

ASSESSMENT OF SEISMIC PERFORMANCE OF RC FRAME STRUCTURES WITH MASONRY INFILL PANELS PARTIALLY UNCOUPLED FROM THE SURROUNDING FRAME MEMBERS

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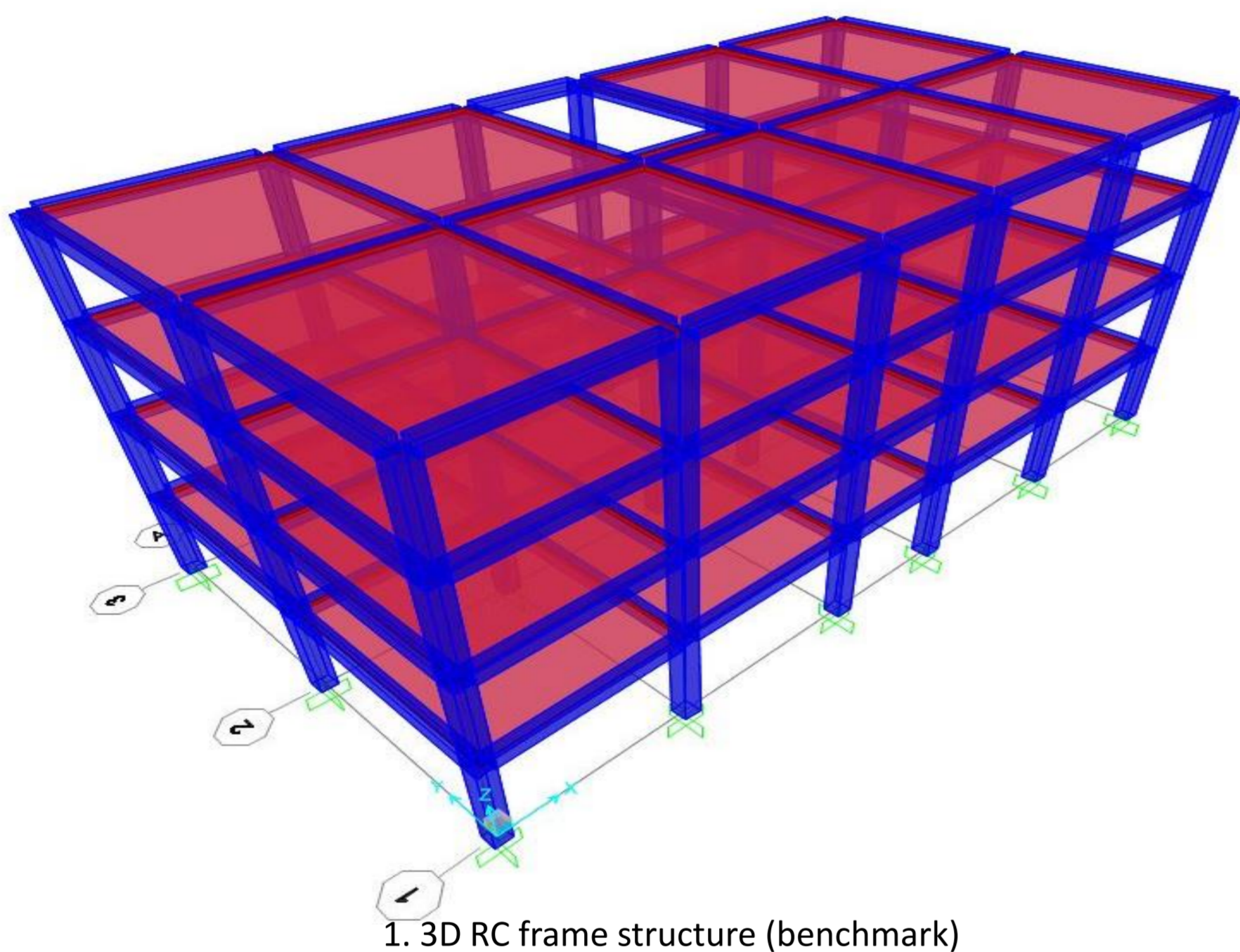
1. ABSTRACT

The present study numerically analyses the influence of physical and mechanical properties of materials used for masonry infill panels upon the seismic response of low rise reinforced concrete framed structure. The benchmark structure is a four-storey residential building located in Timisoara. Then, infill panels have been added to the structure, being investigated in four variants, by using 2 types of masonry units and two mortars bed joints altogether. The seismic behaviour of all buildings has been analysed in terms of peak inter-storey drifts at two limit states and the out-of-plane strength of infill panels. The results obtained in this study highlight the importance of physical and mechanical properties of the masonry infill panels in the assessments of seismic response of frame buildings.

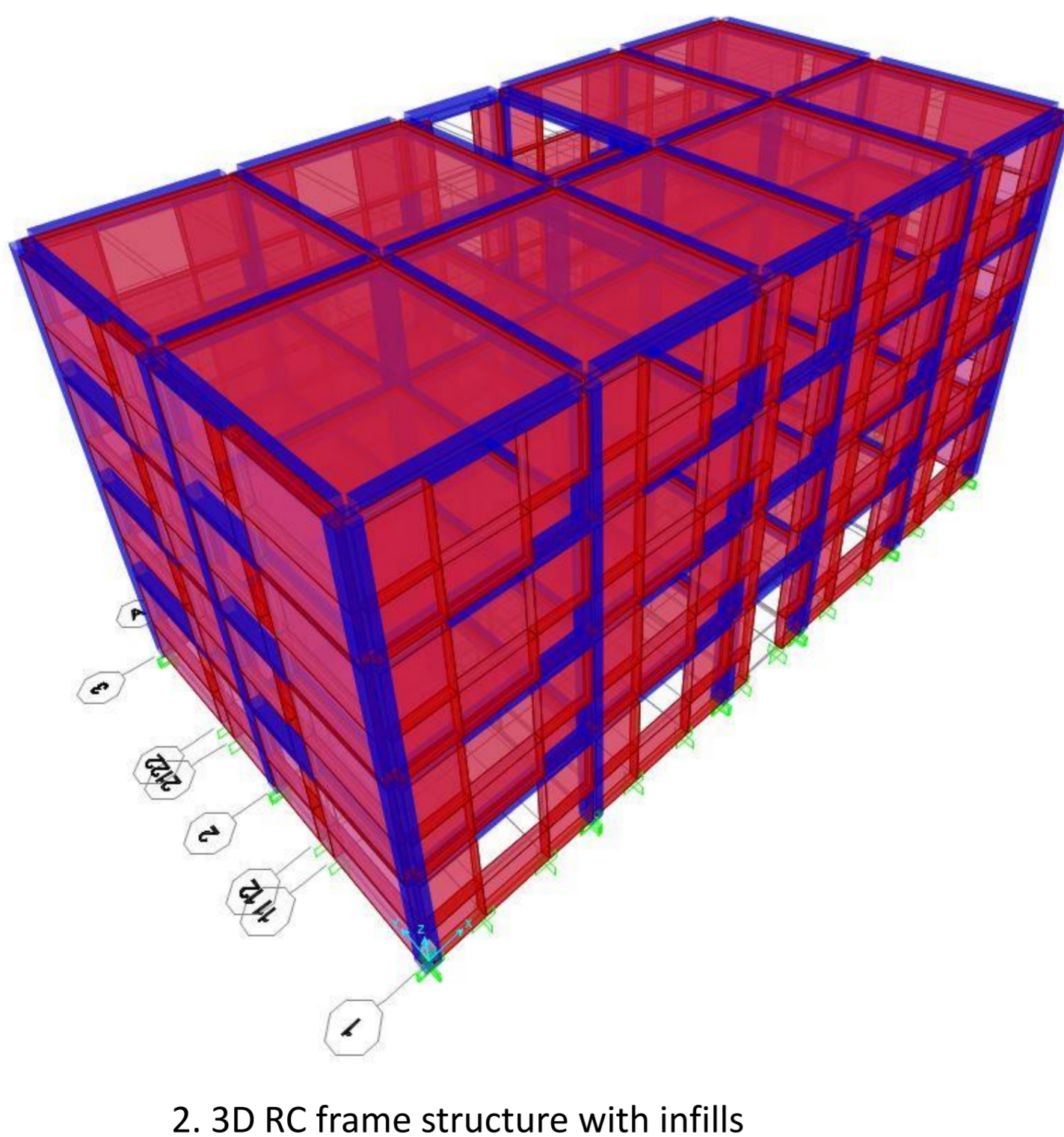
2. MATERIALS AND NUMERICAL SIMULATIONS

2.1 Structures

- ✓ Benchmark (the bare structure)



- ✓ Structure with infill panels



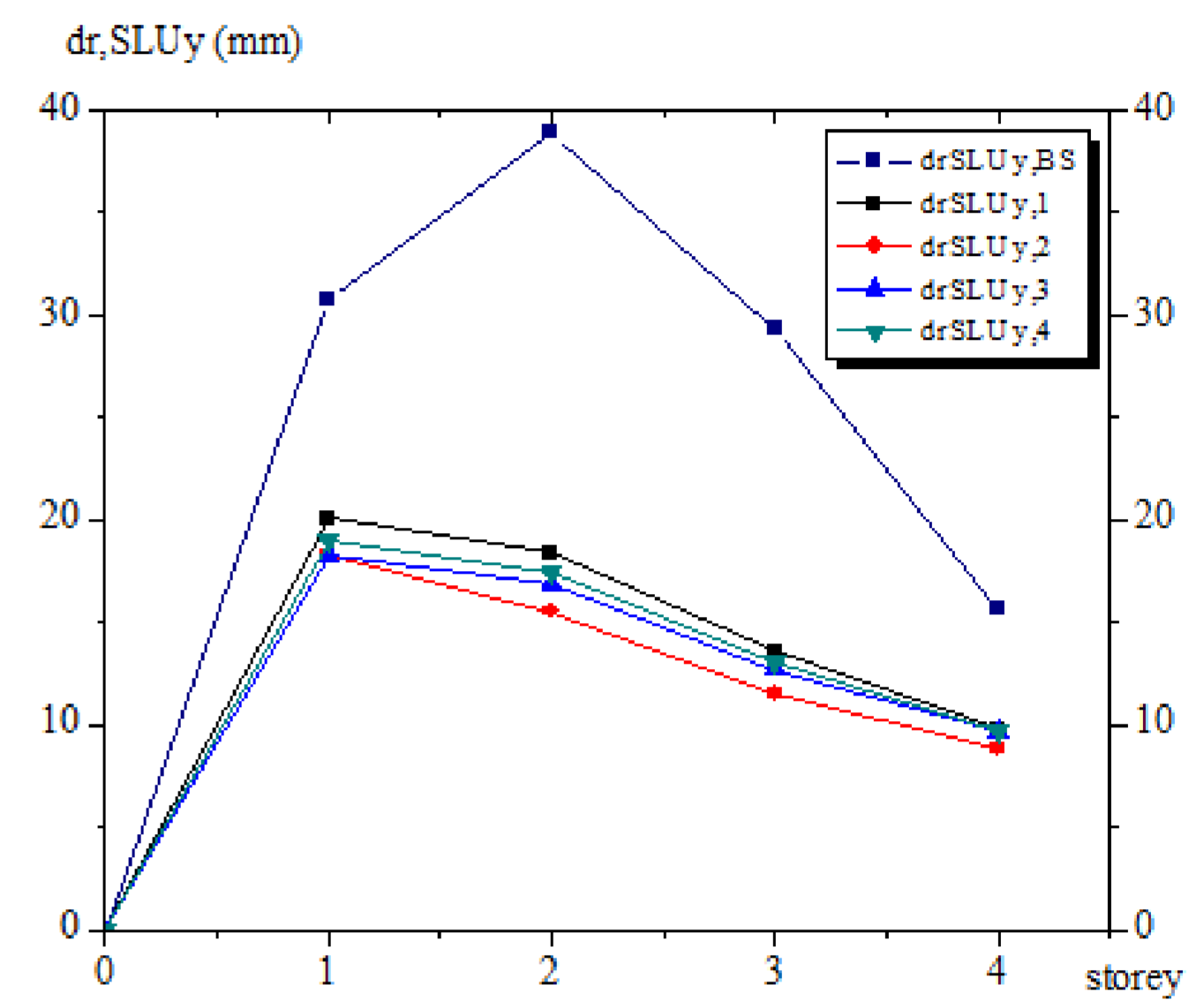
- ✓ Numerical simulations: SAP 2000

2.2 Materials used for masonry infill panels

- ✓ Hollowed ceramic blocks and mortar of class M5 used in normal bed joints (case 1) and respectively in thin bed joints (case 2);
- ✓ AAC and mortars of class M5 used in normal bed joints (case 3) and in thin bed joints, respectively (case 4).

3. RESULTS AND DISCUSSIONS

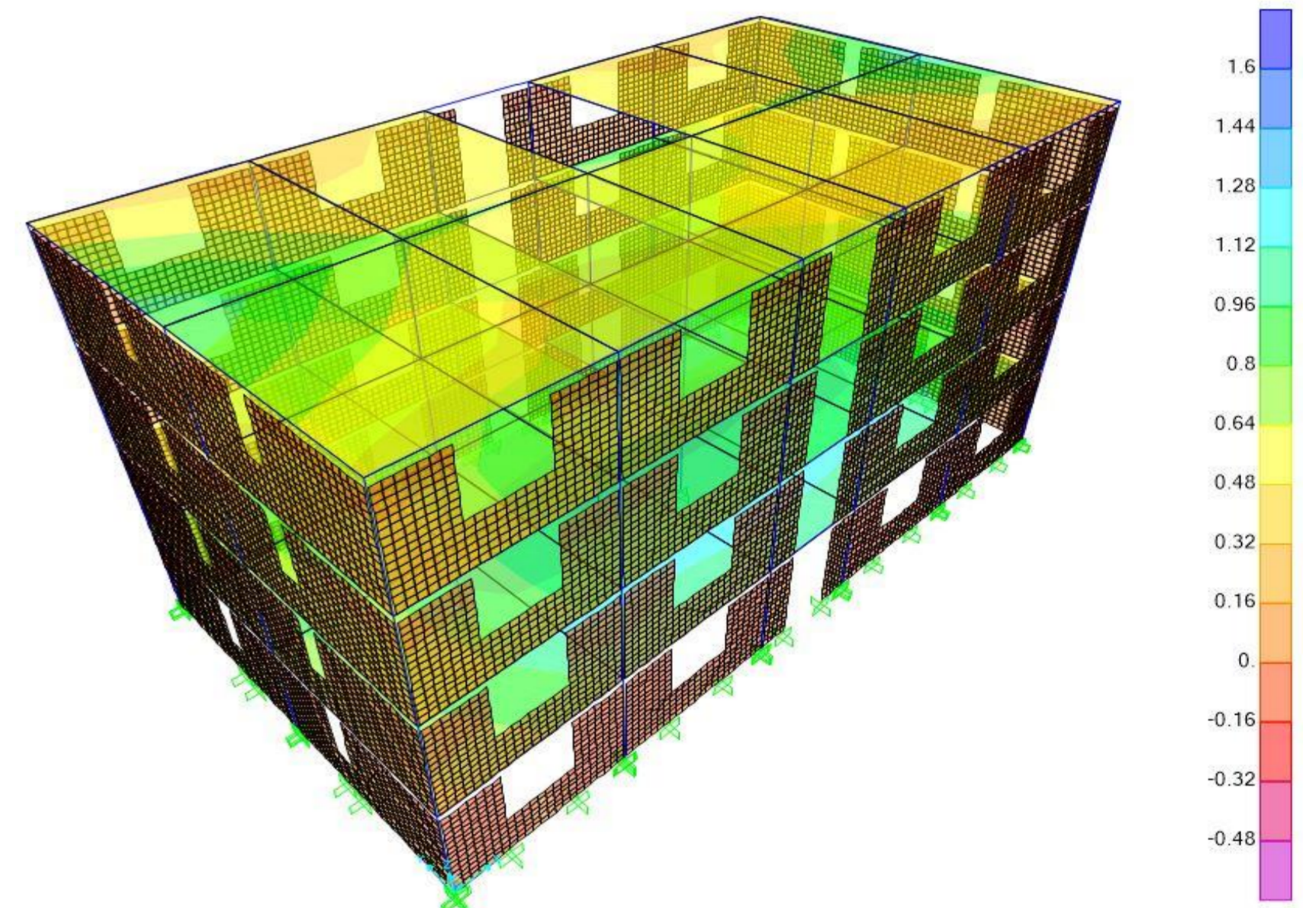
3.1 Inter-storey drifts



3. Inter-storey drifts of benchmark and infilled structures at ULS along Y direction

The results show that the peak inter-storey drifts reductions compared with the benchmark structure are up to 59% at SLS, and 61% at ULS.

3.2 Out-of-plane verification of infill panels



Safety verification is fulfilled only in cases 1 and 3, in both directions.

4. CONCLUSIONS

Seismic response of the buildings is influenced by the material properties (units and mortars) and masonry type (with normal or thin bed joints).

References:

- [1] Indicativ P100/1-2013, Cod de proiectare seismică - Partea I - Prevederi de proiectare pentru clădiri.
- [2] SR EN 1992-1-1, Eurocode 2: Proiectarea structurilor de beton. Partea 1-1: Reguli generale și reguli pentru clădiri.
- [3] Indicativ CR6-2013. Cod de proiectare pentru structuri din zidărie.