



# SUSTAINABLE AND INTEGRATED RAINWATER MANAGEMENT

A PHILOSOPHY AND A TOOLBOX OF  
ALTERNATIVE TECHNIQUES

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*Officer*

## Association for the **O**perational **D**evelopment and the **P**romotion of **A**lternative **T**echniques (stormwater management)

- Missions : moderating, specific leadership, awareness raising, accompanying change

- A hundred contributing members

Territorial communities, engineering and construction companies, architects, suppliers, public sector services...

- A large influence (French National territory and international)

- Promoting the operational development of alternative techniques

Site visits, on-site interventions, advising, education, publication of best practice documents...



# THE PHILOSOPHY OF SUSTAINABLE RAINWATER MANAGEMENT

## Stay as close as possible to the natural water cycle

- If the ground and the groundwater table allow it, **infiltration** of each raindrop as close as possible to its drop-off point,
- If not, the rainwater is **stored in a buffer** and gradually released, preferably towards the natural environment.



This principle must be applied in **future urbanization**, and above all **when modifying existing urban areas**

## A TOOLBOX OF ALTERNATIVE TECHNIQUES

- Infiltration reservoir roadway
- Infiltration trenches
- Swales
- Soakaway
- Infiltration basins
- Permeable surfaces
- Green roof
- Retention ponds
- Rainwater harvesting
- ...

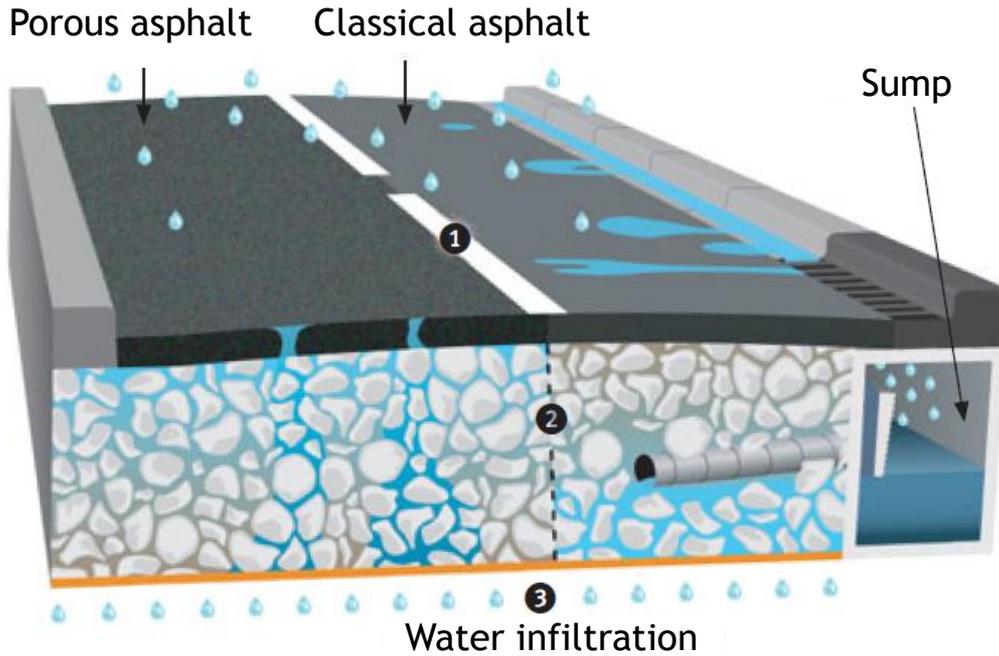


*Showroom*

## Basic principles:

- Avoid concentrating water
- Avoid runoff: water buffers
- Staying close to rainwater drop zone
- Integrating water into urban areas: giving a place two functions at the same time
- Avoiding the creation of impervious surfaces

# INFILTRATION RESERVOIR ROADWAY

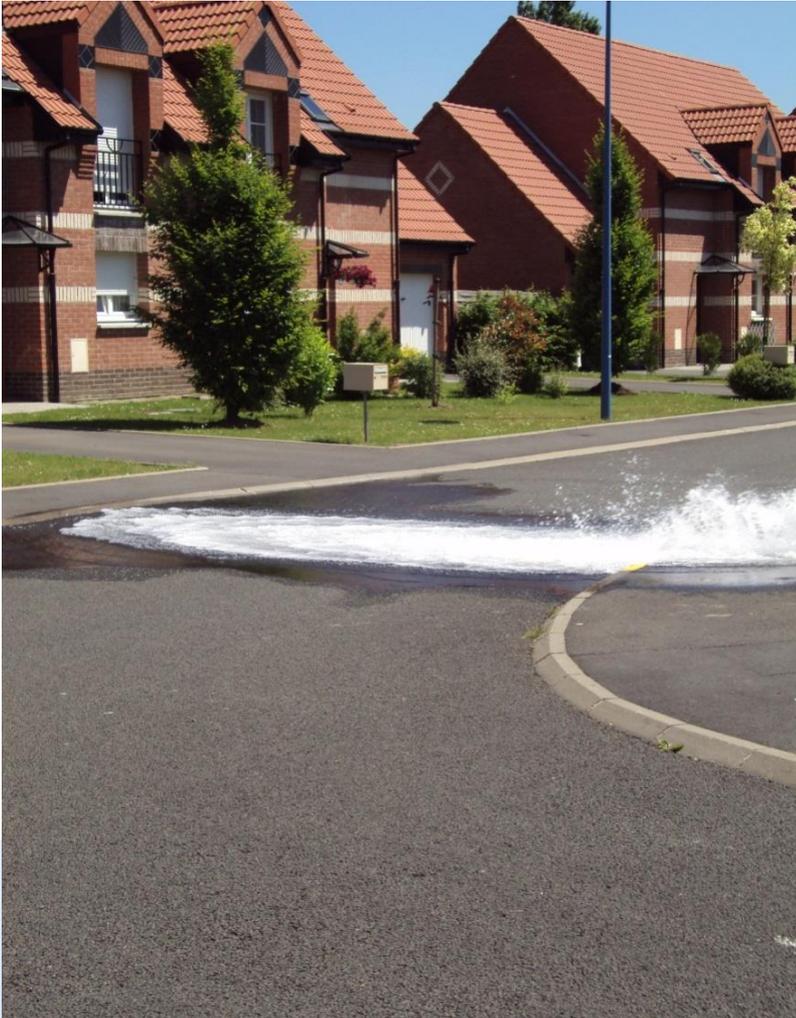


**Infiltration reservoir roadway with classical asphalt**



**Commercial Zone - LAUWIN-PLANQUE**

## INFILTRATION RESERVOIR ROADWAY



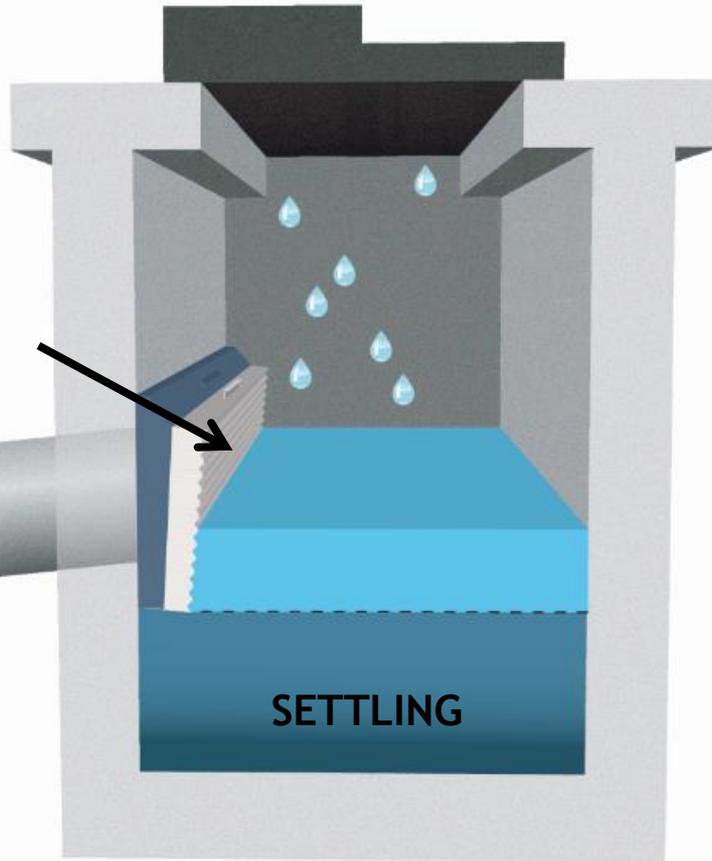
Infiltration reservoir roadway  
with porous asphalt

Residential area - LAMBRES-LEZ-DOUAI

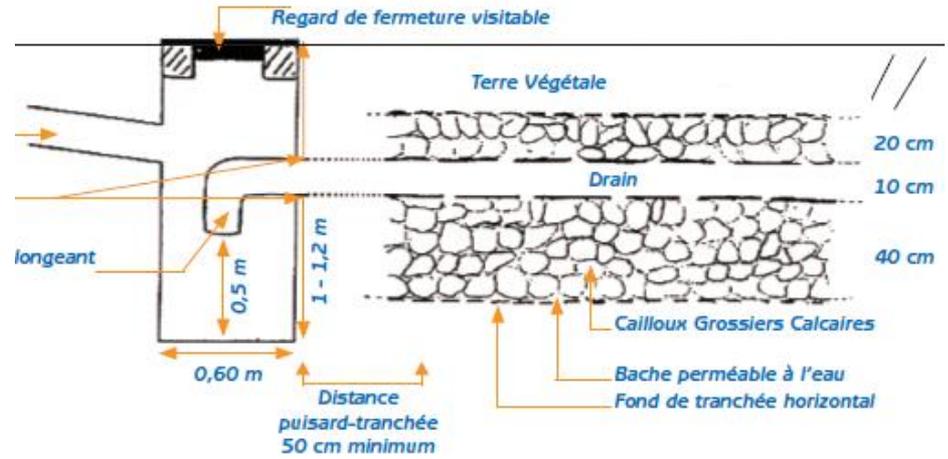
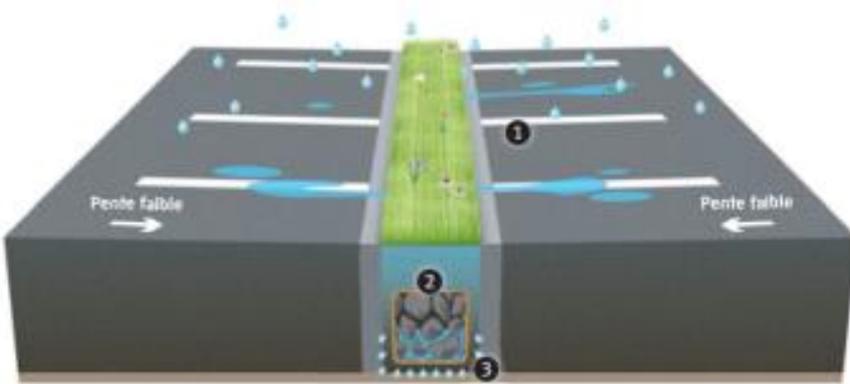
# SUMP

Structure for water sinking and pre-treatment, used with classical asphalt

FILTRATION



# INFILTRATION TRENCHES

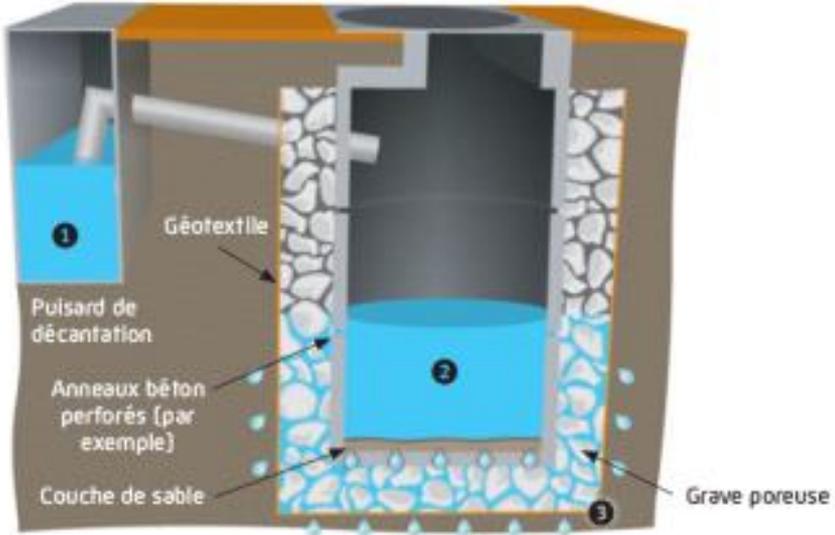


Filled with stone (Void ratio: 35%)



With ultra-light frames (Void ratio: 95%)

# SOAKAWAYS

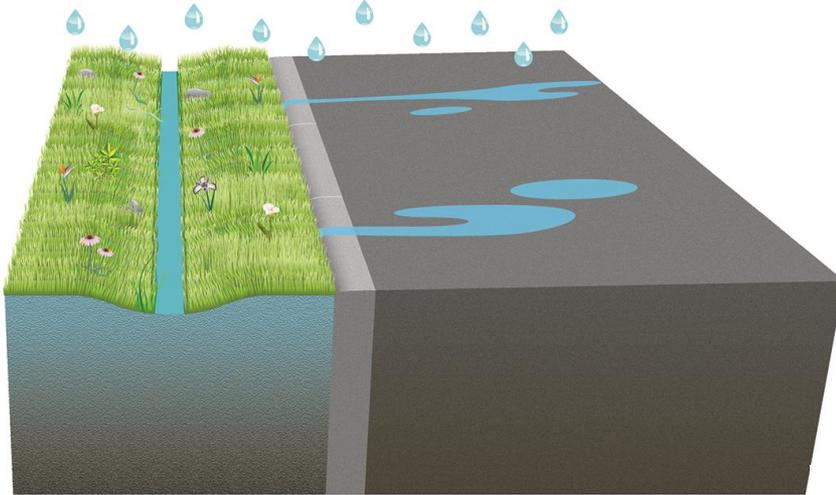


FECHAIN



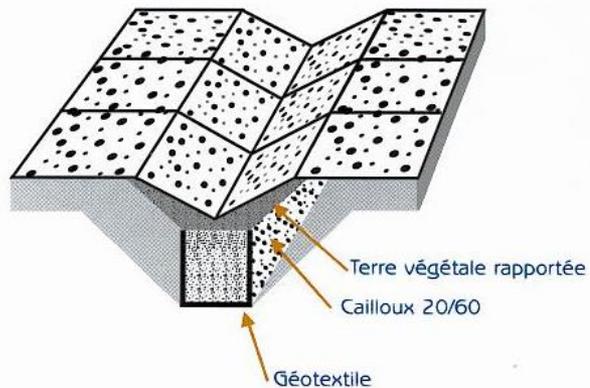
Residential area - FERIN

# SWALES



Commercial area - NOYELLES-GODAULT

## Swale with infiltration structure



Residential area - FERIN

## BASINS



**Underground basin**



**Detention pond**



**Bassin à ciel ouvert sec**

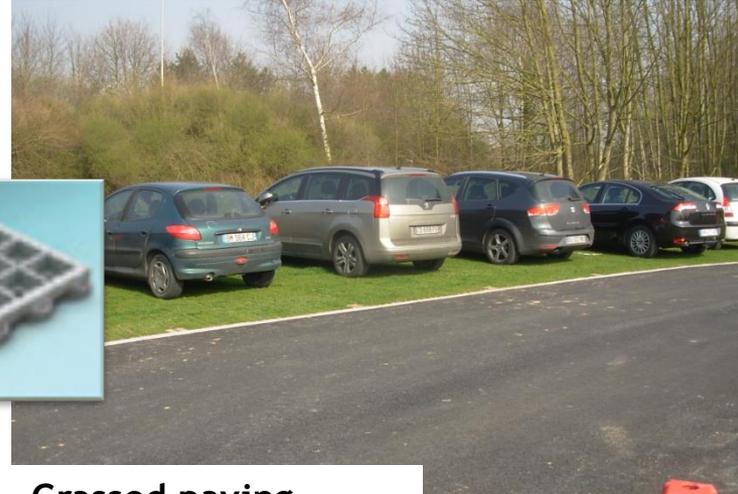


**Bassin à ciel ouvert sec**

# PERMEABLE SURFACES



Permeable paving



Grassed paving



Permeable pavers with large joints



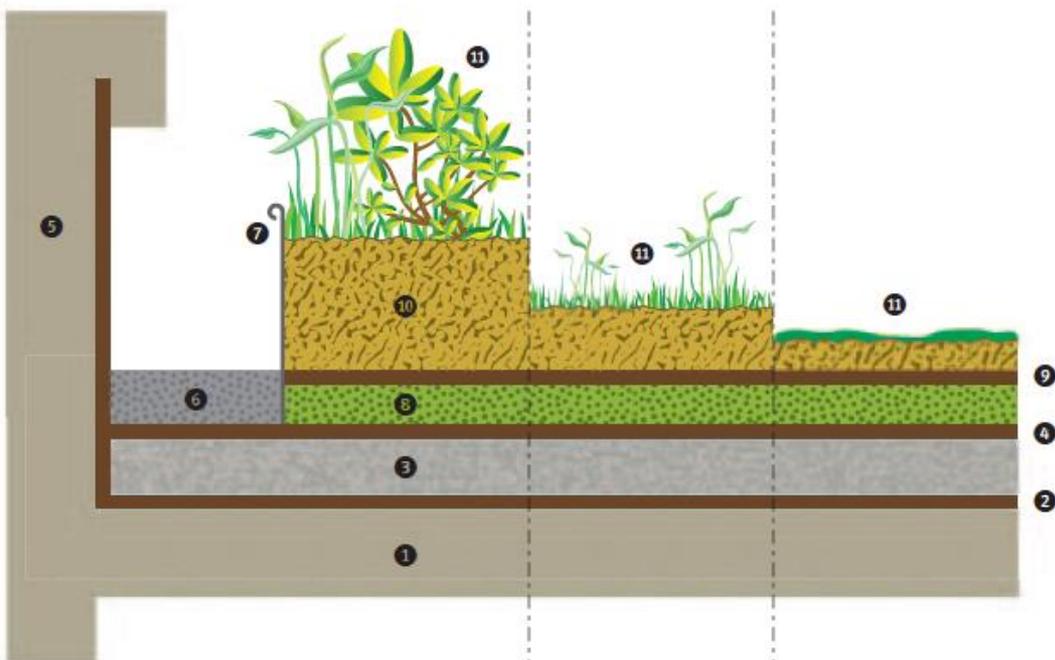
Pervious concrete



Pervious concrete pavement

# GREEN ROOFS

INTENSIVE      SEMI-INTENSIVE      EXTENSIVE



- 1 Élément porteur
- 2 Pare-vapeur
- 3 Isolant thermique
- 4 Étanchéité

- 5 Ouvrage émergent
- 6 Zone stérile
- 7 Dispositif de séparation entre la zone stérile et la zone végétalisée

- 8 Couche de drainage + stockage des eaux pluviales
- 9 Couche filtrante
- 10 Substrat
- 11 Végétation



POCHECO - FOREST-SUR-MARQUE



Arkeos Museum - DOUAI

# RAINWATER HARVESTING



**Re-using rainwater for internal and external uses**

**(Pay attention to regulations!)**



### - Quantitative advantages

- Flood risk reduction
- Groundwater recharge

### - Qualitative advantages :

- Reduction of runoff and urban discharge
- Enhancement of our natural environment quality

### - External benefits

- Climate change adaptation and mitigation
- Development and reinforcement of the urban biodiversity
- Mitigation of heat island effects
- Cost control
- ...

**THANK YOU FOR YOUR ATTENTION!**

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