Goal Done Solution

Mehsana- Gujarat (382715)
Contact No.- +91– 9662052779
infodesk@goaldonesolution.com
info.goaldone@gmail.com

Document- First Look of Our Project…

Project Name: UNI & BI - AXIAL SHAKE TABLE

Why Equipments for Earthquake Engineering?

Earthquake Engineering Equipments are helpful in the practical study of subjects of earth quake engineering & structural dynamics in Civil Engineering and Machine Vibration analysis in mechanical engineering Curriculum for both undergraduate and graduate programs.

The set of equipment in this catalog are designed to help student as well as professors understand the behavior such as damping, static and dynamic response, resonance condition and amplitude magnification, model of vibration, vibration isolation and absorption etc.

1. Servo Operated Shake table (variable amplitude & frequency)

The shake table is an indispensable testing facility for development of earthquake resistance techniques. A shaking table is a platform exited with servo motor to simulate different types of periodic and random motions, such as artificial earthquakes and other dynamic testing signals of inertia forces, which can be used to simulate different types of motion such as recorded earthquake ground motions, sine sweeps, etc. Shake table test results enhance further the understanding of the behavior of structures and calibration of various numerical tools used for analysis. This facility can be utilized for verification of earthquake resistance buildings, other structures, mechanical components, devices, etc.

A single-axis table is the simplest form of earthquake simulator which is not only useful for many investigations when it is only desirable to excite the specimen in one axis, but also simplifies subsequent interpretation of the results.

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TABLE Size	**1200mm x1000mm**
Load Capacity	**1200 Kg**
Frequency Range	**0 to 25 Hz**
Displacement range	**0 to 260mm**
Touch Screen	**3.5”**

2. Servo Operated Shake table (worked on real Earthquake history)

This Shaking table is artificial, where in we can define real Earthquake history/ time history by computer software. We can feed variable waves like sine, triangular and random motion waves.

TABLE Size	**2000mm x 2000mm**
Load Capacity	**800 Kg**
Frequency Range	**0 to 50 Hz**
Displacement range	**0 to 150mm**

3. Horizontal Shake table (worked on cam mechanism)

Sliding table dimension	**1000mm x 750mm**
Load Capacity	**75 Kg**
Motor	**1 HP**
Frequency Range	**0 to 30 Hz**
Amplitude	**0 to 100 mm**
Resolution	**1 mm**

Cam 1. ± 0.5 mm, Cam 2. ± 1 mm, Cam 3. ± 2 mm,

Cam 4. ± 5 mm, Cam 5. ± 10 mm, Cam 6. ± 20 mm

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4. Vertical Shake table (worked on cam mechanism)

Sliding table dimension	**1000mm x 750mm**
Load Capacity	**75 Kg**
Motor	**1 HP**
Frequency Range	**0 to 20 Hz**
Amplitude	**0 to 10 mm**

5. Double axes servo operated Shake table

TABLE Size	**750mm x750mm**
Load Capacity	**200 Kg**
Frequency Range	**0 to 18 Hz**
Displacement range in both direction	**0 to 100mm**
Touch Screen	**5”**

6. Models and Experimental setups

Single Storey Building Frame

- **With 2 steel slabs-1 base slab and 1 top slab, 3 aluminium columns and 1 steel column.**
- **With 2 Perspex slabs-1 base slab and 1 top slab, 4 aluminium columns.**
- **With 2 aluminium slabs-1 base slab and 1 top slab, 4 aluminium columns, 4 aluminium stiffners.**

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Three Storey Building Frame

- With 1 aluminium base slab, 3 aluminium floor slabs, 4 aluminium columns.

Four Storey Building Frame

- With stiffners Model- With 5 aluminium slabs- 1 base slab and 4 floor slabs, 4 aluminium columns, 16 aluminium stiffners- 4 each for each floor.
- With slabs, Rebars and sleeves Model- With 2 steel slabs-1 base slab and 1 top slab, 4 Rebars of EN 19 with MS connecting plates and 12 MS sleeves

Water Tank Models

- Dimensions- 0.3m x 0.24m x 0.5m with MS angle frame and Perspex walls. Weight less than 20 Kgs. Leak proof

Liquefaction Model Setup

- Two plywood boxes-1 with dimension 0.35m x 0.45m x 0.14m and the other surrounding it with dimensions 0.4m x 0.5m x 0.15m

Soil Model

- 4 Perspex sheets hinged at the edges around a block of dimensions 0.63m x 0.325m x 0.2m

- 2 Foam blocks provided.

Beam Setup

- 4 Perspex sheets hinged at the edges around a block of dimensions 0.63m x 0.325m x 0.2m

- 2 Foam blocks provided

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Vibration Isolator

- Thin Aluminium Isolator of 1mm thickness, and Aluminium Block and a Aluminium Mass.

Vibration Absorber

- Main beam, absorber beam, supporting structure, connecting rod, D.C Motor, Flywheel with eccentric mass and Mass on absorber beam.

Free Standing Rigid Body Model

- Solid model of Mild steel to be used with liquefaction model.

7. Measuring instrument

We are highly precision accelerometers are provided for measurement of acceleration of vibration and hence amplitude of vibration with following instruments.

Accelerometer
Digital Oscilloscope
Signal amplifier
Interfacing
Computer

Thanking you.

Milap Vaishhnav
Project Manager
GoalDone Solution

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Quotations of Earthquake Engineering Laboratory

Sr No.	Instruments	Approximate cost (Rs.)
1.	Servo Operated Shake table (variable amplitude & frequency)	4,50,000/-
2.	Servo Operated Shake table (worked on real Earthquake history)	5,50,000/-
3.	Horizontal Shake table (worked on cam mechanism)	2,25,000/-
4.	Vertical Shake table (worked on cam mechanism)	1,90,000/-
5.	Double axes servo operated Shake table	10,50,000/-
6.	Models and Experimental setups	1,50,000/-
7.	Measuring instrument	6,80,000/-
	TOTAL APPRO. COST:-	32,95,000/-

Note: Taxes and Transportation Extra.