

**Design of Three-Storey Reinforced Concrete
Cavite State University Medical Center**

**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**



00001239

*Design o three-storey reinforced concrete
Cavite State University Medical Center
624.17 D47 2005
DP-165*

**MOISES L. DESTURA
MICHELLE A. DIGMA**

March 2005

ABSTRACT

Destura, Moises L., Digma, Michelle A., Design of Three-storey Reinforced Concrete Cavite State University Medical Center. Undergraduate Design Project. Bachelor of Science in Civil Engineering. Cavite State University, Indang, Cavite. March 2005. Adviser: Engr. Renato B. Cubilla.

The design project conducted from June 2004 to March 2005 at Department of Civil Engineering, College of Engineering and Information Technology, Cavite State University, Indang, Cavite. The project aimed to design a three-storey reinforced concrete medical center that includes architectural plan, structural plan, lighting and plumbing layout, cost estimate and scaled model of the building. This design project would serve as a future reference for the future construction of the project.

Structural Aided Analysis and Design (STAAD Pro 2003) was used in the analysis of the three-dimensional structural frame. The ultimate moments, shears and axial loads were the basis for manual computation of the design. The guidelines set by the National Structural Code of the Philippines (NSCP), National Building Code of the Philippines and American Concrete Institute (ACI) were followed in design computations. Safety, economy and aesthetic aspects were also considered in conceptualizing the design of the building.

TABLE OF CONTENTS

	Pages
BIOGRAPHICAL DATA	i
ACKNOLEDGMENT	iii
ABSTRACT	ix
LIST OF APPENDICES	xiii
LIST OF TABLES	xiv
INTRODUCTION	1
Nature and Importance of the Project	2
Statement of the Project	3
Objectives of the Project	3
Scope and Limitation	3
Time and Place of the Study	4
LITERATURE CITED	5
Hospital Planning	5
Structural Design	7
Building	8
Concrete	8
Concrete Hollow Blocks	9
Mortar	10
Excavation	10
Foundation	10

Footings	11
Columns	11
Beams	12
Slabs	12
Stairway	13
Estimation	13
Building Materials	14
Masonry	15
Timber	15
Steel	15
MATERIALS AND METHODS	16
Site Investigation	16
Gathering Technical Data	16
Structural Analysis	17
Design and Computation	17
Static Lateral Force	17
Design of Roof Deck Slab	19
Design of Beam	21
Design of Column	25
Design of Footing	28
Design of Stairway	30
Preparation of Detailed Cost Estimate	32
Earthworks	32

Masonry Works	32
Estimating Mortars for Layering	33
Estimating Mortars for Plastering	33
Steel Works	35
Concrete Works	36
Forms, Scaffoldings and Staging	38
Symbols and Notations	42
RESULTS AND DISCUSSIONS	47
Site Investigation	47
Gathering Technical Data	47
Structural Analysis	48
Design and Computation	48
Design of Beams	48
Design of Slabs	57
Design of Columns	57
Design of Stairway	61
Design of Footings	61
Detailed Cost Estimate	63
SUMMARY, CONCLUSION AND RECOMMENDATIONS	64
Summary	64
Conclusion	66
Recommendation	67
LITERATURE SITED	69