# Long Stoke and High Speed Earthquake Simulator

Near-fault ground motions have special characteristics of large displacement and high velocity which could lead to catastrophic damage of buildings and infrastructures. The NCREE Tainan Laboratory is equipped with a high performance earthquake simulator which is designed specifically for simulating near-fault ground motions.
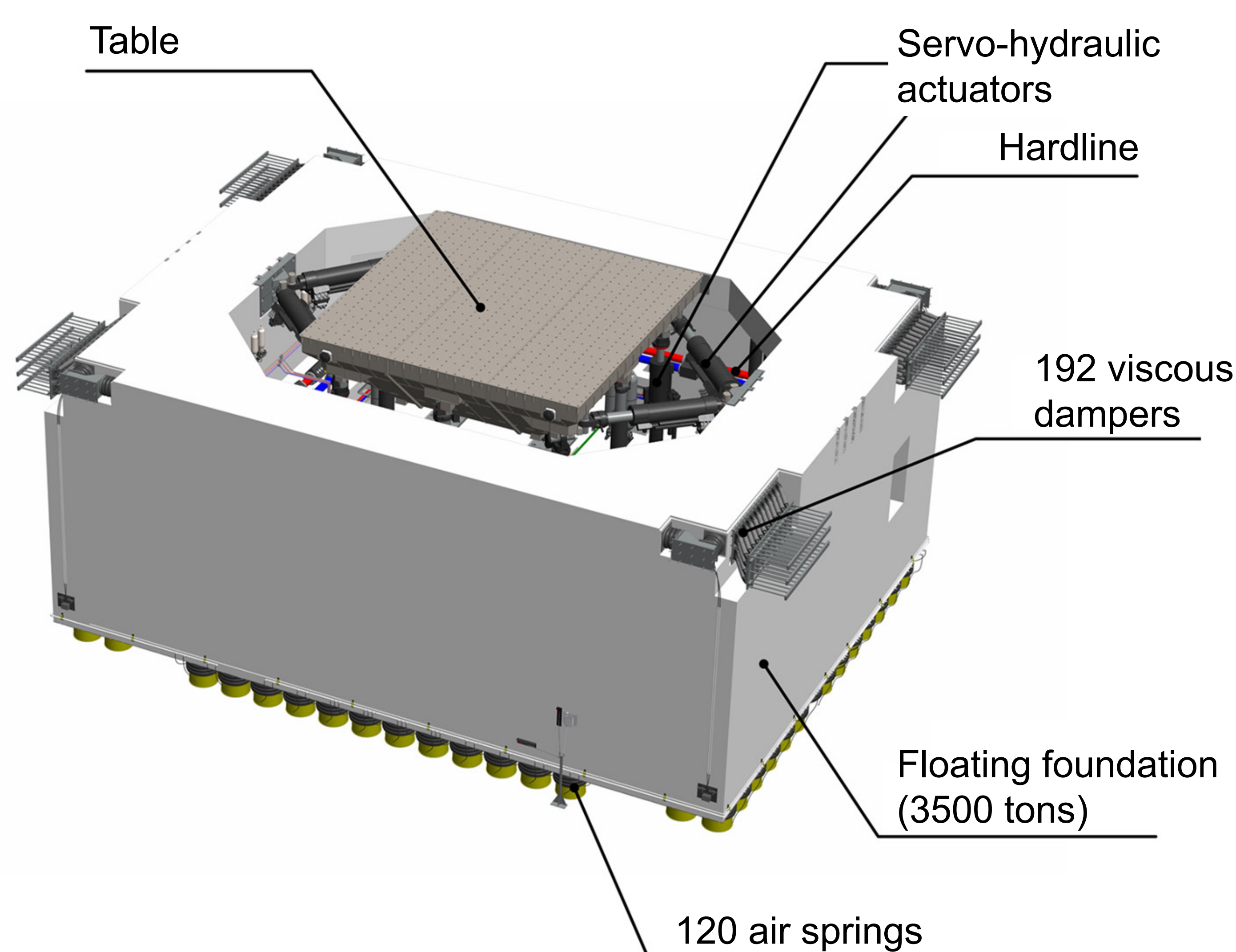
High-performance earthquake simulator

Specifications of the earthquake simulator

6 DOF 8m x 8m earthquake simulator			
Maximum payload of 250 ton specimen mass			
Frequency of operation: 0.1~30 Hz Uniaxial Sinusoidal waveforms			
	X axis	Y axis	Z axis
Stroke:	± 1.0 m	± 1.0 m	± 0.4 m
Velocity:	± 2.0 m/s (for 10 sec)	± 2.0 m/s (for 10 sec)	± 1.0 m/s (for 20 sec)
Acceleration: 250t specimen 100t specimen Bare Table	±0.75 g ±1.4 g ±2.5 g	±0.75 g ±1.4 g ±2.5 g	±0.5 g ±0.8 g ±3.0 g
Overturning Moment	500 tonf-m (bi-axial) 1000 tonf-m (uni-axial)		

The size of the earthquake simulator is 8m x 8m with a weight of 750 kN. Experimental specimens with a maximum weight of 2500 kN can be accommodated on the earthquake simulator. The earthquake simulator is driven by eight servo-hydraulic actuators. Four are installed horizontally and the others are mounted vertically. The weight of the earthquake simulator and the specimen is balanced by four static supports. The reaction forces of the actuators are provided by the reaction mass with a weight of 35 MN. The reaction mass is isolated from the fixed foundation by 120 air springs and 192 viscous dampers. The hydraulic power is provided by five electrical pumps which offer a total continuous flow rate of 3,500 lpm with a working pressure of 210 kgf/cm^2. Six accumulator banks are equipped to provide supplemental pressure with a peak flow rate of 26,000 lpm. The maximum horizontal stroke and velocity of the earthquake simulator are ±1.0m and ± 2.0 m/s, respectively. The maximum horizontal and vertical accelerations for bare earthquake simulator are ±2.5 g and ±3.0 g, correspondingly.