

## DPRI Geotechnical Centrifuge Center – Kyoto University

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Owner: Disaster Prevention Research Institute (DPRI), Kyoto University

Location: Uji, Kyoto, Japan

### Introduction

Geotechnical centrifuge modeling is one of the methods for small-scale model testing to study the behavior of soils and structures. By applying high centrifugal acceleration to a scaled model ground, a confining pressure of the ground in prototype scale can be simulated in a scaled model, which is one of the advantages of using a geotechnical centrifuge facility. The geotechnical centrifuge at DPRI, Kyoto University, has operated since 1988. Since then, the geotechnical research group at Kyoto University has been supporting the centrifuge facility. In 2010, the geotechnical centrifuge was extensively renovated. We accept undergraduate and graduate students and researchers not only from within the university but also from universities and research institutes in Japan and abroad. Our group aims to contribute to developing geotechnical engineering through research using the geotechnical centrifuge and to become one of the leading centers in the world's centrifuge users community.



Geotechnical Centrifuge Center at DPRI, Kyoto University

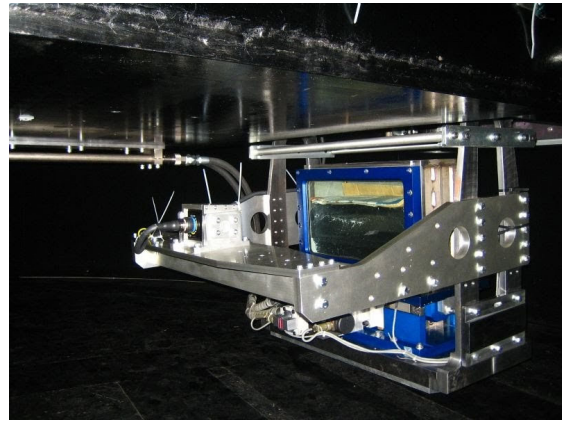
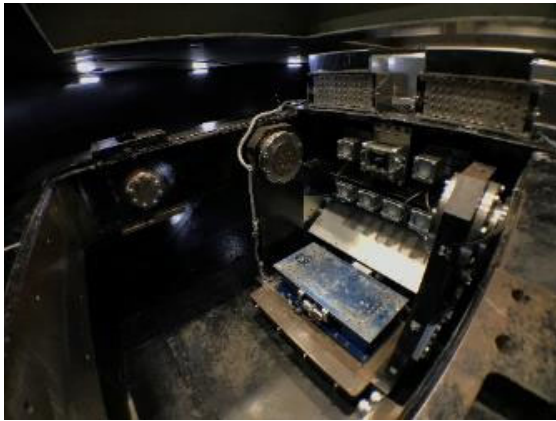
### Key Technical Specifications

Beam Centrifuge	
Manufacturer	Marui Co., Ltd.
Year established	Established in 1988, renovated in 2010
Radius to base of platform	2.5 m
Capacity	24 gton (max G-level: 200 g for static, 50 g for dynamic)
Bucket area	1.2 m (L) x 1.2 m (W) x 1.5 m (H)
Major equipment	Shaking table (capacity 1 kN @50 g)

Measuring instruments (strain gauge type sensor: 80ch, charge output accelerometer: 12ch) High-speed cameras (2 units) / Imaging devices Dam-break tsunami simulator* Rainfall device* Vertical and/or horizontal loading device* (*Need to contact the owning laboratory since these are not for common use.)
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### Shaking table

The shaking table has been introduced to investigate the seismic behavior of embankments, slopes, and soil-structure systems during earthquakes. Horizontal vibration loading is applied to the soil container mounted on the centrifuge arm in a direction perpendicular to the direction of centrifugal acceleration by a hydraulic servo actuator. The shaking table can provide seismic motions of arbitrary waveforms with a maximum acceleration of 50 G and a maximum frequency of 200 Hz in addition to sinusoidal waves.



### Measurement room

The DPRI geotechnical centrifuge is located underground. The inside of the pit can be observed on a monitor in the measurement room above ground. Spin-up and spin-down operations of the centrifuge are performed in this measurement room, and it takes about 15 minutes to reach 50G centrifugal acceleration and about 10 minutes from 50G to stop. In addition, the shaking table mentioned above, high-speed cameras, and loading devices can be controlled in this room.

