

GANTRIES FOR LABORATORY EXPERIMENTATION: BRIDGING THEORY AND PRACTICE THROUGH MATERIALS AND STRUCTURES RESEARCH ALONG WITH ACADEMIC ADVANCEMENT

Carlos N. A. Salinas-Rodríguez, Fabiana Viscarra Agreda, Andrés Vallejos Valladares

ABSTRACT

The gantries for laboratory experimentation constitutes a transcendental tool for the characterization of the mechanical behavior of structural elements made of various materials. The definition of fundamental relationships, such as stress-strain, which allows to design structures efficiently, appropriately, and safely, arises from extensive experimental campaigns. Moreover, the use of gantries for testing the properties of different materials allows the implementation of research at different engineering courses related with the study of materials; also, it allows to study the behavior of different materials and innovative materials for structural use, such as those resulting from industrial processes like rice natural fiber or glass powder. The preliminary experimentation and the results obtained were conducted on wood elements, and they are part of a research line looking for a better understanding of elasticity properties in materials such as steel, reinforced concrete, masonry, among other. The present work aims to demonstrate the capabilities of using testing porticos to bridge the gap between theoretical knowledge and practical application at the academic and research levels within structural engineering. This is achieved through a review of the evolution and usefulness of these elements in education. With this purpose, a bibliographic review of works developed mainly at the Latin American level in laboratories equipped with gantries is conducted. The evolution of these elements is described, along with the main characteristics of different gantries. Standard practices associated with conducting tests on these devices are also presented, and finally, a brief analysis of experimental results and their relevance in academia and research is performed.

Keywords: Testing of Materials, Laboratory Gantries, Reinforced Concrete, Alternative Materials.

DOI: 10.23881/idupbo.023.1-6i