

AWARD

AUDI WEST LONDON

ARCHITECT	WILKINSON EYRE ARCHITECTS
STRUCTURAL ENGINEER	EXPEDITION ENGINEERING
STEELWORK CONTRACTOR	ROWEN STRUCTURES LTD (SEVERFIELD-ROWEN PLC)
MAIN CONTRACTOR	ISG INTERIOREXTERIOR
CLIENT	VOLKSWAGEN GROUP UK LTD



The high visibility of the site alongside the elevated section of the M4 in west London presented the client with an opportunity to display his product in an innovative and striking manner. An important aspect of the brief to deliver a landmark project was to consider the product marketing.

The structure is a seven-storey, 30,000m² celebration of automotive engineering and technical expertise. The five-storey superstructure contains three floors of showroom and sales areas, with offices, marketing and conference facilities over the top two floors. Below ground, a two-storey basement contains futuristic workshops and diagnostic facilities.

Steel is the client's structural material of choice from bespoke steel boxes submerged below the basement slab to trapezoidal tapering raking columns at the southern façade. The use of a steel frame in the

superstructure has allowed a highly flexible floor plan for future renovations to the showroom and office spaces, while the use of a steel intensive perimeter sheet-piled basement has provided significant cost, aesthetic and construction programme benefits below ground.

The building architecture was deliberately pared down by the architect to allow the main features, the cars themselves, to stand out. The structural frame and simple floor arrangements maximise light and airiness. From the full glazing of the main façade to the translucent Kalwall cladding of the rear display areas, natural light is brought deep onto the floors.

Steel was the clear choice for a versatile and flexible floor plan. Long span steel plate girders have been used to allow large (19m span) column free floor plates while squeezing the floor sandwich to a meagre

metre from ceiling to finished floor level. To enable the tight floor construction, early coordination of the services with the structure was essential.

Considering the thickness of the floor construction required, composite steel floor decking was the natural choice. The benefits of simple fire protection, speed and safety of construction as well as providing a very lightweight floor were obvious from the outset.

The exposed internal roof structure is a key feature providing a backdrop of engineered architecture to the cavernous rear display space. The single curve of the roof is formed of curved rolled sections simply and elegantly braced and connected. The economic design extends to the lightweight steel roof deck, chosen to provide the roof structure, architectural finish and acoustic attenuation. The speed



of erection of the roof deck enabled the quick closing of the building envelope following the steelwork erection.

While the primary roof structure is based on a single axis of curvature, the southern M4 facing edge of the building introduces a curve on plan producing doubly curved eaves. This geometrically challenging edge, fabricated from steel, was included in the primary steelwork package to ensure a crisp, engineered finish.

The design team developed 3D model information that was used directly by the steelwork contractor to bend and fabricate the roof edge. Key details, such as the roof edge cantilevers, were developed by the team in 3D ahead of the appointment of a contractor and included in the tender drawings with the aim to transfer as much useful knowledge as possible.

In the two-storey basement, the use of steel sheet piling for the perimeter walls provided the best balance of resistance to imposed loadings, speed of construction - 3500m² of sheet piling was installed in less than two months - final appearance and cost. One of the greatest successes of the perimeter sheet piling is the highly aesthetic

finish gained without the need for a secondary facing.

On entering the building the space immediately opens up with a double height façade articulated by primary steel columns. The tapered trapezoidal columns are fabricated from 20mm plate and lead the eye through the space. They give context for the hanging mezzanine, with the angle of the steel tension rods echoing the geometry of the leaning façade.

The design of the vehicle restraint system made use of steel plasticity theory to develop a catenary restraint and allow a visually lightweight high tensile steel rod to be used in place of an elastically designed structural section.

In the workshops, but hidden from view, are 26 submerged steel boxes. Each box comprises over half a tonne of fabricated stiffened steel plate designed to contain and protect the hydraulic mechanisms of the workshop car jacks. The jacks are state-of-the-art car supports that can elevate the cars 2m above the workshop floor and then retract below the basement slab at night. The boxes protect against hydrostatic and clay heave forces and continue the

waterproofing line of the basement. The plate thickness allows for sacrificial corrosion over the lifetime of the building.

Early consideration of the buildability of the main frame allowed the steel erection to take place with minimum temporary bracing or supports. The building frame was conceived as a central spine comprising two stability cores and the building atrium. From this spine the north volume, braced via floor slabs and roof trusses, spans to slender perimeter box columns. To the south, the floor beams provide a tie restraint to the inclined tapering façade columns.

The construction methodology is expressed in the exposed roof structure, where central primary roof beams taper to a simple pin at the connection to the northern and southern structures either side.

Throughout the project steel has consistently emerged as the optimum material choice. In particular its ability to provide an economic solution while expressing engineered design has worked to great effect. The highly visible steel structure with carefully considered detailing, provides a stunning backdrop to the automotive design on display



JUDGES' COMMENT

Comprehensively well designed and economical in form, the structure and its details reflect a technical ethos. The building showcases the values that Audi project to its public, with great panache.

This is an appropriately stylish and racy building, showing structural steelwork to great effect.