

# Anti-seismic Underground Bicycle Park – ECO Cycle

Giken Seisakusho Co., Ltd.

## 1. Outline of Eco-cycle

Eco-cycle is a fully automated anti-seismic underground bicycle parking accommodating large number of bicycles (204 units). It is designed under the concept of “Culture Aboveground and Function Underground” and put importance on land-saving. Eco-cycle is an environmentally-friendly product contributing to create a sustainable society by eliminating illegal parking of bicycles and nuisance parking at footpath with effective usage of underground space and by encouraging people to use bicycles which are eco-friendly and enhance peoples’ health.

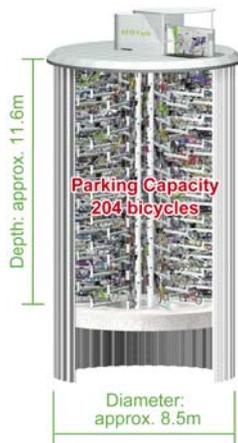


Figure 1: Appearance of ECO Cycle

## 2. Construction of Eco-cycle

First of all, an 8.5m-diameter anti-seismic shaft is constructed underground by directly and cylindrically pressing-in the structural members at 9m x 9m space. Then soil inside the shaft is excavated to create 12m-deep underground space, and the robot is installed at the centre of the shaft, and parking pallets are arranged in a radial fashion with multi-layers on the shaft wall. Finally the prefabricated entrance booth is mounted on the ground. The booth exterior is freely designed with compact and space-saving design.

This construction design enables us to remove the whole Eco-cycle with the anti-seismic wall, and such removed materials would be reused for other projects, when Eco-cycle is no longer necessary at the place. This design also realises the idea of a sustainable design so called “Functional Structure”.

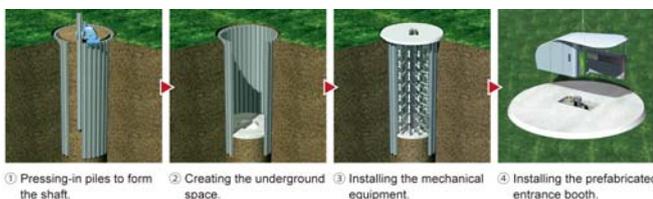
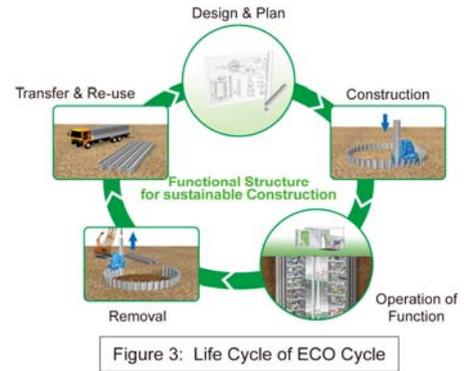


Figure 2: Construction process of ECO Cycle



## 3. Features of Eco-cycle

Eco-cycle can accommodate most types of bicycles regularly available in Japan market, for example, mountain bikes with wide tires, heavy electric bicycle, compact foldable bicycle, bicycle with rear basket and bicycle with child seat. Also, loading and unloading operations of bicycle are safely and easily operated by Card Reader (IC Card and IC Tag recognition) which are based on universal design. The accommodated bicycles are highly secured. Furthermore, the average waiting time for unloading is about 13 seconds and it does not have the users waiting for unloading even during rush hours in the morning and evening.



Figure 4: Easy and safe loading process

## 4. Installation history of Eco-cycle

Since the introduction of 1<sup>st</sup> Eco-cycle in 1998, 36 units of Eco-cycle have been installed at 13 different locations in Japan achieving underground accommodation for 6,605 bicycles. In that process, Giken succeeded in improving the parking capacity from 144 to 204. This upgraded model was introduced in May 2009 at JR Chiba Station and remains available nowadays.

## 5. Summary

14 years ago, Giken led the world to introduce Eco-cycle, and it is now prevalent as “standard model” of automated underground bicycle parking lots in Japan. We will keep providing the solutions nationwide to make aboveground space more comfortable and cultural by Eco-cycle, which can achieve the both aesthetic aspects and parking capacity aspect.