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# Mechanics of Materials

## Project 2 - 1

by

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# INTRODUCTION

- The I-beam had been chosen in this project, where it is also known as H-beam, universal beam (UB) and others because of its 'I' shaped cross section. The 'I' is known as flanges which is the horizontal element, and the 'web' is the vertical element. It is widely used in civil and construction industries. It has a varied important uses, such as, support trusses, or main framework in buildings.
- The I-beam made of steel had structure's integrity with relentless strength and support. Its immense power reduces the need of support structures, save time and cost, and make the structure more stable. It has the versatility and dependability that make them a coveted resource to every builder.
- In order to complete this project, we need to analyze the stress and strain for this I-beam using CAD Software which is CATIA. We chose three tests which are tension (axial), torsion and bending to undergo to that part.
- Axial force is the compression or tension force acting in a member. It is called concentric loading, when the axial force acts through the centroid of the member and eccentric loading, when the force is not acting through the centroid. Also, torsion is the twisting of an object due to an applied torque. Lastly, bending is the behaviour of a slender structural element subjected to an external load applied perpendicularly to a longitudinal axis of the element.



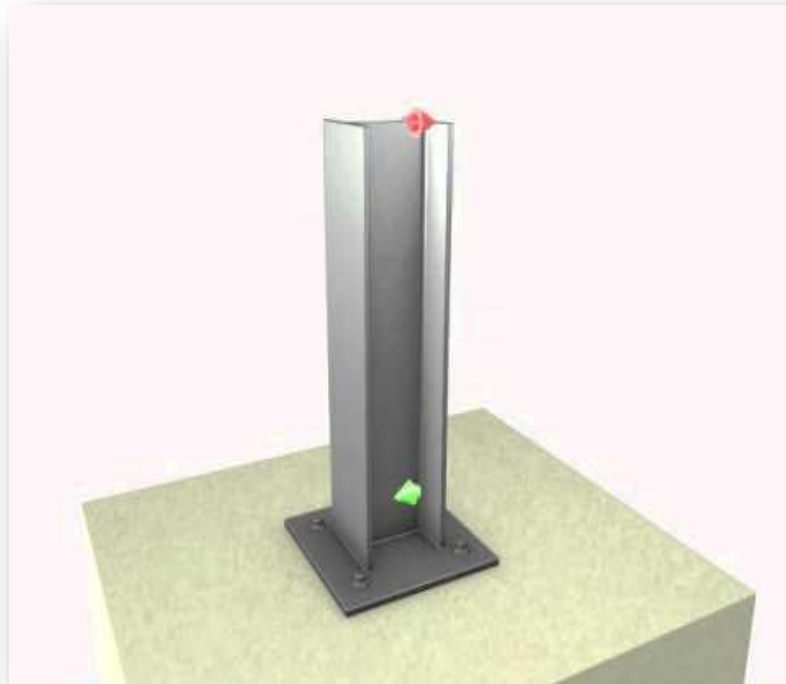


Figure 1. I-beam used in construction