



## Concepts for walkable coverings of historic site

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### Abstract

Historic and archaeological sites are often subjected to harmful environmental as well as human factors. Covering these sites with protective structures or shelters does not always render the desired result, since the authentic character of the site may be impaired. By building walkable covers above the area, social interest in historic remains can be promoted, as visitors can observe them from above without intruding activity or influence the ambient conditions. In addition, these walkways can be equipped with lateral cables to shift foils above the site, whenever visits are prevented by the weather. Three typologies of adapted footbridges are introduced. For each type, requirements of strength, stability, human induced vibration and effects of wind, including vortex are being verified. In some cases vortex shedding seems the most critical condition, albeit simple adequate systems can be installed for mitigation.

**Keywords:** Footbridge, covering, shelters, historic site, structural slenderness, vibration analysis, light structures.

### 1 Introduction

The recent corona pandemic and confinement of human interaction has clearly revealed that cultural activity is an important societal need. Care for historic remains and past civilisations determine cultural identity and should be remembered or allowed to be discovered. On one hand, historic sites should be accessible to the broad public, allowing to display the cultural heritage and thus improving social interest. On the other hand, important remains should be protected from human influence as well as from environmental impact [1]. For this, light covers of various types have been developed. A discussion was raised whether these covers may not be harmful in certain ways, for instance the existence of unwanted shadows, insufficient ventilation or increase of humidity. In addition, the cover may result in harming the authentic character of the

site. Preservation and authenticity have gained importance as ICOMOS [2] has set up guidelines and is promoting a shift towards a sustainable long-term approach. However, the focus still is on protection and does not consider any possibility for the public to walk above historic sites. The latter would provide both : allow the public to see remains albeit from a bird's eye position and protect the site from environmental and human impact.

The idea of creating elevated walkways for visitors certainly is not original and has been applied in the Acropolis museum, at a Roman villa in Sicily and recently at the Kipdorp site above 16<sup>th</sup> century fortifications of the city walls [3].

Hence, this research concentrates on the development of walkable covers and tries to develop this type of structures for typical situations. Obviously, each situation may require