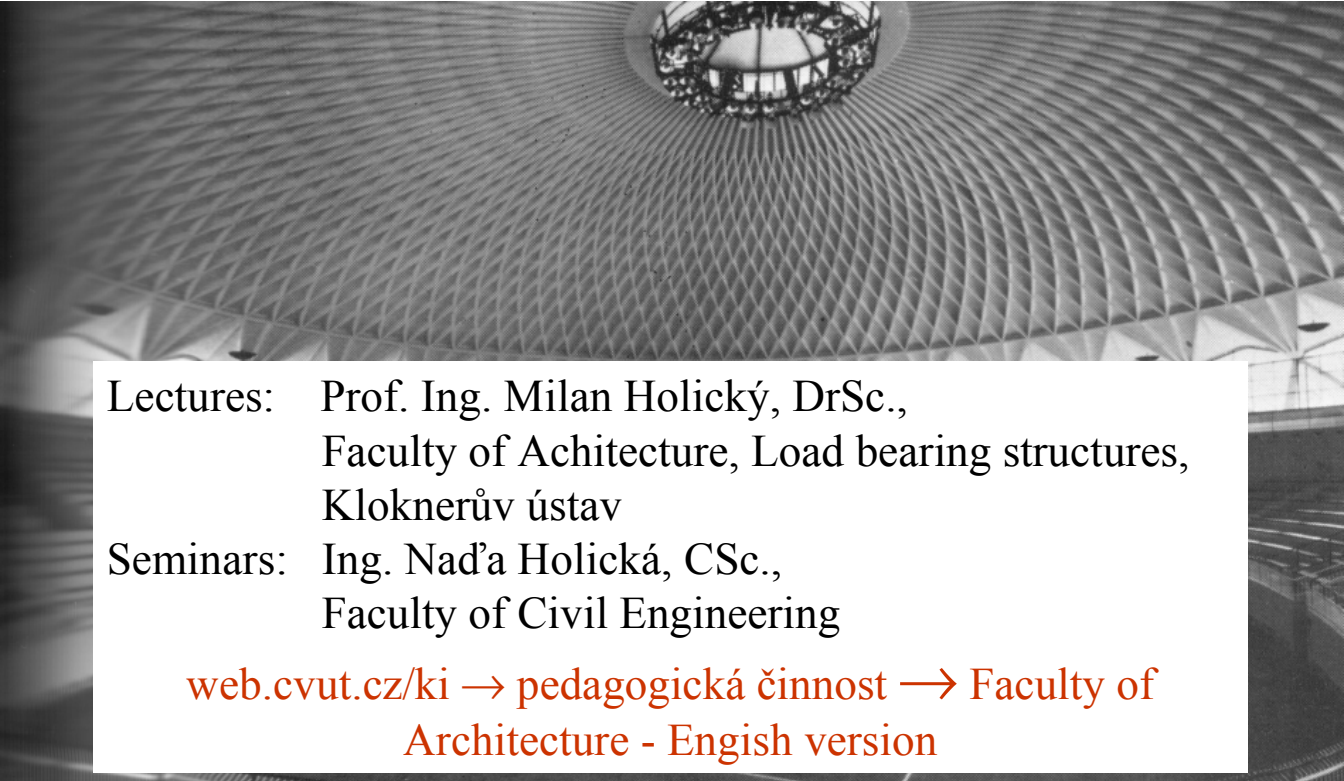


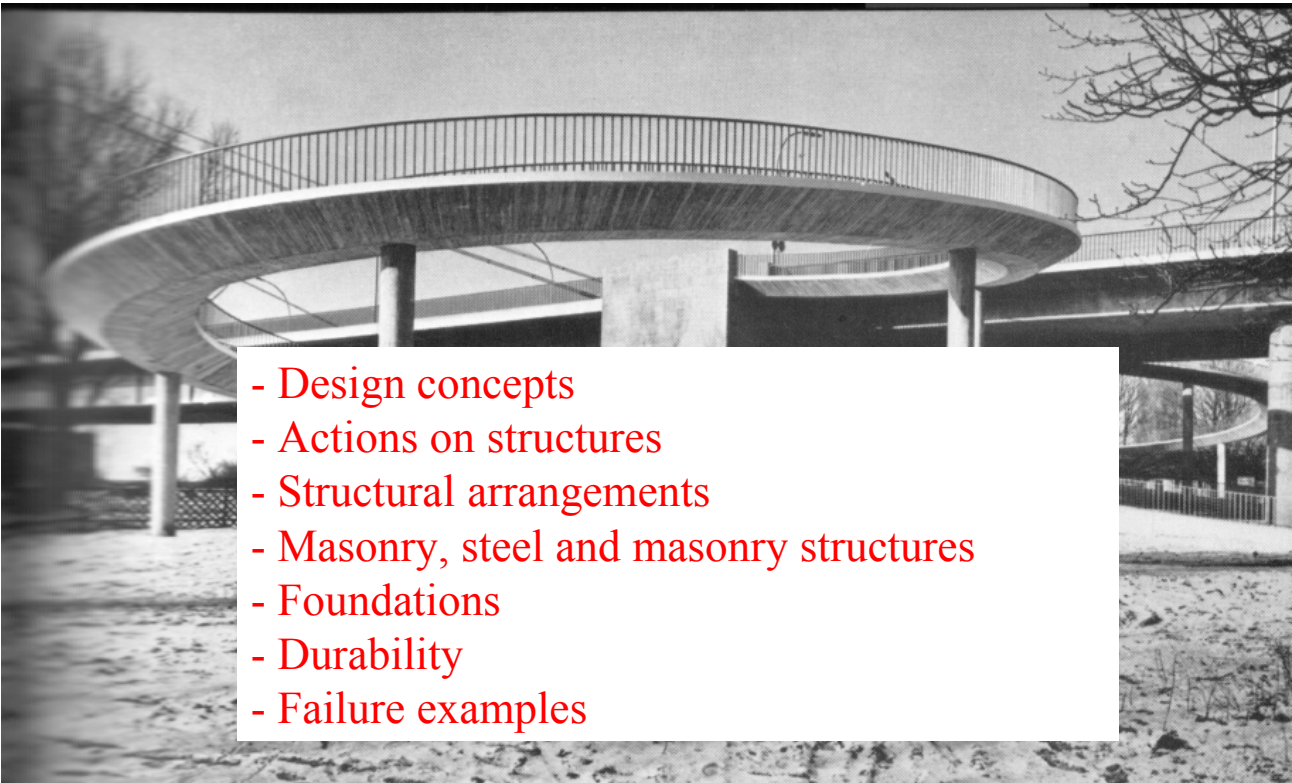
Load bearing structures - Selected topics



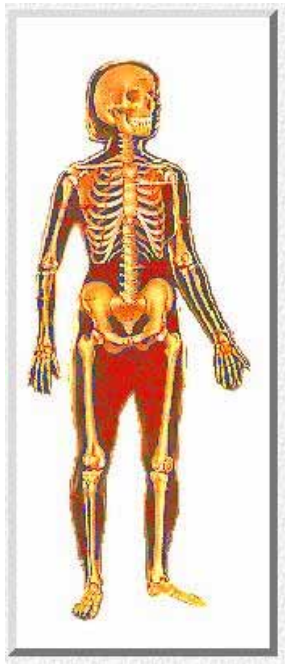
Lectures: Prof. Ing. Milan Holický, DrSc.,
Faculty of Architecture, Load bearing structures,
Kloknerův ústav
Seminars: Ing. Nad'a Holická, CSc.,
Faculty of Civil Engineering

web.cvut.cz/ki → pedagogická činnost → Faculty of
Architecture - English version

Main topics

- 
- Design concepts
 - Actions on structures
 - Structural arrangements
 - Masonry, steel and masonry structures
 - Foundations
 - Durability
 - Failure examples

What is a bearing structure?



A load bearing structure is frame (skeleton), that transmits actions, provides adequate stiffness and protection against environmental influences.



Basic requirements on load bearing structure: strength, sufficient stiffness and durability.

Water tank



Lactarius badiosanguineus

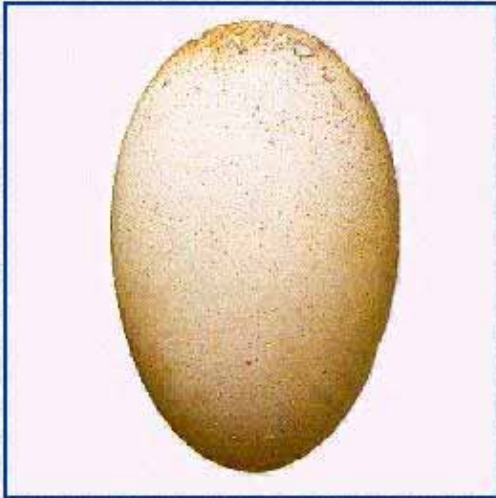


Water tank in Findland

Hyde Park, London



Natural and artificial structures



A very shell of an egg protects support and protect embryo.



Opera house in Sydney is a relatively thin structure providing also protection against environmental influences.

Structure in a nature and in architecture



Spider network



Lord's New Stand

Both structures use members exposed to tensile forces only.

Objectives of architectural design

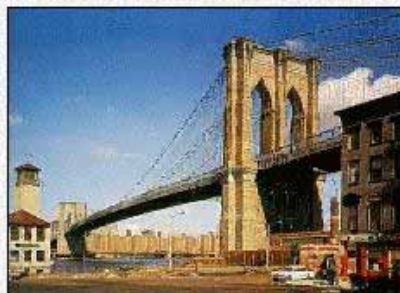
Q What does a structure have to do?



Resist Loads Safely



A Fulfill the following five criteria



Be Buildable

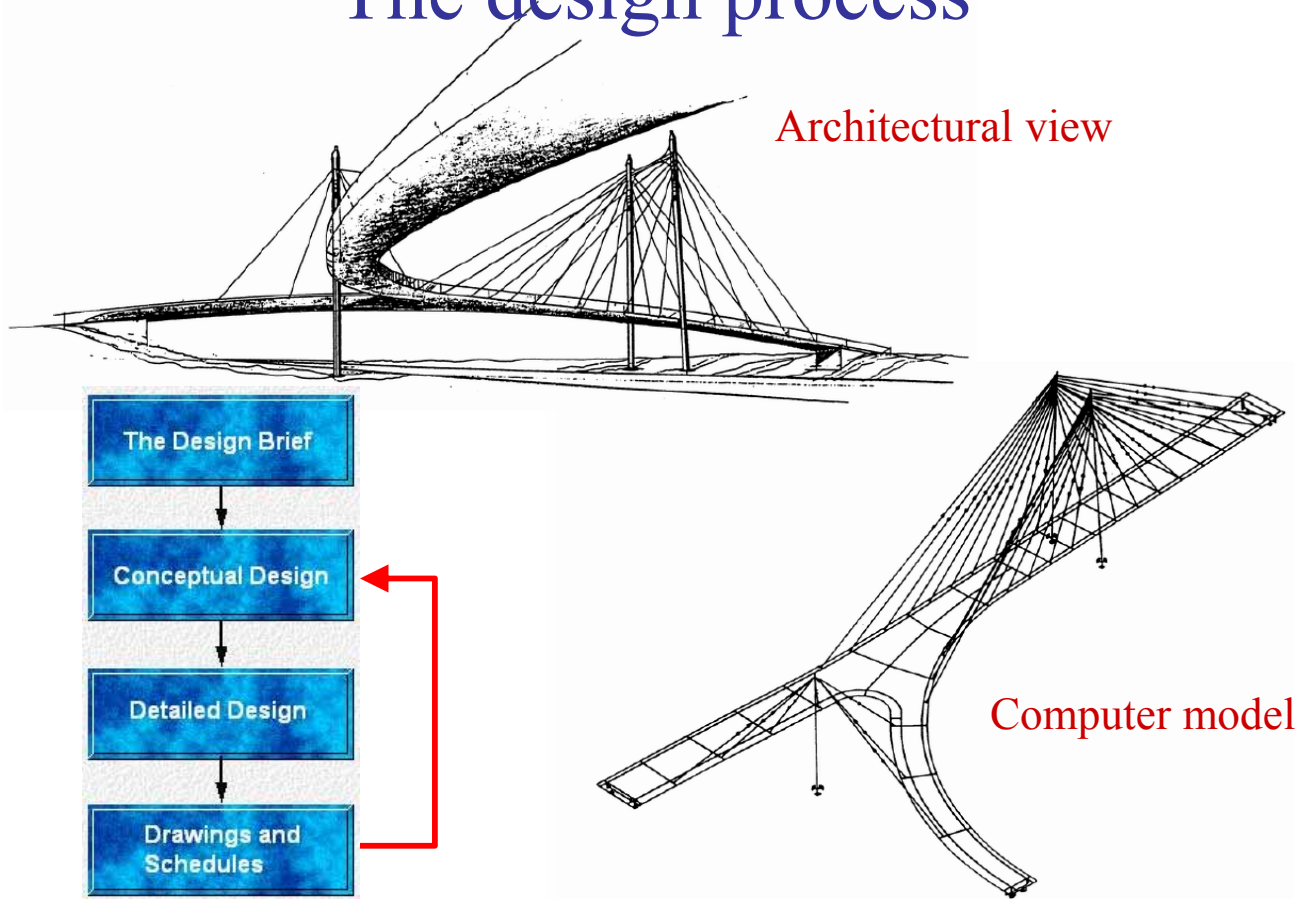


Function Properly



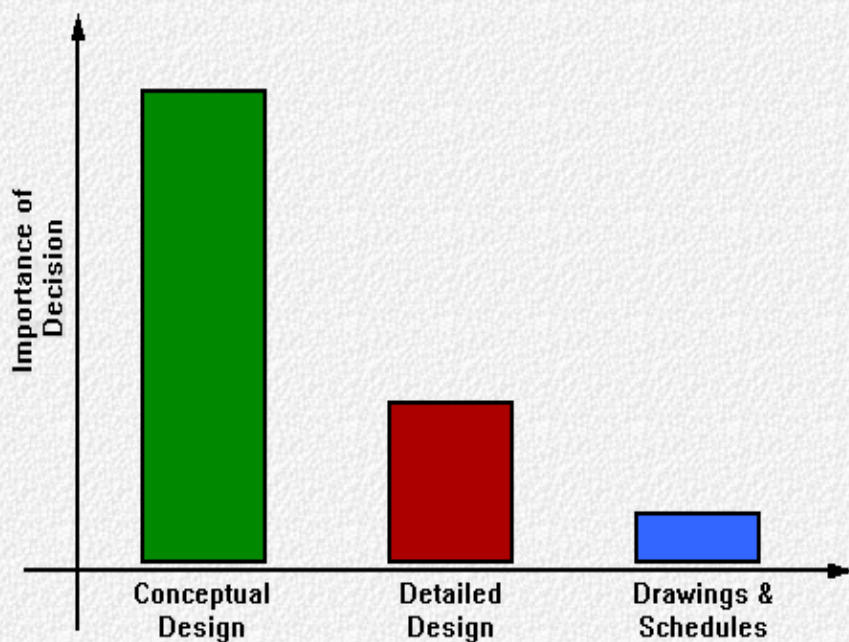
The Brooklyn Bridge which spans the Manhattan River, was a great engineering achievement. However it proved incredibly difficult to build. Progress was slow and risky given the confined working conditions. Once the piers were complete it still took another seven years to complete the deck and suspension structure. The Bridge finally opened in 1873. In today's construction industry, architects must strike a balance between aesthetics and buildability in order to reduce the overall cost of the structure.

The design process



Comparison of stages

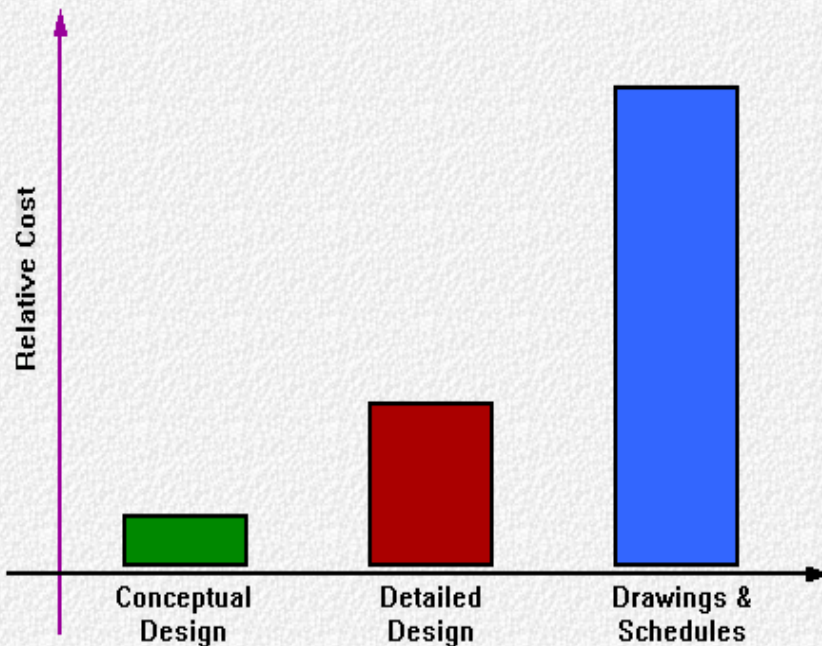
The figure below indicates schematically the relative influence of the ultimate success of a project, by the decisions taken at each stage of the Design Process.



It will be seen that almost all important decisions which will influence the quality and success of the project are taken in the conceptual Design stage. This is the "REAL" Engineering

Costs of design stages

Now if we alter the Y-axis to show the relative cost of each stage of the Design Process...



Conceptual Design is thus vital but accounts for only a small proportion of design costs. This is why substantial effort has been put into mechanising the production of drawings and the detailed design.

Summary - the most important points

- What is a load bearing structure?
- Basic requirements on load bearing structure.
- Provide examples of structures similar in nature and architecture.
- Objectives of architectural design.
- Main stages of a design process.
- Influence of the main design stages.