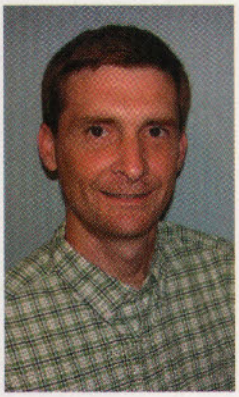
Lines and slopes



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We are in the planning stages for a new combination football/soccer stadium. An architect who only has experience in building football fields with "turtleback crowns" is designing the field. As a soccer coach my teams have played on some of the fields he has designed. They may be suitable for football but are not good soccer venues. We have been a soccer only school for 30 years but added football 2 years ago. Our current field has about an 8-inch crown (center to sidelines) which has been touted by some as one of the best soccer facilities in the state. We are beginning a $16 million capital expansion campaign that will include our new soccer/football facility. As a member of the local design team I am trying to ensure that the newly devised field will have both a thorough underdrain system as well as a suitable crown for surface shedding of water (to catch basins) located at the perimeter of the field. When I spoke with the architect about less crown than he had designed he became nervous about the field holding too much water. What guidelines can you offer us in order to provide a surface both suitable for football and soccer?

DJ
Central Florida

Thanks for the e-mail. Well, it sounds like you are on the right track and understand what you want and need. It has been my experience that almost everyone associated with football and soccer has their ideal field design as it relates to crowns. The most important issue is that when a field is going to be used for both sports, that the coaches and those involved in the design and construction listen to each other so that there are no surprises after the field is constructed.

As you know, crowns were originally designed to promote surface drainage for fields constructed from native soils that have poor internal drainage due to their silt and/or clay content. The simplest football field design has the field crowned longitudinally down the center of the field to promote surface drainage toward the sidelines. The sidelines may or may not include catch basins for further water removal. In some cases, the sidelines are level and sometimes sloped or contoured to promote better water movement. The crown may include up to 2% slope from the sidelines.

Today's modern football fields usually have low crowns (6 to 10 inches rather than 12 to 18 inches) even though old-fashion football coaches (and perhaps architects) think that big crowns are necessary in football. The move toward lower crowns for school and municipal fields largely resulted from the increased popularity of soccer in the US. Soccer's popularity resulted in more dual-use fields. Since soccer requires extending the football field's sidelines, there is a greater need for a consistent slope through the field's perimeter to maintain consistent soccer field slopes and to provide a better transition between the two field designs. The design of many traditional football fields has caused a few problems when they are used for soccer.

I believe that the most important point in this issue is that a crown is not necessary for a field if the field is properly designed, constructed, and maintained with the intention of not having one. If the soil has good internal drainage (at least 6 inches per hour with grass installed, higher for lab tested ksat) and underground drainage to remove the water, then there is no reason to have a crown. I know some football organizations that have still elected to build a small crown just because it seems to be part of the football tradition. An 8-inch crown for a soccer-width field is fairly common in high quality sand-based fields and is a reasonable compromise between soccer and football aficionados.

Unfortunately, the cost of building sand-based fields may be a little high unless suitable sands are readily available. The flatter the field, the more important the sand selection and the drain system become. I would recommend that the architect have the soil samples tested at an accredited lab that is accustomed to running "USGA specification" tests. The USGA provides an up-to-date list of accredited labs on the website (www.usga.org). This will assure the architect and you of the infiltration rate (and relate to you the amount of water the soil will hold). Hooghoudt's equation can be used to calculate drain line spacing based on the infiltration rate of the soil, height of rootzone mix, and anticipated extreme rainfall event. With properly sized and spaced drainage lines and some off-field contouring, standing water should not be an issue.

Two other resources that are readily available that you may want to invest in (and share with your architect) include the publications, "Designing, Constructing, and Maintaining Bermudagrass Sports Fields", the ASTM International standards that relate to designing and constructing sand-based athletic field root zones; and the ASTM guides to maintaining turfgrasses on athletic fields. These publications are filled with suggested related to material selection and testing as well as construction specifications. Some of the information may have to be tempered for your specific situation. The first publication is available from the extension service of Clemson University, University of Georgia, or University of Florida. In addition the STMA normally sales this publication at the annual conference. The ASTM publications are available for downloading at www.astm.org. ■