



The **Stars** and **Stripes** fly over this issue of *THE GRASS ROOTS* to honor the American men and women who served in the Persian Gulf.



# THE GRASS ROOTS

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## MAINTENANCE FACILITIES

### *The Wisconsin Survey*

By Robert J. Erdahl

Just what is a golf course maintenance facility? Is it that unassuming old dairy barn out on the Back Nine? Or is it that modern steel building over on the sixth hole that resembles a county highway department garage? We all know that here in Wisconsin we have examples of both of these extremes as well as just about everything in between.

Regardless of its age, size and appearance, our maintenance facilities are being called upon to fulfill an ever demanding role in golf course management. Today's golf course maintenance facilities must comply with a myriad of government regulations, address the safety and comfort of our employees, provide adequate shop area to service sophisticated equipment, store larger equipment fleets and take into consideration the increasing role of women in the work force.

Given this imposing list of requirements, is your maintenance facility up to the task? To be honest, mine falls woefully short in satisfying all of the above criteria. In fact, my maintenance facility is one of those old dairy barns that was modified 25 years ago and has seen no further improvements. I know that my situation is not unique, for there are many golf course superintendents in Wisconsin who work with maintenance facilities that can no longer fulfill the demands of modern golf course management.

So where do we go from here? The obvious solution is to remodel an exist-

ing maintenance facility or to build a new one. The realization of this solution, however, can often be blocked by economic limitations, government red tape, membership attitudes and other factors that might be unique to a particular golf course. All these issues aside, the basic problem of inadequate maintenance facilities remains for many superintendents and we need a place to start our quest for new and/or remodelled maintenance facilities.

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*“Given this imposing list of requirements, is your maintenance facility up to the task?”*

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For members of the WGCSA, problem solving is likely to start with an exchange of ideas with our peers. It seems to follow, then, that a forum for establishing the current state of golf course maintenance facilities in Wisconsin as well as a look at what may lie ahead could provide valuable information for all superintendents seeking to upgrade their maintenance facilities. In order to provide such a forum, I have written this two-part article for *THE GRASS ROOTS*. In this issue, Part 1 will discuss the results of a survey on golf course maintenance facilities in Wisconsin. Part 2, in the next issue of *THE GRASS ROOTS*, will cover my experiences at North Shore Country Club in the pursuit of a new maintenance facility.

#### PART 1.

#### **A Survey of Golf Course Maintenance Facilities in Wisconsin**

A survey on golf course maintenance facilities was sent out to a cross section of WGCSA members. The survey asked for the present size of the following maintenance facility components as well as any plans for improvements in the next 1-3 years:

#### HEATED AREAS

- Office
- Lunch Room
- Men's Locker Room
- Women's Locker Room
- Work Shop
- Parts Room
- Grinding Room
- Store Room
- Equipment Storage
- Other Rooms

#### UNHEATED AREAS

- Equipment Storage
- General Storage
- Other Rooms

The survey also asked for the age of all buildings that make up the maintenance facility. In addition, respondents were asked to describe their present situation and future plans for pesticide storage—mixing/loading, fertilizer storage, fuel storage and top-dressing storage. I have tabulated the results from the 30 surveys I received and have come up with some interesting facts that are contained in the following discussion.

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A good place to start is with the number and age of heated and unheated buildings that make up the 30 surveyed maintenance facilities. These values are listed in Table 1.

**Table 1. Heated and Unheated Buildings in the Wisconsin Survey**

TYPE OF BUILDING	NO. <sup>1</sup>	RANGE IN AGE	AVERAGE AGE <sup>2</sup>
Heated	37	New-80 Years	20 Years
Unheated	52	New-100 Years	22 Years

<sup>1</sup> A single structure can be counted as both a heated and an unheated building.

<sup>2</sup> The average age calculation was performed using a value of 0 for the two new heated buildings and the two new unheated buildings.

Please note that a single structure can be counted as both a heated and unheated building.

The 37 heated buildings include all of the areas for equipment maintenance and employee activities. Each golf course had at least one, main heated building with several golf courses using smaller, heated buildings as specialty areas for grinding, carpentry work or pesticide storage. The range in age for heating buildings is new to 80 years. The two new heated buildings are counted as 0 years old which yields an average age of 20 years for heated buildings.

Now if you stop to think of all the changes in golf course management that have occurred in the last 20 years, it seems incredible that the average heated building in this survey is functioning based on design and performance standards that average 20 years old. Oh sure, a few superintendents indicated that some minor remodeling had taken place, but for many superintendents in this survey an outdated heated building is the rule. I wonder how many clubhouses, pro shops or swimming pools are functioning with the same physical plant they had 20 years ago?

The 52 unheated buildings in this survey are used mainly for equipment storage, general storage, fertilizer storage and pesticide storage. (fertilizer and pesticide storage will be covered in detail later in this article.) Each golf course has at least one unheated building and many golf courses have added additional unheated buildings to meet the increased demand for equipment and general storage. The range in age for unheated buildings is new to 100 years. Once again, the 2 new buildings are counted as 0 years old which yields an average age for unheated buildings of 22 years.

The closeness in the average age of heated buildings (20 years) and unheated building (22 years) indicates to me that many golf courses have been just as interested in protecting their equipment as they have of providing pleasant and safe working conditions for their employees. I guess the answer lies in the fact that an unheated pole barn for protecting equipment is much easier to get approved than an expensive heated building containing adequate work facilities and locker rooms.

Since the heart of my maintenance facility is an 80-year old dairy barn, it was interesting for me to find out that six other golf courses are in a similar situation. In this survey, the range in age for the seven dairy barns in use as maintenance facilities is 50-100 years, with an average age

of 80. I'll cover how I use my dairy barn in Part 2 of this article. For now, I'll just say that they are very usable buildings if you stay within their structural limitations.

The breakdown of individual components of the heated and unheated buildings is displayed in Table 2. As you look at this table, notice that not all 30 surveyed golf courses have each of the listed components in their maintenance facility. Also notice the wide range in sizes for each of the individual components. I'll take a look at the present size of the components first and then turn to improvements planned for the next 1-3 years.

**Table 2. Maintenance Facility Components in the Wisconsin Survey**

MAINTENANCE FACILITY COMPONENT	# OF GOLF COURSES	RANGE IN SQUARE FOOTAGE	AVERAGE SQUARE FOOTAGE
<b>HEATED AREAS</b>			
Office	28	70-240	150
Lunch Room	24	100-560	250
Men's Locker Rm	12	60-325	150
Women's Locker Rm	8	30-160	80
Work Shop	30	500-4,400	1,600
Grinding Room	11	64-560	200
Parts Room	15	80-560	250
Storage Room	10	100-1,500	+600
TOTAL			3,280
<b>UNHEATED AREAS</b>			
General Storage	16	250-2,400	940
Equipment Storage	30	1,000-8,000	+4,000
TOTAL			4,940

Twenty-eight of the maintenance facilities had separate offices for the superintendent. The remaining two maintenance facilities had an office contained within the heated work shop area. Sizes ranged from a cramped 70 sq. ft. to a comfortable 240 sq. ft. The average size of 150 sq. ft. should be acceptable to most superintendents. Two of the larger maintenance facilities also contained a nice extra; an office for the assistant superintendent.

Lunch rooms are provided in 24 of the maintenance facilities. Dining style ran from a compact 100 sq. ft. to a banquet hall size of 560 sq. ft. The average of 250 sq. ft. should be large enough for the maintenance crews of most 18 hole golf courses. Some of the dining space is used up, however, in the 12 maintenance facilities that have lockers in the lunch room.

The bathroom and locker room issue is not favorable for the majority of the surveyed golf courses. Many maintenance facilities are below State of Wisconsin Health Codes in their bathroom and locker room facilities, while others are just squeaking by. I'll cover this issue in detail in the second part of this article. For now, I'll just review the results of the survey.

Starting with the worst situations; three of the maintenance facilities do not have a toilet. Obviously this should be changed as soon as possible and 2 of the 3 have improvements planned in the near future.

The remaining 27 maintenance facilities all have toilets, but most of the locker room areas could stand some improvement. There are 12 men's locker rooms; 8 containing showers. For the women, there are 8 locker rooms; 3

containing showers. In addition, the women only have 6 private toilets. While the average size of both men's and women's locker rooms seems adequate (150 sq. ft. and 90 sq. ft., respectively), 5 out of the 12 men's locker rooms are less than 80 sq. ft. and 4 of the 8 women's locker rooms are less than 50 sq. ft.

Most superintendents will acknowledge that the heart of any maintenance facility is the work shop. In this survey, all 30 golf courses have a heated work shop. Sizes ranged from 500-4,400 sq. ft. with an average of 1,600 sq. ft. While 1,600 is a reasonably sized area, it can quickly become too small once winter equipment maintenance begins.

Several superintendents indicated that they had an indoor wash area with a floor drain in their work shops. I must admit that I forgot to ask that question in my survey. My best guestimate is that close to one half of the golf courses have such a facility.

Grinding rooms and parts rooms have become common components of many maintenance facilities. The ability to isolate the noise and dust of the grinding operation has a positive effect on the work shop environment. It is also very beneficial to be able to store parts in a closed area where they can stay dust-free and well organized. Those golf courses that do not have grinding and/or parts rooms have incorporated those functions into the work shop area.

The average size of the 11 grinding rooms was 200 sq. ft.; this comes from a range of 64-540 sq. ft. The 15 parts rooms have a size range of 80-560 sq. ft. with an average of 250 sq. ft.

There are 10 maintenance facilities that have an additional heated storage room. No doubt these rooms may also be used for parts storage, but in the survey I did not ask for the specific usage of these rooms. There are 10 such rooms that average 600 sq. ft.

The maintenance facility component designated as heated equipment storage is not included in Table 2 because only 4 golf courses have such an area. The sizes are 300, 750, 1,600 and 3,500 sq. ft. Note that the 3,500 sq. ft. area is heated to only 50°F.

The heated area of several maintenance facilities contained the following specialized rooms:

- Carpenter Shop (2) . . . . . 300, 600 sq. ft.
- Flammable Liquids Room (1) . . . . . 200 sq. ft.
- Irrigation Parts Room (1) . . . . . 120 sq. ft.
- Painting Room (3) . . . . . 240, 400, 560 sq. ft.
- Sand Blasting Room (1) . . . . . 64 sq. ft.

The unheated areas of the maintenance facilities are divided into two components; general storage and equipment storage. Sixteen golf courses list general storage areas that range from 250-2,400 sq. ft. with an average of 940 sq. ft. Not surprisingly, all 30 golf courses reported the largest area of their maintenance facility to be unheated equipment storage. The sizes range from 1,000-8,000 sq. ft. with an average of 4,000 sq. ft. Remember that many golf courses have unheated general storage and unheated equipment storage in more than one building.

To sum up Table 2, let's take a look at the average sizes of each component. If we add up all the averages for the heated areas, the sum is 3,280 sq. ft. The sum of the averages for the two unheated areas is 4,940 sq. ft. Adding these two values yields 8,220 sq. ft.; the average size of a maintenance facility in this survey.

Before leaving the discussion of Table 2, I need to point out how the results are dominated by the 9 maintenance facilities that have been built in the last 0-5 years. Without

these 9 newer maintenance facilities, the results in Table 2 paint a far less appealing view of golf course maintenance facilities in Wisconsin.

After all this analysis, I'm sure you might be curious as to which golf courses have the best maintenance facilities. Without revealing any names, I can reach my decision if you allow me to set two conditions:

- 1) the best maintenance facilities must have approximately 8,000 sq. ft. and be divided into the areas and average sizes listed in Table 2.
- 2) the best maintenance facilities must have adequately sized men's and women's locker rooms that contain both toilets and showers.

If you accept my conditions, there are 5 maintenance facilities in this survey that stand out as the best.

If five stand out as the best, that means 25 maintenance facilities (definitely including mine) need improvement. Table 3 lists the maintenance facility improvements projected for the next 1-3 years on the surveyed golf courses. Group A contains 3 golf courses that are planning on complete new maintenance facilities (If all goes according to plan, one of them will be mine) that will qualify them for my "Best Group". Group B has 4 golf courses that are going to remodel or add to existing maintenance facilities. When completed, these 4 will also join my "Best Group". Finally, the 2 golf courses in Group C are planning additions to their maintenance facilities that will improve certain conditions, but not enough to qualify them for the "Best Group".

**Table 3. Maintenance Facility Improvements Planned for 1991-1993 in the WI Survey**

GROUP	NUMBER OF GOLF COURSES	DESCRIPTION OF IMPROVEMENTS	SQUARE FOOTAGE OF IMPROVEMENTS
A	3	New Maintenance Facility	7,500 8,000 8,000
B	4	Lunch Room Locker Rooms Work Shop	500, 1,200 1,500, 2,000
C	2	Unheated Equipment Storage	1,500 7,200

Let's turn to a discussion of how the 30 survey respondents store topdressing, fertilizer, fuel and pesticides. I think I'll follow this order because it starts with the easiest topic and works up to the hardest. The discussion will include the storage methods used in 1990 as well as what is planned for 1991-93.

Storing of topdressing is a fairly low-tech operation as shown in Table 4. The majority of golf courses store their topdressing either outside in a pile or bins; or under a roof in a shed or building. Two innovative superintendents employ a silo and a vertical tank in their storage operations. Changes projected in the near future include 3 more storage systems, 2 more buildings with roofs and another vertical tank operation. From comments made on the surveys, it appears that the majority of superintendents who store their topdressing under a roof use some type of sand/soil/peat mixture; while the superintendents using a straight sand topdressing use outside storage or the silo-vertical tank system. This makes sense, since a wet sand topdressing is much easier to handle than a wet mixture of sand/soil/peat.

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**Table 4. Topdressing Storage in the WI Survey**

TYPE OF STORAGE	NUMBER OF GOLF COURSES IN THE YEAR	
	1990	1991-93
Outside in a Pile	17	11
Outside in a Bin	2	5
Inside a Building with a Roof	9	11
In a Silo	1	1
In a Vertical Tank	1	2

Fertilizer storage on golf courses has managed to avoid most governmental regulation. As long as you don't have a bulk storage facility, all that is currently required is an enclosed, dry storage area. As you can see from Table 5, the majority of golf courses store their fertilizer in general storage areas. However, there are 6 superintendents storing their fertilizer in a separate building and 4 more who will join them in the next 1-3 years. Perhaps these 10 superintendents can predict more government regulations. Who knows; in a few years maybe we will have to store fertilizer in a separate building with a containment dike and load over a containment area. One thing I will predict is that the storage of fertilizer products that contain pesticides will be regulated before the storage of straight fertilizer products. I'll touch a bit more on fertilizer storage in the second part of this article.

**Table 5. Fertilizer Storage in the WI Survey**

TYPE OF FERTILIZER STORAGE	NUMBER OF GOLF COURSES IN THE YEAR	
	1990	1991-93
General Storage Area	24	20
Separate Building	6	10

The storage of gasoline and diesel fuel in underground and aboveground storage tanks has received considerable attention in the last 2 years. By this time, every golf course superintendent should be aware of the regulations in place at the State and Federal level of government and be taking steps to comply as soon as possible. If you are still uncertain about your gasoline and diesel fuel storage tank situation, I suggest you call the State of Wisconsin Department of Industry, Labor and Human Relations at 608-266-8981 and ask for Rex Colvin. Mr. Colvin will be able to answer your questions and send you a copy of the State of Wisconsin's "Tank Owners' Guide For Underground Storage Tanks".

Looking at Table 6, we see that 15 out of 30 golf courses have taken care of their fuel storage situation. Fourteen have installed above ground tanks in containment areas and one has underground tanks equipped with leak detection systems.

Of the 11 golf courses still storing fuel in underground tanks, 5 will convert to above ground tanks in containment areas in the next 1-3 years. The remaining 6 indicated no plans for taking their tanks out of the ground.

The 4 golf courses that currently store fuel in above ground tanks without containment areas did not list any future plans for containment areas.

It is disturbing to see that 10 out of 30 golf courses apparently plan no upgrading of their fuel storage tanks. This is hard to understand when such improvements are cost effective, environmentally responsible, and mandated by State and Federal law.

**Table 6. Fuel Storage in the WI Survey**

TYPE OF STORAGE TANK	NUMBER OF GOLF COURSES IN THE YEAR	
	1990	1991-93
Underground	11	6
Underground with Leak Detection	1	1
Aboveground with No Containment	4	4
Aboveground with Legal Containment	14	19

This seems like a good time to make a few comments about the storage of waste oil. Long gone are the days when we dumped waste oil on the gravel shop yard. Today, waste oil is classified by the Department of Industry, Labor and Human Relations (I'll use the abbreviation DILHR from now on) as a Class 1 Flammable Liquid that requires special storage techniques. Rather than hassle with the restrictions of storing waste oil in the maintenance facility, several superintendents (4 in 1990; 2 more in 1991) have a separate storage tank and containment area for their waste oil. Using this disposal technique assures them of a safe place to store their waste oil and the added bonus of selling the waste oil to a waste oil processing company.

The final topic in the survey is one of the hottest issues facing our profession today: pesticide storage and mixing/loading. Our ability to successfully resolve these two issues will no doubt shape the future of pesticide usage in golf course management for years to come. My discussion will focus on the survey results and not on the multitude of complex factors that play a role in the design and construction of a pesticide storage and/or mixing/loading facility. A more complete treatment of pesticide storage and mixing/loading is reserved for the second part of this article.

The survey responses reveal that many superintendents (myself included) are looking for some direction on the best way to resolve their pesticide storage and mixing/loading problems. After considering all the answers and ideas in the surveys along with some personal observations, it seems that the best sources of information are as follows:

1) *Wisconsin Department of Agriculture, Trade and Consumer Protection, Chapter Ag 29 Pesticide Use and Control.* This part of the Wisconsin Administrative Code, known as Ag 29, lists the regulations for a basic pesticide storage facility along with specific guidelines on when a contained mixing/loading area is required, and design and construction specifications for containment areas. Further information on Ag 29 can be obtained from Paul Morrison at 608-267-7726.

2) *Wisconsin Department of Industry, Labor and Human Relations, DILHR.* DILHR is responsible for enforcing the chapters of the Wisconsin Administrative Code that deal with the health and safety of your employees. While Ag 29 gives basic guidelines on pesticide storage, DILHR deals in complex specifications. Basically DILHR wants to know

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what type and quantity of pesticides you will be storing. They classify the pesticides based on the information on the Material Safety Data Sheets and then tell you how to construct your pesticide storage facility.

Both DILHR and Ag 29 have jurisdiction in pesticide mixing/loading. DILHR regulations protect the health and safety of your employees. Ag 29 regulations protect the environment.

The best sources of information about DILHR regulations are Jim Smith at 608-266-0251 or Terry Nolan at 608-266-5824.

3. Professor David Kammel, Agricultural Engineering Department, University of Wisconsin-Madison. Professor Kammel and Mr. Dan O'Neil (Ozaukee County Agricultural Agent) have authored a paper titled "Farm Sized Mixing/Loading Pad and Agrichemical Storage Facility". The paper describes the planning, construction and operation of a pesticide storage building and contained mixing/loading area that appears to be just the right size for golf course application. Copies of the paper can be obtained from Professor Kammel at: Agricultural Engineering Department  
University of Wisconsin-Madison  
460 Henry Mall  
Madison, WI 53706

The top half of Table 7 lists 7 golf courses that currently meet "State Code" with their pesticide storage area. From the description of their facilities, however, a few of these 7 golf courses appear to meet only Ag 29 guidelines and do not take into account DILHR regulations.

TYPE OF PESTICIDE STORAGE	NUMBER OF GOLF COURSES IN THE YEAR	
	1990	1991-93
Room or Building that meets State Code	7	18
General Storage Area	23	12
TYPE OF PESTICIDE MIXING & LOADING		
On Golf Course	4	3
In Containment Area	2	9
No Containment Provided	24	18

An additional 11 golf courses plan on upgrading to pesticide storage facilities that comply with "State Codes" within the next 1-3 years. All of these superintendents confessed that they were not sure yet as to what type of facility they were going to build.

That leaves 12 of the 30 golf courses that gave no indication at all of any plans to improve their pesticide storage facilities in the next 1-3 years. Given the growing anti-pesticide movement within our society, I don't think that this kind of approach to pesticide storage bodes well for the future of our profession.

When it comes to pesticide mixing/loading facilities, the bottom half of Table 7 lists only 2 golf courses that current-

ly have containment facilities and only 7 other golf courses planning them in the next 1-3 years. There appears to be several reasons for this low interest in building containment areas for pesticide mixing/loading:

1) Many golf courses fall under the Ag 29 limit of 1,500 pounds of pesticide active ingredient per year so they are exempt from the containment requirement. Personally, I am a bit nervous about this arbitrary level of 1,500 pounds; stricter regulations that would lower this limit could easily be just a few years away as our use of pesticides comes under even closer scrutiny. On a related note, 2 superintendents mentioned that they will be switching to pesticides with lower levels of active ingredients in order to come in under the 1,500 pound limit and thus avoid the containment requirements.

2) Four golf courses are currently avoiding the containment issue by mixing/loading in the field. This practice is allowed under Ag 29 and involves filling the sprayer out on the golf course with irrigation water (back flow devices are used on the hoses) and then mixing/loading right at the fill site. At the present time, however, it is not certain whether Ag 29 can be interpreted as meaning that the golf course as a whole can qualify as a field to mix on or that each individual target spray area, such as a single green, must be classified as a field. If the latter interpretation holds up, every single green, tee and fairway would have to be field-mixed on an individual basis. In other words, it would take 18 field-mixed loads to spray 18 greens.

3) Golf courses that use over 1,500 pounds of pesticide active ingredients per year have until January 1, 1993 to comply with the containment requirements of Ag 29. Some of these golf courses may be taking a wait and see attitude before committing to a containment facility.

The seven superintendents at the golf courses that will be upgrading to containment facilities in the next 1-3 years expressed the following concerns either individually or as a group:

1) How do you prevent unwanted water from rainfall, snow, etc. from entering the collection sump? Once in the sump, this water must be disposed of out on the golf course.

2) Will containment areas require roofs?

3) Can containment areas be inside of the main maintenance facility?

4) How do you keep mud, gravel and other debris from contaminating the water in the containment sump?

At this time, there is no state or federal publication entitled "Everything You Always Wanted to Know About Pesticide Storage, Mixing and Loading, But Were Afraid to Ask". Instead we face a situation where the laws have been written, but interpretation and enforcement of those laws are still question marks. In the absence of guidance from governmental agencies, it falls squarely on the superintendent to be sure that his golf course is up to date on the latest pesticide regulations.

That wraps up my discussion of the maintenance facility surveys. I hope you have been able to pick up some information that you can use to improve part or all of the maintenance facility at your golf course.

Part 2 of this article will appear in the next issue of *THE GRASS ROOTS*. My topic will be the planning of a new maintenance facility at North Shore Country Club.