Drainage Solutions For Water Woes

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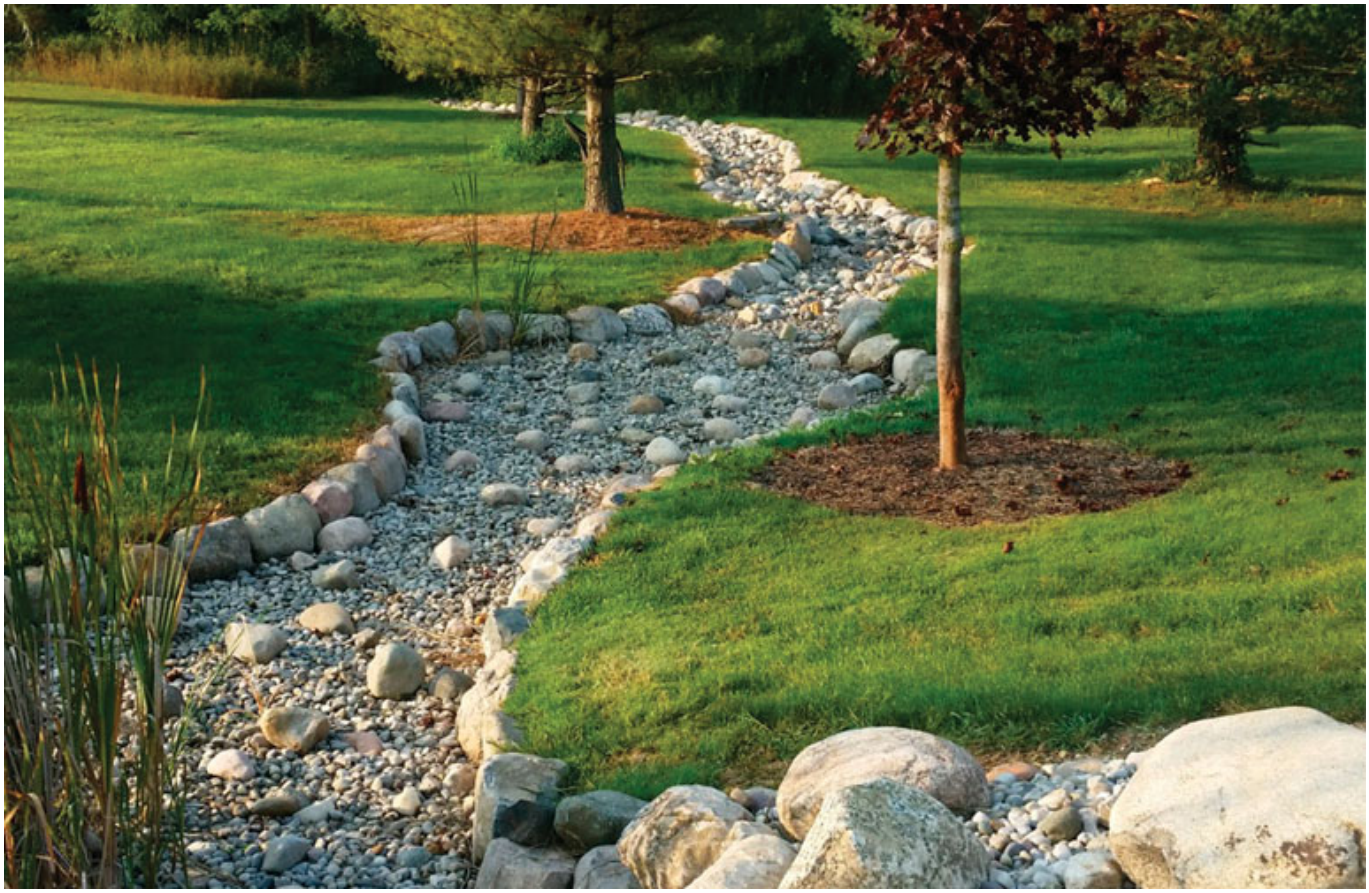
[dropcap]A[/dropcap]s temperatures warm, winter snow melt and spring rains can saturate properties with excess water. Most landscapers have seen firsthand the damage that can be done by one of nature's most powerful forces. The same water essential to helping plant life flourish within any landscape also has the capability of killing those plants, destroying building foundations, flooding basements, cracking cement, and producing harmful mold, mildew, and other bacteria.

My company, Twin Oaks Landscape, of Ann Arbor, MI, began putting a focus on drainage back in 2003. Though we had been a successful full-service landscaping company for a decade, we were looking to find a niche that would separate us from other companies. That's when we learned the important role drainage solutions play within the landscaping industry. Through the help of civil and geo-technical engineers, we began educating ourselves on drainage solutions and have continued those partnerships to this day. Our engineers evaluate and assesses each site to determine the specific drainage problems and recommend solutions, and our staff continues to focus on drainage solution education.



A dry river bed, like the one seen here created by Twin Oaks Landscape, can help catch excess water for better drainage on a property. (Photo: Twin Oaks Landscape)

Over the years, we've found two main factors commonly contribute to the water damage caused by improper drainage on a property:

Overland flow system (more commonly known as surface runoff). The original design of the overland flow system can be easily interrupted by the addition of buildings—like garages, sheds, or other structures – or other landscaping elements. When these elements are added into the equation, the proper flow of water is disrupted, and the consequent damage results. Water may begin to pool in yards, flow toward buildings instead of away from them, and affect the underlying soil that supports the landscaping and buildings. Existing storm water management systems can become temporarily useless when this happens.

Improper drainage planning or implementation. This is especially common in newer housing developments built around 10 years ago. Poor planning or implementation has played a significant role in many drainage problems. Due to the economic events surrounding 2008, many lots were left empty and builds left unfinished. This consequently led to numerous drainage problems once construction resumed later on. Poor quality products used in these builds fail easily, and water that was left pooling caused significant damage to the ground and landscape.

Who Is The Client?

Are your landscaping clients primarily residential, commercial, or Homeowners Associations (HOAs)? The drainage needs, and therefore water damage concerns, can vary depending on which category a client falls into. These unique needs and specified solutions need to be addressed carefully and thoroughly in order to prevent or limit future water damage issues from developing.

Pictured on the left is an old, failed trench drainage system. To the right is the new system Twin Oaks Landscape installed behind approximately 10 residences in a condominium complex. (Photo: Twin Oaks Landscape)

- Residential customers often find that drainage concerns develop due to landscaping or structural problems like yard grades, ineffective downspouts, improper sump pump discharge, and poorly functioning drains.
- HOAs often experience water damage from improper drainage due to the individual drainage systems that are constructed for the association itself. Capacity limitations and other outside factors contribute to the failure of these retention/detention ponds. Retention/detention ponds are part of the infrastructure and often require semi-annual maintenance.
- Commercial clients often experience water damage and drainage failure due to the more public nature of their drainage systems. Parking lots, sidewalks, landscaping, and building foundations are often damaged due to failed catch basins, cheap pipe, and negative grade.

There are many ways that these varied client drainage problems can be addressed, so landscapers need to assess the specific problems that are unique to each situation in order to deliver a solution.

Residential Customers

Those living in residential homes often find themselves the unfortunate recipients of water damage due to poor drainage. Whether there is too much or too little water left in a yard, the damage can be devastating to a property.

Older homes, built more than 40 years ago, frequently suffer water damage today because of failing drainage solutions put in place decades prior. These homes most likely were not built with sump pumps underneath and rely on

foundation drains to divert water away from the house and toward the street. When these become clogged, damaged, or fail in any way, excess water can cause flooding and damage to everything around it. In addition, frost heave from standing water is a major threat and cause.

Other sources of drainage problems commonly found on residential properties can include: clogged downspouts and gutters; lawn grades that are sloped toward the home; leaking egress windows or window wells in basements; soil erosion; leaky irrigation systems; improper sump pump discharge; and a cheap drainage pipe within clay soils.

Homeowners Association (HOA) Drainage Systems

In residential areas located in urban settings, the city or municipality typically maintains the primary drainage means, such as the sewer and sanitation system. But in a HOA complex, the association usually has its own dedicated drainage system. This drainage system usually features a retention/detention pond to store stormwater overflow from the homes and yards. Large drains or ditches that pass through the neighborhood can also serve as a drainage point for surface water.

Pictured on the left is a drainage system on a site managed by a homeowners association that had become overgrown and was no longer effective. To the right is a maintained stormwater management solution. (Photo: Twin Oaks Landscape)

However, these systems come with limitations. The size and content capacity of these retention/detention ponds can restrict how much water can remain inside at a given time. If weather patterns produce too much snow melt and/or precipitation, it can cause ponds, ditches, and drains to overflow. As a result, these shared community drains often require ongoing maintenance to ensure pathways remain functional and unobstructed from debris.

If you are already servicing a HOA, this stormwater infrastructure maintenance can be a logical upsell. Explain to the client that adding preventative drainage solutions into the annual budget and membership fees will help curb the expense of a potential emergency visit and any resulting damage. At Twin Oaks, we have a multi-year agreement with a local community encompassing over 1,300 homes and 11 condominium associations. The scope of work includes, but is not limited to, maintaining their stormwater ditches

and retention and detention ponds.

Commercial Business Accounts

Clients who fall under this category may have significant damage caused in part by the drainage catch basins serving the property. These catch basins, also known as storm drains, collect and direct water away from sidewalks, parking lots, buildings, and paved streets, and into underground waterways and sewers. The main reason catch basins can fail is because they become clogged with leaves, debris, and foreign objects. Blocked sewer lines can also cause a backup in catch basins and may cause catch basins to break down over time. Or simply, Mother Nature dumps more on us than what the drain was designed for.

When catch basins/storm drains fail, simply speaking, flooding starts to happen. Flooding around a commercial property can cause a variety of problems: damaged sidewalks, parking lots, and other paved areas; destroyed landscaping and plant life; compromised structural building integrity; hazardous entrance and egress conditions; property damage if water enters the building; and frost heave around the foundation during winter months.

Providing Drainage Solutions

When called in to assess water damage and drainage concerns, it’s important to examine all possible areas of cause. One area of concern could easily turn into several problem areas that need amendment. The goal is to find the drainage solutions that will best assist in alleviating the issue and implement them in a way that makes sense to the client. In general, the landscaping staff must understand the original intent of a system in order to understand and provide a solution.

First, though, landscapers must understand the existing soil conditions by conducting the following: soil boring tests (substance of the soil: sand, clay, gravel, etc.) and soil infiltration tests (how fast water dissipates into the soil) to determine the conditions.

Based on the test results, the following solutions are the most effective approaches:

Yard re-grading. Every yard has some sort of slope to it. A yard with no grade or a minimal grade will result in standing surface water that collects or pools in the grass. A negative grade that slopes toward a home or building is even more problematic. Re-grading a yard to create a positive grade that slopes away from the home and directs stormwater toward an overland flow/central underground system is ideal.

Trench drainage. Adding underground drains can assist in redirecting surface water or ground water away from an area. These trench drains should ideally be installed in areas where excess water is pooling. They are constructed of three main components.

1. Piping—Trench drains contain perforated pipes to carry excess water

away. The perforations allow water to enter the pipe freely and then transport the water to another location, such as a storm drain.
2. Gravel—Gravel surrounds the pipe. Its porous nature allows water to filter down freely enough to ensure that any and all water can enter the pipe but slowly enough that the system will not be overwhelmed. The gravel should be round stone (3/4″) to allow the water to flow.
3. Fabric—Surrounding the entire trench is filter fabric. This allows water to pass through freely, but keeps out other elements like rocks and soil, which might clog the system.

Dry River Beds. These gullys, usually lined with stones, and edged with plants or grass, attract excess water in prolonged or significant rain events where you need to direct water from one location to another.

Swale. Similar to a dry river bed, a swale is a more subtle depression within a grade to direct water from one location to another.

Dry Well (French Drain). An underground structure designed to collect excess water. Its intent is to hold the water until it can reach the sand vein near the bottom of the system to dissipate back in to the sandy soil.

Sump pumps. Sump pumps should always be assessed to determine where they lead to (discharge exit). For sump pumps to be truly effective, they need to have a daylight exit, a place for the water to go where it will no longer interfere with the property (such as a storm drain or retention pond). Too often, sump pumps simply disperse water right back into the yard, creating an unfortunate cycle.

This downspout system avoids drainage problems by tying into a trench drain leading to a retention pond. (Photo: Twin Oaks Landscape)

Additionally, assess if the sump pump is working properly. A sump pump will generally only overflow if the pump itself ceases to function or is clogged with debris. Therefore, explain to your client that a little maintenance can go a long way.

Another crucial measure to avoid overflow is to include a float switch or a sensor to shut the machine off once the water within reaches a certain level. Finally, if there is no sump pump, consider if one needs to be installed. If so, choose a non-corrugated pipe, and make sure it's a Schedule 35 or better. The last thing a landscaper wants is for a client's discharge pipe to freeze or be invaded by a tree root. A backup battery for the sump pump is also a very good idea since storms, which create excess water, may also coincide with power outages.

Downspouts and gutters. These two systems are some of the most common culprits of water drainage problems. Leaves, sticks, ice, or debris can easily clog gutters, and downspouts often become homes for rodents and other small animals. These clogs can lead to water leaking inside the home, wood and structure damage, flooding in and around the building, and an infestation of grubs, earwigs, and other creatures in the organic-rich soil. Simple, regular maintenance and cleaning of gutters and downspouts can quickly eliminate these problems.

Even unclogged, some downspouts simply dump water into a yard, often near the building foundation. If this is the case, augment or alter the system with a daylight exit.

Soil, Aeration, and Plantings. Barren soil creates an unobstructed channel for water and leads to erosion problems. By the same token, soil that is overly compacted may not allow the water to easily seep into the ground, adding to standing water problems. This can be especially true, and problematic, if a client's soil is composed primarily of heavy clay. Aeration and possible amendment to create more porous soil, as well as grass that is in tip top shape can help to eliminate standing water by essentially slowing down runoff and providing a place for drainage. So, too, can adding thirsty plants and trees, or installing a rain garden, in the right location.

Speen is the owner and general manager of Twin Oaks Landscape, a full-service lawn and landscaping company serving Ann Arbor, MI and surrounding regions. With more than 20 years of experience in the landscape industry, Speen shares a passion for creating and maintaining beautiful outdoor living environments. He is committed to providing reliable landscape services to residential and commercial clients through his experience, adaptability, and loyalty, and he provides the education necessary to understand and help maintain their landscaping beauty.

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