POLITECNICO DI TORINO

Honors thesis

Master of Science in Sustainable Architecture

Abstract

THE NOCTURNAL PERCEPTION OF THE CULTURAL LANDSCAPE

Effects of renovation of lighting installations in Montepescali and Batignano

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by

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The Italian nocturnal landscape presents different characteristics and cultural identities. The visual perception of these landscapes through LED retrofit of public lighting systems is continuously transformed.
The light and shadows design transforms the night landscapes and shows the mystery and beauty of the observed scenery, generating emotions in the observer. The simple instrument of light thus becomes an immaterial medium through enhance the vision of the landscape and attract the observer, generating repercussions on his behavior.

The thesis research aims to analyze the transformations of the visual perception of the nocturnal landscape after the improvement of current lighting systems based on energy and environmental Standards. Specifically, the case study analyzed are two medieval villages, named Montepescali and Batignano, two historical villages located in prominent positions in the area of *Maremma Grossetana*, close to the city of Grosseto, in the Tuscany Region of Italy. This nocturnal landscape will be transformed through the application of the new LED Lighting Plan which has the objective to energetically improve the current and outdated public lighting system in accordance with the requirements of street lighting and light pollution Standards.

Thesis research is divided into two main sections. In the first section the history and environmental characteristics of the territory of the two villages were analysed, identifying the citizens and landscapes identity characteristics. In addition, significant sites for the observation of villages landscape were identified (also used during the relief phase of thesis) and the visual perception from these external and internal viewpoints were analyzed. In the second part, the technical characteristics of current and project public lighting systems were investigated. The lighting project analyzed in the thesis research was developed during my internship period by the lighting design studio named *Studio GMS*.

The final assessments of nightscape transformations were generated by a multicriterial interpretative analysis constituted by the visual perception analysis, the energy-environmental analysis and the lighting Standard values. A 3D model of the case studies was used for the lighting simulation of both the current and design nocturnal condition with LED light sources installed, carried out with the lighting software *Dialux Evo 8.2*. From this multicriterial methodology of analysis were emerged significant differences between two different nocturnal landscape configurations, through simulation of lighting, energy and perceptive impacts generated by the introduction of LED sources.