diapo

designer and manufacturer of bespoke feature staircases

September 2013

Tasked with creating a staircase for a split level property, our team was set the challenge to produce a staircase completely hanging off the existing building structure.

A gauzy red staircase floating high up in a gallery at Tate Modern - a recent installation of artist Do Ho Suh - "Staircase-III" was the inspiration.

Material Firstly our choice of material had to echo the lightness, the flexibility, translucence and porous contrasts with the solidity of the original architectural structure which Suh has emulated through his work.

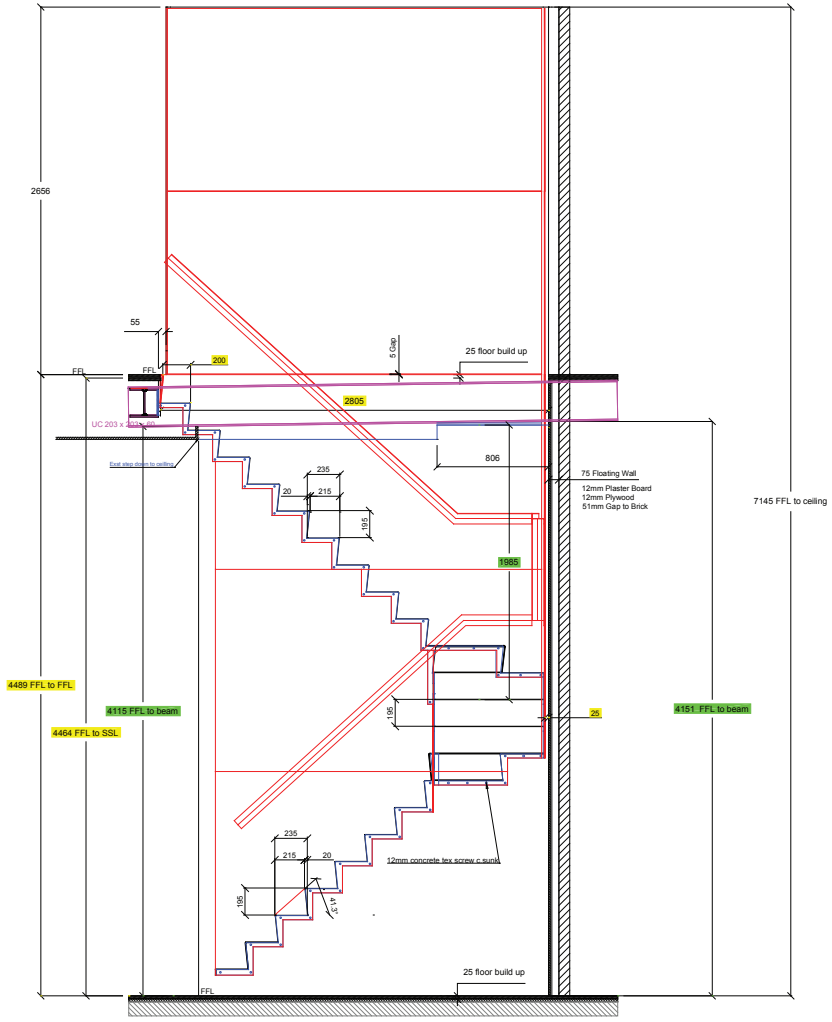
Perforated Steel Sheet as our choice of material provided both the contrast in transparency and structural integrity required. The transparency becomes very evident as the perforation and light condition gives a different experience at different times of day.

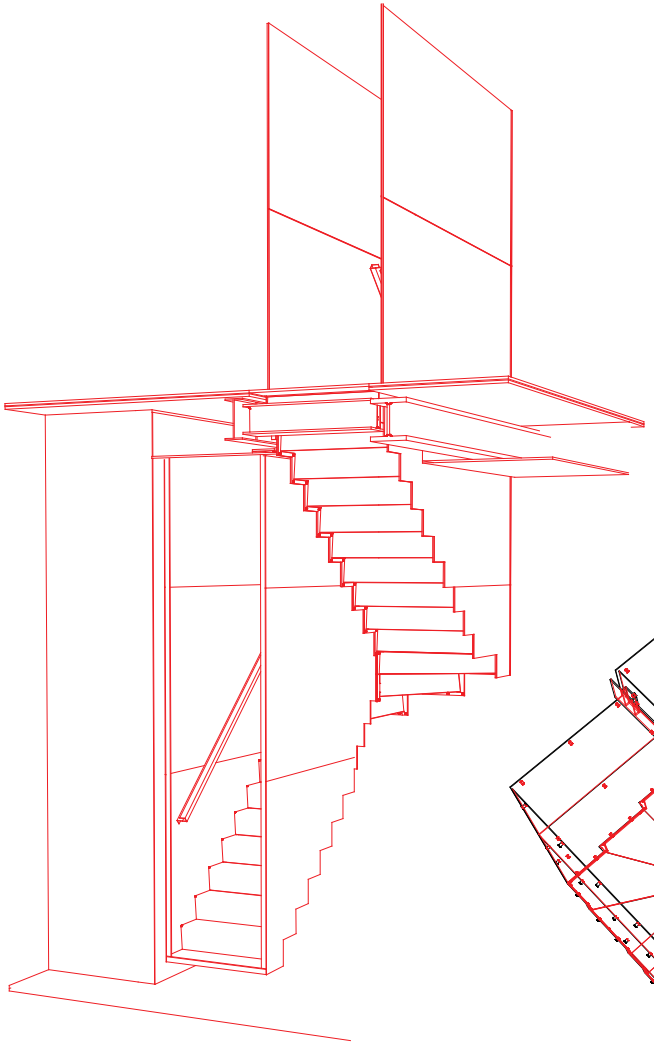
The sense of space and gravity is experienced by the viewer as a stair hanging and floating in space. Furthermore for the user, seemingly floating as their silhouette floats up and down the stairs.

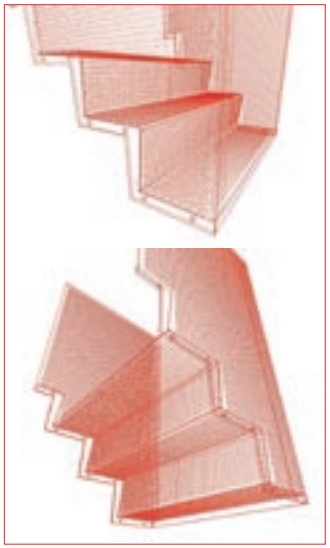
The Colour Red remained true to Suh choice of colour which works predominantly as a means of removing the structure from its original context, and "heightening the dream-like intensity of a recognisable structure that appears to hover and float overhead".

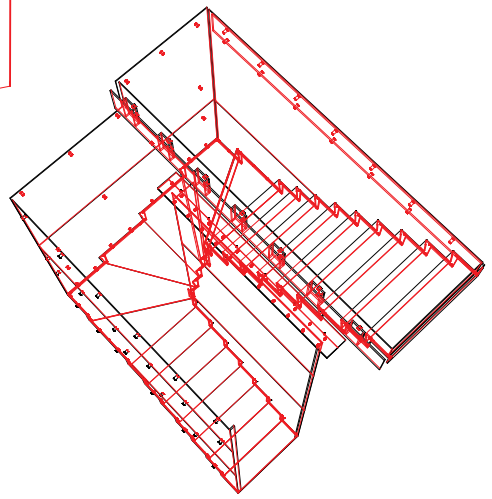
DESIGN The staircase by virtue of its nature and form is a 'lightweight' structure and has been designed to be structurally sound but light in perception.
One of the challenges was to develop a hanging light structure while maintaining its entire structural integrity.

While putting all of our knowledge and experience to the task, our design team ensured all the final details of this seamless structure were not compromised with any fixings to be visible.



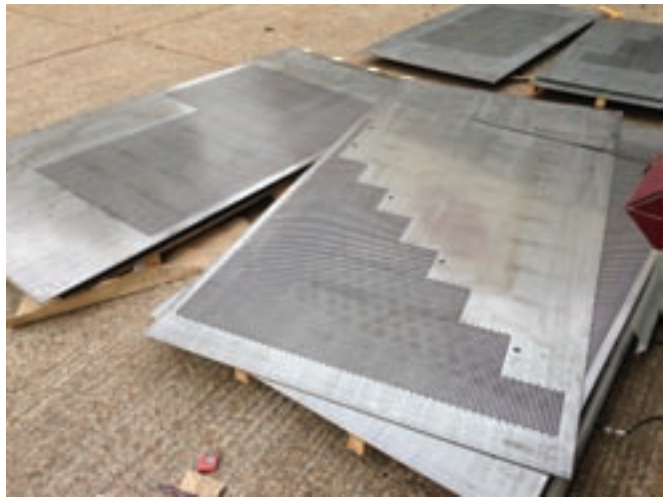






KEY DESIGN FEATURES the full height hanging perforated panels (5x4metres), and the smooth transition between treads and vertical panels.

The staircase was designed to be constructed in several easy to assemble parts, allowing for smooth and accurate manufacturing, transportation and installation; Emphasis has been in creating a continuous and homogenous flow throughout the intricate details of the whole entity.



MANUFACUTRING

The manufacturing process involved a combination of skills from specialist engineering, precision metalwork and skillful craftsmen ship.

• The initial fabrication process required all shaped parts to be developed and nested with perforation holes to suits a "multi punch" method of perforating blank sheets. The accuracy of the perforation patterns was crucial for final components to be programmed and Laser cut towards fabrication.

• The stair treads are fabricated from a continuous run of 5 mm perforated folded plates spanning the full length of the stairs.

INSTALLATION

• The stair flights are attached to the vertical perforated balustrade panels which act as hangers to support the vertical loading of the stair.

• Lateral loads on the balustrade panels are resisted by a combination of plate bending and membrane action generated by tension forces in the hanger panels.

• The balustrade hanger panels are fixed to existing steel beams within the 2nd floor structure. All existing elements were designed to suit.

Arch 356, Westgate Street, London E8 3RL tel: +44(0)2079230006 email: info@diapo.co.uk website: www.diapo.co.uk