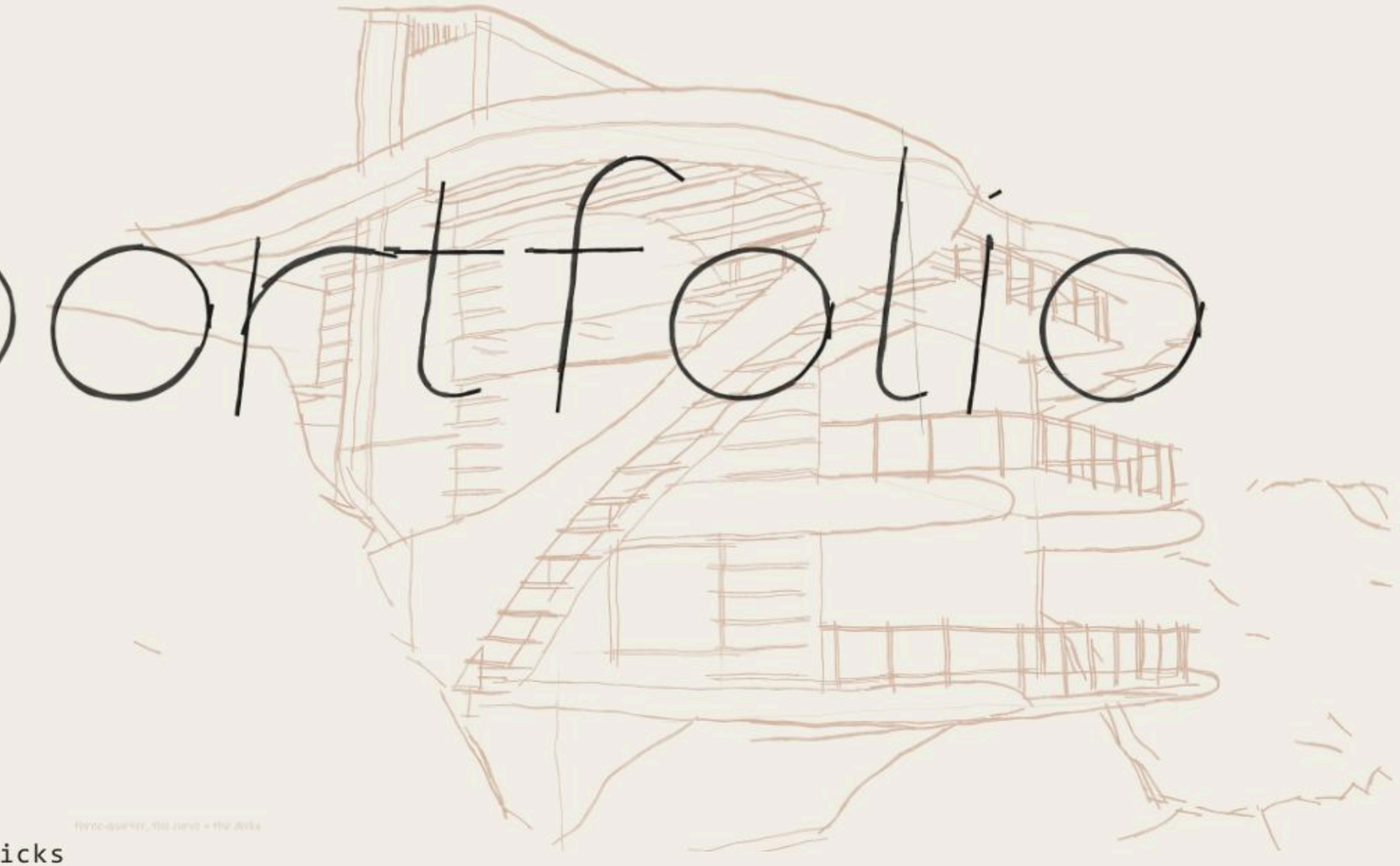
ARCHITECTURE PORTFOLIO

selected works, 2026

portfolio



Luke Fredericks

Tufts University, Architectural Studies in Engineering, 2028



luke fredericks

Tufts University, Architectural Studies in Engineering, 2028

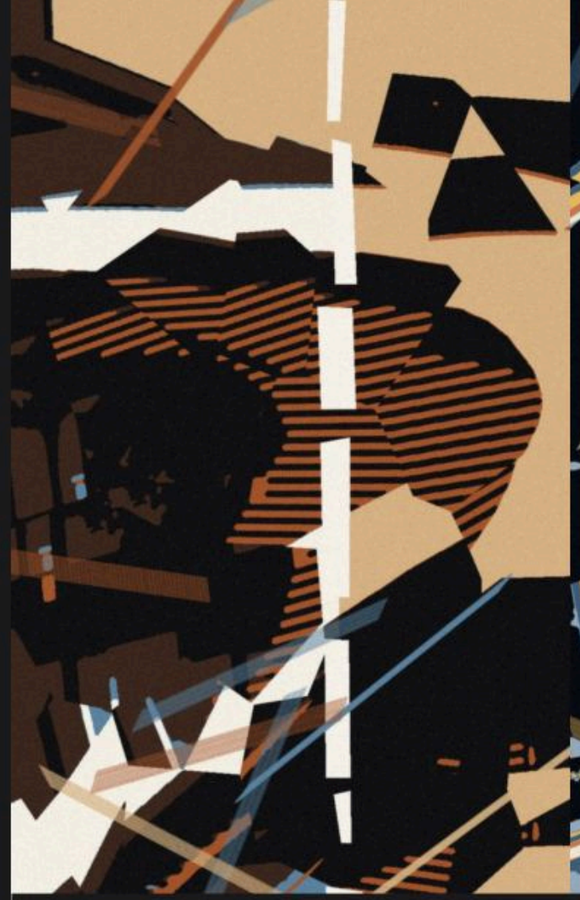
luke.fredericks@tufts.edu

SOFTWARE

Revit, Rhino, Enscape, hand sketching

ABOUT

These are three projects from 2026: a house on a cliff, a footbridge over the Charles and a bus stop in my hometown. Each one went from early sketches through rounds of digital models to finished renderings and a set of drawings.







01

aerie house

a house on a cliff edge

page 03

02

whale bridge

a footbridge at the Museum of Science

page 17

03

calla lilies

a bus stop in Jamaica Plain

page 28



01

aerie house

An aerie is the nest a hawk or eagle builds on a rock ledge.

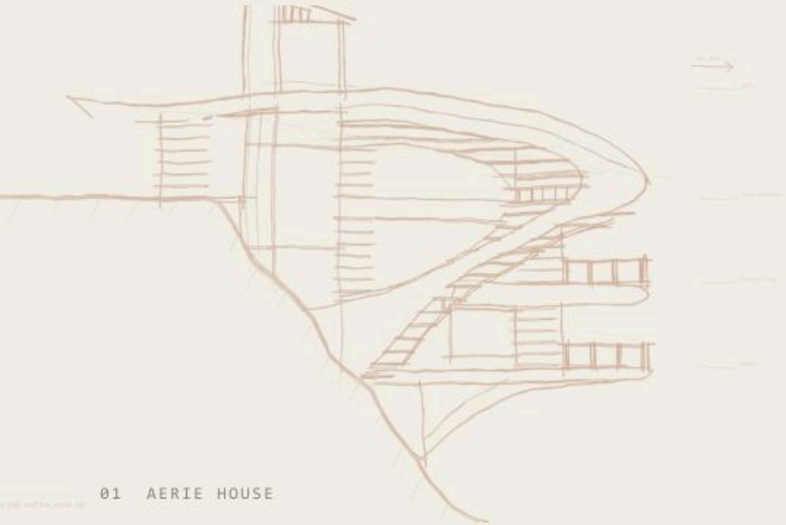
TYPE	single-family house
SITE	cliff edge, conceptual
LEVELS	four, stepping down the rock
TOOLS	hand sketch, Revit, Enscape
YEAR	2026

THE IDEA

Aerie House is a family house built into the face of a cliff. It takes the same position as the nest it is named for, holding on to the rock and hanging out over the valley.

The two white walls that curve around its sides began as one line in my first section sketch. I traced the model directly from that drawing and kept checking it against the sketch as the design grew, so the line never got lost. Ash bars fill the gap between those walls and the dark timber house inside them.

The house has four levels stepping down the cliff: the entry and bedrooms on the main floor, the kitchen and living room below facing the view, guest rooms and a rec room at the bottom, and an office with a glass lookout on top.



4
LEVELS
13 ft from floor to floor

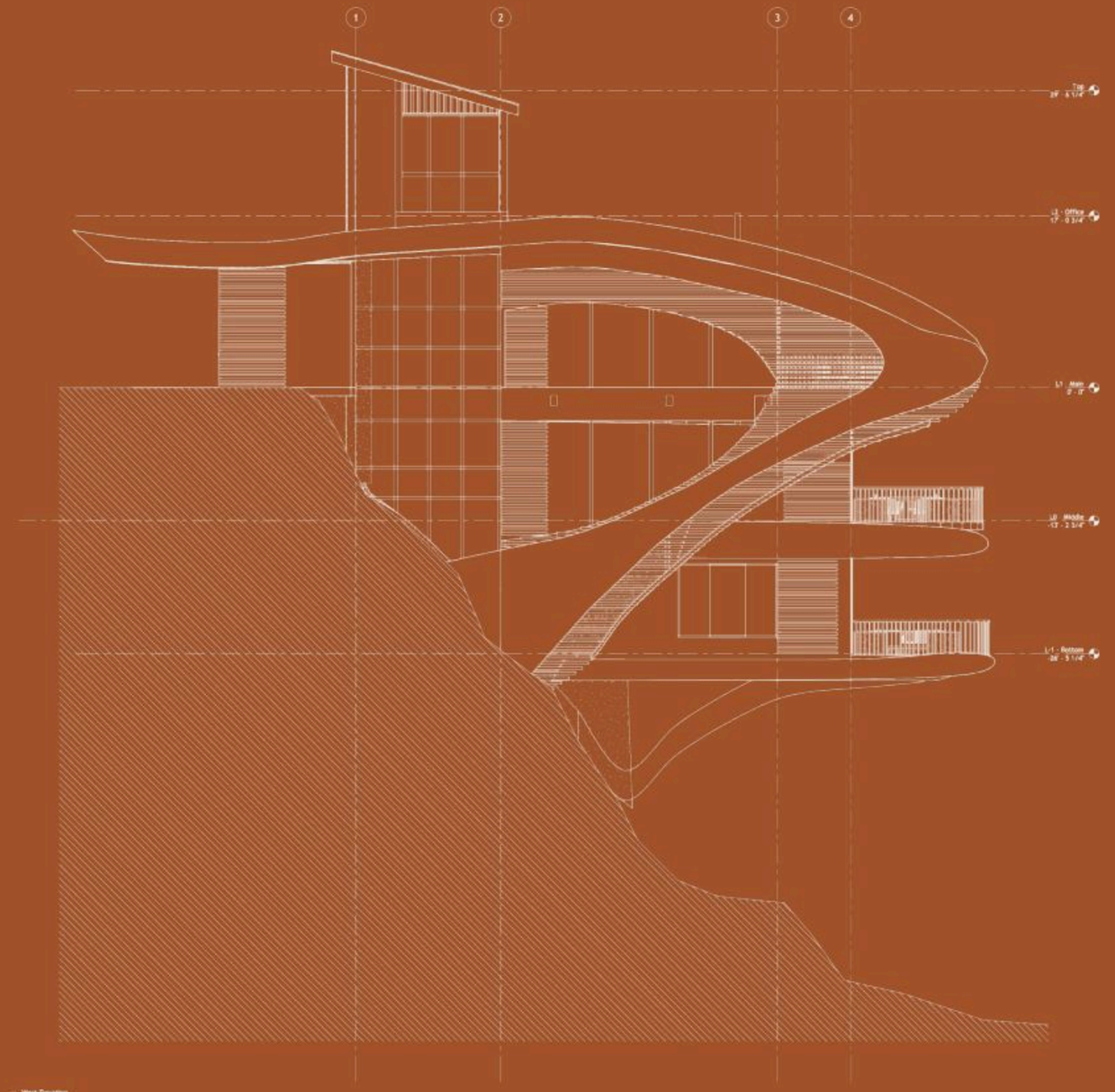
3,990 sq ft
INDOORS
across the four levels

1,315 sq ft
OF DECK
three decks facing the valley

70 ft
TALL
from the keel to the lookout roof

43 ft
OFFICE TRAVEL
the moving office, bottom floor to top

85 ft
LONG
from the north wall to the tip of the nose



WEST ELEVATION



From above the cliff, late afternoon.

SITE AND ARRIVAL

The site is imagined: a lot on top of a rock cliff, with open ground behind it and a valley and mountains in front. Everything practical stays on the flat ground up top, and only the house goes over the edge.

You arrive from the hilltop. The drive winds down past a kitchen garden, a greenhouse and an orchard to a motor court and carport, so the first thing you see is the quiet north face. The view is held back until you are inside.







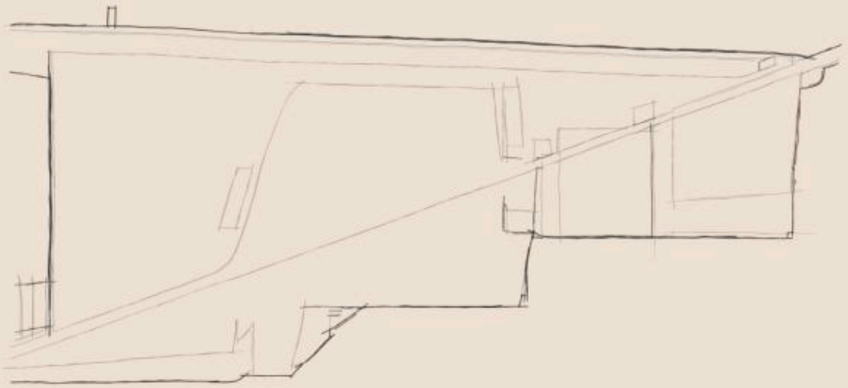
Down the drive, and the front door at night.



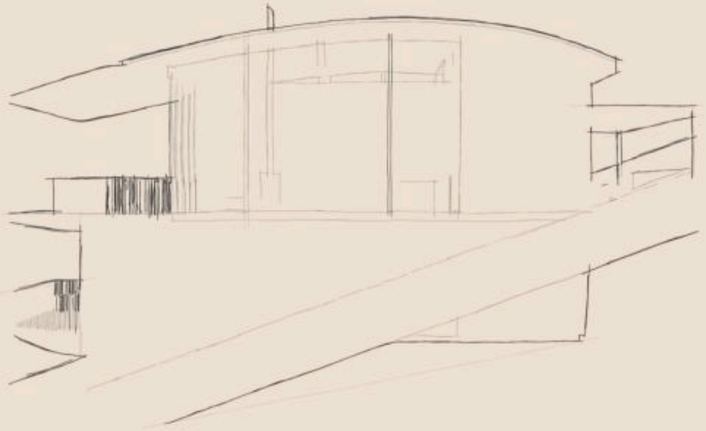
process

The first version was a box on the slope with a sloping green roof. The roof started to curve, and then a wing wrapped the side with a sharp point at the front.

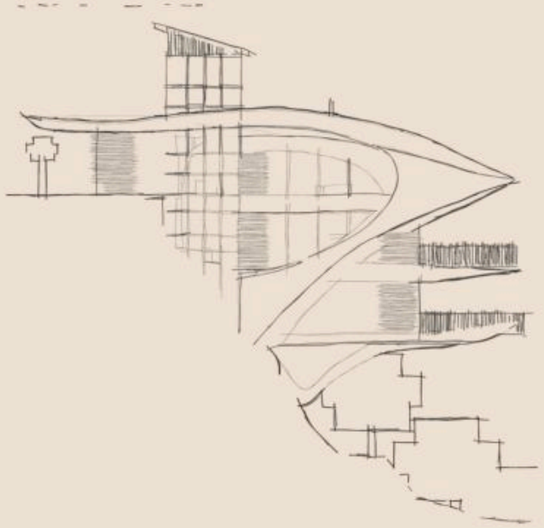
I rounded the point off because it felt aggressive, stacked the decks into the curve of the wing, and finally redrew the whole side by tracing my own section sketch.



1 A BOX ON THE SLOPE



2 THE ROOF CURVES



3 A WING WITH A SHARP NOSE



4 NOSE ROUNDED, DECKS STACKED



5 TRACED FROM THE SECTION SKETCH



The west side, where the white wall runs back into the rock.



THE NORTH FACE

The lookout's back wall faces the driveway, so it is the first thing you see when you arrive. It had to answer the curves on the other sides without copying them.

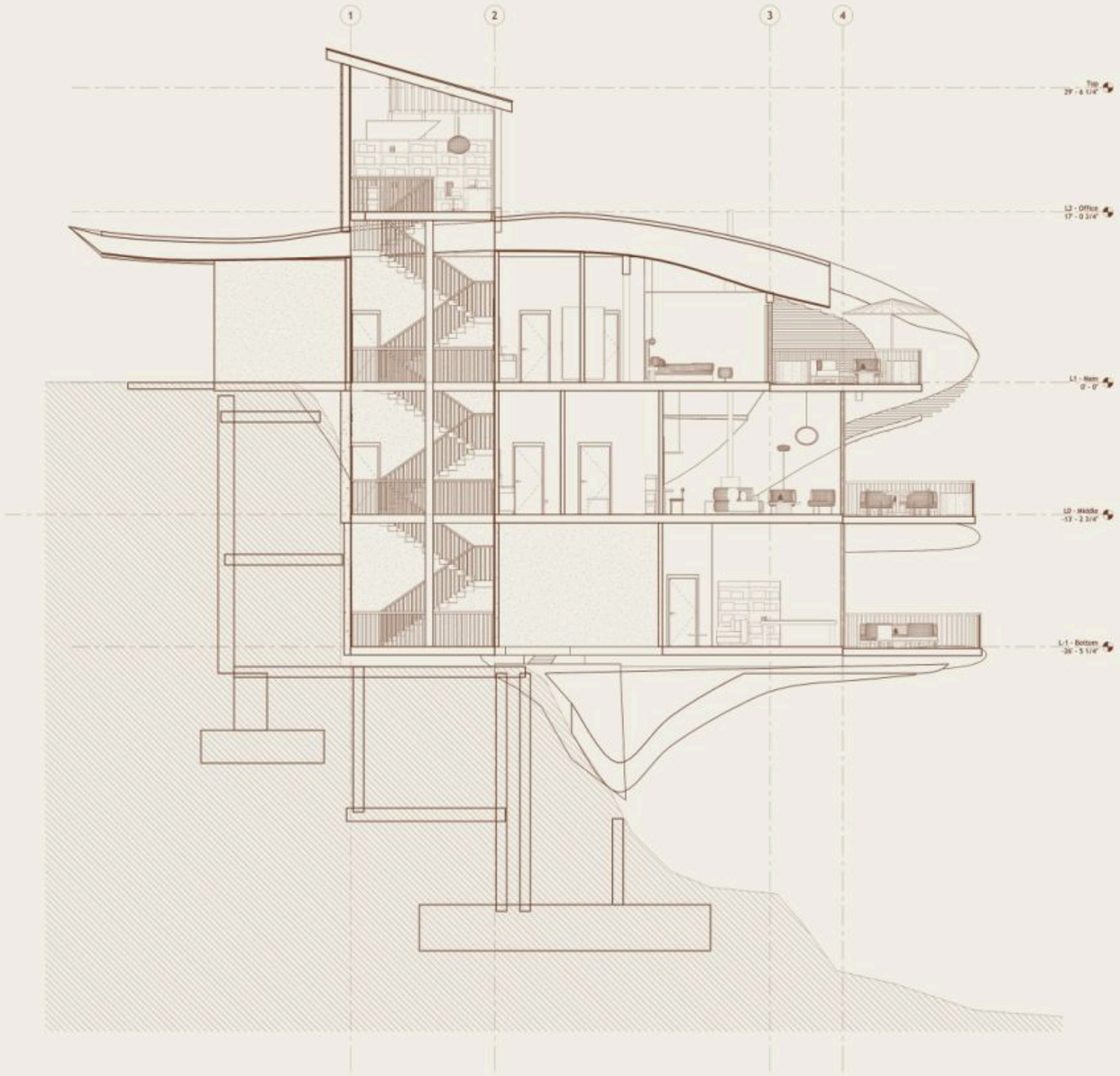
Solid ash boards wrap both corners, with a dark center bay and one large window between them. It is a calm face, and it leaves the white walls on the sides as the strongest thing on the house.

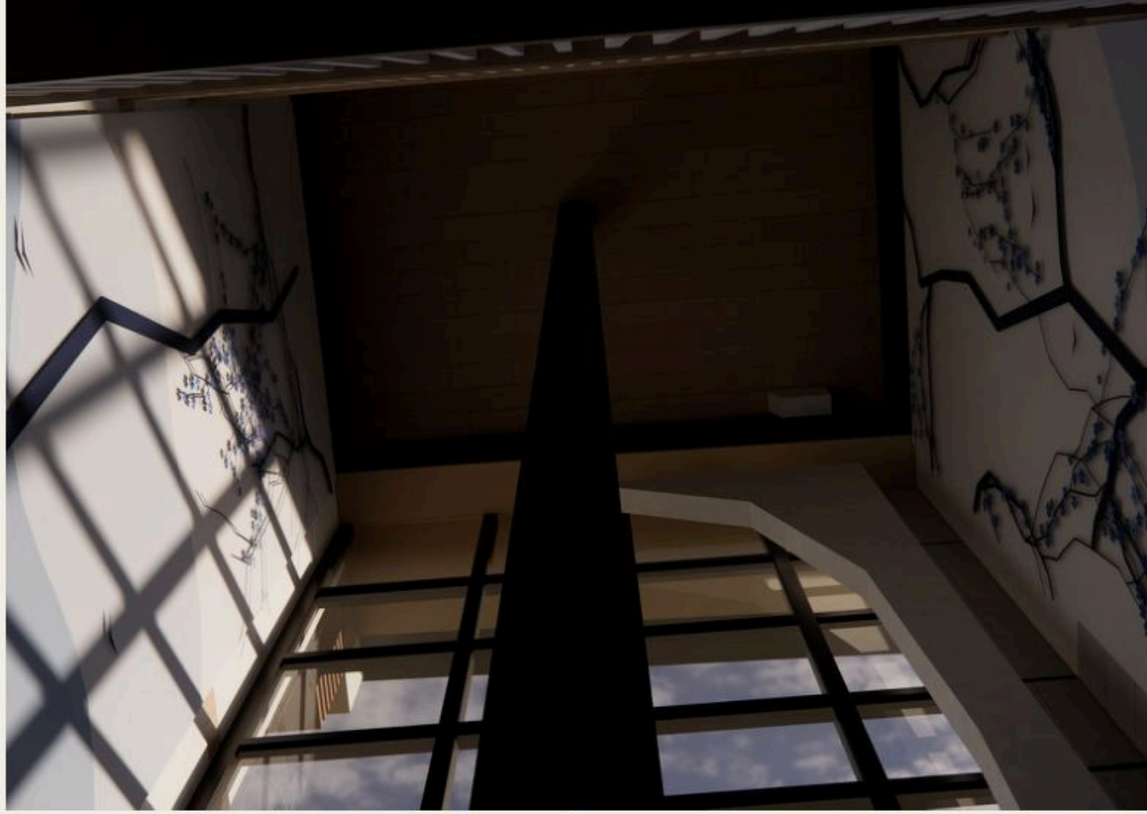
The lookout from the drive at dusk. Below, the north side by day and two rooms behind it at night.

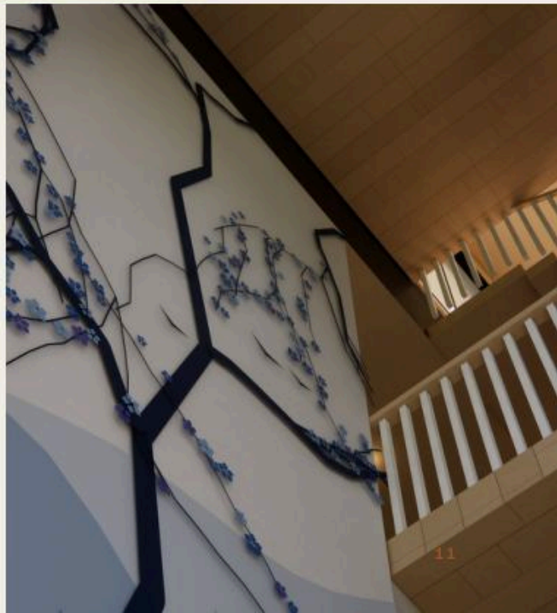








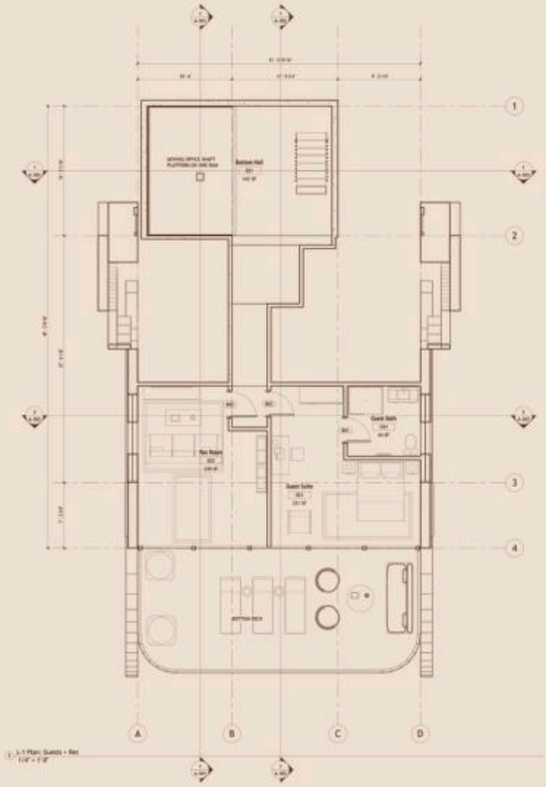


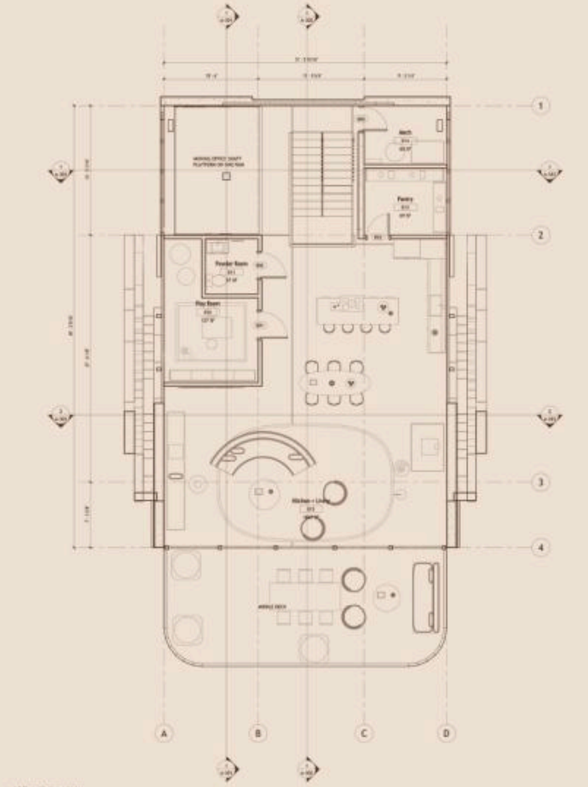


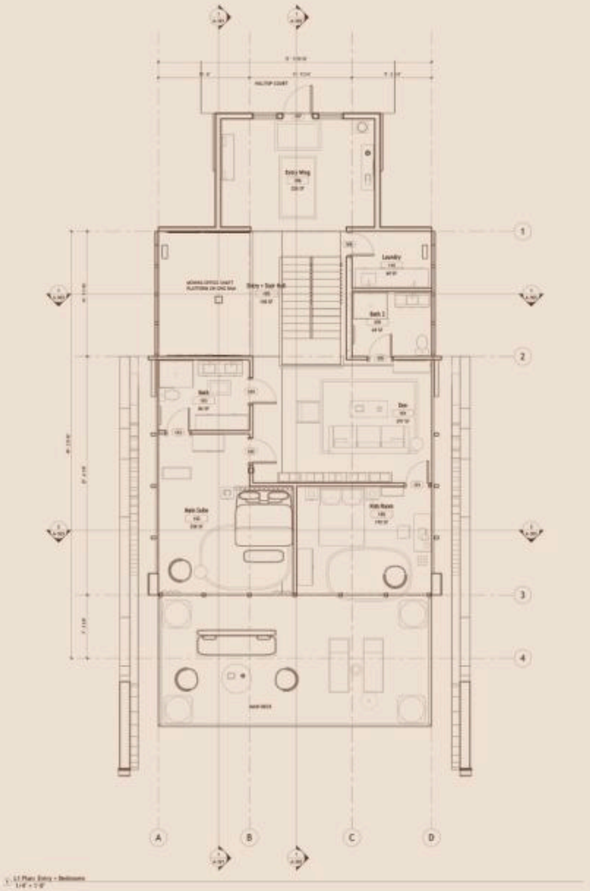
A ROOM THAT RIDES BETWEEN FLOORS

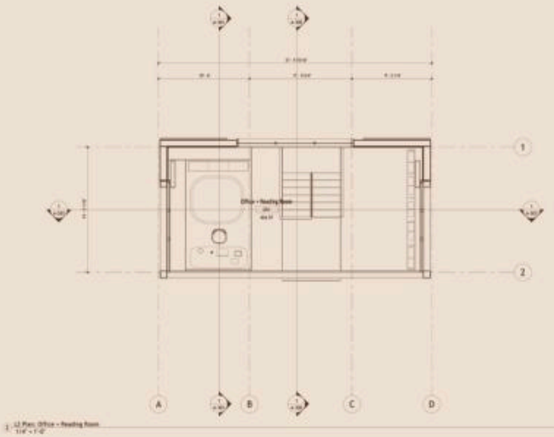
The office is a platform on a single hydraulic ram, loosely based on Rem Koolhaas's Maison à Bordeaux. It moves up and down inside an open glass bay, so it can stop at any floor or at the view.

Its shaft is wrapped in a mural I designed: the climb up the hillside, from dark ridges through mist to a tree, blossoms and birds.









LOWER FLOORS

Kitchen and living room open to the view, then guest rooms and a rec room at the bottom, reached by the same stair.

UPPER FLOORS

Entry, den, the main suite and a kids room on the main floor. The office and reading room above, with the lookout on top.

inside

Pale oak, white plaster and walnut inside, lit warm and low so the house glows from the valley at night.











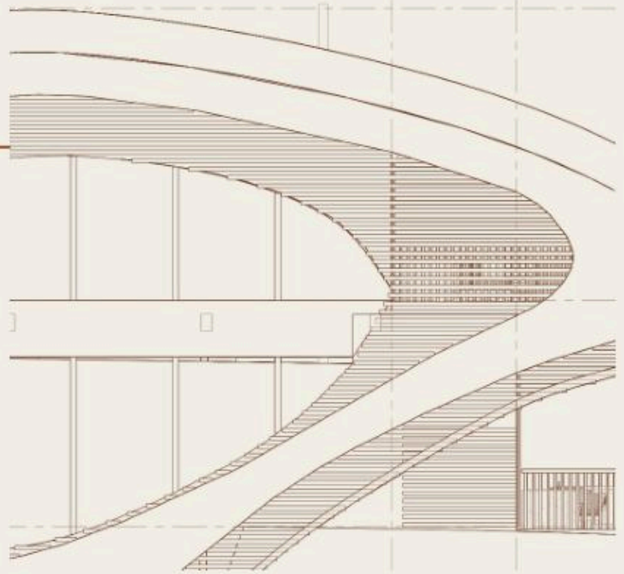


The living room and deck after dark.





01 AERIE HOUSE



THE WING

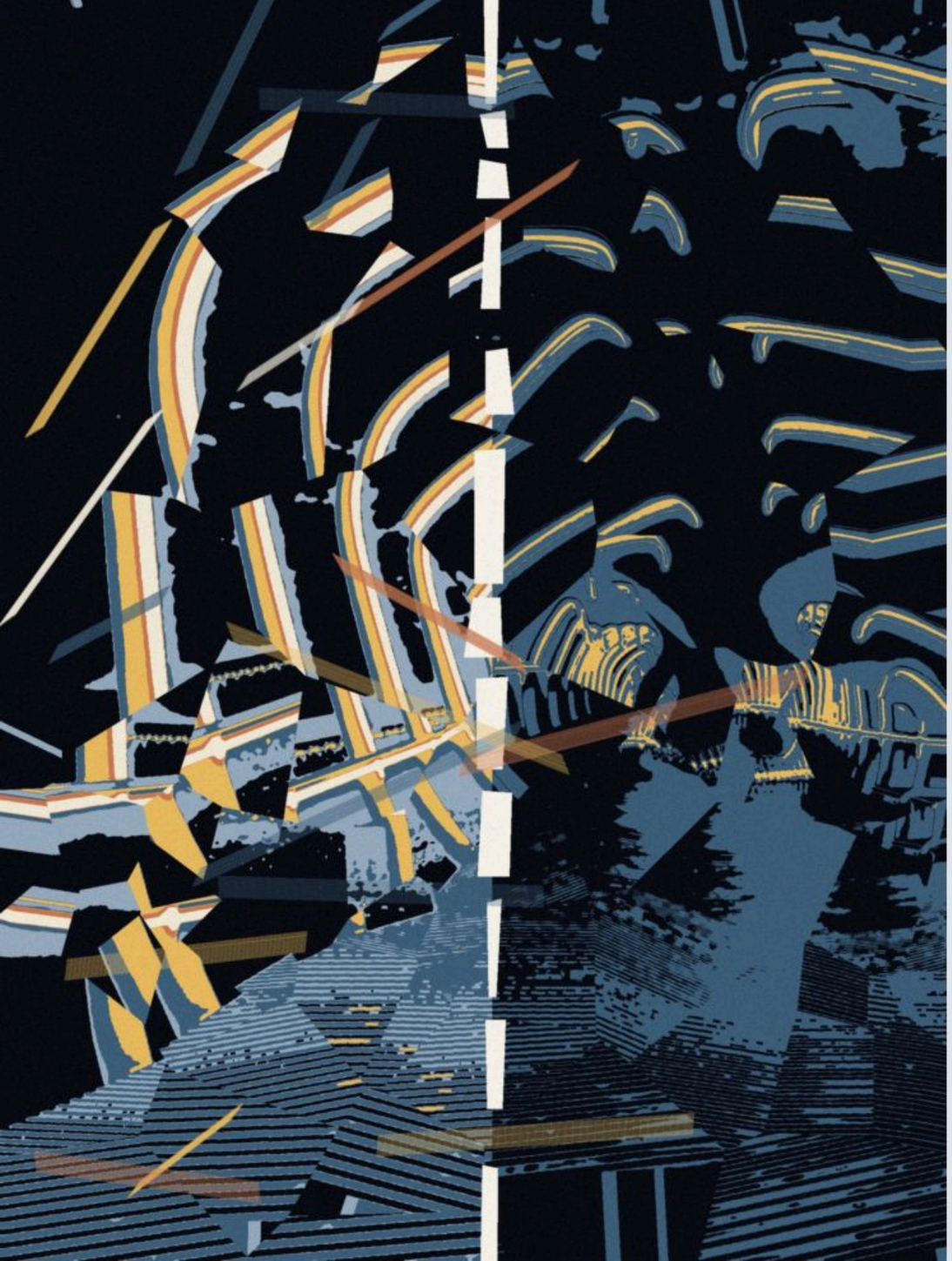
1 Each wall is a single curve standing a meter off the house, with ash bars between. At the back it keeps going and runs into the cliff.

MATERIALS

WALLS	white mineral render
HOUSE	charred timber
SCREENS	thermal ash
ROOF	graphite zinc
FRAMES	dark bronze



From the valley, with the decks stacked inside the curve.



02

whale bridge

A walk across the Charles, inside a whale.

TYPE	footbridge with a lifting span
SITE	Charles River, Museum of Science
LENGTH	941 ft
TOOLS	sketch, Rhino, Enscape
YEAR	2026

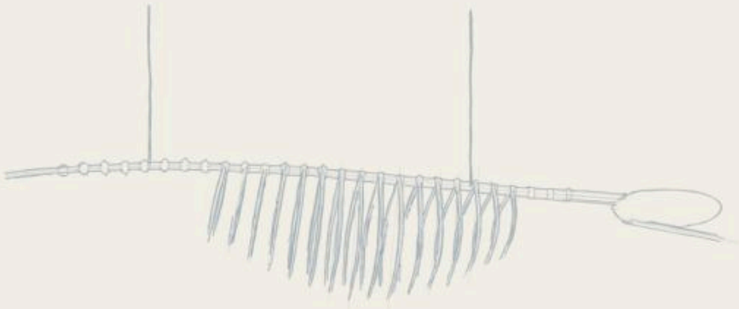
02 WHALE BRIDGE

THE IDEA

I went to the Museum of Science a lot as a kid, and now I run past it on my way to the river. There is no good way to walk across the Charles at that spot. The nearest crossing is well downstream, and you share it with traffic.

The structure is a whale skeleton turned over. One curved spine runs under the deck, and pairs of ribs rise over the walkway, so you cross the river inside the ribcage. At night, LED strips on the inside of each rib light it up.

The piers are shaped like children with their arms up, holding the bridge over the water. Most of the museum's visitors are kids, and the piers are a nod to them.



941 ft

LONG

bank to bank along the curve

4.1%

STEEPEST GRADE

an easy walk the whole way

17 ft

RIB HEIGHT

open 2 ft 6 in at the top

95 ft

LIFTING SPAN

for boats in the channel

71°

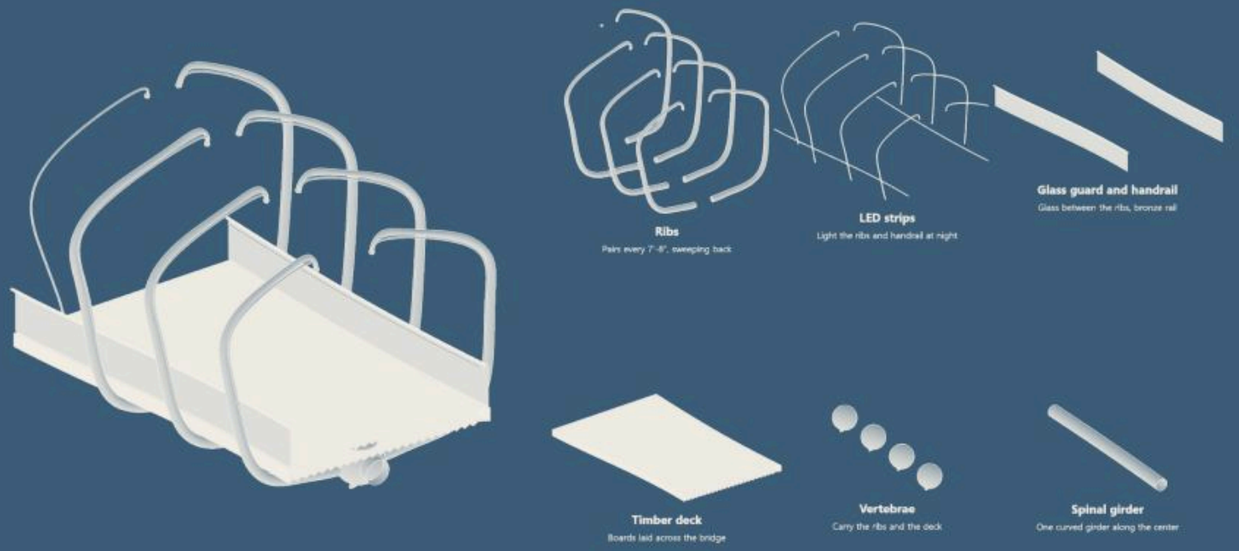
LIFT

on a hinge in the skull pier

20 ft

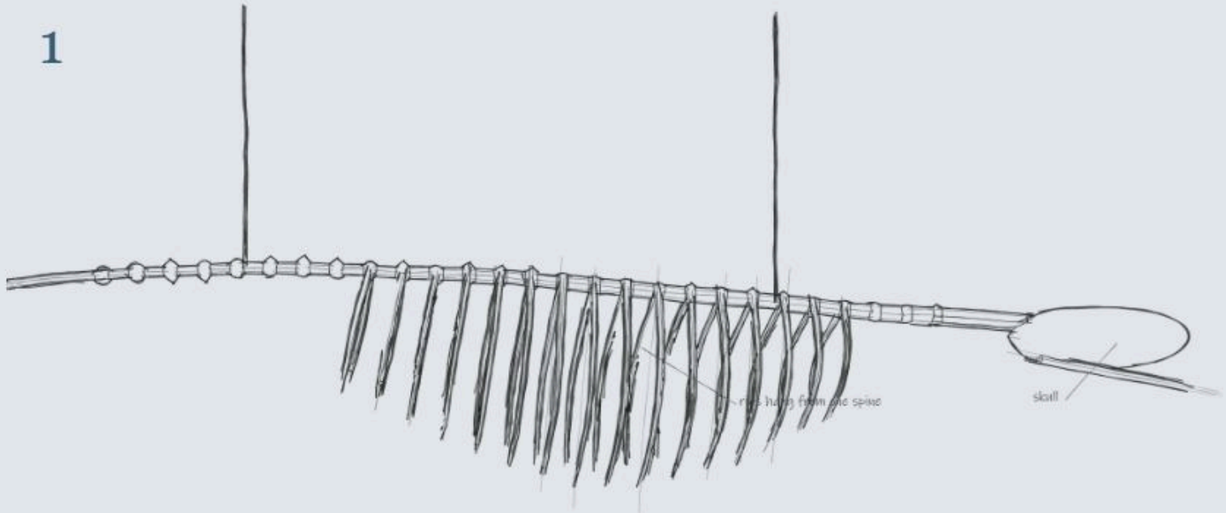
ABOVE THE RIVER

at the middle of the crossing

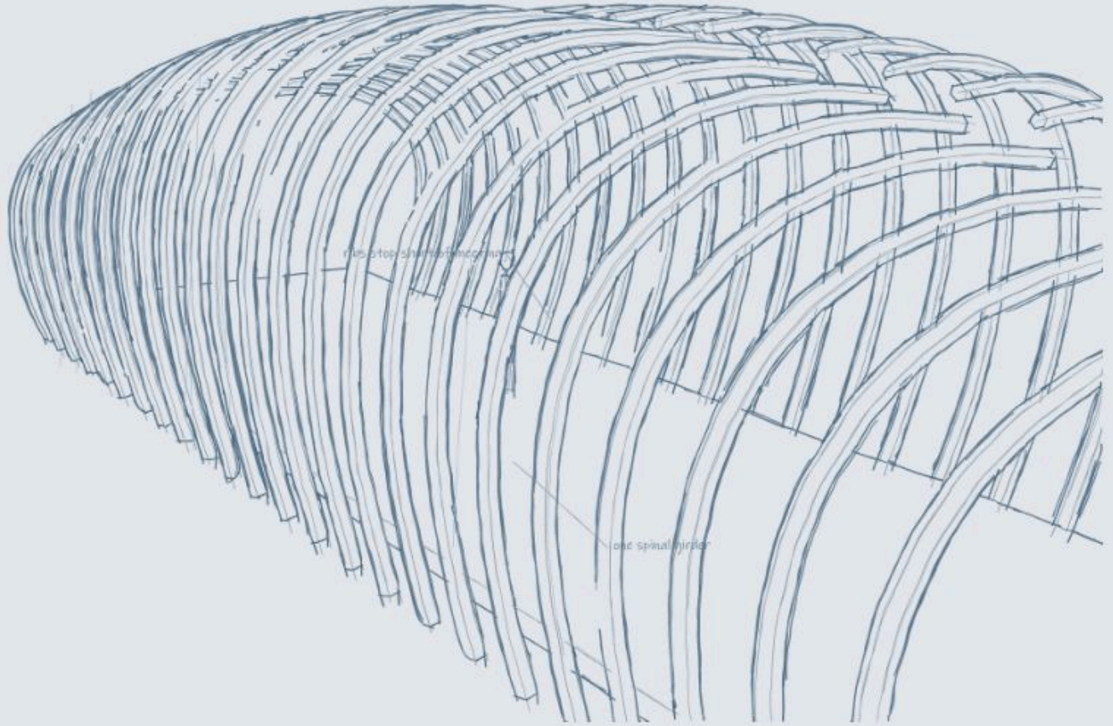


concept

1



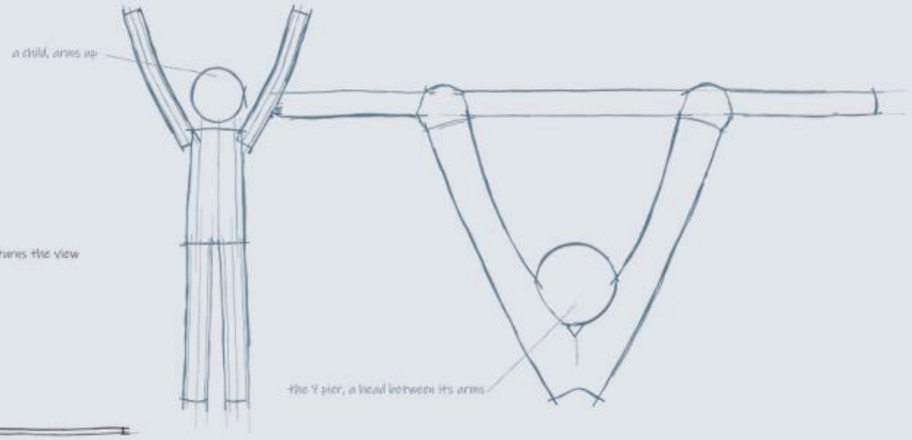
2



3



4



1 A whale skeleton hung in a museum hall, ribs hanging from one spine.

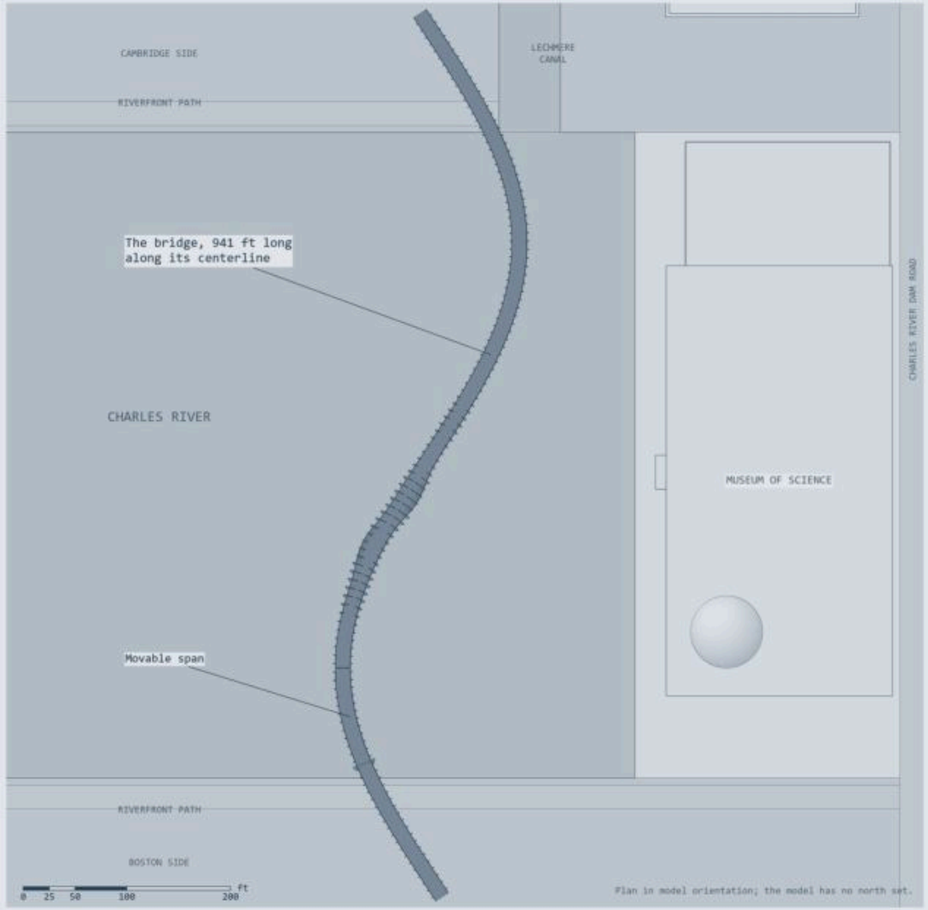
2 Flip it over. The spine carries the deck and the ribs rise around you.

3 Bend the spine into a long S across the river.

4 Hold it up with children, arms raised.



Night: LED strips run along every rib.

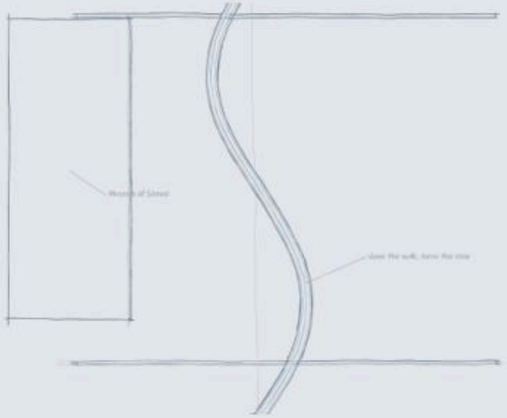




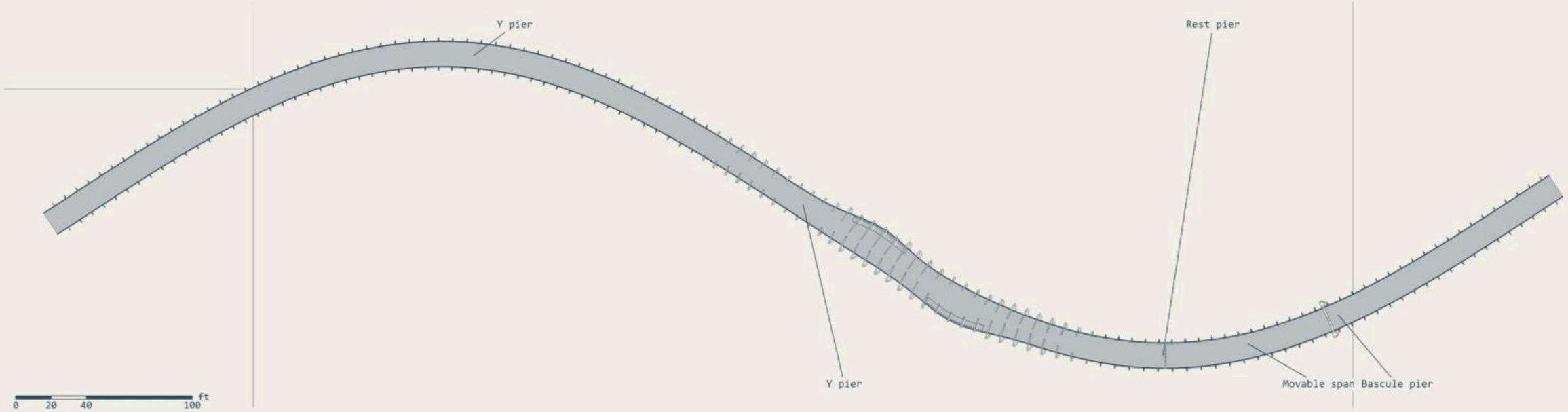
SITE

The bridge connects the riverfront paths on the Boston and Cambridge banks, next to the Museum of Science and the Charles River Dam.

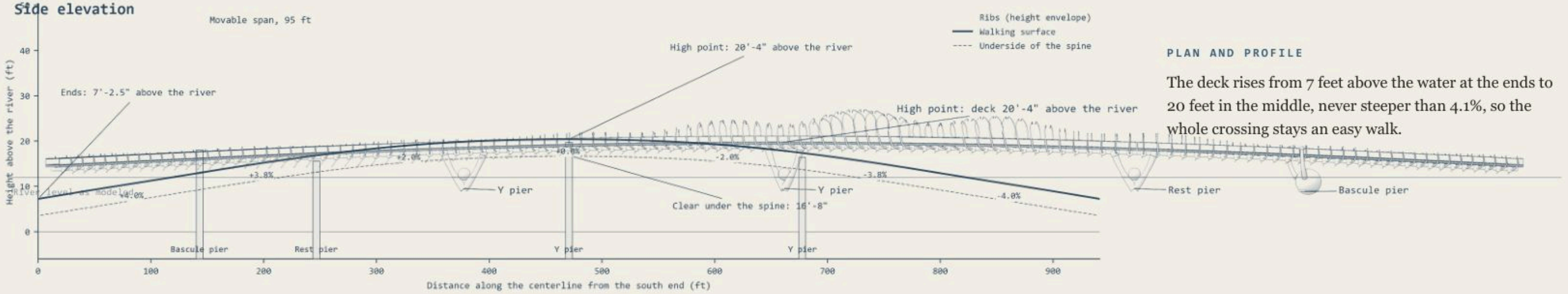
It crosses in a long S, turning your view from the river to the museum to the city as you walk. Halfway across, bench alcoves bulge out between the ribs.



Plan



Side elevation



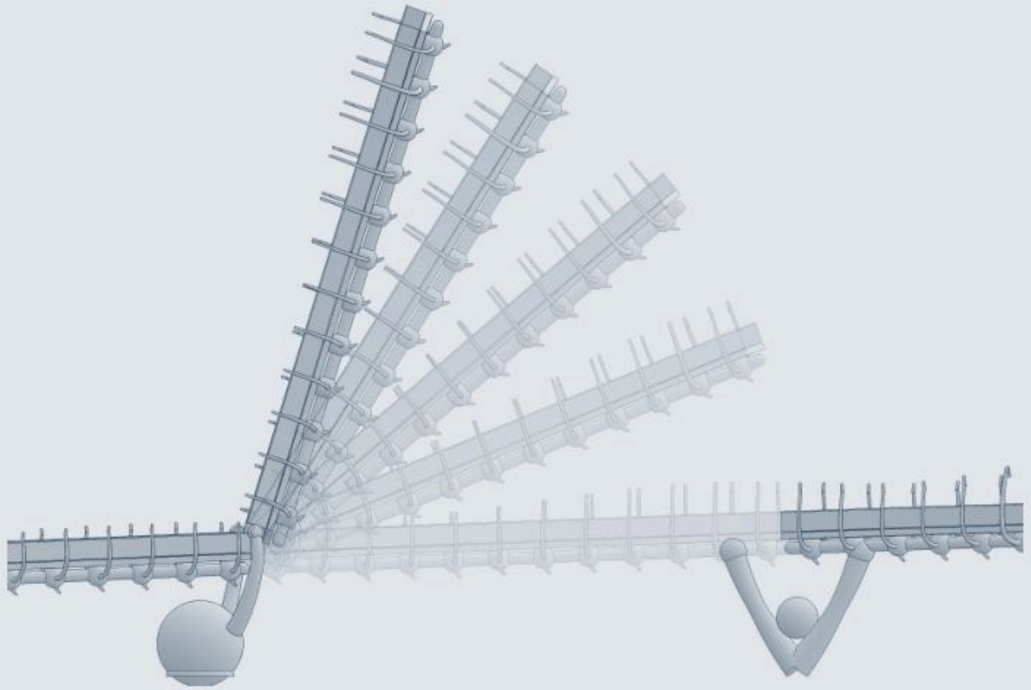
PLAN AND PROFILE

The deck rises from 7 feet above the water at the ends to 20 feet in the middle, never steeper than 4.1%, so the whole crossing stays an easy walk.



THE PIERS

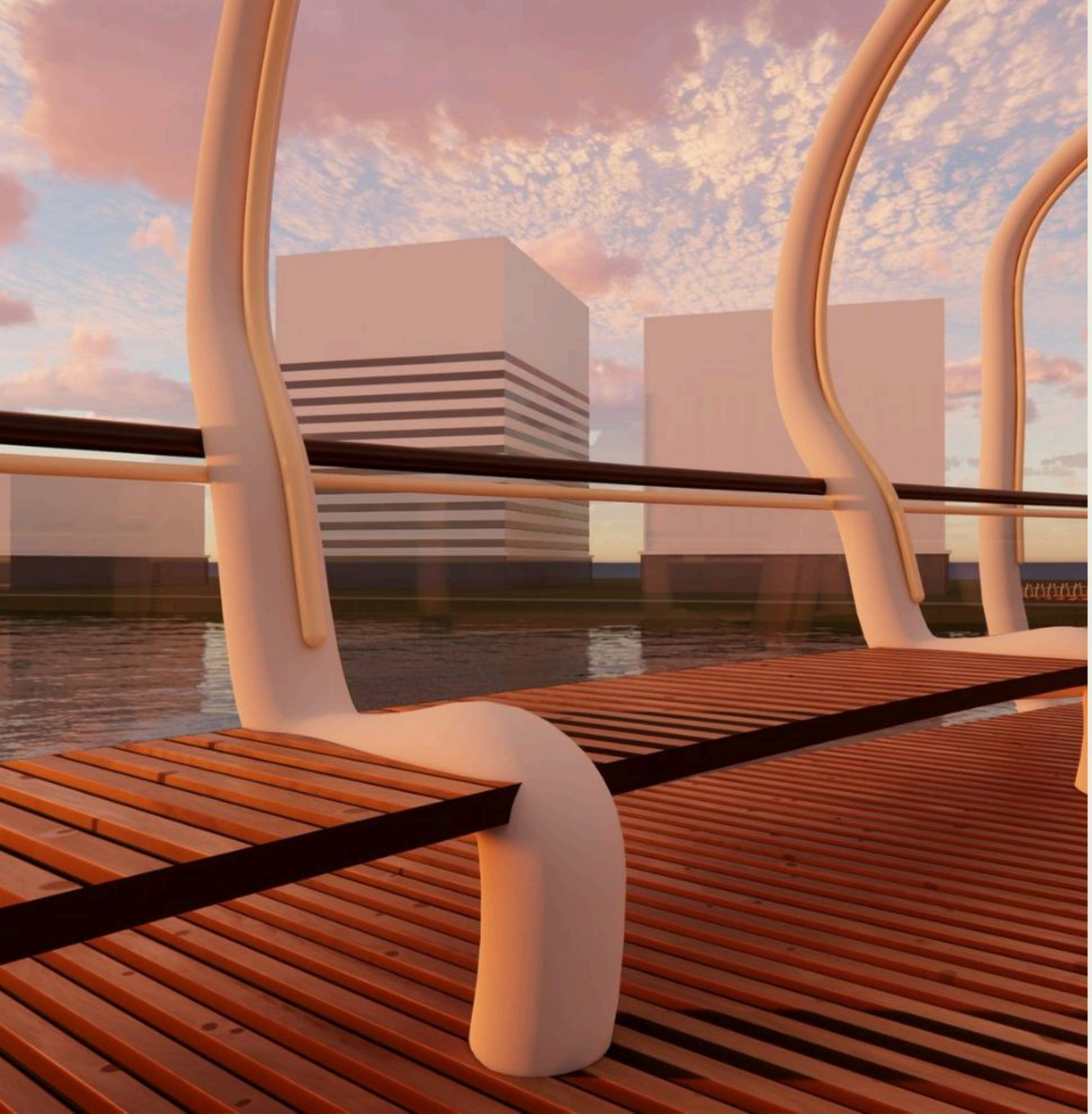
Each Y-shaped pier is a child with its arms raised and its head between them, taking the spine in its hands. Seen from the bank, a line of them carries the bridge across the river.



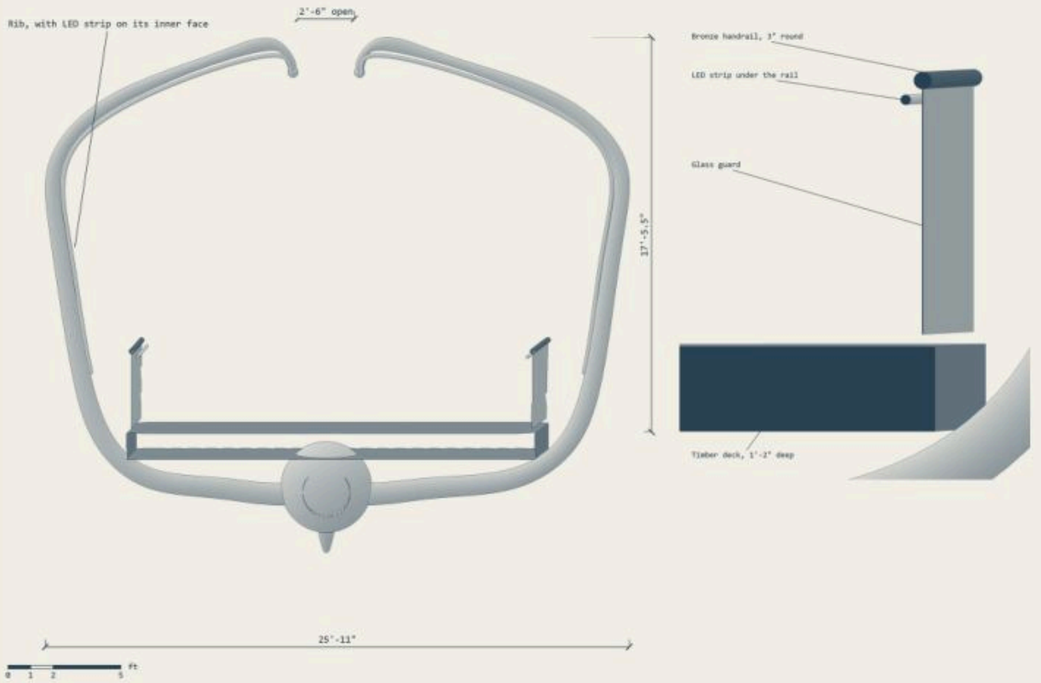
THE LIFTING SPAN

Boats still need to get through, so a 95-foot section near the Boston end lifts about 71 degrees to open the channel. The drawing shows it at five moments on the way up.

Its hinge sits inside a larger pier shaped like the whale's skull, the only pier that isn't a child.



One rib pair, seen square-on



THE RIBCAGE

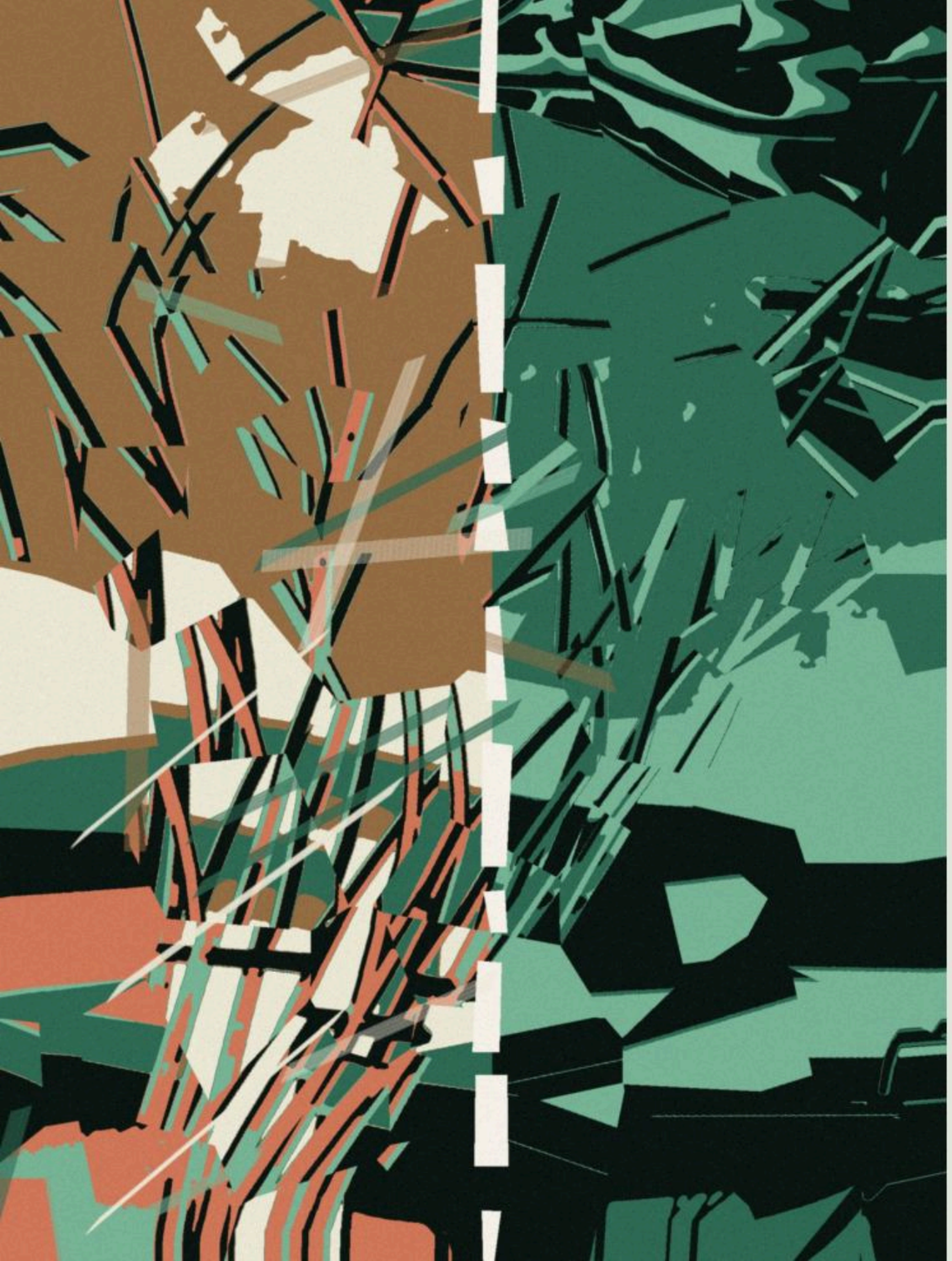
Each rib pair is 17 feet tall. The ribs stop 2 ft 6 in apart at the top, so the cage never quite closes over you.

THE EDGE

A bronze handrail with an LED strip under it, glass below, and a timber deck on one steel spine.



Coming off the Boston bank.



03

calla lilies



A bus stop for the corner I grew up walking past.

TYPE	bus stop and bike parking
SITE	Monument Square, Jamaica Plain
ROUTES	MBTA 39 and 41
SIZE	34 ft long, 16 ft tall
TOOLS	sketch, Revit, Enscape
YEAR	2026



THE IDEA

Monument Square is the center of Jamaica Plain, where I grew up, and I have walked past this bus stop more times than I can count. Right now it is a pole and a sign on one of the busiest corners in the neighborhood.

Calla Lilies replaces it with three flowers in green metal and bronze, drawn in the spirit of Art Nouveau ironwork. Each stands on a bundle of thin reeds that spreads into a roof, tall enough to shelter the stop and open enough to see through.

Everything else grows from the same plant: a walnut bench around the center stem, leaf-shaped bike racks, and an arrival screen between curling stems. The roofs are green solar glass, and each powers what sits under it.



3

FLOWERS

at three heights, roofs overlapping

8

REEDS PER STEM

tied with bronze bands

16 ft

TALLEST FLOWER

over the walnut bench

1/2 in

ROOF EDGE

4.4 in at the center

17

CHARGERS

powered by the solar roofs

34 ft

LONG

on the Centre Street sidewalk





Green solar glass

The roof and the power source



Bronze lines

Hold the glass in a spiral



Rim and landing ring

Closes the edge, and takes the reeds



Green metal underside

The thin leaf you see from below



Bronze veins

Carry each reed across the underside



Reeds, bands and plate

Eight reeds, eight thinner crossing reeds

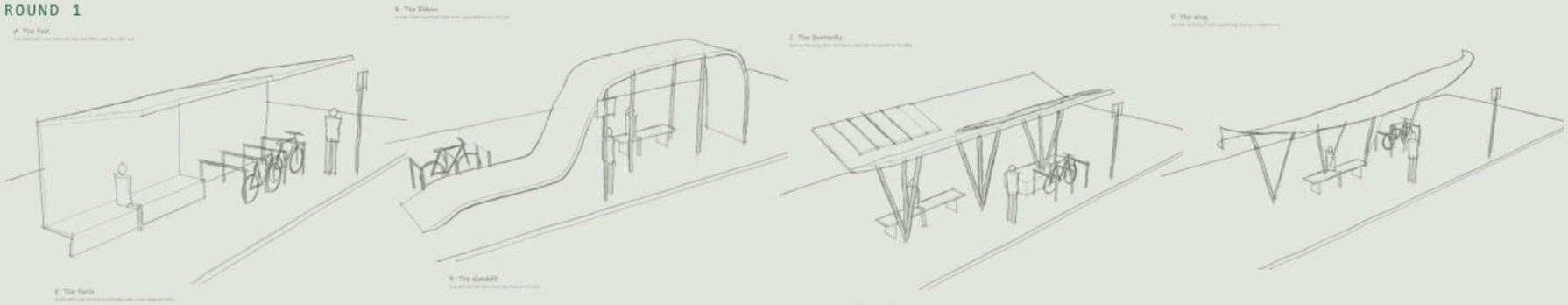
ONE FLOWER, TAKEN APART

process

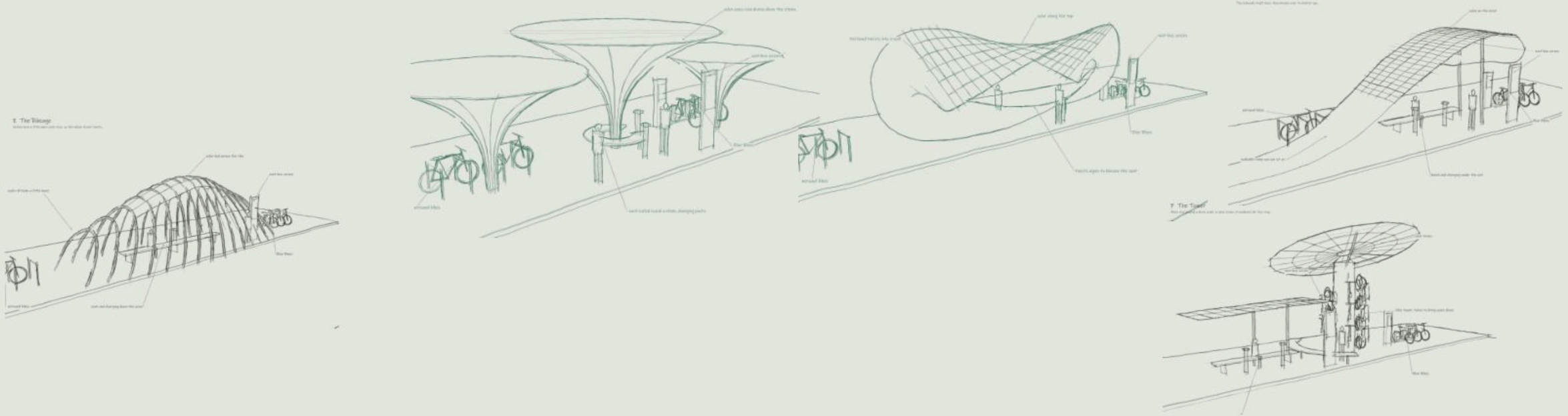
The first round tried roofs: a fold, a ribbon, a butterfly, a wing, a porch, a handoff. None felt like more than a shelter, so the second round went bolder: a wheel, funnels, a twist, a wave, a ribcage, a tower.

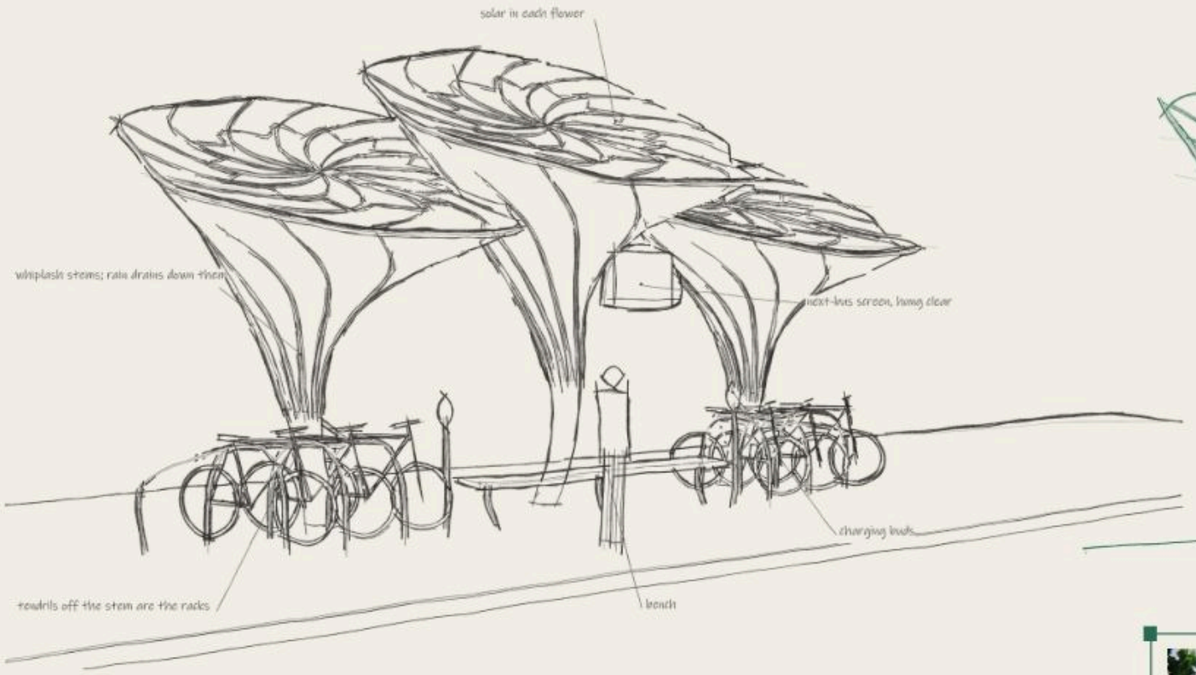
I developed the Twist, one band that turns from roof to wall to seat, and dropped it when it caused more problems than it solved. The funnels, mixed with Art Nouveau, became the lilies.

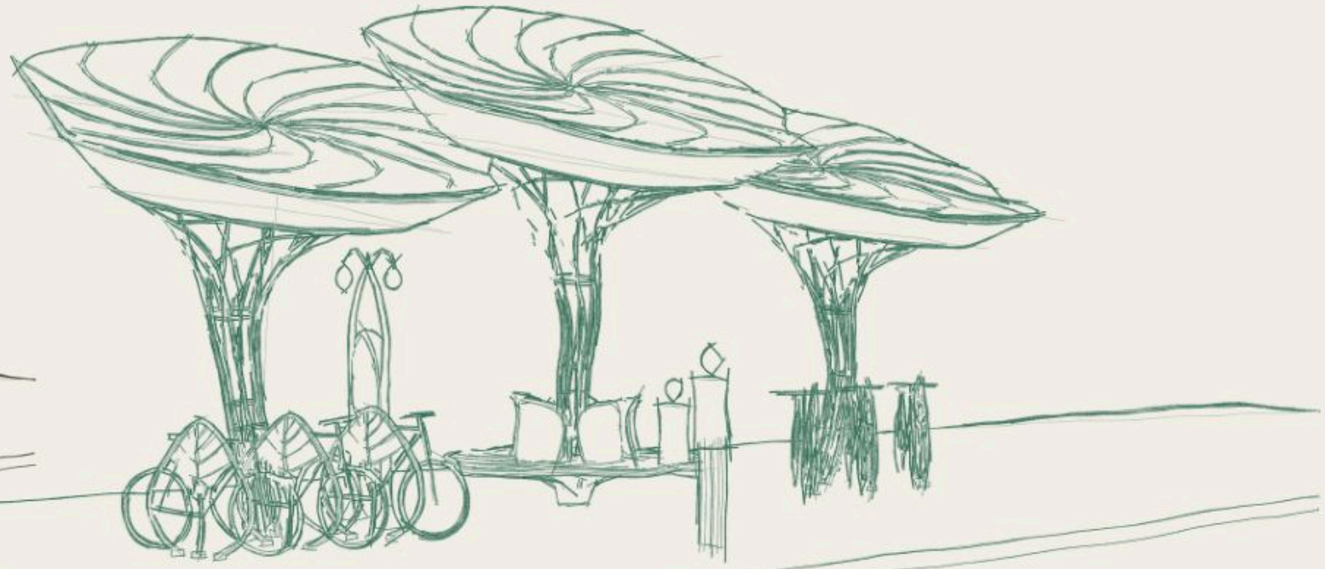
ROUND 1



ROUND 2







ROUNDS 4 AND 5

The lilies arrived as three tilted funnels with thick, blocky stems. They lacked the thinness that makes Art Nouveau iron feel alive, so each stem became eight slim reeds tied with bronze bands, opening into a lace under the roof.

The roof itself stayed solid, because it has to keep the rain off.



Right, the reeds as built, at the bike racks.



Monument Square, from across Centre Street.



The 39 pulls in under the flowers.



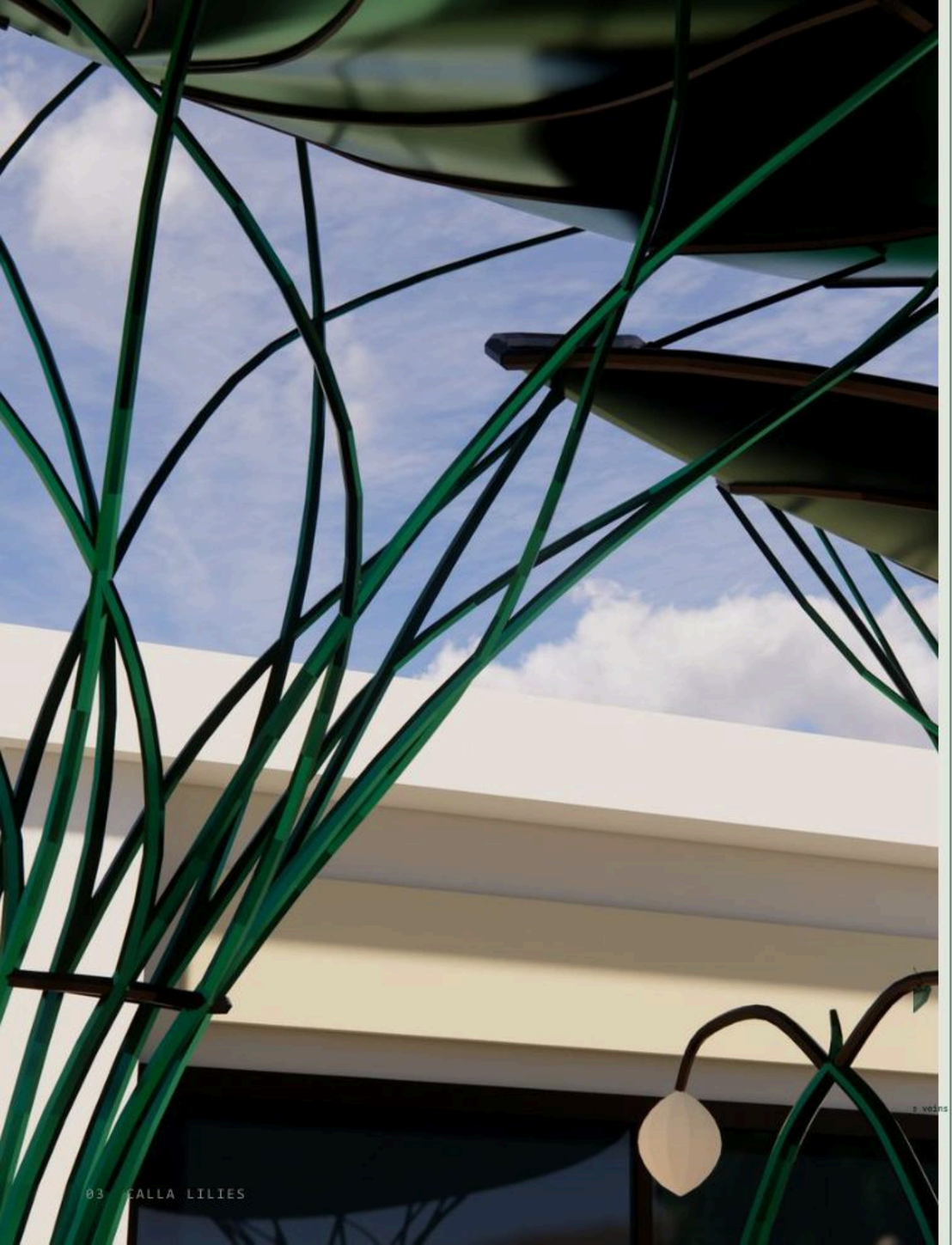


SITE

I checked the MBTA stops in JP against the city's curb and sidewalk data. Monument Square was the only one where the whole stop fits on public sidewalk, on the wide corner where Centre and Eliot Streets meet.

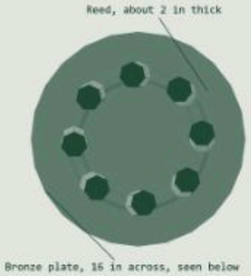
The flowers keep 8 feet clear at the bus door, and the crosswalks around the square connect every sidewalk.





03 CALLA LILIES

B At 2 ft: tight bundle



1 1/2" = 1'-0"

C At 5'-3": still together



1 1/2" = 1'-0"

D At 9 ft: opening



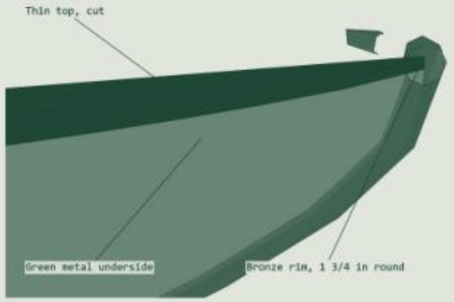
3/4" = 1'-0"

E At 11'-6": lace



1/2" = 1'-0"

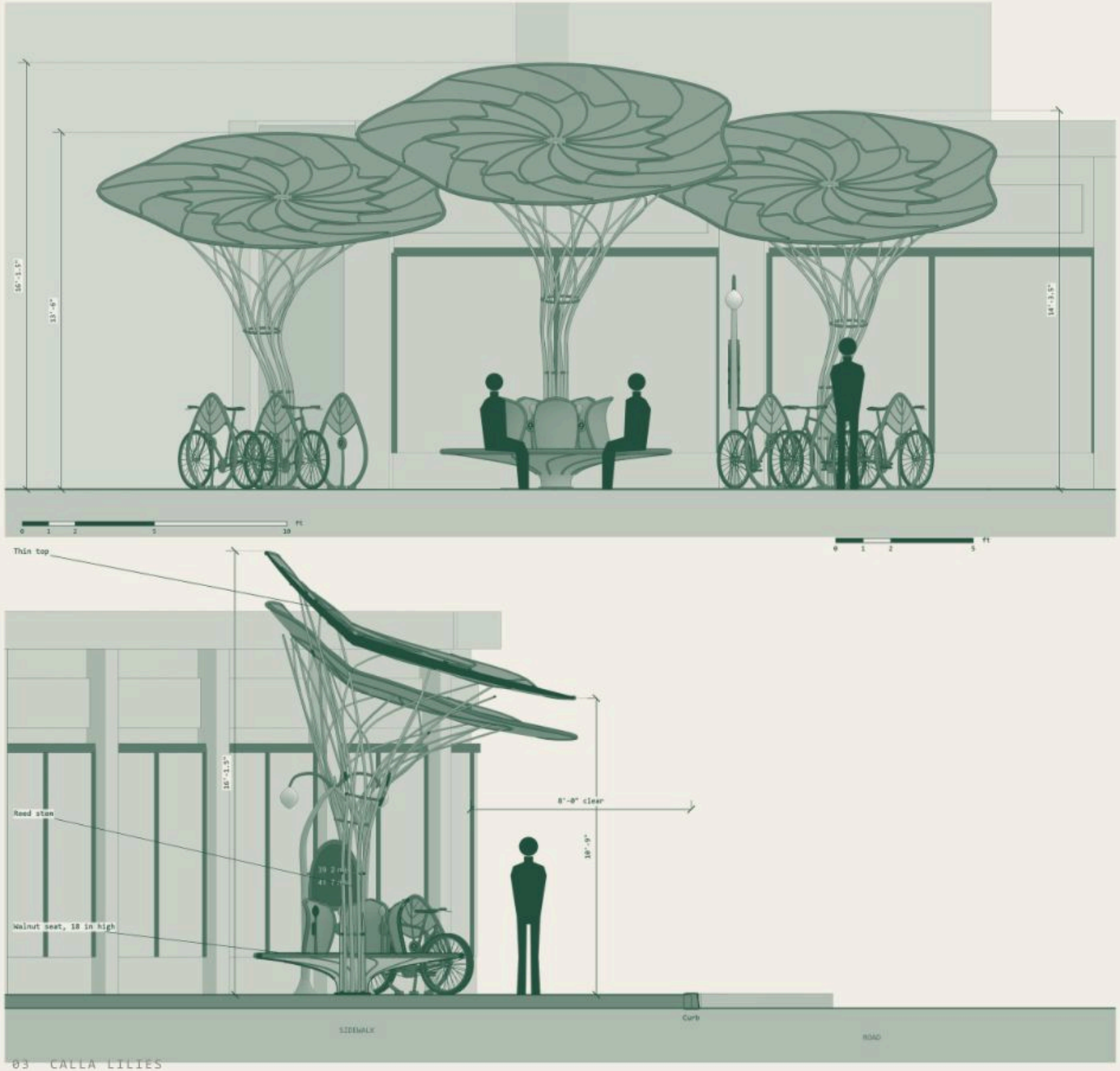
B At the edge 3" = 1'-0"



STRUCTURE

Above, four cuts up one stem: eight reeds about 2 inches thick read as one stem at seat height, then spread into lace above 9 feet.

Left, the roof edge: a thin lens 4.4 inches at the center and half an inch at the rim, closed with bronze.



ELEVATION AND SECTION

The three flowers stand at different heights so their roofs overlap and shed water onto each other. The tall center one rises 16 feet over the bench.

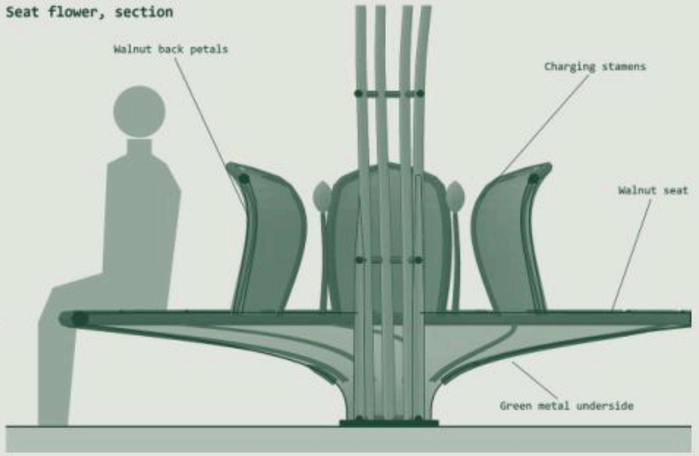
The section shows 8 feet of open sidewalk between the bench and the curb, where the bus door opens.







Seat flower, section



Screen stand



3

B Outlet, front 6" = 1'-0"



AT HAND HEIGHT

1 The bench is walnut on a green metal base, 18 inches high, with phone chargers built into the stems between the seat backs.

2 The screen hangs between two curling stems, with lamp buds above it.

3 Every charger is a bronze disc with two brass ports and a lit ring, so you can spot one from a few steps away. There are 17: 12 on the bike racks and 5 at the bench.



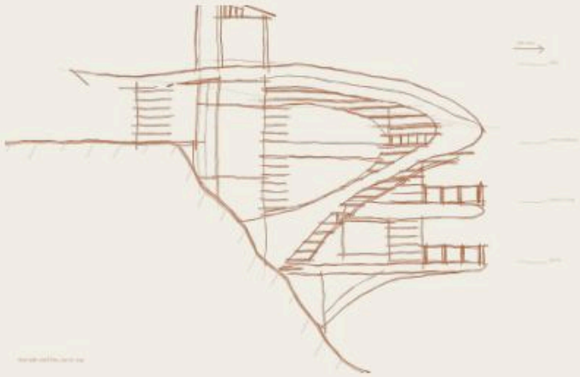
At dusk the screen, lamps and chargers light up.

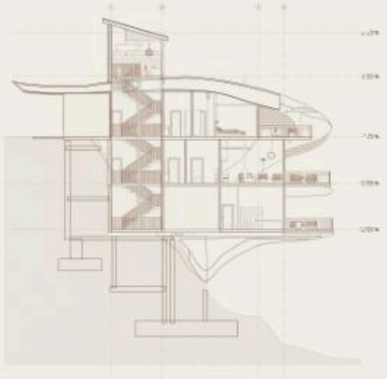
SKETCH

DRAWING

RENDER

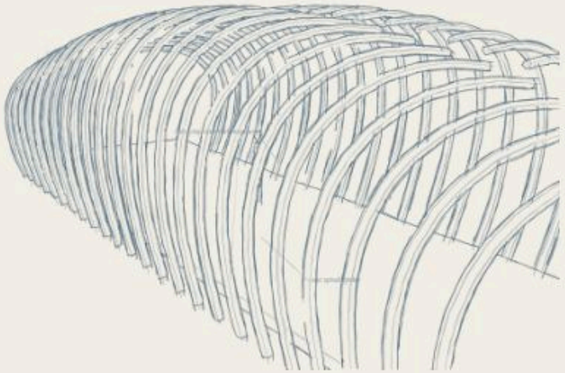
aerie house

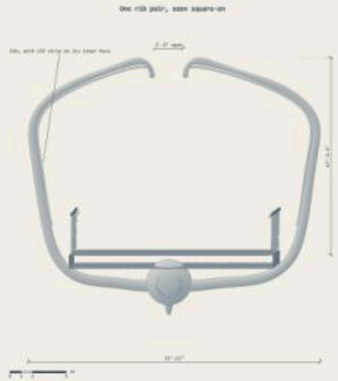


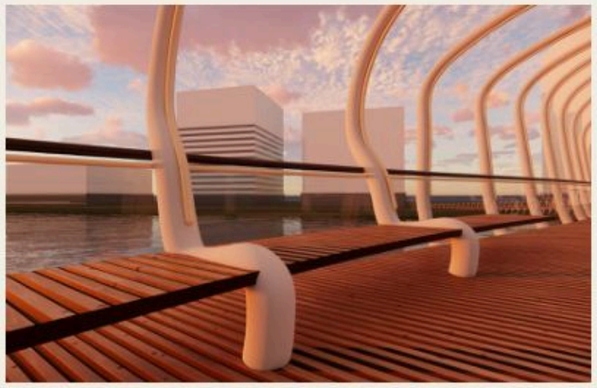




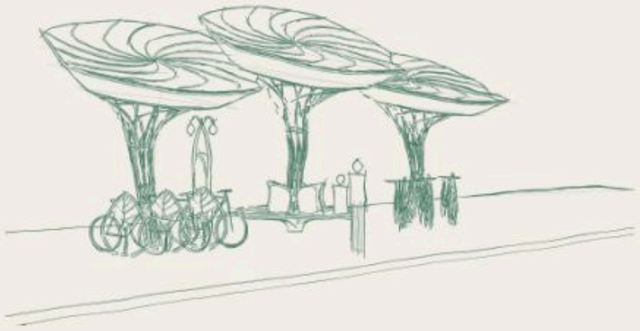
whale bridge

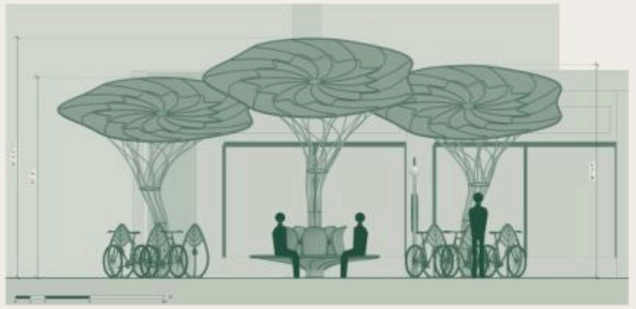




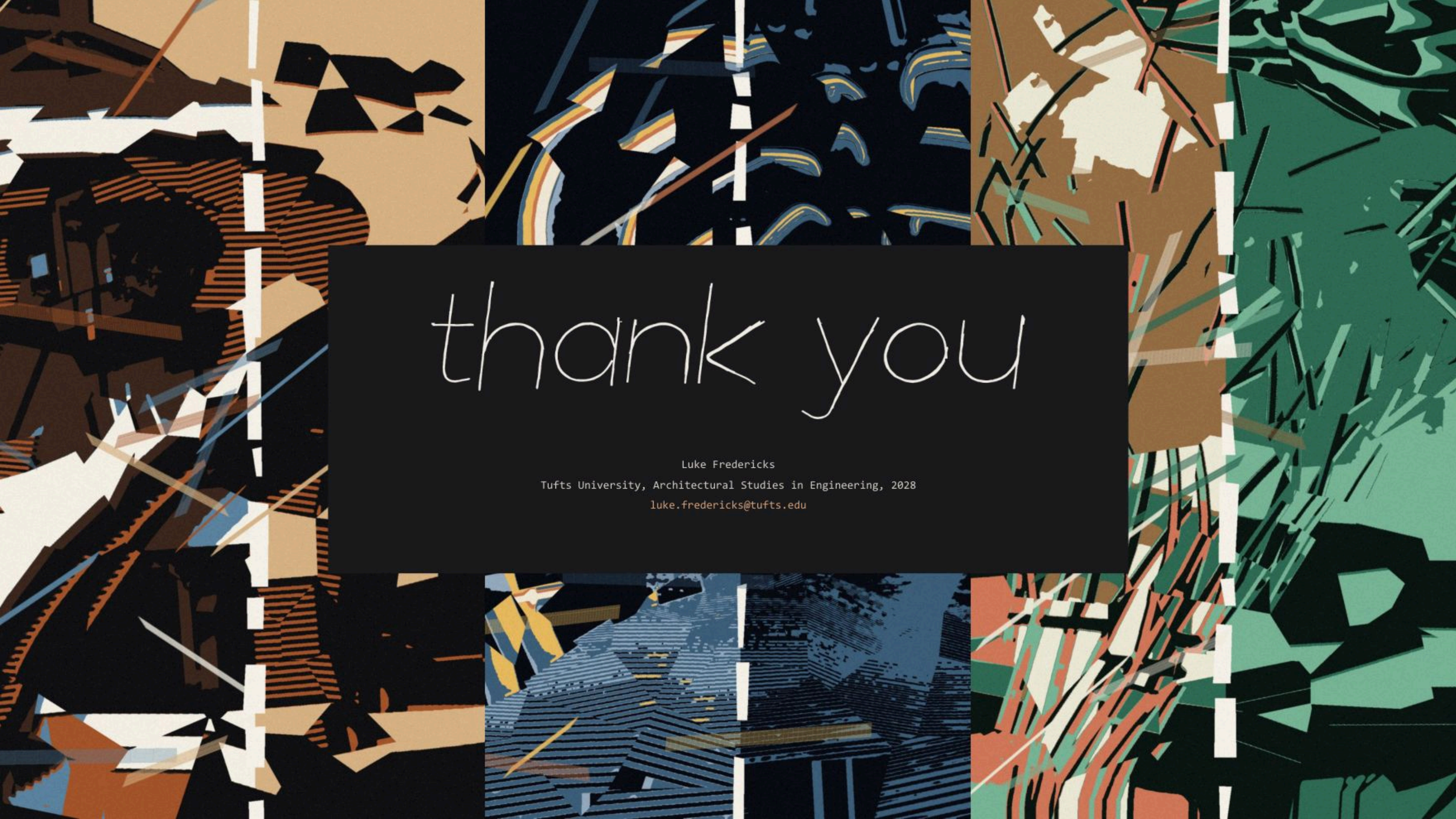


calla lilies









thank you

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