Wastewater plant Plantins in Beynes

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Year of commitment : 2013

Green energies : Thermal solar, Geothermal, Energy Efficiency, Heat
Water cycle : Used water recycling
Circular economy and waste management : Eco-Design, Industrial Ecology, Preservation of natural heritage, Bio-based materials

4 500 000 €

Builder

The work was carried out by the Degremont consortium (agent process part), ZUB (co-contractor, civil engineering), Watelet (joint venture, VRD)

Manager / Dealer

The current operator of the treatment plant is Saur.

GENERAL INFORMATION

The treatment plant Plantins in Beynes (78) is at the heart of a remarkable site, bordered by an area of archaeological excavations in the south and agricultural land in the North. The landscaping of the future equipment was a priority expectations, given the sensitivity of the site and the desire to preserve the living environment of residents and the quality of its built heritage.

The landscape integration of the project was essential. Therefore, the architectural aims to create a dialogue with the surrounding countryside, respecting the biological balance in place, and integrating its architectural and landscaping the operations building.

• The design of the operations building is bioclimatic and eligible THPE.

• Use of recycled and sustainable eco-materials generating the least possible waste (wood frame structure, gabion walls, roofs and vegetated wall ...).

• Implementation of renewable energy (solar panels, Canadian well and VMC double flow).

• Creation of an innovative filter plant allows the processing and extraction of stale air from the WWTP.

• Sludge treatment on site phytopurification through macrophyte beds (4,000 m² treating 25,000 m3 of mud / year).
• An educational course for the general public was produced in the treatment plant, which allows to highlight eco exemplary of this building.

Progress Status

Delivered

Data Reliability

Self-declared

Funding Type

Public

Infrastructure Video

Website Enterprise / Infrastructure

http://www.ar-architectes.com/
http://www.naldeo.com
http://www.degremont.fr

Sustainable Development

Attractiveness :

Wastewater plant Plantins is enhanced through a learning path, structured and sequenced steps, allowing the public or the user to learn about the remarkable points of the project, the water management on site, the bias architectural and landscape.

The site can be visited by the public, and in particular allows the school to discover the project, both wastewater management process, as the architectural treatment, environmental and landscape.

Well Being :

The building housing the business premises and the technical rooms, is a bioclimatic building eco-designed, allowing well-being and comfort for the operator of the station, but also for visitors. The wood has been used both in structure and outdoor siding. Bioclimatic greenhouse, including the treatment of air by plants, thermal inertia involved in the transmission of heat to the upstairs meeting room.

Renewable energy have also been implemented: heat pump water / water, solar thermal and water wells glycolated associated with VMC double flow. In addition to the wood, many agro-materials were used in this project: metal siding, aluminum joinery, walls gabion, blown cellulose wadding insulation and hemp fermacell for the inner walls, creating a warm atmosphere and comfort heat in each room.

Preservation / Environmental Improvement :

The hotel grounds were created to meet the visual and ecological balance of the site, with a focus on the flora and fauna, with the selection of semi-aquatic species and colorful meadows (no irrigation and low interview) that enable the restoration and preservation of biodiversity, structuring the site in low footprint site.

The 4000 m² planted reed beds, treating 25,000 m3 of slurry per year, complete the landscaping component, and promote the return of biodiversity on site. traffic areas, requiring soil stabilization, are equipped with hollow core, "evergreen" for the drainage of rainwater and ensuring constantly clean and stable space? even in rain, increasing the grassed areas, and revegetation of the site. Colorful meadows are planned landscaping, including different varieties of trees, wild flowers, not to pick or récolter.Les vegetated roof and green wall also participate in the integration of the station in a green setting, promote drainage of rain water, the colonization of different animal species and the air quality.

Responsible use of resources :

The overall design of the bioclimatic operations building and adjoining infrastructure, was performed by thinking the responsible use of resources:

- the wood is certified PEFC or FSC,
- the gabion wall is filled with stone from local quarries,
- the hollow core of heavy road coating are recycled and recyclable tire
- the insulation is made of cellulose wadding, from recycled paper.

Bioclimatic design of the building, and waterproof insulated shell allows for savings on heating and ventilation consumption. Energy optimisations implemented on the station are:

- recovery of calories from wastewater treatment by a heat pump water / water (COP 4, ie it consumes 1 kWh of electricity to produce 4 kWh of heating) for space heating.
- wells brine coupled with comfort ventilation, ensuring internal temperature stability.
- 2.5 m² of solar panels positioned south side, for the supply of a hot water tank of 400L.

A water feature accompanies the building, rehabilitation of an old water works in the retention pond, it collects rainwater and runoff, allows the creation of ecological habitats and guarantees available supply of water for firefighters. Sustainable water management also involves the creation of green roofs and a green wall and a tied recovery and processing of heavy road runoff in case of peak rainfall.

Testimony / Feedback

Presentation of the Plantins Eco-plant in Beynes, by Mr Gilles HOCQUET, First Deputy Mayor of the Commune of Beynes (project owner), and Mrs Ruba ALABED, architect manager of AR ARCHITECTES (Architectural, landscape and environmental project management), for the Janus de la Cité 2014 prize, awarded by the Institut Français du Design.

Governance

Town of Beynes (78)

Holder Type : Local Authority

The work was carried out by the Degremont consortium (agent process part), ZUB (co-contractor, civil engineering), Watelet (joint venture, VRD)

Builder Type : Construction Industry

The current operator of the treatment plant is Saur.

Manager / Dealer Type : Private

Design realization by:

- NALDEO Consultancy, www.naldeo.com
- Architect: AR Architects, www.ar-architectes.com

Business Model :

The project was funded by the Municipality of Beynes, the Yvelines General Council and the Water Agency Seine Normandie.

Sustainable Solutions

bioclimatic filter Serre

Description :

The olfactory comfort is ensured by the implementation of an innovative biofilter plant for processing and extraction of stale air of technical rooms. The 35m biofilter treats 3500 m3 / h of exhaust air. It is located in an eco-designed greenhouse, which heats the adjoining meeting room in the winter and allows, for jealousy located at the top, a dissipation of excessive heat in summer. This biofilter planted with suitable species such as ferns or grasses, requires very little maintenance and maintenance, and reduces the interior temperature variations up to 40%.

This alternative solution for air treatment in the form of greenhouse contains a bioclimatic and energy aspect. The greenhouse as it is located in the building involved in the period winter heating of the meeting room that adjoins it. Glass walls located between the greenhouse and the boardroom for transmitting the stored calories in the greenhouse. During the summer, solar radiation does not penetrate inside the greenhouse. Planted greenhouse allows a filtration effective air in architecture involved in building heating and reduction of heating related consumption.

- Biodiversity :
- Energy/climate :
- Air quality

Company (es) Website :

Contest

Reasons for participating in the competition(s)

La station des Plantins de Beynes se situe au coeur d'un site remarquable, bordé par une zone de fouilles archéologiques au Sud, et des terrains agricoles au Nord. Le parti architectural vise à créer un dialogue avec l'espace rural environnant, en respectant l'équilibre biologique en place, et en intégrant par son traitement architectural et paysager le bâtiment d'exploitation. L'ensemble s'inscrit dans une démarche d'économie circulaire :
- La haute qualité environnementale a été intégrée au coeur du projet : la pluviométrie, les vents dominants, la courbe d'orientation du soleil et l'environnement.
- Utilisation d'éco-matériaux recyclables : ossature bois, plaques composées de gypse (Fermacell) en revêtement intérieur, murs gabions en revêtement extérieur, utilisation de bardage en aluminium et d'enduits à la chaux.
- Le bâtiment d'exploitation est conçu bioclimatique en ossature bois. Une serre bioclimatique à l'étage permet de chauffer la salle de réunion attenante.
- Les eaux pluviales sont acheminées vers un mur végétalisé vertical et une toiture végétalisée horizontale pour se diriger vers le milieu naturel : la Mauldre et le ru de Gally.

- L'aménagement paysager comprend un ancien bassin d'aération recyclé en zone humide, des lits plantés de roseaux de 4000 m2 filtrant l'ensemble des boues liquides (25 000m3/an) de la station d'épuration, et une attention particulière portée à la faune et à la flore : enherbage, prairie semée de fleurs des champs, aires de nidifications des oiseaux, espaces pour le développement des papillons, des libellules, réserve pour les batraciens et les canards.
- La gestion de l'énergie dans le bâtiment éco-conçu : éclairage de la station en basse consommation, puits canadien couplé à une VMC double flux, et panneaux solaires thermiques pour chauffer l'eau du ballon d'eau chaude sanitaire.
- La création d'une serre filtrante traitant 3500 m3/h d'air vicié, désodorisé et dépollué par les plantes, sans aucun réactif chimique.
- La démarche éducative et le parcours pédagogique initiés par la mairie de Beynes, pour sensibiliser le public et particulièrement les écoliers, au domaine de l'environnement au fil de l'eau.

L'économie sur le prix d'une eau filtrée de qualité résulte de tous ces paramètres pour la consommateur : 1,16€/m3 au lieu de 1,70 €/m3. Une économie de 85 000 euros HT/an est générée suite au traitement des boues par les plantes (roselière) in situ (absence de transport et stockage des boues traitées).

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