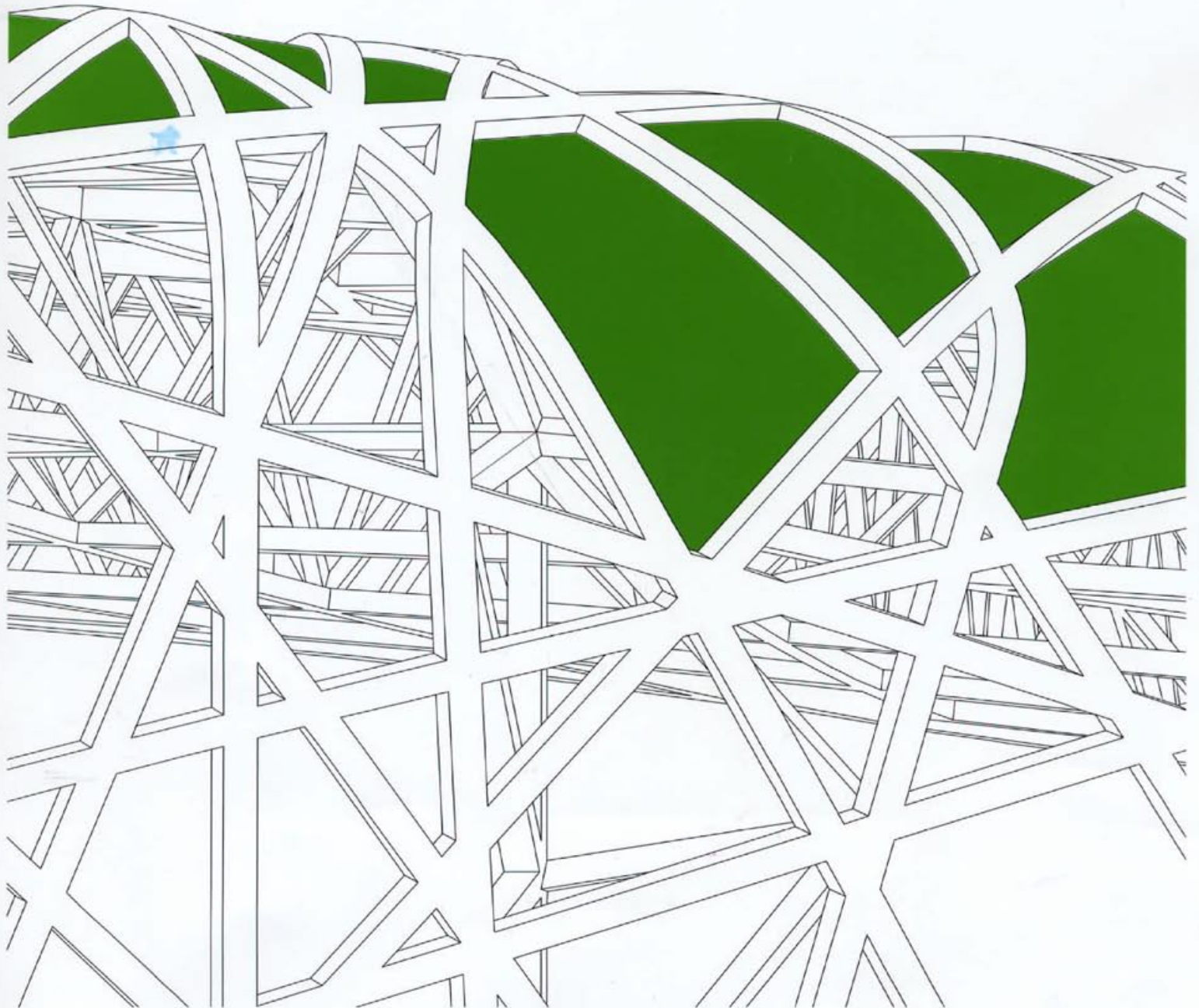


ISSN 1614-4600 · SEPT · OCT  
£12 · US\$24.50 · €18

English Edition

# DETAIL

Review of Architecture and Construction Details · Large Structures · Vol. 2008 · 5



## Southern Cross Station in Melbourne

### Architects:

Grimshaw Architects, Melbourne/London  
Keith Brewis, Neil Stonell, Mark Middleton,  
Jason Embley


Jackson Architecture, Melbourne

### Structural engineer:

Winward Structures, Melbourne

Others involved in the project: see page 565

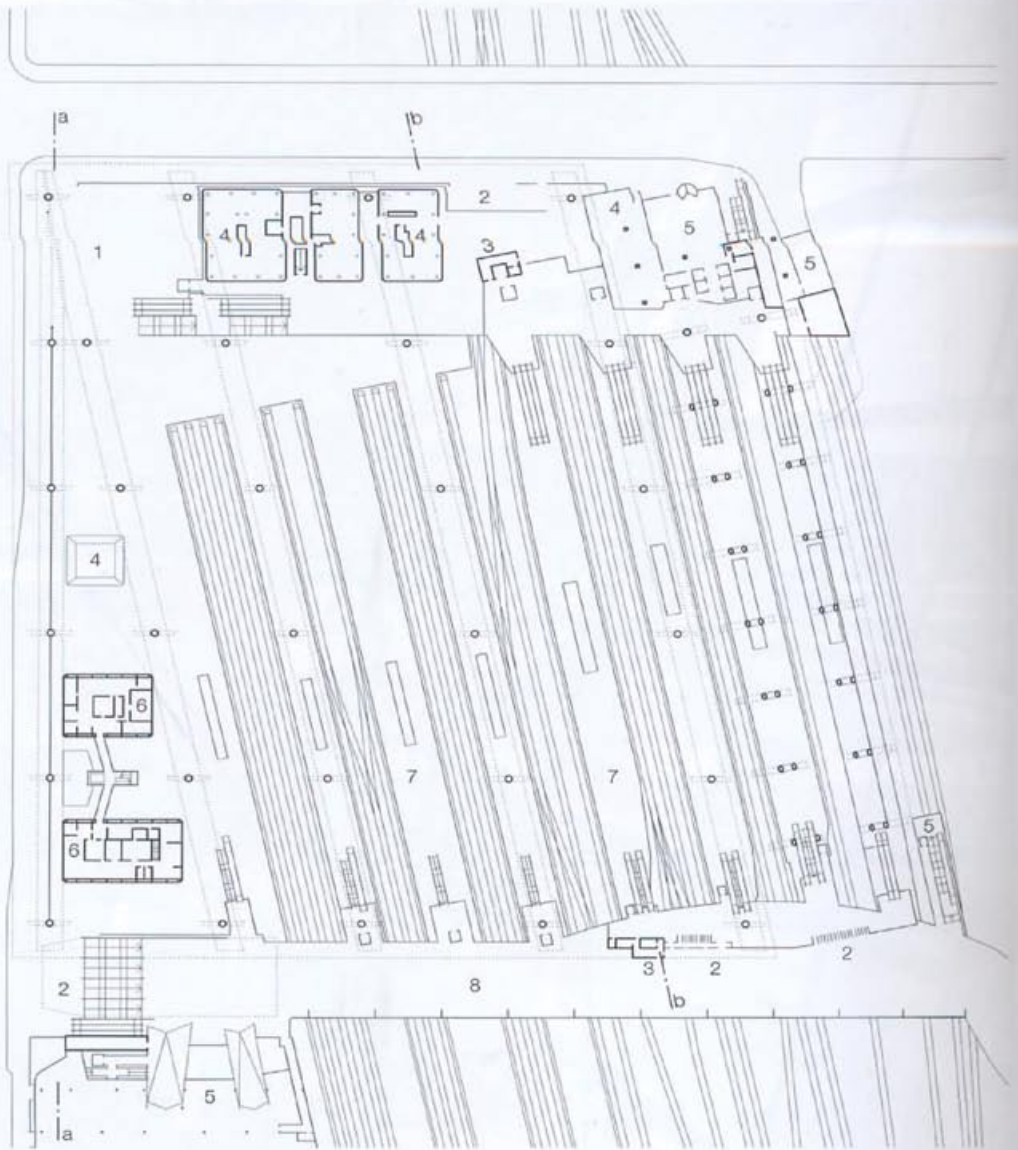


 DETAILplus: diagram of roof system  
www.detail.de/0071

Melbourne's old Southern Cross Station was rebuilt to a design that projects a modern-day image, as a European-style urban modal interchange. The result is a kind of extended covered plaza, accommodating all the railway functions, but also acting as a protected pedestrian link between the city centre and the developing docklands area. The trapezoidal roof system, which covers an entire city block of 216 x 180 m, has an extremely complex geometry, with no symmetry or repetition. Thanks to CNC manufacturing it was possible to produce the different cross-sections without incurring excessive costs.

The aerodynamic behaviour of the dune-like shape of the roof was investigated thoroughly at the design stage, with the aim of exploiting natural convection as the principal method of ventilation. The hot air and diesel fumes occurring on the underside of the undulating roof are drawn upwards to the apex of each "mogul", from where they are expelled through vents, through the action of the prevailing winds.

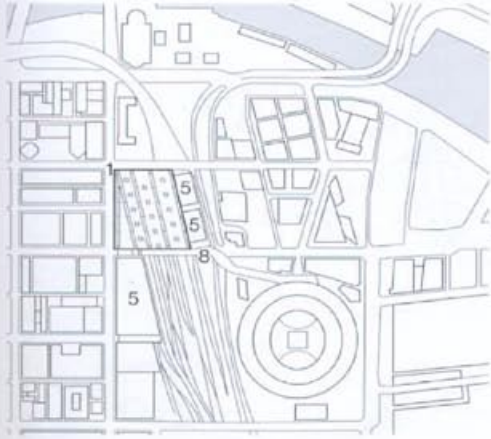
The 6 to 16 m high, hollow Y-shaped steel columns are positioned on every other platform, at 40-m centres. Bearing on these, in parallel with the tracks, is the primary support frame for the roof, a series of wave-shaped lattice girders, covered by an almost 6-m wide skylight of transparent ETFE pillow cladding. Supported on these girders is a structural grid of variously curved and arching CHS tubes. Their curves set up an intriguing contrast to the precise lines of the underside of the roof. Ancillary functions are housed in cubic "pods", placed intermittently in the space and raised on piles so as to afford unhindered lines of sight and access at platform level.



Floor plan of upper storey  
Sections  
scale 1:2000

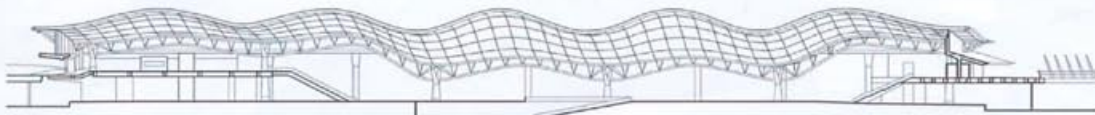
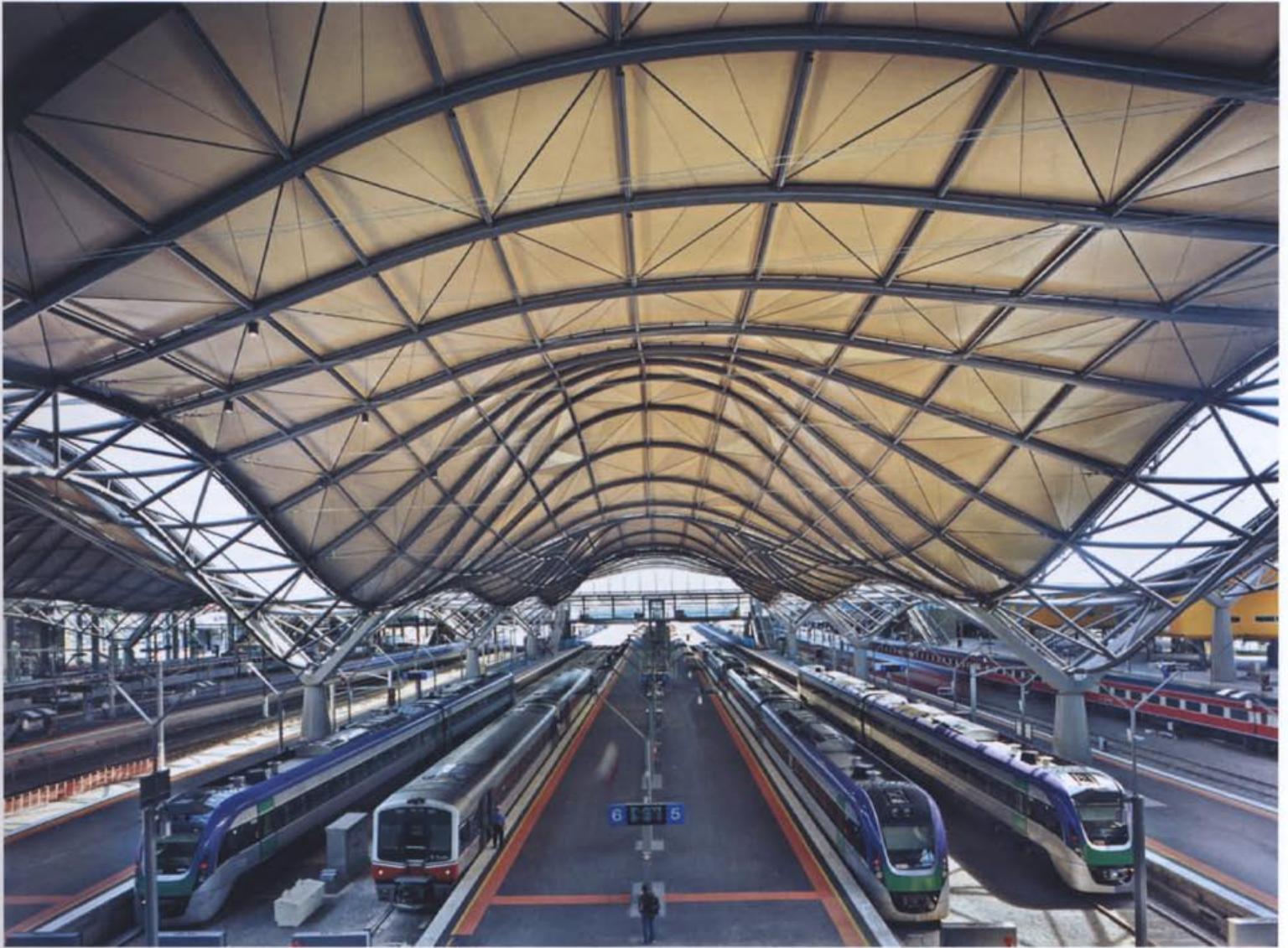


aa

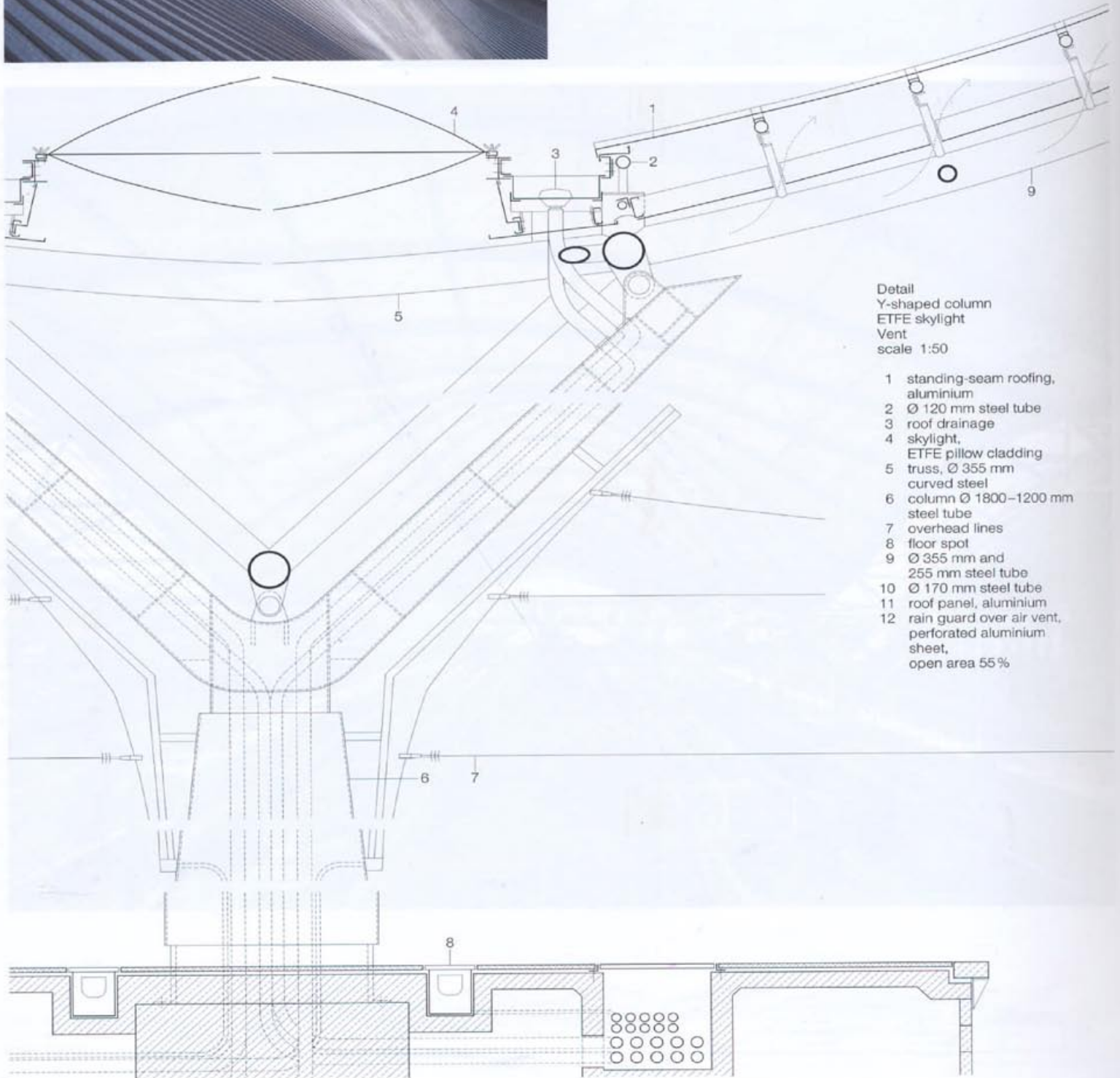


Site plan  
scale 1:20000

- 1 Main entrance
- 2 Entrance
- 3 Ticket counter
- 4 Station retail
- 5 Shops/offices
- 6 Administration
- 7 Void over platform
- 8 Footbridge



bb



Detail  
Y-shaped column  
ETFE skylight  
Vent  
scale 1:50

- 1 standing-seam roofing, aluminium
- 2 Ø 120 mm steel tube
- 3 roof drainage
- 4 skylight, ETFE pillow cladding
- 5 truss, Ø 355 mm curved steel
- 6 column Ø 1800–1200 mm steel tube
- 7 overhead lines
- 8 floor spot
- 9 Ø 355 mm and 255 mm steel tube
- 10 Ø 170 mm steel tube
- 11 roof panel, aluminium
- 12 rain guard over air vent, perforated aluminium sheet, open area 55%

