Parametric Study of the Structures: Influence of the Shells

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Abstract : The conception (design) of an earthquake-resistant structure is a complex problem seen the necessity of meeting the requirements of security been imperative by the regulations, and of economy been imperative by the increasing costs of the structures. The resistance of a building in the horizontal actions (shares) is mainly ensured by a mixed brace system; for a concrete building, this system is constituted by frame or shells; or both at the same time. After the earthquake of Boumerdes (May 23; 2003) in Algeria, the studies made by experts, ended in modifications of the Algerian Earthquake-resistant Regulation (AER 99). One of these modifications was to widen the use of shells for the brace system. This modification has create a conflict on the quantities, the positions and the type of the shells at adopt. In the present project, we suggest seeing the effect of the variation of the dimensions, the localization and the conditions of rigidity in extremities of shells. The study will be led on a building (F+5) implanted in zone of seismicity average. To do it, we shall proceed to a classic dynamic study of a structure by using 4 alternatives for shells by varying the lengths and number in order to compare the cost of the structure for 4 dispositions of the shells with a technical-economic study of the brace system by the use of different dispositions of shells and to estimate the quantities of necessary materials (concrete and steel).

Keywords : reinforced concrete, mixed brace system, dynamic analysis, beams, shells

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