**3. H. Al-Thairy, Y.C. Wang, An Assessment of the Current Eurocode 1 Design Methods for Building Structure Steel Columns under Vehicle Impact, Journal of Construction Steel Research, 88 (2013) 164–171**

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**Abstract**

This paper presents a detailed assessment of the static and dynamic force requirements in Eurocode 1 for the design of steel columns under vehicle impact. Numerical simulations of steel columns under vehicle impact were carried out using the finite element package ABAQUS/Explicit. In these numerical simulations, the vehicle was represented by a spring-mass system which had been validated previously by the authors. The assessment results indicate that the equivalent static design force approach in Eurocode 1 is generally conservative for small and moderately sized columns that are typically used in low and medium multi-storey buildings (less than 10 storeys). For bigger columns, it is unsafe to use the Eurocode 1 equivalent static forces. It has also shown that it is acceptable to use a dynamic impulse to represent the dynamic action of vehicle impact on columns, but it is important that both the column and vehicle stiffness values should be included when calculating the equivalent impulse force – time relationship. It is also necessary to consider the two stages of behaviour of the impacting vehicle, before and after the column is in contact with the vehicle engine. This paper presents a method to implement these changes.

Keywords: Assessment, Eurocode 1, Vehicle impact, Steel column, Design requirement, Equivalent static force, Dynamic impulse.