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Installing an Irrigation System with the Use of a Vibratory Plow

by Joel Purpur, Supt.
Bartlett Hills Golf Club

As the 1984 season comes to a close, project plans for the coming season become more concrete. If irrigation work is in the planning, you may want to consider using a vibratory plow and pull in the smaller diameter pipe.

At Bartlett Hills Golf Club we're installing a new irrigation system in-house. With a tight budget for course improvements, we decided that a single row quick coupler fairway system with manually operated pop-up sprinklers on greens and tees was the best we could do for the money available. Trenching the main lines and plowing in 2½" and smaller diameter pipe were the methods chosen for installation.

Fairways at Bartlett Hills had no irrigation, and with little topsoil on much of the course, I had my doubts on how well the plow would work through the dry, rock hard clay. With very little practice of vibration frequency versus ground speed, the worst of soil conditions were sliced with little problem.

Pulling in pipe is much faster with less mess and settling than trenching, backfilling, tamping, and sodding. Some say pulling in pipe causes permanent mounding, but if the depth of the "bullet" on the plow blade is kept at a desired depth of 18" - 24" very little mounding is left after driving over the area with the wide floatation tires or a heavy roller.

A case model DH-4 was rented from Case Power and Equipment in Bolingbrook. The machine is diesel powered, 4 wheel drive with articulate steering which is great for maneuvering over and around banks on greens and tees. The "bullet" on the bottom of the plow was about 6" diameter. A 6-8" chain coupled the "chinese finger" (made of braided steel strands) which slips over the pipe and pulls the pipe through the tunnel made from the vibrating bullet. A fence post cap fit perfectly on the end of the 2½" pipe, preventing the pipe end from being damaged and kept soil out of the pipe. The end of the chinese finger was taped which kept it tight and prevented soil from caking on the end of the finger making it easier to remove at each interval.

A trench about 6 feet long and 2 feet deep was made every 80 feet where each sprinkler valve and swing joint was to be installed. All soil was kept on plywood and slid out of the way until backfilling and tamping. 80 foot sections of pipe were glued the day prior to use to help prevent the pipe from pulling apart. With the fence post cap taped over the pipe end, the finger slipped over the pipe as far as it will go, and the finger end taped securely, the plow blade is lowered into the trench to the maximum desired depth.

The vibratory plow is not activated until pressure is put on the bullet or damage to the shaker box could result. As the bullet enters the ground the vibration frequency and ground speed are increased. One man assigned by stepping down on the pipe giving the pipe a straighter shot into the bullets tunnel. Ground speed depends mainly on the soil and turf condition. Deep rooted turf in a good soil will yield a higher ground speed than shallow rooted turf in a dry, hard soil.

Vibration frequency is determined mainly by how smooth the machine rides. If you're operating the machine and your teeth start chattering and your eye balls are about to fall out, this is

(cont'd. pg. 7)

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(Vibratory Plow cont'd.)

a strong indication you'd better vary the plow frequency!

Constant checking of the plow depth is very important as drifting up and down is common. The larger the pipe that is pulled the more important it is to keep as straight a line as possible. Too much friction may cause the tires to spin, the chain to break or the finger to slip off if ground speed is not reduced. If you become disconnected you have to dig it up and re-connect. This problem shouldn't occur once you get the feel of the machine.

When plowing from one trench to the next, as the plow blade nears the open area, ground speed is reduced and plow frequency is carefully observed so damage to the shaker box does not occur when the plow breaks through into the trench. When the run is completed, the finger is removed and the pipe is tapped back into the gasket fitting in the previous trench. Pipe ends were beveled, lubed, and carefully inserted into the slip fittings to prevent damage to the gasket. 1½" pipe could usually be slide through the ground by hand, but the larger pipe needed to be tapped by a sledge, with a board over the pipe end to prevent damage. Once the crew got the system down the process went quickly. Two holes can be completed in a week, valves, thrust blocks and all.

Pulling in 2½" and smaller pipe definitely worked for us and is cutting the project time considerably with a minimum of ground disturbance. Talk to others who have worked with vibratory plows, pulling pipe may also fit your needs.

MAGCS Survey

In response to the question in the MAGCS Survey concerning golf cart maintenance responsibilities we received the following answers:

- A. At the private equity owned clubs there were 9 superintendents who were responsible for golf cart maintenance and 29 who were not. There was only 1 superintendent who was compensated for this additional responsibility.
- B. In the privately owned and resort course group there were 10 responses and none of the superintendents were responsible for golf cart maintenance.
- C. In the municipal, park district, and forest preserve group there were 3 responses and these were also negative.

In response to the question of the employer providing a vehicle we received the following answers:

- A. At the private equity owned clubs there were 31 superintendents who were provided a vehicle and 7 who were not. Of those vehicles 24 were trucks and 7 were automobiles.
- B. In the privately owned and resort course group there were 12 superintendents who were provided trucks and 1 superintendent that was not provided a vehicle.
- C. In the municipal, park district, and forest preserve group there were 5 superintendents who were provided trucks and 8 superintendents who were not provided a vehicle.

It should be noted that in a number of cases where the superintendent was not provided a vehicle he was given a vehicle allowance.

MAGCS Survey Committee

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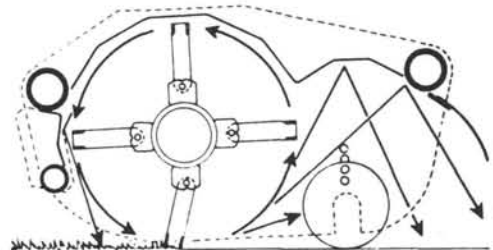


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