5.0 SOIL MANAGEMENT

The following measures for soil handling and amelioration shall be adhered to.

5.1 Soil Handling

For the duration of the soiling and playing field construction works, the following soil handling measures shall be adhered to:

- It is important to avoid physical degradation during all phases of soil handling (e.g. spreading, cultivation, amelioration and seeding). As a consequence, soil handling operations should be carried out when soil is non-plastic (friable) in consistency.
- In particular, it is important to ensure that the soils are not unnecessarily compacted by trampling or trafficking by site machinery. In addition, soil handling should be stopped during and after heavy rainfall, and not continue until the soil has regained a non-plastic (friable) consistency.
- If, during the course of the soiling and playing field construction works, the soil is compacted, it will be important to ensure that it is suitably cultivated to relieve the compaction and restore the structure prior to seeding.
- Ensure that the topsoil and sand are not mixed with each other or other building materials during importation, handling and temporary storage.

5.2 Soil Ameliorants

The use of fertilisers or any other soil ameliorants is dependent on the findings of the soil tests and the recommendations provided within the interpretive report.

SPECIFICATION QUALIFICATIONS

This document considers the proposal to use imported topsoil and imported subsoil for soft landscape purposes for the Marble Hill Park project, Twickenham, London. This document should not therefore be relied on for alternative end-uses or for other schemes.

This specification has been prepared solely for the benefit of our client English Heritage. No warranty is provided to any third party and no responsibility or liability will be accepted for any loss or damage in the event that this document is relied upon by a third party or is used in circumstances for which it was not originally intended.

Appendix 2

Sports Pitches - Agronomic Assessment Report - by Tim O'Hare Associates LLP

SPORTS PITCHES

AGRONOMIC ASSESSMENT REPORT

MARBLE HILL PARK

TWICKENHAM, LONDON

Prepared on behalf of:

ENGLISH HERITAGE

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CONTENTS

1.0 INTRODUCTION

Tim O'Hare Associates LLP (TOHA) was commissioned by English Heritage to undertake an agronomic assessment of the sports pitches at Marble Hill Park, Twickenham, London.

Permission to carry out the work is provided by English Heritage Purchase Order No. 600012934, dated 8th November 2016.

1.1 Aim of Assessment

The following information is required by English Heritage in relation to the existing sports pitches at Marble Hill Park to inform the Management & Maintenance Plan:

- Current condition of the pitches (soil, grass species, pests/weeds etc)
- Renovation options and costs
- Annual maintenance costs

The existing sports facilities include a number of natural turf football and rugby pitches (further detail below), a cricket field with an artificial wicket and surfaced tennis courts.

An agronomic assessment was required for the existing natural turf pitches and cricket field to determine their current condition and ascertain any improvements that may be required, together with estimated budget costs for recommended works and maintenance operations.

1.2 Actions

TOHA has carried out an agronomic assessment to ascertain the current condition of the existing pitches and cricket field in line with Sport England guidelines to assess surface evenness, rooting depths, ground cover, weeds, pests and disease.

The survey has included a reinterpretation of the findings from the existing Soil Resource Survey (ref. TOHA/16/3995/CS, dated 03/11/2016), to provide information on soil fertility, soil depths and types, compaction and aeration. In-situ topsoil infiltration tests have also been carried out as part of the site work.

2.0 INFORMATION REVIEW

The following information has been reviewed to provide information on the project:

- J&L Gibbons – Drawing Ref. 581_SK_160909_JLG mark-up – dated September 2016
- Greenhatch Group – Drawing Ref. MHH16T17 – *Topographic Survey*
- English Heritage – Grounds Maintenance Contract – Marble Hill Sports Maintenance Section (received via email from Emily Parker (EH), dated 14/12/2016
- Email correspondence – Neil Davidson (J&L Gibbons) – dated 17/11/2016
- Email correspondence – Emily Parker (EH) / Brian Clarke (EH) – between 08/12/2016 to 15/12/2016

2.1 Pitch Layout and Dimensions

The locations of the pitches are indicated on the attached site plan in Appendix 1.

Football Pitches

For the purpose of this survey, the football pitches shall be referred to as indicated in Table 1 below (see also attached site plan). With reference to email correspondence from Brian Clarke (English Heritage Landscape Manager) on 08/12/2016, the current pitch sizes are as follows:

Table 1: Current Football Pitch Types and Size

Football Pitch Ref.	Pitch Type	Pitch Size
Pitch 1	Adult	100m x 54m
Pitch 2	Adult	100m x 54m
Pitch 3	Adult	100m x 54m
Pitch 4	Adult	100m x 54m
Pitch 5	Junior: 9 v 9	75m x 45m
Pitch 6	Junior: 7 v 7	60m x 30m
Pitch 7	Junior: 5 v 5	30m x 20m

Rugby Pitches

The rugby pitches shall be referred to as Rugby Pitch 1 and Rugby Pitch 2. These are understood to be 120m x 55m (Rugby Pitch 1) or 120 x 60m (Rugby Pitch 2). Rugby Pitch 1 is a little narrower to avoid the adjacent events access route.

Cricket Outfield

The cricket outfield is currently 64m from centre of the artificial wicket to the boundary, with the boundary measuring 400m in circumference. This would equate to an overall area of 12868m^2, of which 74m^2 is covered by the synthetic wicket (29.5m x 3.5m).

2.2 Pitch Orientation

The current orientations of the pitches are as shown in Table 2:

Table 2: Current Football Pitch Orientation

Pitch Ref.	Pitch Orientation
Pitch 1	Northwest/Southeast
Pitch 2	
Pitch 3	
Pitch 4	
Pitch 5	
Pitch 6	Southwest/Northeast
Pitch 7	Northwest/Southeast
Rugby Pitch 1	
Rugby Pitch 2	

The orientation of the pitch affects play in the direction of the sun when it is low in the sky, potentially putting players at a disadvantage if play is heading directly into it.

The Sport England and SAPCA guidelines recommend the pitch orientation range for football and rugby (goal to goal) to be between northwest 285 degrees to northeast 20 degrees. As such, the current orientation of the majority of the pitches appears to fall just inside the recommended range. The orientation of Pitch 6 (Junior 7 v 7 pitch) would fall outside the range.

2.3 Current Usage

With reference to email correspondence from Emily Parker (EH) dated 14/12/2016, it is understood that the football and rugby pitches are used collectively for approximately 20 hours per week. It is not known how this is distributed between the individual pitches. It is understood that one rugby pitch has been out of use in recent seasons and consistent problems have been experienced with pitch condition every winter (football and rugby), which leads to cancellation of fixtures.

During the last summer season, 61 matches were played on the cricket field however this could potentially be up to 90 matches depending on park events / maintenance work. Based on this information and assuming a season running from April to September, this would equate to approximately 3-4 matches a week.

2.4 Current Maintenance Programme

The current maintenance programme is as summarised in Tables 3 – 4 below.

Football and Rugby Pitches

For the football pitches, this information relates to the 4 No. adult size pitches only (Pitches 1 – 4). No information has been provided for the junior football pitches.

Table 3: Current Football and Rugby Pitch Maintenance Programme

Treatment	Notes
Mowing	*Football* – Maintained height between 25-50mm *Rugby* – Maintained height between 100-125mm (September – April). Mowing to be stopped during July or August (as advised by EH Contract Manager) Pedestrian guided, ride-on or tractor mounted cylinder mowers Arisings to remain on ground (except where indicated otherwise) and scattered evenly
Aeration	Twice a month – September to March inclusive Solid tine turf aerating equipment – tractor mounted or towed Minimum penetration depth 100mm
Topdressing	Annually during renovation works in April/May Goal mouths only
Harrowing	Twice a month – September to March inclusive Tractor towed chain harrow or similar Two directions at right angles
Scarifying	Annually during renovation works in April/May Tractor mounted or towed scarifying equipment Arisings collected immediately and disposed of
Fertilising	Annually during renovation works in April/May Rate as agreed with EH Contract Manager Vehicle mounted mechanical spreader
Overseeding	Annually during renovation works in April/May Rate of 200 Kg/Ha Tractor mounted twin disc contravator
Marking out	Immediately prior to each playing season and as frequently as necessary thereafter throughout the season.

Cricket

Table 4: Current Cricket Maintenance Programme

Treatment	**Notes**
Mowing	*Outfield* – Cut weekly to a height of 25mm – April to September. A 5 metre strip around the synthetic wicket is to be box mown to a height of 20mm (April – September) Pedestrian guided, ride-on or tractor mounted cylinder mowers (outfield) or box mower (around synthetic wicket) Arisings to remain on ground and scattered evenly (except around the wicket where they are to be collected and disposed of)
Aeration	Once a month – April to August inclusive and during renovation works in September/October Area surrounding cricket wicket only (500m^2) Pedestrian operated slit tine equipment Minimum penetration depth 100mm
Topdressing	Annually during renovation works in September/October Area surrounding cricket wicket only (500m^2) Light loam dressing 1m^3 per 1000m^2 Spread using lute or similar
Scarifying	Annually during renovation works in September/October Area surrounding synthetic cricket wicket (500m^2) and practice wickets (50m^2) only Pedestrian operated scarifying equipment Arisings collected immediately and disposed of Two directions at right angles
Rolling	*Outfield* – Twice annually – once in March and once in April Non-vibrating rolling equipment. Min. weight 300 Kg, max. weight 500 Kg Two directions at right angles
Fertilising	Annually during renovation works in September/October Area surrounding synthetic cricket wicket (500m^2) and practice wickets (50m^2) only Rate as agreed with EH Contract Manager Mechanical hand spreader
Overseeding	Annually during renovation works in September/October Area surrounding synthetic cricket wicket (500m^2) and practice wickets (50m^2) only Rate as agreed with EH Contract Manager Mechanical seed sower
Marking out	Immediately prior to each playing season and as frequently as necessary thereafter throughout the season.

2.5 Drainage System

With reference to email correspondence from Neil Davidson at J&L Gibbons (dated 17/11/2016), based on discussions with English Heritage, it is believed that there is no formal land drainage system for the sports pitches.

2.6 Levels

The supplied topographic survey drawing indicates that the overall gradients across the sports pitches and cricket outfield themselves are relatively shallow. However, the general topography undulates, particularly across the football pitches, with a number of ridges/hollows.

The existing overall gradients do not appear to exceed the recommendations given in the Sport England guidelines (ref. *Natural Turf for Sport* 2011). These recommendations state that generally the playing surface should be no steeper than 1:80 – 1:100 along the line of play (and no steeper than 1:40 – 1:50 across the line of play).

2.7 Underground Services

No information was supplied on the locations of underground or overground services prior to this survey.

Enquiries would need to be submitted to the utility companies as necessary prior to any drainage installation and pitch construction work to confirm whether they have any assets in the area, whether any apparatus present will influence the works and what precautions may need to be taken.

3.0 SITE ASSESSMENT

TOHA visited the site on 29th November 2016.

The park is situated to the east of Twickenham (approximate National Grid Reference of centre: TQ1734573656), adjacent to the River Thames.

3.1 Pitches

At the time of the visit, the football pitches were clearly marked out and re-marking was in progress for the rugby pitches. Based on our observations, the majority of the adult football and rugby pitches had fixed goal posts, whilst the junior football pitches did not. The cricket field boundary could be seen but had not been recently marked out, given the season.

3.2 Drainage

Based on observations made during the survey, no evidence of drainage infrastructure was recorded (e.g. gravel trenches, manhole covers, headwalls) nor open ditches on or around the site.

With reference to a conversation with the park warden on duty, the southwestern part of the site in the vicinity of the rugby pitches is understood to be subject to periodic flooding and waterlogging is also a common problem for Football Pitch 3.

3.3 Levels

Observations made onsite correlate with the information given in the supplied topographic survey, with shallow overall gradients across the sports pitches and cricket outfield themselves, with an undulating topography (microrelief), particularly across the football pitches.

Pitch 3 sits in a hollow, surrounded by a reasonably steep bank on its north-western and northern boundaries and to an extent the eastern side. There is bank beside the north-eastern corner of Rugby Pitch 1, with the ground rising within the boundary of the pitch.

As a whole the Park itself falls to the south and southwest towards the River Thames, with terracing to the south of the House, together with raised pathways.

The current variability in microrelief is not ideal for sports pitch use.

3.4 Shade

The majority of the pitches are affected by shade from trees within the Park and along the boundaries.