

## Beams

### Beam

Beam is a horizontal structural member designed to various loads, generally acting perpendicular to the axis of beam.

### Types of beam

1. Cantilever beam
2. Simply supported beam
3. Over hanging beam
4. Fixed beam
5. Continuous beam

#### Cantilever beam:

A beam which is fixed at one end and free at the other end is

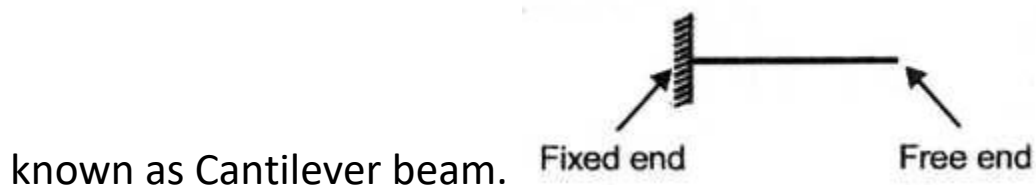


Figure: Cantilever beam

#### Simply supported beam:

A beam which is simply (or) freely supported on supports is called simply supported beam. It normally consists of Hinged support at one end and Roller support at the other end.

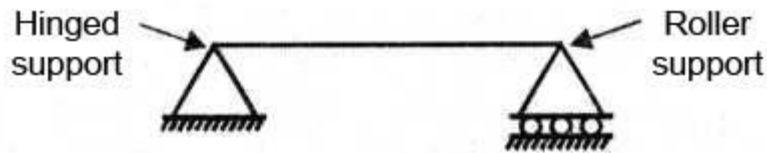


Figure:Simply supported beam

**Fixed Beam:**

A beam which is fixed at both the ends is known as Fixed beam.

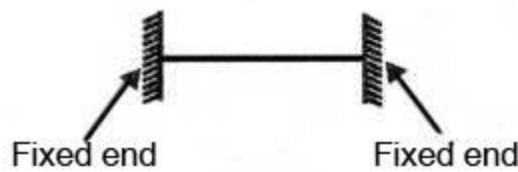


Figure:Fixed Beam

**Overhanging beam:**

If the end portion of a beam is extended beyond the support, it is called as overhanging beam. A beam may be overhanging either on one side (or) both the sides.

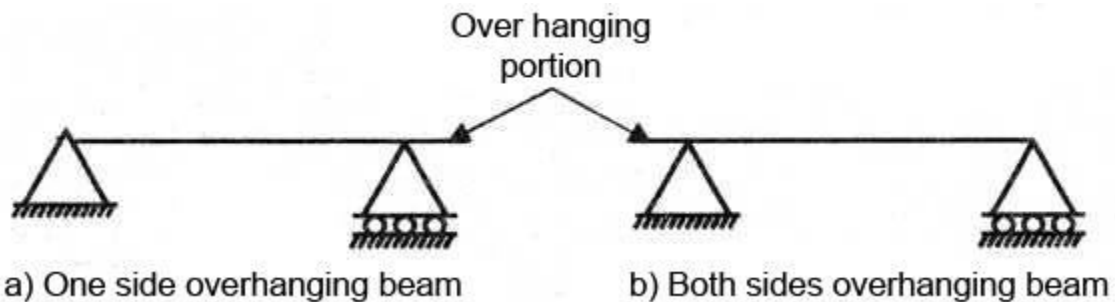


Figure:Overhanging beam

**Continuous Beam:**

A continuous beam is a structural component that provides resistance to bending when a load or force is applied. These beams are commonly used in bridges. A beam of this type has

more than two points of support along its length. These are usually in the same horizontal plane, and the spans between the supports are in one straight line.

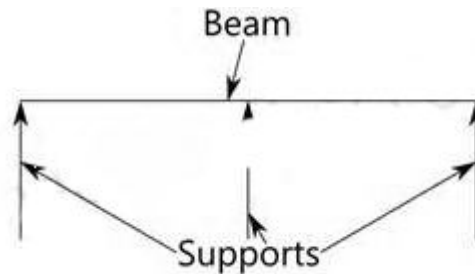


Figure:Continuous Beam

### Types of support

1. Roller support
2. Hinged support
3. Fixed support

#### Roller support:

The simplest type of support, in practice consist of either a single or a group of rollers.

This type of support cannot withstand any force parallel to its own plane. Reaction is always perpendicular to the plane of Roller.



Figure:Roller support

### Hinged support:

Hinged support, also called as pinned support can withstand any type of force both horizontal and vertical. Hence this support can offer two reaction components in horizontal and vertical directions.

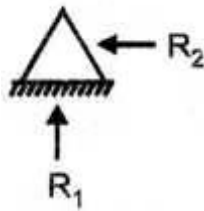


Figure:Hinged support

### Fixed support:

Fixed support, considered as the strongest support can offer reactions in horizontal and vertical directions. In addition, this type of support can resist rotation of beam at the end. Hence this support offer a moment reaction also.

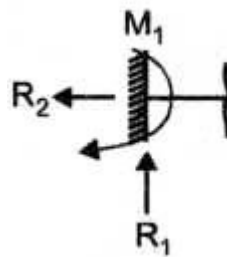


Figure:Fixed support