

A GUIDE TO STORMWATER BEST MANAGEMENT PRACTICES

CHICAGO WASTE AGENDA



CITY OF CHICAGO
Rafael M. Davis
Mayor

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Green Run  6

INTRODUCTION

“Chicago’s world-class status is owed largely to its position at the confluence of the Chicago River and Lake Michigan. These waterways signified transportation and trade to Chicago settlers and continue to attract millions of visitors to our city every year.

Beyond the Lake Michigan shoreline, our water resources extend beyond, and beneath, the City. They are the Chicago River, Lake Calumet, the Calumet River, thousands of acres of wetlands, creeks, streams, and lagoons, as well as canals and channels. Equally important are the thousands of miles of pipes, man-made tributaries, that have – for over a hundred years – delivered drinking water and helped us manage stormwater.

OVERVIEW

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Maintenance Considerations

Operational maintenance considerations include the need for regular inspections and repairs. Some common issues include clogged drains, leaks, and structural damage. Proper maintenance can extend the life of the roof and prevent costly repairs.

Cost Considerations

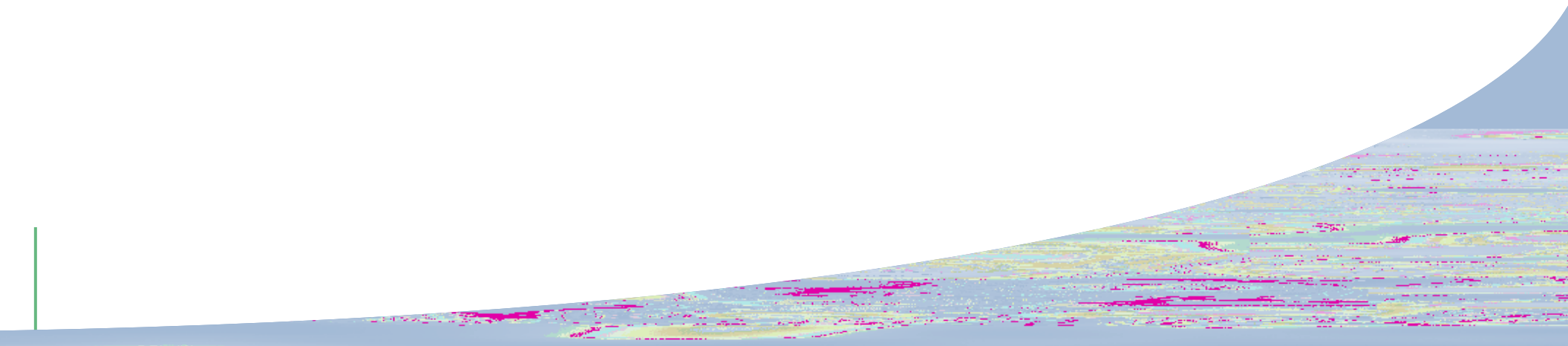
Initial installation costs for green roofs range from \$18 to \$25 per square foot. Annual maintenance costs are typically between \$2 and \$5 per square foot. The long-term benefits of green roofs, such as reduced energy costs and improved air quality, can offset the initial investment.

Local Examples

A notable example is the University of Chicago's new building, which features a green roof with 20,300 square feet of vegetation. Another example is the City of Chicago's City Hall, which has a green roof with 2000 square feet of vegetation. The City of Chicago also has a green roof on its City Hall building, which is a 2000 square foot green roof. The City of Chicago also has a green roof on its City Hall building, which is a 2000 square foot green roof.



Green roof on top of Chicago's City Hall.



Maintenance Considerations

Quality of maintenance is a key consideration. Poor maintenance can lead to increased downtime and higher costs. Regular maintenance is essential for ensuring the reliability and longevity of the system.

Cost Considerations

Total cost of ownership (TCO) is a critical factor. This includes the initial purchase price, ongoing maintenance costs, and the cost of downtime. A TCO of \$20 per user per month is a common benchmark, with some systems reaching up to \$150 per user per month.

Local Examples

Microsoft's Office 365 is a prominent example, with a TCO of approximately \$20 per user per month. Other examples include Google Workspace and Salesforce, which offer similar TCOs. The cost of downtime is a significant factor in these calculations, as it can be much higher than the cost of the software itself.

Maintenance Considerations

Water is a major maintenance consideration. Some systems are designed to be self-cleaning, but many require regular cleaning and maintenance to prevent blockages and ensure efficient operation.

Cost Considerations

Installation costs can vary significantly depending on the system type and the complexity of the installation. However, the long-term benefits of a well-maintained system, such as improved energy efficiency and reduced water consumption, can offset the initial investment. Additionally, some systems offer financing options to make the purchase more accessible.

Local Example

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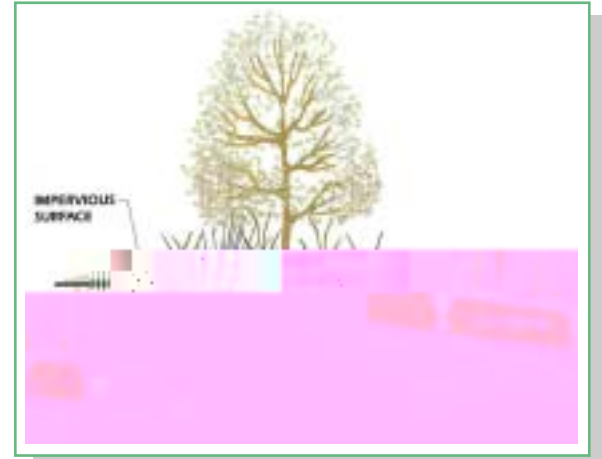
FILTER STRIPS

Filtration is a process of separating particles from a liquid or gas. It is used in water treatment, air purification, and various industrial processes. The process involves passing a mixture through a porous medium that traps the solid particles while allowing the liquid or gas to pass through.

Water filtration is a common application of this process. It is used to remove suspended solids, bacteria, and other contaminants from drinking water. The most common method is sand filtration, which uses layers of sand and gravel to trap particles.

Filtration is also used in air purification. HEPA filters are used in hospitals and laboratories to remove bacteria and viruses from the air. Activated carbon filters are used to remove odors and chemicals from the air. Filtration is also used in industrial processes to separate solids from liquids.

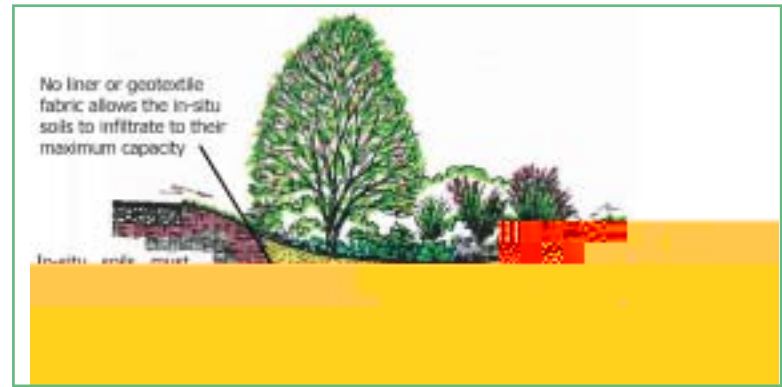
Filtration is a simple and effective process that can be used in a wide range of applications. It is an essential part of many industrial and domestic processes. The choice of filter depends on the specific application and the type of contaminants to be removed.



Applicability

Filter strips are applicable in a variety of settings, including residential areas, commercial buildings, and vegetated buffers. They are used to reduce runoff and improve water quality. Filter strips are most effective when they are installed in areas with high runoff potential, such as parking lots and roofs. They are also used in vegetated buffers adjacent to streams and wetlands to filter runoff before it enters the water.

BIOINFILTRATION: RAIN GARDENS



Bioinfiltration is a process where water and pollutants are filtered through a layer of soil and plants. This process is often used in rain gardens, which are designed to capture and infiltrate stormwater runoff. The plants in the garden help to break down pollutants and improve the soil's ability to absorb water. This process is a key component of sustainable urban drainage systems.

Water infiltration is a natural process that occurs when rain falls on the ground. The water seeps into the soil, where it can be stored or eventually reach the water table. This process is essential for maintaining the health of ecosystems and replenishing groundwater supplies. In urban areas, bioinfiltration techniques like rain gardens can help mimic natural infiltration processes.

Various types of bioinfiltration systems are used in different settings. For example, rain gardens are commonly used in residential and commercial developments. They often feature a variety of plants that are adapted to local conditions. Other systems include swale drainage, which uses shallow channels to collect and infiltrate runoff, and filter strips, which use vegetation to filter pollutants from runoff before it reaches a water body. The choice of system depends on factors like site conditions, climate, and the amount of runoff to be managed.

Applicability

Bioinfiltration is applicable in a wide range of settings. It is commonly used in parking lot islands, residential developments utilizing swale drainage for pre-treatment, commercial developments utilizing filter strips adjacent to parking lots for pre-treatment, and campus developments utilizing swale drainage and filter strips for pre-treatment.

DRAINAGE SWALES

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S a a a a . P a a a a .

Applicability

D a a a a . S a a a a . *office campus, commercial, industrial, multi-family residential, parking lots, residential parkways and highway drainage*. U a a a a .



Maintenance Considerations

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NATURALIZED DETENTION BASINS

Concepts of naturalized detention basins are based on the principles of natural processes, such as sedimentation, filtration, and biological treatment, to remove pollutants from wastewater. These basins are designed to mimic natural ecosystems, providing a cost-effective and sustainable alternative to traditional wastewater treatment methods. They typically consist of multiple basins where water flows through a series of stages, allowing for the gradual removal of solids and organic matter. The naturalized design often incorporates vegetation and other natural elements to enhance the treatment process and improve the aesthetic quality of the water.

Applicability

Natural processes are used to filter and clean stormwater runoff. *rain garden* *bioinfiltration*

Maintenance Considerations

Regular maintenance is required to ensure proper function. This includes weeding, mulching, and monitoring water levels.

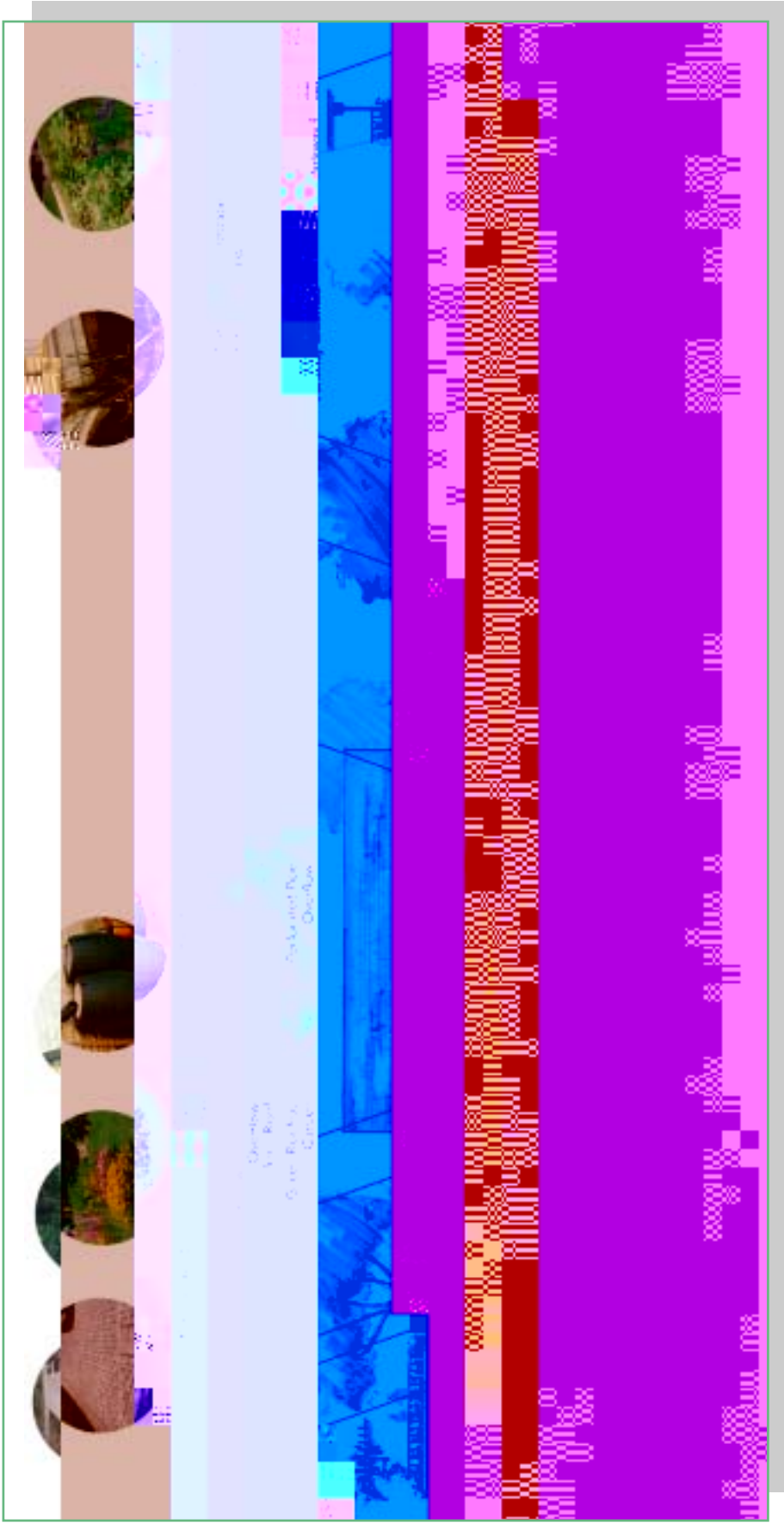
Cost Considerations

Installation costs can vary significantly based on site conditions and the type of system used. Long-term maintenance costs are also a consideration.

Local Examples

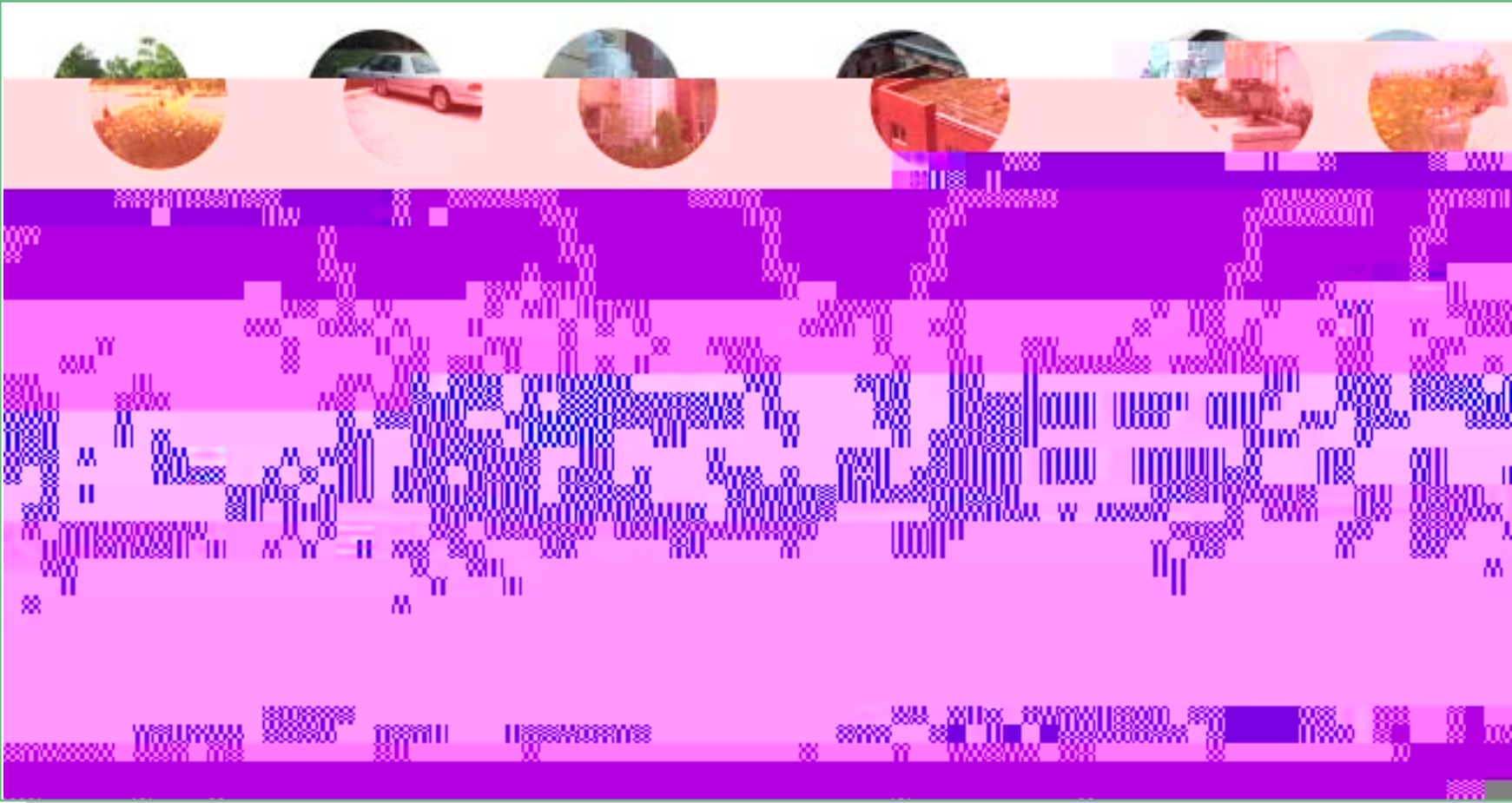
At the University of California, Berkeley, a rain garden was installed at the intersection of CET1 and Tenth Avenue. The garden features a variety of native plants and is maintained by the University's Grounds Department. Another example is the rain garden at the University of California, San Diego, which is a great example of a well-maintained rain garden.





COMMERCIAL/INDUSTRIAL SITE

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WHERE TO FIND MORE!

INDEX OF RESOURCES

City of Chicago Departments

City of Chicago Department of Environment
30 North LaSalle Street, 25th Floor
Chicago, IL 60602
(312) 744-7606

[City of Chicago Department of Environment](#)

City of Chicago Department of Green Technology
445 North LaSalle Street, 15th Floor
Chicago, IL 60612
(312) 746-9642

[City of Chicago Department of Green Technology](#)

CCGT
City of Chicago Department of Green Technology
445 North LaSalle Street, 15th Floor
Chicago, IL 60612
(312) 746-9642

City of Chicago Department of Transportation
30 North LaSalle Street, 11th Floor
Chicago, IL 60602
(312) 744-2600

[City of Chicago Department of Transportation](#)

City of Chicago Department of Water Management
1000 East Ohio Street, 104
Chicago, IL 60611
(312) 744-7001

[City of Chicago Department of Water Management](#)

Northeastern Illinois Planning Commission

222 South Riverside Plaza, Suite 1800, Chicago, Illinois, 60606
(312) 454-0400

[Northeastern Illinois Planning Commission](#)

Conservation Design Resource Manual
(NIPC and Chicago Wilderness, 2003)

[Conservation Design Resource Manual](#)

Protecting Nature in Your Community (NIPC, 2000).

Reducing the Impacts of Urban Runoff: The Advantages of Alternative Site Design Approaches (Dreher and Price, 1997).

Natural Landscaping: A Source Book for Public Officials (NIPC, 1996)

Urban Stormwater Best Management Practices for Northeastern Illinois, a course curriculum (NIPC, 2000).

Drainage Swales

U.S. EPA. *Post-Construction Storm Water Management in New Development & Redevelopment: Grassed Swales.*

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Filter Strips

G.W. Wa. P. Ga. F. S. (2000).
S. a. Ma. a. R. G. (2000).

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U.S. EPA. *Post-Construction Storm Water Management in New Development & Redevelopment:*

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CREDITS

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