

AN ABSTRACT OF A THESIS

**FREE VIBRATION OF FINITE LENGTH SOLID
CIRCULAR CYLINDERS**

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The free vibration of finite length solid circular cylinders was analyzed using nine-node Lagrangian finite elements in the cylindrical coordinate system. The governing equations for three-dimensional dynamic elasticity were solved assuming periodic motion in time. Numerical results for frequency of vibration and mode shape were presented in tabular form and graphical form, respectively. Vibration frequency for isotropic solid circular cylinders with Poisson's ratio $\nu = 0.3$ were compared with similar results in the existing literature to verify the computer codes. The analysis was extended to include vibration results for cylinders with hexagonal material properties.