Elias Tamer

I-Beam (Euston square Station)

The I-Beam is a structural material comprised mainly of steel. The I beam is formed by two main elements:

- Flanges: the vertical part of the I beam that prevent it form bending
- The web: the horizontal part of the I beam to tolerate shear loads

The beam is commonly used in construction due to its amazing resistance to heavy loads, extreme pressure, dangerous vibrations and other factors that would normally cause any other material to easily break or bend. The beam's components allow it to be highly flexible and stiff, thus unbreakable. This particular quality is highly important to engineers who constantly perceive the weather and heavyweight loads as recurring expensive obstacle in their construction sites.

Beams can be classified by their shape, which can be straight or curved and tapered or with a constant cross section. Beams also differ according to their support systems (cantilever, overhanging, simply supported, fixed ended, continuous, cantilever simply supported) and use in the construction site (Griders, Joists, Lintels, Girts, Purlins, Sringers). The design of the I-beam focuses mainly on the strength of its stiffness to resist any deformation, vibration or or other tension.

There are two different production process of the I-Beam. The first stage of both production process focuses on coagulating the liquid material by pouring it into a water-cooled mold. From there, one option is rolling the beam as a single cross-section to achieve the desired thickness through processes called hot rolling, cold rolling or extrusion. In the opposite, the second option is to disperse structural steel plates and mechanically weld them to form the web and flanges.

I-beam is commonly used for flat rooftops in underground tubes construction. Due to its most prominent quality, stiffness, I-beam is the ideal material to uphold the masonry for tubes construction. In addition it acts as a thinner for the sidewalls columns, as a column connector through the roof and as a waterproof option for any water damage crisis.

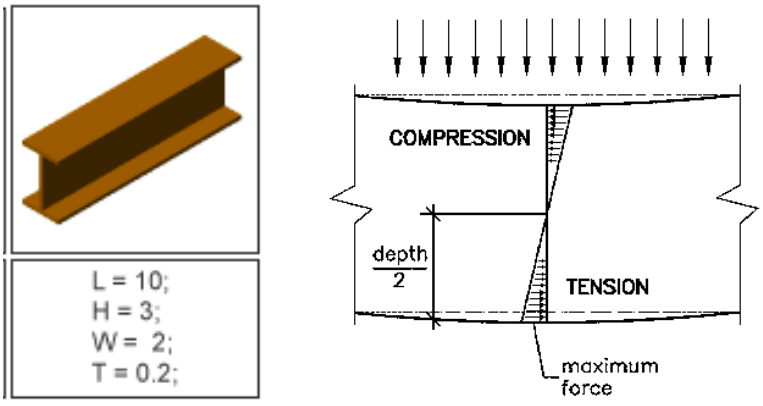

Figure 1- I-beam dimension (in cm) and bending mechanism
(When faced with pressure, the top of the beam is in compression and the bottom is in tension)

Figure 2- Euston Station

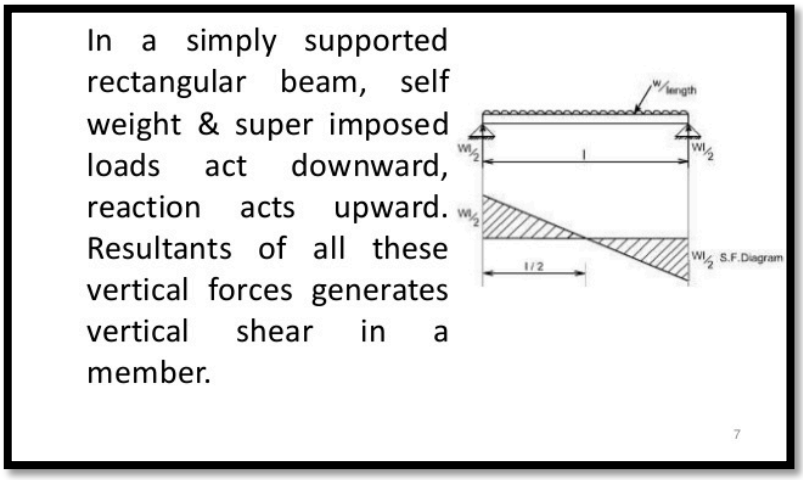

Figure 3- Shear Mechanism of I-beam