Writing & Developing Specifications

by David Frey, Field Specialties

Specification: a detailed description of the parts of a whole: statement or enumeration of particulars, as to actual or required size, quality, performance, terms. - ***Webster's New World Dictionary***

We already know that practically everything manufactured is developed, constructed or planned with some type of specifications. Specifications should assure a predictable result. Buildings, runways, airplanes and the fuel that powers them are safeguarded by written specifications.

The goal of using set specifications is predictable, guaranteed results. You want to know that the performance of a given product will be successful if you use the correct components. Specifications can be developed in several ways.

1. Defining a specific fact. Example: A tree can be felled over a river and be used for a person to cross that river without getting wet.
2. Developed detail with limitations. Example: How many people can cross at the same time?

The answer can be developed by trial and error or speculation. Experience helps us to develop the answer and form basic rules. Engineering, which is based on research and application, develops specifications that are useful within limitations of the variables. It could be said that 5 people could cross the river at the same time. Does that allow for the one person that weighs 300 pounds, or should the specification be the total weight. Athletic surfaces have been affected by the changes of purpose, monies available and research.

Applying the above information, we can see the value of specifications in the athletic surface industry. Irrigation and drainage systems are engineered by physical properties of pipe areas to be affected, water supply and demands. Soils are also engineered, but the grass growing results are not as predictable. Infield clays also have variable responses. The engineering can allow for variables and the needed performance of that product. A bridge can be engineered to carry a certain weight load. Designs can be affected by cost, materials and purpose.

The sportsturf business comes from a different direction. Like farming, athletic fields were original generic soils of that area, not engineered or transported, due to cost. The soils could be improved, fertilized and modified, but if the site had a sandy loam, it stayed a sandy loam. Athletic fields were built in a location and the soils and materials that were handy or available were used. Maybe the use of sand for the floor of the coliseum of Rome, to soak up the blood, was the first use of specialized surface materials. The first groundskeepers would decide on materials using their sense of feel and experience.

I still find examples of European groundsmen that only choose clays by observation or feel. Engineering of soils was not practical or affordable. We need to thank the acceptance and use of synthetic surfaces for establishing a new level of costs for the construction and maintenance of athletic surfaces today.

The construction of athletic surfaces has come a long way. We build fields and import materials to meet architect specifications. Are these specifications working? Let's get down to the facts on how the modern day soil specifications for athletic fields were developed and you will see the process of creating a specification.

FACTS:

Fact #1. We need athletic surfaces to be more durable.
Reason: Natural grass fields cannot stand continued play of multi-use stadiums.
Result: Find alternative surface materials - synthetic surfaces - Limit use; Separate Stadiums; Develop better natural grass playing surfaces.

We know that synthetic surfaces have certain limitations, and separate stadiums have an associated cost. The effort was made to study the natural grass sys-

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tem and improve it. First to be determined were what factors could be improved and how.

Fact #2. Water (rain or snow) was the greatest detrement to the surface condition and playability.

Reason: Soils that were known to grow the best turf, held water and were destroyed in wet conditions.

Result: Sand is suggested to be the answer because of the high drainage characteristics

Now here is where the specifications can be misguiding and common sense is needed. Where do you find the line between drainage and a superior growing medium. Along came the first sand systems; P.A.T.

The P.A.T. system was designed to drain at 14 inches per hour. How was that specification reached? Lets take a look:

Major Premise: Drainage of at least 14 inches per hour are required.

Fact: The soil medium was engineered to drain at 14 inches per hour

Fact: Established turf drains at approximately 4 inches per hour

Question: Where in the U.S.A does it rain at 14 inches per hour?

Question: What was given up in soil characteristics that contributed to the 14 inches per hour rate?

Result: 1. Water was purged in the grass layer and then drainage was limited as to grass infiltration rate.
2. Significantly higher maintenance was required.
3. The selling point that field covers were not needed was false
4. Quality stands of grass were questionable under certain circumstances.
5. Playability was questionable

The P.A.T. system solved one targeted problem, but did not necessarily improve the total product. In fairness, the P.A.T. systems do work well in certain situations.

My question to you is how do you find a soil specification? The easiest method is to go a known athletic field that you feel performs the best for your purpose. Take samples and create the same soil for your site. You now have taken a proven commodity and copied it. But, to get the same results, you must have the same irrigation, maintenance, drainage, amount of play and control of play in adverse conditions. Pretty simple, but we need to take a close look at the soil specification to make sure that you have copied it correctly and are giving consideration to the other issues involved.

Separate growing medium components:

1. Sand
   a. type (shape, chemical properties free of carbonates, source)
   b. sieve analysis
2. Soil
   a. condition and makeup
3. Organic matter
   a. Specification
   b. pH
   c. fiber content
   d. sieve size
4. Sand/Soil/Peat mixture
   That is the total relationship and percentage amount of each part of the total mix
5. Infiltration rate of total mix

Any change of any of the above factors will change the results or performance of the mix. Another problem is the costs of the components, availability and location in proximity to your site.

Additional tools to help with soils specifications:

1. Use a soils consultant that is familiar with these types of mixes,
2. Do not be sold a system simply because it is easiest for the contractor or the architect.
3. Be certain that contractors and suppliers are experienced and are responsible in this type of work; meaning that they can meet the specifications.

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Now that we understand the meaning of a specification - how do you write them?

Most suppliers will supply a specification sheet for their products. Some bidding procedures do not allow you to write specifications that eliminate competition for that type of product. That is actually a good situation as you can get more information on products to fit a given scenario. It is important that you can justify the cost of the product you want and the specification can prove that.

Other examples of specification:

1. Field covers - Understand the language needed to define the specifications. Know that the product that works is the one you have specified.

Example:

Material Properties: warp 9 weft 7 (Threads running from side to side and across)

1000 denier (A unit of weight used to express the fineness of the fiber, nylon, rayon based on the number of .05 grams (of weight) in 450 meters of length. (The higher the number the coarser)

Unit weight 3.3-oz./sq. yd.

2. Finish Grading: A quote from a major league project. ? The words "finished grading", as used herein, mean the establishment of the required final grade elevations indicated on the drawings.

A second Quote from a major league project. " Final grade means that the grade is within 1/4 inch each 25 ft."

What does this mean? Are tolerances implied? Put yourself in the contractors' position.

My father always told me, "Mean what you say and say what you mean." Specifications are the same.

How Do You Do...?

The Question: How Do You Handle "Heat Stress" on Your Field(s)?

Answered by Greg Garber, City of Cambridge, MA

Although Cambridge is a fiscally healthy city, we certainly don't have the resources of a top-tier university or a professional franchise. Thus, to avoid the problems that are typical during high heat conditions, we strive to maintain a consistent annual program and stick to the basics: efficient irrigation, compaction relief, and mowing height.

When I came aboard here in 1998, two of our soccer fields and two of our softball diamonds, all heavily used, had no irrigation at all. The results were easily predictable- - higher soil temperatures and banner crops of knotweed and nutsedge during the summer months, compared to some of the other fields. As I write this, we are in the midst of a capital investment program to bring irrigation to all these fields, as well as modify existing systems that were inefficient.

Although the soils of most of our fields are classified as sandy loam, use is so heavy that they become compacted rather easily. During my first year here, we convinced our leadership to use capital funds to purchase a Vertidrain attachment for our turf tractor. We try to get on each field, in two directions, twice a year. On those fields where we have done this consistently over three years, we have not had to do anything extraordinary to combat the heat.

We mow all of our fields at two-and-a-half inches throughout the year, and if we get a break in activity on any field during the summer, bump up to three inches for that period. Introducing this practice required a considerable public relations effort, as league administrators initially could not understand why we weren't mowing at the

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