Oldcastle Infrastructure™
A CRH COMPANY

From Compliance to Excellence

Maintenance Solutions for Optimal Stormwater Management

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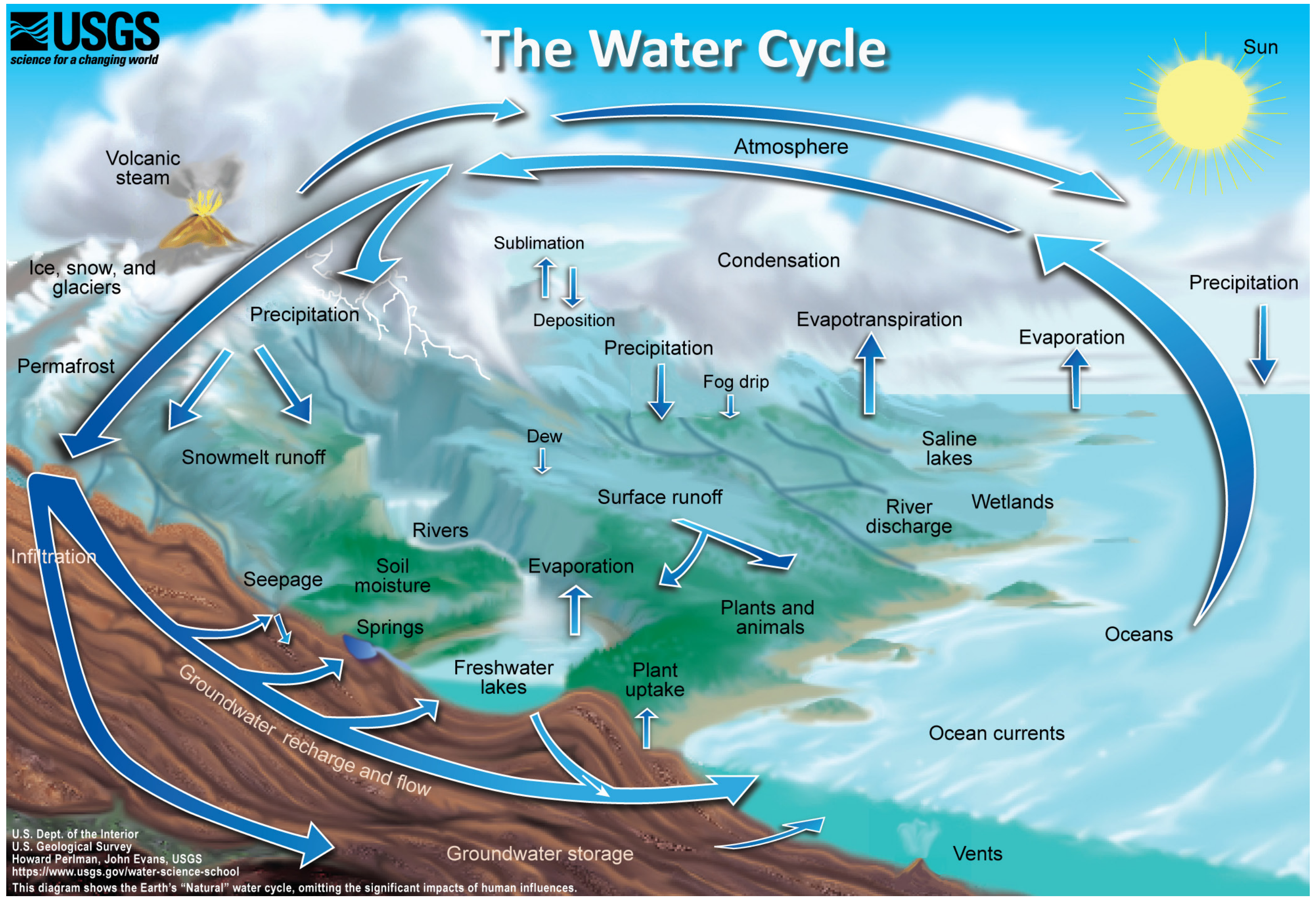
www.oldcastleinfrastructure.com/maintenance | (888) 965-3227

Water is Our Most Precious Resource. How we manage it now is the key to our collective future success. This is why recognizing the importance of regular maintenance of our stormwater management infrastructure is so crucial. The impact in system performance, longevity and compliance with regulations cannot be overstated. This paper will look at real world solutions designed to improve system efficiencies, reduce maintenance costs and minimize environmental impact.



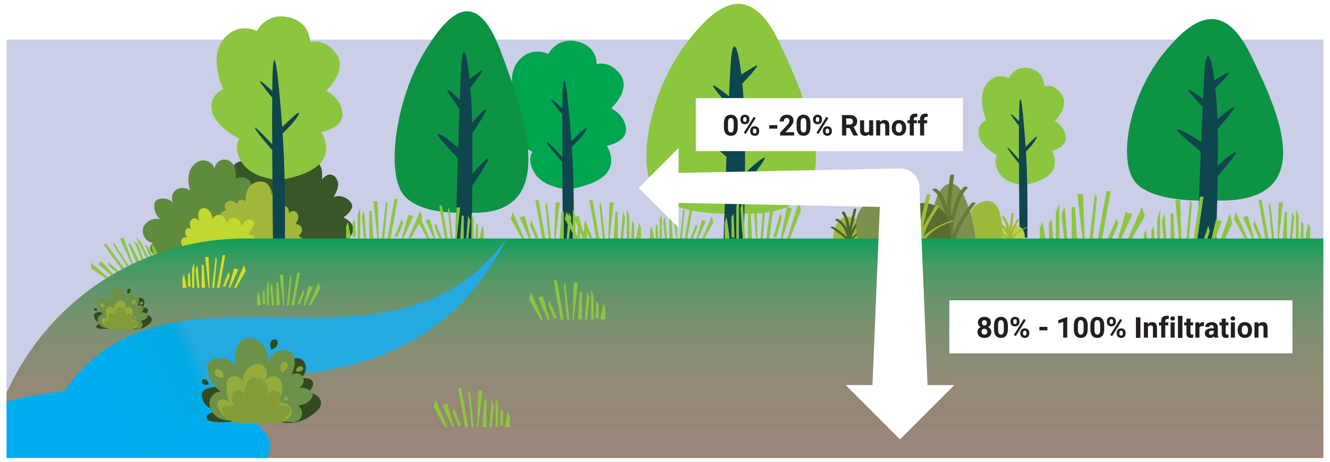
Mimic the Natural Cycle

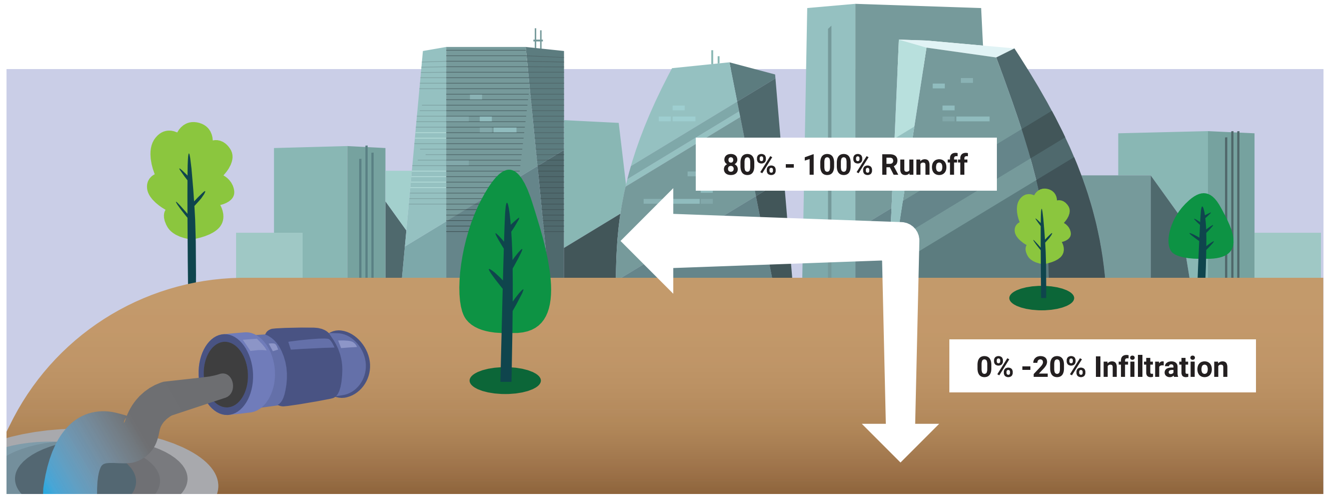
As we increase the built environment and cityscapes, we are also preventing stormwater runoff from going into the ground. This is why it is imperative we mimic everything in the natural water cycle in our stormwater design. For the cycle to be effective, however, we must also ensure these systems are maintained or they will not function.

What we are seeing now is that there is a lot of money coming in to buy our products, but there is not enough focus or emphasis on the maintenance of those products. Within five years or even less, products not properly maintained will fill up with sediment and stop working. It's that simple. It can also be extremely expensive.

Infiltration Versus Run Off

Pollutants accumulate on the impervious surfaces and get picked up by stormwater as it travels across the ground, drains into the storm sewer and is discharged untreated into local waters. Known as Total Suspended Solids (TSS), the pollutants are comprised of trash, oils, nutrients, heavy metals, bacteria, and more.





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Varous best management practices (BMPs) are utilized to remove pollutants. All BMPs need maintenance, which can consist of detention, infiltration, filtration, low impact developments (LID) and green infrastructure, just to name a few.

So, at a high level we're trying to recreate this environment with stormwater, but because we get 80% to 100% runoff, instead of 80% to 100% infiltration, we need to have all of our maintenance systems in place to clean the infrastructure products, control flooding, enhance safety and meet increasingly stringent regulations."

Changing Climates are Exacerbating the Situation

According to the Environmental Protection Agency (EPA), climate change is projected to increase the frequency and intensity of storms in all regions of the U.S. These storms can lead to extreme flooding and other impacts that can overwhelm or damage water infrastructure.

If stormwater systems are not correctly maintained, intense storms will result in more back-up because the water simply has no place else to go.

5 Benefits of Effective Stormwater Runoff Management

The EPA highlights five key environmental benefits of an effective stormwater runoff management program for owners and other stakeholders in the built environment:

1. **Protection of wetlands and aquatic ecosystems**
2. **Improved quality of receiving waterbodies**
3. **Conservation of water resources**
4. **Protection of public health**
5. **Improved flood control**

Stormwater Management Regulations

All stormwater in the United States is federally regulated through the EPA, which grants permission for states to implement their stormwater programs. To meet EPA standards, we need regulations. States that have adopted legislation have a more defined regulatory process. Many local jurisdictions and municipalities within states have their own stormwater programs that strictly encompass all the requirements from the federal and state level and include their own considerations. This makes their programs more applicable and often more stringent to their specific region.

Who Bears the Legal Responsibility?

Any construction project that goes through a city/county/state/etc. for review, approval, and permitting must provide a stormwater quality management plan (SWMP or SWQMP or other acronyms depending on the jurisdiction). The plan is a description of the design and operation of permanent stormwater quality best management practices (BMPs) on the project. These can include water quality ponds, bioretention systems, hydrodynamic units, filtration systems, etc. Regardless of the type of BMP utilized, they are always permanent and require permitting and maintenance, usually on an annual basis.

When it comes to legal responsibility, it is the owner that is responsible for maintaining their systems. There are some cases where a local jurisdiction has taken over the responsibility, but usually the onus is on the owner of the property.

The owner pays to put the system in and that makes them responsible. But in many cases, the owner is not even aware which stormwater products and infrastructure they have. Maybe they are the third or fourth owner and have no idea what the original engineer and contractor put in. All they know is that it is not working, water is backing up and they have a problem on their hands. We go out and find that the one part that is not working may be connected to another 15 parts in the system.

A lot of times it comes down to educating the customer on what system they have so they can learn how to properly clean and maintain the various parts in the system.

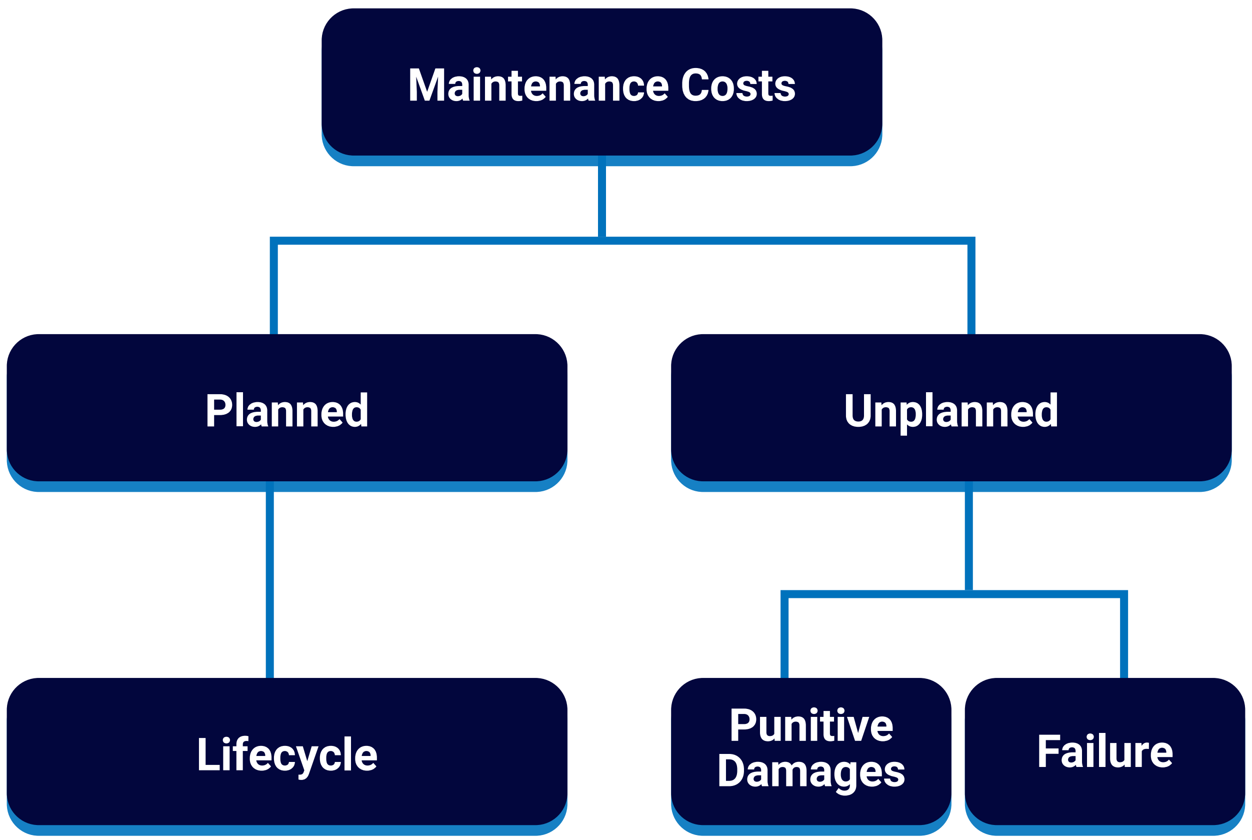
And in some cases, the owner may know which systems they have, and have regular maintenance performed by someone that may not fully understand the systems and how to properly clean them. This can lead to many underlying issues if sufficient maintenance and cleaning isn't performed. The superficial view of their site may look appealing – but underneath, it is a far different story.

Maintain Your Stormwater System as if It Were Your Vehicle

It's like your car engine isn't functioning and your car is really dirty – so you give your car a really good wash and wax on the outside. It looks really pretty - but you've done nothing to clean and maintain the oil and engine parts. And the longer you wait, the more expensive the repairs will become.

Maintenance Costs: No One Likes Surprises

Maintenance costs generally fall into two categories: Planned and unplanned. Planned is where the owner does frequent inspections (monthly, quarterly or annually) as a preventative measure. Ideally this is done by storm water experts that understand the systems in place where they can come in at least annually to do the maintenance and make sure everything is up to date. Owners can budget and pre-plan for maintenance so there are likely to be fewer unwanted surprises.



Unplanned events are triggered by the system not working or functioning properly. Maybe there is a smelly pond or bog and people are complaining. The costs to fix a system that has not been properly maintained can be very high.

Added costs can also be a function of punitive damages. When a responsible entity does not make the ongoing investment in maintenance or pay heed to aging assets, infrastructure or establish resiliency efforts, the costs of failure are even more significant. BMP maintenance is enforceable. Penalties can be severe and may include fines and even criminal charges.

Visual Observation (Check All That Apply)		
Trash Basket Condition ☐ 100% Full ☐ 75% Full ☑ 50% Full ☐ 25% Full	**Description of Material with Basket** HYDRILLA TRASH STICKS	**Number of Photos Taken** 4
Settlement Basin Condition Basin 1 ☐ 100% Full ☐ 75% Full ☐ 50% Full ☐ 25% Full NA	**Settlement Basin Condition Basin 2** ☐ 100% Full ☐ 75% Full ☐ 50% Full ☐ 25% Full NA	**Settlement Basin Condition Basin 3** ☐ 100% Full ☐ 75% Full ☐ 50% Full ☐ 25% Full NA

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The Importance of Regular Maintenance in Stormwater Management

Case Study – Sediment Trap Failure

This trapezoidal channel was modified into a concrete decorative creek that runs through a master planned dining, shopping and entertainment corridor. At the transition, there is a sediment trap to prevent solids from accumulating in the creek. Maintenance of the sediment trap was not conducted, resulting in failure of the sediment trap and allowing sediment to settle out into the creek.

The stormwater permit was violated by not maintaining the sediment trap and as a result invasive vegetation started to grow and damage the channel. The city had to conduct an emergency cleanup. The cost of the cleanup exceeded the O&M budget and required emergency funding from the city council. Construction reduced the local shopping and dining establishments customer visits for about six weeks

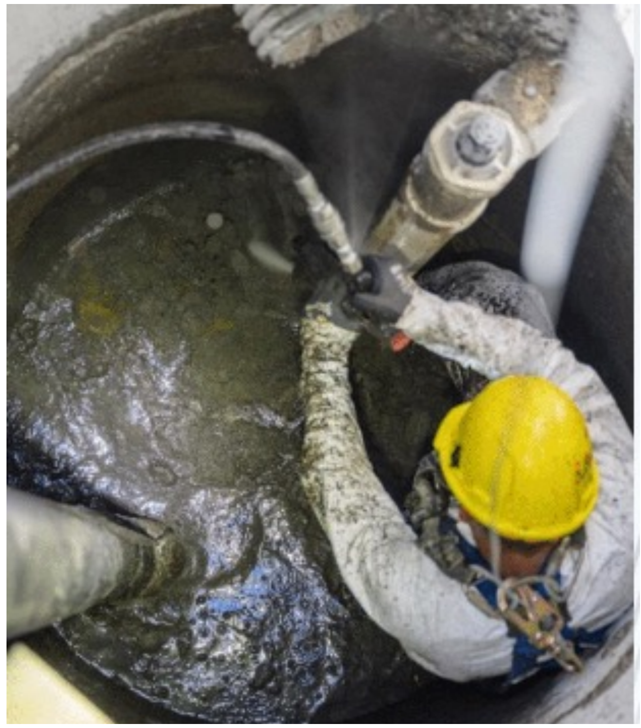
As a result of a small piece of equipment in the system (a sediment trap in the upper right) not being maintained over time, the entire area ended up being affected. This included nearby paths the public could no longer enjoy and nearby businesses that were impacted and lost revenue for weeks while the system had to be completely redone.

Maintaining this system would cost thousands of dollars a year. That's an inexpensive solution compared to redoing an entire system which could cost hundreds of thousands to restore it to what was.

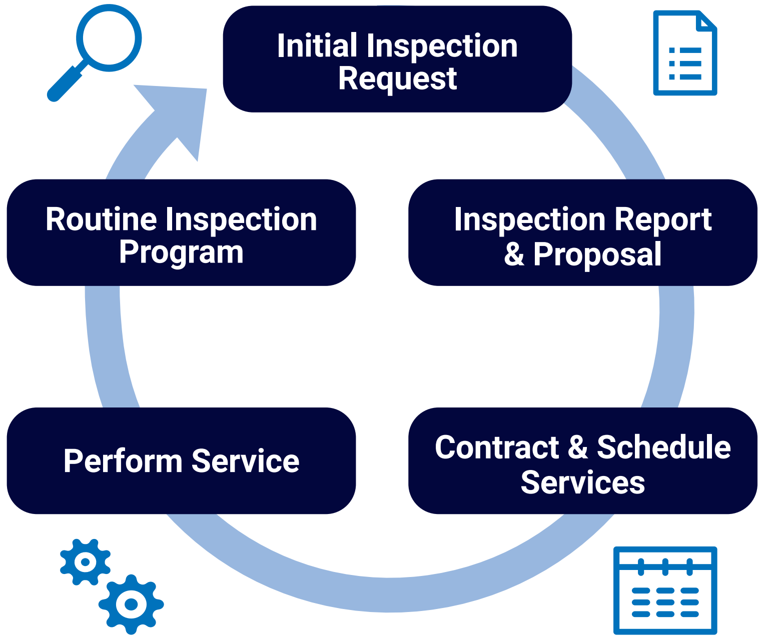
The Impact of Maintenance Services

To the owner, the scene looks immaculate. But looking under the hood can tell a different story.

Near the beautiful pond, a manhole like the one at left could be filled with sediment and be ready for failure – at great expense. The manhole on the right, however, is being cleaned and maintained on a regular basis. The difference can be worth hundreds of thousands of dollars.



Understanding the Maintenance Process



How it should work.

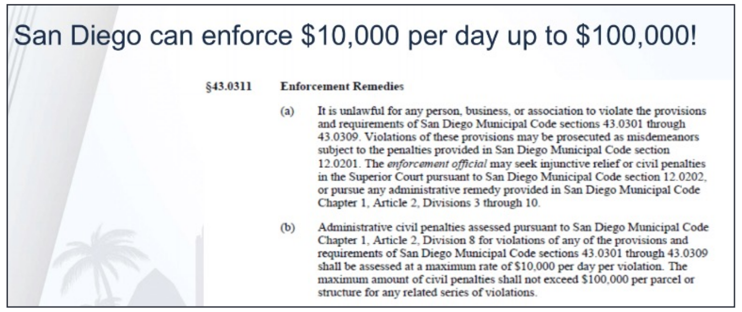
Owners request an inspection and Oldcastle Infrastructure does the initial report and proposal for what needs to be done. We get it scheduled, perform the maintenance and the owner receives a report and certificate of compliance. The owner implements a routine inspection program with whatever frequency is best for that site.

An owner can be a commercial business, municipality, property management firm, homeowner, etc.

Remember:

Staying up to date with maintenance requirements and system compliance can mean avoiding heavy fines.

Not being fined but remaining compliant in your area is the kind of paperwork owners want to see. These certificates also serve as an official record of maintenance.



San Diego can enforce $10,000 per day up to $100,000!

§43.0311 **Enforcement Remedies**

(a) It is unlawful for any person, business, or association to violate the provisions and requirements of San Diego Municipal Code sections 43.0301 through 43.0309. Violations of these provisions may be prosecuted as misdemeanors subject to the penalties provided in San Diego Municipal Code section 12.0201. The *enforcement official* may seek injunctive relief or civil penalties in the Superior Court pursuant to San Diego Municipal Code section 12.0202, or pursue any administrative remedy provided in San Diego Municipal Code Chapter 1, Article 2, Divisions 3 through 10.

(b) Administrative civil penalties assessed pursuant to San Diego Municipal Code Chapter 1, Article 2, Division 8 for violations of any of the provisions and requirements of San Diego Municipal Code sections 43.0301 through 43.0309 shall be assessed at a maximum rate of $10,000 per day per violation. The maximum amount of civil penalties shall not exceed $100,000 per parcel or structure for any related series of violations.

CERTIFICATE OF COMPLIANCE

JOB NUMBER xxxxxx

This certifies stormwater treatment unit service and maintenance was performed at

XXX
XXX

This service is in compliance with the contract between
Oldcastle Infrastructure Service and Maintenance

STORMWATER TREATMENT UNIT SYSTEM SERVICE AND MAINTENANCE

May 18, 2023
Service Date

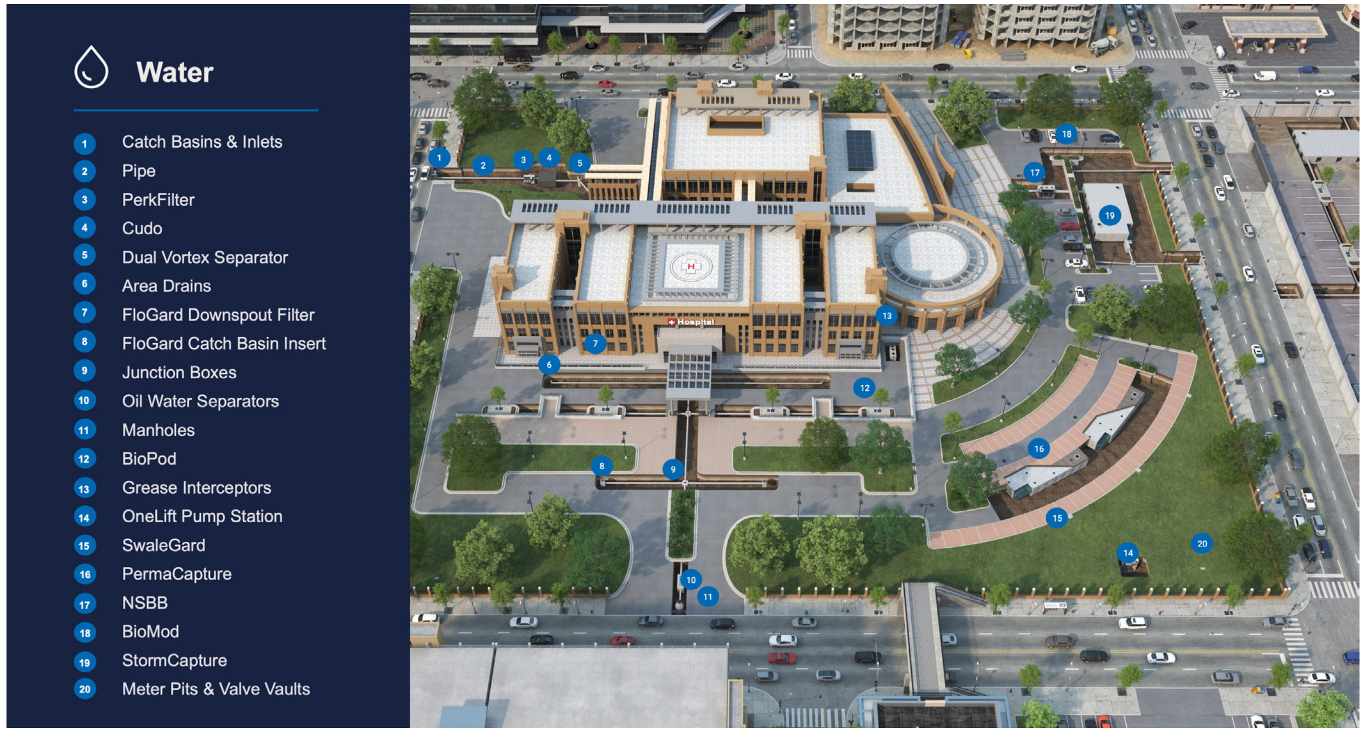
Cathy Orozco
Cathy Orozco, Admin. Assistant

The Benefits of Maintenance Services

- **Increases time between major services**
- **Information to plan for upcoming expenses**
- **Keeps system functioning properly**
- **Maintain compliance**
- **Peace of mind for surprise inspections**
- **Prevents costly emergencies**
- **Much less costly than fines & penalties**

There's More to the Picture than You Think

This hospital scene illustrates why some owners may not actually realize what they own underground. There are some 20 systems in this example. You can't see them, but you sure do want them to work, especially in a place like a hospital.



Some of the systems are interconnected and require specialized maintenance. Owners who have an issue with number 7 may call a plumber and think they have solved the issue. However, the plumber may not know the other 19 products in the system even exist. Nor are they compliant in specialized stormwater systems.

Owners would be well served to call an expert in stormwater solutions. They can get the drawings, access the systems and provide compliance for all 20 products, not just one piece.

The more you can do upfront, the more you can head off future challenges. Use proven, safe, dedicated stormwater equipment and expertise.

Oldcastle Infrstaucture is known for their stormwater products, solutions and maintenance programs specially designed to meet the ever-changing regulations that protect our environment.

To learn more, scan the QR code or visit the link below.

oldcastleinfrastructure.com/maintenance-infrastructure-services/?utm_source=APWA&utm_medium=white_paper&utm_campaign=maintenance_infrastructure_services

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