



# ACKNOWLEDGEMENT

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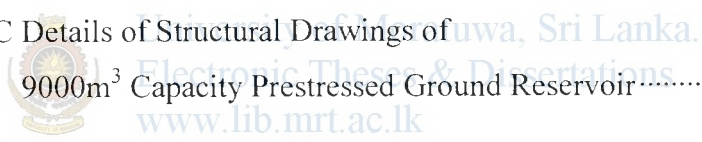
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# NOTATIONS

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This appendix contains a list of notations used in this paper.

- a = Radius of cylinder, ring beam.
- d = Depth of ring beam.
- E = Young's Modulus of Elasticity.
- $H_0$  = Horizontal force at an edge?
- $H_R$  = Radial force on ring beam.
- h = Height of water above the crown of the bottom spherical dome.
- $h_1$  = Depth of water in the cylindrical portion of the tank.
- M = Bending Moment, Subscripts  $x$  &  $\phi$  denote the meridional bending moments in the cylindrical shell and the spherical dome respectively. Subscript  $\theta$  denotes the transverse bending moment. Subscript  $\Phi$  denotes the redundant moment at an edge. Subscript R denotes the radial moment in a ring beam.
- N = Direct force - subscripts  $x$  &  $\phi$  denote the meridional forces in the cylindrical shell and the spherical dome respectively. Subscript  $\theta$  denotes the hoop force.
- P = Line load per unit length.
- p = Load per unit area.
- Q = Shearing force, subscription  $x$  &  $\phi$  denote the shearing forces in the cylindrical shell and the spherical dome respectively.
- R = Radius of a spherical dome.
- s = Distance of a point in a conical shell from the vertex of the cone.
- t = Thickness of shell, ring beam.
- V = Membrane rotation. Subscripts c, and d denote the cylindrical shell, spherical shell.
- v = Rotation due to edge forces moments. Subscripts c and d denote the cylindrical shell, spherical dome respectively. Subscripts H and M denote the horizontal force and redundant moment applied at an edge respectively.
- x = Distance of a point from an end in a cylindrical shell.
- y = Shell constant for a conical shell.

$y$  = Shell constant for a conical shell.

$$y = 2\sqrt{\frac{12(1-\mu^2)s^2 \tan^2 \alpha}{t^2}}$$

$\alpha_1$  = Angle made by a point in the spherical dome with its edge.

$\alpha$  = Angle made by a conical shell with its base circle.

$\beta$  = Shell constant.

$$(1) \beta = 4\sqrt{\frac{3(1-\mu^2)a^2}{t^2}} \quad \text{for a cylindrical shell}$$

$$(2) \beta = 4\sqrt{\frac{3(1-\mu^2)R^2}{t^2}} \quad \text{for a spherical shell}$$

$\gamma$  = Density of water.

$\mu$  = Poisson's ratio.

$\Delta$  = Membrane displacement. Subscription c & d denote the cylindrical shell, spherical dome.

$\delta$  = Displacement due to edge force and moments. Subscripts c, d, denote the cylindrical shell, spherical dome respectively. Subscript R denotes the ring beam. Subscripts H and M denote the horizontal force redundant applied moment at an edge respectively.

$\gamma_c$  = Density of Concrete ( $\text{Kg/m}^3$ )

$E$  = Young's modulus ( $\text{kN/m}^2$ )

$\delta_{RH}$  = Displacement of the ring beam due to radial force

$\delta_{RM}$  = Displacement of the ring beam due to radial moment

$\delta_{dH}$  = Displacement of the dome due to unit edge force

$\delta_{dM}$  = Displacement of the dome due to unit edge moment

$\Delta_d$  = Displacement of the dome

$\nu_{RH}$  = Rotation of the ring beam due to radial force

$\nu_{RM}$  = Rotation of the ring beam due to radial moment

$\nu_{dH}$  = Rotation of the dome due to unit edge force

$\nu_{dM}$  = Rotation of the dome due to unit edge moment

$\nu_d$  = Rotation of the dome