

Olympic Delivery Authority

**Leyton Marsh Games Time
Temporary Basketball Training
Venue**

Reinstatement Plan

122815-12

Draft 1 | 25 June 2012

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

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1 Introduction

This report has been prepared on behalf of the Olympic Delivery Authority (ODA) in order to discharge Condition 1 and 11 of the planning permission for the Temporary Basketball Training Venue at Leyton Marsh (Ref. 2011/1560). This concerns the removal of the temporary venue and the reinstatement of the site.

Condition 1 states:

This permission shall be for a limited period only, expiring on 15 October 2012 on or before which date the buildings and all associated works undertaken in implementing the permission (including any works installed pursuant to any condition of this permission) shall be removed and the land reinstated to its original state prior to the grant of this permission in accordance with a scheme of reinstatement works detailing the size, species, location, phasing and timing of replacement planting that shall be submitted to and approved by the local planning authority prior to its implementation, and thereafter fully implemented in accordance with said details.

Condition 11 states:

....A similar Method Statement shall thereafter be submitted relating to the removal of the buildings prior to commencement of removal of the facilities.

This report therefore includes the following information in compliance with these conditions:

- A scheme of reinstatement works;
- A Method Statement relating to the removal of the buildings.

The format of the report is as follows:

- A condition assessment of the site to identify the correct approach and requirements of the reinstatement;
- An appraisal of options to achieve the reinstatement;
- The consultation undertaken with stakeholders to develop the proposal;
- The Method Statement for undertaking the reinstatement works.

We enclose at Appendix A a site plan of the area subject to reinstatement.

2 Condition Assessment

A site condition survey was undertaken by specialist consultants Sports Turf Research Institute (STRI) in March 2012 and updated in June 2012 [To be updated as a result of this survey]. We continue to set out the findings of the STRI survey.

2.1 General Description and Species Composition

The species found on the short mown turf and the rough uncut grassland were commonplace. No unusual flora was noted within the scope of this survey. Species present (listed below) are typical of mesotrophic and amenity grassland areas in the region, suggesting the underlying soils are patchy, nutrient rich and immature. A simple turf maintenance programme is clearly in place which is likely to have involved a basic level of nutrient application and mowing over the years.

The short mown turf had a sward height of between 25 – 50 mm at this time. This area was more species rich than the scrub grassland. Wildflower species made up an estimated 20% of the ground cover amongst the grasses.

Routine public use has led to some evidence of localised compaction, eutrophication and wear, notable within the short turf areas. In the taller scrub grasslands nutrient rich soils give rise to a dominance of the coarse, more competitive grass species.

The number of wildflower species dropped noticeably in the areas of unmanaged grassland. A smaller number of grasses dominated, with occasional wildflower species dotted around, 1-5 plants per m² or c.5% of the ground cover.

2.1.1 Short mown turf

Wildflowers	
Abundant:	
Daisy	<i>Bellis perennis</i>
Cat's Ear	<i>Hypochaeris radicata</i>
White Clover	<i>Trifolium repens</i>
Ribwort/Narrow-leaved Plantain	<i>Plantago lanceolata</i>
Yarrow	<i>Achillea millefolium</i>
Common:	
Dandelion	<i>Taraxacum officinale</i>
Hoary Plantain	<i>Plantago media</i>
Mouse-Ear Chickweed	<i>Cerastium spp.</i>
Common Hawkbit	<i>Leontodon hispidus</i>
Smooth Hawks Beard	<i>Crepis capillaris</i>
Dove's-Foot Cranesbill	<i>Geranium molle</i>
Common Chamomile	<i>Anthemis nobilis</i>
Common Chickweed	<i>Stellaria media</i>
Few:	
Wall Speedwell	<i>Veronica arvensis</i>

Thistle	Cirsium sp.
Ragwort	Senecio jacoboea
Horn Plantain	Plantago coronopus
Cinquefoil	Potentilla reptans

Grass Species	
Abundant:	
Rye Grass	Lolium perenne
Tall Fescue	Festuca arundinacea
Creeping Red Fescue	Festuca rubra
Creeping Bentgrass	Agrostis stolonifera
Browntop Bentgrass	Agrostis tenuis
Few:	
Smooth-stalked Meadow Grass	Poa Pratensis
Annual Meadow Grass	Poa Annua
Yorkshire Fog	Holcus lanatus



Close up of representative area of short mown turf

2.1.2 Unmanaged scrub grassland

Wildflower Species:	
Common:	
Common Hogweed	Heracleum sphondylium
Nettle	Urtica dioica
Ribwort Plantain	Plantago lanceolata
Yarrow	Achillea millefolium
Few:	
Hemlock	Conium maculatum

Dove's-Foot Cranesbill	Geranium molle
Thistle	Cirsium sp.
Ragwort	Senecio jacoboea
Mouse-Ear Chickweed	Cerastium spp.
Common Chickweed	Stellaria media
Dandelion	Taraxacum officinal
Russian Comfrey	Symphtum uplandicum
Bramble	Rubus sp.

Grass Species:	
Abundant:	
Couch	Agropyron repens
Common:	
Tall Fescue	Festuca arundinacea
Yorkshire Fog	Holcus lanatus
Cocksfoot	Dactylis glomerata
False Oatgrass	Arrhenatherum elatius
Few:	
Creeping Red Fescue	Festuca rubra
Rye Grass	Lolium perenne
Creeping Bentgrass	Agrostis stolonifera



Scrub grassland characterised by tussocks of cocksfoot and couch

2.2 Levels

Short Grassland: The whole site is reasonably level with gentle undulations of no more than 300 mm over 5-6 m throughout. The area is characterised by occasional dips and humps throughout. It will be important to recreate this unevenness during restoration, as it was noted that the grassland ecology varied a little between high and low areas.

Unmanaged Scrub Grassland: This area was notably more uneven due to the tussocky growth of the grasses and also some ant hills. Undulations in this area were typically 150 - 200 mm over 0.5 m.

2.3 Soil Profile

Soil core samples were taken to reveal 200 mm depth of rich loamy topsoil which was well structured. There was lots of worm activity in the profile. Grass rooting was predominately down to 100 mm with some extending deeper than this.

Below the topsoil was drier soil mixed with a clinker type (manmade) material found from 200 – 400 mm+. The ground level was raised with spoil material following World War II and this forms part of this fill material. This layer was notably drier than the topsoil and undoubtedly increases the drainage and susceptibility to drought of this grassland.

Subsoil taken from the site has been removed for treatment and disposal due to high levels of contaminants. The topsoil stored on the site has been tested for contaminants and **XX%** found not to be suitable for re-use and this has been disposed of alongside the subsoil. The remainder of the soil is available for re-use as part of the reinstatement.

3 Options Appraisal

3.1 Objective

Restoration of the site should enable full public access and meet the following objectives:

- Perimeter fences removed with no further restrictions to public access (areas beneath fence lines returned to good status);
- Surface has a full and vigorous sward throughout;
- Specified wildflower and grass species are present (albeit at rosette or dormant stage);
- Turf is fixed and cannot be moved without exertion;
- The finished grass sward shall provide a minimum live ground cover of 85% of the specified grass & wildflower species when measured with a sward cut at a height of 25-35mm.

The requirements for restoration of the site are based upon the previous condition survey and the necessity to hand the site back to the Lea Valley Regional Park Authority (LVRPA) in a fully useable condition by 15th October 2012. Use is determined to be casual public access dog walking, recreational games etc.

The following three options were considered as expanded at Appendix B:

3.2 Option 1 – seeding

- Develop and procure bespoke seed mix;
- Design topsoil amelioration programme;
- Prepare seedbed;
- Drill-seed reinstatement area;
- Fence off area;
- Irrigate and maintain to a full and vigorous sward (Autumn 2012 through Spring 2013);
- Re-instate damaged or weak areas (Autumn 2012 through Spring 2013);
- Irrigate and maintain to a full and vigorous sward (Spring 2013);
- Remove fencing and restore areas of turf affected by fence line;
- Handover – May 2013.

3.3 Option 2 – standard turf (20 mm depth, 1m² rolls)

- Develop and procure bespoke grown turf;
- Design topsoil amelioration programme;

- Prepare seedbed;
- Cut, deliver and lay standard turf rolls;
- Fence off area;
- Irrigate and maintain (Autumn 2012 through Spring 2013);
- Repair and re-turf damaged, desiccated or dead areas (Autumn 2012 through Spring 2013);
- Remove fencing and restore areas of turf affected by fence line;
- Handover – May 2013.

3.4 **Option 3 – ‘big roll’ turf (30mm depth, 75 m² rolls)**

- Develop and procure bespoke grown turf;
- Design topsoil amelioration programme;
- Prepare seedbed;
- Cut, deliver and lay large turf rolls;
- Handover – 15th October 2012;
- Irrigate and maintain – Autumn 2012.

4 Engagement/Consultation Undertaken

4.1 Residents Engagement Meeting 15th May 2012

The ODA held a drop in session for local residents and interested parties on the 15th May. Invitations were sent to approximately 1,500 addresses and requested an RSVP and contact details for the ODA to maintain a direct communications channel to local residents and interested parties. The drop in session was attended by about 30 people and two local councillors, and the ODA presented an overview of the three possible options for Leyton Marsh Reinstatement - seeding, 'thin' turf and 'thick' turf. The ODA also reiterated the temporary nature of the Basketball Training Facility and confirmed that contractual arrangements were in place for the dismantling and reinstatement. There was a question and answer session and where people wanted to submit a written question there was a submission box. Both the verbal and written questions, and their respective responses, have been consolidated into the document titled '15th May LM Residents meeting – questions and feedback' shown in Appendix C. The Q&A and feedback has been reviewed against this Reinstatement Plan.

4.2 Lee Valley Regional Park Authority Consultation Meeting 21st June 2012

The ODA met with representatives from LVRPA on 21 June 2012 and a draft of this document was reviewed. The key points raised by LVRPA were:

- Ensure all plants will be of certified UK provenance;
- The survey's undertaken by STRI look to be comprehensive and should therefore supersede the previous surveys that have taken place on Walthamstow Marshes (dated 1970 and 2002) as there has been the opportunity for new species to have become established on site;
- Certain species can be omitted from the reinstatement mix (eg daisy, hemlock, cow parsley) as they will naturally recolonise, and their presence at the beginning may be at the detriment to other species. This is expanded in section 5.3.4;
- Reconfirm the requirement for fertiliser. This is covered in section 5.3.6.

Overall LVRPA are strongly in favour of the 'thick' turf option as there is a desire to return the land to public use, and a fence protecting option 1 (seeding) or option 2 ('thin' turf) clearly does not allow this.

4.3 Further Residents Engagement Meeting

To be completed

4.4 Outcome

To be completed

The view of the Landowner LVRPA was that the ‘thick’ turf option was the optimal solution as the priority was to get the land back into public usage, without a protective fence, at the earliest opportunity. The ‘thick’ turf option was also supported by the majority of the Residents engaged with, though some had detailed questions about the methods to be used (which later sections of this document aim to give more detail).

To ensure that the chosen ‘thick’ turf option can be delivered within the programme constraints set by the Planning Consent and Licence periods, the ‘thick’ turf has already been secured from a UK supplier.

5 Reinstatement Method Statement

The reinstatement process is divided into the following phases:

1. Dismantling of the venue;
2. Removal of groundworks;
3. Replacement of groundworks with retained and imported soil/fill;
4. Completion of grass reinstatement.

5.1 Phase 1 & 2

We enclose at Appendix D the contractor's Method Statement for these works.

All introduced foundation fill material will be removed from the site and will have no impact on the future soil quality or ph level.

5.2 Phase 3

Subsoil taken from the site has been removed for treatment and disposal due to the levels of contaminants when measured against industry guidelines. The topsoil stored on the site has been tested for contaminants and **XX%** found to not be suitable for re-use and this has been disposed of alongside the subsoil. The remainder of the soil is available for re-use as part of the reinstatement.

To form a replacement for the contaminated material removed from the site additional material will be imported. The site levels will therefore be returned to their previous condition by imported fill/soil, reinstatement of top soil and imported turf. The volume of material is approximately as follows:

- Ameliorated retained top soil TBC sq m³
- Imported soil/fill TBC sq m³

[Ground make up illustration to be inserted]

We provide certification at Appendix E that confirms that the imported material is a suitable inert and non contaminated material.

5.3 Phase 4

Further to the feedback received and the overriding objective to return the site to active use as quickly as possible Option 3 'big roll turf' has been selected to be taken forward. We continue to set out the approach to implement this option.

5.3.1 Specialist Contractor

The Sports Turf Research Institute (STRI) have now been appointed as the specialist contractor to undertake these works. STRI (originally Sports Turf Research Institute) was established in 1929, in association with the UK Golf Unions and The R&A (Royal and Ancient Golf Club of St Andrews), to provide research and advisory services for golf clubs on their golf greens and courses.

They have developed to be a leading international turf consultancy headquartered in Bingley, Yorkshire.

While Leyton Marsh is not a sport pitch STRI are well versed in a range of turf applications and specialists in rapid and successful application of turf. They have also been appointed as the contractor for the ground and surface preparations for the London 2012 equestrian cross country course at Greenwich Park. Following the hosting of the equestrian event in 2012, STRI will remain on-site to restore the park, including the sensitive acid grassland habitats and amenity areas. STRI will ensure the provision of specialist staff, equipment and machinery for delivery of the project including construction, irrigation, surface preparation and restoration.

5.3.2 Chosen Turf Solution

Laying of thick cut, big roll turf provides the most instantaneous solution to the problem. The use of big roll turf will provide an immediate surface that can be walked and run upon and allow all casual use immediately on handover with no fencing. Once laid, it will not be possible to lift the turf by hand, without excessive and co-ordinated effort; therefore the risk of trip hazard to the public will be minimal.

We continue to set out the specification on which this will be procured and implemented.

5.3.3 Specifications

Turf should be well established sward on a sandy loam soil with average root depths of over 200 mm (10 samples taken per 100 m²) and 10-15 mm of thatch.

The turf farm shall be visited to identify the required turf for the specific project. The existing turf shall comprise a generally even blend of *Lolium perenne*, *Festuca rubra* sp, and *Poa pratensis* with no more than 15% *poa annua*. The area will be uniform (sward density, species composition, soil structure), free of noxious weed and level.

The turf nursery shall provide the following information:

- Species/cultivar mix used to establish the turf
- Species composition of the established turf
- Date of seeding
- Previous management
- Soil type

STRI will visit the turf farm to identify and secure a quantity of turf suitable to provide replacement for the entire site area within the fence line at Leyton Marsh. Not all areas have been disturbed and require reinstatement but this will provide sufficient flexibility to ensure turf is available to reinstate all disturbed areas. The extent of the secured turf that needs to be delivered to site will be assessed at the completion of the building deconstruction works.

On selection of the turf, it will be ring fenced and developed specifically for the project. All prior chemical weed control practices and fertility applications to cease and a new maintenance programme established as follows. Turf is selected prepared and managed to be ecologically compatible with Leyton Marsh. Turf is subject to a full integrated Pest Management Programme throughout the year and is regularly tested for harmful pests and diseases by independent laboratories during the establishment phase and prior to cutting.

Outline timetable of works:

Date	Operation
June 2012	Entire area to be cut to less than 50 mm above ground level with collection of all material (if grasses are longer than 100 mm). Thereafter, the areas will be subject to a double scarification (perpendicular to any slope at 15-25 o angles to one another) to a depth of 75 mm below existing ground level. The Project Agronomist will retain a watching brief and give direction to ensure the integrity of the turf is retained.
June 2012	Apply specified seed mix using a drill seeder in 3 directions to give a total of 35 g/m ² .
June 2012	Allow 3 weeks following seeding before first cut. Turf will then be cut to 50 mm with any clippings removed (should the grass be taller than 100 mm) mowing will thereafter continue weekly through to harvest.
July 2012	A second scarification and seeding operation will take place in line with the works detailed above
Ongoing	A bespoke fertility programme should be developed based on existing turf conditions. The turf contractor will need to demonstrate the ability to take and analyse soil and leaf samples in order to prepare a fertility programme that will secure a healthy and strongly rooted sward without compromising the introduced and weakly competitive grasses and wildflowers.
Ongoing	Irrigation as required. Water will be applied to ensure germination and rooting of the introduced wildflowers and grasses. Irrigation will not be applied to the point of run-off. The turf contractor and turf farm should allow for a maximum irrigation of 5 mm per day and also provide plans for dealing with a hosepipe ban in the area of the establishing turf.

5.3.4 Seed specification for intraseeding

STRI will work with specialist seed suppliers to develop a bespoke grass and wildflower seed mix of native UK provenance.

A single seed specification has been chosen for both the short mown grass and unmanaged scrub grassland as they share the same base species. Their different appearance is due to their management and public uses. Once laid, the turf will be established as short mown or unmanaged and the sward will develop.

Daisy and Dandelion have not been included in the seed mix as they will re-colonise the site very quickly and their inclusion in the introduced turf would potentially give them an early competitive edge to the detriment of less vigorous species. The same logic has been used for excluding Hemlock and Cow Parsley from the seed mix.

The seed specification will be based on the following:

Grasses:	
Agrostis capillaris	25%
Festuca rubra	25%
Poa pratensis	25%
Dactylis glomerata	5%
Festuca arundinacea	10%
Lolium spp.	10%
Wildflowers: - An even blend of:	
Hypochaeris radicata	
Trifolium repens	
Plantago lanceolata	
Achillea millefolium	
Plantago media	
Cerastium spp	
Leontodon hispidus	
Crepis capillaris	
Geranium molle	
Anthemis nobilis	

All plants will be certified UK provenance.

5.3.5 Turf harvesting

Only turf approved by the Project Agronomist shall be lifted and imported from the turf nursery. The turf shall have a full and dense sward of the approved grass species.

The turf shall have no more than 15mm surface thatch, shall be cut to a uniform 30mm (40mm if required – as detailed below) thickness and care should be taken to ensure that turf thickness and uniformity is maintained.

Turf will be cut into 75m² rolls and stacked onto pallets, transported and delivered to site within 24 hours of harvest. Rolls will measure 2.5m wide by 30m long, be plastic wrapped and cut with clean edges. Should inclement weather prevent the installation of the 2.5m wide rolls, the turf contractor should allow for a 1.25m wide roll, cut at 40mm thickness.

The turf shall be protected from drying out, freezing, heating in the roll or any other events which may cause damage.

At turf harvesting ensure that the turf has adequate moisture (20-25% volumetric moisture content) to ensure the root zone stays on the roll. Turf moisture should be measured (10 random samples taken over 100m²) by the project agronomist. Air temperature should also be measured and recorded as should soil temperature.

5.3.6 Site preparation

The reinstated and imported topsoil and fill will be spread across the site. This will be applied in layers and compacted between each layer application to prevent subsidence. The top 15-30cm of this should be a sandy loam topsoil to ensure that the turf when laid can root into this.

Levels will be even, yet undulating as per existing ground conditions (detailed above). The natural gentle undulations of the site will be recreated with no more than 10cm lateral deviation over 2m. The surface shall be lightly cultivated or raked to produce an even grade of uniform consolidation over the whole site to the intended contours.

Very light fertility will be applied simply to encourage germination. This will be organic 12:0:0 or similar applied at only 10gms-2. This will be applied only upon recommendation and under supervision of experienced project ecologist. If necessary (as guided by the project agronomist), the site shall be lightly watered before laying.

5.3.7 Turf laying

Each turf shall be laid carefully to ensure a continuous level surface mirroring the intended contours. Before laying the surface shall be raked by hand or approved machine to produce a level, firm base. This operation must be undertaken immediately in front of the turf laying machine.

Once laid, the turf edges shall be protected from damage with a board or plank 40mm deep until the next adjacent turf is laid.

The turf edge shall abut each other turf edge and not overlay another or leave a gap. A mechanical turf pusher should be used to achieve a tight joint between adjacent turves.

The aim shall be to have no difference in height between turf edges, although a maximum tolerance of 2mm will be allowed.

All turf shall be watered as soon as possible after laying, especially in hot weather. The turf shall be watered within one hour of laying and no later than 3 hours after laying.

The area shall be turfed in an agreed sequence/pattern ensuring minimal machinery movements over the prepared surface and none over the laid turf.

An approved medium weight flat roller shall be used if deemed necessary by the Project Agronomist to consolidate the turf surface once completed but only when

the turf is below field capacity but not dry. All vehicles shall have low ground pressure turf tyres.

5.3.8 Maintenance

Following installation of big roll turf, the turf contractor should allow a four week maintenance/grow in period.

Following turf installation the Project Agronomist will determine the exact maintenance schedule based on weather and site conditions at the time.

Mowing: It is anticipated that the site will require mowing on 8 occasions to 50 mm during the grow-in period (not including the areas to be established as long grass). During this period the grass height will not be allowed to exceed 75mm.

It will be the contractor's responsibility to determine where slopes of an acceptable nature are present that can be mown by a ride on machine specified. If land is present that is unacceptable for use of ride on machinery, the contractor will have to arrange for suitable pedestrian mowers that are capable of mowing to the specifications laid out.

STRI will make provision for 1 x rotary ride on mower that disperses clippings evenly back onto the ground. The machine should be 4 wheel drive and demonstrate the capacity to reduce wheel spinning or slippage

Mowing will take place early mornings to avoid public disruption. It will be the turf contractor's responsibility to secure mowing equipment overnight at a location agreed with the Main contractor and LVPA or off site.

Fertility: It is expected that the turf will receive one fertiliser application at the point of laying followed by a single further 'winter' feed in early November as directed by the Project Agronomist.

Granular fertiliser will be applied using a tractor mounted fertiliser spreader capable of achieving an application within 0.5 m accuracy.

All fertiliser will be applied first thing in the morning or late in the evening out of direct heat and sunlight hours. The turf maintenance contractor will ensure all applied fertilisers are thoroughly watered into the turf canopy (not off the surface) to ensure that no significant leaf burn occurs after the fertiliser application.

Fertilisers will be applied during calm winds and will cease should the wind increase to an unacceptable level so as minimise/eliminate misapplication onto the surrounding habitats.

Irrigation: Irrigation will need to be routinely applied through the grow-in period (15th October through 10th November). The turf contractor should allow for application of 4mm per day across the site.

6 Conclusion

This reinstatement plan has been developed following the appointment of specialist contractor Sports Turf Research Institute (STRI) and outlines the three reinstatement options available. The use of pre-grown thick turf has been chosen as the option that best achieves the reinstatement objectives. The use of turf will provide an immediate surface that can be walked and run upon and allow all casual use immediately on handover with no fencing. It delivers a solution within the period of the ODA/LVRPA Licence and within the validity of the Planning Permission.

A seed specification has been chosen to best replicate the previous condition of Leyton Marsh and developed in agreement with the Lea Valley Regional Park Authority.

In addition further works will be undertaken to Leyton Marsh by LVRPA as part of their £65,000 improvements package from the LVRPA funds received from the ODA.

Appendix A

Reinstatement Site Plan

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