



## Seismic performance of Greater Jakarta LRT with added lead rubber bearing using non-linear time history analysis

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### Abstract

In order to overcome stringent seismic requirement in the new Greater Jakarta Light Rail Transit Project, a breakthrough seismic system shall be chosen to obtain expected structural performance. This seismic system shall be designed to provide operational performance level after strong earthquake events. To achieve the criteria, seismic isolation system using Lead Rubber Bearings is chosen. With this isolation system, Greater Jakarta LRT has become the first seismically isolated infrastructure and apparently an infrastructure with the largest numbers of LRBs in one single project in Indonesia. More than 10.400 Pcs LRBs are used for the first phase of the construction and the numbers will be certainly increased in the next phase of the construction. To evaluate the structural performance, non-linear time history analysis is used. A total of 3 pair matched ground motions will be used as the input for the response history analysis. The ability of the lead rubber bearing to isolate and dissipate earthquake actions will determine its structural performance level. This will be represented by the nonlinear hysteretic curves obtained throughout the earthquake actions.

**Keywords:** structural performance; performance-based design; seismic isolation system; passive control device; lead rubber bearing; energy dissipation; nonlinear time history analysis

### 1 Background

Greater Jakarta Light Rail Transit project was initiated to clear up heavy congestions on both existing Jakarta-Cikampek Toll and Jagorawi Toll

Road. The original concept from Indonesian government is to offer public modes of transportation that are safe, comfortable, and affordable for its citizen. With these criteria, it will be easier for the private vehicle users to switch to