Beach Gardens
Cauldon Avenue
Swanage
Dorset
BH19 1PG

Artificial Bowls Green

Contract Specification

Client	Swanage Town Council Town Hall Swanage Dorset BH19 2NZ			
Project	Artificial Bowls Green			
SSL project code	SSL1949a			
Document title	**Contract Specification**			
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Contents

1 Introduction

1.1 Document Context

Swanage Town Council (the Employer) invites tenders for the proposed Artificial Bowls Green.

This document describes the proposals for constructional work necessary to implement the sports facility and facilitate tenders from bona fide contracting organisations.

1.2 Site Address

The proposed development is situated at:

Beach Gardens
Cauldon Avenue
Swanage
Dorset
BH19 1PG

1.2 Associated Documents

The following documents to be read in conjunction with this Contract Specification include:

Tender Stage Drawings

SSL1949a 01 - Existing Site Plan SSL1949a 02 - Existing Courts and Utility Topo Survey SSL1949a 03 - Proposed Plan

Appendices

SSL1949a_Beach Gardens_Photographs of Site

1.3 Main Contract Preliminaries / Conditions of Contract

Refer to documents:

- SSL1949a_Part 1_Invitation To Tender
- SSL1949a_Part 2_A20 Form of Contract

- SSL194a9_Part 3_Contract Specification
- SSL1949a_Part 4_Tender Certificates
- SSL1949a_Part 5_Tender Submittal Labels

1.4 Performance Quality Standards (PQS)

The comprehensive constructional specification and work schedules described within this document are designed in accordance with, and must be constructed if full compliance with; the following sources of appropriate technical guidance:

Field test standard

- Performance Standards For Flat Green Bowls Surfaces
- World Bowls Ltd standards
- World Bowls et al, Laws of the Sport of Bowls - Crystal Mark Edition.
- British Standards Institute, BS 903: Part A8:1990 - Method for Determination of Rebound Resilience.
- British Standards Institution, BS903: PartA26: 1969 - Determination of Hardness.
- British Standards Institution, BS7044: Section 2.2: Methods for Determination of Person/Surface Interaction.
- British Standards Institution, BS7044: 1991 Section 2.5: Miscellaneous.
- Netherlands Sport Federation, N/F5.1: Underfoot Friction.
- BS EN 13108-1: 2006 - Bituminous mixtures - Material specifications - Part 1: Asphalt Concrete.
- BS EN 13036-7: Irregularity measurement of pavement courses.

BS EN 15330-1. Surfaces for sports areas. Synthetic turf and needle-punched surfaces primarily designed for outdoor use. Part 1. Specification for synthetic turf surfaces for football, hockey, rugby union training, tennis and multi-sports use

This European Standard specifies performance and durability characteristics for synthetic turf sports surfaces used primarily outdoors.

This European Standard is based on type approval testing of products in the laboratory.

Selected requirements may also be used on site to assess the suitability of installed surfaces.

Ball-Stop Fencing

- BS EN 15312:2007 A1:2 Free access multi-sports equipment – Requirements, including:
- Clause 5.5.1.2.1 Resistance to repeated impact of footballs
- Clause 5.5.1.2.2 Very intense forceful impact resistance to player's kicks

Pathways

- Sport England Design guidance Note – Accessible Sports Facilities – Issue 003 / April 2010.
- Part III of the Disability Discrimination Act 1995 (DDA)
- BUILDING REGULATIONS PART M 2010 - ACCESS TO AND USE OF BUILDINGS

Generally

- Works must comply with current Building Regulations and British / European Standards applicable to the proposal.

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- Works must comply with current Building Regulations and British / European Standards applicable to the proposal.

1.5 Construction Work Requirements

The proposed works will comprise:

Contractual Provisions and Compliance
Site Establishment
Site Clearance, Excavations, Groundwork's and Drainage
Base Work and Hard Standing Areas
Playing Surface System
Perimeter Ball-Stop Fencing
Reinstatement
Testing
Client Contingency (5% of above costs)

Additional / Alternative / Optional Works

Alternative Base Option One
Alternative Base Option Two
Maintenance Equipment
After Care
Sports Equipment, Site Furniture, Signage and Sundries

1.6 Work Schedules Preamble

Work Schedules are to be read in conjunction with the all other sections contained within tender documentation and associated drawing package/s.

All rates and prices shall be expressed to two places of decimals.

All items in these Work Schedules should be completed with individual rates or prices provided by the Contractor and should not be grouped together. If items are left blank then it is assumed that these items have been included in the pricing of the works.

If any item contained in these Schedules is not priced, it will be deemed that the cost has been included elsewhere in these Schedules and the rate payable against that item will be zero. On request from the Employer, the Contractor must provide details of where this cost has been included, to the Employer's satisfaction.

Where there is a discrepancy between the rate and the associated amount tendered in a Work Schedule, the rate shall apply and the amount shall be adjusted accordingly. Where there is a discrepancy between the rate and the associated amount in a Work Schedule, the amount shall apply and the rate shall be adjusted accordingly.

Unless stated otherwise the cost of complying with Main Contract Preliminaries with Special and General Conditions of Contract shall be covered by the rates and prices inserted against the items in these Work Schedules.

In these Work Schedules, the sub-headings and item descriptions identify the work covered by the respective items, but the exact nature and extent of the work to be performed is ascertained by reference to the Constructional Specification, Technical Drawings and Main Contract Preliminaries / Conditions of Contract.

The rates and prices entered in these Work Schedules shall be deemed to be the full inclusive value of the work covered by the respective items, including but not limited to the following, unless expressly stated otherwise:

A. Labour and costs associated therewith including all site allowances.

B. Plant and costs associated therewith including transport to and from Site.

C. The supply, loading, transporting and delivery to site, unloading, handling and storage of materials and goods.

D. Taking delivery of materials and goods supplied by others, loading, transporting and delivery to Site, unloading, handling, storage and returning any surplus.

E. Assembling, mixing, fixing, erecting, lifting, hoisting, handling, spreading, installing and placing of materials and goods in position.

F. Waste, bulking and shrinkage of materials.

G. Removal and disposal off site of surplus or spoil materials and costs in connection therewith including tip fees.

H. Temporary works.

I. Provision of working space and upholding sides of excavations.

J. Notifying, making arrangements and liaising with all relevant statutory bodies, authorities and clients to obtain all licences and permits necessary for the execution of the Works, and costs in connection therewith.

K. Taking precautions and measures as far as is reasonable and practical to prevent interference with or damage to existing structures, services, utilities, roads, footpaths, paved areas, watercourses, drainage systems, public and private vehicular and pedestrian accesses, trees, graves, burial urns, including the provision of alternative access, if necessary.

L. The effect of phasing of the works or of alteration or additions to existing services and supplies to the extent that such work is set forth or reasonably implied in the Contract.

M. Keeping the Works where necessary, and as near as may be practical, free from water and protected from damage due to water and from weather conditions which may adversely affect the Works including dewatering of excavations, and taking measures to prevent flotation of new or existing structures.

N. Submitting to the Employer all drawings, details of procedures and methods of construction to be used, calculations, technical literature, test certificates and any other documents or information required to be submitted in accordance with the Constructional Specification.

O. All costs for quality assurance systems including carrying out all tests and providing certificates of conformity.

P. Attendance and transport for sampling and testing carried out by the Employer, and supplying results of tests carried out by the Contractor.

Q. Establishment charges, overhead charges, profit and all preliminary costs.

R. General obligations, liabilities and risks involved in the execution of the works set forth or reasonably implied in the Contract.

S. Adjustment for rise and fall in costs.

All items have been measured net and no allowance has been made for laps, cutting, bulking, shrinkage or waste, unless expressly stated otherwise.

Schedules of Rates and provisional quantities included in shall be remeasured.

Work Schedules (except for provisional quantities) shall not be remeasured.

Measurements for calculations, except for Provisional Quantities, have been taken to the dimensions shown on the Tender Drawings. The quantity given against items in these Work Schedules has been rounded up to the nearest whole.

The following abbreviations have been used for units of measurement:

Unit	**Abbreviation**	**Unit**	**Abbreviation**
Millimetre	mm	Item	item
Metre	m	Millilitre	ml
Square Metre	M2	Litre	l

Linear Metre	m.lin	Hour	Hr
Cubic Metre	M3	Day	Day
Kilogram	kg	Man Day	M/Day
Tonne	t	Week	Wk
Number of	No	Provisional Sum	PS
Set	Set	Provisional Quantity	PQ

Provisional Sums

All work included as Provisional Sums in these Work Schedules shall be completed within the contract period, unless expressly stated otherwise.

Provisional Quantities

Provisional Quantities (PQ) as applied to these Work Schedules means that such quantities have not been estimated from dimensions on the drawings and whilst it is probable that some part will be required and possible that the whole or part might be required, no guarantee can be given that any or all will in fact be required. The rates affixed to such items shall include the direct costs together with their associated on-costs and shall allow for the quantities stated in these Work Schedules to be completed within the contract period.

Furthermore, no consideration will be given to claims against the Employer, including claims for loss of profit, should the actual measured quantities prove to be more or less than those stated in these Work Schedules.

Day Works

No work may be claimed as day works by the Contractor unless prior written instruction has been provided by the Employer.

2 Constructional Specification and Work Schedules

Description of Work	Quantity	Unit	Rate	Cost
Contractual Provisions and Compliance				
Allow for compliance with Main Contract Preliminaries with Special and General Conditions of Contract and all and obligations and requirements stipulated by the Employer.	1	Item	£	£
Allow for the provision of necessary management, supervision and administration of the works in compliance with Construction (Design & Management) 2015 as advised by the Employer.	1	Item	£	£
Allow for sufficient resources in which to prepare, mobilise and install the scheduled works and to ensure Practical Completion on the planned due date.	1	Item	£	£
Allow for the implementation of the agreed Contractor's Code of Practice to be undertaken during the sequential construction phase stages.	1	Item	£	£
Provision of Building Manuals (incorporating the Health and Safety Files) in bound hard copy and electronic copy formatsat Practical Completion. To include relevant end-user warranties, guarantees and operating and maintenance (O&M) manuals.	1	Item	£	£
Allocation for the undertaking of Inspection / Testing procedures (ITPs) for works and materials, to be completed and reported at each critical stage of construction and throughout the sequential programme of works. The absolute requirement of ITPs is to ensure that the completed works may be accepted by the employer with the reassurance that at the point of handover , the works contain no significant faults or omissions in the work which would require the Contractor to re-enter the site to carry out further works ('zero defects'). Allow for the publication of a closure report within Building Manuals.	1	Item	£	£
Allow for the provision of full and detailed demonstration of the operational requirements for the completed facility to the Employer. Prior to completion of the works, the Contractor will provide a statement describing the general and detailed maintenance required on the newly developed facility. The statement shall include details of the maintenance programme. It shall detail procedures to ensure the specified parameters are maintained, the appropriate climatic conditions in which work can be carried out, the appropriate health and safety requirements and training the personnel may require. The Contractor will allow an appropriate cost to cover the training and advising of the grounds maintenance staff.	1	Item	£	£
Carry forward to Pricing Summary				£

Contractual Provisions and Compliance				
Appraisal of site approach, entry and movements whilst tendering for the works and make all necessary allowances as required, including: • Banksperson for all deliveries and removals as necessary. • Road cleaning during the construction period as necessary • Wheel wash facility for vehicles exiting site as necessary. • Maintaining an emergency access.	1	Item	£	£
Supply and install a suitable haulage track over any areas deeded vulnerable and required to the site access and entrance to withstand all trafficking and haulage during the works	1	Item	£	£
Establish an area to be used as the site compound and site access with a hard-standing surface to withstand all trafficking and haulage for the duration of the works within the Academy grounds. The site compound and access must accommodate all construction activities and movements, which must be contained within the site curtilage for site office and welfare, storage of plant and materials, parking and manoeuvring of site operatives and visitors vehicles together with the loading and un-loading of goods vehicles.	1	Item	£	£
Supply and erect temporary security fencing, consisting of 2.0m high open steel weld mesh fencing (Heras or similar approved) to where deemed required and appropriate for the working area and compound area and site access. Allow for tree protective fencing to the tree within the access route throughout the duration of the works. This fencing shall be retained intact and at full height and extent until the works are completed. The fencing should include security entrance gates as required. The fencing should be checked twice daily.	1	Item	£	£
Supply a site office and appropriate welfare facilities to comply with Construction (Design & Management) 2015. Upon the initial site visit and inspection with the client there may be some facilities available such as a bathroom which can be utilised and assist.	1	Item	£	£
Supply temporary storage facilities for any and all fragile / vulnerable building materials as deemed necessary by the contractor during the construction period as required.	1	Item	£	£
Supply and erect public health and safety / warning signage to the temporary security fencing as required by Construction (Design & Management) 2015 as required.	1	Item	£	£
Deliver construction machinery and plant to site and allow for removal upon completion of the works.	1	Item	£	£
Carry out a comprehensive underground services detection survey of the entire working area and transport routes prior to the commencement of excavation works and then provide suitable temporary protection as necessary to any and all vulnerable	1	Item	£	£

utilities, services, manholes and inspection chambers, etc...; capable of withstanding all trafficking and haulage during the works; to avoid damage for the duration of the works.				
Carry forward to Pricing Summary				£
Site Clearance, Excavations and Groundwork's				
Dismantle, break out and remove the 1.2m high fencing system to the south side of the court boundary. Dispose of all arisings generated during the above works repsonsibly at a registered tipping site or similar.	1	Item	£	£
Break out and remove the surrounding area of paved slabs and excavate and remove the underlying material and subsoil material required to the paving slabbed areas to a further depth to make up the required formation layer ranging up to 100mm to enable the makeup of the macadam footprint to tie in with the existing surrounds and allowing for the bank down to the bowls green to be sufficient. Works to include the temporary removal of the wooden decking to the front of the building to allow the removal of the decking whilst carefully retaining and protecting the posts and reinstating the decking upon completion.  Remove stripped materials offsite and dispose in an environmentally sustainable recycling method or similar.	320	M2	£	£
Lift, strip and remove the existing edging boundary, gutters and perimeter details to the bowls green along with any / all associated materials, underlays and surround surfacing; and any / all existing pitches base materials and perimeter edgings / restraints / retainers. Remove stripped materials offsite and dispose in an environmentally sustainable recycling method or similar.	1	Item	£	£
Cut off water supply to the irrigation system and remove all associated pipe work and features. Dispose of all arisings generated during the above works repsonsibly at a registered tipping site or similar.	1	Item	£	£
Carry out ground works to the grassed perimeter that holds the irrigation system to produce a formation level to support the construction make-up including:				

• Supply / install herbicide treatment over the grassed development area, leave for up to seven days to ensure adequate chemical reaction; then carry out surface rotavation / flail mow in preparation for surfacing stripping works.	71	M2	£	£
• Strip the existing grass and topsoil and transition layer materials from the development area (150mm average thickness) to expose the underlying strata / near surface geology.	71	M2	£	£
• Undertake balanced cut and fill / trimming / grading to the exposed sub-grade materials and full consolidation / compaction of the prepared surface to produce an even formation level with reduced levels accurately below designated proposed levels. All groundwork's shall be laid to produce the following workmanship quality: <u>General operations</u> • All materials to be prepared in accordance with in accordance with MCHW – Volume 1 – SHW Series 600. It is anticipated that River Terrace deposits will be classified as class 2A in accordance with the specification (table 6/1) and recommend the material used as a fill be compacted in accordance with table 6/3. • All materials disturbed during this process should be replaced in layers no greater than 150mm thick and must be fully compacted and consolidated to ensure no future settlement or subsidence. • The use of vibratory compaction techniques shall be avoided. Instead, consideration should be given to the use of dead weight / smooth drum rollers only or similar. • The formation surface shall be compacted using smooth drum rollers to ensure full compaction and consolidation to ensure no future settlement or subsidence. • The formation shall be free from mud or slurry and will have no areas of freestanding water. • Any loose, fragmented or soft materials shall be removed and re-packed with crushed rock, free from detritus material, in accordance with in accordance with MCHW – Volume 1 – SHW Series 600. • Any replacement aggregate shall consist of Type 3 open-graded unbound (SHW Series 800) aggregate to comply with BSEN 13285: 2003: Unbound Mixtures – Specification and EN 13242. This aggregate must be virgin-quarried, consist of Granite / porphritic andesite / basalt / hard limestone or equal material type, free-draining, hard, irregular, crushed and frost resistant. It shall contain 30% voids (minimum) in order to provide water storage capacity. <u>Adverse weather conditions</u> • Cut and fill and re-grading operations shall be carried out when sub soil is below its plastic limit. <u>Accuracy</u>	14	M3	£	£

• The formation surface shall be graded such that there are no deviations >25mm beneath a 3m straight edge, relative to design levels. • The formation surface shall be trimmed to a tolerance of no more than ±10 mm deviation relative to design levels. • The formation surface shall form a smooth transition with adjacent ground (hard standing spectator walkways).				
Carry out ground works to produce a formation level to support the construction make-up including: • Supply / install herbicide treatment over the grassed development area, leave for up to seven days to ensure adequate chemical reaction; then carry out surface rotavation / flail mow in preparation for surfacing stripping works. • Strip the existing grass and topsoil and transition layer materials from the development area (200mm average thickness) to expose the underlying strata / near surface geology. • Undertake balanced cut and fill / trimming / grading to the exposed sub-grade materials and full consolidation / compaction of the prepared surface to produce an even formation level with reduced levels accurately below designated proposed levels. • Carry out Californian Bearing Ratio (CBR) testing or similar to six (3no.) different areas of prepared and drained formation level to ensure the formation level has achieved adequate compaction with a CBR rating of >5% and provide published results upon completion of testing. All groundwork's shall be laid to produce the following workmanship quality: <u>General operations</u> • All materials to be prepared in accordance with in accordance with MCHW – Volume 1 – SHW Series 600. It is anticipated that River Terrace deposits will be classified as class 2A in accordance with the specification (table 6/1) and recommend the material used as a fill be compacted in accordance with table 6/3. • All materials disturbed during this process should be replaced in layers no greater than 150mm thick and must be fully compacted and consolidated to ensure no future settlement or subsidence. • The use of vibratory compaction techniques shall be avoided. Instead, consideration should be given to the use of dead weight / smooth drum rollers only or similar. • The formation surface shall be compacted using smooth drum rollers to ensure full compaction and consolidation to ensure no future settlement or subsidence. • The formation shall be free from mud or slurry and will have no areas of freestanding water.	1478 1478 296 1	M2 M2 M3 Item	£ £ £ £	£ £ £ £

• Any loose, fragmented or soft materials shall be removed and re-packed with crushed rock, free from detritus material, in accordance with in accordance with MCHW – Volume 1 – SHW Series 600. • Any replacement aggregate shall consist of Type 3 open-graded unbound (SHW Series 800) aggregate to comply with BSEN 13285: 2003: Unbound Mixtures – Specification and EN 13242. This aggregate must be virgin-quarried, consist of Granite / porphritic andesite / basalt / hard limestone or equal material type, free-draining, hard, irregular, crushed and frost resistant. It shall contain 30% voids (minimum) in order to provide water storage capacity. <u>Adverse weather conditions</u> • Cut and fill and re-grading operations shall be carried out when sub soil is below its plastic limit. <u>Accuracy</u> • The formation surface shall be graded such that there are no deviations >25mm beneath a 3m straight edge, relative to design levels. • The formation surface shall be trimmed to a tolerance of no more than ±10 mm deviation relative to design levels. • The formation surface shall form a smooth transition with adjacent ground (hard standing spectator walkways).				
Supply and install 170 linear metres of 100mm diameter ducting with 4no. duct boxes / draw pits: • Ducting shall be installed underground to a minimum depth of 450mm below ground cover and covered with warning marker tape and sand marker layer. • Ducting shall be laid on a 50mm sand bed and buried in pea shingle before the makeup material is back filled. • Draw pits sized 450 x 450 x 450mm shall be installed at each corner and all changes in direction. They shall be pre-formed and have lockable recessed covers. • Draw cords are to be left in situ in all ducts before and after the drawing through of cables • Draw pits shall be installed prior to the installation of the ducting. Where stacked plastic sectional draw pits are used, duct entries shall be drilled to avoid weakening the structure	1	Item	£	£
Grub-out all vegetation (predominantly weed) including roots from entire pitch perimeter. Supply and apply proprietary residual herbicide treatment to the entire surface and development areas. During this process, protect surrounding grassed and vegetation areas from damage by the herbicide treatment. <u>Please note</u>	1	Item	£	£

The use of pesticides (inc. Herbicide treatments) is covered by various pieces of legislation primarily The Food and Environment Protection Act 1985 (FEPA), Control of Pesticides Regulations 1986 (COPR) and The Control of Substances Hazardous to Health Regulations 1988(COSHH). Only approved products may be used and a Certificate of Competence must be held for all persons applying pesticides (e.g. National Proficiency Test Council (NPTC) PA1, PA2, etc...) and those advising on pesticide use should be registered with BASIS (British Agrochemical Standards Inspection Scheme). Dispose of all arisings generated during the above works repsonsibly at a registered tipping site or similar. Make good disturbed ground.				
Drainage works				
To designated areas, supply and install: • 100mm Ø UPVC perforated corrugated plastic carrier drainage pipes to EN1401-1:1998 laid into geotextile lined, gravel-filled trenches beneath the green ditch. The Ditch is to be backfilled with clean drainage shingle up to the required 160mm lipped kerb edging detail without the rubber infill placed.	153	m.lin	£	£
• 80mm Ø UPVC perforated corrugated plastic carrier drainage pipes to EN1401-1:1998 laid into geotextile lined, gravel-filled trenches. Installed laterally over green footprint at 10.00m centres.	117	m.lin	£	£
• Supply and lay heavy duty black rubber matting supplied in 300mm by 910mm fully interlocking sections or similar approved system **(technical details shall be submitted within the tender submission).**	153	m.lin		
• Allow for connecting any / all existing land drains uncovered, exposed or severed as a result of groundwork's into the new drainage system with proprietary junctions as required	1	Item	£	£
The system shall consist of 100 mm drains laid around the four sides of the green under the ditch channels with the highest point being approximately 150 mm to invert below formation level and graded uniformly with a fall in both directions towards the connection point where the system shall connect into the existing surface water drainage outfall. The perforated plastic drain pipes shall be to BS 4962:1989 and of sizes shown on Drawing and all joints in the line of drains shall be made with purpose made connectors, by slotting or by other approved means according to the type of pipe. End stops shall be provided to seal open ends and all connections between pipes shall be formed with purpose made junctions of appropriate sizes. Purpose made bends shall be used at ditch corners. Drain trenches shall be minimum 125 mm wide to allow easy laying of pipes. The trench bottom shall be shaped to bed, fit and secure the pipes centrally at the required invert depths. <u>Materials generally</u> Conforming to EN1401-1:1998.				

UPVC pipe shall comply with the requirements of BS4514-1 and BS EN 1329-1 and be Kitemarked certified and/or produced to any other relevant current British or European Standards. All other drainage materials shall be manufactured in accord with the current British and European Standards. All proprietary drainage systems shall have an Agreement or comparable certification and shall be installed strictly in accordance with the manufacturer's requirements. <u>Installation generally</u> Trenches to be sized 200mm wide minimum. Trenches to extend 175mm deep minimum below formation level. Trenches to lower to a sufficient depth at connections with Ics. Trenches must be laid to consistent and even gradients Carrier drainage pipes to be placed onto 25mm minimum gravel bedding. Trenches to be completely back-filled with clean, angular, hard gravel with no fines and evenly graded 5/20mm. Gravel to be fully compacted and consolidated to prevent any future settlement. Trenches to be lined with a proprietary geotextile membrane. All geotextile joints should be overlapped by a minimum of 300mm. The membrane shall be a non-woven type and shall contain a minimum tensile strength of 20kN/m when tested in accordance with BS EN ISO 10319. The membrane shall contain static puncture strength of at least 2.0KN when tested in accordance with BS EN ISO 12236. <u>Accuracy</u> Workmanship and materials shall be such as to ensure the adequate function of the drainage system through its design life if properly maintained and operated. The contractor shall be responsible for coordinating the drainage systems with adjacent services and sub-structures as required. On completion of the works the contractor will carry out inspections and tests in accordance with BS EN 1610 and supply the results of such tests and inspections.				
Base Works				
Over the entire development areas, supply and install: • A proprietary geotextile membrane directly over the prepared and drained formation level to be occupied by the pitch and hard standing areas. All joints should be overlapped by a minimum of 300mm.	1844	M2	£	£

The membrane shall be a non-woven type and shall contain a minimum tensile strength of 20kN/m when tested in accordance with BS EN ISO 10319. The membrane shall contain a static puncture strength of at least 2.0KN when tested in accordance with BS EN ISO 12236.				
Over the entire Bowls Green area, supply and install: • ABGRID 30/30 Biaxial Geogrid directly over the geotextile covered formation level to be occupied by the pitch and hard standing areas. All rolls to be overlapped as per recommended installation instructions. Supplied by ABG Ltd or equal approved.	1444	M2	£	£
Supply and install 900mm x 900mm x 50mm hydraulic pressed pre-cast concrete (PCC) paving slabs, laid on edge and complying with the requirements of BS 7263-1 providing a clear 400mm retaining edge detail laid vertically with precision. Provide and secure in position artificial grass as backing sheet to ditch units using adhesive recommended by the supplier. All edgings shall be laid on a suitable concrete bed and haunch (GEN0 or Standard mix ST1 or similar as recommended) in accordance with BS EN 206-1: Specification, performance, production and conformity of concrete, BS 5328-1, 2, 3 & and BS 8500-1, 2 and BS EN 206-1. All edgings shall be installed to produce the following workmanship qualities: <u>Cutting</u> Neat, accurate and without spalling. Form neat junctions. <u>Bedding of units</u> Position true to line and level along top and front faces, in a mortar bed on accurately cast foundations. The concrete bed and haunch should be sized 550mm wide by 550mm deep minimum throughout, plus supplementary concrete for extended haunches to accommodate the new levels. All exposed concrete haunches should be installed with a smooth trowelled finish. Concrete haunches will be finished level against retaining walls where appropriate. <u>Securing of units</u> All concrete to be installed onto well-compacted granular sub-base. After bedding has set, secured with a continuous haunching of concrete. <u>Adverse weather conditions</u> Do not construct if the temperature is below 3°C on a falling thermometer or 1°C on a rising thermometer. Adequately protect	156	m.lin	£	£

foundations, bedding and haunching against frost and rapid drying by sun and wind. Accuracy All edgings to be laid to a consistent line and level to match proposed levels. Level: ± 6 mm. Horizontal and vertical alignment: 3mm in 3m.				
Supply and install 300 x 50 x 914mm hydraulic pressed pre-cast concrete (PCC) edging kerbs complying with the requirements of BS 7263-1 providing a clear 150mm retaining edge detail laid vertically with precision. Provide and secure in position artificial grass as backing sheet to ditch units using adhesive recommended by the supplier. All edgings shall be laid on a suitable concrete bed and haunch (GEN0 or Standard mix ST1 or similar as recommended) in accordance with: • BS EN 206-1: Specification, performance, production and conformity of concrete, BS 5328-1, 2, 3 & and BS 8500-1, 2 and BS EN 206-1. All edgings shall be laid to produce the following workmanship quality: Cutting • Neat, accurate and without spalling. • Form neat junctions. Bedding of units • Position true to line and level along top and front faces, in a mortar bed on accurately cast foundations. • The concrete bed and haunch should be sized 300mm wide by 150mm deep minimum throughout for 150 x 50mm edgings. • The concrete bed and haunch should be sized 500mm wide by 500mm deep minimum throughout for 900 x 900mm slabs. Securing of units • All concrete to be installed onto well-compacted granular sub-base. • After bedding has set, secure with a continuous haunching of concrete. • All concrete haunches to be finished with smooth floated finish set at 45° angle. Adverse weather conditions • Do not construct if the temperature is below 3°C on a falling thermometer or 1°C on a rising thermometer. Adequately protect foundations, bedding and haunching against frost and rapid drying by sun and wind. Accuracy	152	m.lin	£	£

• All edgings to be laid to a consistent line and level to match proposed levels. • Level: ± 6 mm. • Horizontal and vertical alignment: 3mm in 3m.				
Supply and install 150 x 50 x 914mm hydraulic pressed pre-cast concrete (PCC) edging kerbs complying with the requirements of BS 7263-1. All edgings shall be laid on a suitable concrete bed and haunch (GEN0 or Standard mix ST1 or similar as recommended) in accordance with: • BS EN 206-1: Specification, performance, production and conformity of concrete, BS 5328-1, 2, 3 & and BS 8500-1, 2 and BS EN 206-1. All edgings shall be laid to produce the following workmanship quality: <u>Cutting</u> • Neat, accurate and without spalling. • Form neat junctions. <u>Bedding of units</u> • Position true to line and level along top and front faces, in a mortar bed on accurately cast foundations. • The concrete bed and haunch should be sized 300mm wide by 150mm deep minimum throughout for 150 x 50mm edgings. • The concrete bed and haunch should be sized 500mm wide by 500mm deep minimum throughout for 900 x 900mm slabs. <u>Securing of units</u> • All concrete to be installed onto well-compacted granular sub-base. • After bedding has set, secure with a continuous haunching of concrete. • All concrete haunches to be finished with smooth floated finish set at 45° angle. <u>Adverse weather conditions</u> • Do not construct if the temperature is below 3°C on a falling thermometer or 1°C on a rising thermometer. Adequately protect foundations, bedding and haunching against frost and rapid drying by sun and wind. <u>Accuracy</u> • All edgings to be laid to a consistent line and level to match proposed levels. • Level: ± 6 mm. • Horizontal and vertical alignment: 3mm in 3m.	193	m.lin	£	£
To the surrounding pathways supply and install a minimum 150mm layer when compacted of primary Type 1 unbound sub-base to produce a lower pitch base; (SHW 800 Series / Clause 803) to comply with BSEN 13285: 2003: Unbound Mixtures – Specification and EN 13242).	330	M2	£	£

This aggregate must be:

- Consist of granite / quartzite / porphritic andesite / unweathered basalt / hard limestone or equal material type
- Free-draining
- Non-plastic
- Interlocking
- Contain hard physical properties
- Resistant to fragmentation (LA 30 – 35)
- Irregular shaped
- Crushed at source
- Non-frost susceptible if used within 450mm of the designed final surface or 350 mm if the Mean Annual Frost Index (MAFI) of the site is less than 50

Summary of Grading Requirements for Type 1 (open graded) Unbound Mixtures

Sieve size, mm	Percentage by mass passing
	Overall grading range
63	100
31.5	75 - 99
16	43-81
8	23-66
4	12-53
2	6-42
1	3-32
0.063	0-9
Grading of individual batches – differences in values passing selected sieves	
Retained sieve size, mm	Passing sieve size, mm
8	16
4	8

All filling works shall be installed to produce the following workmanship qualities:

Materials generally

- Not less than two weeks before starting work provide an onsite sample for inspection and approval and confirm the name(s) of all supplier(s) and certification of compliance for the aggregate material.

- At the time of delivery submit a test certificate for each delivery batch, certifying compliance with this specification and the relevant standard.

General operations

- All materials to be installed in accordance with in accordance with MCHW – Volume 1 – SHW Series 600.

- All materials to be installed in layers no greater than 150mm thick and must be fully compacted and consolidated to ensure no future settlement or subsidence.

Accuracy

- The finished surface shall be graded such that there are no deviations ≥10mm beneath a 3m straight edge at any position and in any direction.

<table>
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- The finished surface shall be trimmed to a tolerance of no more than ±10 mm deviation relative to design levels.

<u>Performance</u>

- The installed lower base shall have a compacted density of 95% of the maximum dry density when tested in accordance with BS5835 and have a CBR of 30% when tested using a BS 1377 plate test.
- Upon completion, there shall be no detectable movement under the roller used to compact the surface.

Given that remedial action is extremely difficult to execute on all types of playing surfaces, extreme care must be taken in the construction of the bases to avoid consolidation or settlement of the playing area

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To the area for the Bowls Green supply / install granular sub-base a minimum depth of 200mm layer when compacted of granular sub-base to produce a lower pitch base; consisting of Type 3 unbound (SHW 800 Series / Clause 805) to comply with BSEN 13285: 2003: Unbound Mixtures – Specification and EN 13242).

This aggregate must be:

- Virgin-quarried (primary aggregate)
- Consist of granite / quartzite / porphritic andesite / unweathered basalt / hard limestone or equal material type
- Free-draining
- Non-plastic
- Interlocking
- Contain hard physical properties
- Resistant to fragmentation (LA 30 – 35)
- Irregular shaped
- Crushed at source
- Containing30% voids (minimum) in order to provide adequate water attenuation and percolation>500mm/hr
- Non-frost susceptible if used within 450mm of the designed final surface or 350 mm if the Mean Annual Frost Index (MAFI) of the site is less than 50

<u>Summary of Grading Requirements for Type 3 (open graded) Unbound Mixtures</u>

<table>
<tr><td>Sieve size, mm</td><td>Percentage by mass passing
Overall grading range</td></tr>
<tr><td>80
40
20
10
4
2
1
0.500
0.063</td><td>100
80-99
50-78
31-60
18-46
10-35
6-26
0-20
0-5</td></tr>
<tr><td colspan="2">Grading of individual batches – differences in values passing selected sieves</td></tr>
<tr><td>Retained sieve size, mm</td><td>Passing sieve size, mm</td></tr>
<tr><td>10
4
2
1</td><td>20
10
4
2</td></tr>
</table>

</td>
<td>1444</td>
<td>M2</td>
<td>£</td>
<td>£</td>
</tr>
</table>

All filling works shall be installed to produce the following workmanship qualities: <u>Materials generally</u> • Not less than two weeks before starting work provide an onsite sample for inspection and approval and confirm the name(s) of all supplier(s) and certification of compliance for the aggregate material. • At the time of delivery submit a test certificate for each delivery batch, certifying compliance with this specification and the relevant standard. <u>General operations</u> • All materials to be installed in accordance with in accordance with MCHW – Volume 1 – SHW Series 600. • All materials to be installed in layers no greater than 150mm thick and must be fully compacted and consolidated to ensure no future settlement or subsidence. <u>Permeability</u> • The finished surface shall contain permeability of >500 mm/hour (measurements to be 21ormalized to a water temperature of 10°C to allow for temperature dependent changes in viscosity). <u>Accuracy</u> • The finished surface shall be graded such that there are no deviations ≥10mm beneath a 3m straight edge at any position and in any direction. • The finished surface shall be trimmed to a tolerance of no more than ±10 mm deviation relative to design levels. <u>Performance</u> • The installed lower pitch base shall have a compacted density of 95% of the maximum dry density when tested in accordance with BS5835 and have a CBR of 30% when tested using a BS 1377 plate test. • Upon completion, there shall be no detectable movement under the roller used to compact the surface. • Given that remedial action is extremely difficult to execute on all types of playing surfaces, extreme care must be taken in the construction of the bases to avoid consolidation or settlement of the playing area.				
To the bowls green, supply and install: ▪ Open textured (porous) macadam base layer and wearing course. Comprising: 40mm consolidated thickness of either 0/10mm, 0/14mm or 0/20mm sized aggregate open textured macadam base course containing granite / basalt / quartz / hard limestone or an equal approved alternative free-draining, hard, irregular, crushed and frost resistant material.	1444	M2	£	£

25mm consolidated thickness of 0/10mm sized aggregate open textured macadam wearing containing granite / basalt / quartz / hard limestone or an equal approved alternative free-draining, hard, irregular, crushed and frost resistant material. Installation generally **In accordance with:** World Bowls Performance Standards for Flat Green Bowls Surfaces BS 4987: Part 1: 2005: Coated macadam (asphalt concrete) for roads and other paved areas – Part 1: Specification for constituent materials and for mixtures, also Part 2: Specification for transport, laying and compaction. BS EN 13108-1: 2006 – Bituminous mixtures – Material specifications – Part 1: Asphalt Concrete. BS EN 13036-7: Irregularity measurement of pavement courses. Not less than two weeks before starting work submit to the name(s) of all supplier(s) of bituminous material. At the time of delivery submit a test certificate for each manufacturing batch of bituminous material, certifying compliance with this specification and the relevant standard and giving complete information on the composition of each mix. Transportation Macadam material is to be transported from the manufacturing plant to the site in clean insulated vehicles and protected against adverse weather conditions to minimise loss of heat. The material is to arrive on site at a minimum temperature set out in BS 4987 pt 2 Table 4 and be in a condition suitable for spreading and compacting. Any material outside this range of temperature will be rejected. Advice notes of material for each consignment delivered to site must be available for inspection. The macadam when tipped from the vehicle to be covered with tarpaulins to maintain to temperature. Acceptance of sub-base Before starting work ensure that: The base is sound, free of debris, mud and soft spots, and suitably close textured. The levels and falls of the sub-base are as detailed, within the specified tolerance <3mm over a 3m straight edge and 2mm over a 2m straight edge. Kerbs and edgings are complete, adequately bedded and haunched and to the required levels. Abutments Clean and paint with a thin uniform coating of bitumen all edges of manholes, kerbs and other abutments.				

Laying generally Remove all loose material, foreign matter and standing water from surfaces to receive paving materials. Form neat junctions with and prevent damage to adjacent work. Keep clean all channels, kerbs, inspection covers etc… Keep new paving free from traffic until it has cooled to prevailing atmospheric temperature. Do not allow rollers to stand on paving at any time. Do not use paving as a building platform or for storing, mixing or preparing materials. Lines and levels of finished surface to be smooth and even, with regular falls to prevent ponding. Finished surface of paving to have an even overall texture. Adverse weather conditions Do not use frozen materials or lay paving on frozen or ice covered surfaces. Do not lay coated macadam if the temperature of the laying surface is below 2°C (or -1°C on a rising thermometer). Do not lay rolled asphalt if the temperature of the laying surface is below 5°C or the air temperature is below 0°C. Protection No vehicular traffic is to be allowed to cross or stand on any footpaths or play areas after completion of surfacing. Cutting back Cut back macadam to specified widths at junction of new and old work, around cover frames and gullies, dress new macadam to existing, apply application of bitumen emulsion as previously described where instructed. Permeability The finished surface shall contain permeability of >500 mm/hour (measurements to be normalised to a water temperature of 10°C to allow for temperature dependent changes in viscosity). Accuracy The finished surface regularity shall be finished no deviations: • <3mm above or below 3m straight edge • ≤2mm above or below 2m straight edge The finished surface shall be to a tolerance of no more than ±10mm deviation relative to design levels. Step-like irregularities between joints shall be no greater than 1mm in height. Surface imperfections such as fissures, excessive textural variation, bubbles, delamination, etc., shall not be acceptable.				

There shall be no ridges or bay joints that result in erratic ball behaviour.				
To the surrounding pathways and designated areas (adjoining surrounds), supply and install: ▪ Open textured (porous) macadam base layer and wearing course. Comprising: 40mm consolidated thickness of either 0/10mm, 0/14mm or 0/20mm sized aggregate open textured macadam base course containing granite / basalt / quartz / hard limestone or an equal approved alternative free-draining, hard, irregular, crushed and frost resistant material. 25mm consolidated thickness of 0/6mm sized aggregate open textured macadam wearing containing granite / basalt / quartz / hard limestone or an equal approved alternative free-draining, hard, irregular, crushed and frost resistant material. <u>Installation generally</u> In accordance with: BS 4987: Part 1: 2005: Coated macadam (asphalt concrete) for roads and other paved areas – Part 1: Specification for constituent materials and for mixtures, also Part 2: Specification for transport, laying and compaction. BS EN 13108-1: 2006 – Bituminous mixtures – Material specifications – Part 1: Asphalt Concrete. BS EN 13036-7: Irregularity measurement of pavement courses. Not less than two weeks before starting work submit to the name(s) of all supplier(s) of bituminous material. At the time of delivery submit a test certificate for each manufacturing batch of bituminous material, certifying compliance with this specification and the relevant standard and giving complete information on the composition of each mix. <u>Transportation</u> Macadam material is to be transported from the manufacturing plant to the site in clean insulated vehicles and protected against adverse weather conditions to minimise loss of heat. The material is to arrive on site at a minimum temperature set out in BS 4987 pt 2 Table 4 and be in a condition suitable for spreading and compacting. Any material outside this range of temperature will be rejected. Advice notes of material for each consignment delivered to site must be available for inspection. The macadam when tipped from the vehicle to be covered with tarpaulins to maintain to temperature. <u>Acceptance of sub-base</u> <u>Before starting work ensure that:</u>	330	M2	£	£

The base is sound, free of debris, mud and soft spots, and suitably close textured. The levels and falls of the sub-base are as detailed, within the specified tolerance <10mm. Kerbs and edgings are complete, adequately bedded and haunched and to the required levels. <u>Abutments</u> Clean and paint with a thin uniform coating of bitumen all edges of manholes, kerbs and other abutments. <u>Laying generally</u> Remove all loose material, foreign matter and standing water from surfaces to receive paving materials. Form neat junctions with and prevent damage to adjacent work. Keep clean all channels, kerbs, inspection covers etc… Keep new paving free from traffic until it has cooled to prevailing atmospheric temperature. Do not allow rollers to stand on paving at any time. Do not use paving as a building platform or for storing, mixing or preparing materials. Lines and levels of finished surface to be smooth and even, with regular falls to prevent ponding. Finished surface of paving to have an even overall texture. <u>Adverse weather conditions</u> Do not use frozen materials or lay paving on frozen or ice covered surfaces. Do not lay coated macadam if the temperature of the laying surface is below 2°C (or -1°C on a rising thermometer). Do not lay rolled asphalt if the temperature of the laying surface is below 5°C or the air temperature is below 0°C. <u>Protection</u> No vehicular traffic is to be allowed to cross or stand on any footpaths or play areas after completion of surfacing. <u>Cutting back</u> Cut back macadam to specified widths at junction of new and old work, around cover frames and gullies, dress new macadam to existing, apply application of bitumen emulsion as previously described where instructed. <u>Permeability</u> The finished surface shall contain permeability of >500 mm/hour (measurements to be normalised to a water temperature of 10°C to allow for temperature dependent changes in viscosity). <u>Accuracy</u>				

The finished surface regularity shall be finished no deviations: • <10mm above or below 3m straight edge • ≤3mm above or below 300mm straight edge The finished surface shall be to a tolerance of no more than ±10mm deviation relative to design levels. Step-like irregularities between joints shall be no greater than 1mm in height. Surface imperfections such as fissures, excessive textural variation, bubbles, delamination, etc., shall not be acceptable. There shall be no ridges or bay joints that result in erratic ball behaviour.				
Please Note: The purpose of the granular sub-base for any artificial sports pitch is to provide a resilient substrate onto which the playing surface system can be installed. The principal qualities associated with satisfactory base construction include: • Resistance to the effects of frost or drought that may be expected to occur in a return cycle of once every fifty years. • Adequate stability that it does not move outside the tolerances for surface regularity over a period of seven years (minimum) and to resist deformation, settlement or subsidence over several life cycles of the pitch. • Capability for supporting and transmitting to the underlying substrate the loads of all vehicles, plant, machines and playing surface construction to be used during the construction and the maintenance and refurbishment of the facility throughout its functioning life. • Sufficient vertical percolation and water volume storage to prevent standing water during normal and critical precipitation in combination with the playing surface and drainage system. • Adequate resilience, evenness and smoothness to support the initial and subsequent artificial turf life cycles.	Note			
Carry forward to Pricing Summary				£
Playing Surfaces				
Prior to the laying of the surface include for independently testing and checking the finished base system for WB compliance by a credited test house with regard to dimensions, regularity, deviation from design level, and porosity. The costs shall include for any down time required before the results can be formally received in writing before works can continue. If any defects or alterations are required then all shall be completed and checked via the independent test house continually until the works have been signed off with no additional charge to the client.	1	Item	£	£
Please note	1444	M2	£	£

This is a Contractor's Design Proportion (CDP) item. Design, supply and install performance underlays and surfacing to the entire area. <u>Compliance</u> Performance underlays and surfacing must form part of a current ECB approved non-turf pitch system. The surfacing must be of a current proven World Bowls approved non-turf system from a proven supplier and manufacturer with accredited testing. The surfacing shall comply with Clauses 6.1 to 6.5 of this Standard as appropriate. Unless indicated by the manufacturer or supplier, the surfacing shall meet the appropriate parameters in all climatic conditions in which it may reasonably be expected to be used. In countries in which surfacing could be expected to be damp for significant periods of the year, tests shall be carried out on damp areas. In countries in which the surfacing could be expected to be dry for significant periods of the year, tests shall be carried out on dry areas. Note: World Bowls or their accredited laboratories shall determine in advance of testing which surface condition should apply. Before commencement of verification tests a facility should be maintained in accordance with the supplier's detailed procedures to the satisfaction of the supplier and facility owners/users. Greens shall be tested in locations detailed in each test method. If the results obtained are variable or border-line, the test officers shall use their discretion and select additional field locations to evaluate the whole green's ability to comply with this Standard. If a green is only designed to be used in two opposing directions the test locations for Green Speed and Draw shall be adjusted accordingly. If an installation is not designed as a full green but only comprises one or more rinks, each rink shall be assessed in the directions of play as appropriate. <u>Green Speed</u> The Green Speed of the surface when measured in accordance with Test Method WBB-01 shall be in the acceptable World Bowls competition range of 10s and 18s. The Green Speed obtained in each test location shall be within ±0.5s of the mean Green Speed. For carpet-based systems the test location is limited to the direction of tournament play which is across the seams. On a carpet-based system the Green Speed obtained from the tournament direction locations shall be ±0.5s of the mean Green Speed. It is up to each Club and installer to decide what speed is appropriate dependent on the level (international, national or Club level events) of use required and the expectations of the end users (i.e. the bowlers). <u>Surface Draw</u> The maximum Draw, when measured in accordance with Test Method WBB-02, of surfaces having Green Speeds in the range of				

10s to 14s shall be greater than 750mm, whilst the maximum Draw on surfaces having Green Speeds in excess of 14.1s shall be greater than 1000mm. The maximum difference between pairs of left and right maximum Draws shall be less than 40%. <u>Surface Evenness</u> Undulations found on the surface shall be no greater than 3mm, when measured using a 3m straight-edge in accordance with Test Method WBB-03. Undulations of up to 6mm are permissible providing they do not affect the trajectory of a bowl, particularly as it rolls slowly. Undulations greater than 6mm should not occur anywhere on the Green. <u>Surfacing</u> A world bowls approved surfacing system of the following construction and nature by an approved manufacturer and supplier ***<u>(technical details shall be submitted within the tender submission for the surface and underlay / shock pad system along with full details on life span, warranty and maintenance requirements):</u>*** • 'Tufted' synthetic turf, generally sand-filled; • Woven mat or carpet; • Needle-punch carpet. The surface shall be uniform throughout and when a ball is run across the surface it must not bobble, deviate or bounce significantly, which would make fielding on the area dangerous or detract from the practice or skill of the participant. The surface shall be of a uniform colour throughout. The surfaces shall be joined by seaming together with appropriate materials that do not form a lip or detract from the playing performance of the facility. No seams shall be located in the "bowling delivery area", "the popping creases" or "the pitch of the ball area". A drawing indicating the layout of the underlay and the surfacing material shall be provided as part of the submission showing clearly the layout of the components and the seams. All seams shall have a 100mm fixing on either side of the backing tape. Note: 1. The design level of any point within a green should be referred to a temporary bench mark. 2. Finished levels should be checked against design levels by taking levels referred to the temporary benchmark on a 2m grid. <u>Infiltration Rate</u> The green surfacing shall have an infiltration rate, at the time of construction, greater than 100mm/hr when tested in accordance with BS 7044 Section 2.5:1991 or WBB-04.				

The locations of test positions are shown in WBB-04. Such surfaces shall be designated 'Permeable'. The infiltration rate of greens over 12 months old shall be greater than 50mm/hr. Note: Comparative data between the two test procedures is not available. Test data from one procedure should not be compared with test data from the other. <u>Design Levels</u> The green shall be level. The finished level of the green shall not deviate from the design level when measured in accordance with recognised civil engineering practice, using an optical or laser level, by more than ±5mm. The difference in height between adjacent spot levels shall not be greater than 3mm. <u>Underlays</u> Supply and install an underlay / shock-pad to compliment the accredited system in place in order to assist in regulating speed and to make the green more comfortable for users as well as meeting the various performance criteria for the surface over its lifespan. Various forms of shock-pad can be used, from an integrated pad, where the manufacturer bonds the shockpad to the back of the turf carpet at the factory, to a roll-out pad, which is manufactured and laid separately to the carpet/ mat. There is also the potential for an in-situ pad, which is manufactured on site using a hot mix of rubber shred or crumbs, bound with polyurethane, although this technology is rarely used for lawn bowls. The type and construction / laying of the pad is a contractors design proportion in order to allow a compliant surfacing system in total. The nature of the shock-pad thickness will impact on green speed, and this should be considered when selecting an appropriate product. The underlay shall finish flush or on top of the edgings. The underlay shall be firmly fixed and seamed together, if required, and shall not move in service. Underlays shall be of uniform thickness throughout. From a health and safety perspective, the finished surface shall be above or laid over the top of the perimeter edgings. <u>Surface wrinkles, rucking, creases</u> When visually inspected, the entire area shall be free of wrinkles, rucking, creasing etc., or similar defects in the surface components. When newly constructed or where a new surface has been laid there will be no wrinkles during the defects liability period, ideally 12 months. The Supplier shall make the Employer aware of how to deal with wrinkles, rucks, creases and any other defects in the surfacing material should they occur no less than four months after handover. <u>Performance Detail</u>				

Detail on the construction materials, method, seams and technical installation of the artificial turf and underlay / shock pad shall be submitted within the tender.				
Supply and install painted markings along with peg / material or other features required to enable division of the green and immediate play in accordance with Laws of the Sport of Bowls Crystal Mark Third Edition and World Bowls Performance Standards for Flat Green Bowls Surfaces – Test Methodology. ***Technical detail on the paint and materials used are required for the tender***	1	Item	£	£
Carry forward to Pricing Summary Sheet				£
Perimeter Ball-Stop Fencing				
To designated areas, supply and install: New perimeter ball-stop fencing and pitch perimeter barrier including gates to enable pedestrian access and also for maintenance equipment access to include: • Perimeter ball-stop fencing to 2m total height • Double-leaf gate sized 2m high x 3.00m wide. Material quality Standard resistance mesh panels consisting of 6mm diameter vertical wires and twin 8mm diameter horizontal wires forming a 200 x 50mm mesh to centres. Standard panel width to be 2.515m. Material quality All posts and panels formed from pre galvanised rolled steel and wire to BS EN ISO 1461 after fabrication and polyester powder coated to BS 6497. The finished colour shall be to RAL 6005 (dark green) including 20% minimum gloss. Gates shall be in-filled to suit the fence mesh (see above). Fencing and gates up to 3.00m high • Intermediates 80 x 40 x 3mm RHS • Internal corners 80 x 40 x 3mm RHS • External corners 80 x 80 x 3mm RHS (flanged to terminate panels) • Single leaf gate post 80 x 80 x 3mm RHS (flanged to terminate panels) • Double leaf gate post 100 x 100 x 3mm RHS (flanged to terminate panels) Continuous clamp bars • 40 x 6mm RSF	 50 1	 m.lin item	 £ £	 £ £

Black coloured plastic weather caps shall be fitted to the top of all posts where required. Neoprene rubber gaskets fitted to all post fixings to aid noise reduction, rattle and vibration from ball impacts. All fixings to include security domed headed bolts / screws, stainless steel washers and 'U brackets'. External ends of all fixings throughout the Respect spectator area to include decorative rubber grommets to a height of 2.0m. <u>Installation generally</u> In accordance with: BS EN 15312 EN 1991-1-4 BS1722 pt 14 BS EN 15312:2007+A1:2 To produce a consistent topping to the fencing, mesh panels should be clad onto posts with a slight taper as necessary. All fence mesh must be correctly secured within 'U brackets' by vertical wires forming the sides of every panel. Mesh to be fixed to posts with continuous clamp bars and anti-tamper fixings. Symmetrical post layout required at maximum 2.525m centres. Posts set into suitable concrete foundations (e.g. C20P or similar as recommended by the supplier) in accordance with BS EN 206-1 Specification, performance, production and conformity of concrete, BS 5328-1, 2, 3 & and BS 8500-1, 2. Foundation sizes shall be a minimum of 300mm x 300mm x 850mm (deep) for fencing up to 3.00m high Foundation sizes shall be a minimum of 400mm x 400mm x 1050mm (deep) for gates and fencing up to 4.50m high. Foundation sizes shall be a minimum of 400mm x 400mm x 1050mm (deep) for gates and fencing over 4.50m high or larger as recommended by the fencing supplier. *Foundation sizes are based on a ground pressure of no greater than 75kN/m sq. (medium to firm ground, cohesive clay soils). All sizes are indicative and must be clarified as suitable for installation onsite*. The bottom of fencing and gates shall be positioned 35mm above the ground level. The maximum gap between the face of the PCC kerb edgings (or similar) and adjacent perimeter fencing shall be 10mm. Gates shall be in-line with perimeter fencing. Gates shall be complete with a lockable slide latch. Gates shall include a removable lintel overhead as required.				

Gate hinges shall allow all gates to swing through 180°, to be integral to construction of gate and fully adjustable. Gates shall be complete with a centre gate stop, drop bolt clamp/s, hold open latch/es and drop bolt keep sheath/s suitably fixed at ground level. <u>General requirements and performance</u> Concrete foundation • Cement supplied to BS EN 197-1. • Ballast supplied to BS EN 12620. Post specification • Rolled hollow section to specified design manufactured to BS4848: Part 2 (1991). • Hot dip galvanised to BS EN ISO 1461 minimum Zinc Aluminium alloy coat weight of 275 gm/m2) giving high corrosion resistance. • If the product is coated then standard RAL colours to BS EN 13438 2005 applies (min thickness 120 microns). Mesh specification • The conformity for welded mesh rolls is as follows: • NF EN 10223-4 – Steel wire and wire products for fences and steel wire welded mesh fencing • NF EN 10016-1-2 – Non alloy steel rod for drawing and/or cold rolling. • NF EN 10244-2 – Non ferrous metallic coating on steel wire. • NF EN 10218-2 – Steel wire and wire products – wire dimensions and tolerances. • NF EN 10245-2 – Steel wire and wire products – organic coating on steel wire – pvc finished wire. • Plastic coated by fusion bonded method according to DIN 3036 Pt 2, and ASTM-F 688-88 Type Class 2B. Sundries • Fixings Drop forged cup square bolts to DIN603. • Hexagon nuts to DIN934. • Washers to BS4320. • Drop forged galvanised bolts to DIN603. • Washers to BS4320. • Cup square bolts and nylon locking nuts to DIN 934. • Neoprene gaskets no official standard available. • Panel connectors no official standard available. <u>Accuracy</u> All perimeter ball-stop fencing shall be installed to ensure that: All fencing and gates must be erected to a consistently even line and height consistent with the finished levels of and ensure that posts are on the outside of the playing surface and the mesh panels clad internally facing the playing surface and are positioned directly above the PCC edgings. The internal face of the fencing must be of a consistent line with no protrusions or sharp edges capable of causing injury to people.				

Maintenance Supply keys to tighten / remove panel fixings.				
Supply and install a 1.80m high windbreak, comprising of air-permeable plastic cover sheet made of polyethylene, approx. 200g/m2, UV-stabilised, with reinforced edging and lashing eyes every 0.50m, which provides a 70% density / wind stop speciation. The windbreak mesh is to be set 100mm from the ground level. The relevant fence posts to hold the additional windbreak mesh should be increased in specification after wind loading calculations have been carried out by the fabricator to determine fail rates. The windbreak material is to be coloured green.	50	m.lin	£	£
Carry forward to Pricing Summary				£
Reinstatement				
Dispose of all arisings (demolished concrete, fencing materials, hedgerow, etc…), spoils, surplus materials and general waste generated during the entire construction works described above works repsonsibly at a registered tipping site or similar.	1	Item	£	£
Remove the temporary hard-standing surface used as the site compound and site access.	1	Item	£	£
Remove all excavated grass, vegetation, Topsoil and Topsoil-like Made Ground described above (with the exception of material required for soil reinstatement works / soft landscaping) and dispose offsite repsonsibly at a registered tipping site or similar.	1	Item	£	£
Reinstate all natural ground affected by the works to fine grass and all remaining areas of shale / hard porous surfacing. All natural reinstatement works shall be implemented in accordance with BS 4428 Code of Practice for General Landscape Operations. • Import new top soil to tie the completed pitch into surrounding land. • Any and all gradients shall contain slopes no more acute than 1:3. • The ground shall be graded to smooth-flowing contours, avoiding any hollows. • The upper 150mm of any reinstatement shall be in topsoil. Below that, levels shall be formed using subsoil and spreading in layers not exceeding 150mm thick, lightly consolidating. The topsoil should not be consolidated. • The top soil should then be cultivated to a depth of 150mm, harrowed to produce a friable tilth, graded and stone picked to remove all stones or flints in excess of 25mm diameter. Other stones should be appropriately buried. • Areas to be reinstated should be prepared and seeded at an appropriate time with a general amenity mix (British Seed Houses or equivalent), sown at the rate of 250 kg/hectare. Sowing is to be preceded by an application of	1	Item	£	£

suitable pre-seed fertiliser in accordance with the manufacturer's instruction. • The Contractor will be responsible for the landscaped areas during establishment and will be responsible for the first two cuts. All cuttings to be collected and removed from the site. • The Contractor will be responsible for further seeding, herbicide treatment/s and stone removal and / or burying following the initial grass sward establishment. • All areas to be reinstated should be cordoned-off with 1.0m high barrier fencing mesh, coloured orange, erected using steel fencing pins or similar. This mesh should stay erected until the initial grass sward has fully established. • No payment shall be made for re-seeding if the seed fails for any reason whatsoever. He shall be required to make good until a reasonable sward is attained.				
Allow for: • Dismantling and removing from site the temporary security fencing. • Remove from site, storage facilities, site office, welfare facilities etc... • Clean / clear any hard standing surfaces affected by the works. • Leave site in a tidy condition acceptable to the client.	1	Item	£	£
Carry forward to Pricing Summary Sheet				£
Performance Testing				
On completion (and during the works where/when required) of the works undertake performance testing by an independent accredited test house to meet World Bowls Performance Standards for Flat Green Bowls Surfaces The test methodology shall be in accordance with: • 'World Bowls Performance Standards for Flat Green Bowls Surfaces – Test Methodology'. • WBB-01 Method of Test for the Determination of Green Speed • WBB-02 Method of Test for the Determination of Surface Draw • WBB-03 Method of Test for the Determination of Surface Evenness • WBB-04 Method of Test for the Determination of Infiltration Rate Using a Disc Permeameter • WBB-05 Wetting Procedure • WBB-06 Method of Test for the Determination of Surface Cushioning	1	Item	£	£
Carry forward to Pricing Summary Sheet				£

Contingency				
Allow for a 5% sum of construction costs above to be used or used in part as a contingency at the discretion of the Employer during the installation programme to cover unforeseen eventualities.	1	Item	£	£
Carry forward to Pricing Summary Sheet				£

Alternative / Optional Works

Alternative Base Option – As an alternative option to a macadam base layer please provide a cost for a dynamic base layer construction / capping layer to act as a regulatory layer before the installation of the shock pad underlay and surface				
Please note *This is a Contractor's Design Proportion (CDP) item.* Performance bases *Compliance* Performance bases must form part of a current World Bowls Performance Standards for Flat Green Bowls Surfaces. The depth of unbound or bound materials shall be in accordance with the approved system or systems used. *Bound mineral* Bonding agents, if used, can be any material provided it will last in service for no less than 10 years. The bonding agents must conform within the limits specified within current legislation. Where the base incorporates a bound structure, it shall conform to the following requirements: • Thickness: be of even thickness throughout, within the specified for structural quality. • Response to Climatic Change: must not breakdown or change its structure significantly. • Stability: must not move significantly. *Unbound Mineral* All materials must interlock and hold together when prepared as a supporting layer, either by the interlocking properties of the particles or as a result of finer particles bonding them together. Water should pass through the formation at no less than the requirements set in World Bowls Performance Standards for Flat Green Bowls Surfaces. *Upper Base* 3/10mm angular, interlocking, clean stone which when compact will allow water to pass through the structure at no less than World Bowls Performance Standards for Flat Green Bowls Surfaces. *Geo-Textiles (when used)*	1444	M2	£	£

Where used within the base structure, geo-textiles shall meet the requirements of the DOT Specifications for Highways Work - Clause 609: Geo-textile used to separate. Thickness of base materials The designed thickness + or – 10%. Permeability No less than 50 mm per hour. See also the World Bowls Performance Standards for Flat Green Bowls Surfaces. Performance Detail **Detail on the makeup, material types and depths of elements should be submitted as part of the quality assessment and scoring**				
Carry forward to Pricing Summary Sheet				**£**
Alternative Surfacing Option One – This should be utilised to offer a range of surfacing options for further discussion and selection. For instance if a tufted surface has been chosen in the main tender of works for budgetary reasons then a woven or needle punch surface option should be utilitised within this area				
Please note *This is a Contractor's Design Proportion (CDP) item.* Design, supply and install performance underlays and surfacing to the entire area. Compliance Performance underlays and surfacing must form part of a current ECB approved non-turf pitch system. The surfacing must be of a current proven World Bowls approved non-turf system from a proven supplier and manufacturer with accredited testing. The surfacing shall comply with Clauses 6.1 to 6.5 of this Standard as appropriate. Unless indicated by the manufacturer or supplier, the surfacing shall meet the appropriate parameters in all climatic conditions in which it may reasonably be expected to be used. In countries in which surfacing could be expected to be damp for significant periods of the year, tests shall be carried out on damp areas. In countries in which the surfacing could be expected to be dry for significant periods of the year, tests shall be carried out on dry areas. Note: World Bowls or their accredited laboratories shall determine in advance of testing which surface condition should apply. Before commencement of verification tests a facility should be maintained in accordance with the supplier's detailed procedures to the satisfaction of the supplier and facility owners/users. Greens shall be tested in locations detailed in each test method. If the results obtained are variable or border-line, the test officers shall use their discretion and select additional field locations to evaluate the whole green's ability to comply with this Standard.	1444	M2	£	£

If a green is only designed to be used in two opposing directions the test locations for Green Speed and Draw shall be adjusted accordingly. If an installation is not designed as a full green but only comprises one or more rinks, each rink shall be assessed in the directions of play as appropriate. <u>Green Speed</u> The Green Speed of the surface when measured in accordance with Test Method WBB-01 shall be in the acceptable World Bowls competition range of 10s and 18s. The Green Speed obtained in each test location shall be within ±0.5s of the mean Green Speed. For carpet-based systems the test location is limited to the direction of tournament play which is across the seams. On a carpet-based system the Green Speed obtained from the tournament direction locations shall be ±0.5s of the mean Green Speed. It is up to each Club and installer to decide what speed is appropriate dependent on the level (international, national or Club level events) of use required and the expectations of the end users (i.e. the bowlers). <u>Surface Draw</u> The maximum Draw, when measured in accordance with Test Method WBB-02, of surfaces having Green Speeds in the range of 10s to 14s shall be greater than 750mm, whilst the maximum Draw on surfaces having Green Speeds in excess of 14.1s shall be greater than 1000mm. The maximum difference between pairs of left and right maximum Draws shall be less than 40%. <u>Surface Evenness</u> Undulations found on the surface shall be no greater than 3mm, when measured using a 3m straight-edge in accordance with Test Method WBB-03. Undulations of up to 6mm are permissible providing they do not affect the trajectory of a bowl, particularly as it rolls slowly. Undulations greater than 6mm should not occur anywhere on the Green. <u>Surfacing</u> A world bowls approved surfacing system of the following construction and nature by an approved manufacturer and supplier ***<u>(technical details shall be submitted within the tender submission for the surface and underlay / shock pad system along with full details on life span, warranty and maintenance requirements):</u>*** • 'Tufted' synthetic turf, generally sand-filled; • Woven mat or carpet; • Needle-punch carpet. The surface shall be uniform throughout and when a ball is run across the surface it must not bobble, deviate or bounce significantly, which would make fielding on the area dangerous or detract from the practice or skill of the participant.				

The surface shall be of a uniform colour throughout. The surfaces shall be joined by seaming together with appropriate materials that do not form a lip or detract from the playing performance of the facility. No seams shall be located in the "bowling delivery area", "the popping creases" or "the pitch of the ball area". A drawing indicating the layout of the underlay and the surfacing material shall be provided as part of the submission showing clearly the layout of the components and the seams. All seams shall have a 100mm fixing on either side of the backing tape. Note: 1. The design level of any point within a green should be referred to a temporary bench mark. 2. Finished levels should be checked against design levels by taking levels referred to the temporary benchmark on a 2m grid. <u>Infiltration Rate</u> The green surfacing shall have an infiltration rate, at the time of construction, greater than 100mm/hr when tested in accordance with BS 7044 Section 2.5:1991 or WBB-04. The locations of test positions are shown in WBB-04. Such surfaces shall be designated 'Permeable'. The infiltration rate of greens over 12 months old shall be greater than 50mm/hr. Note: Comparative data between the two test procedures is not available. Test data from one procedure should not be compared with test data from the other. <u>Design Levels</u> The green shall be level. The finished level of the green shall not deviate from the design level when measured in accordance with recognised civil engineering practice, using an optical or laser level, by more than ±5mm. The difference in height between adjacent spot levels shall not be greater than 3mm. <u>Underlays</u> Supply and install an underlay / shock-pad to compliment the accredited system in place in order to assist in regulating speed and to make the green more comfortable for users as well as meeting the various performance criteria for the surface over its lifespan. Various forms of shock-pad can be used, from an integrated pad, where the manufacturer bonds the shockpad to the back of the turf carpet at the factory, to a roll-out pad, which is manufactured and laid separately to the carpet/ mat. There is also the potential for an in-situ pad, which is manufactured on site using a hot mix of rubber shred or crumbs, bound with polyurethane, although this technology is rarely used for lawn bowls. The type and construction / laying of the pad is a contractors design proportion in order to allow a compliant surfacing system in total. The nature of the shock-pad thickness will impact on green speed, and this should be considered when selecting an appropriate product.				

The underlay shall finish flush or on top of the edgings. The underlay shall be firmly fixed and seamed together, if required, and shall not move in service. Underlays shall be of uniform thickness throughout. From a health and safety perspective, the finished surface shall be above or laid over the top of the perimeter edgings. <u>Surface wrinkles, rucking, creases</u> When visually inspected, the entire area shall be free of wrinkles, rucking, creasing etc., or similar defects in the surface components. When newly constructed or where a new surface has been laid there will be no wrinkles during the defects liability period, ideally 12 months. The Supplier shall make the Employer aware of how to deal with wrinkles, rucks, creases and any other defects in the surfacing material should they occur no less than four months after handover. <u>Performance Detail</u> ***<u>Detail on the construction materials, method, seams and technical installation of the artificial turf and underlay / shock pad shall be submitted within the tender.</u>***				
Alternative Surfacing Option Two – This should be utilised to offer a range of surfacing options for further discussion and selection. For instance, if a tufted surface has been chosen in the main tender of works for budgetary reasons then a woven or needle punch surface option should be utilitised within this area				
<u>Please note</u> *This is a Contractor's Design Proportion (CDP) item.* Design, supply and install performance underlays and surfacing to the entire area. <u>Compliance</u> Performance underlays and surfacing must form part of a current ECB approved non-turf pitch system. The surfacing must be of a current proven World Bowls approved non-turf system from a proven supplier and manufacturer with accredited testing. The surfacing shall comply with Clauses 6.1 to 6.5 of this Standard as appropriate. Unless indicated by the manufacturer or supplier, the surfacing shall meet the appropriate parameters in all climatic conditions in which it may reasonably be expected to be used. In countries in which surfacing could be expected to be damp for significant periods of the year, tests shall be carried out on damp areas. In countries in which the surfacing could be expected to be dry for significant periods of the year, tests shall be carried out on dry areas. Note: World Bowls or their accredited laboratories shall determine in advance of testing which surface condition should apply. Before commencement of verification tests a facility should be maintained in accordance with the supplier's detailed procedures to the satisfaction of the supplier and facility owners/users.	1444	M2	£	£

Greens shall be tested in locations detailed in each test method. If the results obtained are variable or border-line, the test officers shall use their discretion and select additional field locations to evaluate the whole green's ability to comply with this Standard. If a green is only designed to be used in two opposing directions the test locations for Green Speed and Draw shall be adjusted accordingly. If an installation is not designed as a full green but only comprises one or more rinks, each rink shall be assessed in the directions of play as appropriate. <u>Green Speed</u> The Green Speed of the surface when measured in accordance with Test Method WBB-01 shall be in the acceptable World Bowls competition range of 10s and 18s. The Green Speed obtained in each test location shall be within ±0.5s of the mean Green Speed. For carpet-based systems the test location is limited to the direction of tournament play which is across the seams. On a carpet-based system the Green Speed obtained from the tournament direction locations shall be ±0.5s of the mean Green Speed. It is up to each Club and installer to decide what speed is appropriate dependent on the level (international, national or Club level events) of use required and the expectations of the end users (i.e. the bowlers). <u>Surface Draw</u> The maximum Draw, when measured in accordance with Test Method WBB-02, of surfaces having Green Speeds in the range of 10s to 14s shall be greater than 750mm, whilst the maximum Draw on surfaces having Green Speeds in excess of 14.1s shall be greater than 1000mm. The maximum difference between pairs of left and right maximum Draws shall be less than 40%. <u>Surface Evenness</u> Undulations found on the surface shall be no greater than 3mm, when measured using a 3m straight-edge in accordance with Test Method WBB-03. Undulations of up to 6mm are permissible providing they do not affect the trajectory of a bowl, particularly as it rolls slowly. Undulations greater than 6mm should not occur anywhere on the Green. <u>Surfacing</u> A world bowls approved surfacing system of the following construction and nature by an approved manufacturer and supplier ***<u>(technical details shall be submitted within the tender submission for the surface and underlay / shock pad system along with full details on life span, warranty and maintenance requirements):</u>*** • 'Tufted' synthetic turf, generally sand-filled; • Woven mat or carpet; • Needle-punch carpet.				

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