



Design, simulation and matched structure of a living ecological & energized modules (EEMs) bridge system

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Abstract

This paper presents a novel ecological & energized modules (EEMs) system for transportation and bridge systems. It has a general interest in almost all human living & ecological systems, civil engineering, and infrastructure. As an underlying and fundamental system of zero energy, zero-water-consumption, and zero-carbon with a 100% greening rate and 100% clean energy, high-quality air, and powerful carbon capture system with significant positive spillover for global carbon removal and climate challenges, etc., the EEMs bridge system is easy, fast, efficient, and zero-dependence on the large complex equipment during the construction. It is applied to a wide variety of bridge systems, such as road bridges, footbridges, flyovers, and overpasses. It's pollution-free, safe, noiseless, and can be used soon after paving, repairing, and re-laying. The EEMs bridge system has unique superiority in ecosystem integrity and connectivity, resulting in available consequences for global biodiversity, local species interactions, ecosystem integrity and connectivity.

Keywords: Ecological & Energized Modules (EEMs) system, EEMs road bridge, EEMs footbridge, EEMs flyover, EEMs overpasses, ecosystem integrity and connectivity.

1 Introduction

The bridge structure is an important component in highways, railways, and urban roads. A basic bridge structure consists of superstructure (or decking component), bearings and substructure components, in which foundation, substructure, and superstructure are three main bridge areas. The bridge system is used for providing passage over the obstacle when it is difficult or impossible to cross. The bridge system is indispensable in highways, railways, and roads. They are important roles in politics, economies, cultures, defences, as well as ecology & environmental protection.

2 Ecological & energized modules (EEMs) system

Structural engineering for future societal needs is the theme. Climate change and reducing mankind's CO₂ footprint are the pursuit of the bridge and structural designers. They are dedicating to a zero-energy and zero-carbon traffic working system with a 100% green rate. The EEMs bridge system is a multilayer composite, in which the top layer is covered with thin-film solar cells to get cleaner power, the interlayer is growing short green vegetation, and the bottom is often with a multifunctional watering system, etc. The