

HELIOTROPE SPA

University of Waterloo — School of Architecture
*completed as part of 4th year undergraduate studio project

Sonia Yuan
August 2013

The proposal for a spa in Cambridge, Ontario aims to create **sensational, spiritual, and sublime spatial experiences with the use of a highly responsive sustainable building technology skin** mimicking the function of the human body. The programmatic parti is inspired by the biblical Tabernacle — the idea of enclosures within enclosures and prescriptive sequence of spaces as one moves through a sacred ritual of spiritual and bodily cleansing. In the Tabernacle, as you move through the thresholds, every act in the ritual is cleansing on a new level, each space is more holy than the last, and each step is meant to bring one closer to God. So in loosely positioning the spa as a “modern Tabernacle”, the objective was to elevate a completely secular experience to that of a religious intensity. Thus, the action of disrobing in the spa becomes the central theme, so that as one moves through the building, one slowly sheds more and more clothing until full nudity. Nakedness then, is defined as the new currency of “holiness”. For this reason, all the programmatic elements are located along the middle spine, as well as the change rooms, showers, and washrooms, which are spaced throughout the length of the building, and which consequentially double as thresholds between the amenities. Supporting services such as laundry, mechanical rooms, and visiting practitioner residences are located along the flanks of the building. Thus, the typically mundane act of taking off one’s clothes becomes a celebrated process in this spa.

The visitor first enters the spa through the large extended porch, where a reception pavilion greets them before taking their shoes off on a large platform. The ritual is continued with the shedding of outerwear on the next step landing, and subsequently walking through a shallow pool to cleanse the feet on the next platform. This takes them to the interior of the building, where the visitor continues through the progressive disrobing activities through the cafe, change rooms, movement studio, showers, treatment rooms, and finally culminating at the apex in the wet and dry sauna in a state of complete nakedness.

A key consideration of the requirements of the project was to incorporate sustainable strategies into the design of the building instead of using tacked-on technology as an after-thought. The structural system of the building consists of ten columns supporting a space frame, off of which the glass curtain wall hangs. An aluminum frame superstructure supports a system of 18-inch-diameter solar-tracking and solar-energy-collecting fresnel lenses arranged in a grid, which covers virtually the entire surface area of the building. The fresnel lenses converge sunlight onto high-efficiency tandem solar cells to store energy for later use or for immediate building energy needs, such as heating and cooling. This system of lenses not only provide the building with a large amount of useable energy, but in effect also provides solar shading, while allowing redirected, scattered, and dappled light into the building.

The spa is a single level (plus mezzanine) rectangular building with an extended porch. Above the concrete foundation, the structure sits atop ten perimeter wide-flange steel columns spaced at 1650mm o.c and a steel space frame spans across the columns. A triple glazed curtain wall supported on a cable net grid system with spider fittings constitutes the walls of the enclosed building, and a triple glazed curtain system composes the roof; both attached and supported by the space frame. Finally, a solar-tracking fresnel lens system supported by an aluminum frame structure wraps the entire building.

Specifications

OVERVIEW

overall dimensions: 68m x 19m x 8.5m

enclosed building area: 665 m²

enclosed building + exterior porch area: 1,292 m²

materials: steel, aluminum, concrete, glass, fresnel lenses

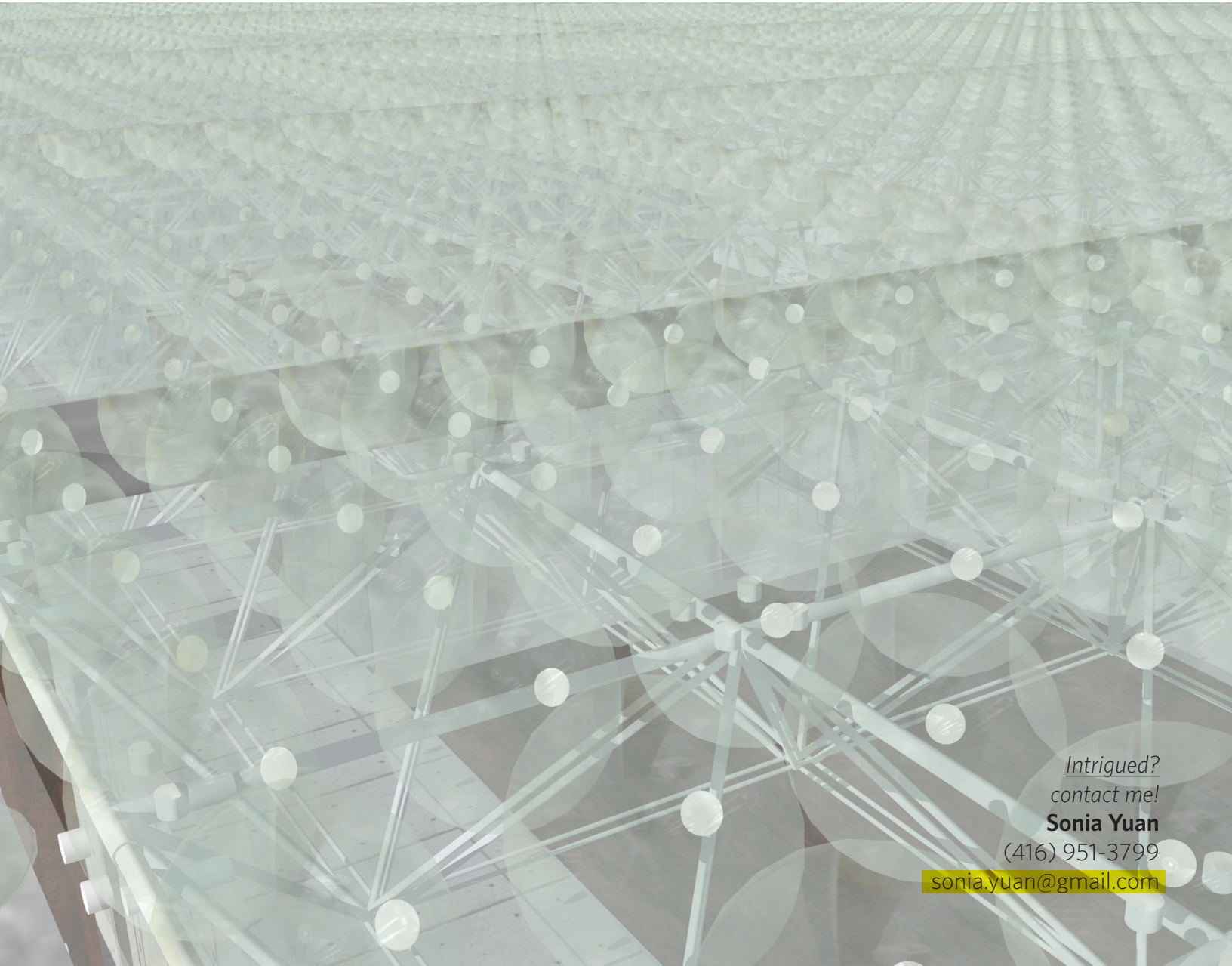
STRUCTURAL SYSTEM

- 300 mm concrete foundation wall on 600 mm concrete footing
- 1500 x 2000 mm concrete column footing
- 175 mm concrete slab
- perimeter columns @ 16.5 m o.c.
- space frame with 1500 x1500 mm modules
- curtain wall cable grid net system on spider fittings
- exterior 13 mm flat plate aluminum frame

BUILDING ENVELOPE

exterior wall assembly

- 500 mm solar tracking fresnel lenses
- 200 mm aluminium support frame
- 36 mm triple glazed krypton-filled tempered curtain wall supported on cable net grid system with spider fittings



*Intrigued?
contact me!*

Sonia Yuan

(416) 951-3799

sonia.yuan@gmail.com