

# Promenade de la gare

## Villeurbanne (Rhône)

### Infiltration of rainwater despite polluted ground

#### The project

##### CONTEXT

A former rail platform with polluted ground has been transformed into a recreational space for local residents.

##### STAKEHOLDERS

Project manager: Ville de Villeurbanne  
Project contractor: Itinéraire Bis / Jean-Baptiste LESTRA: landscape designer, co-contracting agent with dUCKS (set design), A.Perrot (landscaper) and CSD Ingénierie (depollution)

##### DATE

2012-2013

##### COST

€850 k

- Public-Private project
- Urban zone
- Scale: Public space (park)

#### AIMS

- Hydraulic management of rainwater
- Landscaping
- Public space
- Instruction



#### SOLUTIONS ADOPTED

##### Techniques for implementation

- Water storage and infiltration basin
- Infiltration trench

##### Operating principle

- Retention
- Infiltration



# The reasons behind alternative management of rainwater

The Town of Villeurbanne wished to create a public park on the site of this former brownfield which is adjacent to Villeurbanne train station, with the following commitments:

- Firstly, to avoid exporting the polluted soil (the site is a former rail works platform)
- Secondly, to avoid connecting rainwater runoff to the sewerage system (this had not yet been made compulsory by the water authority, Métropole de Lyon).

Public consultation carried out prior to the project revealed residents' concerns in relation to the dangers linked to polluted soils (risk of contact, contamination of the water table, etc.). Nevertheless, the city authorities decided to pursue the project and put forward the creation of a landscaped public space where all rainwater is infiltrated per plot. To this end, a highly precise cartography of soil pollution was drawn up after numerous surveys of the various horizons. This enabled a definition of the possible developments and uses of the various zones in this space (infiltration, promenade/walkway and children's play area), while minimising the risk of contamination of the water table by infiltration of rainwater through polluted soils and the risk of contact with these soils for the public.



*Infiltration trench beneath the 'prairie'*

## Sizing hypotheses

**Intake surface:** 6,500 m<sup>2</sup>

**Return period:** 10 years

**Storage volume:** 95 m<sup>3</sup> (65 m<sup>3</sup> of nidaplast storage + 30 m<sup>3</sup> of 20/40 storage)

**Leakage rate:** 0 m<sup>3</sup>/sec.

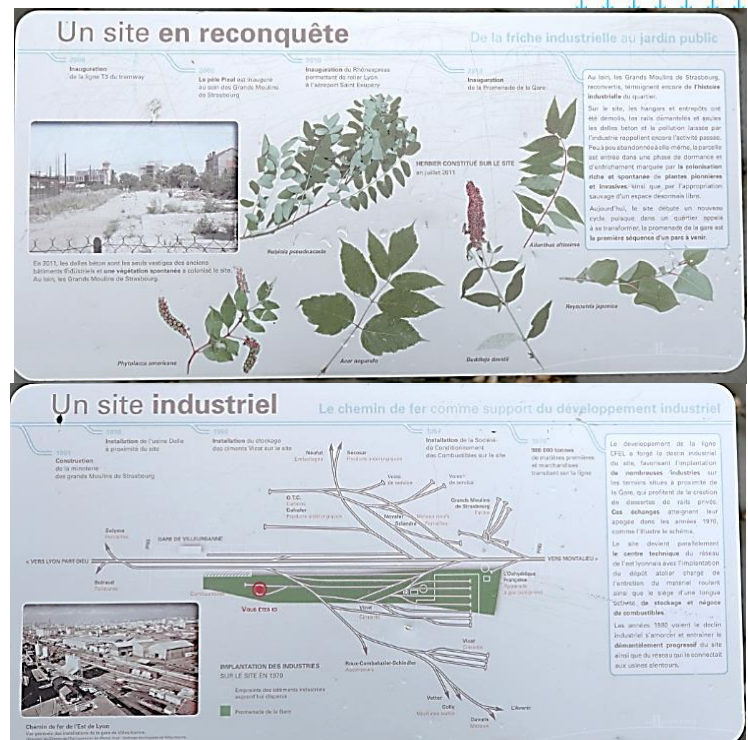
**Topography:** slope

**Ground permeability:** 1.10-4 m/s

## What about biodiversity?

The area is designed as a densely-planted landscape. The choice of plants is adapted to the limitations of a poor soil on shallow ground.

Around forty species can be found throughout three types of gardens: drumlins composed of trees, shrubs and tightly planted ground cover, creating a dense green surface; the dry garden, which grows in a stone-soil mixture and presents a Mediterranean style adapted to the environment, and lastly, theme gardens with boxes of depolluting plants, in order to experiment phytoremediation. Due to a lack of means, however, the concentration of pollutants in plants, water or soil is not monitored.



*Information displays*



## How does it work?

The site has two different water catchment basins. To the east, slopes guide the water to an alveolar structure which serves as a retention and infiltration basin, installed under the 'pebble garden'. To the west, an infiltration trench, located at the end of the 'prairie' collects water from the second basin, the esplanade and the play area. A pipeline links the storage/infiltration basin in the east to the infiltration trench in the west. In the event of heavy rain, the water load rises in the pebble garden zone and at the end of the prairie, which both flood temporarily.

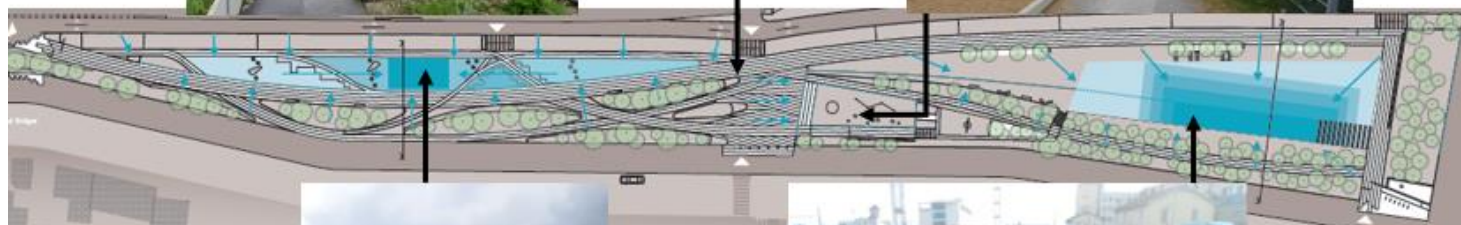
To prevent the migration of pollutants to the water table, the zones in which testing revealed high levels of soil pollution were covered with impermeable asphalt. Furthermore, excavation works enabled the polluted zones to be isolated from the public, by covering them with less polluted soil recovered from the creation of the infiltration basin in the west. Polluted soils were therefore not exported.

The taking into account of these various constraints linked to polluted soils in the design of this park led to the creation of a unique landscape, characterised by different areas of hollows and hills ('drumlins'). Phytoremediation is illustrated by experimental panels of mono-specific depolluting plantations, which surround the project and separate pedestrian walkways from the cycle path. In the absence of an appropriate sector to treat polluted green waste, it was decided to limit this aspect to a landscape and educational role.

*Impermeable passageway to the esplanade*



*Children's play area*



*The pebble garden*



*Work on the infiltration trench beneath the prairie*

### *Organisation and operating principles of the facilities*

## Operation of the facility

**In charge of maintenance:** Ville de Villeurbanne

**Maintenance operations:** Daily cleaning of walkway, maintenance of green spaces and repairs to urban fittings if required. The maintenance of the rainwater management facility (dredging) is under the responsibility of the city, but has not yet been required at the time of the drafting of this document.

## Feedback



### What worked well

- ➔ The sizing of the facility appears to be suitable as the basin and infiltration trench have not overflowed to date.
- ➔ In response to concerns voiced by local residents, display panels presenting the history and development of the site have been installed. The site thus serves an educational purpose for users.
- ➔ The site is very popular with residents of Villeurbanne and Lyon, which demonstrates that the fears expressed by residents during public consultation appear to have abated.



### Aims set aside

- ➔ There was a firm commitment to avoid exporting polluted soils and thus particular care was given to the handling of various layers of sub-soil. In practice, it is possible that soils were mixed accidentally during the works phase.
- ➔ Due to a lack of means, no measure is in place to monitor the pollution level in the plants, water or soil.
- ➔ Green waste produced by the phytoremediation experiment should be handled by a specialised company. This has proven to be too complex to implement and such waste is thus not subject to any specific treatment.



### If we were to repeat the project?

- ➔ This development is a proud achievement for the city, given the constraints linked to soil pollution. The City is planning to extend the experiment to the north by creating a 3.5ha park on another brownfield.



### For more information

#### To visit the site:

**Location:** Avenue Paul Kruger 69100 Villeurbanne

**GPS:** 45°45'21.8"N, 4°53'40.4"E

➔ **Open to the public**

**For more information or to visit the operation, contact:**

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Document compiled in 2019.

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