De Gaulle-Anthonioz middle School: Mediterranean Gold level Building

by Eiffage / 2019-06-17 21:15:36 / France / 8146 / FR

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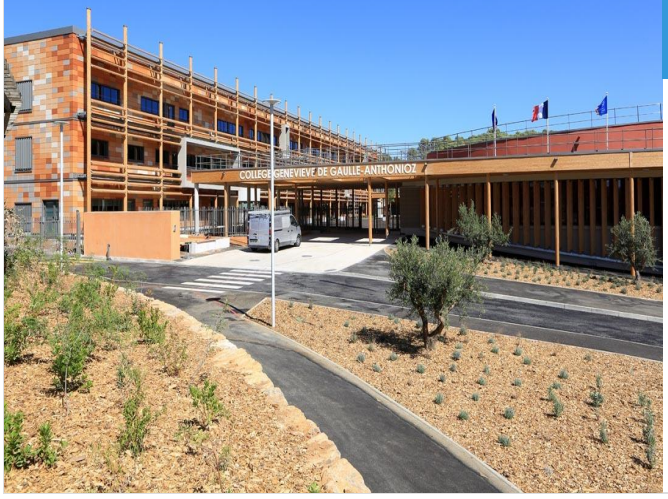
New Construction



Primary energy need :

29.8 kWhep/m^2.an

(Calculation method :)

Building Type : School, college, university
Construction Year : 2016
Delivery year : 2017
Address 1 - street : 143 impasse des Bauquières 83570 CARCèS, France
Climate zone : [CsC] Interior Mediterranean - Mild & dry summer.

Net Floor Area : 7 655 m^2
Construction/refurbishment cost : 23 506 343 €
Number of Pupil : 700 Pupil
Cost/m2 : 3070.72 €/m^2

Certifications :

Proposed by :

EIFFAGE CONSTRUCTION

General information

The Geneviève de Gaulle-Anthonioz middle school in Carcès in Var departement (near Nice) is a new generation establishment, equipment built according to the best standards of energy performance, labeled Mediterranean Sustainable Building Gold and BBC Effinergie. Architectural writing with emphasis on wood, terracotta and raw materials (steel and glass), photovoltaic production, wood-burning boiler, façade sunshades, green roofs, water recovery and reuse, cooling system by geocooling, in other words by geothermal energy ... a wide range of bioclimatic solutions has been used. A very large water retention basin of 2,600 m3 has been built.
Designed by architect Guy Mascherpa, this building with a capacity of 700 students has a 123-seat auditorium with a stage of 63 m2, a kitchen and a dining room that can accommodate more than 300 guests, a large gymnasium. 1,290 m2 and an outdoor sports plateau. The gymnasium, the track and the auditorium have

independent access and can be shared with associations outside college hours. Their use is thus maximized.

Contract: Public Private Partnership signed between the Var department and the company COLOGEN. The latter is responsible for the design, construction, financing, maintenance, operation and maintenance of the establishments. The County Council will pay a fee for twenty-five years. This operation makes it possible for the Department to respond to an urgent need, demographic change and to achieve economies of scale.

In order to conduct this public-private partnership with the departmental council of the Var, Eiffage has set up the Eiffage Construction Azur group (agent), Eiffage Energy Systems Mediterranean, Eiffage Energy Thermie Méditerranée, Crystal Sam, and Eiffage TP Méditerranée for the works. Pigna and Senec SMEs also participated in the Carcès project. **In fact, 80% of the works, in particular the secondary state bodies, have been subcontracted.**

Mascherpa Architects agency designed this college for 700 students with a possible extension to 800.

More information on certification: Mediterranean-level sustainable building gold + obtaining the BBC label Effinergie for college and housing (ie RT2012 -20%, airtightness of networks, buildings, etc.) The Mediterranean sustainable building is a reference system for French environmental quality, created in 2008, which aims to evaluate building construction and rehabilitation projects in a continuous improvement process, through a participatory guarantee system. This design-build project meets ambitious environmental objectives.
The Mediterranean Sustainable Building (BDM) level required Gold requires:
▪ the choice of bio-sourced and local materials;
▪ the reduction of heating needs, GHG emissions and implementation of renewable energies (180 m² of photovoltaic panels placed on the roof), with at least passive buildings;
▪ reduction of water consumption and recovery;
▪ waste management and selective sorting, especially for catering;
▪ biodiversity, green spaces, garden and educational pond;
▪ buildings with quality materials, comfortable and healthy (visual comfort, air quality, hygrometric comfort), with monitoring and controls of summer temperatures and total volatile organic compounds;
* the establishment of a building site with low nuisance.

Sustainable development approach of the project owner

The future middle school had the ambition to be a "twenty-first century school in the countryside". Its construction is deliberately part of a sustainable development approach: bio-sourced materials, mixed wood and gas boiler, rainwater recovery, energy neutrality with 180 m2 of photovoltaic panels, biodiversity compensatory measures. This is the first "green building" for Eiffage Côte d'Azur. As part of its Education competence, the Var Department wanted to improve the reception of middle school students and educational teams. In "Provence Verte", the demographic evolution has led to a rise in enrollment, saturating the capacity of existing colleges. In this regard, the Department of Var has decided to build the new college Geneviève de Gaulle-Anthonioz in Carcès, commissioned since the start of the school year 2017. It has been the subject of special attention regarding respect for biodiversity. The integration of the college on the site meets many environmental objectives (dry stone retaining walls as well as and animal circulation passage way preserved, green roofs, ...) and is also ensured by its colorimetry and its materials. Concrement, Eiffage engaged on the economic aspects and environmental aspects to: • use bio-sourced (and / or local) materials, integrate solutions to reduce heating needs and use renewable energies, • pay particular attention to the water cycle (reduction of consumption, recovery, reuse), • set up waste management, including selective sorting for catering, • promote biodiversity. Optimizing energy performance and hygrothermal comfort for users is a priority in the design of the structure. Given the Mediterranean climate, the notion of "summer comfort" remains one of the bases of the design of buildings and their facilities. Energy needs arise from the following three components:

- to combat the static losses of the building;
- ensure the heating of the hygienic fresh air of the occupants;
- ensure the cooling of fresh air and premises.

The global design developed makes it possible to meet energy consumption by ensuring the new airflow per major occupant that is required without an active air cooling system for the teaching rooms. The reduction of energy needs is first achieved through the bioclimatic design of buildings, including the search for compactness and the treatment of the envelope and facades according to their exposure to prevailing winds and the sun. The control of the solar inputs in summer period is also a determining point of the design of the frame. The solar energy was used for the important needs of production of domestic hot water of the kitchens. To ensure the summer comfort, systems passive are privileged, without resorting to an active system of refreshment for the teaching premises. As fresh ventilation air flows are important, these systems act on the temperature of the premises and especially on the cooling of the fresh air.

Architectural description

The architectural bias for the construction of this establishment can be summed up in three points: - the compactness of the constructions: a built-in underground gym to minimize the mass effect; a general education building in R + 2 closing the northern space - the abundance of natural light, especially in places of circulation and education - the insertion landscape: some roofs will be planted to promote integration in the landscape. All housing is covered with a roof garden. Besides the fact that it helps to remove this body of building, the 50 cm of earth provided on the roof have a very high insulation value and a quality of absorption and rainwater retention, not negligible. The visitor car park is treated as a landscaping element in its own right, covering the storm basin. The high compactness for a fixed functional volume, helps to limit the area of loss of buildings and therefore on the one hand, its heating demand and the other hand the amount of materials to implement to build its envelope. These two points have a direct influence on the building's environmental impact and its cost. In this logic, the main teaching building, comprising more than 80% of the programmatic areas of the college of Carcès, adopts a rectangular shape of very compact. In addition, this college of the 21st century in the countryside of the green Provence offers modern and simple forms in a rich and refined vocabulary and colorimetry. A combination of raw and natural materials (wood, steel and glass) combined with synthetic materials (tinted resin facade panels) combine to give the whole its coherence. A selection of colors taken from the near and far environment, in the history and local tradition is applied to these synthetic materials. The woods are left rough for vertical and horizontal masts and sunshades. They are smoother and clearer for canopies and meadow. The landscaping and the work of the planted roofs complete this palette so that the new equipment expresses its modernity in respect of the locality. "The general education building, part of the auditorium and the basement of the gymnasium were drawn with terracotta siding, there is also a lot of wood. " "The idea is to stay as local as possible in the partnership approach and in the Sustainable Buildings Mediterranean", explains the architect Guy Mascherpa.

Photo credit

Thierry Lavernost / Thierry Beaucap

Stakeholders

Contractor

Name : Société COLOGEN COLlèges nOuvelle GENération (filiale 100% Eiffage SA)
Contact : Magali Chaperon, responsable développement durable - innovation - qualité - environnement Eiffage Construction Sud Est - magali.chaperon[at]eiffage.com

Construction Manager

Name : COLOGEN

Stakeholders

Function : Designer

Mascherpa Architectes

Function : Thermal consultancy agency

Oasis

Function : Thermal consultancy agency

Oxania

Function : Others

Eiffage Construction Côte d'Azur

Representative

Function : Others

Eiffage Energie Systèmes Méditerranée

Function : Company

Crystal Sam

Function : Others

Eiffage Infrastructures Méditerranée

Function : Company

PME Vignat et Senec

Contracting method

Public Private Partnership

Energy

Energy consumption

Primary energy need : 29,80 kWhep/m^2.an

Calculation method :

Breakdown for energy consumption : Heating: Mediterranean passive level or heating needs between 5 and 10 kWh / m².an ECS (half board): max consumption of 60 kWhep / m2.an Consumption for ventilation: <15 kWhEP / m2 / year

Envelope performance

More information :

The air permeability of the building envelope is taken to: 1.7 m³ / h.m².
Calculation method: geothermal heat pump on groundwater

More information

The primary energy consumption of 29.8 kWhep / m2.year is that of the educational building. This is only 17.4 kWh ep / m² by subtracting the 12 kWhep / m².year of photovoltaic production. As the college consists of three buildings (general education building + gymnasium + half-board), the average CEP is estimated at 24.67 CEP. RT 2012 calculation method

Renewables & systems

Systems

Heating system :
- Gas boiler
- Wood boiler

Hot water system :
- Individual electric boiler

Cooling system :
- Others

Ventilation system :
- Double flow

Renewable systems :
- Solar photovoltaic
- Wood boiler

Other information on HVAC :
Refreshment: Geo-cooling (hydraulic provençal well), adiabatic cooling
Ventilation: Geo-cooling (Provençal hydraulic well) + natural ventilation via a serviced canopy opening at night if needed

Energy wood and photovoltaic solar panels. Absence of wind potential or geothermal energy on the site
Renewable energies: 180 m² of photovoltaic panels placed on the roof

Environment

Urban environment

Built-up area : 7 655,00 %

Carcès, Provencal village with its medieval castle, is an exceptional site, in full nature. The project design therefore favors biodiversity given the landscape dimension of the site (green spaces, water management, outdoor spaces ...). Here nothing has been done that is not in respect and preservation of existing species. As such, in compliance with the environmental code and the procedures required for all development projects, the Department of Var, in agreement with the biodiversity services of the DREAL, has taken the necessary measures to protect living species in this natural area such as Hermann's turtle, the prosperous or the murine Bechstein.By its design, the architectural project preserves areas of habitat that are studied in detail: - a first area is that of housing official : the design, the chosen altimetry and the treatment of the roofs made it possible to preserve in its entirety the small wooded nipple around which this construction is wrapped.

On the roof, 50 cm of earth is used to create a perfect reconstruction of the ground of the plate; - the second area of preservation is that of the "restanques" (walls of reservoirs) which climb on the North slope of the hill against which the gymnasium comes to open. To accompany the highlighting of the biodiversity specific to this college, the main objective of the landscaping project was to enhance and reinforce the site's natural heritage by integrating it into the educational process. First, the existing vegetation cover is preserved at best, especially on the upper terraces closing the landscape to the south. This canopy, composed of scrubland trees and shrubs (pines, oaks, arbutus, wireworms, alaterna, paliures), is simply cleaned and completed on lower terraces by a teaching garden treated in meadow likely to evolve over the years. presenting for example the traditional local cultures or their abandonment and the reconquest of fields by the scrubland. The educational garden incorporates vegetable surfaces and a pool treated with ecological pond, with plants from local wetlands (reeds, cattails, water iris) arranged according to the available depth. Announcing this garden, access to the sports plateau is bordered on both sides by flowerbeds with a collection of aromatic plants: immortal, oregano, sage.The sports plateau is framed riverside villas by a curtain of climbing plants covering the wire fence, with a dense mixture of honeysuckle, clematis and ivy, and college side - on the grip of geothermal - by country hedges composed of native shrubs.

Against the facade of the college, the future extension area is temporarily occupied by beds of lavender and grasses punctuated by olive trees, which will be easy to transplant at the time of completion of the extension. In addition to the areas where it is preserved, the natural environment is reconstituted with introduced vegetation, particularly in the northern limit of the project where it acts as a transplant with the natural landscape, with oaks and other hardwoods (linden, ash, elm).) so as to form a dense screen vis-à-vis the riparian properties. This treatment extends to cover the housing function by occupying the roof and planters at different levels and linking with a top plate occupied by an olive grove. The central part of the project complements the plant palette with various groups inspired by the local natural environment. On both sides of the access road to the college, surfaces simply treated in dry meadows are punctuated with irregularly arranged

trees: oaks, ash trees, elms. At the approach of the forecourt, the path is bordered by alignments lime trees shading the parkings, with at their feet persistent shrubs of myrtle type to be trimmed, the places themselves being treated lawn slabs. Around the parking lot and on the forecourt itself, lavender and grass beds evoke the cultivated fields of the region; the one located in front of the entrance receiving two olive trees. A nearby, the parterre facing the room of plastic arts presents him, the appearance of a flower garden formed of colorful massifs with impressionist character (lobelia, St. John's wort, daylily)). The courtyard is enlivened by planted islets hosting cushions of boxwood, myrtle and dwarf pittosporums punctuated with boulders recovered on the site.

The detached island of the facades will also receive old trees with slender port like alders, shading a few benches. Globally, the construction of the college is accompanied by an increase in biodiversity at the neighborhood level. In general, the plant species used in the project are indigenous or in any case perfectly adapted to local conditions. The integration effort also focused on the parking areas with the creation of 2100 m² of additional green space in the West Zone including 1000 m² on the parking areas. This visitor parking is today in the form of a mall, trees, planted and accompanied by a floor treated in evergreen for parking areas. The parking area in the East dedicated to staff and teachers has also been considerably planted: 1000 m2 in total. In addition, allergenic, toxic or invasive species are systematically avoided.The adaptation of plants to the context and the establishment in the green areas of mulches guarantee a maintenance of great facility.In term of watering, networks low-consumption drip) the only sprinklered surface being limited to grass slabs), ensure the recovery of plants planted in the early years.After this period, watering will become optional, possibly limited to climatic accidents (scorching summers).

Products

Product

Gymnastics wood frame glued laminated

Rubner (sous traitant d'Eiffage Construction Côte d'Azur) - Cosylva SAS

Rubner construction bois 36 avenue des Frères Montgolfier 69680 Chassieu Tél.: 04 72 79 06 30 - Cosylva SAS Route de Bénévent 23 400 BOURGANEUF 05 55 64 28 28

www.rubner.com ; www.cosylva.com

Product category : Gros œuvre / Charpente, couverture, étanchéité

Resistance class GL24h
Adhesive type according to EN 301: I
Wood species: Douglas fir: Pseudotsuga menziesii
Formaldehyde class: EI
Reaction to fire: class D-s2, do
Durability class according to EN 350-2: 34 / S / S / S

Reduced carbon weight of the building

Some of the woods come from the French forest

Reduced ecological footprint: Lumber and generally biomass products used as building materials are considered carbon sinks. This is a dry sector that avoids the water consumption associated with concrete.

Optimization of implementation: wood is 5 times lighter than concrete and can be used in combination with all other materials. The prefabrication in the factory of wood works, more or less complex, makes it possible to greatly reduce the duration of the building site and to improve the constructive quality of the buildings,

Aestheticism: wood is a visual element that qualifies spaces and participates in the landscape integration of buildings.

Good acceptance after guaranteeing the durability of external works

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Sunbreaker glued laminated wood

Rubner (sous traitant d'Eiffage Construction Côte d'Azur) - Cosylva SAS

Rubner construction bois 36 avenue des Frères Montgolfier 69680 Chassieu Tél.: 04 72 79 06 30 - Cosylva SAS Route de Bénévent 23 400 BOURGANEUF 05 55 64 28 28

www.rubner.com ; www.cosylva.com

Product category : Gros œuvre / Structure, maçonnerie, façade

Resistance class GL24h
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Wood species: Douglas fir: Pseudotsuga menziesii
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Good acceptance after guaranteeing the durability of external works

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BPE low carbon concrete

Cemex

Cemex Bétons Sud Est Zone Activité de la Grave, 06510 CARROS

www.cemex.fr

Product category : Gros œuvre / Structure, maçonnerie, façade

Use of a cement containing blast furnace slags. Work with the supplier on the provenance of other materials.

Good acceptance.

Costs

Health and comfort

Water management

Recovery and reuse of water
A very large water retention basin of 2,600 m3 has been built.

Indoor Air quality

Contract commitment: limitation and monitoring of VOC emissions: formaldehyde emission <10 µg / m3; total VOC emissions <300 µg / m3 Optimum air management through an ad hoc control system Project problem: in addition to proportional CO2 sensor flow or presence detection, night ventilation is required to to refresh the premises at night (without additional climate production). An air regulation system has been put in place which ensures the control and maintenance of the flow for the control of the consumption, the operation with low pressure drop assuring a gain on the energy consumption of the ACTs. The comfort of the users is all the more assured with the precision on the maintenance of the flows for the quality of air and maintenance of the sound levels.

Comfort

Health & comfort :

Commitment contract: temperature above 28 ° C for maximum 50 hours (without the use of air conditioning), the number of hours is agreed on the opening period College school time is from September to June inclusive.

Daylight factor : Engagement contrat : éclairage naturel des locaux correspondant à FLJ ≥ 1,5% minimum sur 80% de la zone de premier rang et dans 80% des locaux (exprimé en surface) OU niveau d'éclairement naturel moyen (calculé sur la surface totale du local) > 200 lux pe

Carbon

GHG emissions

GHG in use : 11,00 $KgCO_2/m^2/an$

Contract commitment: GHG emissions (for all uses of RT2012): <15 kg eq-CO2 / yr / m² SP.

Life Cycle Analysis

Eco-design material :

Terracotta facade, timber frame, brick facade Commitment contract: Materials, with implementation of the label requirements Bio-based building (obtaining the label not required), at least level 1 is 18 kg / m² SP in new and in rehabilitation 173 820 , 5 kg of wood used throughout the project: gymnasium cover, front sun and insulation

Contest

Reasons for participating in the competition(s)

The use of raw and natural materials (wood of the masts and sunshades, steel and glass), associated with materials of cladding (panels of terracotta facades) and coatings, earth tones, rosés earth and stone made it possible to give to this building the level Mediterranean Sustainable Building (MSB) Gold Level.

The establishment is equipped with a wood boiler, and photovoltaic panels that help improve energy performance.
Its design favors biodiversity in view of the strong landscape dimension of the site (green spaces, water management, outdoor spaces ...).

To go with the highlighting of the biodiversity specific to this middle school, the main objective of the landscaping project was to enhance and reinforce the site's natural heritage by integrating it into the educational process.

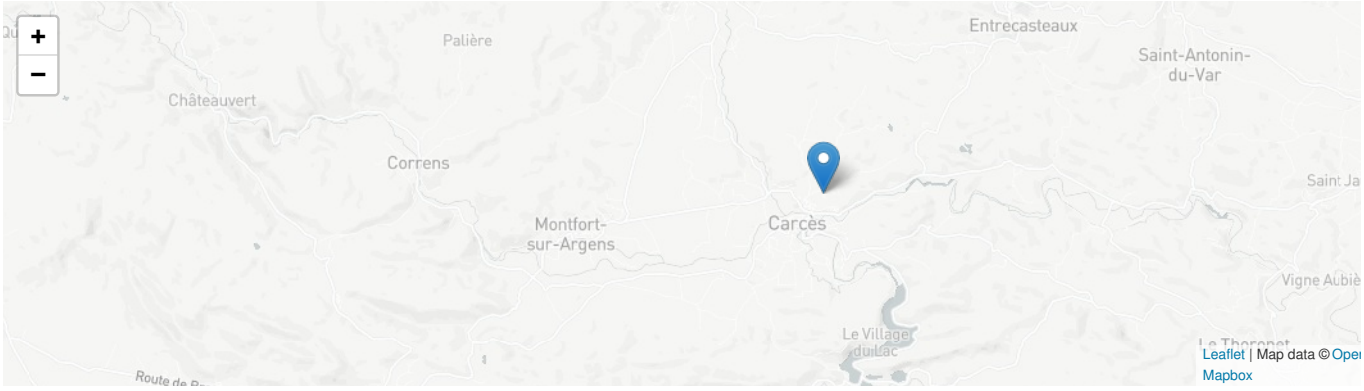
As such, in compliance with the environmental code and the procedures required for all development projects, the Department of Var, in agreement with the biodiversity services of the DREAL, has taken the necessary measures to protect living species in this natural area, such as Hermann's turtle, the prosperous or the bechstein murine.

Building candidate in the category

Bas Carbone

Prix du public

Prix des Etudiants



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