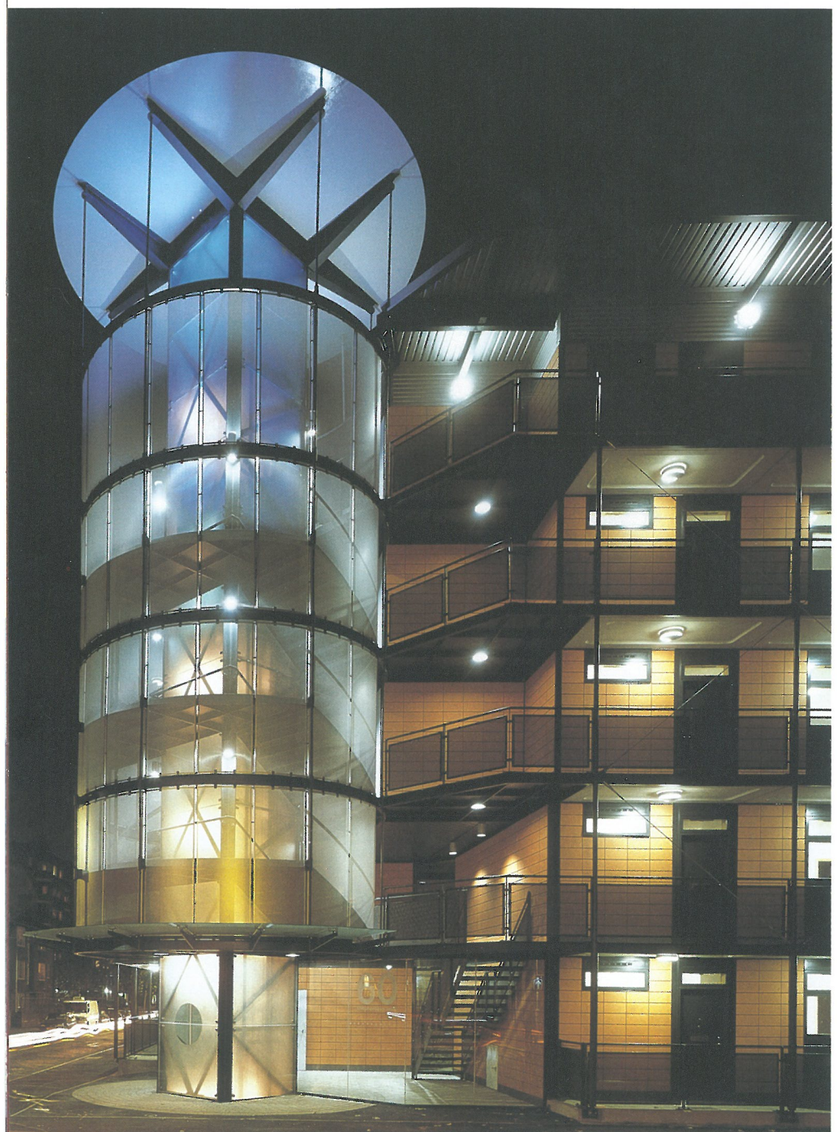
Architect:	**Cartwright Pickard Architects**
Structural Engineer:	**Whitby Bird & Partners**
Modular Building Contractor:	**Yorkon Ltd**
Steelwork Contractor:	**Advanced Fabrications (Poyle) Ltd**
Main Contractor:	**Kajima UK Engineering Ltd**
Owner:	**Peabody Trust**

Judges' comment:
This project represents an important breakthrough in the application of modular construction to multi-storey housing using steel structural elements. The resulting high quality design and specification fully justifies the client's support for innovation.

Murray Grove Flats, London

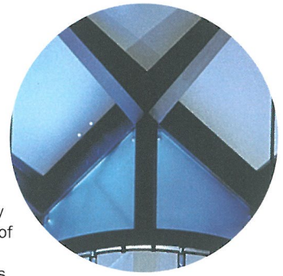


In recognition of the recommendations of the Egan report, the Peabody Trust wanted to develop a housing project which maximised the level of prefabrication and minimised the involvement of 'traditional' on-site building processes - production rather than construction.

Modular construction has been employed to provide housing accommodation using steel framed factory-built units. In recognition of this approach, a high level of prefabrication has also been employed in the structural elements that envelop the modules to provide circulation and access space. The adoption of prefabricated external elements also had the benefit of providing access to the upper levels during construction without the use of scaffolding.

The scheme consists of a five-storey building, L-shaped on plan, providing 30 one and two bedroom flats arranged in two wings. Each flat consists of two or three housing modules which were lifted into position on site, fully fitted out and bolted together to form a single, robust unit. Access to and from the flats is by way of a central stair and lift core, situated at the apex of the two wings, feeding onto external access decks at each level. The modules themselves have been developed by Yorkon, based on their standard hotel system, and provide support and stability for the external structural elements that are connected to them.

The circulation core forms a prominent feature at the corner of the site. It is circular on plan and encloses a central lift and a perimeter stair. In order to minimise the footprint of the tower at entrance level, the stair and landings are suspended from roof level using perimeter hangers. The loads from the hangers are transferred via plate girders to the lift shaft and down to the foundations. The shaft is a skeletal steel structure formed from a pair of vertical trusses that allow it to cantilever from ground level and resist lateral loads while preventing any additional loads being transferred to the housing modules. The shaft was brought to site as a single, full height element to minimise erection time. Early co-ordination with the lift manufacturer enabled secondary steelwork and fixing lugs to be incorporated into the primary structure of the shaft, simplifying the lift installation process.



The landings that wrap around the central shaft are formed from shaped steel plate, stiffened by a regular pattern of steel ribs, with channels or plates forming an upstand around the perimeter. These were brought to site as complete units.

The external decks that provide access to the flats are formed from precast concrete units of the same width as the housing modules. A rectangular hollow section was cast into the rear corners of each unit to provide a pocket for a bolted connection to the corners of the module structure. A steel angle, fixed to the modules whilst still in the factory, provided temporary support for the units as the permanent connection was being made, reducing the requirement for temporary propping. A rolled steel channel was cast onto the outer edge of the precast units to provide fixings for the steel balustrading and to allow the connection to the perimeter columns. The precast units are fair faced so no further finishing was required on site.

The access decks are supported at their external corners by steel columns. The columns increase in size down the façade to accommodate increasing loads and are formed from circular hollow sections, with a spigot detail at each floor level to providing the connection to the columns above and below. The connection back to the precast units is made with a simple fin plate bolted between recessed end plates in the steel edge channel. Fire engineering the steelwork removed the need for any intumescent coatings. By making the columns storey height, they could be installed after each of the precast units was in place, maximising working space during the lifting operations. External cross bracing provides an alternative load path for the vertical loads in the event that a lower column is lost due to vehicle impact as well as providing additional architectural expression.