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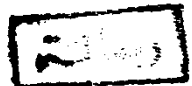
MIT DESIGN OF REINFORCED CONCRETE STRUCTURES -
BEHAVIOUR AND PLASTIC ANALYSIS OF REINFORCED
CONCRETE CONTINUOUS TWO-SPAN I-BEAMS

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APPROVAL SHEET

"Limit Design of Reinforced Concrete Structures"

"Behaviour and Plastic Analysis of Reinforced
Concrete Two-Span Continuous I-Beams"

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TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	i
TABLE OF CONTENTS	iii
LIST OF NOTATIONS	ix

PART A - INTRODUCTION

CHAPTER I INTRODUCTION.

1.1 General	1
1.2 Previous Experimental Work	3
1.3 Objectives and Aims of the Present Study .	6
1.4 Scope and Contents	8

PART B - THEORETICAL STUDY

CHAPTER II REDISTRIBUTION PROCESS.

2.1 Cause and Development of Redistribution. .	12
2.1.1 Cause and Degree of Redistribution .	12
2.1.2 Possible Developments of Redistribu- tion	13
2.2 Factors Affecting the Process of Redistribution	17
2.2.1 Moment-Curvature Relationship . . .	17
2.2.1.1 Effect of Cracks	19
2.2.1.2 Effect of Properties of Concrete	19

	Page
2.2.1.3 Effect of Reinforcement. . .	21
2.2.1.4 Effect of Axial Load	24
2.2.1.5 Effect of Shearing Force . .	24
2.2.1.6 Effect of Torsion	25
2.2.2 Static System	26
2.2.2.1 Effect of the Shape of Bending Moment Diagram and Boundary Conditions	26
2.2.2.2 Effect of Settlement of Supports and Other Imposed Deformations	28
2.2.2.3 Effect of Local Instability.	28
2.2.3 Loads	29
2.2.3.1 Effect of Long-Term Loading.	30
2.2.3.2 Effect of Repeated Loading .	31
2.2.3.3 Effect of Moving Loads . . .	31
2.2.3.4 Effect of History of Loading	

CHAPTER III METHODS OF LIMIT ANALYSIS AND PLASTIC DEFORMATION CALCULATIONS.

3.1 Methods of Limit Analysis and Design . . .	32
3.1.1 General	32
3.1.2 Ultimate Strength Design Method. . .	34
3.1.3 Method of Ultimate Rotations	35

	Page
3.1.4 Method of Imposed Rotations	38
3.1.5 Bi-Linear Limit Design Method	39
3.1.6 Ultimate Equilibrium Method	41
3.1.7 Optimum Limit Design Method	45
3.1.7.1 Full Redistribution Design	46
3.1.7.2 Limited Redistribution Design	47
3.1.8 Guyon's Empirical Method	48
3.1.9 General Discussion	49
3.2 Methods for Calculation of Plastic Deformations and Deformation Capacity of Hinging Regions in Reinforced Concrete Beams	50
3.2.1 General	50
3.2.2 A.L.L. Baker et al	52
3.2.3 Johnson and Sawyer and Tichy	59
3.2.4 Mattock	62
3.2.5 Cohn	66

PART C - EXPERIMENTAL INVESTIGATION

CHAPTER IV EXPERIMENTAL WORK.

4.1 General	69
4.2 Dimensions of the Tested Specimens	69
4.3 Materials and Fabrication	70
4.3.1 Concrete Mix	70

	Page
4.3.2 Reinforcement	71
4.3.3 Casting and Curing of the Tested Specimens	71
4.3.4 Control Tests	72
4.4 Test Set-Up	73
4.4.1 Loading Apparatus	73
4.4.2 Instrumentation	73
4.4.3 Test Procedure	75
 CHAPTER V EXPERIMENTAL RESULTS.	
5.1 General	77
5.2 Behaviour of the Tested Beams	77
5.3 Cracking and Crack Patterns	80
5.4 Moment Redistribution Characteristics. . .	82
5.5 Load-Deflection Relationships	86
5.6 Moment-Curvature Relationships	87
5.7 Summary of the Experimental Results . . .	89
 PART D - FINITE ELEMENT ANALYSIS	
 CHAPTER VI FINITE ELEMENT ANALYSIS.	
6.1 General	92
6.2 Finite Element Method	93
6.2.1 Choice of a Suitable Element for the Structure	94
6.2.2 Idealization of Reinforced Concrete Section	95

	Page
6.2.3 Steel Elements	97
6.2.4 Concrete Elements	97
6.2.5 Cracking of Concrete	100
6.2.5.1 Modulus of Elasticity of Concrete in the Direction Perpendicular to Crack . . .	102
6.2.5.2 Shear Transfer Across Cracks	103
6.2.5.3 Crack Stability	106
6.3 Computer Program	107
 CHAPTER VII RESULTS OF THE FINITE ELEMENT ANALYSIS.	
7.1 General	109
7.2 Behaviour of the Analysed Beams	109
7.3 Cracking and Crack Patterns	111
7.4 Moment Redistribution Characteristics . .	112
7.5 Load-Deflection Relationships	115
7.6 Moment-Curvatures Relationships	115
 PART E - RESULTS AND CONCLUSIONS	
 CHAPTER VIII COMPARISON BETWEEN THEORETICAL AND EXPERIMENTAL RESULTS.	
8.1 General	119
8.2 Analysis of the Tested Beams by the Method of Ultimate Rotations	119

	Page
8.3 Analysis of the Tested Beams by the Method of Imposed Rotations	120
8.4 Comparison Between Theoretical and Experimental Results	122
8.4.1 Behaviour of the Beams	123
8.4.2 Cracking and Crack Patterns	125
8.4.3 Moment Redistribution Characteristics	125
8.4.4 Load-Deflection Relationships	127
8.4.5 Moment-Curvature Relationships	129
8.4.6 Hinge Length and Hinge Rotations	131
 CHAPTER IX CONCLUSIONS.	
9.1 General	133
9.2 Conclusions	134
9.3 Suggested Areas for Further Research	137
 REFERENCES	 139
 APPENDIX (A) Plates, Figures and Tables	 150
APPENDIX (B) List of the Computer Program for the Non- Linear Finite Element Analysis	266
APPENDIX (C) Application of the Developed Finite Element Program to Different Continuous Beams Tested by Other Investigators	284

LIST OF NOTATIONS

The following symbols have been adopted for use in this thesis. Other symbols not listed below are defined where they first appear.

A	Area of bending moment diagram, ,Area of the finite element.
A_s	Area of tensile reinforcement.
A'_s	Area of compressive reinforcement.
b	Breadth of a rectangular section, ,Breadth of the web of a flanged section.
B	Breadth of the flange of a flanged section.
$[B]$	The strain matrix.
c	Load factor at ultimate load.
c_i	Load factor at yield of reinforcement at section i .
C	Crack width.
C_s	Factor represents the type of reinforcement.
C_c	Factor represents the grade of concrete.
$[C]$	The transformation matrix.
d	Distance from extreme compressive fiber to centroid of tensile reinforcement.
D_b	Diameter of the steel bars.
$[D]$	The elasticity matrix.

x

E_c	Modulus of elasticity of the concrete.
E_p	Modulus of elasticity of concrete perpendicular to the crack direction.
E_s	Modulus of elasticity of the steel.
$E_c I_g$	Flexural stiffness of the gross concrete cross-section.
$E_c I_t$	Flexural stiffness of the transformed gross cross-section.
$E_c I_{cr}$	Flexural stiffness of the transformed cracked cross-section.
f_c, f'_c	Cylinder compressive strength of concrete.
f_{cu}	28-days cube compressive strength of concrete.
$f_{c \max}$	Maximum compressive stress of concrete.
f_r	Modulus of rupture of concrete.
f_{ct}	Tensile strength of concrete.
f_s	Stress in tension reinforcement.
f_y	Yield stress of reinforcement.
f_o	Proof stress of reinforcement.
F	Total applied concentrated load.
F_u	Ultimate concentrated load.
G	Shear modulus of elasticity factor.
h	Overall thickness of cross-section.
H	Horizontal force.
i, j, k	Nodes of the triangular element.
I_g	Moment of inertia of the gross section.

I_t	Moment of inertia of the transformed gross cross-section.
I_{cr}	Moment of inertia of the transformed cracked cross-section.
K_p	The plasticity factor.
$\{K_e\}$	Element stiffness matrix.
K_3	The ratio of the maximum compressive stress to the cylinder compressive strength of concrete.
l_{ps}	Length of portion of reinforcement at which the bond fails.
l_{pc}	Length of failure zone in the compression zone.
l_p	Length of the plastic hinge.
l_{80}, l_{90}, l_{95}	The distances to sections where the bending moment is equal to 80%, 90% and 95%, respectively, of the maximum moment.
L	Span of the beam.
L_1, L_2	Idealized elastic and plastic limits.
M	Bending moment at any section.
M_e	Elastic bending moment distribution.
M_r	Bending moment at cracking.
M_e	Bending moment at elastic limit.
M_{ser}	Serviceability bending moment.
M_u	Ultimate bending moment.
M_{L1}, M_{L2}	Bending moments at idealized limits L_1 and L_2 .
$\overline{M}$	Design bending moment.