SEISMIC PERFORMANCE OF AN INNOVATIVE DISSIPATIVE REPLACEABLE COMPONENTS BRACING STEEL FRAME (DRBrC)

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In the present paper the structural performance of a Concentric X Brace Steel Frame equipped with easily replaceable dissipative seismic components, called *DRBrC* is presented.
As it know, conventional braced frames are an efficient structural solution for steel structures against seismic action, concepted to dissipate energy through the damage of braces, while the rest of the elements remain elastic. Anyway, nowadays, is not possible to design a structure in an economically sustainable way without admitting the damage of the dissipative elements and it is still considerably expensive and complicated to replace the whole braces after irreversible damages due to earthquakes. Because of this, wide research activity has been carried out in order to provide repairability of steel buildings, by means of easily replaceable dissipative components. In this spirit, Dissipable *"Fully dissipative and easily reparable device for resilient buildings with composite steel-concrete structure",* is a European research project (2018-2022) funded by the Research Fund for Coal and Steel (RFCS) of European Commission, that aimed to design, product and testing both the single dissipable components and real steel structures equipped with them, under the earthquake load. At this regard, DRBrC was studied during the project and described in this paper.
DRBrC, has the objective to locate the damage into a pin supported by plates forming a box: this element is designed to protect the remaining parts of the frame and to be replaced after the occurrence of a seismic event causing the yielding and plasticization of the pin. The advantage of this type of components is represented by their easy replacement following the earthquake without damaging of the main structure.
The results of Incremental Dynamic Analysis conducted on the structure and compared with the same obtained on a conventional case study building with the same geometry but without components, are reported and discussed, to underline the advantages and disadvantages of the adoption of DRBrC components.

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