



## Determination of the Displacement Amplification Factor ( $C_d$ ) of Industrial Steel Structures with Cranes

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### Abstract

According to construction of industrial Steel Structures with Cranes in developing countries, the importance of studying the seismic behaviour of such structures are getting to be evident. In this research, 3 models of existing industrial steel structures containing overhead cranes, are selected. Connections are assumed to be bolted in all models. For Time History Analysis purposes, accelerograms recorded on soil types 1, 2 & 3 are selected according to 4<sup>th</sup> version of Iranian 2800 seismic code and scaled to  $S_a=0.25g$  &  $S_a=0.35g$  spectral acceleration levels. The Nonlinear Time History analyses of models are completed using above mentioned records. Modal Pushover analysis is also carried out to illustrate the yielding base shear force and displacement and of the first plastic hinge to form. Finally, the results of Ductility Factors,  $\mu$ , overstrength Reduction Factors,  $R_s$ , and the Displacement Amplification Factors,  $C_d$ , are computed for models based on spectral accelerations and soil categories, after which the final results are summarized.

### Keywords:

Nonlinear Time History Analysis, Industrial Steel Structures with Cranes, Spectral Acceleration, Displacement Amplification Factor, Modal Pushover Analysis

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