view from entrance

Pancu Residence

This project, my most recent, was completed while working with Nastasi Architects in Hoboken, NJ. I was lead designer and project coordinator for the staircase and feature wall design. The clients, an older couple who care for an elderly parent in the home, purchased two apartments in Shop Architect's Garden Street Lofts. Nastasi Architects was hired to renovate and upgrade the two apartments including an internal staircase which was my focus.

Due to specific site constraints, high ceilings and shallow depth in plan, the entry into the apartment is behind the stair. Early in design development, I suggested we investigate options that would allow the stair to be as porous as possible while also visually appealing from behind.

handrail and wire system

hss tube stringer

stair support wall

top floor feature wall and ceiling

LED light fixture

handrail and wire system

cantilevered stair

newel post on lower floor
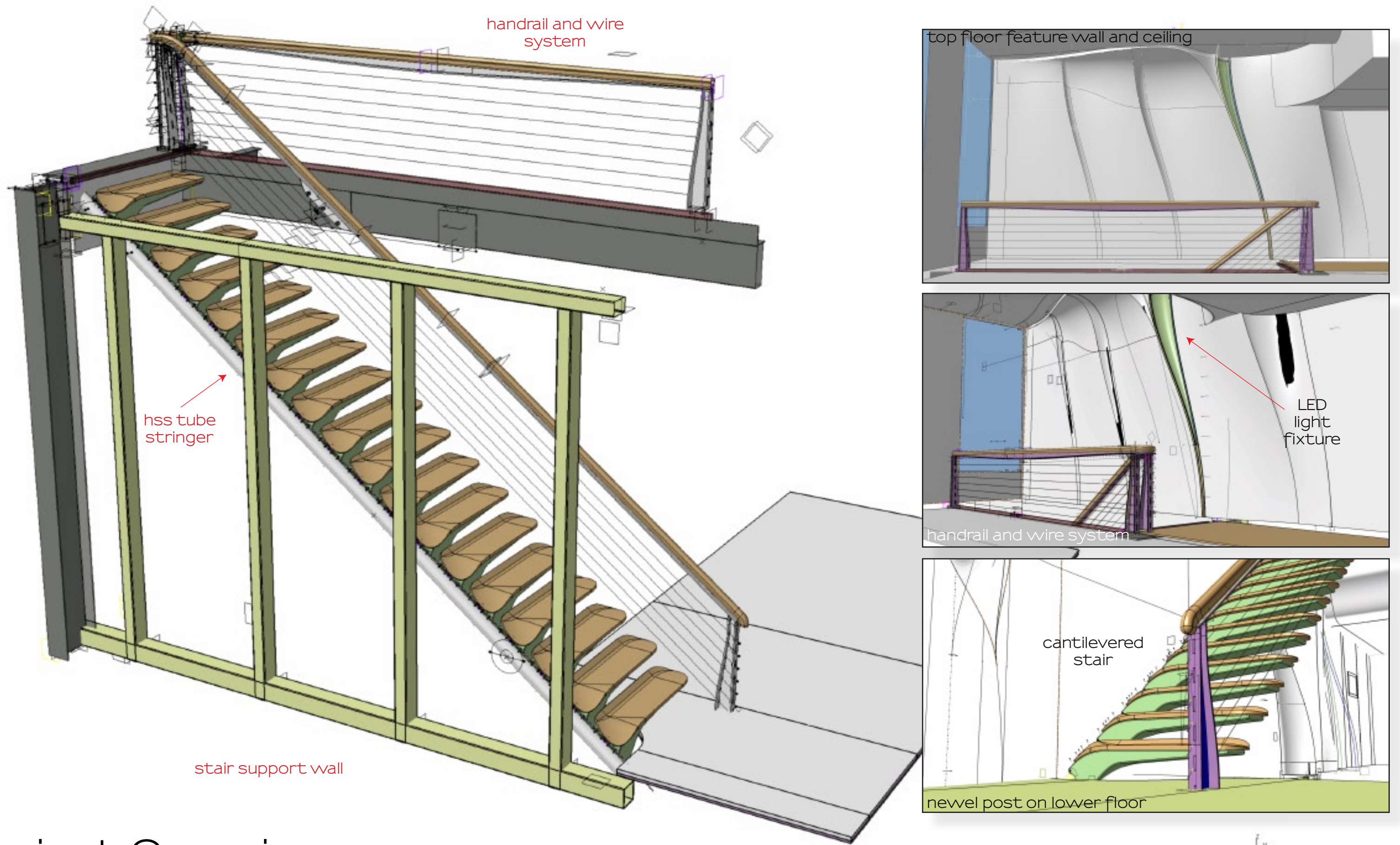
Project Overview

The stair is a cantilevered design which is comprised of a structural steel support wall, steel pipe stringer, composite (fibreglass) tread brackets and cnc-carved oak treads. The handrail is a stanchion-less design with Jakob wire system and an asymetric cnc-carved oak handrail. The pipe stringer and handrail steel were detailed in Catia to support digital fabrication of those elements by Caliper Studio and FIT respectively. Nathanial Stanton (Craftengine) served as structural engineer.

concept sketch

view from under stairs

fem by steve koopman sdk structures
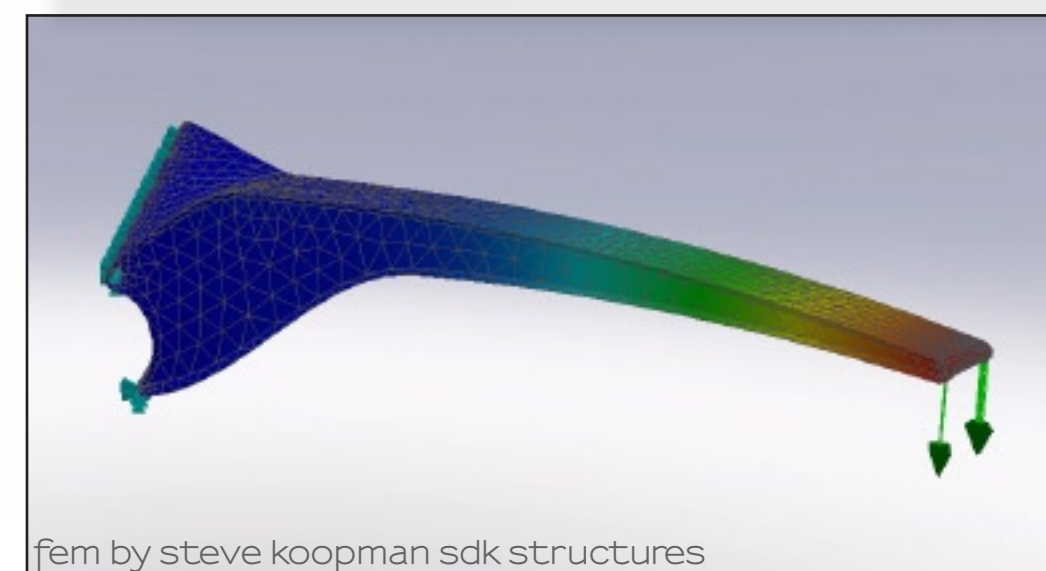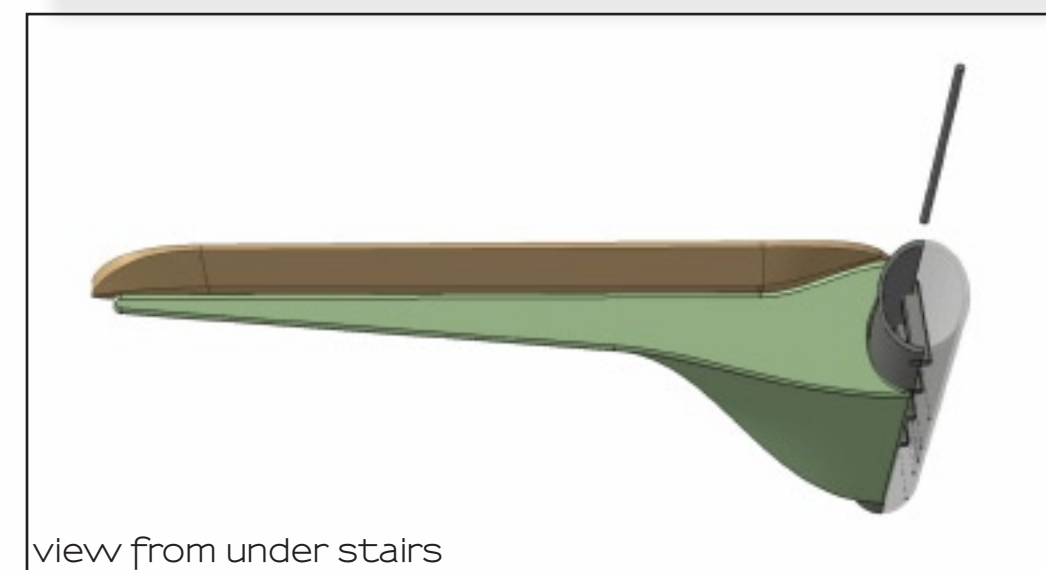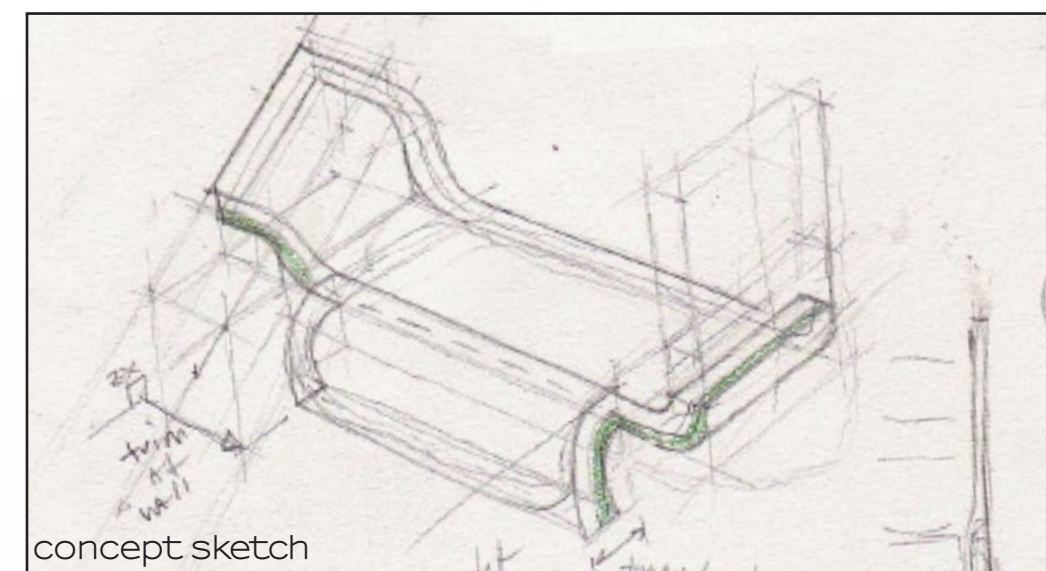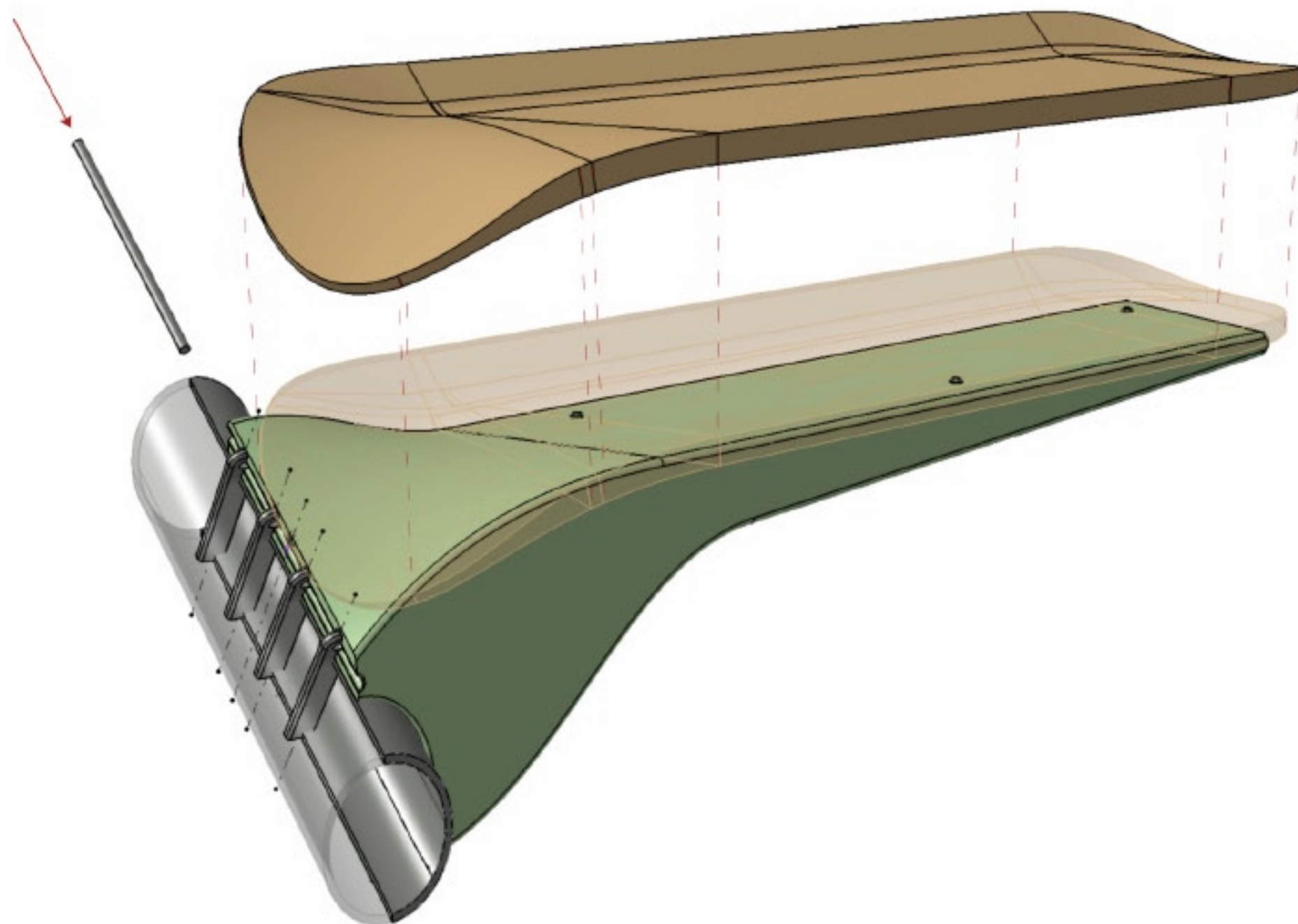
# Composite Bracket and Oak Tread

The composite bracket was originally designed as a fibreglass-wrapped balsa -core element which was prototyped. Final production elements were fabricated by a specialty shop in Rhode Island, C3, as two infusion-formed pieces, molds were milled directly from the Catia model, and bonded together after curing. Additional composite engineering by SDK Structures. The oak tread is designed to accommodate a majority of the code requirements for the stair and will be CNC-carved.

concept model

balsa-core prototype
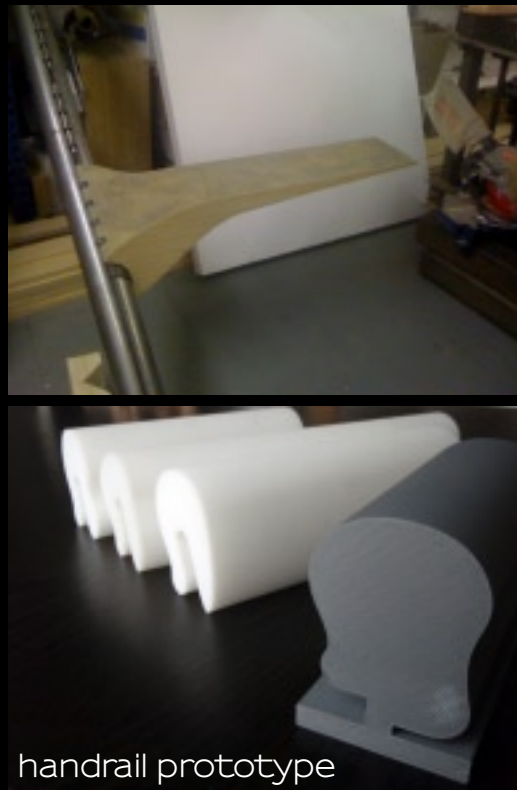
handrail prototype

first-article deflection test

stringer installation

completed tread brackets

Nastasi Architects has a prototyping shop with 3-axis router as well as other digital and analog facilities. I oversaw the work produced in the shop from model-making to physical testing of the first-article bracket. The lower selection of photos documents the installation of the stringer, Caliper Studio, to the supporting steel previously installed. And last but not least, the tread bracket and carved wood tread in the studio.
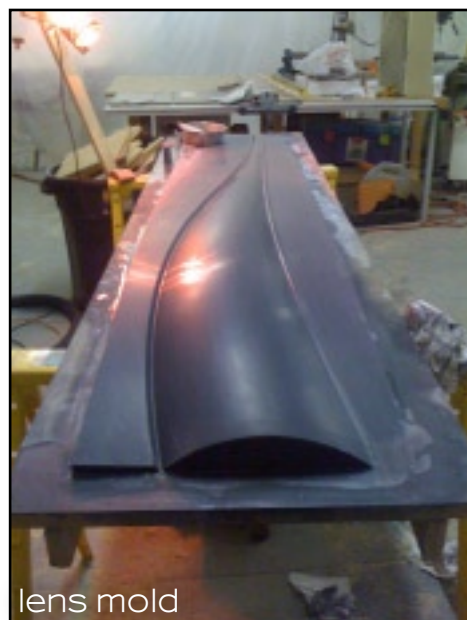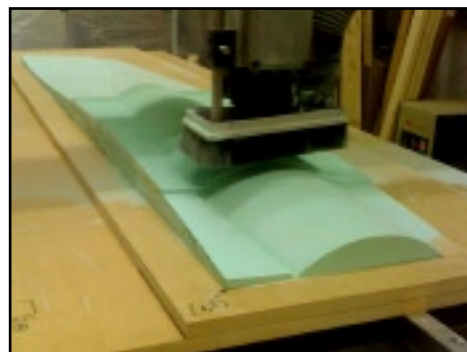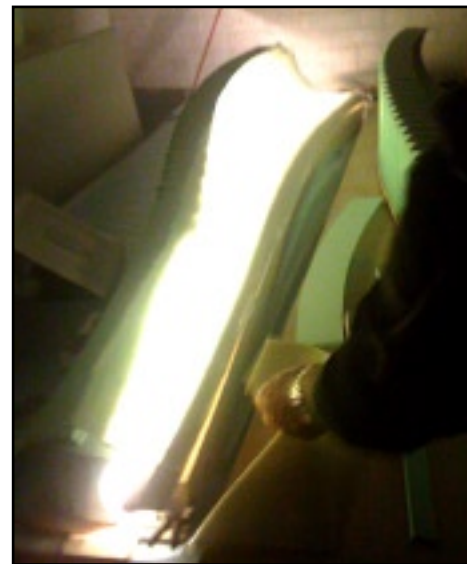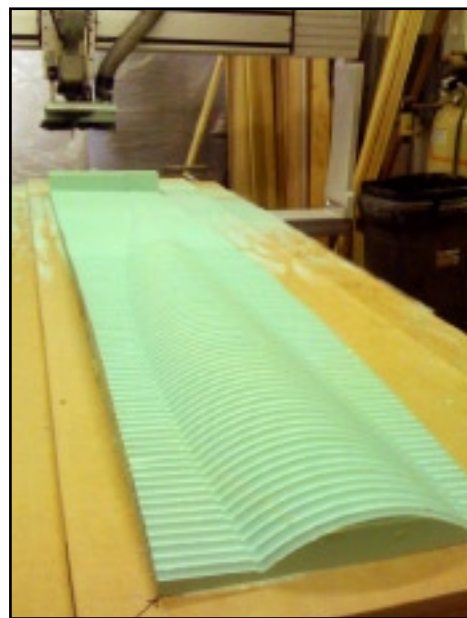
installation

assembly

lens mold

LED Light Fixtures

Early composite samples provided inspiration to explore a custom-light fixture design. Unidirectional fibreglass was used for its aesthetic ra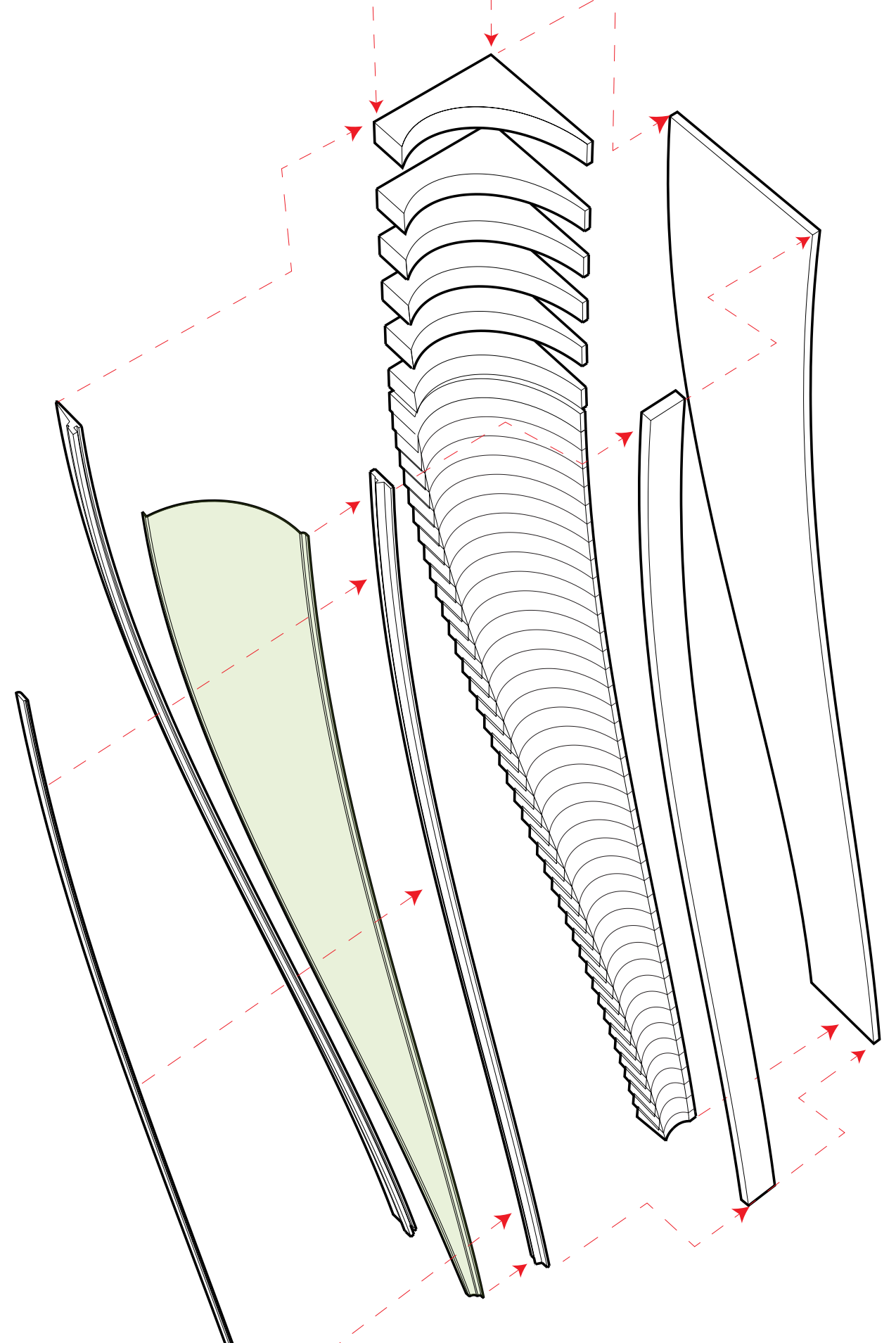ther than engineering properties and made up the lens. While 3 fixtures were originally proposed only two were produced and installed. All elements of the fixture were digitally output, mostly in high-density foam, and hand finished. The light source is high-output LED strip. The lens is removable for servicing. The fixtures are over eight feet tall.

R1_FP4 R1_FP3 R1_FP2 R1_FP1 BTW_01 SOFFIT 03 SOFFIT 02 SOFFIT 01

R2_FP4 R2_FP3 R2_FP2 R2_FP1 BTW_02 BLEND_03 BLEND_02

R3_FP4 R3_FP3 R3_FP2 R3_FP1 BTW_03 BLEND_01
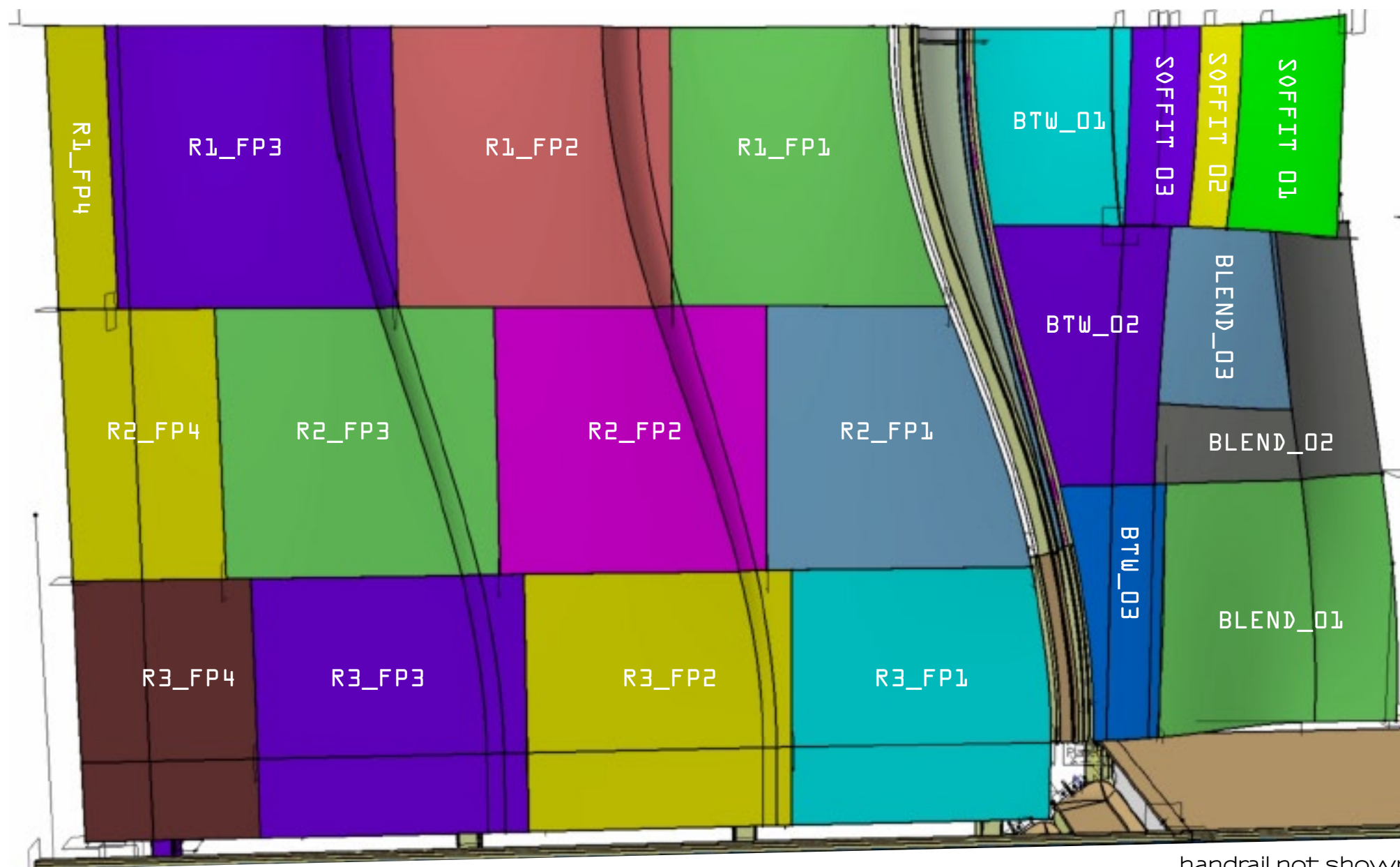
handrail not shown

initial skim coat
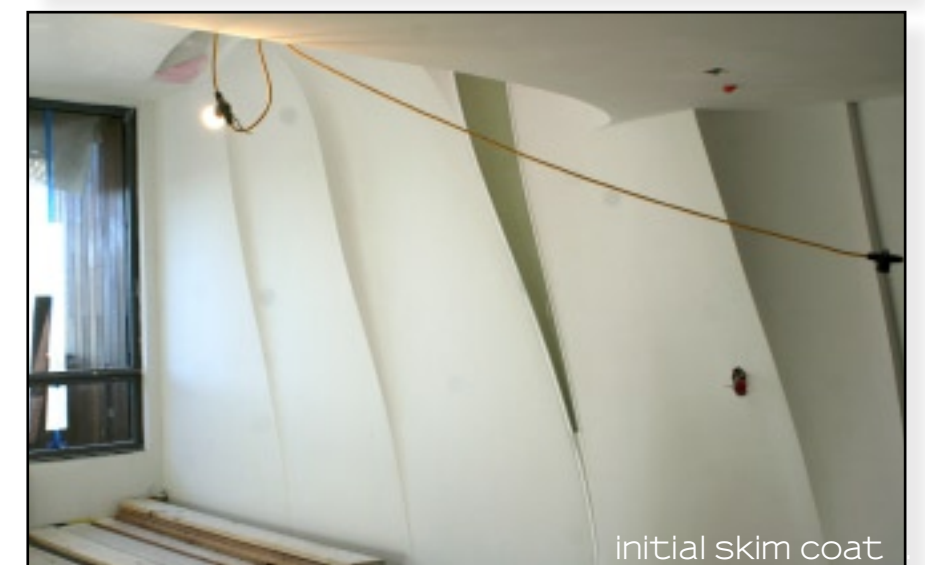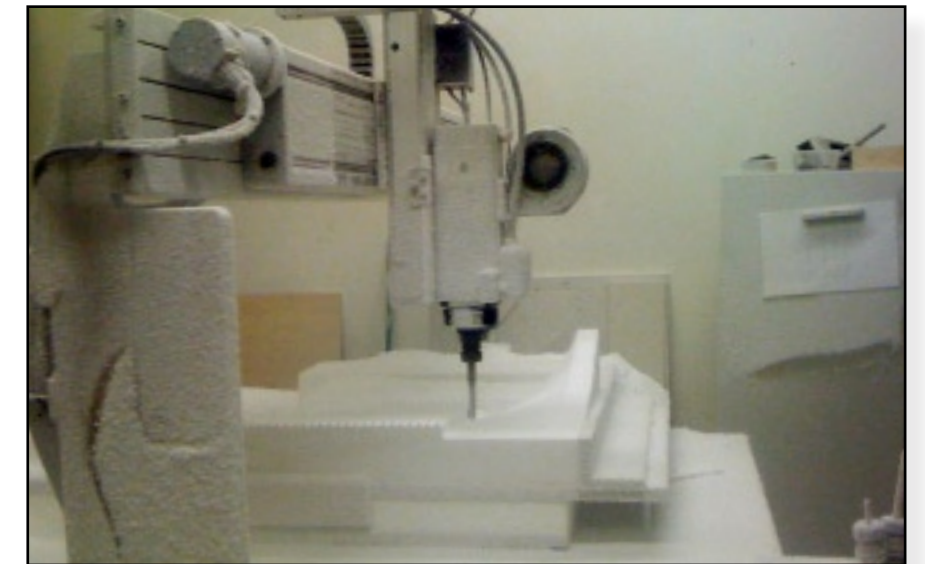
Feature Wall

After modelling, rendering and approval, a 3-axis cnc router was used to output eps foam shapes for mounting and finishing in fibre-reinforced plaster on site. Image on left shows mounting schedule and naming conventions for the foam shapes which are mounted over similarly detailed and digitally output plywood. The center right image shows the light fixture in position on the wall, the pink is the existing ceiling.
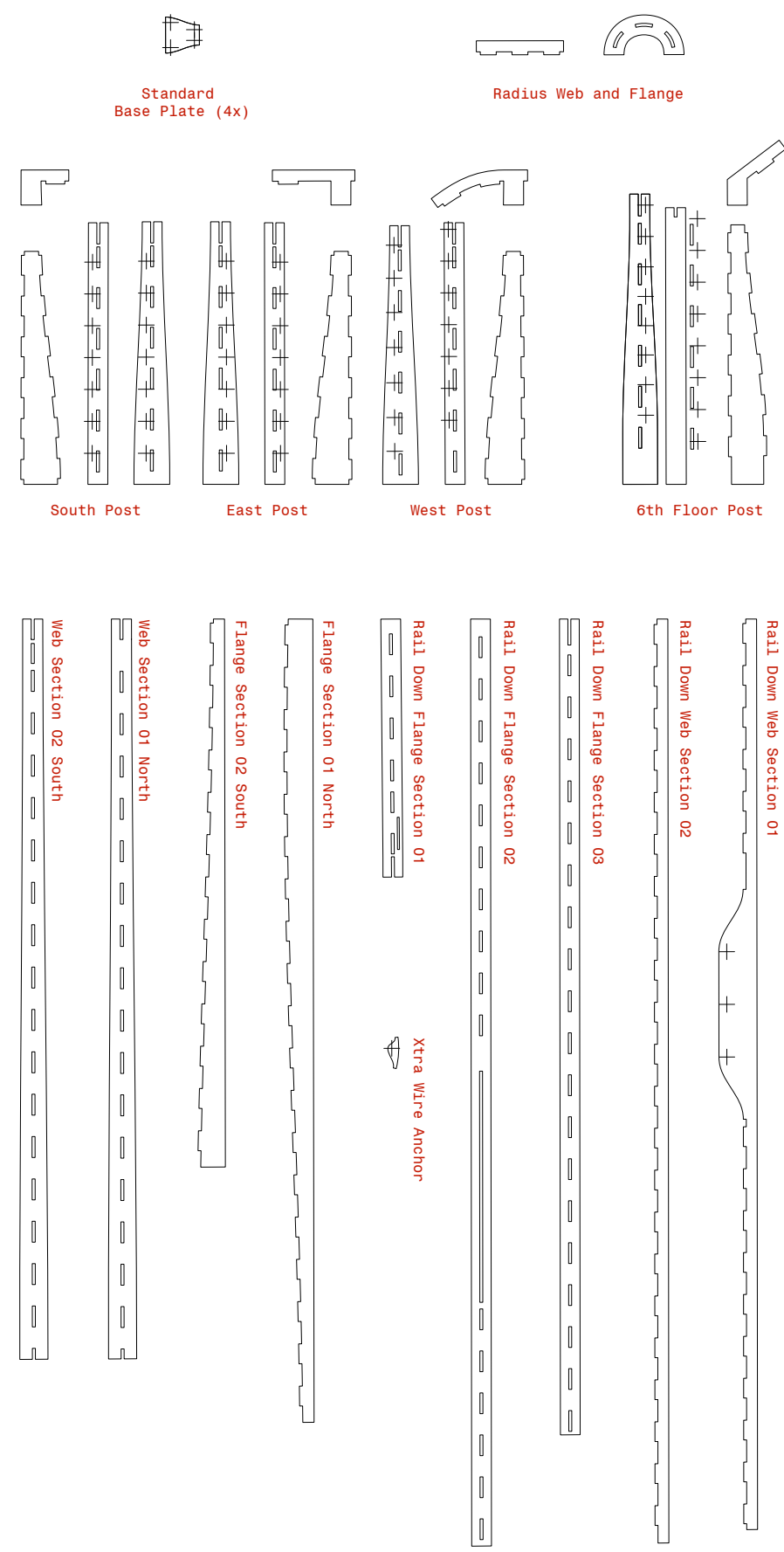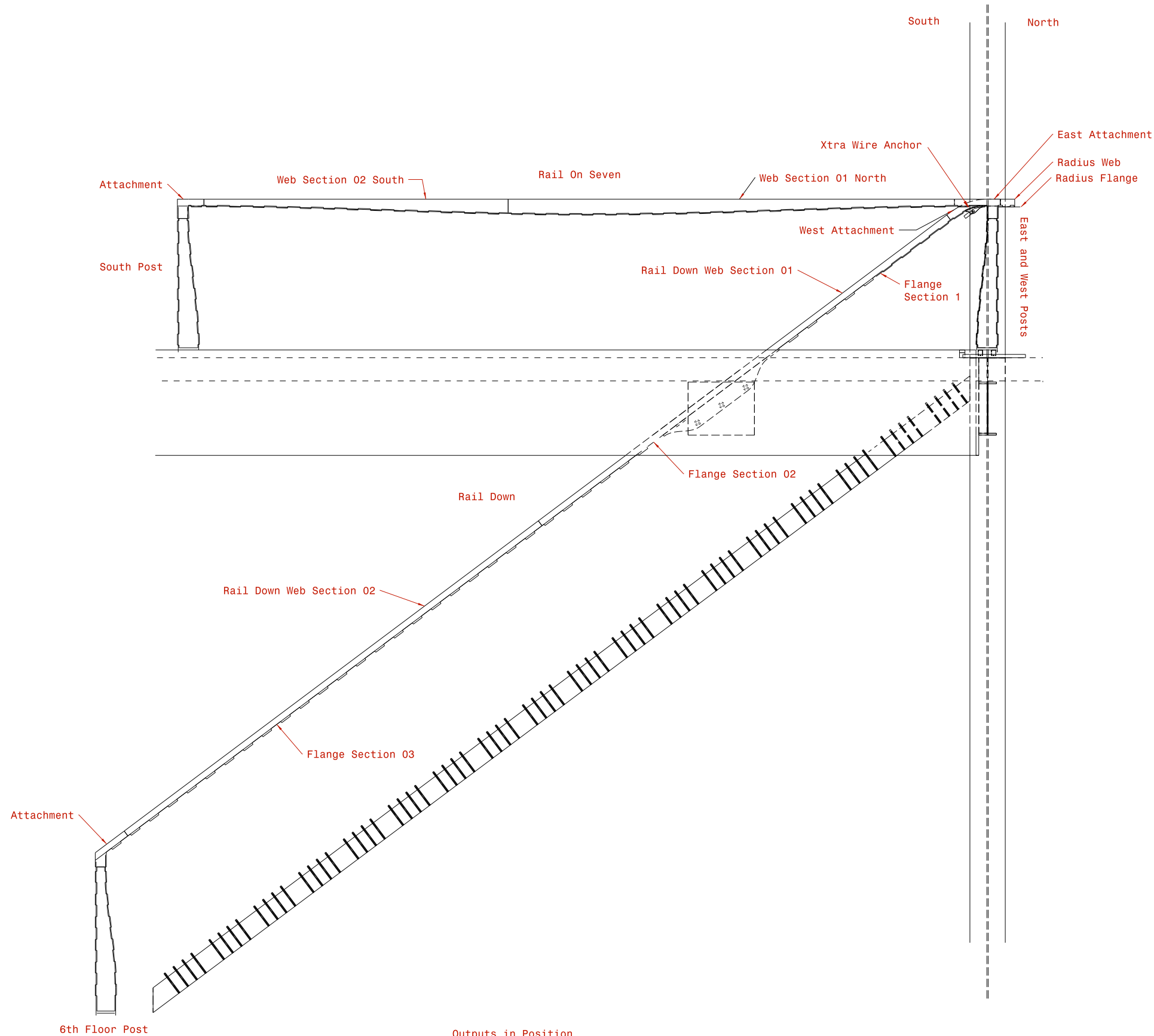
$3\frac{3}{8}$ $1\frac{3}{4}$

$2\frac{1}{2}$

Section cut B-B
Scale: 1:6

$5\frac{1}{4}$ $3\frac{5}{8}$

$3\frac{1}{2}$

Section cut C-C
Scale: 1:6

Jakob 16mm ball connection
(typical)

Finished Plate (1/2")
(bolted to Plug Weld Plate)

Plug welded plate 3/4"
(tapped for Finish Plate Mounting)

Weld Plate 1/2" thick
(epoxied and grouted as per Craftengine spec.)

This upper wire position
in progress

$190\frac{7}{8}$ $4\frac{0}{8}$

$2\frac{1}{2}$ B   C   D

$3\frac{1}{4}$

B   C

$30\frac{1}{2}$

Baseplate Detail
Scale: 1:4

D $5\frac{0}{8}$

Mounting Plate Detail

$236\frac{3}{8}$

treads removed for clarity

$7\frac{1}{2}$

4.00
4.00
4.00
4.00
4.00
4.00
4.00

Finished Floor

Concrete Slab

126.84°

Connection to slab not shown

Section view D-D
Scale: 1:10

Handrail Design

Given the cantilevered tread design, a satisfying design solution for stanchion posts was elusive. Further, any interface between the tread bracket and stanchions would complicate the molding requirements. A free-standing design eliminated those issues and matched the weightless qualities already established. The railing is finished with an oak cap. The design of the cap, based on an ergonomic sketch of a hand, was iterated into final form using 1:1 scale 3d prints to evaluate options.

South   North

Standard
Base Plate (4x)

Radius Web and Flange

Xtra Wire Anchor

East Attachment

Rail On Seven

Web Section 01 North

Radius Web
Radius Flange

Attachment

Web Section 02 South

West Attachment

South Post

Rail Down Web Section 01

East and West Posts

Flange
Section 1

South Post   East Post   West Post   6th Floor Post

Rail Down Web Section 02

Flange Section 02

Rail Down

Web Section 02 South

Web Section 01 North

Flange Section 02 South

Flange Section 01 North

Rail Down Flange Section 01

Rail Down Flange Section 02

Rail Down Flange Section 03

Rail Down Web Section 02

Rail Down Web Section 01

Flange Section 03

Xtra Wire Anchor

Attachment

6th Floor Post

Outputs in Position
Scale: 1:12

Handrail Ouput

The handrail steel was detailed in Catia for direct output to cnc plasma cutter. Working with the fabricator, FIT, the specific details were modelled in position and prepped for output.
The diagram above left shows the elements in position. Above right shows the unrolled profiles ready for the plasma cutter, sans optimal nesting of course.
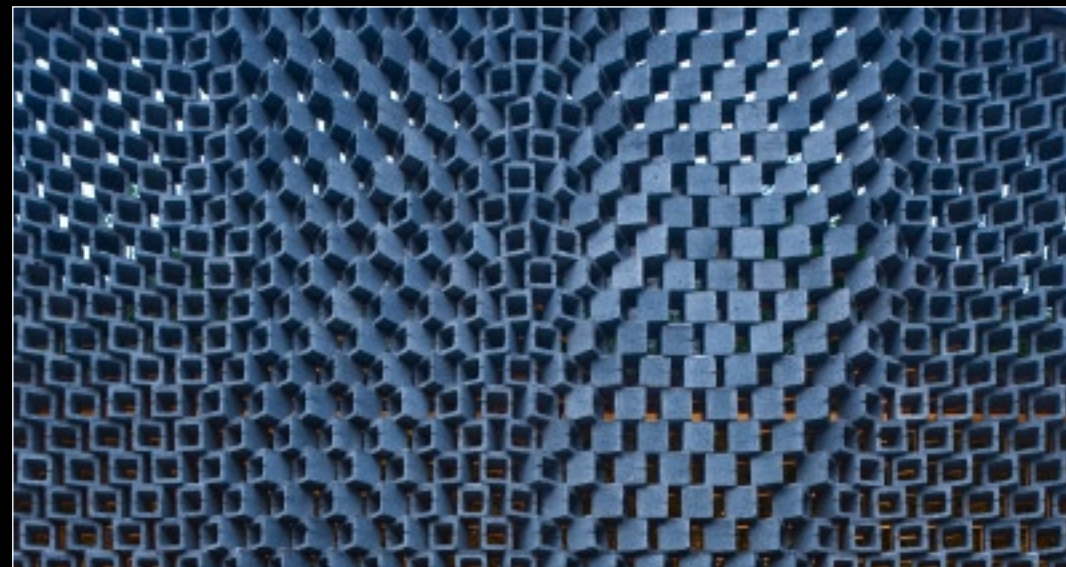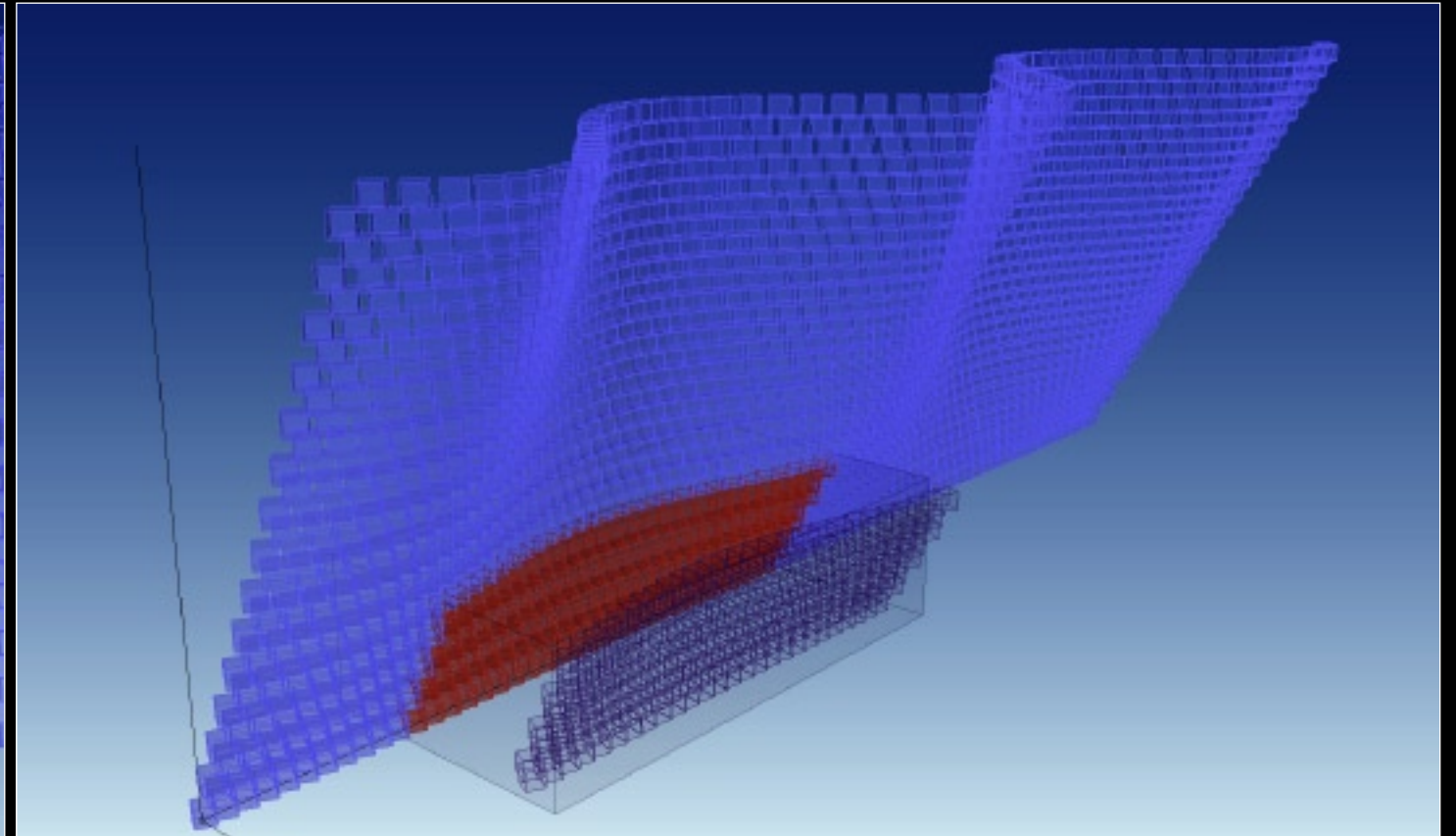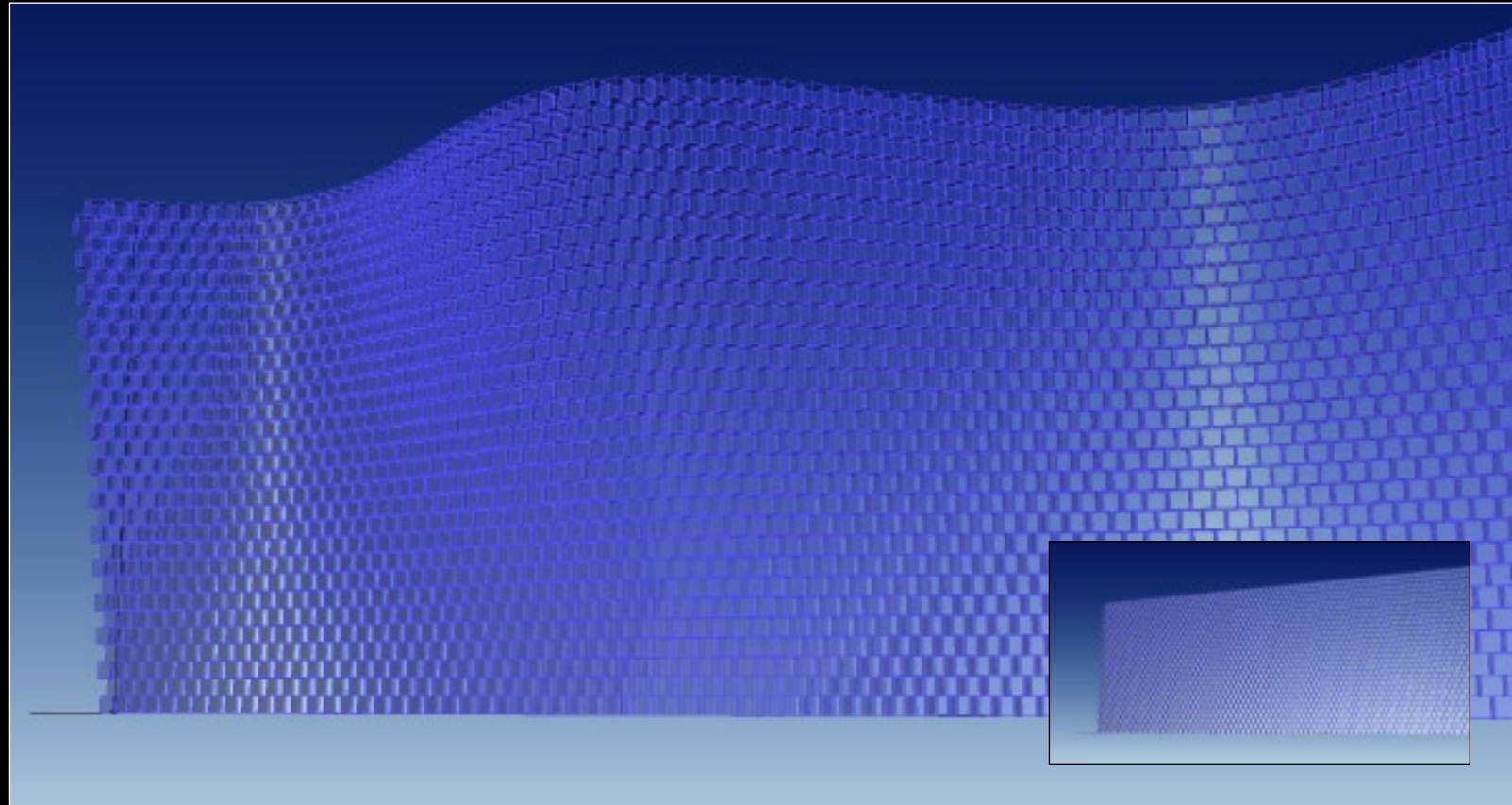
parametric wall, Archi Union

rendering by Alexis Gonzalez, Archipelagos

Astoria Club

This Grasshopper-based study model was created for the fine folks over at Archipelagos. The proposal is a renovation of an existing building in Queens to create a performance venue and three-story facade. The architects wanted to utilize a material-accumulation strategy and express the performance space's acoustic treatment, foam blocks, by using them to also contain programmatic elements, such as coat check and bars, and be expressed as the facade itself. I was asked to develop a parametric model , fabrication strategy and cost estimate. The Grasshopper model auto-generated all material take-offs for cost estimation and included many user adjustable features such as displacement and multi-level pixelization.
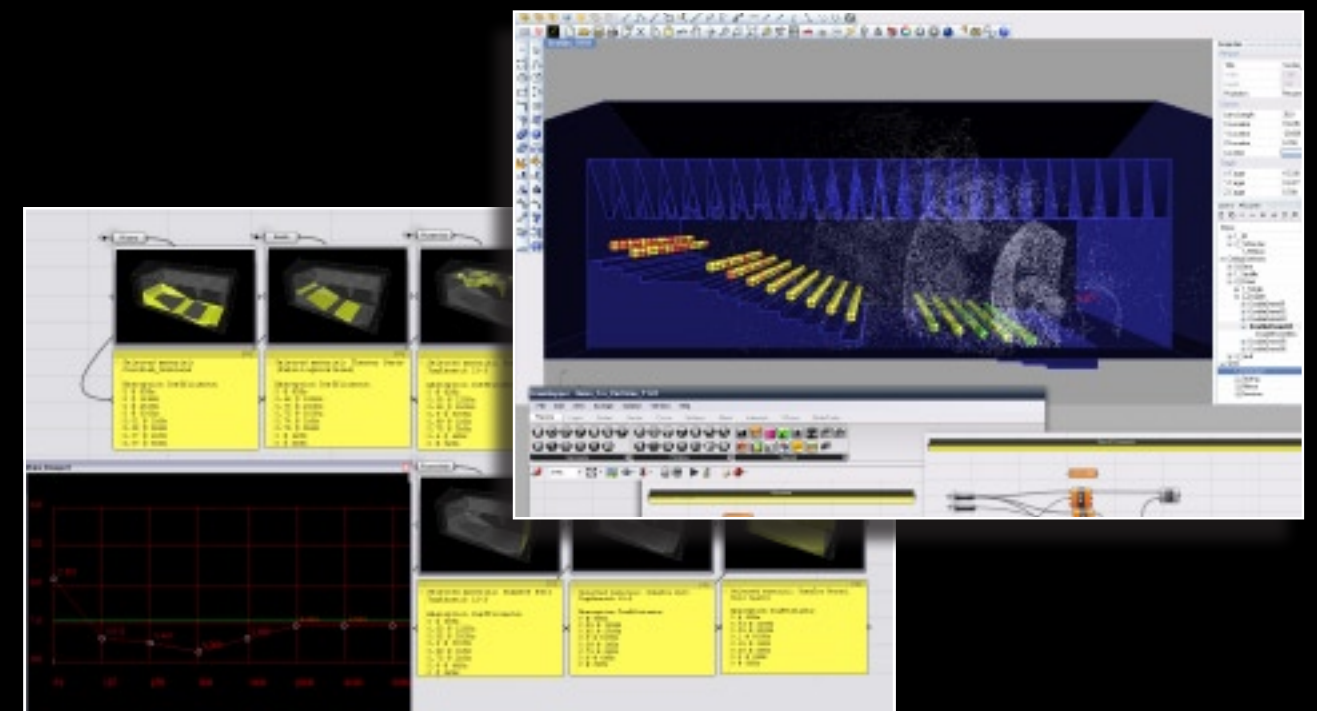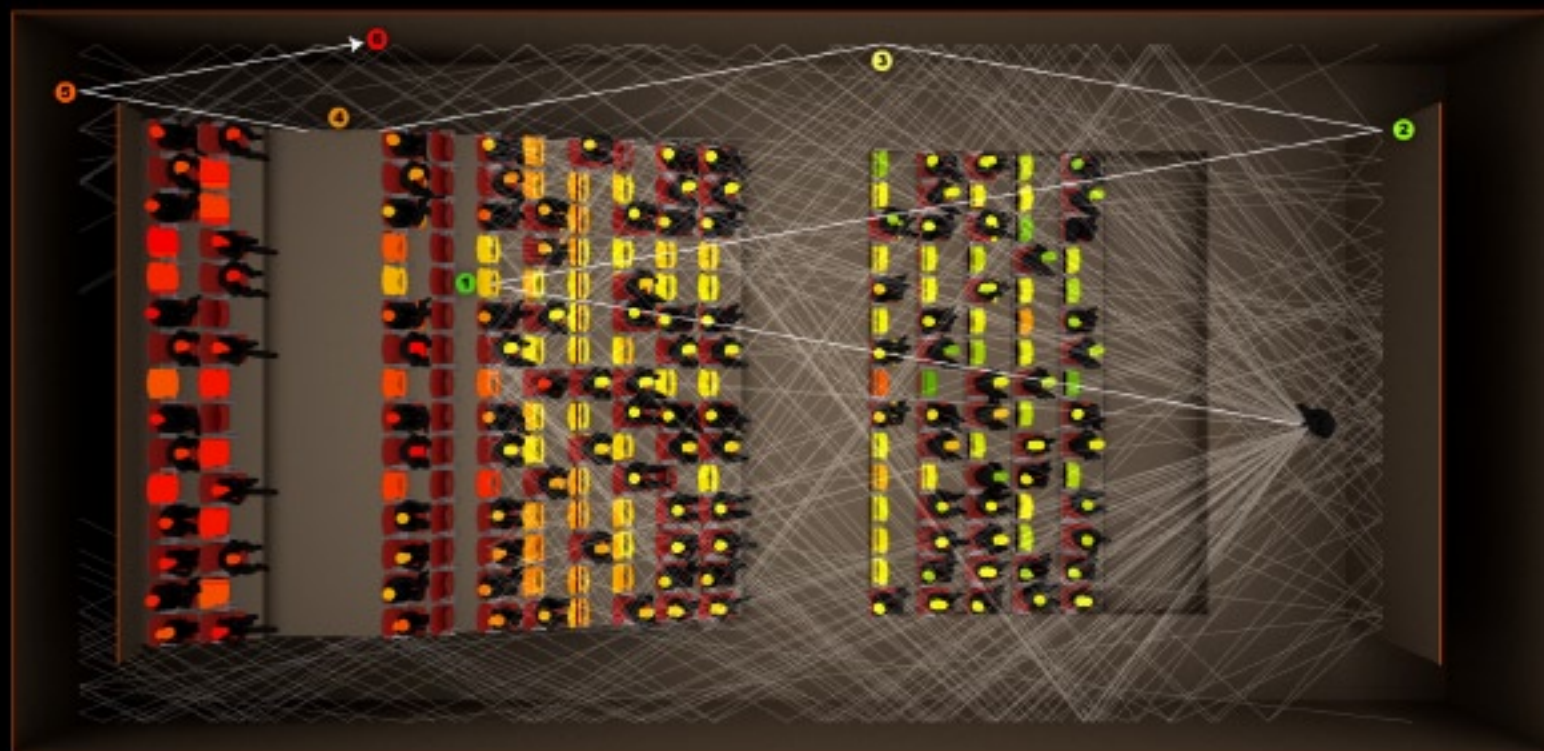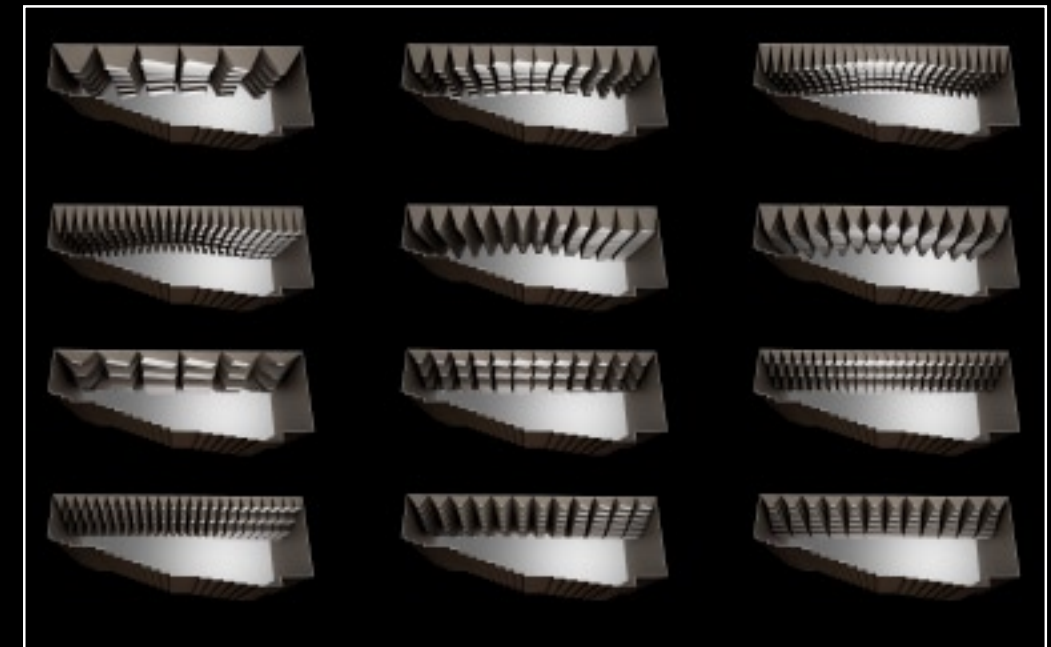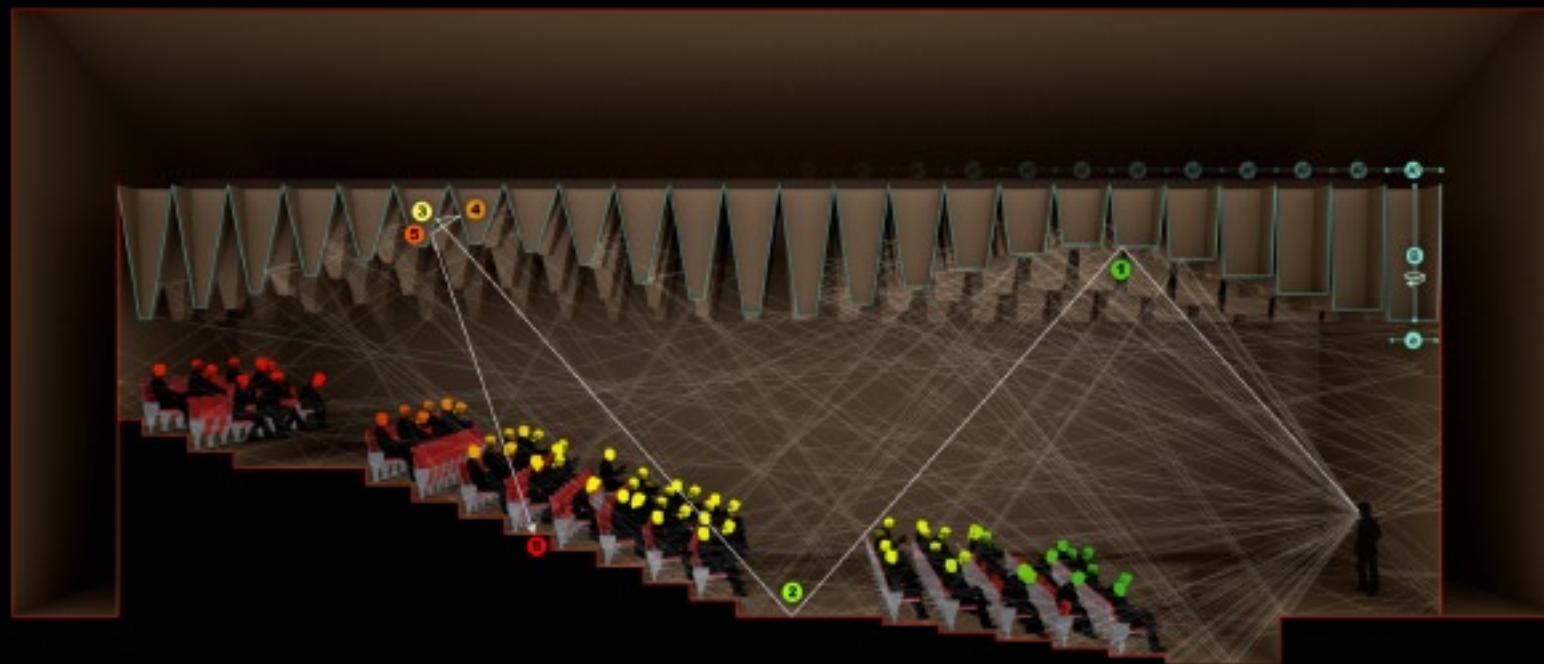
Roma Tre

The Roma Tre Architecture School in Rome is undertaking the renovation of a complex of 19th century warehouses. These are to become classrooms, exhibit halls, workshops and an auditorium. While at the Stevens Institute, I, along with 3 other students, proposed a performance-based design solution as well as provided acoustic analysis of an existing plan. We created a generative-parametric model focused on the articulation of the ceiling. As part of that work, we developed our own acoustical analysis tool for Revit and Rhino, they are documented here.

"Boathouse"

Fabric Tile Driver Diagram

Landscape "bench"

Early Concept Tile
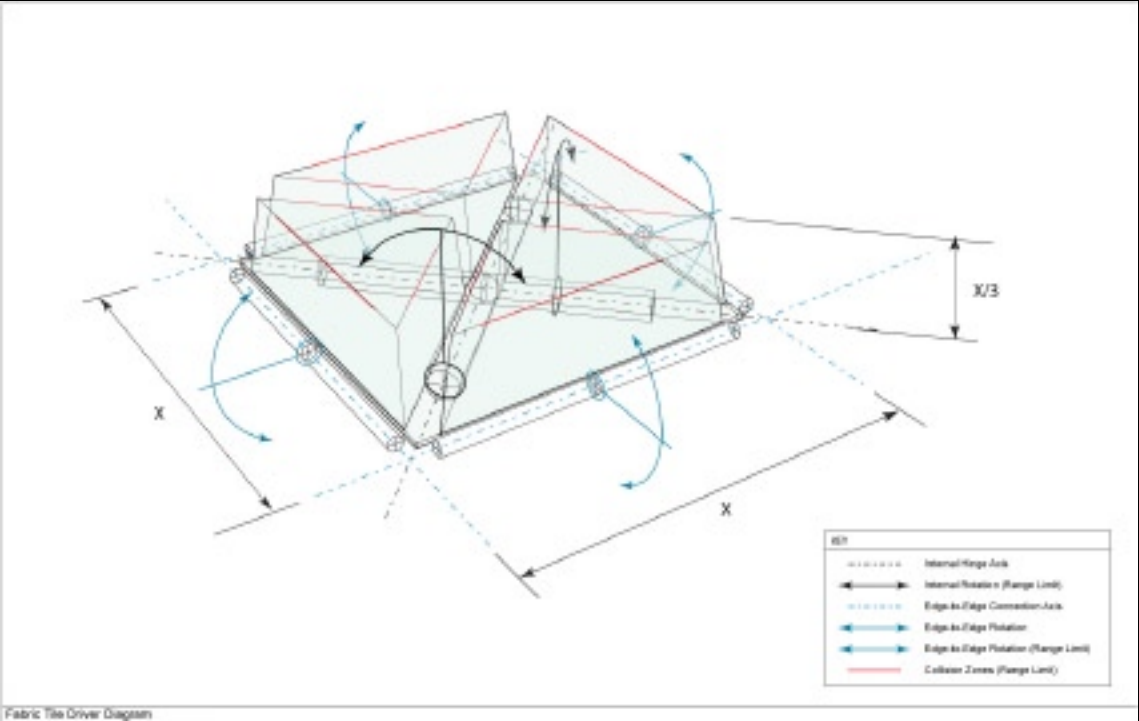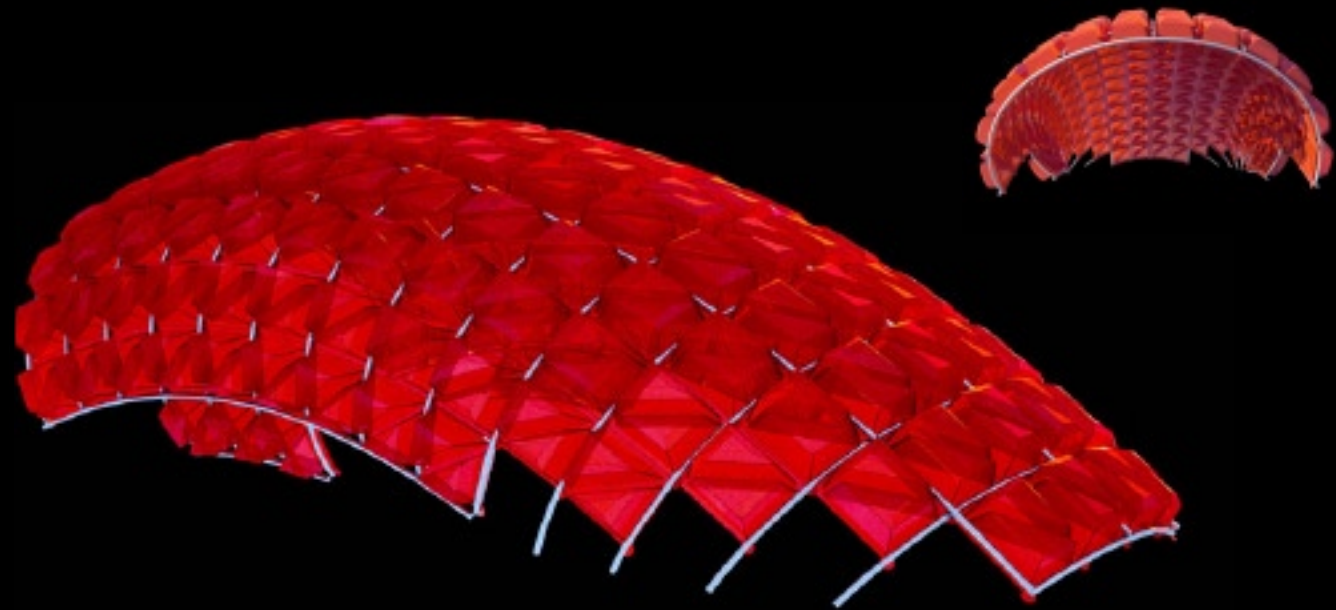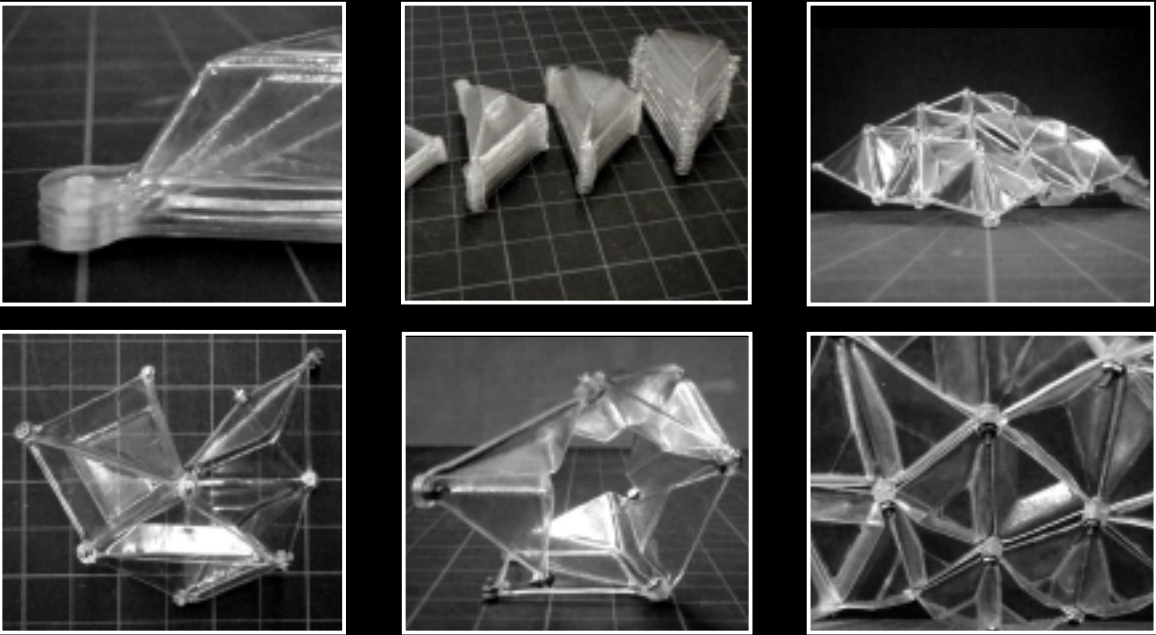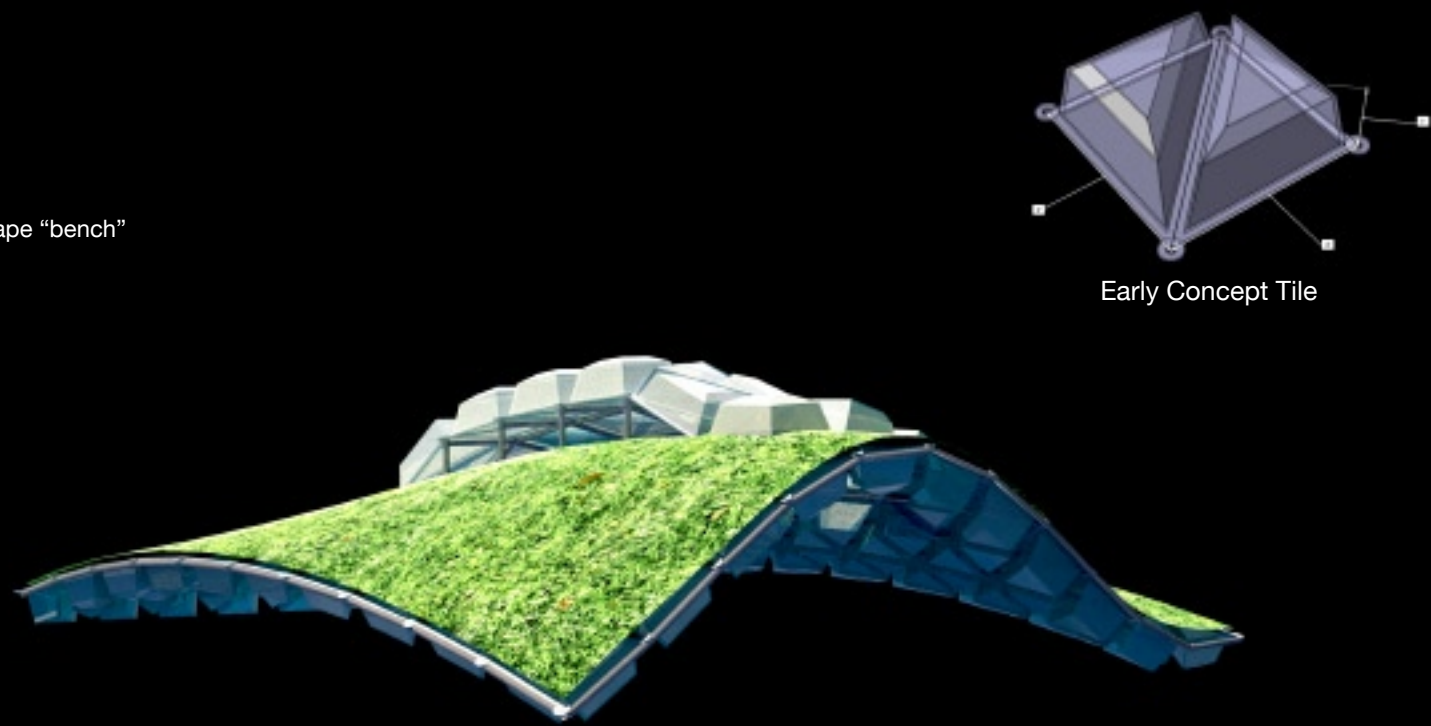
Instant Park

This project, completed while in the Product Engineering and Architecture Program, was a concept to create a plastic component (tub) which could be used to transform a site, awaiting remediation, into a usable park. The tile would be configured to create landscape as well as structures and furniture. This page shows a number of steps in the development of the project which including the creation of a physical model from vacuum-formed plastic.

PS1

MOS Architect's PS1 Young Architect's Program Installation from Summer 2009. As part of a student team, I worked on MOS's proposal performing environmental analysis aimed at validating the "stack effect" the architects planned installation was to create. See that work here. Our analysis instead proved that the design as conceived, and ultimately executed, would not create any notable cooling effects. The project timing dictated that no changes could be made to improve the stack effect the architects originally intended. In response, my process was to perform an in depth environmental analysis to determine the design parameters that would maximize stack effect and to then create an installation based upon those parameters.

The Colbert Report

Last fall, I was asked by The Colbert Report to participate in a pitch to revise the current Show Open. Verb, a company I co-founded, had completed the first version when the show launched. One of my concepts for the new show open was to utilize the conventions of award shows, rather than news, which have the right combination of meaninglessness and faux grandeur. While I worked with a design firm to complete the graphics package, I developed this set design to go along with the direction and make a greater overall brand statement.

Branding

For over 10 years, I have worked as a strategist, creative director, designer, animator and editor. After I cofounded the boutique design firm Verb! I became the Executive Producer a role which cemented my ability to engage with clients at every stage of a project from initial concept through final delivery. I have created media for every possible delivery method from business cards to in-cinema commercials, mobile to multi-screen, :30 second spots to 24 hour environmental installations. I relish the nuances of every environment and have an innate understanding of how to translate brand into design artifacts. To see additional samples of my work including motion samples click here.