POLITECNICO DI TORINO

Honors thesis

DEGREE IN MASTER OF SCIENCE IN ARCHITECTURE (CONSTRUCTION)

Abstract

The Green School Project.

The site sustainability: the soil in relationship to the water cycle

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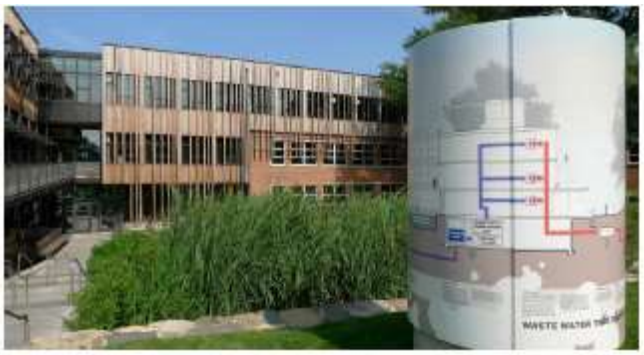
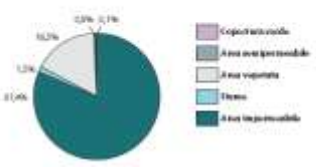
This thesis work is intended for investigating the problem of the measurement of the environmental sustainability of the external areas and of the water management in relationship to the soil within the range of the nowadays buildings of the Italian secondary school. The aim of this work is the construction of an audit methodology intended as primary action for a following processing of conscious strategies and planning intentions.
The two pilot cases from Turin, on which the *audit* will be applied, represent an occasion of checking the correctness of this protocol and of collecting possible project strategies, developed especially on the school construction.



The theme of the external area of the school in comparison with the urban and the site sustainability represent a much vary and complex theme, which applies different subjects; it will be focused on the treated themes, knowing not to be able to treat deeply all the themes and focusing the thesis on the theme of the water and soil cycle.
In a preliminary way, it has been deemed right to introduce the ratio between education and the external area, so to highlight the opportunities that can be faced when working on the themes of the sustainability at school, an environment which is the home of the education and an ideal place for activities of practical and demonstrative experimentation of some sustainability themes, sometimes considered as a master subject, far from the perception of the common citizen. The primary objective of the thesis is the construction of a method for evaluating the sustainability, following the logic flow of a progressive focus; constructed of the basis of the protocols of evaluation chosen among those existing (LEED, BREAM, ITACA).
On an urban scale will be applied the methodology of calculation of the urban permeability, with the aim of obtaining data of reference which, nowadays in Italy, on every scale, are poor and constitute an important focus of this thesis.
In a following step, the analysis will be focused on the external area of the school borders, defining ideal criteria of evaluation of the sustainability on the basis of the above mentioned protocols. Later on, the theme of the water cycle and of the soil sealing will be treated not only in relation with the surface of the school lot, but also will be introduced by a wider vision of the problem and of the strategies of improvement, which have been applied both in Europe and in the USA on a local urban scale. Though the methodology of evaluation it will be possible to quantify the environmental sustainability of the school, for what concerns the external areas and the use and the management of the water, pointing out the lacks and identifying the possible actions of retrofit which can be practiced on the school buildings in general.

It will be reported some schemes of application of the methodology applied on the two pilot schools, followed by a



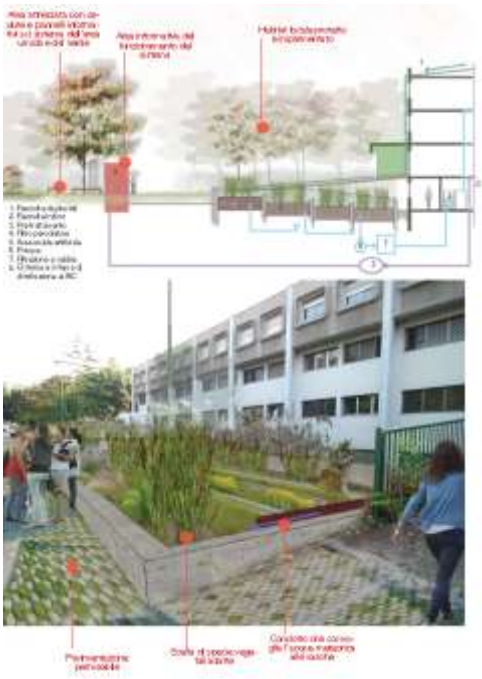


diagram of the interventions and techniques that can be used in the school context, divided by levels of fund investment, joined with a qualitative indication of the feasibility on the pilot schools, based on the economical needs and on the intrinsic features which distinguish the two school buildings. In the end, it has been structured some qualitative project visions on the two schools, to the extent of underlining the potential of the interventions, which meet the needs of environmental sustainability, coded in the protocol, and the need of architectural quality.

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