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Calatrava's Liège Station

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Calatravas's Liège Guillemins Station

Inspiration for urban dreams

Stadiums, airport terminals, trade fair halls and bridges – wherever sophisticated supporting structures in steel are being planned, MSH sections are invariably at the top of the list of materials. Progressive architects and engineers lead the way in exploiting the possibility to create slender, filigree supporting structures from tubes and hollow sections with homogeneous outer dimensions. One of them is Santiago Calatrava, whose Liège Guillemins Station is yet another spectacular work of architectural art.

The futuristic station complex is inspiring new ideas for the urban development of the city. The paving incorporates large areas of glass blocks, through which the underlying passage is supplied with daylight. The MSH sections were mainly used for the external arches of the canopies on the sides facing the city and the hill. (Photo: René Pelzer)

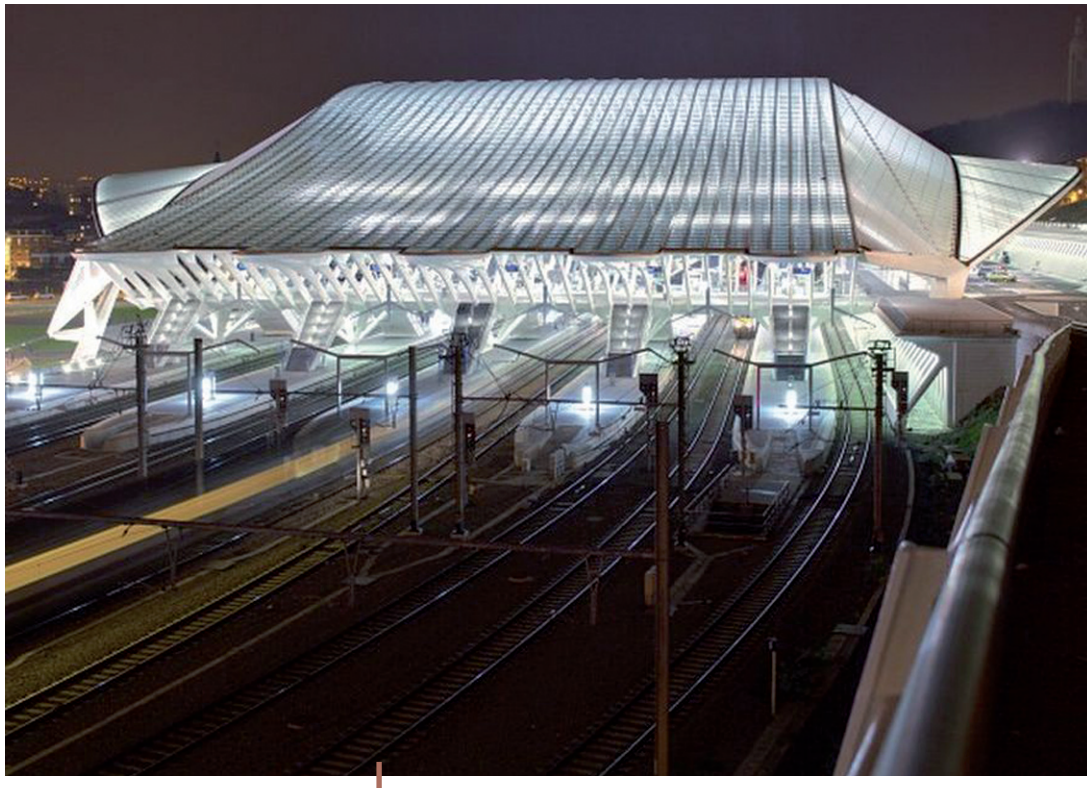
In an article on the Italian steel fabricator Cimolai last year, V&M TUBES mentioned a major Calatrava project in progress, in which the architect incorporates MSH sections in the design of the load bearing elements for the spectacular roofs of the sports complex in Tor Vergata near Rome. The new Liège Guillemins Station was completed and inaugurated in September 2009. The star Valencian architect designed it for "Euro Liège TGV" as one of the most beautiful and striking stations in the world. Close to 2,500 tonnes of circular MSH sections went into this project.

ICONIC AND INSPIRATIONAL

The good times are returning to Liège, and Calatravas's new station can be said to have helped to inspire the regeneration of the Wallonian metropolis. In fact, the railway station has acquired iconic status: widely viewed as the precursor of the Industrial Revolution, it has re-established its European connections after recovering from the setbacks of the deindustrialisation process of the late 20th century. The former international traffic hub, which plays an important role in the regional traffic of the SNCB/NMBS, had become a bottleneck in the European high-speed network between London, Paris, Brussels, Frankfurt and Amsterdam. Only a completely new building would be able to accommodate the 500 trains that arrive and depart every day – including the TGV/Thalys and Intercity Express trains. So where the dilapidated station dating from 1958 fought to keep up with the steadily increasing volume of rail traffic, an elegant building of glass and steel has arisen, whose impressive design reflects the tradition of famous European railway stations. Calatravas's inspirational building generated new momentum and ideas for the urban planning of the third-biggest city in Belgium. There are plans for a new station forecourt, a link between the station area and the embankment of the river Maas, and the conversion of the Maas island Boverie into a museum island. Other highlights are the recently opened shopping and media centre "Médiacité", designed by architect Ron Arad. The newly created Liège Guillemins Station is of crucial importance to all these new developments, both architecturally and in terms of traffic. Liège, Luik or Lüttich – as the town is referred to in the trilingual Euregio – is thus becoming ever more attractive as a destination for lovers of art and architecture.

RHYTHMS IN GLASS AND STEEL

The monumental vault of glass, steel and concrete arches elegantly, in parallel to the rails, over the platforms of the new Liège Guillemins Station. The parallel alignment was necessary to enable the main supporting structure to be pushed gradually over the tracks from the forecourt with the help of a supporting auxiliary structure, so that the station could continue to operate as usual while the structure was being erected. To cover for the nine tracks and the two access areas, the gigantic roof structure has a width of 160 metres and a length of 196 metres – sufficient to accommodate the full length of a TGV/Thalys or an ICE. Despite their weight, the imposing building and its 33,000 square metre roof have a markedly filigree appearance. This is attributable to the relatively small distance of two metres between the parallel arches, which enabled very slender main girders – stiffened by thin tie beams – to be used. The lateral canopies above the station passage cantilever out as far as 45 meters over the forecourt, developing almost unnoticed from the rhythms of glass, steel and light concrete. Like the peak of a cap, they are seamlessly attached to the main roof and are bordered by the elegant widely curved arches made of MSH sections from V&M TUBES.



The monument vault of glas, steel and concrete arches elegantly over the platforms of the new station. (Photo: René Pelzer)

TRANSPARENCY AND CLARITY

Inverted pyramids anchor the vault, which consists of 39 steel arches and rises to almost 40 metres above the tracks, to the ground. Four curved girders spanning the total length of the hall in the area of the cantilevered roof arches are supported by spectacularly branching concrete abutments. This ●●●

Liège Guillemins Station by night: The long elegantly curving arches of the canopies were constructed using MSH sections from V & M TUBES. (Photo: René Pelzer)

gives the impression that a space station has landed here temporarily, underlining the dynamism, flexibility and pace of our times. As the building has no façade in the traditional sense, it creates the optical illusion of being open to all sides. Everywhere in the station are the round, curved, organic forms regarded as the signature features of sculptor and engineer Calatrava. Even the 71 catenary support masts alongside the tracks were specially designed by Calatrava for the Liège Guillemins Station. Like the other technical elements they are in unobtrusive grey, to distinguish them optically from the architectural elements. The paving of the forecourt and the five platforms contain areas formed by glass blocks to allow daylight to reach the passage underneath. Besides pedestrians, the passage is also used by cyclists, and it will soon have space for concerts and art exhibitions. Alongside spacious escalators, tubular hydraulically powered panoramic lifts carry people between the three levels. The platforms and gangways are covered by crystal-sugar blue stone from Belgium (Hainaut), while the outside areas paved in mica-containing Condroz sandstone with white granite inlays bring out the form of the station. Lightness and clarity dominate, which, according to Calatrava, not only have an aesthetic impact but should also promote orientation and security. It is true that cameras are installed for monitoring purposes, but the feeling of security is based above all on the clarity that characterises the whole station. The building is so transparent that scarcely any additional lighting is needed during the day. Even in the passage, the skilful use of light and the light colours ensure that there are no dark corners. The resulting ambience is undisturbed by walls and optical barriers; it is characterised by rhythmic structures, transparency and

Arrival at Liège Guillemins Station: The roof structure has a span of almost 200 metres, but despite its weight it has a markedly filigree appearance. It covers the full length of a Thalys or an ICE. (Photos: René Pelzer)

The curved shapes of the station are elegantly emphasised by the mica-containing Condroz sandstone with white granite inlays. (Photo: René Pelzer)

communication. According to Calatrava, who created similarly imposing major railway stations in Lisbon, Zurich and Lyon, these are elementary prerequisites for every railway station design.

CREATING LINKS

Beside a large part of the forecourt, from which the gallery-like passage with travel centre, waiting room and shops, leads to the entrances and to the platform escalators, the vault spans over the railway track area and two footbridges, each of which is longer than 14 metres. They give access to the platforms and to the west entrance, which is ten meters above the forecourt level. The parking floors built into the slope are located here, as well as various paths to the residential quarter further up the Cointe Hill. In this way the station reactivates the link between the residential area and the shopping district of Guillemins/Fragnée, which were formerly separated by the railway line. A shopping mall was deliberately not included in the planning concept for the station, as it was felt that this could mean the death of the neighbouring shopping district. Now it is already undergoing a revival in its fortunes, thanks to the close integration of the railway station in the local transport system, and the proximity of the motorway. The station has its own motorway exit, permitting faster access from both sides. Liège Guillemins Station has not only accelerated inner-city transfers – its ultramodern technical infrastructure has also brought the cities of Europe closer together. Brussels can now be reached in just 40 minutes, while Cologne is one hour, Paris two hours and London three hours away.

MANY DIMENSIONS

Between October 2002 and mid 2006, in the context of seven supply contracts, some 2,500 tonnes of circular MSH sections in grades S 355 J2H, S 355 J2H and S460 NLH were delivered for the Liège Guillemins Station. In diameters between 159 and 660 millimetres, with wall thicknesses between 5.6 and 80 millimetres, they were used mainly as structural elements for the outside arches of the canopies on the sides facing the city and the hill. Rectangular sections measuring 120 x 80 millimetres with wall thicknesses from 4 to 12 millimetres were also supplied. The MSH sections were produced in the plug rolling mill and the pilger rolling mill at the V&M TUBES site in Düsseldorf-Rath and the mandrel rolling mill in Mülheim on the Ruhr. The deliveries were effected through ThyssenKrupp Mannex in Madrid. (DK)

Further information

Liège Guillemins Station, Luik, Lüttich

Commissioned by: Société Nationale des Chemins de fer Belges
Client: Euro Liège TGV
Architect: Santiago Calatrava AG Ingenieur- & Architekturbüro, Zürich (CH)
Structural design planning/Structural engineering: Bureau d`études Greisch, Liège (B)
Steel engineering: EMESA Elaborados Metalicos S.A., La Coruna (E)