

DESIGN AND ANALYSIS OF CONTINUOUS REINFORCED
CONCRETE BEAMS USING VISUAL BASIC

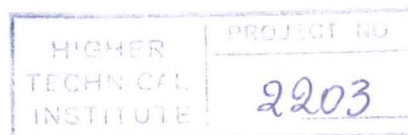
by

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Project Report
submitted to
the Department of Civil Engineering
of the Higher Technical Institute,
Nicosia,
Cyprus,
in partial fulfillment of the requirements
for the diploma of

TECHNICIAN ENGINEER
in
CIVIL ENGINEERING

June 1994



ACKNOWLEDGEMENTS

We would like to express our special thanks to our supervisor Dr. Christis Chrysostomou, for his valuable help and guidance to us.

We would like to thanks, also, our families for their support and help during these three years of studies at the Higher Technical Institute.

Thank you all

SUMMARY

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Project: Analysis and design of R.C. beams using visual basic.

The purpose of the project is to produce a computer programme using the Visual Basic computer language, facilitate the analysis and design of a continuous beam.

It is very well known in civil engineering that this particular method is quite complicated, and time consuming, and the possibility of errors and accuracy is unavoidable.

That is why computer technology is required in this specific project.

The method of moment distribution is used, for the analysis of the beam, since our project is considered as a continuation of an existing one which uses this approach. The design is done in accordance with the British standards (BS8110).

Our main consideration was not only to improve the existing computer program by eliminating bugs and upgrading it to a friendly user software, but also to go further and offer the alternative of additional features. Taking advantage of the latest computing technology.

The list below contains the main additions incorporated in this program:

- Bending moment and shear force envelope are presented graphically.
- All the forms have been created for the input and the output results.
- The theory of the cantilever has been written for a further addition in the program.

It is hoped that this study has given enough additional information to fulfill its purpose which is the upgrading of an existing program to such an extent that can be used even by the professional engineer who is not very proficient in the use of computers.

C O N T E N T S

Section 1 (COMPUTERS)

- 1.1. The Computer System
- 1.2. The Hardware
- 1.3. Software
- 1.4. Types of Computers
- 1.5. Programming
- 1.6. Microsoft Windows
- 1.7. Introduction to Visual Basic
- 1.8. Control buttons
- 1.9. Programming in Visual Basic

Section 2 (METHOD OF ANALYSIS AND DESIGN)

- 2.1. Three moment equation
- 2.2. Slope Deflection Equation
- 2.3. Sign Conventions
- 2.4. Moment Distribution Method
- 2.5. Procedure of the Method
- 2.6. Theory of Analysis
 - 2.6.1. Limit State
 - 2.6.2. Partial factor of safety
 - 2.6.3. Theory of Design
 - 2.6.4. Design for shear
 - 2.6.5. Deflection check

Section 3 (THE PROGRAM)

- 3.0. Variables
- 3.1. Analysis (global variables)
- 3.2. Global variable of design program
- 3.3. Subroutines of the Analysis.bar
- 3.4. Subroutines of the Design.bar
- 3.5. Manual of the Program
- 3.6. Theory of cantilever

Section 4 (ANALYSIS OF A CONTINUOUS BEAMS MANUALY)

Section 5 (CODING)

- 4.1. Intro Form
- 4.2. Input
 - 4.2.1. Geometry Form
 - 4.2.2. Properties
 - 4.2.3. Loading Form
 - 4.2.4. Safety factors
- 4.3. Analysis
 - 4.3.1. Solve
- 4.4. Results
 - 4.4.1. B.M. Envelope
 - 4.4.2. S.F. Envelope
- 4.5. Resign
 - 4.5.1. Properties
 - 4.5.2. Member Design