

Dynamic properties of the isolators used in the Green Museum Library (Taiwan)

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Abstract

Over the last decades seismic isolation technology has got a foothold in the structural protection increasing both the damping and the natural period of the superstructure. The curved surface sliding isolator is one of the most common devices used to aim at this goal. It features a special friction material (HIM) able to dissipate a very large amount of energy while, the recentring capacity is given by the pendulum effect. This kind of isolator has been used in the Green Museum Palace (Taiwan). The constancy of its behaviour has been investigated in ShakeLab (Italy), testing 100% of the Friction Pendulum devices in factory production control. In this paper, response data from FPC tests on seven types of Friction Pendulum devices are illustrated. These data show the constancy of the performance of the isolators subjected to design conditions. Furthermore, scale effect in dynamic properties has been studied because of different size isolators have been taken into account.

Keywords: Friction Pendulum; Isolation system.

1 Introduction

In the coming years, a new museum is going to be erected in Taichung (Taiwan) making you breathe new life into the city centre. The building Green Museum Library, called Green Museumbrary, will accommodate both an art museum and library in a natural setting. The design is the result of an international competition which took place in 2013 and won by the architects Kazuyo Sejima and Ryue Nishizawa (SAANA architectural firm). The 2,6-hectare wide complex will feature eight white buildings ranging from 5 to 7 levels with the 2 levels basement in a greater footprint. A set of isolators are located below the mean mass of the structure. The site slopes at a 3,0 m length level drop from the main road to the inner park region.

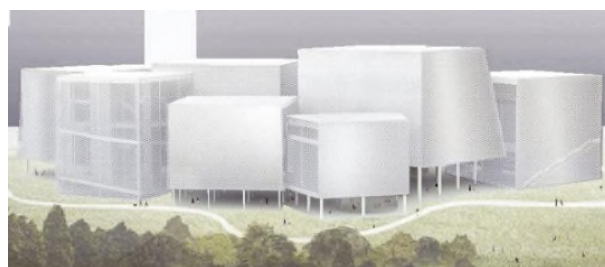


Figure 1. Green Museumbrary Taichung (Taiwan)

2 Performance requirements

The isolation system is characterized by 109 curved sliding surface devices with a special friction material (Hirun International Material - HIM) able to dissipate a large amount of energy, while the pendulum effect allows recentring. Detailed information on the main features of the isolators is provided in the following chapters.