

Construction Site: 1-3 Goodge Street

Investor: Ernest Park
Construction: 2013 -

Mikolaj Karczewski
2nd Year, Unit 8. Technical Studies, Materials
Exercise 1, week 2.



Picture 1.



Picture 2.



Picture 3.



Above: Present views for the construction site: from Goodge street



and from Tottenham Court Road



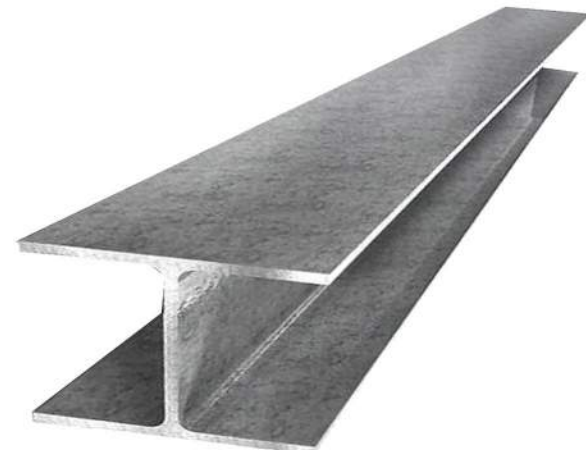
Above: Substring construction on the construction site



Above: Steel construction on the construction site



Above: An example of substring construction, where I-beams are holding wooden ceiling.



Above: An example of an I-beam

Historical Background / Demolition

The area of my interest is the plot situated on the corner of Goodge Street and Tottenham Court Road on the border of Bloomsbury and Fitzrovia in London. From the very beginning, the investment was full of controversies due to historical background of the area - The Georgian building, which was supposed to be demolished was the oldest part of Goodge Street. Built in 1780 by Goodge brothers, it was considered as inevitable historical heritage. Despite local protests, demolition had begun in Autumn 2013, having in plans keeping part of the original facade. Picture 1. is presenting the site before demolition with original buildings. Picture 2. is presenting the site after demolition with the remaining facade of historical building, being supported by the steel, external scaffolding. In January 2014 the facade had to be removed due to its instability. It is however planned to be properly reconstructed in the new project. Picture 3. is presenting the site after the demolition of the facade.

The Present Condition

Two pictures on the Left are presenting the current stage of the construction site - the shape of the 5-storey building is clearly visible. It seems that the final height is already achieved. At the moment the building is still just the steel construction with wooden ceilings, covered with material and scaffoldings. In the building the substring construction was used, what means that the steel I-beams are holding wooden beams for ceilings.

Construction Materials - Steel Frame and Wooden Beams.

Steel Frame:

The building has its frame constructed out of steel I-beams.

Material Advantages:

- Ability to be used right after assembling,
- Low mass in comparison to concrete,
- Resistance for dynamic forces,
- It is able to transfer huge weights with relatively small dimensions,
- Resistance for stretching,
- Reasonable price of material,
- Often used as a material providing long spans in construction.

Disadvantages:

- Vulnerable for corrosion,
- High conductivity of heat and acoustics,
- Low resistance for temperature changes,

Technical information:

I - beams used in the building were of different lengths. Heights of industrial I-beams are normally between 80mm and 550mm. At the height of 80mm, one meter of the I-beam weights approximately 6kg. With the height equal 550mm, the weight of 1m of I-beam grows to 167kg. According to my observations, I-beams used in the building had the height of approximately 30cm. Considering this dimension, the weight of 1m of such an I-beam had to weigh approximately 54kg.

Wooden Ceilings (construction beams)

The building has its ceilings made out of wooden beams

Material Advantages:

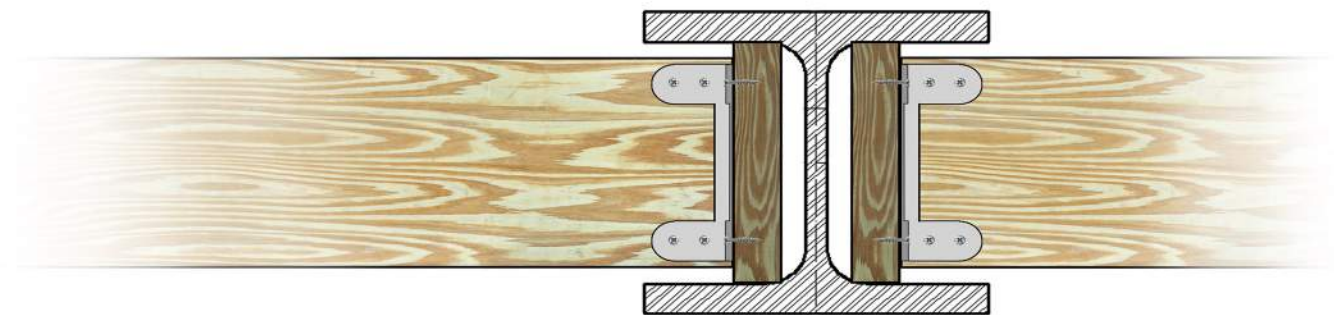
- Low Price and easy to assemble,
- Lower Weight in comparison to concrete ceiling (resulting in lower weight acting on the building's construction.
- Easy in further modifications (such as cutting holes etc.)
- Can be treated as a decoration of the interior.
- It is easier to fit thermal insulation between the beams without increasing the thickness of the ceiling layer.
- It is easier to fit installations, such as ventilation, as well as lighting between the beams.

Disadvantages:

- Worse acoustic insulation than in concrete's case.
- It is hard to get good wood for the construction - not bending one and properly prepared and impregnated for the construction.
- Wood is vulnerable for fungus and woodworms, attack of both of which seriously weakens the strength of the material.
- Even making impregnating wood does not make it fully fireproof.

Technical Information:

Wood used for the structure was probably pine-wood. The dimensions of pines were probably 38x235mm. Their lengths were various.



Above: Section of the Substring construction - I-beam holding wooden beams for ceiling

Summary:

The use of these materials instead of concrete might have a few reasons - Firstly, both of these are easier and quicker in assembling. Secondly - in economical terms, these are cheaper option. Thirdly - These are lighter than concrete - consideration of weight might be related to tube line going underneath the building.

References:

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