Theme: Structural Glass elements: glass blocks and glass columns

Transparent restoration of a historic building by structural glass components

Summary
The conversation about the restoration materialization of historic buildings is an ongoing debate. Except for the colour and the nature of the materials used, arguments include the degree to which a building can be restored without losing its original aesthetic and historic value. Additions are allowed only if they do not detract from the interesting parts of the building, its traditional setting and the balance of its compositions, as well as its relation with the surroundings.

However, completely transparent additions to historic buildings can be an answer to all the above demands. Innovative research in both glass brick (masonry) walls and glass columns by TU Delft have provided a new possibility: replacing the missing parts with transparent, structural components! Glass is a material exceptionally strong in compression, therefore appropriate for load-bearing walls and columns. Challenging cases include abandoned abbeys, gothic or byzantine churches, castles or even ancient buildings in Greece or Italy, yet the choice of any existing building as a case study is open for discussion.

Objective
Research will be conducted on the application of solid glass block-masonry walls and glass columns (of various profiles) as one integrated restoration scheme of a historic building – case studies.

The intended outcome is the proposal of a restoration methodology using glass elements, the validation of the structure with structural or/and thermal calculations, the construction of a scaled prototype and the publication of a scientific paper in the proceedings of an international glass conference.

This thesis can also be done as an independent part of a larger team-thesis including the restoration of a glass roof or/and the use of cast glass elements to obtain complicated shapes.

Student profile
We are looking for a motivated student with apparent interest in structural glass design, building technology and the restoration of historical monuments.

Obligatory committee members:
Prof. Ir. Rob Nijssse or Dr. Ir. Fred Veer
Ir. Faidra Oikonomopoulou

Information:
- Ir. Faidra Oikonomopoulou
  (f.oikonomopoulou@tudelft.nl)