

Canoe Restoration in Minneapolis as it was beyond his expertise.

“Come back when you need new seats and varnish,” he said as we left.

Phil at UC was equally quick with an assessment. Much to the delight of my father, we (I) would likely be able to restore the vessel (he could hardly wait)...with a lot of elbow grease (he would have nothing to do with)! Dad was happy about the prognosis and I very excited, however not looking forward to the effort ahead. Back to his shop we went with new vigor.

For the last several weeks my fingers have been worn raw hand sanding new seats, a thwart, the gunwales and many, many ribs, which provide the canoe its strength as well as resiliency. There are no tools on the market for taking down the aged finish and preparing the steam bent surfaces for several layers of new varnish. Therefore, I have lost my fingerprints first with 180 grit sandpaper, followed by 280 and then 400 between the coats of marine grade finish.

Besides a finely prepared surface, hand sanding provides time to think.

My mind did wander and eventually I landed upon a theme; perhaps it was the season that brought my thoughts to thankfulness.

To be who I am, where I am and when I am at this moment in history is of great comfort. Food is abundant, my house warm, aggression nonexistent and love readily available. I am healthy, educated, free from addiction, old enough to appreciate what opportunities I have and young enough to dream of more. My vocation is very satisfying and something I really enjoy doing. Although my senses are not what they used to be, I can still watch a flock of cardinals upon the feeders, hear distant thunder in the summer, smell fresh, cinnamon and sugary, baked caramel rolls, taste rich strong coffee and feel the smoothness of hand sanded cedar.

On occasion my father will watch me work as he takes a break from puttering at his desk. A great American Hero, I owe him more than he will ever appreciate; my freedom, independence, perspective, drive, humility, intelligence, common sense, retentiveness, humor and likely good looks. A hard man, he was and sometimes still is a real pain in the ass, one trait I temper on my

own. In general however, he is a good individual who I am thankful to have in my life. However I currently wish he could still sand.

Each layer of varnish removed and reapplied has taken me away to the sky blue Boundary Waters. Although this canoe would be my solo craft, I contemplate with happiness, fine memories of northern adventures with my children, wife and friends. I am thankful to be surrounded by incredible people who provide me with both tangible and abstract support. With contained excitement I look forward to the three “F”s associated with my BWCA; food, fish and of most importance, friendship.

Seats installed and interior complete, ribs re-formed and thwart in place, the vessel is taking shape. My imagination puts me over twenty feet of cool and clean water, the call of the loon keeping me company, my watchful eyes always looking for moose along the shoreline. With luck this year will offer a long solo trip, time to contemplate my lot in life and reconnect in-depth with my Higher Power.

I am infinitely appreciative for my spirituality. Having worshipped under

several roofs of different denominations, comfort comes easy to me as I give thanks for the many miracles in my life and pray for others to witness the wonders of faith. Non-theological, my ideology is very personal and based upon the experiences I have lived.

Who I am, where I am and when I am interrupt me as I contemplate re-surfacing the exterior of my watercraft. Sanding dust mixed with resin will heal the injuries and several coats of two-part, red tinted varnish will almost finish the project. Just a new name on the bow, of course I will keep in the tradition of my father and prefix her name with a “Mac’s” and suffix her name with an adjective beginning with the letter “F”.

Through the years there have been red canoes named Mac’s Fury, Mac’s Folly, Mac’s Favorite, Mac’s Fourth and Mac’s Farce (a sailboat!). In perspective I realize each name reflected a stage in my father’s life. Hmmm, I believe my craft will reflect my “now”...Mac’s Freedom.

My family and I wish each of you a very Merry Christmas and Wondrous New Year ahead.



You Are Invited!!!

Beer and Pretzel Social

at the Northern Green Expo

5:00 until 6:30 on Wednesday, January 8th in the Rotunda of the Minneapolis Conference Center.

Come on by and have a beverage and hand snacks with your peers before you hit the town.

FREE *Free* FREE*

Hosted by the MGCSA and the
18 Hole Challenge Sponsors.

* until the beer runs out!

Taking Your Pulse; Maintaining the Heart of Your Golf

By E. Paul Eckholm, CGCS



In part I of this series we looked at the foundation of an irrigation system, the water supply and the pump house. In this article we will look at the next link in the system, the pipe and sprinkler heads. This is the part of the system that non-professionals will at least sometimes see. What we tend to see is that irrigation systems are the forgotten piece of the puzzle when it comes to turfgrass maintenance. Many people look at irrigation and think that if the water comes out of the head everything is good. Nothing

could be further from the truth. We as professionals need to realize and communicate that, for the system to be truly efficient and useful, periodic maintenance, repairs, upkeep and occasional updating of the system must be done.

Piping

Irrigation system piping has come a long way in the past 50 years. Many different types of pipe materials have been used for irrigation systems and each has had its own positives and negatives.

Course Part II



Some of the products that may be found currently in use on golf courses are:

- **Transite** - A cement asbestos product, developed by Johns-Manville, used for its strength and long life. The downfall of the product was the asbestos component which when broken or cut would be released to the air and has been demonstrated to cause cancer. It was also difficult to repair when broken. This type of pipe is now considered hazardous waste and needs to be handled specially.
- **Steel and Ductile Iron** – Strong, cheap and abundant. Rust and corrosion of steel and overall weight are the limiting factors with these products. The ductile iron products are still very common in the irrigation industry, mostly used where a strong fitting is needed and the plastic materials will not withstand the forces placed upon it. The type of graphite used in manufacturing of ductile iron makes it much more resistant to corrosion than standard steel.
- **Galvanized steel** – The galvanization was intended to help slow down the oxidation of the steel and the eventual failure of the pipe due to corrosion. The problem is that the minerals in the soil react with the galvanization and accelerate the corrosive process. Also difficult to repair if a hole developed.
- **Copper** – Much better anti-corrosive properties than the Galvanized steel, however, cost proved to be the limiting factor.
- **Brass or cast bronze** – used

mainly for irrigation heads and valves. These products have excellent anticorrosive properties, are very strong and last a very long time. The negatives include cost and brittleness. Brass and bronze heads being replaced with plastic can easily be taken in for scrap and generate a significant amount of cash.

- **Thermoplastics** – This category includes polyvinyl chloride (PVC), polyethylene (PE) and the newest high density polyethylene (HDPE). These products have been the mainstay of the irrigation industry since the early 1970's and are now probably the most commonly found piping products found on golf courses. They are strong, long lasting, and easy to install and re-

pair. Additionally they are light, corrosion resistant and have excellent insulating capabilities. The downfalls of these products are improper fusion of the pipe, improper pipe rating and overall lack of knowledge about the product and its proper use.

A quick word about pipe ratings:

- **Schedule rating:** The schedule rating is a number relating to the wall thickness of the pipe. There is no official correlation between wall thickness and photopressure ratings.
- **Class rating:** The class rating is a pressure rating for normal



Superior Turf Services, Inc.

Superior Organic

DESIGNED FOR PERFORMANCE, HOMOGENEOUS PRILL.
THE FINEST IN COMBINED TECHNOLOGIES.

<p>Country Club</p> <p>Lebanon TURF PRODUCTS</p> <p>NX-PRO COMPOSITE TECHNOLOGY</p>	<p>8-2-18 Plus Greens & Tees BEST PERFORMANCE</p>	<p>14-0-14 Fe Fairways & Tees TOURNAMENT FAIRWAYS</p>	<p>14-0-7 Greens, Tees & Fairways FAST RECOVERY</p>	<p>11-11-11 Starter & Divot Mix ORGANIC & MINERAL</p>	<p>BIOPRO</p> <p>Biagro Western Nutri-Grow 2-0-16</p> <ul style="list-style-type: none"> • Low Rates • Higher Active Ingredient • Patented Technology
--	--	--	--	--	---

PrimeraTurf

SEED RESEARCH

GENETICALLY SUPERIOR BENTGRASSES FROM THE WORLD'S MOST COMPLETE BENTGRASS PROGRAM

FOR SUPERIOR TURF SERVICES, CALL:

<p>Larry Thornton 612-804-1692</p>	<p>Matt Schmid 612-366-4128 Fax: 952-949-3889</p>	<p>Doug Zobel 952-201-9499</p>
---	--	---

operating pressure. This number does not have a standard for surge pressures or water hammer.

- **SDR** (Standard Dimensional Ratio): this number is a ratio of the pipe diameter to the wall thickness and is a standard ASTM number. Since it is a ratio, the numbers are backwards, ie. The higher the number the thinner the pipe wall.
- As a general rule think of schedule numbers for fittings, generally schedule 40. Class 160 pipe is normally SDR 26 and Class

200 pipe is normally SDR 21.

Once you know what type of pipe is in the ground, the next factor to consider is the pipe sizing. This can usually be determined by looking at an as-built drawing of the system. If you are lucky, there is a very good one of these on the property, if there is not, you should start to develop your own by making notes every time someone digs a hole and finds pipe in the ground. With the knowledge of what is in the ground a superintendent can determine if there is enough capacity to add additional lines to areas previously not irrigated.

Without this knowledge, the risk is that additional heads will either cause too much water flow through a pipe exceeding the flow rating of the pipe or there will not be enough water capacity to operate the heads properly.

Irrigation designers spend a large amount of time making sure that there is proper pipe sizing for the system as designed. If there are plans to add additional areas of irrigation at a later date those considerations should be planned for in the initial design. Adding lateral lines to a system designed for additional output, is a lot easier than adding new main lines to increase capacity. It may seem like a simple thing to pull in a bunch of additional piping to add heads to a previously non-irrigated area, but the calculations necessary to add that additional pipe is more than measuring the length of the run and counting the number of heads. That is if you hope to have it work efficiently and effectively.

Knowing what type of pipe, the size of that

pipe and where it is, can make a superintendents life easy or hard. With the proper knowledge, repairs can be coordinated efficiently, extensions can be made where necessary and updates can be justified.

Sprinklers

The golf course sprinkler is the one piece of irrigation equipment that is visible to the public. From the beginning the goal has always been to distribute irrigation water evenly across the entire wetted diameter of the throw of the water. As with pipe, there are a number of different products and materials in use on today's golf courses. The earliest golf course sprinkler was the impact sprinkler. A product originally developed for the



agriculture industry, the impact sprinkler forever changed the way golf courses were irrigated. We still see today many courses watering with impact sprinklers and the manufacturers still try to improve on a well developed product. This technology was eventually moved inside of a case that could be permanently buried in the ground and turned on individually or as a group.

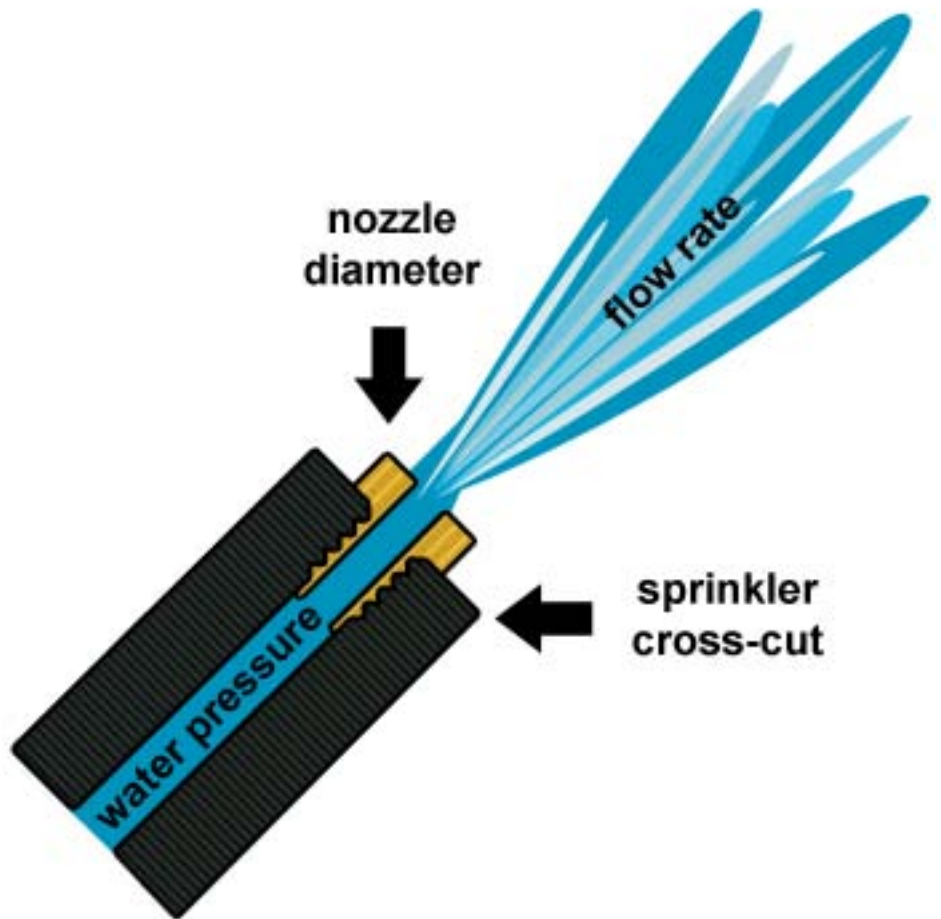


photo irrigation.wsu.edu

As with the above-ground impact sprinkler, the in-ground impact is a tried and true technology that still is in wide use on today's courses. When the engineers determined that there should be a better way of rotating the sprinkler around to improve the uniformity of the distribution pattern, the gear drive rotor was born. This technology was coupled with injection molded plastics to provide what we today see as the mainstay of new irrigation sprinkler heads. Add a valve in the bottom of the head and electric control and you have the

modern golf course irrigation head. Manufacturers continue to work with these products and what we will see in the future will improve control and efficiency.

All of these sprinklers have their place on the modern golf course. However, it is the job of the superintendent to look at how, when and where each of these products is used. As the cost of golf course operations continues to increase it is up to the management teams to help determine areas where efficiencies can be improved. Evaluations of the

sprinkler heads should be done on a continuing basis. Initial evaluation should look at the age of the heads, condition and placement.

As with all products, age will adversely affect the performance of the sprinkler. Wear caused by friction of water will wear out the nozzles; this can be exacerbated if the water is dirty or has large amounts of dissolved solids in it. Some nozzle wear is easy to see, some is not. The best way to determine if the nozzle is good after initial inspection is to conduct a catch can test. This will tell you if the nozzles are distributing the water evenly across the pattern. You do not need to do every head. If a given number of heads are found to be defective, many of them probably are and should have the nozzles replaced. If the head is physically damaged,

it should be replaced. Many times parts can be replaced without needing to replace the entire head.

Check to see if the head is properly placed to cover the area needing to be irrigated. Over time shapes of features on golf courses change. This can cause the irrigation heads to be in the wrong place. Many times they can be easily moved, other times more drastic measures may be needed. If the heads are not level the distribution pattern will be distorted. This seems

like common sense, but the pattern can vary greatly with just a very small tilt.

Delving a little deeper into the operation of the head can reveal some drastic

differences.

Turn the head on and observe the operation. How long does it take to come on? How long does it take



photo USGA Brian Witlark/Levelift