Automated ILD Generation for Deflection of Simply Supported, Fixed and Propped Cantilever Beam Using Excel

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Abstract:

Present work compares results of influence line diagram (ILD) obtained using excel. The ILD shows the behaviour of beam for unit load moving across the span. The ILD can be drawn for deflection at point, slope at a point or support, bending moment, reaction, shear force and end moments. For analysis of beams on road or railway bridges which have moving loads the Influence line diagrams (ILDs) performs the crucial role. This paper presents an automatic analysis method for developing Influence line diagram (ILD) for deflection of single span 1) simply supported, 2) Fixed, and 3) propped cantilever beam on Microsoft Excel. The Macaulay's method is taken in account for input for calculating the Values of ILD. This graphical representation helps to visualize the behaviour of beam for effect of moving load. It is seen the ILD constructed for single span simply supported beam, fixed beam, and propped cantilever beam by slope deflection method on Microsoft Excel are accurate, economical and reduces the time for manual calculation.

Keywords:

Excel, Influence Line Diagrams, Moving Loads, Structural Analysis.