

탄성 댐퍼가 추가된 대형철골 구조물의 응답특성

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Response Characteristics Of Steel Frame Structures With Added Elastic Dampers

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Key Words : elastic damper, dynamic response, steel frame

Abstract : Coupling adjacent steel frame using elastic dampers for control of response to low and moderate dynamic event is investigated in this paper. The complex modal superposition method is first used to determine dynamic characteristic, mainly modal damping ratio and modal frequency, of damper linked linear adjacent steel frame for practical use. Dynamic response of steel frame linked by hydraulic-excitation method. This combined method can effectively and accurately determine dynamic response of non-classically damped systems in the frequency domain. Parametric studies are finally performed to identify optimal parameters of elastic dampers for achieving the maximum modal damping ratio or the maximum response reduction of steel frame. It is demonstrated that using discrete elastic dampers of proper proper parameters to link steel frame can reduce dynamic response significantly. ameters to link steel frame can reduce dynamic response significantly.

평판에서 빔 보강재의 결합 위치를 이용한 구조물 변경법

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Structural dynamics modification using position of beam stiffener on plate

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Key Words : substructure, modification, eigenvalue sensitivity, positional design variable

Abstract :Substructures position is considered as design parameter to obtain optimal structural changes to raise its dynamic characteristics. In conventional SDM (structural dynamics modification) method, the layout of modifying substructures position is first fixed and at that condition the structural optimization is performed by using the substructures size and/or material property as design parameters. But in this paper as a design variable substructures global translational and rotational position is treated. For effective structural modification the eigenvalue sensitivity with respect to that design parameter is derived based on measured frequency response function. The optimal structural modification is calculated by combining eigenvalue sensitivities and eigenvalue reanalysis technique iteratively. Numerical examples are presented to the case of beam stiffener optimization to raise the natural frequency of plate.