



## We Cannot Design Load-bearing Structures without Designing Buildings.

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### Summary

A comparison of structures that are completely different in regard of their architecture but share the same structural system shows: Load-bearing structure is not an object but an abstraction. Every structure is automatically perceived as an architectural form. An academic curriculum focusing on abstract knowledge instead of establishing an intensive connection to the reality of construction and to significant works of contemporary architecture does not sufficiently prepare for this. Examples show how and why significant buildings are suitable models to derive abstract knowledge from and to apply knowledge to. A change in education and thus in the planning process is one of the mandatory prerequisites to inspire a new quality of buildings and bridges designed by engineers – structures that often times dominate their surroundings, cityscape or landscape.

**Keywords:** Civil engineering as architecture, Change in education, Innovative design concepts, collaboration of engineers and architects

### 1. Introduction

Many buildings designed by engineers are good and useful structures; however they are far from being considered architectural masterpieces. There are reasons for this. One of them might have its origin in education.

You might argue what came first, the chicken or the egg. However there is no doubt that the building came before the “structural system” and without any doubt the building was there before it was regarded and analyzed as a structural system. (**Figure 1**) And this is the way it is handled in professional practice today: Structural calculation is the last step in the planning process.



Figure 1: Alhambra, Granada, 15. century



Figure 2: Millennium-Bridge, London