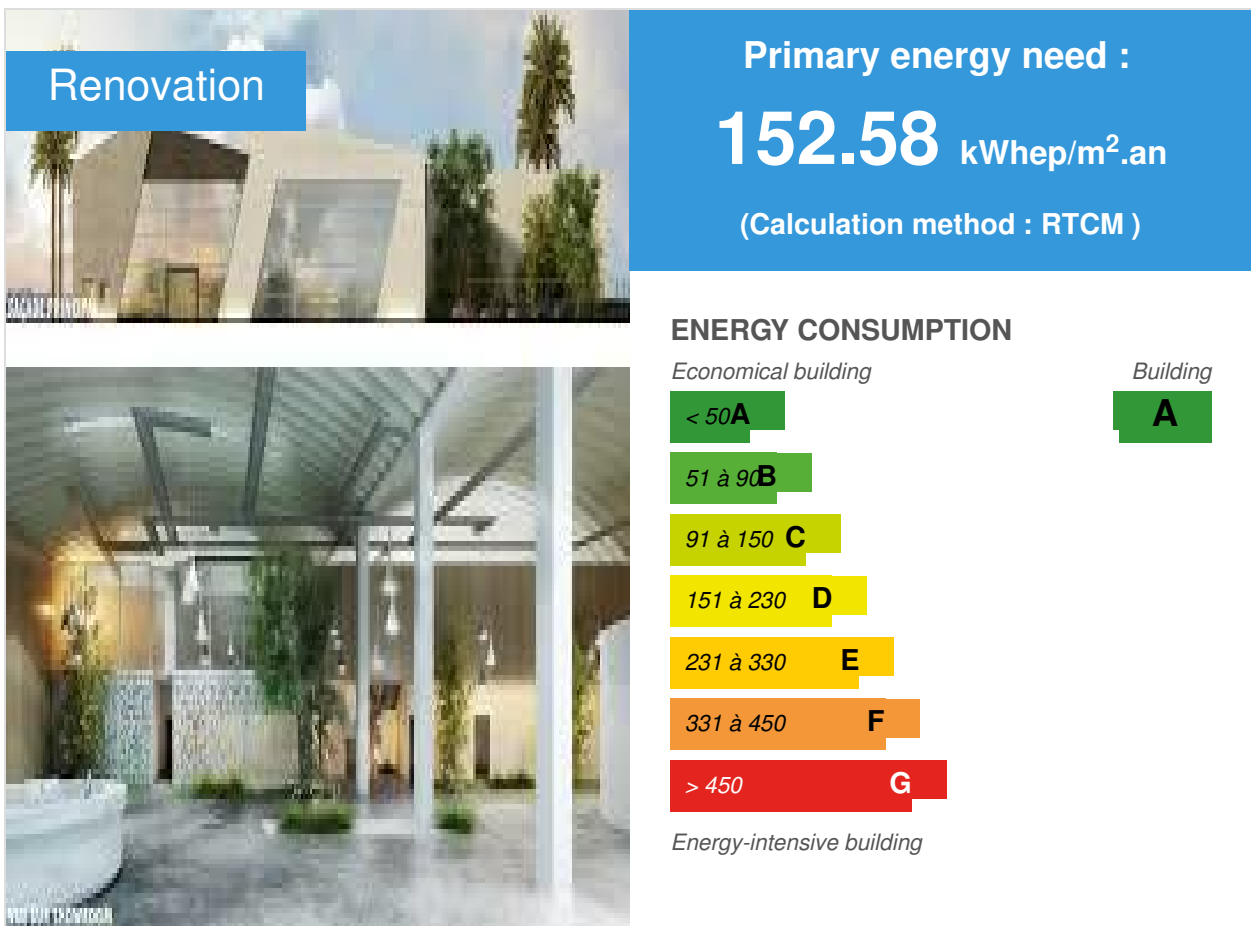


## Smart Construction Lab LafargeHolcim Maroc

by Zakaria SADIK / 2018-05-03 13:32:33 / Maroc / 10682 / FR



**Building Type** : Other building

**Construction Year** : 2016

**Delivery year** : 2017

**Address 1 - street** : 27182 BOUSKOURA, Maroc

**Climate zone** : [Cfb] Marine Mild Winter, warm summer, no dry season.

**Net Floor Area** : 4 000 m<sup>2</sup>

**Construction/refurbishment cost** : 1 600 000 €

**Number of none** : 1 none

**Cost/m2** : 400 €/m<sup>2</sup>

#### Certifications :



## General information

Over an area of more than 4,000 m<sup>2</sup>, the Smart Construction Lab (SCL) research center of LafargeHolcim Morocco will bring together complementary expertise and expertise specialized in materials and construction methods. A space of 800 m<sup>2</sup> of laboratory rooms is available for durability, thermal, mechanical and physico-chemical tests on cement, mortar, concrete, aggregate and soil materials. The building also includes two prototyping areas, two showrooms, an auditorium and training rooms.

Beyond offering a platform dedicated to innovation, the R & D center "SDL Casablanca" will train applicators to the proper implementation of products and constructive systems, develop partnerships and raise awareness of the respect of HSE standards on construction sites. It is the first building renovated and certified "HQE Building Cerway Certified Renovation" with a highest "Exceptional" level.

The project's stakeholders, including BET ALTO EKO, have been able to contribute their expertise to make this building an exemplary innovation center in the field of construction.

## See more details about this project

<https://www.lafargeholcim.com/research-lab-Morocco>

## Data reliability

3rd part certified

## Stakeholders

## Contractor

Name : LAFARGEHOLCIM Maroc

Contact : Anas FILALI BABA

<https://www.lafargeholcim.ma>

## Construction Manager

Name : Yassir Khalil Studio d'architecture

Contact : Yassir Khalil Architecte DESA

<http://www.yassirkhalilstudio.com>

## Stakeholders

Function : Assistance to the Contracting Authority

ALTO EKO

Zakaria SADIK

<http://alto-ingenierie.fr>

## Contracting method

Separate batches

## Owner approach of sustainability

*LafargeHolcimMorocco*, the group's largest site in North and West Africa, operates in an environment similar to that of other countries in the region, characterized among other things by the scarcity of water resources, a low level of development of local communities and a growing ecological awareness.

Sustainable development has always been at the heart of LafargeHolcim Maroc's activities, integrating it into all its processes and at all stages of the value chain: health & safety in all sites and in customer sites, development of employability and education, energy substitution, quarry rehabilitation, use of green energies, etc.

As a leader in construction materials, LafargeHolcim Maroc bears a responsibility and, as such, sets the example in all these areas: environmental protection, social and societal responsibility, health and safety, circular economy ...

The actions of LafargeHolcim Maroc, initiated for several decades, fit perfectly into the 2030 plan of the group based on 4 axes of strategic interventions. "[...]

For more information on this topic, please visit our webpage on sustainable development:

## Architectural description

The CDL project led by LafargeHolcim is part of a sustainable development approach through the implementation of a project that respects the environment and consumes little energy. The following environmental objectives were set as part of the plot development and building design:

Limiting the overall energy consumption of buildings;

Flow optimization;

The attractiveness of open spaces and gardens;

Good waste management;

Good acoustic management between the different premises

The use, as soon as possible, of ecological, ethical building materials and local materials;

The assurance of a balanced, equitable, evolutionary and environmentally friendly development, both during construction and during the use and maintenance of buildings.

LAFARGEHOLCIM Morocco wished to reinforce the anchoring of this operation in the Sustainable Development, by proposing a project integrating all the environmental, economic and societal aspects required.

Aware of the environmental challenges of the region, LafargeHolcim is committed to limiting the resource needs of the future district. This desire will result in a global approach to virtuous cycle, seeking a thrifty project with energy efficiency at each scale, and optimization of means of transport. New technologies will be put at the service of user comfort.

The creation of landscaped areas will contribute to the reinforcement of urban biodiversity and the quality of the living environment of future users.

## If you had to do it again?

Towards a positive energy building

## Building users opinion

Satisfaction of the permanent occupants as well as the management of LafargeHolcim Morocco, which frequently organizes in-house training for staff, customer visits as well as Management Committee meetings.

Internally at the SCL, there is a strong mobilization of all staff for the preservation of the building and the improvement of the well-being of the occupants inside. As examples, we

have implemented this year 5 projects led by 5 different employees: housekeeping and respect for 5S, energy insulation and energy saving, outsourcing management, risk assesment, health and well-being of employees. Trainings are regularly organized on ergonomics at work, hygiene in sensitive areas, selective sorting, recycling, first aid and first aid, etc.

Continuous improvement monitoring of building management is also in place.

## Energy

### Energy consumption

Primary energy need : 152,58 kWh<sub>ep</sub>/m<sup>2</sup>.an

Primary energy need for standard building : 339,67 kWh<sub>ep</sub>/m<sup>2</sup>.an

Calculation method : RTCM

CEEB : 0.0001

Final Energy : 47,00 kWh<sub>ef</sub>/m<sup>2</sup>.an

Initial consumption : 339,67 kWh<sub>ep</sub>/m<sup>2</sup>.an

### Envelope performance

Envelope U-Value : 0,40 W.m<sup>-2</sup>.K<sup>-1</sup>

## Renewables & systems

### Systems

Heating system :

- Heat pump
- Fan coil
- Tape
- Aerotherm Heater
- VAV System

Hot water system :

- Heat pump

Cooling system :

- Reversible heat pump

- o Fan coil
- o VRV Syst. (Variable refrigerant Volume)

#### Ventilation system :

- o Natural ventilation
- o Nocturnal Over ventilation
- o Humidity sensitive Air Handling Unit (Hygro B
- o Double flow

#### Renewable systems :

- o Energy recovery from waste
- o Heat pump

## Environment

### GHG emissions

GHG in use : 52,06 KgCO<sub>2</sub>/m<sup>2</sup>/an

Methodology used :

Elec emission factor Morocco

Building lifetime : 50,00 an(s)

### Life Cycle Analysis

Eco-design material :

Artevia, Hydromedia, Agilia, Ductal .. to consult in the "products" section

## Products

### Product

ARTEVIA

LAFARGEHOLCIM MAROC

LAFARGEHOLCIM

<http://www.lafargeholcim.ma>

Product category : Table

'c21\_spain.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 = '16'



Decorative concrete, used as paving. Reinforced concrete, it plays both a structural role and a role of flooring. It exists in different finishes: polished, rock (bush-hammered), relief (deactivated), color, imprint, sand.

At SCL, we set up the polished Artevia in the showroom, the bush hammered outside.

Architects and building owners come regularly to see the application of the product as well as the different finishes to offer them to their customers.

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Hydromedia

LAFARGEHOLCIM MAROC

LAFARGEHOLCIM

<http://www.lafargeholcim.ma>

Product category : Table

'c21\_spain.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 = '23'



Drainage concrete driveable, it plays the role of structural pavement as well as that of a draining floor covering. At SCL, we connected the Hydromedia tiling to a retention tank for storage and recycling of rainwater and wash water from the showroom.

Due to its various functions and different finishes, this product is in-house and we receive regular requests for applications from customers.

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agilia

LAFARGEHOLCIM MAROC

LAFARGEHOLCIM MAROC

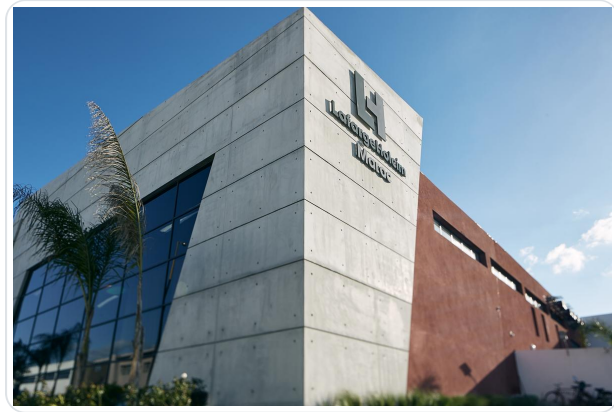
<http://www.lafargeholcim.ma>

Product category : Table 'c21\_spain.innov\_category' doesn't exist  
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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'

RAS

RAS



Ductal

LAFARGEHOLCIM MAROC

LAFARGEHOLCIM MAROC

<http://www.lafargeholcim.ma>

Product category : Table

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oneINNER JOIN innov\_category AS two ON one.parent\_id = two.idWHERE one.state=1AND

one.id = '6'

RAS

RAS



DESIGNBUILDER

DESIGNBUILDER UK

BE BIO Consulting

<http://www.designbuildermaroc.com>

Product category : Table

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SELECT one.innov\_category AS

current,two.innov\_category AS parentFROM

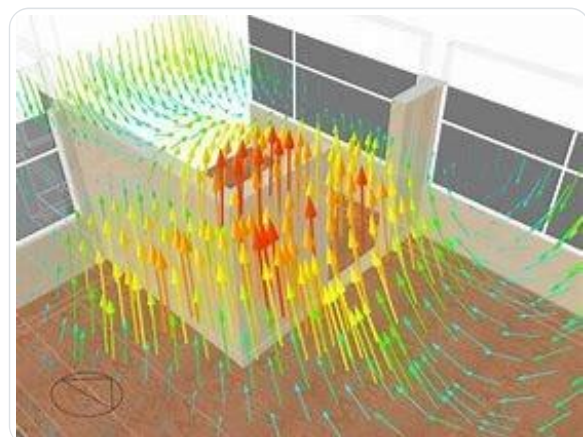
innov\_category AS oneINNER JOIN

innov\_category AS two ON one.parent\_id =

two.idWHERE one.state=1AND one.id = '29'

RAS

RAS





### Urban environment

The layout of the plot has been optimized with regard to bioclimatic design, while respecting the prospect rules applicable to buildings.

### Land plot area

Land plot area : 4 000,00 m<sup>2</sup>

### Built-up area

Built-up area : 66,00 %

### Green space

Green space : 250,00

### Parking spaces

5

## Building Environmental Quality

### Building Environmental Quality

- Building flexibility
- indoor air quality and health
- works (including waste management)
- acoustics
- comfort (visual, olfactive, thermal)
- waste management (related to activity)
- water management
- energy efficiency
- renewable energies

- maintenance
- building end of life management
- integration in the land
- mobility
- building process
- products and materials

## Contest

### Reasons for participating in the competition(s)

- Renovation with preservation of facades and roof that have been improved in terms of architecture, thermal and acoustics;
- Life cycle analysis of materials and building;
- Integration of integrated photovoltaic panels as cover for parking spaces;
- Square for electric cars
- Centralized technical management of the building;
- Rainwater harvesting;
- Integration of natural skylights and redesign of the main facade for a better architectural integration and brightness of the interior spaces;
- Sorting and waste treatment in partnership with Geocycle

### Building candidate in the category



Bas Carbone





Smart Building



Coup de Cœur des Internautes