FINAL DRAFT

SYNTURF HOCKEY PITCHES

GUIDELINES FOR CARE AND MAINTENANCE

(Web Version)

Revised: November 2001

APPROVED BY THE COUNCIL
OF THE INTERNATIONAL HOCKEY FEDERATION
(November 2001)

For the guidance of:

Member Associations
FIH Officials
Pitch Manufacturers / Suppliers
FIH-accredited Laboratories
Pitch Proprietors Generally

Disclaimer

The views expressed in these guidelines are given in good faith and no responsibility or liability can be accepted by the FIH for any damage or loss as a result of any party relying on the views given.

These Guidance Notes have been compiled by the FIH to assist in general terms. NHAs and facility managers are advised to refer to manufacturers, consultants, and other authorities.

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FOREWORD

For a variety of reasons, the FIH encourages further dissemination of information on synthetic pitches. Full details of the requirements and classifications are contained in the Handbook of Performance Requirements for synthetic pitches. Regularly, a list of FIH approved products is published. Both documents are available from the FIH office in Brussels or the FIH website: www.FIHockey.org

One of the main objectives of the FIH is to act as the Centre of Expertise for its members. Because proper maintenance of synthetic pitches is one of the main contributors to player enjoyment , the reduction of injuries and extended longevity, the Equipment Committee of the FIH has undertaken to compose these guidelines for general use. Reference is regularly made to manufacturers, who know best about maintenance and have a vested interest in extended life cycles of their products.

The views expressed in these guidelines are given in good faith and no responsibility or liability can be accepted by the FIH for any damage or loss as a result of any party relying on the views given.

The guideline is sub-divided into a number of self-contained sub-sections for easy reference; as a result, there is an element of duplication when the document is read in full.

Recognition is extended to a number of manufactureres of FIH approved products who have put their documentation at the disposal of the FIH Equipment Committee for the compilation of these guidelines.

As with all technical issues, numerous changes are anticipated in the not too distant future; hence, an easy up-to-date format has been chosen in the presentation of these guidelines.

Brussels, November 2001

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1. PREFACE

1.1 Introduction

Pitch maintenance is deemed to be a very important factor in the short-term and long-term viability of a synthetic playing field. In the short-term, the enhanced playability of the pitch, the minimisation of injury potential and added enjoyment are the major considerations. Over the longer term, a good maintenance regimen greatly increases the longevity of the pitch - a major economic consideration.

This manual is intended as a guideline for National Hockey Associations (as well as clubs, local authorities, schools & other bodies) undertaking the installation of a synthetic pitch. As well as expertise garnered from members of the FIH Equipment Committee and other knowledgeable members of the international hockey community, several manufacturers provided maintenance schedules, advisory notes and other very helpful technical information. However, this manual is not intended to be prescriptive, definitive or authoritative; it is merely intended as a reference guideline for proprietors and users of synturf pitches, with the aim of achieving optimum playing and safety conditions for users of synturf pitches.

It is generally recognised that a major advantage of synthetic turf over natural grass is the greatly reduced maintenance required. However, a reduction of maintenance does not mean no maintenance. It is extremely important to realise that sufficient maintenance be performed to ensure the pitch is kept in top condition. This applies both to filled and unfilled pitches; hence this manual covers both.

1.2 Objectives

It is generally recognised that a well-maintained pitch enjoys the following advantages:

- Optimising playing conditions
- Minimising potential for injury
- Maximising longevity of pitch

Thus, the objective of this manual is to:

- Identify preventive measures in design and implementation
- Stress importance of following specified maintenance routine
- Outline maintenance protocols and procedures
- Emphasise the need for regular monitoring and inspection
- Highlight advantages of early detection and prompt intervention
- Recognise the need to refer to experts (manufacturers)
- Realise that proper installation of the pitch, getting the watering right (automatic), and having knowledgeable local contacts on hand is imperative

1.3 Scope

This manual endeavours to address care and maintenance requirements of unfilled and filled synturf pitches.
In the case of filled pitches, this refers to pitches filled with sand or materials simulating sand. Not rubber.

1.4 Limitations

This manual contains little information on long-fibred surfaces infilled with rubber granules, as feedback on the hockey-playability of these surfaces is limited at this stage of their development.

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2. GENERAL PRINCIPLES

2.0 Optimum Playing Conditions

The prime objective of a properly maintained synthetic turf pitch is to provide the best possible conditions of playability and safety for the participants.

2.1 Economic Considerations

The capital cost of installing a synturf pitch, and the cost of replacing or up-grading it later, are so high that maximising the interval between these two events (thereby increasing the longevity of an installation) is of the utmost importance. There are examples in several countries around the world where strict supervision of pitch use and conscientious following of proper maintenance practices has resulted in a pitch life of at least 12 years, for both filled and unfilled surfaces. On the other hand, there are also numerous examples where failure to follow these recommended practices has led to failure in less than 5 years.

2.2 Design and Pre-Construction

Many facets of good maintenance practice can be incorporated into the design and pre-construction phase of the installation:

- Installation of concrete/tarmac paths
- Installation of security fences / gates
- Availability of synturf practice/warm-up areas
- Provision of markings and extra goals for cross-pitch practice
- Installation of boot cleaners
- Provision for and regular emptying of rubbish bins
- Routing of player traffic to minimise tracking of impurities
- Set up of food and beverage facilities well off-pitch

2.3 Installation Supervision

It is vital that expertise be available during the installation to ensure that specifications are adhered to, that inspection is thorough, and that any corrections have been satisfactorily completed. (This is especially pertinent in developing countries with no experience of synturf pitches and no local synturf manufacturers).

2.4 Provision of Trained Personnel

In order to be certain that maintenance regimens are clearly outlined, trained personnel is on hand, and essential machinery is available, it is recommended **MANUFACTURERS BE REQUIRED TO** ensure that:

- maintenance regimens and procedures be very clearly described
- several local personnel receive full knowledge of requirements and sufficient training to ensure back-up
- maintenance machinery be purchased/leased as necessary for carrying out the maintenance programme
- monitoring takes place to ascertain that maintenance/inspection regimens are fulfilled

2.5 Importance of Proper Watering of Unfilled Pitches

A very important aspect of maintenance is ensuring that the pitch is properly watered during all times of activity (matches/practices). As well as short-term considerations such as playability, injury avoidance and enjoyment, improper watering has negative long-term implications with respect to pitch maintenance and longevity.

If not properly watered a synturf pitch loses its cleansing properties, resulting in depositing of impurities, thus creating abrasion of the carpet. Furthermore, played on when dry, much greater forces are in action, which have a very detrimental effect on the turf (fibres / joints / interface with sub-base/e-layer) causing wear and more rapid deterioration (rippling, tearing, uneven stretching). This greatly decreases the longevity of the pitch, a major economic consideration.

The optimum solution for ensuring that a pitch is properly watered at all times is the provision of a computer program controlled watering system. This is the only real practical solution. With respect to watering, it is especially true that: **"a penny well spent is a pound well saved".**

N.B. If a club has its own water well, the water MUST be free of ferric oxide.

For more comprehensive information on watering, please refer to the FIH Irrigation Manual.

2.6 Access and Security Considerations

If the pitch is on public or unsupervised private land, there is a need for the provision of a security fence and a gate to control entry and exit. A single access with distribution of keys to a limited number of responsible persons is advisable. The optimum situation with respect to access and security of a synturf pitch is the appointment of a facility manager.

2.7 Posting and Prohibitions

To facilitate maintenance of the pitch, it is necessary to identify positive actions which are required and activities which are prohibited and to post notice of such actions / prohibitions clearly and prominently. It is important that adequate supervision be maintained to ensure that these actions and prohibitions are adhered to by ALL players/users, and that failure to observe them results in appropriate sanctions.

2.8 Monitoring and Inspection

During the life of the pitch, and especially in its initial stages, it is imperative that periodic monitoring and inspection be incorporated into the routine. Manufacturers should undertake to provide a periodic inspection service, particularly during the warrantee period, to detect early any need for adjustment or repair. Details of inspections should be defined in the warranty contract. Appointment of a Facility Manager to carry out these duties helps to ensure that vital tasks are done.

2.9 Rapid Action / Early Intervention

The old adage **"a stitch in time saves nine"** is certainly relevant when it comes to pitch maintenance.

2.10 Consultation with Manufacturers

It is important to consult with manufacturers regarding maintenance and to conform with manufacturers' specified maintenance procedures. Warrantee conditions will typically demand fulfilment of a maintenance regime. Some manufacturers will offer a separate service contract in which they undertake to perform for a fee a pro-active role in the regular maintenance of a pitch (e.g. 3 visits in the first year and then 2 per year). In addition to normal adjustments and repair functions, a service contractor would be expected to undertake all tasks where special equipment is needed (e.g. high-pressure hosing, vacuuming and line re-marking).

2.11 Technical Aspects Referred to Appendices

Technical aspects of a specialised or evolving nature are referred to Appendices.

3. MAINTENANCE
(Major Topics / Sections)

3.1 Preventive Measures

"An ounce of prevention is worth a pound of cure"

Certain preventive measures, aimed at keeping the pitch and adjacent areas free of litter, gravel, grit, mud, dirt, oil and toxic materials, can be incorporated into the design and contruction of the facility:

- landscaping with non-leafshedding trees and bushes
- installation of concrete/tarmac paths
- routing of player traffic to minimise tracking of impurities
- set up of food and beverage facilities well off-pitch
- control of access to minimise possibility of vehicles entering pitch area
- availability of synturf practice/warmup areas
- provision of markings and extra goals for cross-pitch practice
- installation of brushes / sluices / mats for cleaning boots
- strategic placement of rubbish bins with provision for regular emptying
- erection of prominent signs designating required positive actions and prohibitions FOR EVERYONE

Positive actions:
- Clean boots before entering pitch area

Prohibitions:
- No smoking
- No chewing gum (can be removed with the help of dry ice - CO2)
- No food/drinks (except water)
- No glass containers / bottles
- No sharp tags on boots / no stiletto heeled shoes

Vehicles:
- Observe all recommended static and rolling load limits

3.2 Preventive Maintenance

Periodic Monitoring and Inspection:

- Close watch for algae invasion on unfilled pitches, especially in warmer climates
- Constant vigilance for moss on filled pitches
- Attention for seam separation, rips & tears in turf and observation of worn areas

Routine Action:

- Frequent collection of foreign material from pitch area (litter, canteen waste, tape, gum, etc.)
- Sweep up grass, leaves, twigs and cones regularly
- Clean up organic materials such as food, faeces, compost, mud, etc.
- Empty bins frequently to ensure they do not overflow
- Cross-brush filled pitch regularly
- Repair minor damage promptly
- Report more serious damage or repair problems immediately to manufacturers

- Take early action on algae / moss / weeds / etc. N.B. for a prophylaxis, it is useful to install a dosage system, continually adding the appropriate amount of "DIMANIN" (Special or A) to the sprinkler system. The recommended dosage is in the range of 10 ppm minimum, to 30 ppm maximum.
- Attend to any watering system problems promptly
- If ever lines or seams come loose, they must be repaired as soon as possible. A loose seam running a few centimetres can quickly become several metres unless quick action is taken.

MAINTAIN COMPLETE AND ACCURATE DETAILS OF MAINTENANCE REGIMEN, INCLUDING RECORD OF MONITORING AND INSPECTION.

3.3 Routine Care of Carpet (Sweeping / Brushing)

(This may be done by the customer. It concerns minor maintenance requiring no specialised equipment)

As well as ensuring that litter is removed from the pitch immediately, it is also essential that grass, leaves, twigs, cones, other organic materials and coarse dirt be swept up periodically. These will be deposited on the pitch under various seasonal and climatic conditions and if they are not removed, over time they will work themselves into the fibres. This will affect the permeability because of soiling of the carpet pile. Thus, it is important that they be removed as soon as possible. This can be accomplished with a synthetic lawn rake, a sweeper (when using a sweeper on a filled pitch, make sure not to sweep up too much of the sand), or a blower. A leaf-blower with adjustable settings usually gives the best result. Blow the debris to one side of the pitch with the wind, where it can be collected with a lawn rake and removed. Do not point the nozzle too deep. With filled pitches, care must be taken to avoid the sand shifting or to ensure that the filling of the pile flooring is subsequently evened out again.

In the case of filled pitches **(including "dressed" pitches)**, to keep the amount and distribution of the sand in optimum condition, regular sweeping with a triangle brush is highly recommended (once per week is considered appropriate for good maintenance). Do not use metal brushes.

N.B. The fill in the long-pile "starter level" pitches may be composed of rubber granules instead of (or as well as) natural or simulated sand.

Wear of the synturf pitch causes micro-grindings. These grindings are concentrated during heavy rainfall and tend to cause a "cake". This material should be removed as soon as possible with a plastic or wooden snow-shovel before it is walked about the pitch and must certainly be separated from the sand before carrying out major maintenance of a filled pitch.

When using machines with engines, take care not to leak oil as it is very difficult to remove oil from synturf. Moreover, oil may damage the elastic layer and as a result affect the pile anchorage. If a tractor is used, check wheel pressure to see that it comforms with the limit set.

3.4 Periodic Major Cleaning of Carpet (unfilled)

(maintenance requiring specialised equipment - should be carried out in consultation with manufacturer)

One of the hazards of a unfilled pitch is the very fine soiling from worn fibres, airborne dust, smoke and chemical emissions, fine sand particles, and other organic impurities which initially appears on the surface and rapidly seep into the filling of the pile flooring. Not only does this continual invasion of polluting material accelerate the mechanical wear of the pitch, but it also clogs the pores, affecting permeability and reducing drainage capacity. Over time, surface pooling will occur in certain areas during heavy rain and will linger longer than is desired after watering.

To prevent this the impurities must be removed regularly. Special machinery, specifically designed for the purpose (a sweeper-vacuum fitted with two contra-rotating brushes and broad wheels, deployed by experienced operators), is available to carry out the required in-depth suction cleaning of the pitch. The machinery is fitted with an appliance which raises down-trodden fibres. Care must be taken to avoid the forming of waves in the carpet. Conventional unmodified road-sweepers and sweepers designed for large areas are seldom suitable because of their high surface load and because they usually lack the technical requirements for cleaning synturf.

Before using a machine on the pitch, the surface should always be carefully inspected. Attention must be paid to weakened adhesive seams and line intersections. If any faults are detected, these must be repaired before cleaning begins.

If, over the course of time, impurities appear which can no longer be removed with the sweeper-vacuum, periodic flushing with a high pressure water jet can be used to keep a pitch in good clean condition.

3.5 Treatment of Algae

Algae growth is a natural occurrrence caused by humidity. Algae invasions in unfilled pitches occur more frequently in warmer climates especially in pitches that are not cleaned regularly and thoroughly. Usually the first sign is that, in patches, the green carpet turns brown and becomes very slippery.

As a preventive measure, spraying of the surface at given intervals with an approved algae killer, is recommended. (N.B. too much algae killer will affect the coating of the turf). There may also be the option of feeding this product through the existing irrigation system by means of a metered addition unit.

The most effective treatment, so far, is to apply a product called "Dimanin Special" * to the affected area, followed by high pressure water-jet cleaning and suction removal with a vacuum cleaner capable of vacuuming water. If the pitch is under warrantee or is subject to a service contract, this treatment is best left to the contractor. The most important action by the pitch proprietor is the early detection and reporting.

* produced by Bayer A.G.

3.6 Treatment of Moss / Weeds

Filled pitches are not so affected to algae attacks, but are subject to the growth of moss, particularly in shaded areas, and growth of weeds arising from seeds blown onto the surface. Early detection is important. In the case of moss, high pressure water cleaning wherever and whenever it appears is the best measure. With weeds, removal by hand is usually adequate, taking care not to damage the turf or its sub-base. However, if the problem is not solved, weedicide may be required (refer to manufacturer or contractor).

3.7 Repairs to Seams / Tears / Patching of worn carpet)

If ever lines, seams, etc. come loose, they must be repaired as soon as possible. A loose seam of just a few centimetres can quickly become a tear of several metres unless quick action is taken.

The need for carpet repairs can occur in both types of pitches, but tends to occur most frequently at the seams of an unfilled pitch, particularly on a loose-laid surface. If the carpet is fixed to the sub-base, the seams will usually be held by a seam tape or butt-jointed with a glue bead or, alternatively, lap-jointed using glue. After exposure to weather and regular wetting, these seams may be subject to separation or

peeling failures. These can be repaired, usually by re-glueing, if problems are detected early and reported to the manufacturer or contractor.

The stitching in the seams of loose-laid unfilled pitches will become exposed to sunlight and abrasion at a relatively early stage. Unless the stitching cord is treated for ultra-violet resistance (check with manufacturer before deciding on carpet!), it will soon break up, particularly in conditions of prolonged sunlight. Resewing can be undertaken but is never very easy to do on top of the carpet and often leads to smoothness imperfections which cause erratic ball behaviour. This is one of the major weaknesses of loose-laid design which has led to the wider use in recent years of fixed carpets with either sewn or glued seams.

3.8 Line Marking and Painting

As this is often specific to the type of turf, details of line marking and painting procedures are best left to reference of manufacturers' instructions.

3.9 Treatment of Chemicals and Stains

There are numerous toxic chemicals which may come in contact with the turf. The best advice is to take all possible precautions to avoid their incidence in the first place. However, if chemicals are spilt, or stains appear, it is important that they be detected early and action taken immediately. Remedial treatment will depend on the chemical and type of turf. Again, reference to manufacturers' instructions is advised.

3.10 Major Treatment of Filled Pitch (Rejuvenation)

Over time impurities will intermingle with the sand in a filled pitch, detracting from its playability, creating potential for skin abrasions to become septic, and causing hard spots in the playing surface. Periodically, a basic maintenance procedure should be carried out to cleanse the pitch.

First, the amount of sand is checked. Then systematic inspection across the width of the pitch is carried out. All seams and woven-in lines are checked for tears and loose parts. If present, weeds along the sides and ends of the pitch are removed (ensuring that the roots are removed as well) making sure not to damage the sub-stratum in which they have grown. The perimeter of the pitch is treated with herbicide (e.g. "Roundup" from Monsanto).

Next, all loose refuse and coarse impurities are cleaned from the surface. The pitch is now subject to a treatment which consists of "tossing " it intensively. The process is carried out by progressing lengthwise and, if necessary, cross-wise. The sand filling is extracted with a special rotating brush. This sand is separated during the brushing process by vacuuming up the very fine impurities and, if necessary is fed back into the upper covering through a riddle sifter to separate sand and small stones. Hard spots should also be brushed up with a stiff brush (not metal). Brushing out when the sand is damp is inadvisable because it is not possible to remove the dust, which may subsequently be brushed back in.

The pitch is now brushed again to remove all remaining loose refuse. Then all "spots" are supplied with extra sand; i.e. new sand is strewn in and brushed with a synthetic broom.

This treatment has the following advantages:

- the structure of the sand becomes and remains loose, which makes the pitch more pleasant to play on and reduces the chance of injury.
- the sand is "aired" so that moss and weeds get less chance to grow.

- existing moss is partially or completely removed.
- permeability is improved, which inhibits soiling of the top layer and reduces puddling.

During major maintenance, it is opportune to check all accessories like goals, dug-outs, flag poles, etc. as well as fences and gates. They should be repaired or replaced as necessary.

3.11 Replacing and/or Up-grading (may include sub-base)

Average life of a pitch - depending on playing intensity - is about 10 years, several years more if it is well maintained, considerably less if not. Provided the sub-base has not been damaged, and irrigation/drainage systems are in good condition, at the end of this period a further 10-12 years of life should be obtainable essentially by only having to replace the carpet.

3.12 Summary of Key Points

1. Take care in the design stages to facilitate simple and effective maintenance features.
2. Post clearly positive actions and prohibitions and closely monitor adherence to them.
3. Ensure that the pitch is properly watered before every match or practice activity.
4. Carry out simple maintenance regimens and routine inspections regularly.
5. Attend to any problems urgently and take remedial action immediately.
6. Refer to manufacturers for expertise required to ensure proper carrying out of maintenance.
7. Adhere to the long-term maintenance programme recommended by manufacturers.

4. APPENDICES

4.1 Appendix A

[Appendix A is an article prepared by Dr Kurt Schneider entitled *Red Card for Algae (April 2001)*]

This document was sent out under Bob Davidzon's signature on 22/4/2001 to members of the Equipment Committee, NHAs, Continental HFs, and FIH registered manufacturers and accredited laboratories.

5. REFERENCES and RESOURCES

5.1 FIH Publications:

Handbook of Performance Requirements for Synthetic Hockey Pitches - Outdoor, 4th Edition (June 2000)

Guide to the Artificial Lighting of Hockey Pitches, 2nd Edition (April 2000)

Irrigation Manual, 1st Edition (2001)

5.2 FIH Up-Dates:

Quarterly Listings of FIH Approved Hockey Products (Also under heading "products" on FIH website)

FIH web-site (www.FIHockey.org)

5.3 Supplementary Resources:

6. ACKOWLEDGEMENTS

Recognition is extended to a number of manufactureres of FIH approved products who have put their documentation at the disposal of the FIH Equipment Committee for the compilation of these guidelines. In particular, the documents kindly provided by Desso and AstroTurf were most helpful.

The contributions of Frank Yeend, Chairman of the FIH Equipment Committee from its inception in 1986 to 1996, is greatly appreciated. Reference to Frank's numerous articles, in particular his 1999 publication *Synthetic Hockey Pitch Solutions*, has proved invaluable in the compilation of this document.

Preparation of this Manual was instigated by Bob Davidzon, Chairman of the FIH Equipment Committee from 1996 to 2001. Bob's creative ideas, organisational skills, guidance and attention to detail were crucial in the evolutionary process of developing these Guidelines.

Acknowledgement is also extended to fellow sub-committee members Allan Woods, Kurt Schneider and John Giles for their contributions during the compilation and editing phases of these Guidelines.

Valuable feedback was provided by Brenda Read, former Equipment Committee member, and Colin Horsley of the English Hockey Association, who are also gratefully acknowledged.

John McBryde,
Sub-Committee Convenor,
FIH Equipment Committee

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