

Modal Analysis of Various Truck Unloading Platforms by Finite Element Method

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Truck unloading platforms are available in many logistic center in order to unload goods inside a trailer very rapidly. The most widespread unloading platforms are powered by hydraulics. During the operation of an unloading platform, the tip of the platform can raise more than 12 meters from the ground. Since wind speed increase with altitude, this height may cause structural problems on the platform. Therefore, in this study, dynamic characteristic of various platforms was evaluated by finite element method. In the analysis, the platforms were considered as unloaded and loaded with a mass of fully loaded truck. The first twelve frequencies and first twelve mode shapes of the platform deflection were calculated. According to these results, when the platform was unloaded, natural frequencies and deformation were slightly different for two various platforms, whereas there was a significant difference in these values for other platform. When the platform was loaded, all platforms natural frequencies were found close to each other. Adding load to the platform lowered the frequencies up to 1 Hz at first mode of all platforms.

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