

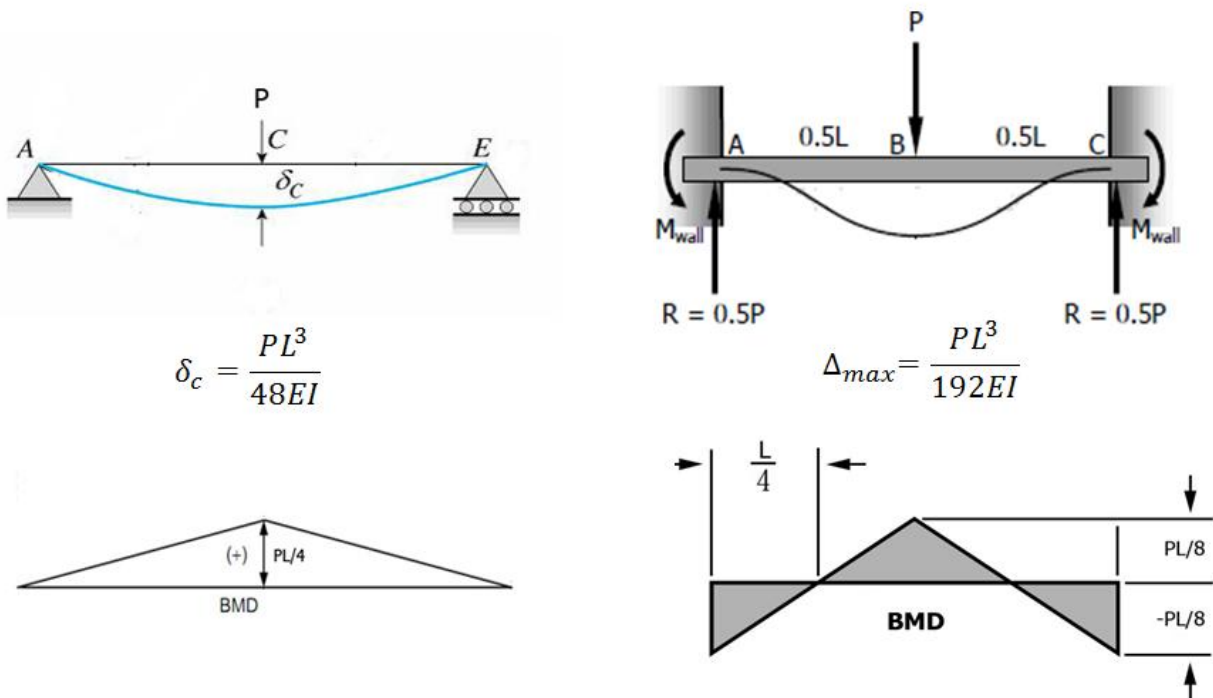
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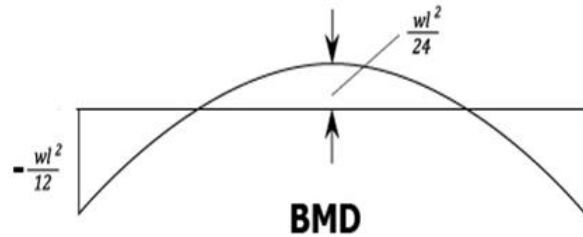
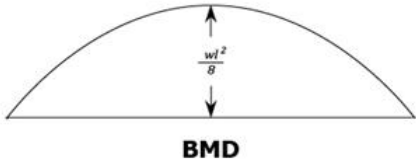
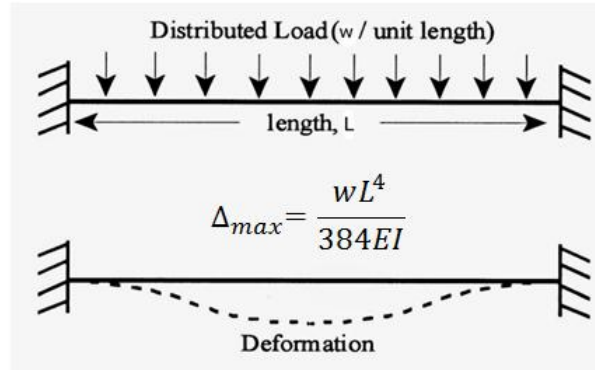
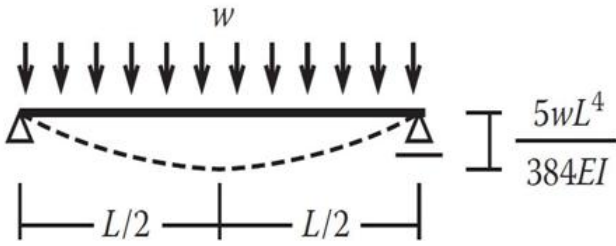
Structural Analysis and Design-II

There are some major advantages to statically indeterminate structures than statically determinate structures (courtesy of Prof. E.W. Sandt, Prof. J. S. Arora, Prof. Q. Wang, and Prof. Gebland).

Advantages:

1. Statically indeterminate structures have a tendency to redistribute its load to redundant supports in the case of faulty design or overloading occurs.
2. Statically indeterminate structures can support loads with support loading on thinner members with increased stability.
3. Statically indeterminate structural designs create lighter and more rigid structures. With added redundancy in the structural system, there is an increase in the overall factor of safety in statically indeterminate structures.
4. Statically indeterminate structures introduce redundancy, which may insure that failure in one part of the structure will not result in catastrophic or collapse failure of the structure.
5. Statically indeterminate structures typically result in smaller maximum stresses and greater stiffness, therefore, smaller deflections as illustrated for the following beam.





Disadvantages:

1. More analysis is involved than statically determinate structures.
2. Comparatively expensive to make an indeterminate than determinate structure.
3. Redundant structures can induce problems such as differential displacement i.e. A stress created by settlement of a support.

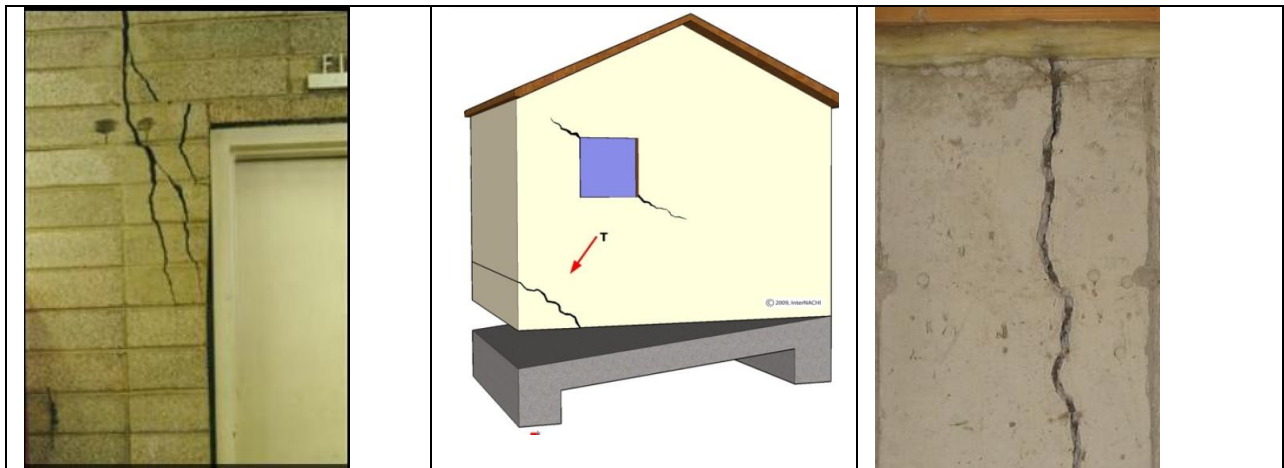


Figure: Differential settlement distresses