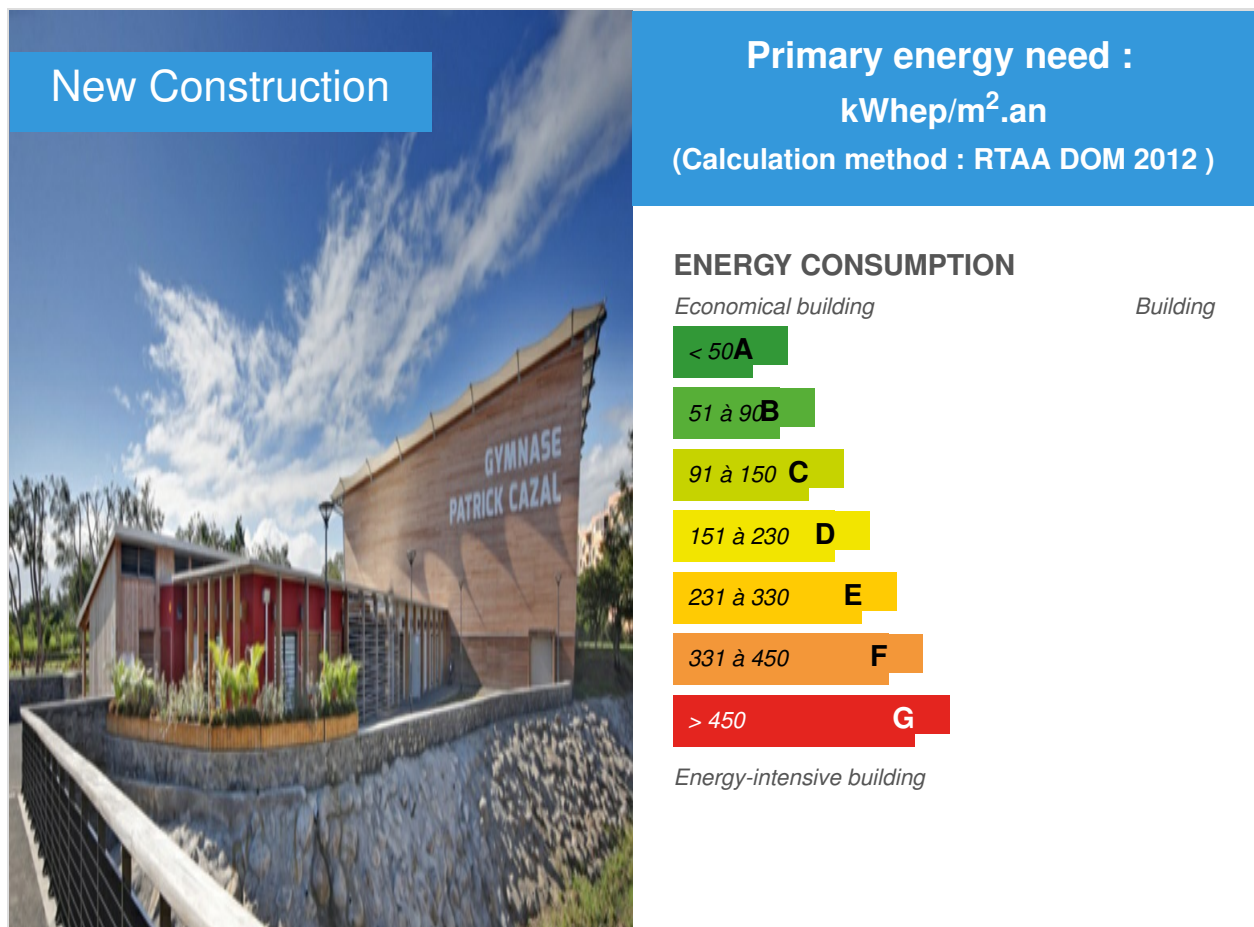


## Gymnasium Patrick Cazal

by Catherine Morel / 2017-04-18 17:19:41 / France / 7372 / FR



**Building Type** : Indoor gymnasium, sports hall, stadium

**Construction Year** : 2014

**Delivery year** : 2014

**Address 1 - street** : 97400 SAINT-DENIS, France

**Climate zone** : [Af] Tropical Wet. No dry season.

**Net Floor Area** : 1 365 m<sup>2</sup> SHON

**Construction/refurbishment cost** : 2 400 000 €

**Cost/m2** : 1758.24 €/m<sup>2</sup>

Proposed by :



## General information

The operation takes place within the heart of the family in PRU zone. This 35-hectare urban park dedicated to recreation in the heart of Saint-Denis, dotted with many amenities, contributes to the exchange and well-being of all Dionysians and allows to connect several districts between them. The program of this training gym provides, apart from the sports hall, changing rooms, clubhouse and offices. This project proposes a passive design, with a porous building and therefore not waterproof and air-tight which is a different approach to the gymnasiums modeled on the metropolis with closed facades. It is a climatic shelter.

## Sustainable development approach of the project owner

This project focused on optimizing the two essential uses of the gymnasium, that of the sports practitioners and that of the spectators by insisting on comfort and thermal, visual and acoustic quality. Natural ventilation has been favored, either by front louvres, providing through ventilation, or by the micro-perforated textile facades of the large room, or again by the mono-slope roof creating a façade in pressure and another in depression . Natural lighting was also favored and determined a major architectural choice via an architectural textile cover. This material, exceptionally resistant to cyclonic winds, offers a unique quality. Indeed, the roof filters natural light and provides an optimal luminous comfort. At night, this cover also reveals its role as a friendly urban landmark.

## Architectural description

In view of the energy ambitions of the program, a bioclimatic architecture has emerged. The architecture takes into account the dominant winds ubiquitous on the site and particularly strong during the winter, from the east sector. In addition to the plant filters, the exposed façade of the room is very closed to these winds to limit their impact, only adjustable man-made ventilations allow this orientation to be managed. In summer the wide openings of the facade filters allow them to catch the thermal breezes, sea, mountain. The general orientation North North East, South South West proposed for the main facades, is almost optimal with

respect to the race of the sun. Appropriate solar shields are provided, and the grazing illumination gene is suppressed by the general system of zenithal illumination. The shape of the mono-sloped roof also makes it possible to create a pressurized front and the other in vacuum, ensuring an optimal natural draft guaranteeing thermal comfort, in the direction of the dominant breezes.

## If you had to do it again?

Originally planned as a training facility, the gym currently receives competitions at late hours. The high porosity of the building, so useful to the thermal comfort, does not limit the noise nuisance of the sporting activity to the residents in the South. This point will be corrected by an external noise barrier. The design of the gymnasium provided that by rainfall northeast area, water could penetrate a few meters into the building. This hazard has been incorporated into the design to avoid any degradation due to a permissible slope (1%) in the pavement and a lead (and not glued) floor covering. These penetrations, although infrequent, are perceived as a gene by the agents in charge of maintenance (need to scrape residual water). This minor inconvenience, given the contributions in terms of thermal comfort throughout the year, could be better accepted by all thanks to adapted information. The patio had to be planted, in a natural garden spirit with low maintenance and high density, thus bring comfort and intimacy to the premises of the clubhouse and the office of the site manager. The edges of the volume had to be made by a free strip of zoizia tenuifolia (not necessary mowing) watered regularly by drainage of gray water. Unfortunately, the treatment of the surroundings and patio is not part of this contract and remains suspended

## See more details about this project



[http://www.smartweb.re/envirobat/files/fiches\\_envirobat\\_reunion/tertiaire\\_et\\_equipements/FICHE\\_ENVIROBAT\\_REUNION\\_GYMNASSE\\_PATRICK\\_CAZAL.pdf](http://www.smartweb.re/envirobat/files/fiches_envirobat_reunion/tertiaire_et_equipements/FICHE_ENVIROBAT_REUNION_GYMNASSE_PATRICK_CAZAL.pdf)

<http://www.caue974.com/en/collectivites-et-professionnels/les-rendez-vous-du-caue/137-dernieres-actualites/539-visite-du-gymnase-patrick-cazal>

<http://www.archi.re/gymnase-patrick-cazal/>



### Stakeholders

## Stakeholders

Function : Contractor

Ville de SAINT-DENIS

communication@saintdenis.re

<http://www.saintdenis.re/>

Project management

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Function : Designer

Antoine PERRAU Architectures

02 62 35 42 26

<http://iletducentre.fr/>

Architecture

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Function : Designer

Atelier EPICéa

02 62 57 07 44

Architecture

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Function : Structures calculist

A3 Structures

02 62 43 47 05

Study of the structure

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Function : Other consultancy agency

INSET Nord

bet.inset@inset.fr

<http://www.insetgroup.fr/inset.html>

Study of fluids

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Function : Environmental consultancy

APAVE

<http://www.apave.com/menu-bas/contact.html>

<http://www.apave.com/>

Control office

Energy

## Energy consumption

Calculation method : RTAA DOM 2012

## Envelope performance

### More information :

- Underfloor: reinforced concrete and facing rubble
- Reinforced concrete paving
- Glued laminated timber frame assembly by galvanized metal elements
- Cladding wood or derived panels
- Circulation in wood deck, general use of wood class IV anti-termites labeled (CO2 storage, 100 tons for the framework).
- Thermo-reflective, easily recyclable textile membrane, Ferrari pre-stressed textile membrane 1202 T2 with anti-fouling coating.
- Coverage of the main circulation: Powder coated steel + rock wool 100mm + vegetalized sealing
- Covering of the locker rooms and the local storage Supply and installation of a cover in steel vat type thin complex thermo-acoustic from ONDULIT

## More information

The main objectives are: reduction of building expenses and consumption, reduction of the environmental impact of the building and CO2 emissions, reduction of maintenance.

## Renewables & systems

## Systems

### Heating system :

- No heating system

### Hot water system :

- Individual electric boiler
- Solar Thermal

### Cooling system :

- No cooling system

### Ventilation system :

- Natural ventilation
- Nocturnal ventilation

#### Renewable systems :

- Solar Thermal

## Environment

### Urban environment

Land plot area : 1 371,00 m<sup>2</sup>

Built-up area : 99,50 %

At the western edge of the green heart, the building takes place between the urban boulevard Jean Jaurès (Bd Sud) and a heteroclite popular fabric made up of houses and buildings. He hangs up on it, extending the Rue de la Verdure, leading to it by a pedestrian walkway. On the coastal strip, less than 700 m from the ocean, the site is subject to the steady regime of the trade winds (east coastal acceleration) and also benefits from thermal breezes. The site is marked by the two depressions of the ditches (collector of rainwater) in the North and the South. The building naturally takes place between these two structures, in prow, parallel to the South Boulevard thus ideally disposing its long facades in the north North-East / South South-West with respect to the sun and the wind.

## Products

### Product

Natural ventilation

Ville de SAINT-DENIS

communication@saintdenis.re

<http://www.saintdenis.re/>

Product category : Génie climatique, électricité / Ventilation, rafraîchissement

The natural ventilation was privileged and concentrated completely at the height of the users, with complementary scoops strongly ventilating the plenum of the volume. Through ventilation is available in several devices. In the sports hall, the long linear wooden shutters at the height of the man on the two large opposite facades allow to generate a constant air flow

On users. The micro-perforated textile facade evacuating thermal overloads in the upper part. In the locker rooms, the ventilation is through an air intake on the side of the circulation "sports shoes" whose facades (North East) are porous (wooden shutters). The air is sucked through the openings in the upper part of the opposite facade. The hot air is evacuated by aerothermal extraction. In both cases, the shape of the roof (monopan) and its orientation towards the wind increases the effect "pressure / depression", base of the natural ventilation through. All long-occupied rooms operate in natural through ventilation.



Pre-stressed fabrics

Ville de SAINT-DENIS

communication@saintdenis.re

<http://www.saintdenis.re/>

**Product category :** Génie climatique, électricité / Eclairage

Natural lighting is widely favored by the canvas stretched in front and cover that diffuses a soft and homogeneous light (4% transmission of sunlight through the canvas). The absence of direct light eliminates glare and shadows that are not conducive to ball games. The translucency of the fabric ensures 800 lux of natural lighting on average throughout the year. Visual comfort is optimal. Artificial lighting is required only at night. The canvas also allows extensive visual breakthroughs to the distant landscape and surrounding gardens. The other rooms all have natural lighting.



## Costs

### Construction and exploitation costs

**Total cost of the building :** 2 400 000 €



### Water management

The production of solar hot water, by plane panels covers 70% of the needs with an electric supplement.

Rainwater is discharged into the open-air outfalls provided in the urban park.

### Indoor Air quality

No materials known for their VOC or formaldehyde emissions have been used. The strong natural ventilation of the spaces would avoid being exposed to Possible emanations.

### Comfort

**Health & comfort :** Natural lighting is widely favored by the canvas stretched in front and cover that diffuses a soft and homogeneous light (4% transmission of sunlight through the canvas). The absence of direct light eliminates glare and shadows that are not conducive to ball games. The translucency of the fabric ensures 800 lux of natural lighting on average throughout the year. Visual comfort is optimal. Artificial lighting is required only at night. The canvas also allows extensive visual breakthroughs to the distant landscape and surrounding gardens. The other rooms all have natural lighting.

**Acoustic comfort :** In a gymnasium, the reverberation time must be controlled so as not to disturb the hearing of the information to reach the players. Thus, openwork louvres, wood and canvases have little reverberation and curved roof shapes limit the phenomenon of acoustic reverberation. In the sports hall, the reverberation time is 50% lower than the objectives of the standard. In the other premises are installed false ceilings absorbing. The lack of noisy technical equipment, the nearby green and calm environment improve comfort.

## Carbon

### Life Cycle Analysis

**Eco-design material :** Siding and wood cladding



