HOUSE IN FROGS HOLLOW

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Categories: Low Density, Project, Senseable Technologies, Technology and fabrication, Williamson Chong

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The House in Frogs Hollow, a 2000 s.q.f. country retreat, is located on a long slope of the Niagara Escarpment overlooking Georgian Bay. The property is a collection of eroded clay hills and protected watershed zones blanketed with a dense field of hawthorn and native grasses. It is not picturesque, but tough and impenetrable.

View of the second floor family room walkout to the landscape.

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Dusk view of the living spaces from the hillside.

The clients, who gather at the property throughout the year, are avid cyclists who spent months on the 100 acre property prior to construction cutting in discreet mountain biking trails and learning the paths of the horses and snowmobiles as they emerge from the community over the seasons. Because of their connection to the landscape, a primary site strategy was to resist the inclination to build on top of the hills where one could survey the property in its entirety and instead carve out a building area at the base of the hillside. The house is not the final destination, but a stopping place within their network of activity.

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Aerial photo showing the site in the context of Grey Highlands and Nottawasaga Bay.

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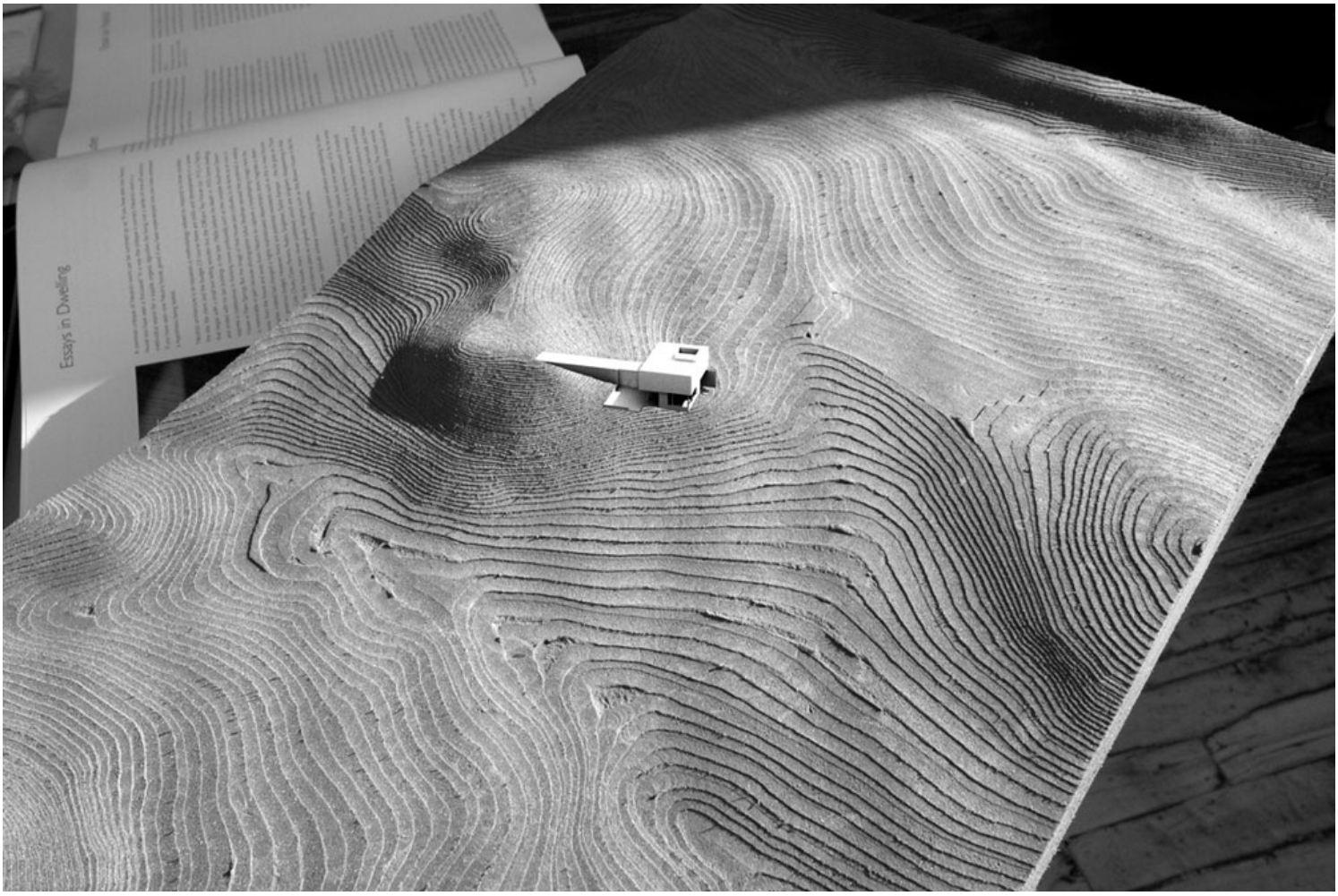

Site model showing the house nestled into the hillside.

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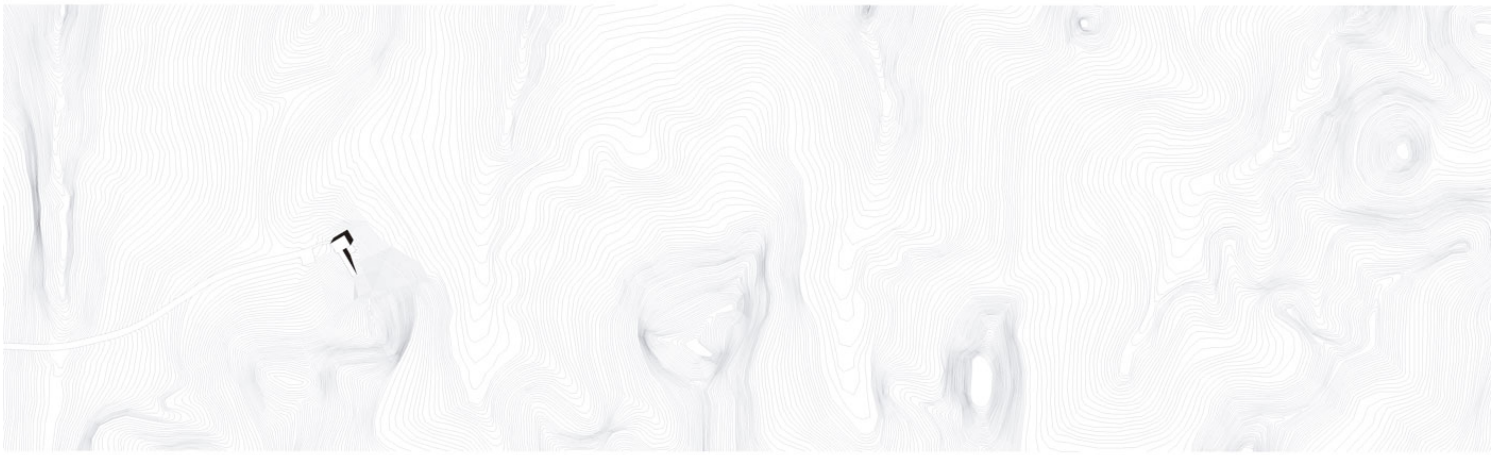

Site plan showing the natural topography of the site with the house located on the hillside.

Carved into the landscape, the muscular tectonic of the long concrete wall figuratively clears the site for building while bridging the natural and tempered environments. The concrete has a toughness that mirrors the landscape, providing protection from the prevailing winter winds. During the summer months the wall provides patio shade, creating pools of cooler air that are passively drawn through the house.

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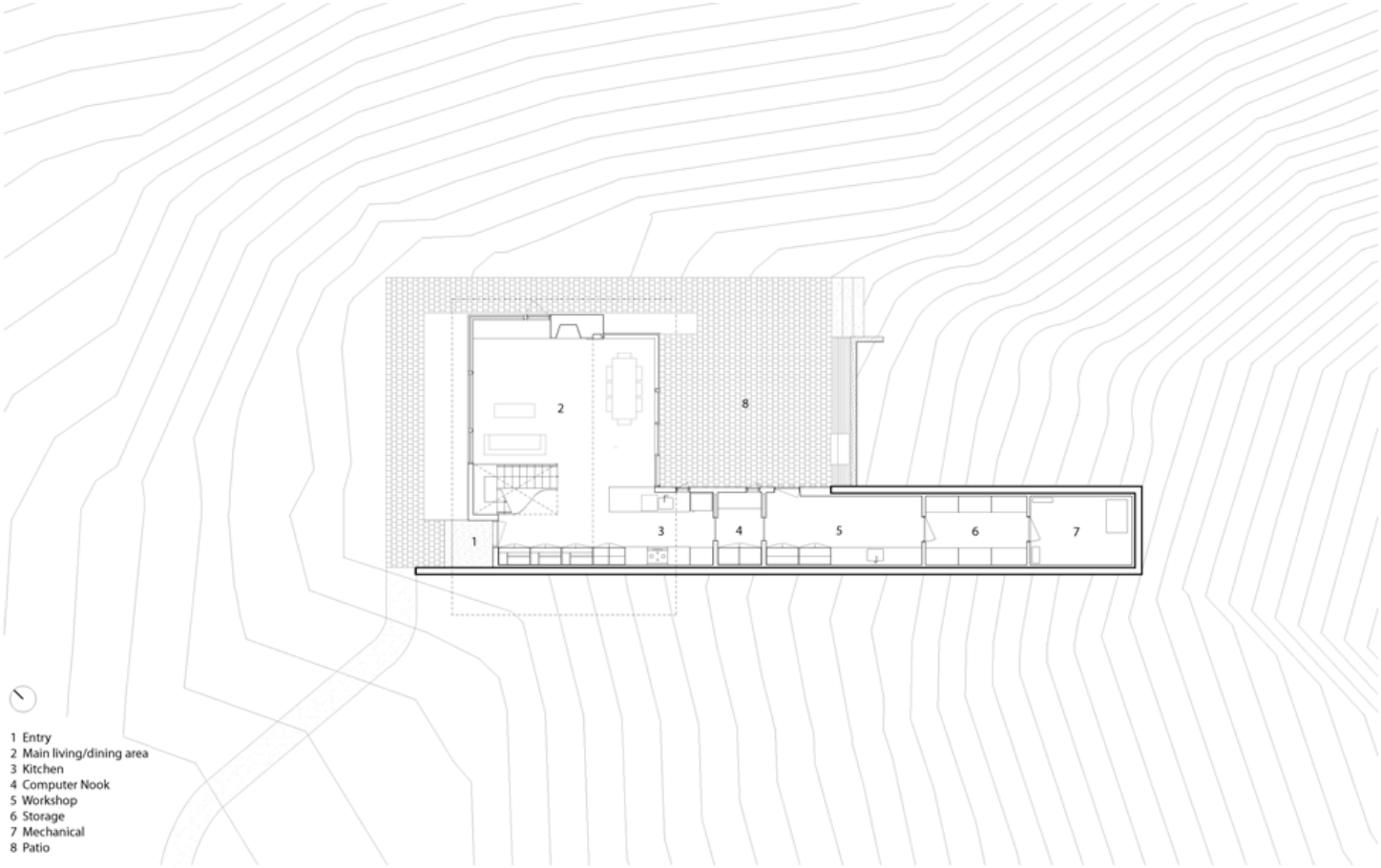

Ground Floor & Second Floor Plans.

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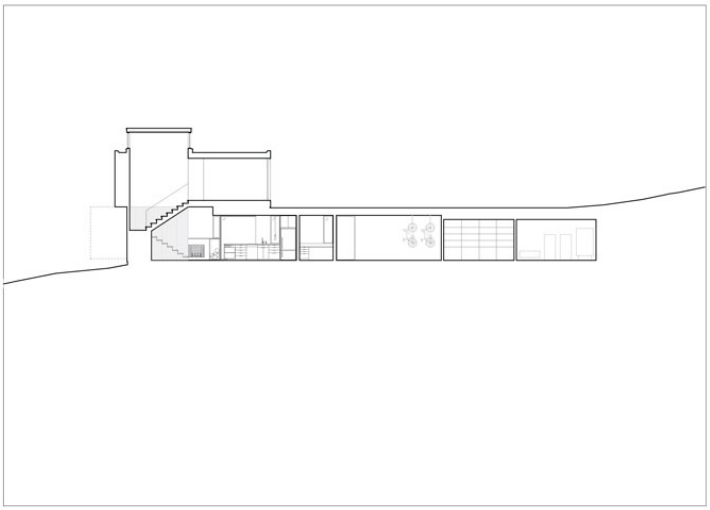

Southwest elevation study rendering and section through the stair tower and service bar.

Entry is at the west end of the concrete wall and into a service bar containing the stair, kitchen, office, bike workshop, storage room, and mechanical room. This functional zone serves as a backdrop to the glassed in living area that opens on three sides to an extended view of the rolling landscape.

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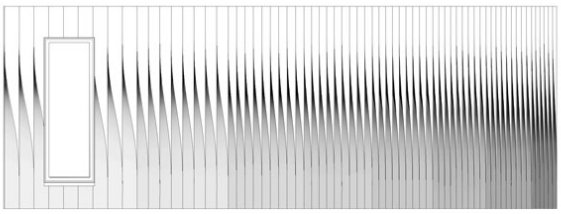
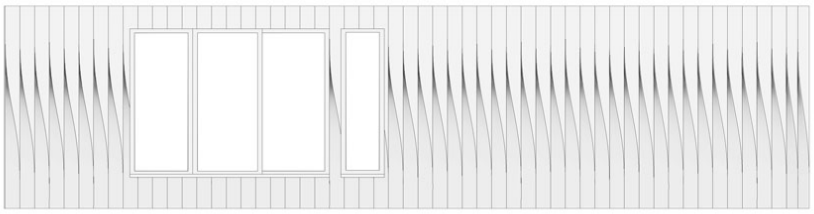
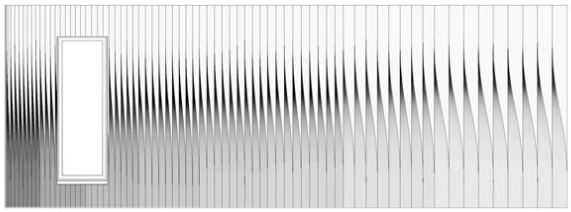


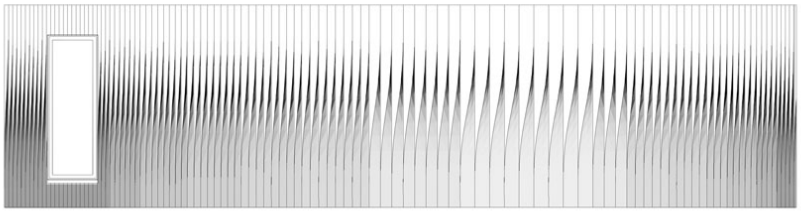
NORTH ELEVATION



EAST ELEVATION



SOUTH ELEVATION



WEST ELEVATION

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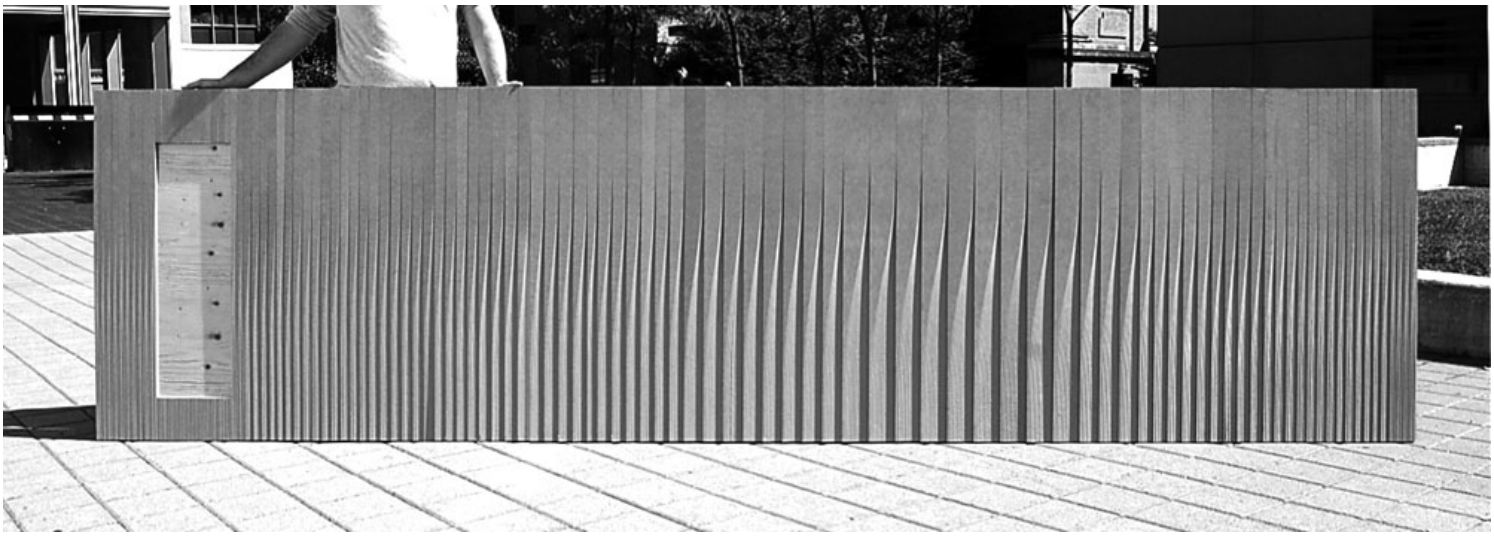
Rendering of unwrapped façade.

The second level hovers above the concrete wall and living space. It contains the bedrooms, bathrooms, and family room in a tight wrapper of customized shiplap siding. Designed as an undulating rhythm of varying widths, thin boards are CNC milled to a shallow depth while wider boards are milled with deep striations, casting long shadows that track the sun as it moves around the house. The siding is stained with a linseed oil based iron oxide pigment that requires reapplication only once every 15 years.



1/3 scale mockup of the west elevation.

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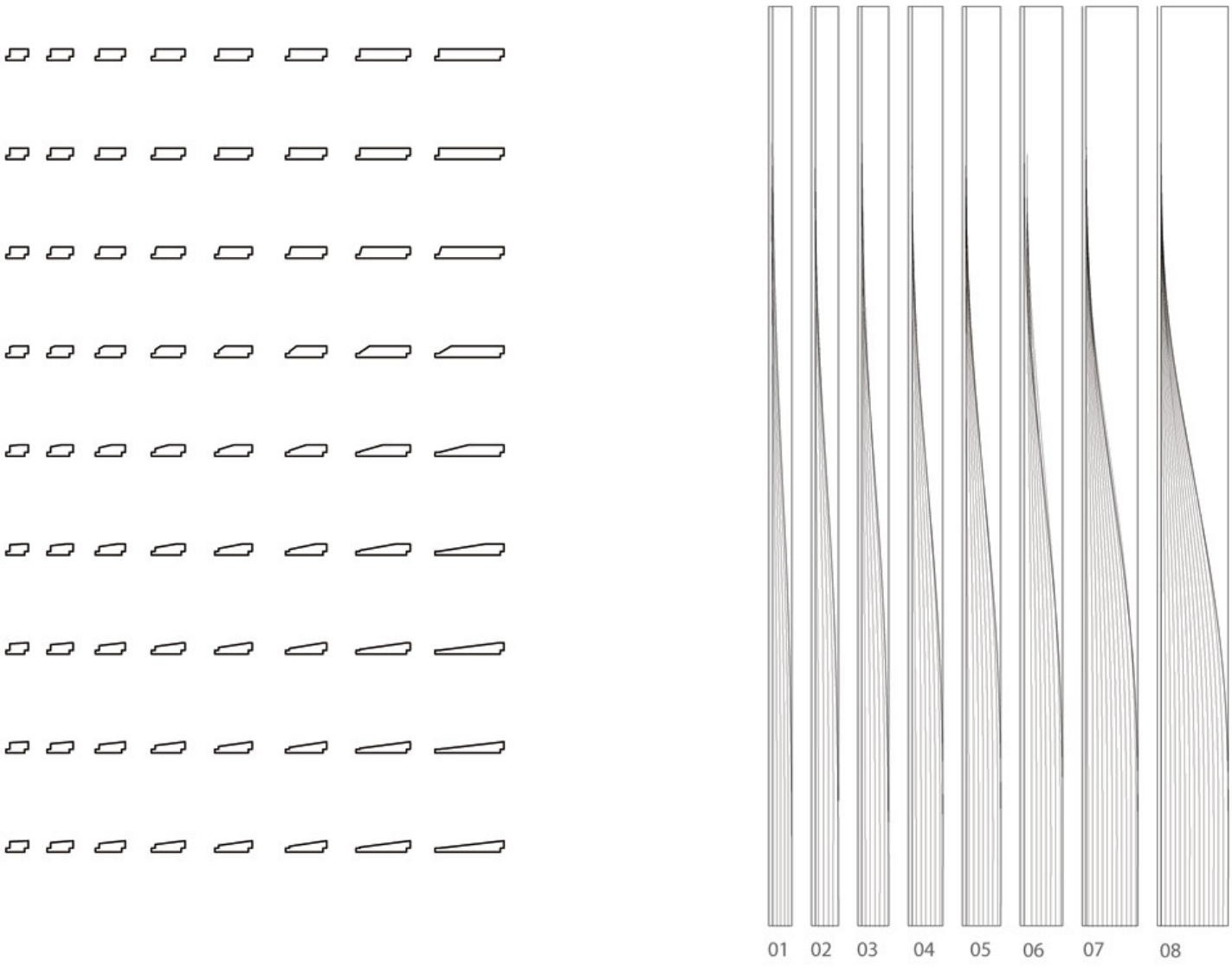

Detail drawing showing variable board widths and associated milled relief.

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The milled siding volume skims over the top of the concrete entry wall.

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Looking towards the southwest and the cantilevered concrete wall.

The north facing patio is protected from the prevailing winds and doubles the living space during three seasons.

The first and second floors are connected by a figured stair enclosure. This digitally fabricated element is designed to filter light from the clerestory volume above. At the ground floor it carves into the area below its upper run to gather more space at the entry and allow for a seating area.

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Left: Three prototype siding boards were milled full scale. Right: A study model showing an early permutation of the stair curvature.

Left: Study model showing the striated and laminated character of the curvilinear underside of the stair. Right: Pre-assembly of individually milled profiles.

Diagram showing the 2d-nested profiles cut from plywood sheets.

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Sunlight creates a shadow pattern on the milled profile stair.

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View of the stair showing the curvature created by the stepped profiles.

Front view of the stair with light well above.

The house's connection to the land is reinforced not only in its architectural form, but also in its environmental footprint. The house is heated with radiant floor loops that supplement the passive winter heat gain from south facing windows. In addition, there is no mechanical cooling. Instead, the stair tower and operable windows facilitate passive ventilation that draws cool air through the house from shaded exterior areas. Natural materials and pigments were used throughout and a small

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square footage was maintained to further reduce construction costs and keep future energy consumption to a minimum.

Fresh air vents were milled by calculating the area required and distributing it across a field.

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