

1.8 ADVANTAGES OF LIMIT STATE METHOD OVER OTHER METHODS

The advantages of limit state method over the other methods are the following

- a) In the limit state method of analysis, the principles of both elastic as well as plastic theories used and hence suitable for concrete structures
- b) The structure designed by limit state method is safe and serviceable under design loads and at the same time it is ensured that the structure does not collapse even under the worst possible loading conditions
- c) The process of stress redistribution, moment redistribution etc., are considered in the analysis and more realistic factor of safety values are used in the design
- d) Hence the design by limit state method is found to be more economical.
- e) The overall sizes of flexural members (depth requirements) arrived by limit state method are less and hence they provide better appearance to the structures.

Working Stress Method	Limit State Method
The stress in a component is derived from the working load and compared with the permissible stress.	The stresses are derived from the design load and are compared with the design strength.
This method can also be referred to as the deterministic method as a result of the method assumes that the actual load, permissible stress and safety factors are identified.	This method can also be referred to as non-deterministic because the method is based on a probabilistic approach that relies on real data or experience.
The work stress method is based on elastic theory which assumes that concrete and steel are elastic and the stress-strain curve for both is linear.	The limit state method is based on the actual stress-strain curves of steel and concrete, The stress-strain curve for concrete is non-linear.
Physical capabilities are largely underestimated, Safety factors are used in the work stress method.	The capabilities of the material are not underestimated as much as they are in the working stress method. Partial protection factors

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	are used in the limit state method.
The ultimate load-carrying capacity cannot be precisely predicted.	Ultimate stresses of the material themselves are used as allowable stresses.
Within the work stress method, the material follows Hooke's rule because the stress is not allowed to exceed the yield limit.	In the limit state method, stress is allowed to exceed the yield limit.
In working stress method, a section which is plane before bending remains plane after bending.	In LSM, a section normal to the axis of the structural element remains on the plane after bending.
In the work stress method, no safety factor is used for the load.	In the limit state method, the design load is obtained by multiplying the load's partial safety factors to the work load.
The working stress method is less economical as it gives thicker parts.	The limit state method is more economical because it gives thin sections.