

# Why civil engineers can be superheroes and why civil engineers are even obliged to become superheroes

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Imagine the corrupt, calamitous, condemning Carla Carbonatrix (Fig. 1) is planning to roast town. What will be the only logical solution to stop her?

Ask your children! They will know the answer: only a league of superheroes can stop her (Fig. 2). A league of people who put all their individual talents together to create one collective force, which is greater than the sum of their individual talents.



Fig. 1: Carla Carbonatrix, trying to roast your town.



Fig. 2: Typical league of super heroes using characteristic poses to show off.

However, also in real life, may it be any kind of team sports, global business, arts or music, successful projects require that people operate together - hand in hand and synchronised.

Only in construction business, this seems to be totally forgotten. First, the investor makes decisions, then the architect defines the structure, then the structural designer specifies the materials properties, which, then, are developed and delivered by materials experts. Eventually, this is all brought together by the executing engineer. This is a pretty linear process, which is neither hand in hand nor synchronised (Fig. 3).



Fig. 3: Typical players in the construction decision making chain.

Imagine Carla Carbonatrix were real, and along with your town she aims at roasting the entire globe. Wouldn't it be necessary to find the adequate league of superheroes to stop her?

Most relevant global challenges of this century, namely, habitat, infrastructure, urbanisation, environment, and sustainability are heavily linked to civil construction activities. Thus, civil engineers and architects along with their sisters and brothers from physics, chemistry, materials, geo and environmental sciences, and economics are doubtless responsible for our global challenges.

At the same time, when we consult, plan, build, maintain, and exploit and process our global resources in a conscious, sustainable way, we also hold the key for a brighter, more climate friendly future.

Hence, by conscious engineering, good communication, and by putting together all individual talents to create one collective combined force, which is greater than the sum of our individual talents, we, civil engineers, architects and adjoining disciplines definitively do have the potential to become members of a global league of superheroes (Fig. 4).



Fig. 4: Civil engineers getting used to their superhero outfits.

However, while it is nice to know that this is possible, in the light of the climate change, global social challenges, and resource scarcity, isn't it even an obligation for civil engineers and architects to become superheroes? Targeting to smite down Carla Carbonatrix (Fig. 5)?



Fig. 5: Carla Carbonatrix after the league of conscious super engineers is done with her.

We urgently need to understand the responsibility engineers, architects, and materials scientists do have for our planet, for the climate, and the societies. We are more than calculators, more than designers, or supply chain optimisers. We decide whether to build a wall to lock people in or keep people out, or if, way better, we rather build a bridge to connect people. We decide how future cities grow, and how people move and communicate within them. We decide if cost or climate is given priority in our material and design selection.

Conscious engineering can significantly contribute to the mitigation of global social and environmental challenges, but conscious engineers do not fall from the sky, they need to be trained for their responsibility. It is time that this aspect is given priority in future curricula.