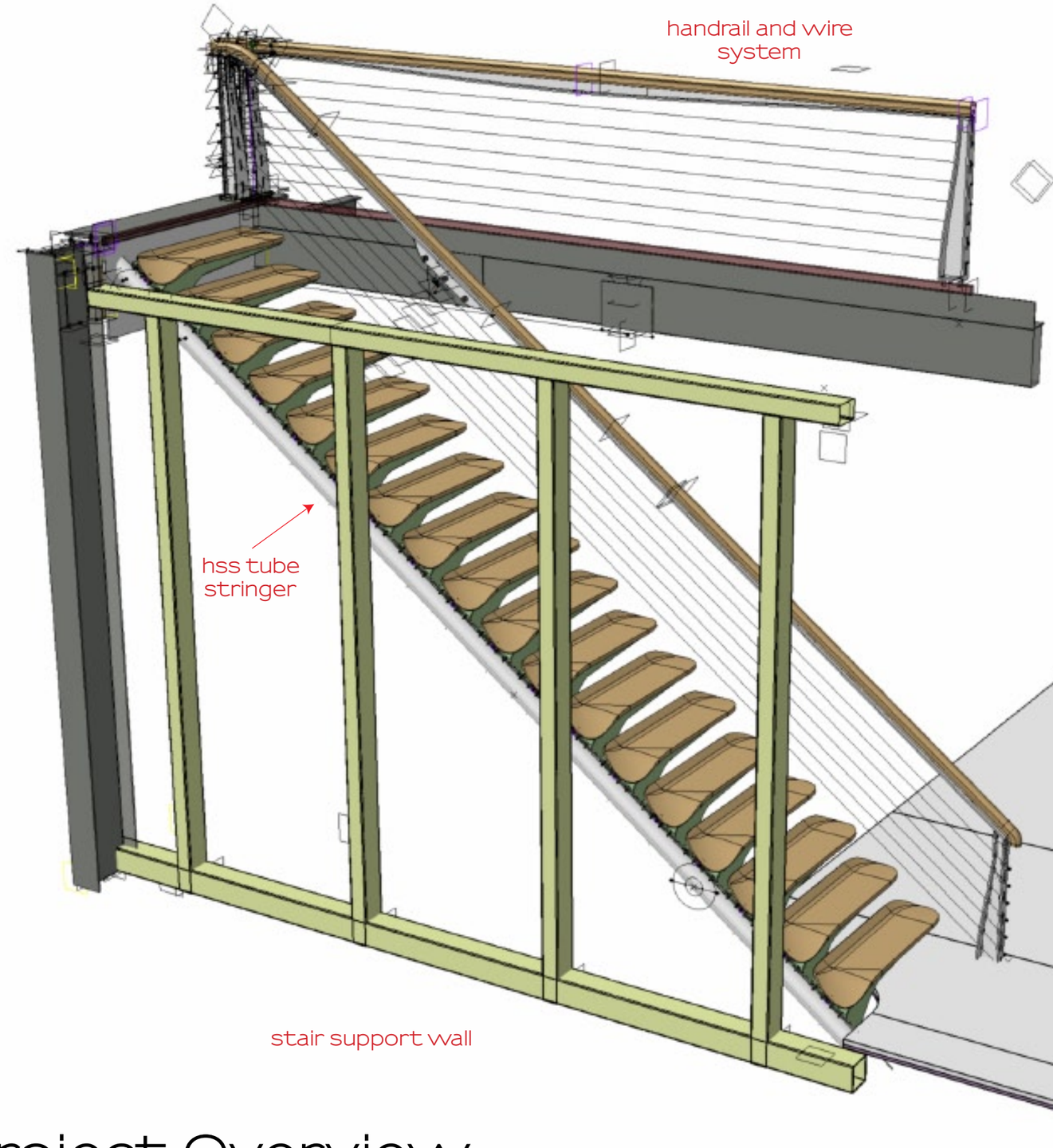
view from entrance

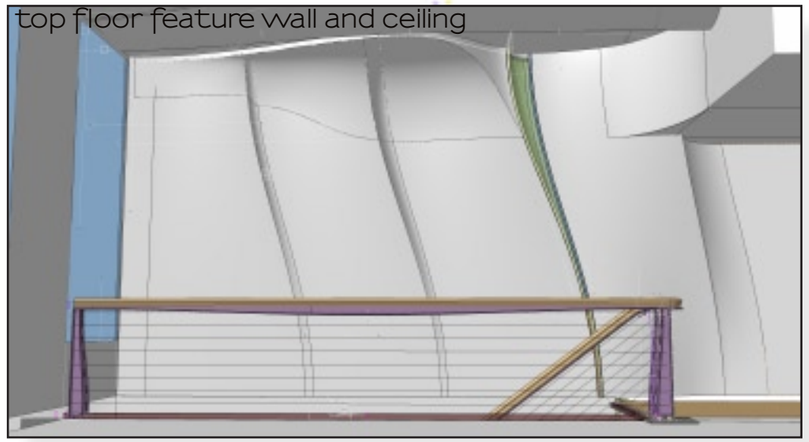
renderings by jason colbert, nastasi architects

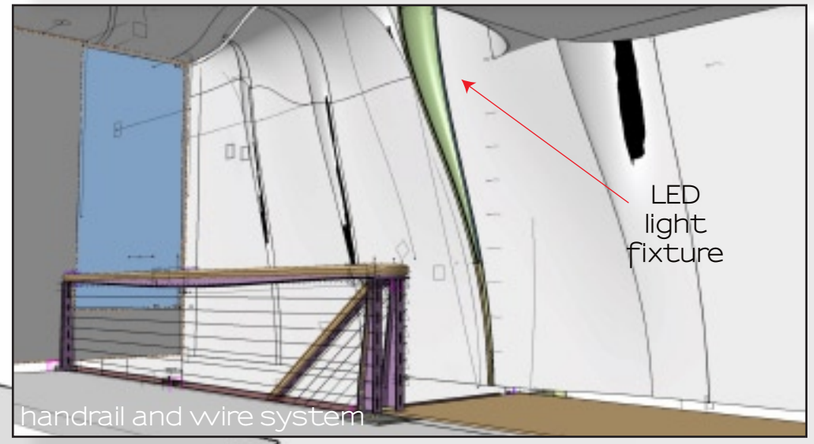
# Pancu Residence

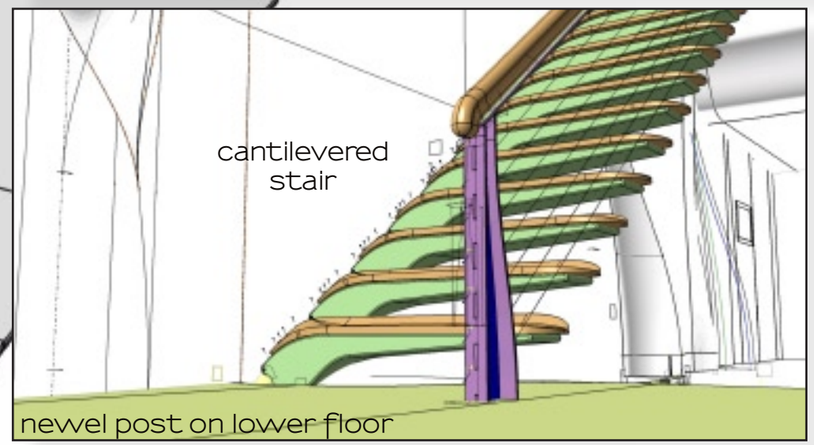
This project, my most recent, was completed while working with Nastasi Architects in Hoboken, NJ. I was lead designer and project coordinator for the staircase and feature wall design. The clients, an older couple who care for an elderly parent in the home, purchased two apartments in Shop Architect's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



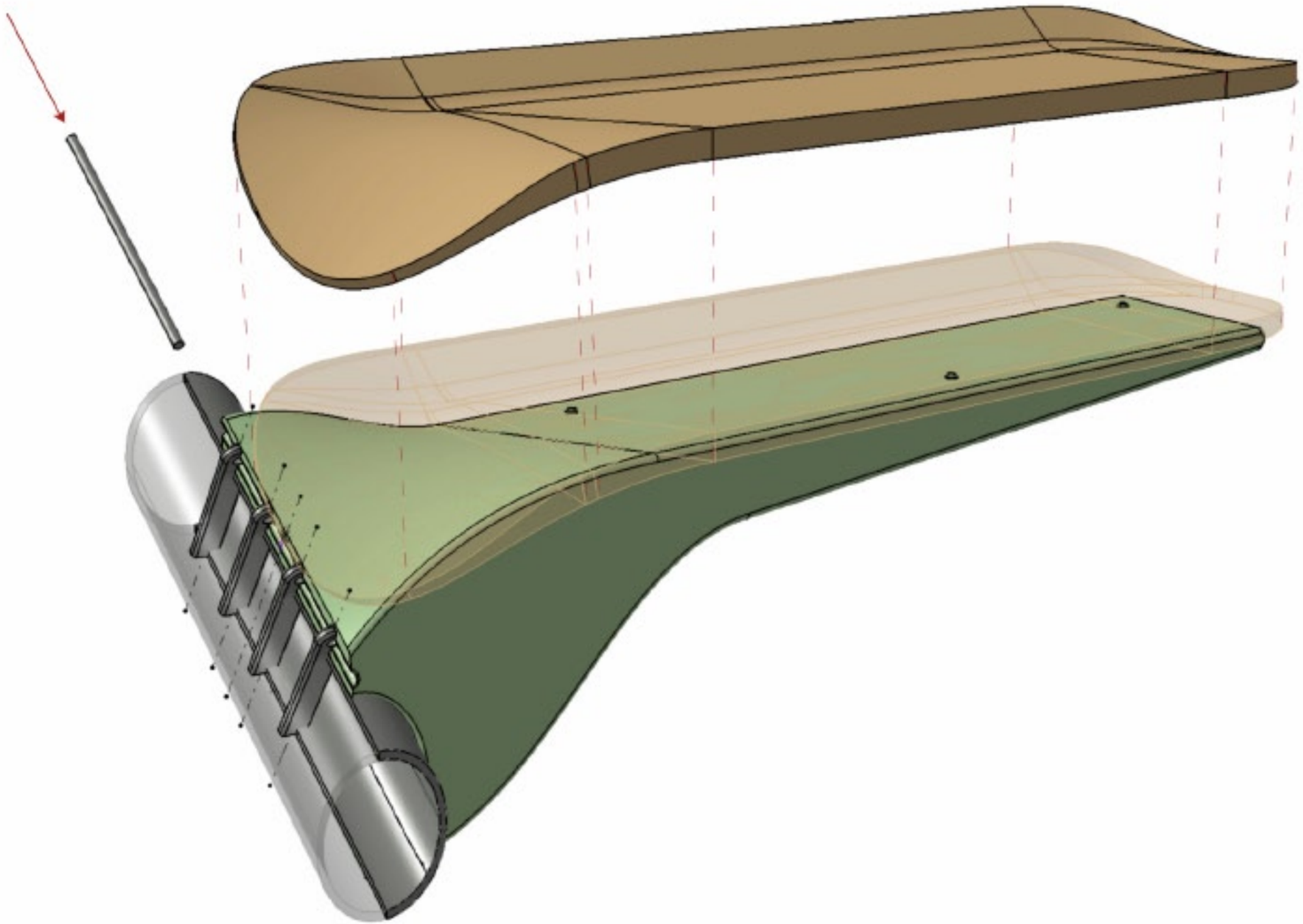



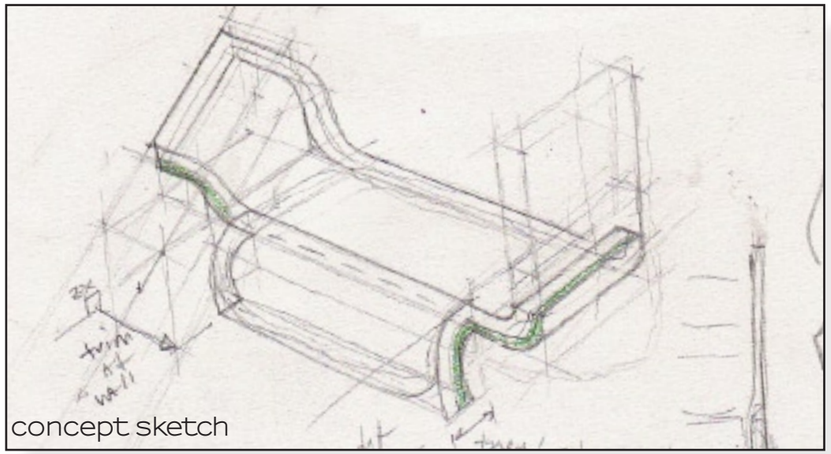



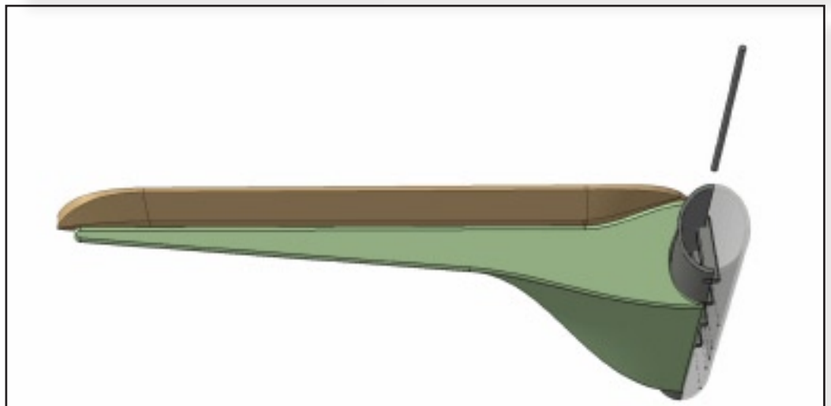

# Project Overview

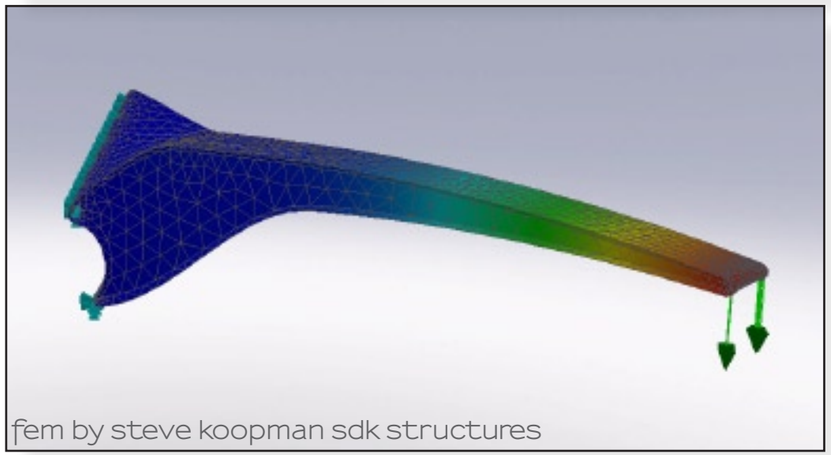
The stair is a cantilevered design which is comprised of a structural steel support wall, steel pipe stringer, composite (fibreglass) tread brackets and cnc-carved oak treads. The handrail is a stanchion-less design with Jakob wire system and an asymetric cnc-carved oak handrail. The pipe stringer and 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

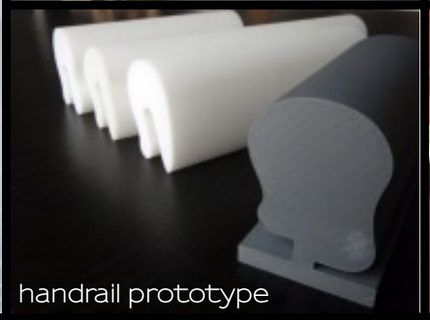

fem by steve koopman sdk structures

# 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

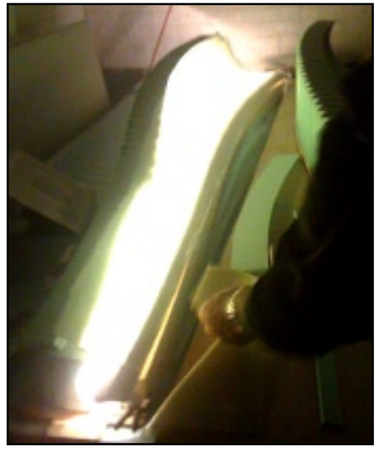

handrail prototype


first-article deflection test


stringer installation

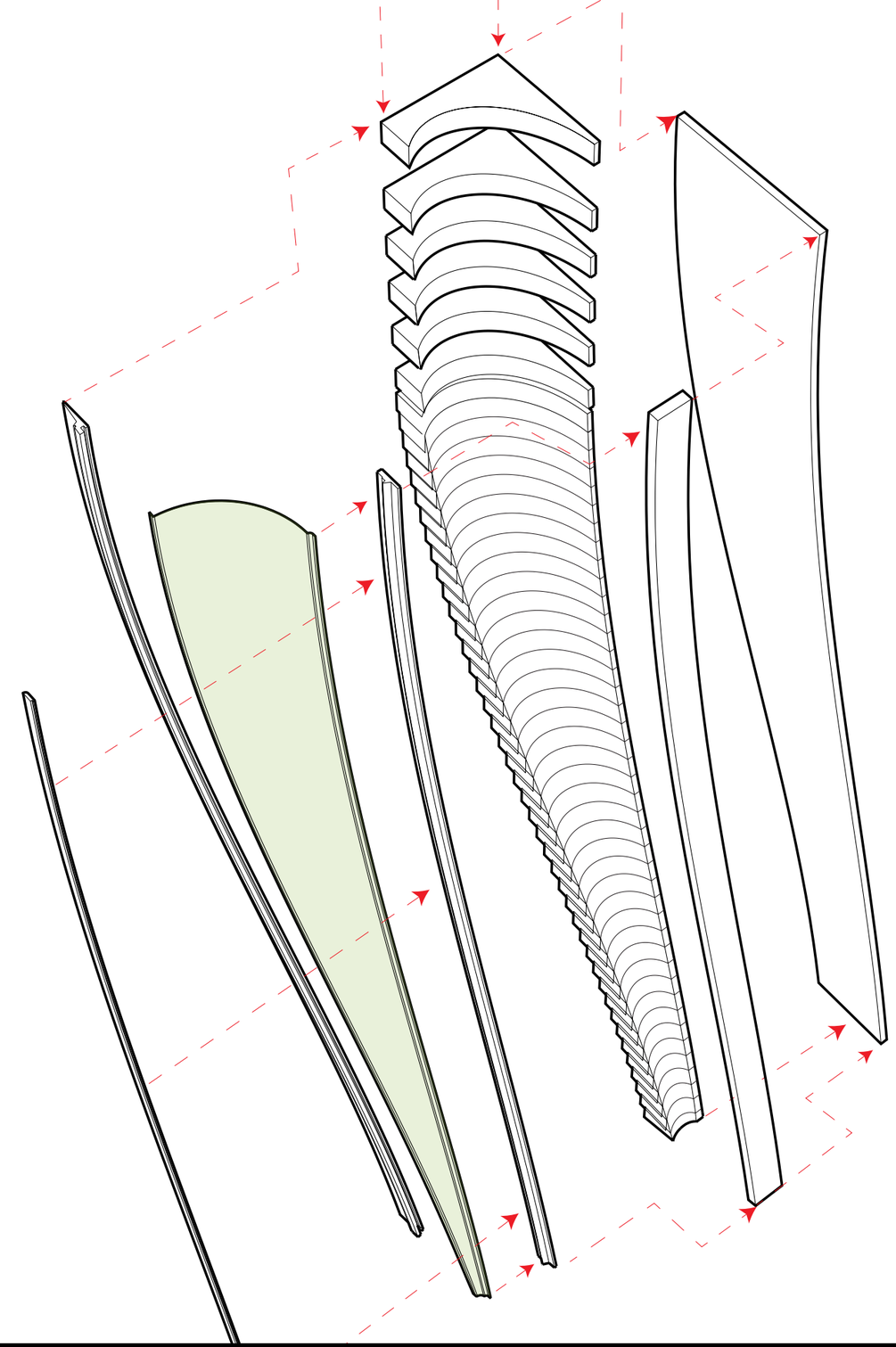

completed tread brackets

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.



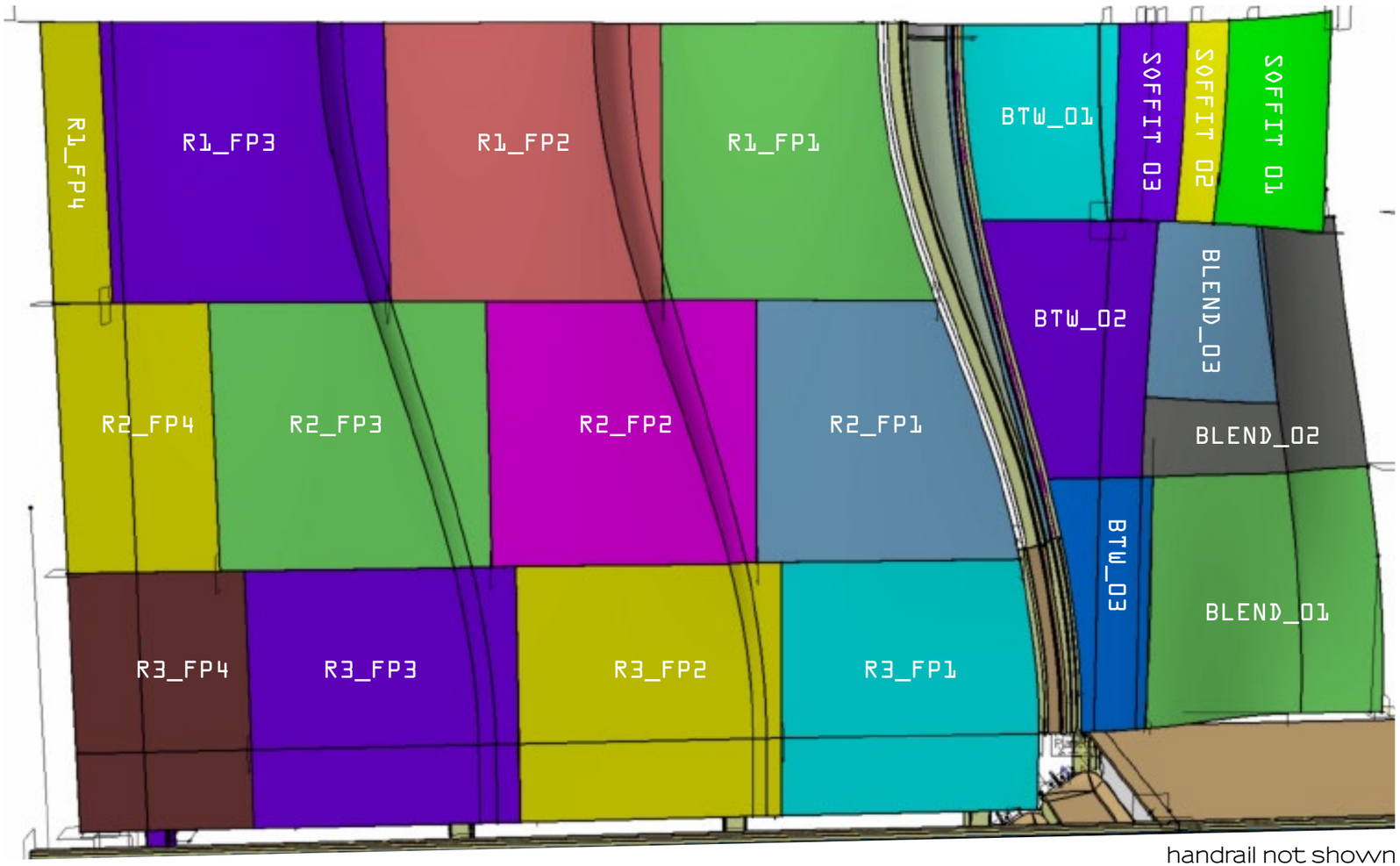




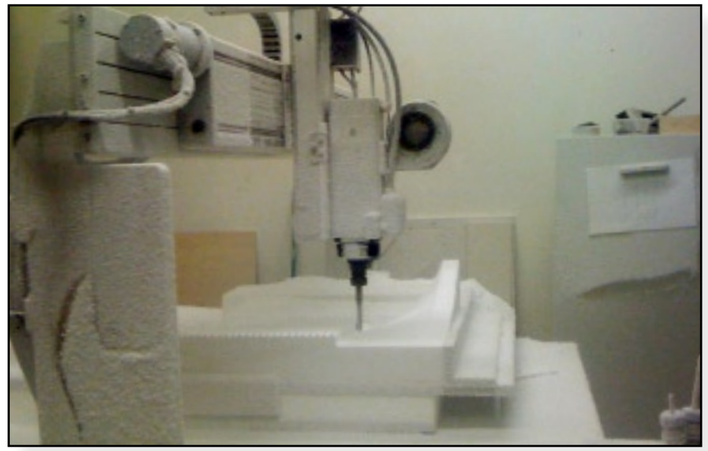



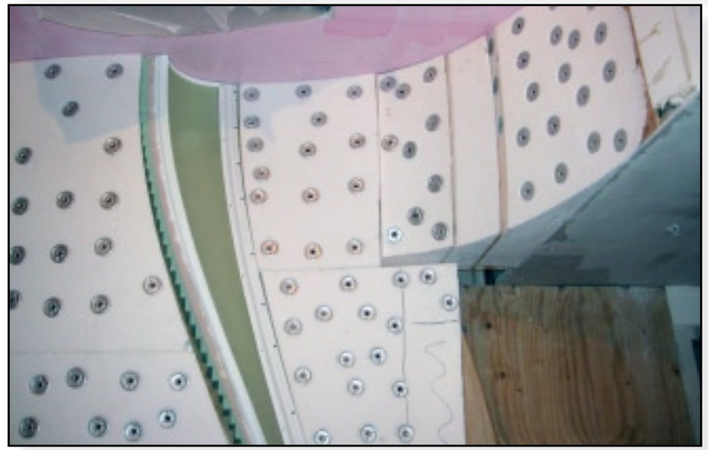
# LED Light Fixtures

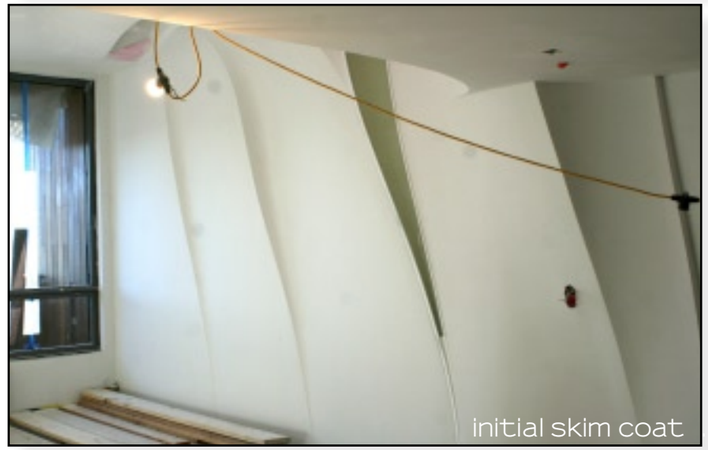
Early composite samples provided inspiration to explore a custom-light fixture design. Unidirectional fibreglass was used for its aesthetic rather than engineering properties and made up the lens. While 3 fixtures were originally proposed only two were produced and installed. All elements of the fixture 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.




handrail not shown



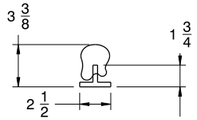




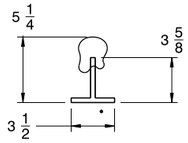
initial skim coat

# 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.




Section cut B-B
Scale: 1:6



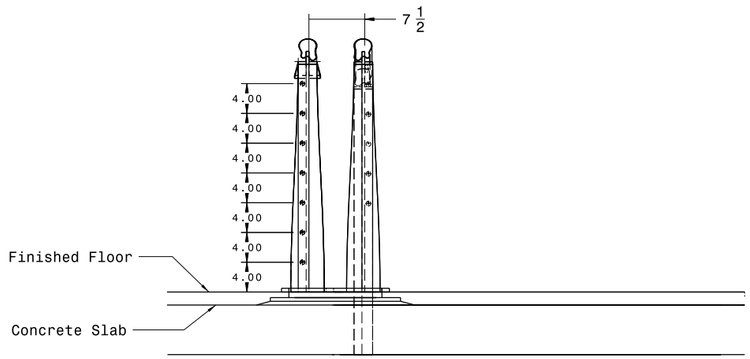

Section cut C-C
Scale: 1:6




This upper wire position in progress



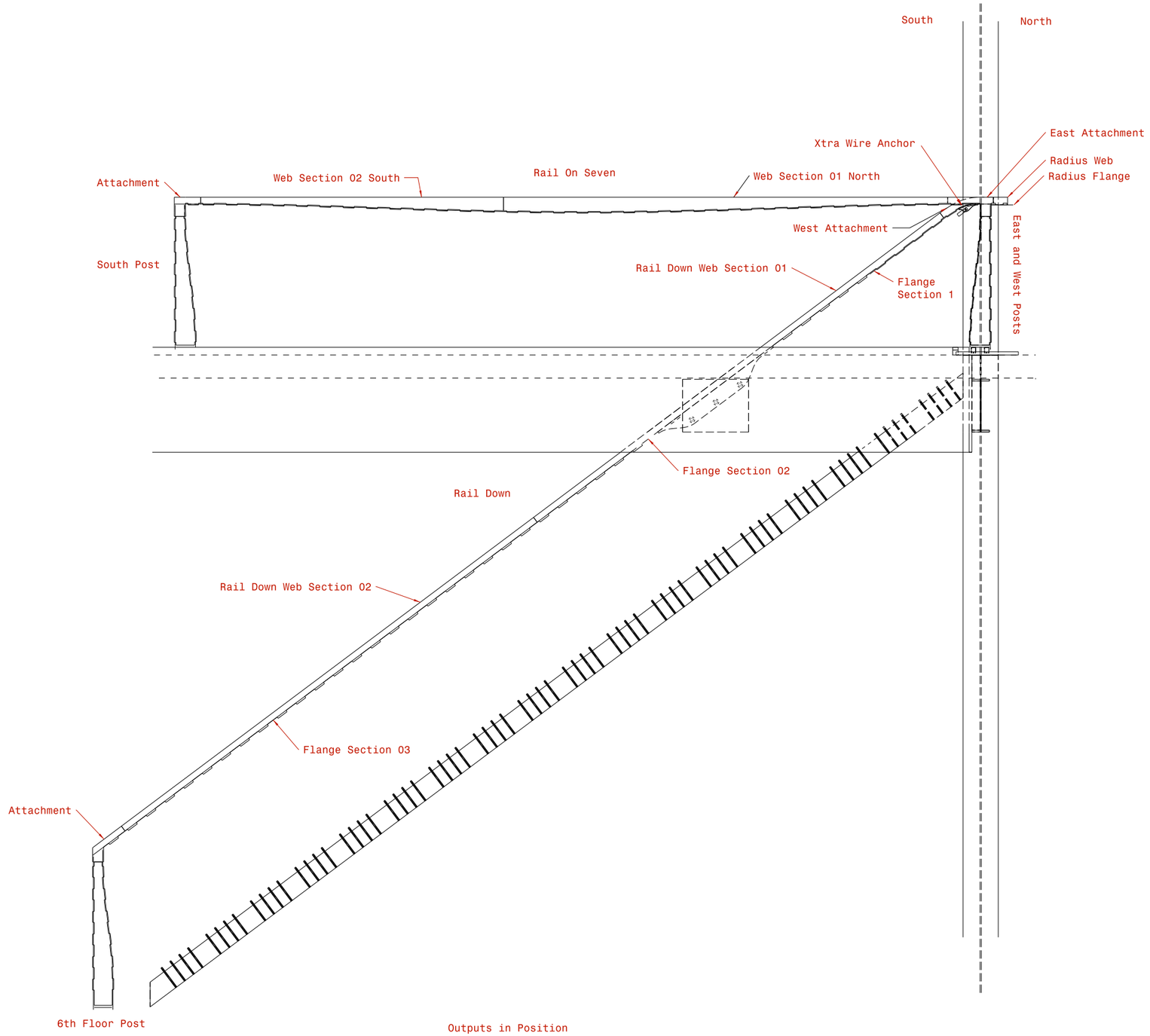

Baseplate Detail
Scale: 1:4



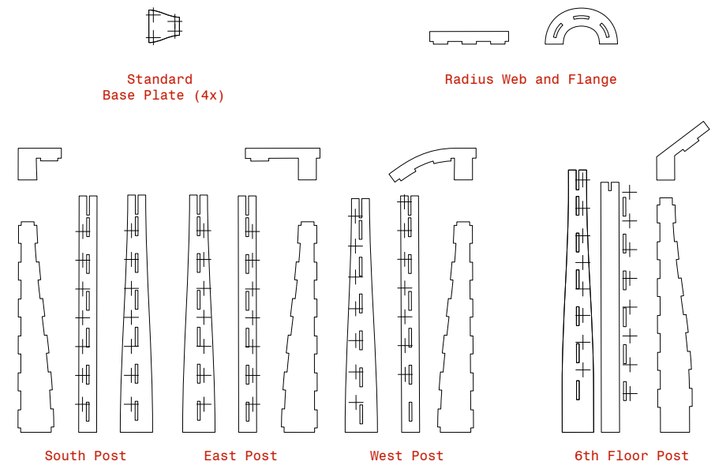

Section view D-D
Scale: 1:10

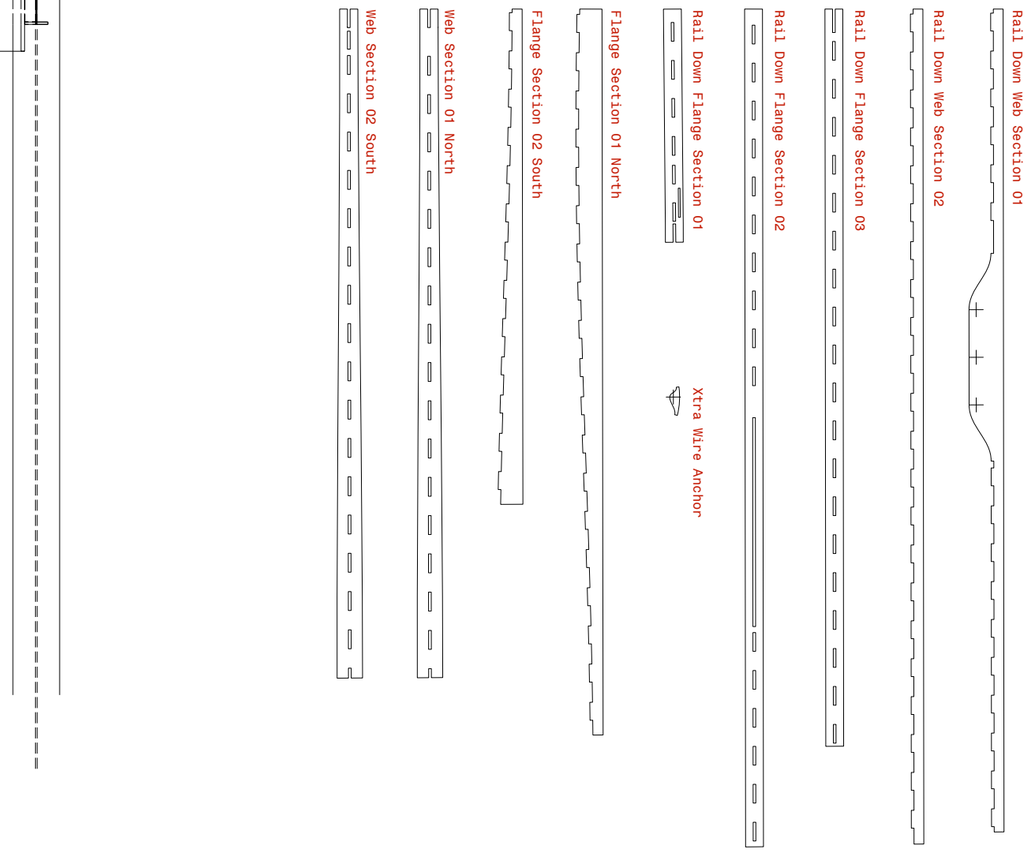
# Handrail Design

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.




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.