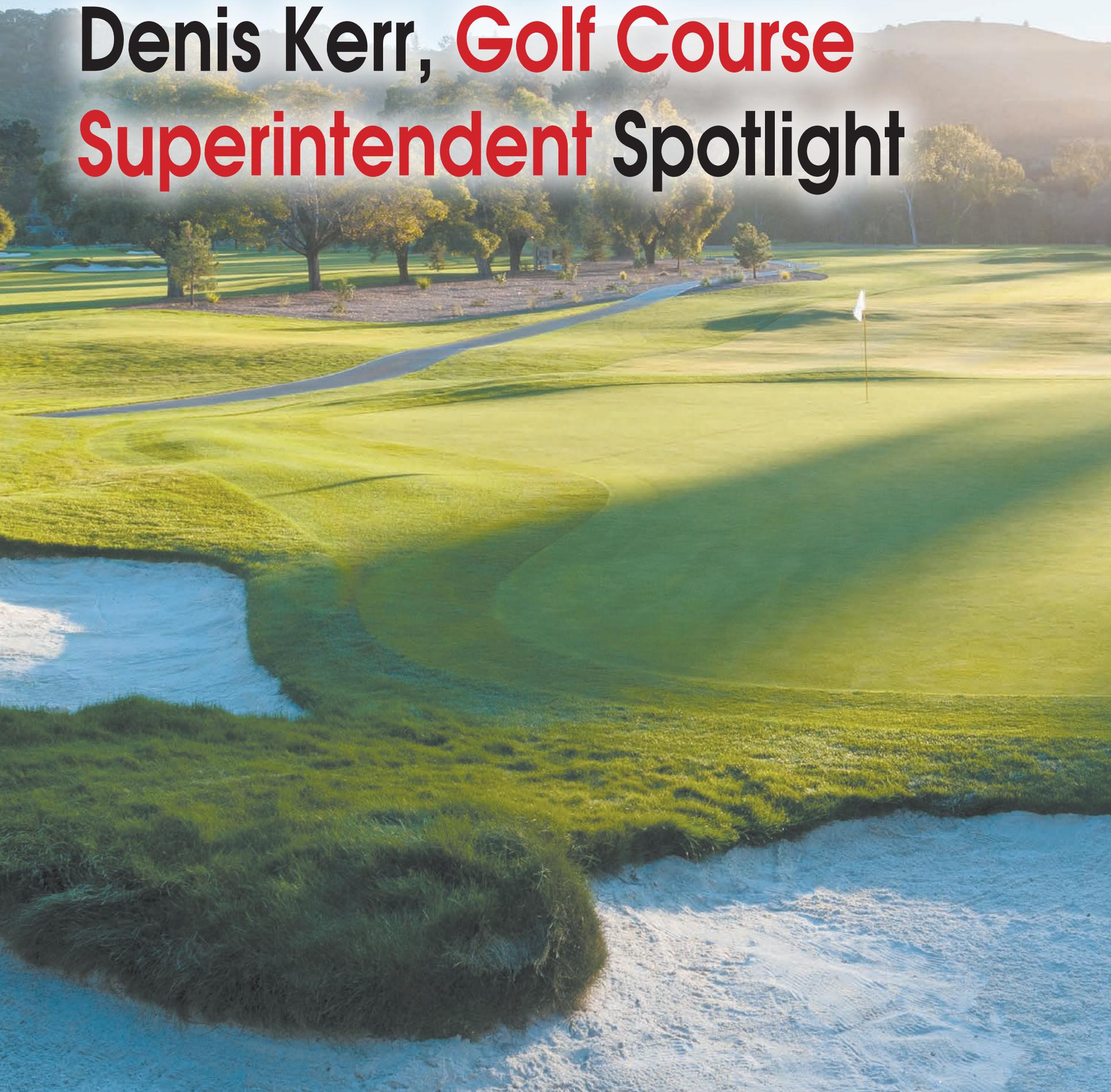


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Denis Kerr, Golf Course Superintendent Spotlight



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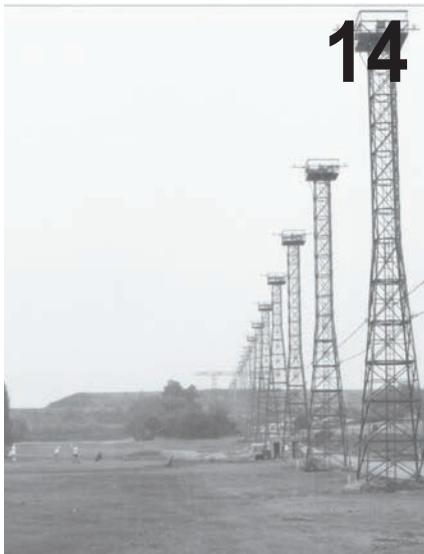
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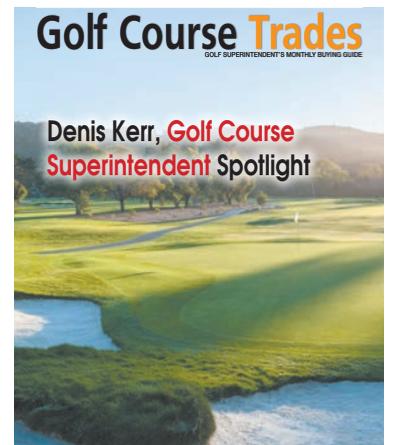
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Sleepy Hollow Country Club – Macdonald Reborn

By Jay Flemma



Even before Washington Irving wrote the town of Sleepy Hollow forever into our national literary culture, the area was known to be home to countless ghosts and goblins. Myriad tales of specters and spooks found their genesis in this once thinly-traveled recess of the Hudson highlands, and its reputation for being haunted extended much further back than Irving. But since the 1819 publication of his iconic short story there has been one indomitable figure; the Headless Horseman is likely the most iconic phantom in American literature. Chief among the cursed souls that in that valley

dwell he rides like the winds of Hell through the Rockefeller State Forest chopping off heads where he finds them.

But now, almost 200 years to the day from the publication of “The Legend of Sleepy Hollow,” another ghost has risen, this one far more benevolent. It’s Charles Blair Macdonald, the quintessential Golden Age golf architect, the designer of such indelible masterpieces as National Golf Links of America, Yale, and Piping Rock, and progenitor of dozens more through his architectural bloodline of Seth Raynor and

Charles “Steamshovel” Banks.

Macdonald was the original designer of Sleepy Hollow Country Club, but land acquisitions and sales, along with intervening designers, resulted in a confused checkerboard of a course that was part Macdonald and...well...part not Macdonald. And like the old football adage of “When you have two quarterbacks, you have no quarterbacks,” when you have two design styles at your golf course, you do not have a contiguous whole.

Happily, in 2005 Sleepy Hollow C.C., wisely and steadfastly stewarded by Greens Committee chair George Sanossian, hired Gil Hanse to restore what Macdonald features still remained, and to re-create the strategies and artistry of Macdonald in the holes that were not originally his. 13 years later, the work is finally complete, and Sleepy Hollow is now the envy of the golf world, fully renovated so that the new holes designed by Hanse look like something Macdonald might have created, Golden Age splendor newly-minted. Macdonald has risen again. Now two specters haunt Sleepy Hollow, equally fearsome, both worthy of the immortality they

have achieved.

MACDONALD VS. TILLINGHAST

Macdonald came to Sleepy Hollow in 1913, fresh off his wild success at National Golf Links of America. He had rocked the golf design world to its foundations with his brash boasting of how he would show everyone how to design a golf course, and then he went and blew everyone away with the results. He talked the talk, and then he also walked the walk.

Macdonald was riding the crest of a high and beautiful wave, a revival and a return to sublime strategies and bold features. National attracted the attention of Sleepy Hollow C.C.’s founders, a veritable Who’s Who of American high society – Rockefellers, Astors, and Vanderbilts. So just as rich patrons in Italy would choose Da Vinci or Michelangelo to paint their daughters who wouldn’t sit still, over a verdant 340-acre Vanderbilt estate that bordered the Hudson and looked across its sapphire waters to the frowning rocky tors of the Palisades Macdonald recreated holes from the greatest courses in the United Kingdom for America’s crème de la crème.

What a glorious location they gave him: with dappled sunshine blazing like gold off the mirror-clear, motionless Tappan Zee beneath the mighty mountain, it could have been painted by an Italian master. The clubhouse is a former Vanderbilt estate. It’s downright palatial.

Macdonald finished his work in 1914, but his design began to erode just six years later. Real estate deals erased four holes (they were replaced by work from Tom Winton, a local architect), and then A.W. Tillinghast came in 1930 to increase the number of holes at SHCC to 27. Some of Tillie’s work became the first, eighth through 12th, and 18 holes of the course Macdonald had designed.

But as Morrisett noted in his recent GolfClubAtlas.com profile of the renovation work, the club had a dilemma – two giants of golf course architecture worked at Sleepy, but their design styles clashed. When it came time for a renovation, “the conundrum the board faced was how to act as a custodian when it wasn’t certain





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Superintendent Spotlight: Denis Kerr Quail Lodge Golf Course



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asks for none. An unsung hero who commits his life to ensuring that our golf course is second to none. He is dedicated, passionate and handsome (albeit self-proclaimed) beyond compare. To those within the world of Golf Course Superintendents, he is referred to as “the man,” “the myth” and sometimes

even “the legend.” But to us here at Quail Lodge & Golf Club, we simply refer to him as Denis. Our appreciation, admiration and respect, however, fall nothing short of in line with the aforementioned references.

Denis Kerr, Golf Course Superintendent, started working at Quail Lodge & Golf Club under the same position in 1989. All joking aside, and though he may not admit it, he is the heart, the soul and the backbone of Quail's award-winning course conditions. Having received a formal education in his craft and acquiring a respectable array of certifications and memberships along his journey, he has expressed no interest in doing anything else or working anywhere else. When asked why Quail Lodge & Golf Club is so

special to him, his response was simple, “It's home.”

The complexities of maintaining a golf course are a true combination of science and art ... and there is no one better at it than Denis. Therefore, we at Quail Lodge & Golf Club are proud to showcase one of the world's greatest Golf Course Superintendents in this month's #StaffSpotlight. For example, how many people do you know that have slept in the back of their pick-up truck on the first fairway to ensure that the wild pigs wouldn't tear it up in the middle of the night? If that doesn't scream dedication to his job and the guests who play Quail, then we don't know what does!

So the next time you join us to play a round of golf, take a moment to stop and appreciate the gorgeous landscape that Denis Kerr and his team bring to life on a daily basis.

Source: <https://www.quaillodge.com/special-offers/staff-spotlight>



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what it was trying to preserve."

In the end, the club chose Macdonald, perhaps because so many great Tillinghast courses are within shouting distance of Sleepy Hollow, or perhaps because by 2005 the Second Golden Age of Golf Course Architecture was in full swing and Macdonald designs were, once again, garnering the attention they richly deserve. It may even have been a little of both.

Hanse succeeded beyond all expectations. In 2005-06 he finished the bunkering style and scale of the renovated holes, then in 2016-17 he redid the greens, adding bold Macdonald-like internal contours, while increasing pinnable space. In particular, greens one, eight, nine, 10, 14, and 18 were all significantly enlarged. Moreover, one, eight, and nine became new Macdonald template holes: a Leven, a Road Hole, and a Knoll respectively.

"At number one, we wanted to stop people driving into the 18th fairway to shorten the hole," notes head superintendent Tom Leahy, who has been at Sleepy since 1993, and who worked with Hanse throughout the entire project. "The mound that guards the front right of the green now sends balls scurrying into the left bunker, where before that green was a catcher's mitt, with no penalty to the player who drove into the other fairway."

The eighth now features a deep Road Hole bunker greenside and the same playing angles as its famous namesake at the Old Course at St. Andrews. Moreover, the green size was increased from 6,100 square feet to 8,400, and the contours were shaped so the ball could be fed from right to left, an enormous improvement from the narrower, blander hole that existed before.

Hanse's rejuvenation continues throughout the back nine. The 10th green was enlarged significantly as well, while the approach shots on 11 and 13 are now far more terrifying as yawning chasms guard the right side of both greens. You risk getting black lung disease trying to extricate yourself from those deep bunkers. And the finish of the course is all-world.

"The green at 14, for example,

now features two long rails that run throughout its length, and it has been squared up, increasing its size significantly," Leahy says admiringly. "Hanse also not only added a perfect thumbprint in the 16th green that makes the gorgeous outline of a horseshoe, he tied in that green with the third tee box, linking them like the classic Golden Age architects used to do frequently."

Finally, after the magnificent, dizzyingly downhill 17th, the 18th climbs back to the clubhouse before ending at a new green that features a false front and a back portion that abuts the club veranda.

Sleepy Hollow is Colonial Americana in all its charm and earnestness. Just a half-hour drive from the City, it feels a world away. Moreover, after several false starts, the eponymous country club is once again a unified Macdonald whole. Better still, with so much phenomenal movement in the earth, both laterally and vertically - sidehill lies, gargantuan bunkers, and of course wildly curvaceous greens - it is unquestionably now one of the greatest clubs in the world and needs to be spoken of in the same holy whispers as Winged Foot, Pine Valley, Merion, and Cypress Point.

"Gil knew what the weaknesses of some of the holes were and turned them into strengths," Leahy confided. "It truly is a special place."

When not reporting live from major sports championships or researching golf courses for design, value and excitement, multiple award-winning sports writer Jay Flemma is an entertainment, Internet, trademark, and banking lawyer from New York. His clients have been nominated for Grammy and Emmy awards, won a Sundance Film Festival Best Director award, performed on stage and screen, and designed pop art for museums and collectors. Twitter @JayGolfUSA

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Making the Rounds – Part 3

By Jeff Shelley



One of the oiled-sand “browns” at Woodburn Golf Club in Oregon. (Photo by Jeff Shelley)

It’s amazing how many types of golf courses there are. When people ask to name my favorite, I always demur, muttering, “It depends on where you’re at.” There are simply too many favorites.

It’s amazing how many types of golf courses there are. When people ask to name my favorite, I always demur, muttering, “It depends on where you’re at.” There are simply too many favorites.

In the Pacific Northwest alone, nearly every major climate/geographic zone and type of course is represented. You’ll find golf played alongside a major ocean (the Pacific), mountains, major rivers, riparian areas, meadowlands, farmlands, bone-dry deserts, rain forests, sprawling estuaries, and high spots offering vistas stretching 100 miles and farther. There’s a reason why the term “Big Sky Country” was coined in this neck of the woods.

The weather in the nation’s upper-left-hand corner encompasses very cold winters and magnificent summers; frigid winters and steamy summers; “banana belts” that receive only 12 inches of rain a year while nearby areas get 40; and climates influenced by mountain ranges and fresh- and salt-water bodies. Growing seasons stretch from 150 to 260 days. Golf courses are situated at sea level and elevations as high as 5,000 feet.

Of the estimated 800 golf courses I’ve played and/or visited around the globe, over 500 were in the Pacific Northwest

(Washington, Oregon, Idaho and Montana). I’ve also been lucky to have golfed in places as diverse as the Canary Islands, Mexico, Louisiana, Mississippi, Massachusetts, California, England, Ireland, Hawaii, New Zealand, Australia/Tasmania, Hawaii, North Dakota, Vancouver Island, South Carolina, Illinois, New Hampshire, Maine, New Jersey, Scotland, Antigua, New York, Texas, Germany, Washington D.C., Maryland, Virginia, British Columbia and Wyoming.

Among these were four courses outfitted with oiled-sand greens (some of you oldsters like me may remember them). Half have since been converted to grass putting surfaces. But the Country Club of Seattle (a super-exclusive par-3 nine on Bainbridge Island established in 1896), and the 1925-built Woodburn Golf Club south of Portland, still retain their “browns.”

I’ve seen some amazing designs, some that required moving hundreds of thousands of cubic yards of dirt to fulfill the architect’s vision. The most extreme case was a single par-3 at Tom Fazio’s Querencia in Cabo San Lucas that reportedly involved 750,000 yards! Yet others needed minimal earth-moving; for example, the magnificent original

course at Bandon Dunes Golf Resort took around 10,000 yards.

But, just as memorable as the sublime layouts on top-100 lists extolled by golf writers and course raters, are others that I’d call wacky designs. Here are some of my personal “favorites.”

There was the former Clover Valley Country Club near Port Orchard, on Washington’s Kitsap Peninsula. The original nine at the then-semiprivate club was built in 1962. Another nine holes were added a decade later. Changes were made over the ensuing years, the oddest of which was switching the poplar-lined fairways a baffling 90 degrees. Nothing like standing on a tee, seeing a blurry green in the distance behind dense foliage, and firing a golf ball through a wall of trees that never should be planted on a golf course in the first place!

The course also had notoriously wet playing conditions. In a 2013 story in the Kitsap Sun newspaper, Dwight Babcock, who played in a men’s league at Clover Valley, told reporter Jeff Graham, “It was built on a bog. It just sucked up water.” Also chiming in was another regular, Bill Anderson, “In winter time, you could row a boat down there. It was a very poor place

for a golf course.”

Sadly, I came to personally experience Clover Valley’s watery nature. While crossing a rickety bridge over Salmonberry Creek, my trusty Canon – presumably secure in the cart’s cubbyhole – bounced out and plopped into the drink. Clover Valley cost me \$250 to repair that camera. My biggest regret is that photographic proof of the poplar-blocking fairways was washed away. In 2003, a fellow named Won Yang purchased the 100-acre property and, thankfully, converted these 18 holes into Yang’s Botanical Gardens.

Another doozy was Hot Springs Golf Course overlooking the Columbia River on the Washington side. Named after the nearby Carson Hot Springs, a naturally heated spa used by pioneers as early as 1876 – and Native Americans likely well before then, the course started as a forested nine-hole before expanding to 18. When I called then-owner, Rudy Hegewald, about wanting to come by for my guide book, he exclaimed, “Oh, wonderful! You must come and see my new course. It’s better than Augusta National!”

A week later, I found that Rudy had removed every fir, pine or cedar on the site and sold the timber. On the “signature” hole, he placed an irrigation pond that spewed 105-degree water from the naturally-heated springs. Though it was purportedly cooled to 60 degrees before application, the mineral-rich water made the turf hard, wiry and just plain weird.

The pond was situated at the corner of what the scorecard indicated was a 400-yard, dogleg-left par-4, rated the course’s toughest hole. When I reached the tee, I took a look at a wide fairway curling around the water, then glimpsed the green off to the left across the hazard. This 10-handicapper pulled out a 5-wood, hit my drive onto the green, and two-putted for an easy birdie. Just like at Augusta National.

Two courses’ claims to fame were for having the shortest par-4s in the Northwest (and hopefully nowhere else). One was Golf City in Corvallis, Ore., home



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of Oregon State University's vaunted turfgrass program, and the other was Wayne Golf Course in Bothell north of Seattle.

Golf City had a less-than-brawny 85-yarder. An "albatross" was possible by scorching a worm-burner under low-hanging branches (a putter in the summer?). Wayne's shorty – on a back nine since converted into a natural area (see Yang's Botanical Gardens above) – was maybe 120 yards. It doglegged 90 degrees to the right around a Cyclone fence to a green on a bluff. Two choked-up sand wedges did the trick on this brute.

Perhaps some courses should never have been built due to their less-than-ideal locations. At last check, the Northwest boasted three courses named "Riverside," and each has a history of flooding. ("Jeopardy" answer: Riverside is most common name for an American golf course.) The clubhouse at the Riverside in Kelso, Wash., had to be put on three-foot-high blocks; it's interior walls still show waterlines from past deluges. An 18-holer east of Seattle, Carnation Golf Course, lies on the Snoqualmie River floodplain. In 1990, a raging torrent

carried a bridge on its second hole all the way to the city of Everett, 15 miles downstream.

Another course subjected to the vagaries of its "unique" site is Tye Valley on the south end of Sea-Tac International Airport. Every day, it's subject to a thousand or so low-flying jets taking off and landing at one of America's busiest hubs. A row of landing lights penetrates the course's north-south midsection, and the right side of the 7th fairway is lined by a string of orange flight towers. Regulars, who've learned to communicate with their own sign language, call the place "Thunder Valley."

Other courses have successfully coped with unusual sites. At one time there were two Northwest layouts within horse-racing tracks. Despite its popularity, Portland Meadows was closed years ago. But historic Touchet Valley – established in 1925 – in Dayton, Wash., is still going strong. Signs warning golfers to look both ways for galloping horses precede Touchet (pronounced "Too-shee") Valley's two infield holes, an area that once housed the high school football field. These side-by-side, mirror-image par-4s head through the center of Columbia

County's largest stadium to greens butting against the track's inside railings.

Other venues have employed local "resources" to outfit their golf courses. At Kellogg Country Club in Idaho, blackish copper tailings from nearby mines are used as bunker sand, a material also employed at the much more acclaimed Jack Nicklaus-designed Old Works course in Anaconda, Mont. Aspen Lakes Golf Course in Sisters, Ore., was developed by the Cyrus family, owners of Sisters Aggregate and Construction. Their road-building company filled the course's surprisingly facile traps with crushed basalt, rendering these Bill Overdorf-designed hazards bright red in color. And the Robert Muir Graves-designed Three Rivers in Kelso was built atop millions of tons of ash and mud dredged from the nearby Cowlitz River following the eruption of Mount St. Helens on May 18, 1980.

And lastly (though I could go on longer), there's Fort Steilacoom Golf Course. Before its recent closure, this short nine south of Tacoma abutted one of the largest mental institutions on the West Coast, Western State Hospital. The course was built in 1951 as a

rehabilitation facility for patients. These "committed" people were often seen walking the paths beside fairways. They were likely saying to themselves, "Those golfers are crazier than me."

Note to Readers: So what wacky golf course designs have you seen? Please send them to jeffs@cybergolf.com and I'll use them in a future installment of "Making the Rounds." Be sure to include your full name, phone number, email address, job title, place of business and, if available, a high-res (and copyright-free) jpg photo. Thanks – this could be fun!

Jeff Shelley has written and published nine books as well as numerous articles for print and online media over the past 30 years. The Seattle resident is the co-founder of the Northwest Golf Media Association and board president of First Green, an international, nonprofit program that provides environmental and STEM education outreach using golf courses as environmental learning labs. fairgreens@seanet.com



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Water – The Single Biggest Input

By Brad Snavelly



What do you apply on your golf course more than anything else? 15 to 20 years ago, the most common answer would be nitrogen, or calcium; water was never a consideration.

What do you apply on your golf course more than anything else? 15 to 20 years ago, the most common answer would be nitrogen, or calcium; water was never a consideration. Ask that same question today, the answer many times will be WATER. With increased use of recycled water and deteriorating ground water quality, nutrient loads are getting larger. We are being reactive with soil testing to correct poor base saturation cation balance (Calcium, Magnesium, Potassium and Sodium) in the water, then typically amend the soil to balance and combat the detrimental constituents, such as too much sodium, chloride, sulfate, and let's not forget bicarbonate. For those who are blessed with using pure water sources... infiltration, percolation and potential for nutrient stripping is a concern. If you are using poor water quality, be careful with what, and how much you apply, or you can induce your own salinity issues. Sometimes, it's not what you didn't do that causes problems, it's what you did do. As we enjoy the benefits of rain, cleaning up the soil, and in some cases having drought restrictions lifted, higher prices for water will still

prevent many Superintendents from implementing leaching fractions to prevent accumulation of detrimental salts in the root zone by applying more water than is needed for Evapo-Transpiration (ETo). In the Southwest for example, as they head into their long stretch with little or no rainfall, reductions in water use will favor salt accumulation. We have learned to become better environmental stewards by irrigating at about 60% of ETo on warm season grass, with 70% to 80% of ETo being applied to cool season turf varieties. Due to this water conservation strategy, other methods should be considered to maximize salt management. Good soluble sources of calcium, penetrants to aid water movement and depth of penetration, carboxylic and other organic acid(s), including aminated compounds work well, but keep in mind that salt management starts with water movement and drainage. Innovative water treatment systems can help by reducing surface tension, drive salts deeper in the root zone, prevent scale formation in irrigation piping and maintain water flow for better distribution uniformity, such as Magnation (rainlikewater.com). We should also take into consideration

created based on greens not being the same size and sometimes having a different number of heads. This tool allows the turf manager to adjust for the individual size of each green, the number of heads and sprinkler flow rate(s). This will work to promote equal water distribution as opposed to smaller greens getting more water and larger greens getting less. Once the basic adjustments are made, then further fine tuning can be done to address site-specific nuances on greens such as different root zones, location of the green, air movement and/or shade issues, surrounding stress impacting water use, etc.

2. The second helpful tool is available through STS Turf, and is a Nutrient Contribution - Amendment Application Spreadsheet, which helps turf managers identify site-specific water challenges. The first item is inputting water-based constituents, then calculating the volume of water that will be used, with the spreadsheet formulas providing the number of acre-feet of water applied per acre, specific to certain areas, while also illustrating when the greatest amount of water will be applied. This will work to quantify the constituent contribution and compensate for the time of year when irrigation water use is at its' greatest. The objective is to first balance the soil, then pro-

Greens Irrigation Normalization Spreadsheet - Brian Whitlark USGA Agronomist

Site Specific Data in Yellow Areas				Desired Inches of Water	Min Per Head at Desired	Percentage To Apply in Computer	
Green	# of Heads	GPM/Head	Sq Ft	Inches/Hr	Depth of Water	For Each Green	
1	4	23	4200	2.11	14.23	15.00	99%
2	5	23	4780	2.32	12.85	13.00	90%
3	5	23	4875	2.27	13.21	14.00	92%
4	5	23	4825	2.29	13.08	14.00	91%
5	4	23	4250	2.08	14.40	15.00	100%
6	5	23	4925	2.25	13.35	14.00	93%
7	4	23	4100	2.18	13.88	14.00	96%
8	5	23	5025	2.20	13.62	14.00	95%
9	5	23	5150	2.15	13.96	14.00	97%
10	5	23	4750	2.33	12.87	13.00	89%
11	5	23	4775	2.32	12.94	13.00	90%
12	5	23	4990	2.22	13.52	14.00	94%
13	4	23	4125	2.15	13.97	14.00	97%
14	5	23	4885	2.27	13.24	14.00	92%
15	5	23	4850	2.28	13.14	14.00	91%
16	5	23	4825	2.29	13.08	14.00	91%
17	5	23	4715	2.35	12.78	13.00	89%
18	5	23	4775	2.32	12.94	13.00	90%
LPG	8	23	8250	2.15	13.97	14.00	97%
SPG	4	23	4100	2.18	13.88	14.00	96%
Average IPH				2.23			

“Sufficiency Levels of Available Nutrients” (SLAN), and target the right nutrient levels based on the site-specific challenges and targets. Management strategies should be applied in front of potential problems to be more proactive. Two (2) items that can assist turf managers with pro-active water management are:

1. Greens Irrigation Normalization Spreadsheet available through the USGA (www.usga.org/course-care.html)

This unique spreadsheet was

actively manage by establishing an amendment schedule structured to compliment any soil type and/or situation based on water quality and input. This enables the user to proactively maintain ideal soil content and balance, as opposed to reacting to soil testing and making corrections after the fact, thus soil testing becomes more of a monitoring tool as opposed to a reactionary tool.

When using pure water, this spreadsheet allows the end-user to

Continued on page 21



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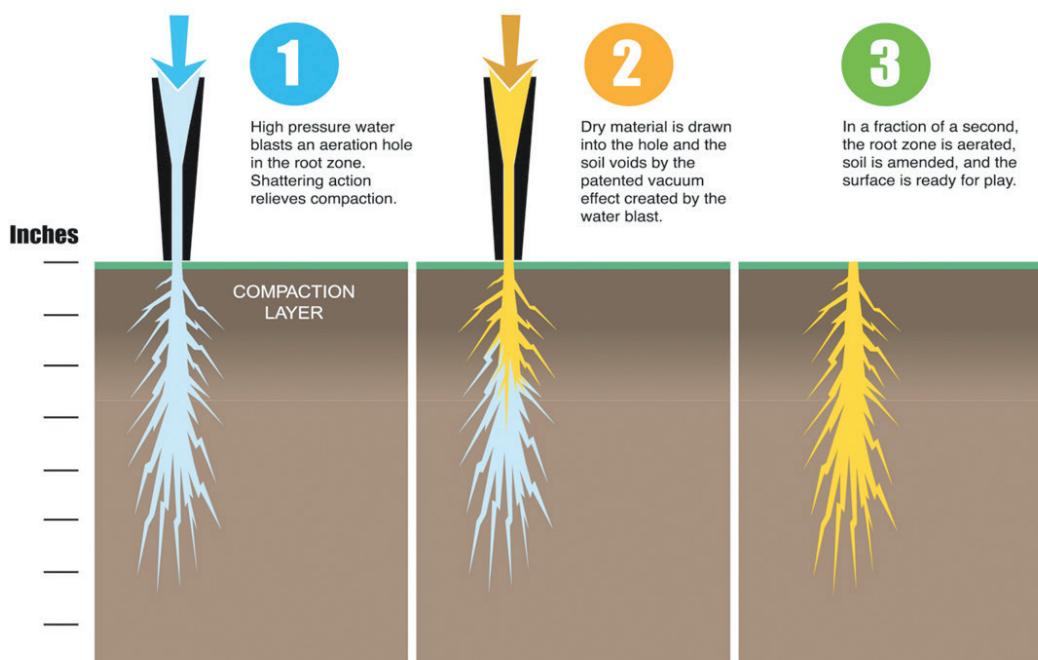


for the turf to heal until the greens are back to normal. How much is the revenue reduced in that time period through lost rounds and heavy discounts? What about the lost sales in the pro

shop and restaurant? These are just some of the concerns that face all decision makers at golf courses who are responsible for a healthy bottom line.

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**Justin N. Smith, General Manager,
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Continued from page 18



determine what should be applied, how much and how often to target nutrient goals.

The STS Turf spreadsheet has been continually fine-tuned over the past 15 years since being first exposed to the use of recycled water and the impact it had on the soil chemistry. This proprietary spreadsheet will also work to help prevent overloading of amendments and / or N-P-K fertilizer to reduce potential of creating a self-induced salinity hazard by putting out too much, either at one time or over the duration of the amendment schedule. Using poor water quality, it is many times difficult to achieve an ideal Calcium to Sodium ratio, otherwise you take the chance of overloading.

Once you know how much you should apply to off-set the water contribution (let's say sodium), then you can work on correcting the balance of Ca-Mg-K. Using recycled

water for example, Potassium typically is significantly lower than Calcium and Magnesium, and in the presence of high sodium when turf cannot differentiate between the two single positive charged cations it becomes important to foliar feed Potassium in addition to amending the soil to prevent issues.

An abbreviated list of detriments these tools can help you manage include:

The Sodium Adsorption Ratio, or SAR, which quantifies the potential sodium hazard of water based on the variety of turf being managed. This value determines the relative proportion of sodium, compared to calcium and magnesium. As the SAR value increases, so does the sodium hazard to soil and low tolerant turf.

The adjusted SAR was developed to account for the sodium hazard of the water due to the SAR, while

factoring in the bicarbonate (HCO_3) concentration and its' precipitation potential converting soluble calcium and magnesium into insoluble lime. Bicarbonate adversely affects plant balance, soil structure, and the uptake and metabolism of nutrients in the plant. Lime-induced iron chlorosis can occur, especially late in the growing season. Acidifying will help decompose bicarbonate before it has a chance to create issues.

High sodium can adversely affect soil structure and aggregation, limit water infiltration, percolation, aeration, gas exchange and pore space where roots can grow. Water moves from an area of low salt concentration to an area of high salt concentration.

High chloride can cause leaf burn, premature leaf drop, stem dieback, and inhibits plant growth and root development. It can also impact Nitrogen uptake, with high chloride sometimes dictating increased Nitrogen inputs.

Sulfur deficiencies result in chlorosis, but when high in the water, restricts N in a poor ratio, can tie up metals, and react and convert into ferrous or hydrogen sulfide (black layer). If toxic gases cannot vent, they can damage roots, resulting in turf decline and loss. High sulfur can also limit uptake of calcium. Calcium deficiency symptoms can occur when sulfate levels are too high, as well as when plants stress due to

high temperature, winds, or low soil moisture. Sulfur in the profile can react with sodium, to form sodium sulfate, which like sodium chloride, is very soluble.

When looking to manage your growing medium, light, air and water should always be addressed as the foundation to ensure nutrient inputs work efficiently. Manage water movement, drainage and quality before it manages you.

The Author:
Brad Snavelly – Technical Director of Sustainable Turf Science, Inc. has a combined 40 years of experience in agriculture and sports turf management. Brad consults world-class sports stadiums, Top 100 golf courses as well as lower level facilities, municipalities and sports complexes to maximize their budget dollar while promoting turf quality and stress resistance. STS Turf - Next Generation Turf Nutrition is the industry leader for enzymatic fragmentation / pre-digestion yielding nutrients stabilized in ionic form along with organic acids, carbon, bio-stimulants, vitamins and enzymes to optimize turfs' genetic potential.

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Atlantic Installations

By Andrew Penner



I'm standing on the tee on a 200-yard par-3 that plays downhill to a bunker-guarded green. And, even though I've played the course a dozen times or so, today something looks very different. "I don't remember there being ponds on this hole," says Ben, my playing partner. I take a closer look at the green complex and notice that there is no sand in sight. Instead, the "pits" are full of water; unplayable little vestibules that yearn to swallow anything whole. "Ah, yes, here we go again," says Ben. "Three inches of rain last night and the bunkers are swimming pools. At least it's a free drop."

Unfortunately, as every superintendent knows, there is nothing "free" about bunker maintenance. It's one of the most expensive, money-draining aspects of golf course maintenance. In fact, per square foot, there is no other area of the golf course that costs more to maintain. And, for decades (perhaps centuries!), the problem of bunker drainage has been a thorn in the side of golf course superintendents around the world. However, one company, thanks to their vertical-chamber drainage systems, is changing this problem once and for all. They are called Atlantic Installations.

"Bunker drainage hasn't worked properly for sixty years," says Willie Burton, the President of Atlantic Installations. "French drains fail

continuously. Horizontal drainage systems have cost the golf industry millions. Our vertical drainage system changes all of that. We have had courses use our system for over fifteen years without a single failure. The system is designed so that even in torrential rains drainage won't be an issue. Golfers can get back out there almost immediately and have playable bunkers. Instead of closing the course for a few hours, a day, or longer, golf courses can keep their revenue streams flowing. Installing our vertical chambers can pay for itself in a very short period of time. And this system also works beautifully on fairways."

Based in North Myrtle Beach, South Carolina, Atlantic Installations, a relatively small company that employs about a dozen people, give or take (depending on the size and scope of their current projects), is a golf course renovation company. Although they do complete golf course renovations, they specialize in bunkers and drainage solutions. Their goal is to minimize recovery time after a rain event and make sure revenue losses are at a minimum after storms or during the wettest months. And key to all of this is their patent on their unique, vertical-chamber system.

Essentially, bunkers fail because of the use of gravel or stone under the sand. After each rain event the fine sand particles move downward

and clog up the spaces in the gravel. Eventually, water flow to the drain pipe is blocked off. This causes the bunkers to flood and the native soils move upward. And, in turn, along come the headaches and the costly, time-consuming process of draining, digging, pumping, and so forth. It can be an endless cycle.

Atlantic Installation's approach eliminates all stone in the bunkers and, most importantly, eliminates clogging. To cut to the chase, the system is on a vertical plane. The chamber system, which is lined with a geo synthetic product, is positioned vertically and this keeps sand from migrating into the sidewalls. These patented "Quickplay chambers" have a larger effective infiltrative area and can handle as much as 100 inches of rain per hour.

"Regardless of what type of environment your course is situated in, monsoon belt, sand belt, a rain forest, you name it, this system will do the job," says Burton. "Time is money in this industry. And when golf courses are closed because of standing water and drainage issues, my temperature goes up. Most of these situations are avoidable. This system typically pays for itself in months, not years."

Mark Nykorchuck, Golf Course Superintendent at The Founders Club in Sarasota, Florida, is one of a fast-growing list of superintendents who

would agree. "We installed the vertical chamber system in dozens of bunkers in 2003," says Nykorchuck. "And they have performed exceptionally well. We had a rain storm a few weeks ago with over 15 inches of rain and we were back out playing almost immediately after the rain stopped. There was no standing water in any of the bunkers where we installed the chambers. The vertical chamber systems that Atlantic Installations installed have worked for many years now. Put it this way, after a storm, and we get a few, I'm not worried about standing water. These systems come as advertised."

"Bunker drainage isn't all we do, though," says Burton. "We install artificial turf, which is definitely a growing business for us, and basically do any type of golf course renovation work that courses require. Often we'll take on a project and kill a few birds with one stone. It's a cost effective way to do business. However, bunker drainage is where we really have a competitive advantage."

My partner and I play on and try to make the best of the situation with the "new" and "unimproved" water-filled bunkers. I hoist a five-iron into the air and Ben immediately calls for it to hurry. To no avail. My ball plunges into the black hole of water guarding the front right of the green and is gone, perhaps, forever. "Might need your water wings to retrieve that one, pal," he quips. I mutter something unpublishable and we start the journey along the puddle-peppered pathway to the green.

Without a doubt, there will be many golfers playing this day that will hit their ball into a bunker-turned-pond and utter a few choice words in the process. It's an aggravating situation for golfers and superintendents alike. Of course, given the state of the golf course, we probably shouldn't have even been out there in the first place. Thankfully, I think, we were both given a discounted green fee rate based on the condition of the course.

"Be nice if they had a magic solution for bunker drainage," says Ben. "Like a snap of a finger and, poof!, it all disappears."

"Well, Ben," I reply, "as a matter of fact..."

Andrew Penner is a freelance writer and photographer based in Calgary, Alberta, Canada. His work has appeared in many leading golf publications throughout North America, including Golf Magazine, Golf Digest, The Golf Channel, Golf Canada, and SCORE Golf Magazine. Contact Andrew at andpenner@shaw.ca

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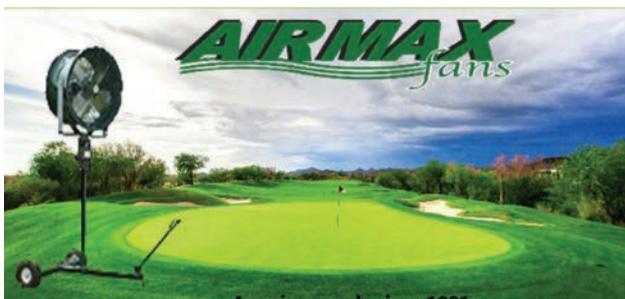
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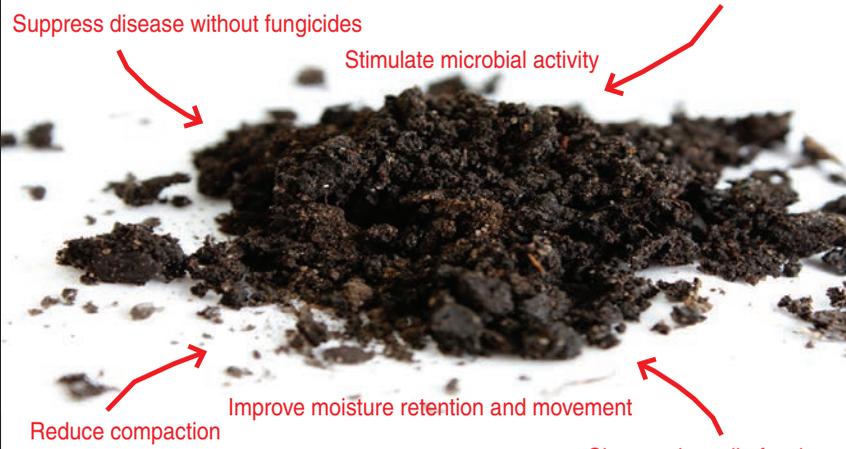


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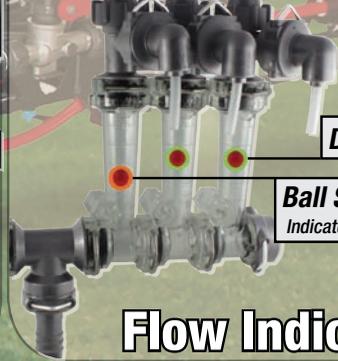
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