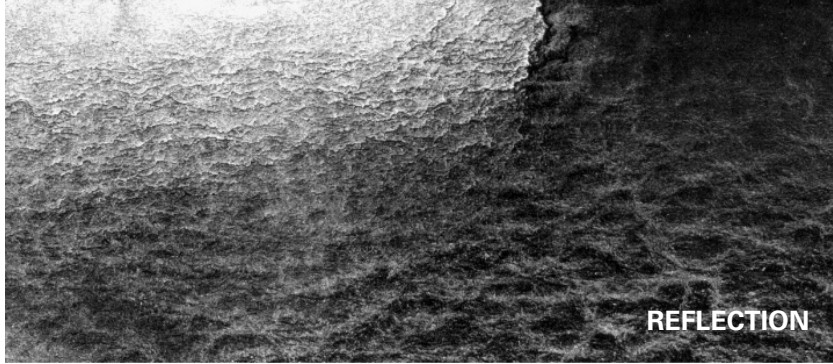
An Adaptive Reuse of an Historic Industrial Building

Jacqueline Tugman

MFA Interior Environments
Virginia Commonwealth University
Richmond, VA
May 2012

CONTENTS

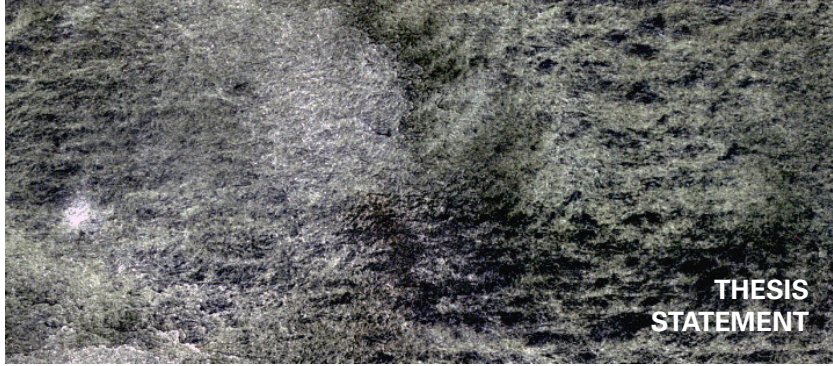
- 01 REFLECTION
- 02 THESIS STATEMENT
- 03 RESEARCH
- 04 CASE STUDIES
- 05 TEXTURAL STUDIES
- 06 DESIGN EXPLORATIONS
- 07 DRAWINGS
- 08 MODELS
- 09 THESIS SHOW
- 10 BIBLIOGRAPHY



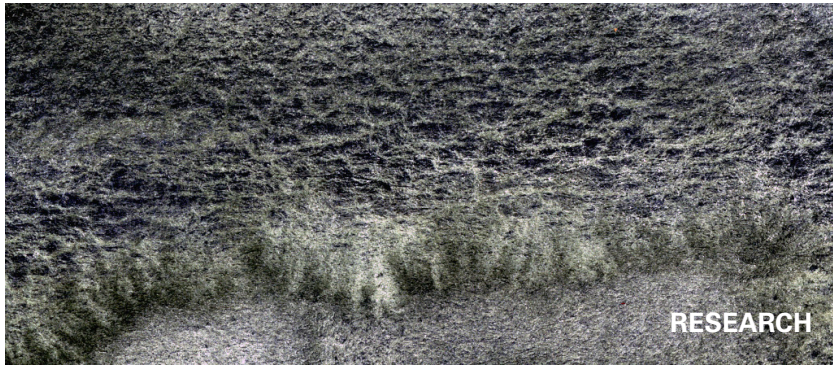
The Pump House found me two summers ago while I was searching for access to the river just beyond Byrd Park in Richmond, VA. Pump House Park is a public park, but a dilapidated chain link fence right off the road and warning signs made me approach with caution. I was too uneasy to venture down the trail alone, but the Pump House stood massive and dormant like a silent guardian.

This thesis is about the exploration of ideas. These ideas surfaced while investigating the history and context of the site. Studying the Pump House on scales ranging from the immediate building to the city to the state provided an understanding the building's relationship to its context. Programmatic elements evolved from uncovering what the building wants to become. Historical research inspired design decisions in support of the programs. This approach ultimately led to discovering a sense of place and what is most appropriate for the Pump House.

It was important to me that the making of the project be in tune with the essence of the building. Cardboard, an ordinary and often overlooked material, paralleled the impressive, textural granite and shadowy vestiges of the interior. It also served as what I called the "host" in my three-dimensional interaction studies. An iterative two-dimensional study of textures resulted in six charcoal rubbings depicting light, shadow, space, overlaps, and interactions. These studies inspired the project drawings' sensitivity to light, shadow and texture.

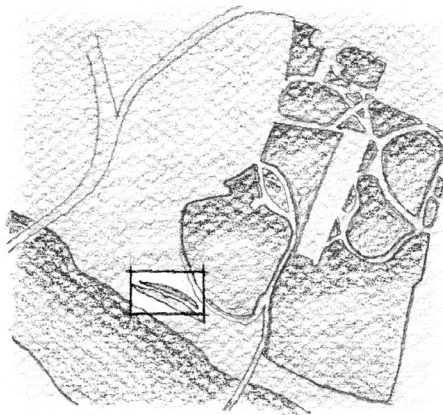
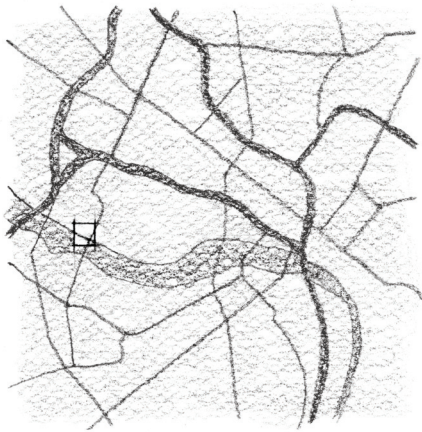
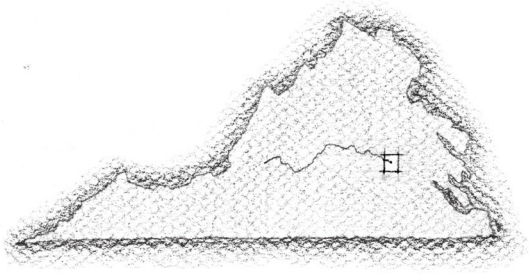


This thesis is an exploration of the way design facilitates people's understanding of a place. Hermeneutic theorist Hans Georg Gadamer wrote that we belong to history in the "splendid magic of immediately mirroring the present in the past and the past in the present" (Klemm, p. 181). Hermeneutics is the study of how we interpret non-verbal communication. Researching the history of the site on multiple scales guided design decisions that will intuitively shape visitor's comprehension of Pump House Park's past, present and future relationship with the city.



Colonel Wilfred Emory Cutshaw

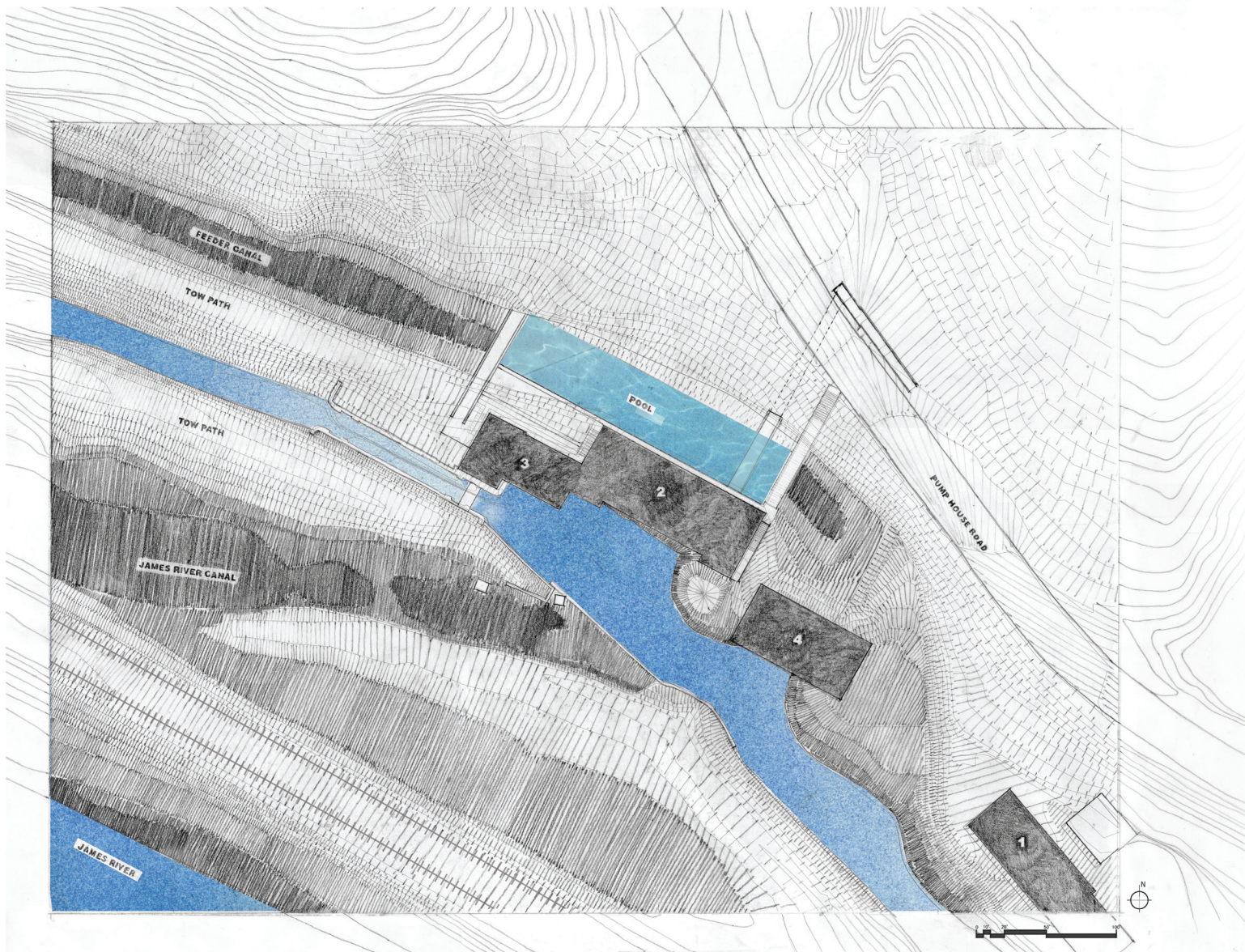
Colonel Cutshaw was born in Harpers Ferry, WV in 1838. He died in 1907 and is buried in Richmond's Hollywood Cemetery. Upon graduating from the Virginia Military Institute in 1858, he taught at VMI until 1873. He lost his right leg in the Civil War in 1865. Cutshaw served as Richmond's Engineer from 1874-1907. He designed the Pump House and oversaw its construction in 1883.



Scale of the state

Scale of the city

Scale of the neighborhood



1. steam powered pump house, built 1881
2. water powered pump house, built 1883
3. addition for development of electric pumping technology, built 1905
4. electric powered pump house, built 1924 and still in use today



65 hours



40 hours



35 hours



33 hours



20 hours

In the 1850s travel from Richmond to Lynchburg on the canal took 33 hours. (Dunaway p. 170) The museum's prolonged entry sequence helps visitors gain a sense of this slowness.



13 hours



3 hours



2.5 hours



40 minutes

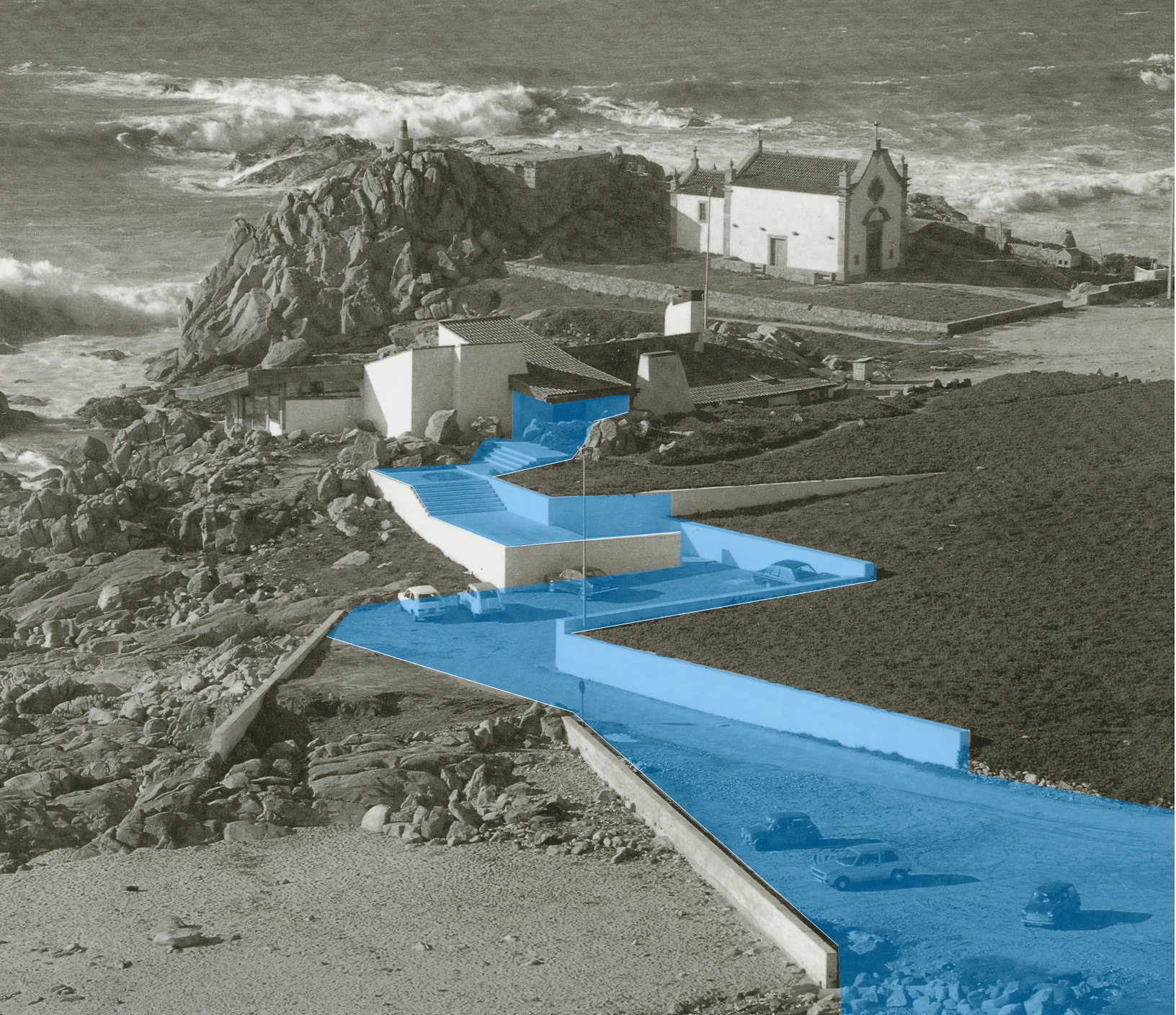


ALVARO SIZA, PORTUGAL

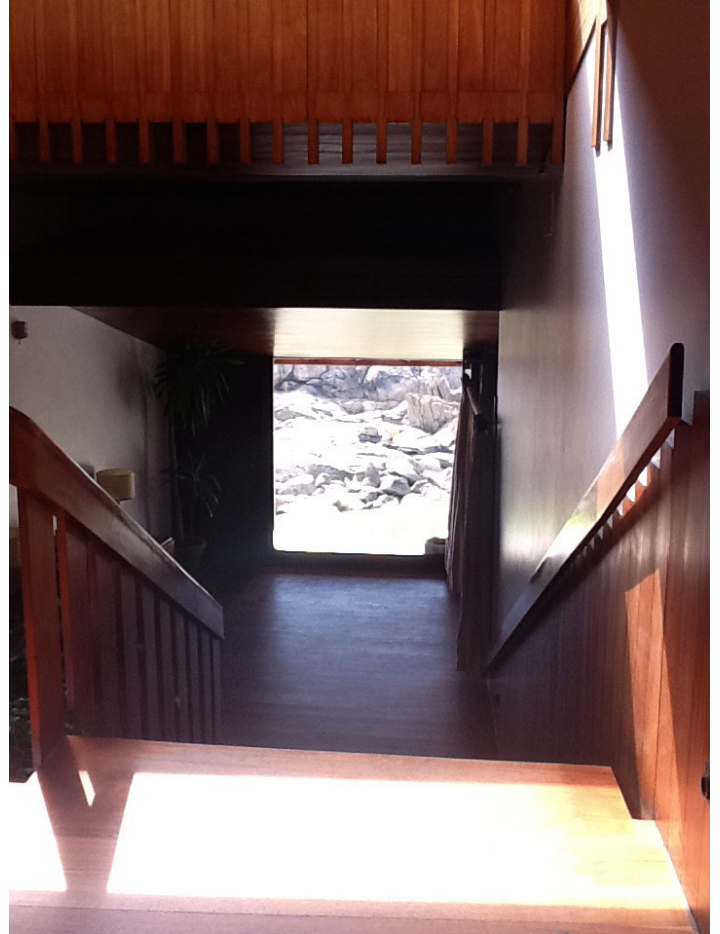
Boa Nova Tea House

Leca de Palmeira, Portugal

The Boa Nova Tea House's entry begins at the parking lot just off the road. Patrons are guided by a series of ramps, stairs and retaining walls that choreograph an entrance experience interacting with both the ground and the sky. The entrance to the tea house remains obscured until ascending the final flight of stairs. Upon entrance into the dimly lit vestibule, visitors descend immediately down again to the cafe. The dominant view is directly ahead to the rocks, sea and sunlight.

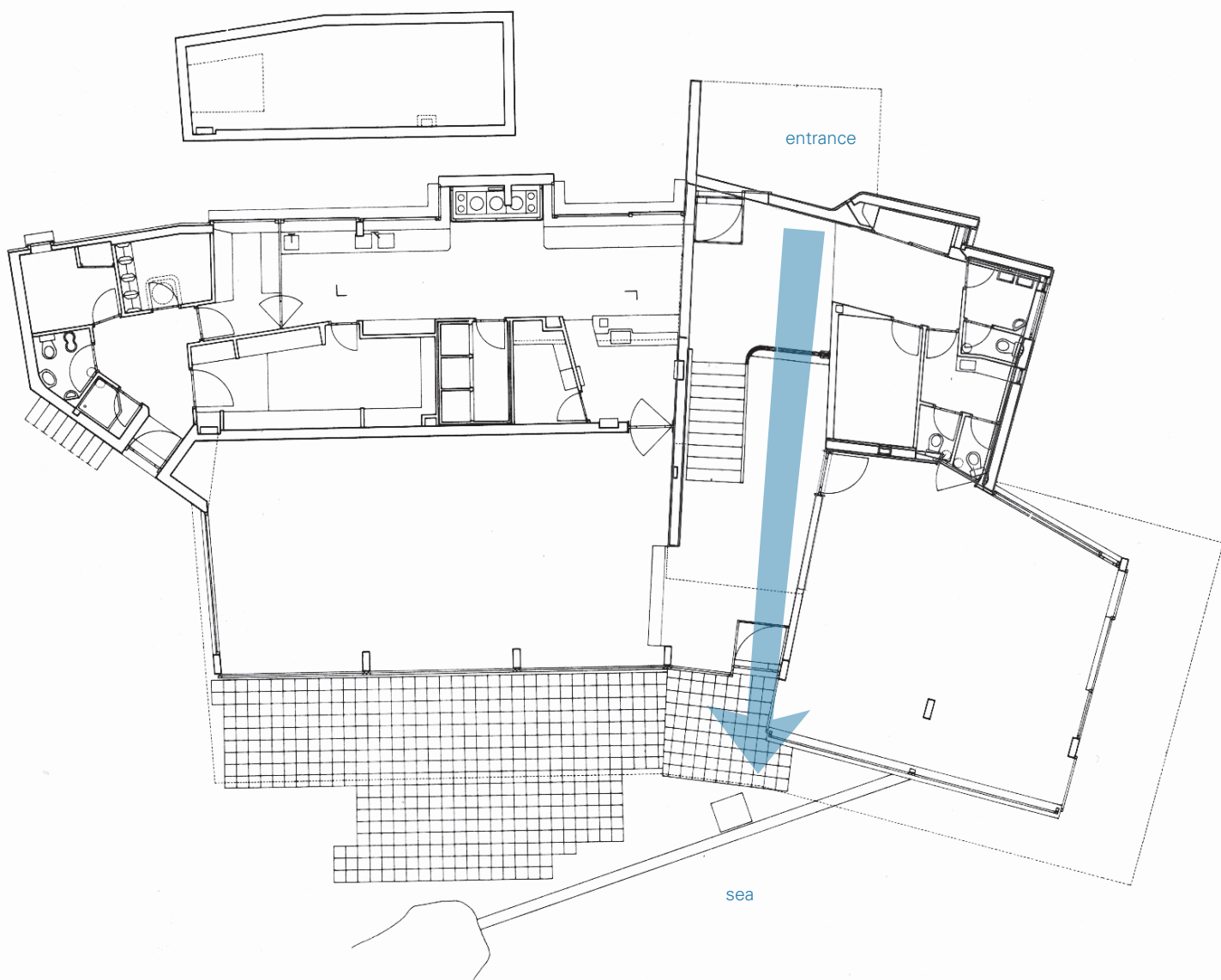


(Rodríguez, 2007)



First set of entry stairs. View at horizon

View from vestibule downward to sea.



Plan
(Rodríguez, 2007)

ALVARO SIZA, PORTUGAL

Piscina en Leca de Palmeira

Leca de Palmeira, Portugal

The choreographed entrance from the parking lot to the swimming pools is similar to the Boa Nova Tea House. Visitors descend a ramp and move into a dimly lit bath house structure completely integrated with the rocky terrain. The bath house is dark and cool, a nice reprieve from the hot sun. Entry to the pool is extended from the changing rooms through a hall that slowly transitions to the light.

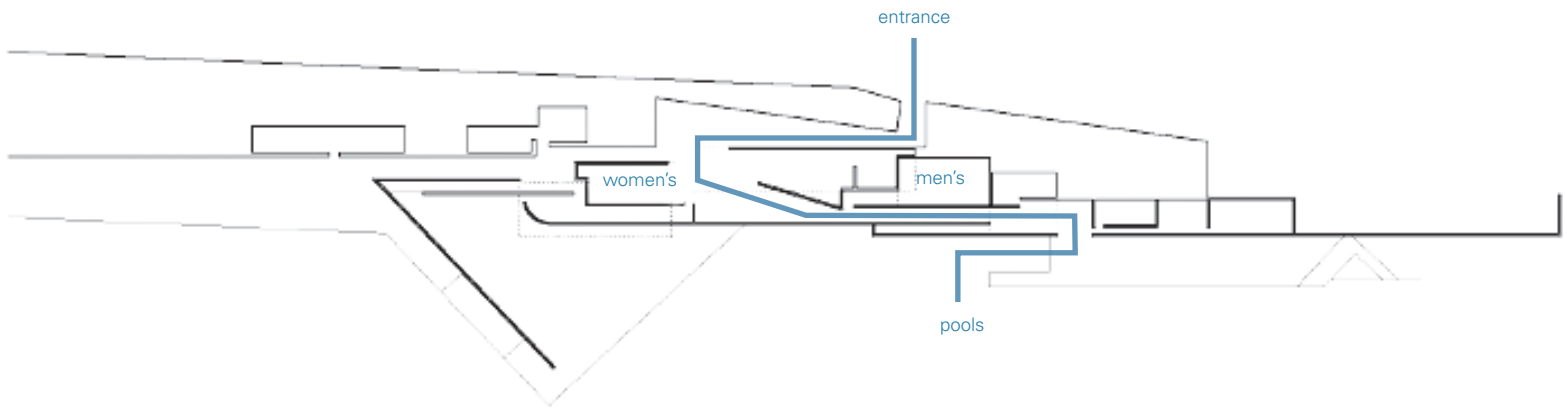
This project and Boa Nova inspired me to consider how visitors enter the Pump House, how design interacts with the site's topography and transitions from compression to release and light to dark.



Inside the bath house.



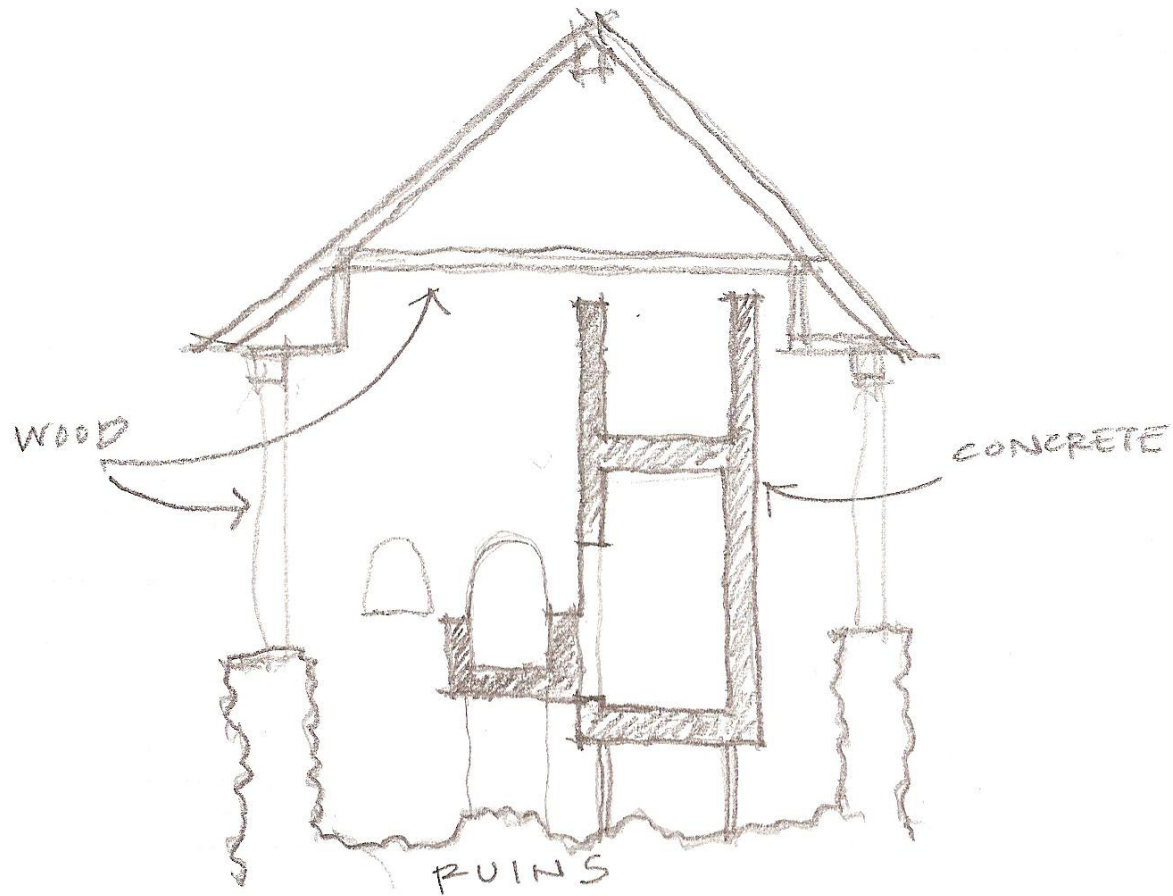
(Rodríguez, 2007)



Plan
(Rodríguez, 2007)



The main swimming pool completely integrated with the shoreline of the Atlantic Ocean.



SVERRE FEHN, NORWAY

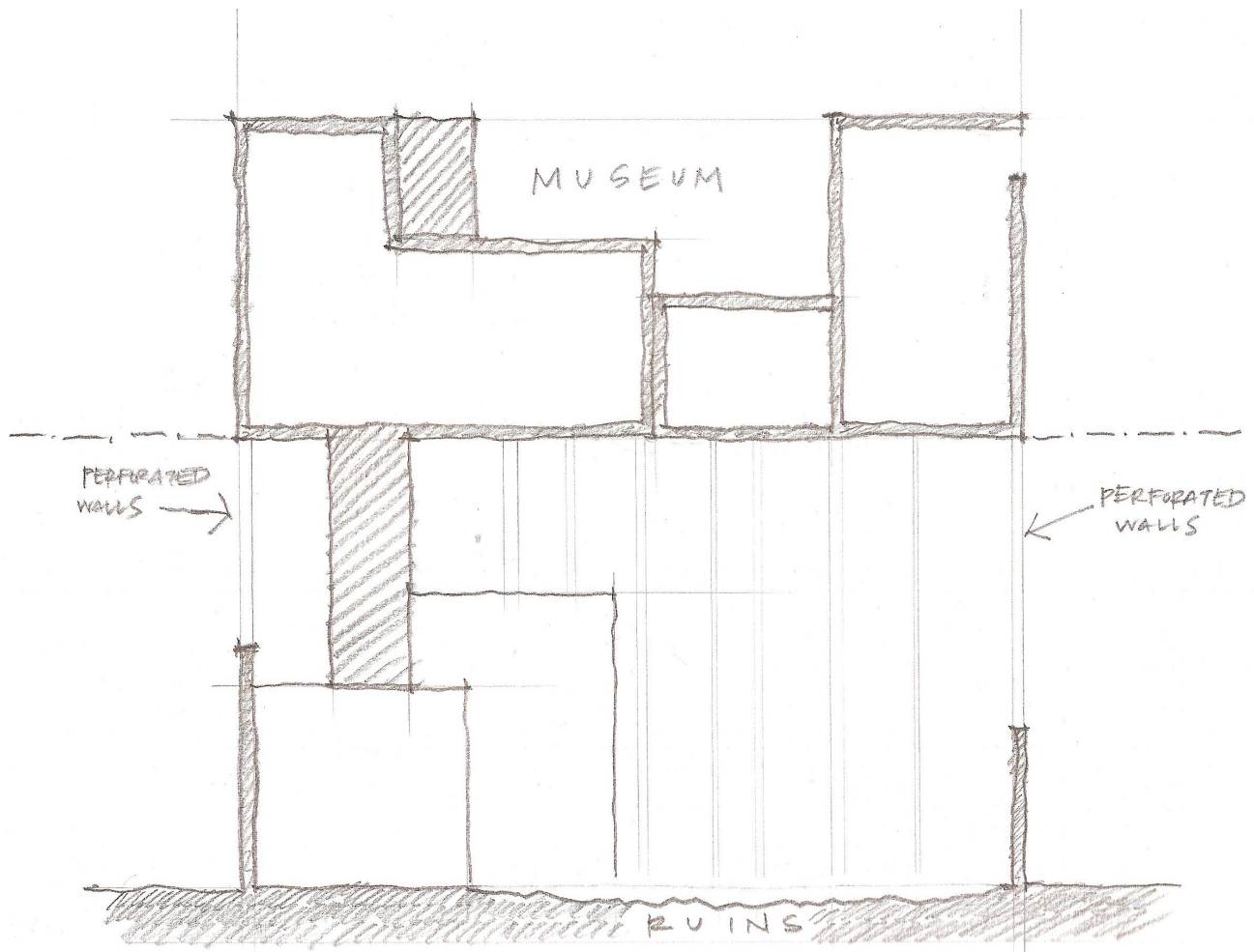
Bispegaard Museum

Hamar, Norway

The Bispegaard Museum is a renovated historic barn and medieval castle. The design concept: a suspended museum. Fehn wanted to preserve the existing remains and make it possible for the archaeological excavations to function as an important part of the museum, in line with the exhibits. Sverre Fehn experimented with pairing modernist materials like concrete, slate and unfinished wood with stone ruins. The effect deflects attention from the architectural insertion to its surroundings. (Fjeld, p. 130-35)



(Livingstone, 2003)



PETER ZUMTHOR, SWITZERLAND

Kolumba Museum
Cologne, Germany

The Kolumba art museum is built around wreckage of St. Kolumba parish church destroyed in World War II. Zumthor studies the detailed junction between the new and the historic. Light was used to soften the impact of the museum's insertion above the ruins. Perforating the walls around the ruins it maintains the ambient sounds from outside. Zumthor preserves the ruins and successfully integrates the museum by allowing the ruins to serve as the foundation for the museum. This strategy of adding the museum above the ruins

is also an act of preservation. By adding walkways that hover just above the ruins, visitors view them to become part of the museum's collection.

Like Fehn's museum, the Kolumba museum's simultaneous preservation and intergration of ruins and museum served as a guide for how I placed the Canal Museum in the pump room. Zumthor's consideration of the surrounding environment also influenced the way I thought about the relationship of each programmatic element and the site.



(Spekking, 2007)





(van Raaij, 2008)

Glass tunnel

San Sebastián Aquarium

San Sebastián, Spain

Early studies of how to enter the Pump House settled on the museum's point of entry through one of the pipes that brought water in from the feeder canal. Canal water was a factor before the swimming pool evolved. Some kind of bridge/tunnel was needed to gain access to the level of the entrance, which is most often beneath the surface of the canal. The creation of the swimming pool in place of the feeder canal allowed for a consistent water level and translucency. Encasing the tunnel in glass allows for unique interaction between museum visitors and swimmers.



(O'Grady, 2011)



Public swimming hole

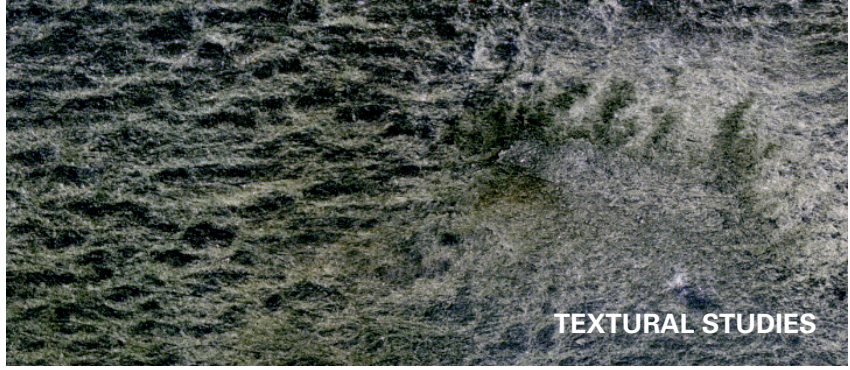
Barton Springs

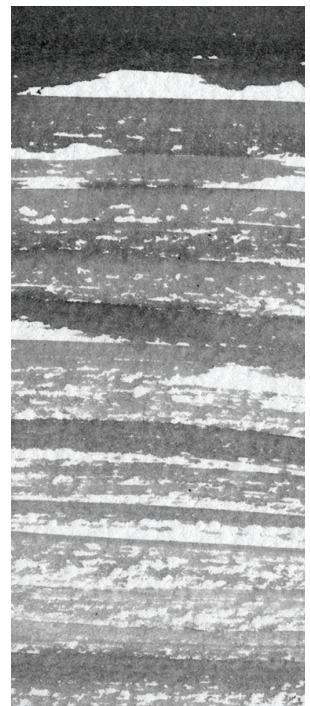
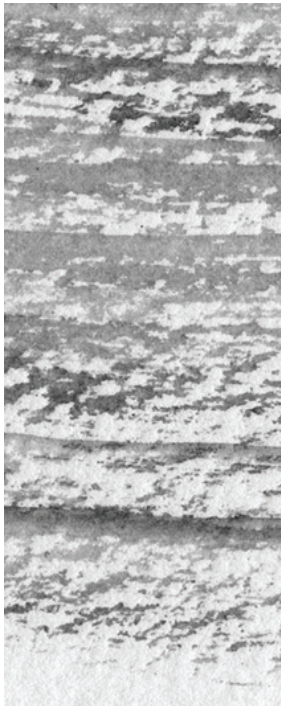
Austin, TX

At this phase the swimming pool's footprint is defined, but the design is still in development. Barton Springs is an example of the direction Pump House Park's pool will take. Far from the sterile, chlorine-filled, white basin, the swimming pool will be a more landscaped version of the feeder canal.

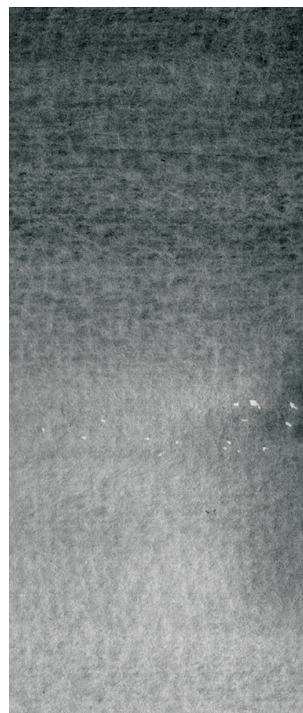
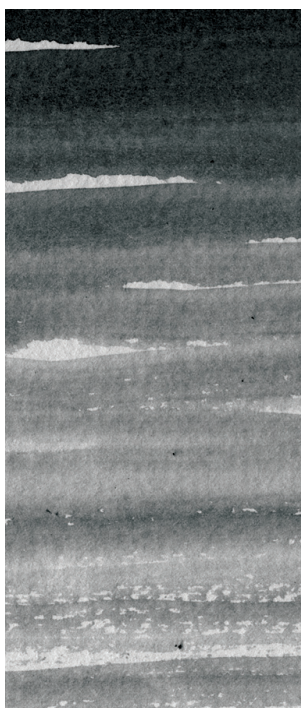
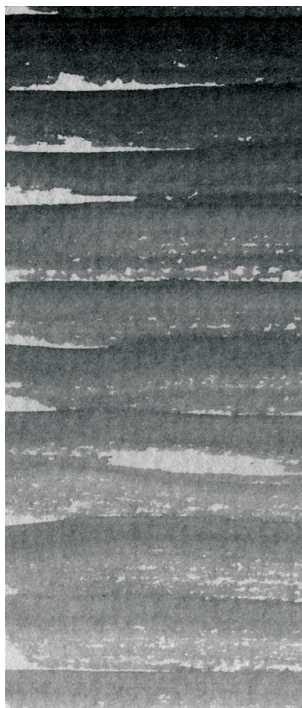


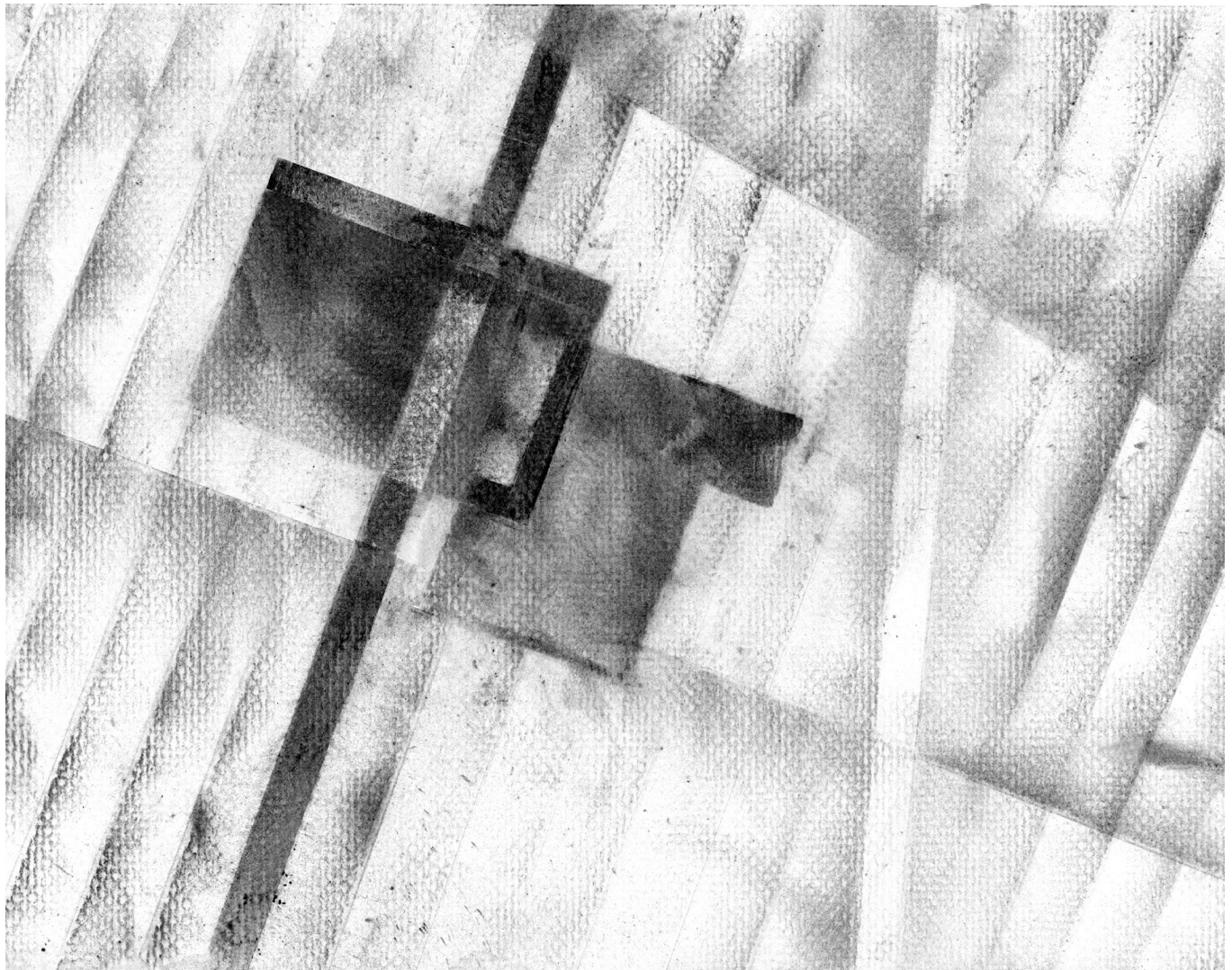
(Lucas, 2010)





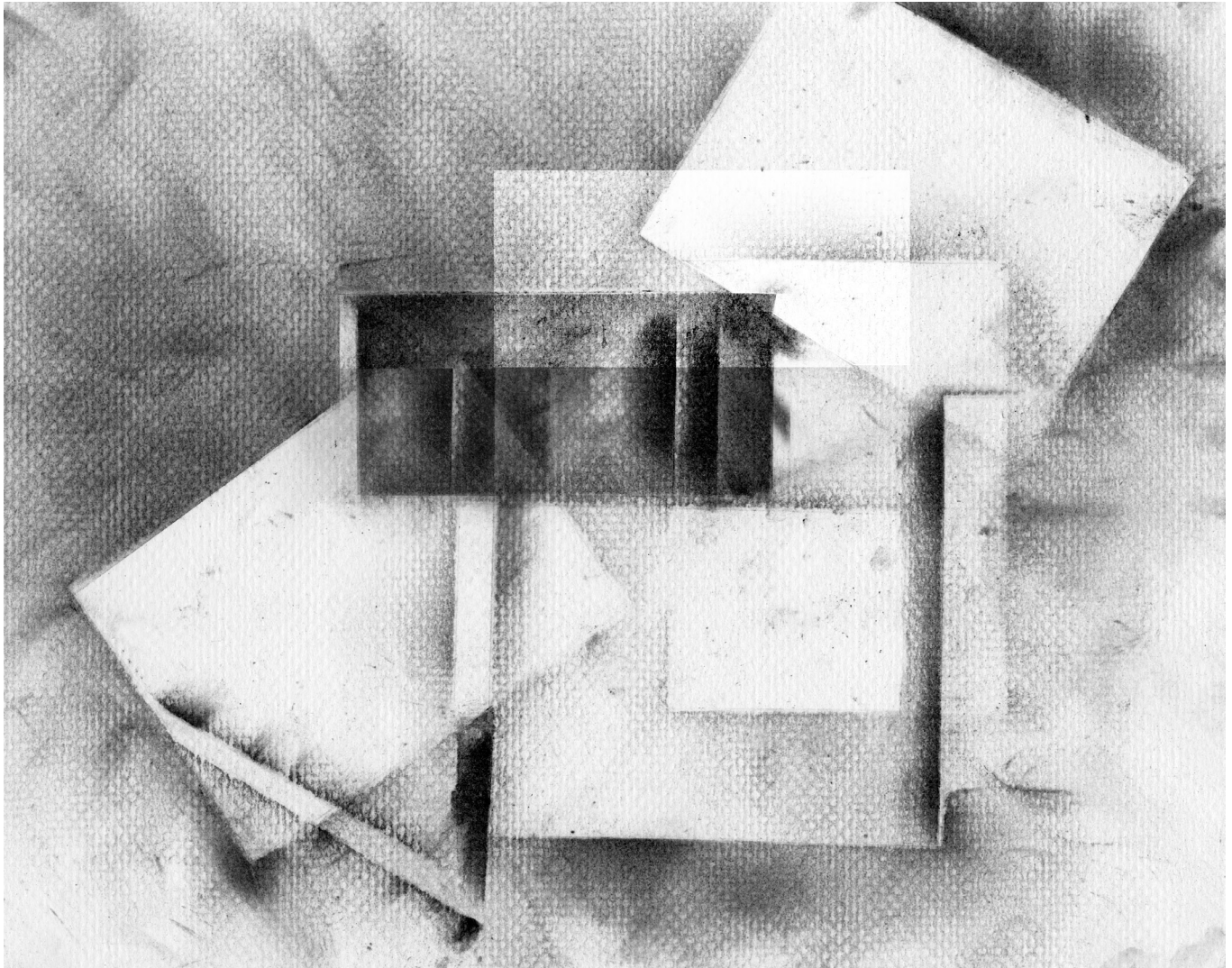
early texture and gradient studies





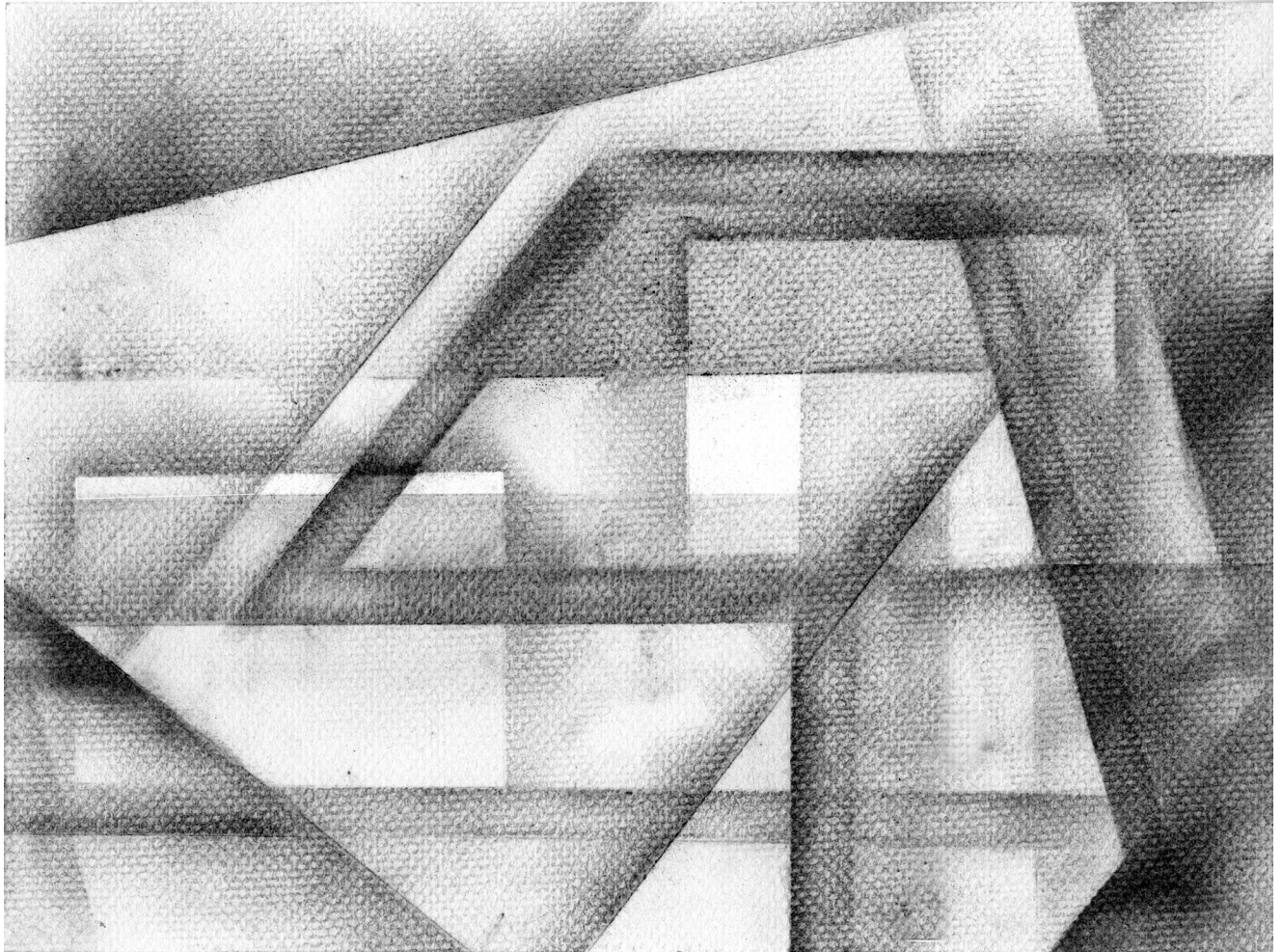
Master plan parti

This drawing explores the connections and overlaps of Byrd Park and adjacent parks through Pump House Park to the river.



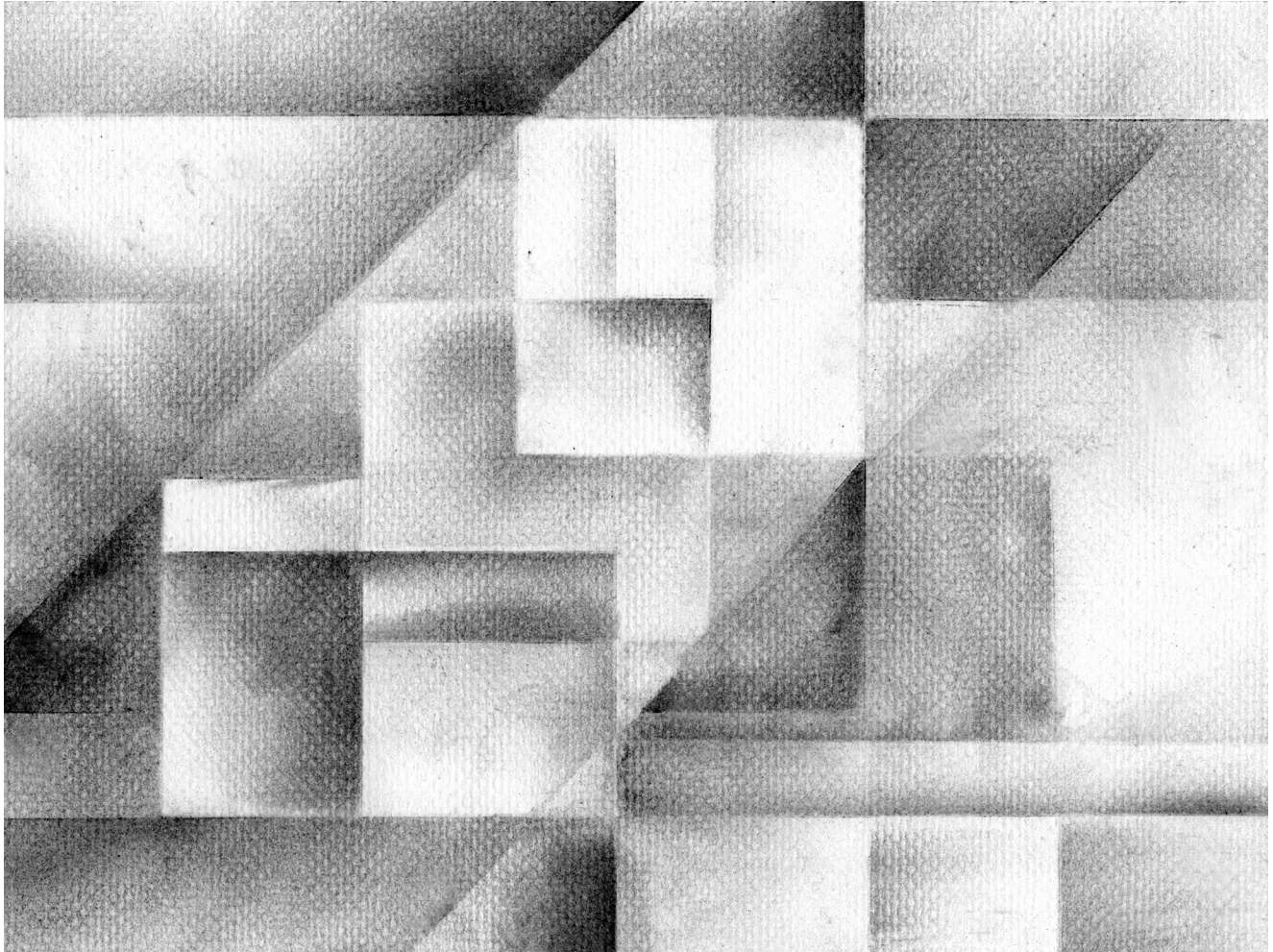
Program parti

This drawing explores the connections and overlaps between the museum, swimming pool, dance hall, bath house and park trails.



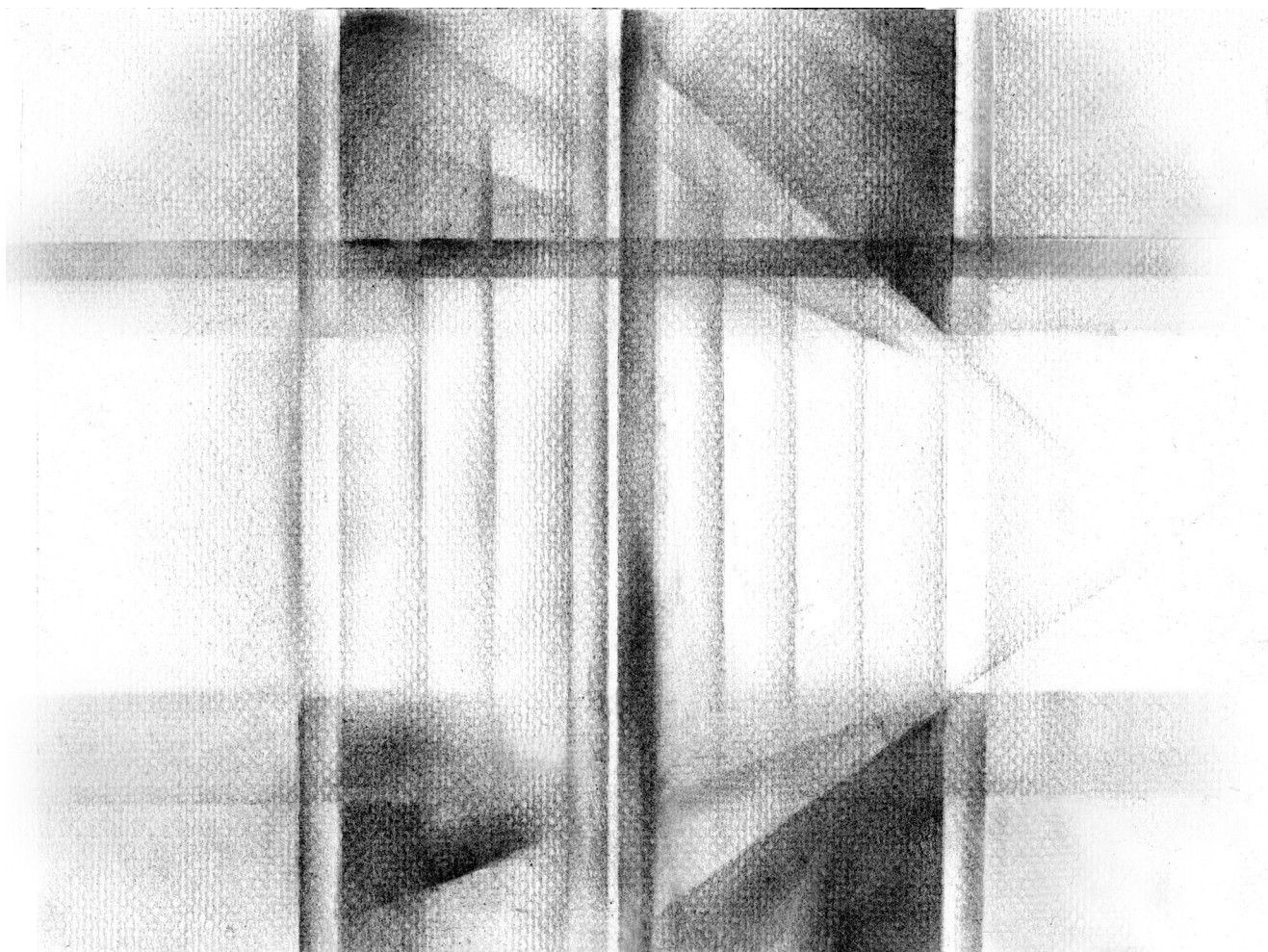
Interaction studies

A two-dimensional study of
insertions and installations
and interventions.



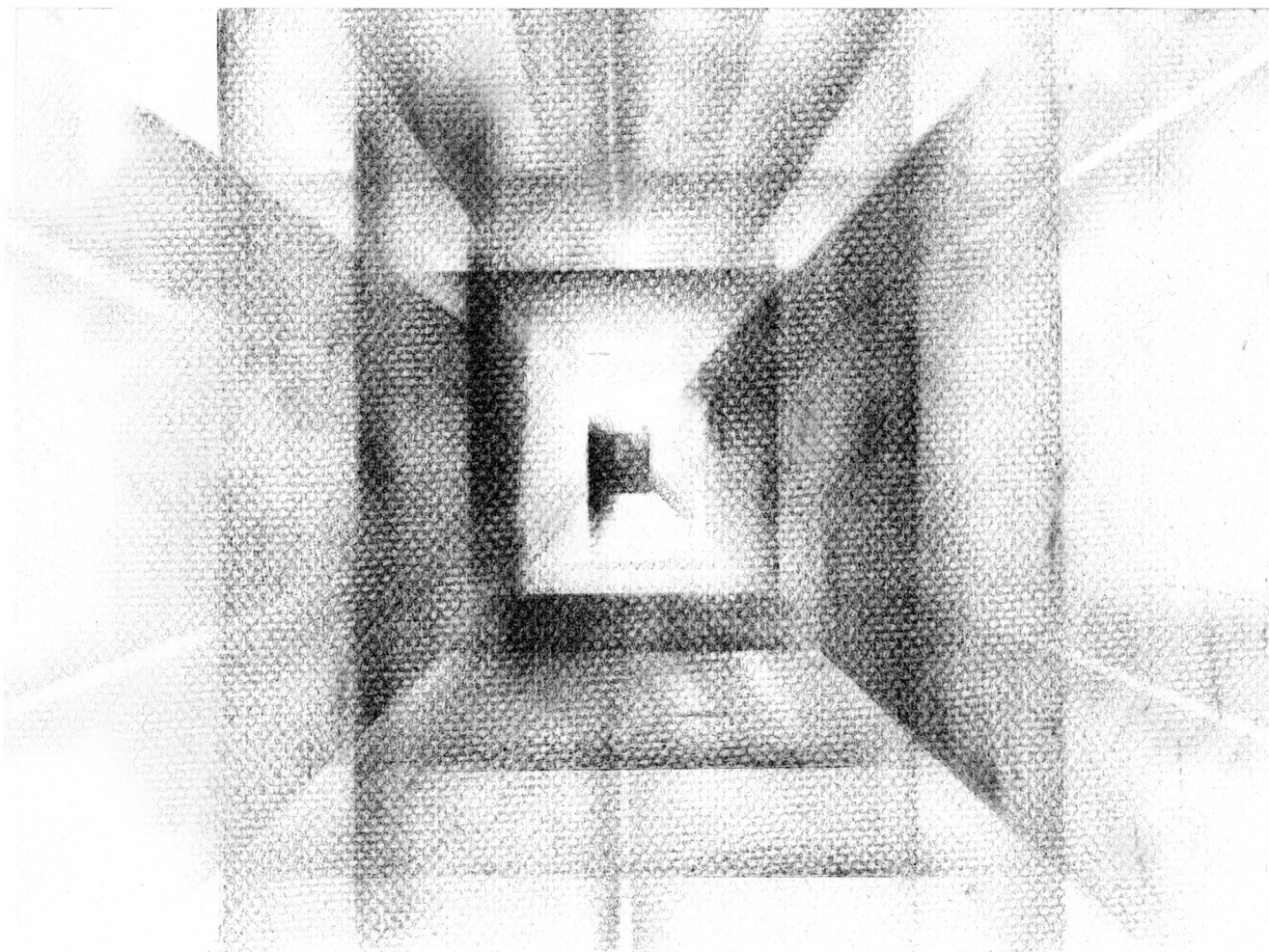
Interaction studies

A two-dimensional study of insertions and installations and interventions.



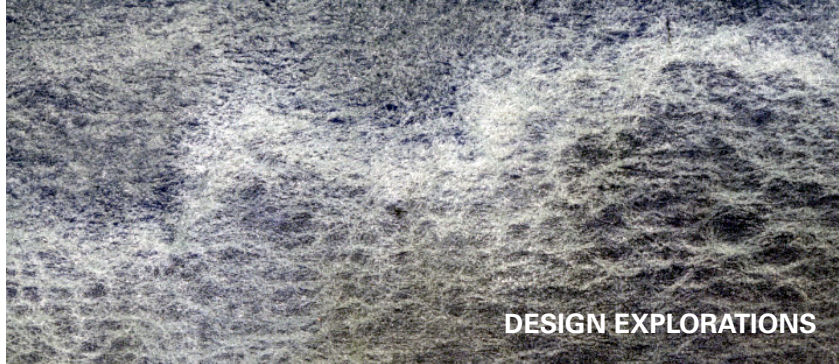
Light study

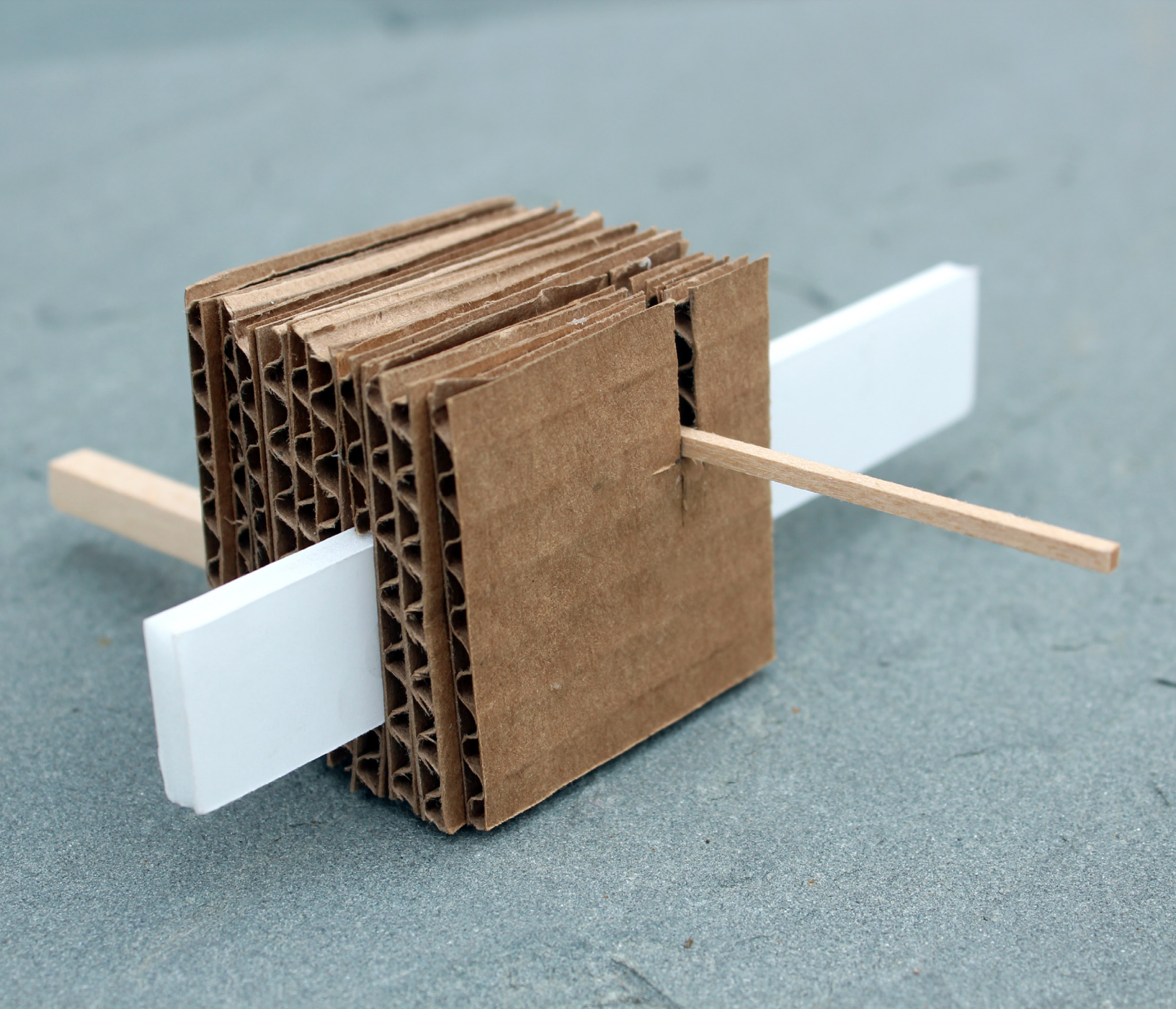
An abstract section study
of the qualities of light and
symmetry in the bath house.



Light study

An abstract section study of the qualities of light and symmetry in the museum's tunnel.

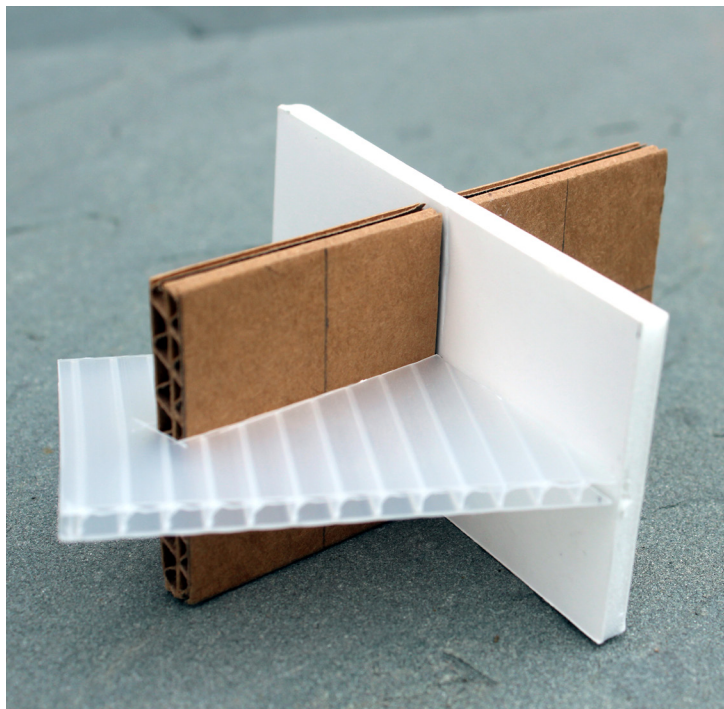




Early Programmatic Study Models

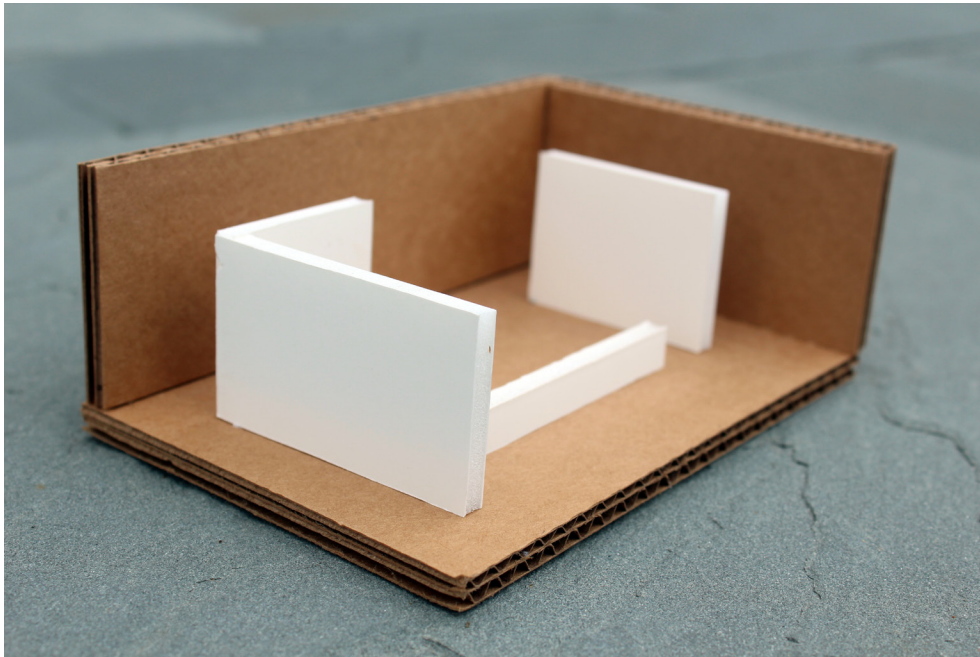
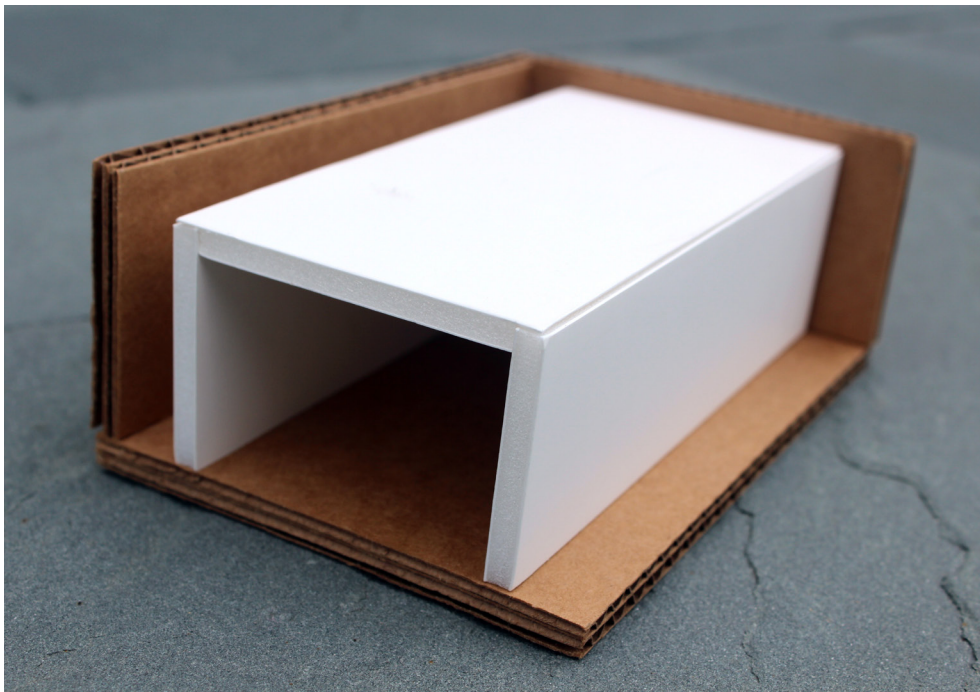
The photo above shows how the foamcore “information” remains constant throughout the building. The basswood is thin on one side as it enters the building and comes out much thicker on the other side. This represents how visitors leave the building with more knowledge than when they started. The stick also shifts points from entry to exit indicating that it interacted with the foamcore center.

cardboard = host
foamcore = museum
basswood = visitors



An early programmatic parti study of how the building and the museum hold equal importance and the “fun” element touches upon both, but with a different level of engagement.

cardboard = building
foamcore = museum
gatorboard = dance hall



Early interaction studies

These models explore three different ways new can interact with the old. The top photo is an example of insertion, bottom photo, installation and opposite photo, intervention.

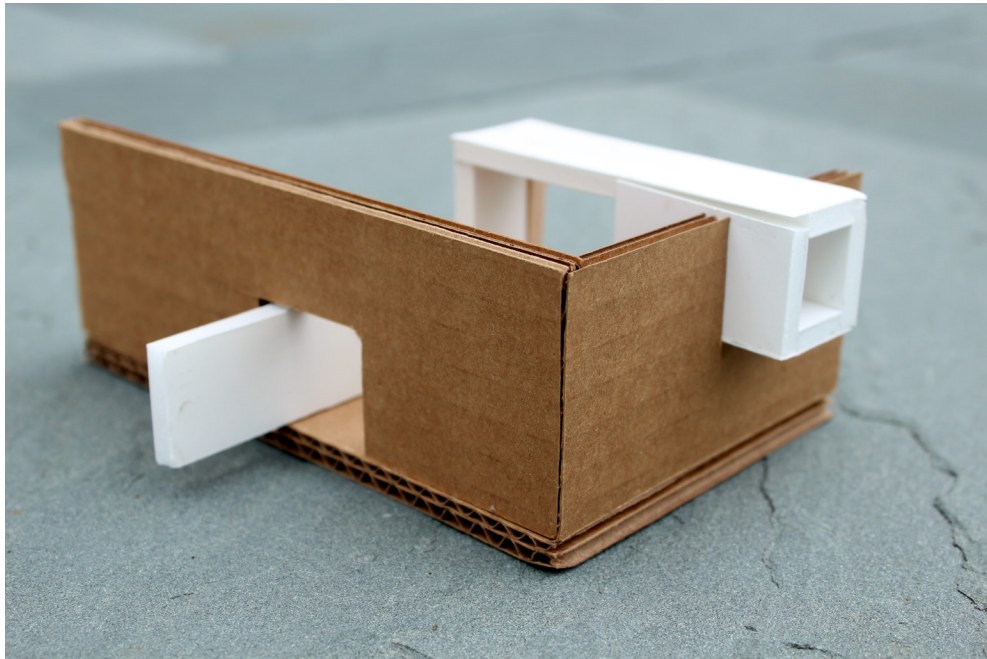
Observations

In between space becomes very important.
 How does introduced material respond to host?
 How does the host change to receive new material?
 How is an insertion different than an installation?
 Does an insertion take on host's form or vice versa?

Goal

Design each part of the program to have instances of all three interactions.

Which is best for displaying information?
 Which is best to shape space?
 Which is best for sectioning spaces?
 How to announce the new?
 How does new respect the old?
 How does new feature the old?
 How do all three exist together?

**Insertion**

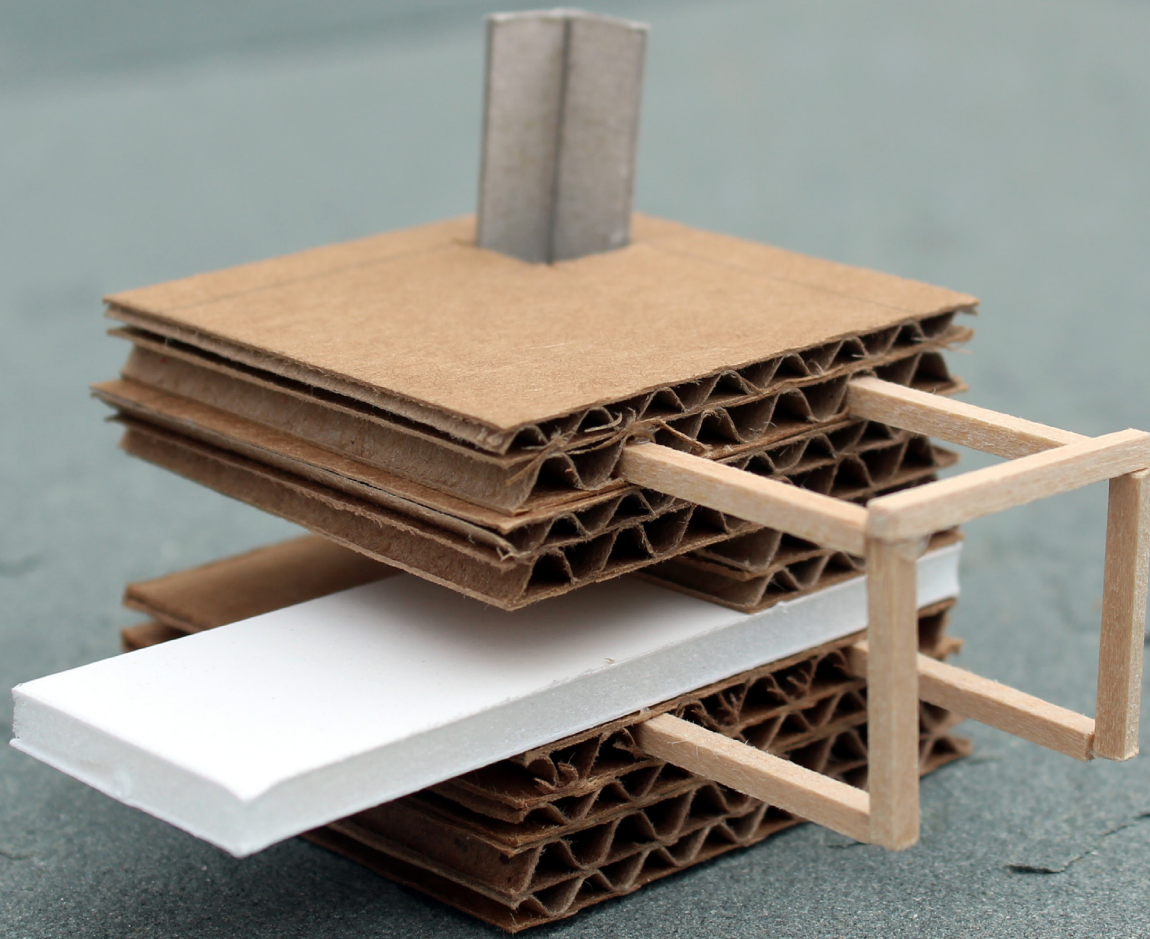
mimic host's form
interacts with host
dominates host

Installation

temporary
changeable
freestanding
interacts with viewer

intervention

engages with host
distinction between old and new blurred
interacts with host and viewer



A Search for Programmatic Opportunities

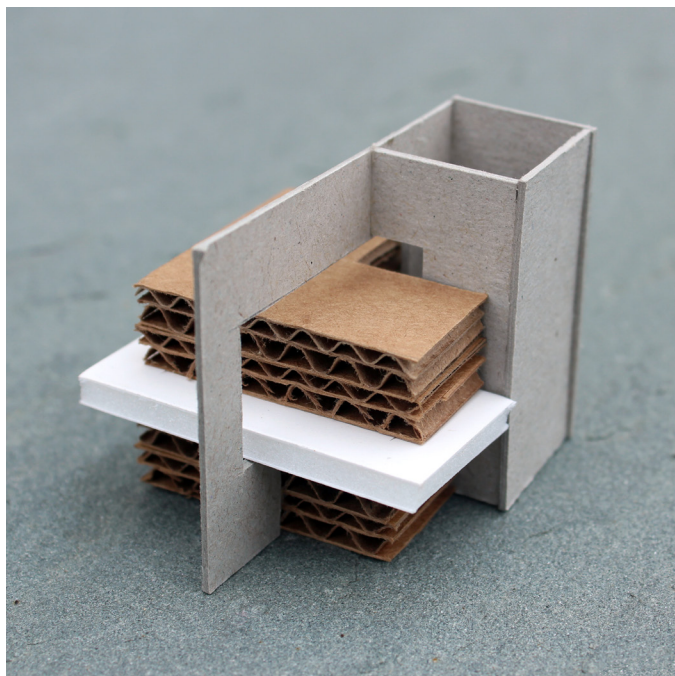
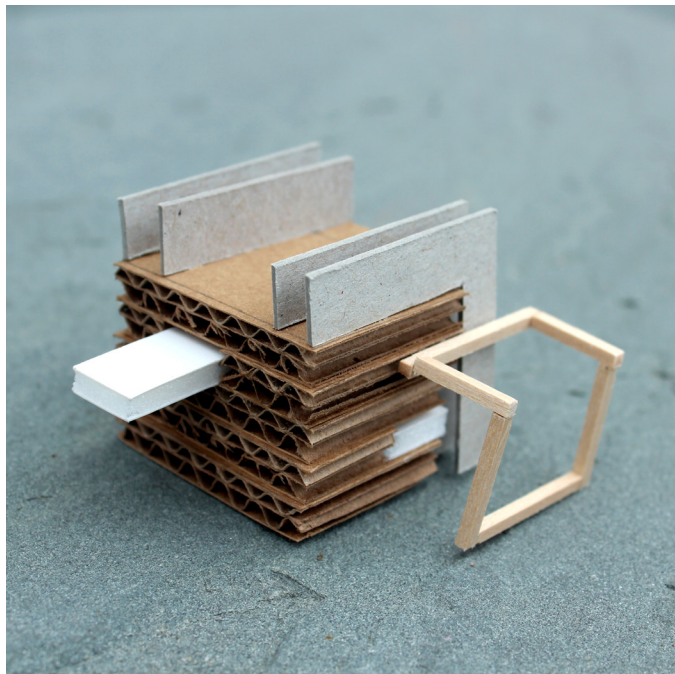
This iterative process operates on the stacked cardboard cube multiple ways. The cardboard represents the Pump House. It provides a rich environment in which to respond and test different scenarios of installation, insertion, and intervention. These studies also test the different ways each programmatic element can respond to the other two elements.

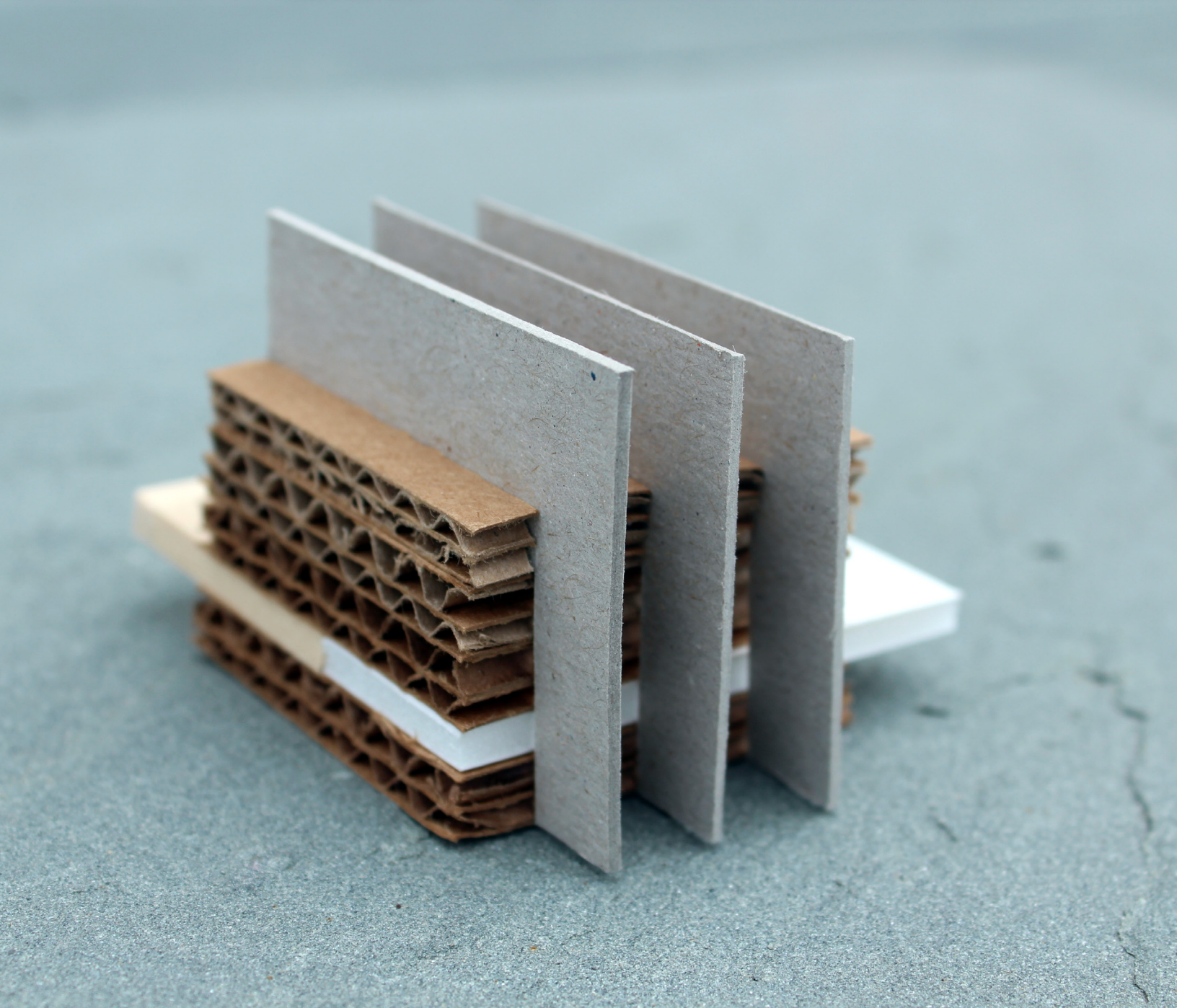
cardboard = pump house

foamcore = museum

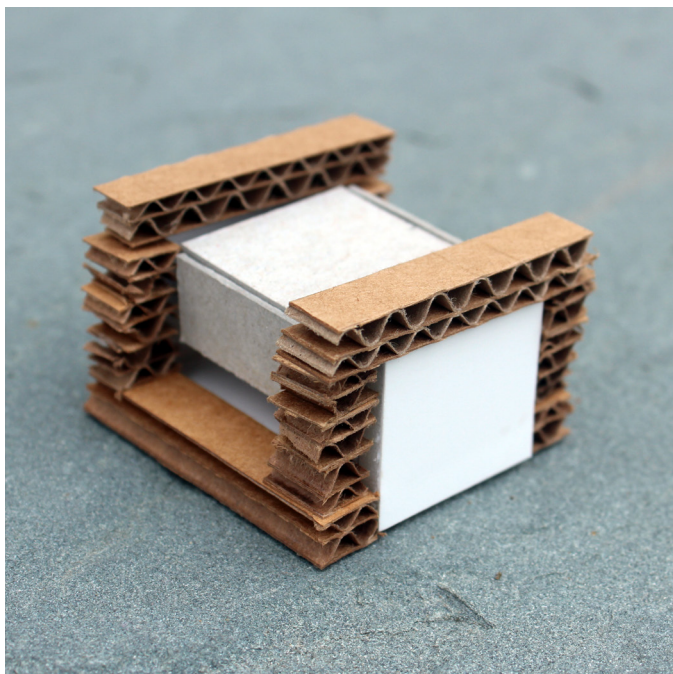
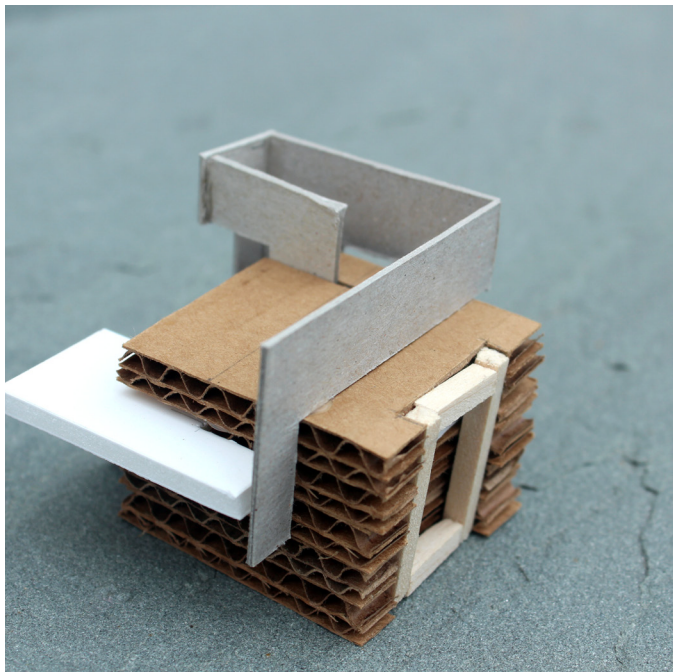
chipboard = dance hall

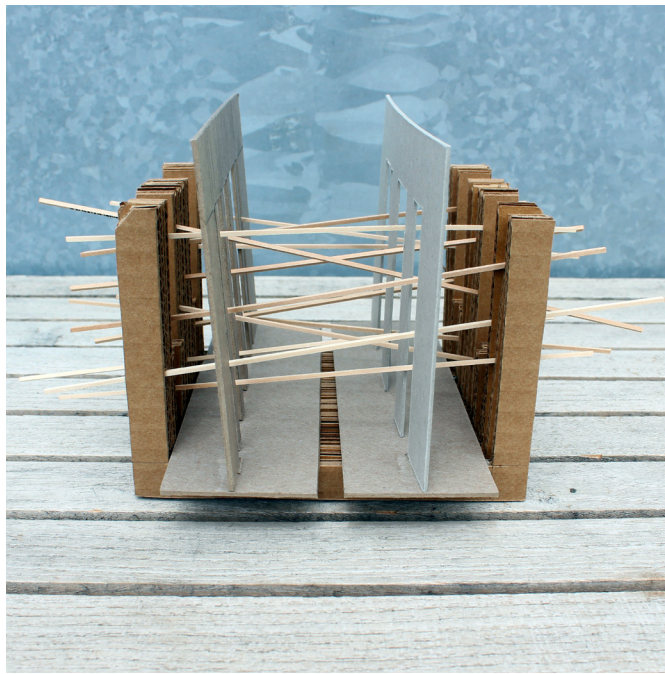
basswood = bath house





cardboard = pump house
foamcore = museum
chipboard = dance hall
basswood = bath house







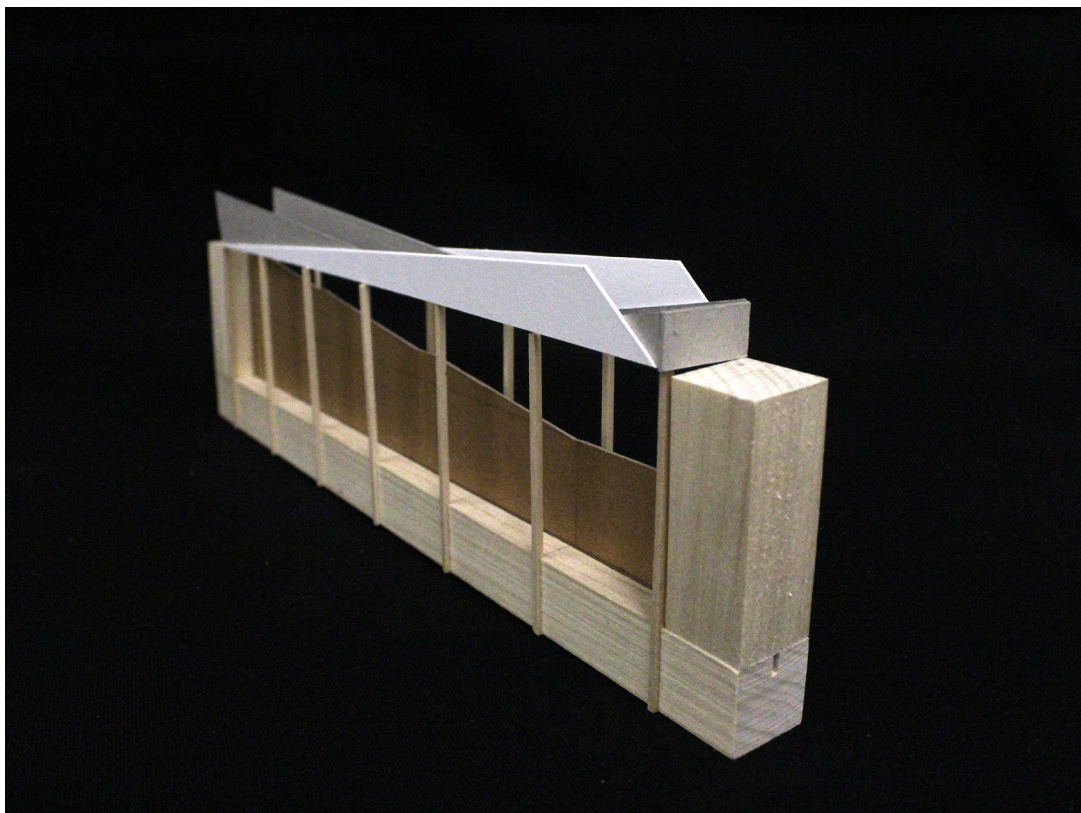
Bath House Studies

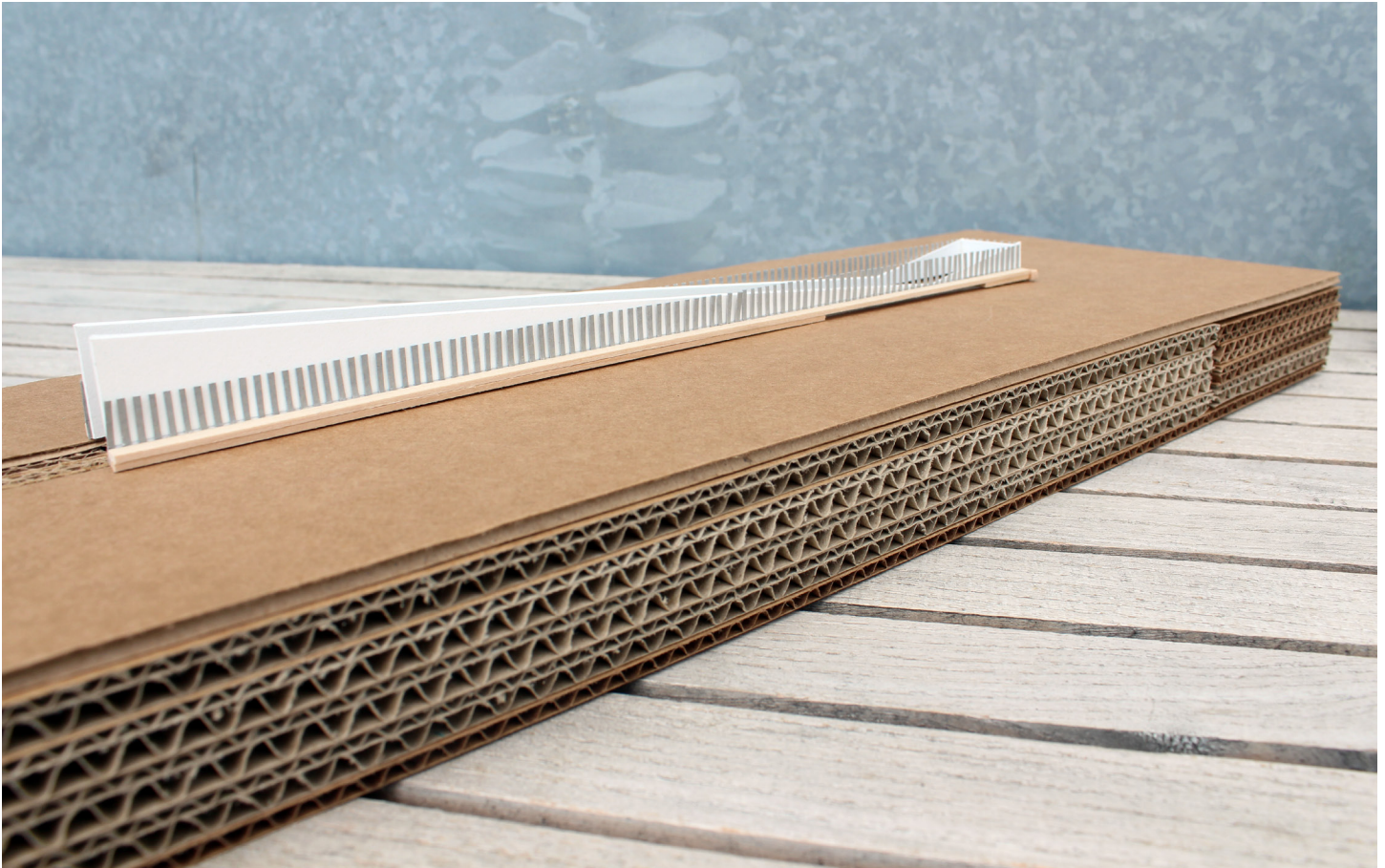
In order to better understand how the bath house interacts with its host, the addition to the Pump House, a textured shell with cardboard was created. The model (opposite page, top right) with the basswood sticks is an exploration of how a symmetrical space can contain elements of asymmetry informed by what happens on the opposite side.



Museum Entrance Study

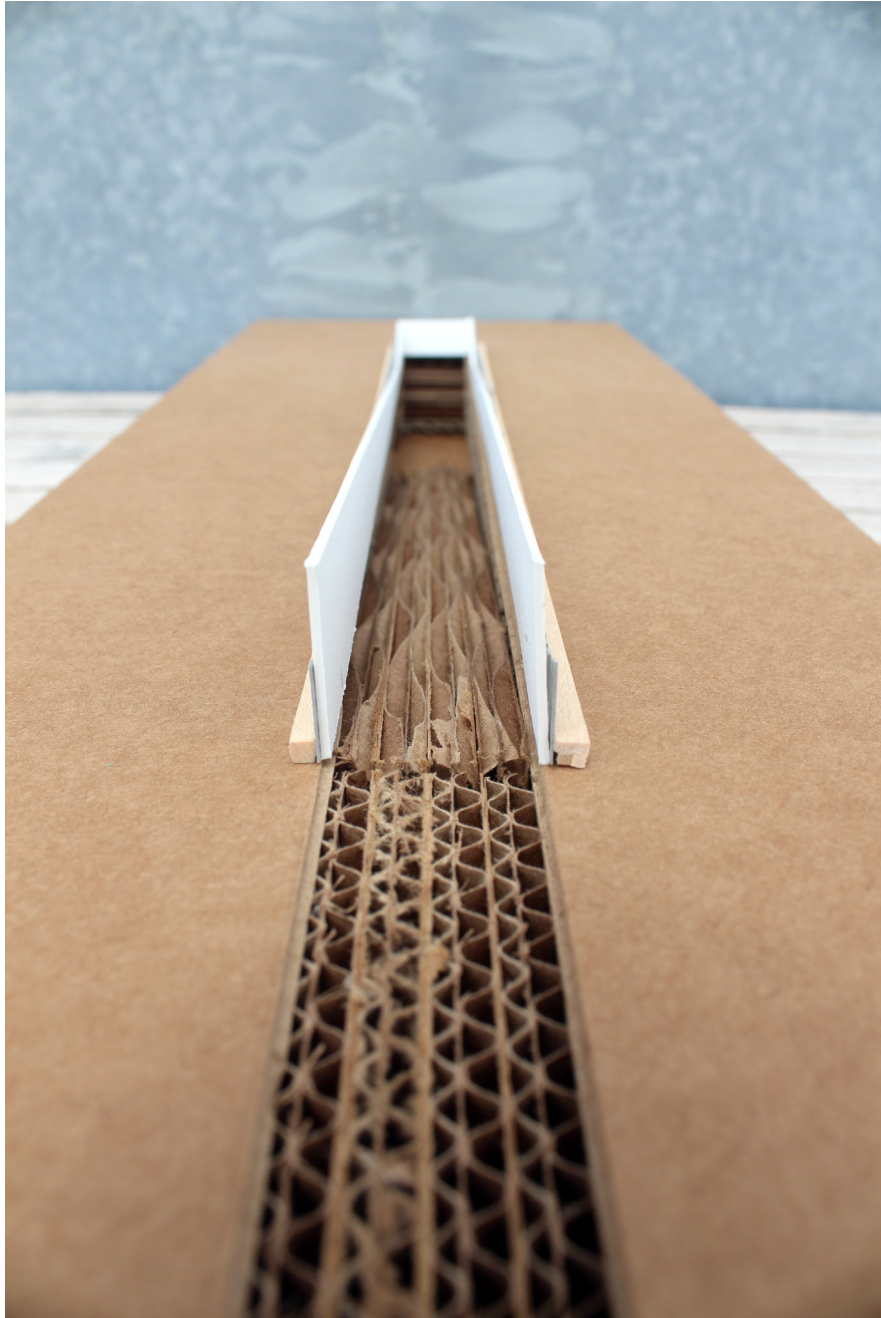
This model is an investigation of the first descent toward the museum's entrance. The ramp starts with a canal-like trench descending to the tunnel under the road and then through the pool. The ramp's railing provided an opportunity to indicate the beginning point and where the tunnel begins.

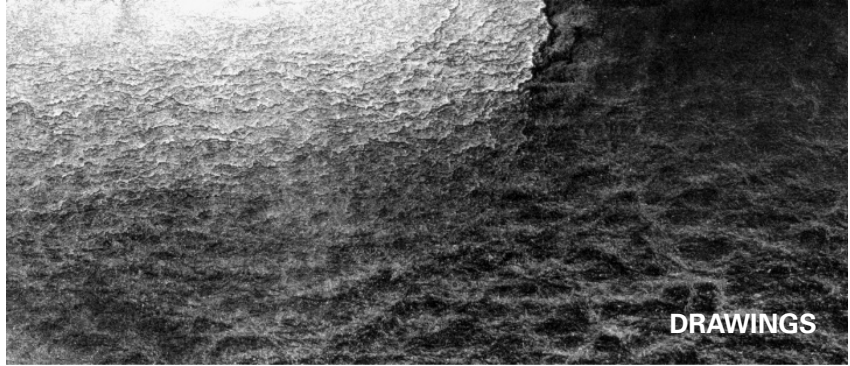


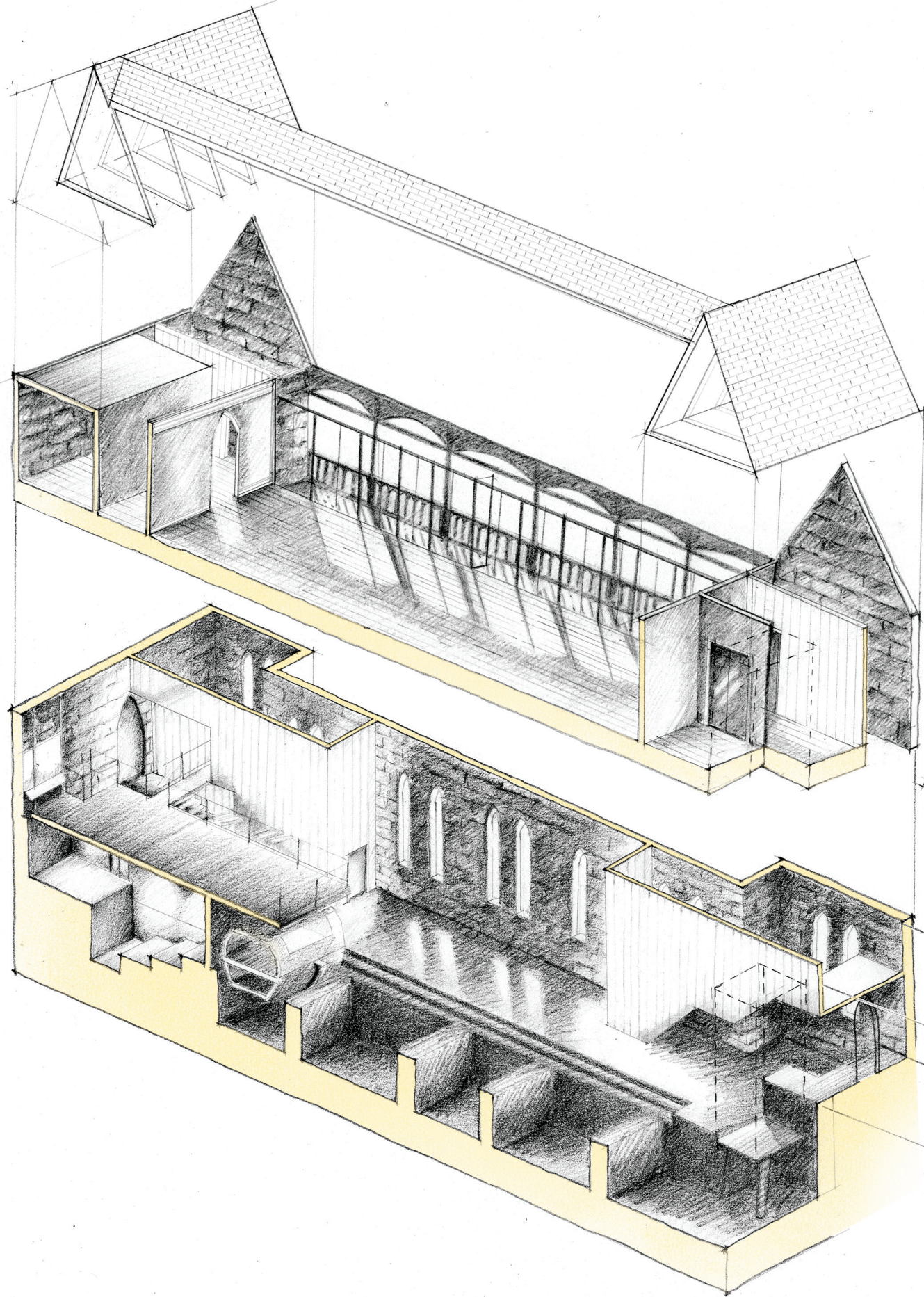


Museum Entrance Study

The museum's trench was further developed to show a clear indication of the museum entry's beginning point and where the tunnel begins. The steel fence goes along the entire length providing a 4' barrier where the wall drops down indicating the tunnel, and it also helps to connect the length of the wall. A solid bench surrounds the railing. The bench base is pulled back where there are views down into the bottom of the ramp.



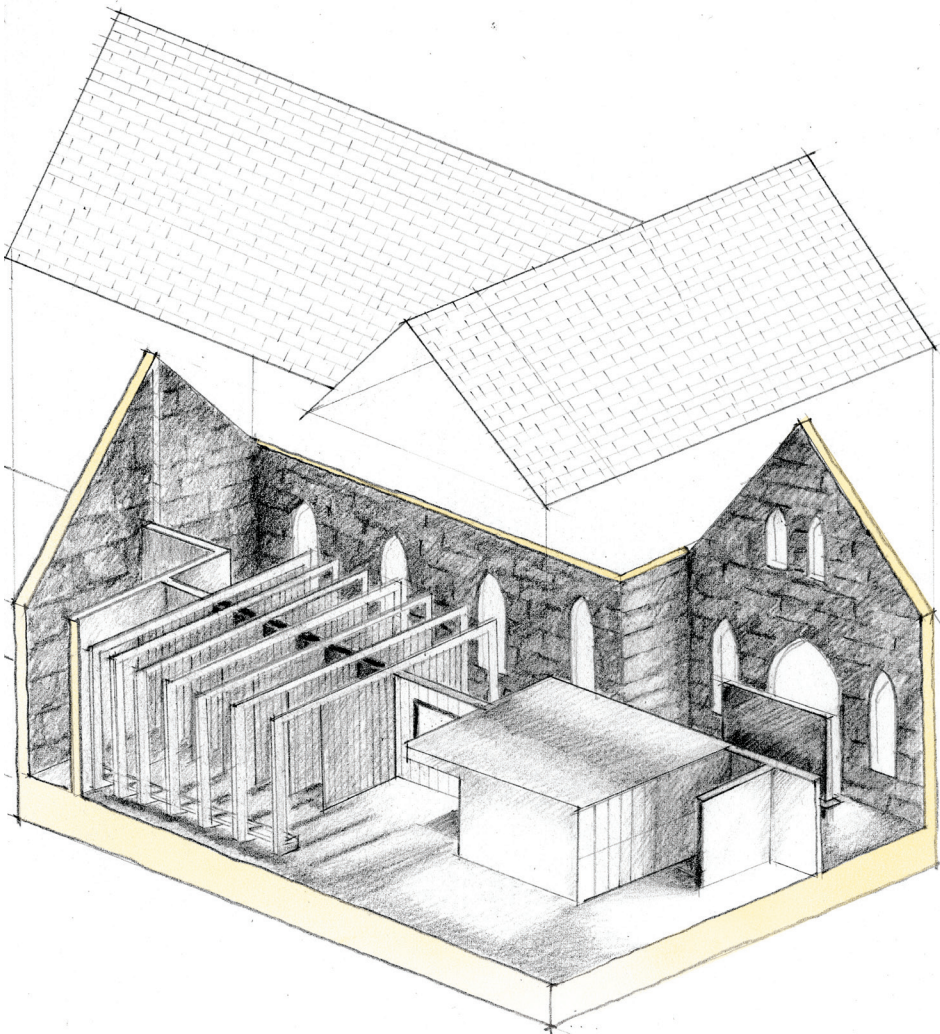


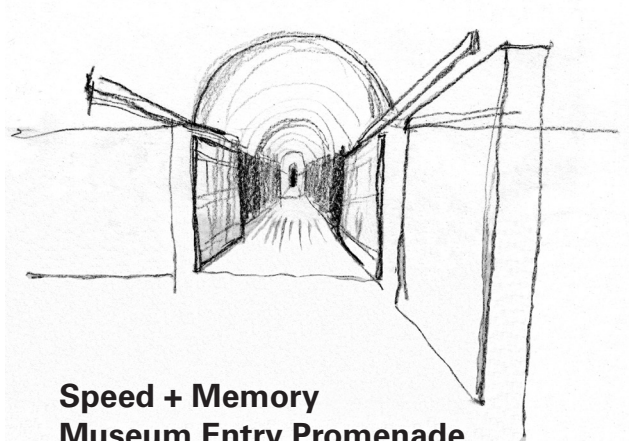


PUMP HOUSE

The Pump House was designed in 1883 by Colonel Wilfred Emory Cutshaw, Richmond's City Engineer from 1874-1870. Colonel Cutshaw was instrumental in creating public parks, including the adjacent Byrd Park, his largest public park project. Cutshaw's devotion to urban outdoor activities inspired me to replace the now defunct Feeder Canal with a public swimming pool.

The city of Richmond only has 8 outdoor public swimming pools. Such a unique pool combined with the Canal Museum and refurbished open air dance hall will make Pump House Park a lively destination within the surrounding complex of parks.



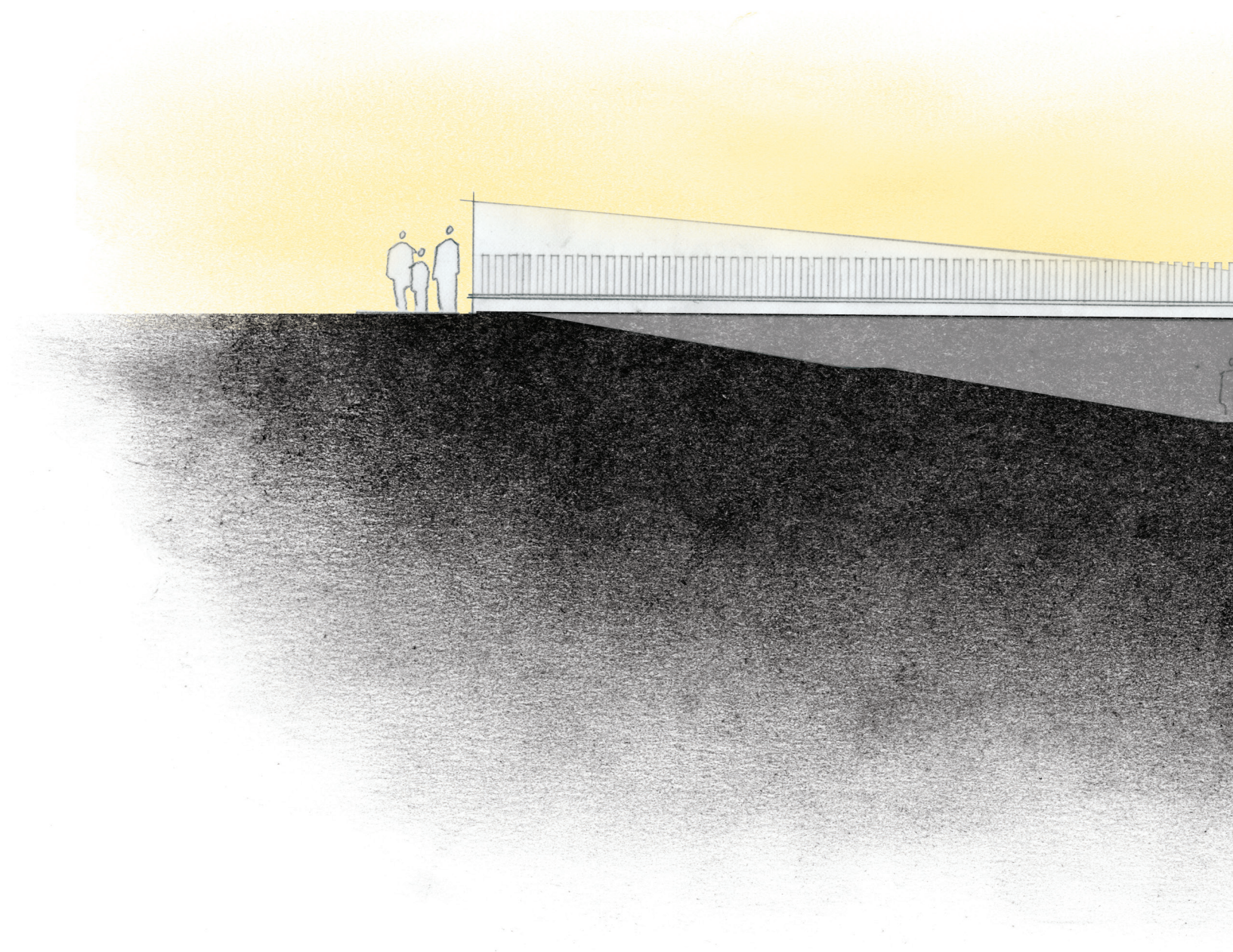


Speed + Memory

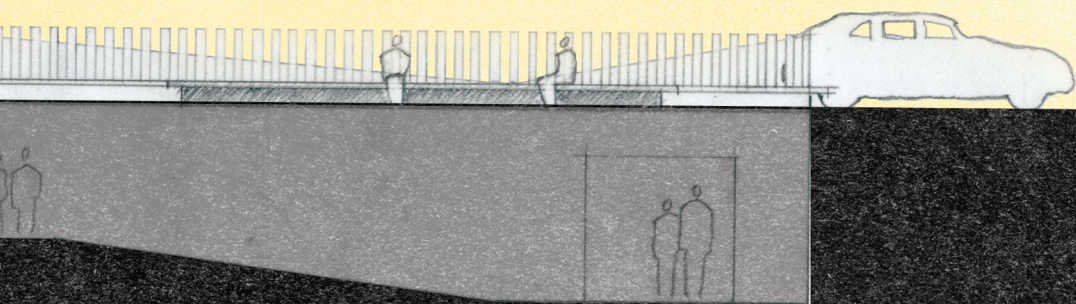
Museum Entry Promenade

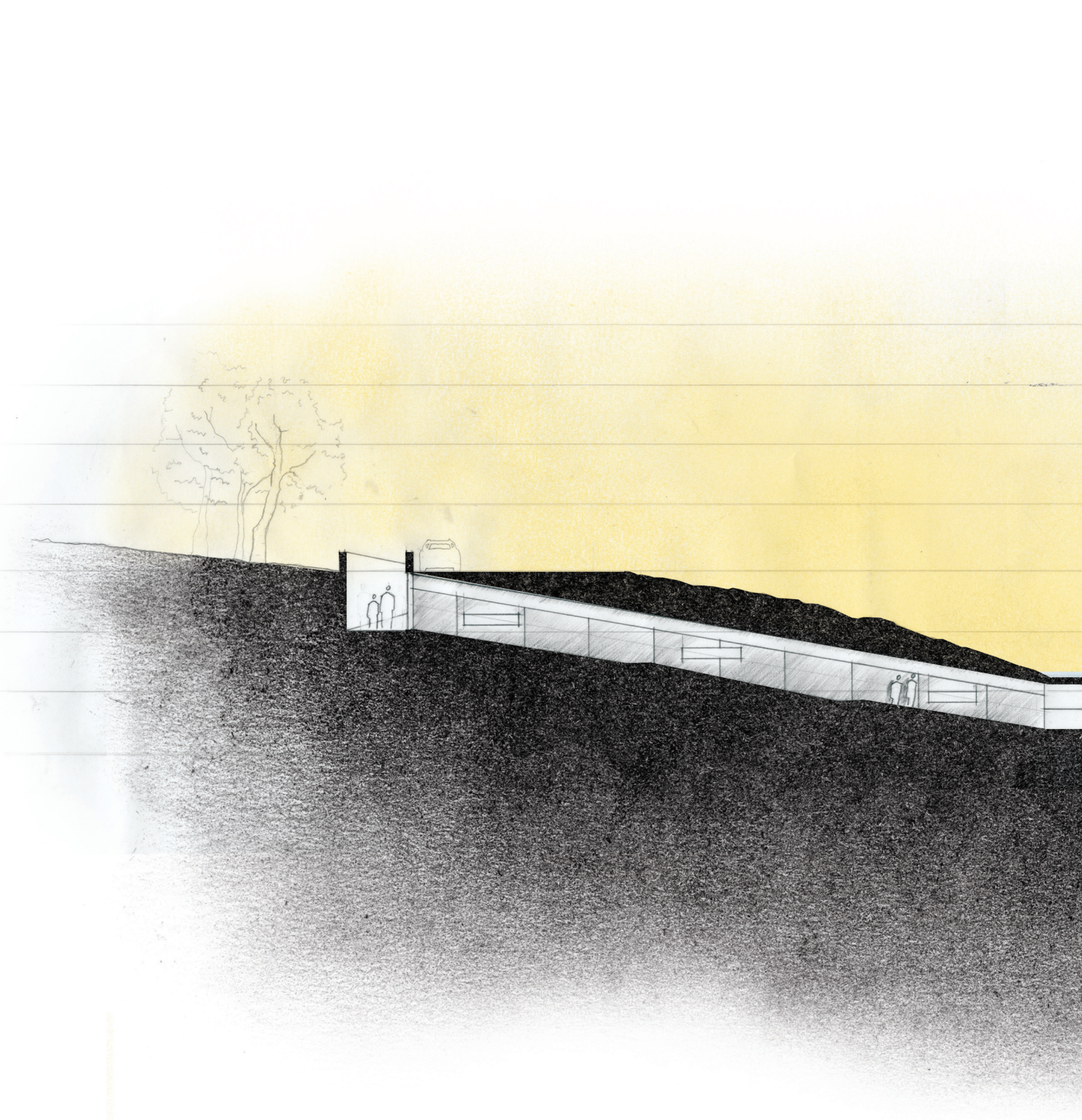
The museum entrance begins with a canal like descent. Experiencing a canal from this perspective enables visitors to imagine Irish immigrant and slave laborers manually digging into the earth for 196.5 miles from Richmond to Buchanan.

The tunnel transitions museum goers' path under the road and pool seating allowing the disparate functions to acknowledge each other without interference. The darkness of the tunnel gives way to the fantastic passage through the pool just under the water's surface. Visitors then enter the pump room through an opening that originally fed water to turbines from the feeder canal. This helps visitors understand the Pump House's interaction with the canal.

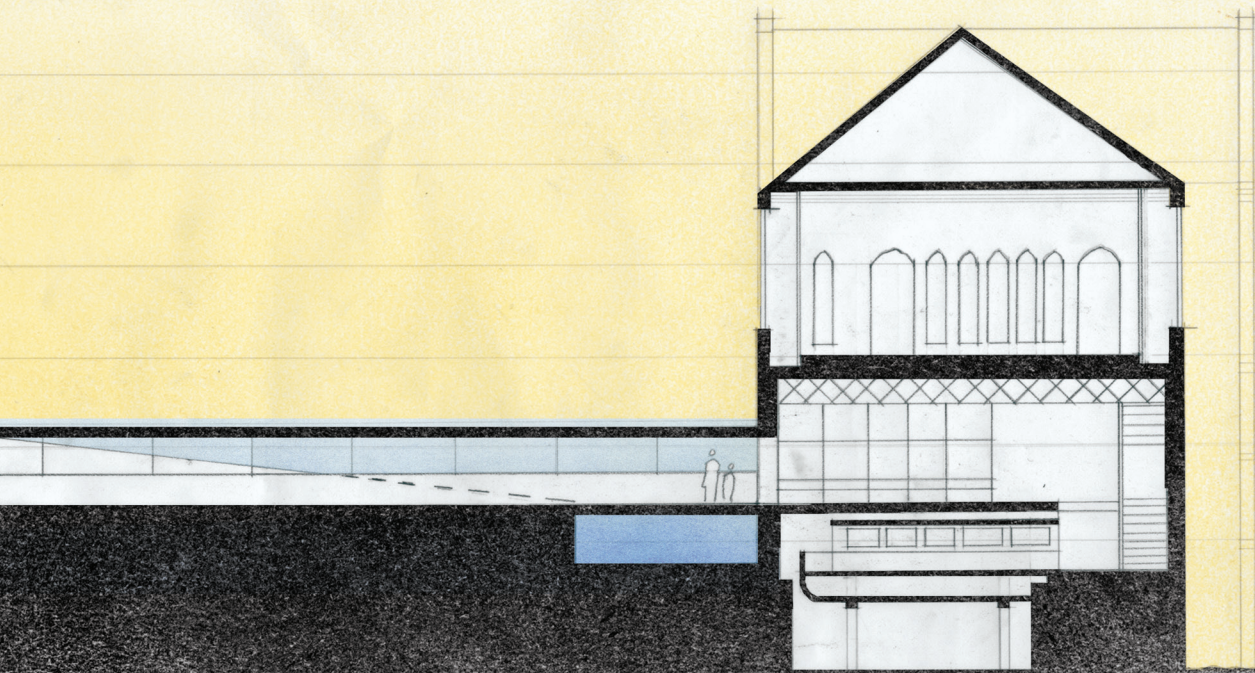


section through trench connecting to tunnel





section through tunnel, swimming pool and museum



MUSEUM

The Pump Room houses the Canal Museum and serves as a museum exhibit itself. The museum's design respects the now abandoned industrial function by taking only a small footprint and leaving the austere concrete and granite largely untouched. The fire rated stairwells are encased in channel glass to maximize natural light with a watery glow.

The museum contains elements of all three interaction studies. The entry sequence is an intervention upon the land and the building, the museum itself is inserted into one third of the pump room, and the museum's exhibitions are installed so they do not touch the pump room walls.

Programming

Department James River and Kanawha Canal Museum (Pump Room level)

Description of Space

stimulating and engaging experience for visitors
high contrast between dark and light

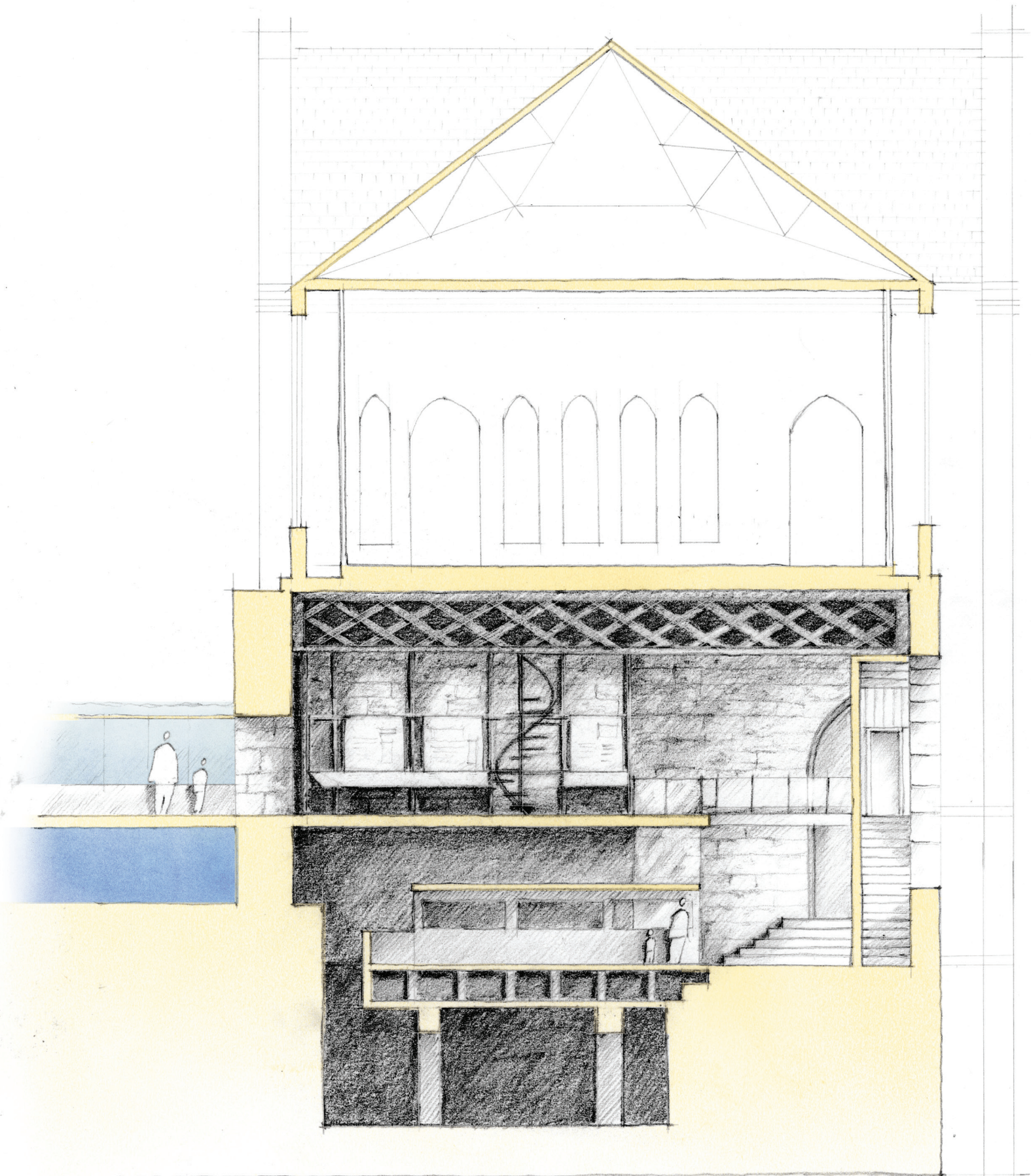
Space Needs	Size	Acoustical Privacy	Visual Privacy	Adjacencies	Lighting
Information Desk	150 sq ft	medium	low	entry	visually stimulating
Gallery	750 sq ft	medium	low	reception	point/track system
Theater	600 sq ft	high	high	gallery	low/egress, overhead projector
Vertical Lift	64 sq ft	n/a	n/a	gallery + theater	n/a
Elevator	64 sq ft	n/a	n/a	dance hall	n/a

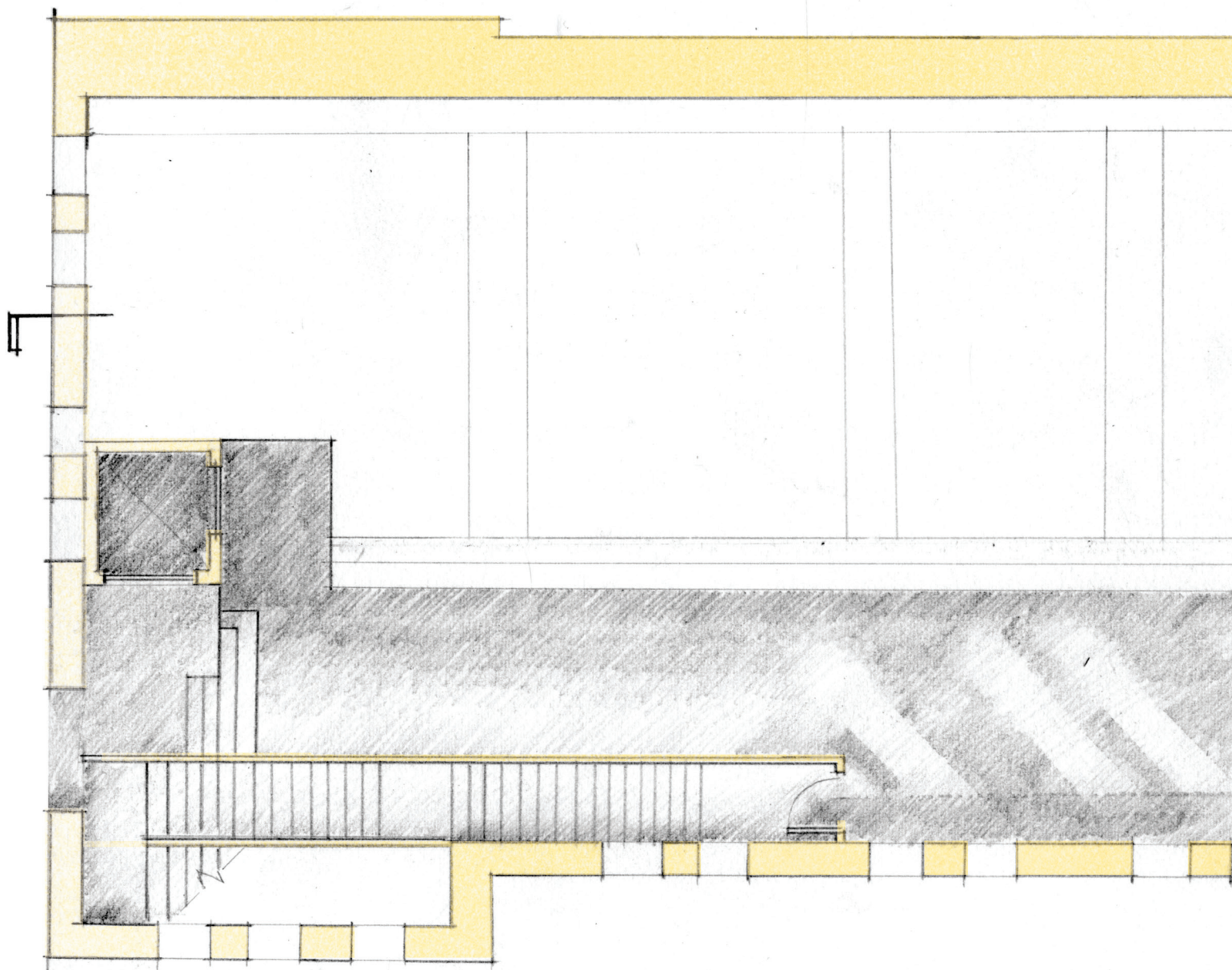
Department James River and Kanawha Canal Museum Administrative Office (Dance Hall level)

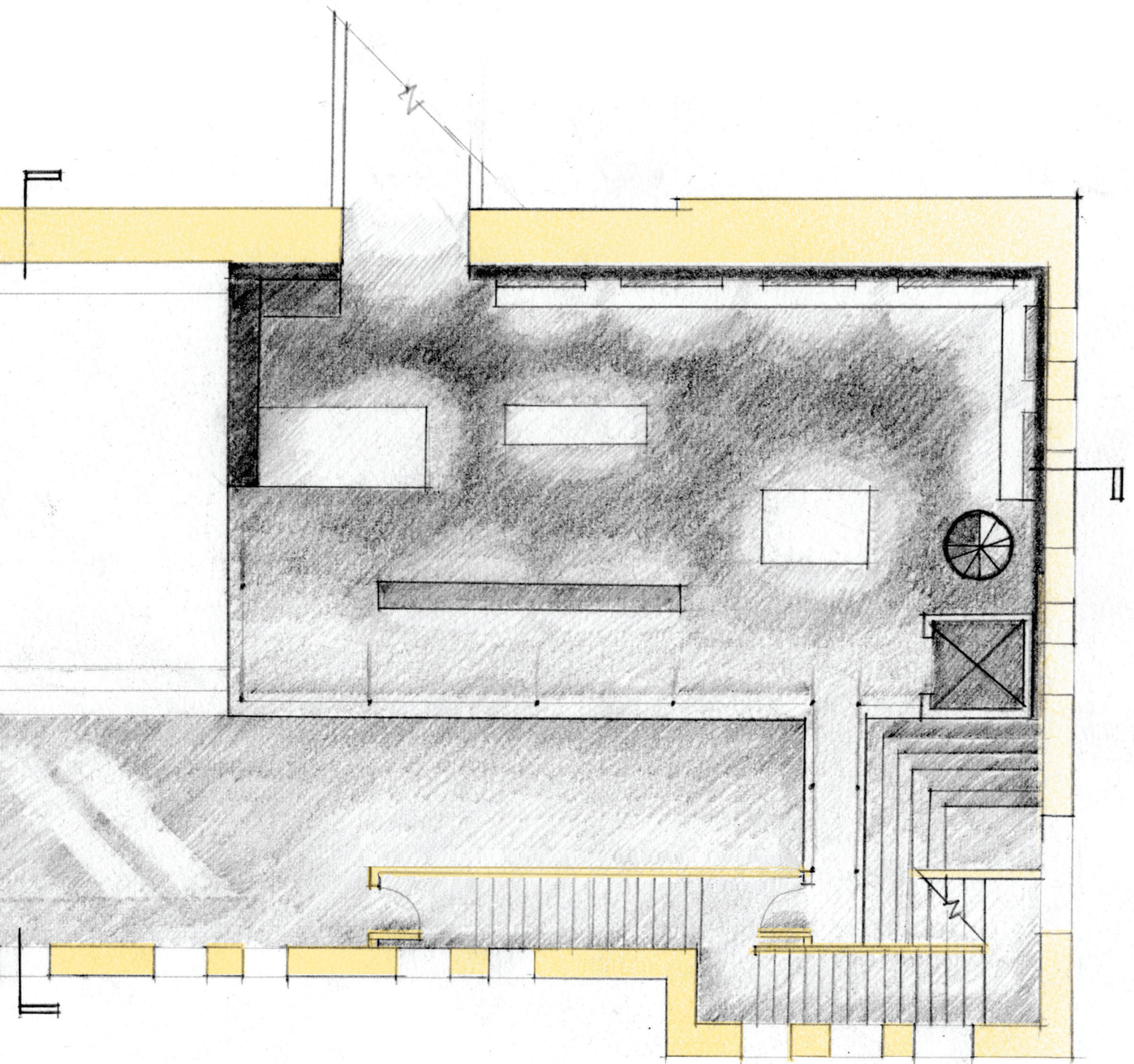
Description of Space

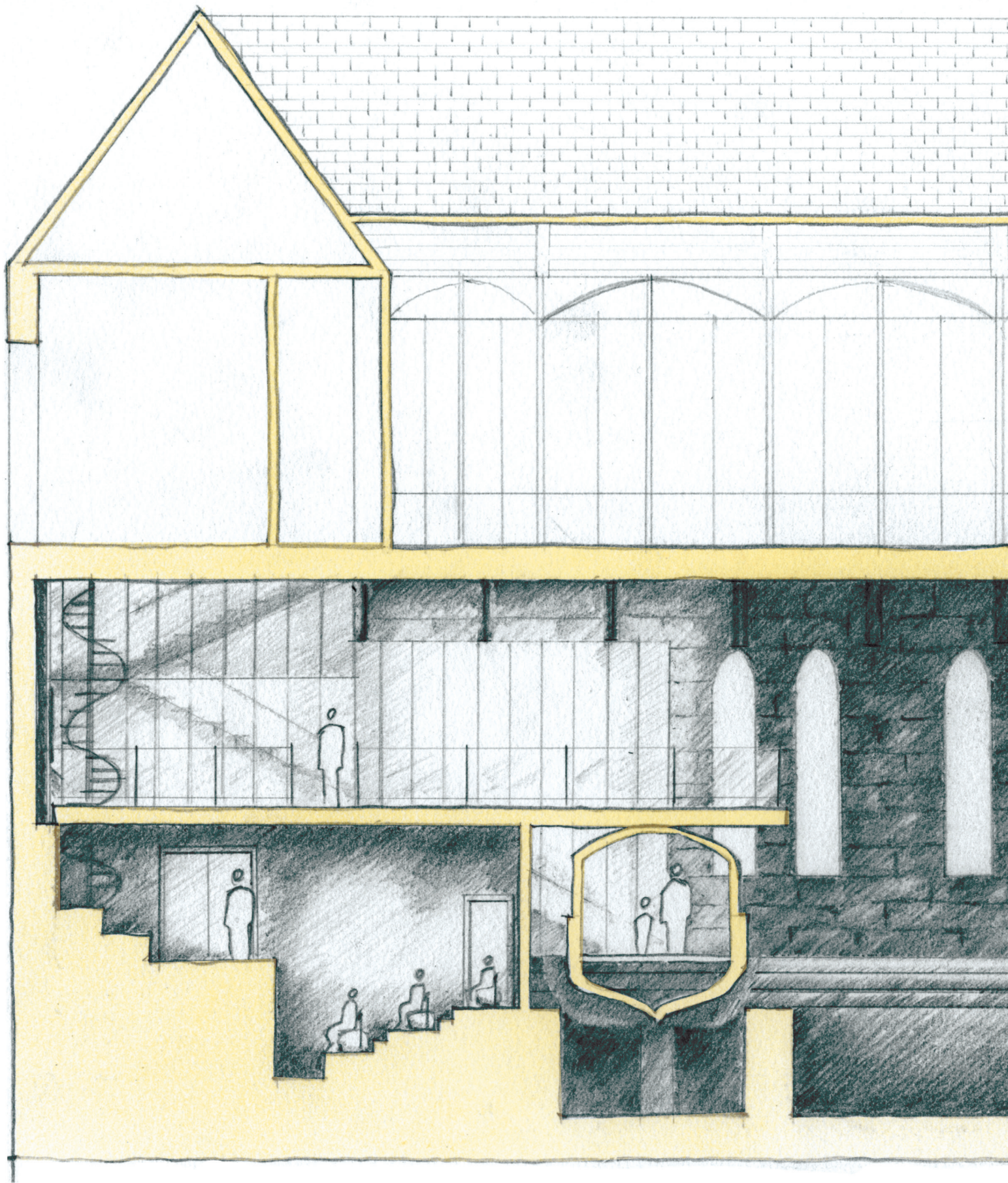
A quiet, organized place for tasks related to running the museum.

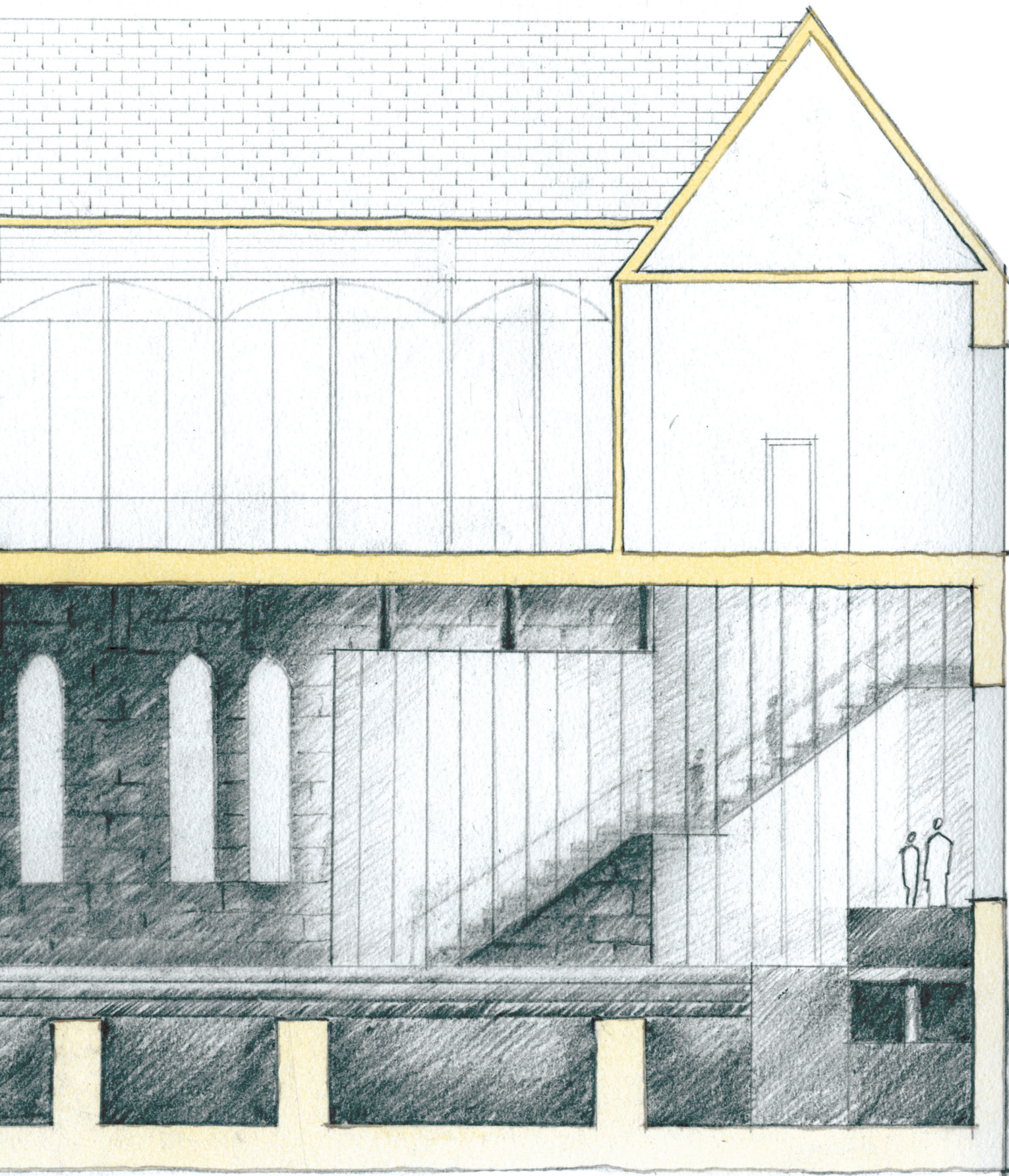
Space Needs	Size	Acoustical Privacy	Visual Privacy	Adjacencies	Lighting
3 desk/work areas	500 sq ft	low inside, high outside	medium	gallery + event	high
shelf storage	20 lin ft	n/a	n/a	n/a	high
locked file storage	10 lin ft	n/a	n/a	n/a	n/a













An open-air dance hall was part of Cutshaw’s original design. Richmonders arrived by canal boat from downtown Richmond. This level contains the museum offices, restrooms and a catering space. The dance hall is part of the museum except when events are taking place.

The dance hall’s design is derived from the insertion studies. It has a raised, acoustically insulated floor to prevent sound from interfering with the museum. The original floor is exposed five feet away from the railings. This step down coincides with new glass doors that can shut completely to keep out the elements. When open, the doors create small “rooms” for party-goers to have a sense of intimacy.

Programming

Department Event Space

Description of Space

A reception hall for events and parties
Host up to 150 people
Open air connection to the park

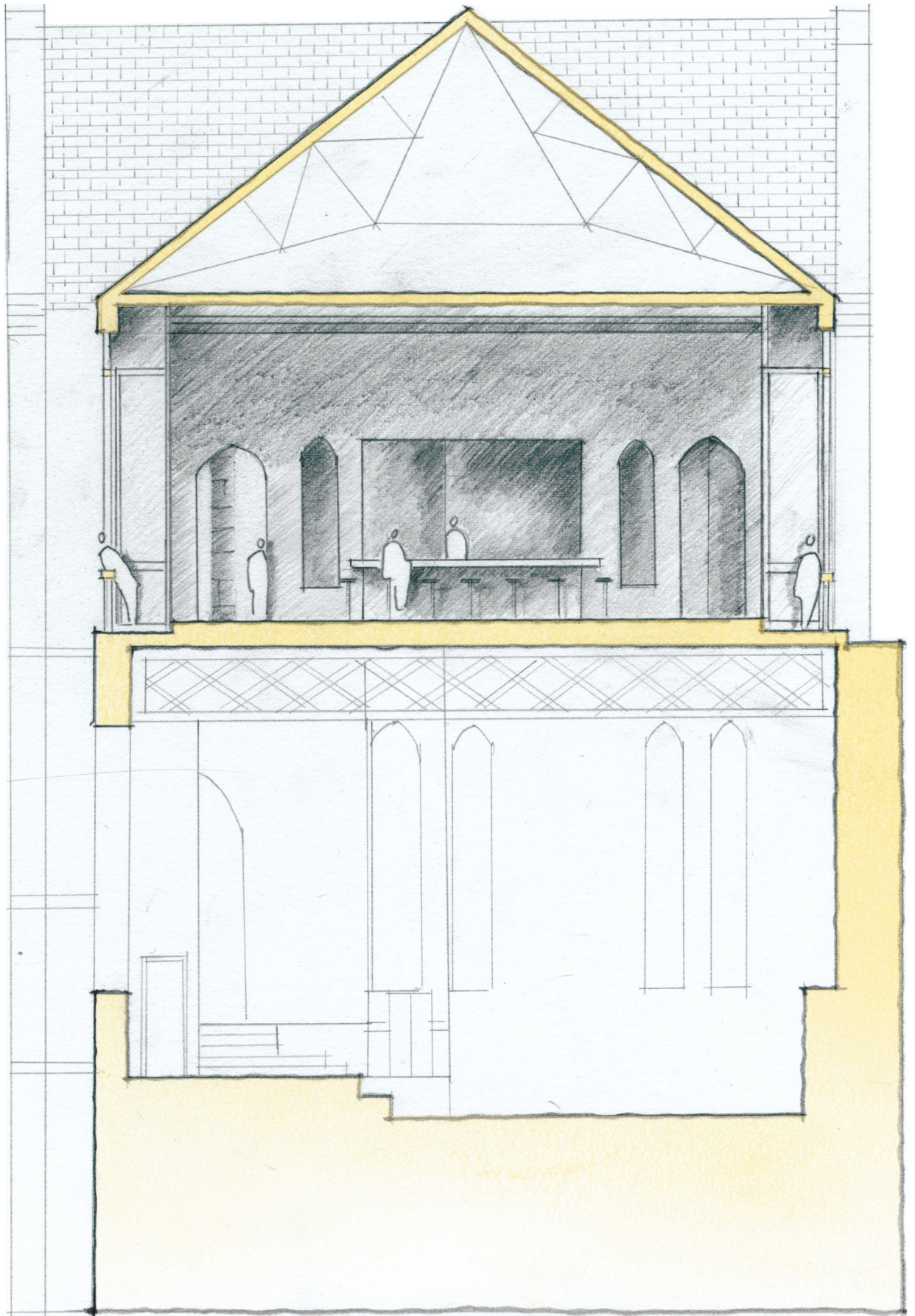
Space Needs	Size	Acoustical Privacy	Visual Privacy	Adjacencies	Lighting
Catering Area	500sq ft	medium	medium	elevator	overhead
Bar Area	150 sq ft	medium	low	catering & reception	overhead
Reception Area & Dance Floor	2500 sq ft	low	low	restrooms bar	overhead & chandeliers
Music Area	250 sq ft	low	low	reception	overhead
Storage	300 sq ft	n/a	low	reception	motion sensor

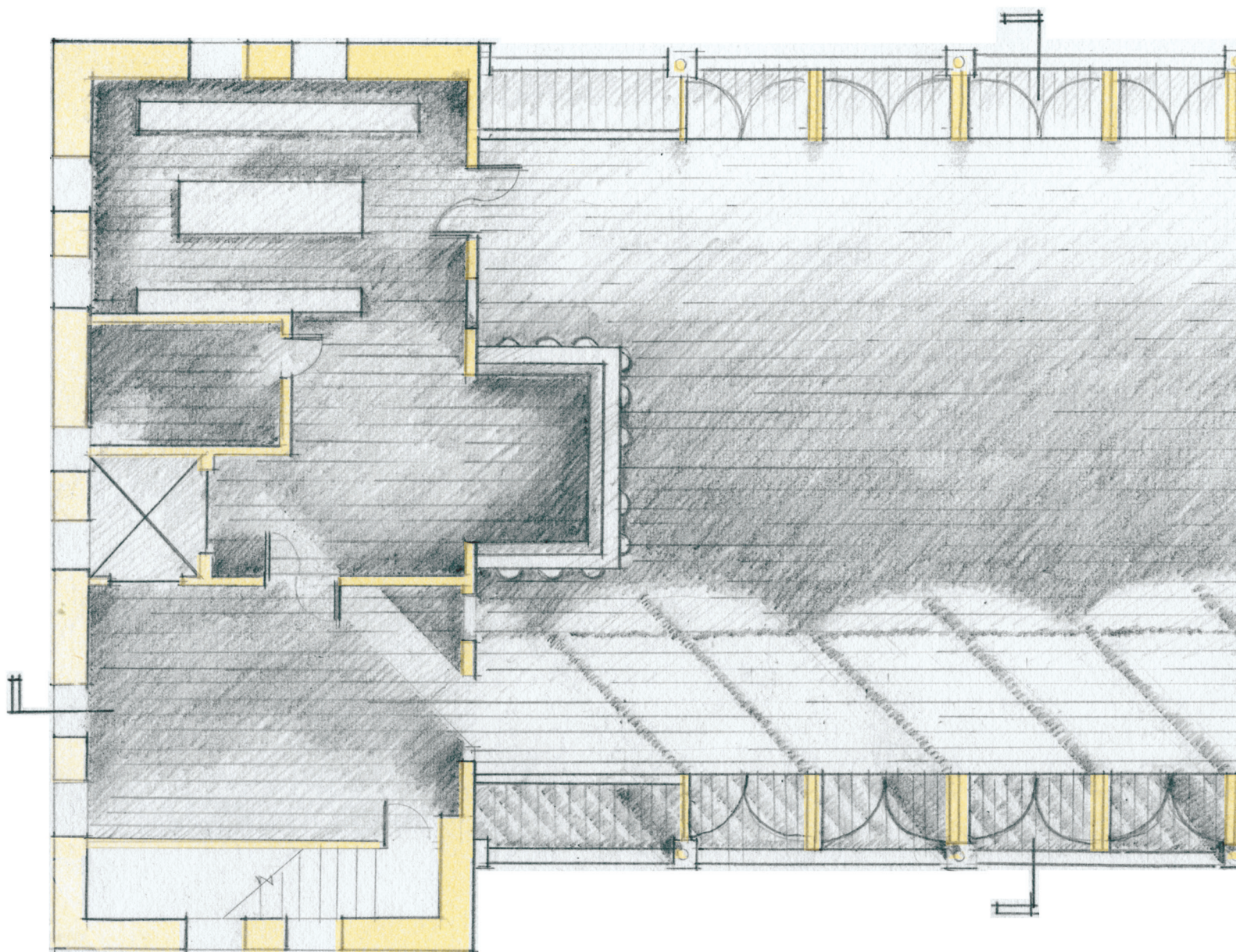
Department Restrooms shared between James River and Kanawha Canal Museum and event space

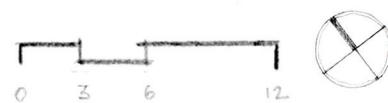
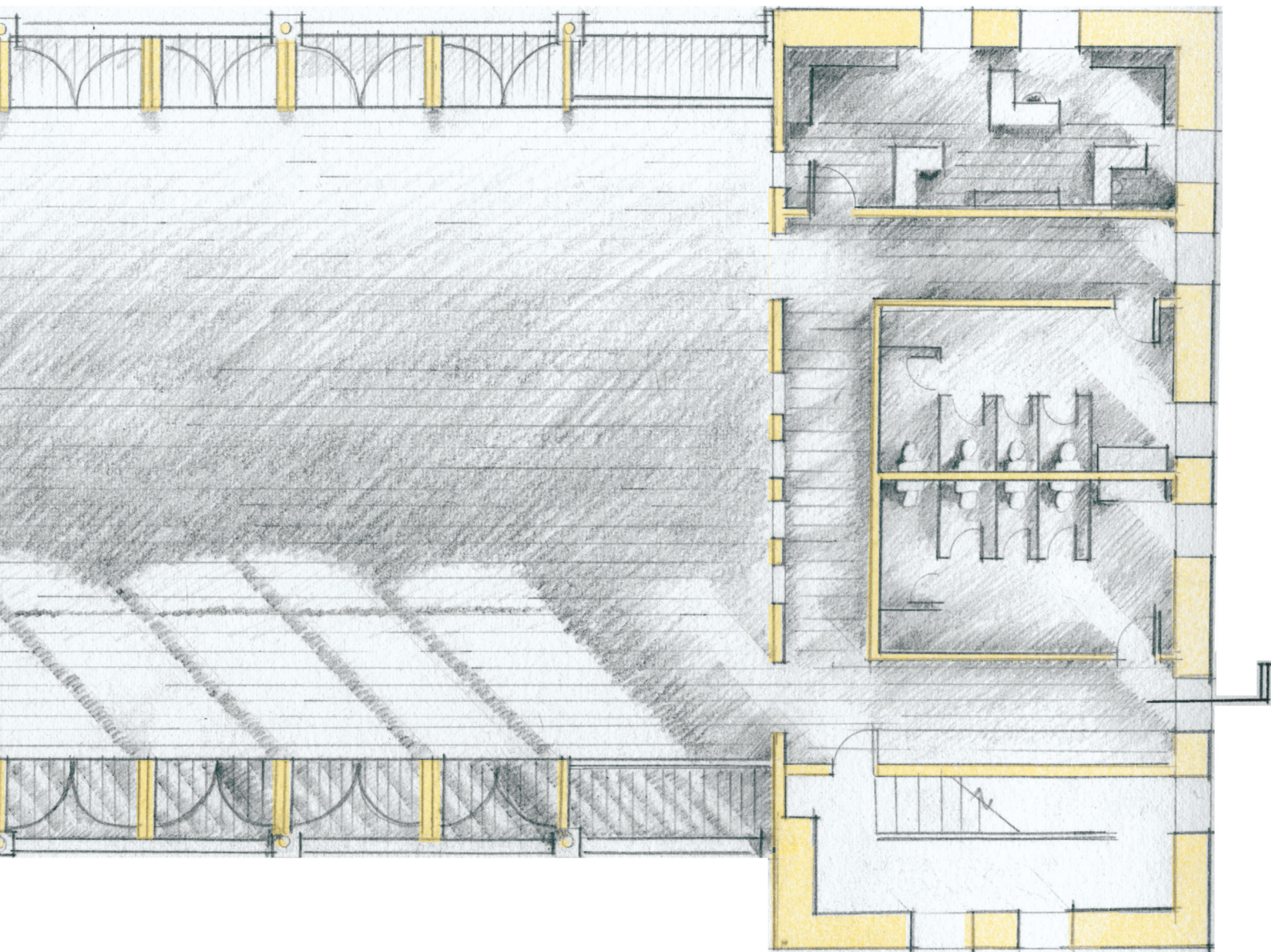
Description of Space

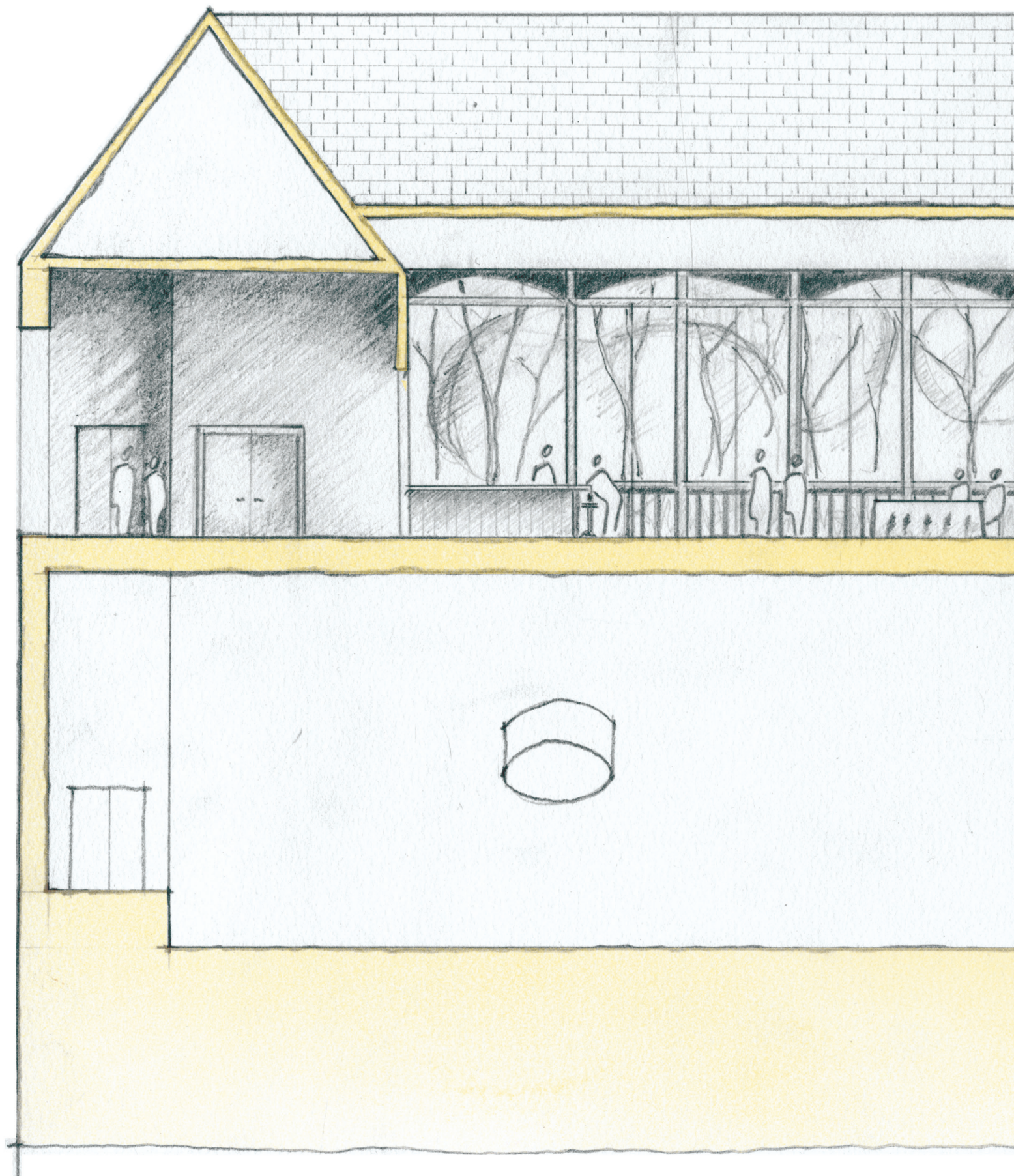
Clean

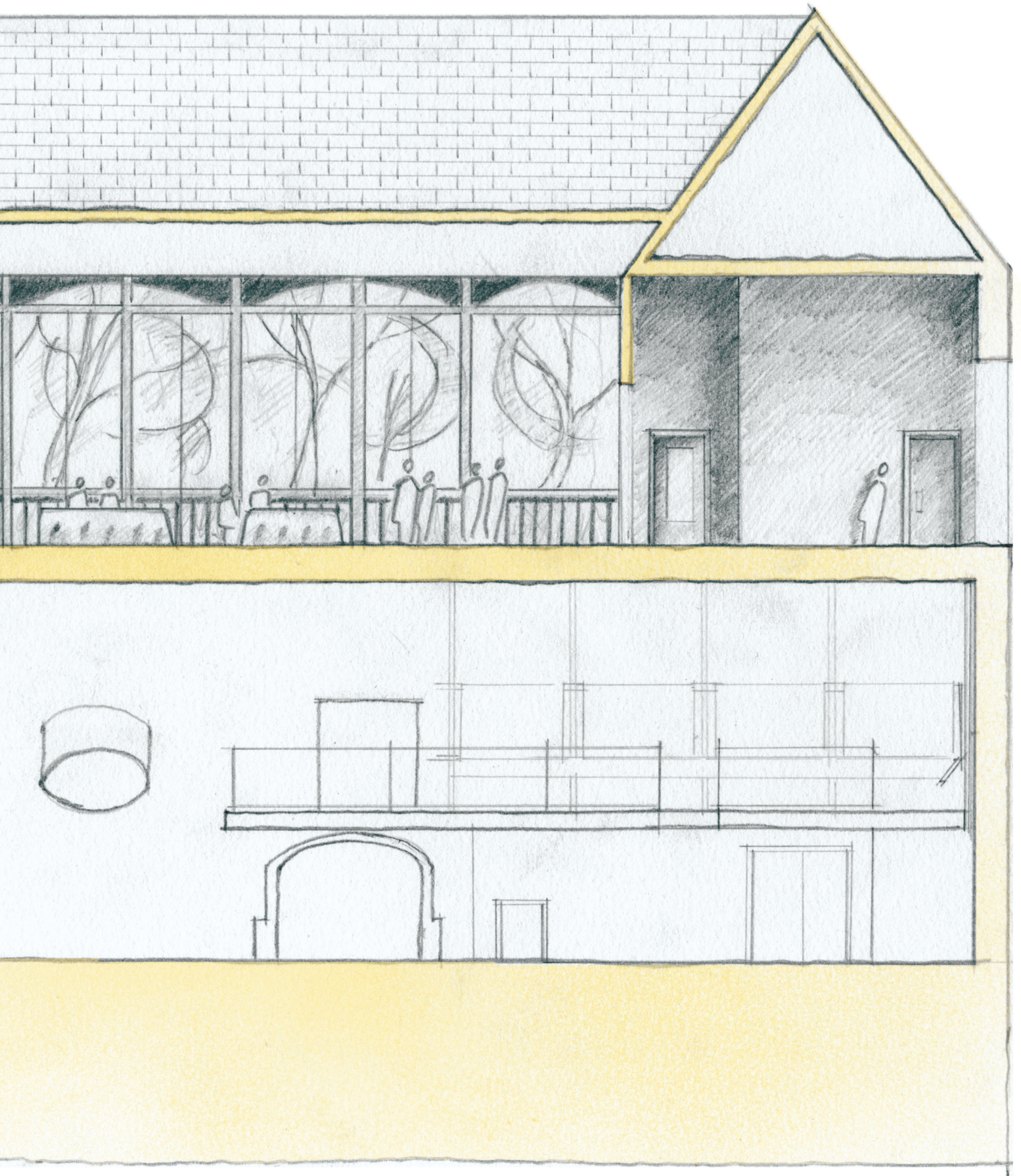
Space Needs	Size	Acoustical Privacy	Visual Privacy	Adjacencies
Museum + Event Men’s	300 sq ft	high	high	gallery + event
Museum + Event Women’s	300 sq ft	high	high	gallery + event











BATH HOUSE

The 1901 addition was created for the development of electric water pumping technology used in the pump house that supplies water to Richmond today. To preserve and highlight the fact that this addition served a separate function from the Pump House, it continues to contain a separate and external function. This part of the building contains the bath house for the swimming pool.

The bath house’s design was created from the installation studies in an effort to fill the space without touching the granite walls. The men’s and women’s entrances are separate and keep the original sets of doors so close together from being redundant. The third entrance to the addition is an additional handicap accessible entrance to the museum and dance hall because it is adjacent to the elevator. This entrance is completely separate from the bath house, except for a service door to the storage area.

The thick granite walls keep the interior of the Pump House much cooler when it is hot outside. This is the perfect atmosphere for a reprieve from a hot summer’s day of swimming. Lighting is purposely kept low to give a sense of being in a spa or sauna rather than a locker room

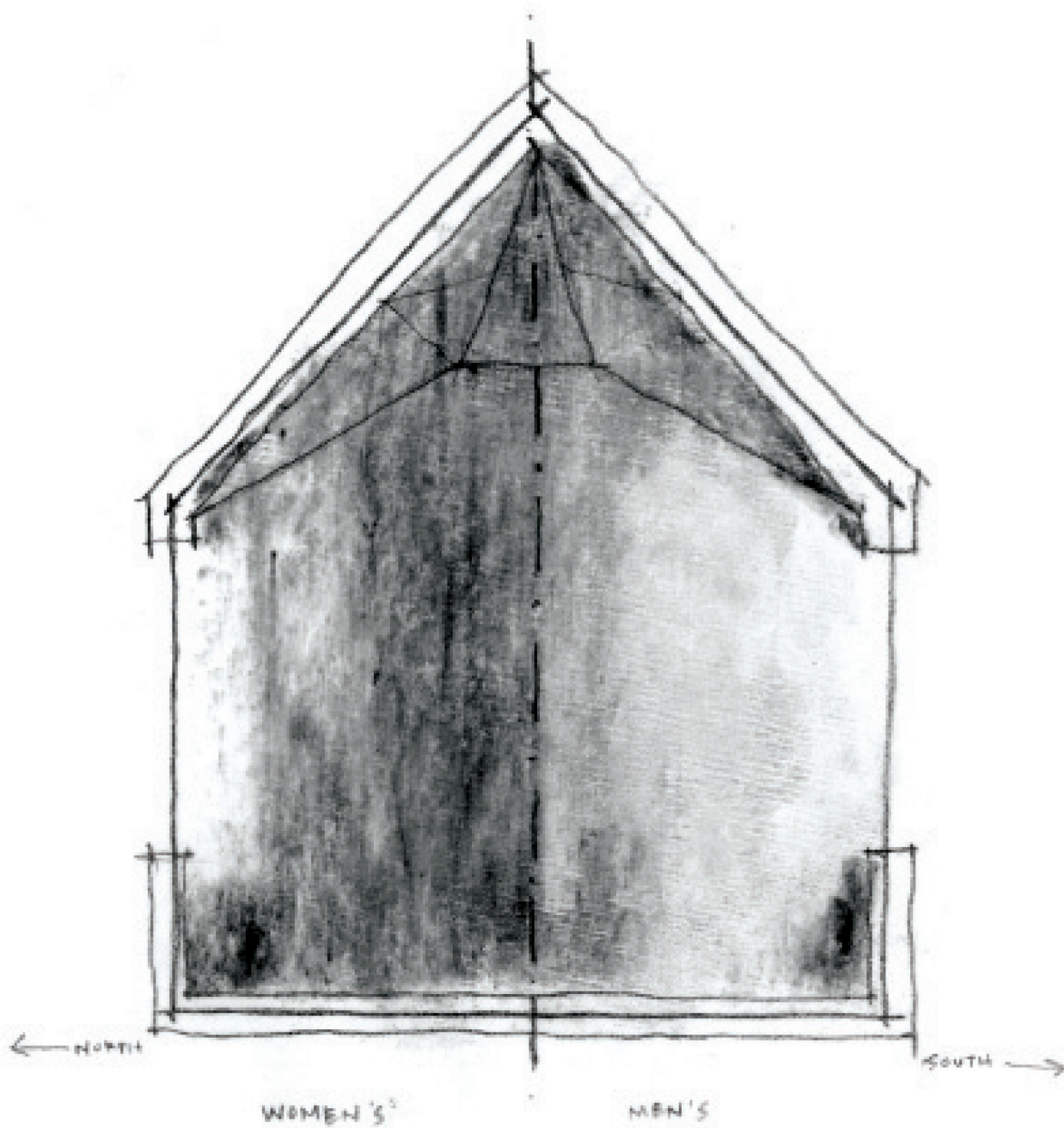
Programming

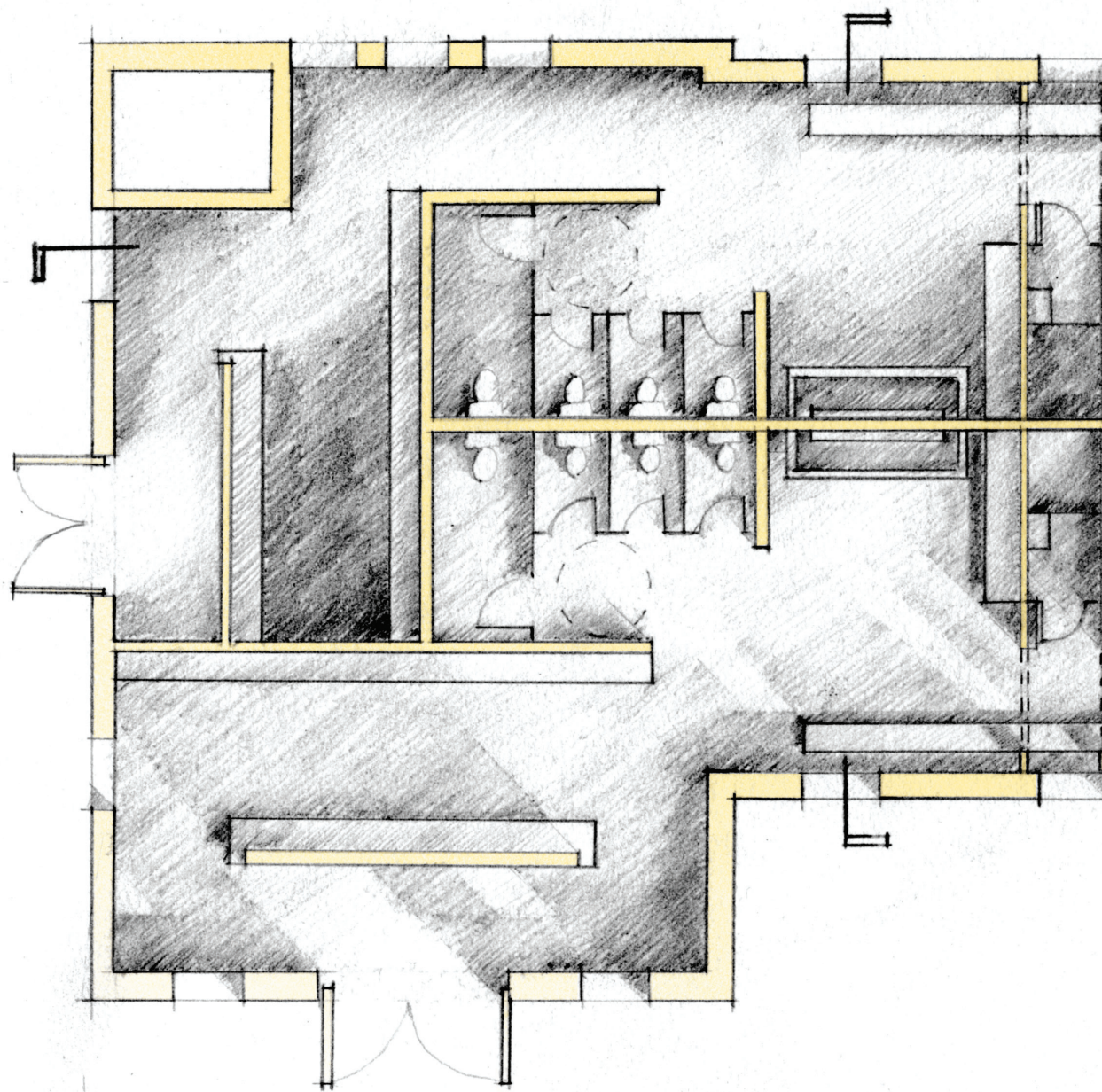
Department Bath House

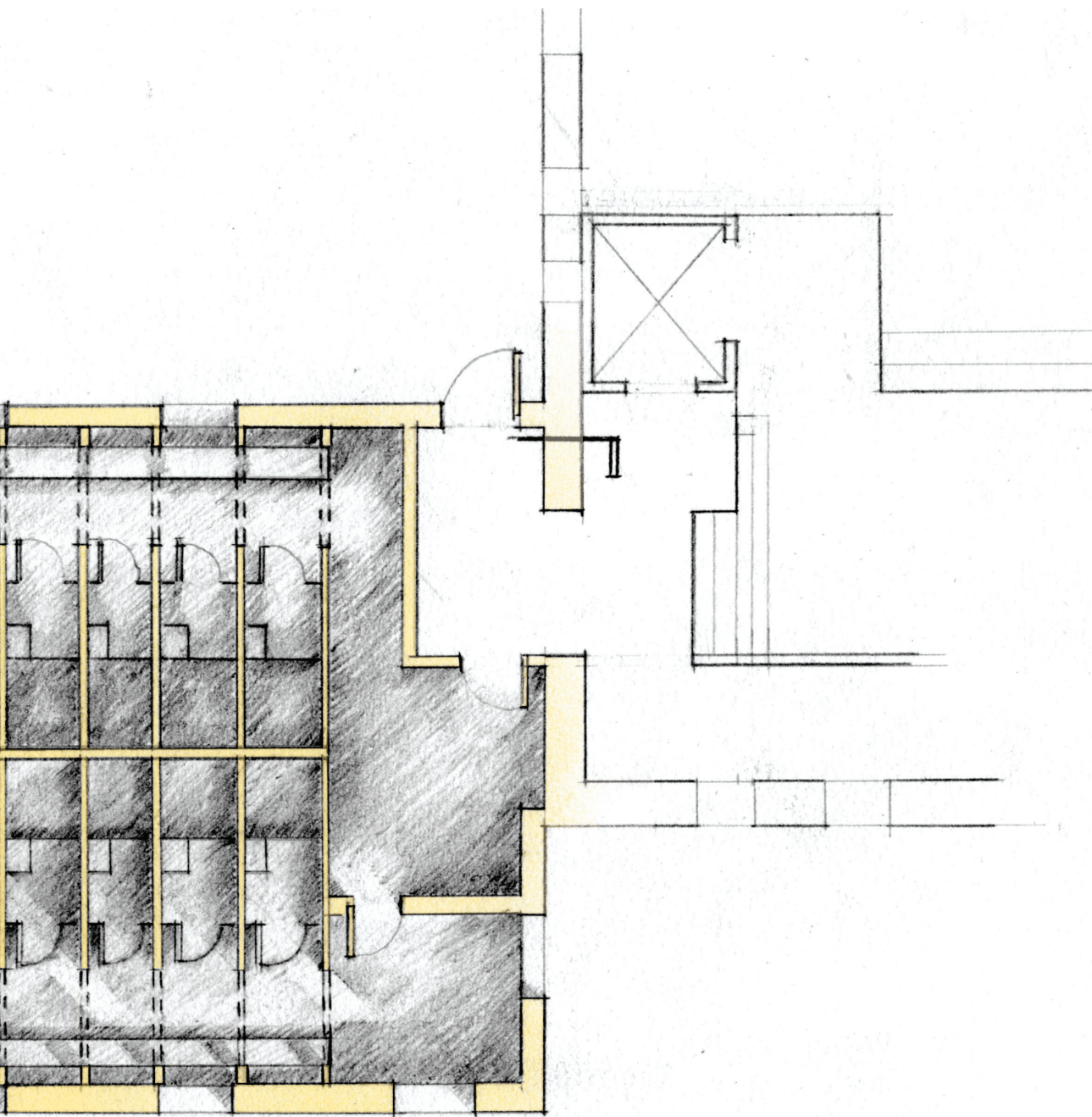
Description of Space

Separate entrances for men and women
both sides equal in size
dark and cool

Space Needs (per side)	Size	Acoustical Privacy	Visual Privacy	Adjacencies	Lighting
showers	500 sq ft	low	high	lockers & toilets	ambient & overhead
toilets	150 sq ft	high	high	lockers & showers	overhead
lockers	18 lin ft	n/a	n/a	bench	ambient & overhead
benches	30 lin ft	n/a	n/a	lockers & showers	ambient & overhead
storage	100 sq ft	n/a	high	men's & women's sides	motion sensor

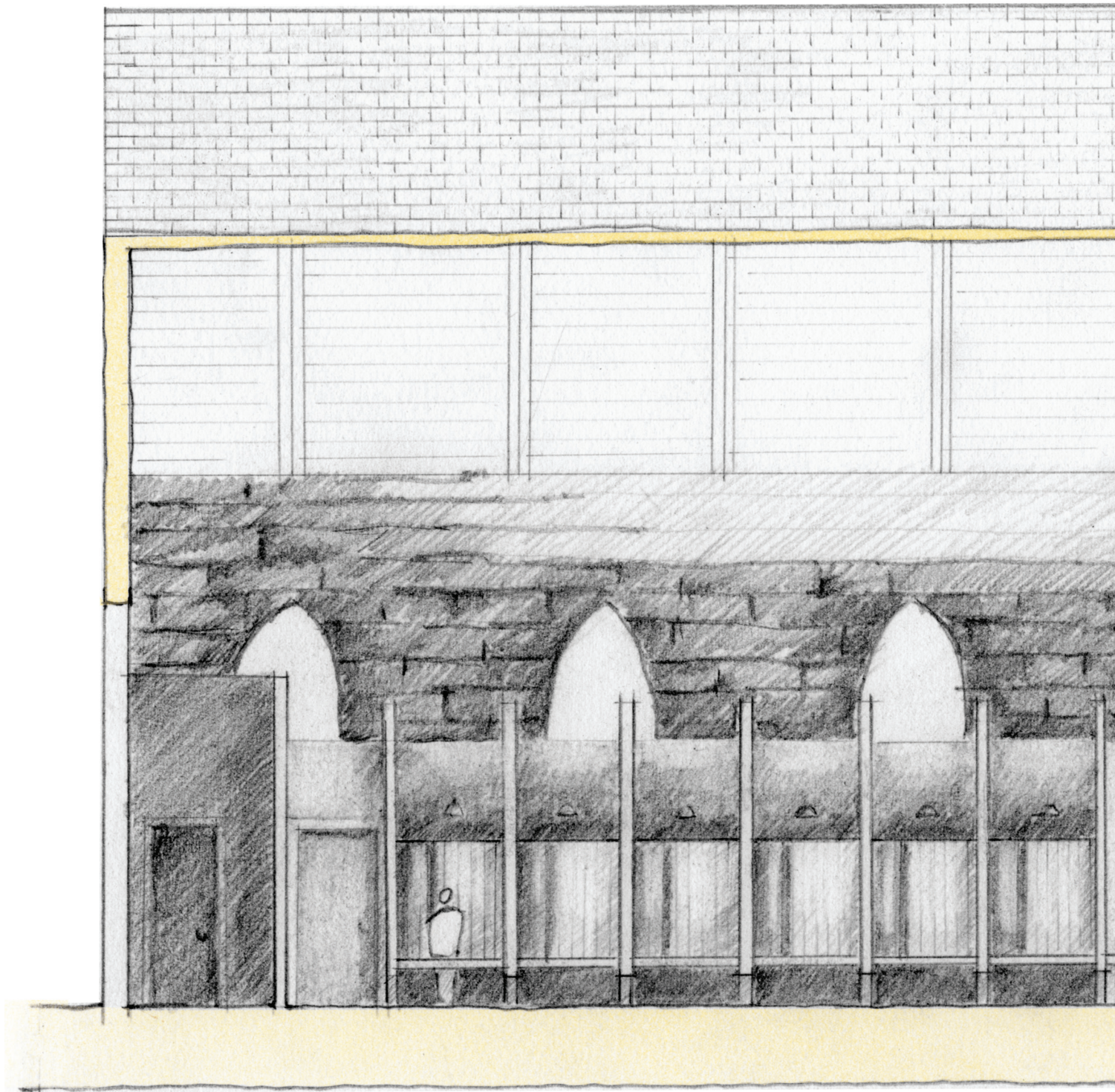


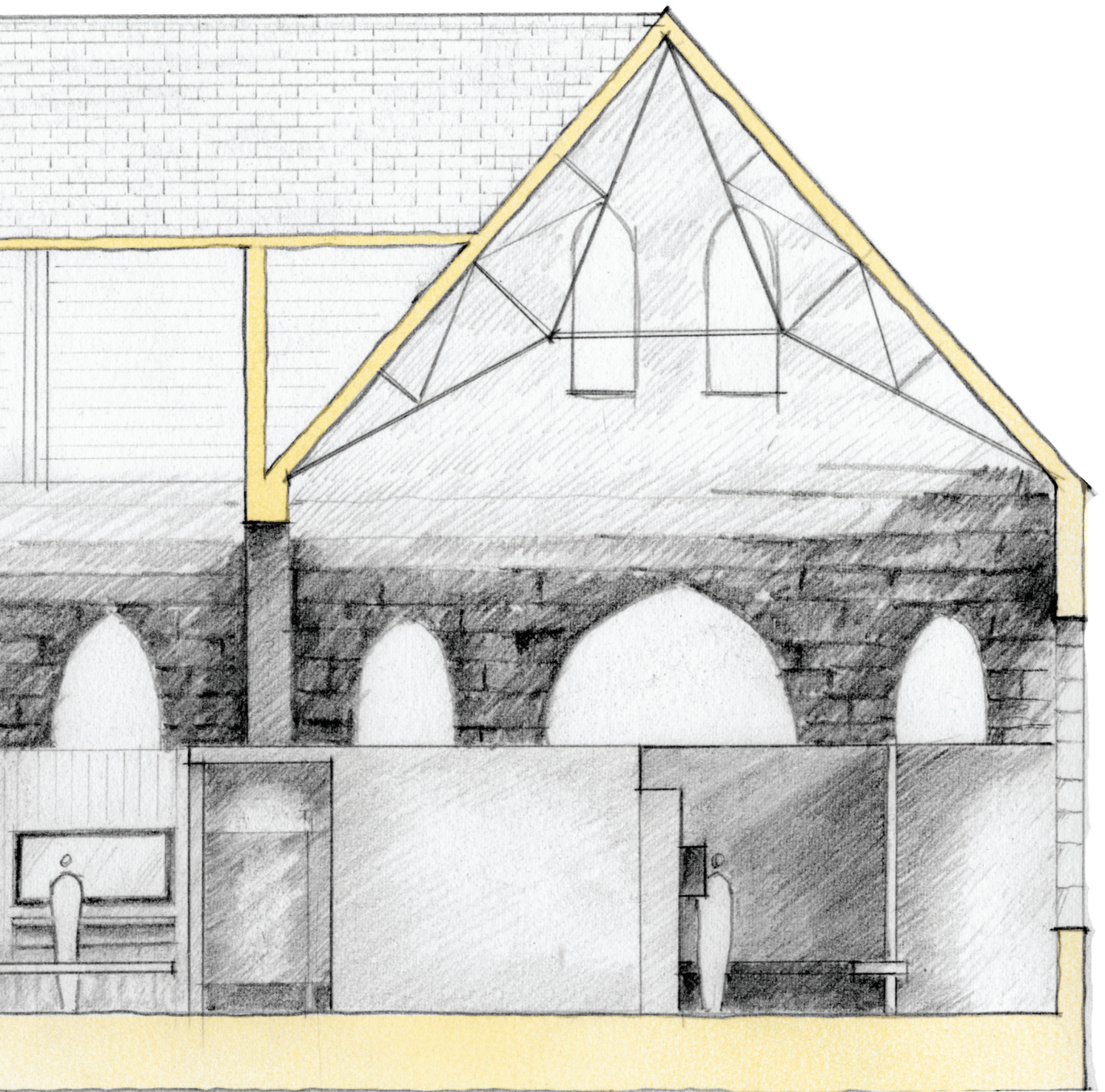


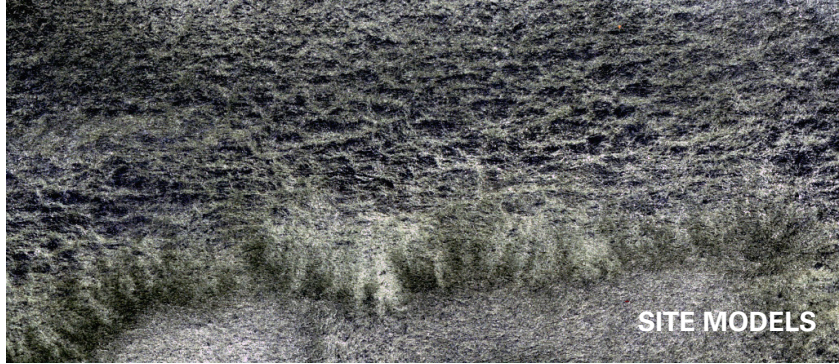


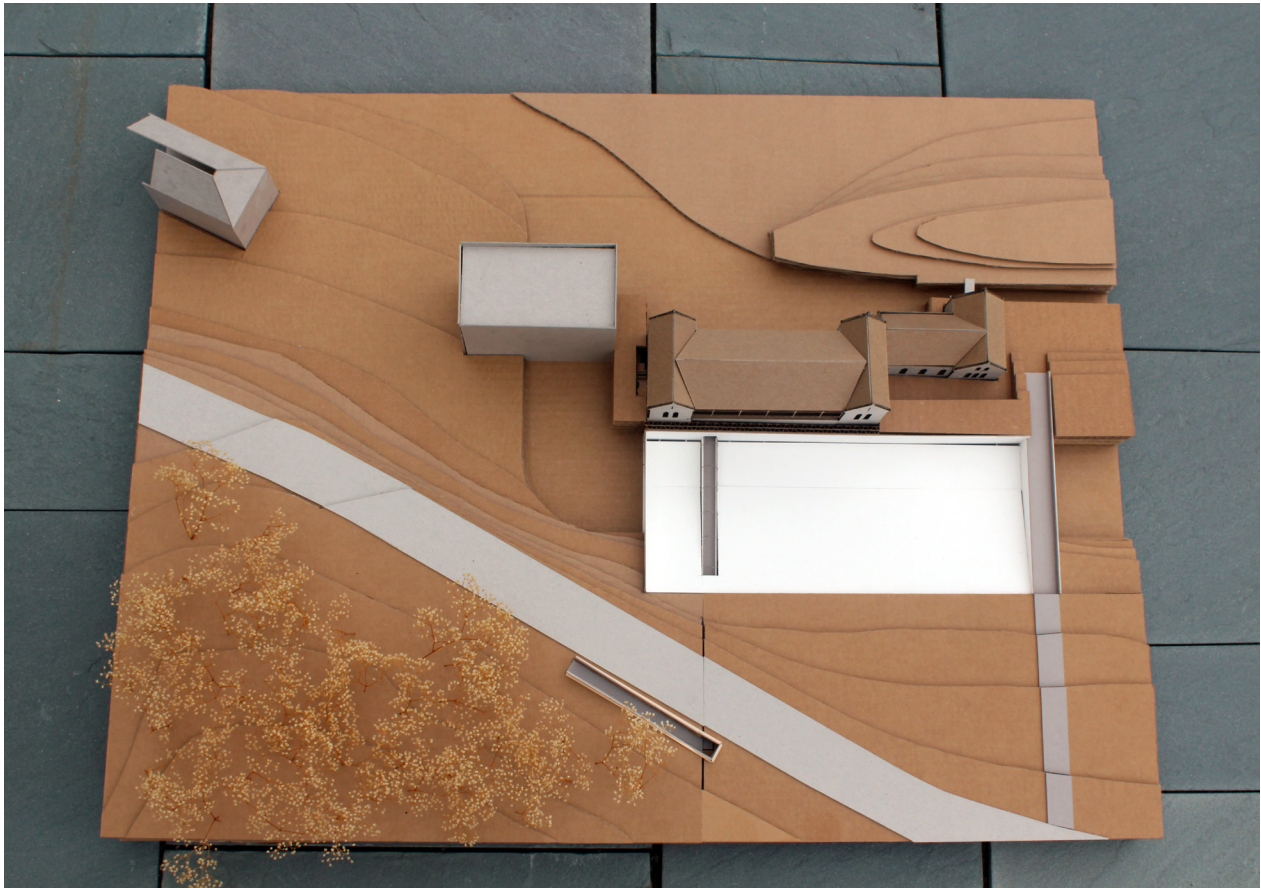
0 3 6 12

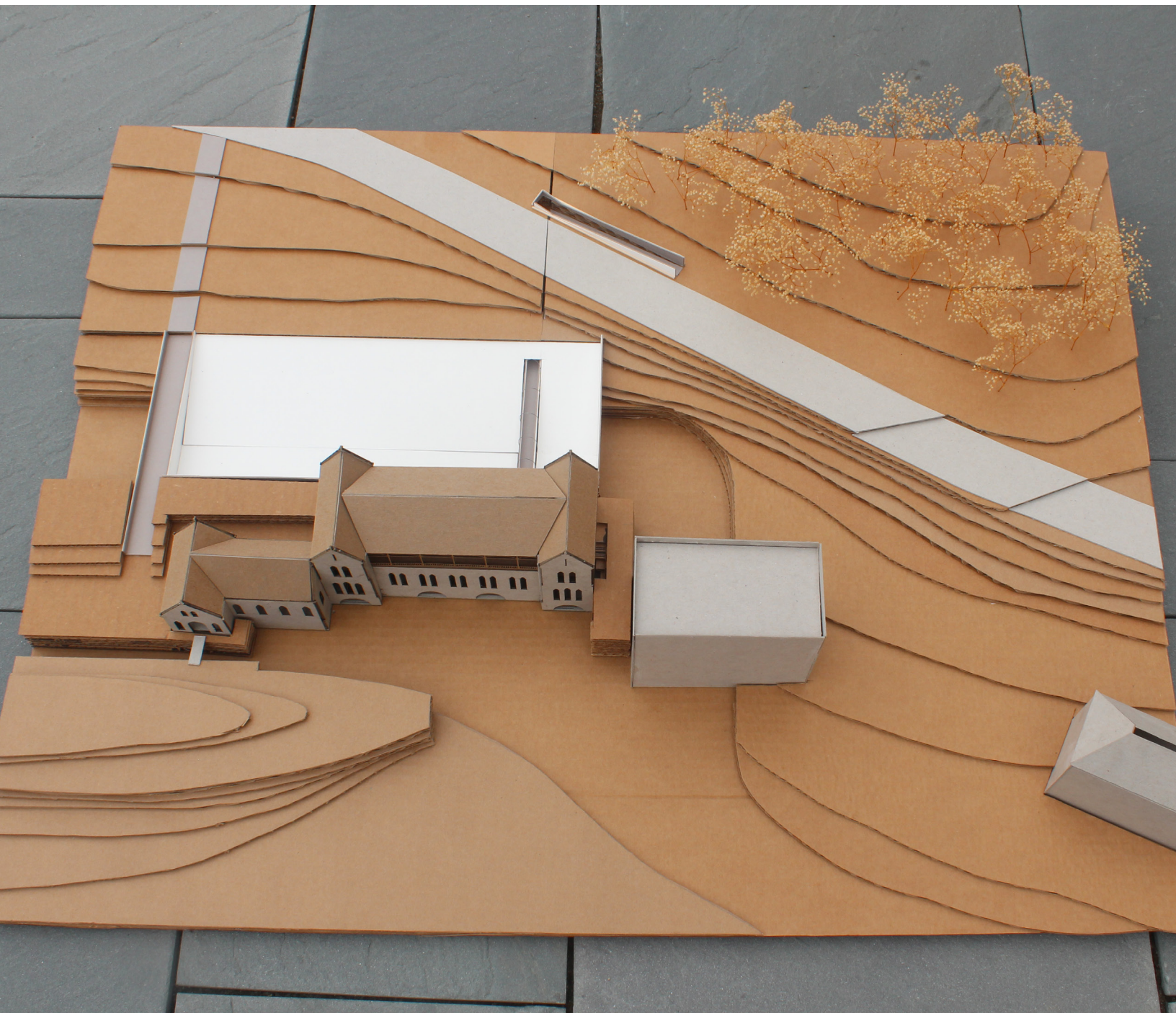


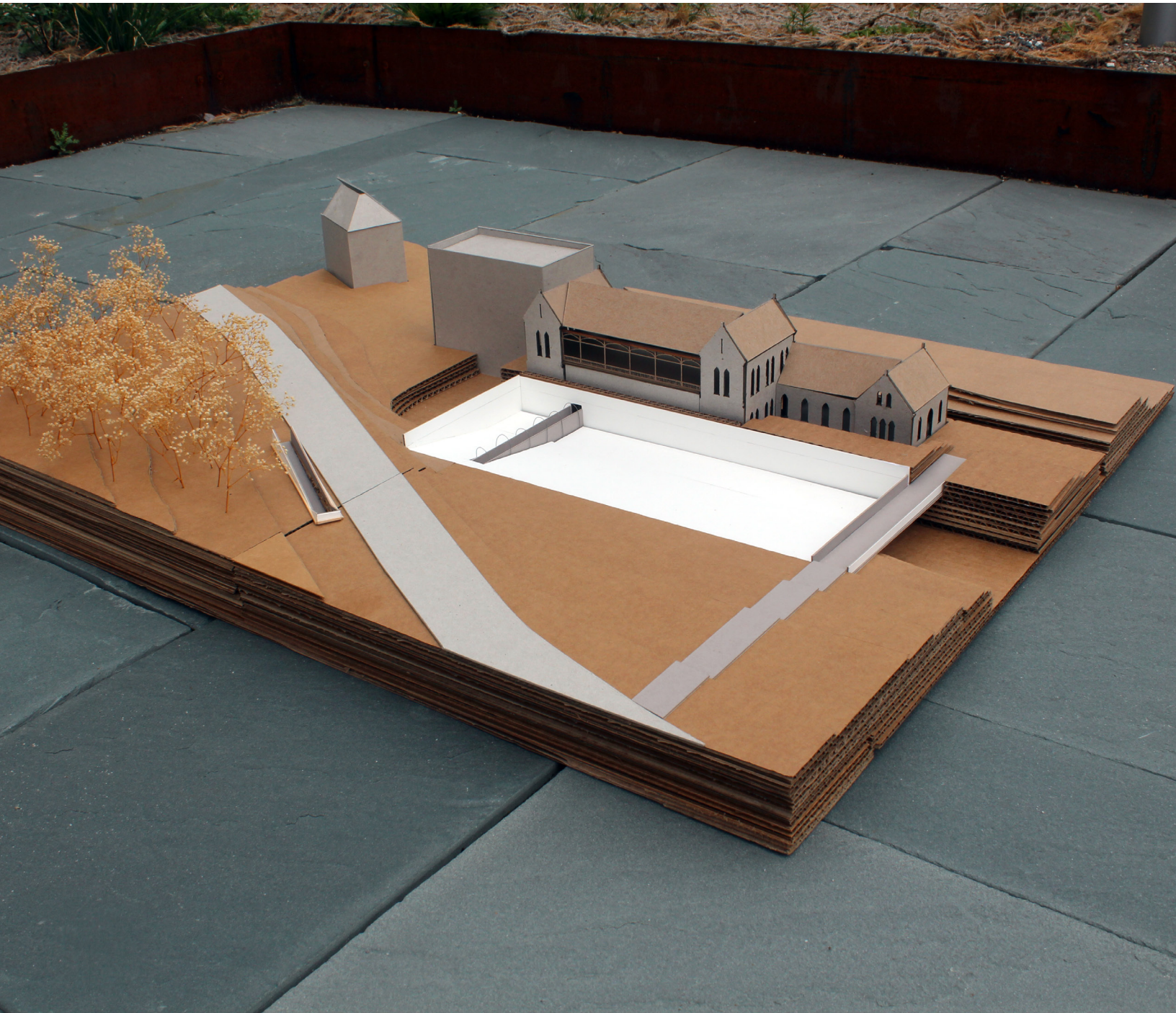


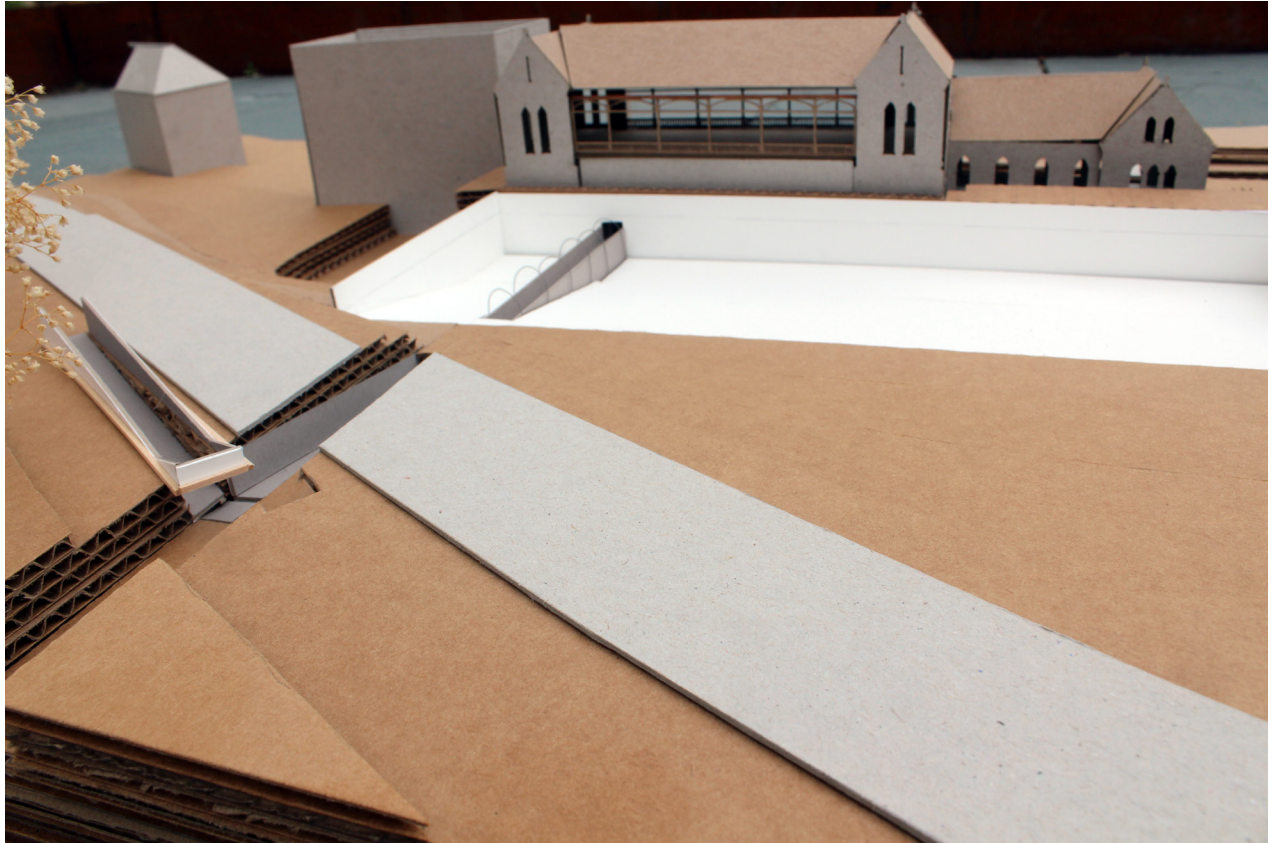














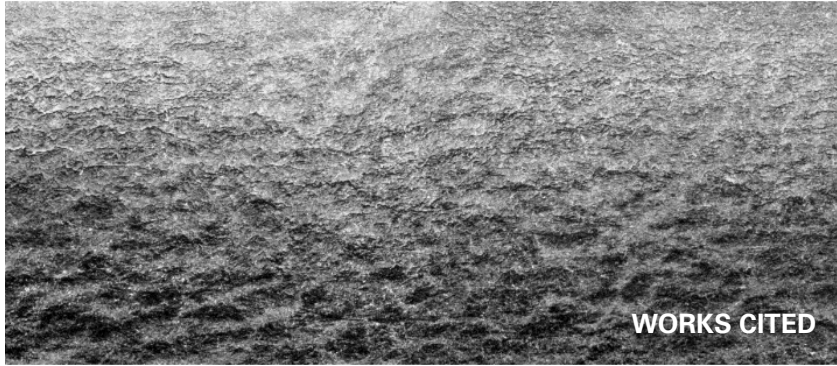






Virginia Commonwealth University's Anderson Gallery
April 20-29, 2012





Literature

- Dunaway, W. F. (1922). *History of the James River and Kanawha Canal Company*. New York: AMS Press, Inc.
- Fjeld, P. O. (1983). *Sverre Fehn: The thought of construction*. New York: Rizzoli.
- Klemm, D. E. (1986). *Hermeneutic Inquiry: Volume 1, The Interpretation of Texts*. Oxford: Oxford University Press.

Image Credits

- Lucas, C. (Photographer). (2010). *Barton springs pool*. [Web Photo]. Retrieved from <http://writingthroughthefog.com/2010/10/26/swimming-in-austin-three-spots-to-worship-the-water/>
- Livingstone, R. (Photographer). (2003). *Hamar Bispegaard Museum, Norway*. [Web Photo]. Retrieved From <https://secure.flickr.com/photos/53521870@N06/4970218659/in/photostream/>
- O'Grady, T. (Photographer). (2011). *Aquarium tunnel: Hello fishies!*. [Web Photo]. Retrieved from <http://naturallygeographic.wordpress.com/>
- Rodríguez, Á. (2007). *F. M. Cecelia & R. Levene (Eds.), Alvaro Siza 1958-1994 Madrid: El Croquis*.
- Spekking, R. (Photographer). (2007). *Fundamente von St. Kolumba im Diözesanmuseum Kolumba*. [Web Photo]. Retrieved from http://en.wikipedia.Org/wiki/File:St._Kolumba_Köln_-_Diözesanmuseum_-_Ausgrabungen_1.jpg
- van Raaij, M. (Photographer). (2008). *Peter Zumthor - kolumba, Cologne*. [Web Photo]. Retrieved from <http://www.eikongraphia.com/?p=2553>

