PARAMETER ESTIMATION AND DESIGN OF
DYNAMIC ABSORBER AS VIBRATION
ABSORBER OF EARTH SURFACE

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ABSTRACT

The strength of building towards the earth movement among other things is dependent upon the building foundation. The earth movement is caused by many factors such as transportation and gambut soil with is structure that is vulnerable to the movement. DVA as a kind of absorber that dynamically absorb the movement of the earth. In this research, the foundation of building is moving earth. With the installation of DVA, it is expected that the damage of building caused by the earth movement can be reduced. The optimalization of DVA depends on the parameter and its construction. DVA has three parameter namely m (mass), k (spring) and c (damper).

Analyzes component construction k and c both parallelly and serially and it is obtained parameters of k, m and c for serial model:

\[
\frac{k}{m} = \frac{1}{(1-\mu)(1+\sqrt{\frac{\mu}{2-\mu}})\mu}\omega^2
\]
\[
\frac{c^2}{mk} = \frac{4\mu(\mu-3)}{8\mu}
\]
\[
\frac{K}{M} = \left(\frac{\omega^2}{(1+\sqrt{\frac{\mu}{2-\mu}})}\right)\sqrt{1-\mu}
\]

And it is obtained parameters of k, m and c for parallel model:

\[
\frac{k}{m} = \gamma^2\frac{\omega^2}{\lambda^2\mu}; \quad \frac{K}{M} = \gamma\frac{\omega^2}{\lambda^2\mu}; \quad \frac{c^2}{mk} = 4\xi^2
\]

Thus, parallel vibration absorber can absorb the vibration better than the serial one. The parallel vibration absorber can maximize absorbance and minimize vibration.

Key-Words: Dynamic Vibration-Absorber, Optimalization, Vibration of earth’s surface.