

## **Vibration Induced By Rapid Impact Compaction on Granular Soils**

**Omar El Khaled**

Trevi Arabian Soil Contractors Ltd.  
Al Khobar, Saudi Arabia  
okhaled@trevispa.com;

**Emmanouil Spyropoulos**

Saudi Aramco, Dhahran, Saudi Arabia.  
emmanouil.spyropoulos@aramco.com;

**Omar Maalej**

Trevi ASC, Al Khobar, Saudi Arabia  
omaalej@trevispa.com;

**Abstract** - The use of Rapid Impact Compaction (RIC), sometimes referred as Rapid Dynamic Compaction (RDC), has increased significantly in the latest years in Saudi Arabia mainly for large scale and strategic projects due to substantial time and cost saving benefits. Following the concept of Dynamic Compaction, RIC machines have been developed for the compaction of embankments and shallow treatment up to 6m depth, by providing a compaction hammer attached to a strengthened arm of a hydraulic excavator. This paper concludes the minimum required safe distance to prevent any potential damages of RIC on adjacent buildings and buried utilities, based on the results of experimental measurements supported by numerical model results.

**Keywords:** Rapid Impact Compaction, Vibration Transmission, Safe Distance, Vibration Measurements.