



# **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**

# THE TOOLS FOR SUSTAINABLE RAINWATER MANAGEMENT

## A TOOLBOX OF ALTERNATIVE TECHNIQUES

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

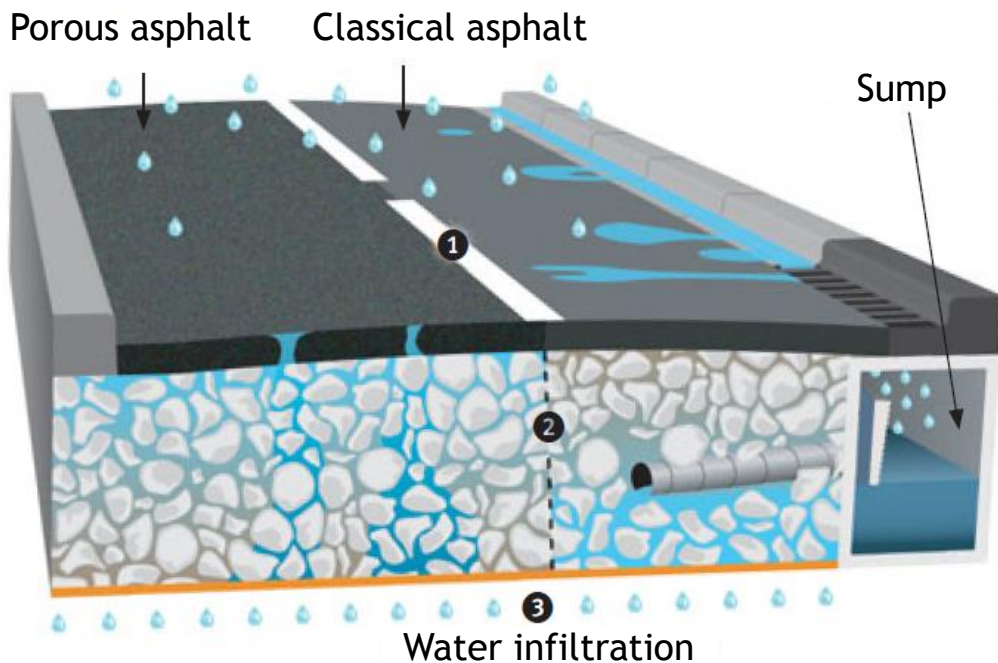


*Showroom*

## 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

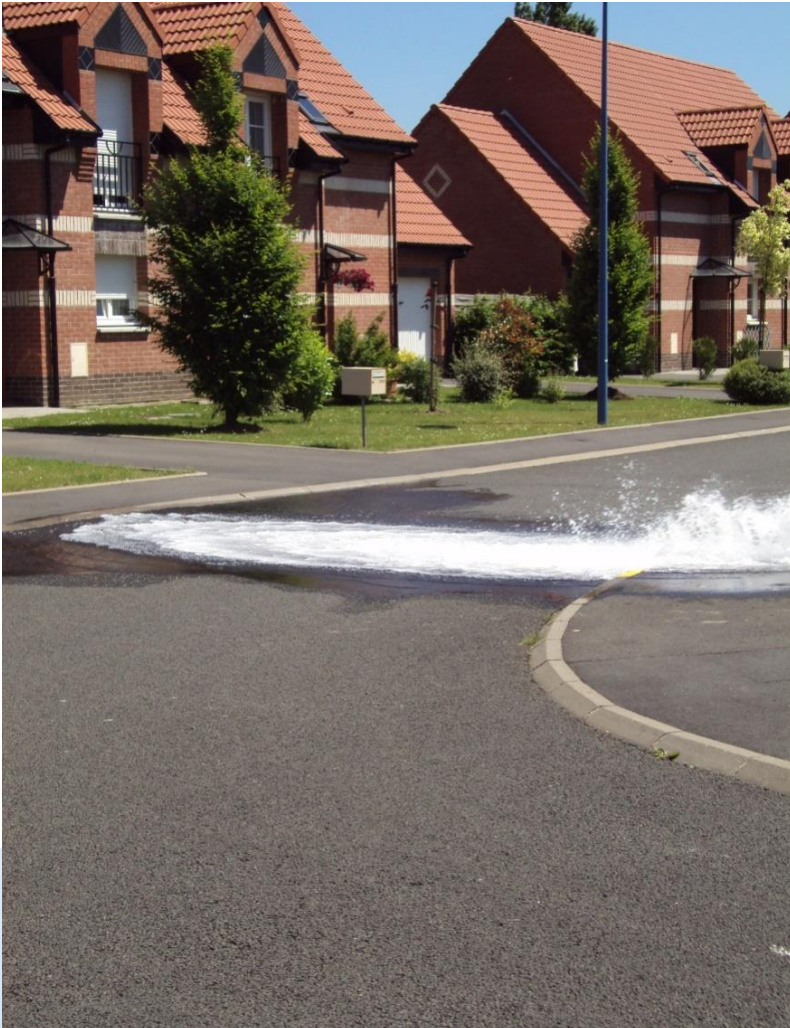


**Infiltration reservoir roadway  
with classical asphalt**



**Commercial Zone - LAUWIN-PLANQUE**

## INFILTRATION RESERVOIR ROADWAY

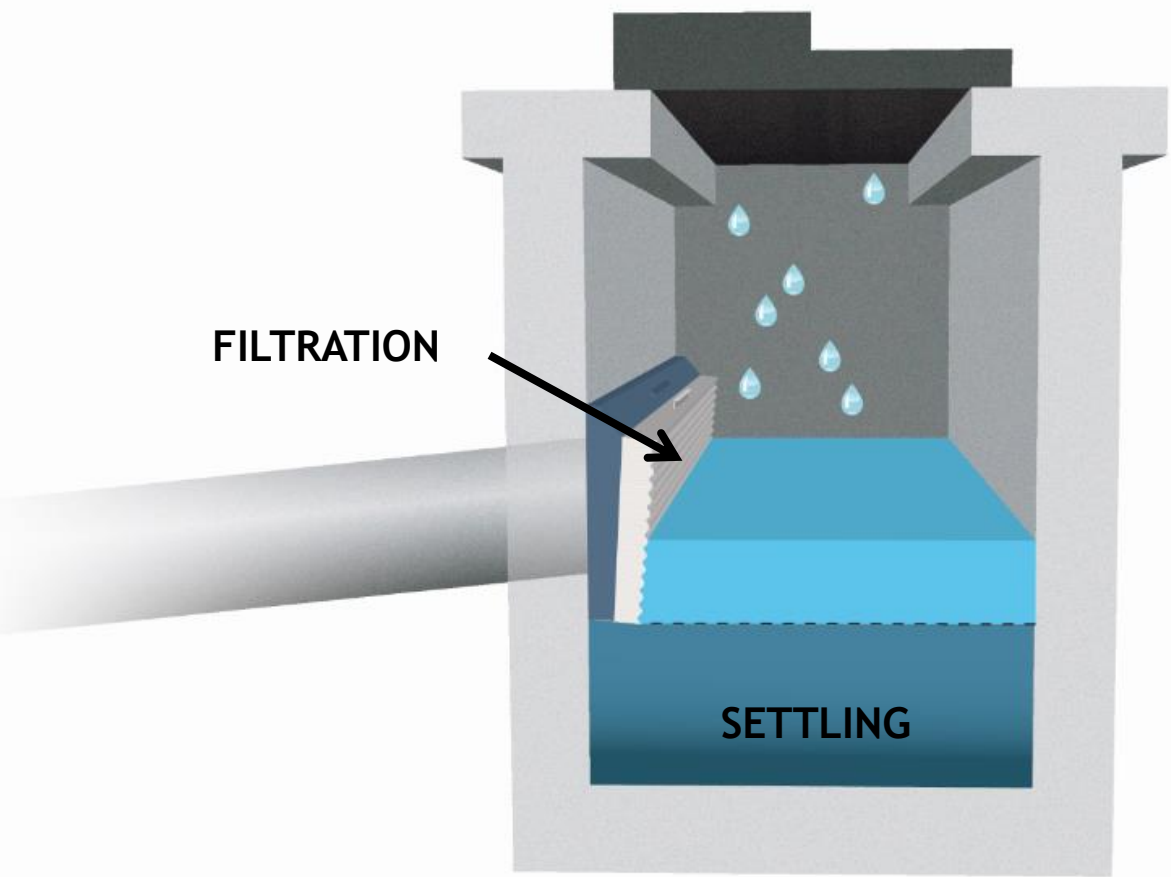


Infiltration reservoir roadway  
with porous asphalt

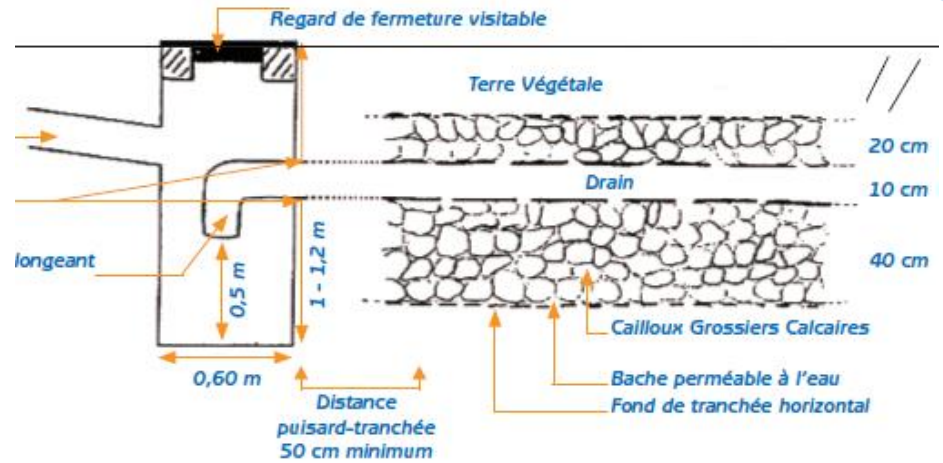
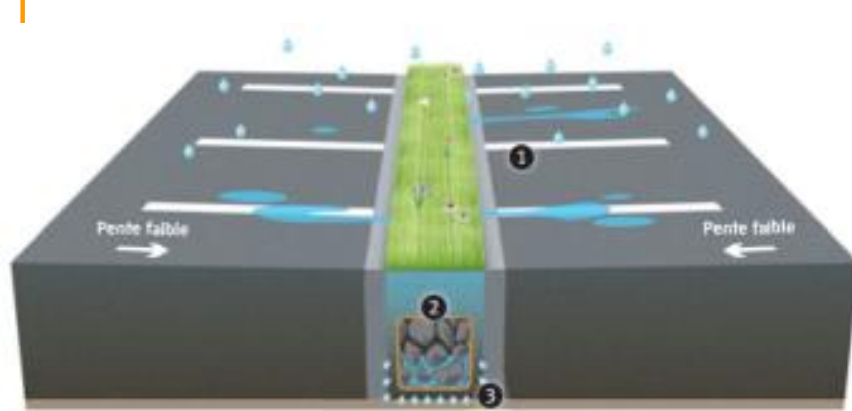
Residential area - LAMBRES-LEZ-DOUAI

## SUMP

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



# INFILTRATION TRENCHES

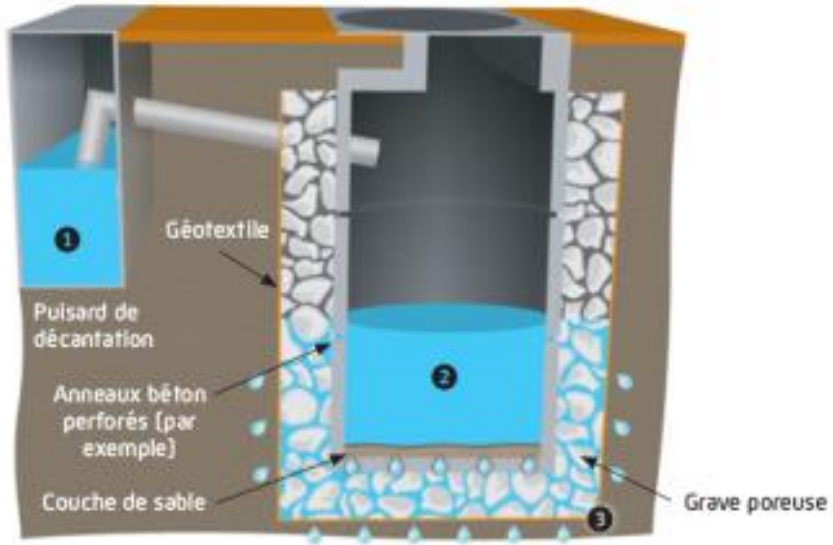


Filled with stone (Void ratio: 35%)

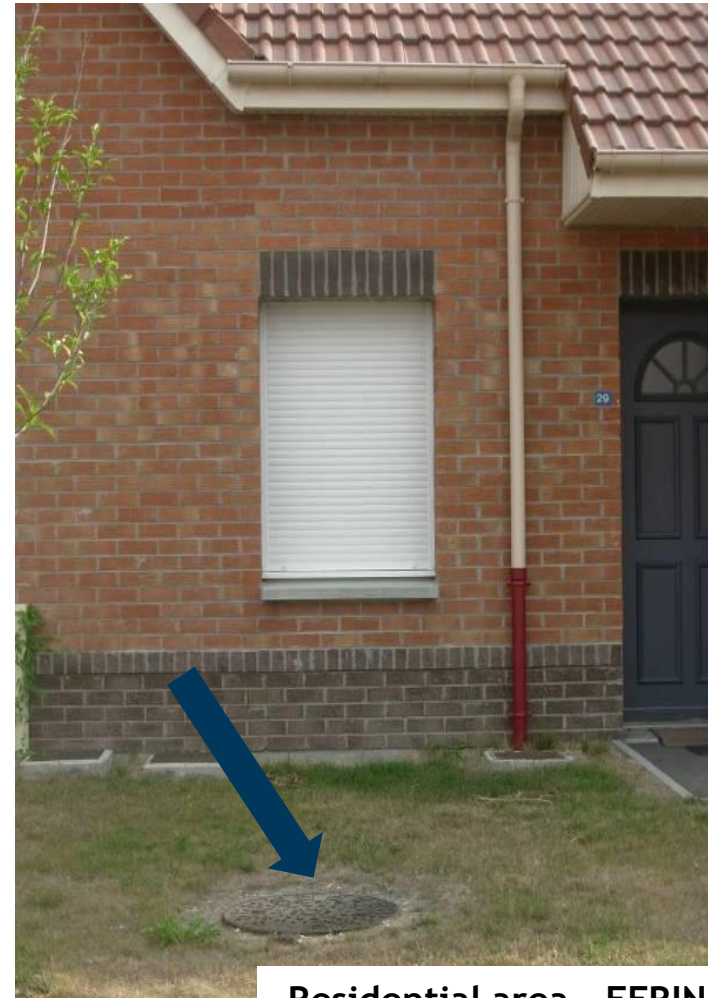


With ultra-light frames (Void ratio: 95%)

# SOAKAWAYS

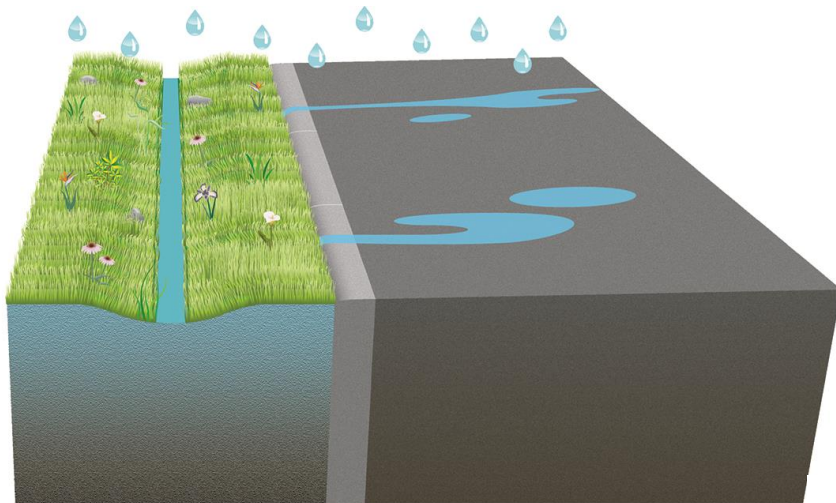


FECHAIN



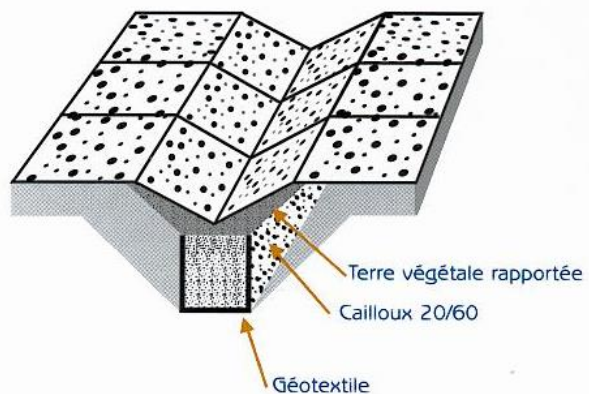
Residential area - FERIN

# 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



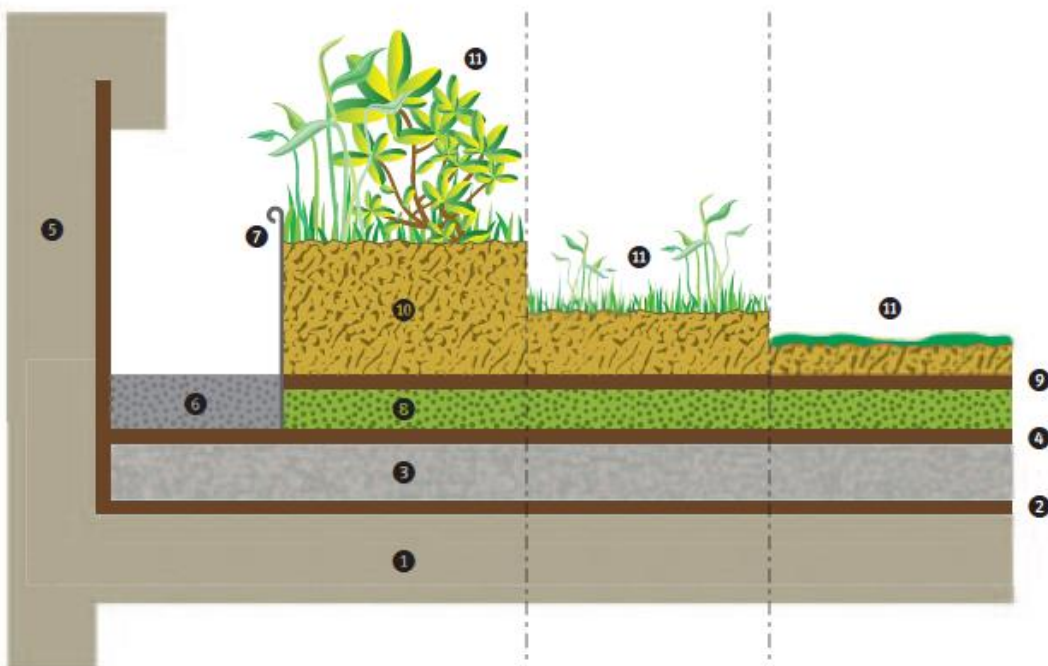
Pervious concrete



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!)**



## CONCLUSION: THE FUTURE AT STAKE

### - 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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