

# 3 Joseph Koon

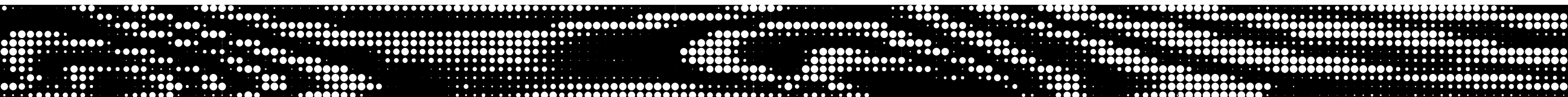
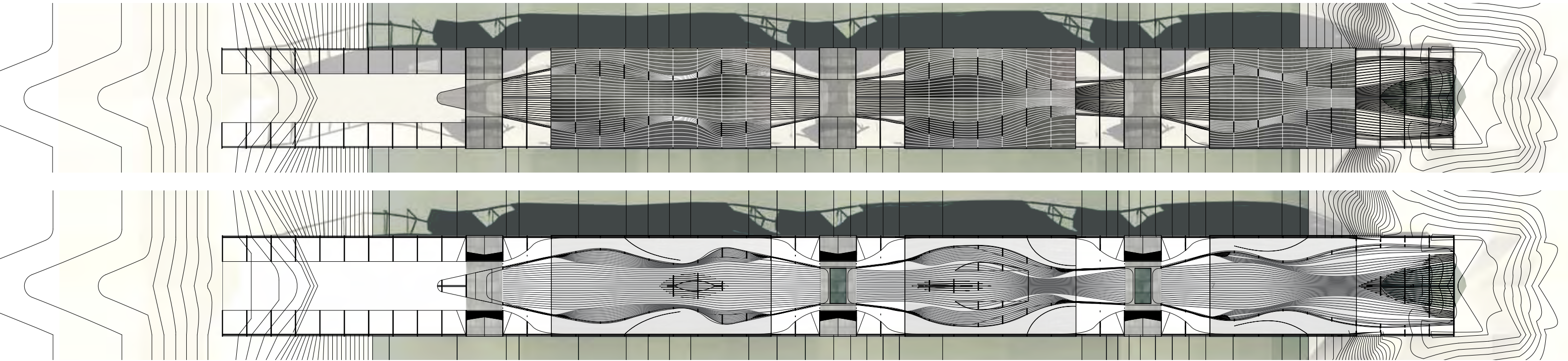
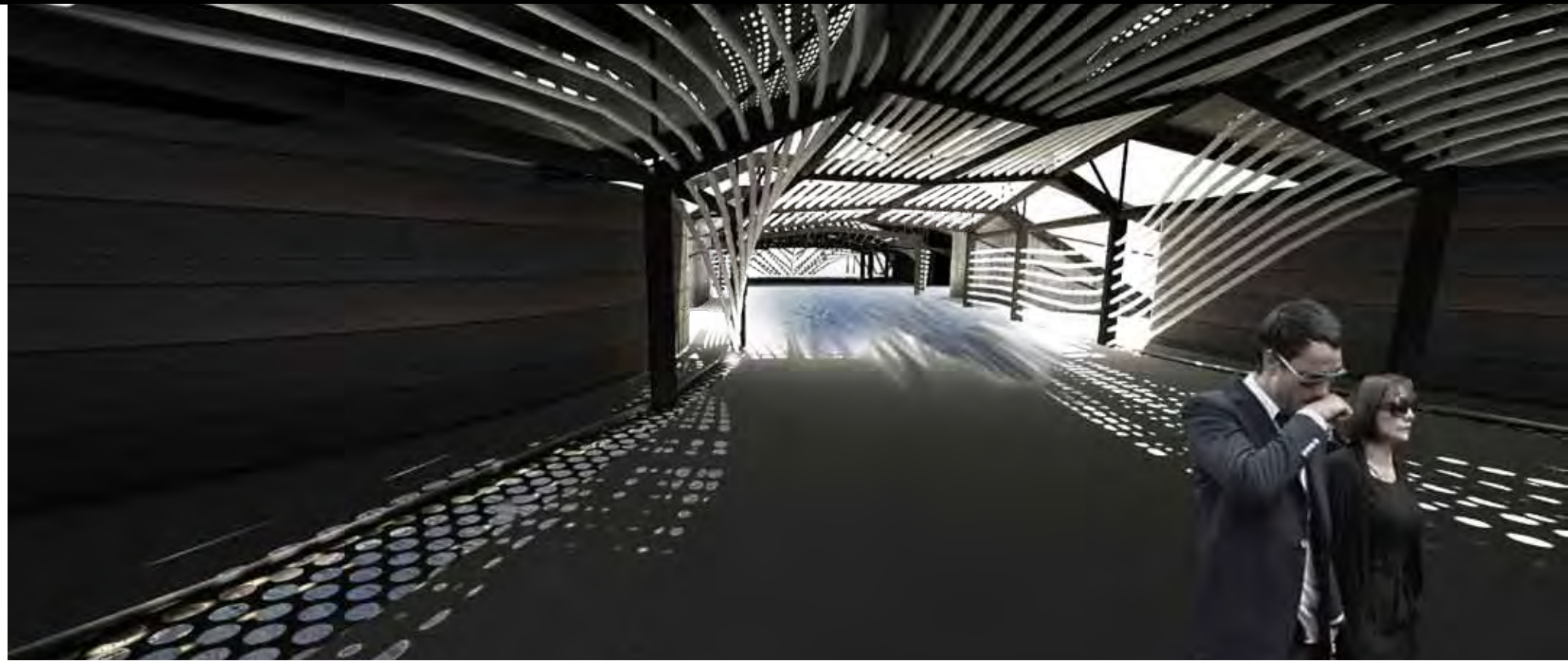
## Bridge/Museum

Carnegie Mellon School of Architecture

48-305 Third-Year Studio, Spring 2010

Instructor: Gwin

The project engages in the production of an aesthetic expression of sustainability/ecology in the context of Pittsburgh. The program required both enclosed museum spaces and sustainable utility within a single structure. Pittsburgh steel bridges are historically beautiful and intense in their elaborate structural ornamentation. Rather than concealing the ecological function, the process of water filtration is exposed as sensual ornamentation within the bridge's structural members. Light filters through the exposed translucent tubing intensifying the gallery experience. The various stages of filtration are expressed in a continuous gradient perforation pattern. The steel frame bridge, sited between an abandoned industrial site and an uninhabited Brunot island, becomes the site of advancing ecological technology towards the revitalization of the territory. Sustainability is not a hidden system or an applied dressing, it is integral to the structural intensity of the gallery experience.





## Pre-Treatment

Water is pumped from river into pipes. Large debris are removed through screening. The water is treated with soda-ash and prechlorine. The pH of the water is adjusted to suitable levels.

## Flocculation

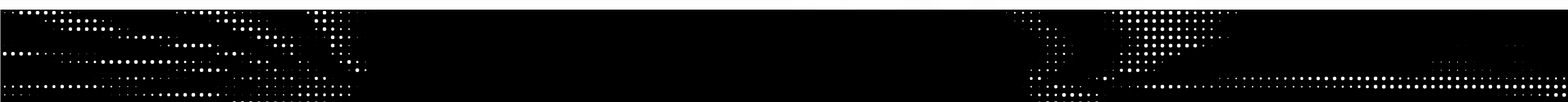
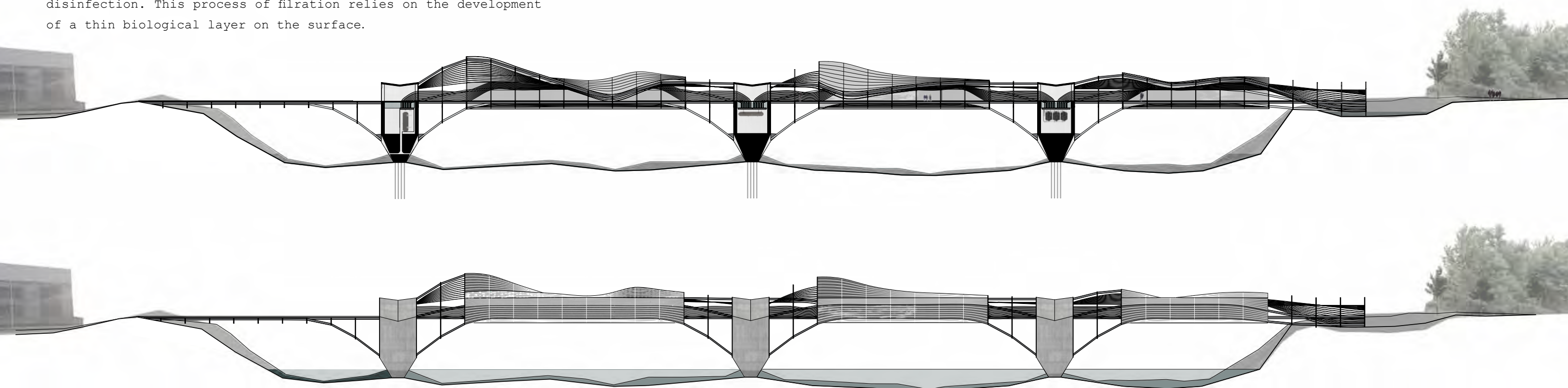
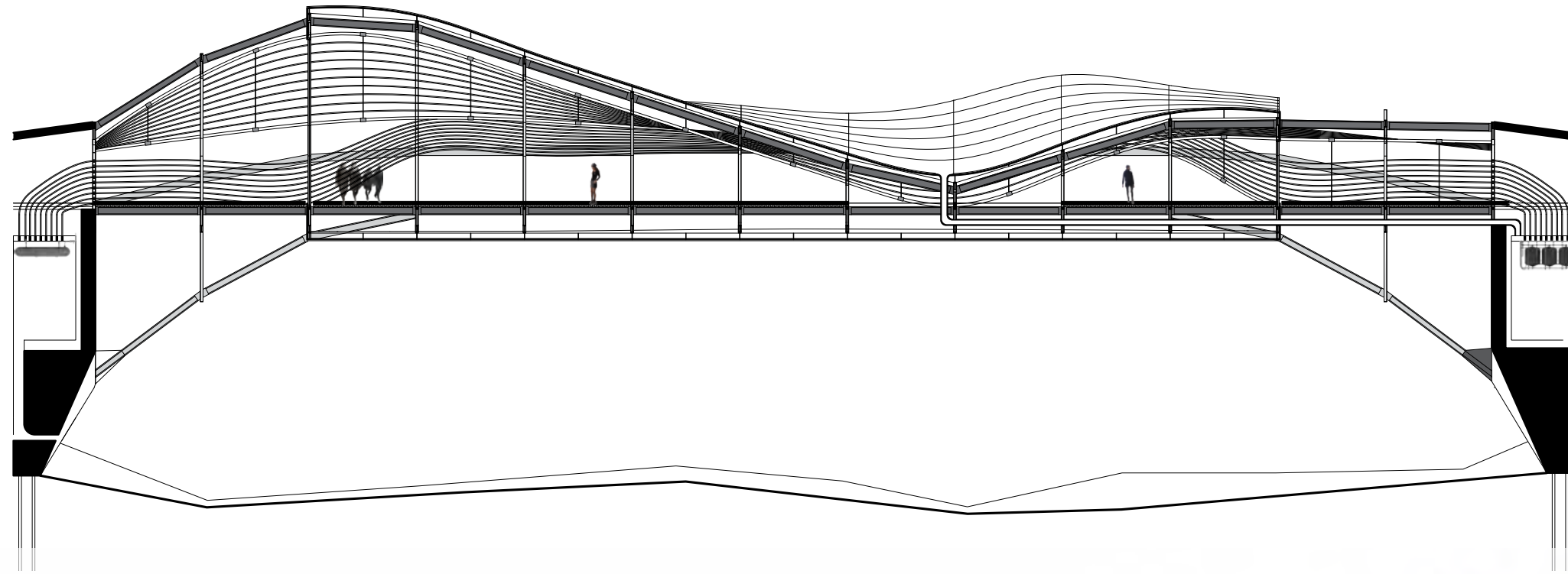
Water is clarified by removing turbidity. Aided by Iron Hydroxide, precipitates mass up as the water is stirred.

## Sedimentation

Water exits the flocculation basin into the sedimentation basin. Flocc settles at the bottom of a large tank with a slow flow.

## Slow Sand Filtration

Water is passed slowly through filters. These specialized filters rely on biological treatment using graded layers of sand. The coarsest sand is placed at the bottom and the finest sand is placed on top. Drains at the base convey treated water away for disinfection. This process of filtration relies on the development of a thin biological layer on the surface.

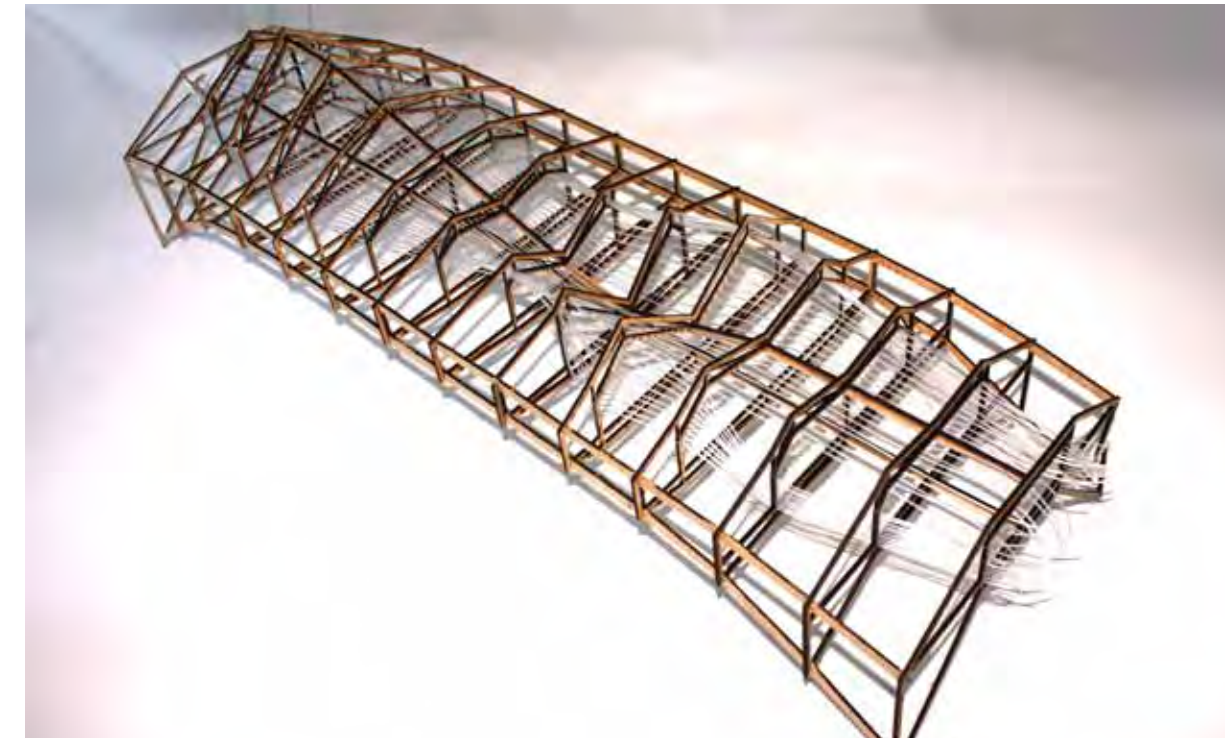
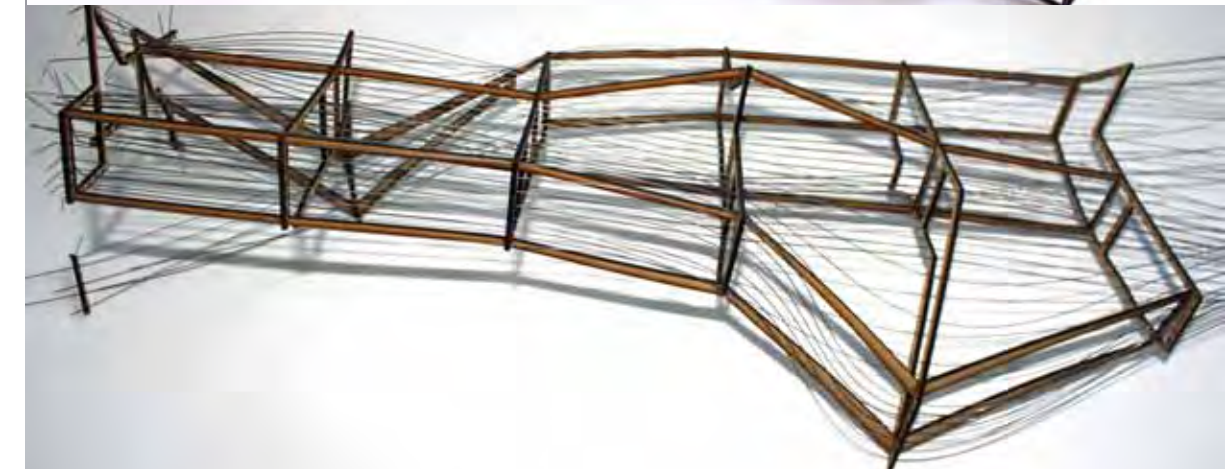
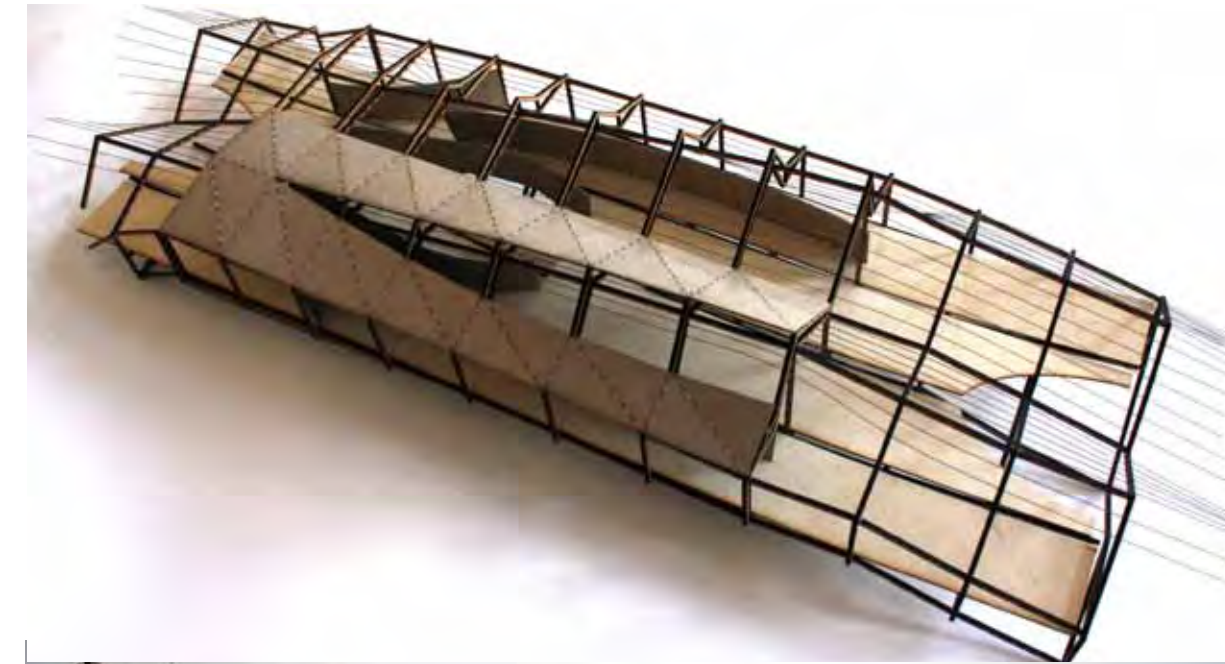
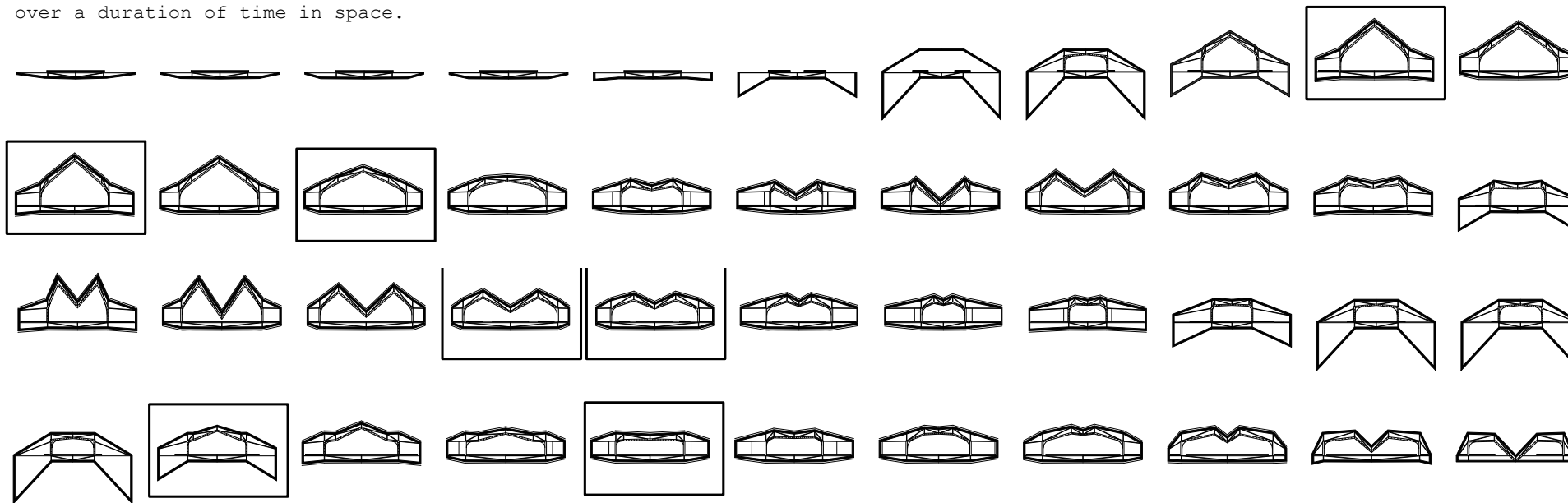
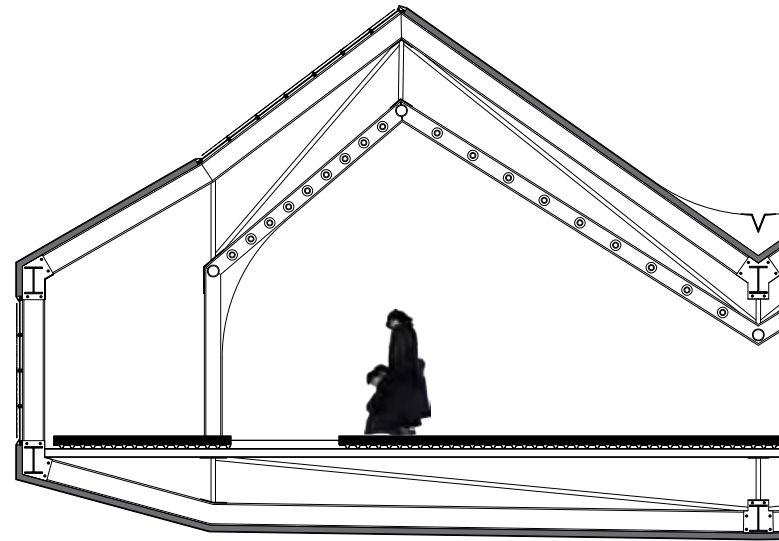




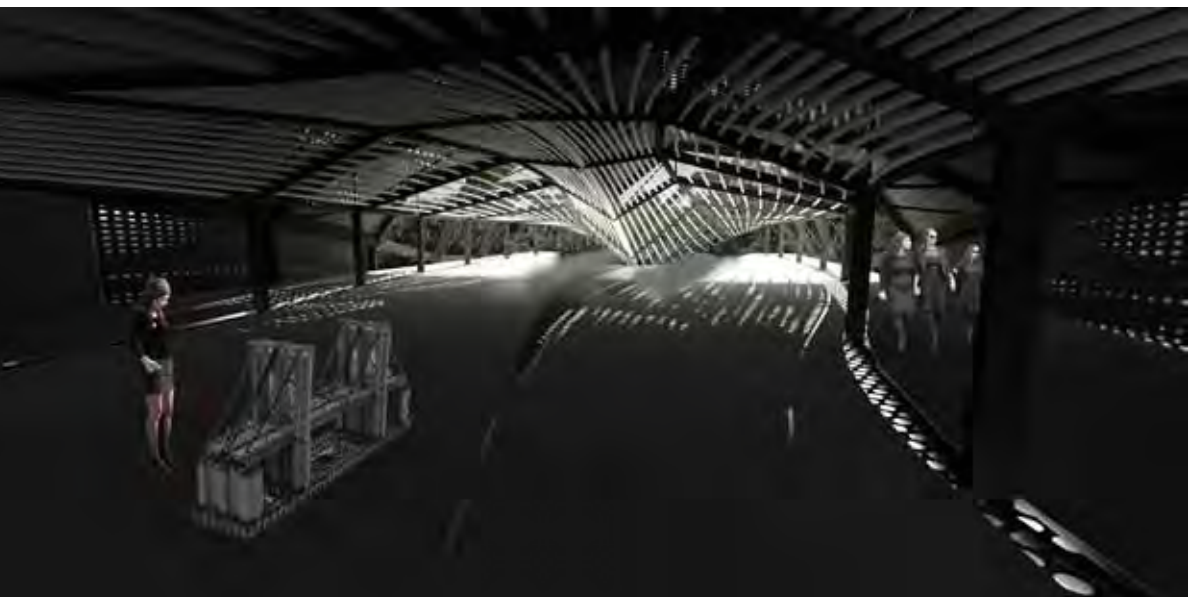
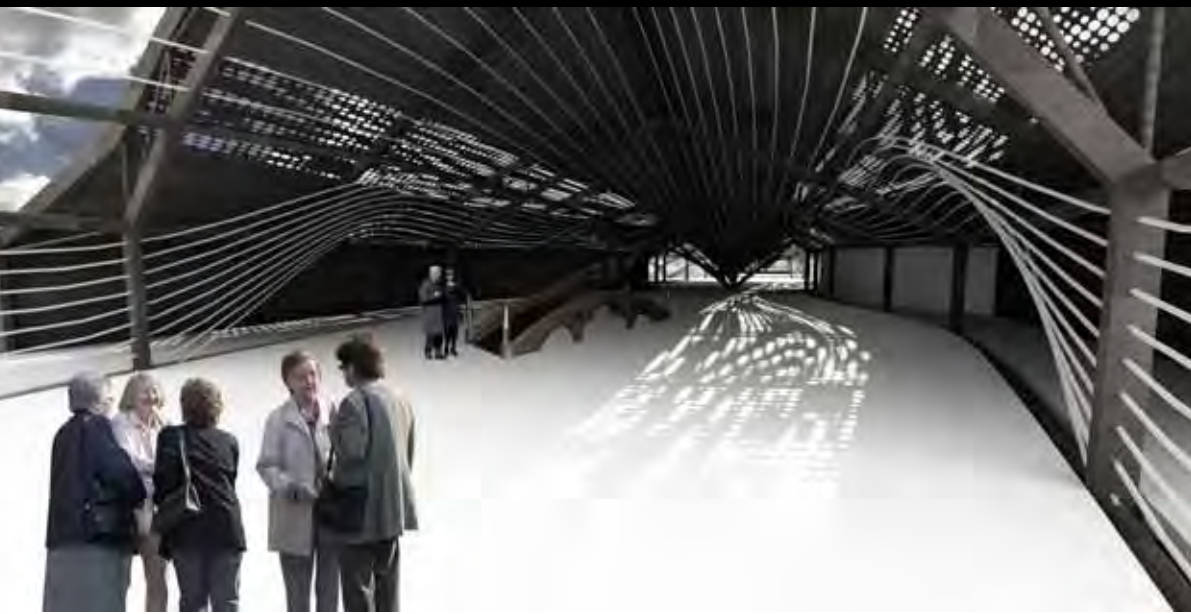
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To express the fluid "changefulness" of the bridge's ecological function, each structural frame is unique. A gasket is placed within the custom perforation of the structure members and the tubes are threaded through. The insulated metal panel enclosure is supported off of the internal frame structure. Through the continuous process of parametric transformation of the frames, the galleries are experienced as a series of structural compressions and expansions. This is not easily understood through drawing, but is experienced over a duration of time in space.





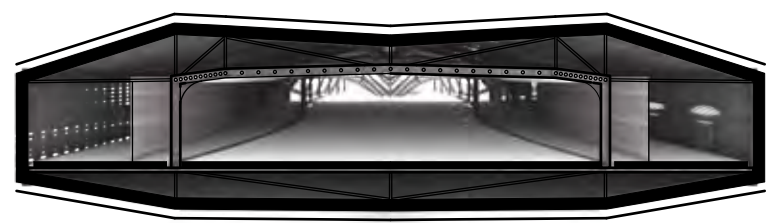
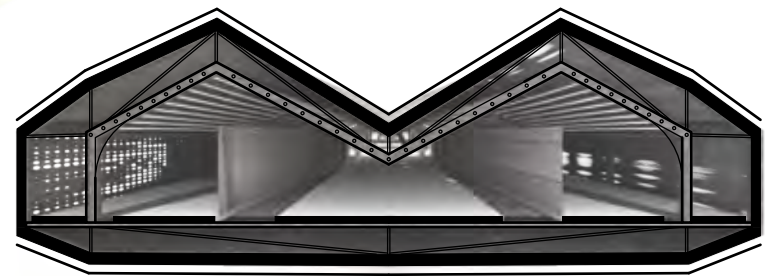
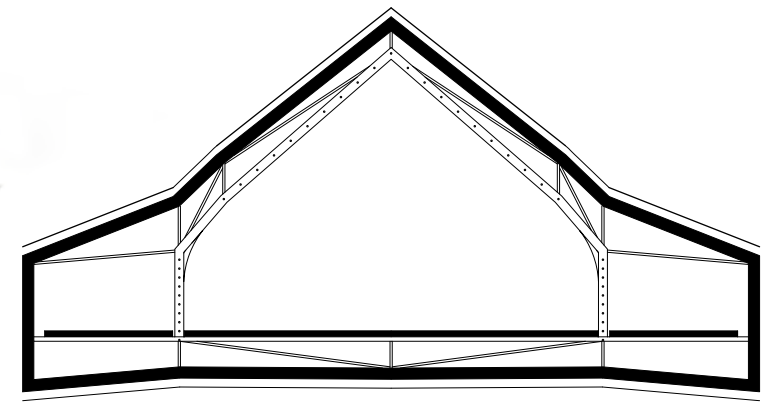
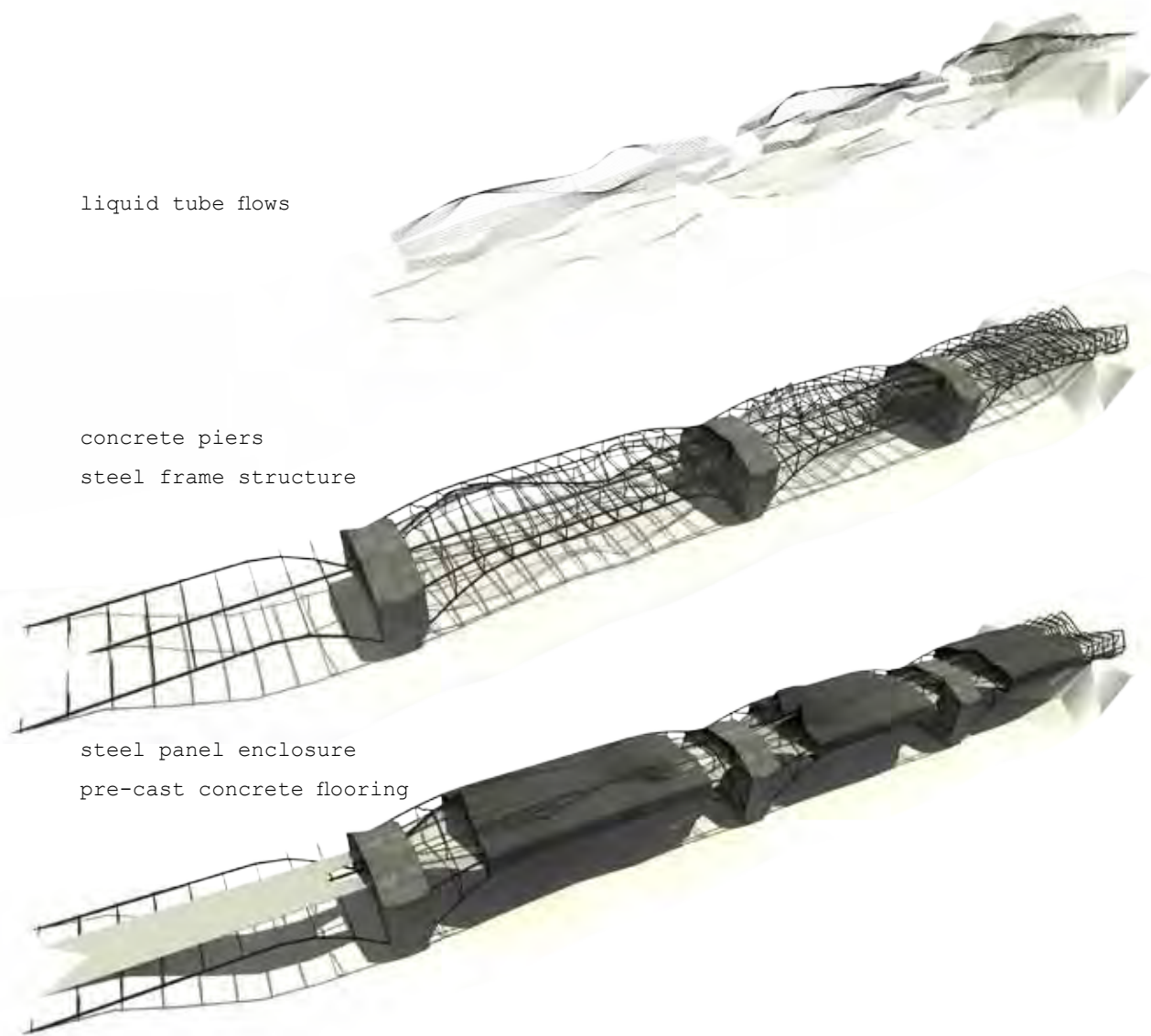


construction sequence

liquid tube flows

concrete piers  
steel frame structure

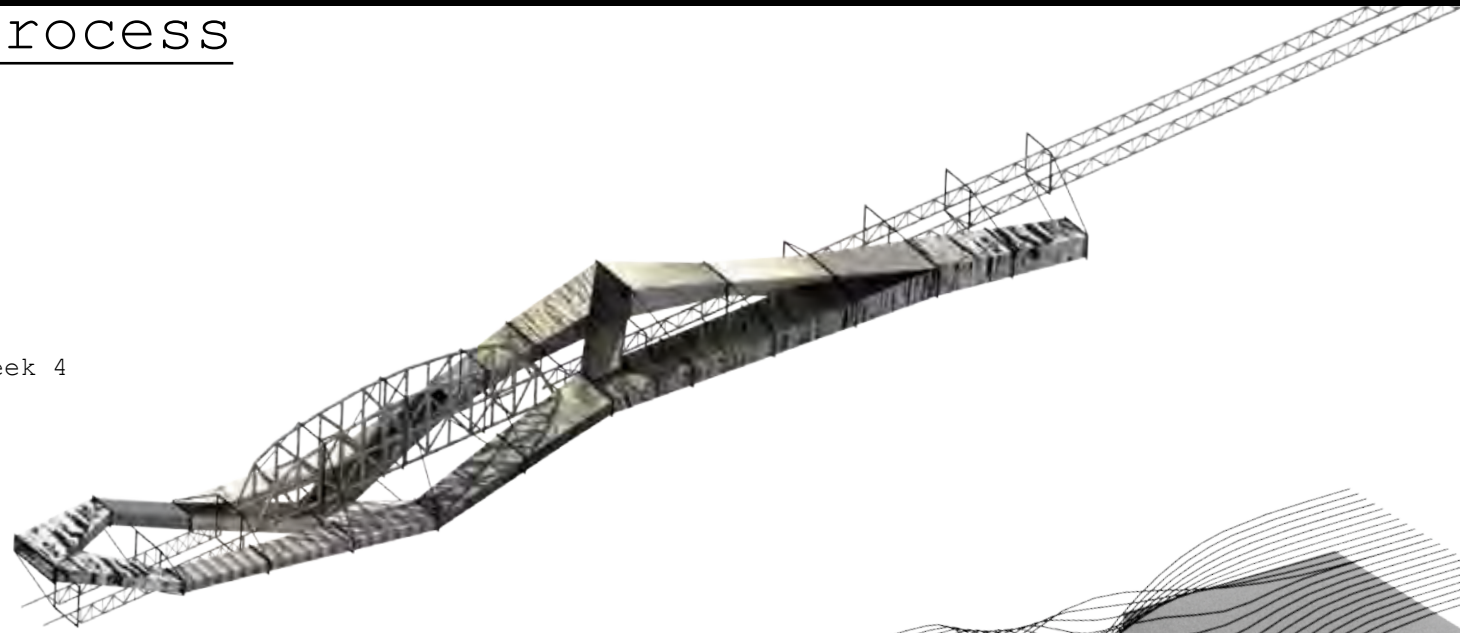
steel panel enclosure  
pre-cast concrete flooring



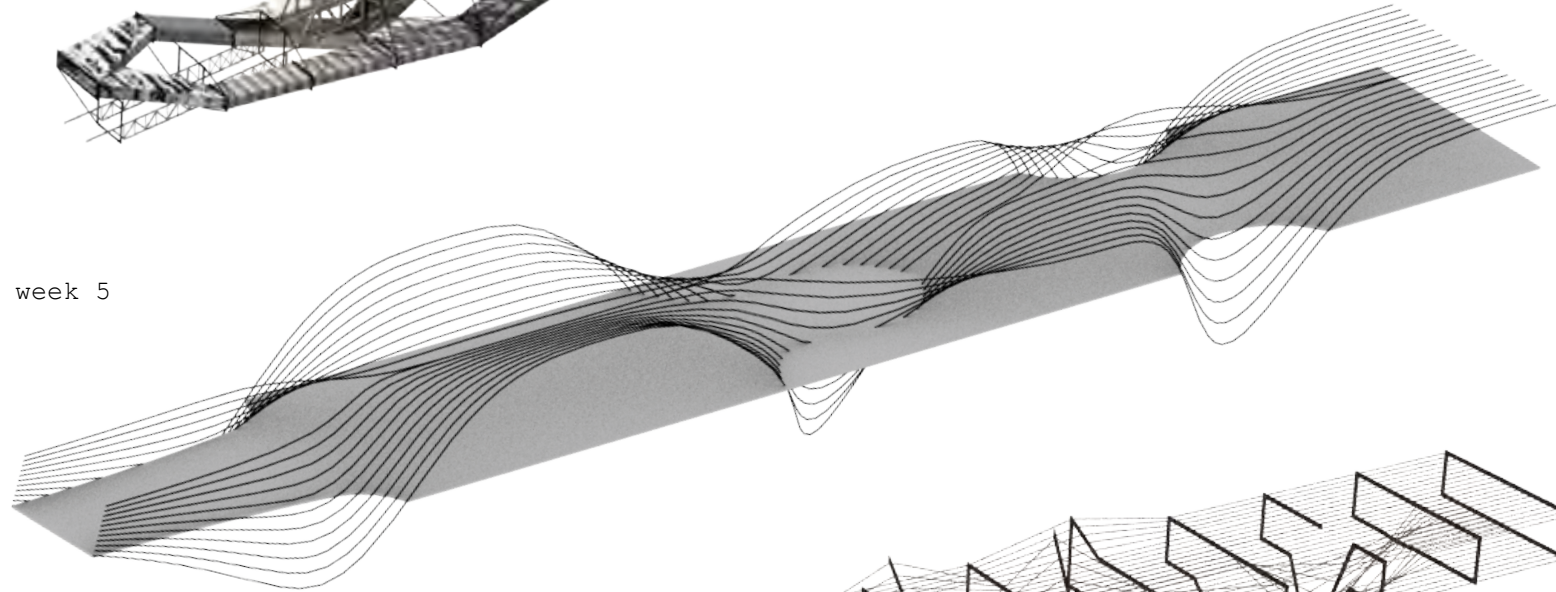


process

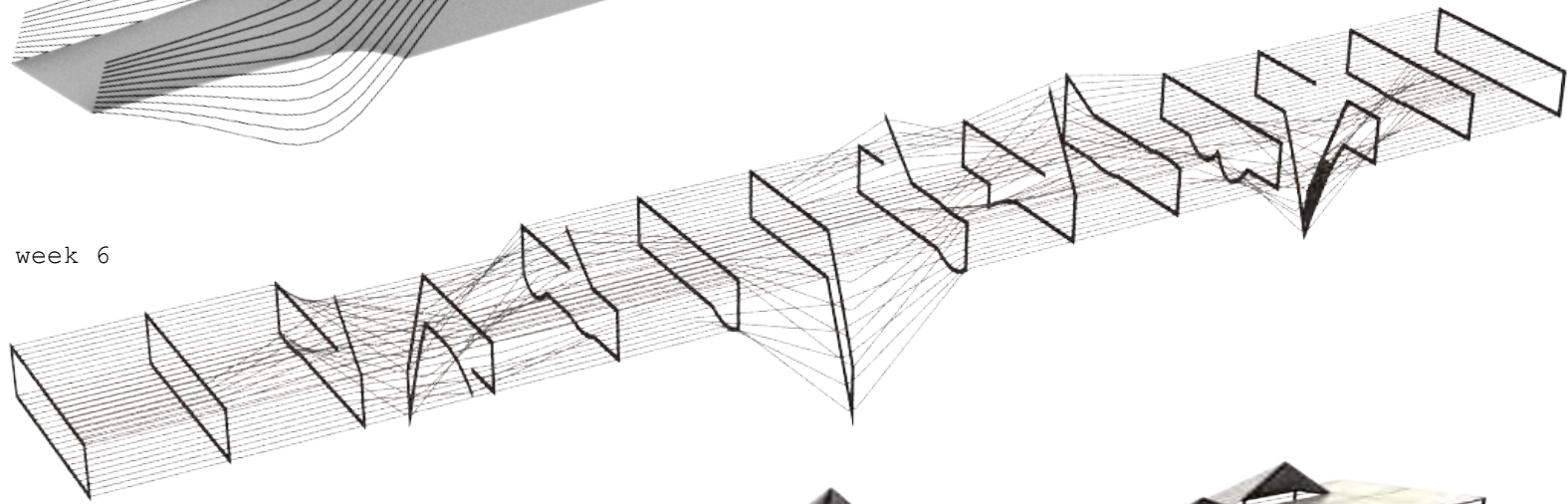
week 4



week 5



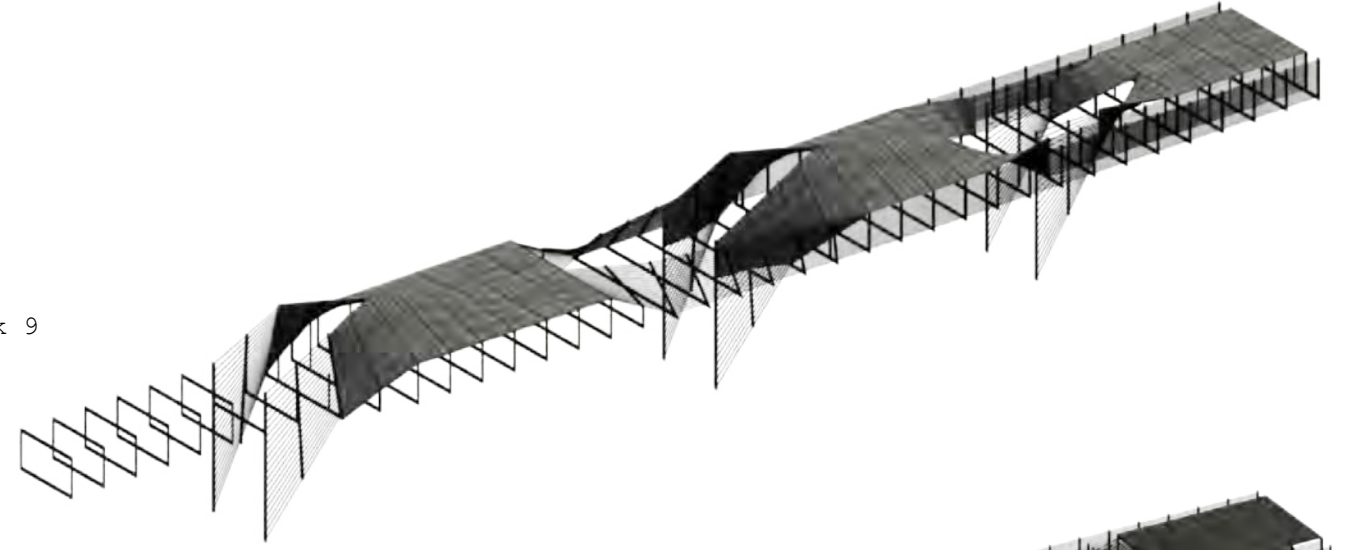
week 6



week 7-8



week 9



week 10



week 11-12



week 12-13

