LIST OF SYMBOLS

A  Cross-section area of beam; Parameter in modified Phase term (7.5)

B  Parameter in modified Phase term (7.5)

C  Velocity of propagation of flexural wave

C₀  Rod wave velocity (velocity of propagation of Longitudinal wave)

C₂  Shear wave velocity (velocity of distorsional wave)

D  Displacement of striker from the beginning of impact

E  Young's Modulus; Young's Modulus of beam material (YB)

F  Force

Fₘₐₓ  Maximum contact force (3.7)

G  Modulus of rigidity

H  Hertz's constant (A.2.10)

H₁  Constant for the material of striker tip (A.2.10)

H₂  Constant for the material of beam (A.2.10)

I  Centroidal second moment of area of cross-section of beam

K  Radius of gyration of a cross-section about neutral axis of bar (6.6); coefficient of restitutions (3.4)

Kᵣ  Scale factor (shear modulus of steel/shear modulus of rubber)

M  Subscript for Model

P  Subscript for Prototype; Time varying contact force between beam and striker.

Pₘₐₓ  Equivalent maximum contact force

Pₙ  Contact force between beam and striker after nth interval of time from the beginning of impact

R₁  Radius of hemispherical striker tip (A.2.10)

R₂  Radius of top edge of beam (A.2.10)

T  Time measured from the beginning of impact
Hass attached spring (7.4)  
Y Central deflection of lower fibre of beam  
\( a \) Subscript; Beam parameter = \((EIg/AV)^{1/2}\)  
\( b \) Subscript  
\( c \) Acoustic velocity  
\( d_{n-1} \) Distance moved by the centre of the striker in a time equal to \((n-1)T\) from the datum at the beginning of the impact  
\( f_{m} \) Material fringe value  
\( g \) Acceleration due to gravity  
\( i \) Index number  
\( j \) Index number  
\( k \) Spring constant of Spring-mass system  
\( k_{1} \) Coefficient in Rayleigh surface wave equation (6.3)  
\( l \) Linear dimension; span of the beam (BS)  
\( m \) Mass of the colliding body; mass of the striker (BM)  
\( n \) Parameter in modified phase term (7.5); subscript denoting interval of time after impact  
\( t \) Time  
\( t' \) Equivalent time  
\( t_{1} \) Time ranging from zero to \( T \) with an increment of \( dt_{1} \)  
\( t_{d} \) Total duration of symmetrical triangular force history  
\( t_{s} \) Duration of contact force  
\( v \) Velocity of the colliding body; velocity of striker at an instant of time after impact  
\( v_{0} \) Velocity of striker just before collision  
\( \Delta v \) Change in velocity  
\( v_{n} \) Velocity of striker after \( n \)th interval of time  
\( y_{n} \) Central deflection of the beam after \( n \)th interval of time
\[ \lambda \] Local deformation at impact point
\[ \lambda_1 \] Coefficient used in the expression \( \lambda = \left[ \frac{(1-2\nu)/(2-2\nu)}{(2-2\nu)} \right]^{\frac{1}{3}} \)
\[ \lambda_n \] Contact deformation after nth interval of time
\[ \gamma \] Density
\[ f \] \( \gamma/g \) (Density/Acceleration due to gravity)
\[ \nu \] Poisson's ratio
\[ \lambda \] Wave length
\[ \sigma \] Fibre stress in beam
\[ \sigma_1 \] Instantaneous stress at a chosen point
\[ \tau \] Small element of time (1/180 th of time period of fundamental mode of vibration of beam)
\[ \omega \] Circular frequency of beam vibration (7.4)
\[ \omega t \] Phase term (7.5)
\[ \Gamma \] Dynamic amplification factor
\[ \Gamma^* \] Modified dynamic amplification factor