

# Symbols

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## ENGLISH SYMBOLS

$a, b, d$	Constants related to geometry of a sliding isolator
$c_1$ & $c_2$	Constants of CFPI.
$c$	Damping coefficient of structure
$c_b$	Damping of isolator
$\mathbf{C}_0$	Damping matrix of superstructure
$\mathbf{C}$	Damping matrix of isolated structure
$\tilde{\mathbf{C}}$	Modified damping matrix for complex modal analysis
$d_b$	Threshold value where CFPI becomes tangential to FPS
$d_f$	Distance from centre of isolator where coefficient of friction is varied
$dy/dx$	Slope of isolator at $x$ – coordinate
$f_R$	Restoring force of isolator
$g$	Gravitational acceleration
$k$	Stiffness coefficient of structure
$k_b$	Stiffness of isolator
$\mathbf{K}_0$	Stiffness matrix of superstructure
$\mathbf{K}$	Stiffness matrix of isolated structure
$\tilde{\mathbf{K}}$	Modified stiffness matrix for complex modal analysis
$m$	Mass of structure
$m_b$	Base mass
$m_i$	Mass of $i^{\text{th}}$ DOF
$m_t$	Total mass of structure
$\mathbf{M}_0$	Mass matrix of superstructure
$\mathbf{M}$	Mass matrix of isolated structure
$\tilde{\mathbf{M}}$	Modified mass matrix for complex modal analysis
$p_{fm}$	Complex participation factors for $m^{\text{th}}$ mode for frictional force
$p_{gm}$	Complex participation factors for $m^{\text{th}}$ mode for ground acceleration
$r$	Non dimensional parameter of VFPI

$R$	Radius of FPS
$\mathbf{r}$	Load influence vector of isolated structure
$\mathbf{r}_0$	Load influence vector of superstructure
$\text{sgn}(\ )$	Signum function
$T$	Period of isolator
$T_b$	Time period of FPS
$T_i$	Initial time period of VFPI and CFPI
$\mathbf{u}$	State vector
$W$	Supported weight on isolator
$x_b$	Isolator displacement
$x_g$	Ground displacement
$x_i$	Displacement of $i^{\text{th}}$ DOF
$\mathbf{x}_0$	Vector of relative displacement of superstructure
$\mathbf{x}$	Vector of relative displacement of isolated structure
$y(x)$	Displacement of slider
$y_m$	Modal co-ordinate of $m^{\text{th}}$ mode
$\mathbf{y}$	Vector of modal coordinates of superstructure
$\mathbf{Y}$	Modified vector of modal co-ordinates of isolated structure
$\mathbf{z}$	Vector for complex modal co-ordinates

## GREEK SYMBOLS

$\alpha$	Mass ratio
$\Phi_0$	Normal modal matrix of superstructure
$\Phi$	Normal modal matrix of isolated structure
$\phi_{0m}$	Shape vector of $m^{\text{th}}$ mode
$\gamma_m$	Participation factor of $m^{\text{th}}$ mode for fixed base structure
$\lambda_m$	Complex eigen vector for $m^{\text{th}}$ mode
$\mu$	Coefficient of friction of isolator
$\mu_1$	Initial coefficient of friction
$\mu_2$	Final coefficient of friction
$\mu_f$	Total frictional force
$\omega_m$	Modal frequency of $m^{\text{th}}$ mode
$\omega_I$	Initial frequency of the isolator
$\omega_b(x)$	Natural frequency of isolator at slider position $x$
$\theta$	Slope of curved sliding surface of isolator
$\zeta_b$	Damping constant of isolator
$\zeta_m$	Modal damping ratio of $m^{\text{th}}$ mode
$\Psi_L$	Left complex eigen vector

$\Psi_R$  Right complex eigen vector

## MISCELLANEOUS SYMBOLS

$\cdot$  First derivative  
" Second derivative  
 $T$  Transpose of matrix