House of Forest and Wood of Guyana (MFBG)

by Paul TRITSCH / 2017-03-22 22:15:13 / France / 15303 / FR

Primary energy need :

103 kWhep/m².an

(Calculation method : RT 2012)

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 : 2015
Delivery year : 2017
Address 1 - street : 97300 CAYENNE, GUYANE, France
Climate zone : [Aw] Tropical Wet & Dry with dry winter.

Net Floor Area : 609 m² SHON
Construction/refurbishment cost : 2 200 000 €
Cost/m2 : 3612.48 €/m²

General information

Window technological wood in Guyana

Close to the Route de Montabo and the Zephyr Ring Road, both very popular, the Forest and Wood House of Guyana is a distant landmark. In order to exist as a major equipment, modeling of the ground in a vegetable base provides a light and natural pedestal to the building.

The varied volumes and various heights form a heterogeneous ensemble that meets the different needs of the program: The volume of the showroom and reception room presents an original shape with arched curves and curve oriented towards the center of the parcel. In addition to being a playful visual cue, this volume demonstrates the performance and the originality that can bring the whole wood industry Guyanaise. This volume, a place of sharing and meeting open to the public, is at the heart of the project.

Two other wooden partitions contain the Library, the Xylotheque (listing the woods of Guyana), research laboratories and offices of the wood industry. A mineral volume houses the mechanical testing workshops. This differentiation makes it possible to clearly identify the different functions of the project, while offering dynamic environments and varied views on the neighborhood.

A large roof "canopy", organic form, calms this heterogeneity by sheltering and unifying the various buildings under its canopy. The fusion between the plant and the mineral occurs naturally.

The project affirms its balance by the great vertical breakthrough, hollow "tree stump". It creates a well of filtered light on the project and erects a flagship signal in the extension of the landscaping of the Hibiscus ZAC.

This strong architectural part, integrated in the district, preserves thermal comfort. Volumetry meets the climatic requirements (protection of facades, natural ventilation, sun protection, optimization of air conditioning) by limiting the effects of mask for the surrounding buildings.

The choice of the use of peyi wood as the main material is evident when it comes to building the premises of the promoter of the wood industry in Guyana. Its use has been reflected both in terms of an architectural requirement and of good management of natural resources.

Sustainable development approach of the project owner

The objective was to define, in terms of the mass plan, the Bioclimatic compromise on the basis of the following provisions: - Implement the building according to the strengths and constraints of the site: orientation, sunshine, Noises, winds, quality of outdoor spaces, shores, etc. - For other areas with high internal inputs (offices, cloakrooms, wellness areas, etc.), The most favorable orientations, those which provide the maximum amount of natural light Minimum solar overheating and minimal thermal losses. - To preserve the right to the sight, the light, the sun and the calm of the local residents, with Particular for residential areas. Concerning the envelope and the volumetry of the building, the objective is to define the best bioclimatic compromise on the basis of the following provisions: - Optimize glazed surfaces (size, leakage coefficient, solar factor) in order to Solar radiation and a satisfactory level of natural lighting while limiting the loss and overheating. - Limit unnecessary heights / volumes and isolate the envelope strongly to limit its losses thermal. - Encourage constructive typologies of building envelope and volumetric Natural through ventilation. - Install sun protection on exposed façades. - Ensure the conditions of comfort, through passive technical and constructive solutions (orientations, Solar radiation, solar protection, inertia, ventilation, natural lighting, insulation) so as not to The use of energy-intensive systems (lighting, refreshment, artificial lighting) Than as a complement.

Architectural description

Close to the Route de Montabo and the Zephyr Ring Road, both very popular, the Forest and Wood House of Guyana is a distant landmark. In order to exist as a major equipment, modeling of the ground in a vegetable base provides a light and natural pedestal to the building. The varied volumes and various heights form a heterogeneous ensemble that meets the different needs of the program: The volume of the showroom and reception room presents an original shape with arched curves and curve oriented towards the center of the parcel. In addition to being a playful visual cue, this volume demonstrates the performance and the originality that can bring the whole wood industry Guyanaise. This volume, a place of sharing and meeting open to the public, is at the heart of the project. Two other wooden partitions contain the Library, the Xylotheque (listing the woods of Guyana), research laboratories and offices of the wood industry. A mineral volume houses the mechanical testing workshops. This differentiation makes it possible to clearly identify the different functions of the project, while offering dynamic environments and varied views on the neighborhood. A large roof "canopy", organic form, calms this heterogeneity by sheltering and unifying the various buildings under its canopy. The fusion between the plant and the mineral occurs naturally. The project affirms its balance by the great vertical breakthrough, hollow "tree stump". It creates a well of filtered light on the project and erects a flagship signal in the extension of the landscaping of the Hibiscus ZAC. This strong architectural part, integrated in the district, preserves thermal comfort. Volumetry meets the climatic requirements (protection of facades, natural ventilation, sun protection, optimization of air conditioning) by limiting the effects of mask for the surrounding buildings. The choice of the use of peyi wood as the main material is evident when it comes to building the premises of the promoter of the wood industry in Guyana. Its use has been reflected both in terms of an architectural requirement and of good management of natural resources.

See more details about this project

http://www.architectes-pour-tous.fr/diaporama/23249?projet=33752

Stakeholders

Stakeholders

Function : Contractor

Collectivité Territoriale de Guyane

Paul POLYDORE

https://www.ctguyane.fr/
Owner

Function : Designer

GAIA ARCHITECTURE

Paul TRITSCH - architecte

http://www.architectespourtous.com/gaia-architecture
Architect

Function : Thermal consultancy agency

INGEKO Energies

Pierre PERROT - gérant

http://www.ingeko-energies.fr
Thermal and environmental quality

Function : Designer

ABRIBA

Brigitte Bienaimé

Architect co-contracting

Function : Structures calculist

SETI

Thierry TORRENTE

Structural engineer

Function : Other consultancy agency

A2E

Jean Louis Hernandez

fluids

Function : Other consultancy agency

BTC

Alain Champenois

Economist

Function : Designer

DETAILS PAYSAGE

Rodolphe BARD

Grounds

Function : Other consultancy agency

ERPE

Cedric LOTAIRE

VRD

Function : Other consultancy agency

CRONOS

Frederic TRICHET

OPC

Type of market

Global performance contract

Energy

Energy consumption

Primary energy need : 103,00 kWhep/m^2.an

Primary energy need for standard building : 400,00 kWhep/m^2.an

Calculation method : RT 2012

CEEB : 0.0001

Breakdown for energy consumption : Electricity is the only energy used in the building. The consumption is distributed according to usage: Heating: 0%, refreshment: 37%, lighting: 16%, ventilation: 2%, hot water: 2%, specific uses (offices and labs): 44%. Conventional energy consumption (5 uses) is 103 kWhEP / m² / year, total consumption at 183 kWhEP / m² / year

Real final energy consumption

Final Energy : 92,00 kWhef/m^2.an

Envelope performance

Envelope U-Value : 1,70 $W.m^{-2}.K^{-1}$

More information :

The Guyanese building standards do not yet incorporate the insulation of the vertical walls or the double glazing. The heat loss coefficients are therefore generally high.

However, in a tropical climatic context, the Ubat criterion is not the only representative of the energy performance of the envelope, as the internal / external temperature differences are generally low. On the other hand, it is essential to reduce as much as possible the solar contributions, the main source of thermal discomfort and energy consumption.

In this case, considerable efforts have been made to protect against direct sunlight (roof overhang, horizontal solar shading, double wooden skin, etc.).
Overall, the solar factor of the building envelope is of the order of 2%, at a very high level.

Building Compactness Coefficient : 1,10

More information

Consumption has been estimated in the design phase, the actual consumption can be determined after one year of operation. nb. The use of the RT2012 calculation standard for this project in the Guyanese context required the following adaptations: climatic zone H3, offices use, summer comfort CE2, climatic data, standardized hours. The reference values are: CEP max = 132 kWhEP / m² / year. The Electricity -> Primary Energy conversion factor is estimated at 2 for the coastal Guyana electricity grid.

Renewables & systems

Systems

Heating system :

- No heating system

Hot water system :

- Individual electric boiler

Cooling system :

- VRV Syst. (Variable refrigerant Volume)

Ventilation system :

- Natural ventilation

Renewable systems :

- No renewable energy systems

Environment

Urban environment

Land plot area : 1 702,00 m^2

Built-up area : 25,70 %

Green space : 762,00

Near the Montabo Road to the north and the Zephir Ring Road (RD18) to the west, both very busy, the future building is a distant landmark. At the district level (ZAC Hibiscus), the land is bordered by the Boulevard Urbain, giving it an identity status of the neighborhood. In an urban environment composed on a wide orthogonal framework, the site is the point of articulation of two parks arranged very present. The three facades participate fully in the animation of the public space.

Products

Product

Local Wood

Scieries locales

Guyane

http://www.guyane-bois.net/

Product category : Gros œuvre / Charpente, couverture, étanchéité

Use of local wood on all roofs of the project, the central totem. The exhibition room is made up of 100% local wood (superstructure, roofing, flooring ...).

It was a clear objective of the project manager: The building, which welcomed the local wood industry, had to be a demonstration of local know-how in the field.

Local Wood

Scieries locales

Guyane

http://www.guyane-bois.net/

Product category :

The interior joinery is made of local wood, as well as all the solar protection and cladding of buildings made of masonry. Bearings, decks and exterior stairs are also made of local wood, class IV on the ground floor.

It was a clear objective of the project manager: The building, which welcomed the local wood industry, had to be a demonstration of local know-how in the field.

Costs

Construction and exploitation costs

Cost of studies : 272 000 €

Total cost of the building : 2 472 000 €

Subsidies : 900 000 €

Health and comfort

Comfort

Calculated thermal comfort : L'ambiance intérieure est régulée à 25°C / 70% hR en période d'occupation pour les zones climatisées.

Carbon

GHG emissions

GHG in use : 50,00 $KgCO_2/m^2/an$

Building lifetime : 40,00 année(s)

GHG emissions related to the energy requirements of the building are estimated on the basis of a carbon factor of 545gCO2 / kWh_el of electricity in the Guyanese coastal network.

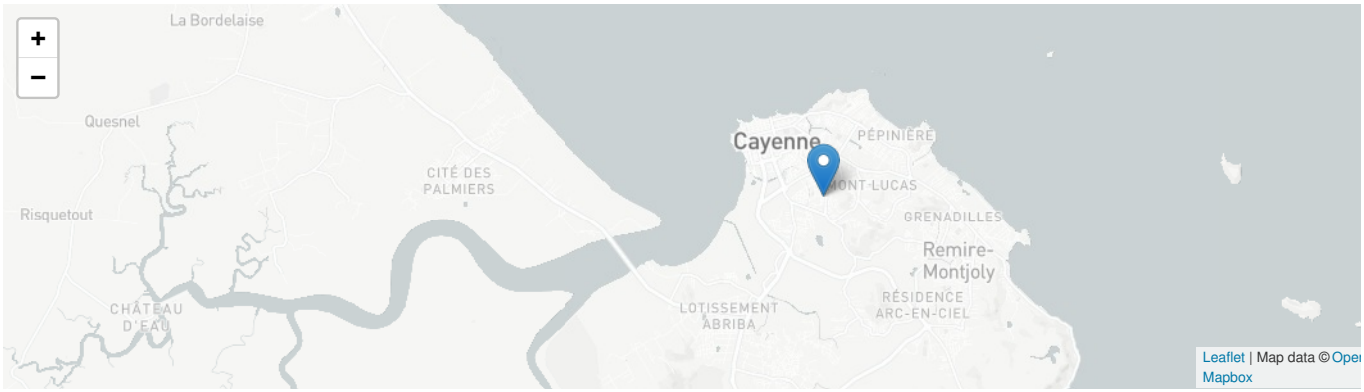
Contest

Building candidate in the category

Green Solutions AWARDS
powered by Construction21.org

Energie & Climats Chauds

Coup de Cœur des Internautes



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