GRAIN STORAGE CONSTRUCTIONS BEHAVIOR SUBJECTED TO WIND ACTIONS. MATHEMATICAL MODELS AND VON KARMAN ANALYSIS FOR GRAIN STORAGE CONSTRUCTIONS LOCATED IN SEAPORT AREAS

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Abstract. Constructions for storing grain located in seaport areas are most affected by the action of the wind. The most unfavorable behavior of the silos is in the category of prefabricated steel structures, where the slenderness of the structural assembly plays a decisive role. The action given by the wind over constructions is evaluated in accordance with the provisions of SR EN 1991-1-4, but, for this type of objectives, the standard method of calculating the action is, most of the time, restrictive - the results obtained being semi-precise. In this article we will present an analysis of the wind behavior of flat bottom silos, applying, as an alternative, the pseudo-static calculation method indicated by SR EN 1993-1-4. The article presents the advantages of using dynamic calculation methods, the emphasis being on the Von Karman model (modal calculation of an equivalent SDOF element). Through the numerical application presented, the advantages of using the second calculation method will be highlighted, this being proposed as an alternative for accurately establishing the displacement effects.

Keywords: *Steel silos, flat bottom, SCIA Engineer, wind calculation, Von Karman*