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Benefits of Backstay Effect in Design of Podium Structure for Tall Building as Per IS 16700:2017

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Abstract: *In a multi-functional tall building, generally the building has a more extensive plan area and higher lateral resistance at the lower story level than the above story levels. So, the scope of this study is to understand the realistic behaviour of such structures under lateral loads considering the backstay effect as per IS: 16700(2017). The present work focus on the effect of podium structure of single tower structure connected by a common podium at the interface level under seismic load. For this purpose, the simulation model with varying tower height and podium height is created in the ETABs and it is analysed for the equivalent static and response spectrum method. In this study, the effect on the top displacement of the tower connected with podium structure under equivalent static and response spectrum method of analysis is observed. The backstay forces that are developed to resist the lateral overturning actions at the interface when the lateral horizontal forces are transferred from the tower to the podium are studied. The unfavourable effect of podium on the shear force distribution at and above the interface level of the structural wall is observed. The positioning of the tower on the podium structure is found to be the reason for the differential displacement between the structural walls.*

Keywords: Tall structures, Podium, Backstay effect, Floor diaphragm, Structural wall

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