

At a glance

Location

Amsterdam

Country/Region

Netherlands

Client

Stichting de Oude kerk te Amsterdam

Industries

Arts and Culture

Services

Architecture Building physics Electrical engineering Structural engineering Digital

Partners &

Collaborators

+

As a historical place of worship and now also a museum, Amsterdam's oldest building the Oude Kerk, has quickly established itself as a space for atemporal reflection, connecting centuries of spiritual contemplation with curated contemporary art interventions.

Inviting visitors to reflect, the space currently showcases a world-class range of site-specific art installations. To celebrate the restoration of the baroque Vater-Müller organ, the church unveiled a new programme in May exploring spatial music, 'Playing the Cathedral'.

Between Light is the first intervention combining organ-based soundscapes with visual art to explore ideas of rhythm and space. Arup worked with artist collective Children of the Light to engineer a 25-metre-long lighting sculpture designed to evoke the movement of light during sunrise and sunset in a compressed, intensified manner.

Suspending the slender arc of the artwork from the roof structure of the 800-year-old Unesco heritage church was a delicate intervention. Arup's integrated design approach and the use of digital tools allowed our designers to deliver an art installation with a discreet structural suspension system that protects the listed building from any damages.

Project Summary

25_m *aluminium tube*

0.02_{m/s} *vertical displacement*

350_{kg} *total installation weight*

The installation, a slender aluminium tube filled with 25 metres of LED lights, was imagined to be solid yet fragile. To incorporate the experience of cosmic cycles through light, the artist collective sought to "relocate the horizon within the Oude Kerk", depicted as a crack of light stretching over the horizontal crossbar of the church. The suspended line, bent naturally by gravitational forces, evokes the rhythms of sunrise and sunset.

Hanging the piece in the listed 14th century church was a key challenge Arup was asked to solve. One of the key drivers was minimising the overall weight to around 350 kgs in order to prevent damage to the historical monument by means of a discreet structural suspension system, while retaining the desired shape. The total final weight includes the suspension cables, the support platform, the winches and winch cables as well as the 50 kg aluminum tube.

Another driver was to balance the structural loads over the length of the tube in order to prevent torsion of the structure, while hoisting it 12 meters upwards and downwards via a customized winch system. Furthermore our designers calculated and tested several light configurations and electric wiring systems in order to create a feasible design, with minimal weight of cables and preventing heat issues inside the tube.

“ *The successful collaboration between the artists, the curators and Arup's designers has resulted in a beautiful piece of art, just how the artists had envisioned it. ”*



Vivian Scheepers
Senior Designer

Digital tools enable artists' design

Arup's engineers used a range of *digital tools* to model the structural, electrical and architectural design of the art piece. The 3D model was the starting point for a structural parametric model, which enabled the designers to iterate different options in quick succession.

Solar studies and light simulations were carried out to assess the interactions of time and space with natural light cycles. We captured the different concepts and outputs in a VR environment, allowing the artist collective and the Oude Kerk's curators to visualise the piece within the context of the church. The close collaboration with the artists and the Oude Kerk resulted in a final design that meets the expectations of all parties, including a major reduction overall weight 350 kg by optimising the shape and electric system, to ensure the artwork was structurally safe and wouldn't damage the church.



To support the unveiling of the 400-year old Vater-Muller organ in the Oude Kerk the artist collective Children of the Light was asked to design a site specific art work called Between Light. A slender 25-meter-long lighting sculpture. Arup was responsible for the technical design and structural engineering and this video shows how.

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