A NOVEL APPROACH FOR PRELIMINARY DETERMINATION OF DYNAMIC WIND IN DESIGN PROBLEM

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Tóm tắt bằng tiếng Việt:

In design problem, the determination and selection of preliminarily geometrical dimensions for all structures in building normally is large difference in comparison with real results. Simultaneously it consumes a lot of time. Specifically, for high-rise building that the impact of dynamic wind to the results of preliminary verification, assessment and design is large. Therefore, seeking of a solution that it can surmount and reduce the aforementioned drawbacks is very necessary. This paper is about description of a novel approach based upon a factor. In which it is defined by a ratio between dynamic wind and static wind in order to precisely and effectively evaluate the preliminary design. During formulation of this factor, it is based on TCVN 2737:1995 [1] and TCXD 229:1999 [2] concerning to computation of dynamic and static components of wind load. Fortunately, the results of the proposed method have been validated with the results by using SAP2000® software, simultaneously comparison with the ratio of bottom shear forces (BSF). Further this approach also investigates the effect of structural stiffness with respect to values of dynamic component of wind load. All comparative results have demonstrated that the proposed approach is reliable and effective.

Từ khóa: Wind load; dynamic wind; static wind; gust; loading factors.

Tóm tắt bằng tiếng Anh:

In the design problem, the determination and selection of preliminarily geometrical dimensions for all structures in buildings normally shows big differences in comparison with real results. Simultaneously, it consumes a lot of time. Specifically, for high-rise buildings with the impact of the dynamic wind on the results of the preliminary verification, the assessment and design is considerable. Therefore, the search for a solution that can surmount and reduce the aforementioned drawbacks is very necessary. This paper presents the description of a novel approach based upon a factor which is defined via a ratio between the dynamic wind and the static wind in order to precisely and effectively evaluate the preliminary design. The formulation of this factor is based on TCVN 2737:1995 [1] and TCXD 229:1999 [2] concerning the computation of the dynamic and static components of the wind load. Fortunately, the results of the proposed method have been validated with the results via the use of the SAP2000 software, simultaneously in comparison with the ratio of bottom shear forces (BSF). Furthermore, this approach also investigates the effect of structural stiffness with respect to the values of the dynamic component of the wind load. All the comparative results have demonstrated that the proposed approach is reliable and effective.

Key words: wind load; dynamic wind; static wind; gust loading factors.