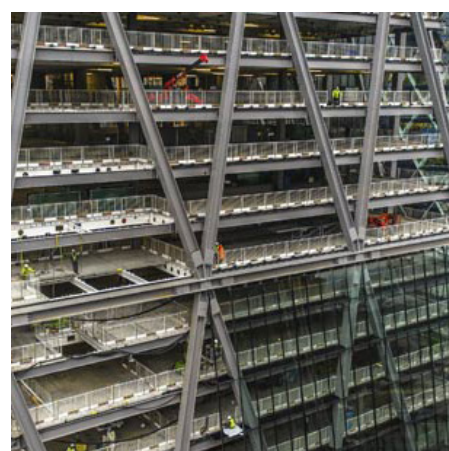


The Leadenhall Building 2002–2014



Example of another the prefabricated Steel component and joint to the window panes.
Photo by Brandon Whitwell-Mak, taken at the Richard Rogers RA: Inside Out exhibition



Construction of the prefabricated steel components



Example of a Leadenhall Steel node

The Steel Frame Structure

The steel structural elements which envelope the building uses prefabricated nodes. This allows for a less complex site assembly as welding is not needed. The nodes are manufactured off site and then delivered to site once complete. Due to the large scale components and limit access of the site, the prefabricate pieces which could be bolted together made the construction very efficient.

Prefabricated nodes: Process

Steel is an alloy of primarily iron and other chemicals, such as carbon, manganese, niobium and vanadium to tailor its strength and durability for a project. An alloy of mild steel would have been produce for the structural purposes of the Leadenhall building, containing 0.1% to 0.33% of carbon, as it is very tough, high tensile strength and can go through a hardening process. Also, this explains the finishing seen on the steel because it is a ferrous metal it is not naturally corrosion resistant.

Due to some of the nodes of the Leadenhall building transferring forces of up to 6000 tonnes in at least three different directions simultaneously the need for joints which can withstand high tensile and compression forces is vital.

As these components were fabricated off site, they may have been 'rolled' because this process refines the grain size and improves the mechanical properties, in particular toughness. After the steel is rolled at around 750°C, it would be cooled naturally.

Due to the exposure, location and design of the Leadenhall building, it is corrosion and fire protected. The whole structure is sprayed prior to site assembly with a marine standard, epoxy intumescent coating in layers of 3-12mm, depending on the thickness of the steel. This gives 90 minutes of fire protection. To make the structure and building maintain its structural and aesthetic standards the structure will contain 500 tonnes of paint at the end of construction.

When the finishing process is complete, the nodes are typically 6m x 3m and weigh up to 30 tonnes (crane limitations also determine this). They are then taken to site and bolted to the columns and diagonals of the main structure.



Site Photo by Brandon Whitwell-Mak