

Stansted Airport Terminal

For:
Stansted Airport Ltd
/ BAA plc



Architects:
Sir Norman Foster and Partners

Structural Engineers:
Ove Arup and Partners

Steelwork Contractor:
Tubeworkers Ltd

Main Contractor:
Laing Management Ltd

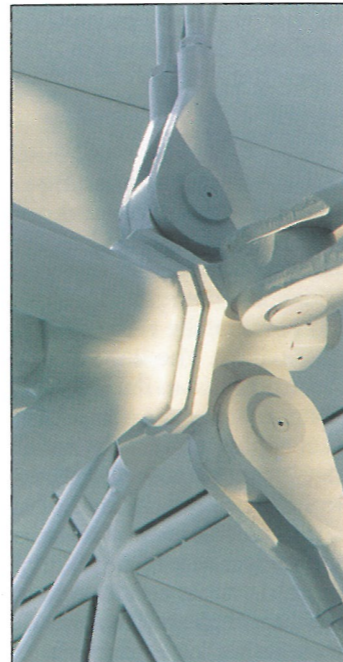


The new terminal at Stansted Airport is destined to become one of Sir Norman Foster and Partners' best known buildings. First commissioned in 1981, their brief grew to encompass a British Rail station, stations for the tracked transit system, two satellites and ancillary buildings, as well as the terminal itself and the masterplan for the terminal zone.

From the set down point, the traveller moves in a straight line and at a constant level straight through the terminal building, from landscape to airside or vice versa, without going through all the infuriating changes of direction that disfigure most major airports.

The simplicity of the terminal interior has been achieved by banishing service runs normally contained in the ceiling zone to an undercroft. This runs beneath the entire area of the concourse and contains all the baggage handling and all the environmental engineering plant.

The tubular steel roof structure is approximately 200m square and 20m high. It is supported by 36 freestanding tree structures which are founded at ground level and pass through the concourse slab to support the roof. The heating, ventilation, air-conditioning and artificial light of the concourse is contained within the clusters of steel columns



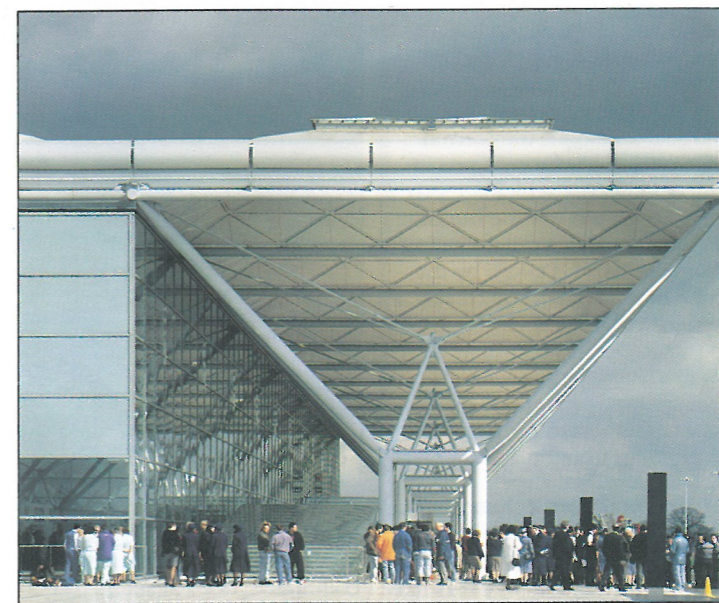
which rise up through the floor - the 'trunks' of the structural trees.

From the terminal, a Tracked Transit System (TTS) leads to the first two satellite buildings designed to handle the expected 8 million passengers a year. The satellite is a narrow finger which adjoins the aircraft parking stands. It is a complex building as it has to provide a TTS link, arrival and departure levels and a concourse for gate lounges. The upper level concourse has a grandstand view of the apron through fully glazed external walls and provides the first and last views of the terminal before air travellers move down a level and walk through the link bridges onto the aircraft.

Stansted is in the tradition of a newer energy-conscious series of buildings by a Foster office. By digging the bulk of the building into the contours of the site, its roofline drops below the treeline, an important issue in the environmental debate and at the public inquiries which finally allowed the project to proceed.

The Terminal Building was designed to take the maximum opportunity for offsite prefabrication and onsite preassembly at ground level. All the main nodes in the steelwork are formed from cast steel and were welded onto the tubes offsite. This construction sequence provides benefits in terms of quality, time and cost. The structure for the Terminal Building was also closely integrated with both the functional planning of the building and the mechanical and electrical engineering services.

A wind tunnel test was carried out to design an edge profile for the roof which would ensure minimisation of external roof suction. Even so, under the worst



combination of wind, asymmetric snow loading and temperature, the edge of the roof can still move up to 100mm in any direction. Expansion joints in the roof structure were eliminated by removing the bracing in the trunks and propping the trees horizontally at the level of the concourse slab. For construction, the trees with their trunks, branches and four gridline beams, were erected independently and prestressed. The shells were assembled at ground level with the roof decking and erected into position complete.

An in-situ reinforced concrete coffered slab

forms the floor to the concourse and the structure for the forecourt road in front of the Terminal which is also the roof of the BR station.

There are a number of other secondary structures within the Terminal Building, of which the two most significant are the main glass wall of the concourse and the cabin structures within it.

The glass wall is 12m high and extends for 720m in length, being on all four sides of the concourse. The cabin structures mirror the independent trees and service philosophy of the main roof structure and contain the service risers.

Judges' Comments:

The complex demands of a major airport terminal have been mastered with beguiling simplicity and elegance. Spaciousness and the clever use of both natural and artificial light surround the user with an atmosphere of reassuring calm.