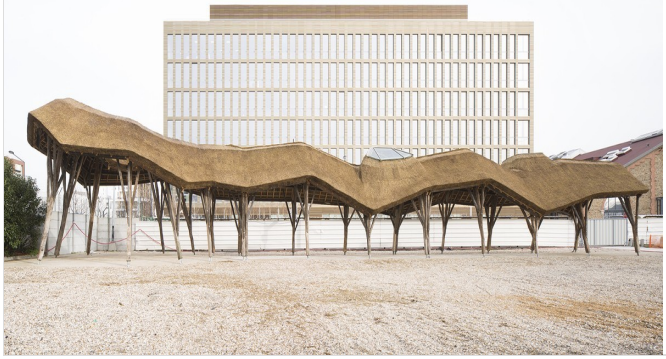
Urban Thatch

by axel adam / 2021-06-11 00:00:00 / France / 2857 / FR

New Construction



Primary energy need :
kWhep/m^2.an
(Calculation method :)

ENERGY CONSUMPTION

Economical building *Building*

< 50	A
51 à 90	B
91 à 150	C
151 à 230	D
231 à 330	E
331 à 450	F
> 450	G

Energy-intensive building

Building Type : Other building
Construction Year : 2020
Delivery year : 2021
Address 1 - street : rue des céréales 93210 SAINT-DENIS, France
Climate zone : [Cfc] Marine Cool Winter & summer- Mild with no dry season.

Net Floor Area : 235 m^2 Autre type de surface nette
Construction/refurbishment cost : 280 000 €
Cost/m2 : 1191.49 €/m^2

General information

The “Urban Thatch” project is a street covered in thatch and re-used wood which allows the workers of the tertiary park to join the metro to the office buildings. The ring, connected to the Place du Front Populaire opposite the metro exit, is an invitation to stroll.

This urban architecture adopts an exemplary and innovative approach in terms of ecology, biobased materials and reuse.

Local, biobased and associated with the history of the site, thatch is used as an organic volume, a plant topography that animates the urban landscape. Like an articulated myriapod, this intriguing landscape element arouses the curiosity of users and creates a myth around this centipede, promoting soft mobility and encounters.

Sustainable development approach of the project owner

Explain the motivations which led you to construct such a building:.

The Parc des Portes de Paris, located on the territories of the towns of Saint-Denis and Aubervilliers, is a private landholding of 65ha of which ICADE is the owner and manager. The site corresponds to the old premises of the warehouses and general stores of Paris (EMGP).

In the general context of developments in Greater Paris and more precisely of the programs of the Territorial Development Contract 2014/2030 “Territory of culture and creation”, ICADE wishes to make the Parc des Portes de Paris **a business district demonstrating the smart and sustainable city**, through concrete

experiments.

To meet a demand from tenants which is to protect pedestrians from bad weather, make this last kilometer pleasant and revitalize the areas served: create a “covered street” connecting the Front Populaire metro to the place of commercial activities.

The “covered street” route stretches for approximately 1km from the entrance located at 45 avenue Victor Hugo in Aubervilliers to the Front Populaire metro.

It can be broken down into three parts: a North-South axis, a bend that will accommodate a future tram stop and an East-West axis.

What was your goal?

Today, the Parc des Portes de Paris is served by different modes of public transport (Metro, Bus, Tram, etc.).

To support the change in behavior in favor of public transport and soft mobility, Icade wishes to support simpler and more pleasant journeys linking the tertiary zone to public transport stops.

"The covered street" must have 3 main functions:

- Shelter: promote and facilitate soft mobility on its route by using re-used materials and offering ease of use and maintenance over time.
- Energize: make the covered street a lively and attractive center with informative and recreational functions (services related to mobility, catering, artistic installations, etc.)
- Produce: this passage can also be a place of production of resources (production of renewable energy, water recovery, urban agriculture, etc.) with an educational function for users.

What objectives did you set at the start of the project? Is this your first green building?

The objectives we have set for ourselves respond to Icade's raison d'être, which is:

“Design, Build, Manage and Invest in cities, neighborhoods, buildings that are innovative places, places of diversity, inclusive places, places that are connected and have a reduced carbon footprint. Places where it is good to live, live, work.

This is our ambition, this is our goal.

This is our reason for being ”

This project also meets ICADE's CSR objectives, which revolve around three axes:

- low carbon transition and conservation of resources;
- well-being of occupants, support for new uses and local roots;
- development of employee skills, well-being at work and diversity.

It is also about responding to the demands of our customers by promoting gentle travel in our park.

What makes the difference between this project and the previous ones, with regard to the design, the stages of construction and the final result?

It is an atypical project which does not correspond to what we usually do, it has allowed us to be very ambitious on reused materials.

Architectural description

A unique urban entity, this long covered street will energize the site and accelerate the development of soft mobility in the Parc des Portes de Paris. The covered street is connected to the Place du Front Populaire to the north, then extends along the rue des céréales.

Designed as a reversible space, the covered street can accommodate several temporalities of uses, daily and seasonal. From the metro, the user will enjoy walking in the shelter of this promenade, on foot or by bike. This multifunctional space will be a real area for creating links between the occupants of the place; it will be the occasion for meetings and exchanges between the workers who will be able to meet there for the lunch break. This street will also be an opportunity to welcome new ways of working “outside the walls”: meetings while walking, running, at the café, outside conferences, promotional events.

Conversely, passers-by can disconnect from the office by strolling through an outdoor relaxation area.

Assuming the contrast of the material in a very urban area, this thatch skin covers a re-used wooden structure. This anachronistic ensemble in this environment leads passers-by to look up, stop and take the time to wonder about their surroundings and the place where they pass through on a daily basis.

See more details about this project

https://www.moonwalklocal.fr/project/chaume-urbain-reemploi/

Photo credit

Clement GUILLAUME

Stakeholders

Contractor

Name : ICADE
Contact : GUILLOUET Olivier, olivier.guillouet[at]icade.fr, 0141578720
https://www.icade.fr/activites/fonciere-tertiaire

Construction Manager

Name : MOONWALKLOCAL
Contact : ADAM Axel, a.ada[at]moonwalklocal.fr, 0648821326
https://www.moonwalklocal.fr/

Stakeholders

Function : Structures calculist

CUBE Ingénieurs

Ferran Yusta Garcia, yusta.cube[at]gmail.com, 0973237323

https://www.cubeingenieurs.fr/
structure study

Function : Other consultancy agency

MOBIUS REEMPLOI

Noé BASCH, nb[at]mobius-reemploi.fr, 0675767247

https://www.mobius-reemploi.fr/
reuse study

Function : Other consultancy agency

LAB INGENIERIE

Noé BASCH, nb[at]lab-ing.fr, 0675767247

https://www.lab-ing.fr/
environmental study

Function : Assistance to the Contracting Authority

GREENFLEX

Sebastien DELPONT, sdelpont[at]greenflex.com

https://www.greenflex.com/
consulting

Function : Company

GLOT CHARPENTE

Denis GLOT, glot.charpente[at]wanadoo.fr, 0243767345

https://www.glot-charpente.fr/
Carpenter

Function : Company

BOUGEARD CHAUMIER

Adrien BOUGEARD, chaumier35730[at]gmail.com, 0299888471

https://www.chaumiers-bougeard.com/
thatching craftsman

Type of market

Global performance contract

Renewables & systems

Systems

Heating system :
- No heating system

Hot water system :
- No domestic hot water system

Cooling system :
- No cooling system

Ventilation system :
- Natural ventilation

Renewable systems :
- No renewable energy systems

Environment

Urban environment

The rehabilitated warehouses of the Parc des Portes de Paris reveal their history through their upgraded industrial architecture, but also through the toponymy of this converted site. High place of storage of the capital city, the non-perishable foodstuffs which stopped there at the end of the XIXth century appear today on the plates indicating the names of the streets: streets of grain, flax, salt, barley, cereals or even hops. A few clues that give passers-by the ingredients to understand the original functions of this now tertiary park.

In the continuity of this imaginary to be developed, starting from a story being rewritten, the covered street project proposes to connect the brick warehouses in their mineral setting by a thatch ribbon. This ancestral covering material is composed of stalks of cereals (here reed straw). It makes the link between the image of foodstuffs and the building material.

Today, it has become a tertiary park where the headquarters of large national firms and television studios coexist, a microcosm swarms almost 24 hours a day.

Products

Product

Base de données environnementales

Product category : Autres / Autres

Costs

Construction and exploitation costs

Additional information on costs :
re-used wood represented an additional cost of € 35,000 excl.

Circular Economy

Reuse : same function or different function

Batches concerned by reuse :
- Structural works
- Structural framework

For each batch : Reused Materials / Products / Equipments :

CARPENT LOT: 12 m3 of structural reuse timber

posts, crossbowmen, struts, slope links and purlins are made of re-used wood

WORK LOT: old existing railway slab in reinforced concrete on site reused for some shallow foundations

Reused materials rate :

Wooden structure: 16 m3 of wood

. 12 m3 of re-used wood (posts, crossbowmen, struts, slope links and purlins) corresponding to 820 linear meters of re-used wood

. 4 m3 in new wood (rafters and head of the two fireplaces)

Or 75% of the re-used timber frame lot.

Field of use and material origin :

Origin of re-used wood:

1. Species of leafy oak whose origins belong to two sites

- deposit 1 comes from a demolition site for a mansion in the city center of Le Mans.
- deposit 2 comes from a supplier of noble reused materials (Gazut et fils in Montlandon) - elements from a demolition site for a farmhouse near Chartres.

2. Larch type resinous species from a single source:

- deposit 3: comes from a demolition site for the pergola of a restaurant in Montfort-le-Gesnois

Distribution of wood elements according to their functions:
- the posts come from deposit 1 (old solid oak purlins)
- the slope links come from Site 1 (old rafters in solid oak wood)
- the crossbowmen come from Site 2 (old solid oak floor joists)
- the purlins come from Deposit 3 (old pergola joists in glued laminated larch wood)

Concrete railway slab:

A concrete slab was pre-existing on the project plot under the gravel layer: its composition and strength made it possible to reuse it instead of building shallow foundations.

Environmental assessment

Impacts avoided : water, waste, CO2 :

A structure and roofing in biobased elements makes it possible to reduce GHG emissions by more than 90% compared to a structure and a metal roof;
- The use of re-used wood makes it possible to reduce the structure's GHG emissions by 85% (but which is already very low due to the use of biobased material);
- There are always GHG emissions from electrical devices that cannot be reduced.
Gray energy is all the energy used to make the material. In the case of reed, very little is needed because it is a natural material that does not require transformation. In addition, its carbon footprint is positive because it is also a CO2 sensor.

The advantages of thatch are:
- French sector (harvest and storage of reed in the Camargue)
- fully compostable: zero waste when it is renewed
- environmentally friendly cultivation (Natura 2000 harvesting site, no use of chemicals, harvesting machines that do not damage the natural environment)
- biobased: carbon impact close to 0, even negative / cultivation allowing the maintenance of auxiliary fauna / CO2 sensor
- resistance: weather resistant (rain, frost, hail, snow)
- durability: longevity of 50 years, with an autoclave protection treatment

On this project, the reuse of materials * made it possible to avoid:

The emission of 2.26 tonnes eqCO2

The use of 36 m3 of water

The production of 2 tonnes of waste

This impact calculation was carried out using environmental data from the INIES database.

* Excluding concrete slab

Economic assessment

Total cost of reuse : 60 000 €

Cost of reuse in percentage of the operation : 22 %

Saving realised thanks to the implementation of reused materials compared to new materials : -25 000 €

Contest

Reasons for participating in the competition(s)

The challenge of developing national sectors: THATCH / WOOD

The use of thatch and re-used wood directly benefits the local economy. Indeed, by their nature, these two techniques favor know-how and labor rather than industry.

Thatch designates roofs made from plant materials. These are stems of grasses that are collected at the beginning of autumn once dry: it can be reed, rush, rye or heather. For the project, we used Camargue reed (production and processing).

The ancestral know-how of craftsman-thatching is thus promoted in an emblematic project. Little mechanized, this sector mainly requires labor from harvest to installation on the frame. This technique therefore directly benefits the local economy through its place of production, processing and implementation.

Combining empirical common sense and technological innovation

Mixing low and high tech, the innovation of the project lies in the alliance of a secular roofing material with advanced technology for the realization of the framework. The complex volumetry assumes the use of specific 3D modeling techniques.

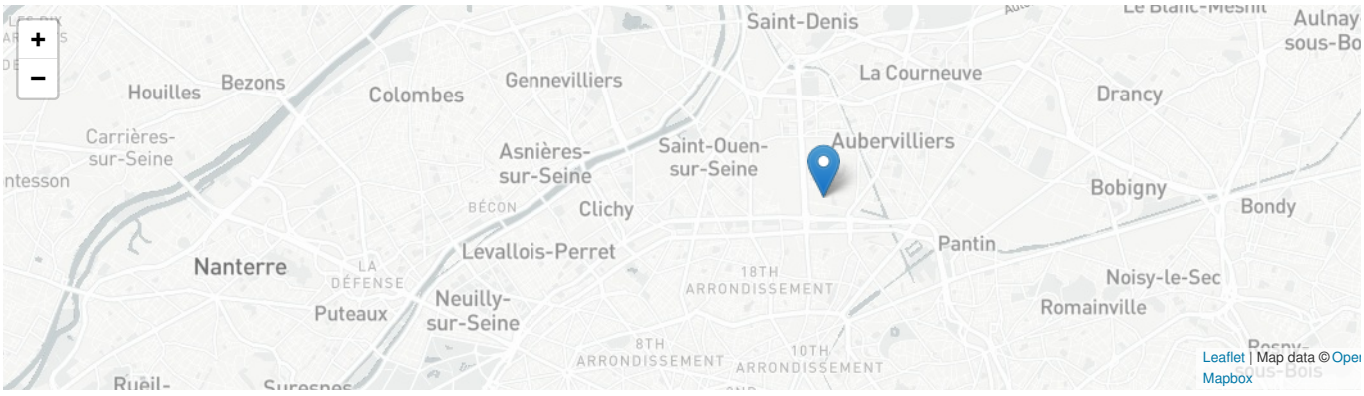
The thatched roof is both a reference to history, a mixture of ancestral and innovative techniques, as well as environmental education.

The use of re-used wood for the structure (75% of re-used wood corresponding to the posts, struts, slope links and purlins) makes it possible to perpetuate and preserve the know-how of the carpenters on its analytical capacity and hand shaping.

The wooden structure is designed with reused elements. In this approach, the complexity is to coordinate the schedules between sourcing (finding the available material) and the site. The selected company got its supplies from a demolition site it had in progress and from a specialized supplier.

Using re-used timber requires a good knowledge of the carpenter trade. It is advisable to use the parts according to their deformation and their aging.

The imperfections of re-used timber are assumed and give the structure a particular character (left timber, marked, holes, presence of old mortises).



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