



ENGINEERED
FOR HOCKEY

FACILITIES GUIDANCE

HOCKEY FIELD IRRIGATION

Performance and operational
requirements

VER. 1.1



INTERNATIONAL HOCKEY FEDERATION
FÉDÉRATION INTERNATIONALE DE HOCKEY

fih.ch/qp

Introduction

Wet hockey turf has become the playing surface of choice for many; the surface allows the fast, technically skilful game seen at the higher levels of our sport, today.

Recognising, however, that water is precious and becoming increasingly scarce in some parts of the world the FIH wishes to move from hosting elite level hockey competitions exclusively on wet turf and has challenged the synthetic turf industry to develop surfaces that play the way the sport wants without using watering.

In the meantime, venues will continue to require new fields with wet turfs, so the FIH has produced this updated standard to define how an irrigation system should perform. It forms part of the *FIH Hockey Turf and Field Standards*.

Field irrigation objectives

The combination of a Global category hockey turf and water ensures the performance of the playing surface is as required. Together they:

- Ensure the ball does not bounce or bobble excessively as it rolls across the surface, aiding ball control.
- Reduces the friction between the ball and the surface so the speed or pace of the surface is as players desire.
- Allow the hockey stick to glide across the surface smoothly and without jarring.
- Ensures that if players fall or slide on the surface, they do not suffer injuries from carpet burns and abrasions.

It is therefore important that a field is adequately watered, and that the water is applied uniformly to ensure consistent and predictable performance. It is also important to ensure that a field is not over watered, as excess water will have a negative effect on the optimum playing characteristics of the surface.

An assessment of a field's irrigation system forms a key part of a field test for facilities having surfaces designed to be watered. The performance tests undertaken assume a field has an irrigation system that complies with this Standard meaning there is no need to measure all of the properties described above. Therefore, any venue with a Global category hockey turf that does not have an irrigation system that complies with this Standard will not qualify for FIH Field Certification.

Sustainability

Understanding the need to use water as sparingly as possible, the FIH currently encourages the use of technology that aids this. This includes:

- Using water harvesting to supply the irrigation system
- Recycling water
- Using hockey turfs that only require low amounts of water to provide the required performance

FIH Quality Programme

This guide is part of the FIH's Quality Programme (www.fih.ch/qp). The programme provides internationally recognised standards that ensure the appropriate qualities of performance and longevity for hockey facilities, irrespective of whether they are intended for community development, international competition, or anything in between.

The FIH Quality Programme also recognises FIH certified companies that have a proven ability to build great hockey facilities. The FIH recommends that those investing in hockey facilities always use these FIH trusted companies. Their details are listed at www.fih.ch/qp.

Scope of this Standard

Part 1 of this Standard defines the performance and operational requirements for irrigation systems installed on permanent 11 a-side hockey fields or Hockey5s courts. It applies to any field or court seeking FIH Field Certification that has a hockey turf that needs irrigating.

Part 2 details additional requirements for fields being designed to host higher level tournaments (e.g. FIH international tournaments).

Irrigation may be provided by an above ground system of sprinklers or rain guns (see Appendix B), or by sub-field irrigation that allow water to wick up to the hockey turf (see Appendix C for details).

This Standard does not automatically apply to Temporary Overlay Pitches that are built for short term use and will often also have a portable irrigation system.

Part 1 – Irrigation requirements

1.1 Performance – general

- 1.1.1 The irrigation system should be designed to ensure that the hockey field or Hockey5s court is watered with a volume of water that is in accordance with the wetting requirements of the hockey turf installed on the field or court.

Note: The quantity of water required by any specific hockey turf is detailed on the certificate issued when the product is approved by the FIH. This is expressed as either a depth (mm) or volume per square meter (l/m²).

As excess watering can detrimentally influence the performance of the playing surface it is important that the water applied during each irrigation cycle is in accordance with the needs of the hockey turf. Experience suggests a maximum application of plus 50% is appropriate (i.e. for a hockey turf needing 1 mm the maximum quantity applied should be 1.5 mm per irrigation cycle).

- 1.1.2 The water depth/quantity applied at any measuring spot should not be more than twice the depth (+100%) or less than half the depth (-50%) of an adjacent measuring point.
- 1.1.3 The means of verifying compliance with these requirements are described in Appendix A.

Note: If required, an existing irrigation system may be augmented with flexible or movable sprinklers/hoses that allow partial or reduced watering to ensure the optimum playing conditions.

1.2 Performance – above-field irrigation

- 1.2.1 The irrigation system should be capable of applying the required water over the field in a time not exceeding 10 minutes.

Note: Existing fields with irrigation systems designed to apply water over a 15 minute cycle may still be tested and certified, but their inability to irrigate during the 10 minutes halftime break may exclude them being used as tournament venues.

- 1.2.2 There should be no sprinklers located within the field of play or within 2m of an end-line or 1m of a side line.
- 1.2.3 If sprinklers heads are fitted with covers that are more than 50mm in diameter, and they are located within the inner run-off of the field or court, the covers should be covered with the same hockey turf as the surrounding run-off.

When closed, the covers of the sprinklers should sit flush with the surrounding hockey turf, so they do not form a trip point, or cause balls hitting them to lift from the playing surface.

- 1.2.4 If column mounted rain guns or permanently raised sprinklers are used, they must be located outside of the field's run-offs.

1.3 Performance – sub-field irrigation

- 1.3.1 The irrigation system should ensure that the optimum playing conditions, as required by the installed hockey turf, are provided at all times, and that ponding of water on the playing surface does not occur.
- 1.3.2 The sub-field irrigation system should be sufficiently responsive so that it self-adjusts to any rain-fall event occurring during a game, so there is no adverse effect on the playing qualities.

1.4 Water quality

- 1.4.1 The water applied to the field should be of potable quality.

Note: Unless specified otherwise in national regulations, potable quality means as defined by the World Health Organisation.

- 1.4.2 At locations where any of the conditions listed below could occur, the irrigation system should be designed to ensure the risk of water borne bacterial infection of players or spectators (from diseases such as Legionnaires Disease) is eliminated:

- the water temperature in all or some parts of the system is between 20°C and 45°C
- water is stored in an open-loop system
- water is sourced by water harvesting from adjacent infrastructure
- water is re-circulated
- where there are sources of bacterial nutrients within the irrigation or storage system

Note: Sources of bacterial nutrients include, rust, sludge, limescale, organic matter or biofilms

- local climatic conditions are likely to encourage bacteria to multiply

Water with a high salt content is likely to increase the risk of minerals crystallising on the hockey turf, leading to discolouration and possibly a more abrasive playing surface. High salinity may also adversely interact with the UV stabilisers incorporated into the plastics used to make the hockey turf. If a local water supply has high salinity consideration should be given to incorporating suitable water filtration/treatments into the water supply system.

Part 2 – specific requirements for tournament venues

2.1 Water supply & storage capacity

2.1.1 The daily water usage requirements should be based on the projected tournament daily schedule of team warm-ups/training, and match-play.

Note: Typically, larger hockey tournaments may schedule between four and six matches/training events per day per field.

2.1.2 In climates where the average ambient daytime temperature during the playing season is expected to exceed 32°C, the system should be able to apply a second full irrigation cycle during the half time break of each match.

2.1.3 In climates where the average ambient daytime temperature during the playing season is not expected to exceed 32°C, the system should be able to apply a half cycle.

2.2 Above ground irrigation systems

2.2.1 The system should be based on an automatically controlled irrigation system capable of applying the required watering over the field in a time not exceeding 10 minutes.

2.2.2 The pop-up sprinklers (or rain-guns) should be fitted with 90° or 180° sectoring capability.

2.2.3 Sprinklers should be individually controlled to allow them to operate individually or in matched arc pairs.

2.2.4 The design of the irrigation system should consider prevailing wind directions and minimise water spray drift onto spectators.

2.2.5 Application rates should be adjusted by varying the run time of the sprinklers, and the control panel should be capable of operating in minutes and seconds. Each application cycle should ensure the entire playing area and surrounds are watered.

2.2.6 The control panel should allow the following cycles:

- Full cycle: 8 – 10 minutes,
- Half cycle (full coverage): 3 – 4 minutes
- Single station activation

2.2.7 A warning klaxon should be set to operate prior to the system commencing an irrigation cycle, with the option to immobilize if required.

- 2.2.8 The system should also be equipped with sprinklers at each end-line, to allow penalty corner/penalty stroke practice to take place without the need to run the full irrigation system.

2.3 Sub-field irrigation

The control panel should prevent the unauthorised adjustment of the water levels during matches.

Appendix A – irrigation testing procedure

Testing of an irrigation system forms part of an FIH Field Test for any field or HOCKEY5s court that has a hockey turf that is only Approved for use when wet.

Field tests are undertaken by independent test institutes accredited by the FIH. For a list of accredited test institutes visit www.fih.ch/qp.

A.1 Above ground irrigation

The performance of an above ground irrigation system is assessed by laying out a series of collection bowls on a nominal 10m x 10m grid; running the irrigation system for one complete cycle and measuring how much water is collected in each bowl.

The outer boundaries of the measuring grid should be 2m beyond each end line and 1m beyond each side line (giving boundary dimensions of 95.4m x 57.0m).

A full watering cycle should be conducted. This should be completed in no more than 10 minutes.

The depth or volume of water collected in each dish should be determined and the uniformity of water distribution across the field calculated.

Tests should not be undertaken if winds are causing the water spray:

- to drift significantly off the field
- to over or under water certain areas of the field

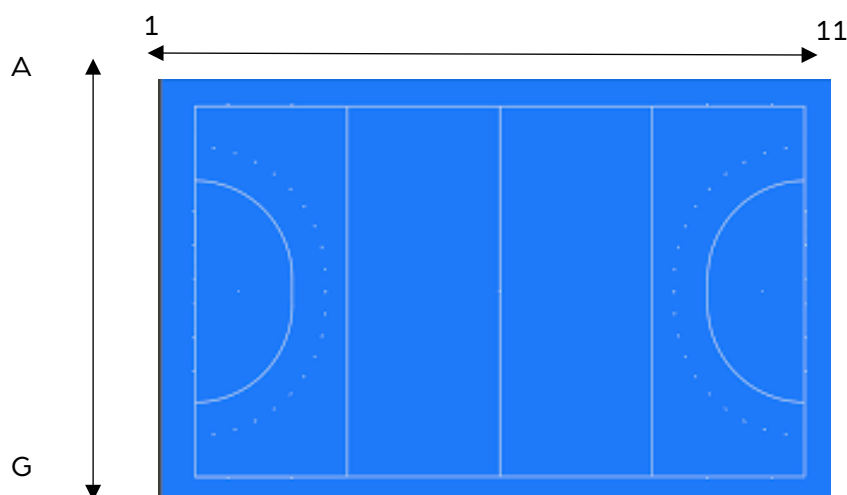
Tests should not be undertaken if it is raining.

A. 2 Sub-field irrigation

On fields having sub-field irrigation the method of verifying adequate and consistent wetting should be agreed by the FIH Preferred Supplier/Certified Manufacturer, the Accredited Test Institute and the FIH prior to the test being undertaken.

Irrigation test report

Date of test		Conditions	
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Irrigation time cycle (min)		Measurement units	
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Quantity of water collected

	A	B	C	D	E	F	G
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							

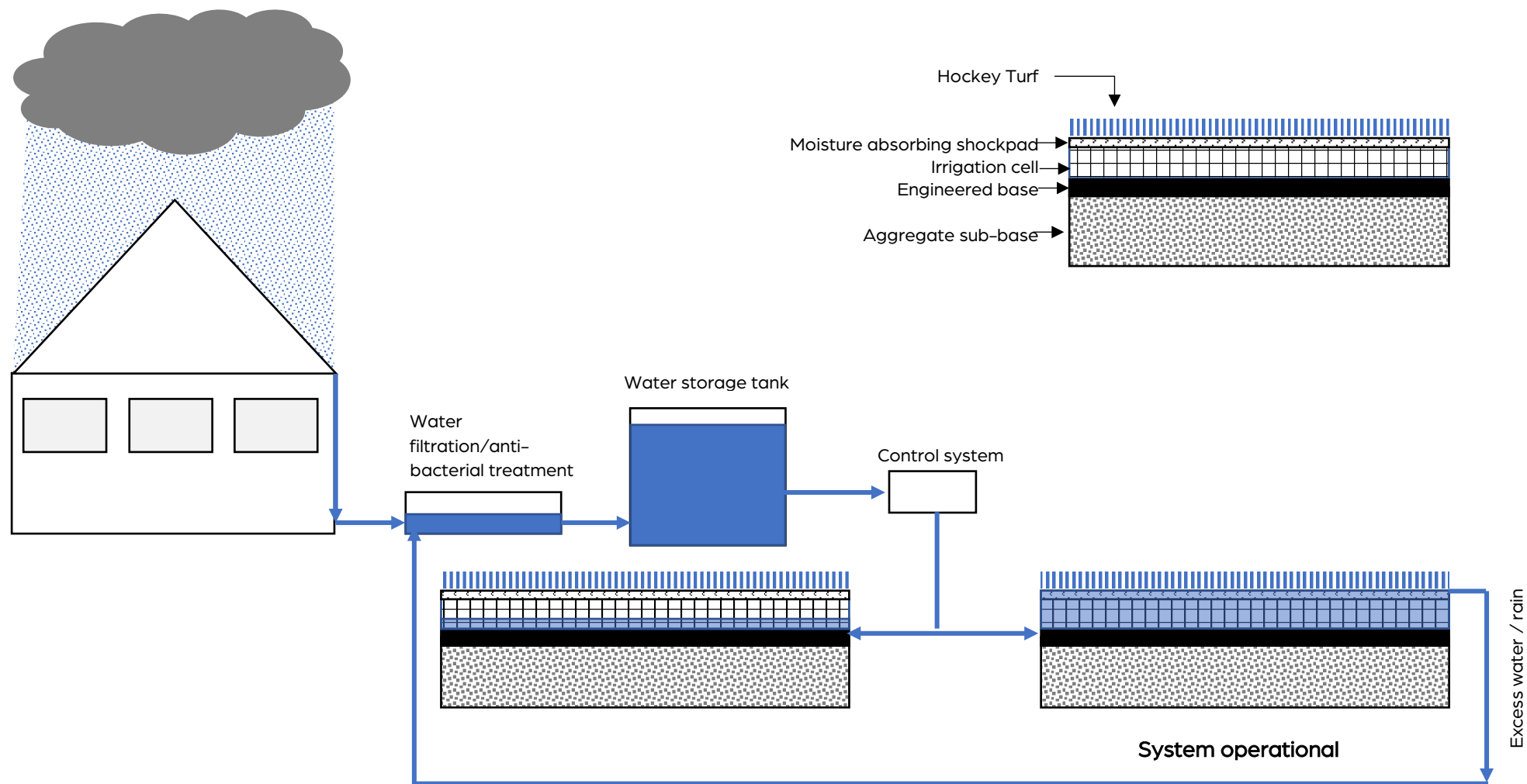
Average depth of water collected

Is the depth collected in any one location greater than 100% or less than 50% of an adjacent location?

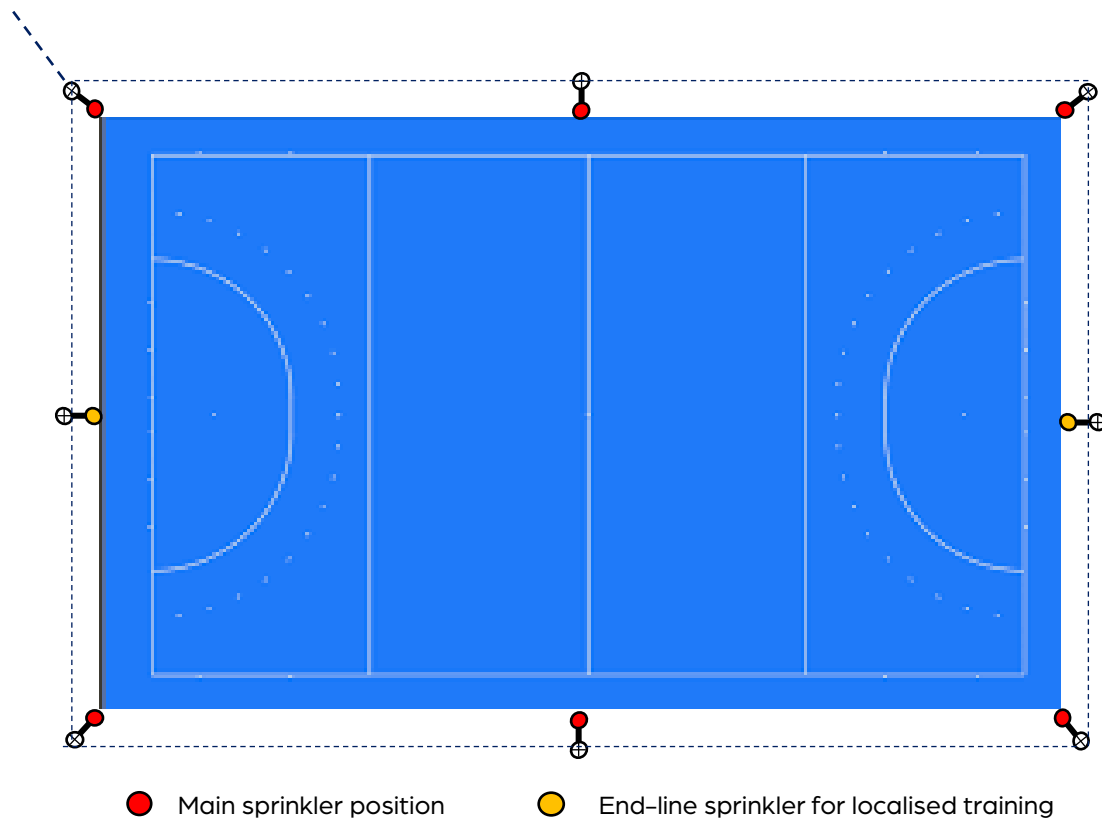
Irrigation requirement for installed Hockey Turf

Is the average depth equal to or greater than the irrigation requirements of the installed Hockey Turf?

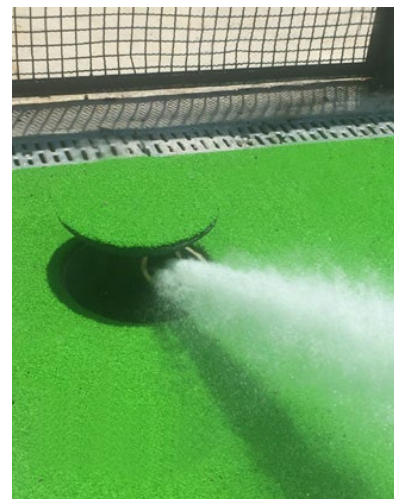
APPENDIX B - PRINCIPLES OF SUB-FIELD IRRIGATION



APPENDIX B - IRRIGATION TESTING PROCEDURE



Typical irrigation layout



Example of sprinkler head with hockey turf cover, located within run-off



Example of rain gun located outside perimeter run-off

Use of this guide

Whilst every effort has been made to ensure the accuracy of the information contained in this publication, any party who makes use of any part of the guide in the development of a hockey facility shall indemnify the International Hockey Federation (FIH), its servants, consultants or agents against all claims, proceedings, actions, damages, costs, expenses and any other liabilities for loss or damage to any property, or injury or death to any person that may be made against or incurred by the FIH arising out of or in connection with such use.

Compliance with the requirements detailed in this guide by a User does not of itself confer on that User immunity from their legal obligations. Compliance with the requirements detailed in this guide by a User constitute acceptance of the terms of this disclaimer by that User.

FIH reserve the right to amend, update or delete sections of this Standard at any time, as they deem necessary.

Any questions about this guide should be addressed to facilities@fih.ch

FIH facilities guidance – helping you win

This guide is part of a series of facilities documents produced by the FIH. Other information that might assist you is available at www.fih.ch/qp. It includes:

- Facilities Guidance – Outdoor Hockey Facilities
- Facilities Guidance – GEN 2 multi-sports areas
- Facilities Guidance – HOCKEY5s Courts
- Facilities Guidance – Sports Lighting for Non-Televised Outdoor Hockey
- Facilities Guidance – Sports Lighting for Televised Outdoor Hockey
- Facilities Guidance – Hockey Field Irrigation
- Facilities Guidance – Indoor Hockey

- Hockey Turf and Field Standards – Part 1 FIH Approved Hockey Turfs
- Hockey Turf and Field Standards – Part 2 – 11 a-side hockey fields
- Hockey Turf and Field Standards – Part 3 – HOCKEY5s courts
- Hockey Turf and Field Standards – Part 4 – Temporary Overlay Pitches (TOPS)

- FIH Approved Field Equipment – Hockey Goals
- FIH Approved Field Equipment – HOCKEY5s Rebound Boards
- FIH Approved Field Equipment – Team Shelters
- FIH Approved Field Equipment – Technical Officials Booths
- FIH Approved Field Equipment – Indoor Hockey goals
- FIH Approved Field Equipment – Indoor Hockey side-board



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