

Bush Lane House, Cannon Street, London EC4
for City and West End Properties Ltd

ARCHITECTS & STRUCTURAL ENGINEERS
Arup Associates
STEELWORK CONTRACTOR
Boulton & Paul (Steel Construction) Ltd

Judges Comments

The parentage of this unusual building has a close affinity with the Pompidou Centre in Paris. The factors which have contributed to the striking appearance have developed from a unique combination of environment and commerce coupled with the ready availability of several parallel high technologies. The building is placed on a small awkward corner of the City of London which is earmarked for future access to the construction of the Underground Fleet Line. This restriction has limited the foundations of the building to a three-point suspension and has raised the first usable floor to a level which in a conventional building might be a fourth storey. It also leads quite naturally to a combination of cantilever and braced-frame systems of support.

The designer has chosen to express this bracing in an attractive external network. The water tube contribution to fire resistance was made possible by the availability of design skill used on the Paris Centre and the high strength of materials and quality of workmanship seems to be borrowed at least in part from a sister industry.

The high open space below the perimeter of the building has been attractively landscaped and every feature of the building and structure is extremely well detailed. The result has been to confer distinction on an area which might otherwise be derelict.

INTRODUCTION

With the Fleet Line Bill of 1970 London Transport sought powers to acquire the freeholds it required along the route between Charing Cross and Fenchurch Street. The existing Bush Lane House occupied one of these sites and the owners, Trafalgar House Developments Limited, therefore considered the possibility of replacing this with a new building, designed to allow for the subsequent tunnel and station construction, below the site. Arup Associates were commissioned to test the feasibility of this approach and an outline design was prepared and accepted. The design was then developed and planning approval obtained. The brief was to provide the maximum permitted lettable office space with a high standard of finishes and servicing. The building is fully air conditioned.

The requirements of London Transport imposed two prime conditions:

- 1 Foundations were restricted in location and extent to positions between areas allocated for the tunnels and shafts.
- 2 A clear headroom of 10m was required above ground level over the whole site area.

A condition of the Planning Authority was that the drum and dome of St Paul's should be visible from the Monument. The building is directly in line between these two and therefore was restricted in height.

THE BUILDING

The building is an eight-storey office building planned over a first-floor plant-room 10m above the ground. 36m long and 18m wide it rises 44m above Cannon Street and provides 3800 sq.m of lettable space. It is supported by columns set 11m in from the extremities of the building to avoid the future underground tunnels and concourse.

THE STRUCTURE

The frame is mainly of structural steel in order to keep the weight of the building within the limit imposed by the foundation conditions. A full-height lattice frame was adopted to carry the floors, capable of resolving the large cantilever movements created by the inset columns. By avoiding a heavy concentration of structure at one level this allows the main air supply ducts to distribute from the plant-room to each floor level.

Both structure and duct work are located outside the line of the fixed glass curtain wall, thus providing uninterrupted office floor space.

Floors are of composite steel and concrete construction and span 18m with an overall depth of 700mm. Floor beams are arranged to coincide with the planning grid of 1.6m with alternate members projecting through the curtain wall. These are supported by the lattice of its principal node points.

The lattice frame consists of a number of fabricated panels 3.2m wide and 14.4m high made up on intersecting diagonal tubes 194m o.d. and top and bottom booms 324m o.d. These were welded to the node sections which were bolted together on site using high-strength friction grip bolts.

The lattice was constructed in stainless steel so that it should comply with the weather protection requirements of the by-laws and also to meet the client's requirement for no maintenance other than washing. Tubular sections were centrifugally spun castings to allow differing wall thicknesses while retaining the constant external diameter. These were welded to the cast node sections to form fabricated lattice panels suitable for transport and erection. All surfaces were machined and then sprayed with glass beads to achieve a consistent finish.

The lattice structure is water filled to provide the statutory fire rating. Fed from an appropriately sized storage tank at roof level each lattice section is supplied at low level from a feeder pipe circulating in the plant-room. Water does not pass through the bolted connections between lattices. Vents are located at the head of each column to allow steam to escape at atmospheric pressure should a fire cause the water to boil.

