Tall, narrow systems worth a look

Narrow Trench Installation Technology means a narrow trench, a narrow product, good flow rates, and extended life span.

Good drainage to turf managers is like a doubleplay to pitchers: a best friend. While not a sizzling topic in conversation, drainage is so important it can make or break a field.

While the basic design of narrow and tall, or what some refer to as "panel" drains or "vertical" drains, has been around for years, many of the early products had open cores that led to poor flow capacity and higher structural failure rates. Today's second generation of these systems are fundamentally different and instead have enclosed cores that provide structural integrity.

Gravity-operated drainage systems create paths of least resistance that allow excess water to leave the soil. "A system should remove only excess water that the soil can't hold," says Arnie Plowman of Varicore Technologies. "A lot of people believe that all the water is removed [by drainage systems] but it is not. Drainage only brings the soil water level down below the saturation point."

Plowman's company manufactures Multi-Flow systems. He says the benefits of his product's design, like all panel-shaped drains, include increased surface area in contact with the soil and, because it is placed in a narrow trench, it is cheaper to install. "But the Multi-Flow design features enclosed flow channels which creates a stronger, faster flowing product," says Plowman. "It can be closer to the surface, moving water faster, without being crushed by traffic."

Backfill Multi-Flow with clean sand, he recommends, which acts as a filtration system for fines in soils. Different soil types offer corresponding challenges for turf managers, and drainage is a big part of it. If you've got a sandy loam, you can drain it with lines farther apart than in a clay soil. "We use slightly different techniques for different drainage patterns," says Plowman, and adds that that's the case with all systems.

Keys to good installation

Arnie Plowman, head of technical sales for the Multi-Flow system, says there are four keys to getting a good drainage system installation:

1. Choose a product with adequate flow rates.
2. Have an adequate system layout design that meets your specific recovery time preferences.
3. Get the grading correct for your drain lines.
4. Make sure the transport system for carrying water away from the field is designed well so it won't become a bottleneck to your drainage performance.

Installation

Plowman says his system can be trenched in using a 4-inch width. "Many customers see our system, the flow tubes and the filter and think it will be expensive. But because you can install the system efficiently you can save money," he says.

Installation time is difficult to gauge, says Plowman. "If you bring enough people to the job it can be done in 2 days. It's not rocket science; I've seen it done by volunteers. Most maintenance staffs can handle it, though bidding it out is always an option.

"Our design functions to get rid of water in minutes. We can affordably lay out a system designed to handle 1-inch per hour rainfall events," he says.

Plowman says the life of a drainage system directly relates to its surrounding soil structure and the velocity of water as it moves into the system. Lots of variables play into this but suffice it to say, if your drainage system needs to be replaced, you probably need a new field. "For all the millions of feet of system we've sold we've never heard of an internal clog," he says.

Hydraway system

Jim Surrell, sales manager for Hydraway, says his company's drainage system has a designed trench width of 2 to 4 inches by 12 inches deep (for 6-inch product) and 24 inches deep for 12-inch in vertical installations. If the field is deep tined then the depth will be deeper, he says.

"Traditional pipe only allows 3-5% of water in per foot due to the small size of the openings in the pipe. Our system allows for water penetration of up to 90% of water per foot. Our core design creates an opening of more than 66 square inches per square foot. This is an incredibly fast intake of surface water," Surrell says.

"Our geotextile fabric is designed for high volume of water. We use a 4.5-oz non-woven that resists fines and clogging. The fabric is 'heat fusioned' bonded, not glued to, the core," Surrell says. "This allows for a secure system. The geotextile is approved for most DOT applications. A typical traditional drain system clogs due to the small openings and clay fines that pass through the rocks around the pipe."

The Hydraway 2000 drainage system is made of high-density polyethylene (HDPE) and can exceed its 9200 PSF rating. "HDPE has higher compressive strength than polypropylene and it resists chemicals," says Surrell. "And our core design promotes more water flow.

"We recommend for backfill a 'coarse' sand to be an added filter for clay fines in the soils," he says.

Installation

Is a contractor required to install or can turf managers do it themselves? Surrell says it depends mainly on the application and the amount that needs to be installed. "I have several customers who have the manpower and the equipment to install themselves. For example, the University of Michigan recently installed a few thousand feet with their own crews using a simple 4 x 12-inch trencher," he says. Hydraway has templates that will aid in a successful application depending on the slope and design of the field.

"There are contractors who have special equipment to install Hydraway that will trench a 2-inch trench up to 24 inches (depending on the application), remove the spoils, and install Hydraway in one pass," Surrell says. "Then a second piece of equipment comes behind the first installing the coarse sand via a hopper system. These contractors can install about 3000 lineal feet a day.

"If turf managers are simply removing water in selected areas, they typically will install themselves. If it's a new field install or a complete renovation is when a contractor who has the equipment to install our system is chosen."

Proper planning and selecting the right back fill is key to a successful installation, Surrell says. "I can't emphasize enough that short cuts should not be taken when the backfill is selected." ■

TECHNOLOGY UPDATE: rain sensors

SportsTurf asked Jeff Kremicki, product manager-controllers/sensors, for Hunter Industries to share what's new in the world of rain sensors:

ST: How do rain and moisture sensors work?

Kremicki: Sensors for commercial irrigation systems include rain, freeze, wind, and flow sensors. Each sensor is designed to activate or deactivate automatic irrigation when it reaches a threshold level.

Rain sensors are the simplest and most effective way to prevent sprinklers from coming on during or after precipitation. Our models at Hunter can be easily installed on any automatic irrigation system. They shut the sprinklers off in a storm and keep them off, automatically compensating for the amount of rainfall that has occurred. There are disks inside the rain sensor that absorb water and expand proportionally to the amount of rainfall that fell (e.g. a small cloudburst would result in little absorption, a large thunderstorm would lead to more absorption and expansion). As moisture-laden disks expand, they eventually activate a switch that interrupts the circuit from the controller to the solenoid valves. Once they dry, the disks contract and release the switch. Thus the rain sensor resets automatically without affecting your controller.

The Rain-Clik model overcomes an issue inherent with most rain-sensing devices that must first accumulate a set amount of rainfall before a switch is activated that interrupts watering. In that "accumulation time," the system will continue to water, giving the appearance a precious resource is being wasted, which is exactly the opposite impression a turf manager would like to convey. This model can command a controller to shut off immediately, not after a quarter- or a half-inch, but right when it starts to rain.

ST: Is there a certain level of irrigation system turf managers must have to employ these sensors?

Kremicki: You will find these sensors on irrigation controllers ranging from a small residential controller up to a large commercial controller. Many controllers on the market today are designed with sensor terminals that can support one or more sensor inputs.

ST: How can turf managers use this tool to his or her best advantage?

Kremicki: Install them! They are really a cost effect way to save water and prevent potential site damage. In addition to rain sensors, flow sensors can prevent significant site damage due to a ruptured pipe or broken sprinkler that is left undetected. These sensors can help identify a break and shut the irrigation off before any damage can occur. Freeze sensors can prevent systems from activating by automatically stopping the flow of water when the outdoor temperature drops to near freezing.

ST: Where's the technology with these sensors headed? What are you developing now?

Kremicki: Irrigation sensors have been around for many years. Their popularity is due to the ease of use and cost effectiveness. We've evolved the sensor product line from sensors that are wired directly to the irrigation controller, which are still in use today, to sensors that send wireless signals to the irrigation controllers from up to 1,000 ft away.

For example, our wireless rain sensor attaches by simply installing the receiver unit next to your irrigation controller, and then installing the transmitter anywhere that the device can receive representative rainfall. No ladders needed to attach to a high outcropping on a building, no messy wires to hide out of view, and the transmitter can be placed out of reach of vandals.

Hunter has also spent a significant amount of time developing and testing new sensors that actively take over the irrigation scheduling of controllers.

The Hunter ET System uses a sensor that gathers weather data on site, and continuously self-adjusts to calculate the ideal program for your field. This type of sensor takes the guesswork out of irrigation scheduling, by using your own state-of-the-art weather station to track your local microclimate and automatically calculate a scientific irrigation program.

Your local Evapotranspiration (ET) factor, the combination of two separate processes whereby water is lost from the soil surface by evaporation and from the plant by transpiration, can be taken into account. Measuring the rate at which water is consumed by weather conditions, the ET System will initiate a new schedule to replenish only the water that is actually needed for your sprinkler system, plants, and soil conditions. ■