



**HICKSTEAD SHOWJUMPING ARENA
ARENA SURFACE IMPROVEMENT
DESIGN PLANNING AND INCEPTION**



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CONTENTS

1.0 INTRODUCTION

2.0 SUMMARY OF FEASIBILITY STUDY AND DECISIONS TAKEN

3.0 IRRIGATION

4.0 SEEDING VERSUS TURFING

5.0 MATERIAL SUPPLY AND MATERIALS NEEDED

6.0 CONTRACTOR GROW IN VERSUS ON SITE MANAGEMENT GROW IN

7.0 INDICATIVE PROGRAMME OF WORKS

8.0 COST CALCULATIONS

9.0 NEXT STEPS

REFERENCES

APPENDICES

1.0 INTRODUCTION

STRI have carried out a feasibility study to determine the approach needed to improve the All England Showjumping Arena at Hickstead. The decision to approve design inception of a similar surface to that used at the RDS Arena in Dublin was made following presentation of a report and meeting.

The inception brings this to the next level which deals with practical design issues and decisions as well as the pros and cons of each option.

2.0 FEASIBILITY STUDY

The findings and acceptance of the following points was a summary of the feasibility study

- The installation of a gravel raft profile was recommended and accepted
- The scope would include reconstruction of the surface and either installation of a new irrigation system or refurbishment of the existing system.
- An irrigation survey and independent report was recommended
- A topographical survey of the arena was commissioned
- The client stated that to reduce costs, they were prepared to pay for and supply all materials
- The client stated that to reduce costs, they were prepared to put contractors men up and provide rooms and food
- To reduce the risk of needing to turf the pitch fixtures were relocated to allow for an August 6th 2010 start date
- June 27th 2011 is the first event
- Progression to design inception was agreed which would deliver (1) specific recommendations (2) specific costs associated with project (3) timelines and key outstanding decision issues (4) irrigation survey

3.0 IRRIGATION

An independent irrigation survey was commissioned by STRI in order to (1) assess best practice in terms of the type of system which should be used compiled together with a site assessment. This report forms appendix 1 to the report.

The report recommends that best practice would be to (1) install a large tank and pumping system (2) install a ring main and series of stationary sprinklers around the edge of the arena (3) use connection points and roll out sprinklers for the centre of the arena. A cost analysis of this indicated that it would cost in the region of £150,000.00 to upgrade the system with an increased complexity to the project adding risk time which could lead to having to turf.

Pros

- More even and accurate application of irrigation
- Automated system will mean less dependence on labour
- Storage tank available in case river runs dry

Cons

- Cost
- Labour is on site anyway
- River is reported to be relatively reliable
- Potential planning issues with environment agency
- Existing pumps and systems could not be used
- New system will not put out as large a volume over as short a space of time
- Planning consents etc. could be an issue
- A new irrigation system can be retrofitted if necessary

Catch can test

An indicative catch can test and physical examination of the irrigation system and operation was carried out. The results of this are also shown in Appendix 1. On pressure build up, the existing system does dribble water from the joints and a number of joints, seals and heads need replacing. We may also need to look at coverage and extending of the system.

Recommendation on irrigation

Considering that the existing irrigation system is functional and considering that the client accepts the risks associated with the system, STRI are happy to proceed on the basis that the existing irrigation system be fully restored and serviced with the option to install a new irrigation system in 2011/2012 if problems occur.

4.0 SEEDING VERSUS TURFING

The option of turfing and seeding needs to be carefully considered but more importantly, the risks associated with each option need to be considered in the decision making process.

Pros

- Immediate green surface
- Less grow in issues like erosion
- Lower risk of poor performance in year 1; imported mature sod
- Allows for later installation and increased programme due to weather

Cons

- Cost
- Management operations need to be intensive in year 1
- Matching of soils can be difficult
- Rider perception and pre judgement
- Potential drainage issue

Based on the above pros and cons the aim should be to seed the arena with a reduced risk being placed on an earlier seeding. A call would need to be made on turfing the arena if the programme slips, but again this judgement would be made on weather conditions. The allowance in contingency must also be made.



Seeding will produce a better surface if we meet the programme

5.0 MATERIAL SUPPLY AND MATERIALS NEEDED

A key issue where Hickstead can (1) save money and (2) reduce risk of project timeline issues is to ensure that the materials used for the construction are pre ordered and bought by the client. This allows the client to have a full quality assurance procedure carried out on the material pre construction and have it ringfenced for delivery once the project starts.

Sand

The sand required is a medium fine sand which fits within the grading curve on Appendix 1. If the sand does not fit within this grading curve, we will review it and it still may be suitable. At construction 40 mm of sand is needed for amelioration at various phases. Following this another 10 mm would be needed for sand topdressing.

Gravel

A clean 6 – 10 mm gravel (preferably double washed) is needed for the gravel raft construction. This gravel should be available locally but it is very important that it is double washed and ringfenced.

Grit

A layer of 3-6 mm grit will be dozed over the entire gravel carpet construction. Again, this needs to be a clean, double washed material with more fine material which will remain stable.

Coarse sand

A series of coarse sand connection bands will be installed which connect the surface to the gravel raft underneath. These will be installed mid construction and will require a slightly coarser material than the medium fine sand.

Green waste compost

To allow for better growth, moisture retention and nutrient retention, the application of and amelioration of 10 mm of a suitable green waste compost is also being considered. This will (1) benefit soil structure (2) improve consistency of the surface (3) provide better agronomic growing conditions.

6.0 CLIENT GROW IN AND MAINTENANCE

One area which does pose questions regularly is contractors ability to grow in and maintain surfaces to the exacting standard of the client and the consultant. In the vast majority of cases, contractors struggle with grow in and maintenance of new surfaces with clients being forced to take them over sooner rather than later to reduce the risks associated with poor maintenance. Having somebody on site but also having somebody daily monitoring the grow in is extremely important.

Pros

- Contractually tighter; all risks are on the contractor
- Potentially better maintenance but unlikely
- Contractor takes all risks

Cons

- Contractor may not be able or willing to grow the surface in
- Corners may be cut on the provision of equipment and materials
- Client may end up taking over the management of the surface anyway
- Unlikely contractor will be full time on site

Considering that STRI will be actively involved in the maintenance regime, the best approach would be for (1) the contractor to agree a responsibility waiver to the client for the client to carry out the grow in (2) the contractor to provide the equipment and products necessary to grow in and maintain the new surface (3) the contractor to allow for carrying out regular maintenance inspections (4) the Hickstead staff to grow in and maintain the surface following the advice of STRI. Supplies and equipment supplied and left behind by the contractor will include

- Germination blanket and pegs
- Fertiliser spreader
- Sprayer
- Rotary mower (self propelled)
- Vertidrain
- Overseeder
- 1.5 extra tonnes of seed
- 6 tonnes of granular fertiliser (9:7:7 or similar)
- 300 kg of liquid feed
- Iron etc.

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7.0 INDICATIVE PROGRAMME OF WORKS

Mobilisation of equipment (Aug 2nd- 6th)

It is proposed that all equipment would be mobilised ready for use on the day after the last event finishes on site. It is proposed that Hickstead provide an area for the contractor.



Mobilisation is an important part of the planning

Aug 6th – 7th Surface removal

This will be carried out using 2 koro field topmakers, shaving the surface with dumpers hauling the material away for disposal.



The surface vegetation will be stripped with a koro field topmaker

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Aug 7th – 10th Plough, doze and remove topsoil

This will be carried out by (1) ploughing (2) dozing (3) excavators and dumpers. An agreed series of topsoil piles will be created and sealed on site.



Topsoil removal

Aug 9th – 12th Grading

This will be carried out on the underlying soil and will allow for shaping, grading and trimming the approved new grades of the surface but also the tie ins of the existing jumps. It will be carried out using (1) excavators (2) dozers (3) tractor grading boxes to GPS laser levels.



Grading

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Aug 11th – 18th drainage installation

This will be carried out using a combination of maestenbroek trenchers, tractor whizzwheels and tracked excavators. Drains will be piped and backfilled as they are installed.



Drainage installation

Aug 12th – 18th Gravel raft dozing

Once the geotextile membrane is placed between the drains, the gravel will be dozed over the site using a combination of dumpers and dozers. Work around the jumps will be carried out with excavators. The layers will be dozed, graded and finished to a high level tolerance. Both a gravel layer and a blinding layer will be dozed.



Gravel raft dozing

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Aug 14th – 20th topsoil Spreading and grading

The topsoil will be spread in a similar manner to the gravel layers, using dumpers, dozers and excavators. The topsoil will be graded to a high tolerance using GPS guided machinery.



Topsoil Spreading

Aug 20th – 30th Gravel band installation

These gravel bands connect the surface to the gravel raft below and will be installed using specialist equipment.



Secondary drainage installation

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Aug 25th – September 2nd Sand Application

Sand will be applied to the surface and tilled in to specific depths allowing for adequate amelioration with the existing soil but more importantly getting the final trims and grades correct



Sand Application

September 2nd – 4th Trimming final preparations

Final raking, grading and trimming of the surface will be carried out.



Trimming

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September 5th – September 6th Fertiliser and seeding

The surface will be seeded in at least 3 directions at a high seeding rate with a pre seeder fertiliser also applied.



Fertiliser and seeding

7.0 COSTS

Costs presented are an estimate at this stage stage. They have been calculated using recent rates tendered on projects in the last 6 months in Ireland and do take account of (1) recession (2) standard of work needed (3) equipment needed.

HICKSTEAD SHOWJUMPING ARENA

| Description | Unit | Quantity | Rate | Cost | Stage Total |
|---|------|----------|-------|------------|-------------------|
| Contractual Requirements | | | | | |
| Site Security | Sum | | | £1,000.00 | |
| All associated insurances | Sum | | | £3,500.00 | |
| The contractor shall allow for any additional costs for complying with general requirements not covered elsewhere | Sum | | | | |
| Contractual Requirements subtotal | | | | | |
| Photography | | | | | |
| Photographs and time lapse camera | Sum | | | £500.00 | |
| Photography subtotal | | | | | |
| Accommodation, buildings and security | | | | | |
| Establishment, maintenance and site removal | Sum | | | £3,500.00 | |
| Site agents office, engineers accommodation, staff onsite accommodation and wash facilities as per specifications | Sum | | | £2,000.00 | |
| Prepare maintain and remove equipment and materials compound as per specification | Sum | | | £7,000.00 | |
| Accommodation, buildings and security subtotal | | | | | |
| Temporary works | | | | | |
| Maintaining site access and crossings and all associated roads as well as condition survey of roads as specifications | Sum | | | £650.00 | |
| Complying with health safety regulations and production of health and safety information as per specification | Sum | | | £2,000.00 | |
| Dust control as per specification | Sum | | | £1,500.00 | |
| Temporary works subtotal | | | | | £21,650.00 |
| Physical and chemical testing | | | | | |
| Taking samples of gravel backfill and analysis (as per specification) | 3 | | 60 | £180.00 | |
| Taking samples of blinding sand and analysis (as per specification) | 2 | | 60 | £120.00 | |
| Taking samples of topdressing sand and analysis (as per specification) | 3 | | 60 | £180.00 | |
| Taking samples of topsoil and analysis (as per specification) | 6 | | 60 | £360.00 | |
| Physical and chemical testing subtotal | | | | | |
| Site Investigation and preliminaries | | | | | |
| Allow site investigations and preliminary checks | Sum | | | £500.00 | |
| Site information board | Sum | | | £600.00 | |
| Site investigation and preliminaries subtotal | | | | | |
| Setting out | | | | | |
| Allow for engagement of an engineer for setting out and continuous involvement throughout | Sum | | | £5,000.00 | |
| Setting out subtotal | | | | | £6,940.00 |
| Topsoil strip | | | | | |
| Koro removal of surface | Sum | | | £14,500.00 | |
| Topsoil strip, storage and transportation as per specification (stage 1) | m3 | 0.7 | 18100 | £12,670.00 | |
| Disposal of topsoil on site not used | Sum | | | £4,000.00 | |
| Topsoil strip subtotal | | | | | £31,170.00 |
| Earthworks | | | | | |
| Cut subgrade material | m2 | 0.7 | 18100 | £12,670.00 | |
| Fill and level subgrade | m2 | 0.6 | 18100 | £10,860.00 | |
| Earthworks subtotal | | | | | £23,530.00 |
| Irrigation | | | | | |
| Upgrade and improve existing irrigation | | | | £15,000.00 | |
| Irrigation subtotal | | | | | £15,000.00 |

HICKSTEAD SHOWJUMPING ARENA

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|--|-------|-------|-------|-------------|-------------|
| Drainage and gravel carpet installation | | | | | |
| Install geotextile membrane | m2 | 1.2 | 18100 | £21,720.00 | |
| Install lateral drains at 8 meters centres and connect to existing collector drain | m | 3620 | 8 | £28,960.00 | |
| Supply drainage gravel for drains | | | | £8,000.00 | |
| Install other collector drains, main drains and manholes | item | sum | | £10,000.00 | |
| supply manholes etc. ducting etc | | | | £6,000.00 | |
| Supply gravel as per specification | tonne | 2900 | 13 | £37,700.00 | |
| Install gravel carpet | m2 | 18100 | 0.9 | £16,290.00 | |
| Supply blinding sand | tonne | 1450 | 14 | £20,300.00 | |
| Install blinding layer | Sum | 18100 | 0.5 | £9,050.00 | £158,020.00 |
| Topsoil profile replacement | | | | | |
| Replace topsoil, doze and grade | m2 | 18100 | 0.9 | £16,290.00 | |
| Supply sand | tonne | 2316 | 24 | £55,584.00 | |
| Spreading and mixing operations of sand | Sum | | | £10,000.00 | |
| Supply slit drainage sand | | | | £10,000.00 | |
| Install secondary drainage | m2 | 18100 | 1.5 | £27,150.00 | |
| Finished grading, trimming and handwork | Sum | 18100 | 0.5 | £7,000.00 | |
| | | | | | £126,024.00 |
| Establishment and Grow-in | | | | | |
| Seeding and fertilising of arena | m2 | item | sum | £5,500.00 | |
| Allow for germination blanket | m2 | 18100 | 0.7 | £12,670.00 | |
| Base fertiliser supply for year on site | Sum | | | £12,000.00 | |
| Vertidrain | | | | £15,000.00 | |
| Mower | | | | £10,000.00 | |
| Sprayer | | | | £2,000.00 | |
| Sand topdressing | | | | £7,000.00 | |
| Spread sand | | | | £2,500.00 | |
| Seed | | | | £5,000.00 | |
| Overseeder | | | | £8,000.00 | |
| | | | | | £79,670.00 |
| Subtotal | | | | | |
| | | | | £462,004.00 | £462,004.00 |
| Contingency | | | | | |
| | | | | £46,200.40 | £46,200.40 |
| Total (excl VAT) | | | | | |
| | | | | £508,204.40 | £508,204.40 |
| Turfing of arena (Provisional) | | | | | |
| | m2 | 18100 | | £130,000.00 | £130,000.00 |
| MATERIALS PAID FOR BY CLIENT | | | | | |
| | | | | £144,584.00 | |
| TOTAL TO CONTRACTOR | | | | | |
| | | | | £317,420.00 | |

8.0 THE NEXT STEPS

- Full design, specification, tender and contract documents (May 25th 2010)
- Tender procedure (May 21st 2010 – June 1st 2010)
- Contractor appointment (June 5th 2010)