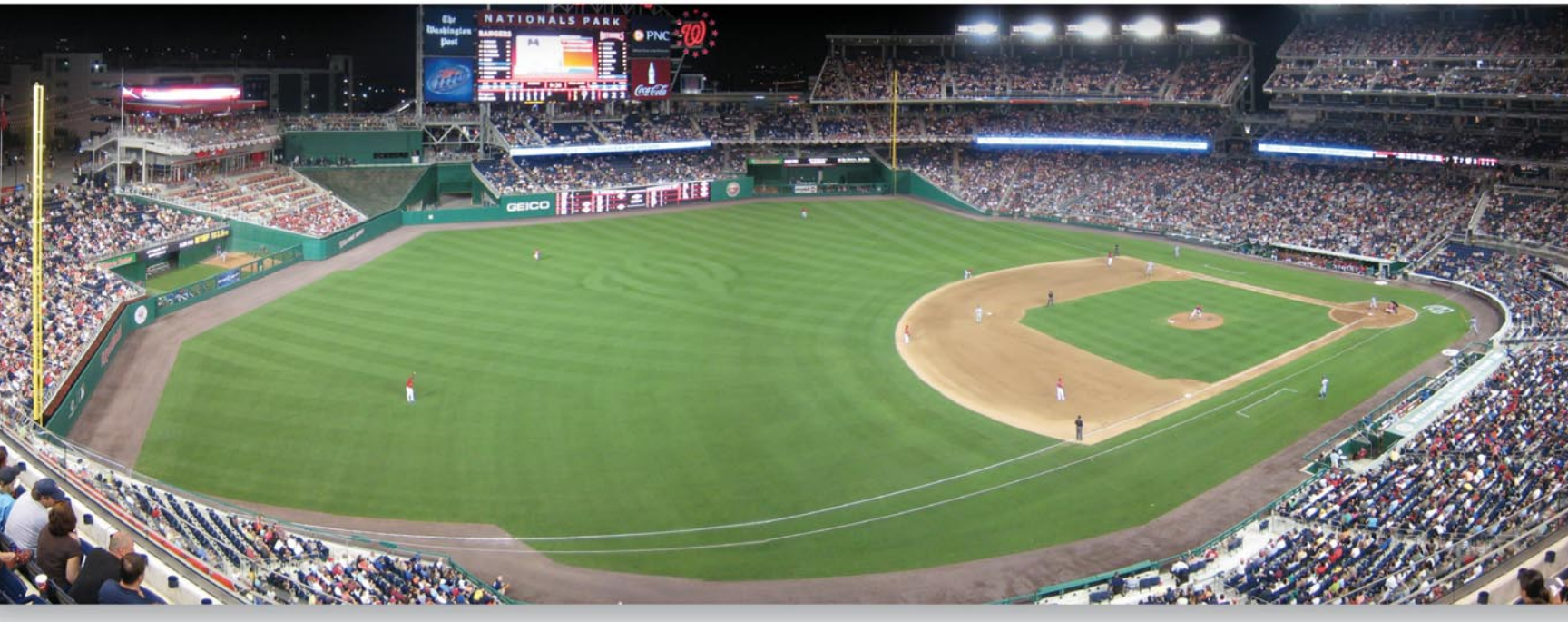
CAROLINA GREEN CORP.

Athletic Field Construction



Outstanding in our Field!

www.cgcfields.com

Toll Free (866) 753-1707

Email: info@cgcfields.com

- ✓ ***Field Design & Specifications***
- ✓ ***New Field Construction***
- ✓ ***Field Renovation***
- ✓ ***Laser Grading***
- ✓ ***Drainage Systems***
- ✓ ***Synthetic Infill Systems***
- ✓ ***Maintenance Programs***

Setting the standard for quality field construction with every project.

By Chad Price

Field design challenges mirror use demands

A common problem we see is a drainage system [with] beautiful pipe and stone layout that is covered with 6 inches of topsoil; ***the surface water never reaches the pipe.***

OVER THE PAST 20 YEARS of increasingly complex design challenges and the growing, high-use demands on athletic fields, sports field design and construction has emerged as a uniquely specialized craft, requiring not only years of experience to be able to meet and master these challenges but also a substantial investment in the development of the highly specialized work force and custom-designed equipment it takes to perform this work properly, as envisioned and designed. And to do it on time and on the money.

In short, today's athletic field to which in these severe economic times must be designed and built to stand both the test of time and high usage, is simply no place for on the job training of untested designers and contractors. Unfortunately, that is precise-

ly what is happening time and time again as owners turn to landscaping, grading and civil contractors with little or no experience in the field for their sports field construction needs, often tacking an athletic field project onto a larger campus construction project.

"After all," they reason, "anyone can grade a field and grow grass. Right?" Repeatedly, the answer to that question has been "no." All too often it is a time-wasting, budget-busting cry of "Oh, no!" And a private institution certainly wants to use "friends" of the church or school to keep costs down. Many times however the end product is a field that has long-term problems at a price that exceeds the cost if doing it right the first time.

The bottom line: when it comes to sports field design and construction, the "anyone can do it" believers are turning to contractors who not only lack expertise and experience in the field, but who also don't even know what they don't know. This article is my advice to help you in your quest to know what you have to know—by asking the right questions and getting the answers—when planning your athletic field project. Here are some considerations for making your field project a success.

Why a sports field contractor?

As with any "new" trade, sports field contractors (SFC) have borrowed equipment, techniques, and technical information from other industries, primarily the grading industry. It is tempting to pull in a local contractor that builds roads or buildings, thinking that the principles of grading and drainage apply equally to sports fields. One major difference is that in road and building construction you are controlling subsurface or underground water at a foundation or under a highway. In athletic fields you are controlling water at the surface, for footing, safety, and playability.

A common problem we see is a drainage system installed by a grading contractor that has beautiful pipe and stone layout, but is covered with 6 inched of topsoil and the surface water never reaches the pipe. This makes sense with road construction, but not with athletic fields. Even a 1 inch clay sod layer can fail a drainage system.

Grading techniques are also an important factor. With the introduction of automatic laser controlled grading systems, tolerances are lower and expectations are greater. Even though a grading contractor may use laser guided equipment, they most likely don't have the custom built equipment of the weight and size to get within the tolerances expected for athletic fields (standard is ¼ in. over 50 ft.).

Equally as important is that the field be designed with the proper grade and layout, so that surface water moves consistently off the field or into the drainage system by the shortest means possible.

The most successful sports field projects consistently involve a qualified field designer and field contractor. This holds true for synthetic turf as well as natural turf projects.

The all-important "p" word

Planning can make or break any project and sports field construction and renovations are no exception. Start by identifying field design firms and sport field contractors (some contractors do both). Pre-qualify these firms based on experience and references. Anyone can claim to be proficient, but the clients usually speak best to capabilities. Field builders and designers can be found through organizations such as the Sports Turf Managers Association the American Field Builders Association. Discuss your project with prospective designers and builders to get ideas concerning your project.

The next step in effective planning is a site evaluation. At a minimum this should include evaluation of grading and land use issues, site drainage, soil conditions, neighbors, lighting, pedestrian flow and parking, available space, traffic flow, truck and maintenance equipment access, water sources, and current and potential use needs.

Continue to consult with a sports field contractor and designer as you go though the planning process, asking for informal quotes for "ballpark" pricing. Developing a budget and understanding maintenance capabilities should be part of the planning process as well. Meeting with the end users (coaches and turf managers) will help to understand what the expectations will be for field performance and level of use.

Field design

The design phase is when interviewing of design or design-build firms should begin. Many firms may be well qualified to design an entire site or facility, but lack the knowledge or expertise to design and write specifications for sports fields. This can be an opportunity to use a "friend" of the school or church to help with erosion control and grading design, as long as you have a qualified sports field contractor advising the design.

Oftentimes the decision to hire a design firm is driven by the procurement process. We usually see three types: design-build, design-bid-build, or Request for Proposals (RFP).

In the design-build scenario, it is wise to interview sports field contractors and sports field design firms. Again, some sports field builders have in-house CAD capabilities, and can turn-key the design-build project.

In the design-bid-build scenario, very detailed specifications and field contractor qualifications should be included in the project bid documents. You may want to consider pre-qualification of field contractors: experience & references, percent of work self-performed, financial stability, bonding capability, insurance program, Certified Sports Field Manager (CSFM) and agronomist on staff, owned equipment list, length of time in business, etc.

The pre-qualification process becomes more valuable in a RFP scenario. The benefit of an RFP process is the wealth of knowledge gained from the interview/presentation process. The challenge is trying to compare proposals as you would be able to in an "apples to apples" bid situation.

How and when you sign a contract with the field builder varies, but generally the sooner the better. Make sure you include a detailed schedule, warranties, guarantees, project management meetings, and any specific requirements concerning work hours and facility access in the contract documents.

One of the biggest mistakes we see in the design process is the drainage system, if included at all. As referenced above, this is not a place to use a utility or grading contractor. There are many systems advertised and in the ground that do not work, or do not work for long. Always seek references and visit sites to inspect the performance of the drainage system you are considering. Again, this applies to both natural and synthetic turf.

Permitting

Once design is complete, the permitting process begins. The length of time to make this happen can be surprising. This process is often started in the design stage, and this is an area in which hav-

ing a good local connection definitely helps expedite the process. Requirements vary depending on state and local laws, but you may have from three to ten departments to seek approval. Depending on the scope of the project, this process could take from 1 to 4 months and may involve reevaluation of parking, access, noise, dust, stormwater, and other departments you never knew existed. So allow for some time. Cost outside of the field such as water sources should also be considered.

The best case scenario is to have the field contractor already on board to help you work through the process. Submittals detailing all materials used in the project and any testing before construction can be provided by the contractor now so that there are no questions or discrepancies once construction begins.

Construction

If all of the above has gone well, then you should be working with a good design, capable sports field contractor, quality materials, and ready to break ground. The construction should be the easy part, other than dealing with weather. As with any project, worry with things you can control by making the best preparations prior to construction, then deal with things you can not control, such as weather, as it comes.

Have an assigned owner's representative between the owner and contractor. It is often the facility director or board member, or maybe a third party hired manager. Many times in private schools and churches, the money comes from donations or gifts, and the "gifters" want a say in the day to day construction process and can misdirect the contractor, leading to a big mess. If the contractor communicates and takes direction from one person, the potential for confusion can be greatly reduced.

If at any time during the construction process you don't feel right about something, certainly ask the question. One of the benefits of a design firm is they can assist with quality control, inspecting installation and materials in relation to design and specifications. At the conclusion of the project, make sure the contractor is required to provide as-built drawings, especially helpful when irrigation systems are installed. ■

Chad Price is president of Carolina Green Corp., Charlotte, NC. Chad is a Certified Sports Field Manager, and active on the Board of Sports Turf Managers Association. In business since 1989, Carolina Green has designed, built, renovated, or maintained more than 400 sports fields throughout the southeastern US. Chad welcomes follow-up questions to this article at 866-753-1707 or cprice@cgcfields.com.

Selecting synthetic turf adhesives

THE TOTAL COST for a sound base for synthetic turf, the synthetic turf itself, and labor for a successful installation is very high compared to the cost of the adhesive used to hold the installation together and/or down. However, it's the adhesive that often determines the success of an installation; the amount of profit after the job is completed and how much profit is retained later by avoiding expensive callbacks due to adhesive "time bombs."

Tremendous amounts of money have been wasted by intelligent, educated, and experienced turf people and architects who have no technical knowledge of adhesives or adhesive chemistry. They buy or specify a synthetic turf adhesive based on its high strength after it cures and/or its low price. Both reasons are costly and unimportant because the adhesive strength needed for an adequate bond is one that is stronger than

>> **Left:** Spray

the bond between the turf's primary and secondary backing, both initially and after weathering.

Higher adhesive strength will not give a better bond. Some adhesives that have high initial strength deteriorate and become time bombs after weathering. Regarding price, it's the finished job profit that counts and not the initial cost of the adhesive. With unpredictable day to day weather, why jeopardize finished job profits by trying to "save money" on an adhesive that is weather sensitive during installation?

If the adhesive slows down or temporarily prevents an installation because its "outdoor working window" is narrow (too hot, too cold, too damp, too dry, too windy, it's going to rain, etc.), and/or the adhesive requires more labor to use, the job becomes more expensive and less profitable. Even on the same day, an installation is different at 7 AM vs. 10 AM vs. 1 PM, etc., as the sun rises and sets. Also, after installation, the adhesive must be durable enough to withstand several years of weathering.

Let's outline negative followed by positive adhesive properties that are necessary for a successful and profitable installation.

Negatives

Don't purchase or specify a synthetic turf adhesive based on price and/or indoor laboratory tests of cured films at room temperature. Such indoor tests do not reveal "fair weather adhesives" with installation problems due to: the adhesive becoming too thick to spread when cold; or snap curing too fast when hot; or with a narrow weather working window during installation; or requiring sand bags, brinks or other weights to hold the turf in place while the adhesive cures, especially if the turf has a curl or if it is windy; or if the adhesive will be damaged by rain when it occurs almost immediately after application.

Positives

Factors and properties that indicate a good outdoor adhesive are: it can be left outside on the jobsite in unopened pails without fear of it becoming too thick to spread when cold; or

when hot, not snap curing with little or no working time; it is practical to use in variable weather, unexpected rain or surface expansion and contraction on sunny days from passing clouds or moving shadows; plus it has a high green strength.

Green strength is the ability to hold two surfaces together when first contacted and before (still green) the adhesive develops its ultimate bonding properties when fully cured. High green strength adhesives are vital to outdoor installations because they help overcome the tendency of surfaces like synthetic turf to separate, curl, bubble, lift, creep, slip and wrinkle during installation without resorting to excessive rolling or sand-bagging.

High green strength or "high grab" adhesives are essential for profitable installations because they don't have limits like oily, slippery adhesives have, regardless of their strength after curing. There will always be delays if the installer can not use the adhesive when it's below 40 degrees or above 90 degrees or if it is likely to rain. Incidentally, don't mistakenly think that because an adhesive is thick or a paste that it has green strength; grease, toothpaste, mud pies are thick but they don't have grab.

Adhesive types

There is no such thing as a "one size fits all" synthetic turf adhesive. Most adhesives used today for installing synthetic turf are one-part urethane; but the term "urethane," like the word "metal," is generic. Just like there is an enormous difference between metals like gold, tin, lead or copper, not all "urethane adhesives" are the same or remotely similar.

Newtonian liquids pour and flow like syrup, water and most common liquids.

Thixotropic liquids which resist flow when

Pay now or pay later

There is much more to selecting a synthetic turf adhesive than its price and a high initial strength. More importantly is obtaining an adequate bond, not just initially, but after years of weathering. It is also essential that the adhesive be easily usable and reliable when applied under a wide variety of variable outdoor weather conditions. Profits disappear if the adhesive slows down installation, increases labor costs, or later becomes a "time bomb."

>> **Below:** Squeegee

>> **Below:** Glue Box


>> Trowel

at rest but temporarily thin down for easy spreading when subjected to shear such as stirring, shaking, troweling, or when applied from a glue box. However, when the shear is stopped they once again return to resisting flow. Thixotropic adhesives that have a light mayonnaise-type consistency at rest are easy to spread while their thixotropy also enables them to hold trowel ridges and not flow off the sides of seam tape nor to messily leak out of the bottom of glue boxes when not applying adhesive.

Spraying adhesives must be handled carefully. It is essential when spraying that the adhesive has negligible overspray and minimal airborne adhesive mist even when breezy. This is a safety issue, and a cleanliness issue. Not inhaling an aerosol mist of sticky, durable adhesives is a good idea.

Hot melt adhesives go from liquid to solid when they cool. However, they require special equipment to melt them for use.

Two-part adhesives are liquid until cured. Keep in mind that each component by itself is not an adhesive so that if not completely and accurately mixed at the jobsite, durability problems can arise later.

Silicone (silane) adhesives are light pastes that after application need contact with water in order to hydrolyze and then begin to cure.

Water-based (latex) adhesives are environmentally friendly but they depend on water evaporating to dry. Hence, sensitive to humidity and/or rain during installations.

When and where to use

Newtonian liquids are used because they are supplied in containers with pour spouts and can be easily applied with a squeegee, trowel, or sprayed. They flow and level after application.

Thixotropic adhesives are preferred for glue boxes and troweling where maintaining trowel ridges instead of leveling is important. This includes when applying to vertical surfaces.

Spraying is usually for total glue downs of turf and/or shock absorbent underlayments in large installations like synthetic turf athletic fields. Also, for fast application to long runs of seaming tape.

Hot melt adhesives bond fast when they cool. Handling can sometimes be tricky. Their performance is better in cool weather than hot weather because even thought they don't completely remelt when hot, some re-soften in hot desert or tropical climates. The re-softening sometimes allows turf seams to "creep open."

Two-part adhesives also usually bond well. They are more labor intensive because of the mixing and lack of green strength.

Silicone adhesives give adequate bond but the usual installation problems associated with negligible green strength.

Water-based adhesives are like going to Las Vegas to gamble on what the weather will be on future installation days. Sometimes you win, sometimes you lose. ■

Norris Legue, "The Guru of Glue" is president of Synthetic Surfaces, Inc., Scotch Plains, NJ, www.nordot.com.

Membership Application

SportsTurf MANAGERS ASSOCIATION

Experts on the Field, Partners in the Game.

Fax to: (785) 843-2977

Or mail with payment to:
Sports Turf
Managers Association
P.O. Box 414029
Kansas City, MO 64141

Name _____ Title _____

Employer/ Facility _____

❑ Business ❑ Home

Address _____

City _____ State _____ Zip _____

Home phone _____ Work phone _____ Cell phone _____

Fax _____ Email _____

Signature _____

Direct Supervisor Name _____

Membership Category:

❑ Sports Turf Manager	$110
❑ Sports Turf Manager Associate* (Additional member(s) from the same facility)	$75

Please select the primary facility type where you are employed:

❍ Professional Sports ❍ Higher Education ❍ Schools K-12 ❍ Parks and Recreation

❑ Academic	$95
❑ Student (verification of enrollment)	$25
❑ Commercial	$295
❑ Commercial Associate* (Additional member(s) from the same commercial company)	$75
❑ Affiliate (Person who is indirectly or on a part-time basis, involved in the maintenance/management of sports fields)	$50
❑ Chapter Dues (contact headquarters for amount) Chapter name) _____	$_____
❑ Contribution To SAFE Foundation (research, education and scholarship):	$_____
Total Amount Enclosed:	$_____

"I know I am a better sports turf manager because of this association. As sports turf managers, we take the challenge seriously to make our fields the best possible for the next game. The resources I have access to through STMA helps me do it."

— Bob Campbell, CSFM
Higher Education
Membership Segment

Payment Method:

❑ Check ❑ Money Order ❑ Purchase Order #:_____

Credit Card: ❑ Mastercard ❑ Visa ❑ American Express ❑ Discover

Name on Card _____

Card #: _____ Exp. Date: _____

Signature: _____

*There must already be a national sports turf manager from your facility or commercial member from your company before you may sign up in the Associate category.

Phone: 800-323-3875 **www.sportsturfmanager.org**

Cut Here

2/2007

Veteran synthetic turf installer *speaks out*

Editor's note: Justin Fowler has managed or worked on hundreds of synthetic turf installations since 2000 and personally trained more than 20 installation crews.

"Using sheep shears to accurately put in field markings is like using a chainsaw to accurately cut crown molding."

SportsTurf: How long have you been installing synthetic surfaces?

Fowler: Nine years.

ST: How many have you done?

Fowler: More than 160, as well as being a part of just as many. I have trained many crews on various aspects of installation and also assisted crews with installations that were running behind so I don't have an exact figure on how many [but] it's a lot.

ST: How did you get started?

Fowler: I worked for a major airline as a maintenance engineer until shortly after 9/11 when I was laid off. I knew various people that were just starting to install new age synthetic turf fields. Two things I really enjoy are sports and aviation. Since aviation jobs were nowhere to be found, I decided I wanted to be a part of this new sports field technology.

>> South Fayette Township HS, McDonald, PA

ST: What is the most important part of the installation process in your opinion?

Fowler: There are so many. Assuming the base is hard and draining properly and assuming a good quality turf is being used there are three main parts to a typical field installation:

1. Accurately measuring and laying out the field with an understanding of the rules of the game and what each line represents.

2. Applying the proper amount of infill evenly across the playing surface. Many companies have cut back on the amount of infill to lower costs. This reduced infill level causes more wear to the fibers making for a much shorter life span.

3. The most important step—SEAMING. Seams are the biggest problem on turf fields nationwide. Many companies will sell the idea that sewing is stronger than gluing. Unfortunately this is simply not correct. The material being sewn is actually the carpet salvage. Salvage is the outside scrim of the carpet. Salvage is the weakest part of the carpet. It should be cut off and thrown in the trash. Turf companies call it a "sewing flap" and use this excess garbage to hold everything together. In reality they sew because thread costs much less than adhesive.

A properly glued field will outperform a sewn field every time. If sewing was stronger than gluing NASA would sew the space shuttle together. Instead they use multi-part adhesives that are designed for specific products. Synthetic turf should be installed with an adhesive designed specifically for synthetic turf. Carpets are designed to be cut and glued in place. Synthetic turf is no different and using the proper adhesive is a must. Some companies will try and sell the customer on the concept of shearing and hot melting to "avoid" seams and cuts in the carpet. This process is used because the hot melt or tar is cheaper not