



2020

THE YEAR OF THE **3S** APPROACH

SAFE – SOUND – SUSTAINABLE



The need for integrating Structural / Seismic Upgrade of Existing Buildings, with Energy Efficiency Improvements

➤ The majority of the existing building stock in most European countries built in the 80s, 70s or earlier, lack modern design standards, including the requirements for seismic safety and energy efficiency. One of the most important Human rights is to possess **Safe, Sound and Sustainable buildings (3S)**.

➤ Thus, based on their date of construction, the vast majority of buildings are deficient both in terms of energy efficiency and seismic resistance. This creates the need for the society (public and engineers) to take actions to keep and maintain **the building stock in operational, reliable and resilient state, in order to ensure primarily the safety of the users.**

➤ The extent to which a building can resist loads depends mainly on its columns, beams and walls, its load resisting system – LRS. Most existing buildings do not pose significant Lateral load Resistance and require upgrading to increase the efficiency of one or more of the above. In the case of aging existing buildings, **the lack of consideration for any dynamic effect means that the building stock is more vulnerable to earthquakes and other dynamic effects.**

➤ In addition, as it is exceeding its design life of 50 years, it means that along with strengthening interventions to improve the building's seismic performance, **durability and structural assessments procedures to ensure functionality should also be carried-out, bringing safety and comfort for the users.**

➤ In the last decade, **the importance on the energy front has been highlighted enough; increased energy consumption lead to adverse environmental impact** (e.g. climate change). Therefore, the building sector introduced the energy efficiency concept, highlighted by Europe's goal to reduce the Greenhouse gas emissions by 20% and achieve 20% energy savings by 2020. **The building sector accounts for large energy consumption in EU** with the European households consuming nearly the 70% of the energy demand in the form of electrical energy. **Unfortunately, the importance of safety has not been highlighted or considered likewise.**

➤ Currently, from a sustainability perspective, emphasis has been placed on developing an integrated structural and energy design methodology for new buildings to override individual actions to ensure a **Sustainable Structural Design (SSD)**.

➤ However, in older existing buildings, the issue of structural, seismic and energy inefficiency becomes of primary importance and a similar overarching concept approach is required to provide upgrading on both fronts and if possible, in an integrated common holistic approach.

The new trend nowadays is...
smart financing for **smart** buildings.
But a building can only be called **smart...**
once it fulfills the **3S** approach
“safe, sound and sustainable”.

So, as ECCE we declare year 2020 as...
The Year of the **3S** Approach



 European Council
of
Civil Engineers

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