

## **Analysis of Cracked Beams with Spalling Having Different Arrangements of the Reinforcement Bars Using Finite Element Analysis (FEA)**

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**Abstract :** The existence of a crack, affects the mechanical behaviour and various properties of a structure to a great degree. This paper focuses on recognizing the parameters that gets changed due to the formation of cracks and have a great impact on the performance of the structure. Spalling is a major concern as it leaves the reinforcement bars more susceptible to environmental attacks. Beams of cross section 300 mm × 500 mm are designed and for a calculated area of steel, two different arrangements of reinforced bars are analysed. Results are prepared for different stages of cracking for each arrangement of rebars. The parameters for both arrangements are then compared. The Finite Element Analysis (FEA) is carried out and changes in the properties like flexural strength, Elasticity and modal frequency are reported. The conclusions have been drawn by comparing the results.

**Keywords :** cracks, elasticity, spalling, FEA