

What Makes a Good Maintenance Facility?

They range in shape, size, age, and condition, but effective maintenance facilities share several key attributes.

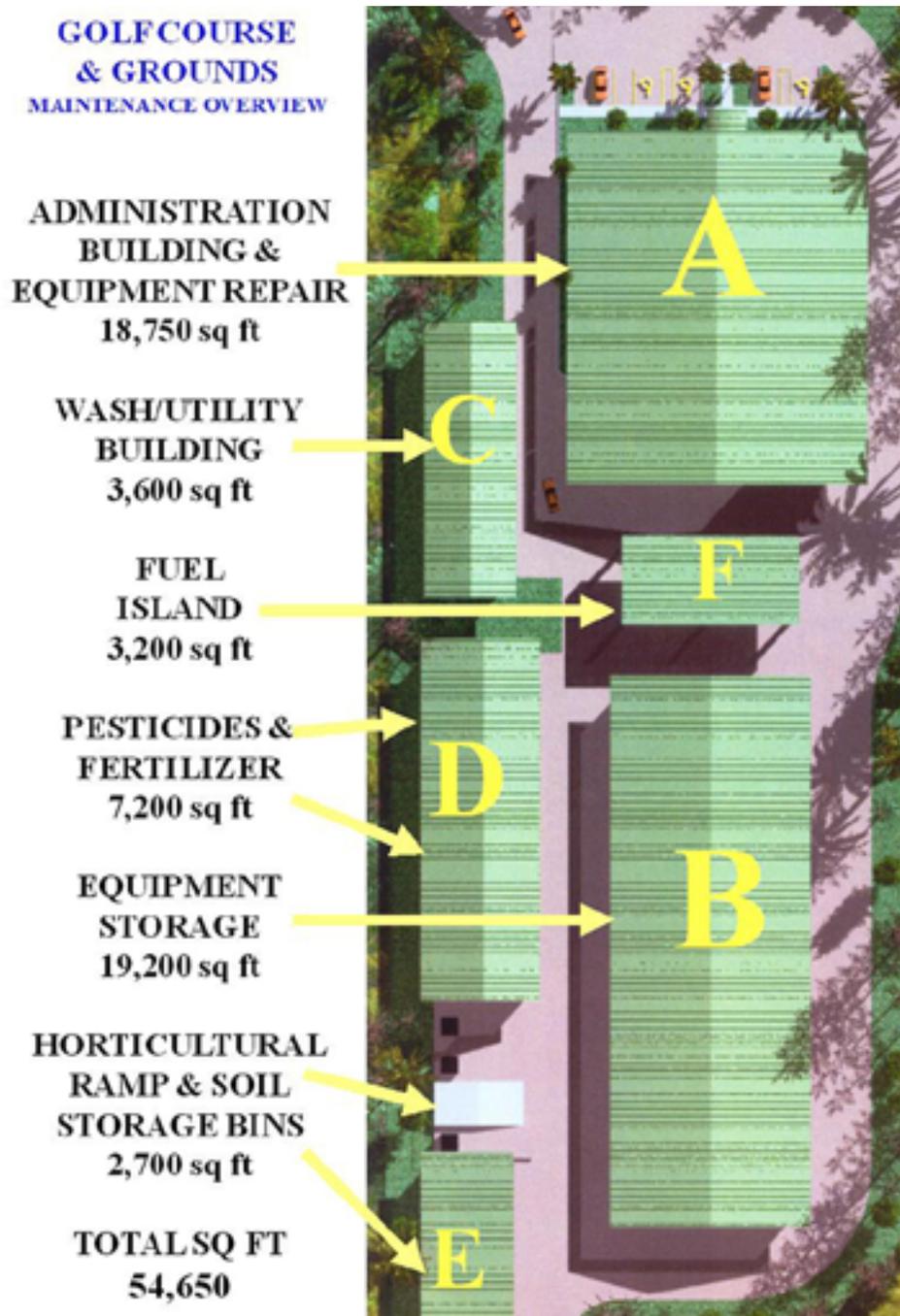
BY TODD LOWE

Golf courses vary in size and quality, and so do the facilities that maintain them. In my years with the USGA, I have visited many inadequate and outdated maintenance facilities. However, I also visit many newer facilities with spacious courtyards, ample equipment storage areas, safe and efficient equipment repair areas, state-of-the-art chemical handling areas, separate fertilizer storage, and covered storage bins for bulk materials like soil, sand, gravel, etc. The staffs at these facilities generally take greater pride in their work and maintain cleaner, safer, maintenance facilities. It stands to reason that with improved facilities come more professionalism, increased worker safety, higher staff morale, and greater overall efficiency.

There is no “one-size-fits-all” model for golf course maintenance facilities, as they differ in size, available area, layout, and location. However, successful modern facilities share many common attributes that can be incorporated into your maintenance facility. This article lists several features that should be considered when building or redesigning your next maintenance facility.

COMMON PRINCIPLES

No matter how large or sophisticated the facility, there are several common principles, including providing adequate space in each area of the facility, location in relation to the golf course, the “zonal” concept, workflow, staff safety, and protection from outdoor elements. While it may not be possible to address each factor at your facility, these principles are important to keep in mind.



Having separate zones for each area of the maintenance facility improves staff efficiency and workflow. Diagram courtesy of Quail West Country Club, Naples, Fla.

Take time to consider how much space you will need in each area of the facility. Make certain there is adequate parking for employees and guests. Allow enough space and facilities in the lunchroom and bathrooms to

reduce wait times for employees. Provide ample storage area for each piece of equipment and sufficient office space for all administrators and managers. Spacious courtyards allow large delivery trucks to safely unload

materials and provide equipment staging areas for staff each morning. While golf course superintendents seldom complain of having too much space, there are numerous instances of small, cramped facilities that reduce efficiency and production.

Ideally, the golf course maintenance facility is centrally located so staff can quickly reach multiple areas of the golf course. Poorly located maintenance facilities increase transit time, decrease staff efficiency, and make it more difficult to protect staff during inclement weather. Workers seeking shelter in the maintenance facility remain safe and can perform other tasks like organizing and cleaning the facility until the weather improves. Relocating a maintenance facility represents significant expense, but it may be worthwhile if it results in greater safety and operational efficiency.

The zonal concept is important to keep in mind when constructing or redesigning a maintenance facility. This principle creates separate “zones” for each area of the facility, which keeps the facility organized and improves staff efficiency by reducing the time spent looking for tools and materials. For instance, the fertilizer zone creates an area where fertilizers and all associated equipment are stored together. Likewise, a separate IPM or chemical zone houses all chemicals applied to the golf course and all associated equipment. Creating zones also protects the staff and the environment by isolating materials like fertilizers and pesticides in separate, secured areas.

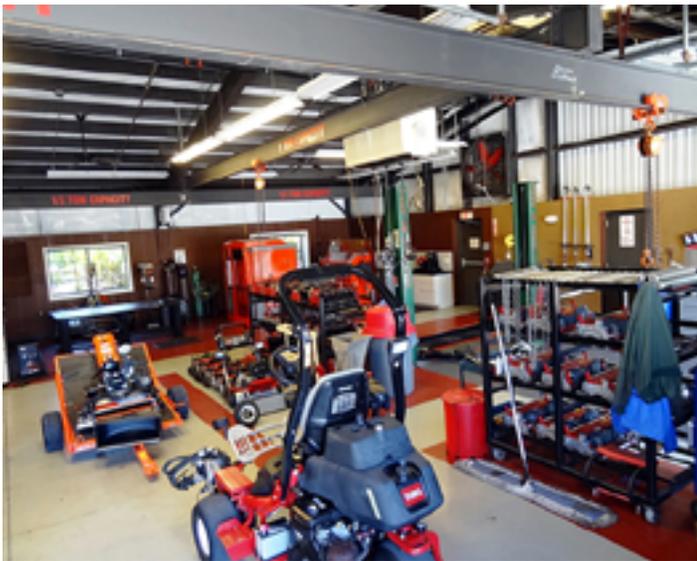
Keeping the zonal concept in mind is not only important for staff efficiency but also staff protection. For instance, the equipment repair zone is best located near the equipment storage zone but not necessarily within the same structure. Storing equipment in the same area where it is repaired can disrupt equipment technicians because other workers are continually moving through the repair area. The likelihood of an accident increases if workers are continually moving through repair areas while equipment is being raised or lowered, mowers engaged, and reels honed or sharpened. Furthermore,



Conference rooms allow important meetings to take place at the maintenance facility and provide an area for staff training.



The lunchroom – or break room – is an important area that should have ample space and amenities for all employees.



(Above left) Equipment repair areas should have several types of lifts and self-contained reel-grinding areas. For staff safety and operational efficiency, equipment repair areas should also be in separate zones from other maintenance operations. (Above right) A stocked and organized parts room keeps the equipment fleet running well.

tools can be easily misplaced when they are exposed to increased employee traffic.

Workflow is another principle to keep in mind when designing maintenance facilities. Workflow patterns are generally the same at each facility, as employees clock in, receive their daily assignments, locate their designated equipment, and proceed to the golf course. At the end of each day equipment is blown off, washed, refueled, and then adjusted by an equipment technician or parked at the completion of each task. Be mindful of workflow when placing features like fuel islands and equipment wash areas in relation to equipment storage and repair areas.

You should also keep weather and climate in mind when designing a maintenance facility. Having a roof over every zone protects staff from rainfall and solar radiation. Roofs over structures like staging areas, fuel islands, blow-off areas, and equipment wash areas improves staff morale and increases the likelihood that equipment is thoroughly washed and properly maintained. Roofs also protect other items like hoses and chemical containers from solar degradation and extend their useful life. Lastly, having a roof over the fuel area decreases fuel loss through evaporation. Features like appropriate insulation, taller structures, extended roofing, lighter colors, and

landscaping around the facility improve energy efficiency and may reduce your electric bill. In cooler climates, having appropriate heating is necessary to keep staff warm and protect equipment during cold weather.

ADMINISTRATIVE BUILDING

The administrative building is usually comprised of several offices, a conference room, lunchroom, and bathrooms. The administrative building generally opens into a reception area where an administrative assistant is located. In addition to providing space for a computer, telephone, desk, file cabinets, and other necessary office items, a small sitting area for vendors and guests is often appreciated.

A conference room is another valuable feature, as it provides an area for staff, vendor, and green committee meetings to take place. Conference rooms can also become an area of instruction, and having a TV mounted in the conference room is a helpful tool for video presentations. The conference room can also serve as a library for safekeeping of irrigation as-built drawings, architectural renderings, construction blueprints, textbooks, reports, and trade magazines.

Adequate office space is recommended for the golf course superintendent and other managers. A separate office is recommended for the super-

intendent with enough space for a computer, office furniture, small sofa, and separate bathroom. Also, there should be enough space for clothing, golf clubs, and other personal items. Offices for assistant superintendents are also recommended, along with shared offices for irrigation technicians, chemical applicators, and crew leaders.

The lunchroom should be large enough for the entire crew and should have ample space for tables, chairs, refrigerators, and multiple microwaves. Generally, the lunchroom is the hub where the crew receives daily job duties and training sessions throughout the year. Several newer facilities utilize SMART® board technology that can connect to a computer or tablet for both daily job duties as well as training sessions.

Bathrooms with tile are professional in appearance and easy to clean. Hands-free toilets, urinals, soap dispensers, and paper towel dispensers are recommended because they reduce the amount of work necessary to keep the facility clean each week. Each employee should have a large, well-ventilated locker, ideally located near the lunchroom and bathroom. Lockers with flat tops quickly accumulate clutter like hats and coats, but those with beveled tops do not allow stacking of items and thus maintain a

cleaner look. A dry room or mud room to store rain gear and work boots is also worthwhile.

EQUIPMENT STORAGE

The average golf course equipment fleet is quite costly and should be stored indoors to protect the golf facility's investment from solar degradation, rain, and temperature extremes. There should be adequate area to store nearly all equipment indoors. Some units – like tractors or front-end loaders – can be kept outdoors, ideally under some sort of covered structure. When determining necessary equipment storage area, get the dimensions for each piece of equipment and add at least 1 foot to its length and width. This allows space for staff to safely move around the equipment.

There should be sufficient bay doors with concrete posts or landscaping to protect the building. Furthermore, a sturdy epoxy floor sealant provides a professional appearance that can last many years. Epoxy floor coatings are easy to clean and can help detect equipment oil leaks. Some equipment storage areas use paint or tape to outline parking spaces for each vehicle. A designated area for hand tools reduces clutter and improves staff efficiency as well. Some facilities also provide areas for golf course setup equipment, as it is important that these tools are quickly located each morning.

EQUIPMENT REPAIR

The equipment repair zone should have an office with a computer for the equipment manager to track equipment maintenance and repairs and maintain a proper inventory of parts. A secured area for parts storage should be included in the equipment repair zone. Parts storage areas can be located in or adjacent to the equipment manager's office.

The equipment repair zone should also have an area for grinding reels. This operation is noisy, dirty, and, unless it is self-contained, should be in an enclosed or isolated area. Pressurized air is used for multiple functions at a maintenance facility, including inflating tires, blowing off



A designated area for hand tools improves worker efficiency as these tools are quickly and easily located each day.



Separate and secure fertilizer storage areas with heavy-duty shelving make it easy to store all equipment associated with fertilization and enhance worker safety and environmental protection.



Separate chemical storage and mix/load facilities are best when designed with rinsate collection and adequate storage for sprayers.

clippings and debris from equipment, and powering a variety of hand tools. It is important to place the compressor in a location that reduces noise. Underground or overhead lines can be run from the compressor to multiple locations throughout the facility to allow for easy access.

A quality equipment repair area includes several types of lifts and chain hoists to raise heavy equipment for service and repair. Movable racks for mowing units are also nice features. Floor mats with sufficient cushioning protect workers from injury and wear on joints, especially in areas of prolonged standing or kneeling. Ideally, the repair area is large enough to allow several pieces of equipment to be worked on comfortably at the same time.

FERTILIZER AND CHEMICAL STORAGE

Fertilizers are best stored in a separate secure facility to reduce exposure from environmental elements and decrease the likelihood of theft or accidental spillage. Fertilizers are generally delivered on pallets; therefore, taller buildings with heavy-duty shelving that can be accessed with a small forklift are recommended. Ideally, the fertilizer storage area should be large enough to store tractors, pull-behind spreaders, push spreaders, and other equipment



Covered equipment wash/fuel areas improve staff morale, reduce fuel evaporation, and lengthen the useful life of tanks and hoses. These areas are staged so that equipment may first be blown off with compressed air (foreground) before washing/fueling. Equipment can then be inspected by equipment managers (background) or stored.

used for fertilizer applications. Since fertilization is generally not a practice that is performed daily, fertilizer storage areas can be located farther away from the administrative building.

Chemicals should also be stored in a separate facility to reduce exposure and the potential for contamination. The chemical storage area should be enclosed yet well ventilated. It should be large enough to store chemicals and all spray equipment, as well as provide ample space for chemical measuring, mixing, and loading.

Chemical storage facilities should be able to contain a spill and have all required safety features. Ideally, chemical storage areas should be sloped to a drain that collects spills or rinsate after each application. Once collected, the rinsate and any spilled chemicals can be pumped into holding tanks or back into a sprayer for non-selective herbicide applications in landscape beds.

EQUIPMENT WASH AND FUELING

At the end of the day, equipment should be cleaned and refueled before it is either stored or adjusted by equipment technicians. Mowers accumulate turf clippings that should be removed each day before the mower is parked. A clean mower not only helps maintain a clean facility, but also makes it easier for technicians to adjust and repair the mower. Clippings contain 2 to 5 percent nitrogen by weight and should be recycled back into the soil instead of loading additional nutrients and debris into sewage systems. An ideal wash facility has a blow-off station that uses compressed air to remove clippings before washing. Clippings can be gathered and spread onto adjacent turf areas, allowing nutrients to be recycled and used by the turf.

Wash-water recycling systems are excellent features of equipment wash



Covered bins are recommended for dry storage of bulk materials such as sand, soil, gravel, mulch, etc. They can be used to house tractors and other loading equipment as well. Notice to the right an elevated access area to allow workers to dump trash into waste receptacles.



This covered equipment wash and refueling area is for a larger 36-hole facility that features a wash-water recycling system.

areas. These systems collect water in a reservoir that filters out clippings and oil before the water is recycled to wash more equipment. Wash-water recycling systems not only reduce environmental nutrient loading but also considerably reduce maintenance facility water use. Another suggestion is to allow wash water to be filtered through a turf area before entering the sewage system.

Areas for blowing off equipment, washing, and fueling should be in close proximity to each other to improve workflow and efficiency. Also, covering these areas with roofs protects workers from environmental elements, reduces fuel loss, and extends the life of hoses and fuel tanks. Lastly, providing multiple air, water, and fuel lines allows several machines to be cleaned and fueled simultaneously.

SAND, SOIL, AND AGGREGATE STORAGE

The maintenance facility should have an area for bulk storage of sand, soil,

mulch, and gravel, as well as a waste area for aggregates. Incorporating topdressing sand into the turf canopy is difficult when it is wet, and having a covered sand bin greatly improves topdressing practices on putting greens. If large enough, bulk storage facilities can also store tractors that are used with these materials. The location of sand bins can be farthest away from the main facility, because these materials are used less frequently. Locating bulk storage areas away from the remainder of the maintenance facility can also keep the equipment storage area cleaner by reducing tracking of sand and soil into the main facility. Bulk-material storage areas must be accessed by large trucks, so locate them with this, staff safety, and traffic flow in mind.

CONCLUSION

Many of the features listed in this article were gathered from several newer facilities and would be considered ideal. When planning a new

maintenance facility, many superintendents remark that the best advice is to visit others that have been recently built or renovated to get ideas. Also, take your time and seek input from the entire staff. After all, you rely on these individuals to keep the golf course in great condition and their opinions are valuable. Lastly, many golf course superintendents feel it worthwhile to hire a building contractor with previous experience in building golf course maintenance facilities.

For more suggested reading and to help determine if you need a new or renovated maintenance facility at your golf course, please see [I Know We Don't Have the Money, but Can We Afford NOT to Invest in a New Maintenance Facility?](#)

[TODD LOWE](#) is a senior agronomist in the USGA Green Section's Florida Region and has seen the good, the bad, and the ugly when it comes to golf course maintenance facilities.

SUBSCRIBE TO THE USGA GREEN SECTION RECORD

TEXT "GREENSECTION" TO "22828" OR CLICK HERE

Offering the latest information on golf course management, turfgrass culture, environmental issues, research and economic sustainability.