

**EXPANSION OF MAG-ASAWANG LAYON PRESTRESSED  
DECK GIRDER BRIDGE IN BARANGAY GREGORIO,  
TRECE MARTIREZ CITY**

**Undergraduate Design Project  
Submitted to the Faculty of  
Cavite State University  
Indang, Cavite**

**In partial fulfillment  
of the Requirements for the degree of  
Bachelor of Science in Civil Engineering**



00001226

*Expansion of mag-asawang layon prestressed  
deck girder bridge in barangay Gregorio,  
624.2 D59 2005  
DP-152*

**RYAN PAUL J. DIMARANAN  
MICHAEL R. TAPAWAN  
March 2005**



## ABSTRACT

**DIMARANAN, RYAN PAUL J., and MICHAEL R. TAPAWAN.** Expansion of Mag- Asawang Layon Prestressed Deck Girder Bridge in Barangay Gregorio, Trece Martirez City. Undergraduate Design Project. Bachelor of Science in Civil Engineering, Cavite State University, Indang, Cavite. April 2005. Adviser: Engineer Marcelino Dagasdas Jr.

The design project was conducted in Barangay Gregorio, Trece Martirez City from the first week of September 2004 up to March 2005 under the supervision of Engr. Marcelino Dagasdas Jr. It was evaluated on January 28, 2005, 8:00 to 11:00 a.m. at the Audio Visual Room of the College of Engineering and Information Technology, Cavite State University.

The design project aimed to enhance the knowledge of the authors in analyzing and designing Prestressed Deck Girder Bridge with the application of Structural Aid Analysis and Design (STAAD Pro.). The project would serve as a practical application of the ideas and knowledge learned by the authors. It will also serve as reference for future researchers and for the implementation of the project.

Ultimate Strength Design (USD) method was used in designing the structural member of the bridge. Architectural and structural plans, detailed survey, structural design, method of construction and implementation, detailed cost estimate, and scaled model of the proposed bridge were provided in the project.

The two-span expansion of the bridge was designed to carry a maximum load of 20-ton truck with a 16-to semi-trailer.

Design guidelines and specifications are carefully studied so as to arrive with an efficient and effective design.



## TABLE OF CONTENTS

	Page
BIOGRAPHICAL DATA. ....	iii
ACKNOWLEDGEMENT. ....	iv
ABSTRACT. ....	x
LIST OF FIGURES. ....	xiv
LIST OF TABLES. ....	xvi
LIST OF APPENDICES. ....	xvii
INTRODUCTION. ....	1
Importance of the Study. ....	2
Objective of the Study. ....	2
Statement of the Problem. ....	3
Scope and Limitation of the Study. ....	3
Time and Place of the Study. ....	3
REVIEW OF RELATED LITERATURE. ....	6
METHODOLOGY. ....	22
Data Gathering. ....	22
Survey of the Proposed Bridge. ....	22
Architectural Plans and Concept. ....	23
Structural Plans and Specification. ....	23
Analysis and Design. ....	24
Method of Construction and Implementation. ....	44
Detailed Cost Estimate. ....	44



Preparation of Scaled Model. ....	46
RESULTS AND DISCUSSION. ....	47
Site Investigation and Inspection. ....	47
Data Gathering. ....	47
Survey of the Proposed Bridge. ....	47
Architectural Plans and Concept. ....	48
Structural Plans and Specification. ....	48
Analysis and Design. ....	48
Design of Deck Slab. ....	49
Design of Sidewalk. ....	50
Design of Girder. ....	50
Design of Diaphragm. ....	51
Design of Pier Coping. ....	51
Design of Pier Column. ....	52
Design of Footing. ....	52
Design of Back wall. ....	53
Design of Abutment. ....	53
Method of Construction and Implementation. ....	54
Detailed Cost Estimate. ....	54
Preparation of Scaled Model. ....	55
SUMMARY, CONCLUSION AND RECOMMENDATION. ....	56
BIBLIOGRAPHY. ....	60
APPENDICES. ....	61