

## **Sustainable Drainage Management for Outdoor Sports Surfaces**

### **Background**

Synthetic sports surfaces have sub-soil drainage systems to clear rainwater to ensure maximum usage. Although the presence of the pitch does not create any more surface water in the area, it is perceived that the rate that the water enters the local drainage system increases and requires significant attenuation.

In the case of a well constructed synthetic pitch, this need not be the case. The depth of construction, materials, sub-soil drains, and peripheral collector drains all help with attenuating flow, and infiltration to the subsoil may still occur. However in many cases large and expensive drainage attenuation tanks are required as a planning condition of new pitch and track developments. The cost of such systems can be prohibitive.

This research will establish the extent of the attenuation provided by current pitch/surface systems, to optimise the design of the attenuation provision required. In addition it is proposed that a small study within this work will evaluate run-off water quality, especially for artificial pitches. If designs can be optimised this will result in significant savings to developers, funding bodies, clubs, and the industry at large. The research will further inform the debate on appropriate water management and sustainability, providing up to date field data to allow the publication of a code of practice for the design of surface water drainage from sports pitches.

It is proposed that the most appropriate method to provide an accurate assessment of the actual run-off from a pitch/surface system is to observe scientifically many different real examples, over an extended period of time to ensure high relevance and data quality.

### **Project Aim**

To produce design guidance for sustainable drainage solutions for natural and synthetic turf pitches, in accordance with the latest requirements of SUDS and the future impact of climate change.

### **Project Scope:**

The research project will be supervised in the Department of Civil and Building Engineering at Loughborough University and is expected to be supported by several parties including SAPCA, the IOG and possibly Sport England.

The research methodology will include a thorough review of current related guidance and research on pitch design and sustainable drainage, measurement of run-off at carefully selected sites to provide the benchmark data and design validation. The project will ideally cover several types of sport surface system (including natural) and several geographical areas to represent an adequate sample of the population. The activities for the full-time researcher include site selection, installation of instruments and monitoring of data, interpretation of the findings and input into industry guidance.

The project is suited to a 3 year doctoral (PhD) study, and will require good academic rigour.

### **Project Objectives**

1. Review of related current guidance and research findings.
2. Evaluate existing systems for drainage behaviour, with a focus on the potential attenuation of systems with differing surface types (i.e. sport specific), including assessment of base-works, subgrade and drainage collection systems.
3. Evaluate water quality and environmental impact of pitch irrigation/drainage.
4. Make recommendations for specific design guidance for natural and synthetic turf surfacing systems for future installations.
5. Disseminate the outcomes widely to architects, designers, planning control officers, local authorities and the sports construction industry in general.