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FLORA

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Categories: Energy and sustainability, expanding design practices, IAAC, No Density, Project, Technology and fabrication, Territory and mobility

Tags: Architecture, Architecture&nature, Birds, clt, Community, IAAC, Observation, Observatory, Project, Spain, Sustainability, Sustainable, Technological Approach, Territory, Wood

Authorship: Architects: IAAC Location: Valldaura, Spain Year: 2021 Photography: Adrià Goula

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The Forest Lab for Observational Research and Analysis (FLORA) is a mass timber structure located in Valldaura, situated in the central forest of the metropolitan area of Barcelona, the Collserola Natural Park.

Measuring over 8.5 meters in height, the Master's project was built from invasive pine species

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sourced within the park through rigorous sustainable forest management and traceability procedures. Seventy trees were cut and processed by the Master's students to create cross laminated timber panels, laminated beams, and solid wood elements. FLORA will be used as short-term accommodation for a researcher who will be studying the biodiversity of the park and utilizing FLORA's new weather station.

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Considered the most extensive green space in Barcelona's metropolitan area, and covering over 8,000 hectares (seventeen kilometers long and by kilometers wide) with its highest peak at 512 meters (Tibidabo), the Parc de Collserola is a natural area and getaway for the residents of Barcelona and neighboring cities. Located in a mountain range and near the sea, it houses 190 different types of vertebrates, forests of Aleppo pine (*Pinus halepensis*), and an estimated population of 1,000 different plant species and some 10 million trees. Amid these surroundings, IAAC Master's students built the first building that allows for the observation of the forest canopy: FLORA.

The students of the MAEBB carried out further research to analyze the biodiversity of the forest and identify inhabitants of the underground, aboveground, canopy, and sky levels. This research let them discern the structures and dimensions necessary to develop the construction and, more importantly, the type of materials they could use.

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From its construction to its end use, the FLORA project adheres to the philosophy of local sourcing. The primary building material is timber, obtained from the surroundings, without the need for a supply chain. The forest of the Parc de Collserola contains a wide variety of trees and plants that require sustainable management actions to support the efficient development of the forest itself and the biodiversity it hosts.

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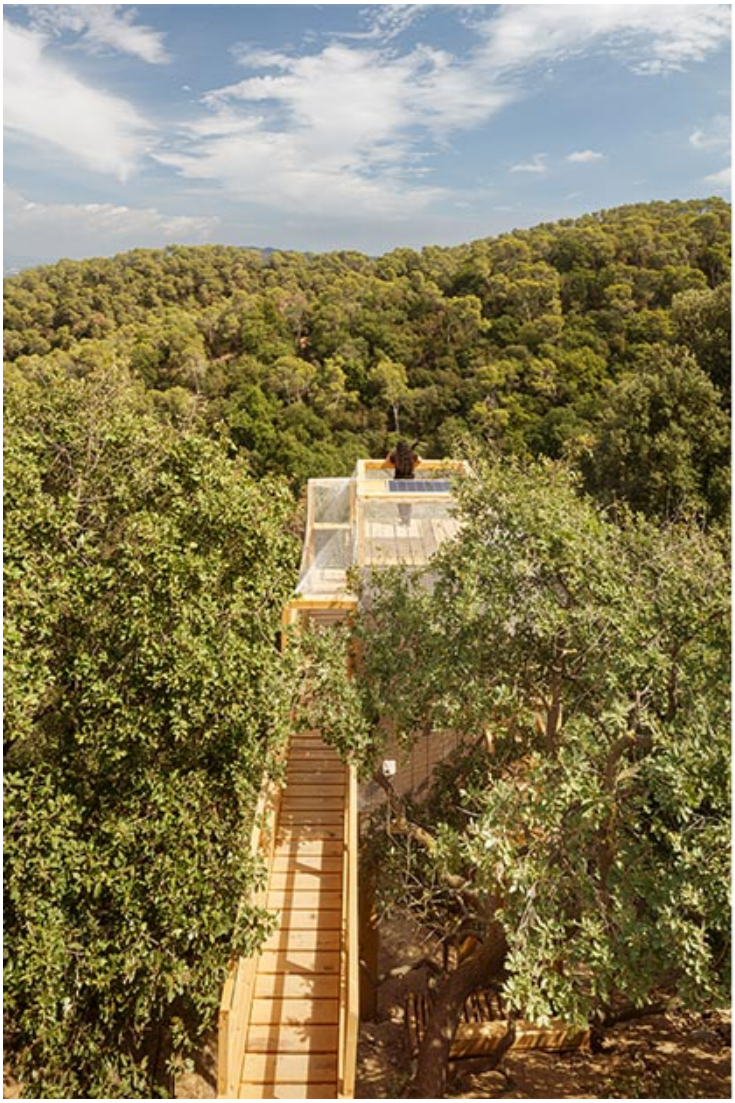

Seventy pine trees were felled to provide the necessary building material for FLORA. These trees were extracted and harvested in the Valldaura area in accordance with the Sustainable Forest Management Plan in Collserola. The students processed the harvested pines to create cross-laminated timber (CLT) panels, glulam beams, and solid wood using the sawmill and small CLT press available at Valldaura Labs.

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The CLT core rests on four glulam timber columns measuring 30 x 30 cm. The bridges are made from homemade glue laminated timber, the longest of which spans approximately 12 meters. These components were all individually made and then assembled using a crane in a highly intricate installation sequence. The CLT structure is protected by two layers of natural cork panels, providing thermal and acoustic insulation.

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The surrounding net, which takes influence from a hunter's nest, was designed digitally and then woven by hand. The net is intended to better camouflage the construction by allowing plants to grow across it, thus further merging the structure with the forest in order to hide it from the surrounding wildlife.

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FLORA provides short-term accommodation for a researcher to study the local biodiversity and observe how the effects of climate change are influencing the natural park. Housing a bird radio, bird houses, a work space, and bird-watching spaces, the project seeks immersion in nature and to create an ecological interactive prototype.

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