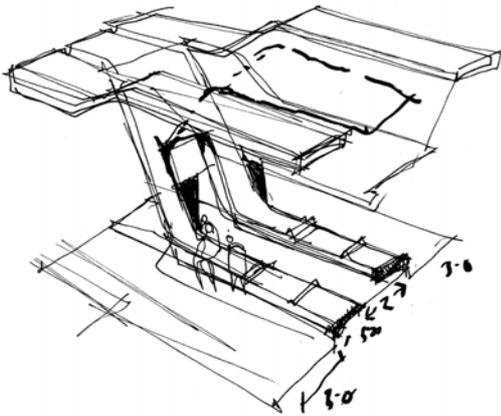


Vauxhall Cross Bus Station in London



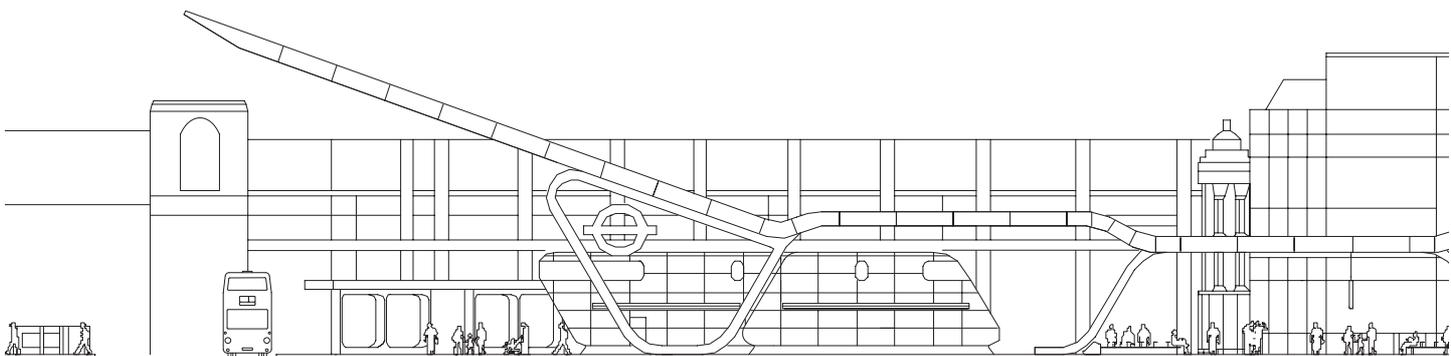


An undulating strip of stainless steel forms a flowing, continuous roof over the waiting passengers and buses.

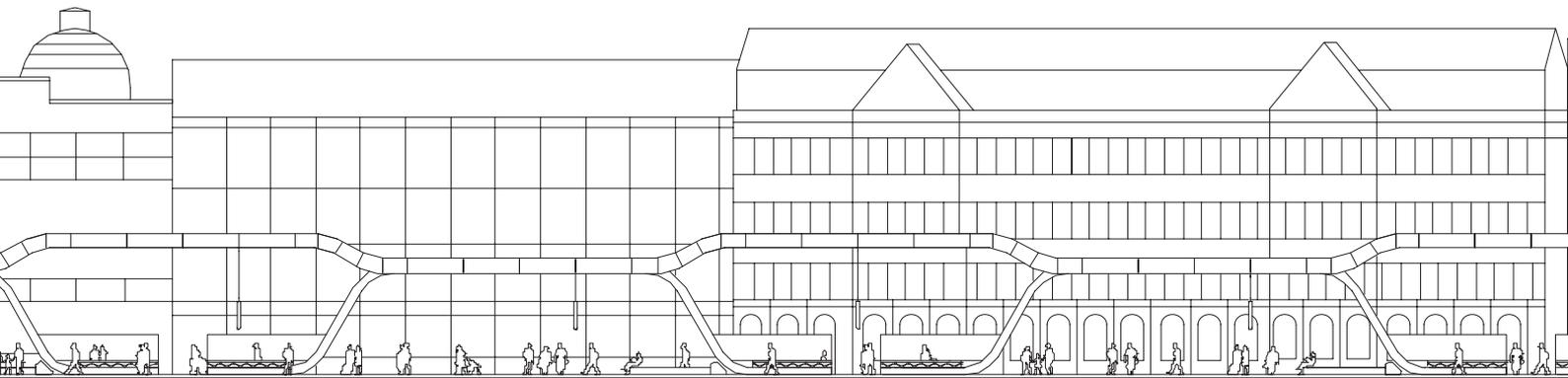
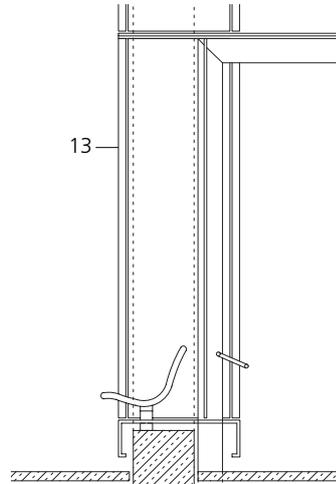
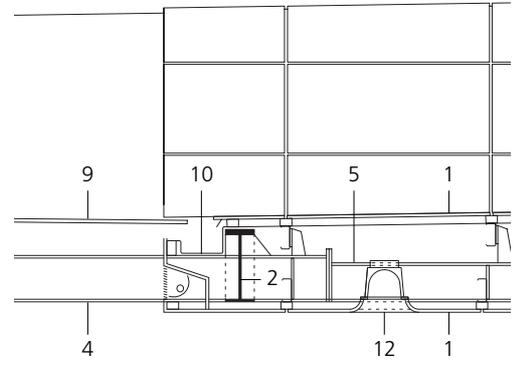
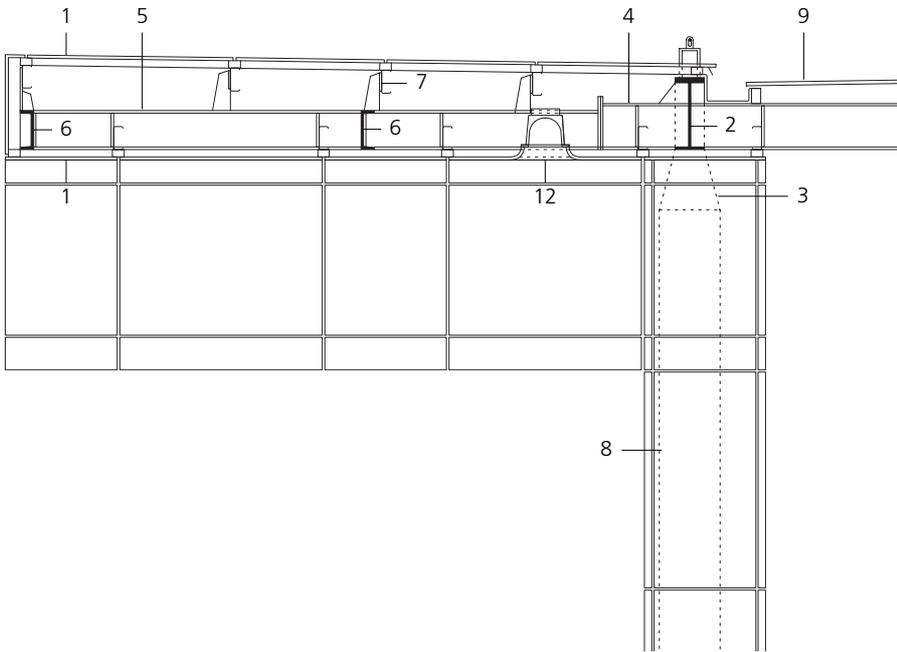
This new bus station in the London borough of Lambeth on the south bank of the Thames was designed by Arup Associates as part of a general reconfiguration of Vauxhall Cross, a major road junction at this location. Each day over 45,000 commuters use this transport interchange, switching between the bus (2,000 bus movements per day), underground and mainline rail networks. It is now London's second busiest bus station, after Victoria.

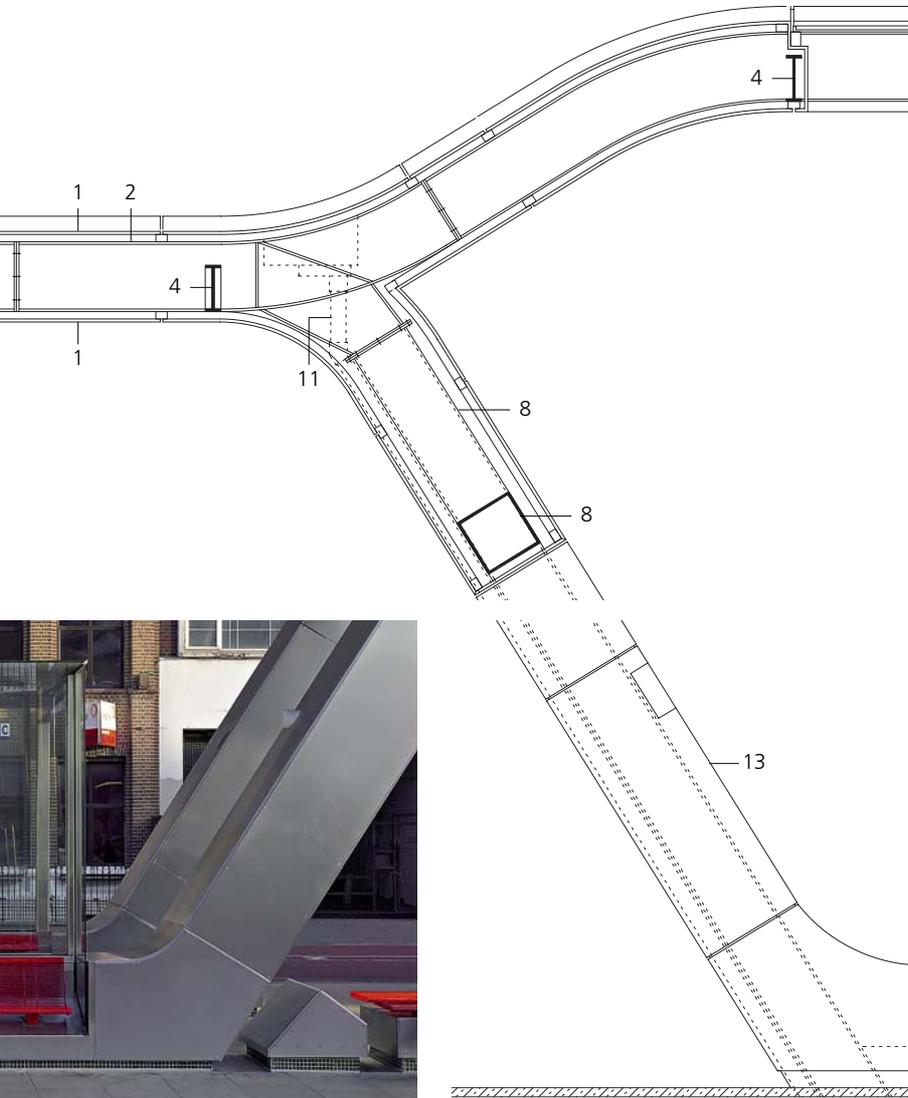
The bus station's strikingly sculptural form is an easily identifiable urban landmark. Clad entirely in stainless steel, a 12-metre wide undulating 'ribbon' stretches in a 120-metre

long line, elevating dramatically at its northern end to finish in two mighty cantilevers. The outline of the canopy dips and rises along its length, providing shelter for single- and double-decker buses, forming columns and covering the passenger waiting areas below. The impressive cantilever 'prongs' reach out over the entrance to the underground railway station. The upper surfaces of these extensions are angled 20° to the south, and fitted with 200 m² of photovoltaic cells. This contributes to the energy requirements of the station, and serves as a model project in London's programme to reduce greenhouse gas emissions.



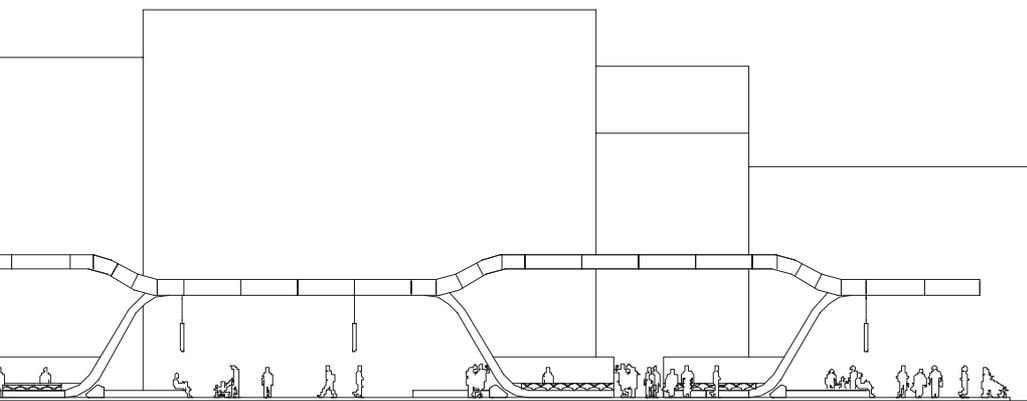
VAUXHALL CROSS BUS STATION IN LONDON



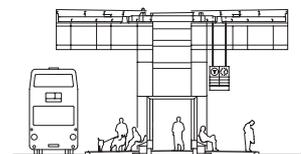


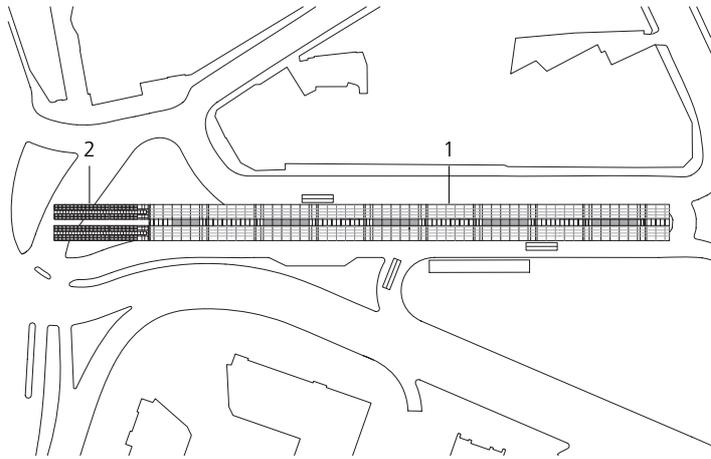
Cross sections of the upper and lower parts of the roof
Longitudinal section scale 1:50

- 1 1.6 mm stainless-steel sheet, grade EN 1.4401, rolled patterned surface (linen structure)
- 2 longitudinal beam, 467.2/192.8 mm I-section steel
- 3 stiffening, 12 mm steel sheet
- 4 cross beam, 312.9/102.4 mm I-section steel
- 5 cross beam, 251.4/146.1 mm I-section steel
- 6 longitudinal beam, 254 parallel flanged steel section
- 7 steel purlin, 150 mm deep
- 8 400/400/8 mm hollow-section steel
- 9 16 mm glazing
- 10 gutter
- 11 downspout
- 12 integrated spotlight
- 13 2.00 mm stainless steel sheet, grade EN 1.4401 patterned-rolled surface (linen pattern)



Elevation · Cross section
scale 1:400





Top view of roof
scale 1:2500
1 stainless steel
2 photovoltaic cells

Stainless-steel sheet with a rolled linen pattern was used as cladding to give the station a homogeneous look. The sheets were riveted onto a subframe of cold-formed steel purlins. To enhance resistance to accidental damage and vandalism, 2 mm stainless-steel sheet was used for the cladding in

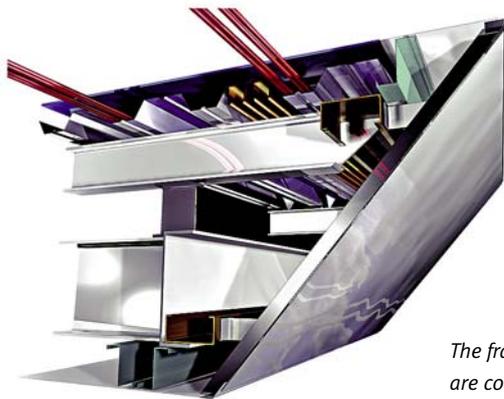
the areas around the seating and the base of the columns. Elsewhere on the roof structure the stainless-steel sheet is 1.6 mm thick.

Thanks to the open design, the waiting areas have high visibility from all sides, and ample daylight illumination. At night, the station becomes a beacon, its stainless-steel surfaces reflecting the many lights, which in some sections are coloured. The various public facilities and small shops associated with the new station also enhance the attractiveness of the surrounding urban area.

The structure has a modular steel frame. Raking columns of welded hollow sections support the flat roof, which consists of a grid of parallel longitudinal beams bolted to cross members. The long spans along the length of the roof reduce the number of columns needed and correspondingly increase the space available for free movement in the concourse below.



The broad-spanning frame of the roof is clad with a skin of stainless steel, a material suited to the exacting conditions at this busy inner-city interchange.



The frame and all cabling are concealed within a homogeneous envelope of stainless steel.



168 photovoltaic modules are fitted to the top of the cantilevered arms of the roof. Generating around 23,000 kWh of energy per year, they provide around 30% of the bus station's annual electricity requirements.



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Illustrations: Kenneth Fraser/Arup Associates, London (p.1 top left); Arup Associates, London (p. 5 top left)