

USGA Style Constructed Putting Greens

Owner's Manual



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Arizona California Nevada
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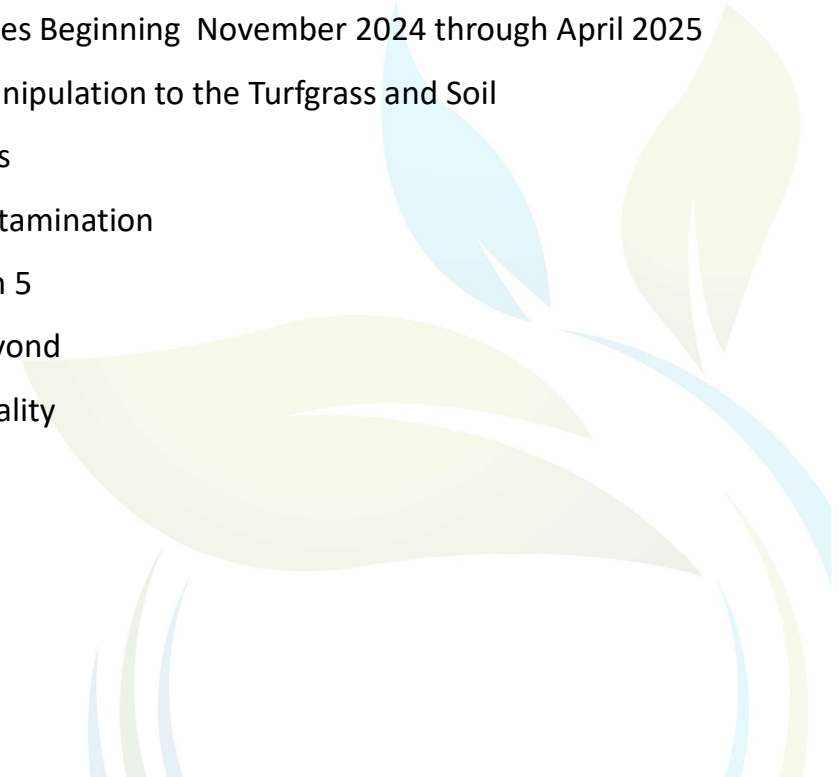
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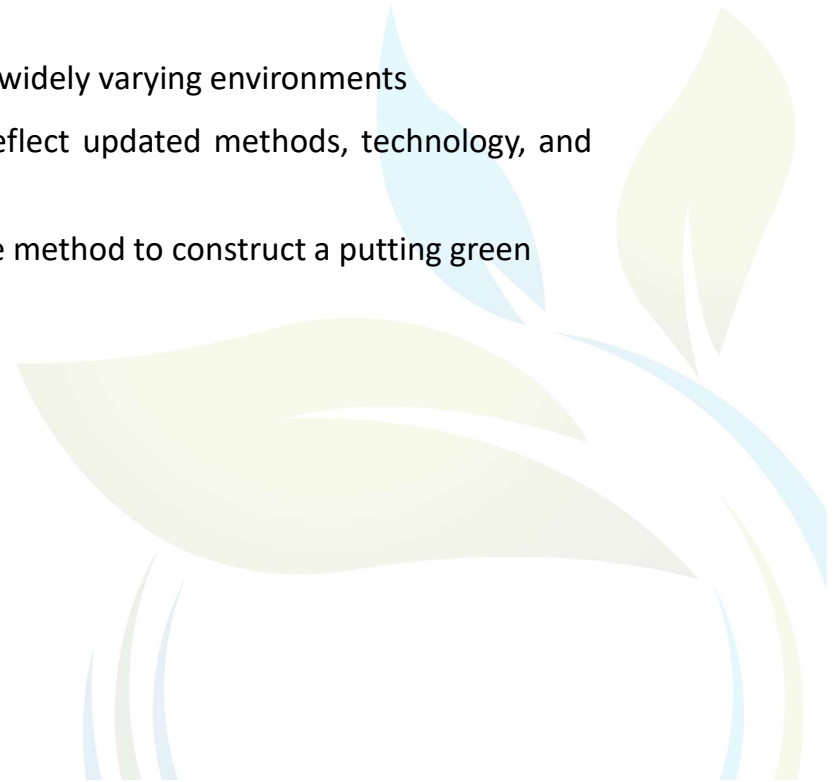
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Overview

A USGA Style Putting Green Construction Method was chosen for your golf course during 2022. The USGA revised its recommendations in 2018 and we used these parameters during the pre-construction and construction testing. The following bullet points are from the Revised *“Recommendations for the USGA Method of Putting Green Construction”* by Brian Whitlark

- The USGA method is used successfully throughout the world in widely varying environments
- The Recommendations are updated about every decade to reflect updated methods, technology, and techniques
- The USGA method is not necessarily the best or least expensive method to construct a putting green



	WCS&G 90/10 QC #1 4/2023	WCS&G 90/10 QC #2B 5/2023	WCS&G 90/10 QC #3 6/2023	WCS&G 90/10 QC #4 6/2023	WCS&G 90/10 QC #5 7/2023	WCS&G 90/10 QC #6 7/2023	WCS&G 90/10 QC #6 DEL. 8/2023	WCS&G 90/10 QC #7 DEL. 8/2023	WCS&G 90/10 QC Average	<u>USGA Recommendations</u>
Silt and Clay	2.40	2.00	3.00	2.60	2.20	3.00	2.10	2.10	2.43	<= 8.0%
Sand	97.60	97.90	96.90	97.30	97.80	97.00	97.90	97.80	97.51	94 - 100%
Gravel	0.00	0.10	0.10	0.10	0.00	0.00	0.00	0.10	0.06	
Organic Material	0.56	0.53	0.73	0.58	0.64	0.69	0.71	0.72	0.66	
<u>Sieve #:</u>										
Fine Gravel 10	0.00	0.10	0.10	0.10	0.00	0.00	0.00	0.10	0.06	2.0mm <= 3.0%
Very Coarse Sand 18	7.30	8.50	7.30	5.60	7.20	7.10	9.20	8.70	7.66	2.0mm + 1.0mm <= 10%
Coarse Sand 35	49.00	47.10	45.50	41.20	44.00	43.30	44.10	44.90	44.30	
Medium Sand 60	33.60	31.60	33.80	38.60	35.40	34.70	33.80	33.50	34.49	0.5mm + 0.25mm >= 60%
Fine Sand 100	6.30	8.10	8.10	9.20	8.30	9.20	7.90	8.30	8.44	0.15mm <= 20%
Very Fine Sand 140	1.10	1.70	1.70	2.10	2.20	1.90	2.20	1.70	1.93	0.106mm + 0.053mm <= 5.0%
Very Fine Sand 270	0.30	0.90	0.50	0.60	0.70	0.80	0.70	0.70	0.70	
Saturated Hydraulic Conductivity in/hr	10.60	14.50	15.30	13.70	12.80	17.90	9.10	19.30	14.66	Greater than 6" per hour
Coefficient of Uniformity	2.68	3.08	3.07	2.9	3.00	3.15	3.05	3.02	3.04	1.8 to 3.5 for peat and sand mixes

- The average depth of sand above the gravel layer should be approximately 29 centimeters or 11.4". The greens were constructed using a goal of 12" deep above the gravel layer.

December 2023 through April 2024

I have nearly 20 years of experience and data in the Southern Nevada area, to prove that soil temperatures in sand/peat-based greens reach what is considered prime growing conditions (60-70 degrees at 4" deep in the soil) near the end of April. Some years it is the end of May. Because soil temperatures dictate so much about growth in both the roots and leaves of bentgrass, forcing green speeds and playability is not advised. Soil temperatures at 4-inch depths will follow the overnight lows. So, just because it is 75 degrees for a day or two in February, that is not enough to put the grass plants into prime growing conditions.

Many years ago, Las Vegas golf courses decided that opening newly constructed bentgrass greens was most advantageous for revenue, in December. Although it is "tradition" in the area, it is not an ideal time to have golfers on the grass. Protecting the greens through restricting certain pin placements, controlling entrance and exit points and having tee times spread farther apart all help to keep detrimental wear to a minimum. There should be no confusion, however, there will be areas on the greens during this time period that will look very worn out. (ie Practice Putting greens)

With regards to warming the greens during this time period, covers can be used to "catch up" and protect areas on new greens that may not have grown completely leading up to the opening day. Pigments, paints, and other colorants can be applied to the grass. In doing so, the intense desert sun will be utilized to its fullest and some leaf growth may be seen. If that happens, light rate topdressings-using the original construction greens-mix can be applied to help protect the crown of the plants, fill in voids, raise low areas and generally smooth the surface.

As you near the end of March, cultural practices such as acidification through spray applications, medium rate sand topdressings and aerification should begin. Even though these are seeded greens, aerification during the first 3 years will be critical. Las Vegas is a uniquely harsh area to grow grass. By taking an offensive approach from the beginning, the greens will last longer. To use a simple comparison, routine maintenance on gasoline powered vehicles require oil changes, tire rotation, etc. within the first 5,000 miles of use. By around April 2024, you will be reaching that stage for the greens. The long-term goal for the greens is to “run the car” for over 200,000 miles. To get there, disruptive maintenance practices must start at the sign of the greens first growing season. (Spring of 2024) Current Las Vegas area expectations for greens are 20 years. I believe by following the recommendations of this Owner’s Manual, 40 years will be possible. But it requires continuity from one management team to the next.



Cultural Practices Begin May 2024 through October2024

The sand/peat mix chosen to build the greens, was mined, and shipped from Palm Springs, CA. There is no sand sold locally that fits USGA parameters. Although the greens mix used is regional and tried-and-true, there are limitations to every product. The specific issue is that, under the right conditions, the sand/peat mix under the turfgrass will become compacted. It is not because the particle size is wrong. It is because sand mined in the Southwest is often a step or two away from being used to make concrete. Although, we don't add cement to the greens to make concrete, we do add a lot of high bicarbonate water. The bicarbonate is like adding cement to the mix. Understanding this is important. Because Southern Nevada gets very little rain and when it does rain it is often very "neutral". In many parts of the country, rain is acidic. Acid will break the bonds in soils and concrete, thus naturally reliving some compaction. This lack of acid rain in Las Vegas means we must try to create our own. We do that through water and or soil treatments. Some examples are sulfur burners in ponds, injection systems in the irrigation pump houses and spray applications that contain products that are safe but very low pH acid-based products.

Although treating the water and/or soils with acids is not the only thing needed, by using them from the beginning, you will extend the life of the green. Medium rate topdressing applications can begin in conjunction with small hollow tine core aerification. There is no need to remove larger cores during this time period. However, not aerifying during the turf's first growing season would be advised. This is where communication with the golfers is critical. No one likes disruptions to the putting greens. Explaining to a new 40-year-old member, for example, that by using sound agronomic practices from the beginning of new greens, that he or she will not likely have to go through another green's renovation is appealing.

To “advertise” aerification during this time period is not necessary. With newer and better tines and aerification machinery, the holes are little noticed within a few days and the topdressing sand application only aids in firming and speeding up the greens. This process should be done monthly from May through October. Protecting the greens during the high heat from medium rate topdressing applications with small hollow tine core aerification in July and August is the decision of the on-site Superintendent.

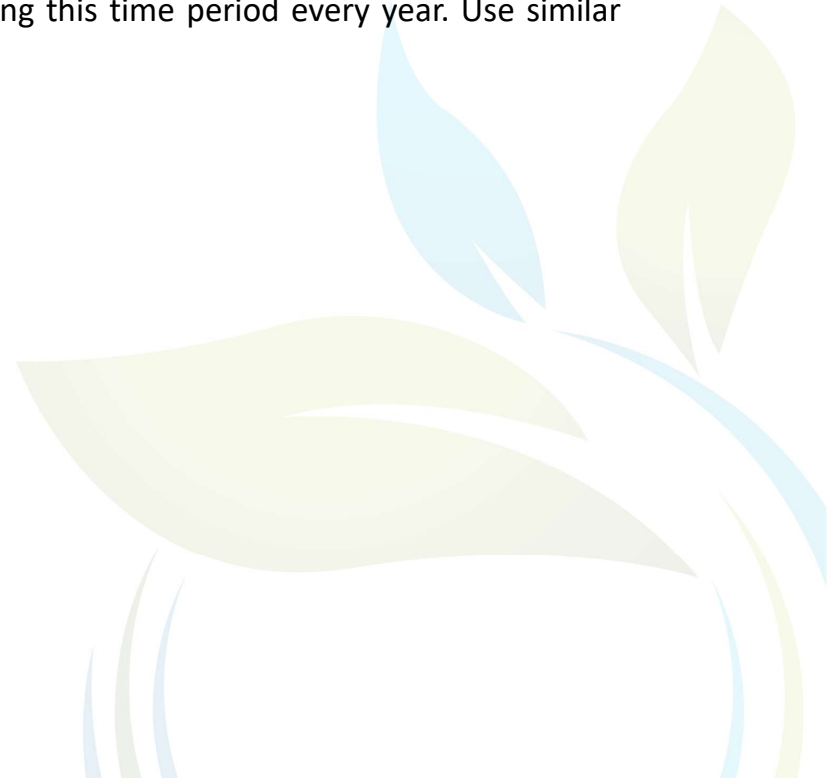
Light rate and weekly topdressing applications can begin in May. Consistency is the key. If weekly is difficult to complete, then find a frequency that can be completed every time. These applications of sand in conjunction with controlling nitrogen applications will work to reduce any layering that can occur in the soil profile while growing in the greens more aggressively, in the first year.

By routinely topdressing the greens, mowing heights can be reduced significantly and safely from the Opening Day height of cut, by May 1. I do not give a specific height of cut recommendation due to golfers differing needs at different facilities, however, the Dominator Bentgrass can be cut at below 0.100” on a regular basis during the growing season. (May- October) Attaining a higher Stimp Meter reading and speed of the greens based on the grass type you selected, will not be difficult.



Cultural Practices Begin November 2024 through April 2025

Although next Winter will be much easier on the greens, I believe that Winter in Southern Nevada may be the harshest time for bentgrass greens. They primarily only grow roots during this time and there are certain times when the top 1' or so, is frozen while play continues. Compaction in the very top layer of the soil happens through the Winter and there is no good way to relieve that until early Spring. Top growth is minimal, and recovery is non-existent. So, I highly recommend being cautious with the greens during this time period every year. Use similar caution as you did the first Winter of play.



Mechanical Manipulation to the Turfgrass and Soil

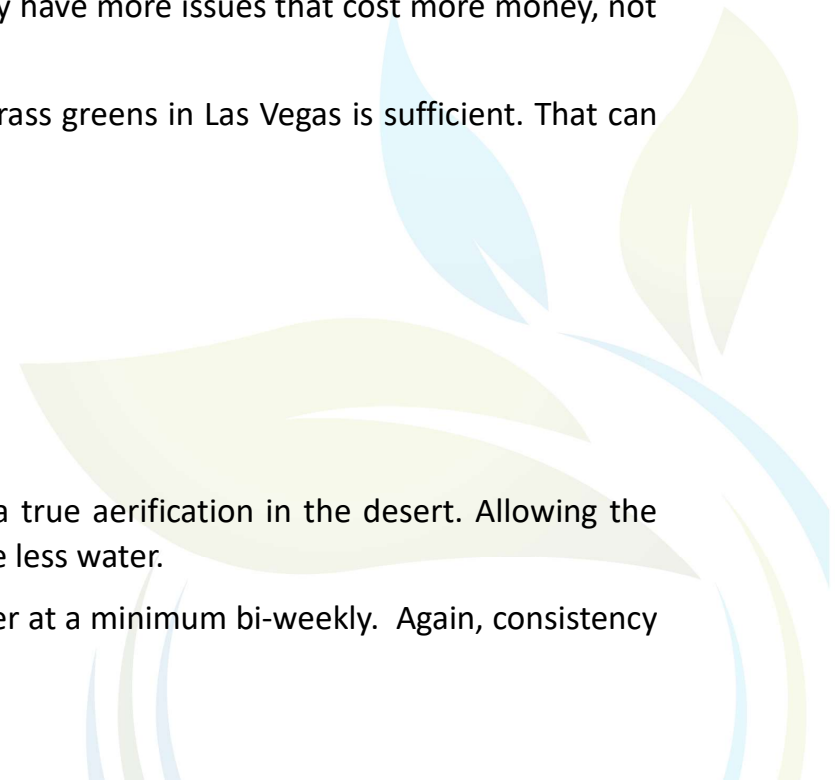
Although this topic cannot be precisely mapped out for the next 40 years or maybe even the next 5 years, cultural practices such as verti-cutting, aerification and dethatching need to be varied in depth and frequency. When a decision is made to proceed with aerification, for example, it should be based on need at the time- ***not tee sheets and event calendars***. Certainly, the Superintendent can wait a week for the Member-Guest tournament to finish, but when the greens need help, they can't wait for too long in the desert. Much like routine vehicle maintenance when you defer oil changes, tire rotations and wheel alignment, you inevitably have more issues that cost more money, not to mention, vehicle downtime later.

Over the years, I have decided that 4-6 aerifications per year on bentgrass greens in Las Vegas is sufficient. That can include:

- Core aerification
- Deep tine aerification
- Compressed air fracking
- Sand Injection
- Dethatching
- Drilling

I do not consider the use of solid tines and then rolling them closed a true aerification in the desert. Allowing the greens to be consistently drier probably has the same effect and you use less water.

Verti-cutting and topdressing should be done from April through October at a minimum bi-weekly. Again, consistency is the key to success.



Flushing Greens

The greens were engineered to take on a tremendous volume of water and then flush like a toilet through the drain lines. In Nevada it may be more important than many areas due to the irrigation water quality. Although you have potable water on the greens “loop” of the irrigation system, that water can add up in the soil and its negative constituents such as sodium, chloride and bicarbonates can cause turf issues. One reason USGA greens require routine flushing in Las Vegas is because of the low humidity. Water can be wicked upwards through the greens-mix and leave salt build up in the soil at the roots level. As that becomes more prevalent in the Summer, the greens will require flushing more frequently. Although flushes cannot be scheduled exactly, during some post construction testing, I can determine approximately how long a flush should take (using water analysis) as well as approximately how often it should happen during different seasons of the year. (using saturated paste analysis).

As mentioned previously, water and soil treatments should be an important part of the plan. Treating the water will make the flushing process more effective. Also, acid-based products can be applied to the turf/soil prior to a flush to help move the negative salts through the soil profile faster thus conserving water. Flushing should be completed during daylight hours. All heads on a green should be running for the time determined proper for that season. Essentially, you will be completing two or three greens at a time. (or whatever your irrigation system can handle)

➤ *Flushing greens may be as important as aerification.*

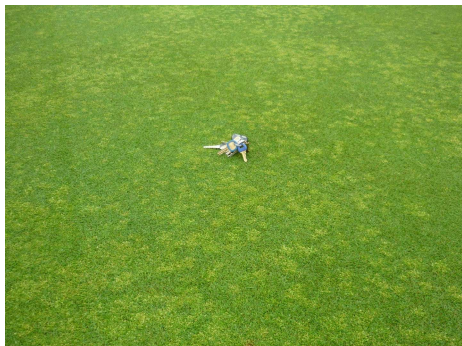


Poa Annua Contamination

There will be poa annua on the golf course. It will get on the greens. It should be eradicated immediately! The best defense against poa annua intrusion is a healthy stand of grass. Additionally, courses that do not ryegrass overseed will have less poa annua on the property. Poa annua can come in the ryegrass seed and with what is needed for good ryegrass, are the same conditions poa annua thrives in. Soil that errs to the dry side and a thick stand of turf along with cultural practices (described previously) don't let poa annua in.

The first, year you should be able to keep up with any poa annua contamination through picking it out manually. In the second year and beyond, and with continuing to overseed the course, poa annua could be at varied stages on different holes. To remove poa annua from the greens is best done manually. However, there is a product currently on the market called **PoaCure**, that superintendents are using with great success that kills the poa annua and won't harm the bentgrass. There are also several products that can kill poa annua in bermudagrass without damaging it either.

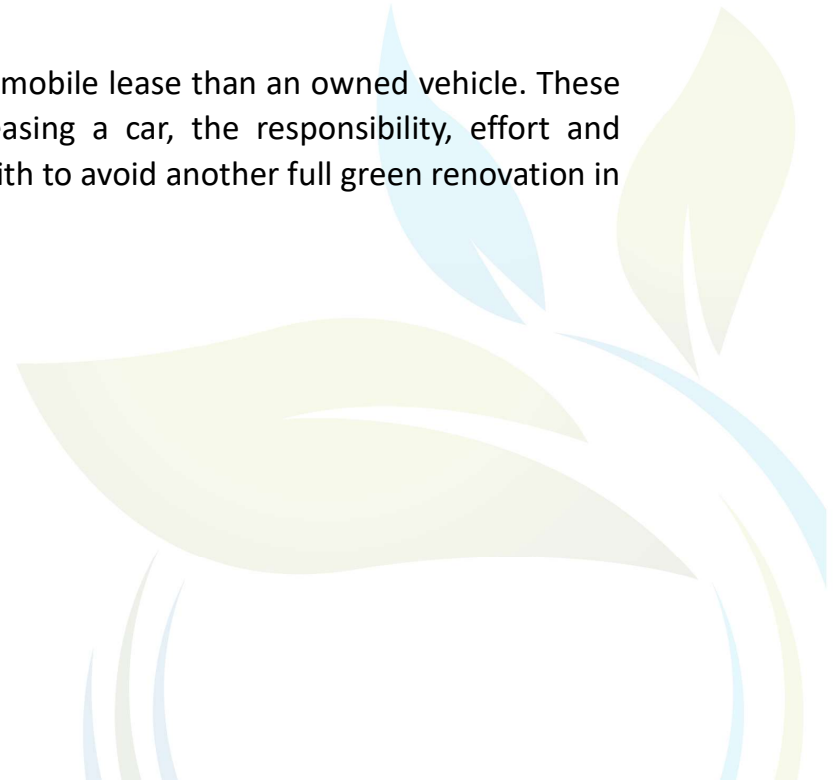
➤ *If chemicals are required on the greens to kill poa annua, then the staff got behind removing manually.*



Years 3 through 5

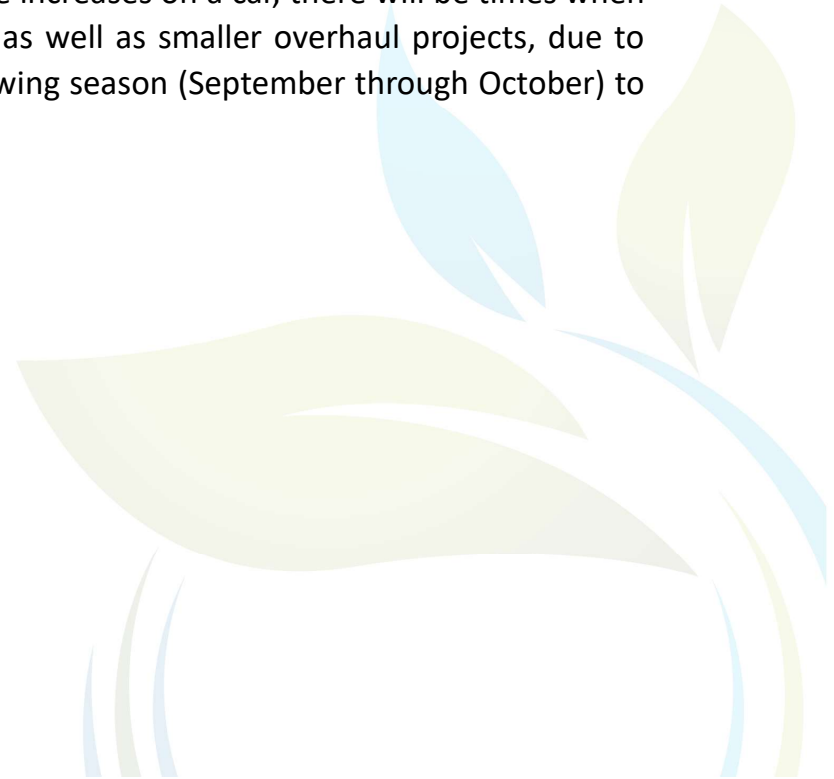
These years are critical to the longevity of the greens. This is the time period when, if maintained properly, they should be thriving and “settled” into place. If so, whatever it took to keep the greens mix loose, moving water and growing a good stand of bentgrass, should be continued in years 3-5. However, if this manual and recommendation have not been used during the first three years, thatch and other layers will accumulate that will take an intense amount of time, labor and possibly course closures to make up for it.

Golfers may expect new greens to be managed more like a 3-year automobile lease than an owned vehicle. These greens have been purchased. Meaning, like owning a car versus leasing a car, the responsibility, effort and sometimes inconvenience of “owning” these greens need to be dealt with to avoid another full green renovation in 20 years or less.



Years 6 and beyond

As the greens age, it may take a more intense version of the previous year's cultural practices. Projects such as videoing drain lines searching for weak or crushed sections should be completed. Drill and Fill aerifications may need to happen yearly. Researching, through soils data collection, the possibility of changing topdressing sand should take place. These greens will age like a car, if maintained properly, as mileage increases on a car, there will be times when the car spends more time at the mechanics for routine maintenance as well as smaller overhaul projects, due to aging. Consider closing the greens for a full week during the prime growing season (September through October) to accomplish these and other projects.

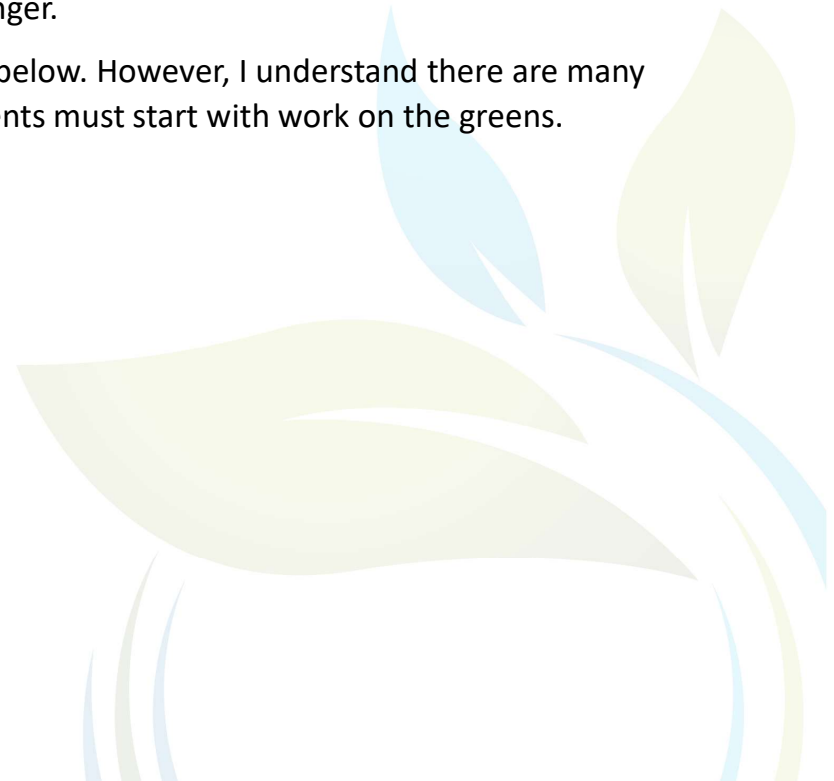


The Cost of Quality

To reach a goal of 40 years old or older greens, they must be of high quality as often as possible. This will cost time and money to do so. The most important part of a green's lifespan is the day-to-day care. Properly mowing, consistently changing hole positions, hand-watering, fertilizing, etc. will probably add up the most to how long the greens live at a high level. We have seen in Las Vegas that any significant lapse in proper management, lack of resources or even outside forces that slow down revenue, lead to low quality greens and cut years off the life of the green. If the high priority is given to the putting greens, they will live longer.

Some examples of what is required to maintain high quality greens are below. However, I understand there are many other tasks that require daily and long-term attention, the job assignments must start with work on the greens.

- Walk mow greens 6-7 times a week
- Change cups 6-7 times a week
- Irrigation repair and hand-watering
- Supervision
- Mechanic equipment repair



Summary

The sand was purchased from West Coast Sand and Gravel in Palm Springs, CA and the gravel from Impact Sand and Gravel in Boulder City, NV. Both products were brokered and checked in on site at the time of delivery by BJ Kerzetski of Lone Mountain Sand Co. This was very helpful to both the Construction Contractor, Landscapes Unlimited, and the Golf Course Superintendent, Rick Friedemann. Using this process, we were able to catch anything that didn't "look right" and correct it. It reduced the need for many extra Quality Control testing and sped up the time in getting laboratory results from Brookside Labs, Inc.

There were a few things that happened during the grow-in process that should be noted. Although they may not be things that will affect the longevity of the greens, in the short-term, they should be noted:



Wind Damage



Fencing Need



Must be secured to stakes



Use of Covers

Some greens needed to be reseeded after a windstorm. Fencing was needed for Coyote damage and did need to be secured to the stakes. During windy conditions, some stakes were dragged across the greens. The use of Covers during the Winter months has shown dramatic improvement in areas where greens were seeded later.

This Owner's Manual is intended to guide the golf course maintenance decisions for the greens built in 2023. You may have found a certain section of the manual to be non-specific. It was done on purpose as we all understand that flexibility as the grass grows and the soil profile ages, will be needed.

If there is ever a time that someone would like more details or to talk to me, I would welcome the conversation.