

ALEXANDRIA TEXTILE FACTORY

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

Master of Architecture

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textile . fabric . weave . texture . fiber

abstract

The fabric of the city.
A folded roof plane.
Textile brick.

The density of a weave.
A fabric's structure.
A hem's meter.

The selvage.
The fringe.
Weaving.

The connections drawn
between textiles and
architecture are limitless.

Can a building and the
processes that occur within it
stitch together the holes in a
city?

The project explores the
relationship between weaving
and architecture. Can all
aspects of the building –
from spatial sequences and
circulation to structure and
skin – be woven?

dedication

For Grandad ... It is your artistic talents and unyielding spirit that have inspired me to pursue my dreams of becoming an architect. Thank you for your continuous love and support.

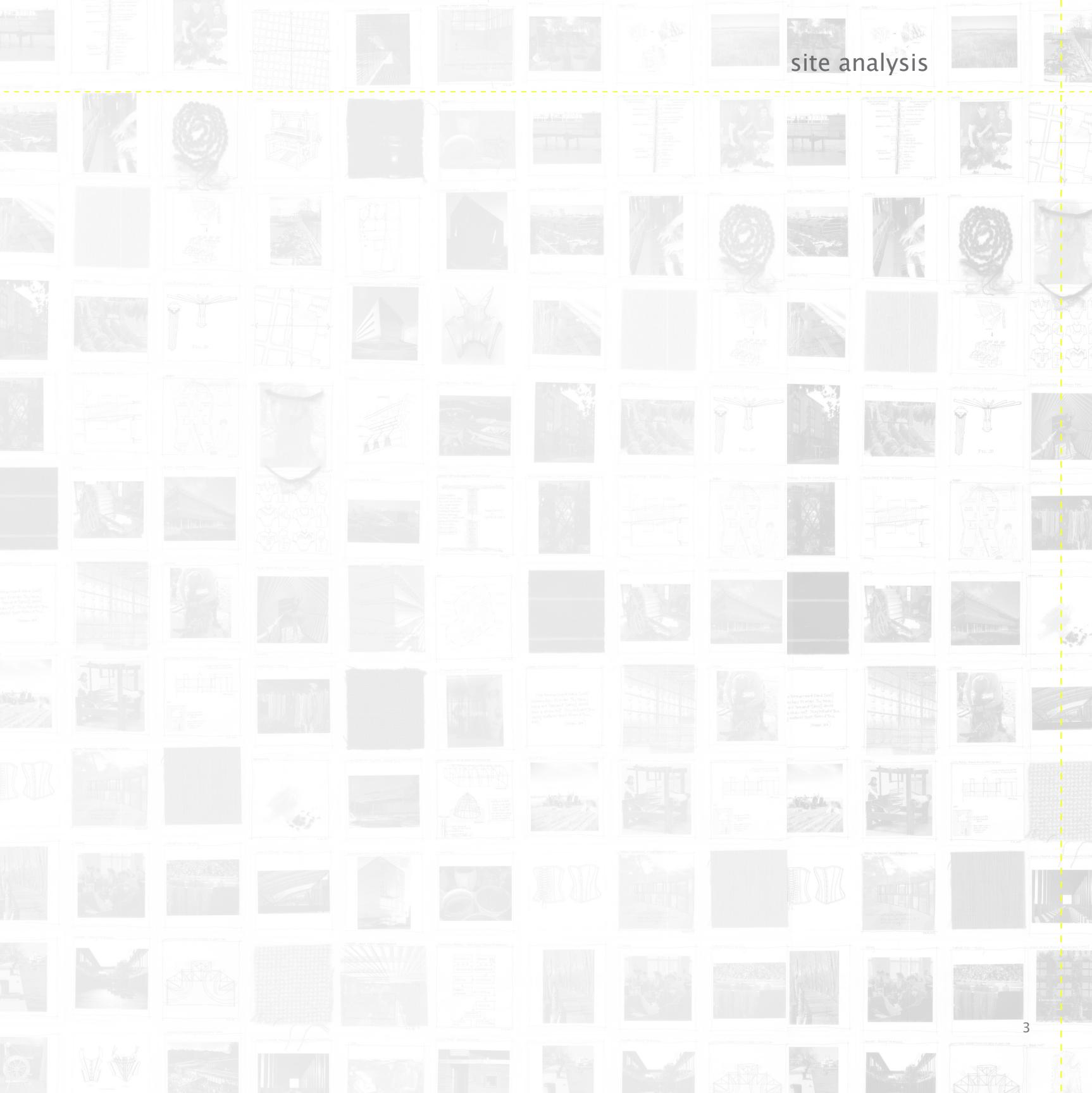
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inspiration

American Apparel, a Los Angeles based clothing company, produces a line of garments – from t-shirts and sweatshirts to bathing suits and dresses – in an 800,000 square foot downtown factory. Everything from marketing and design to knitting, sewing, and dyeing occur under one roof in what the company calls “vertically integrated manufacturing.” As all steps of production occur under one roof, the manufacturing process is highly efficient and thus very sustainable. Raw materials are delivered to the downtown LA factory. They are then transformed into articles of clothing and loaded back onto trucks to be distributed around the country. There is no shipping overseas. There are no harmful dyes released into a nearby river. All fabric scraps are recycled back into the manufacturing process. Not only is the building sustainable, but the processes occurring within the architecture are environmentally conscious.

site analysis



the site

King Street, the main axis and public passage through Old Town, Alexandria, connects the Masonic Temple to the Potomac River. This strong axis is felt throughout the city, as it is flanked by restaurants, shops, and numerous other public spaces. Currently, the eastern terminus of King Street, at the Potomac waterfront, is occupied by a plot of shabby grass and a few benches. On the north side of the terminus is the Old Dominion Boat Club. On the south side is a fenced-in parking lot, owned by the Boat Club. Thus, the terminus of the most public of streets in Old Town, is flanked by two very private, gated spaces. As such a grand gesture through the city, King Street ends in a very anti-climatic way.

The site of the project will occupy what is currently the Old Dominion Boat Club parking lot.

axial connection to Masonic Temple



image by author





image by author

the disconnect



The site is bordered on one side by a small green space, that acts as the termination to the King Street axis, and on the other by an Alexandria City park. As the site currently functions as a parking lot, it acts as a physical and visual barrier to the adjacent spaces. The pedestrian path that winds along the Potomac River, paralleling the George Washington Parkway, terminates at the site. Thus, the southern edge presents a physical barrier to the public, as seen in the photograph to the right.

The current state of the site creates a complete disconnect between the city and the park. To reconnect the two worlds, the new building must stitch together the park and King Street.

Old Dominion Boat Club



King St. terminus



the site

image by author

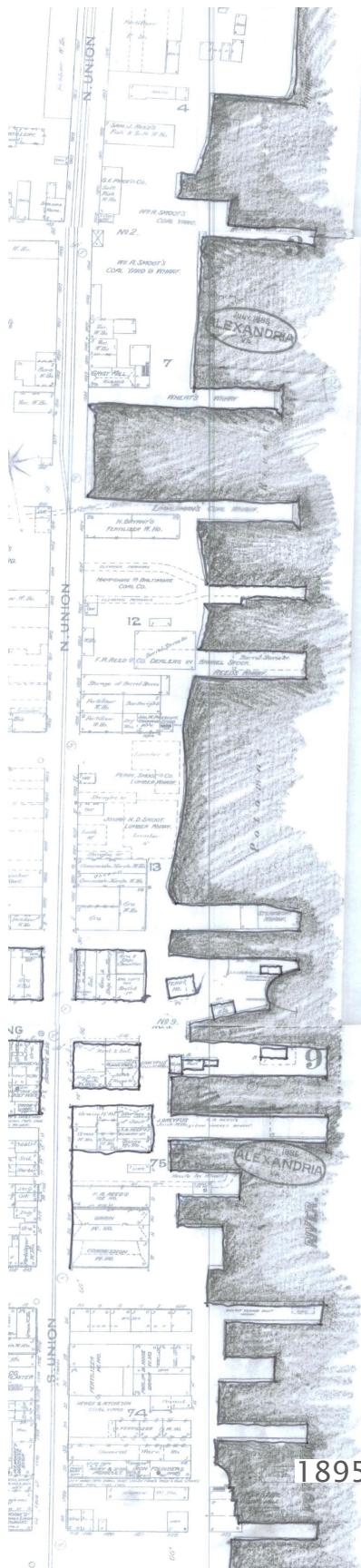
views to the Potomac River



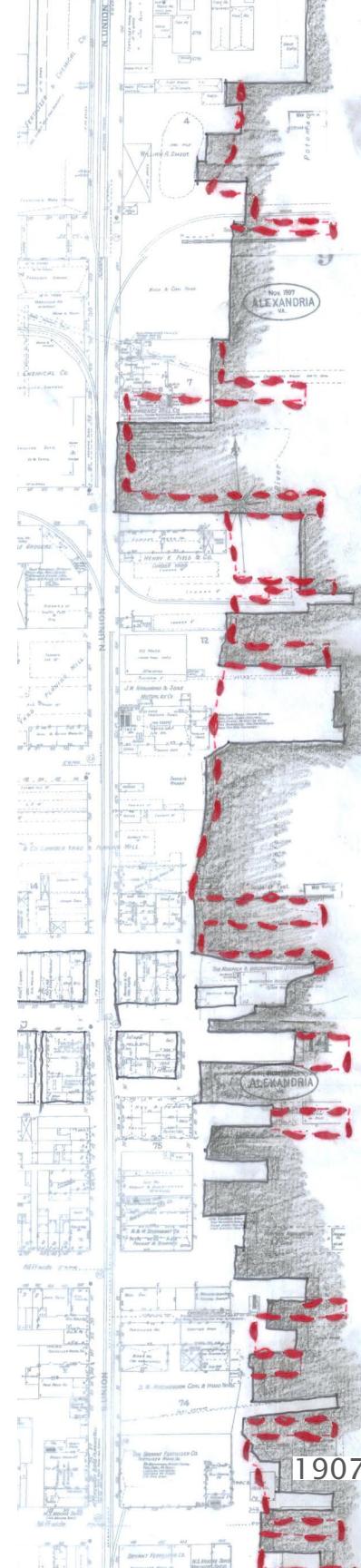


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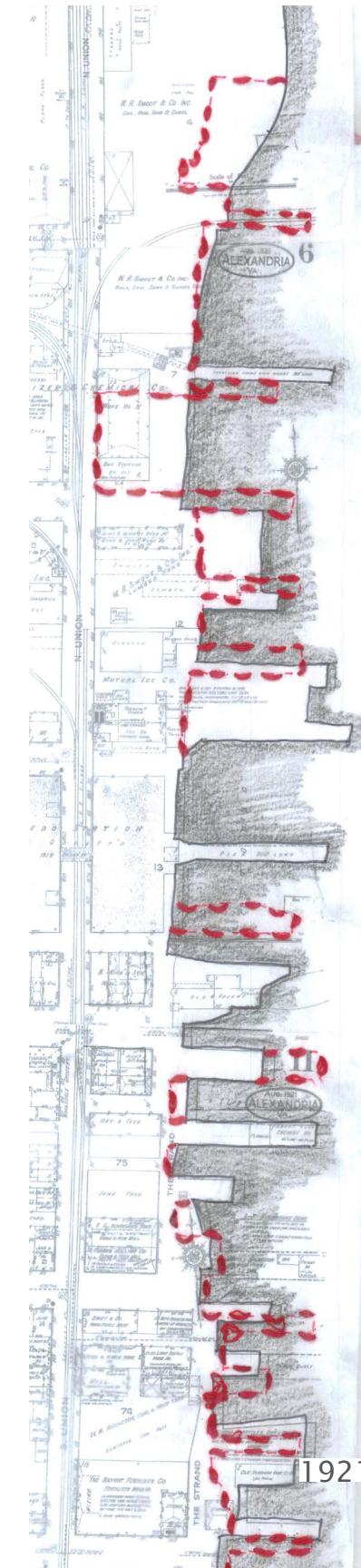
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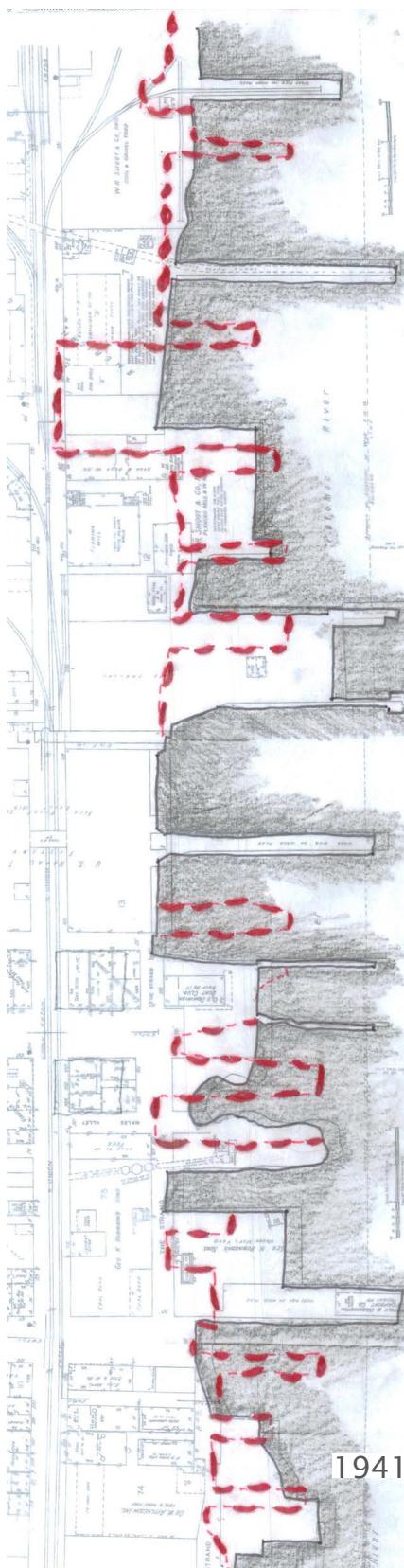
1895



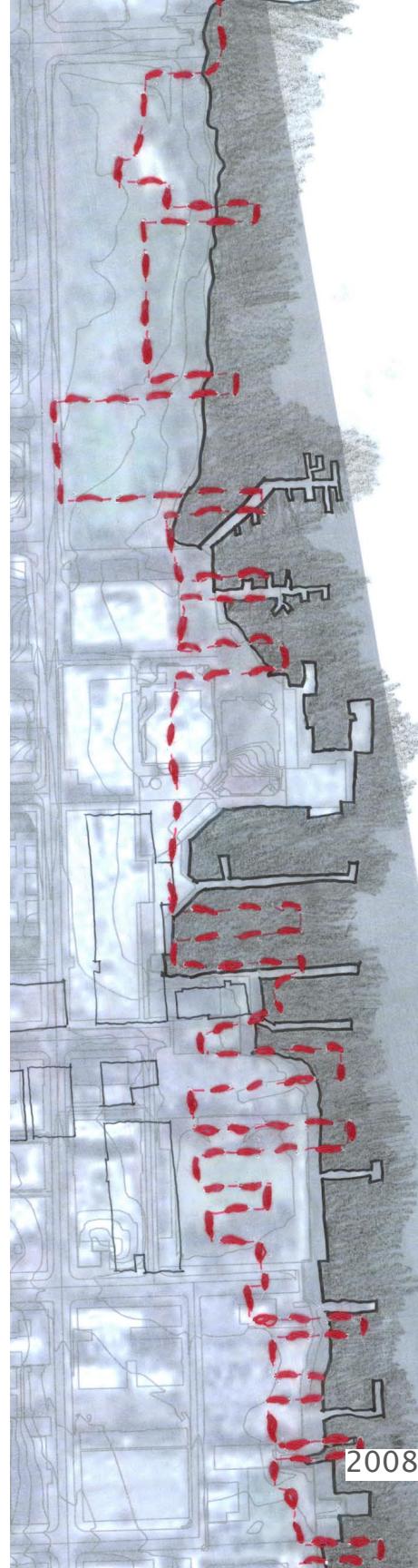
1907



1921



1941



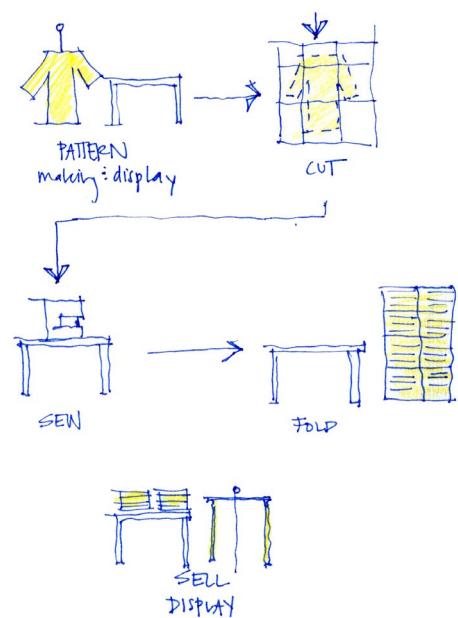
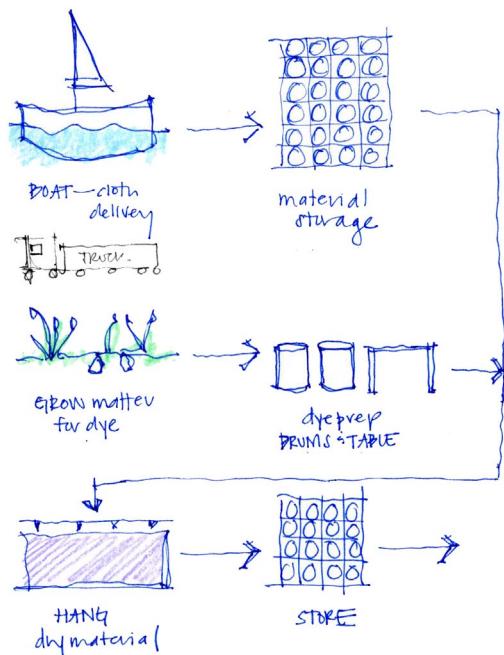
2008

studies of the potomac shoreline

An identifying feature of Old Town Alexandria, the Potomac River shore line is largely comprised of piers, public paths, and parks. A study of the profile of the coast throughout the last 120 years revealed drastic changes. The red stitch on each of the images indicates the profile of the shore from 1895, the year of the first available Sanborne map.

With radical changes throughout the last century, the current profile of the Potomac coast is not sacred. This discovery provides the opportunity to extend the axis of King Street into the Potomac River.

the program

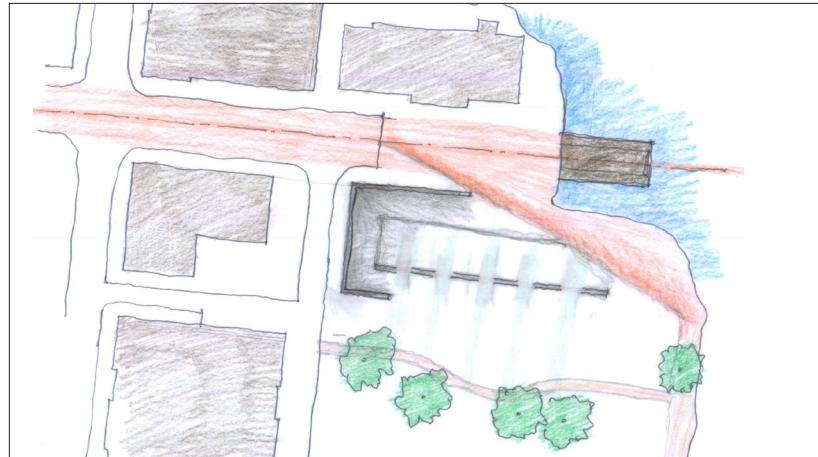


As the site occupies a very prominent spot, it was necessary for the program of the building to include a public component. A pure factory, similar to American Apparel's downtown Los Angeles factory, would not work on this site. Thus, the Textile Factory will serve as a counterpart to the existing Torpedo Factory, located only one block from the site. The Torpedo Factory houses work spaces for various types of artists, who in turn provide art classes to the public. The program of the Textile Factory will be similar, although textiles will be the sole focus. Classes will be offered to the public; someone may attend a weaving class and leave the Textile Factory with a homemade placemat.

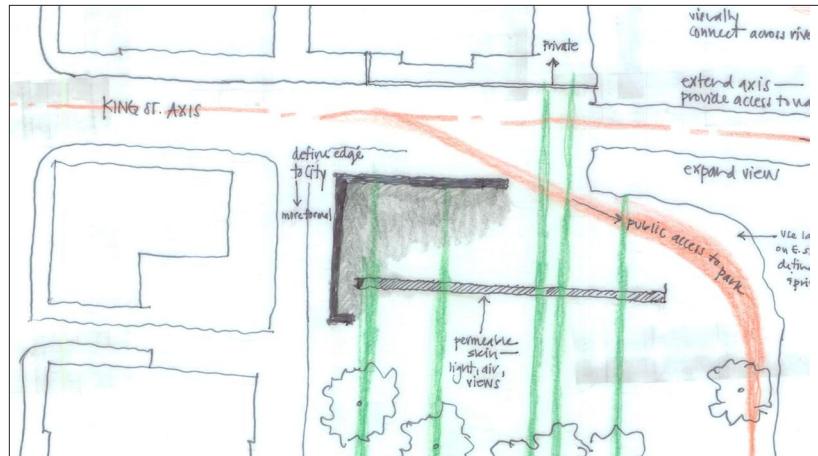
Exhibit space – similar to that at the Textile Museum in the Kalorama neighborhood of DC – will enhance the public component of the Textile Factory.

Stemming from the concept of vertically-integrated manufacturing, the entire process of textile production will occur under one roof – from design, marketing, and finance to fiber production, dyeing, knitting, weaving, pattern making, and sewing. The finished products will then be sold back to the city in a large retail market to further enhance tourist and public aspects of the building in its site.

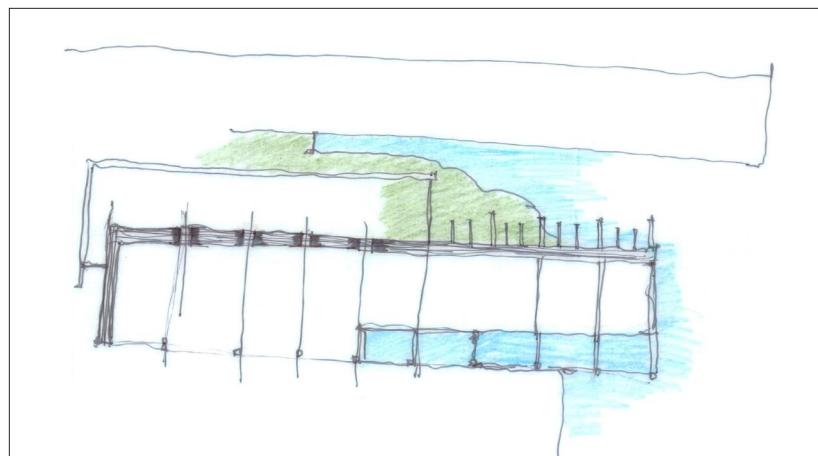
A hard edge wraps the northwest corner of the site, as it engages the city, while a much more porous edge borders the public park.



As a public path weaves through the site, elements of landscape also pull across the site and reveal themselves on the King St. axis.

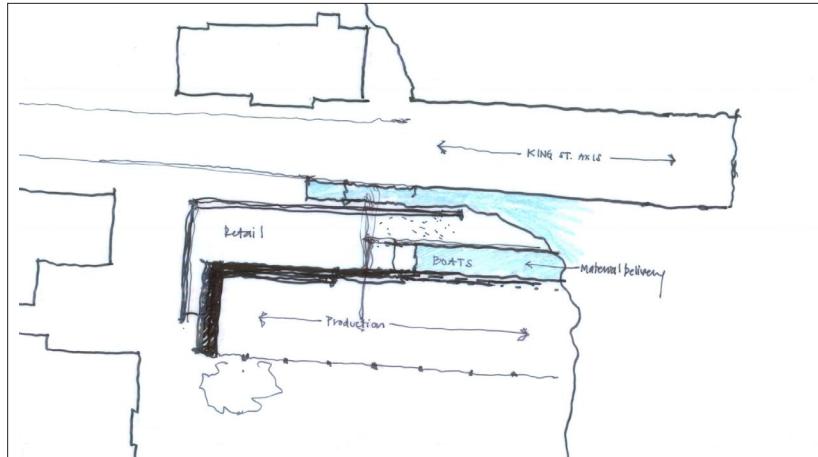


The building is wrapped in multiple layers, creating differing zones of privacy across the site.

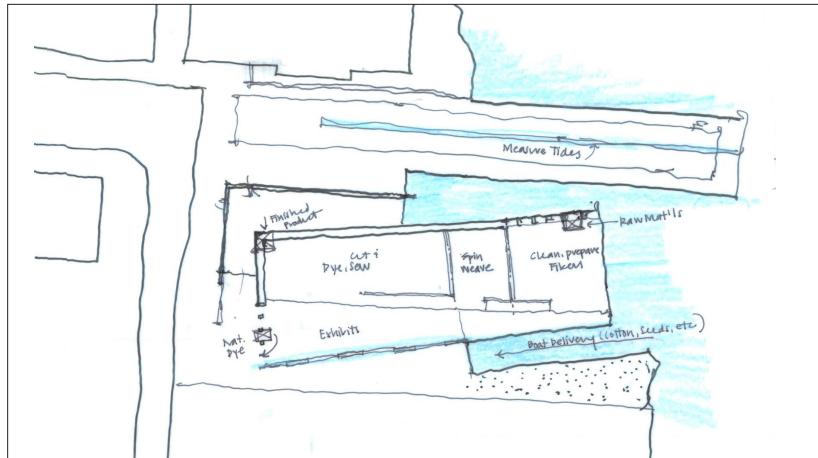


site sketches

The building disengages from the King St. axis at the eastern end of the site, revealing a slot of water. Boats are permitted to slip directly into the building to unload cargo



The building is skewed to align with true north, creating a more dynamic relationship with the river.

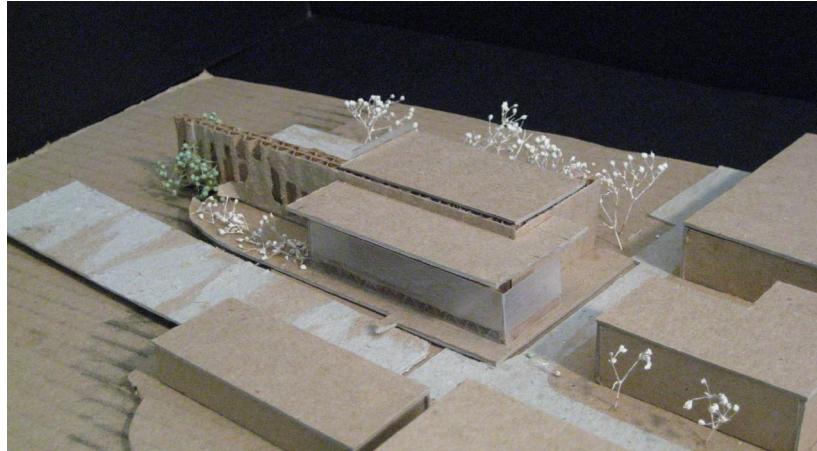


Zones for gardens mediate the irregularly-shaped spaces on the south edge of the site and provide a buffer to the public park.

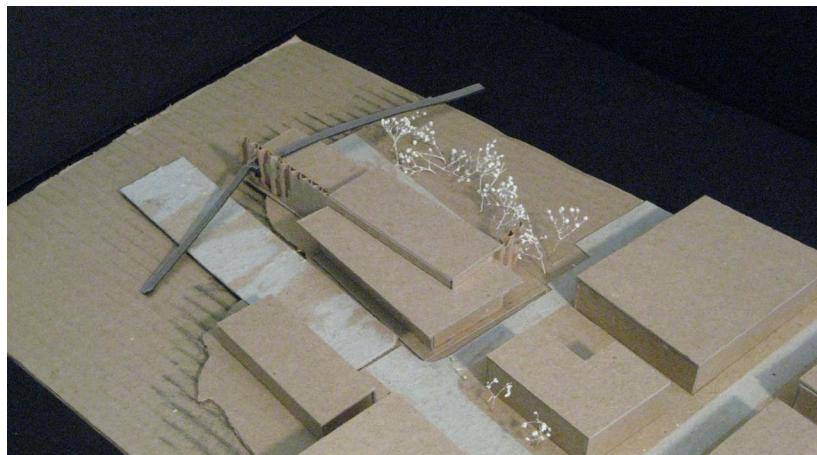


A series of sketches study possible site strategies. The relationship of the King St. axis to the public park is a vital aspect of the design of the Textile Factory. These sketches test the opportunities for hard edges versus porous edges, axes, and circulation.

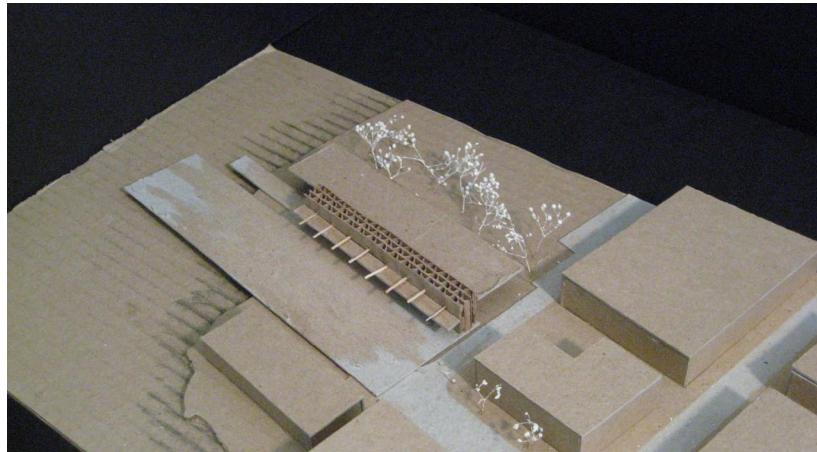
A structural spine splits the building into public and private domains and provides a place for organic matter to grow.



A public path engages the building and reconnects the waterfront bike path with the King St. axis.

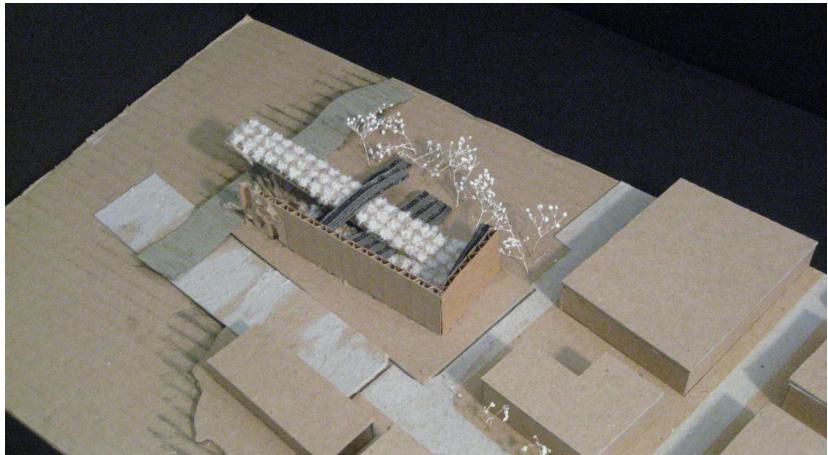


The north edge of the building is pulled back from the King St. axis to provide a more generous space in front of the building to be used as a marketplace.

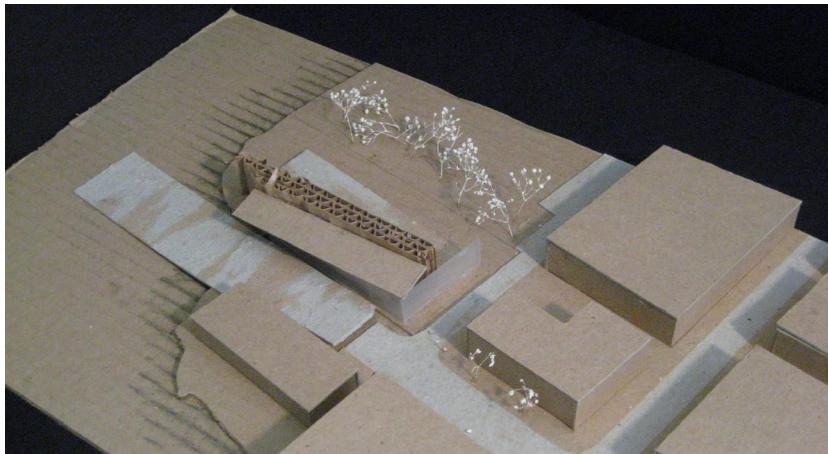


study models

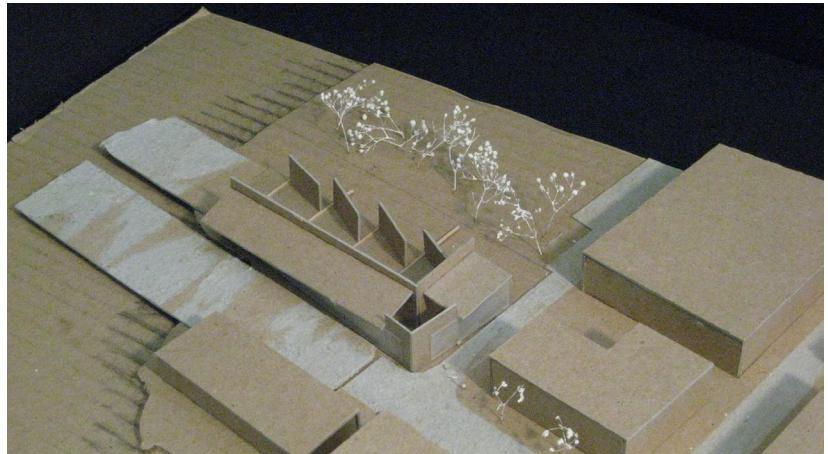
Floor plates in the building are interwoven, creating dynamic zones of circulation.



The grid of the building is cranked to align with true north in order to open up to the northwest corner, where the building meets the city.

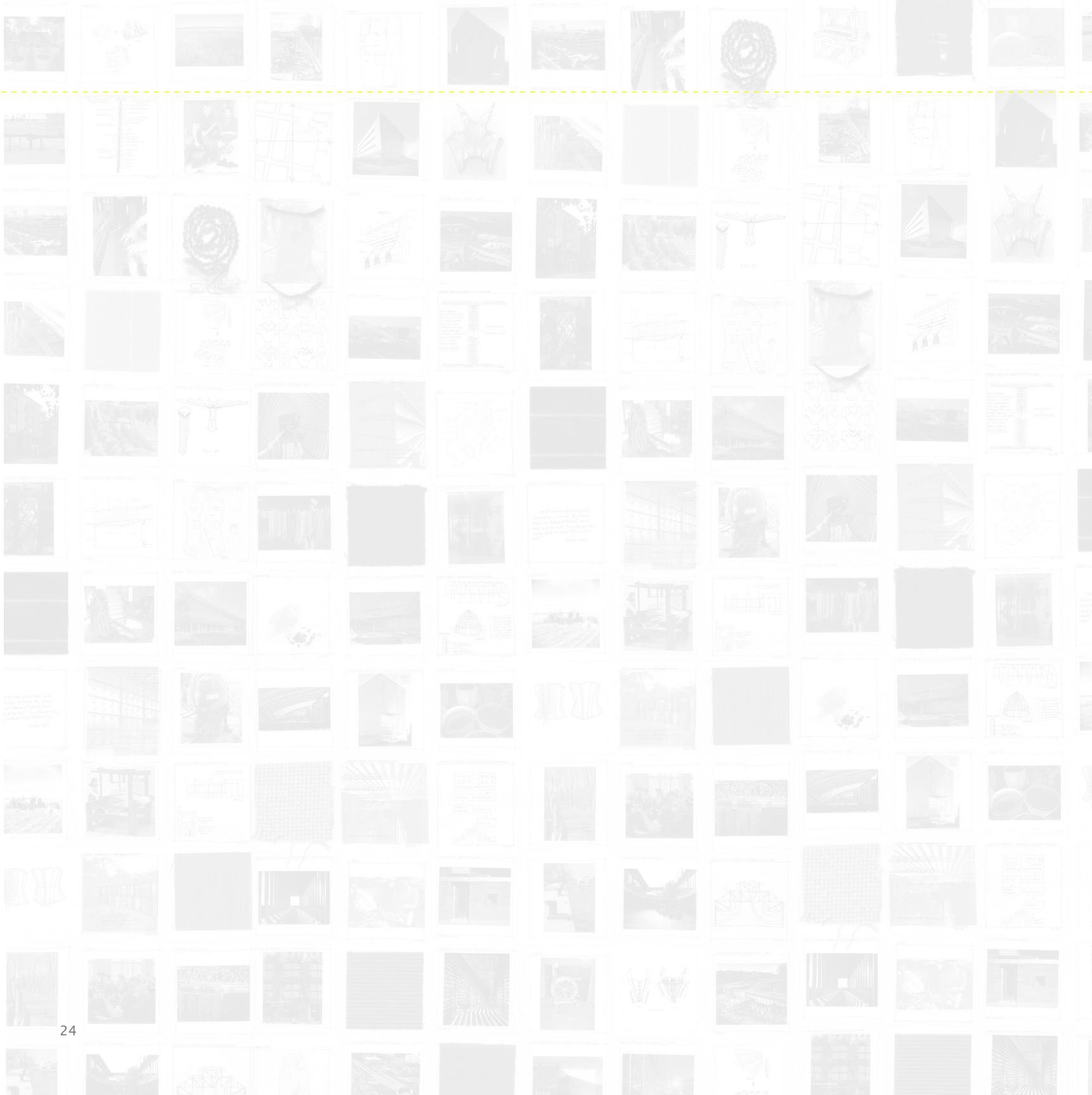


The south edge of the building is very porous, with operable doors to promote an interchange between the public park and the building.

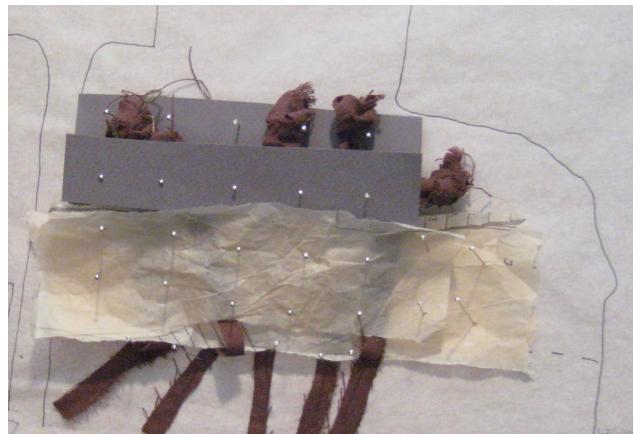
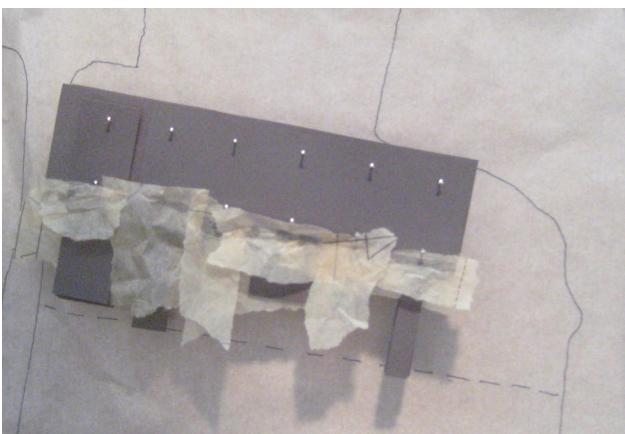
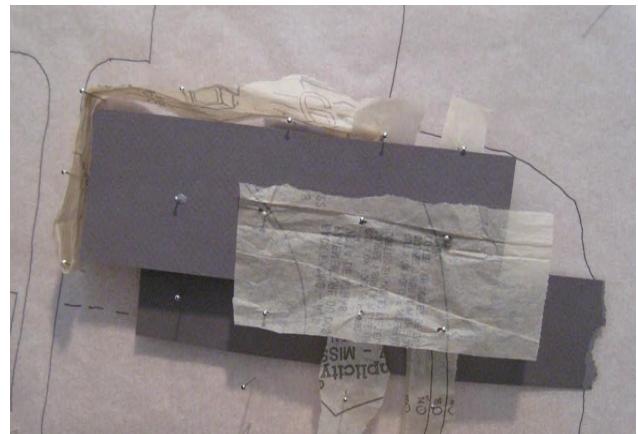
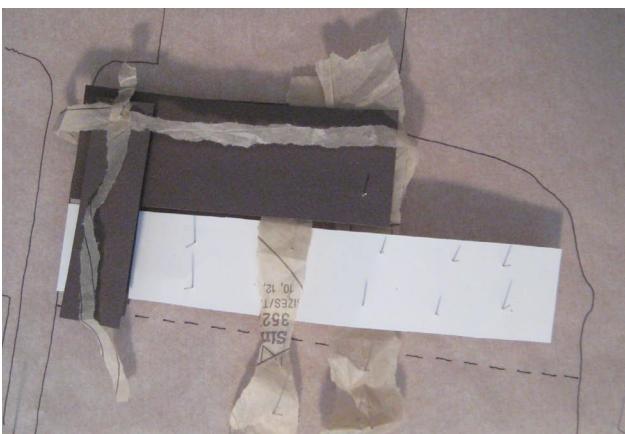


A series of small-scale study models were constructed to study site strategies and scale issues. By extending the King St. axis into the Potomac River, a small pedestrian plaza is created in front of the Textile Factory.

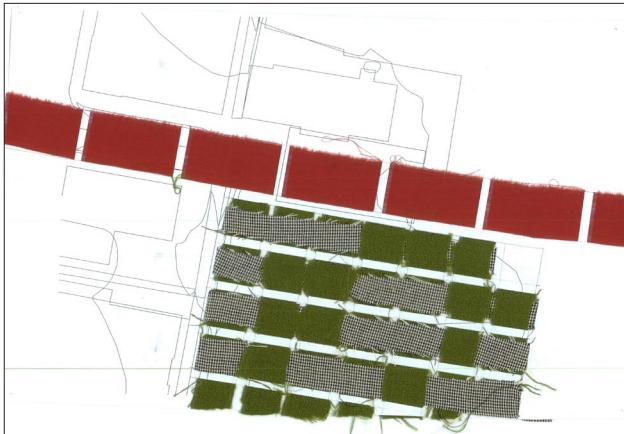
These models also study the strategy of putting a more formal edge to the city (on the northwest corner) and allowing the south side of the building to become much more porous, as it engages the park.



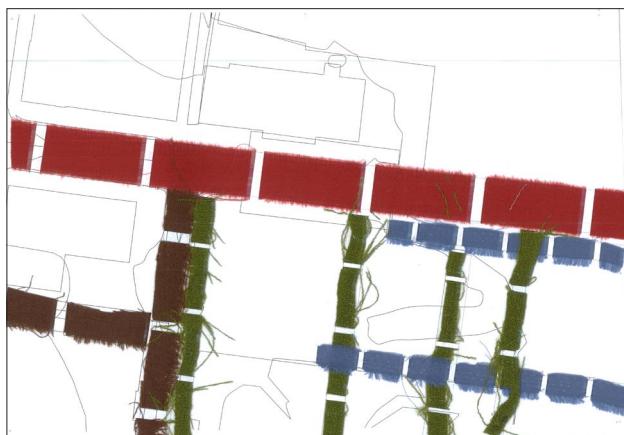
weaving



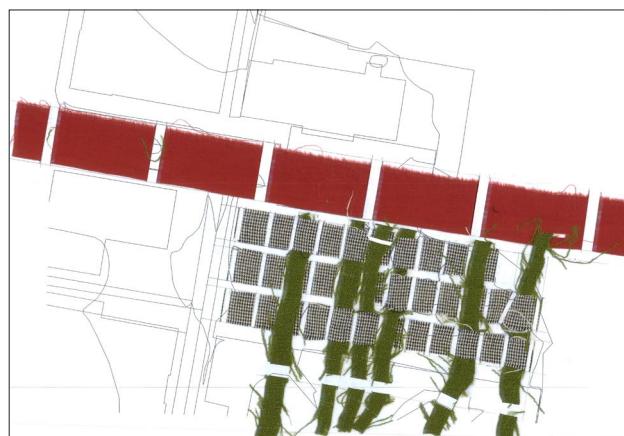
fabric studies



A series of studies, constructed of paper and strips of fabric, were utilized to study the relationship between the landscape, the building, and the King St. axis.



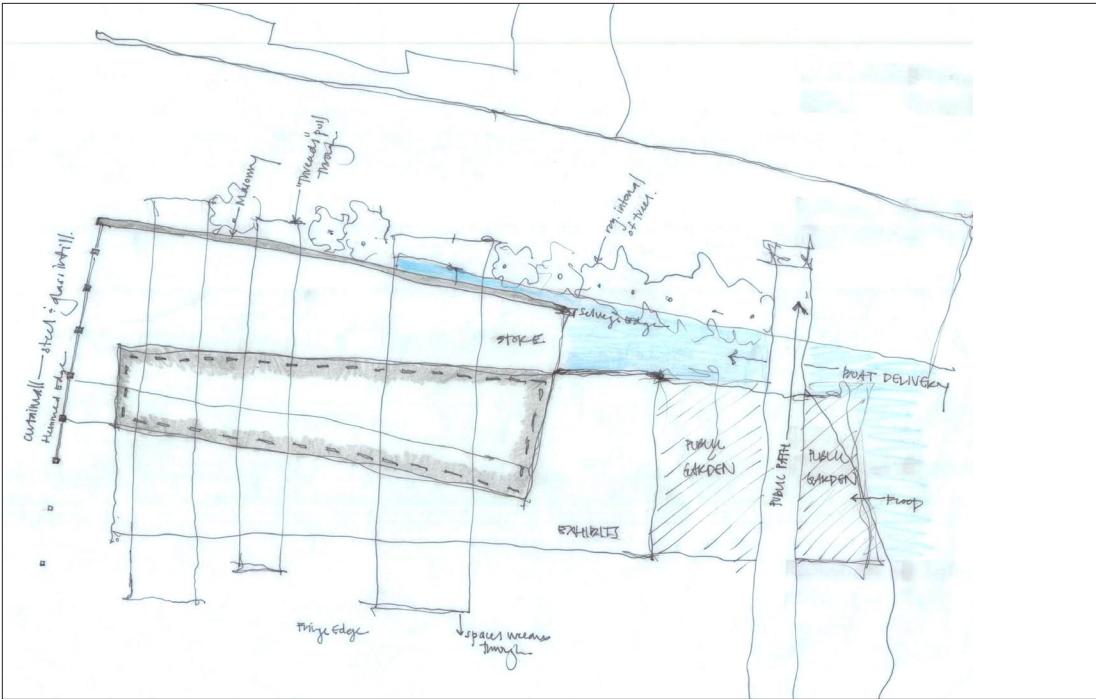
The “stay” was introduced to begin to pull apart the layers of fabric and add a layer of depth to the studies.



The final study incorporated several knots, which provide a termination point for the fabric strips that weave through the site. The knot may resolve itself architecturally as a space, a material change, or simply a tree.

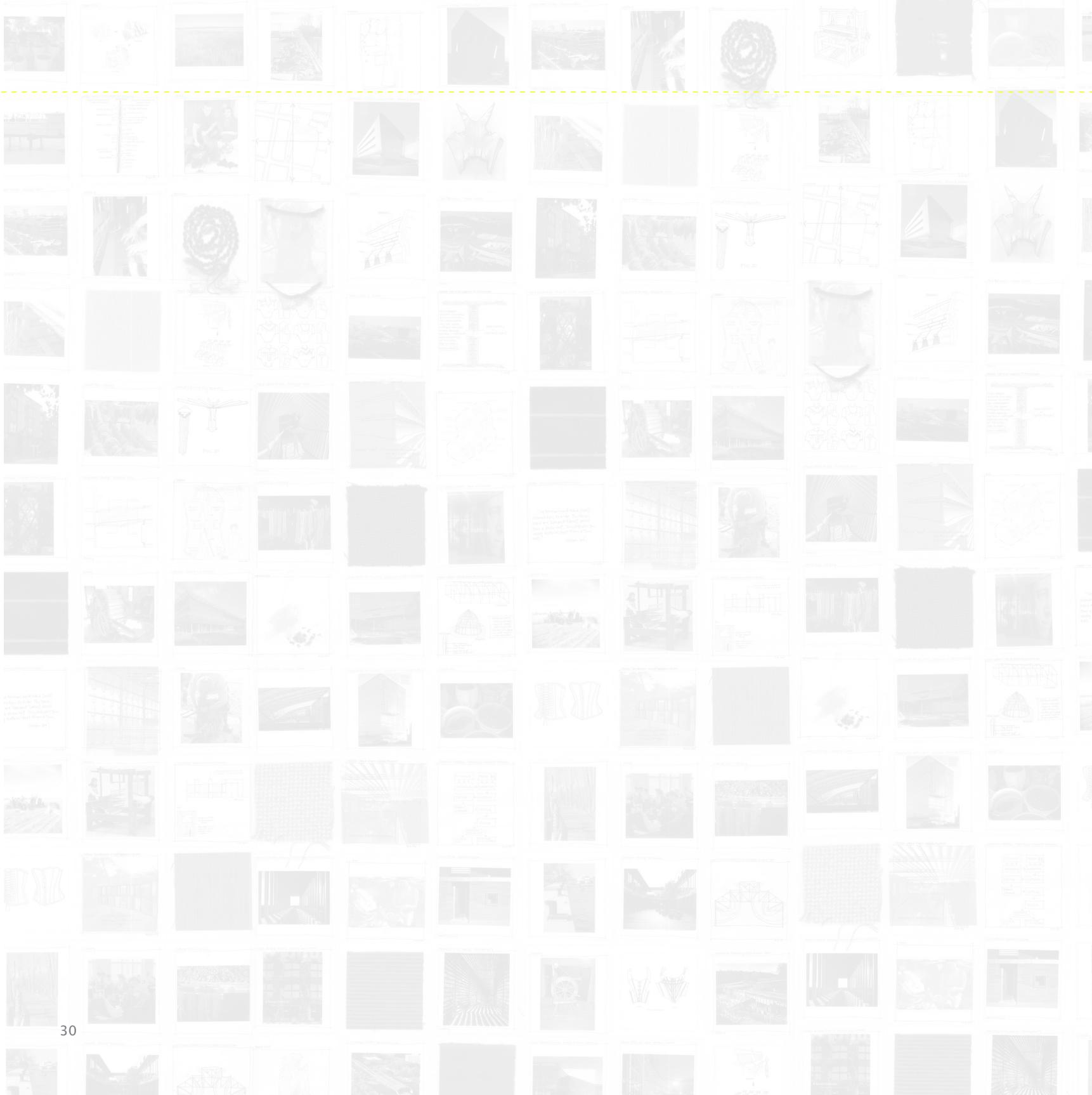


plan sketches

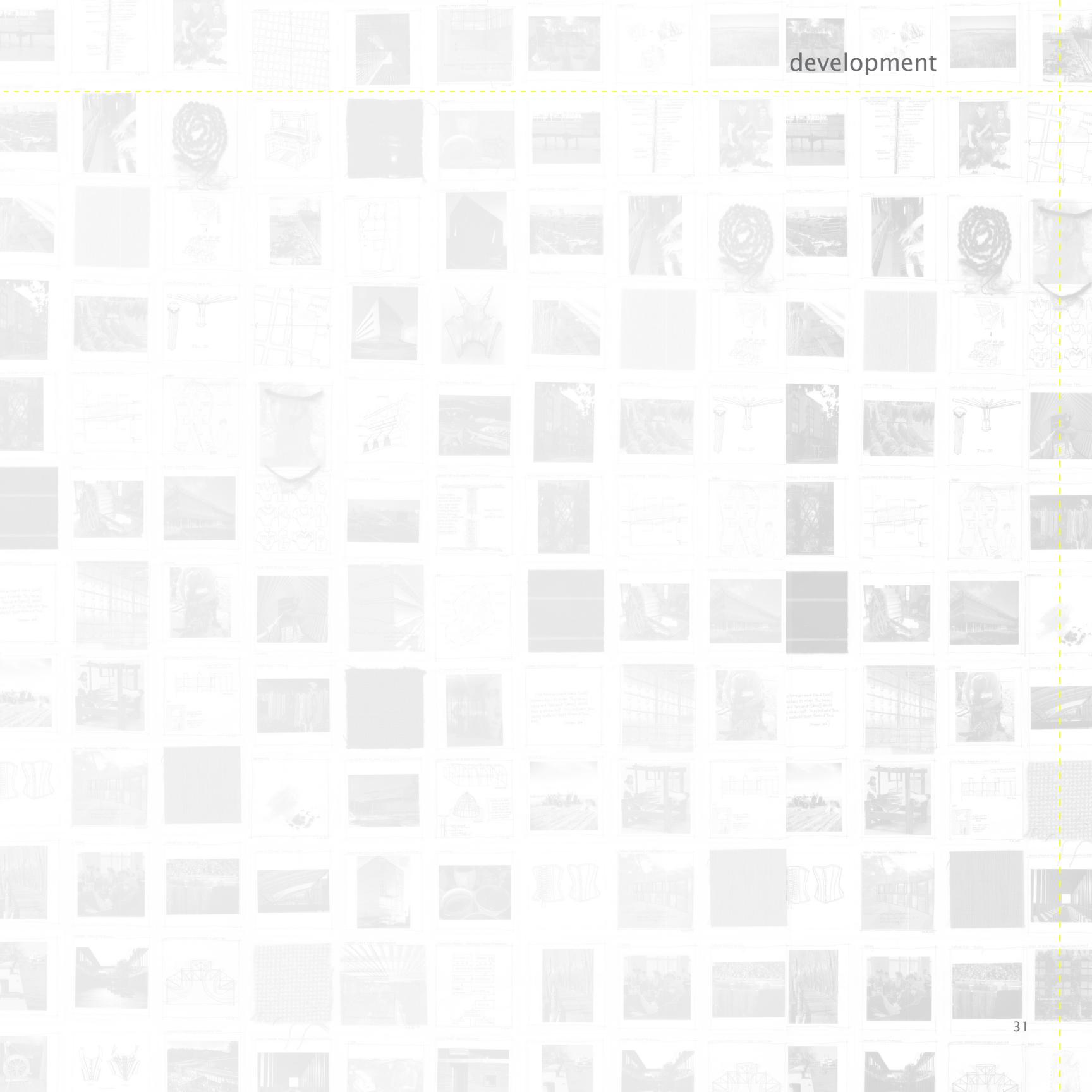


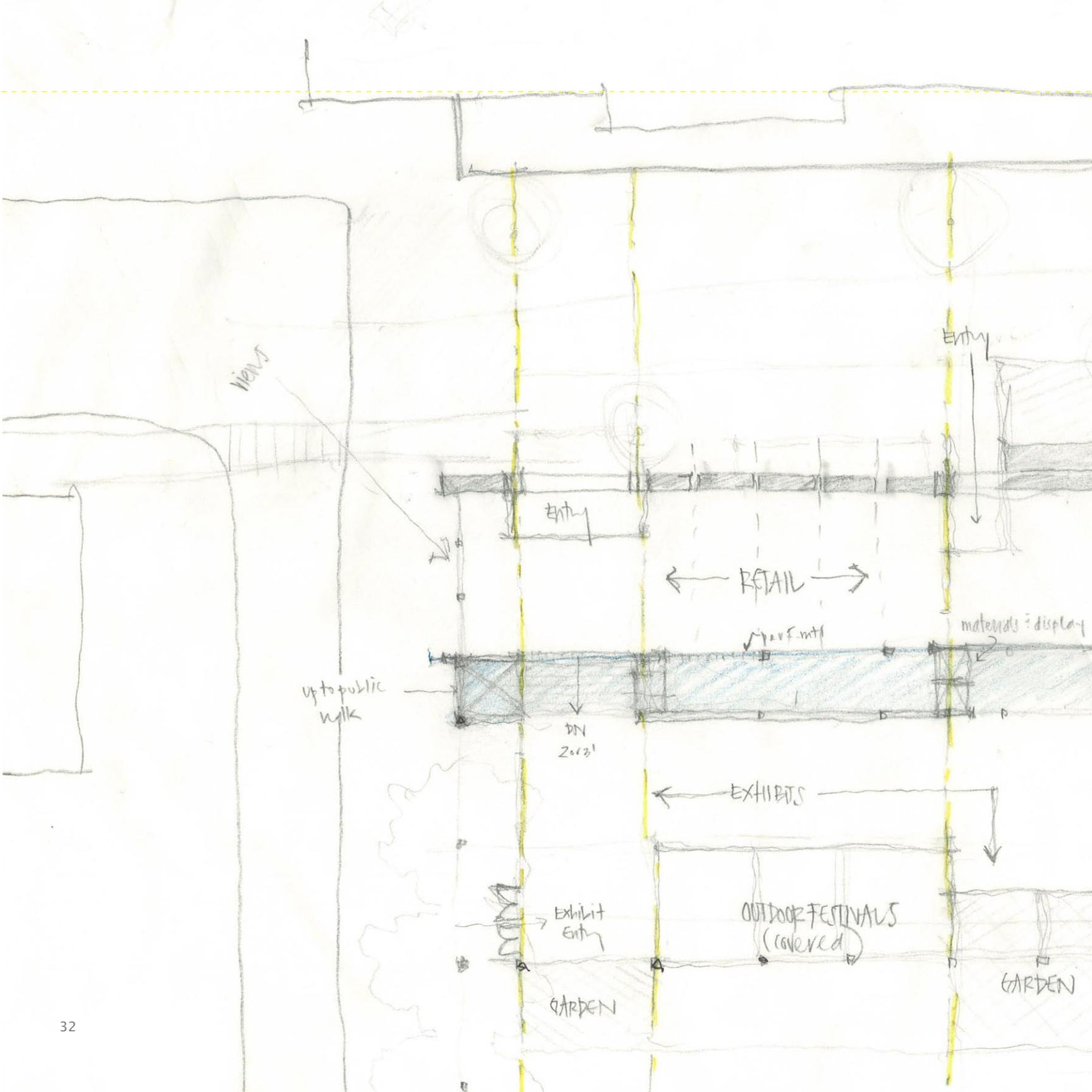
The fabric studies were transformed into plan studies by introducing program elements into the sketches. The “strips of fabric” become zones of production, gardens, and paths. The zones then begin to define their rhythm and structure of the building.





development

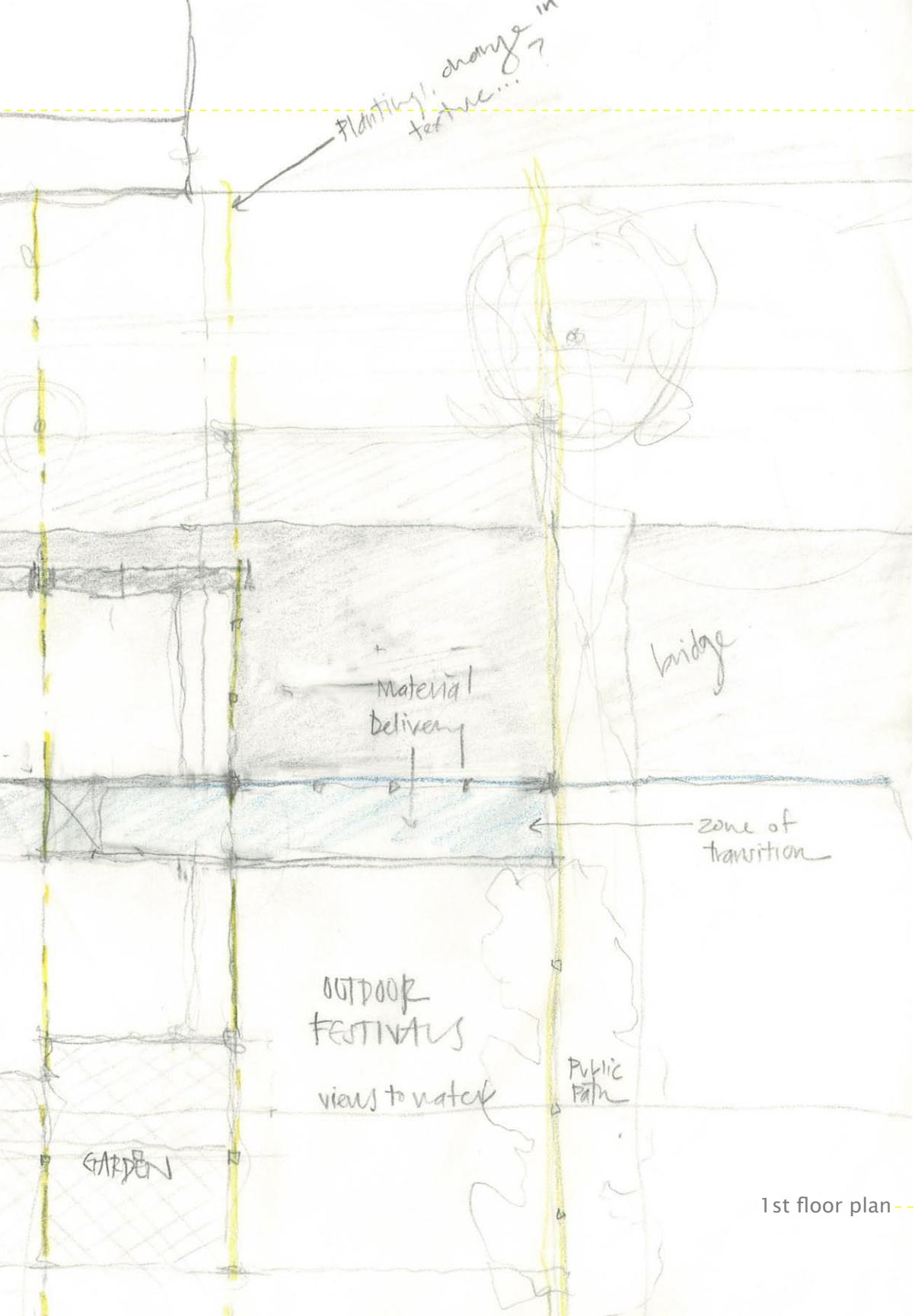


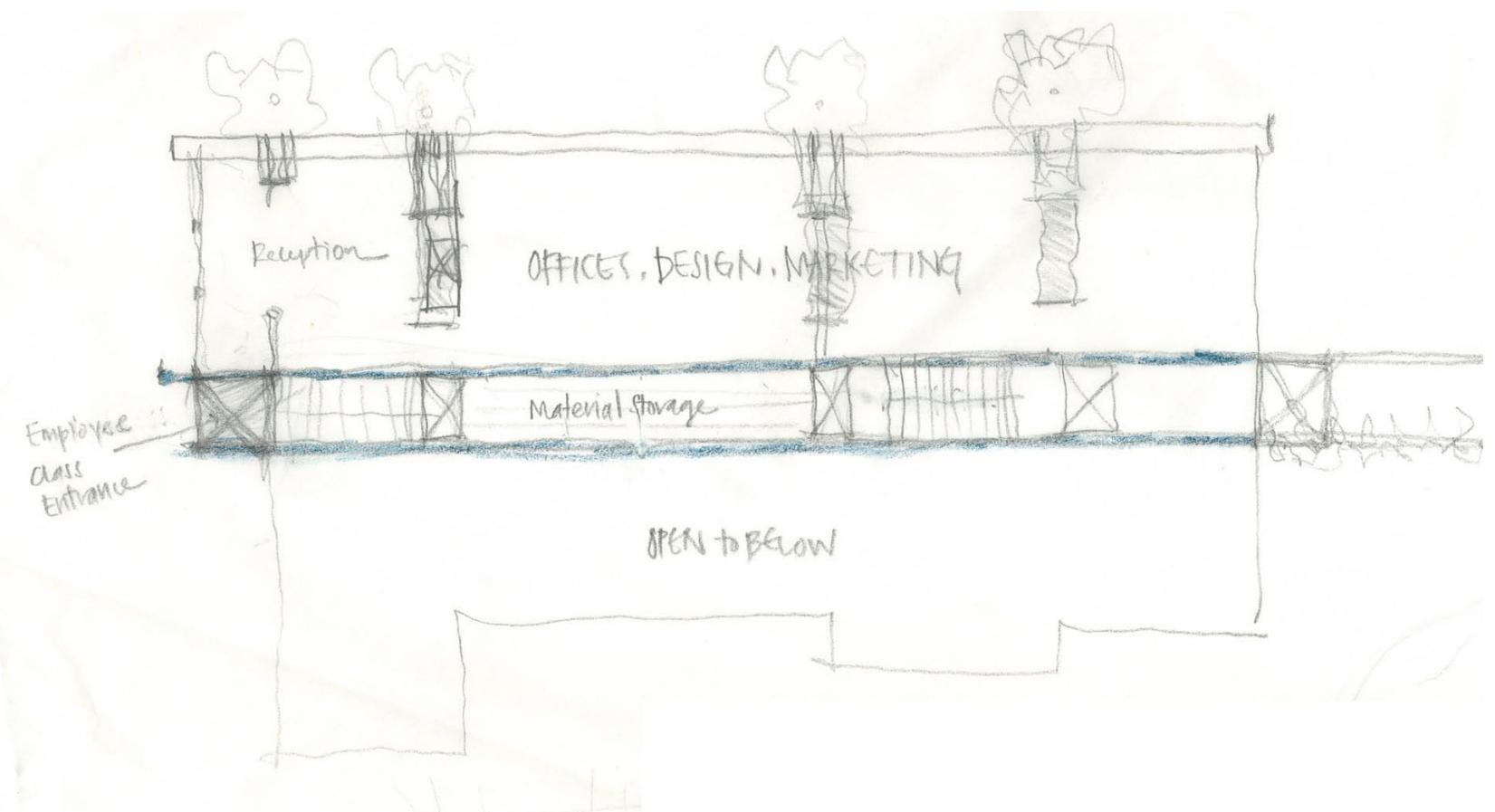


the plan

As the physical connection to the city, the north facade of the building acts as the selvage edge. The selvage of a piece of fabric is the finished edge, where the weft doubles back on itself. This translates into the building as the edge that meets the city; the character and scale of the facade relates directly to that of King St.

The south facade of the building is the fringe edge, providing a mediating space between the building and the adjacent park. The materials, spaces, and structure begin to pull apart and express themselves, thus blurring the boundary between interior and exterior.

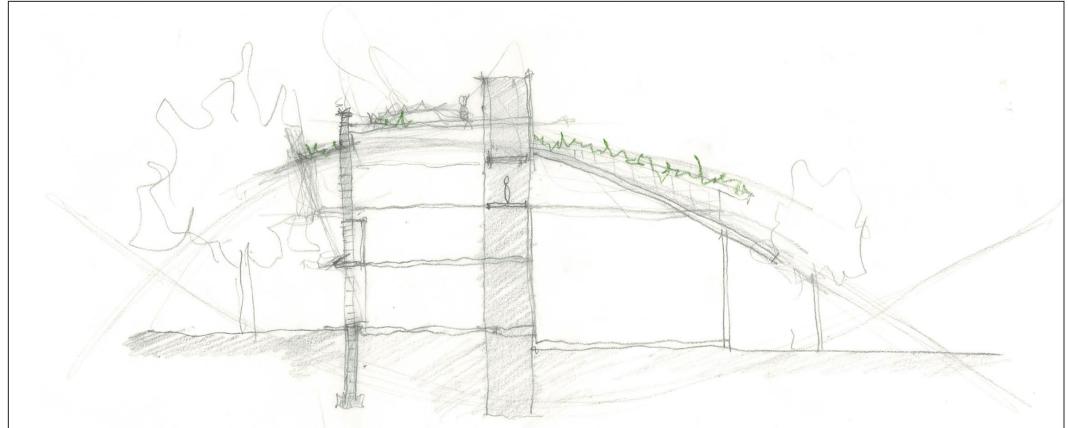
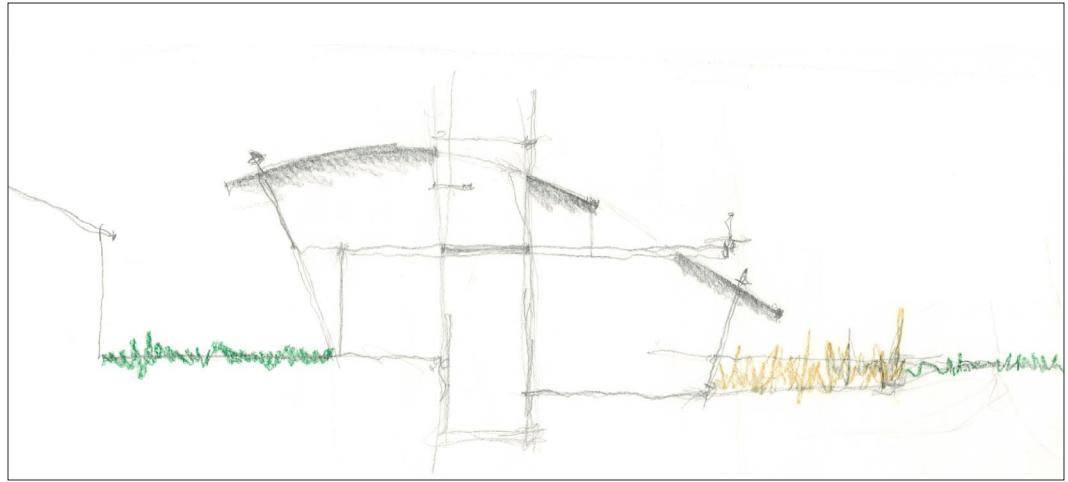
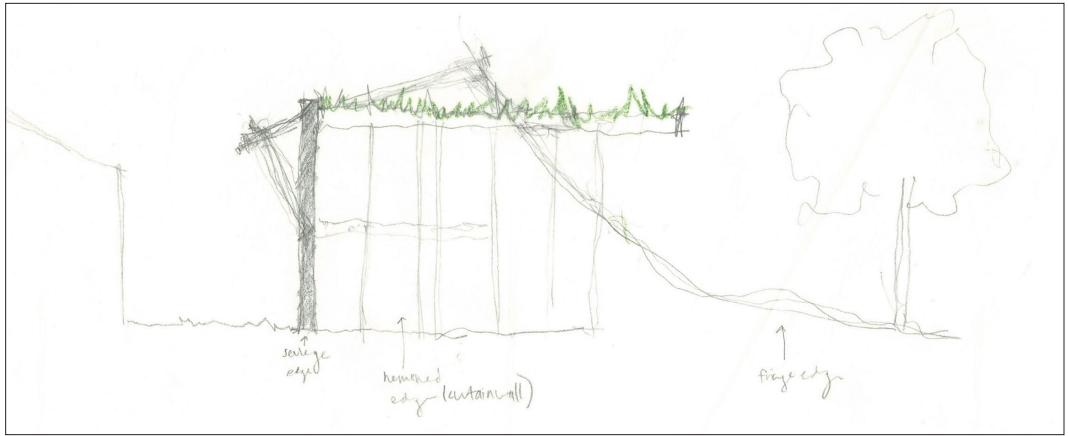




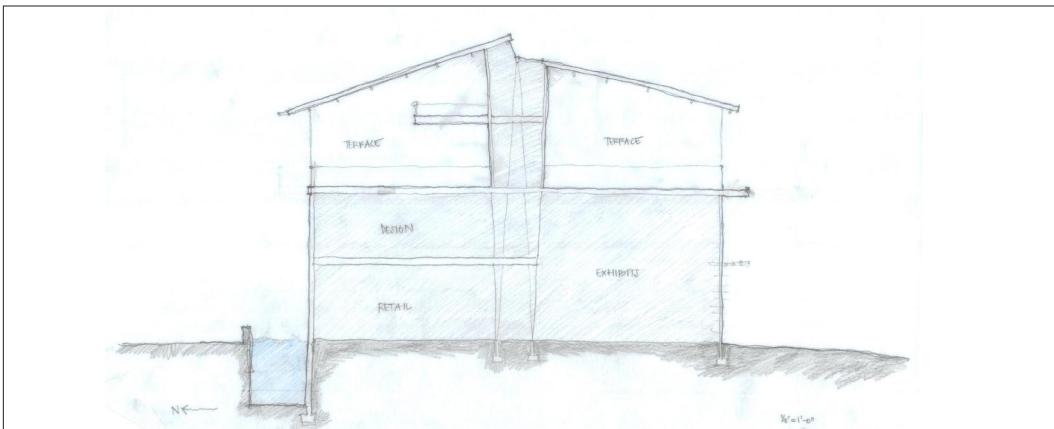
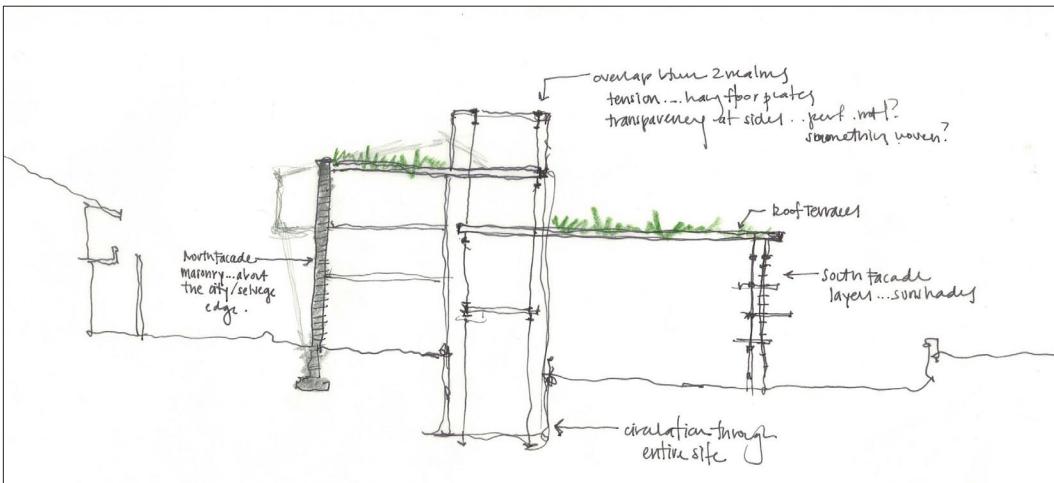
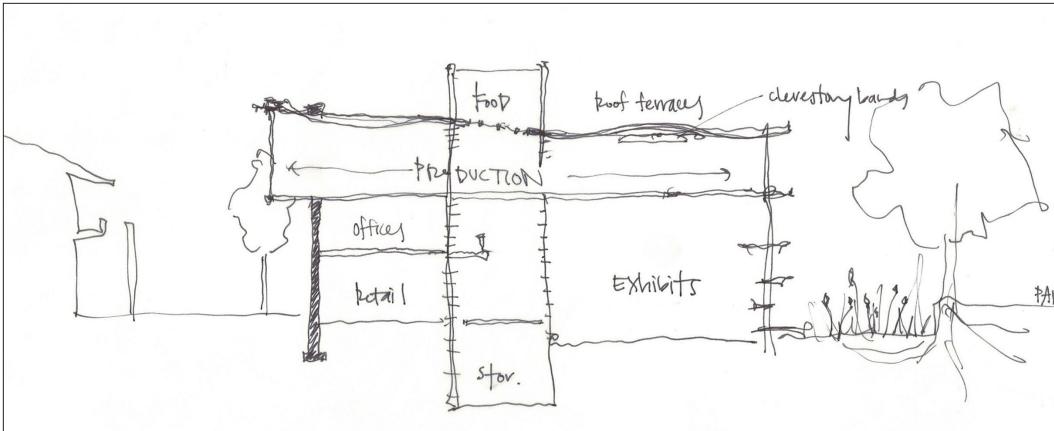
2nd floor plan



3rd floor plan

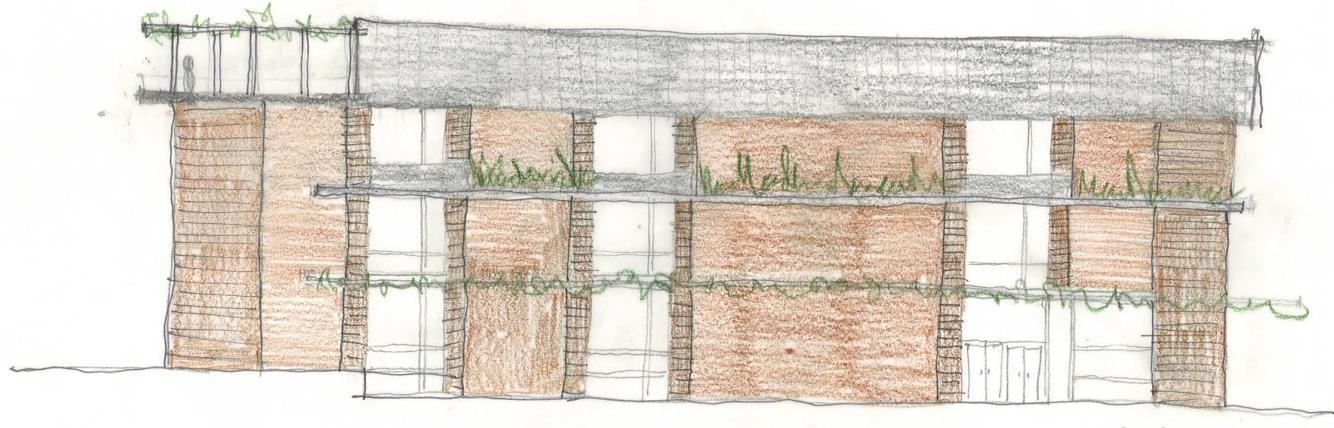


sectional studies

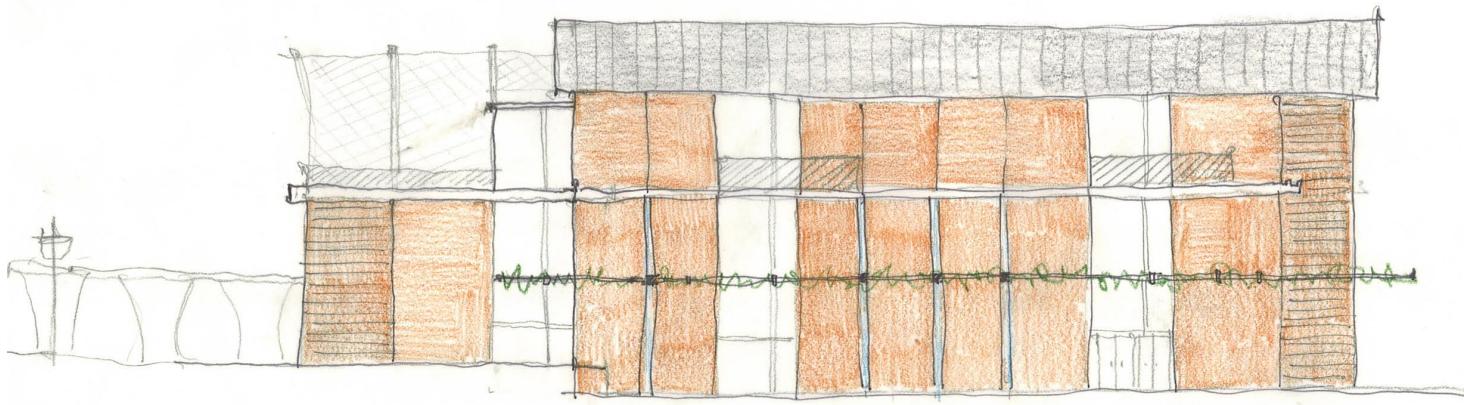


A series of sectional sketches study the relationship between the park to the south and the King St. axis to the north. How can the landscape be pulled through the site to stitch the spaces together?

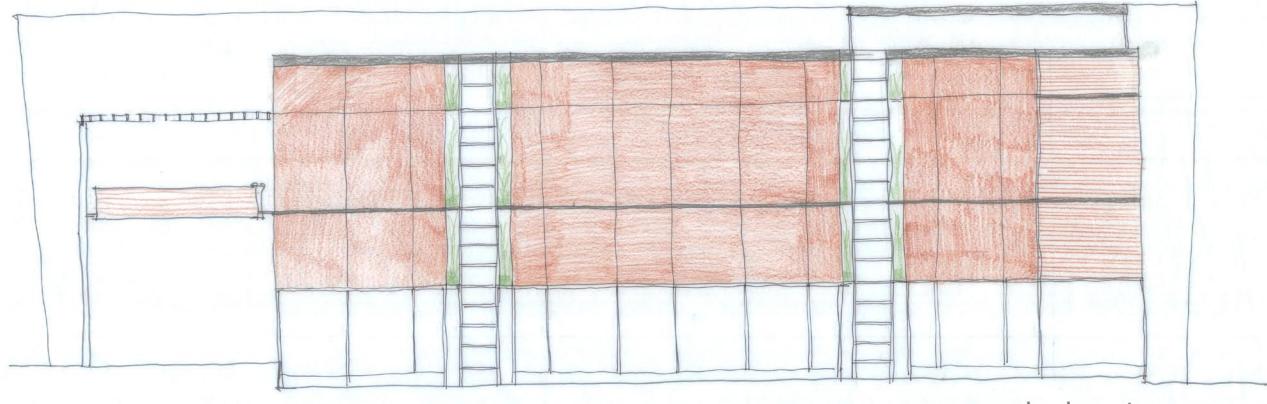
A vertical element, inspired by the "stay" from earlier fabric studies, was introduced as a metering and structural device. The stay becomes a spine from which the rest of the building is anchored.



north elevation

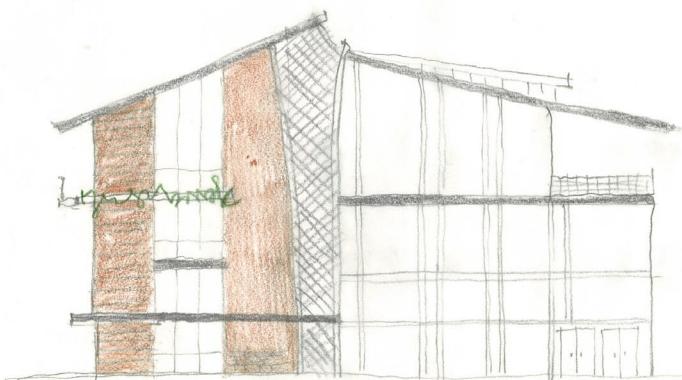


north elevation



north elevation

elevation studies



west elevation



west elevation

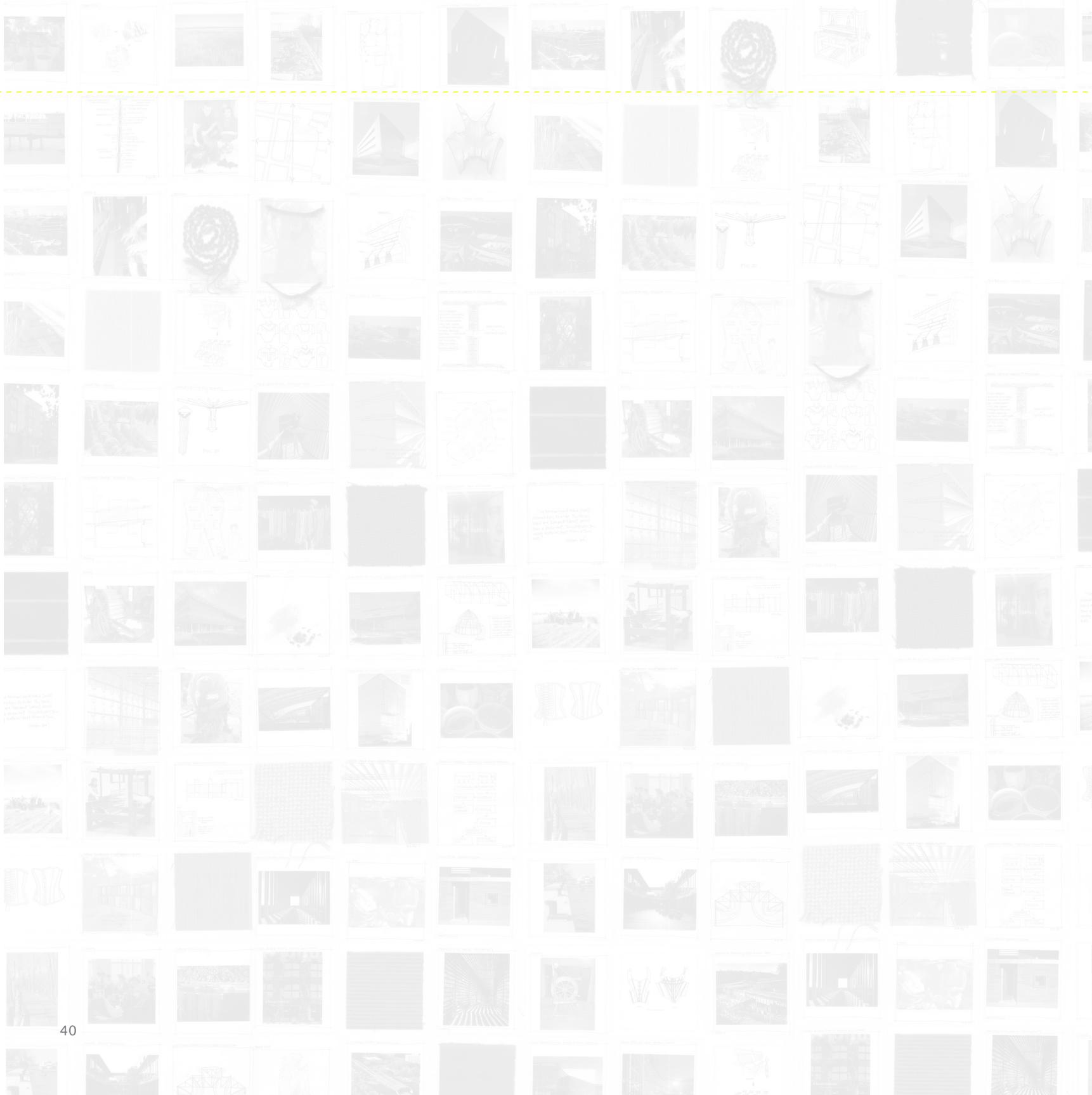


east elevation

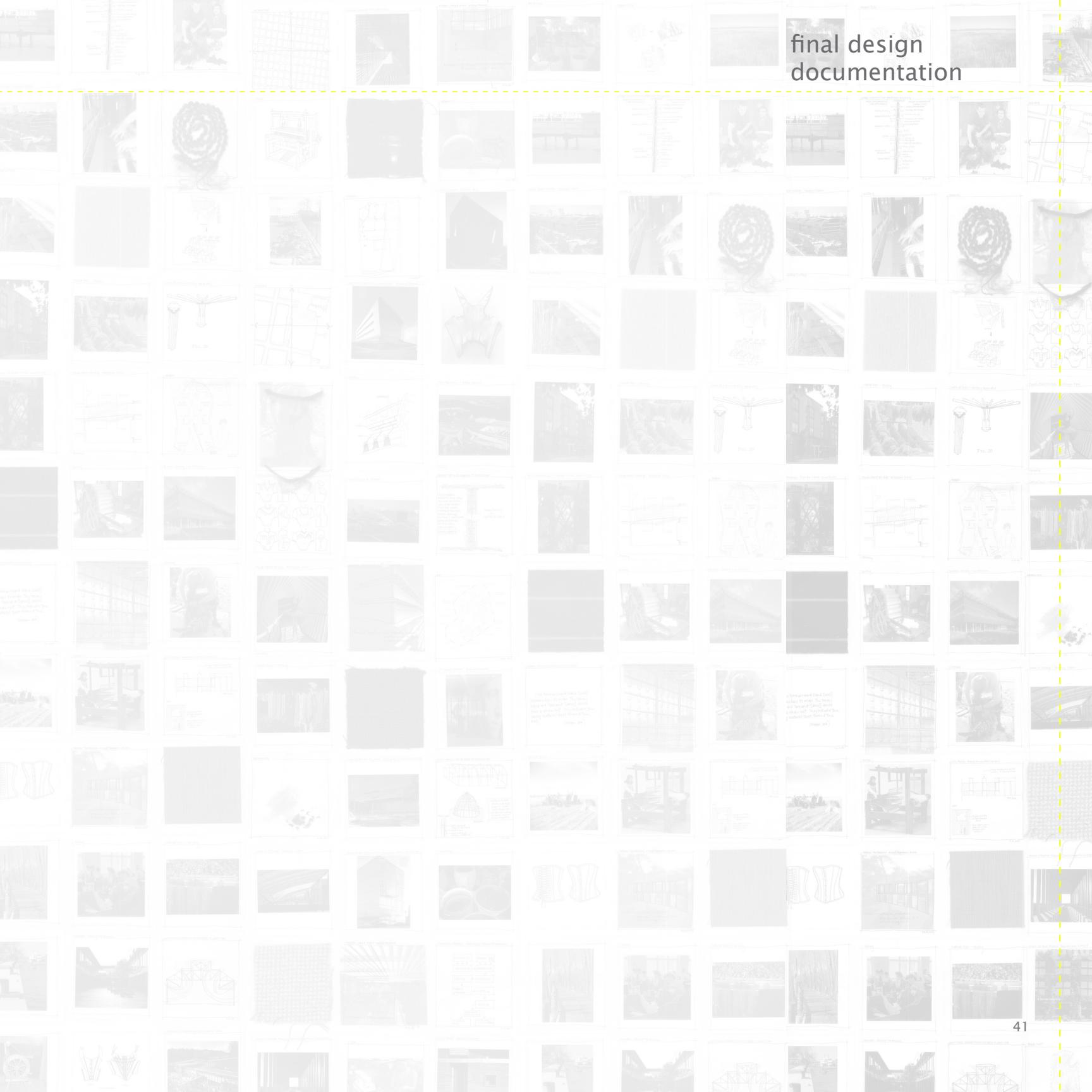
As the selvage, the north facade of the building is wrapped in a terracotta rainscreen. Terracotta is a material that is prefinished by definition, and thus an appropriate representation of the selvage. As King St. is lined in traditional, brick buildings, the terracotta rainscreen serves as modern interpretation of traditional brick. The ground floor is opened up with glazing to provide views into the public spaces.

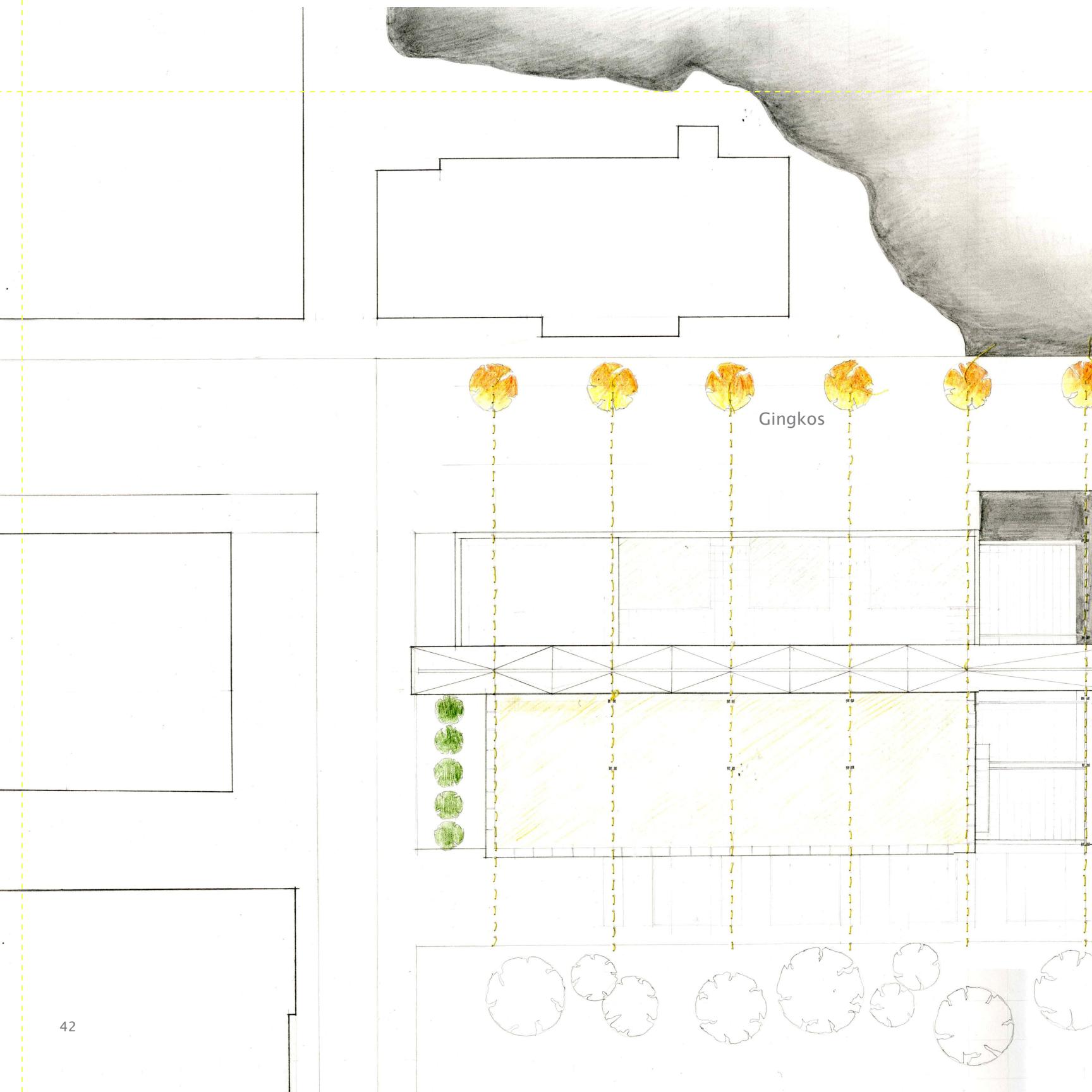
The south facade is composed of multiple layers, a glass curtainwall, free-standing structure, a terracotta sunscreen, and deep overhangs. Each of the layers expresses itself individually to blur the boundary between interior and exterior.

The east and west facades of the building are established as a result of decisions made on the north and south.

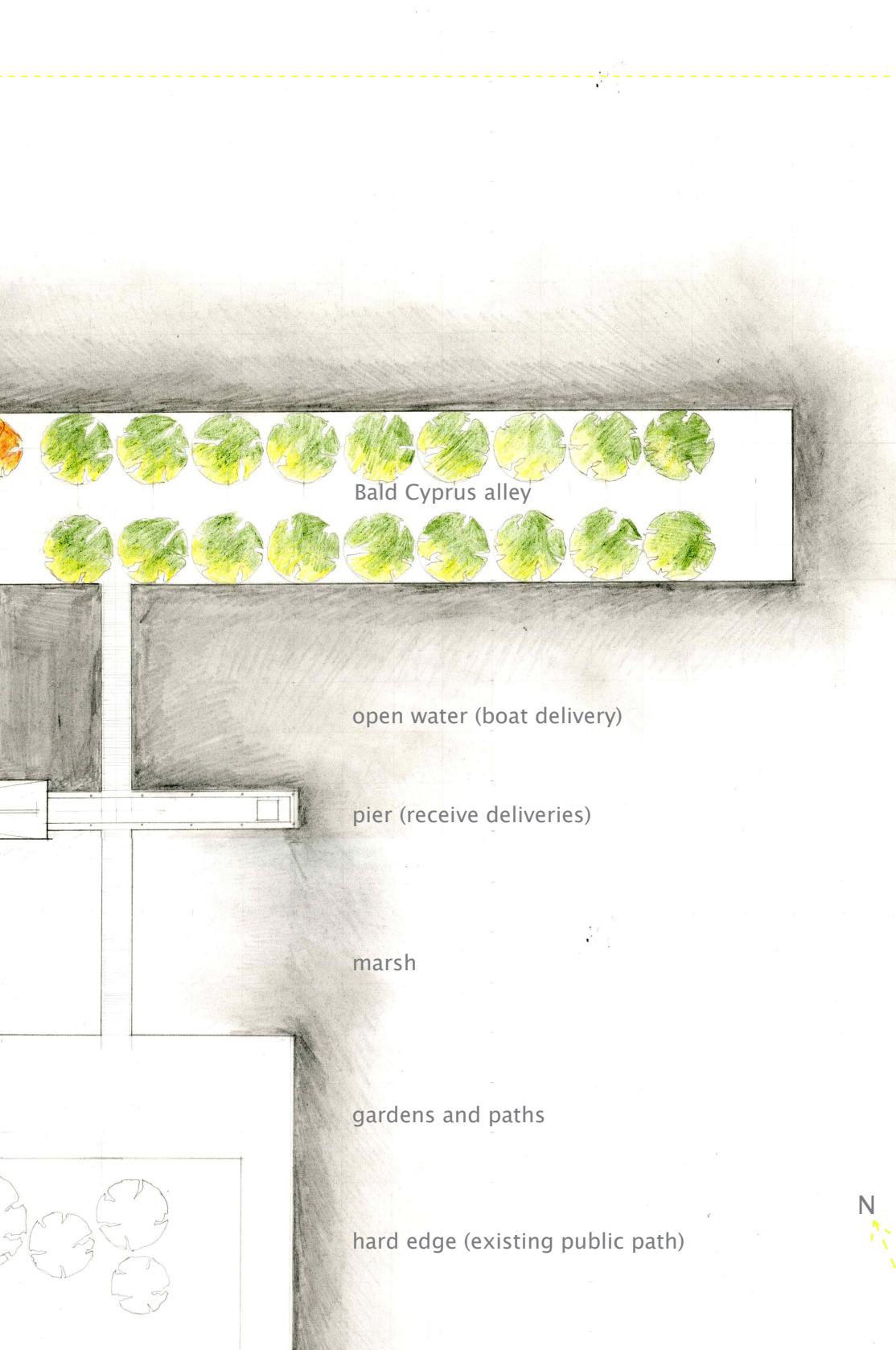


final design documentation





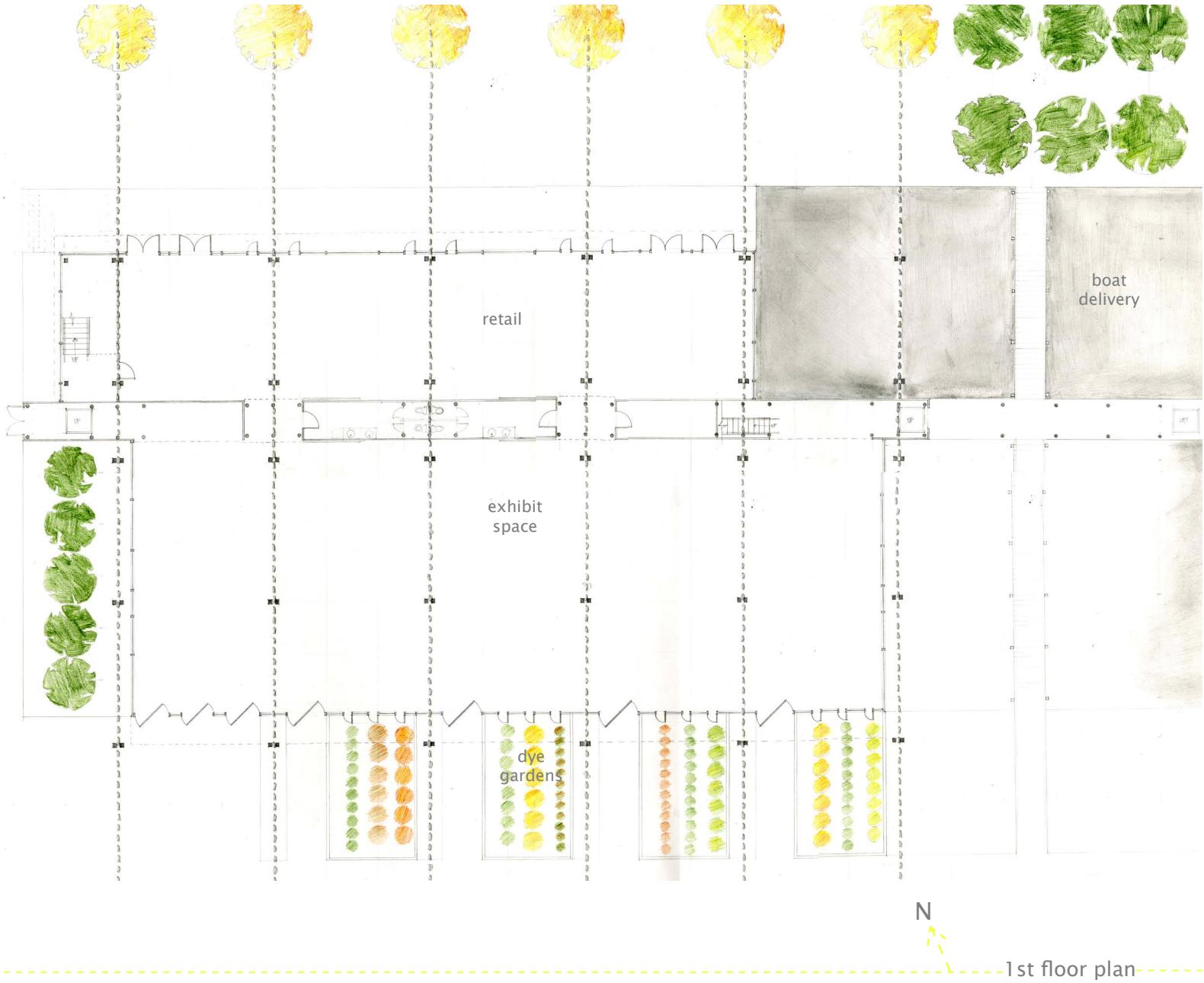
site plan



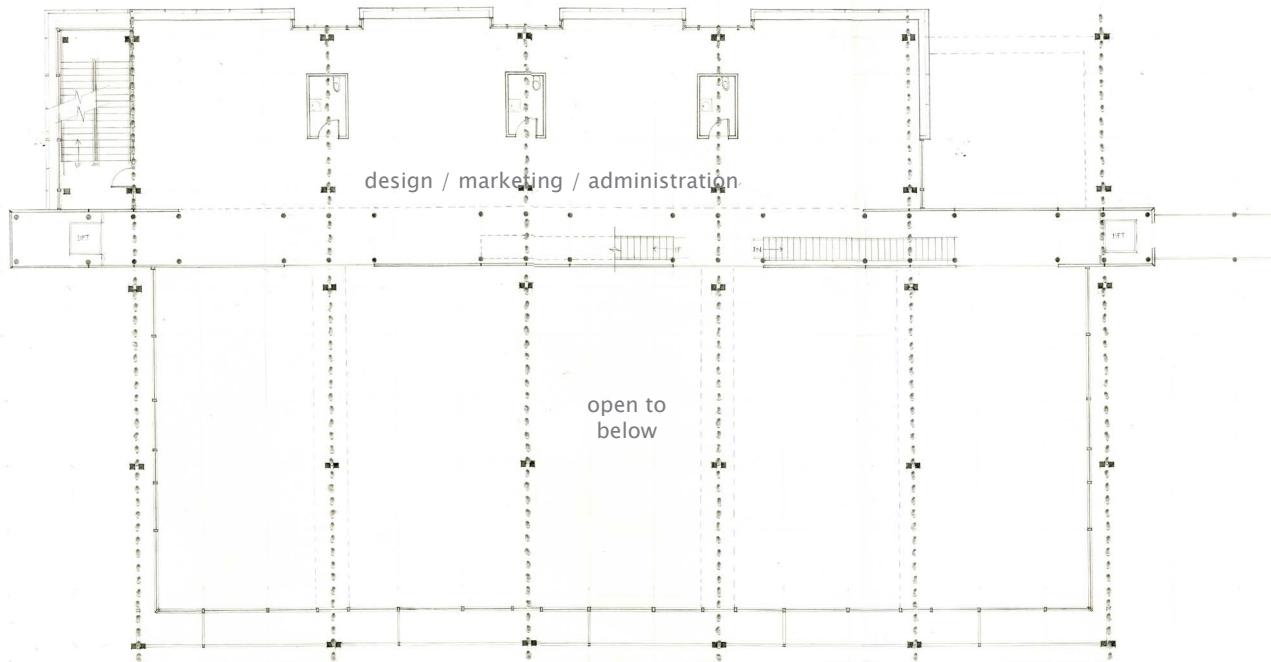
A study of the George Washington Parkway bike path provided a language of edges... how the earth meets the Potomac River. The building was abstracted into a series of zones, which were then extruded into the river, continuing the metaphor of the warp and the weft. Each zone meets the water in a unique way, with a direct connection to the adjacent building.

A jetty, planted with an alley of Bald Cypress trees, extends into the Potomac River, defining the King St. axis as the most prominent. Upon reaching the end of the axis, the visitor may step out of the alley to capture an expansive view of the river. Turning to face the west, the visitor will be presented with a view of the Masonic Temple, framed by the alley of trees.

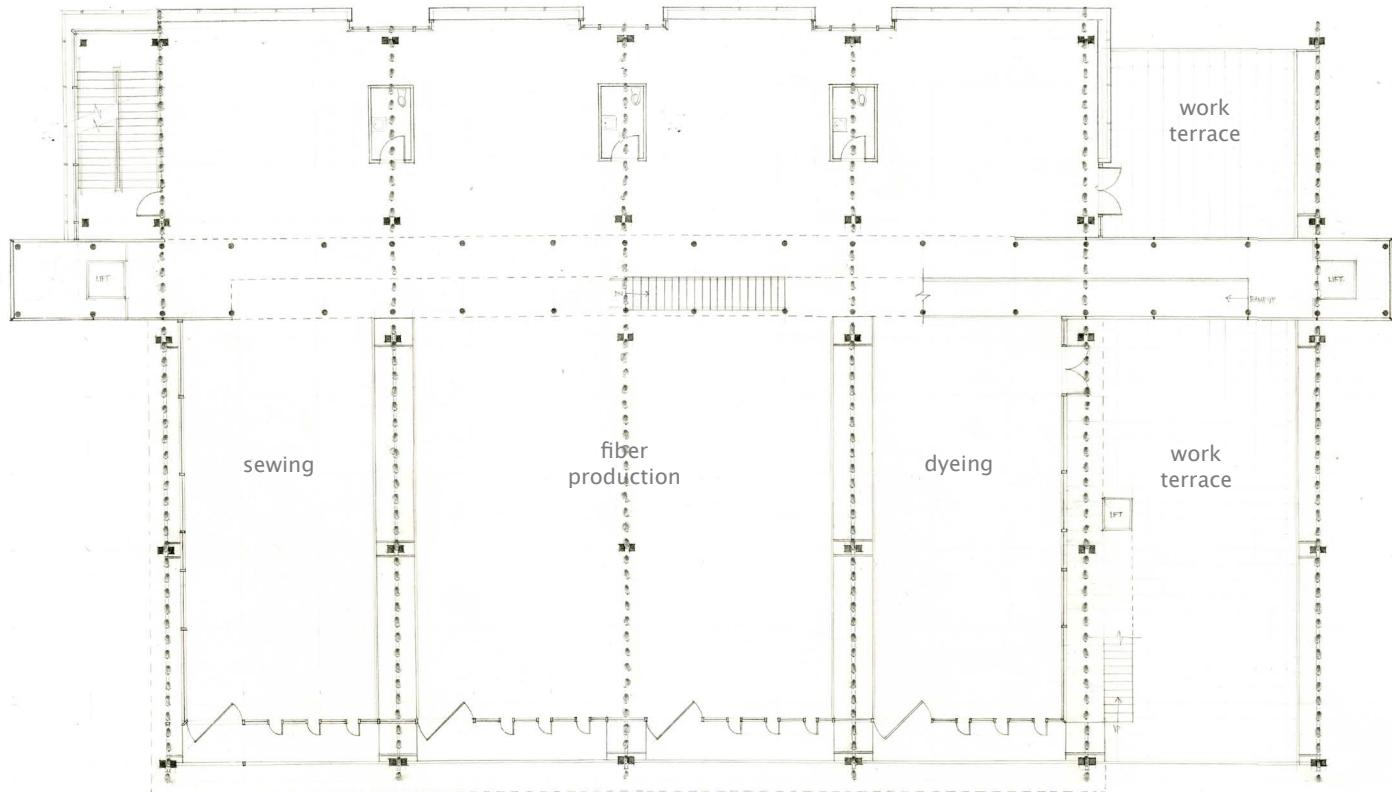
The threads that pull through the site, from the park to King St, are resolved to the north as knots in the landscape. The Gingko tree represents this knot as a sculptural object. This row of trees begins to frame a plaza in front of the retail space for markets to occur.



floor plans



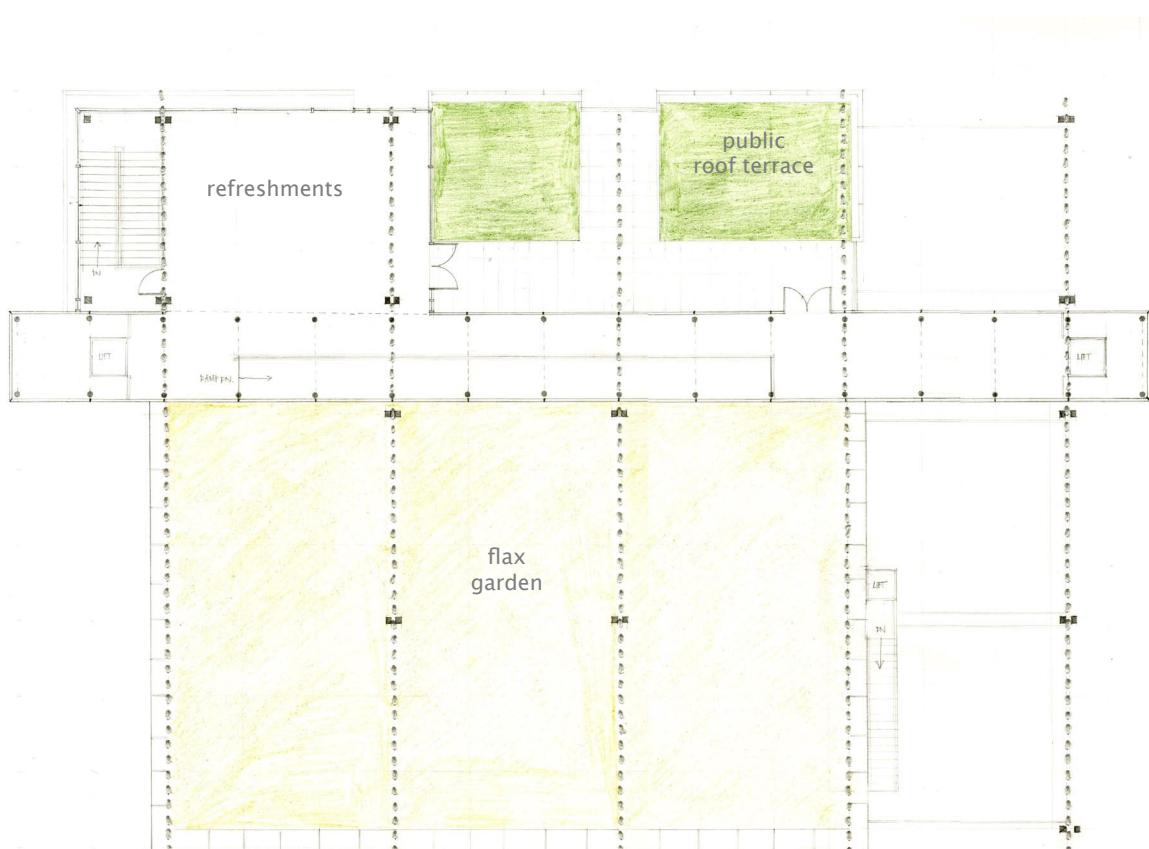
2nd floor plan



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3rd floor plan

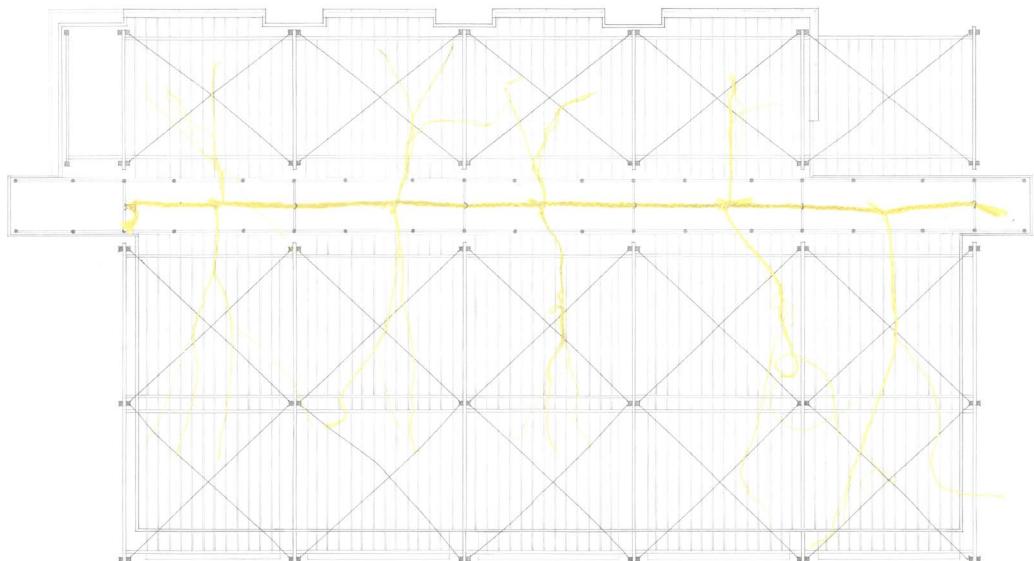
floor plans

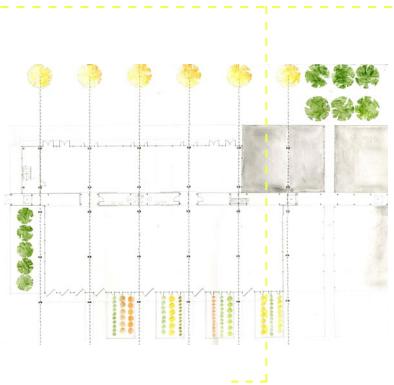


4th floor plan

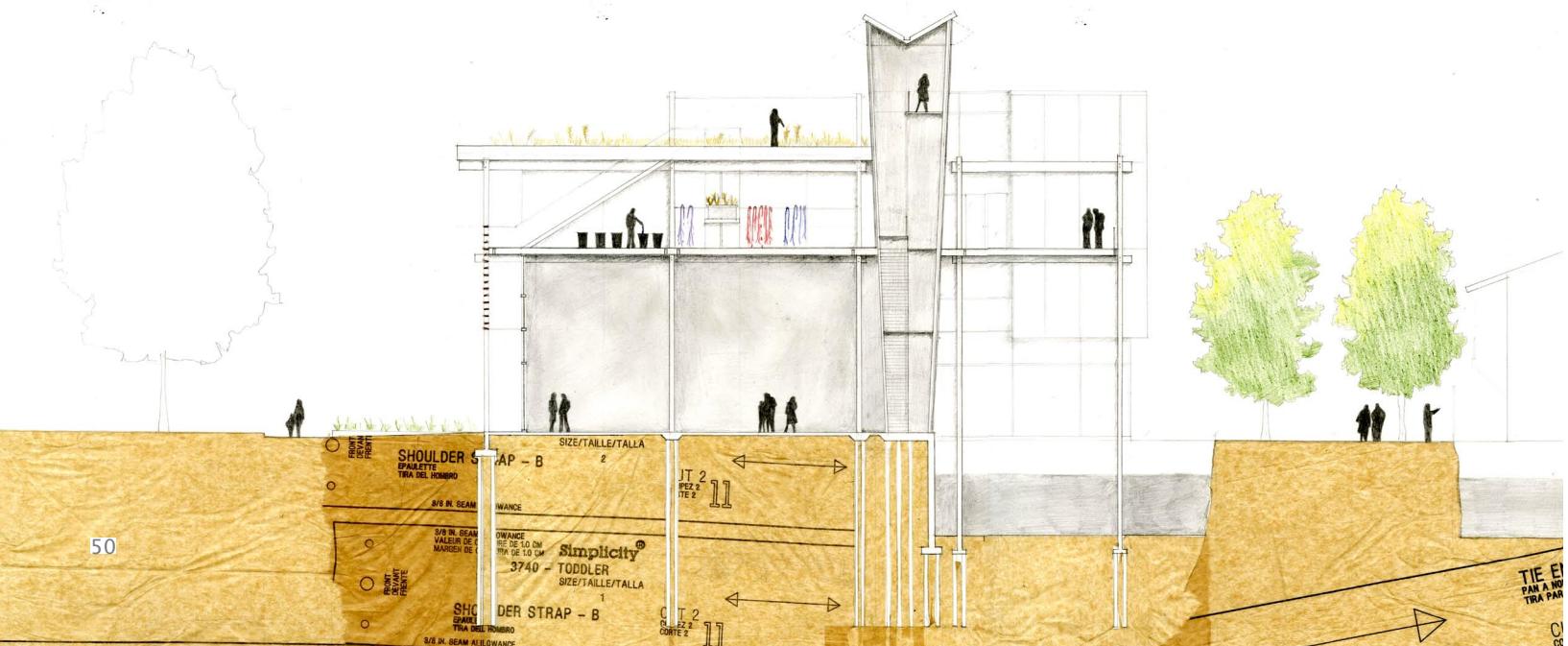
reflected ceiling plan

The mechanical system of the building emulates a braid. The main trunk of the ductwork will be located in the spine; smaller ducts will branch off of the main line into the adjacent spaces.

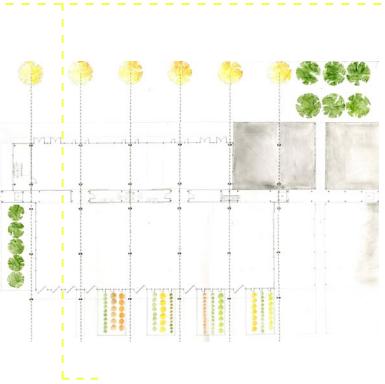




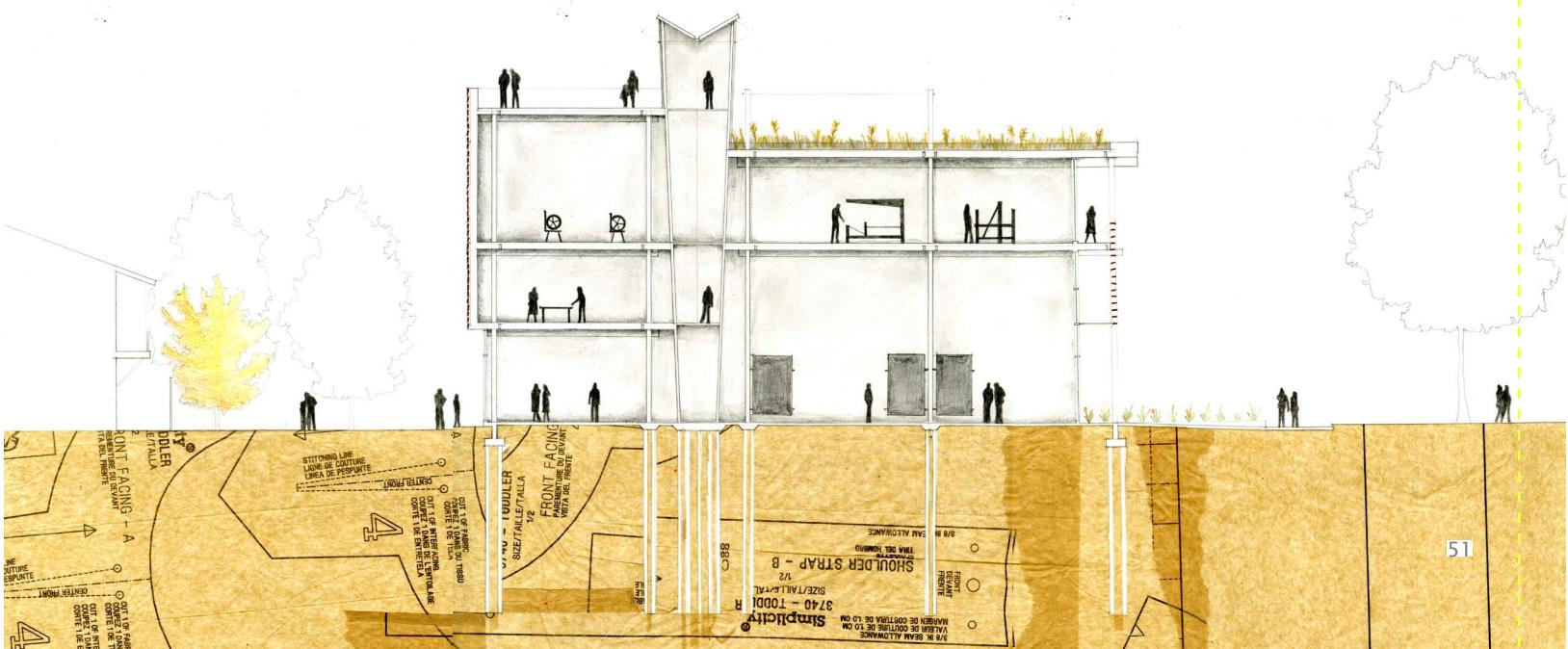
North-South cross section cut through east end of building, looking at work terraces on the 3rd floor.

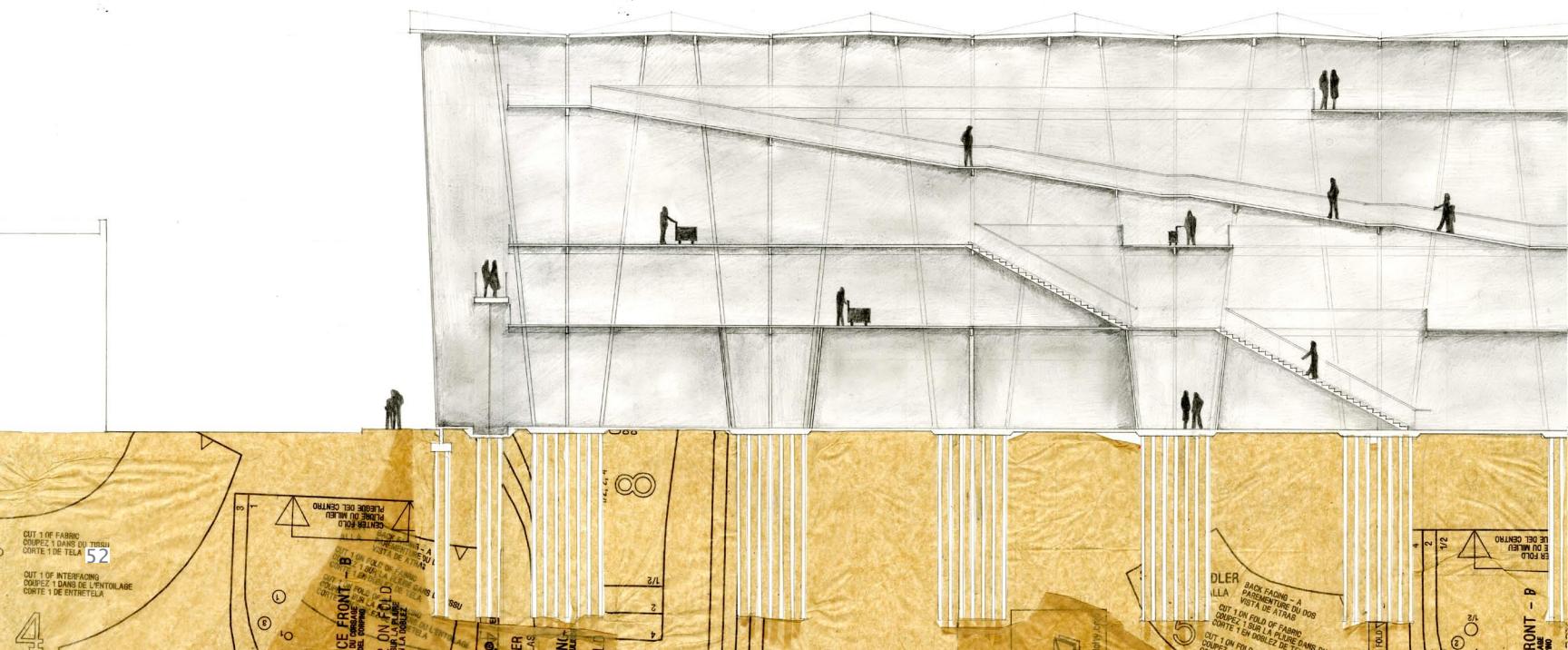


sections

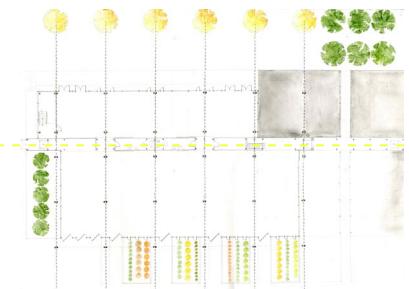


North-South cross section cut through west end of the building, looking at 1st floor retail and exhibits, 2nd floor design studios, 3rd floor production spaces, and roof terraces and flax garden.

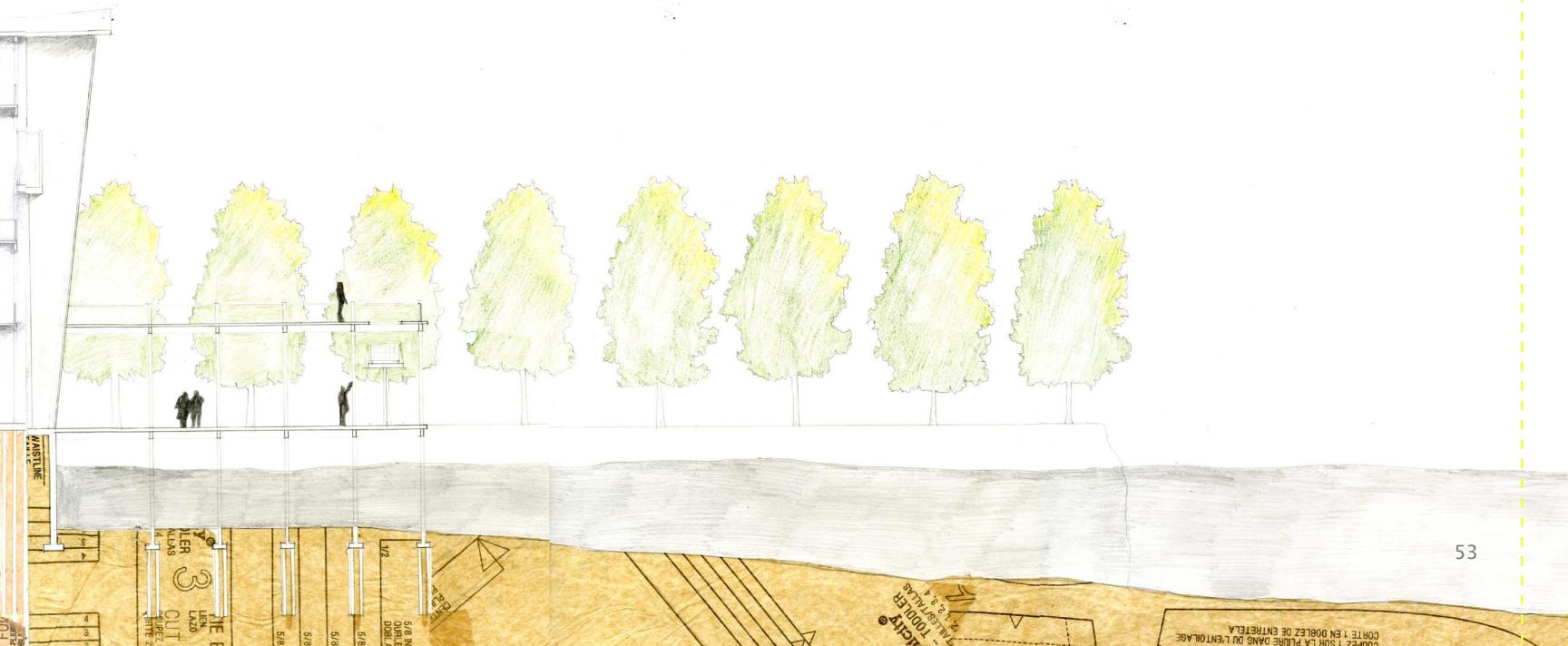


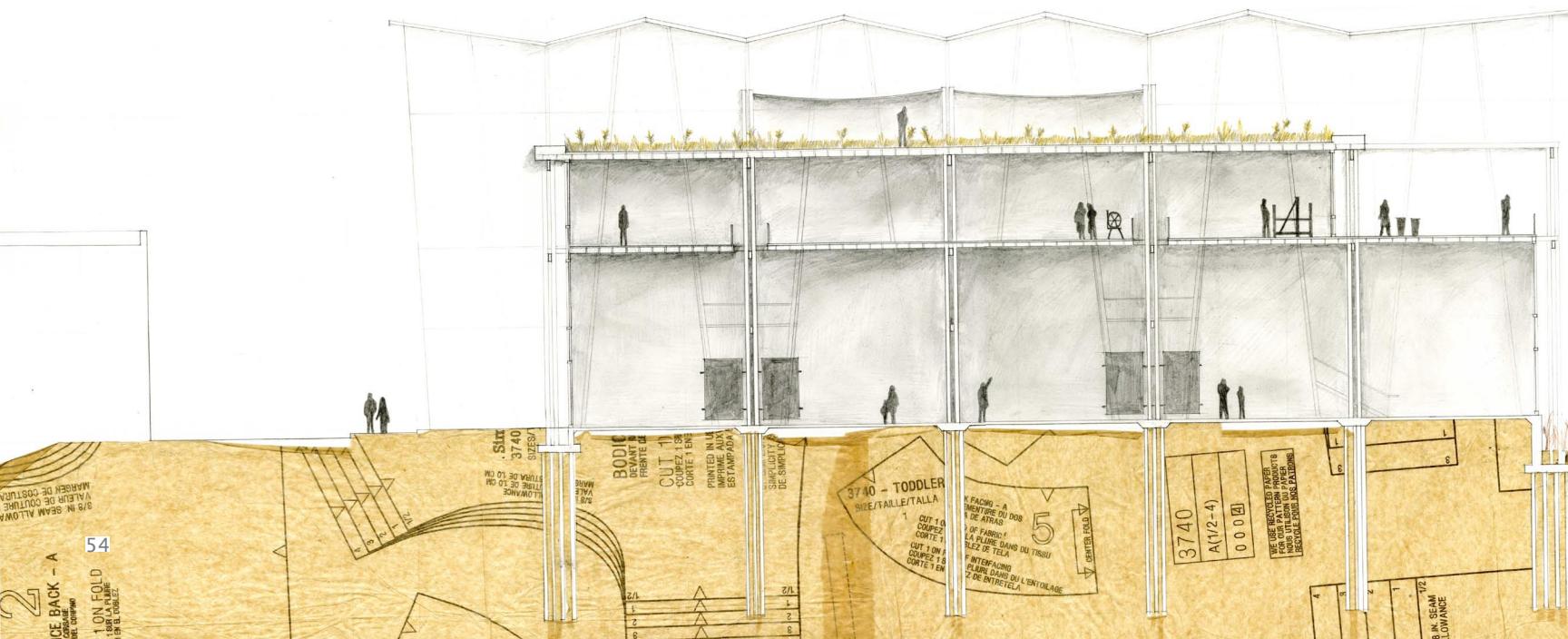


sections

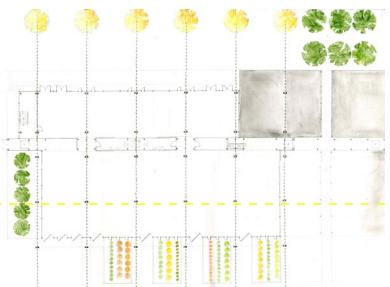


East - West longitudinal section through the central circulation spine. The spine projects out into the Potomac River as a pier to collect boat deliveries.

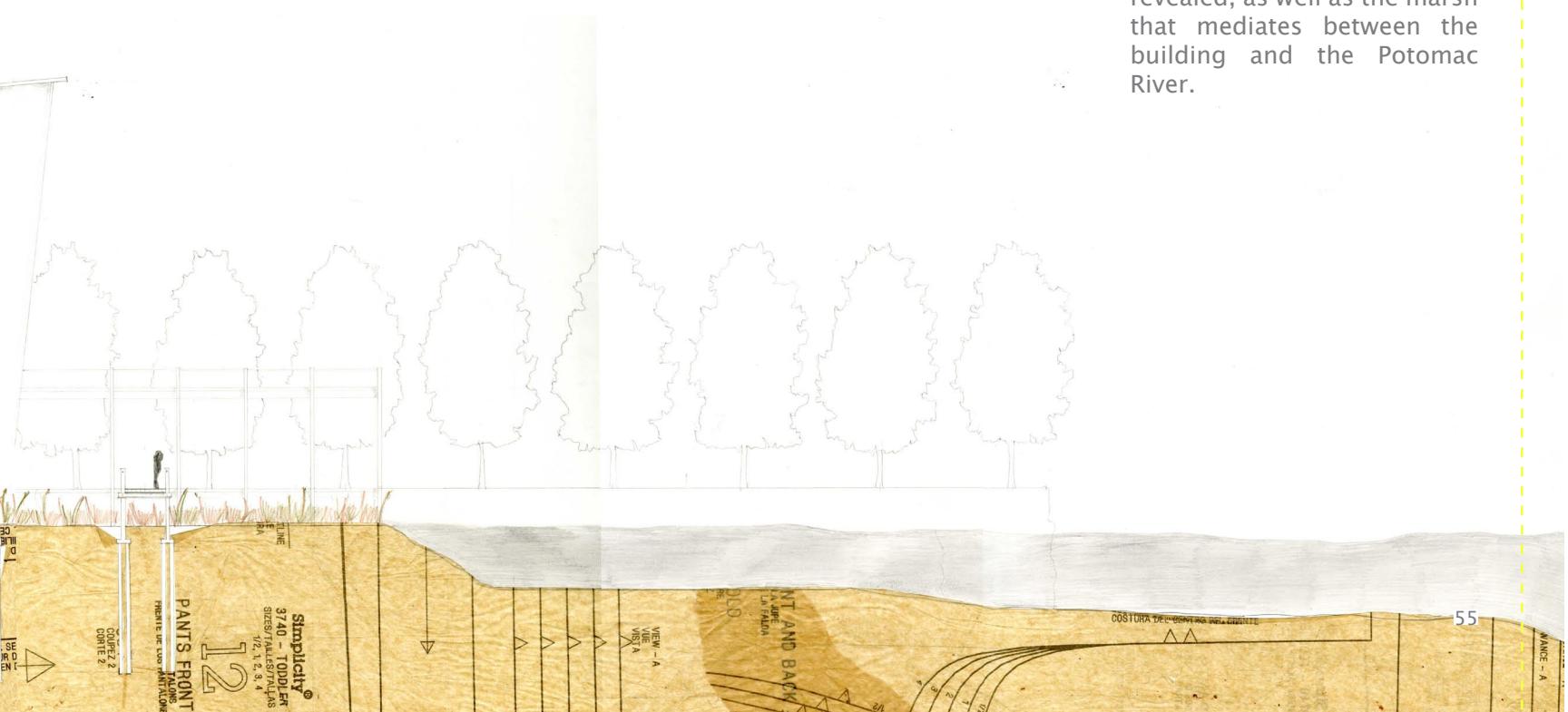


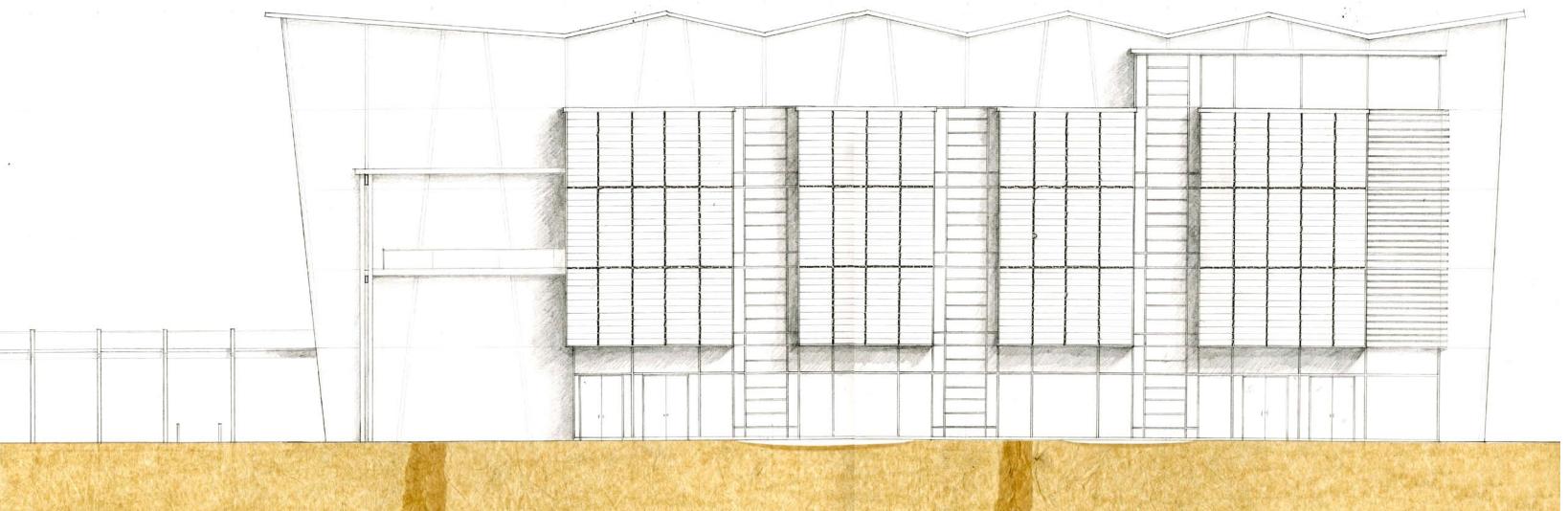


sections

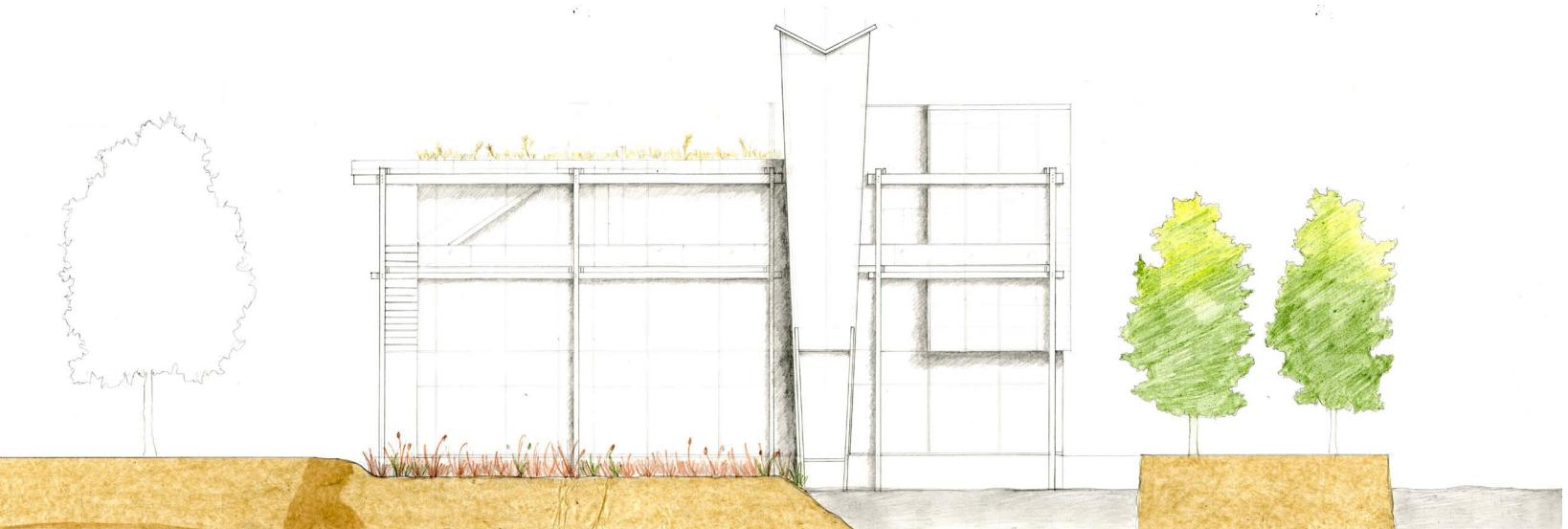


East - West longitudinal section cut through the south end of the building. The 1st floor exhibit spaces and 3rd floor production spaces are revealed, as well as the marsh that mediates between the building and the Potomac River.



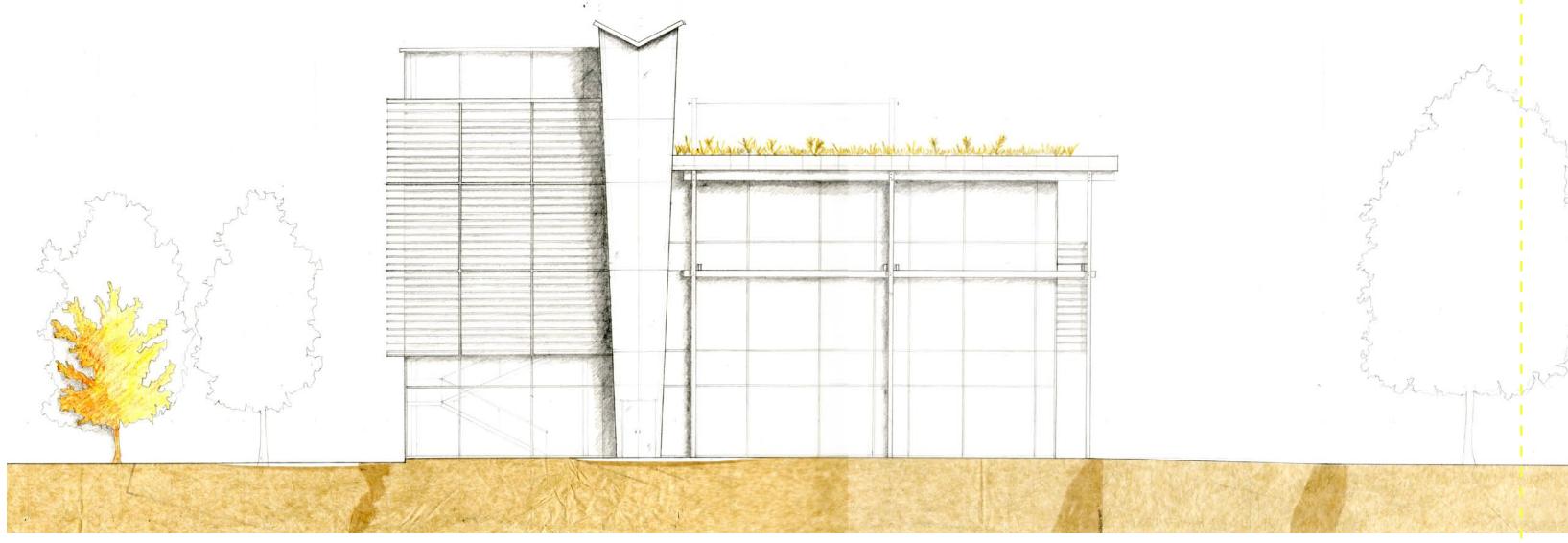


North



East

elevations

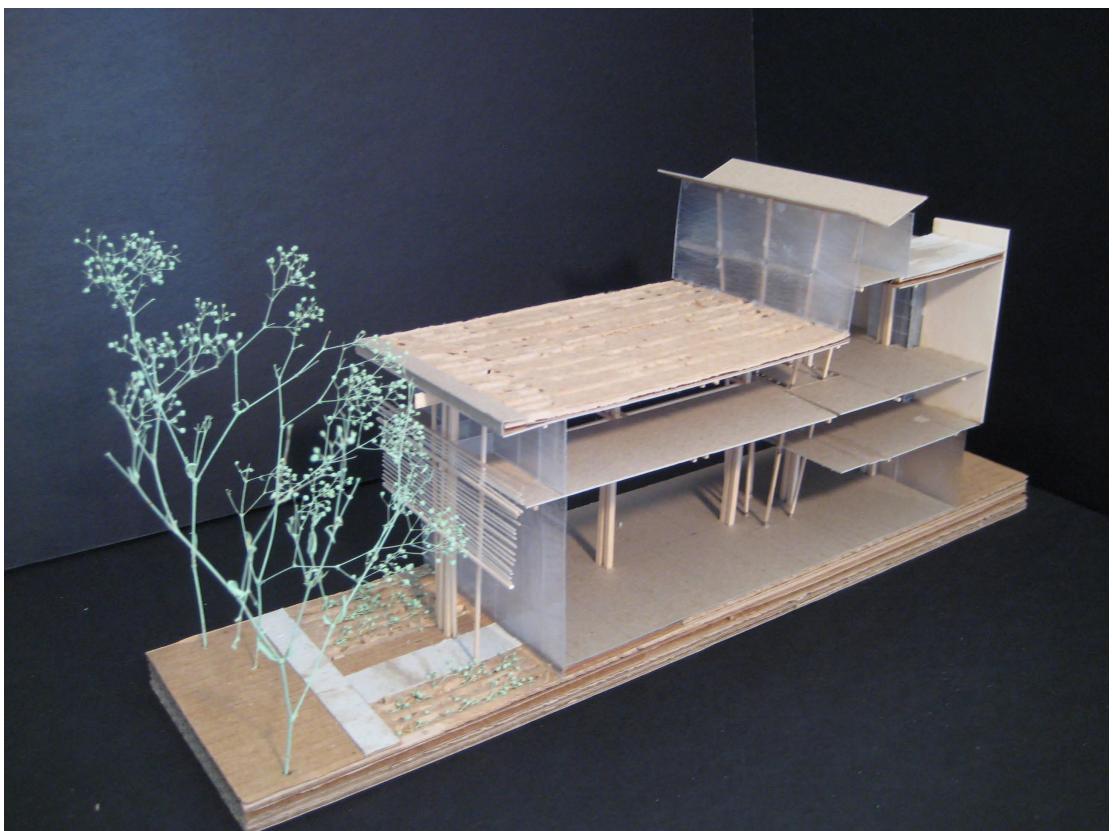


West



South

structure



Pairs of columns march through the building, with beams threaded through them. On the north edge, the structure is tucked neatly behind the terracotta rainscreen. On the south facade, the structure is revealed, as the layers of the facade are pulled away from one another. The columns on the south side continue through the roof at a few key points to provide a framework from which a shading device may be strung.

The structural design of the central spine provides a zone of circulation independent of the rest of the building. The corset and the stay were the inspiration for the spine. In comparison to the rest of the building, the structure of the spine is light and thin. There are a series of round columns that run the length of the building, opening up and out to the sky, and capped by a butterfly roof. The roof of the spine is sculptural; at each of the major beam lines, the butterfly roof folds in on itself, allowing rain water to drain to a few central points. The water then filters into a series of scuppers that empty onto the south flax garden.



view from the Potomac River,
looking west at the boat
delivery pier and marsh

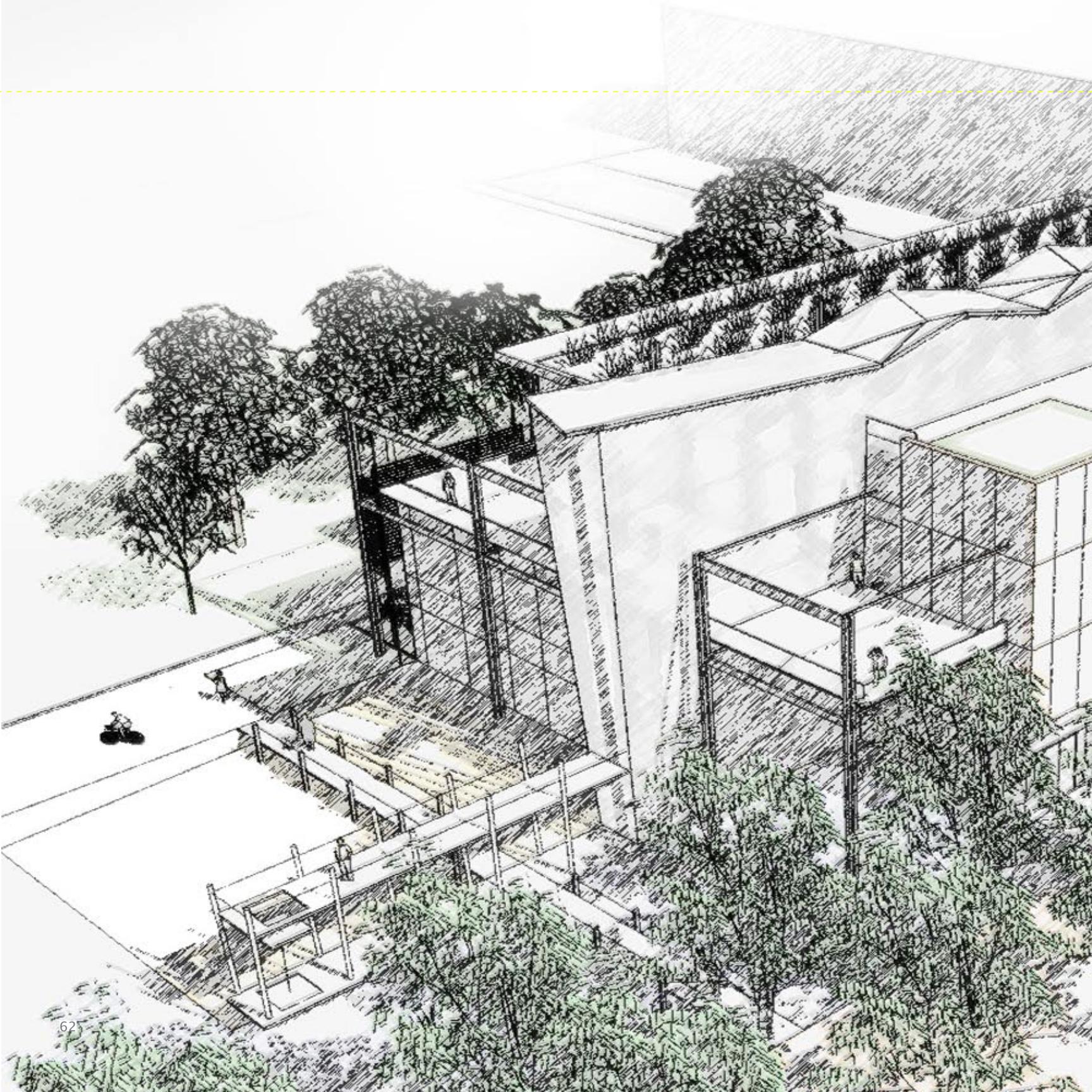


view from northeast, look-
ing at the north facade of the
building

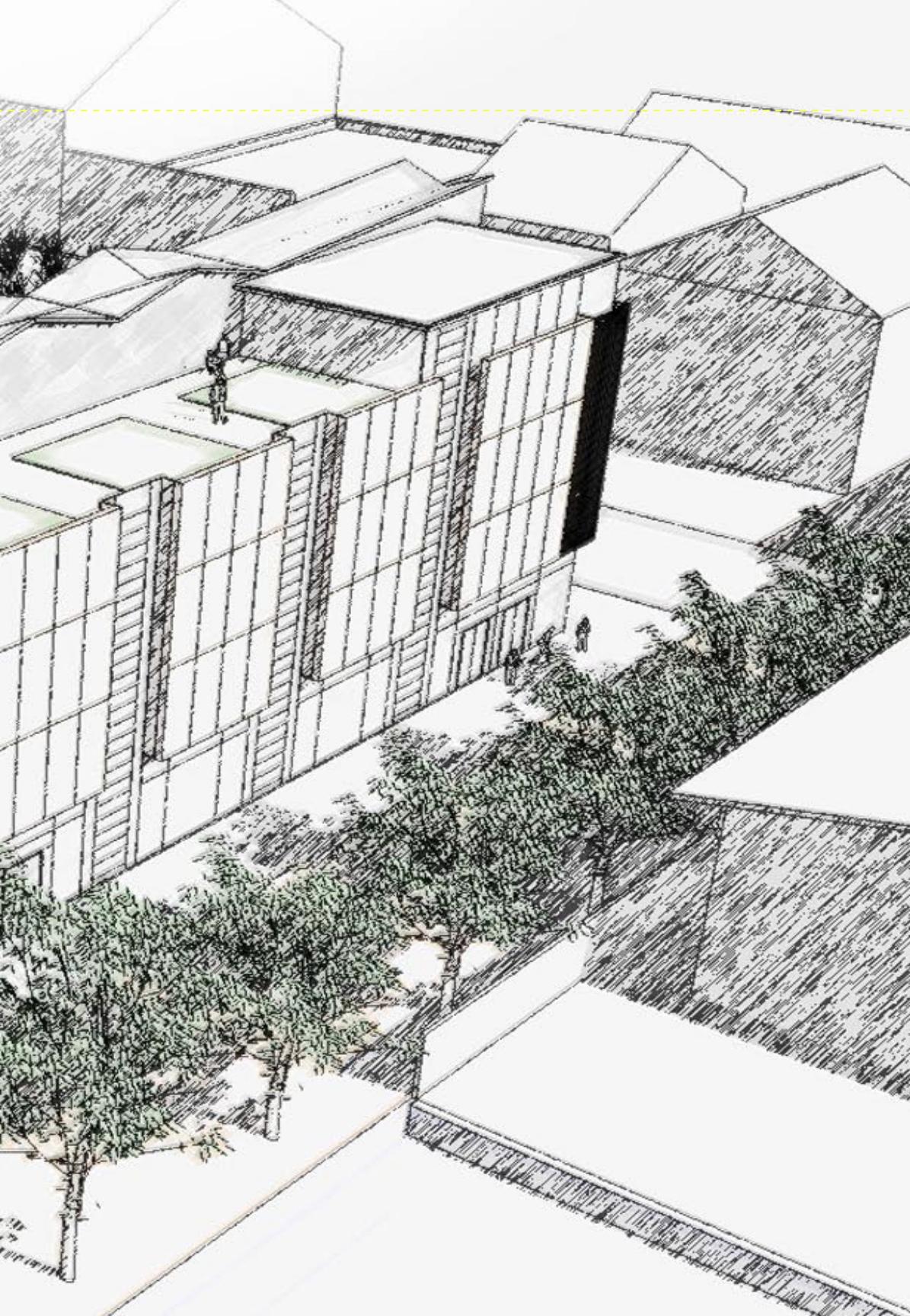
model



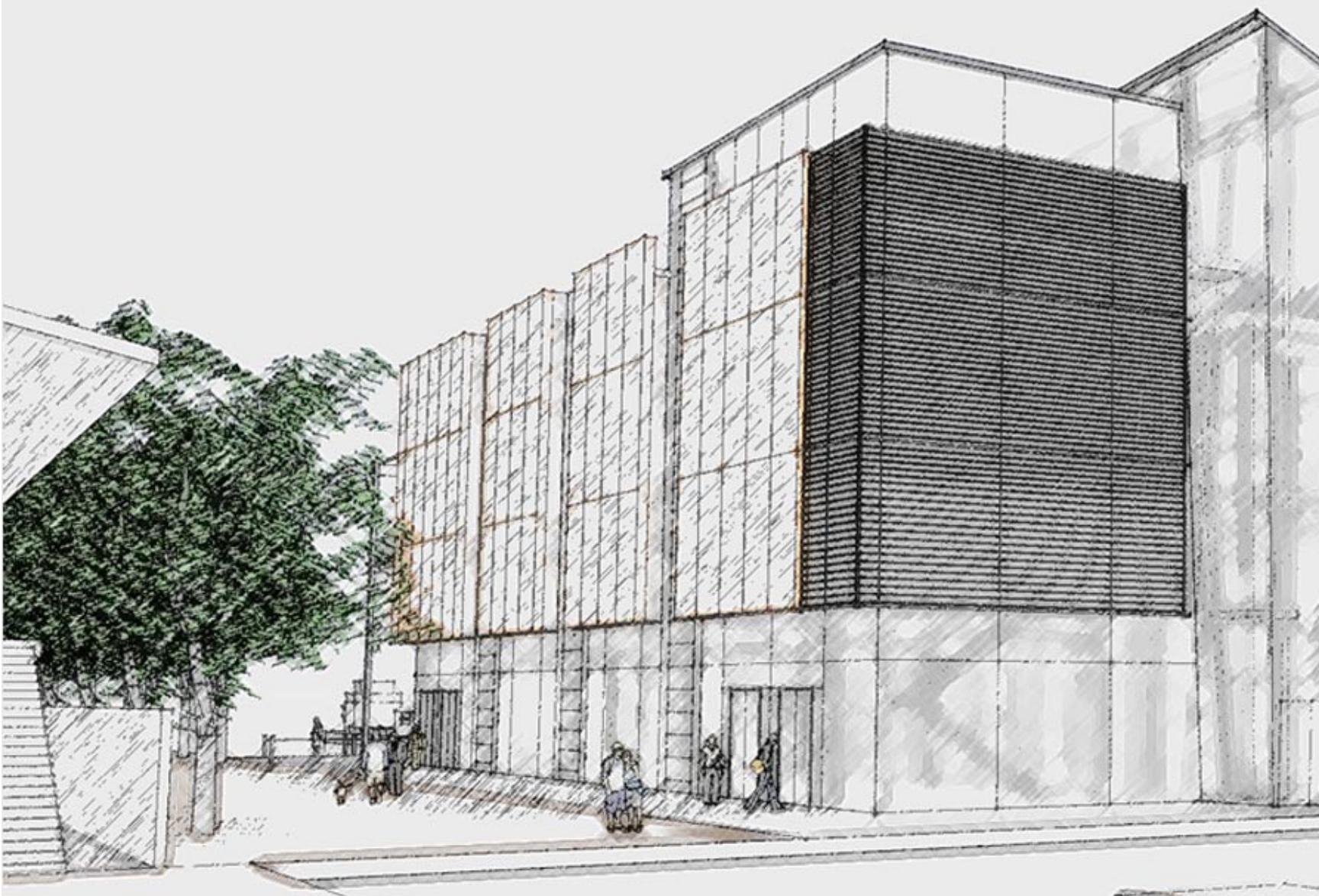
aerial view of building,
adjacent gardens, and Bald
Cypress alley extending along
the King St. jetty



perspective views



aerial view looking at the north facade and alley of Bald Cypress trees defining the jetty



perspective views



view from King St, looking at
the northwest corner of the
building



perspective views



view from the public path
that winds along the Potomac
River



perspective views



view from The Strand, looking at the south entrance to the exhibit spaces



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Defense
image by author

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