European Council of Civil Engineers

WCCE
WORLD COUNCIL OF CIVIL ENGINEERS

THE 3S APPROACH

SAFE - SOUND - SUSTAINABLE

THE NEED FOR INTEGRATING STRUCTURAL / SEISMIC UPGRADE

OF EXISTING BUILDINGS, TOGETHER WITH ENERGY EFFICIENCY IMPROVEMENTS

The majority of the existing building stock in most countries built in the 80s, 70s or earlier, lacks modern design and construction standards and techniques, including the requirements for resilience, robustness, seismic safety and energy efficiency. One of the most important Human rights is to possess **Safe, Sound and Sustainable** buildings **(3S)**. Adequate housing was recognized as part of the right to an adequate standard of living in article 25 of the 1948 Universal Declaration of Human Rights and in article 11.1 of the 1966 International Covenant on Economic, Social and Cultural Rights.

Based on their date of construction, the vast majority of buildings are deficient in terms of energy, durability and seismic resistance. This creates the need for society (public and engineers) to take immediate actions to maintain the aging existing building stock in an operational, reliable and resilient state, in order to ensure primarily the safety of the users. That will also greatly contribute to United Nations Sustainable Development Goal 11 - Make cities and human settlements inclusive, safe, resilient and sustainable and other related UN initiatives such as the Sendai Framework for Disaster Risk Reduction or UN Habitat's Global Housing Strategy, the Sustainable Development Goal for Safe and Resilient Cities.

The extent to which a building can resist loads depends mainly on the characteristics of its lateral load resisting system – LLRS (i.e. columns, beams, foundations, floor slabs and supporting walls). Most existing buildings do not pose significant Lateral Load Resistance and require upgrading to increase the efficiency of one or more of the above. For many EU countries and many others around the world, the structural performance and safety are intertwined with seismic vulnerability.

In the case of the aging existing buildings, the lack of consideration for structural stability and durability means that such building stock becomes more vulnerable to natural (earthquakes, flooding, tsunami, extreme weather events, drought, landslides, volcanic events) or man made (transport disasters and explosions) disasters. In addition, as buildings' design life is coming to an end, interventions will be required to ensure habitability and basic services provision along with any other structural stability and durability assessments ensuring safety and comfort for the users.

In the last decade, the importance on the energy front has been highlighted enough; increased energy consumption led 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 the EU with European households consuming nearly 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 aging 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.

A common method of evaluation of the seismic and structural vulnerability of buildings is of paramount importance for governmental authorities to quantify the required resources, plan investment schemes and define prioritisation strategies for seismic and structural risk mitigation and corresponding sustainable retrofitting.

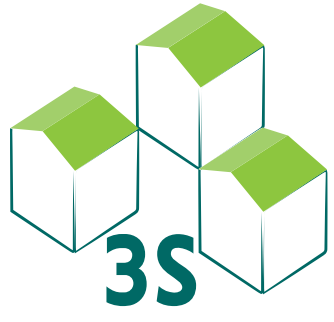
The new trend nowadays is...
smart financing for smart buildings.

But a building can only be called smart... once it fulfills the 3S approach "Safe, Sound and Sustainable".

So, the World Council of Civil Engineers (WCCE) and the European Council of Civil Engineers (ECCE) would like to declare the urgent need to follow and implement the 3S Approach.

3S Approach
Safe - Sound - Sustainable

(ECCE Moto for 2020)



Read more

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