FORMER FRIENDS SCHOOL FIELD

CRICKET BALL STRIKE ASSESSMENT

LABOSPORT

BALL STRIKE ASSESSMENT– FORMER FRIENDS SCHOOL FIELD – CRICKET PITCH

CLIENT	Chase New Homes
SITE ADDRESS	Mount Pleasant Rd, Saffron Walden CB11 3EB
CLIENT CONTACT	Chad Neaves

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INTRODUCTION	To assess the potential risk of cricket balls surpassing the boundaries of a cricket pitch and football pitches at Former Friends School Fields, Labosport Ltd has reviewed the site distances and topography to analyse the risk of balls surpassing the site boundaries. The analysis uses a cricket ball trajectory model that has been developed by Labosport, in collaboration with the ECB. If required, the report will identify the height of any ball trajectory mitigation to minimise the potential risks. **Note:** This is a desk study, Labosport have not visited the site, taken measurements, or carried out a visual inspection. All measurement information has been provided by the client and any error in measurements are not the responsibility of Labosport. This assessment is undertaken on the basis of accurate data.

CONTENTS

Section 1 – Executive Summary of Conclusions

Executive Summary of Conclusions

This report has been prepared to assess the potential risk of cricket balls and footballs surpassing the boundaries of a cricket pitch at Former Friends School Fields and advise on the height and location of mitigation recommended to provide a suitable level of protection.

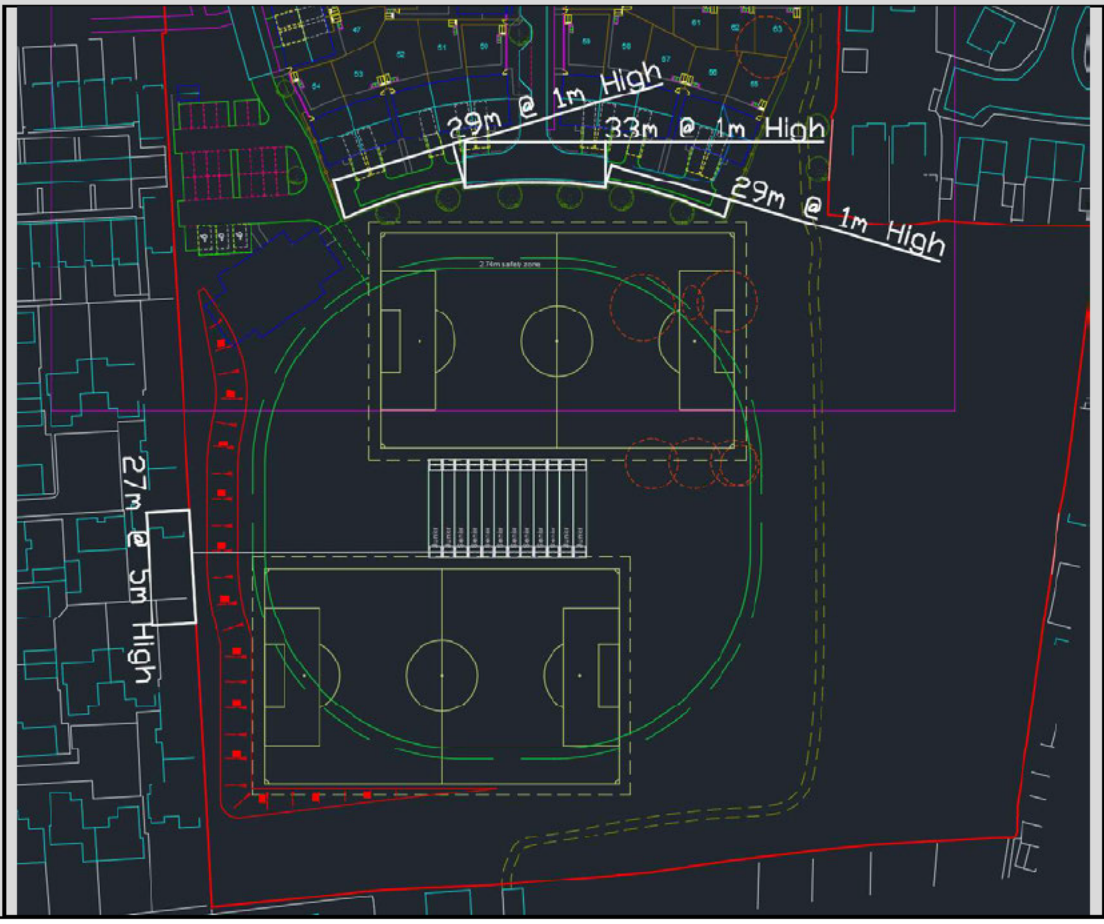
Orientation	Recommended mitigation height (based on recreational cricket and U11/12 football)
North	1 m
East	0 m
South	0 m
West	5 m*

*Adjusted from the 3m recommendation due to the approx. 2m fall in height from the cricket square to the site boundary.

It should be noted that the client is deciding to place a 6m high mitigation in the location suggested below, giving the gardens beyond increased protection from ball strike in comparison to Labosport's suggestion of 5m high.

Please Note: This may not stop all shots from landing beyond the site boundary, but it is believed from the assessment of the ball trajectory it will significantly reduce their frequency.

The below diagram shows the proposed locations of the recommended mitigation for heights detailed above:

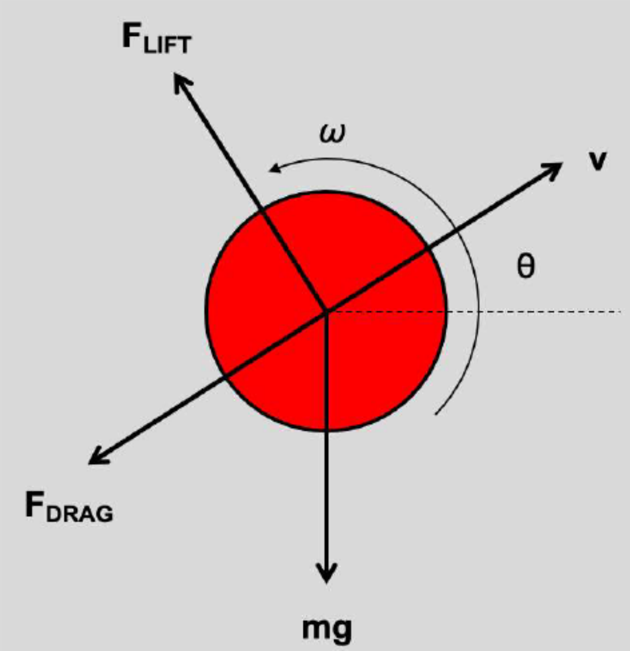


Section 2 – Cricket Ball Trajectory Model

Trajectory Model Overview

Previous work undertaken by Labosport for the England and Wales Cricket Board (ECB) led to the development of a sophisticated trajectory model to estimate the distance a ball would travel, and its trajectory given a specific velocity, angle, spin rate and atmospheric conditions (i.e. altitude).

The trajectory model uses aerodynamic principles and Newtonian physics to predict the ball flight path whilst accounting for the effect of air resistance. The model uses aerodynamic coefficients taken from published wind tunnel studies on cricket balls at different velocities.



The aerodynamic forces of drag (F_D) and lift (F_L) are proportional to the ball's velocity relative to the air flow, frontal area, air density and the drag coefficient respectively lift coefficient. The forces are defined as:

$$F_D = \frac{1}{2} C_D \rho V^2 A$$
$$F_L = \frac{1}{2} C_L \rho V^2 A$$

where C_D and C_L are the non-dimensional drag and lift coefficients, ρ is the air density in kg/m^3, V is the air stream velocity in m/s and A is the frontal area of the ball in m^2. Due to the complexity of the flight dynamics, the trajectory can only be resolved by using a numerical time step approach whereby the ball conditions are calculated at small timesteps throughout the trajectory. The conditions at time step 1 are used to calculate the conditions at time step 2; the conditions are timestep 2 are used to calculate the conditions at time step 3 and henceforth. A timestep of 0.001 seconds was used to generate high-resolution trajectory data.

Trajectory models are known to exhibit high accuracy and Labosport have undertaken extensive experimental validation of this trajectory model to refine its accuracy. However, it is not possible to simulate the full complexity of the real world and this model does not account for variations in bat/ball restitution or wind (speed and direction). Due to these limitations, the model is regarded as an indicative prediction tool.

Trajectory Scenarios

The hit angles and velocities are estimated from in-game action to cover a range of 'typical' shots ranging from 20 degrees to 50 degrees and 20 m/s (45 mph) to 50 m/s (112 mph). The exact frequency of shots resulting in a cricket ball being hit into adjacent areas is unknown and impossible to predict with certainty (player skills, type of game and many other factors can influence this) hence a proportionate approach needs to be taken to provide safety to users. In reality, there may be a "freak" shot that will result in a further than expected trajectory; however, the implications of planning for this type of worst-case approach could result in the closure of hundreds of cricket grounds across the country and hence a balanced risk mitigation strategy needs to be implemented that is proportionate. Indeed, there are risks associated with many everyday activities, but plans need to be developed to reduce risk following good practical health and safety principles including a combination of likelihood and severity.

Trajectories at an angle to the pitch

In scenarios where the direction of the trajectory is perpendicular to the direction of the pitch (or within 45 degrees of perpendicular), the analysis considers one trajectory scenario. This scenario is a ball trajectory played from the closest batting crease in the trajectory direction.

Trajectories parallel to the pitch

Where the direction of the trajectory is parallel to the direction of the pitch (or within 45 degrees), the analysis considers two trajectory scenarios; 1) a trajectory played from the closest batting crease, and 2) a trajectory played from the furthest batting crease. The type of cricket batting shots required to hit the ball from closest stumps are 'late cut' and 'late glance' shots and these do not achieve the same velocity as a 'straight drive' from the furthest batting crease. A greater emphasis is therefore placed on trajectories from the furthest batting crease.

Previous Work

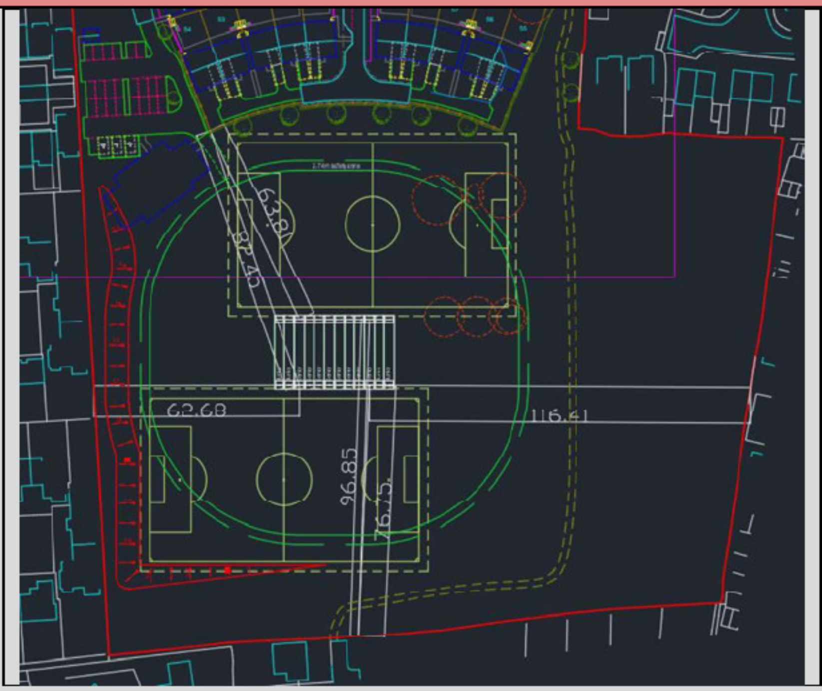
Labosport Ltd have undertaken this type of boundary risk assessment for a great many other cricket grounds over the past 5 years when there have been perceived problems with cricket balls exceeding the boundary, or the potential influence of a new adjacent development to an existing club. Through this work, Labosport Ltd have developed significant expertise that supports our judgements in these matters.

Section 3 – Site Specifics

Playing Standard of Cricket on the Site
Labosport have investigated the level of cricket that is played on this site. We have been advised that recreational and junior cricket is played on this site. For recreational level cricket the basis of the shot velocity is 40 m/s. For recreational level cricket the basis of the 'late cut' or 'late glance' type shots is 30 m/s For junior level cricket the basis of the shot velocity is 30 m/s. It is on this basis that the recommendations in this report have been made.

Existing Mitigation
There is no known existing mitigation around the facility. This report does not account for any existing, or planned planting (trees, hedges etc). It is our informed opinion that planting cannot be relied upon to provide protection against ball trajectories. The planting may not be sufficiently dense to stop the ball, nor homogeneous across the length. The planting may change during the seasons, or indeed be cut back or removed.

Site Measurements and Topography



There is an approximate 2m fall in height from the cricket square to the boundary on the West.

Orientation of Risk
This boundary risk assessment will evaluate possible ball trajectories in all directions from the cricket square; however, the focus on the analysis is based on the shortest distances from the closest cricket pitches to the site boundaries. The client has informed Labosport that recreational is only played on the central 8 pitches. Labosport have carried out this assessment based on this information.

Section 4 – Site Measurements

Site Measurements

The above diagram illustrates the minimum distances from the cricket square to the site boundaries. Note as this is a risk assessment the worst-case scenarios are considered; consequently, the shortest measured (and calculated) distance is used for the study. The following distances have been used to calculate the projected height of the ball for different shot conditions as specified below:

Measured Distance	Shortest Boundary (m)
North – Closest stump to site boundary	Circa 63.81 m
North** – Furthest stump to site boundary	Circa 82.45 m
East – Closest stump to site boundary	Circa 116.41 m
South – Closest stump to site boundary	Circa 76.75 m
South** – Furthest stump to site boundary	Circa 96.85 m
West – Closest stump to site boundary	Circa 62.68 m

Section 5 – Estimated Ball Height

Estimated Ball Height (Using the Projection Modelling Tool)

North Orientation

Estimated Ball Height @ 63.8 m		Angle (degrees)						
		20	25	30	35	40	45	50
Velocity (m/s)	20	0	0	0	0	0	0	0
	25	0	0	0	0	0	0	0
	30	0	0	0	0	0	0	0
	35	0	0	0	0	0	0	0
	40	0	0	0	1.6	1.9	0	0
	45	0	3.2	7.1	9.9	11.9	12.1	9.2
	50	3.3	7.9	12.2	16.1	18.9	20.9	20.4

Estimated Ball Height @ 82.5 m		Angle (degrees)						
		20	25	30	35	40	45	50
Velocity (m/s)	20	0	0	0	0	0	0	0
	25	0	0	0	0	0	0	0
	30	0	0	0	0	0	0	0
	35	0	0	0	0	0	0	0
	40	0	0	0	0	0	0	0
	45	0	0	0	0	0	0	0
	50	0	0	0	0	0	0	0

East Orientation

Estimated Ball Height @ 116 m		Angle (degrees)						
		20	25	30	35	40	45	50
Velocity (m/s)	20	0	0	0	0	0	0	0
	25	0	0	0	0	0	0	0
	30	0	0	0	0	0	0	0
	35	0	0	0	0	0	0	0
	40	0	0	0	0	0	0	0
	45	0	0	0	0	0	0	0
	50	0	0	0	0	0	0	0

South Orientation

Estimated Ball Height @ 76.8 m		Angle (degrees)						
		20	25	30	35	40	45	50
Velocity (m/s)	20	0	0	0	0	0	0	0
	25	0	0	0	0	0	0	0
	30	0	0	0	0	0	0	0
	35	0	0	0	0	0	0	0
	40	0	0	0	0	0	0	0
	45	0	0	0	0	0	0	0
	50	0	0	1.1	3.2	3.4	3.2	0

Estimated Ball Height @ 96.9 m		Angle (degrees)						
		20	25	30	35	40	45	50
Velocity (m/s)	20	0	0	0	0	0	0	0
	25	0	0	0	0	0	0	0
	30	0	0	0	0	0	0	0
	35	0	0	0	0	0	0	0
	40	0	0	0	0	0	0	0
	45	0	0	0	0	0	0	0
	50	0	0	0	0	0	0	0

West Orientation

Estimated Ball Height @ 62.7 m		Angle (degrees)						
		20	25	30	35	40	45	50
Velocity (m/s)	20	0	0	0	0	0	0	0
	25	0	0	0	0	0	0	0
	30	0	0	0	0	0	0	0
	35	0	0	0	0	0	0	0
	40	0	0	0	2.4	3.4	1.7	0
	45	0	3.8	7.6	11.0	13.1	13.5	10.9
	50	4.2	8.3	12.6	16.5	19.9	22.0	21.7

See Appendix A for example trajectories.

Section 6 – Risk Assessment Discussion

Risk Assessment Discussion
This report has been prepared to assess the potential risk of cricket balls surpassing the boundaries of a cricket ground at Former Friends School Fields and to advise on the height and location of mitigation recommended to provide a suitable level of protection.

Mitigation Recommendations – North Orientation

Distance	Distance to boundary	Mitigation height (majority of risk removed)	Mitigation height (vast majority removed)	Overall mitigation height recommendation
Closest stump to site boundary @ 30 m/s	63.81 m	0 m high	0 m high	**0 m high**
Furthest stump to site boundary @ 40m/s	82.45 m	0 m high	0 m high	

Please Note: This may not stop all shots from landing beyond the site boundary, but it is believed from the assessment of ball trajectory it will significantly reduce their frequency.

Mitigation Recommendations – East Orientation

Distance	Distance to boundary	Mitigation height (majority of risk removed)	Mitigation height (vast majority removed)	Overall mitigation height recommendation
Closest stump to site boundary @ 40 m/s	116.41 m	116.41 m high	0 m high	**0 m high**

Please Note: This may not stop all shots from landing beyond the site boundary, but it is believed from the assessment of ball trajectory it will significantly reduce their frequency.

Mitigation Recommendations – South Orientation

Distance	Distance to boundary	Mitigation height (majority of risk removed)	Mitigation height (vast majority removed)	Overall mitigation height recommendation
Closest stump to site boundary @ 30 m/s	76.75 m	0 m high	0 m high	**0 m high**
Furthest stump to site boundary @ 40 m/s	96.85 m	0 m high	0 m high	

Please Note: This may not stop all shots from landing beyond the site boundary, but it is believed from the assessment of ball trajectory it will significantly reduce their frequency.

Mitigation Recommendations – West Orientation

Distance	Distance to boundary	Mitigation height (majority of risk removed)	Mitigation height (vast majority removed)	Overall mitigation height recommendation
Closest stump to site boundary @40 m/s	62.68 m	3 m high	4 m high	**5 m high***

Please Note: This may not stop all shots from landing beyond the site boundary, but it is believed from the assessment of ball trajectory it will significantly reduce their frequency.

Further Notes

This report does not recommend the specific design of a mitigation system, however options could include;

- Ball stop netting
- Rigid panel fencing
- Permanent or temporary fencing structures

It is recommended the client discuss design options with the relevant stakeholders including the LPA, the ECB and the cricket club.

In addition, the client may wish to consider alternative mitigation options such as the location and orientation of the cricket square, controlling the level of cricket played on the site, or defining the location of junior and senior cricket pitches. It is recommended that the client discusses any such plans with the ECB and other relevant organisations along with the club to ensure that plans are suitable in mitigating the risk but also practicable for the cricket club's day to day use.

Section 7 –Football Trajectory Model

Football Trajectory Model Overview

A sophisticated three-dimensional trajectory model was developed to analyse the trajectory of the football ball. The model was built in the numerical programming software 'Matlab' and incorporated aerodynamic drag and lift forces, and the complexities arising from the ball's spin rate.

The model used published aerodynamic coefficients taken from wind tunnel studies on football balls at different kick velocities (Asai, T., Seo, K., Kobayashi, O. *et al*. Fundamental aerodynamics of the soccer ball. Sports Eng 10, 101–109).

The aerodynamic forces of drag (F_D) and lift (F_L) are proportional to the ball's velocity relative to the air flow, frontal area, air density and the drag coefficient respectively lift coefficient. The forces are defined as:

$$F_D = \frac{1}{2} C_D \rho V^2 A$$
$$F_L = \frac{1}{2} C_L \rho V^2 A$$

with C_D and C_L are the non-dimensional drag and lift coefficients, ρ the air density in kg/m^3, V the air stream velocity in m/s and A the frontal area of the ball in m^2.

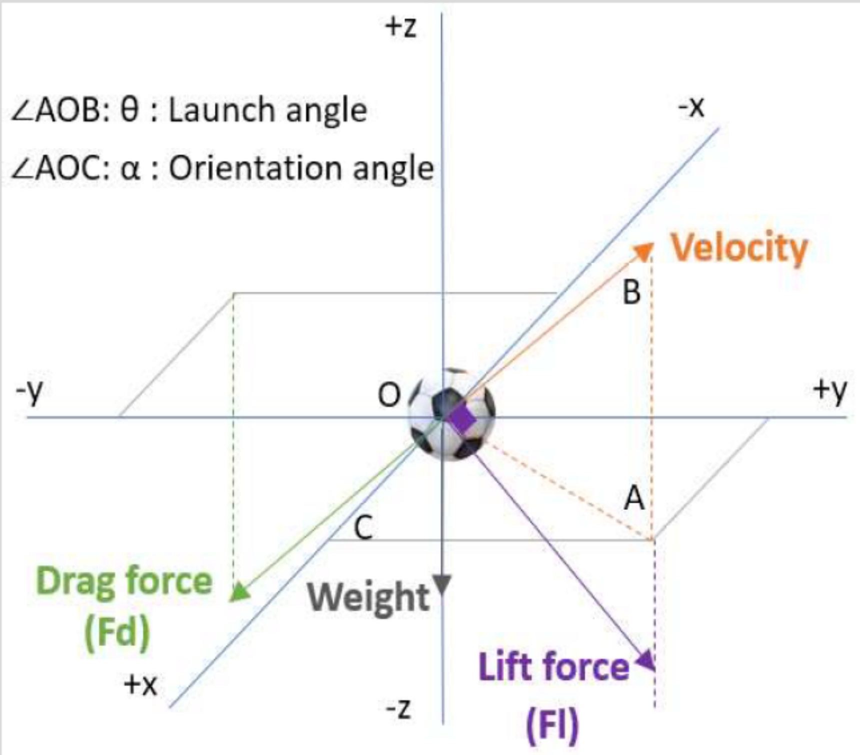


Figure 5.. A free body diagram for the football ball trajectory model showing the aerodynamic drag and lift forces.

Due to the complexity of the flight dynamics, the trajectory can only be resolved by using a numerical time step approach whereby the ball conditions are calculated at small timesteps throughout the trajectory. The conditions at time step 1 are used to calculate the conditions at time step 2; the conditions are timestep 2 are used to calculate the conditions at time step 3 and henceforth. A timestep of 0.001 seconds was used to generate high-resolution trajectory data.

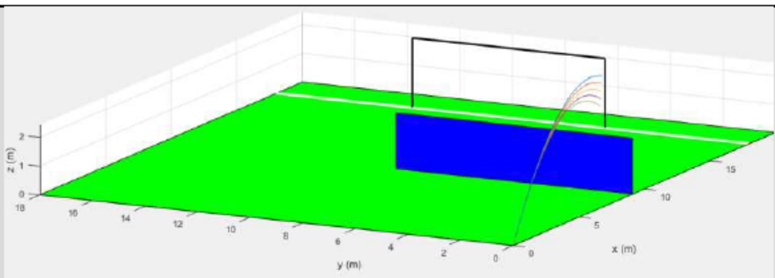


Figure 6. An example of a trajectory simulation from the Matlab model.

Trajectory models are known to exhibit high accuracy; however, it is not possible to model the full complexity of the real world and the model developed for this project is best regarded as an indicative predictive tool.

Football Kick Scenarios

In the game of football, the ball can be kicked in any direction with a wide range of velocities. Nonetheless, some trajectories are far more common than others. This risk assessment uses a proportionate approach by focusing on the common trajectories to determine the most likely scenarios where a ball may surpass the site boundary.

Labosport has significant experience and expertise in football and provides technical support to the world's national governing bodies (e.g. the FA, FFF, KNVB etc) as well as to FIFA. Labosport have drawn on their expertise to define four different in game scenarios where the ball may be kicked on a trajectory that surpasses the site boundary.

For each kick scenario, a reasonable initial speed is determined, and the trajectory is simulated for a range of different launch angles (25 degrees to 35 degrees).

Football Kick Velocities

In the game of football, the ball can be kicked with a wide range of velocities (speeds and angles). Nonetheless, previous researchers have made accurate measurements of ball speeds and spin rates using high speed video and similar technologies. The table below summarises maximal kick velocities from three different studies (taken from; Sterzing, Thorsten, and Ewald M. Hennig. "The influence of soccer shoes on kicking velocity in full-instep kicks." Exercise and Sport Sciences Reviews 36.2 (2008): 91-97).

TABLE 1. Maximum resultant ball velocity achieved with selected kicking techniques.

Study/Authors	Kicking Technique	Maximum Ball Velocity (ms^{-1})	SD (ms^{-1})	Subject Characterization
Levanon and Dapena (1998) (15)	Full-instep	28.6	2.2	Intercollegiate players, n = 6
	Side-foot	22.5	1.8	
Nunome *et al.* (2002) (18)	Full-instep	28.0	2.1	High school players, n = 5
	Side-foot	23.4	1.7	
Neilson and Jones (2005) (17)	Full-instep	27.1	2.2	Professional club players, n = 25
	Inner-instep	23.5	2.3	
	Outer-instep	20.9	3.1	

Figure 7. Maximum resultant ball velocity achieved with selected kicking techniques overview

We also have to consider the level of play and age when considering velocities. The table below defines the findings collated from the study into 'Kicking Performance in Young U9 to U20 Soccer Players: Assessment of Velocity and Accuracy Simultaneously'. (Luiz H. P. Vieira et al. (2018) Kicking Performance in Young U9 to U20 Soccer Players: Assessment of Velocity and Accuracy Simultaneously, Research Quarterly for Exercise and Sport, 89:2, 210-220).

Table 1. Mean ± standard deviation (95% confidence limits) for kicking performance variables according to age (n = 366).

	U9	U11	U13	U15	U17	U20
V_{ball} (km/hr^{-1})	$48.54 \pm 8.31^{a, b, c, d}$ [42.96, 54.12]	$57.87 \pm 10.93^{e, f, g, h}$ [55.32, 60.42]	$66.70 \pm 13^{i, j, k}$ [63.81, 69.60]	76.92 ± 15.58^{l} [73.90, 79.93]	81.35 ± 16.04^{m} [77.74, 84.97]	98.74 ± 16.35 [90.55, 106.62]
V_{foot} (km/hr^{-1})	$49.08 \pm 5.16^{a, b, c, d}$ [45.62, 52.55]	$53.79 \pm 7.25^{e, f, g, h}$ [52.10, 55.48]	$60.54 \pm 8.77^{i, j, k}$ [58.58, 62.49]	65.17 ± 10.43^{l} [63.15, 67.19]	68.44 ± 11.83^{m} [65.77, 71.10]	78.24 ± 9.49 [73.66, 82.81]
V_{ball}/V_{foot} ratio (a.u.)	$0.99 \pm 0.13^{a, b, c, d}$ [0.90, 1.07]	$1.07 \pm 0.11^{f, g, h}$ [1.05, 1.10]	$1.1 \pm 0.11^{i, j, k}$ [1.07, .12]	1.18 ± 0.1^{l} [1.16, 1.20]	1.19 ± 0.1 [1.16, 1.21]	1.26 ± 0.11 [1.21, 1.31]
LSL (m)	$1.09 \pm 0.14^{a, b, c, d}$ [1.00, 1.18]	$1.25 \pm 0.14^{e, f, g, h}$ [1.21, 1.28]	1.36 ± 0.19^{k} [1.32, 1.40]	1.43 ± 0.23^{l} [1.38, 1.47]	1.44 ± 0.2^{m} [1.39, 1.48]	1.6 ± 0.14 [1.54, 1.67]
$D_{support\text{-}ball}$ (m)	0.33 ± 0.07 [0.28, 0.37]	$0.3 \pm 0.07^{e, f, g}$ [0.29, 0.32]	0.34 ± 0.06 [0.33, 0.35]	0.34 ± 0.09 [0.33, 0.36]	0.34 ± 0.06 [0.33, 0.36]	0.35 ± 0.04 [0.32, 0.37]
MRE (m)	1.4 ± 0.49 [1.07, 1.73]	$1.65 \pm 0.6^{f, g, h}$ [1.52, 1.79]	$1.59 \pm 0.59^{i, j, k}$ [1.46, 1.72]	1.34 ± 0.48 [1.24, 1.43]	1.29 ± 0.5 [1.18, 1.40]	1.14 ± 0.35 [0.98, 1.31]
BVE (m)	1.26 ± 0.58 [0.87, 1.65]	$1.47 \pm 0.73^{f, g, h}$ [1.31, 1.64]	1.30 ± 0.57 [1.17, 1.43]	1.18 ± 0.51 [1.08, 1.27]	1.17 ± 0.5 [1.06, 1.28]	1.05 ± 0.32 [0.90, 1.21]
ACUR (m)	1.93 ± 0.64 [1.50, 2.36]	$2.25 \pm 0.84^{f, g, h}$ [2.06, 2.45]	2.09 ± 0.72 [1.93, 2.25]	1.81 ± 0.62 [1.69, 1.93]	1.77 ± 0.5 [1.63, 1.92]	1.57 ± 0.4 [1.38, 1.76]

Note. a = U9 × U13; b = U9 × U15; c = U9 × U17; d = U9 × U20; e = U11 × U13; f = U11 × U15; g = U11 × U17; h = U11 × U20; i = U13 × U15; j = U13 × U17; k = U13 × U20; l = U15 × U20; m = U17 × U20. Confidence limits = (lower, upper bound). V_{ball} = ball velocity; V_{foot} = foot velocity; V_{ball}/V_{foot} = ball velocity-to-foot velocity ratio; LSL = last stride length; $D_{support\text{-}ball}$ = distance between support foot and ball; MRE = mean radial error; BVE = bivariate variable error; ACUR = accuracy. Significance level of post-hoc comparisons: $\mathbf{V_{ball}}$ = $^{a, e}$ $p < .01$. $^{b, c, d, f, g, h, i, j, k, l, m}$ $p < .001$. $\mathbf{V_{foot}}$ = ^{i} $p < .05$. $^{a, m}$ $p < .01$. $^{b, c, d, e, f, g, h, j, k, l}$ $p < .001$. $\mathbf{V_{ball}/V_{foot}}$ **ratio** = $^{a, l}$ $p < .05$. $^{b, c, d, f, g, h, i, j, k}$ $p < .001$. **LSL** = $^{e, l, m}$ $p < .01$. $^{a, b, b, d, f, g, h, k}$ $p < .001$. $\mathbf{D_{support\text{-}ball}}$ = $^{e, f, g}$ $p < .01$. **MRE** = $^{i, k}$ $p < .05$. $^{f, h, j}$ $p < .01$. ^{g} $p < .001$. **BVE** = $^{g, h}$ $p < .05$. ^{f} $p < .01$. **ACUR** = $^{j, k}$ $p < .05$. ^{h} $p < .01$. $^{f, g}$ $p < .001$.

Figure 8. Mean standard deviation for kicking performance variables according to age

The pitch at Former Friends School Field will be a predominantly U11s/ U12s, therefore, a maximal kick velocity of 18.53 m/s for u13s level play with a spin rate of 40 rad/s has been selected for this ball strike assessment.

Section 8 – Trajectory Model Simulations

Trajectory simulation

The diagram below shows a global view of the five different football trajectory scenarios that will be considered for the Football pitches.

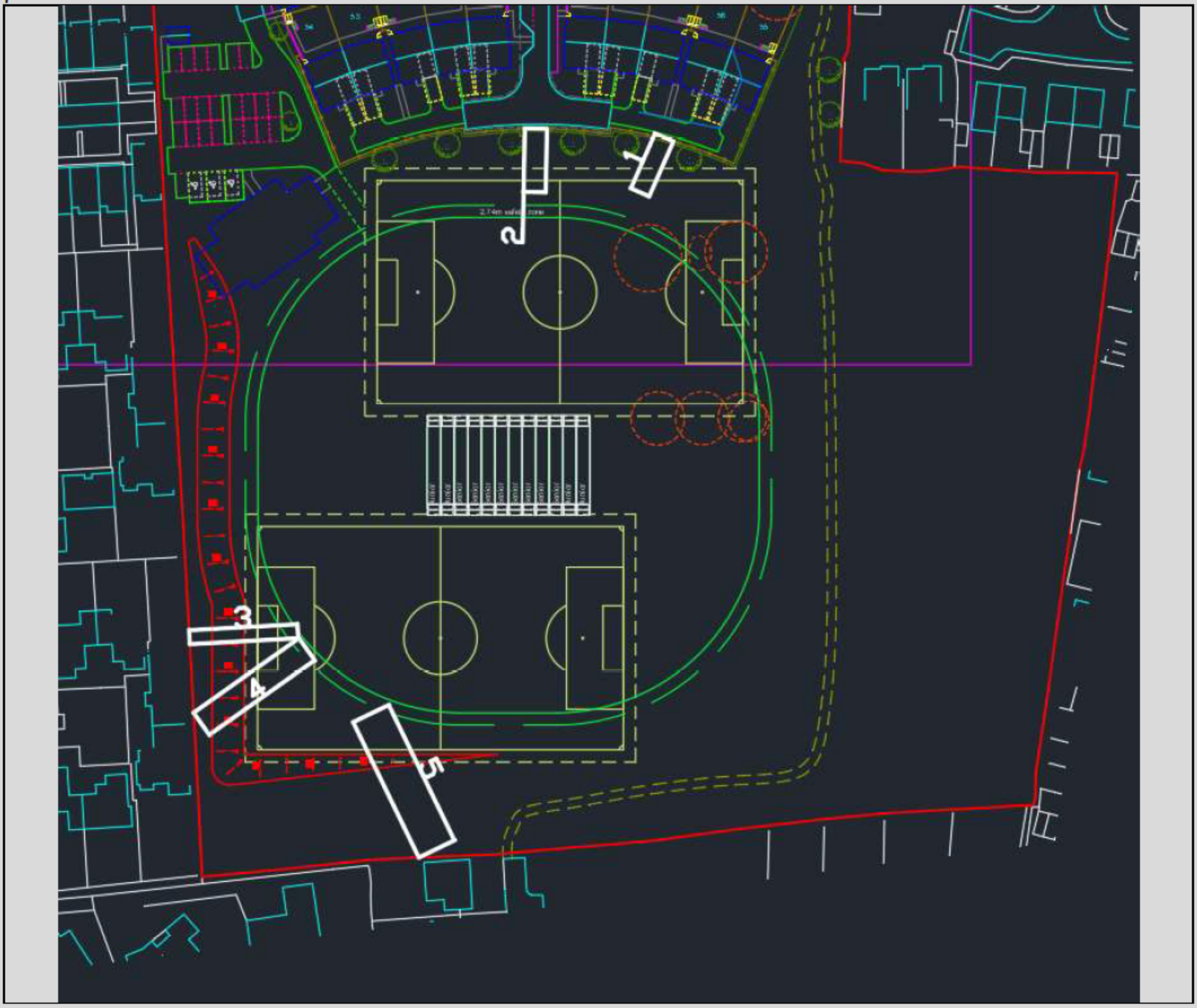


Figure 9. A global overview of the site with the 5 different trajectory scenarios identified for the football pitches.

Trajectory 1 – a football clearance – 13.49 metres to the edge of the embankment. (18.53 m/s ball speed)

Kick launch angle (degrees)	20	25	30	35
Predicted trajectory height as ball intersects boundary (m)	*0*	*0*	*0.23*	*0.66*

Trajectory 2 – a football clearance – 14.31 metres to the edge of the embankment. (18.53 m/s ball speed)

Kick launch angle (degrees)	20	25	30	35
Predicted trajectory height as ball intersects boundary (m)	*0*	*0*	*0*	*0.27*

Trajectory 3 – a penalty missing the goal high – 24.42 metres to the edge of the embankment. (18.53 m/s ball speed)

Kick launch angle (degrees)	20	25	30	35
Predicted trajectory height as ball intersects boundary (m)	*0*	*0*	*0*	*0*

Trajectory 4 – A penalty missing the goal high and wide – 29.05 metres to the edge of the embankment. (18.53 m/s ball speed)

Kick launch angle (degrees)	20	25	30	35
Predicted trajectory height as ball intersects boundary (m)	*0*	*0*	*0*	*0*

Trajectory 5 – A football clearance –33.88 metres to the edge of the embankment. (18.53 m/s ball speed)

Kick launch angle (degrees)	20	25	30	35
Predicted trajectory height as ball intersects boundary (m)	*0*	*0*	*0*	*0*

Section 9 – Conclusions

Conclusions

This report has been prepared to assess the potential risk of cricket balls and footballs surpassing the boundaries of a cricket pitch at Former Friends School Fields and advise on the height and location of mitigation recommended to provide a suitable level of protection.

Orientation	Recommended mitigation height (based on recreational cricket and U11/12 football)
North	1 m
East	0 m
South	0 m
West	5 m*

*Adjusted from the 3m recommendation due to the approx. 2m fall in height from the cricket square to the site boundary.

It should be noted that the client is deciding to place a 6m high mitigation in the location suggested below, giving the gardens beyond increased protection from ball strike in comparison to Labosport's suggestion of 5m high.

Please Note: This may not stop all shots from landing beyond the site boundary, but it is believed from the assessment of the ball trajectory it will significantly reduce their frequency.

The below diagram shows the proposed locations of the recommended mitigation for heights detailed above: