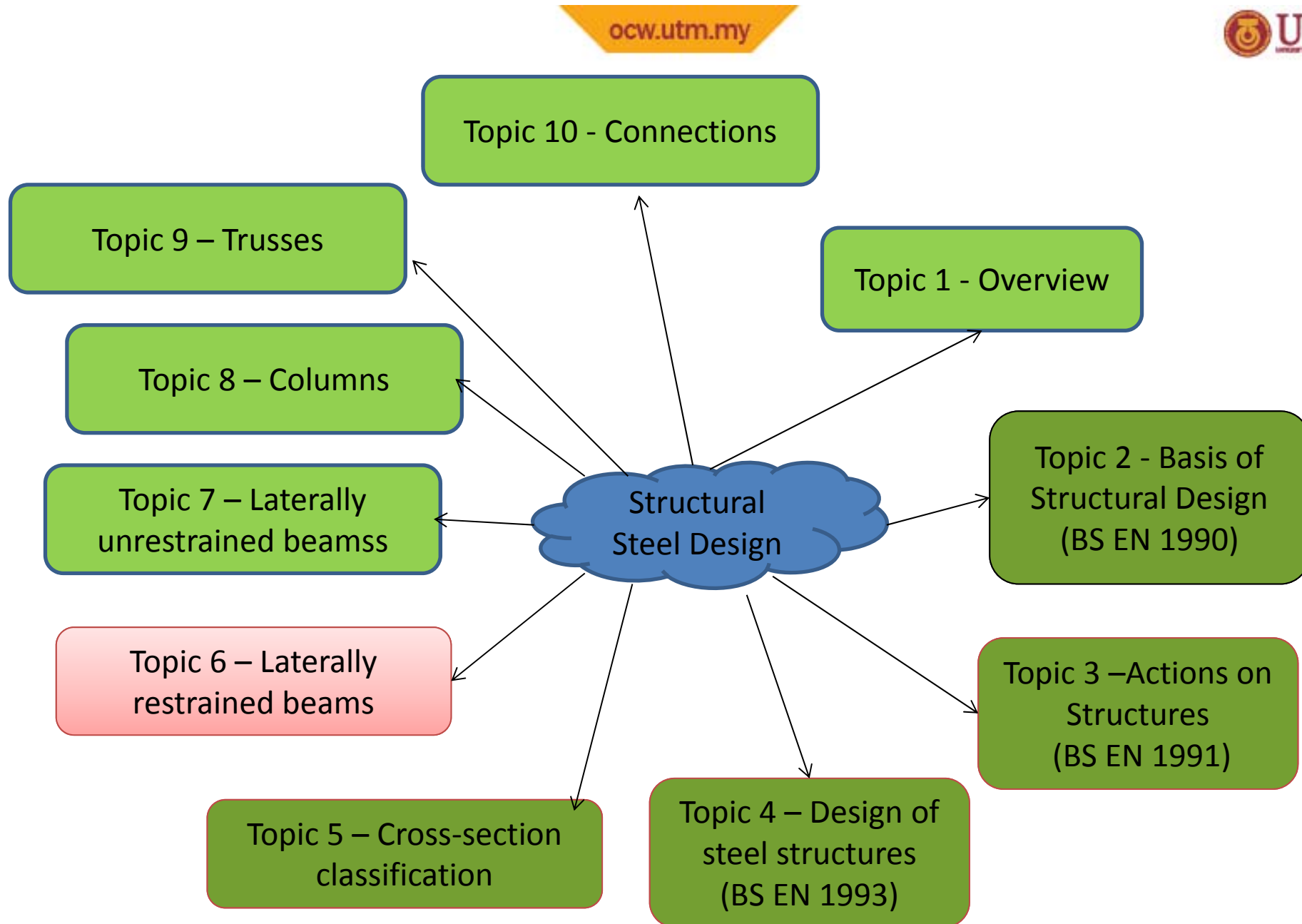


Structural Steel and Timber Design SAB3233

Topic 6 Laterally restrained beams

Prof Dr Shahrin Mohammad







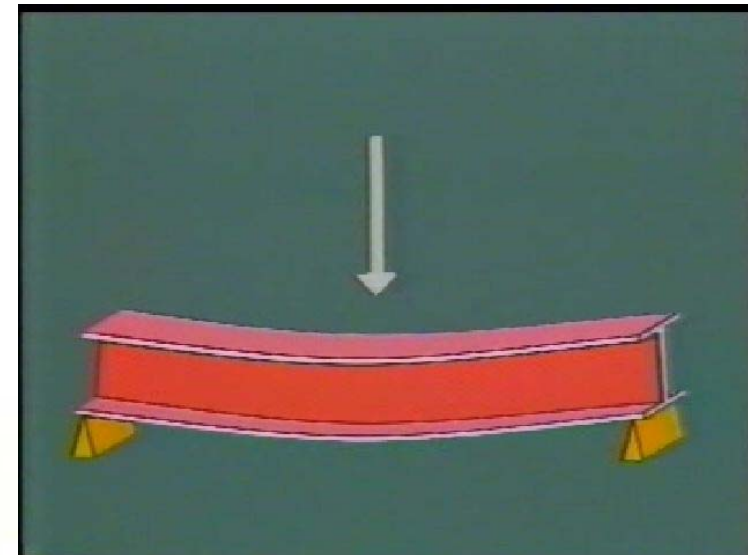
Secondary beams

Main beams

Secondary beams

Main beams

Beam is a member predominantly subject to bending. A beam is a structural member which is subject to transverse loads, and accordingly must be designed to withstand shear and moment. Generally, it will be bent about its major axis



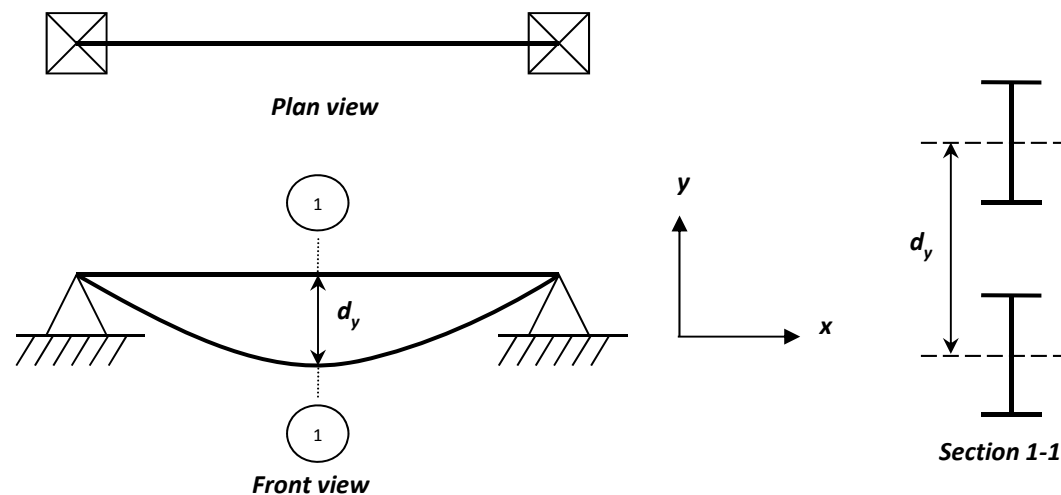
Types of restraining condition of beam

- In the design based on the standard, two types of restraining condition of beam i.e.
 - restrained beam and
 - unrestrained beam

Types of restraining condition of beam

1. Restrained Beam

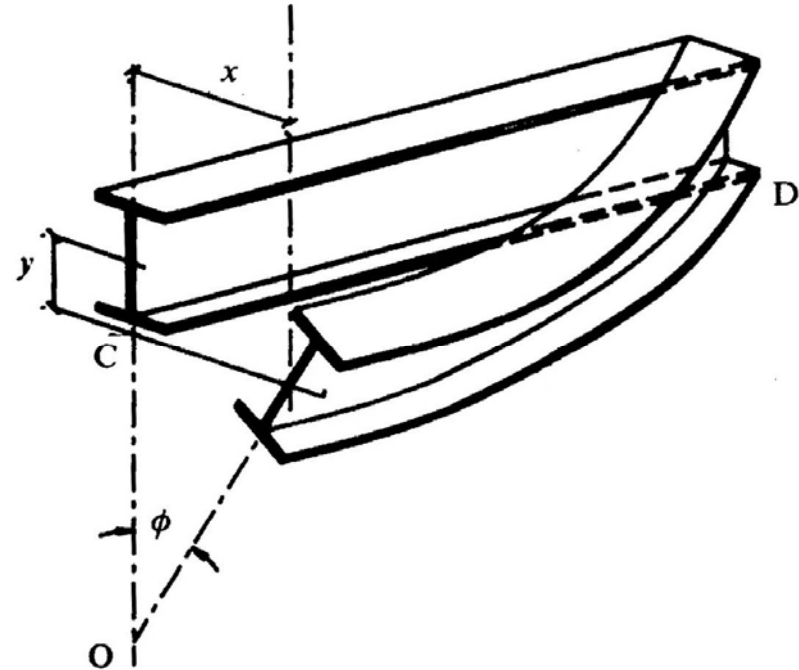
A beam where the compression flange is restrained against lateral deflection and rotation. Only vertical deflection exists.



Types of restraining condition of beam

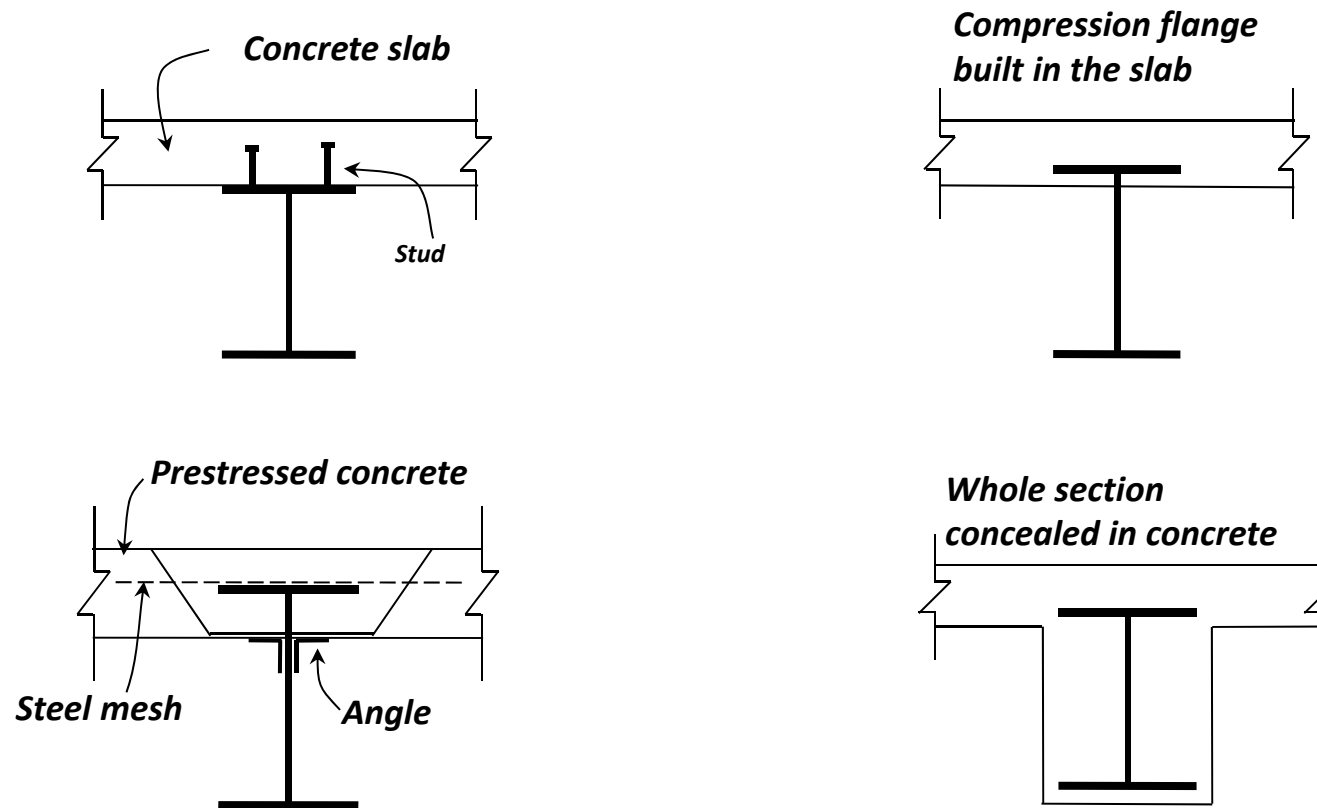
2. Unrestrained Beam

- The compression flange is not restrained from deflect laterally and rotate about the plan of the section, which is called **lateral torsional buckling**
- Three components of displacement i.e. vertical, horizontal and torsional displacement



Restrained Beam

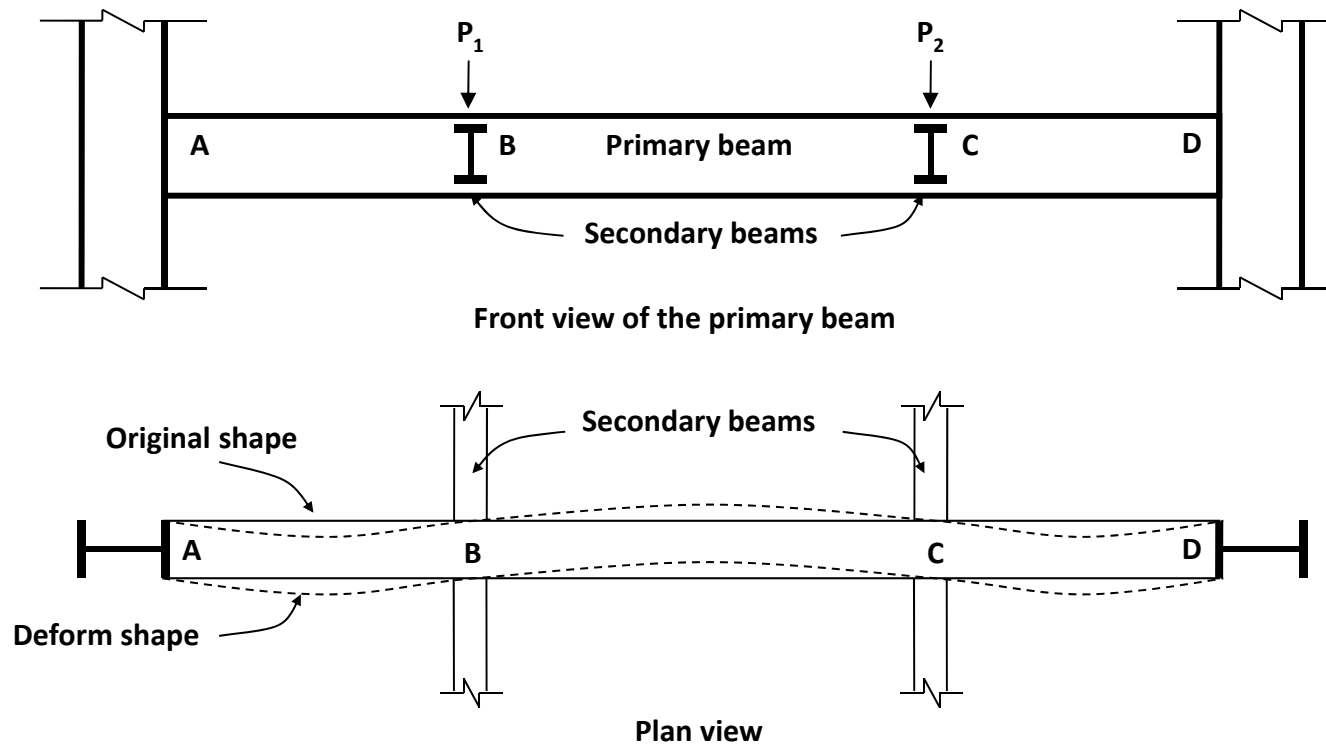
A full lateral restraint may be provided by concrete floor which sufficiently connected to the beam, or by sufficient bracing members added.





Restrained Beam

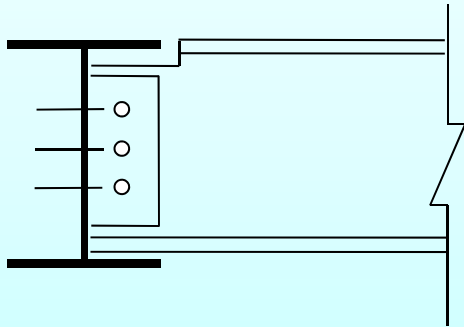
- Lateral restraint may be of along the span or at some points along the span.



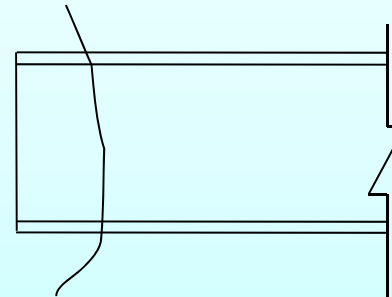
Points A, B, C and D are restrained from deform laterally by the secondary beams and the connection at column

LATERAL RESTRAINT

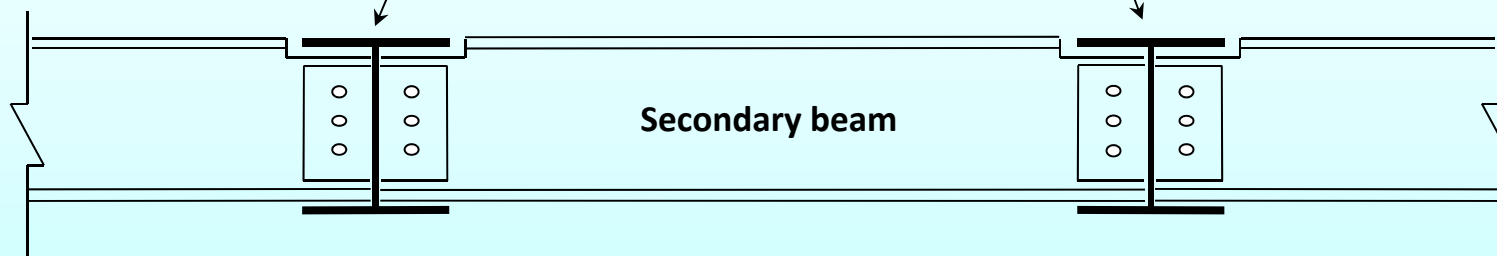
Secondary beam provides lateral restraint to the primary beam at the connected point



Lateral restraint exist at the beam end which fixed in the concrete

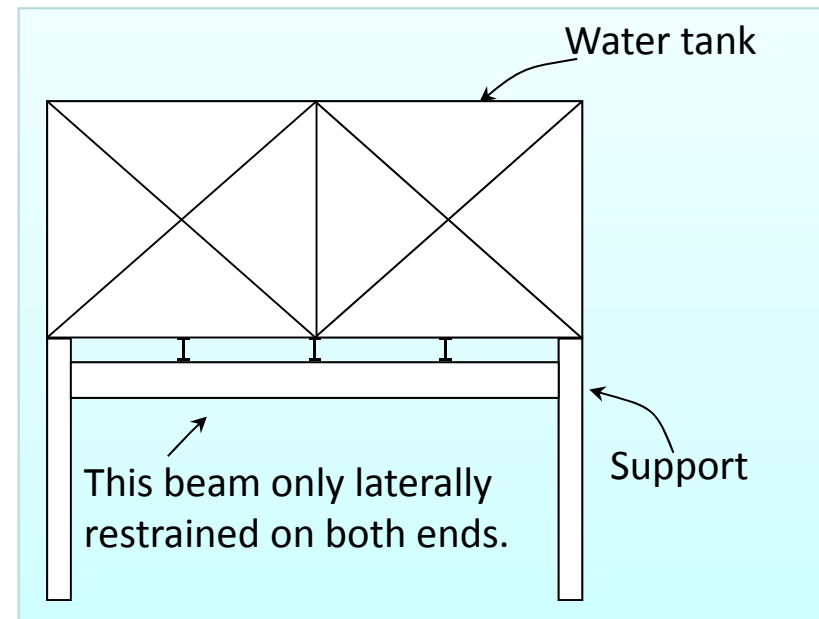
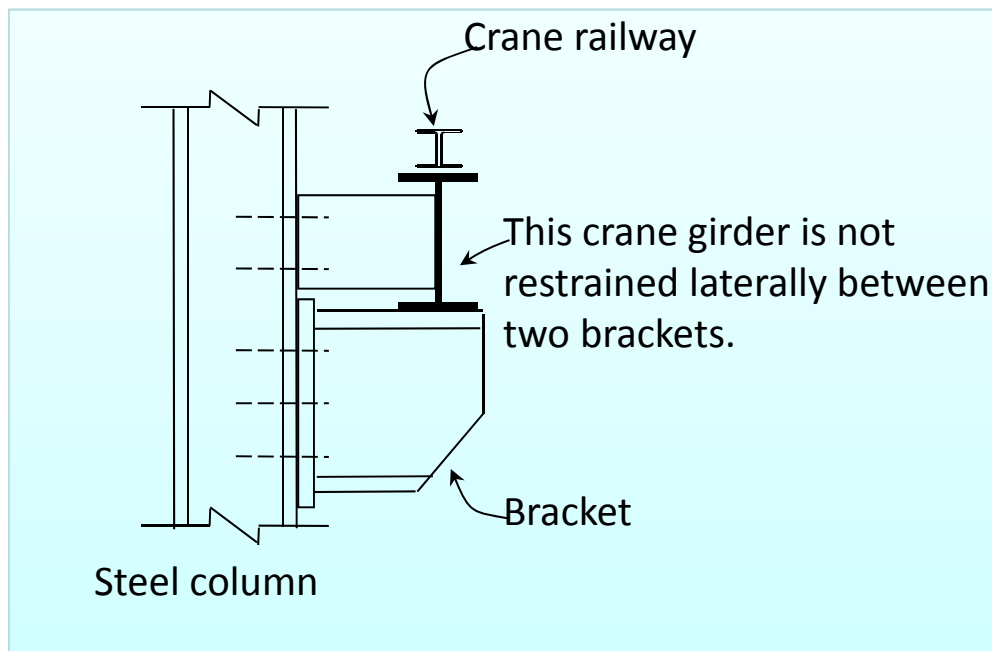
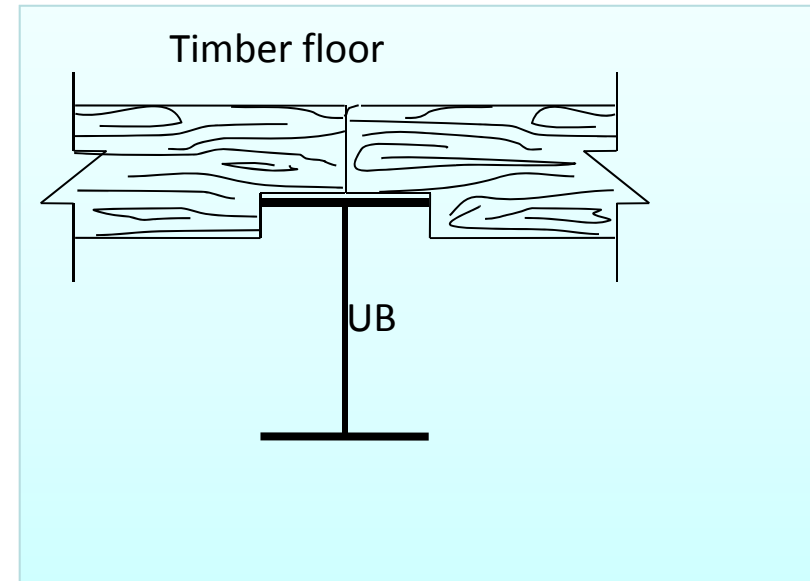
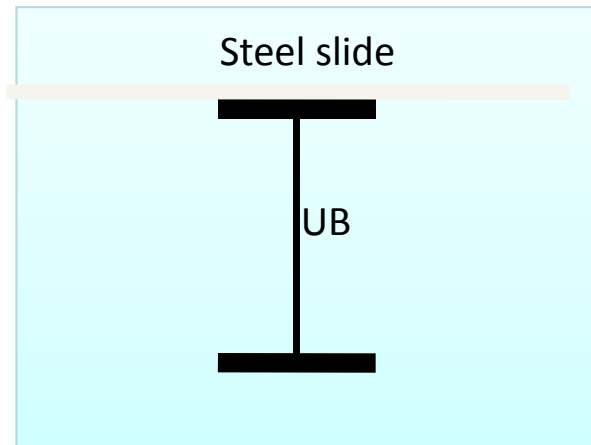


Secondary beam provides lateral restraint to primary beams at the connected point



Unrestrained Beam

Examples :







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