



Making great sport happen

West Berkshire District Council

Manor Park

Sports Pitch Feasibility Report

Prepared by: Mark Murphy

Date: December 2021



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Report Title: Sports Pitch Feasibility Report

Sports Facility Name: Manor Park

Date of Visit: 9th November 2021

Visit Objective: Initial site appraisal

If you have any queries with regards to this report, please call +44 (0)1274 565131 or email enquiries@strigroup.com

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Prepared by: Mark Murphy

Date: 16/08/2021

1.0 Introduction and Background

1.1 General

STRI has been appointed by West Berkshire District Council to assess the feasibility of developing a natural grass sports pitch on an area of park land within Manor Park.

STRI understand that the proposed development consists of a natural grass area which is currently not been used as a grass playing surface. Historically, the area had been used for park land only.

As such, the objectives of the appraisal are summarised below:

1. To review existing site information made available to STRI.
2. To investigate and report on the present situation including:
 - Surface levels.
 - The topsoil and ground conditions.
 - The drainage conditions and drainage infrastructure present.
3. To provide discussion/recommendations on whether to develop a natural grass sports pitch within the Site boundary.

The report includes a photographic record of the conditions observed during the site visit. Additional site visit photos shall be made available upon request.

Representative samples of topsoil were collected for physical and chemical analysis. The results of the soil laboratory analyses are set out in table form within the general site description to enable comparison of the results. The full soil analysis reports are included as appendices to this report.

1.2 Site Appraisal

The Site was inspected on 9th November 2021 by Mark Murphy, STRI Design Consultant and Luke Gawthorp, STRI Design Technician.

1.3 Reporting

The data obtained from the Site survey is reported in a standard format, containing the following information:

- General site information.
- The type and condition of the vegetation and presence of weeds.
- The general geomorphological and soil conditions.
- The local climatic conditions.
- The type and condition of the soil profile and drainage systems present.
- General hydrology and drainage conditions.
- The overall performance is discussed with comments on the significant limiting factors.

- Recommendations.

2.0 General Site Description

2.1 Location

Site Address: Manor Park, Stoney Lane, Newbury, RG14 2 NG.

The area within the scope of this report is a roughly rectangular shaped parcel of land.

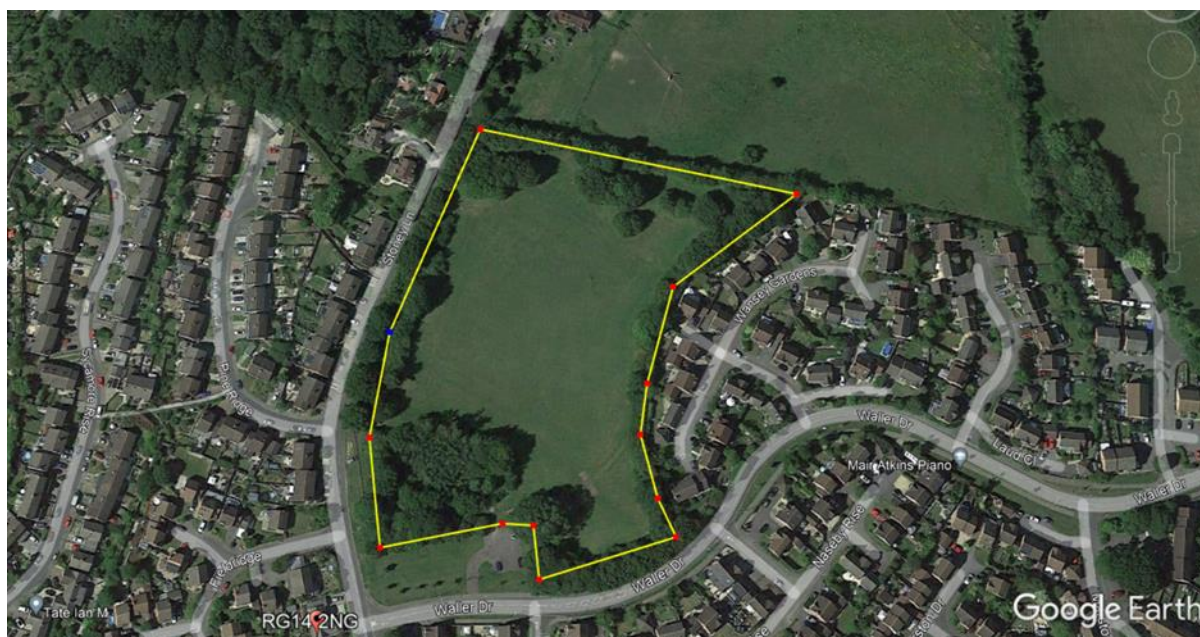


Figure 1 Area within scope of STRI feasibility study (demarcated by solid yellow line)

Hereafter, the area within the scope of the STRI feasibility study as illustrated in Figure 1 will be referred to as 'the Site'.

The Site area measures approximately 21,194 m² (2.119 hectares) and consists of existing grass land which was being managed to a poor standard.

The existing access to the Site is directly off the existing carpark off Waller Drive through a single agricultural style gate. The Site has a mature tree boundary which includes various different species as noted. The Site is bound to the north by trees/hedgerow, bound to the south by the carpark, swale/soakaway and Waller Drive. The Site is bound to the east by a housing development and bound to the west by trees and Stoney Lane.

There is sufficient space to accommodate a full-size rugby/football pitch while adhering to Sport England guidelines (94 x 70 m).

2.2 Existing Sports Facilities

There were no existing natural grass sports facilities within the Site boundary, the car park was noted to be small.

2.3 Topography and Surface Evenness

2.3.1 Levels and Gradients

Surface levels and gradients have been assessed based on a topographic survey carried out by an STRI consultant (see Appendix 4).

The Site has a pronounced, roughly diagonal fall from the north-west corner to the south-east corner.

The highest ground levels were observed in the north-west corner of the Site (110.79 m). The lowest ground levels were observed in the south of the Site (103.19 m).

Based on the topographic information as reviewed by STRI, it can be confirmed that a major cut and fill earthworks operation would be required if any developments were to take place on this area to create a pitch platform with a uniform grade to meet Sport England Requirements cross fall. There is a 1:21 fall across the Site.

2.3.2 Surface Evenness

Surface evenness within the area under examination was generally good with few if any high spots or undulations on the platform, although the gradient was quite steep (1:21). It should be noted there was an open drain running from the south-east to the south (swale/soakaway), which affects surface evenness in that area.

2.4 Existing Vegetation

At the time of the investigation, the Site and surrounding area was well grassed, the turf being dominated with perennial ryegrass, along with other weed grass species such as annual meadow-grass, Yorkshire Fog and minor fescue sp. Significant broad-leaved weed populations were a common theme throughout the area with plantain, clover and buttercups. At the time of the visit the grass height was roughly 100 mm. The Site was surrounded by semi-mature/mature trees. It was noted that these trees/hedgerows have not been maintained and have grown over. The swale contained water at the time of visit.

2.5 Climate

The average monthly rainfall (mm) is shown below using data from Reading University, the nearest official Met Office climate station for the period 1981 – 2010.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
61	41	45	48	46	45	46	52	50	72	66	63	635

Average monthly rainfall mm

It should be noted that Met Office data for the period 1981 – 2010 shows that average annual rainfall observed at the Reading University climate station is below the England average.

Reading University average annual rainfall 1981 – 2010 = 635 mm

England average annual rainfall 1981 – 2010 = 885 mm

The months receiving the highest average rainfall at the Reading University climate station are October, November, December and January.

The average minimum temperature using data from Reading University, for the period 1981 – 2010 is 6.7°C. It should be noted that the average minimum temperature is in above with the England average minimum temperature (5.9°C).

The average maximum temperature using data from Reading University for the period 1981 – 2010 is 14.5°C. It should be noted that the average maximum temperature is again above the England average maximum temperature (13.5°C).

2.7 Topsoil Conditions

It should be noted that the quality of a sports surface is always dependent in the soil or growing medium used in its construction.

A series of trial pits were excavated during the Site investigation at various locations to confirm the topsoil conditions. In summary, the existing site topsoil was of poor-quality clay loam topsoil which had an easily consolidated structure at the time of visit. There was red ochre colouring observed along root lines which is indicative of seasonal waterlogging. Across all three test pits rootlets were observed within the soil profile.

Trail pits were excavated in three locations covering the south, central and northern sections of the Site.

Southern section

Dark-brown, easily consolidated clay loam topsoil to 330 mm depth. Roots to 160 mm depth. Clear interface between the topsoil and the subsoil, which was a yellow clay with increasing clay content with depth. Depth reached 450 mm. There were frequent stones and white gravel observed within the topsoil profile which were 30 mm in diameter. Earthworm activity was high.

Central section

Similar dark-brown, clay loam topsoil to 370 mm depth. Roots to 150 mm depth. Clear interface between the topsoil and the subsoil which again was a similar yellow clay. Depth reached 500 mm. Slightly more white gravel was observed and less worm activity.

Northern section

Again dark-brown, shallower topsoil was noted at a depth of 270 mm. Roots to 150 mm depth. Clear interface between the topsoil and the subsoil which again was a similar yellow clay. Depth reached was 400 mm. Mixture of gravel and white pebbles along with no worm activity noted.

It can be anticipated that the infiltration rate of the Site subsoil will be very low.

Particle Size Analysis

Representative samples of topsoil were collected for particle size analysis to determine the mineral and organic matter composition of the Site topsoil. Full particle size analysis reports are included in Appendix 1.

For reference, winter games pitch topsoil should ideally fall into the loamy sand or sandy loam textural classification to enable suitable drainage performance.

Sample Location & STRI lab no.	Soil Texture	Sand %	Silt %	Clay %	Organic Matter %
Topsoil Sample Representative topsoil sample A19181/1	Clay loam	50	28	22	4.9
Subsoil Sample Representative subsoil sample A19383/2	Clay	44	21	35	1.3

Laboratory analysis confirms that the Site topsoil falls into the Clay loam textural classification. Although there is reasonable sand content, the soil also has a high proportion of fine particles ('fines') comprised of 22% clay, 28% silt and 40% very fine sand. There was a low proportion of larger very coarse (1%), coarse (1%) and medium sized sand (4%) particles. The high proportion of fines particles observed means hydraulic conductivity of the topsoil is likely to be low, and as such, the soil will have a high-water holding capacity. This is not conducive to the development of a rugby/football pitch surface, which must be efficiently drained to ensure playability all year round. The organic matter content of the Site was 4.9 %.

Chemical Analysis

Representative samples of topsoil were collected for chemical analysis to determine the pH, extractable Phosphate (P_2O_5) and extractable Potassium (K_2O) levels in the Site topsoil.

The chemical analysis of the samples taken across the Site is summarised below with more detailed results shown in Appendix 2.

Sample Location & STRI lab no.	pH	pH Status	P_2O_5 Level (mg/l)	P_2O_5 Status	K_2O (mg/l) Level	K_2O Status
Topsoil Sample Representative topsoil sample A19181/1	6.8	Normal	18	Low	60	Low

Soil pH has a significant effect on the grass species which dominate the turf. For turf dominated by perennial ryegrass, for optimal growth and recovery from wear, soil pH should be in the range 6-7. Laboratory analysis shows a pH of 6.8 in the samples of topsoil collected.

Laboratory analysis shows that concentrations of extractable phosphate and potassium were generally low. For healthy turf growth, phosphate and potassium should be included as part of a balance fertiliser programme. This can be addressed during the pitch construction and longer-term maintenance thereafter and is not of concern.

2.8 Drainage Conditions and Systems

Overall, there were slight variations in firmness across the Site. It was noted along the east wing and south-east corner was holding a lot of water. Before entering an open drain, which runs to a large water basin in the south/south-west corner. It should be highlighted that the Site investigation was carried out in November.

When walking across the grassland area of the Site there were no obvious signs of existing drainage being present in the form of visible lines of stimulated or droughted grass growth. When assessing historical aerial photography of the Site, there was no evidence indicating the presence of drainage systems.

Given the low infiltration of the Site subsoil, an intensive sports pitch drainage system should be included within the design of any proposed pitch.

A prominent feature of the Site was the existing large water basin in the south-west corner. The Site was noted to be on a flood plain. The basin contained water at the time of the visit. There were no other viable outfall locations observed during the investigation.

2.9 Utilities

One utility service which was confirmed was an A/AE oil pipeline and a A/TC oil pipeline. STRI mapped the approximate surface location of the oil pipes during the topographical survey. STRI carried out a meeting with Exolum, who operate the pipeline. The pipes are noted to be approximately 1 m under the surface and have 8- and 10-inch pipe diameters. These oil lines were noted to be running to Heathrow. It was noted one of the pipes may in fact be unused by there is no way of knowing unless a trial hole excavation was carried out. To do this a CAT scan would need to be completed prior to any excavation. It is possible to construct over this pipeline, however usually 750 mm cover is needed. If less cover is needed for an earthworks operation extra measures/ control will need to be put in place. Exolum stated that pipe crossings with machinery should be limited as much as possible and should be coordinated that traffic is only crossing the pipe at one location. This is a buffer zone which is 3 m either side of either pipe (6 – 7 m in total) where extreme caution needs to be taken and Exolum will need to present while working in this area. To divert the pipeline around the park would cost approximately £20,000 per m per pipe¹ (2 pipes).

¹ NB: this is an approximation given without prejudice following a discussion with Exolum

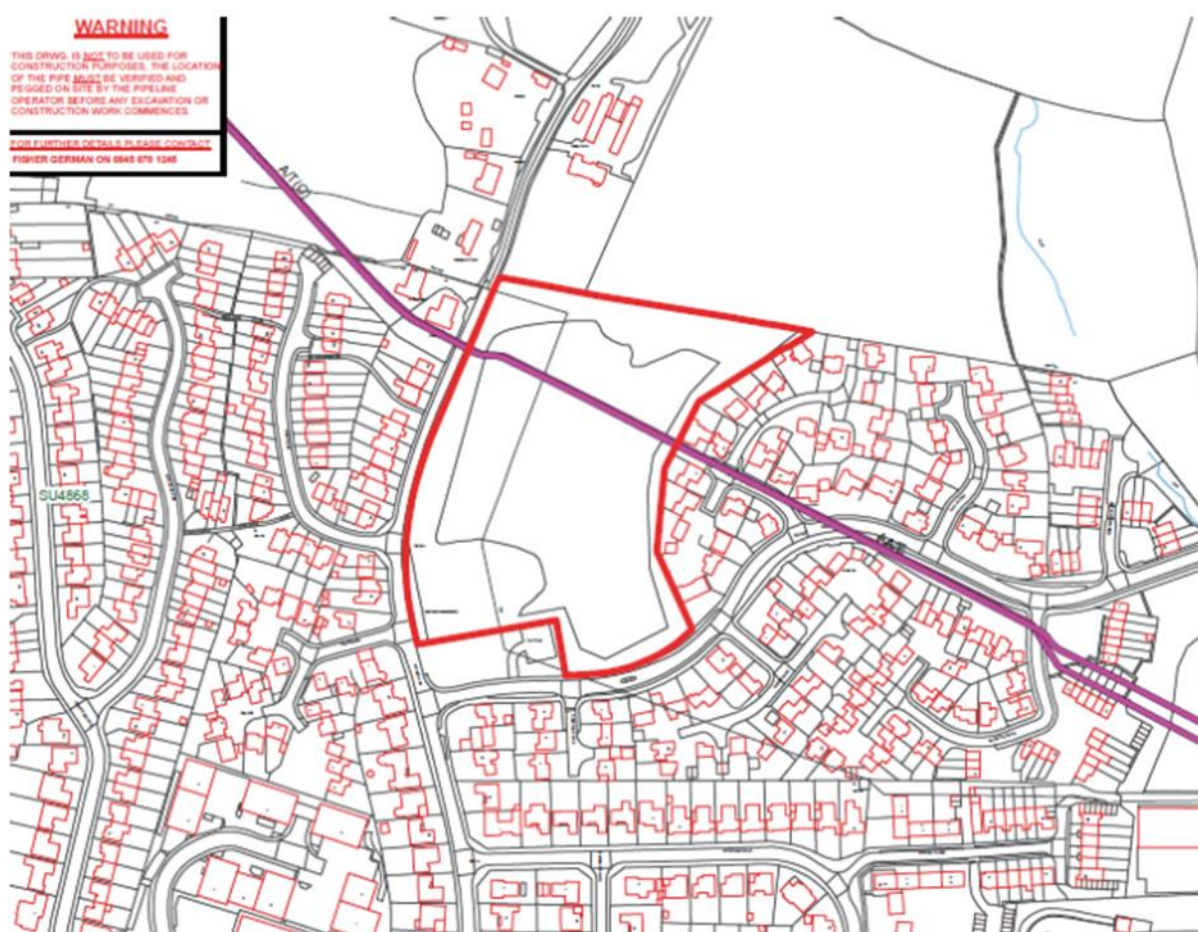


Figure 2 Indictive location of pipeline in purple

3.0 Ecological Report executive summary

West Berkshire District Council are looking to employ a consultant to submit a planning application for the development of a new rugby pitch with the potential to create a multi-use sports pitch. The Council have identified two potential sites within the district for the proposed development, Hollybrook Linear Park and Manor Park. The Manor Park site was identified as requiring a Preliminary Ecological Appraisal (PEA). The survey aimed to identify any ecological constraints, protected habitats, or species constraints across the site.

A baseline UK Habitat Classification survey was conducted to create a detailed map of the site and all the habitats currently present. There are no historic Tree Protection Orders (TPO) placed over any of the trees on the Site, however some mature trees were identified. Good quality scrub, patches of woodland and hedgerow are present on site. Woodland patches, treelines, hedgerows and individual mature trees, including root protection zones have been mapped. A small patch of wet woodland is located in the southwest area of the site which is a priority habitat under the UK Biodiversity Action Plan Priority Habitats Descriptions.

Any mature trees will need to be checked for bat roost potential before removal. Any potential works needing vegetation clearance will need to consider breeding birds, badgers, small mammals and

reptiles. Further amphibian and bat activity surveys will be needed if works are to affect the woodland patches and wet woodland habitats. Compensation will be needed for the loss of any habitat.

4.0 Discussion

When considering the development of a new sports pitch at this site, the following points should be considered.

- There is sufficient space to accommodate a full-size rugby/football pitch while adhering to Sport England guidelines (94 x 70 m).
- The Site currently has a range of grass and weed species. Before any upgrades to any pitches the existing vegetation should be thoroughly killed off and removed to enable the pitch development works and to prevent weed re-infestation.
- The primary limiting factor site has a pronounced, roughly diagonal fall from the north-west corner to the south-east corner. A major cut and fill earthworks operation would be required if there were any developments on this site as there is a 1:21 fall to provide a pitch platform with a uniform grade to meet Sport England Requirements (1:80 - 1:100 along the line of play and 1:40 - 1:50 across the line of play). Quite a substantial amount of material would need to be imported to create a pitch platform (+ 13,353.44 Cu. M.) which will come at a significant cost.
- Another limiting factor of this site is the oil pipe running from east to west in the northern part of this site. 750 mm cover must be maintained over these pipes when construction is taking place. Exclusion need to be present when any works are been carried out within the buffer zone. Crossings of the oil pipelines are restricted to one designated area.
- The other limiting factor of this site is the poor topsoil. Topsoil which laboratory analysis has confirmed is a clay loam. It can be anticipated that the Site topsoil will have very poor drainage characteristics, which may be exacerbated by maintenance and play (wear). This site topsoil contains extreme high levels fines (fine sand, silt & clay). The topsoil consists of 90% fines. As such, the topsoil which is indigenous to the Site is not ideally suited to the provision of winter games pitches.
- There is no known outfall option which means the water will have to be retained and disposed of onsite using a soakaway. There is an existing large water basin in the south-west corner for attenuating water. It is unclear this was created as a soakaway. With that said soakaway/percolation testing will need to take place.
- The existing access to the Site is directly off the existing carpark off Waller Drive through a single agricultural style gate.
- The wettest months of the year at the Site are October, November, December and January. This coincides with the months with low average minimum temperatures. Winter rainfall coupled with low levels of evaporation mean drainage is likely to be the another limiting factor affecting the quality of the natural grass surface during the winter months of the year.

- It should be noted that there are no changing facilities/ toilets at this location. If any works were to take place these facilities would need to be provided. Extra parking needs to be considered, there is some scope to extend the car park to the south-west to create more spaces.
- This site was noted to have good ecological elements with many native species of trees and wildlife species. STRI independent Ecology report is attached in separate pdf document.

5.0 Recommendations

A significant amount of import material is needed to create a pitch platform with a uniform grade. The topsoil is a poor-quality clay loam with a high percentage of fines and will have limited drainage capabilities. The oil pipeline is anticipated to cause issues for the reasons mentioned above. There are no changing/ toilet facilities located at this site and would need to be developed. This site was noted by STRI's ecology team to have good ecological elements across the entire area. Taking high level costing estimates into account STRI think this site is a less feasible/ cost efficient to develop.

With all this said it is recommended not to develop this site due to the limiting factors and it is recommended to develop Holybrook Linear Park as an alternative.

Signed by:

A handwritten signature in black ink, appearing to read 'Mark Murphy'.

Mark Murphy

Design Consultant

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Appendix 1 – Soil Particle Size Analysis

STRI

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SOIL PARTICLE SIZE ANALYSIS

CLIENT: WEST BERKSHIRE DISTRICT COUNCIL DATE: 26/11/21
RESULTS TO: MM
DESCRIPTION: REPRESENTATIVE TOPSOIL SAMPLE NO: A19383/1
MANOR PARK

CATEGORY	DIAMETER mm	%
Stones	>8	9
Coarse gravel	8-4	1
Fine gravel	4-2	1

Particle size distribution of mineral matter smaller than 2mm

Very coarse sand	2-1	1
Coarse sand	1.0-0.5	1
Medium sand	0.50-0.25	4
Fine sand	0.250-0.125	4
Very fine sand	0.125-0.050	40
Silt	0.050-0.002	28
Clay	<0.002	22
Loss on ignition (% of oven-dry fine earth)		4.9
Calcium carbonate	%	0.4
SOIL TEXTURE		CLAY LOAM

T = TRACE

THESE RESULTS PERTAIN ONLY TO THE SAMPLE(S) SUBMITTED AND TESTED

SOIL PARTICLE SIZE ANALYSIS

CLIENT: WEST BERKSHIRE DISTRICT COUNCIL DATE: 26/11/21
RESULTS TO: MM
DESCRIPTION: REPRESENTATIVE SUBSOIL SAMPLE NO: A19383/2
MANOR PARK

CATEGORY	DIAMETER mm	%
Stones	>8	0
Coarse gravel	8-4	0
Fine gravel	4-2	T

Particle size distribution of mineral matter smaller than 2mm

Very coarse sand	2-1	T
Coarse sand	1.0-0.5	T
Medium sand	0.50-0.25	1
Fine sand	0.250-0.125	1
Very fine sand	0.125-0.050	42
Silt	0.050-0.002	21
Clay	<0.002	35
Loss on ignition (% of oven-dry fine earth)		1.3
Calcium carbonate %		NIL
SOIL TEXTURE		CLAY

T = TRACE

THESE RESULTS PERTAIN ONLY TO THE SAMPLE(S) SUBMITTED AND TESTED

Appendix 3 – Site Investigation Photos



Photo 1: General site photo taken from a drone (NE)



Photo 2: General site photo taken from a drone (SW)



Photo 3: General site photo (S)



Photo 4: General site photo (N)



Photo 5: Surface location of oil pipes



Photo 6: Open drain



Photo 7: Culvert drain



Photo 8: Outlet of culvert drain into basin



Photo 9: Large water basin in SW corner



Photo 10: Test pit 1- topsoil 330 mm deep



Photo 11: Subsoil TP1



Photo 12: TP3 – topsoil 250 mm deep



Photo 11: Existing Vegetation



Photo 11: Existing vegetation

Appendix 4 – Topographic Survey



Appendix 5 – Proposed Pitch Location

