One of three removable sumps on the wash pad

Water quality management for the equipment wash area

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The equipment wash area has become a hot topic in recent years. Most superintendents' management styles are slightly different, but I believe we all want the same outcome, an environmentally conscious equipment wash area that functions up to our standards.

A couple of years ago, it seemed everyone was jumping on the band wagon and buying water recycling units. The recycling units were supposed to filter all contaminants from the water and recycle the water for reuse. The feeling was that the units were going to be the wave of the future, and someday they might be.

However, it seems that people are currently shying away from these units because of the horror stories that are being told by some of the original purchasers, not to mention the cost. I was told by one equipment technician that he spends one-third of this time working on their recycling unit. I also know of a golf course that bought a unit three years ago, and it has still never worked to this day.

I contemplated the purchase of one when I was designing our maintenance facility. I did not buy one, and with a few minor exceptions, I am very happy with the system we are using at Olde Florida. I am sure that this system would not work for everyone, but it is an option.

Goals

My goals of the equipment wash area are simple:

To be located in a convenient area that coincides with the desired flow of traffic.

The area to be large enough so at least three pieces of equipment can be cleaned at once.

The quality of water used to clean equipment be free of any damaging compounds that might cause premature corrosion or deterioration of the equipment.

The availability of compressed air for use on electrical components or other needed parts of the equipment.

Complete capture of any clippings/solids.

Complete capture of any petroleum products (by using an oil/water separator or a similar baffle system).

A pleasant area to clean the equipment, with little or no unpleasant odor.

The Pad

The concrete pad at Olde Florida measures 20-feet by 40-feet The sides and back also have a 5-inch poured concrete curb to prevent water and/or debris from leaving the area. Along with the wash pad, a concrete ramp should be poured leading on to the wash area so that water and debris are not channeled on to the pad from the surrounding area.

The concrete pad is sealed with a silicone, acrylic concrete stain. It is very important to use this or a similar concrete stain, and follow the directions completely. If you do not, you will most likely be dissatisfied with the longevity of the coating.

Before applying the stain, the concrete should be at least 45 days old, clean, dry and free of paint and grease.

For best results, the concrete should be etched with one part muriatic acid and two parts water. The solution can be mixed in a plastic sprinkler can. The area

should be thoroughly and evenly wet with the solution. Then rinse the area with clean water after 20 minutes. The concrete should then be allowed to dry for at least 24 hours before applying the stain.

For the first two coats, one gallon of concrete stain should be mixed with one to two quarts of solvent. The third coat (and fourth if needed) should be straight concrete stain. The final step is simple, stay off the area for at least 72 hours.

Why seal the concrete? I can think of several reasons. One, the area is aesthetically more pleasing (it looks cleaner). Don't laugh until you think about this. If an inspector (DER, EPA, etc.) came to your facility, I think you would agree that the cleanliness of this area will most likely have an impact on his decision whether to investigate the area further.

I also strongly believe that a clean maintenance facility results in better work habits among the staff. In addition, a clean, organized maintenance facility will provide a more positive feeling by the membership towards the money they are spending for the maintenance of the golf course.

Another reason to seal the concrete is since concrete is semi-permeable, the concrete stain/sealer will not allow petroleum products to penetrate. The grease spots can then be wiped off with a reusable shop rag and a cleaner.

The pad is formed so that the entire area slopes to one of three concrete sumps. The sumps are 1-foot by 1-foot by 2-foot deep. The sumps have a recessed lip so the aluminum grate that covers the sump rests flush with the concrete pad. Inside the sumps are removable stainless steel baskets that catch the solids that enter the sump.

One side of the basket has a stainless steel grate so clippings are contained, and the water flows unobstructed through the baskets. These baskets are removed daily, excess water is allowed to drain out of them, and the clippings are emptied into a utility vehicle to be disposed of on property.

Separation Tank

Once the water leaves the three sumps, it travels through a 4-inch pipe into a 1,200-gallon concrete tank. The tank is a septic tank that was modified for Olde Florida. It is divided into three chambers by using two concrete divider walls.

The first wall extends from the very bottom of the tank upward to a height slightly below the intake pipe. The object of the first chamber is to contain all solids that might escape the catch baskets in the sumps.

The first chamber periodically must be cleaned. To dispose of this material, our loader/backhoe is used to carefully scoop out this material. This material is then transported by a utility vehicle to a site on property and either spread out, or used to fill in a hole. Experience has shown the need to clean this chamber approximately every 9 months.

Left, *a 40 x 20 ft. wash area with multiple air and water stations.* In photo below, *the sumps are emptied daily and the collected solids are spread on the course.*

The second chamber that is formed between the two walls functions as an oil/water separator. The second wall extends from the top of the tank and does not extend the full distance to the bottom. Therefore, it creates a chamber that would contain oil, since oil will always float on water. The water then flows under the second wall into the third chamber.

The third chamber should have clean water in it always. However, to be extra cautious, we extended the exit pipe down from the top so that the water is forced up from the bottom of the tank. Therefore, in theory, it would be impossible for any soil to escape the tank.

Since the tank is installed level, it remains full of water. Because the exit pipe is lower than the entrance pipe, hydraulics force the water through the system (not gravitational flow). This is important since the second chamber is used as an oil/water separator. If the water level would fluctuate, the oil that might be in this area, could in theory escape under the second wall.

The lid of the tank must be removable so that at least solids contained in the first chamber can be removed. At the same time, the lid must be secure enough so it makes a seal to the second wall. This will ensure the second chamber retains all potential oil that might enter the system.

The water that leaves this tank then filters through a long retention swale that contains a healthy stand of wetland plants (duck potato). The water is then retained on-site in the irrigation pond.

Other features

When designing the maintenance facility, we provided numerous blank conduits under the surrounding pavement for future use. In particular, two were provided to the equipment wash area so that compressed air hoses could be run through the conduits for use at the equipment wash area.

Using air to assist in the cleaning of the equipment has been extremely beneficial. The air allows us to clean sensitive areas of the equipment, such as electrical components, without the fear of causing damage.

Using compressed air to clean the engine also will help extend the life of the machine. Severe damage could occur if cold water was constantly used to wash a hot engine. Also, if large deposits of clippings have accumulated on a machine, air can speed up the cleaning process by dispersing the clippings before using water. (If compressed air is supplied for operator use at the equipment wash area, be sure that signs are posted requiring that eye protection be worn.)

The wash pit is equipped with three

High-pressure water can invade seals and bearings causing damage and extra work for the mechanic staff

separate water outlets. The three outlets are equipped with a 1-inch hose. Using a 1- -inch hose provides us with a high volume, low pressure water supply.

There are several advantages of using a high-volume, low-pressure water supply. First, the time it takes to clean the equipment is reduced. Second, the potential damage to an operation, or the painted surface of the equipment, is less than if a high pressure system was used. Finally, high-pressure water can invade seals and bearings causing damage and extra work for the mechanic staff.

One feature that I would definitely like to have, and would advise anyone considering a system like this to include, is a roof over the pad where the equipment is washed.

The roof would serve two purposes. First, it would create a more pleasant area for the operators to clean the equipment. The operators would most likely play closer attention to the quality of job that they are performing, rather than rushing to get out of the sun.

Second, the roof would keep the operators dry so that they can clean the equipment in the rain. (The roof should have lightning protection on it for employee safety.) The roof would also keep heavy rains from forcing unnecessary water through the separation tank.

The final point I would like to make is that this system is not for use as a mix/load site or sprayer cleaning area. That should be a separate area, also with a method of containment. The water that is emitted in mix/load operations should not be discharged, rather it is preferred that this water be recycled as a tank rinse or some other means of disposal on a turf area.

Conclusion

I am not inferring that the system we designed at Olde Florida is the only way to design an equipment wash area. What works well for us might not work for you. Many people are trying to predict what the future local, state, and federal regulations are going to be. However, I feel that as professional turf managers, we should not simply ignore the problem. Rather, it is our duty to make the most environmentally, financial, and functional decision for our individual situation.