

**DESIGN AND ANALYSIS OF STEEL FOOTBRIDGE IN MANGGAHAN,  
GENERAL TRIAS, CITY, CAVITE**

**Design Project**

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**DESIGN AND ANALYSIS OF STEEL FOOTBRIDGE IN MANGGAHAN,  
GENERAL TRIAS CITY, CAVITE**

Undergraduate Design Project  
Submitted to the Faculty of  
College of Engineering and Information Technology  
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Bachelor of Science in Civil Engineering

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## ABSTRACT

**GUTIERREZ, KRISTEL G., and VIVERO, MARK ANDREW N. Design and Analysis of Steel Footbridge in Manggahan, General Trias City, Cavite.** Undergraduate Design Project. Bachelor of Science in Civil Engineering. Cavite State University. Indang, Cavite. June 2019. Adviser: Engr. Roslyn P. Peña

The design project was conducted from August 2018 to April 2019. It was evaluated on April 2019 under the supervision of Engr. Roslyn P. Peña at the Department of Civil Engineering, College of Engineering and Information Technology, Cavite State University, Indang, Cavite. The study served as an application of the authors' gained knowledge and skills and an outlet to improve their potentials in designing structures.

The study of the Proposed Design and Analysis of Steel Footbridge aimed to design a footbridge that could help to decongest the traffic and could also give pedestrians a safe way to cross Manggahan intersection without slowing down the traffic. Specifically, the design project aimed to: 1. provide architectural and structural plans; 2. perform structural analysis; 3. determine the estimated cost of the structures.

The footbridge has a total length of 122 meters with 5 meters vertical clearance. It connects all sides of the intersections and has a four man lifts. The estimated cost of the footbridge is Php 16,198,667.36.

National Structural Code of the Philippines (NSCP), American Institute of Steel Construction (AISC), Load Resistance and Factored Design (LRFD) and Department of Public Works and Highways Department Orders were used in determining the design standards for steel bridges.

Structural Aided Analysis and Design, Sketchup and Computer Aided Drafting Device were used to have an accurate analysis on the structural members of the superstructure and to accomplish the architectural and structural details of the building.

Upon the completion of the study, the authors recommended to conduct a design and analysis for the proposed project using different materials like concrete or composite steel in order to determine which type of materials will be more economical.

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An undergraduate design project outline submitted to the faculty of the Department of Civil Engineering, College of Engineering and Information Technology, Cavite State University, Indang, Cavite in partial fulfillment of the requirements for the degree of Bachelor of Science in Civil Engineering with Contribution No. CEIT-2018-19-2-126, prepared under the supervision of Engr. Roslyn P. Peña.

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## **INTRODUCTION**

Transportation is the movement of goods and people from one location to another and the various means by which such movement is accomplished. It is responsible for the increase of economic activity and provides efficient ways to transport people wherever they need to go.

The city of General Trias has a land area of 81.46 kilometers and population of 314,303 people. It is an inland city of Cavite located 35 kilometers (22 mi) southwest of Manila and is now included on Manila's conurbation due to numerous number of agro-industrial and residential businesses. Due to this, some of the places on this city is subjected to congestion.

According to Traffic Engineering Center of Metropolitan Manila Development Authority (MMDA), traffic congestion is a serious problem in General Trias City with large and adverse effects on both the quality of life and the economy. As the population of the