

## Investigation of Vortex Induced Vibration and Galloping Characteristic for Various Shape Slender Bridge Hanger

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**Abstract :** Hanger at the arch bridges is an important part to transfer load on the bridge deck onto the arch. Bridges are subjected to several types of loadings, such as dead load, temperature load, wind load, moving loads etc. Usually the hanger bridge has a typical bluff body shape such as circle, square, H beam, etc. When flow past bluff body, the flow separates from the body surface generating an unsteady broad wake. These vortices are shed to the wake periodically with some frequency that is related to the undisturbed wind speed and the size of the cross-section body by the well-known Strouhal relationship. The dynamic characteristic and hanger shape are crucial for the evaluation of vortex induced vibrations and structural vibrations. The effect of vortex induced vibration is not catastrophic as a flutter phenomenon, but it can make fatigue failure to the structure. Wind tunnel tests are conducted to investigate the VIV and galloping effect at circle, hexagonal, and H beam bluff body for hanger bridge. From this research, the hanger bridge with hexagonal shape has a minimum vibration amplitude due to VIV phenomenon compared to circle and H beam. However, when the wind bruises the acute angle of hexagon shape, the vibration amplitude of bridge hanger with hexagonal shape is higher than the other bluff body.

**Keywords :** vortex induced vibration, hanger bridge, wind tunnel, galloping

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