

Servicing Hangar

Heathrow London for BEA

Buildings section

ARCHITECTS

Murray Ward & Partners

STRUCTURAL ENGINEERS

Scott Wilson Kirkpatrick & Partners

STEELWORK CONTRACTORS

Braithwaite & Co. Structural Ltd

Judges' Comments

Servicing modern aircraft requires a very extensive clear floor area and considerable head room. These were provided in a classic latticed girder design with the advantage that the 3,200 ton roof structure was assembled at ground level including cladding and services and then accurately raised by jacks to corner columns some 70ft high. This is a courageous and effective engineering solution to the problem.

The new Servicing Hangar for the British European Airways Corporation at London Heathrow Airport provides cover for four of the new Trident 3B aircraft or two Tridents and two airbus-size aircraft.

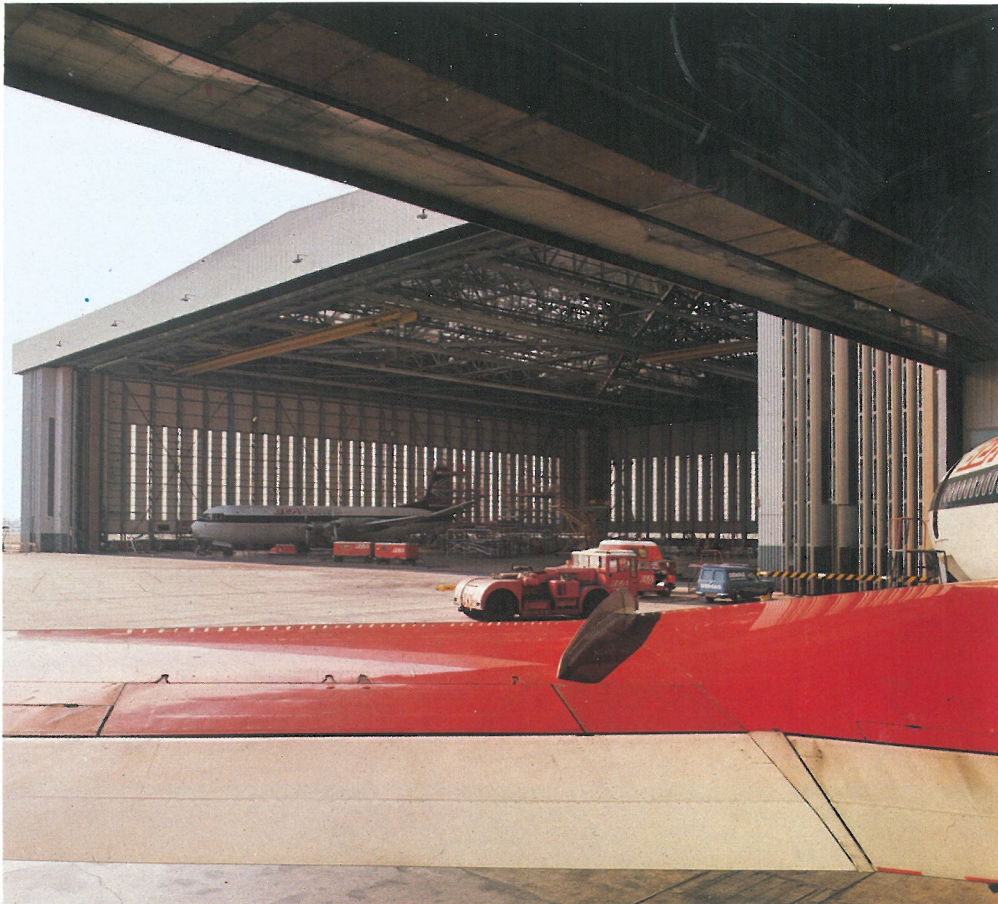
The size and form of the hangar were derived from the need to provide maximum flexibility for aircraft servicing and possible future re-orientation of the doors which could only be achieved by the adoption of a roof supported at the four corners. The hangar is situated close to a runway and the height restrictions imposed on buildings in its proximity together with the necessity to maintain a clear headroom of 70ft throughout the interior of the hangar limited the depth of roof construction at one corner to 8ft. These requirements influenced the structural form of the roof and the architectural treatment.

The roof steelwork comprises two large box lattice girders spanning diagonally on to the steel corner columns. Girders of similar construction on each side of the roof also rest on the tops of these columns and secondary trusses carrying the sheeting purlins span perpendicular to the edge lattice girders on to the main diagonal trusses. The top chords of these diagonal trusses and of the secondary trusses are pitched to the slope of the roof which forms a truncated pyramid. The bottom chords of the girders and trusses are horizontal and support two 11-ton travelling suspension cranes which serve the whole of the floor area.

The roof structure was designed so that it could be jacked up the four octagonal steel columns after assembly at ground level. The 2,700 tons of steelwork in the roof was bolted into units at site before assembly on trestles at ground level and with services and cladding installed prior to lifting the total weight was 3,200 tons. On each corner column sixteen hydraulic jacks supporting two screw rods per jack lifted the roof at an average rate of 4ft per hour. When raised the full height, the roof steelwork was bolted to a part of the permanent steelwork already positioned on the bearings at the tops of the columns.

The columns are 7½ft wide steel boxes, weighing 80 tons each, cast 20ft into a concrete foundation 18ft diameter at the top reducing to 14ft diameter at the bottom of its total 70ft depth. These columns resist in bending the large wind forces on the hangar transmitted through the roof to the bearings at the top of the columns which allow the roof to flex freely under the varying vertical loading. The column section is sufficiently stiff to resist wind forces without excessive lateral deflection and yet flexible enough to permit the horizontal expansion and contraction of the roof.

The hangar is clad in double-skin insulated PVC coated steel sheeting with large areas of the roof covered with translucent sheeting and with vertical strips of translucent sheet in the walls and doors to permit a high level of natural lighting.





G-APEP

BEA