>> A CONVERTIBLE or "roll-up" turf system allows facilities to install a multi-purpose field

>> **Above: BAYLOR UNIVERSITY'S** synthetic turf football field

>> **Below: AN OPTIONAL ELASTIC LAYER** (e-layer) provides additional shock absorption, reduces the cost to replace a field, and drastically improves your turf's lifespan.

From dirt to turf:
7 steps for successful construction of a synthetic field

Editor's note: *This article was written by Ross Clurman of Hellas Sports Construction, Inc., Austin, TX.*

BUILDING AN ARTIFICIAL TURF FIELD is no small task and often involves months of budgeting, planning, meetings, and sometimes school board or community votes. Whether you are replacing an existing grass field, or building a new one altogether, understanding the process of planning and constructing a synthetic turf field will ensure its success.

There are three main phases of building a synthetic field: pre-construction, construction, and post-construction. Within each phase, there are milestones that, as a decision maker, you need to be aware of and prepared to tackle.

PHASE 1: PRE-CONSTRUCTION

Before you break ground on the construction of your field, you should have a handle on the following:

- Reason(s)
- Location
- Conditions
- Budget
- Turf Selection
- Deadline(s)
- Requirements

Reason(s)—Why are you installing a synthetic turf field? Knowing why will help you determine other factors, such as location, budget, timeline and requirements. In addition, you will need to convey these reasons when the support of a third party (e.g. community, school board, owners) is required. **Define your reasons**.

Location—Where will the new synthetic field be located? If you're replacing an existing grass or synthetic field with new turf, you probably already know the location, but if it is a new field construction, you may not have a site selected. Do that. Upon determining the site, regardless of a new field or replacement field, you will need to obtain a soil survey. **Determine the location**.

Conditions—What are the current conditions of the location? Any construction project starts with a solid base. In the case of an artificial turf field, your base is the soil. A geotechnical soils report is not very expensive, and knowing the soil composition is very important when constructing a field, as this may vary the cost by upwards of $100,000. I recommend you use a third-party geotechnical company. **Survey the conditions**.

Budget—How much do you have to spend? Where is the money coming from?

When approaching your project, it is

important to know how much you have to spend. As a general rule, a new synthetic turf field can run anywhere from $850,000-$1,000,000. This is also true for replacing an existing grass field with artificial turf. A typical drop-in field, (replacing an existing synthetic turf field), runs between $450,000-$550,000.

These figures do not include anything other than the construction of the new field. Your project's cost may vary when you factor in architects, engineers, planners, etc.

Another piece that will increase the initial cost, but pay for itself overtime is a pad, or elastic layer. These "e-layers" are designed to improve the shock absorption and makes replacing your field (in 8-10 years) much less expensive.

The second aspect of your budget: knowing where the money will come from. If you have the money in-hand, great; otherwise, consider ways to offset the cost.

- Build a multipurpose field (soccer, football, lacrosse, field hockey).
- Sharing the financial burden with other schools, or teams.
- Fundraising by selling advertising space on the field.
- Donation drives from the community.

Fundraising, building a multipurpose field, donations drives and/or sharing the field with another institution can make a huge impact on the cost. Consider a convertible or "roll-up" field, so it can be changed out for different teams or events. **Figure out the budget**.

Turf Selection—What turf to use and why? The technology and techniques of manufacturing synthetic turf have evolved a lot over the years, and so have the standards for what makes turf safe, playable, and durable. Not all synthetic turfs are created equal and selecting the right turf is a big part of constructing the perfect field.

In addition, your synthetic turf is just one component in an athletic field. We like to think of them as a complete system comprised of a compacted soil base, intelligent drainage network, precisely layered gravel, optional elastic layer (e-layer), on which the turf and infill are laid.

Please note the specifications of our Matrix Turf. I won't go into the specific properties and testing methods, but in general here are a few things to consider when selecting the appropriate turf:

What activities will take place on the field? Certain synthetic turf systems are optimized for different sports. For instance, we have artificial turfs designed for American football, soccer, and two types for baseball—one for the field, and another specifically for the running paths.

How often will the field be used? The more you use something, the faster it will wear out, so it makes sense to plan accordingly. If your turf field will be used 24/7, consider paying the premium for a higher quality turf system.

Who will be using the field? High school sports are more demanding than elementary and middle school sports and collegiate sports are more demanding than high school sports. Consider the level of competition taking place on your turf.

Where will the field be located? Is the field an indoor practice field, or an outdoor multipurpose field? Will you need a roll-up

turf system to remove or change the field for different events? Location and climate are two big factors that affect the longevity of a field.

The significant thing to understand here is the importance of turf quality, especially when combined with the other components involved in the field construction. **Select your turf**.

Deadlines—When can construction start and when does the field need to be completed? The amount of time required to build a synthetic field is fairly straightforward. Your start and completion dates are flexible. Knowing the estimated project duration can help you establish these two important dates.

For a drop-in field, figure no less than 7-10 weeks from breaking ground to completion. For a new field, and replacing grass with synthetic turf, there are other factors that may affect the critical path. *The critical path is a timeline for construction projects that outlines specific events that must occur in a set order. If any of the events on the critical path are shifted, they affect the subsequent events.*

Your start date depends on when and how often the field is used. If it's a new field that's irrelevant, because it's clearly not being used; but, taking into account the timelines I presented, you can probably estimate a completion date.

>> **REGULAR USE** of a maintenance vehicle improves lifespan and maintains a safe surface.

One of the things we pride ourselves on is being on time, so once you have these dates establish, hold your construction company accountable. **Establish your deadlines**.

Requirements—How will the field be used, by whom, and how often? Is the field going to be a practice field, or strictly for game use? Will others be using the field outside of your organization? Will events take place during the day, or in the evening and at night?

The answers to these questions can help you plan the type of turf, select accessories (lighting, goals, equipment), and even establish how the field will be paid for. (As I mentioned, the cost may sometimes be divided up between multiple teams or institutions.) **Outline the requirements**.

PHASE 2: Construction

The second main phase is the actual construction of your synthetic turf field. This is where the majority of the money and time will be spent, so it makes that it is also the most important phase. The milestone in phase two is vendor selection.

Vendor Selection—Who will construct the field and install the turf? Selecting a construction company is of equal importance to selecting the turf, because the construction of the field affects the safety, performance, and longevity of the field. Poorly constructed athletic field turf may fail within the warranty period leading to increased maintenance costs and sometimes may require a full field replacement.

Some criteria for selecting and evaluating a sports construction company:

- Safety Record
- Expertise
- Reputation
- Project Management

Notice that "price" is not included within the list. Price, as a criterion for evaluation, is rarely an accurate gauge when all other factors are considered. For instance, what is the value of having your field completed on time?

Safety Record—Large construction projects require the use of heavy machinery. Sometimes these machines can cause expensive accidents, and even lead to injury and death. The last thing you want is negative PR, so make sure you select a construction company with an impressive safety record.

Expertise—This is a combination of how long the company has been manufacturing artificial turf and installing athletic fields, and

Specs of Hellas Construction's Matrix Turf

Property (ATSM Std.)	Specification
Pile Weight (D418/D5848)	42 - 46 oz./Sq.Yd.
Primary/Secondary Backing Weight (D5848)	7.7 oz./Sq.Yd.
Secondary Coating Weight (D5848)	20 - 22 oz./Sq.Yd.
Total Weight (D5848)	69.9 - 75.9 oz./Sq.Yd.
Yarn Denier (D1907)	12,400
Pile Height Finished (D418/D5848)	2 ¼"- 2 ½"
Tufting Gauge (D5793)	1/2"
Primary Backing (D5848)	D12 or Tri-layer woven Polypropylene
Secondary Coating (D5848)	Polyurethane
Tuft Bind without Infill (D1335)	10 lbs. +/-
Grab Tear (width) (D1682/D5034)	250.1 - 273.1 lbs. Force
Grab Tear (length) (D1682/D5034)	197.6 - 236.1 lbs. Force
Carpet Permeability (D4991)	>40 inches/hour
Flammability (Pill Burn) (D2859)	Pass
G-max (Impact Attenuation) (F355)	<130 at installation <190 over warranty life
Realfill™ Infill (E-11)	5 - 6 lbs +/- per square foot
Fabric Width	15'
Perforation	3/16" Holes 4" X 4"
Yarn	250 microns & 150 microns

- All characteristics listed above nominal +/- 5%
- Matrix® turf incorporates life like individual blades of grass, tufted into the strongest and most dimensionally stable backing system available with a polyurethane pre-coat for the ultimate in tuft-bind.
- Matrix is filled with a pea gravel (2-3 lbs) and cuboidal rubber infill (2.5-3.0 lbs) - Realfill™.
- Infill will be a minimum of 75% of synthetic turf pile height.
- The monofilament fibers curl down to cover and trap the rubber granules preventing the system from expelling the infill upon impact.
- Matrix is a fully UV stabilized system ideal for outdoor use.

the actual team that will be performing the construction work. The company may be 50 years old, but the team doing the work is composed of the cheapest labor they could find to contract the work to.

Reputation—Don't just take the word of the salesperson, call several references, and don't solely rely on the recommendation of the few references they provide. Ask to see the entire list of projects the construction/manufacturing company has worked with and call as many as you have time for.

Project Management—This is often overlooked, but affects the entire project from start to finish. It is not very common in the synthetic turf and sports construction industry, but finding a company that manages the entire project from a single source is extremely important. Working with one vendor, rather than several, can save you time and money.

During the construction of your field, you should maintain a constant stream of communication with the project manager and your salesperson. Expect to receive weekly (if not daily) progress reports and make sure you are aware of any issues that may arise during construction.

Remember your established deadlines and hold your construction company accountable.

Consider a co-op—Many public institutions have to take the project to bid. But, a cooperative purchasing unit, or co-op, eliminates that need and has other benefits, such as:

- Assisting with contract creation
- Reducing the time from contract to construction
- Performing the due diligence to ensure quality
- Reducing the overall cost of the project

There are several regional and national programs that do the legwork for you, making the vendor selection process much easier, and reducing your cost because prices may have been pre-negotiated with the co-ops.

PHASE 3: Post-construction

The number one misconception about synthetic fields is that they do not require maintenance. Just like real grass fields, artificial fields need to be cared for to maintain optimal safety and performance.

The company responsible for constructing your field should provide some type of post-construction orientation for your facilities department, to educate them (and you) on what needs to be done to clean and care for your synthetic field.

In addition to internal maintenance, it is recommended that your artificial turf field be checked for safety before each season.

Constructing a synthetic turf field is a long, layered process, much like the field itself. There are many layers (components) and each one affects the others. ■

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