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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
$[B]$	Strain-displacement matrix
$[B_{ij}]$	The element of coupling stiffness
c, s	$\cos\theta$ and $\sin\theta$, respectively
$[C]$	Stiffness matrix
$[C_{ij}]$	The element of stiffness in x_1-x_2-x_3 coordinate system
$[\bar{C}_{ij}]$	The element of stiffness in x-y-z coordinate system
$[D_{ij}]$	The element of bending stiffness
$\{d\}$	Nodal displacement
$\{\ddot{d}\}$	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 ith 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
$\{F_e^{nd}\}$	Nodal forces applied to the element
$\{F_e^{pr}\}$	Element pressure vector
$\{F_e^{th}\}$	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
K	Kinetic energy
k	Foundation stiffness in units of force per length per unit area
$[K]$	The structure stiffness matrix
$\left[K\right]$	Stiffness matrix
$\left[K_e\right]$	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 *x* direction
m	Mass per unit area of plate
$\left[M\right]$	Mass matrix
$\left[M_e\right]$	Element mass matrix
N_x, N_y	Normal forces per unit length of sections of a plate perpendicular to *x* and *y* directions, respectively
N_{xy}	Shearing force per unit length of section of a plate perpendicular to *x* direction
$\left[N\right]$	Element shape functions or interpolation functions
$\left[N\right]$	Matrix of shape functions
$[N_n]$	Matrix of shape functions for normal motions at the surface
$\{P\}$	Applied pressure vector
Q_x, Q_y	Shearing forces parallel to *z* direction per unit length of sections of a plate perpendicular to *x* and *y* directions, respectively
$[\overline{Q}_{ij}]$	The element of plane stress-reduce stiffness
$[S_{ij}]$	The element of compliance in x_1-x_2-x_3 coordinate system
$[\overline{S}_{ij}]$	The element of compliance in *x*-*y*-*z* coordinate system
t	Time
U	Strain energy
u, v, w	Components of displacements in *x*, *y*, and *z* directions, 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
$\varepsilon_1, \varepsilon_2, \varepsilon_3$	Normal strains in x_1, x_2, and x_3 direction, respectively
$\varepsilon_x, \varepsilon_y, \varepsilon_z$	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
$\kappa_x, \kappa_y, \kappa_{xy}$	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
Π	Potential energy
ρ	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
$\tau_{23}, \tau_{13}, \tau_{12}$	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

$[\partial]$ Derivative operator matrix