



POLITECNICO
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Honors thesis

COURSE OF ARCHITECTURE FOR THE
SUSTAINABILITY DESIGN

Abstract

**Deterioration of bridges and viaducts. Proposal of a system
of datasheets for the deterioration's relief on extended
territorial scale**

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by

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The aim of this thesis consists in a production of an operative database in order to support the bridges and viaducts' inspection phases and to provide, even if approximately, an estimate of the most mainly needy works.

Monitoring bridges is fundamental as much as all check-up which have been carried out during people lifetime, because both suffer the ageing, the degradation, the unfavorable environmental conditions, etc...

The dissertation begins with a view on the international context about bridges management, then it is focused on the Italian situation. After many analyses into different territorial scales, as far as Italian context is concerned, it is possible to observe a deep dispersion and multiple gaps in the information tied to the management of the highway works, as a result of sum of many reasons such as the complicated diversification of administrations, the lack of resources of public authorities and, consequently, a deficiency in the coordination at national level.

As a result of many analyses, about structures and material degradation, it has been possible to create a model datasheets able to contain an adequately elevated number of degradations and, concurrently, to be simple enough to be employed as support during the bridge's inspections.

With the datasheets model it was also created an index to make a comparison between different bridges based on the degradation detected and on the relevance of the structure inside the road network.

The datasheets and the deterioration's index, even if are not applicable to all kind of bridges (because some structures have a static behavior which results too different compared to others), were intended to make a check-up about a preliminary state of bridges' conservation (or degradation) due to monitor them at a national level.

In case of bridges were managed through a modern BMS yet, the datasheets' system could be used to transfer the most important information to the national agency manager, which could compare the results.

Otherwise, in case of minor works or not even inserted in a complex monitoring system, the datasheets' system could be directly employed to verify and record the degradation's development level of road structures, waiting for a modern Bridge Management System.

During last year were created a lot of simplified models to compare bridges, and were also created many Italian modern BMS, but none of them have been used to manage structures in the national road network. Causes may be found in the Italian legislation, which results not being able enough to impose a correct planning, contrary to situation in the USA, where every state was obliged to employ a modern BMS and to implement the national database.

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