


Rivière-Salée Medico-Social Center

by jocelyn meschenmoser / ⌚ 2021-03-23 10:41:21 / France / 👁 6801 / 🇫🇷 FR

New Construction



Primary energy need :
84 kWh_{ep}/m².an
(Calculation method : Other)

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 : 2020

Delivery year : 2020

Address 1 - street : rue Lévesque 98000 NOUMEA, France

Climate zone : [Aw] Tropical Wet & Dry with dry winter.

Net Floor Area : 2 055 m²

Construction/refurbishment cost : 6 704 000 €

Cost/m2 : 3262.29 €/m²

General information

This building was awarded the Energy & Hot Climates Prize of the Green Solutions Awards 2020-21 at both national and international levels.

The Rivière-Salée medico-social center is located in Nouméa, New Caledonia. It is located in the Rivière-Salée district, in an urban area near other public facilities, in a hot and humid tropical climate.

It brings together medical care and consultation rooms, a radiology center, an analysis laboratory, offices, waiting areas and rest areas for the public or staff.

Its ambitious bioclimatic design is the result of a combined desire of the client to have an economical and resilient building, of the designers to offer an exemplary building for the Caledonian territory in all aspects of sustainable development, and of the users of benefit from healthy and comfortable premises for staff and the public.

Beyond the environmental and bioclimatic aspects, it is also a social and cultural approach that has been developed in the architecture and the landscape, with the objective of achieving an *Oceanian* building in which users recognize and find themselves.

Thus, the building revolves entirely around a large central patio heavily vegetated, thus making it possible to release rooms open to semi-outdoor spaces protected from the weather and the nuisances of the city. This patio is organized as a low pressure fireplace to accentuate air circulation and promote natural ventilation. The facades on the street are all provided with a double skin in porous mesh, a generalized solar filter also providing protection against urban degradation to which all buildings in the area are subject.

Thus, the majority of premises can operate with natural ventilation without air conditioning, opening onto a *quiet and shaded haven*, in the heart of the surrounding mineral and overheated town. The wide use of wood and the dry sector also contributes, beyond the search for a reduced carbon impact, to the appropriation of spaces and buildings by users.

Sustainable development approach of the project owner

Main objective of an economical, comfortable and healthy building.

The technical program included precise and high-performance environmental requirements, developed in a specific thesis on the environmental quality of the project, and including in particular numerous justifications to be presented by the team of designers during the studies

(dynamic thermal simulations, calculations of solar factors , simulations, ...).

An environmental approach, sometimes simply addressed on previous projects, was developed by the MOA for the first time in a comprehensive manner on this project.

Architectural description

The Rivière-Salée medical-social center is a tropical Oceanian bioclimatic building.

All the premises are articulated around the central patio, the true heart of the project, both for its active role in natural ventilation and for its lush vegetation that adorns all the spaces.

The exterior facades are all covered with a protective double skin that filters solar gain, rain, dust, views and possible frequent degradation in the area.

With the exception of the technical rooms and the laboratory, all spaces are through or semi-exterior, to promote natural ventilation and limit the use of air conditioning.

Building users opinion

A detailed post-construction assessment is planned after 6 months of use (July 21). Detailed questionnaires will be completed by all staff on the concepts of thermal and visual comfort, the use of technical systems, etc.

The first feedback from occupants over the first 2 months of use shows great satisfaction in the use of the premises and their comfort.

If you had to do it again?

Since the start of use, in January 2021, some adjustments have been made: - problem of dazzling of people stationed at the reception of the R + 2, semi-outdoor space. Additional blinds have been installed to protect from direct sunlight. - the commissioning of the GTC system and the handling by the staff remains, 3 months after delivery, still hesitant. Technical system sophisticated but difficult to use without technical staff permanently in the establishment. Need for a specific procedure for securing the premises in the event of cyclones, in particular the semi-outdoor spaces and the furniture located in these spaces, which had to be adjusted and detailed to the staff after the first cyclone alert.

See more details about this project

Photo credit

Urban Ecology Laboratory

Stakeholders

Contractor

Name : CAFAT

Contact : 4 rue du général MANGIN 98800 NOUMEA

<https://cafat.nc/>

Construction Manager

Name : Atelier d'architecture KASO

Contact : claire PASCAL ; cp[a]atelierkaso.com

Stakeholders

Function : Contractor representative

SECAL

+687 46 70 00

<https://secal.nc/>

Function : Designer

LAB réunion

+262 262 35 42 26

<https://labreunion.fr/>

Function : Other consultancy agency

Laboratoire d'Ecologie Urbaine

jocelyn MESCHENMOSER ; leu[a]nautille.nc

<https://www.leureunion.fr/>

Environmental Quality Study Office

Function : Other consultancy agency

ECEP

+687 23 22 22

design office for all trades

Function : Environmental consultancy

LFJ design paysage

Laetitia Franzini Jacquin

landscaper

Function : Other consultancy agency

SIGMA

Joel Beaumont

BET VRD

Function : Other consultancy agency

ES2

Anne Gesdon

BET fire safety

Contracting method

Separate batches

Type of market

Global performance contract

Energy

Energy consumption

Primary energy need : 84,00 kWh/m².an

Primary energy need for standard building : 225,00 kWh/m².an

Calculation method : Other

Breakdown for energy consumption : air conditioning and treatment: 32580 kWh / an EF
VMC: 2895 kWh / an EF air conditioners: 1430 kWh / an EF lighting: 13125 kWh / an EF
sensor: 6000 kWh / an EFE for sanitary heating: 1800 kWh / an EFTOTAL: 57 830 kWh / an
EF

Real final energy consumption

Final Energy : 33,00 kWh/m².an

Envelope performance

More information :

solar factors: metal roof: 0.015

insulated roof terrace: 0.018

facades NE, NO, SW: 0.007

SE facade: 0.005

Jealousy berries NE: 0.30

fixed bays NE: 0.27

OSB or sliding windows NE: 0.27

jealousy berries NO: 0.33

fixed bays NO: 0.29

OSB bays NO: 0.30

Jealousy berries SO: 0.35

Fixed bays SO: 0.31

OSB SO bays: 0.32

Jealousy berries SE: 0.23

Fixed bays SE: 0.20

OSB SE racks: 0.21

Users' control system opinion :

GTC difficult to learn for non-technical staff. During the studies, it was expected that a technical staff would be in the future building to ensure its operation. This is no longer the case, this staff being relocated. The use of the GTC by administrative staff remains difficult.

More information

A mission to monitor actual consumption during the first year is planned by the environmental consultant. It will make it possible to identify certain drifts and to take stock at the end of the first year of use. Signs specifically designated for this building were also produced, to make users aware of energy savings and the proper use of technical devices and systems.

Renewables & systems

Systems

Heating system :

- No heating system

Hot water system :

- Solar Thermal

Cooling system :

- VRV Syst. (Variable refrigerant Volume)

Ventilation system :

- Natural ventilation
- Free-cooling
- Single flow

Renewable systems :

- Solar photovoltaic

Renewable energy production : 51,00 %

Photovoltaic rooftop farm of 35kWp, operating in self-consumption with surplus resale.

Environment

Urban environment

Land plot area : 2 965,00 m²

Built-up area : 47,00 %

Green space : 757,00

The surrounding environment consists of public or service buildings in an urban development of medium density. The immediate neighborhood consists of a vocational school, a sports stadium, a public service pole building, a public parking lot, a shopping center, a cultural center, a church.

The Rivière-Salée district, an old but relatively isolated district, has benefited for several years from urban renovation or requalification, driven by the arrival of the TCSP (neobus), an important stop of which is located 50m from the medico-social center.

Products

Product

RESYSTA

Resysta

<https://www.resysta.com/>

Product category : Structural work /
Structure - Masonry - Facade

Realization of all the double-skin slats in RESYSTA material. After a long comparative analysis of different materials and solutions, it was decided to produce these elements with this composite consisting of rice husk, rock salt of mineral oil. It was chosen for its mechanical properties, its resistance to degradation and bad weather, but above all its very efficient environmental performance. In all, 8770 boards 70cm long were used on the 3 most exposed facades. This material, which is highly visible on the building, helps to highlight the project owner's environmental commitment to this project.



Implementation, handling and work as easy as wood according to the structural company responsible for the installation.

Costs

Construction and exploitation costs

Cost of studies : 830 000 €

Total cost of the building : 7 534 000 €

Health and comfort

Water management

Consumption from water network : 400,00 m³

Consumption of harvested rainwater : 40,00 m³

Water Self Sufficiency Index : 0.09

Water Consumption/m² : 0.19

Water Consumption/none : 8

Rainwater collection on the roof over 400m², storage in an underground tank of 5000 liters, distribution for the supply of irrigation networks to all the green spaces outside (patio) and planters upstairs. All irrigation needs can be covered by recycled rainwater, the plant systems implemented being able to withstand a period of drought if necessary.

Indoor Air quality

The interior coverings (flexible floors, paints, varnishes, glues) have all been selected for their environmental characteristics and their low levels of VOC emissions (environmental labels or FDES sheets required, etc.).

Comfort

Health & comfort :

As it relates to a medico-social establishment, several provisions have been developed for comfort and health:

- thermal comfort, with bioclimatic design and privileged natural ventilation (dimensioning by studies in a wind tunnel and dynamic thermal simulations)
- visual comfort, with favored natural lighting, while completely avoiding glare phenomena (sizing by digital simulations).
- All waiting, reception and circulation areas are treated as open outdoor spaces but protected from rain, sunshine and strong winds.
- All offices and medical practices are equipped with ventilators, desk lamps, and blinds with individual controls so that each user can adapt the operation of the systems to their needs and feelings.
- the ubiquitous vegetation in the building, including upstairs, promotes a peaceful and intimate atmosphere suitable for a care activity

Calculated thermal comfort : Simulations thermiques dynamiques avec DesignBuilder (moteur de calcul Energy+). Les taux de confort (pourcentages de points dans le diagramme de givoni) sont compris entre 92 et 94% pour tous les locaux type simulés

Measured thermal comfort : campagne de mesure hygrothermique dans 5 locaux type prévue en avril 2021, à l'aide d'enregistreurs de température et hygrométrie Testo 174H2

Acoustic comfort :

For the sake of acoustic comfort for users and employees, different

provisions have been put in place:

- Acoustic aluminum ceilings for waiting-reception areas
- Acoustic ceilings in mineral fibers for offices and medical practices
- Acoustic ceilings in plasterboard for meeting rooms and cafeterias
- Isophonic screeds for circulation
- Soft floors in a majority of premises

The objective is to limit the reverberation within the spaces, as well as the transmission impact noises between floors

Between rooms, the dividing walls are made of high hardness plasterboards on frame with incorporated mineral wool. The sound reduction index of these walls is $R_w + C (Ra) = 47$ dB.

The technical terrace roof air treatment equipment will be located on anti-vibration mounts and are located at a distance greater than 40m from the nearest neighboring construction which will greatly limit noise pollution possible on neighboring establishments.

Daylight factor : FLJ moyen dans les locaux simulés (outil DIAL+): à noter, le climat tropical impose de respecter des FLJ plus faible qu'en climat européen pour obtenir les mêmes conditions de confort visuel dans les locaux. Bureau médecin façade SE au R+2: FLJmoyen = 2

Carbon

GHG emissions

GHG in use : 30,00 KgCO₂/m²/an

Methodology used :

Scope: electricity consumption excluding photovoltaic resale, air conditioning leaks, patient travel, personal travel. Electricity consumptions are those calculated in a study according to the RENC method (FE 0.920 kgCo₂ / kWh elec EF).

Building lifetime : 50,00 année(s)

Contest

Reasons for participating in the competition(s)

Le bâtiment permet un fonctionnement en ventilation naturelle et donc économe, grâce à l'articulation des locaux autour d'un patio dépressionnaire dont les dimensions ont été déterminées par des études sur maquette en soufflerie.

Intégration de végétation au coeur du bâtiment pour contribuer au rafraîchissement naturel: dans le patio luxuriant, terrasses végétalisées, très larges jardinières suspendues en étage, pieds de façade végétalisés, parking végétalisé.

Ossature principale en béton armé, mais très large recours à la filière sèche et au bois pour le remplissage des façades (acier et fibrociment), les doubles-peau et habillage des façades (bois exotiques, Resysta), l'escalier principal (acier, bois), les mobiliers et habillages divers (bois).

Démarche globale de maîtrise de l'énergie, avec une limitation de la surface climatisée, un fonctionnement en ventilation naturelle pour la majorité des espaces, des équipements économes (traitement d'air VRV régulé et optimisé, moteurs à courants continus, éclairages LED, brasseurs d'air performants, ...), une production d'eau chaude solaire, et une ferme solaire photovoltaïque en toiture fonctionnant en auto-consommation connectée au réseau.

Bâtiment de santé et de soin avec une approche centrée sur le confort des patients et du personnel: confort thermique en saison chaude avec une ventilation naturelle optimisée et un bâtiment rafraîchi naturellement, confort visuel avec l'éclairage naturel favorisé dans tous les locaux par une double exposition et des larges vitrages tous protégées de l'ensoleillement direct, confort olfactif avec un bâtiment tourné sur le patio protégé et la présence de végétation dans tous les espaces même en étage, confort acoustique avec des habillages en résille de bois pour la patio et les espaces d'attente. les matériaux et revêtements sont choisis pour leurs caractéristiques environnementales et leurs faibles niveaux d'émissions de COV.

Building candidate in the category



Energie & Climats Chauds

