From 3D to reality

By extracting a smaller part from the lower roof plate of the mosque, we can demonstrate how it would work if the building were to be built in real life.

Fabrication

Every arch segment can be subdivided into a flower-like structure. The digital flower-like structure can then be used to form a high-precision mold. The molds would be prefabricated and shipped to the site in an ordered manner.

Structure

1. The reinforcement rods will more or less have the same shape as the arch segments.
2. In order to adjust the reinforcement rods, we need to be able to open the mold prior to pouring the concrete. The images below of the Saijo Crematorium by Toyo Ito show how the roof was reinforced.
3. When the concrete has dried, we will have a very smooth surface due to the high-precision mold.
4. Add color to the columns that are closest to the central space of the mosque.

Saijo Crematorium
Kakamigahara, Japan
Toyo Ito Architects

Branching columns

Every column is different at the top where it meets the roof to form the arch. Each column connects to at least three other arch segments.

Lighting

The extruded cells can be used to integrate lighting into the room. This would create a very mellow atmospheric light and soft shadows inside the mosque.

Not every column is structural. Some of them are there to create the impression of an intense column forest. Lightweight concrete is to be used on the non-structural columns in order to keep the self-weight of the building down.

The self-weight is also reduced due to mass being carved out of the roof to create the light drums.

Every structural column is connected so that it leads the structural load down to the ground in a straight vertical line. The ribs get automatically thicker in size when the arch segment connects and creates a column which in turn results in a more robust structure even if some of the columns are thinner than 600 mm.

In order to allow for bigger spans between the arches, the slab is extra thick (1 m).

The building process

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