# **LafargeHolcimAwards**

# **Bike Station Bamboo Parking**

[Project title]

### **AW20-HMHLU**

[Project ID]

### LafargeHolcim Awards (Main Category)

### General Project Data

**Project Group 2** Landscape, urban design,

transportation infrastructure and

public utilities

Competition region Latin America

**City** Junin **Country** Peru

ClientLocal GobermentInterventionNew constructionStatus of planningFinal design stage

Status of permission--Other--Planned startJan-Jun 2021Project backgroundPublic commission

Latitude11Longitude75Elevation450Other competitionno



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### **Project Contact**

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### **Project Summary**

The Bike Station Bamboo Parking proposes a sustainable design with bamboo for urban and rural areas of the Amazon, considering the physical conditions of the place, the enhancement of renewable and local natural resources with great potential such as bamboo, which helps to activate its productive chain, also linked to promoting sustainable transport. It is based on four pillars: ecology, society, economy and technology.

A design is proposed that can be replicated in other geographical spaces with similar climatic characteristics and where there is the bamboo resource. As well as the possibility of self-construction by local people linked to community and inclusive work.

The station, linearly, consists of three modules, one (center) office and two (side) parking for 20 bicycle units.

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### Project Details

Construction costs19,000 USDSite area65 sq mFootprint areasq m

Floor area ratio

Site occupancy ratio 70%

### Further relevant key figures

21.44m x 3.00m

#### **Materials**

Structure: bamboo, Guadua or Bambusa, Ø 6cm - 75%

Connections: metals - 5% Bases: stone, local cement - 10%

Roof: crushed bamboo, local wood slats and organic tiles or

palm leaves - 10%

### CO<sub>2</sub> Lifecycle Assessment

For the evaluation of the construction life cycle, the stages established by Standard UNE-EN 15978 are considered: Production stage

Raw Material. 350 bamboos from local plantations - Use 75%, Manufacturing: selection and harvest (manual saw tool), removing branches (manual palin tool), preservation (concrete pools and borax salt preservatives), drying (air free ) and Transportation: Local

Construction Stage. Construction process: excavation (peak), formwork (reused wood), foundation and bases (manual mixer, water), bamboo structure and roof (electric circular saw and electric drill).

Final Stage. Bamboo waste can be reused to generate charcoal or energy

Since the plantation becomes a CO2 sink, as a permanent product the CO2 remains trapped, the waste can be burned for energy production.

### Statements on Sustainability

### **Innovation and transferability - Progress**

The project responds to the revaluation of renewable, natural and local materials, with contemporary technologies proposing an integral bamboo structure. Only 10% of cement is used in the bases, and 5% used in metals in the connections.

The project proposes an alternative for urban equipment that protects the Amazon, helps minimize the impact on the environment, improves the urban landscape and encourages the use of sustainable transport. As part of the transfer of knowledge, it is proposed to train the villagers in construction with bamboo, so that the model can be replicated in their localities.

If they build several bamboo parking lots, the retention of CO2 in urban facilities and the activation of the productive chain of the resource could be measured in the long term.

#### Resources and environmental performance - Planet

With the construction of several Bamboo Parking Bike, it will help to minimize the ecological footprint in urban facilities and maximize the positive impact on the environment.

If the greater use of bamboo is encouraged, consequently its cultivation and management of plantations and natural forests are promoted, in this way the environmental impact of bamboo parking bike constructions would be positive in its different phases. From the forest and / or plantation it becomes a C02 sink, as a permanent built product the C02 remains trapped and if there is an end of the product's useful life, the waste can be burned for energy production.

The structure employs 350 bamboo culms of 5.5ml and 6cm in diameter, which contributes to fix 0.6 TN of carbon.

### **Economic viability and compatibility - Prosperity**

The construction of the Bamboo Parking Bike adheres to the logic of the circular economy, bamboo as a material activates the economy in its different stages, and not only for one product but also for several products. From the harvest, a section of the culm will uses as construction material, another section for furniture, crafts, beverage sheets, as a plantation for CO2 capture, waste to generate bamboo charcool and / or electricity. In this way it contributes to activate and generate several productive chains, promoting the local economy.

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### Project Visualization



The Bike Station Bamboo Parking proposes a sustainable design with bamboo that can be replicated in other geographical spaces with similar climatic characteristics and where the bamboo resource exists. As well as the possibility of self-construction by the local population linked to community and inclusive work.



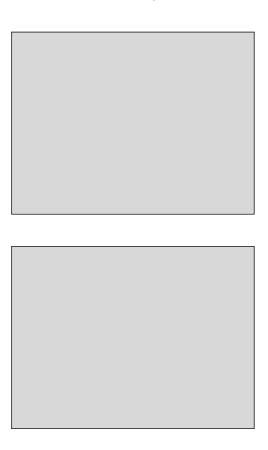
The station, linearly, consists of three modules, one (center) office and two (side) parking for 10 bicycle units, with a total capacity of 20 bicycles.



The use of bamboo in its straight and curved round shape for trusses and beams.



The Bike Station Bamboo Parking as a scale model





The structure of each parking module is composed of three bamboo structural reinforcements.



The three structural reinforcement by elements: curved beams that form the roof.