

New Twists In Drainage

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AFTER several years of testing in different types of applications, turfgrass research centers in universities across the country have realized that the old standard of a four inch diameter in drainage tubing may no longer be necessary.

The possibility of using two inch laterals for football fields, golf course drainage, baseball diamonds, tennis courts and other recreational and outdoor activity areas has been extensively evaluated. Drainage tubing manufacturers like Hancor, Inc. began to take note of these developments and started to study the type of tubing needed to make two inch installations practical for general use (excepting agricultural drainage where four inch is the primary size used).

The Purr-Wick golf course green construction design and the PAT System football field drainage design were made using two inch drainage material. However, during the inception of these two designs, nothing was available on the market that did not require a specific filtering device wrapped around the pipe to prevent silt buildup.

Then too, on golf courses where traps and other sandy areas are en-

countered, it was necessary to wrap the pipe with a sand filter (fiber-glass, tar paper, etc.) to avoid a buildup in the drain lines.

In 1970, Hancor helped eliminate these drawbacks by developing a sand filter slot design for two inch corrugated tubing, as well as a wide slot design for use under heavy soil conditions.

Today, two-inch tubing means easier installation for dozens of projects, partly because of its light weight (approximately 72 lbs. per 500-ft. roll). Installation costs are further reduced because a three-inch trench will accommodate the 2 $\frac{3}{8}$ inch outside diameter of the tubing. Previously, installations with larger diameters (specifically 4 inch) required a trench at least six to eight inches in width. Therefore, if the job was done on existing landscaping, it meant considerably more displacement of soil in digging and installation than with two-inch tubing in its narrower trench.

In many of these drainage applications stone or gravel backfill is called for. The amount required to backfill a three-inch trench with two-inch tubing in the bottom is, of course, half or less the quantity

needed for the four-inch pipe's deeper, wider trenches.

GOLF COURSE LABOR SAVER

Two-inch tubing is being used in original golf course drainage for laterals within a herringbone design. With four inch as the main line, the two inch can be safely and effectively used in lengths of up to several hundred feet in place of the larger tubing. Golf course greens, sand traps and fairways that undergo repair drainage can utilize two-inch tubing with less disturbance to the existing landscape, thereby making the course playable more rapidly after construction is completed.

In regard to golf course applications in general, it is most important to remember that irrigation lines and drainage lines need to be planned together; an irrigation system can only be as functional as the drainage system adjoining it. The entire design must interact, not only to make the best use of irrigation water, but also to drain excessive water after heavy rainfalls and facilitate faster dry-up so that players may enter the course without delay.

DRAINAGE FOR SPORTS FIELDS

Modern day football fields with synthetic turfs have been the target of some controversy. One factor often brought out is the tendency for heat to radiate from the surface of artificial grass. Other characteristics include artificial turf's solid base compaction and inherent drainage difficulties. Consequently, a great deal of work has been directed toward improving artificial turf's practicality with respect to these various situations.

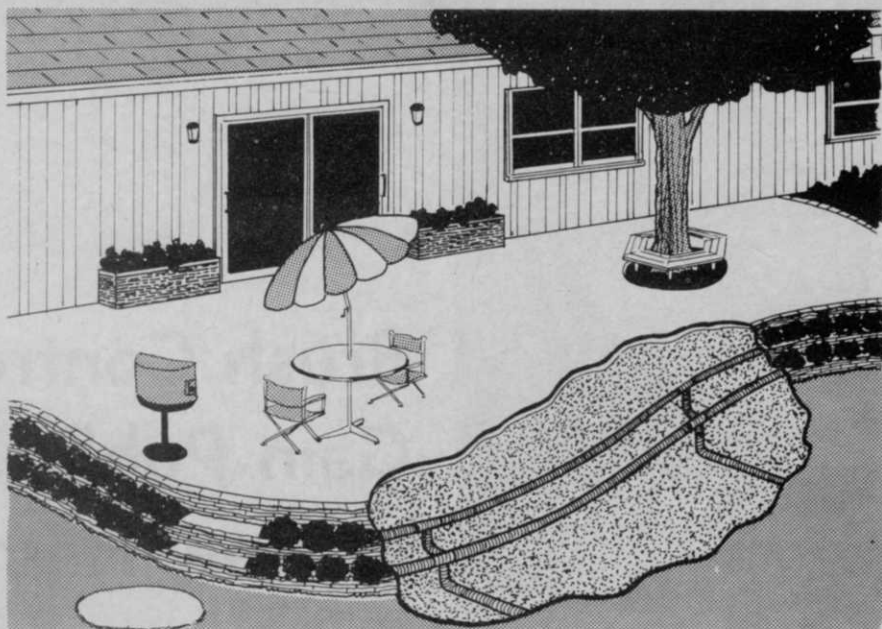
The development of the "Pat System" by the Purdue University Agronomy Department has shown that it is possible to construct a live turf athletic field utilizing a sand base, with proper drainage and sub-irrigation provided through a pump system that removes heavy rainfalls through the soils.

In dry seasons or during playing times, water may be pumped back into the sub-surface soils. Under frozen conditions, the system can be used to warm the ground from underneath, providing players with consistent footing on a flat, live turf field. Just think of the possibilities for changing existing sports facilities in high school, colleges and professional arenas.

Many modern techniques and equipment involving mowing, aeration and turf maintenance are being employed today. To be truly effective, all of these new methods require a good base—and that base is efficient drainage. Two-inch Turf-flow Tubing is being used in commercial and residential landscape plantings, as well as in lawn drainage, tree plantings and any other areas of potential application where it is capable of handling the water present at heaviest rainfall.

University studies undertaken throughout the United States wherever four-inch tubing had been used in recreational, athletic and general landscaped areas have shown that four-inch tubing generally does not run full, even during the heaviest rainfalls. These studies would clearly indicate that two-inch tubing, while running full, can serve the same purpose with lower installation costs, easier handling and less disturbance to the existing landscape.

We should note that good drainage systems are essential not only for heavily saturated areas, but for limited rainfall zones as well. Underground drainage tubing offers an excellent means of controlling local water tables and carrying off any excessive moisture.



OTHER USES

Foundation plantings also require good drainage. Generally we have found that none is installed specifically for the purpose of taking care of the plants. Usually, the foundation drainage system itself, three to four feet underground, is required to take care of subsurface drainage only. In many such cases, there may also be compacted clay soils present to slow the water movement. One easy method of giving life to these plantings starts with digging a small trench twelve to eighteen inches

deep. Place wide slot two-inch tubing in the trench and backfill with gravel to near surface level so that water leaches into the gravel quickly instead of ponding around plants to cause shallow root growth and plant deterioration.

Commercial parking areas with landscaped islands are a constant worry to the landscaper who plants them and must guarantee them for at least one year. Often no provisions have been made during the construction to drain these areas

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Capsule History of Drainage

The first instances of planned drainage systems are obscured in antiquity, but we do know that water embankment and irrigation systems were built by the ancient Egyptians and Babylonians many centuries before the birth of Christ.

Drainage as we know it in round tile form came to this country from Scotland in about 1838. The original tile was actually a horseshoe-shaped tile from which many different patterns and variations evolved over the next 100 years.

During that period, it is said that much of the tile used in the eastern and northeastern U.S. was made in diameters of from one to two inches for laterals and four inches for mains. In the late 1880's, the four inch diameter was adopted as the standard size for laterals, due to its ease of manu-

facture with the machinery available at the time.

Tile proceeded to be manufactured in four inch diameter for many years from clay and other similar materials. Concrete tile was introduced in the 1900's, followed some years later by the development of long, rigid plastic-type pipes. These basic drainage materials have been used throughout the U.S. in subsurface applications for agriculture and athletic facilities.

In the mid-1960's corrugated plastic drainage tubing, flexible and lightweight, was beginning to show its influence on the U.S. drainage market. Research conducted with the new tubing showed it to be satisfactory as a replacement for other types of materials. And by the late 1960's, corrugated tubing's light weight, flexibility and ease of handling had won ready acceptance.

NEW TWISTS IN DRAINAGE

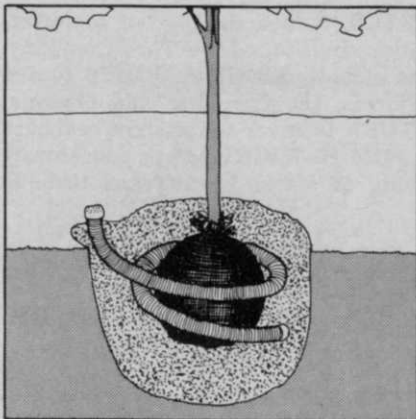
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which literally turn into ponds after a heavy rainfall. Corrugated two-inch tubing can be installed in shallow drainage beds to carry water off into a dry well of gravel underground or into existing drainage.

New playgrounds, senior citizen recreational areas, apartment landscaping and a whole range of outdoor athletic facilities all demand attention to proper drainage in order to keep maintenance costs at a minimum.

Flexible two-inch tubing also lends itself well to various irrigation drainage projects. It is now possible to spiral tubing around balled and burlapped tree roots under ground in order to provide the plant with a "built-in" water reservoir during times of heavy rainfall. A constant supply of oxygen (especially important for the propagation of new root growth) is made available to the balled area through the spiralled tubing which opens at or above ground surface level. Nutrients may also be introduced through the tubing's top opening to disperse slowly around the root ball.

The 1970's have brought a completely new picture to drainage and its application. The materials are now modern, easy to handle, lightweight and inexpensive. With today's trenching equipment and lightweight corrugated tubing we can now work on projects where the problems of handling heavyweight materials once made even getting



near the job sites impossible.

A properly installed drainage system will work efficiently, inexpensively and dependably for many years. As the one element in a landscaping operation that does not require constant watering, feeding, repairing or replacing, it should reflect your careful planning and consideration. Remember, "Drainage doesn't cost, it pays." □



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