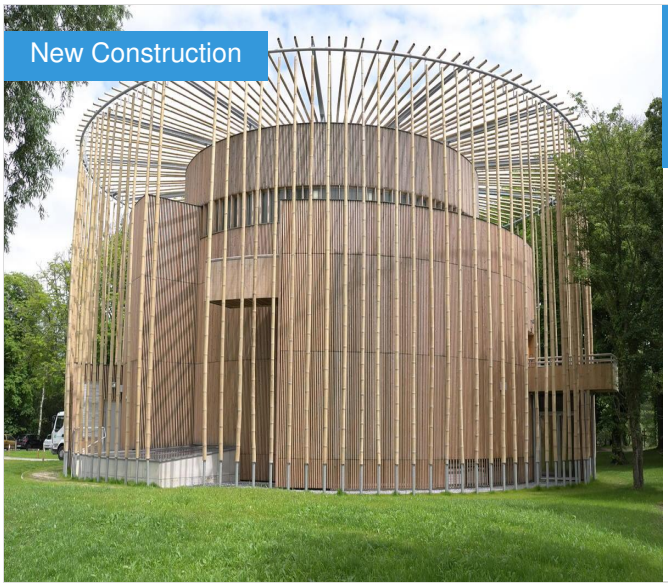
Theater Elisabethain du Château de Hardelot

by LM Ingénieur / 2017-03-22 14:30:08 / France / 13367 / FR

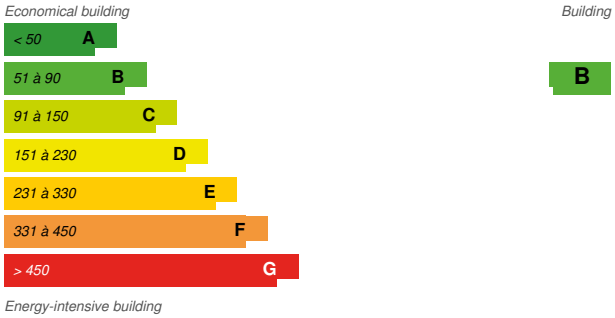


Primary energy need :

56.1 kWhep/m².an

(Calculation method : RT 2012)

ENERGY CONSUMPTION



Building Type : Concert or conference hall, theater
Construction Year : 2015
Delivery year : 2016
Address 1 - street : 62360 CONDETTE, France
Climate zone : [Cfc] Marine Cool Winter & summer- Mild with no dry season.

Net Floor Area : 1 250 m²
Construction/refurbishment cost : 3 780 000 €
Number of Seat : 400 Seat
Cost/m2 : 3024 €/m²

General information

The Elisabethan theater of Hardelot castle in the heart of the nature reserve of the swamp of Condette. This unique place is part of the project of the Cultural Center of Entente Cordiale, where the Department of Pas-de-Calais brings history and Franco-British relations to life. In the continuity of the vagabond tower and the ephemeral theater, this perennial structure will offer the viewer an exceptional close relationship with the stage.

Sustainable development approach of the project owner

The environmental, economic and social criteria used are: - an economy of resources (rational management of energy, water), - comfort for users and staff. The Department of the Pas de Calais insists on a good energy quality of the building according to two points of view: - PASSIVE (bioclimatism, summer comfort, compactness, thermal inertia, insulation of the envelope, treatment of thermal bridges, - ACTIVE, from the point of view of the performance of the systems implemented (double-flow ventilation with Calorific recovery, adapted regulation, efficient boilers, easy to use GTB ...). Limiting summer overheating by streamlining the use of air conditioning is a challenge on this project. The operation meets the requirements of the RT2012.

Architectural description

The building is built in an alluvial plain near the coast. It is thus exposed to the wind, to its very random nature, sometimes even capricious. Instead of being an enemy, the wind becomes the best ally of natural ventilation. The air enters from the bottom of the theater into a zone of masoned plenums running under the stage and the control room. They make it possible to preheat the new air in winter by a set of heating batteries and to temper it during the warm periods thanks to

the inertia brought by the masonry. They also provide the high level of acoustic insulation required. Natural extraction is carried out at extraction chimneys, which form a roof crown. The inlet and outlet surfaces of the device which determine the internal air exchange rate of the theater are modulated by a series of registers controlled by a regulating member which has been developed specifically for the project. The Élisabethain theater is thus the first building in France on which the effects of the wind are apprehended. The spaces of the theater develop within a set of concentric cylinders of 4 distinct rays. These hulls are made of cross-laminated panels (CLT) of spruce spruce. They are associated with flat CLT panels arranged in radius or around the stage. These vertical walls are deployed around a series of laminated oak poles that surround the auditorium. The latter support the glued laminated spruce framework subtended by steel cables. The panels and framing support the roof, floors and stairs, all made of CLT panels. The combination of curved and radiant vertical panels with the floors is a highly rigid hull.

Stakeholders

Stakeholders

Function : Contractor

Departement du Pas de Calais

Departement du Pas de Calais 62018 Arras Cedex

http://www.pasdecalais.fr/

Function : Designer

Studio Andrew Todd

http://www.studioandrewtodd.com
Project manager

Function : Other consultancy agency

LM Ingénieur

Laurent Mouly - 13, rue Chapon - 75003 Paris - Tél : 01 40 29 96 92

BET Structure - Thermal - Envelope - Natural ventilation

Function : Structures calculist

Charcoalblue

http://www.charcoalblue.com
Acoustic Technical Studies

Function : Others

Laboratoire Aérodynamique Eiffel

67 rue Boileau - 75016 Paris

https://www.aerodynamiqueeiffel.fr
Aeraulic studies

Contracting method

Separate batches

Type of market

Global performance contract

Energy

Energy consumption

Primary energy need : 56,10 kWhep/m^2.an

Primary energy need for standard building : 132,00 kWhep/m^2.an

Calculation method : RT 2012

Breakdown for energy consumption : Heating: 30.1
DHW: 8.0
Auxiliary: 7.5
Lighting: 8.5(KWhep / m2.an)

Real final energy consumption

Final Energy : 46,30 kWhef/m^2.an

Envelope performance

Envelope U-Value : 0,34 $W.m^{-2}.K^{-1}$

More information :

Prefabricated enclosure made of solid wood panelsInsulation wood wool and exterior wood cladding.

Building Compactness Coefficient : 0,70

Indicator : I4

Air Tightness Value : 1,56

Renewables & systems

Systems

Heating system :

- Condensing gas boiler

Hot water system :

- Condensing gas boiler

Cooling system :

- Others

Ventilation system :

- Natural ventilation

Renewable systems :

- Heat pump

Solutions enhancing nature free gains :

Enveloppe performance, inertie intérieure et ventilation entièrement naturelle.

Smart Building

BMS :

Controller for interior comfort with natural ventilation

Environment

Urban environment

Land plot area : 7 084,00 m^2

Built-up area : 17,60 %

The site of the Château d'Hardelot is organized around a central inner courtyard and consists of: - a main building called Le Château, built between towers 5 and 6, comprising Basement, Ground Floor, R + 1 and R + 2, - a secondary building called La Chapelle, built between towers 2 and 3, with a ground floor and an accessible terrace, - an enclosure wall punctuated by 7 towers, - a guard house, located at the entrance of the site, recently restructured and extended.

Products

Product

LENO curved panel

Finnforest / Metsä Wood

construction.france@metsagroup.com

http://www.metsawood.com

Product category : Table 'c21_china.innov_category' doesn't exist SELECT one.innov_category AS current,two.innov_category AS parentFROM innov_category AS oneINNER JOIN innov_category AS two ON one.parent_id = two.idWHERE one.state=1AND one.id = '6'

LENO structural panels are large panels made of solid wood planks, stacked in 90 ° crossed layers and glued together over their entire surface. LENO structural panels are in the process of making floors, load-bearing or bracing walls, and roofing supports. They can be experimented in their own building or used for several of the targeted functions, in association with other structural elements.
The LENO structural panels are works for the realization of the structures referred to above in buildings for residential use, Establishments Receiving Public, Office or Industrial Buildings, in classes of service 1 and 2 at Meaning of EUROCODE 5 and in classes of use 1 and 2 as defined in NF EN 335.

Costs

Construction and exploitation costs

Cost of studies : 500 000 €

Total cost of the building : 3 200 000 €

Health and comfort

Comfort

Calculated thermal comfort : T. max Eté : 28°C ; T.min Hiver : 19°C

Carbon

GHG emissions

GHG in use : 12,00 $KgCO_2/m^2/an$

Methodology used :
RT 2012

Building lifetime : 100,00 année(s)

Life Cycle Analysis

Eco-design material : Wood panels Wood wool insulation Exterior wood cladding

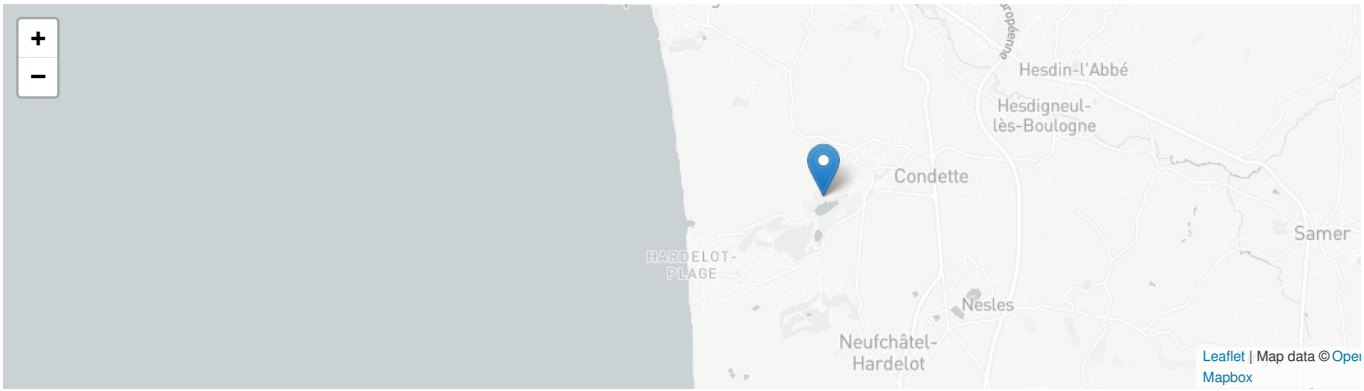
Contest

Building candidate in the category

Green Solutions AWARDS
powered by Construction21.org

Bas Carbone

Coup de Cœur des Internautes



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