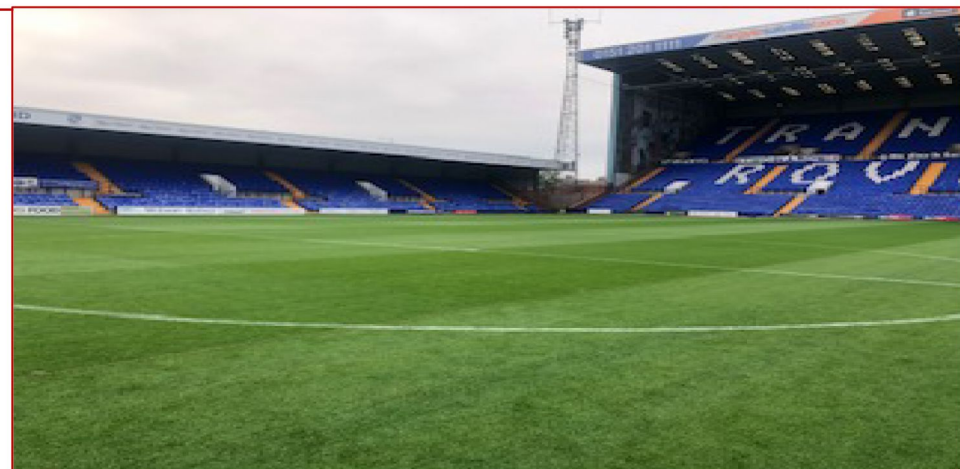
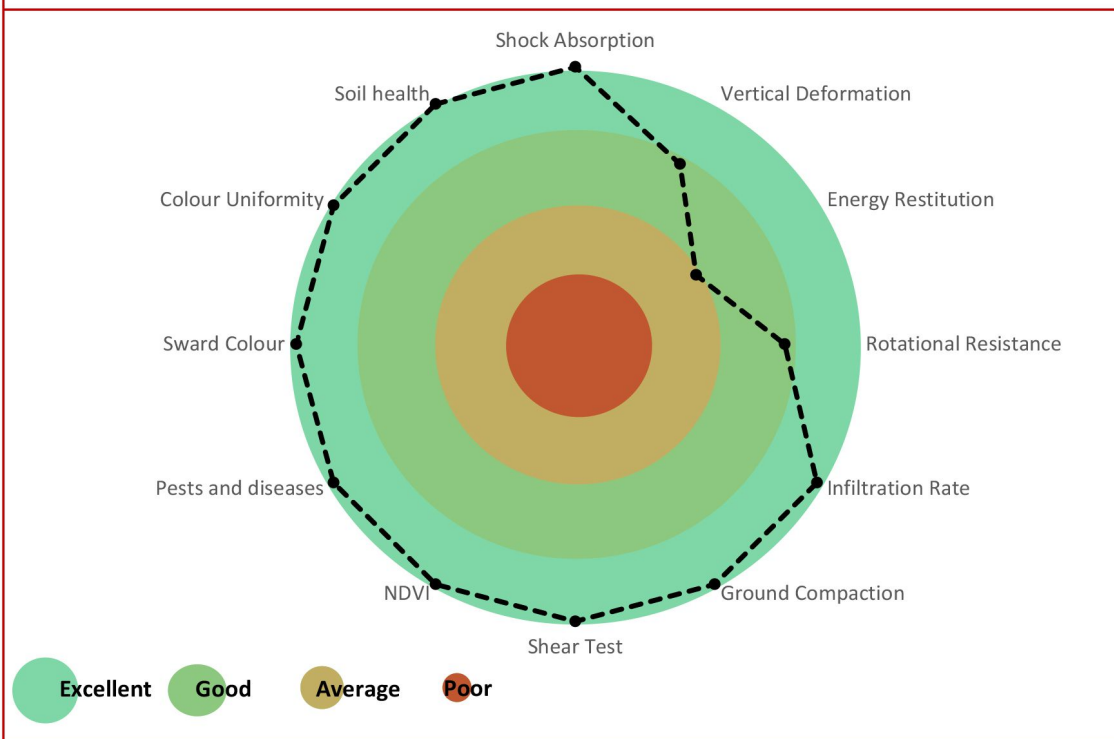




Client	The FA Women's Pitch Testing	Date of Test		Surface Type	Hybrid - Stitched
Venue Name	Tramere Rovers	Category	Professional	Surface Construction	Desso GrassMaster
Report Number	F_023_SP-Lite-TramereRovers_1612_200814	Use of pitch	Women's Championship	Primary Sport(s)	Football

Overall Score /% - 95%

The pitch has been tested in accordance with the Labosport ScorePlay™ system to measure and categorise the performance and quality of the surface. A combination of game performance, construction and agronomy testing have been undertaken to provide a comprehensive assessment of the venue.



Rating Category

Above Target (result > 95%)

Note: any individual score 2 or below is inadequate and requires improvement

Key observations and recommendations

ScorePlay Light Testing was carried out at Tranmere Rovers FC using the following components of the ScorePlay testing which are linked to pitch and player performance:

- Shock Absorption
- Vertical Deformation
- Energy Restitution
- Rotational Resistance
- Ground Compaction
- NDVI
- Shear Strength
- Infiltration
- Visual assessment of sward condition

NOTE: During the Covid-19 Pandemic, the decision was made to replace the pitch at Tranmere Rovers with a new SIS Grass Stitched Hybrid construction, this has provided a complete transformation into one of the best pitches tested.

The results for each component are shown later in the report with the following comments made below:


1. Shock Absorption received a score of 4 which is excellent and provides an ideal amount of cushion for player interaction with the surface.
2. Vertical Deformation received a score of 3 which is good.
3. Energy Restitution received a score of 2 which is average and is typical of a newly constructed pitch, once it settles and ages this score will improve and is not of concern.
4. Rotational Resistance scored a 3 which is good.
5. Ground Compaction scored 4 which is excellent. The values ranged from 65g-85g with an average of 73g which indicates that a consistent surface is present.
6. NDVI results averaged 0.86 which within the good range. The range recorded was between 0.83 and 0.88 which is an indication that the grass coverage and sward health was excellent overall.
7. Shear Strength scored a 4 which is excellent and is an indication of good rooting and a mature soil profile being present.
8. The sward coverage overall was good with coverage visually assessed as being 98%. The soil was aerobic with no stagnant smell present, this element was marked excellent (4). The colour uniformity and sward colour were excellent and were both marked as 4. The pitch was unaffected by pests and diseases and this element was marked excellent (4).
9. Surface levels were visually assessed as conforming to guidelines overall with no obvious depressions present.
10. Infiltration rates are indicated as being excellent with an average of 920mm/hr recorded with a range between 840mm/hr and 1,020mm/hr recorded. This rate of infiltration is particularly high and rates are generally higher in the Summer months and can be expected to reduce during the season. Key maintenance techniques will include aeration to ensure that natural drainage is encouraged whilst keeping the surface open to aid soil health. Managing organic matter accumulation will also be key to aiding performance of the surface and water movement through the profile.

This report has been approved by:

Charles Henderson PSD Labosport - (Managing Director)



Test Conditions & Details

Testing Conditions	Cloudy but warm			
Surface temperature (°C)	Min	0	Max	0
Ambient temperature (°C)	Min	24	Max	25
Relative Humidity (%)	Min	0	Max	0
Test Engineer	C Doyle			
Signature				
Agronomist	D Frith			
Signature				

Pitch Dimensions & Lines

Length goal to goal (m)	0
Touch line to touch line (m)	0
Total Length (m)	0
Total Width (m)	0

Site Photographs



Site Photographs



Results - SPORTS PERFORMANCE

Property	Shock absorption	Vertical Deformation	Energy Restitution	Ball Roll	Rotational Resistance	Ball Rebound Height	Gmax	Infiltration Rate	Surface Regularity	Pace	Bounce
Location	(%)	(mm)	(%)	(m)	(Nm)	(m)	(g)	(mm/h)	(mm)	(%)	(coefficient)
1	62.8	7.9	12.3	-	-	-	-	-	-	-	-
2	62.8	7.1	11.6	-	-	-	-	-		-	-
3	61.3	8.6	10.8	-	-	-	-	-		-	-
4	56.2	7.3	12.5	-	-	-	-	-		-	-
5	55.3	8.9	10.9	-	42	-	-	-		-	-
6	61.0	8.8	11.4	-	-	-	-	-		-	-
7	66.2	9.2	10.5	-	43	-	-	900		-	-
8	65.4	8.5	10.4	-	-	-	-	-		-	-
9	64.0	9.1	9.2	-	-	-	-	-		-	-
10	67.4	11.1	11.4	-	41	-	-	1020		-	-
11	63.0	8.4	8.7	-	-	-	-	-		-	-
12	52.2	7.3	12.5	-	-	-	-	-		-	-
13	57.7	7.1	11.0	-	40	-	-	-		-	-
14	67.3	10.6	9.0	-	-	-	-	-		-	-
15	68.6	11.0	11.0	-	-	-	-	-		-	-
16	66.3	10.7	9.3	-	41	-	-	840		-	-
17	59.7	9.0	9.0	-	-	-	-	-		-	-
18	65.8	9.2	10.8	-	-	-	-	-		-	-
19	66.9	9.5	8.2	-	-	-	-	-		-	-
20	59.1	7.1	10.8	-	-	-	-	-		-	-
21	58.2	8.8	11.0	-	-	-	-	-		-	-
22	58.7	9.0	9.0	-	-	-	-	-		-	-
23	62.3	9.5	9.0	-	-	-	-	-		-	-
24	56.9	7.1	10.5	-	42	-	-	-		-	-
Average	62	8.8	10	-	41	-	-	920	-	-	-
ScorePlay™ Rank	4	3	2	-	3	-	-	4	-	-	-

Results - AGRONOMY

Property	Effective Root Depth	Ground Cover	Weed Content	Sward Height	Ground Compaction	Thatch Depth	Penetrometer	Moisture content	Moisture at core base	Shear Test	NDVI
Location	(mm)	(%)	(%)	(mm)	(CIV)	(mm)	(Mpa)	(%)	(%)	(Nm)	(-)
1	-	-	-	-	72	-	-	-	-	-	0.86
2	-	-	-	-	73	-	-	-	-	-	0.87
3	-	-	-	-	70	-	-	-	-	-	0.86
4	-	-	-	-	85	-	-	-	-	-	0.86
5	-	-	-	-	83	-	-	-	-	109	0.85
6	-	-	-	-	73	-	-	-	-	-	0.87
7	-	-	-	-	74	-	-	-	-	113	0.85
8	-	-	-	-	70	-	-	-	-	-	0.87
9	-	-	-	-	68	-	-	-	-	-	0.87
10	-	-	-	-	72	-	-	-	-	118	0.86
11	-	-	-	-	66	-	-	-	-	-	0.87
12	-	-	-	-	82	-	-	-	-	-	0.87
13	-	-	-	-	80	-	-	-	-	98	0.86
14	-	-	-	-	68	-	-	-	-	-	0.86
15	-	-	-	-	65	-	-	-	-	-	0.85
16	-	-	-	-	72	-	-	-	-	123	0.85
17	-	-	-	-	72	-	-	-	-	-	0.86
18	-	-	-	-	77	-	-	-	-	-	0.85
19	-	-	-	-	78	-	-	-	-	-	0.84
20	-	-	-	-	73	-	-	-	-	-	0.85
21	-	-	-	-	67	-	-	-	-	-	0.86
22	-	-	-	-	69	-	-	-	-	-	0.85
23	-	-	-	-	74	-	-	-	-	-	0.84
24	-	-	-	-	78	-	-	-	-	110	0.84
Average	-	-	-	-	73	-	-	-	-	112	0.86
ScorePlay™ Rank	-	-	-	-	4	-	-	-	-	4	4

Results - AGRONOMY

								ScorePlay™ Rank
Pests and diseases	No pests or diseases present.							4
Sward Colour	Uniform green colour present.							4
Colour Uniformity	Consistent colour uniformity present.							4
Soil health	Aerobic soil conditions present.							4
Salinity								-
Chemical Tests	pH Ideal Range : 6.0 - 7.0		Phosphorus (mg/kg) Ideal Range : 2.0 - 4.0		Potassium (mg/kg) Ideal Range : 2.0 - 4.0		Magnesium (mg/kg) Ideal Range : 2.0 - 4.0	-

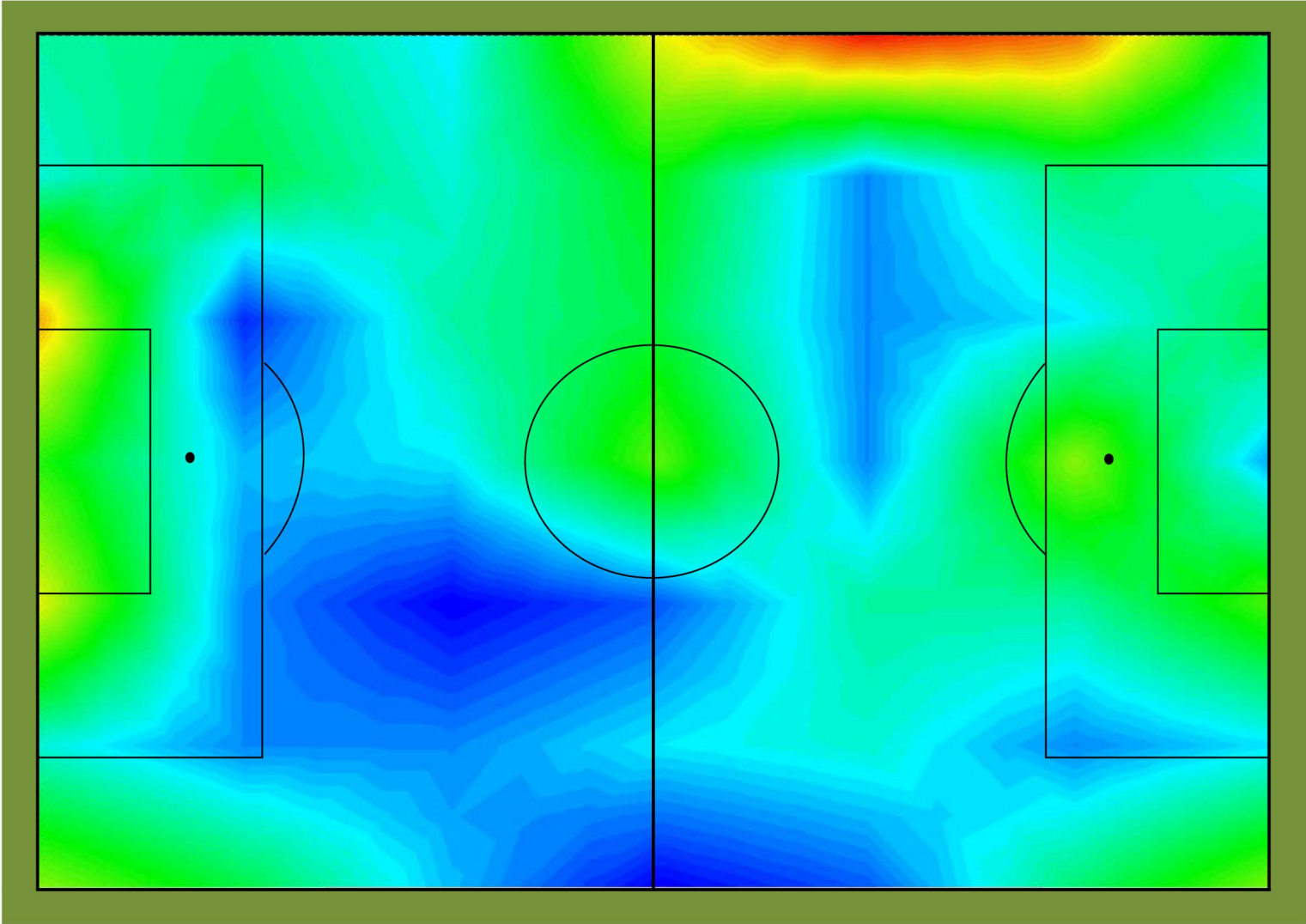
1	Poor
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2	Average
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3	Good
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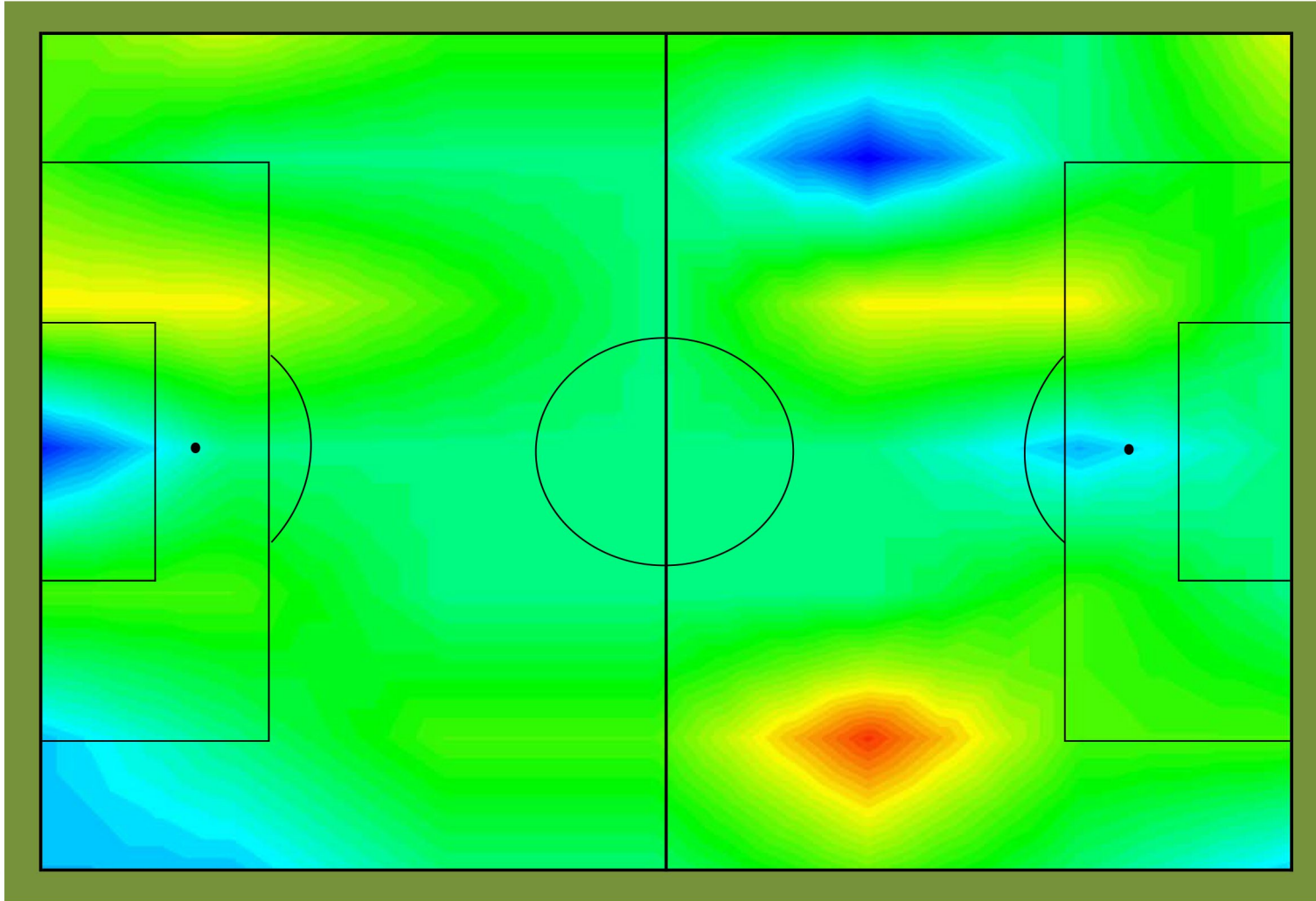
4	Excellent
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MAPPING - Clegg Impact Hammer (g)

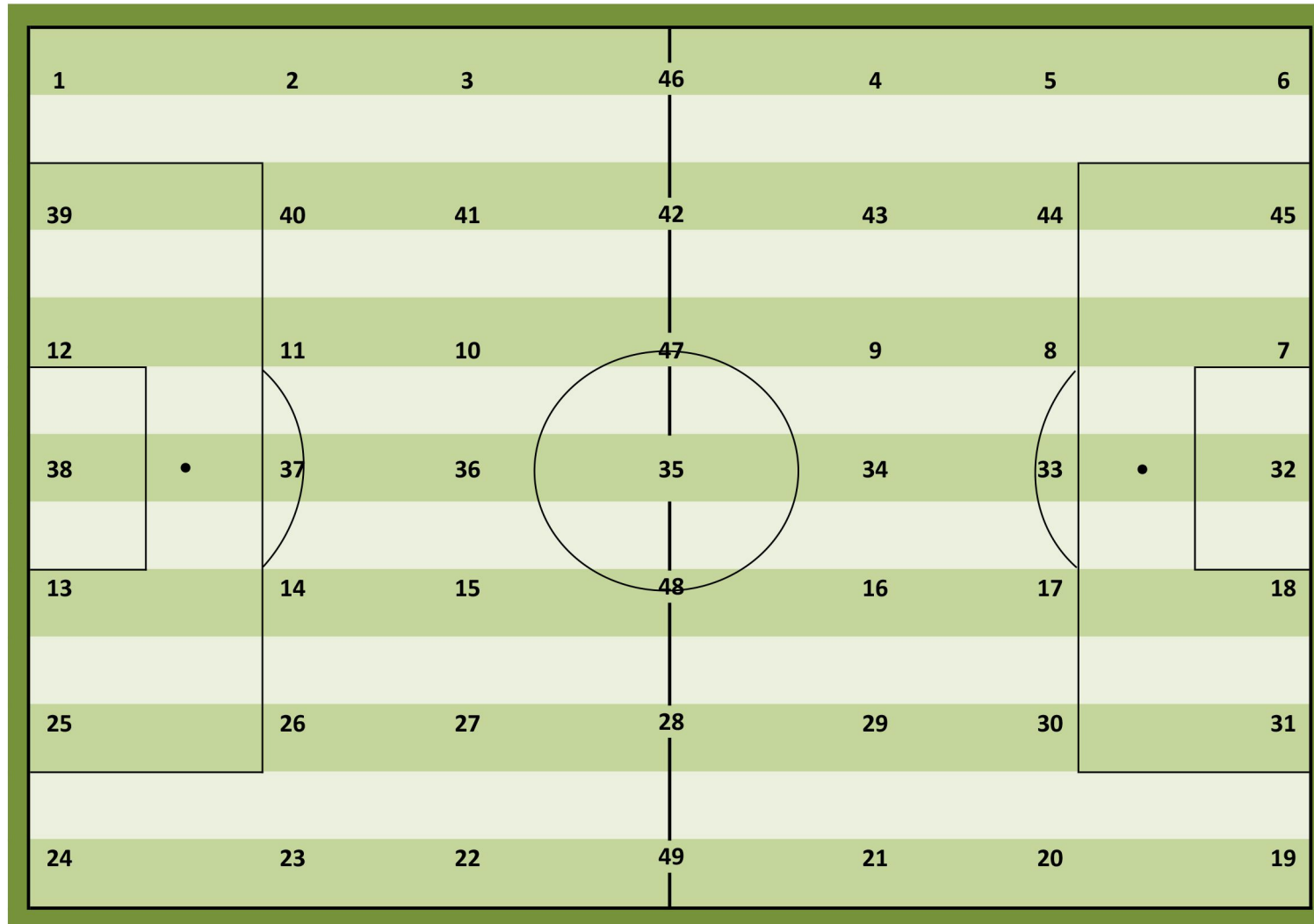


65.00 71.90 85.00

MAPPING - NDVI



Test Locations



Test Methods

Shock Absorption: a measure of the dynamic response of the surface as experienced by a player when running on the surface. Surfaces should neither be too hard to minimise the risk of repeated impact injuries nor too soft, too minimise the risk of fatigue based injuries.

Vertical Deformation: a measure of the stability of the surface as it is impacted when a player runs across it. If the Vertical Deformation is too high or low the player will find the surface unstable or uncomfortable.

Energy Restitution is the ratio of the energy returned to a player as they run across the surface compared to the energy imparted. Surfaces with poor Energy Restitution properties can be considered tiring to play on, with the possibility of fatigue or even injuries occurring.

Ball Roll: the higher the value the faster the ball will run over the surface. The ball should not be too fast or too slow.

Head Impact Criteria (HIC): a measure of the potential risk of a head impact with the surface resulting in a serious injury or a fatality. The test determines the height at which a HIC of 1000 is achieved, this being the point at which the statistical risk of a head impact with the surface causing a serious brain injury is greater than zero. The greater the fall height the low the risk of an injury occurring during normal play.

Rotational Resistance: a measure of the rotational grip or Traction provided by the playing surface. If the surface offers too much grip players may find it difficult to move and turn with ease and in extreme cases injuries due to foot lock could occur. Too little grip and players will not be able to turn and stop with ease and confidence.

Ball rebound: a measure the height a ball bounces when dropped from a fixed height onto the playing surface.

Gmax is a test method covers the measurement of certain shock-absorbing characteristics, the impact force-time relationships, and the rebound properties of playing surface systems.

Infiltration rate is a measure of the rate at which water is able to percolate vertically from the playing surface.

Surface Regularity is a measure of any undulations (depressions or high spot) recorded under a straightedge.

Pace is a measure of the speed of a ball launched by a cannon on the floor at a defined angle and speed.

Dispersion index is a measure of the quantity of infill ejected from the synthetic turf after the rebound of a ball.

Effective Root Depth is a measure to established root depth. A minimum value is specified to ensure adequate stability of the plant to withstand the wear and tear a pitch will experience during a match.

Ground Cover, the percentage of the pitch covered by grass as opposed to bare areas.

Weed content is an evaluation of the quantity of weed.

Sward Height: the height of the grass. A minimum Sward height is specified to protect the plant, whilst a maximum height is specified to ensure a satisfactory playing surface.

Ground Compaction (CIV) is a measure of the degree of compaction of root zone measured with a Clegg Impact Hammer.

Thatch Depth is a measure of degree of thatch within the grass sward. Ideally there should be no thatch.

Penetrometer is a measure the compaction of the soil

Shear test is a measure of the stability of the soil. This test simulates the push of a rugby scrum on the grass.

NDVI is the measure of plant cover rate on the field.

Pests & Diseases is an assessment of any insect pests (nematodes, etc.) or diseases present within the pitch.

Sward Colour is a measure of the colour of the grass sward.

Colour uniformity is a visual measurement of the colour for the entire field.

Soil health is an evaluation of the stratification, the porosity and the anaerobic of the soil of the field.