Mohammed VI International University Hospital

by wafaa BOUMHAOUD / 2021-03-23 13:02:30 / Maroc / 8287 / FR

New Construction

Primary energy need :

665 kWhep/m².an

(Calculation method : RTCM)

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 : Public or private hospital
Construction Year : 2017
Delivery year : 2020
Address 1 - street : P3011, Bouskoura 27182, Maroc 27182 CASABLANCA, Maroc
Climate zone : [Dfa] Humid Continental Hot Summer, Wet All Year

Net Floor Area : 47 000 m² Autre type de surface nette
Construction/refurbishment cost : 67 000 000 €
Cost/m2 : 1425.53 €/m²

Certifications :

HQE
THE WAY TO PROGRESS

General information

The Mohammed VI International University Hospital is a large-scale state-of-the-art project dedicated to scientific research and teaching of medicine. Extending over a covered area of 47,000m2, it has a total capacity of 325 beds, 28 consultation rooms, 15 exploration and treatment rooms and 11 operating theaters on a technical platform that meets international standards. The poles of excellence which make this hospital a benchmark establishment are the Mother-Child pole, the Trauma-Center, the Head and Neck pole. The hospital offers its patients a care space that combines efficiency with pleasure, and its teams a work environment conducive to development and continuous improvement.

Data reliability

3rd part certified

Photo credit

not

Stakeholders

Contractor

Name : BYMARO
Contact : +212 5229-52250
http://www.bymaro.com

Construction Manager

Name : FAOUZI BOUAYAD Architecte

Stakeholders

Function : Contractor
FONDATION CHEIKH KHALIFA IBN ZAÏD

Function : Assistance to the Contracting Authority
JESA

Function : Assistance to the Contracting Authority
ELAN CERTIFICATION HQE

Function : Other consultancy agency
INGEROP FRANCE

Contracting method

General Contractor

Owner approach of sustainability

BYMARO in agreement with the contracting authority wished to include the construction project of the University Hospital of BOUSKOURA in a sustainable development approach through the realization of a project that respects the environment, consumes little energy and offers a pleasant living environment for patients, their families and staff. The following environmental objectives have thus been set:

- Optimization of access to the site
- Limiting the overall energy consumption of buildings
- Water management on the site
- The attractiveness of open spaces and gardens
- Good waste management
- Comfort for patients, staff and visitors
- Good acoustic management between the different premises
- The assurance of a balanced, equitable, progressive and environmentally friendly development, both during the execution of the works and during the use and maintenance of the buildings.

BYMARO wanted to strengthen the anchoring of this operation in Sustainable Development, by proposing a project integrating all the environmental, economic and societal aspects required for the hospital of tomorrow.

In order to guarantee the achievement of its objectives, BYMARO has secured the services of a multidisciplinary team and a Sustainable Construction Project Owner. A Project Environmental Management system has been put in place to define the technical and human organization necessary to maintain the sustainable quality of the project.

Architectural description

See description in the attached note

If you had to do it again?

Yes, it's a great experience to do again

Energy

Energy consumption

Primary energy need : 665,00 kWhep/m^2.an

Primary energy need for standard building : 838,00 kWhep/m^2.an

Calculation method : RTCM

Final Energy : 259,00 kWhef/m^2.an

Breakdown for energy consumption :
Dynamic thermal simulation results
Heating: 7 kWhef / m².an and 17 kWhep / m².an
Cooling: 62 kWhef / m².an and 159 kWhep / m².an
Lighting: 64 kWhef / m².an and 166 kWhep / m².an
Auxiliaries: 125 kWhef / m².an and 322 kWhep / m².an
DHW by oil-fired boiler

Envelope performance

More information :
Roof: U = 0.34 W / m².K
Exterior wall: U = 0.42 W / m².K
low floor to floor: U = 0.53 W / m².K
intermediate floor: U = 1.35 W / m².K
Exterior carpentry: U = 2.44 W / m².K- FS = 0.4

Indicator : EN 13829 - q50 » (en m3/h.m3)

Air Tightness Value : 1,20

Users' control system opinion :

GTC system planned which allows a good follow-up during the exploitation phase

Renewables & systems

Systems

Heating system :
- Boiler fuel
- Fan coil
- VAV System

Hot water system :
- Boiler fuel
- Other hot water system

Cooling system :
- Water chiller
- Fan coil
- VAV Syst. (Variable Air Volume system)
- Radiant ceiling

Ventilation system :
- Natural ventilation
- compensated Air Handling Unit
- Double flow heat exchanger

Renewable systems :
- Other, specify

Other information on HVAC :
3 chilled water production units of 750 kW per unit, with desuperheaters;
2 reversible heat pumps 750 kW cold / 650 kW hot;
2 dual fuel oil / gas boilers of 450 kW;
57 Air handling units;
750 Fan coils;
200 tons of sheath;
28 km of black steel tube

Solutions enhancing nature free gains :

Establishment of an STD: design and implementation phases. Use of efficient production and ventilation systems with energy recovery. Use of a building envelope that performs better than regulatory requirements

Smart Building

BMS :

Presence of BMS and water and energy metering
Unlike a standard project, metering means per station for monitoring energy consumption will be put in place, in particular for:
- Heating,
- Cooling,
- Lighting,
- Ventilation,
- Domestic hot water.

A metering tree allowing the monitoring of water consumption according to the context of the building is planned.

Environment

Water management

The sanitary equipment chosen with a better performance compared to
water requirements that a standard project would have.
- For hospital rooms, the conventional reference water flow values
maximum to consider are the following:
- Flush: 6 liters / flush
- Urinal: 3 liters / flush
- Sink faucet: 10 liters / minute
- Shower: 12 liters / minute
- The recovery of rainwater for watering the green space.

Indoor Air quality

Implementation of a specific ventilation system (s).
Control of contamination in risk areas (2 to 4).

Comfort

Health & comfort :

Spaces frequented by patients for prolonged periods and sensitive to temperature rises are
equipped:
- Movable, adjustable exterior sun screens in hospital rooms.
- Night-time over-ventilation, allowing natural cooling of at least part of the spaces in the structure (sensitive to temperature rises).

Humidity control is provided in premises with device operating constraints
medical devices (for example MRI) or in premises with very specific long-term climatic conditions.

A natural lighting study was planned in the 1-bed and 2-bed hospital rooms ensuring the
Daylight Factor (DLF) level. Indeed, this study represents the assurance of an illumination
optimal naturalness while avoiding glare.

As part of the site survey, an identification of the sources of low-frequency electromagnetic wave and radiofrequency emissions is planned.

Access to daylight for all hospital rooms.

Sun protection that can be operated by users in hospital rooms and more particularly in rooms subject to the risk of dazzling from solar radiation

Respect of the normative values of illumination according to the types of spaces while putting more efficient equipment than ASHRAE standards.

Acoustic comfort :

An acoustic study carried out on the 6 criteria of acoustic environment below,
- Standardized weighted acoustic insulation vis-à-vis the outside space
- Equipment noise level
- Shock noise level
- Internal acoustics (based on specific internal acoustics indicators)
- Airborne noise isolation (in reception) from adjacent spaces
- Sound when walking

Acoustic support by an expert design office in the development of solutions to meet acoustic constraints.

Establishment of a program compatible with the objectives of the project

Implementation of an acoustic quality assurance plan integrated by Bymaro on site in the general site QAP: inter-room insulation, internal acoustic performance, noise control of technical equipment, compliance of noise pollution vis-à-vis neighbors.

Daylight factor : oui calculé supérieur ou égal à 1.2

Costs

Construction and exploitation costs

Cost of studies : 2 000 000 €

Additional information on costs :

67,000,000 euros: Construction excluding equipment

Urban environment

See site analysis in join

Land plot area

Land plot area : 45 000,00 m^2

Parking spaces

14000 m^2

Building Environnemental Quality

Building Environmental Quality

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

Contest

Reasons for participating in the competition(s)

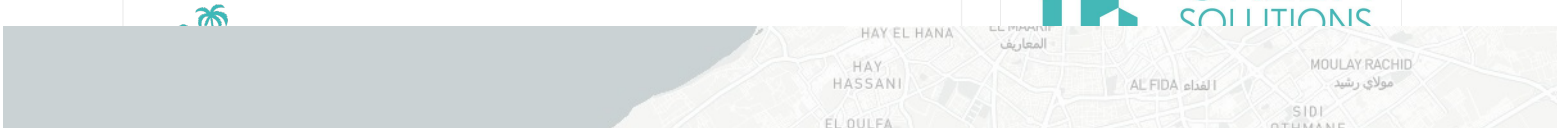
Energy saving compared to the reference building of 21%

Important acoustic performance

Expertise in lean management and BIM model.

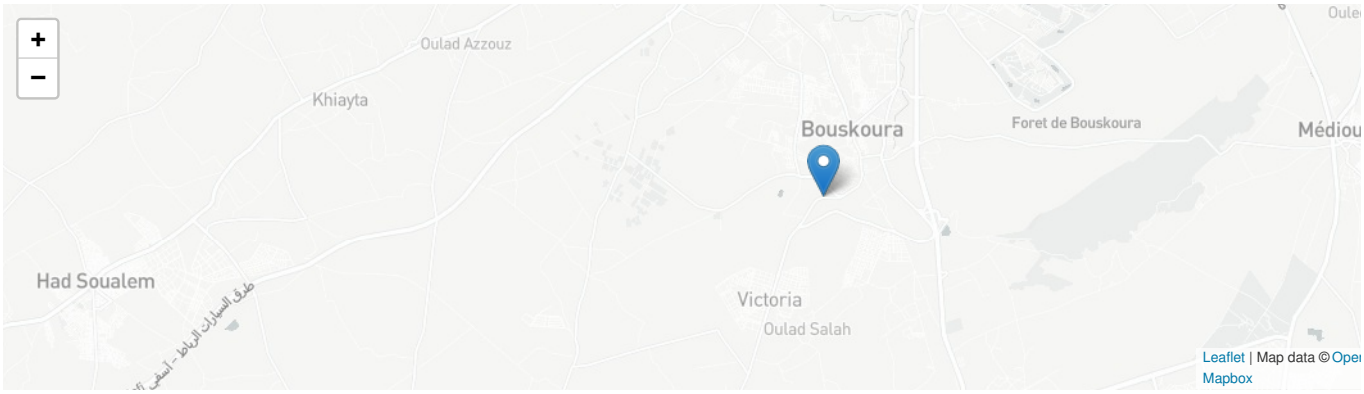
1st HQE certified project at Very good level internationally: Pilot Project

Building candidate in the category



Energie & Climats Chauds

Santé & Confort



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