# The anti-flood pumping eco-station

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**Year of commitment** : 2019
**CO2 Impact** : Reduction of the CO2 impact for the above-ground part (eco-designed building, recyclable materials, low maintenance and maintenance) and 212m² of green roofing capturing CO2 from the air.

**Digital services** : Other
**Sustainable mobility** : Engineering structures
**Water cycle** : Containment, Other, Prevention, Protection
**Circular economy and waste management** : Eco-Design, Industrial Ecology, Optimization of ressources
**Biodiversity & Ecosystems** : / Green roof, Environment education /
**Label/Certification** :

- HQE Infrastructures

**14 500 000 €**

### Builder

MODERN BUILDING CONSTRUCTION, RAZEL BEC, BACHY SOLETANCHE, SEFI-INTRAFOR, SADE, SATELEC, SORECOB CONSTRUCTION

### Manager / Dealer

Department of Val-de-Marne

## GENERAL INFORMATION

**The Seine's anti-flood pumping station, an invisible giant** The Vitry-Sur-Seine anti-flood pumping station is a sustainable infrastructure located in an urban context marked with railways in the East, North, the future SMI (Infrastructure Maintenance Site managed by the SNCF), South A86 overlooking the field and the West, an industrial area. It is the southern end of the Eco-district Gare des Ardoines, on the edge of Léon Geffroy street. This architectural and landscaping

project is a strong link between the buried civil engineering works allowing the anti-flood pumping of the Seine and the urban district in full renewal. Sign of a green mesh in the landscape, it recreates biodiversity and synergy with the surrounding ubiquitous flows.

## Progress Status

Delivered

## Data Reliability

Self-declared

## Funding Type

Public

## Website Enterprise / Infrastructure

https://www.vitry94.fr/actualites/fiche/ardoines-station-de-pompage-anticrue/?cHash=b362acf03269e4a183eea2a5deede206

## Sustainable Development

### Attractiveness :

The infrastructure of the Vitry-sur-Seine flood pumping station was designed and implemented in a global approach to sustainable development. The structure responds to a common problem that many cities experience: the impermeability of soils and the bad flow of rivers. The construction of this equipment is part of a global approach to overcome these issues. Sustainable development was conceived both at the design stage of the project, with the use of recyclable materials, the establishment of a green roof to bring biodiversity, and at the site stage.

The objectives of the project were to have a green building site and a quick project so as not to impede the construction of the nearby SMI line 15 of the Greater Paris metro (RATP managed infrastructure maintenance site). The difficulties, such as the installation of cranes and construction machinery on a small plot, were raised while limiting noise, visual, olfactory and ensuring the safety of workers. The base of life has been installed on the site of the future SMI not to impede the public space.

This work of 14.5 million euros has been completed in compliance with the deadlines and contributes to the environmental quality of the Eco-district Ardoines stations. The building above ground reveals the technical building of exploitation, draws the eye and thanks to its unusual materiality for an industrial infrastructure and its green roof makes sensitize the residents to the sustainable development.

### Well Being :

The infrastructure contributes to the well-being of the inhabitants first of all thanks to its function. The treatment of water is an essential element to allow a pleasant living environment. The equipment also allows the natural environment to be better protected and to deal with the problem of soil waterproofing. Water flows better and is less polluted, improving the quality of life of all inhabitants.

The well-being of the users is ensured by the development throughout the project implementation of the HQE targets listed below to have a ventilated environment, isolated and without overheating.

- Target 8 and 9: hygrothermal comfort and acoustic comfort

Thermal and acoustic comfort are guaranteed by the green roof and wood fiber insulation.

- Target 10: visual comfort

Visual comfort is ensured by the glass roof of 8 m² located on the green roof. It brings natural light into the building and thus decreases its lighting needs.

### Social Cohesion :

Through the above-ground building located at the entrance of the city and at the end of the Eco-district Ardoines station, the anti-flood pumping station Vitry-sur-Seine sensitizes residents to sustainable development. The use of recyclable materials on the façade and the vegetated roof recreating biodiversity attract the eye and question passers-by about the function of this building. Thanks to its pedagogical architecture, the infrastructure contributes to the awareness of local residents about the risks associated with floods and water management. The equipment creates a dialogue and social bond.

### Preservation / Environmental Improvement :

Infrastructure contributes to the improvement of the environment because its function of particulate water pollution (sand chamber and screen) improves the quality of the latter in the natural environment. Thus the water circulates better and is less polluted. This positively influences the quality of the environment and its biodiversity.

The building also contributes to the improvement of the environment thanks to various elements:

- The use of biodegradable and recyclable facade materials such as aluminum and wood fiber.
- The vision of a green space allowed by its green roof.
- The integration of the building into the overall project of the Eco-district Ardoines station as a green island.
- The limitation of the nuisances generated by the operation of the site for the residents: optimization of the interfaces.
- The restoration of biodiversity thanks to green roofs and planter boxes. The planted aromatics and sedum favor the arrival of insects and birds such as bees, butterflies and beetles.

### Resilience :

The anti-flood pumping station at Vitry-sur-Seine was built to respond to the consequences of the natural risk of raising the Seine's level: the rise in the level of the watercourse serving as an outlet for the water network rainwater can prevent the evacuation of precipitated water in rainy weather and create overflow flooding of the sewerage system. This equipment thus makes it possible to overcome the influence of the rising waters of the Seine (isolation valve) and, in rainy weather, to pump the runoff water collected by the sewerage system to reject it in the natural environment.

Its dimensioning and the operation of its equipment are studied to be able to function until a flood of period of return fiftieth. The electromechanical equipment is taken out of water for a flood of period of return centennial. The pumping is sized to be able to evacuate the water from the runoff, on the watershed, of a winter rainfall of decadal return period.

Flood pumping stations play an essential role in returning to normal after a major flood (evacuation of water trapped in the land after overflowing of the watercourse) and allow in rainy weather to ensure the evacuation of water. runoff water (water cycle).

This new facility contributes to improving the quality of life of the inhabitants on a daily basis but also in the event of an exceptional event and contributes to the protection of a rapidly changing neighborhood ZAC Ardoines station (minimizing the risk of flooding through urban runoff).

Responsible use of resources :

The anti-flood pumping station in Vitry-sur-Seine contributes, thanks to its particulate clean-up function (sand chamber and screen), to a rational use of water resources. The energy consumption of its equipment has been optimized to obtain a reasoned consumption.

In order to reduce the energy consumption of the above-ground building and users, insulation of the exterior with wood fiber has been carried out on all facades and roofing. It allows to limit the energy expenses related to the heating or the air conditioning of the building, a better thermal and acoustic comfort and the ilot effect of heat generally generated by the industrial buildings. The green roof also contributes to the improvement of thermal and acoustic comfort. The glass roof of 8 m² in the green roof optimizes energy consumption and brings natural light into the building.

## Testimony / Feedback

## Governance

Department of Val-de-Marne

Holder Type : Local Authority

MODERN BUILDING CONSTRUCTION, RAZEL BEC, BACHY SOLETANCHE, SEFI-INTRAFOR, SADE, SATELEC, SORECOB CONSTRUCTION

Builder Type : Construction Industry

Department of Val-de-Marne

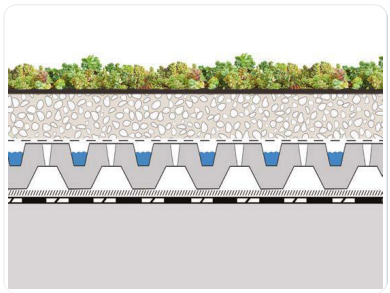
Manager / Dealer Type : Public

The infrastructure of the Vitry-sur-Seine flood pumping station is a public project following a call for tenders launched by the Val-de-Marne department. The Mastery of Technical Work as well as the Owner were both carried out by the department of Val-de-Marne. The architecture of the aboveground building was provided by AR ARCHITECTES in connection with the Val de Marne department, technical master builder and client. This is a project funded 100% by the Department.

The project was carried out in accordance with the design of the technical works by the Val de Marne department, which provided technical project management. Consultative meetings took place during the design phases between the Val de Marne / AR ARCHITECTES department with the Eco-district des Ardoines developer, the Grand Paris company and the EPA ORSA Project Manager of the district, the city of Vitry sur Seine. Consultative meetings were also held with the architect Barani and technical design office such as ARTELIA, designer of the future building of the SMI (Infrastructure Maintenance Site) located on the same plot, on behalf of the SNCF. The project has been accepted by all the stakeholders through the architecture of its technical building that is both simple and unique, the only element above ground of this anti-flood pumping station of the Seine, resonating in the city. as a symbol of the return of the water resource to the natural environment.

## Sustainable Solutions

ECOVEGETAL SUCCULIS



Description :

ECOVEGETAL SUCCULIS is a green roof, it is a creeping and resistant extensive vegetation. SUCCULIS is used for its light weight and low maintenance. The plant cover of the SUCCULIS system consists of different Sedum whose foliage color changes during the seasons. The hue can vary from green to red and the flowers are usually yellow, white, red and pink. It is an ecological protection which advantageously replaces the layer of gravel.

- Low-carbon materials/ infrastructure

Company (es) Website :

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Renewal of building air and buried infrastructure

Description :

The anti-flood pumping station in Vitry-sur-Seine benefits from static ventilation of the operating building and the underground part of the infrastructure.

Mechanical ventilation with a heating coil is also used to maintain an indoor temperature above the dew point to avoid condensation on cold surfaces. The implementation of an external insulation and greening of the roof must allow to reduce the electrical consumptions to maintain this temperature above the dew point is 14 ° C.

- Security
- Infrastructure

Company (es) Website :

ISOLOR

Description :

Isolair panels are insulating panels based on wood fibers manufactured using the "dry process" process. Particularly resistant due to their high densities, Isolair panels serve as both thermo-acoustic insulation but also rigid under-roofing and rainwalls behind a ventilated facade with closed joints. Their large opening to vapor diffusion gives the rigid panels a high permeability to water vapor. The Isolair range allows you to enjoy all the benefits of high-performance wood fiber insulation.

- Low-carbon materials/ infrastructure

Company (es) Website :

## Photo credit

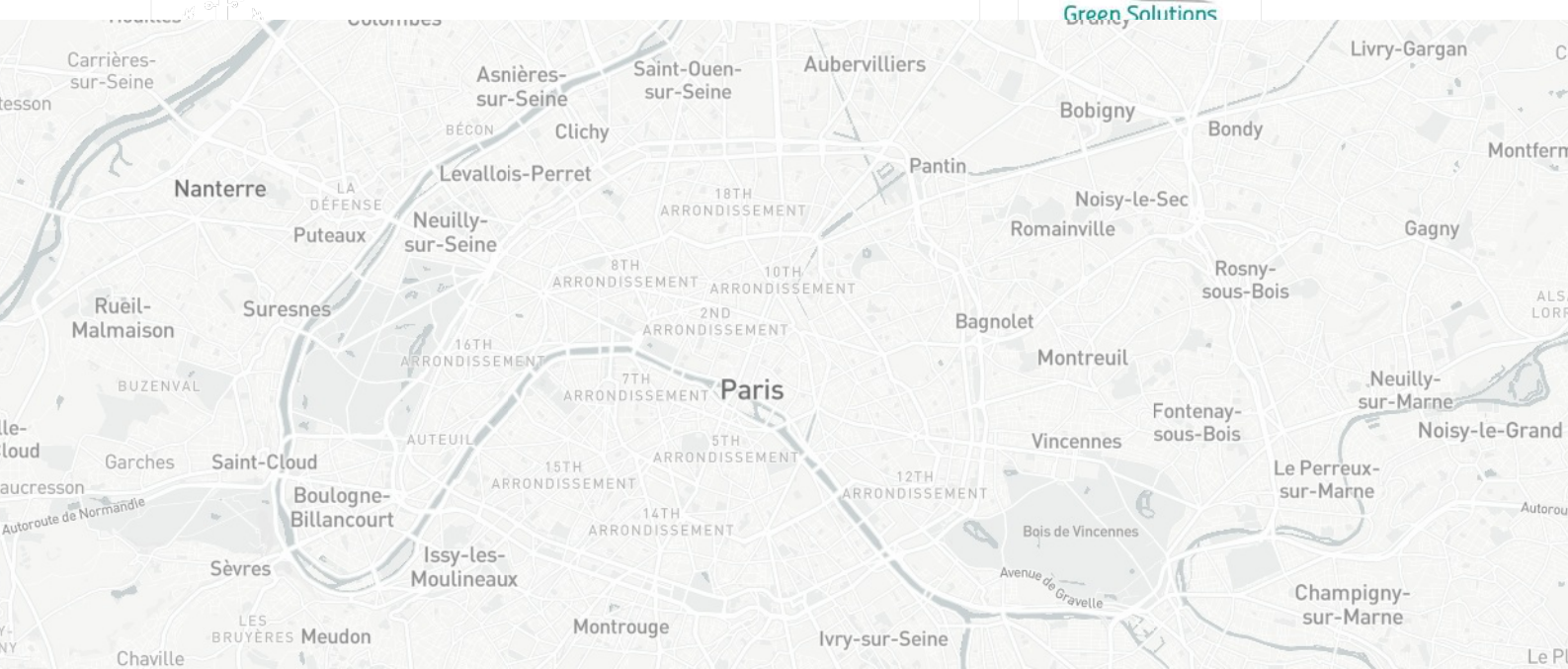
AR ARCHITECTS

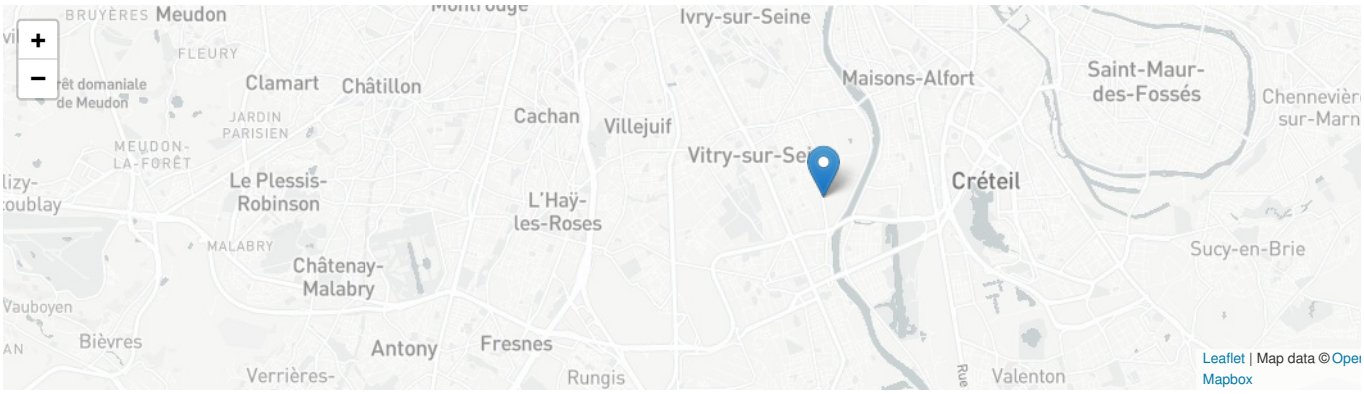
## Contest

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

- An ambitious infrastructure project in the vast territory of Greater Paris in full swing;
- Treatment of rainwater from the city of Vitry-Sur-Seine, and its gradual return to the natural environment, the Seine;
- A major infrastructure project in occupied, dense and urban areas.

### Building candidate in the category



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