

## Treehouses at Kew 2023

### The Project

Treehouses at Kew will be a temporary exhibition of seven treehouses set across the iconic landscape of Kew Gardens. This will be Kew's main exhibition running from April to October 2023.

Designers for three of the treehouses will be chosen through a Treehouse Design Competition that explores the relationship between the natural and built environments. A further three of the Treehouses will be commissioned by architects from Kew's research sites around the world and one will be created in collaboration with young people.

### Contractor

Royal Botanic Gardens, Kew (RBG Kew) ('The client') will be seeking a lead contractor to deliver the technical design, fabrication and installation of all seven treehouses in line with the designs. The treehouses must be installed and handed over to Kew ready for opening to the public by Friday 31<sup>st</sup> March 2023.

The contract will also include for the dismantling and removal of all seven structures including the root protection bases at the end of the exhibition.

The work will be tendered in June 2022 with a view to fabrication commencing in Autumn 2022.

For the purposes of this exhibition, a treehouse has been defined as being 'a spatial experience that allows for visitors to engage with a tree in a new and unique way'. Therefore, it is unlikely that the designs will include the traditional idea of a treehouse and will be a selection of unique structures incorporating a wide range of materials.

Given this, the client will be seeking a contractor through open tender that has the ability to deliver seven bespoke installations within a 3 month timeframe. They will need to be willing to work with a variety of materials such as CLT, bamboo and wood in its natural state among others. A capability to build elements offsite would be considered helpful to reduce risk on the programme.

### Treehouses – 7no. design themes

Each treehouse is being designed by a different architect, selected either through competition or direct commission. The competition is currently underway and shortlist designs selected. The theme given to each is as follows

- Tree 1 : Senses
- Tree 2 : Save the trees – co-designed by young people
- Tree 3 : Home
- Tree 4: Canopy
- Tree 5: Celebrates play
- Tree 6: Nature's architecture and biomimicry

- Tree 7: Sustainable materials and innovative design

The designs are currently in concept design stage. To give an idea of current outline ideas are being considered, some concept design information is provided in **APPENDIX A**. This information is CONFIDENTIAL AND MUST NOT BE PUBLISHED OR CIRCULATED outside of your organisation.

## Materials

Finsa/Xiliner are providing CLT for treehouses 5, 6 and 7 structures free of charge to a value of £60,000. The main materials for these three designs will be CLT with additional materials to be used to create the forms.

Materials for treehouses 1 to 4 are currently unknown, but it is possible that bamboo will be a principal element of one of these.

## Consultants

Each tree house will be designed to RIBA Stage 3 (developed design) by an architect. The designs are currently in concept design stage.

Each tree house will have structural engineering provided by ARUP, appointed directly by RBG Kew.

RBG Kew have appointed a construction project manager.

## Construction budget

The budget for contracted works is £890,000.

The value of the CLT provided by Finsa/Xiliner is in addition to this.

This budget needs to cover:

- the technical design, supply, fabrication, installation of the seven structures including any off site pre-fabrication, non-CLT materials and fixings;
- set up of site locations and temporary fencing;
- tree and root protection measures in each location;
- liaison with the architects, structural engineers and client representatives;
- the dismantling and removal of the treehouses and all materials from site for re-use and/or recycling elsewhere
- the removal of tree protection measures
- reinstatement of turf/local landscape finishes

## Constraints

RBG Kew are applying for statutory planning consent. Work will have to be in accordance with this consent and any associated conditions, including tree and root protection measures.

The work will need to comply with Building regulations. RBG Kew will appoint an Approved Inspector to certify compliance.

Access routes to each location offer limitations to the size of vehicles that can be used within Kew Gardens.

Kew Gardens will be open to the public during the installation phase. Delivery arrangements may be constricted by this.

## **Outline timeline**

March 2022 – final selection of concept designs for trees 5-7

March 2022 – concept designs of direct commissioned treehouses 1-4

April to July 2022 – designs developed by architects

June 2022 – tender for contract based on outline designs

July 2022 – submission of planning application

Autumn 2022 – planning determination and contract signed

Autumn 2022 to March 2023 – fabrication and installation

## **APPENDIX A**

**(CONFIDENTIAL – DO NOT CIRCULATE OUTSIDE OF YOUR ORGANISATION)**



Tree 1

Mush Moon Room  
tonkin liu with Sam Clark, Gary Grant and Martin Bailey  
Tree 1: Celebrating Play



CLT corkscrew stair wraps around the tree without fixing to it

Symbiosis between plants and fungi is the most important interaction to life on earth. Tree 1, a Norway Maple coming to the end of its life, is a prime example of the many complex interactions that take place between fungi and plants, from the mycorrhiza beneath the ground and bracket fungus growing up its trunk, to the lichen and leaf rust visible on its branches and leaves. Our proposal celebrates its end of life and regeneration, towards the creation of diverse new lives.

**Mush Moon Room** has been conceived as an interactive tool for playfully exploring these relationships. The CLT ecosphere harnesses the weather and natural elements, creating a gradient of environments for visitors to explore planted fungal species, from the dark and sheltered to the bright and breezy. A series of ropes carry rainwater to feed the network of fungi specimens. Dappled light, scent, texture, and sound of earth, tree, and fungi, are captured and amplified. A corkscrew stair raises the visitor through the strata of planted fungal species planted within its layers.

The moon has been used as a visual symbol of cycles and contemplation. **Mush Moon Room** will be comprehensively planted with fungal specimens, revealed by Kew's continued research, to be critical to the future of humanity and to our planet.



6 meter wide CLT sphere houses a wide catalogue of fungal species for visitors to explore

**1 Celebrating Existing Fungal Networks**

An eco-sphere for viewing the often misunderstood forms of fungal life on the tree in a playful and engaging way

**2 Cultivating New Forms of Fungal Life**

The eco-sphere develops its own climate, creating a dynamic array of environmental zones for a catalogue of fungi to grow up it

**3 Robust and Efficient Structure**

CLT is used where loading is greatest. A corkscrew stair provides inherent stability, and loads are spread across a wide base around the tree, minimising root damage

2

Tree 1 : Play  
Title: Polypore / Play that Fungi Music  
Practice: India Aspin (Sole Practitioner)

An ode to fungi, this treehouse aims to celebrate the beauty and wonder of fungi. Knowingly referencing the role of mushrooms in popular culture, it unashamedly plays with both scale and colour. Polypore is designed to be lit primarily by UV lights ( a nod to both bio-luminescent mushrooms & the psychedelic properties of some mushrooms ) using painted dayglo elements in the design to transform the structure after dark into an enchanting dreamscape.

**a) Main Polypore Structure:** steps, platforms & canopies made from CLT, inspired by Polypore fungi.

**b) Ribbed Fungi Structure:** CLT supports to platforms

**c) Vertical Giant Mushrooms (recycled steel)** concealing hidden support structure to upper treehouses

**d) Floor-mounted Musical Mushrooms:** a collection of steel petal drums, cymbals & spring mounted wobbly bells.

**e) Jumping Musical Puffballs:** recycled rubber with reeded sounders within

**f) Climbing Mushrooms:** timber based static structures for climbing

As a play space, this treehouse aims to be accessible to all. The cascading steps of the treehouse create a tactile and accessible covered ground level space for those unable to venture further. Those able to use stairs are rewarded with the polypore inspired tree top platforms, one with full height standing space, and a second 'crawl space' / kids area' with limited headroom, noth providing unique views of the kew parkland. Surrounding the tree, creating an accessible play landscape there are a range of interactive play mushrooms, some for climbing & jumping and others of a more musical nature.

Photos Left to Right: ©Jason Mittrione, ©Timothy Dykes, ©Zhen Hu, ©Alonso Romero

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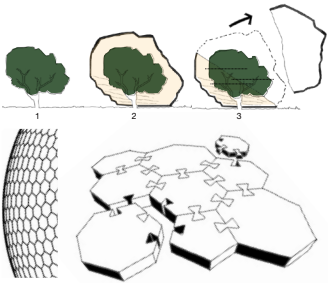
Tree 01:  
Treetop  
Playscape

Treetop Playscape is a proposal by design and architecture studio Unknown Works in collaboration with Construkt CLT.

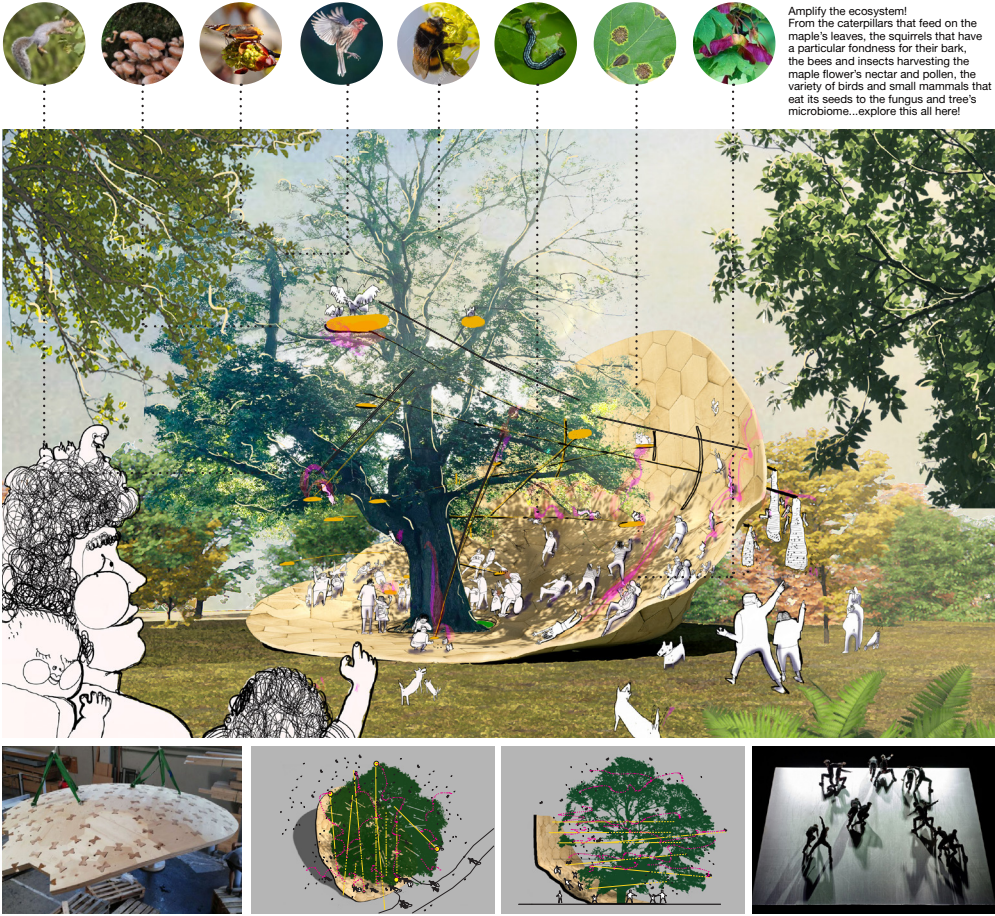
**Celebrating Play**  
A treehouse is an otherworldly place, a realm of separation from the hum-drum everyday of the ground below. It delights and elevates its explorers, allowing one to play and ascend higher to touch, smell and see the minutiae of what's happening; from root ball up to treetop, from tree trunk to branch end. The Treetop Playscape is a bold proposal that amplifies and celebrates this play across a three dimensional stage.

**The Stage**  
The shell of our stage comes straight from the tree itself; it's silhouette a direct offset of the profile of the host Norwegian Maple. On the inside face is a soft and gently inclined topography, encouraging climbing, sitting and exploration upwards. Formed from hexagonal CNC milled timber shells, this surface creates a backdrop that hugs and frames all of the activity across the tree. As if peeled up from the land around, visitors are encouraged onto it to then climb higher and explore its upper reaches, to maybe touch a leaf or to feed a squirrel. One can then descend naturally and playfully, utilising the softly undulating topography to slide or roll down.

**Amplifiers**  
In addition to The Stage are a set of Amplifiers nestled amongst the tree branches. These instruments connect the four protagonists: Tree, Human, Animal and the Elements. A squirrel jumps on an Amplifier and runs toward a nut, stepping on an arm that swoops and rustles branches on the other side of the tree, exciting a parakeet which chirps, all watched on by a child who giggles, putting a smile on everyone's face!



unknown works



CLT prefabricated slot-connected system Plan view Section



Tree 2

1

tree 2



THE NEST

Sabela Rey Villa  
Ignacio García Donoso

concept

The project aims to use nature as a model for creating original solutions, at the intersection of biology and design. The proposal aims to provide a new and interesting experience for visitors by creating a walking canopy that goes around the tree.

The project is inspired by the structures made by birds, specifically cup-shaped nests. These structures in the natural environment are

made of different elements such as leaves, dry moss, roots, mud, dried leaves, etc. In this project we would like to mimic these natural textures found in nature, by using raw wood positioned in an organic and abstract way, following a directional shape.

The structure will be built in such a way that it is easy to assemble and disassemble on site with the minimum disruption. The ramp will be built

out of modular components brought already formed on site. This modular system will allow for a possible expansion or reduction in case the structure will be used in different locations in the future.

The project carefully considers both the root protection zone - the structure will avoid this area - as well as UK regulations of accessibility and best practice standards of construction.

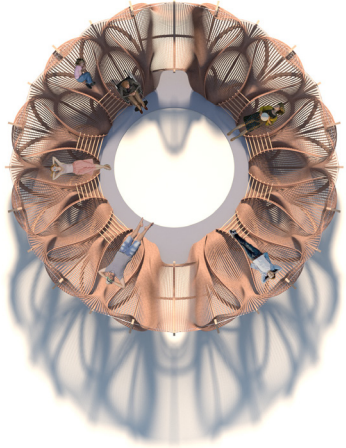


references



2

Tree 2



An Audience with Nature

Kevin Kelly Architects with Stand Engineers.

Appearing translucent from afar, and curious in form, the event begins as visitors are drawn near. Upon closer inspection a woven fabric emerges, revealing activity within. There are people inside, milling around and sitting in individual pods, like seeds in a pine cone. All gathered in an undulating fabric, wrapped in a circle facing a large black pine tree.

A clearing in the woven timber invites you to step inside a wooden amphitheatre with two tiers of seating. The stage is set and nature is performing. You take your place and recline backwards into your pod. Gazing up into the canopy of the large black pine you realise you haven't spent much time looking upwards. The leaves blow in the wind and suddenly sound and vision connect. The gentle, natural swaying hypnotises you. The show begins.

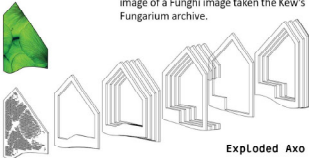
Using principles borrowed from nature, our treehouse is an inhabitable amphitheatre. Mimicking pine cones, the structural strength of the pods comes from their shape and their arrangement as a cluster. Organised over two tiers, for those who want to keep their feet on the ground or the climbers amongst us. It is a space to sit down and look up, to witness the greatest designer of them all, nature.

3



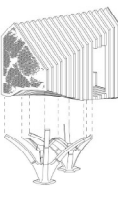
STUDIO JOHN BRIDGE LTD.  
IN COLLABORATION WITH ATMOSFERA

The concept of the treehouse is inspired by nature's growing cycle. The base structure mirrors the arbitrary patterns found in nature and mimics the foundation of trees and plants. The house itself brings a juxtaposition from the tree's organic curves to that of a skewed perspective on a vernacular form. It is fabricated with materials that follow a continuous life cycle through being recycled and reused, showcasing how we can learn and sustainably live alongside nature. The two main trunks of Kew's Black Pine tree, form the focal point of the Treehouse entrance, forming a natural gateway into the Treehouse. During the journey to the entrance, the two end facades act as an interactive experience with an abstract image of a Fungus image taken from the Kew's Fungarium archive.



Exploded Axo

The Treehouse is positioned to one side of the tree, elevated above the base trunk and tree roots, to engross the user into nature's setting, giving an alternative perspective to Kew's gardens through the transparent recycled glass, which half obscures the viewpoint with the natural colours formed through the creation process of the material. This transparent material continues above into the roof component, to focus and guide the user into the wildlife, which inhabit the Black Pine tree.



Size Plan



External View



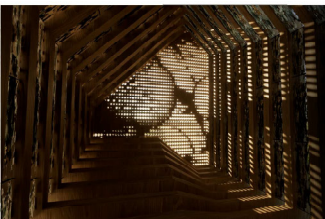
External View



External View



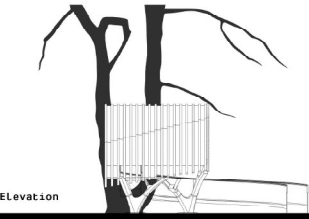
External View



Internal View



External Evening View



Elevation



Tree 3

1

TREE 02 - BLACK PINE  
BOWER TO THE PEOPLE  
BUILT.WORKS

bower / baʊə/  
noun  
a pleasant shady place under trees or climbing plants in a garden or wood.  
  
people / piːp(ə)/  
verb  
(of a group of people) inhabit (a place).

- 1. The tallest point of the bower is 6.0m above the deck
- 2. Polypropylene packing strap
- 3. Primary Bower
- 4. Interior of woven willow grid and polypropylene straps
- 5. The structural deck is made from two 5.6m diameter overlapping discs that circle the two bowers
- 6. The Black Pine (Tree 02)
- 7. CLT steps and platform are also a structural base for the bowers
- 8. The interpretation and orientation bower provides accessible information and signage for the treehouse installation
- 9. Fully accessible route from the existing permanent tarmac path to the bowers

Although widely recyclable, the majority of used plastic exists in its original state. This plastic blows across landscapes, washes up on beaches, or finds itself incorporated in bowers and nests of animals. 100kg of polypropylene packing straps have woven themselves into two bowers under a Black Pine in the gardens at Kew.

Tactile willow handrails lead visitors to the shady relief of the enclosing bowers of this beautiful tree - regardless of impairment guests can see, listen, and feel their way around this seemingly natural structure and shelter, heartbreakingly contaminated by discarded plastic. The brightly coloured straps rustle in the breeze, clinging to

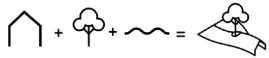
the willow frame. The conical form creates an intimate space to be shared with the Black Pine, where an understanding can be reached regarding habitat and shelter. The life of plastic is to be considered. Opportunities to reuse the material are seized by birds building homes. We

should take these opportunities so they don't ever have to. We can't hide behind the unaccountable recycling bin; used to ship our waste around the globe. Plastic is a resilient material that we can use in construction and to shelter people, as whoever built these bowers has shown us...

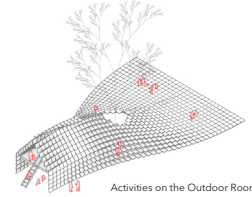
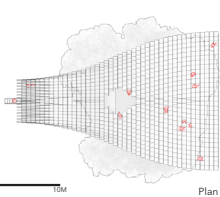
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The Outdoor Room  
NUDES



The project explores the development of interrelations between "tree," "house," and "landscape" to create a unique design experience inspired by nature, driven by technology. The project rises from the landscape to morph into an "iconic" treehouse profile creating a unique figure-ground relationship. The existing tree, landscape, and treehouse are woven together as a unified construct that enables varied experiences respecting the site and surrounding context. The "Outdoor Room" is an inside-outside experience that can be accessed by all age groups and aims at creating a sense of "place" and "recreation" for the visitors. Horizontal platforms are defined for access, seating, reading, and meditation. "The Outdoor Room" treehouse aims to celebrate life and blur the boundaries between figure-ground, house-landscape, and humans-nature.



3

Tree 3

Linden Thing

Thomas Randall-Page + Patrick Fryer + Xylotec



View from the Pagoda Vista



Scan + select: digital scanning of source tree



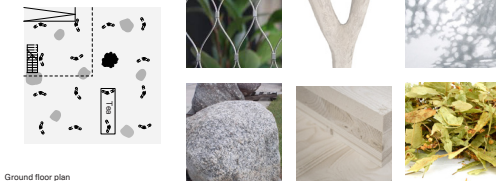
Processed trunks holding engineered slabs



Pruning: branches removed from source tree



Canopy Room: an immersion in dappled light and shade



Ground floor plan



Trunk Room: an abstract field of peeled trunks and breaching boulders frame the epic lime trunk

4

Tree No. 3



A Tower of Trees

Adjoining a large silver lime tree located towards the eastern edge of Kew Gardens, this proposal explores the experience of height typically associated with a tree house while highlighting the tenuous relationship between the built environment and the natural resources that are used to construct it. Scattered among the towering structure are eight trees representing the number of mature specimens harvested to amass the volume of wood required to build this entirely cross-laminated timber (CLT) tree house. While CLT is typically deployed in solid walls and slabs, this system of columns and arches, cut from CLT blanks, result in a lighter structure that appears to extend into the tree canopy above. The modular components will allow the treehouse to be disassembled and rebuilt elsewhere, however, when it reaches the end of its life, we envision it being turned into mulch while the trees adorning it are planted to symbolically replace the resources that were used to make this tree house possible.

AGENDA

