Ain-Shams University
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IN- PLANE STABILITY CONSIDERATIONS OF TRAPEZOIDAL STEEL FRAMEWORKS.

By

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NOTATIONS

The following symbols are used in the present thesis; any other symbols not stated below are defined when they are first used.

A, B, C, D	: frame joints of un-deformed frame;
A_1, B_1, C_1, D_1	: frame joints of deformed frame;
B'	: bracing stiffness dimensionless constant;
F	: force in tie member;
H	: secondary horizontal reaction;
I	: second moment of inertia;
k	: member bending stiffness (EI/L);
L	: column length;
L_b	: beam length;
L_T	: Length of bracing member;
P	: external normal force on column;
P_E	: Euler's buckling load $(\pi^2 EI / L^2)$
P_{cr}	: critical buckling load;
ρ	: ratio of axial load to Euler's load, (P / P_E);
ρ_{cr}	: critical ratio of axial load to Euler's load, (P / P_E);
s,c,m,n,o	: stability functions;
a	: length ratio between bracing joints to column length "L"
δ	: deflection perpendicular to column;
q	: joint secondary rotation;
φ	: column inclination to the vertical;
ψ	: bracing inclination to the horizontal;
h	: length ratio between, corner to bracing joint, to column length" "L;
g	: length ratio between, lower base to bracing joints, to column length "L";
B	: bracing coefficient factor;
[D]	: member displacement vector;
{F}	: load vector;
[K]	: stiffness matrix;
[T]	: transformation matrix;
$[T]^t$	: transpose of the transformation matrix;
$[\overline{K}]$	: global stiffness matrix;
x, y	: coordinates;
μL	: stability dimensionless parameter $(\sqrt{\pi^2 \rho})$

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