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ABBREVIATIONS AND SYMBOLS

A_{ij}	Arbitrary coefficients
$[A_{ij}]$	The element of extensional stiffness
$\{A\}$	Arbitrary coefficients vector
area _f	Area of the distributed resistance
area _p	Area over which pressure acts
[<i>B</i>]	Strain-displacement matrix
$[B_{ij}]$	The element of coupling stiffness
<i>C</i> , <i>S</i>	$\cos\theta$ and $\sin\theta$, respectively
[C]	Stiffness matrix
$[C_{ij}]$	The element of stiffness in x_1 - x_2 - x_3 coordinate system
$[\overline{C}_{ij}]$	The element of stiffness in x-y-z coordinate system
$[D_{ij}]$	The element of bending stiffness
$\{d\}$	Nodal displacement
$\{\ddot{a}\}$	Acceleration vector
E	Modulus of elasticity in tension and compression of isotropic
	material
E_{1}, E_{2}, E_{3}	Modulus of elasticity in tension and compression in x_1 , x_2 , and x_3
	direction, respectively
f_i	The i th natural frequency
$f_i(x)$	Functions which satisfy the boundary conditions along the x
	coordinate direction
$f_{i,x}, g_{j,y}$	The first differentiation with respect to the subscripted variable
$f_{i,xx}, g_{j,yy}$	The second differentiation with respect to the subscripted variable
${F^a}$	Acceleration (D'Alembert) force vector
$\left\{ F_{e}^{nd} ight\}$	Nodal forces applied to the element
$\left\{ F_{e}^{\ pr} ight\}$	Element pressure vector
$\left\{ F_{e}^{th} ight\}$	Element thermal load vector
G_{12}, G_{13}, G_{23}	Modulus of elasticity in shear in the x_1 - x_2 , x_1 - x_3 , and x_2 - x_3 ,
	respectively

$g_j(y)$	Functions which satisfy the boundary conditions along the y
	coordinate direction
h	Thickness of a plate
Κ	Kinetic energy
k	Foundation stiffness in units of force per length per unit area
[<i>K</i>]	The structure stiffness matrix
[K]	Stiffness matrix
	Element stiffness
$[K_e^f]$	Element foundation stiffness matrix
M_x, M_y	Bending moments per unit length of sections of a plate perpendicular to x and y directions, respectively
M _{xy}	Twisting moment per unit length of section of a plate perpendicular to r direction
m	Mass per unit area of plate
[M]	Mass matrix
$\begin{bmatrix} M \end{bmatrix}$	Flement mass matrix
$\begin{bmatrix} I & I \\ e \end{bmatrix}$	Normal forces per unit length of sections of a plate perpendicular to
1•x, 1•y	r and v directions respectively
N	Shearing force per unit length of section of a plate perpendicular to
l v xy	r direction
[N]	Element shape functions or interpolation functions
$\begin{bmatrix} N \end{bmatrix}$	Matrix of shape functions
$\begin{bmatrix} N \end{bmatrix}$	Matrix of shape functions for normal motions at the surface
$\{P\}$	Applied pressure vector
	Shearing forces parallel to z direction per unit length of sections of a
$\mathfrak{L}_x, \mathfrak{L}_y$	plate perpendicular to x and y directions respectively
	The element of plane stress_reduce stiffness
$[\mathfrak{L}_{ij}]$	The element of compliance in $x_1 - x_2 - x_3$ coordinate system
$\begin{bmatrix} \mathbf{S}_{ij} \end{bmatrix}$	The element of compliance in $x_1 x_2 x_3$ coordinate system The element of compliance in $x_1 x_2 x_3$ coordinate system
[_{ij}]	Time
ι I I	Strain energy
	Components of displacements in x y and - directions, respectively
u, v, w	Components of displacements in x , y , and z diffections, respectively

u_0, v_0, W_0	Components of displacements of middle surface in x , y , and z
	directions, respectively
$\{u\}$	Displacement vector
V	External work
vol	Volume of element
$\{w_n\}$	Motion normal to the surface
z	Distance from middle surface
$\gamma_{23}, \gamma_{13}, \gamma_{12}$	Shearing strain components in x_1 - x_2 - x_3 coordinate system
$\gamma_{yz}, \gamma_{xz}, \gamma_{xy}$	Shearing strain components in x-y-z coordinate system
δ	Virtual operator
$\mathcal{E}_1, \mathcal{E}_2, \mathcal{E}_3$	Normal strains in x_1 , x_2 , and x_3 direction, respectively
$\mathcal{E}_x, \mathcal{E}_y, \mathcal{E}_z$	Normal strains in x , y , and z directions, respectively
$\varepsilon_x^0, \varepsilon_y^0, \gamma_{xy}^0$	Normal strains of middle surface in x , y , and z directions,
	respectively
$\{\varepsilon\}$	Strain vector
K_x, K_y, K_{xy}	Curvatures of middle surface of plate
ν	Poisson's ratio of isotropic material
ν_{ij}	Poisson's ratio, defined as the ratio of transverse strain in the j^{th}
	direction to the axial strain in the i^{th} direction when stressed in the i^{th}
	direction, and
П	Potential energy
ho	Density
$\sigma_1, \sigma_2, \sigma_3$	Normal components of stress parallel to x_1 , x_2 , and x_3 direction,
	respectively
$\sigma_x, \sigma_y, \sigma_z$	Normal components of stress parallel to x , y , and z directions,
	respectively
$\{\sigma\}$	Stress vector
$\{\sigma\}$	Stress carried by the surface
$ au_{23}, au_{13}, au_{12}$	Shearing stress components in x_1 - x_2 - x_3 coordinate system
$\tau_{yz}, \tau_{xz}, \tau_{xy}$	Shearing stress components in x-y-z coordinate system
$\{\phi\}_i$	Eigenvector representing the mode shape of the i th natural frequency
ω	Natural circular frequency
ω_i	The i th natural circular frequency

 $[\partial]$



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