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[L]IMIT DESIGN OF REINFORCED CONCRETE STRUCTURES-
[B]EHAVIOUR AND PLASTIC ANALYSIS OF REINFORCED CONCRETE CONTINUOUS TWO-SPAN I-BEAMS

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TABLE OF CONTENTS

Page

Page

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 controid of tensile reinforcement.
D_b	Diameter of the steel bars.
$[D]$	The elasticity matrix.

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	Proff 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.
$\ell_{80}, \ell_{90}, \ell_{95}$	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.
~~$M_{\ell e}$~~	~~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.