# Regional School Uewersauer - Luxembourg

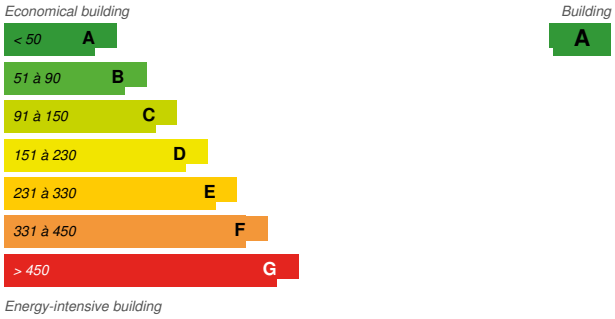
by Wirtz Jean-Marie / 2016-06-09 09:31:32 / Luxembourg / 10118 / FR


**Primary energy need :**

**34.9** kWhep/m².an

**(Calculation method : RGD du 31 août 2010 - bâtiment fonctionnel )**

**ENERGY CONSUMPTION**




**Building Type** : Preschool, kindergarten, nursery
**Construction Year** : 2012
**Delivery year** : 2015
**Address 1 - street** : 15, rue Mgr Fallize 9655 HARLANGE, Luxembourg
**Climate zone** : [Cfb] Marine Mild Winter, warm summer, no dry season.

**Net Floor Area** : 2 375 m² Autre type de surface nette
**Construction/refurbishment cost** : 5 205 000 €
**Number of Children** : 11 Children
**Cost/m2** : 2191.58 €/m²

## General information

The primary cycle school is connected to a school building and an existing sports hall along the creek Walterbaach. Design of different volumes connected by a canopy overlooking a game terrace and oriented to the natural environment of the site. A covered courtyard was created between the existing building and the classrooms which provides access to the different floors of the new building and existing buildings such as the former sports hall and canteen / kindergarten. The construction was carried out in timber frame for the ground floor and first floor. Only a few concrete elements were executed in these floors (stairs and elevator shaft) and, for static and safety reasons. These elements are materialized by the visible concrete walls whose surface has been structured with vertical wood planks. The basement, dedicated to technical equipment and storage, is fully apparent with rough concrete. Most of the wooden elements were prefabricated, which helped save time on site and gave the opportunity to work simultaneously inside the building. These wooden elements were completely covered with plaster to ensure their fire resistance and to avoid over-sizing of the wooden building elements to achieve sufficient strength.

## See more details about this project

http://www.wirtzarchitecte.lu/fr/nos-projets/ecole-prescolaire-et-deducation-precoce-a-harlange/

## Data reliability

Self-declared

## Stakeholders

### Stakeholders

Function : Other consultancy agency

Syntec

Mr Peter ugidos / +35226782010

http://www.syntec.lu
technical studies, follow up of heating installations, ventilation

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Function : Designer

Jean-Marie Wirtz

Mr Jean-Marie Wirtz - +352 25 33 10

http://www.wirtzarchitecte.lu
Design, Construction site management

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Function : Contractor

Syndicat intercommunal

Mr Gira - +352 93 70 90 241

http://www.regionalschoul-uewersauer.lu/
contracting authority

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Function : Structures calculist

Bered solutions SARL

Mr Roland Bastenier - 95 80 96

http://www.bered.lu
Statistical studies, construction site management, infrastructures

### Contracting method

Separate batches

### Owner approach of sustainability

The 3 cities responsibles of the school are part of the climate agreement and want municipal buildings to be renovated efficiently.

### Architectural description

Construction based on low energy criteria: - thermal insulation of walls of +/- 24cm. - mineral thermal insulation of flat roofs: +/- 24cm. - mineral thermal insulation of floor slabs: +/- 14cm. - Installation of high performance exterior woodwork. - Air tightness of the building controlled via a blower door test. The building as been design in order to optimize the contribution of solar energy and natural light into the building through large windows in the classrooms and through the skylights at the courtyard. Two of these skylights give the possibility of having fresh air if necessary. The building was built contiguous to an existing building to provide a compact energy tower respecting the route of the creek "Walterbaach". This design permits maximum preservation of the environment and simultaneously optimizes the building area. - Renaturation of the creek by banks rehabilitation. - New plantings around the building. - Area designed around the building using natural materials such as grass and natural stone for access paths. - Building of a storm storage reservoir. - Use of LED lighting with presence detectors and brightness management. - Classrooms lighting divided in two distinct zones for better light management. - Heat management through external blinds with centralized management. - Use of delay taps. - Mechanical ventilation without air conditioning. - Use of environmental friendly materials requiring little maintenance

### If you had to do it again?

using even more environmental friendly materials requiring little maintenance, and a design allowing more energy savings.

### Building users opinion

users are satisfied with the building

## Energy

## Energy consumption

Primary energy need : 34,90 kWhep/$m^2$.an

Primary energy need for standard building : 172,46 kWhep/$m^2$.an

Calculation method : RGD du 31 août 2010 - bâtiment fonctionnel

Final Energy : 53,60 kWhef/$m^2$.an

Breakdown for energy consumption :
In this case, it is difficult to determine the exact amount of energy consumption since the building is part of a complex of several buildings with the same energy network. Furthermore, new buildings were achieved less than a year ago.

More information :
No evaluation of the energy consumption since the achievement.

## Envelope performance

Envelope U-Value : 0,66 $W.m^{-2}.K^{-1}$

More information :
The outer walls are made of a wooden frame covered with a fiber cement exterior cladding plates and whose U-value = 0.19W / m2K. The slabs between the basement and ground floor are made of a concrete slab insulated with 13 cm insulation with underfloor heating; U-value of this slab is U: 0.55W / m2K. The roof is composed of a wooden frame, the U-value of U = 0.16W / m2K.

Building Compactness Coefficient : 0,33

Indicator : EN 13829 - n50 » (en 1/h-1)

Air Tightness Value : 2,20

Users' control system opinion : users are satisfied

# Renewables & systems

## Systems

Heating system :
- Urban network

Hot water system :
- Urban network

Cooling system :
- No cooling system

Ventilation system :
- Free-cooling

Renewable systems :
- Biomass boiler

Renewable energy production : 100,00 %

## Smart Building

BMS :
KNX-DDC

Users' opinion on the Smart Building functions : Satisfied . Additional switches were placed for the management of external blinds. Indeed, these may be maintained in open position during the cleaning of windows among others

# Environment

## GHG emissions

GHG in use : 12,30 $KgCO_2/m^2$/an

Methodology used :
DIN 18599

GHG before use : 163,00 $KgCO_2$ /$m^2$

Building lifetime : 50,00 an(s)

, ie xx in use years : 13.25

## Life Cycle Analysis

Eco-design material : FSC wood used for the wooden frame

## Water management

Consumption from water network : 350,00 $m^3$

Water Consumption/m2 : 0.15

Water Consumption/Children : 31.82

## Indoor Air quality

NA

## Comfort

Health & comfort : The building as been design in order to optimize the contribution of solar energy and natural light into the building through large windows in the classrooms and through the skylights at the courtyard. Two of these skylights give the possibility of having fresh air if necessary

Calculated indoor CO2 concentration :

NA

Measured indoor CO2 concentration :

NA

Measured thermal comfort : NA

Acoustic comfort : Highly sound absorbent ceiling, classrooms with acoustic insulation doors of 37dB

# Products

## Product

Janitza UMG 511

Janitza

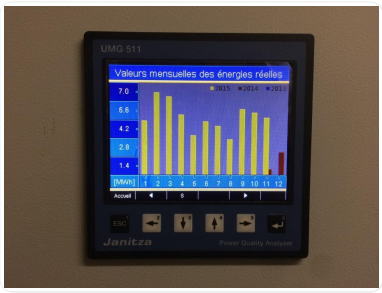
For Top - Automation and energy control - Tel: +31383372700

http://www.janitza.com

Product category :

Easy use, direct communication with maintenance, possibility of multiple data collection

the technical office is satisfied




# Costs

## Construction and exploitation costs

Reference global cost : 2 750,00 €

Reference global cost/Children : 2750

Cost of studies : 300 000 €

Total cost of the building : 6 935 685 €

## Urban environment

The construction site is located in the village center, bordered by a stream and surrounded by a green environment (a forest and agricultural area) School buses stops have been implemented to allow the students from the 3 cities to reach the school using public bus network. A few shops such as the post office, a bakery

and a restaurant are located nearby.

### Land plot area

Land plot area : 59 600,00 $m^2$

### Built-up area

Built-up area : 17,35 %

### Green space

Green space : 12 500,00

### Parking spaces

68 parking spots

## Building Environnemental Quality

### Building Environmental Quality

- acoustics
- comfort (visual, olfactive, thermal)
- energy efficiency
- maintenance

## Contest

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

Lechauffage du bâtiment est relié au chauffage urbain.
Constructionsur base des critères de la basse énergie : isolation thermique des murs de +/- 24cm.
isolation thermique minérale de la toitureplate : +/- 24cm.
isolation thermique minérale des dalles desol : +/- 14cm.
utilisation d'une structure en ossature boispour les étages supérieurs et une structure béton pour le sous-sol enterré.
Mise en place de menuiseries extérieures àhaute performance.
Etanchéité à l'air du bâtiment contrôlée viaun blower door test.
Conceptiondu bâtiment afin d'optimiser l'apport d'énergie solaire et de lumière naturelledans le bâtiment via de grandes baies vitrées pour les salles de classe et viades lanterneaux au niveau de la cour intérieure. Deux de ces lanterneauxpermettant l'apport d'air frais si nécessaire.
Lebâtiment a été construit accolé à unbâtiment existant afin de constituer une construction énergétiquement compactetour en respectant le tracé du ruisseau « Walterbaach ». Cetteconception a permis une préservation maximale du site verdoyant existant et enmême temps un aménagement optimisé du construit.
Renaturationdu ruisseau par remise en état des berges.
Réalisationde nouvelles plantations autour du bâtiment.
Réalisationdes abords de la construction à l'aide de matériaux naturels tels que gazon,gabion et pierres naturelles pour les chemins d'accès.
Réalisationd'un bassin d'orage.
Utilisationdu type d'éclairage LED avec gestion par détecteur de présence et deluminosité.
Eclairagedes salles de classes réparti selon deux zones distinctes pour une meilleuregestion de l'apport d'éclairage.
Miseen œuvre de stores extérieurs avec gestion centralisée pour limiter l'apport dechaleur.
Utilisationde robinets à temporisation.
Miseen place d'une ventilation mécanique sans climatisation. Utilisation de matériaux nedemandant que peu d'entretien et ne présentant pas de risques pourl'environnement

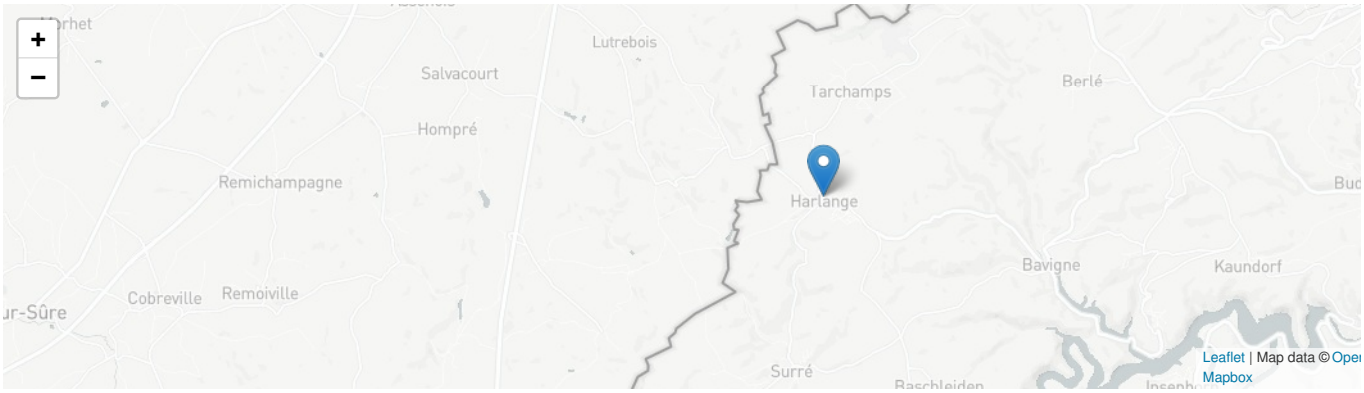
### Building candidate in the category

Energie & Climats Tempérés

Green Building Solutions Awards 2016
powered by Construction21.org

Bâtiment Intelligent

Coup de Coeur des Internautes

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