



FIH field certification

K.K Hakku Stadium, Jammu, India

The FIH is pleased to confirm that this hockey field has been tested and shown to satisfy the construction, performance, and player welfare requirements of an FIH Category 2 hockey field.

Hockey turf	<i>S-tec Solution Xperience IS 15</i>
Hockey turf manufactured by FIH Preferred Supplier	<i>Lano Sports</i>
Field built by FIH Certified Field Builder	<i>Shiv Naresh Sports PVT Ltd</i>

DR. NARINDER DHRUV BATRA
PRESIDENT

Date of Certificate: 20/12/2021

The field is certified until: 14/09/2024

Notes:

- 1 The field was tested in accordance with FIH Hockey Turf & Field Standards – Part 2 (2021 edition).
- 2 Failure to maintain the field correctly may result in a deterioration in the performance and safety of the field.
- 3 FIH reserves the right to retest the field at any time, to verify ongoing compliance with its standards.

CERTIFICATE N° CF-21-131



ENGINEERED
FOR HOCKEY

FIELD TEST REPORT

Field name / designation	K.K. Hakku Stadium, Jammu	
City	Jammu	
Country	India	
Category of field	2	Hockey field designed to host national & international matches
Type of test	Initial field certification	



1 Introduction

A hockey field is a major investment, so it is very important that it meets the expectations of players, funders, site operators, and those organising matches to be played on it. To ensure good quality fields are built, the FIH has developed its *Hockey Turf and Field Standards* (HTFS). These define the qualities required from the playing surface and the layout and construction criteria of 11 a-side hockey fields.

The HTFS describes five categories of hockey fields, based on the various levels of play and use that takes place, from elite level competitions to grassroots development and community play. The field detailed in this report has been tested as a Category 2 field. This category of field is typically used for higher level national and international matches.

This report details the results of the field test recently undertaken. The field test included measurements of the sports performance and player welfare properties of the playing surface and an assessment of the field's irrigation system. A comprehensive series of quality control checks were also undertaken to verify that the installed hockey turf surface is the same as the product previously approved by the FIH, ensuring manufacturing mistakes have not occurred.

The tests were undertaken by a FIH accredited test institute. The results obtained are detailed on the following pages. Results highlighted in green show compliance with the requirements of the HTFS. Results highlighted in pink indicate non-compliance. When non-compliance is noted, further details are provided at the rear of this report. Results not highlighted are provided for information only.

On the basis of this report, the FIH will assess the suitability of the field for FIH Field Certification. If the field is found to comply with the FIH requirements, a certificate of compliance will be issued, and the field will be listed on the FIH website.

Fields less than 12 months old at the time of the initial field test are certified for 3 years from the date of the field test. Fields older than 12 months are certified for 2 years.

Over time and through use, the performance, condition and suitability of the field to host hockey matches will change. It is therefore important that the field is re-checked periodically. This allows the site operator to demonstrate that the field is continuing to provide a safe and suitable playing environment; re-checking is good practice and a simple way for the site operator to demonstrate they are continuing to meet their obligations to provide a facility that is fit for purpose. The FIH recommends, and some National Hockey Associations require, fields to be re-tested at the end of each certification period.



Please think about the environment before printing this report. If you do require a paper copy, please set your printer to print on both sides of the paper.

2 Field details

Location	Road	Sanjay Nagar, Gujrabasti, Jammu
	City	Jammu
	State/Province/County	Jammu
	Country	India
	Post/Zip code	180006
Field owner's contact details	Name	Sh. Rajesh Kumar Agastam
	Position	Executive Engineer
	Email	xenscdjmu@gmail.com
Date of construction (handover month & year)		August 2021
Installed hockey turf (product name)		S-TEC SOLUTION XPERIENCE IS 15
Manufacturer (FIH licensee)		LANO SPORTS
Hockey turf approval category (as shown on FIH certificate)		GLOBAL
Hockey turf certificate number (as shown on FIH certificate)		2018-084
Field builder's name (only required if the field was built by an FIH Preferred Supplier or FIH Certified Field Builder)		SHIV NARESH SPORTS PVT LTD.

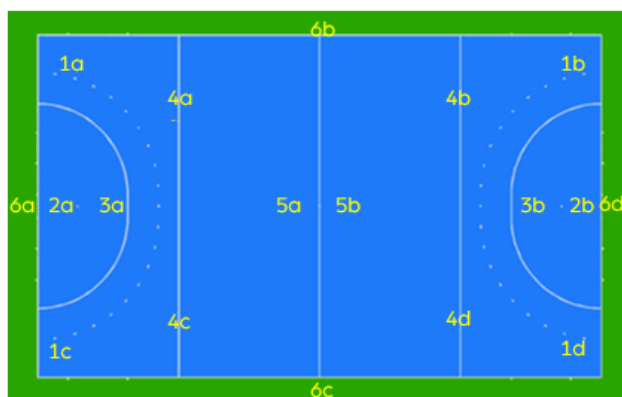
3 Test institute details

Test Institute	Acousto Scan Pty Ltd.
FIH Accredited Field Test Engineer(s)	Aayush Kumar
Other participating field test engineers	
Test institute project / report reference	4291

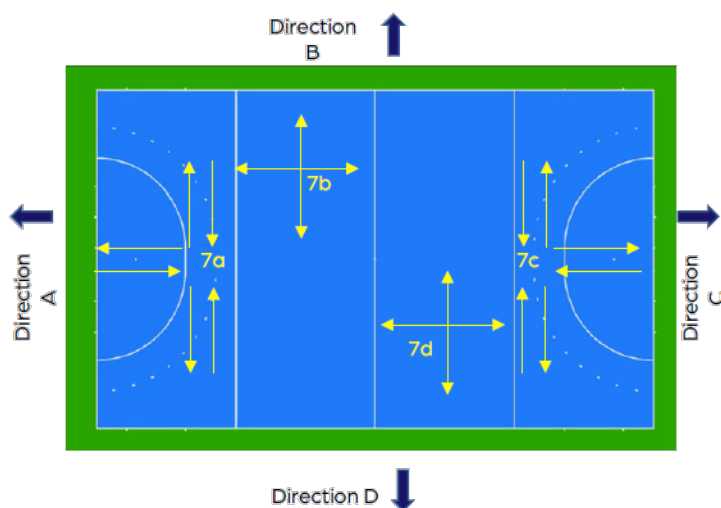
4 Test details

Date of test		14/09/2021			
Field conditions at time of test		Irrigated	X	Wet (rain)	
Air temperature (°C)		Min	48.9	Max.	52.1
Surface temperature (°C)		Min.	45.2	Max.	47.5
Wind speed (m/s)	ball roll tests	Min.	0.2	Max.	0.7
	irrigation tests	Min.	0.3	Max.	0.9

Test positions – spot tests, ball roll & ball roll deviation



1a		1b		1c	X	1d	
2a	X	2b		2c		2d	
3a		3b	X	3c		3d	
4a		4b	X	4c		4d	
5a		5b	X	5c		5d	
6a		6b		6c	X	6d	
7a	X	7b	X	7c	X	7d	X



Field orientation



5 Sports performance

5.1 Ball rebound

Hockey balls should not bounce too high or too low; the bounce also needs to be consistent. These aspects of a field's performance are assessed by measuring the height a hockey ball rebounds when dropped vertically from a height of 2.0 m. Tests are made in a number of locations on the field. For a field to comply, the rebound in each test position must be within the specified range, and the rebound properties must be consistent across the field.

Results (mm)					
TP1	TP2	TP3	TP4	TP5	Overall mean
385	390	374	382	388	384
Requirements:	100 mm – 400 mm	Compliant:	Yes	X	
			No		
Ball rebound consistency (% difference to overall mean)					
TP1	TP2	TP3	TP4	TP5	
+0.2	+1.6	-2.5	-0.5	+1.2	
Requirements:	≤ ± 10%	Compliant:	Yes	X	
			No		

5.2 Ball roll

Ball roll assesses the speed of the surface. It is measured by rolling a hockey ball down a ramp and measuring the distance it travels and the degree to which it deviates from a straight line. Tests are made in a number of locations on the field and in different directions. To satisfy the FIH requirements the ball roll must exceed the minimum ball roll distance, be consistent irrespective of direction and not excessively deviate from a straight line.

Results (m)						
TP	Direction of test					
	A	B1	B2	C	D1	D2
7a	14.7	14.4	12.7	14.0	12.3	14.5
7b	14.0	13.9		12.3	12.6	
7c	13.4	14.4	13.2	13.3	12.6	14.0
7d	14.1	12.8		12.7	14.4	
Overall mean			13.5			
Requirements:	≥ 10.0 m	Compliant:	Yes	X		
			No			
Ball roll consistency (% difference to overall mean)						
7a	+9.0	+6.3	-6.3	+3.6	-9.0	+7.5
7b	+3.8	+3.1		-8.8	-6.8	
7c	-0.6	+6.8	-2.4	-1.6	-7.0	+3.3
7d	+4.1	-5.6		-6.1	+6.8	
Requirements:	≤ ±10%	Compliant:	Yes	X		
			No			
If the field is an existing facility that is being resurfaced or is a field that is being upgraded to become a Category 2 field, and it has slopes that exceeds the FIH Preferred Gradients, tick the adjacent box and apply the criteria detailed.			Requirements:		Compliant:	Yes
			≤ ±15%			No

5.3 Ball roll deviation

Results (m)						
TP	Direction of test					
	A	B1	B2	C	D1	D2
7a	0.02	0.05	0.02	0.08	0.02	0.05
7b	0.05	0.03		0.10	0.02	
7c	0.07	0.12	0.12	0.02	0.10	0.05
7d	0.08	0.02		0.02	0.07	
Requirements:	≤ 0.50 m @ 9.5 m	Compliant:	Yes	X		
			No			

5.4 Shock Absorption

Shock absorption assesses the cushioning provided to players as they run and fall on the surface. The impact force experienced during the test is measured and compared to the value measured on concrete; the result being expressed as a percentage reduction. The higher the result the greater the shock absorption. A minimum value is specified to ensure fields are not too hard and an upper limit is specified to ensure fields are not too soft or tiring.

Results (% Force Reduction)						
TP1	TP2	TP3	TP4	TP5	TP6	Overall mean
59	58	53	55	59	57	57
Requirements:	45% – 60%	Compliant:	Yes	X		
			No			
Shock absorption consistency (difference to overall mean)						
+2	+1	-4	-2	+2	0	
Requirements:	≤ ± 5	Compliant:	Yes	X		
			No			

5.5 Vertical Deformation

The degree to which a playing surface compresses when a player runs on it is also an important characteristic. Surfaces should allow some deformation to ensure injuries do not occur through the jarring of a player's foot, but it is also important that the deformation is not too high, or players will find the surface unstable.

Results (mm)						
TP1	TP2	TP3	TP4	TP5	TP6	Overall mean
8.0	8.5	7.4	7.3	8.1	8.2	7.9
Requirements:	4 mm – 9 mm	Compliant:	Yes	X		
			No			

5.6 Shoe/ Surface Interaction (Nm)

Shoe/ surface interaction is assessed by measuring the resistance the surface offers to a loaded test plate designed to simulate a hockey shoe rotating on the surface. If the level of resistance is too low players will find the surface slippery. If the level is too high players may suffer injuries due to excessive foot grip.

Results (Nm)						
TP1	TP2	TP3	TP4	TP5	TP6	Overall mean
31	32	31	32	32	30	32
Requirements:	25 Nm – 45 Nm	Compliant:	Yes	X		
			No			
Shoe/ surface Interaction consistency (variation to overall mean Nm)						
-1	0	-1	0	0	-2	
Requirements:	≤± 5 Nm	Compliant:	Yes	X		
			No			

5.7 Surface regularity

It is important that there are no depressions or high spots that could distort the trajectory of a ball rolling across the surface or cause it to lift. The whole field is surveyed using a 3 m straightedge and any undulations greater than 6 mm recorded. Any sudden steps (raised edges on carpet or shockpad joints, etc.) are also checked using a 0.3 m straightedge.

Excessive undulations or high spots				
	Limit	Number recorded	Compliant	
3 m straightedge	> 6 mm	0	Yes	X
0.3 m straightedge	>3 mm	0	No	

If undulations or high spots are found their position and magnitude are indicated on the drawing at the rear of this report.

6 Field dimensions

The field of play shall measure 91.40 m x 55.00 m and be rectangular (see section 7 for measurement key).

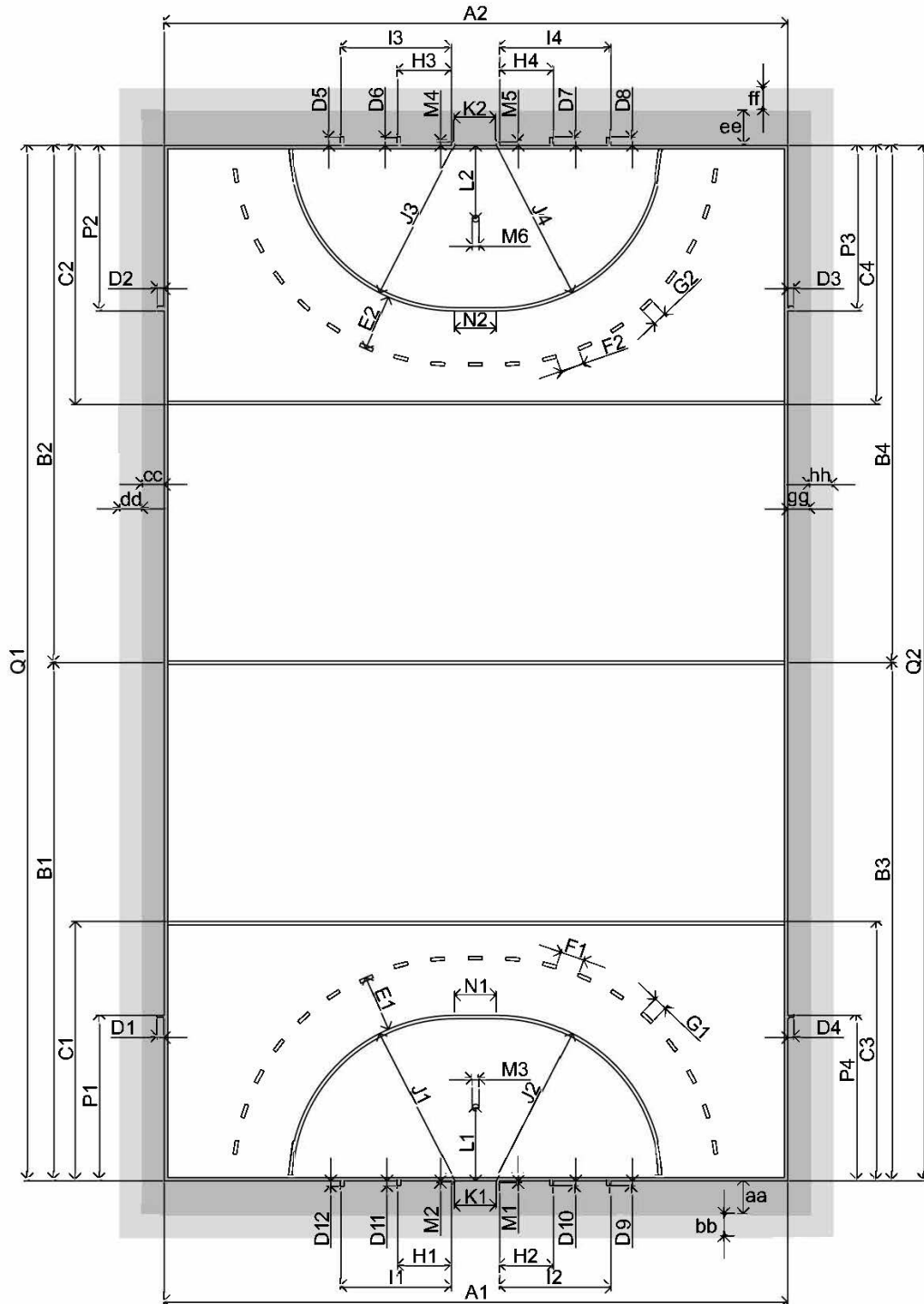
End run-offs must be at least 3.0m wide, and side run-offs must be at least 2.0m wide.

The inner run-offs must be surfaced with the same hockey turf as the field of play.

Field measurements (m)								Compliant	
	Tolerance (mm)	Ref.	Actual (m)	Error (mm)	Ref.	Actual (m)	Error (mm)	Yes	No
Length	± 50	Q1	91.37	+32	Q2	91.41	-6	X	
Width	± 50	A1	55.02	-24	A2	54.99	+10	X	
Field of play diagonals (m)			1	106.66	2	106.67			
Difference between diagonals (mm)			-0.02		Requirement ≤ 300 mm			X	
Run-offs (m)									
	Inner run-off		Outer run-off		Total width	Compliant			
	Surface	Width	Surface	Width		Yes	No		
End 1	Grass	3.3	Drain + Pavement	4.0	7.3	X			
End 2	Grass	3.3	Drain + Pavement	2.6	5.9	X			
Side 1	Grass	3.2	Drain + Pavement	4.4	7.6	X			
Side 2	Grass	3.3	Drain + Pavement	2.8	6.1	X			

7 Hockey line markings

Line markings are checked to ensure compliance with the Rules of Hockey and the HTFS.



Distance (m)	Tolerance	Ref.	Actual (m)	Error (mm)	Compliant		Ref.	Actual (m)	Error (mm)	Compliant	
					Yes	No				Yes	No
45.70	± 50 mm	B1	45.67	+32	X		B2	45.70	0	X	
		B3	45.69	+13	X		B4	45.72	-19	X	
22.90	± 50 mm	C1	22.89	+7	X		C2	22.91	-12	X	
		C3	22.89	+11	X		C4	22.89	+11	X	
0.30	± 30 mm	D1	0.30	0	X		D2	0.30	0	X	
		D3	0.30	0	X		D4	0.30	0	X	
		D5	0.30	0	X		D6	0.30	0	X	
		D7	0.30	0	X		D8	0.30	0	X	
		D9	0.30	0	X		D10	0.30	0	X	
		D11	0.30	0	X		D12	0.30	0	X	
5.00	± 30 mm	E1	5.00	-2	X		E2	5.01	-6	X	
3.00	± 50 mm	F1	2.98	+16	X		F2	2.99	+12	X	
0.30	± 30 mm	G1	0.30	0	X		G2	0.30	0	X	
4.975	± 50 mm	H1	5.004	-29	X		H2	4.977	-2	X	
		H3	4.985	-10	X		H4	4.968	+7	X	
9.975	± 50 mm	I1	9.997	-22	X		I2	9.984	-9	X	
		I3	9.981	-6	X		I4	9.969	+6	X	
14.63	± 30 mm	J1	14.65	-20	X		J2	14.65	-20	X	
14.63	± 30 mm	J3	14.64	-10	X		J4	14.65	-20	X	
3.66	± 50 mm	K1	3.65	+9	X		K2	3.66	+5	X	
6.475	± 30 mm	L1	6.473	+2	X		L2	6.471	+4	X	
0.15	± 30 mm	M1	0.15	0	X		M2	0.15	0	X	
		M4	0.15	0	X		M5	0.15	0	X	
Ø 0.15	± 30 mm	M3	0.16	-11	X		M6	0.16	-12	X	
3.66	± 50 mm	N1	3.65	+9	X		N2	3.66	+5	X	
14.63	± 50 mm	P1	14.65	-19	X		P2	14.63	-1	X	
14.63	± 50 mm	P3	14.62	+13	X		P4	14.62	+11	X	
Line width (mm)	75 ± 10	A1	55.02	A2	54.99	Q1	91.37	Q2	91.41	X	

<u>8 Playing surface</u>			Yes	No
Is the installed hockey turf an FIH Global certified product?			X	
Is the field of play?	an approved shade of blue (RAL, 5002, 5005, 5010, 5017, 50ff19)		X	
	green	X		
What colour are the run-offs	Red/ Gravel			
Are the yarn colours used, detailed in the approved product test report?	Field of Play (FoP)		X	
	Run-offs		X	
	Lines		X	
Does the field have 5m dashed circle markings?			X	
Does the field have cross pitch hockey markings?				X
Does the field have markings for any other sports?				X
Does the field have any logos within the:	Field of Play			X
	Run-offs?			X
Play surface quality and installation	Is the installed hockey turf free from manufacturing and visual defects?		X	
	Are there any carpet rucks, wrinkles, or any other installation defects within the FOP or run-offs?			X
	Are there any excessively open or failed carpet joints?			X
	Are the any joints that may cause a ball to lift or deviate as it passes over the joint?			X
	Are there any other manufacturing or installation defects that mean in your opinion the field should not be certified?			X
	Is the surface laid in full width rolls running across the FOP without head seams?		X	

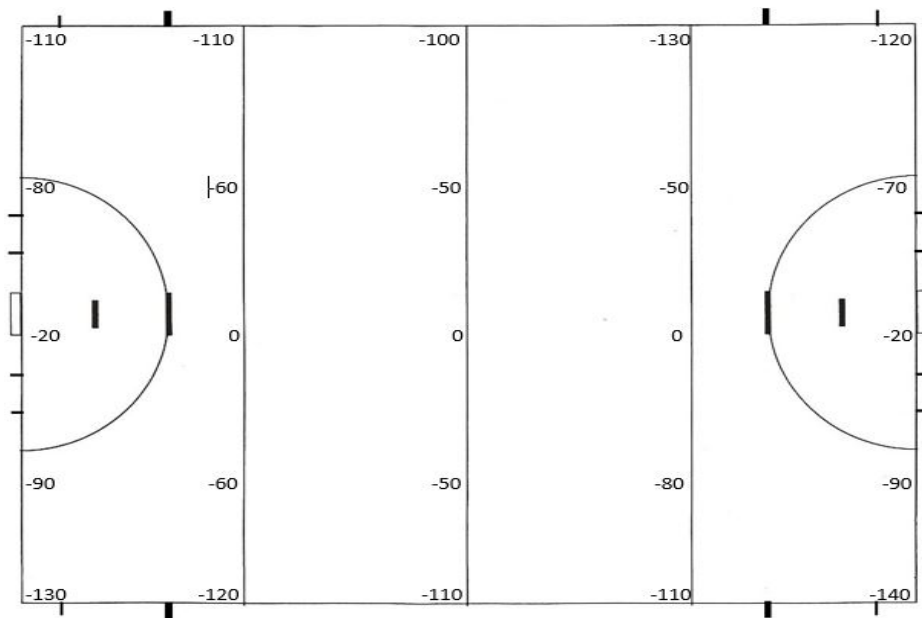
			Compliant	
			Yes	No
Play surface quality and installation	Is the hockey turf	bonded to the shockpad?		
		tensioned and clamped along the boundaries?	X	
	Are there any repairs to the playing surface?			X
	If there are any repairs, have they been undertaken in a satisfactory way, so they do not compromise the performance or appearance of the field?	N/A		
		X		
If there are any defects or repairs, has the field owner confirmed in writing they are still willing to accept the field?		X		

9 General field requirements

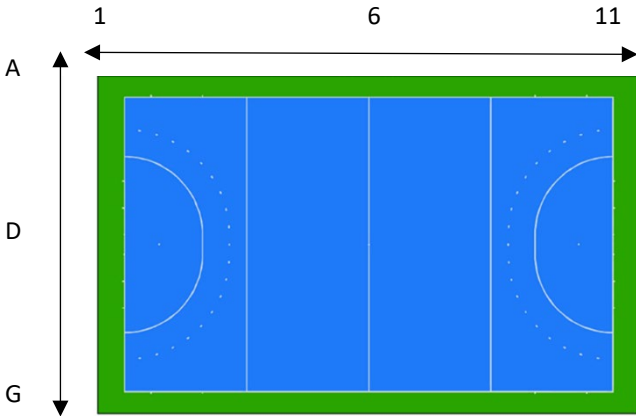
		Compliant	
		Yes	No
Orientation	Is the field aligned North / South ($\pm 15^\circ$)		X
FoP drainage	During the irrigation test was water found to be standing on the hockey turf?		X
Perimeter fencing	Does the fencing ensure balls cannot pass through it and leave the field?	X	
	Is the fencing in an acceptable condition and not pose a risk to anyone colliding with it?	X	
	Is there emergency vehicle access onto the field?		X
Field equipment	Is the field equipped with hockey goals and nets?	X	
	Are the goals FIH Approved?		X
	Are the goals in good condition and suitable for use on an FIH certified field?	X	
Maintenance equipment	Is the field equipped with the necessary maintenance equipment, recommended by the hockey turf manufacturer?		
Are there any other features that you consider may have an adverse effect on the playing qualities of the field or could be a possible hazard to players, officials or spectators using the facility?			X

10 Field profile and gradients

The profile and gradients of the field should comply with Clause 4.2 of the HTFS.

Field measurements		
Indicative drawing showing profile of the field		
Longitudinal gradient along length of the field	Lateral gradient across width of the field	Maximum gradient in any direction on the field
0.13%	0.54%	0.39%

11 Field Irrigation

												Test grid	
Results (mm or l/m ²)													
	1	2	3	4	5	6	7	8	9	10	11		
A	3.3	2.5	2.7	3.2	2.8	3.7	2.7	2.7	3.3	3.1	2.8		
B	2.7	2.5	4.5	2.5	3.3	2.8	3.7	2.7	3.3	2.5	3.1		
C	2.4	3.2	2.7	3.2	2.7	2.9	2.4	3.3	3.6	2.8	3.1		
D	2.8	2.7	2.3	2.5	3.2	2.7	3.2	2.8	2.8	2.9	2.8		
E	2.0	2.4	3.3	2.2	3.1	2.4	2.0	3.4	2.5	2.5	2.4		
F	2.7	2.8	3.7	3.2	2.5	3.7	3.6	3.3	2.8	2.7	3.1		
G	3.7	3.2	2.3	2.5	2.2	3.7	2.3	2.3	2.4	3.1	2.2		
Irrigation requirement for installed hockey turf – as detailed in product approval test report										2.5l/m ²			
Irrigation time cycle (min)			9		Average depth of water collected during test					2.9l/m ²			
Maximum % variation in water collected between adjacent test positions								75					
										Yes	No		
Is the average depth of water \geq 100% of the irrigation requirements of the hockey turf?										X			
Is the average depth of water \geq 150% of the irrigation requirements of the hockey turf?											X		
Is the water collected in any one test position greater than 100%, or less than 50% of an adjacent position?											X		
Was the irrigation cycle completed in 10 minutes or less?										X			

12 Hockey turf quality assurance tests

To verify that the hockey turf installed on the field is the same as the FIH Approved Product, and manufacturer's declaration, representative samples have been checked.

	Characteristic	Manufacturer's declaration	Site sample	Permitted tolerance	Compliant	
					Yes	No
Hockey turf carpet	Method of manufacture	Tufted	Tufted		X	
	Pile type	Curly Mono-filament	Curly Mono-filament	Same type	X	
	Pile profile			Same profile	X	
	Pile height (mm)	10mm	10mm	± 10%	X	
	Pile weight (g/m ²)	1650	1533	± 10%	X	
	Pile dtex	7700	7267	± 10%	X	
	Pile thickness (mm)	160	165,200	≥ 90%	X	
	Yarn polymer & DSC peak temp.	127	129, 130	Same polymer	X	
	Tufts/m ²	71400	70350	± 10%	X	
	Filaments/m ²	1142400	1125600	± 10%	X	
	Carpet mass g/m ²	3280	3219	± 10%	X	
	Water permeability (mm/h)	2000	3789	≥ 90%	X	
	Shockpad	Composition ⁽¹⁾	In-situ	In-situ		X
Manufacturer ⁽¹⁾		Lano sports NV	Lano sports NV		X	
Thickness ⁽²⁾ (mm)		15	15	90% - 130%	X	
Mass/m ²		11	10.51	± 10%	X	
Shock absorption ⁽³⁾ (%FR)		51	50	± 5% SA	X	
Water permeability (mm/h)		4235	4000	≥ 90%	X	

Notes:

1 – Prefabricated shockpads only

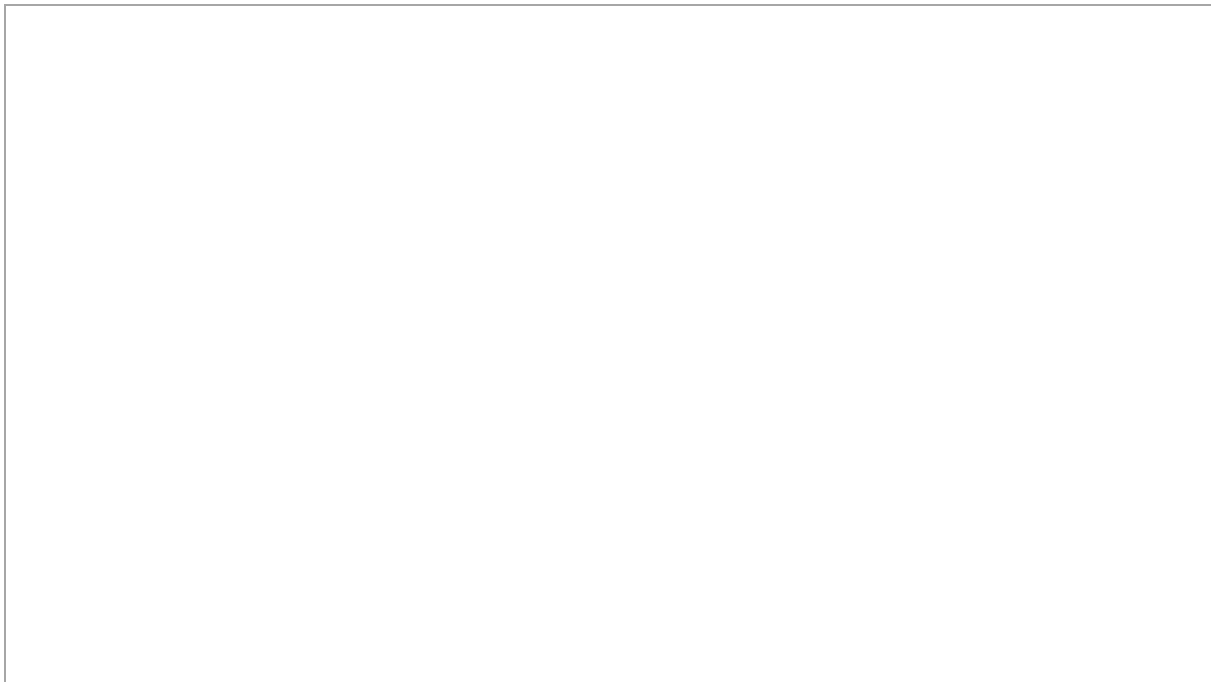
2 – not applicable if an existing shockpad is retained when a field is being re-surfaced.

3 – applicable to new fields or when a new shockpad is laid on an existing field during re-surfacing.

13 Plan showing location of any defects, failures, or items of concern

A large, empty rectangular box with a thin black border, intended for a plan showing the location of any defects, failures, or items of concern.



14 Additional comments by test institute

A large, empty rectangular box with a thin black border, intended for additional comments by the test institute.

Test institute declaration

We certify that the tests described in this report have been carried out in accordance with the latest requirements of the *FIH Hockey Turf and Field Standards* and this report accurately reflects the outcomes.

We further certify that in our opinion there were no defects that compromise the quality, performance, player safety, or durability of the field at the time it was tested.

Report prepared by		
	Name	Aayush Kumar
Report authorised by		
	Name	Grant Humphreys
Date	11/12/2021	



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