JENNER PARK

3G SYNTHETIC FOOTBALL PITCH DEVELOPMENT

3G SYNTHETIC FOOTBALL PITCH SPECIFICATION

S100  General Requirements
S200  Detailed Requirements – 3G Synthetic Football Pitch Works
S300  Detailed Requirements – Miscellaneous Items

APPENDICES

APPENDIX 1 - Table 6/4 – Highways Specification

24th September 2014
CONTENTS

3G SYNTHETIC FOOTBALL PITCH SPECIFICATION

S100  General Requirements
S200  Detailed Requirements – 3G Synthetic Football Pitch Works
S300  Detailed Requirements – Miscellaneous Items

APPENDICES

APPENDIX 1 – Table 6/4 – Highways Specification
120 THE WORKS

• Scope of Works

• Setting out
• Set up compound area
• Spray off topsoil with total herbicide
• Strip topsoil from pitch and remove from site
• Prepare hard standing area off pitch for goal storage and install gates to existing boundary fence
• Grade subsoil formation to crowned formation
• Remove inner most two lanes of the synthetic running track at the side of the new pitch
• Supply and install kerb edging to outer extent of 3G carpet
• Tie in area between kerbs and running track
• Reinstate running track where required
• Supply and install piped drainage system with lateral drains at 8.0m centres
• Supply and install silt traps and inspection chambers
• Supply and install geotextile over graded formation between drain lines
• Supply and install stone base to 350mm minimum depth
• Supply and install 40mm thick porous macadam layer
• Supply and install shockpad to minimum 20mm depth
• Supply and install FIFA 2 Star (40-50mm pile) carpet with sand and rubber infill.
• Employ FIFA accredited independent test house to undertake keystage tests during construction
• Reinstatement of any damage from plant and weather
• Reinstate compound area
• Undertake independent testing of installed carpet to FIFA 2 star standard.
WORKS INFORMATION - GENERAL

1.0 DESCRIPTION OF THE WORKS

1.1 Introduction

The project will include the development of 3G synthetic football pitch at Jenner Park Athletic stadium.

The works include the construction of:

- 1 No FIFA 2 Star 3G synthetic football pitch at Jenner Park.

1.2 3G Synthetic Football Pitch

General

It is proposed to develop this pitch on the site of the present natural turf football pitch.

The proposal is to develop the following facilities in this area:

- 1 No 100m by 64m (plus 3m 3G synthetic grass margins all round) FIFA 2 Star standard
- 3 No sets of mini-goals
- Socketed corner flags with club colours
- One set of fixed full size goals to be socketed
- 1 No 25Hp mini tractor with low ground pressure tyres
- 1 No Drag brush fitted with spring tines
- 1 No Ball-roll ramp.
2.0 CONTRACTOR'S DESIGN

2.1 General

The Contractor is required to undertake the design development of the tendered specification and drawings and will take design responsibility for all of the proposed Works.

The Contractor should be aware of the required programme for construction of the Works and establishment of the playing surfaces.

The work to be undertaken shall include the co-ordination, procurement, supply, fabrication, manufacturing, removal and delivery to site, assembly, installation, supervision, inspection, testing and commissioning of the completed systems and Works.

The Works shall include all associated preparation, temporary facilities plus temporary access and fencing where required and clearance of the site on completion, as well as initial turf maintenance to achieve the required finished standard. The Works shall include the following general items in support of the Works:

i) Provision of Design Development calculations and information
ii) Provision of Method Statements
iii) Provision of Risk Assessments
iv) Provision of Samples
v) Provision of product performance data where appropriate
vi) Provision of operating and maintenance manuals
vii) Protection of the works
viii) Site Clearance and cleaning
ix) Compliance with Health and Safety requirements

2.2 Pitch Contractor’s Design Responsibility

The Contractor shall provide detailed design development information and will be responsible for all design aspects, including but not limited to:

- 3G FIFA 2 Star football pitch
- All drainage
- Hard standing and goal storage areas
- Pitch surrounds and tie-in
- Earthworks
- Temporary site drainage and protection works

The tendering contractor should also take account of ground conditions in the design. Statutory Approvals shall be the responsibility of others but the Contractor will be expected to provide relevant information in respect of the proposed systems and procedures where appropriate.

The pitch contractors design shall be in accordance with the specification included in this document and the FAW Technical Guidance for Synthetic Turf Football. Where there are any differences in the two documents the FAW Technical Guidance for Synthetic Turf Football will not take preference.

2.3 General Performance Criteria

The performance criteria set out in the Contract Documents are applicable to the entire Works including all materials, components and sub-assemblies, and all junctions between it and interfacing building elements.

The criteria set out herein should be regarded as minimum standards and should be used only in conjunction with a proper assessment of the specific requirements of this design and performance
Where specified all the performance criteria must be satisfied for the entire design life of the Works provided always that elements are maintained and replaced as stated in the operations and maintenance manual.

2.4 Design Life Criteria

Each element of the Works shall be designed for a life expectancy in excess of the periods set out below:

(a) Within that period, the material, component, assembly and finish shall perform at or exceed the performance levels specified elsewhere in this document, without maintenance in excess of routine cleaning and minor repairs within the specified design parameters. The Contractor shall identify the life expectancy and guarantees on all materials, components, assemblies and finishes to be incorporated into the Works. The Contractor shall also identify the maintenance free life of all materials, components, assemblies and finishes.

(b) Materials, components, assemblies and finishes which under normal service conditions cannot meet the minimum specified design life shall be identified and brought to the attention of the Employer's Agent as a separate schedule in his tender submission. Details shall be provided of the method of replacement.

(c) To ensure that the materials, components, assemblies and finishes shall serve satisfactorily throughout the expected life of the building without loss of performance or appearance, the Contractor shall provide comprehensive recommendations for the maintenance.

(d) Notwithstanding the above, the Works shall be expected to perform without any structural maintenance.

(e) Warranties for the systems and its materials, components, assemblies and finishes are required, as evidence of compliance with this requirement. Additional guarantees or letters of certification, in writing, are also required from principal material suppliers.

(f) All structural fixings, frames, angles, or other load bearing components shall be designed to remain in position and to meet structural stresses and loadings for a period of 60 years without maintenance, or inspection.

(i) Drainage System 25 years, subject to normal use and maintenance/renovation and repair of wearing parts.

3.0 DRAWINGS

The appointed contractor will be required to provide the following drawings prior to works commencing on site:

<table>
<thead>
<tr>
<th>Drawing Reference</th>
<th>Drawing Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Facility Layout</td>
</tr>
<tr>
<td>02</td>
<td>Pitch Drainage System</td>
</tr>
<tr>
<td>03</td>
<td>Topographic Survey</td>
</tr>
<tr>
<td>04</td>
<td>Existing &amp; proposed levels inc contours and sections</td>
</tr>
</tbody>
</table>
4.0 CONSTRAINTS ON THE WORKS

4.1 General

The Contractor shall ensure that his operations to deliver the Works are carried out in a way that does not impact upon the operation of Jenner Park Athletic stadium.

There are several special constraints that the Contractor must adhere to:

The normal working hours within the site shall be Monday to Friday between 07:30 and 19:00 with no working on public holidays. Working beyond these hours will not be permitted without the approval of the Employer’s Agent. Such approval shall be requested and given in writing and this ruling applies equally to nominated sub-Contractors and other operatives for whom the Contractor is responsible. A minimum of 3 day’s notice is required from the Contractor when seeking such consents.

Saturday and Sunday work is acceptable providing written notice is given (3 days) & later start & earlier finishing hours are adhered to.

The contractor should not that there is a school located on the main access road to the site and deliveries of plant and materials will need to be restricted during the start and end of the school day.

4.2 Temporary Access Routes

There will be a requirement to form a temporary access route onto the pitch.

The contractors shall allow for the formation of the access point and reinstatement of the area following the completion of the works.

The contractor shall allow for the installation of all signage and traffic management of the temporary site access point.
5.0 PROGRAMME

5.1 General

Presented below are the Works Programmes for the two construction options.

3G Football Pitch

<table>
<thead>
<tr>
<th>Work Item</th>
<th>Start</th>
<th>Finish</th>
<th>Weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contractor Mobilisation</td>
<td>TBC</td>
<td>TBC</td>
<td>TBC</td>
</tr>
<tr>
<td>Construction Period</td>
<td>TBC</td>
<td>TBC</td>
<td>TBC</td>
</tr>
</tbody>
</table>

The Contractor shall ensure that his operations to deliver the works are carried out in a way that does not impact upon the operation of Jenner Park Athletic stadium.

The Contractor shall provide the programme in the form of a bar chart produced as a result of a ‘critical path analysis’ and must abide by the constraints listed in Section 4.0. It shall show the level of detail appropriate to each stage of the works and all activities and restraints, each of which shall be given a short title. All events shall be numbered and annotated with earliest and latest event dates.

At the time of presentation of the programme, the Contractor shall also provide a mass-haul diagram showing his intended earthworks movements and locations and capacities of anticipated plant and other resource input.
6.0 COMPLETION

6.1 Topographic Survey – As Built Record

On completion of the Works, a full Topographical "As built" Survey shall be issued to the Employer’s Agent. The survey shall include general site contours. The survey of constructed works shall be tied into and conform with the original topographical site survey and shall be related to Ordnance Datum.

The survey shall include for all elements of:

- Fences and fence posts
- Barriers
- Running track
- Floodlights
- Ducts & draw-pits
- Hardstanding margins
- Kerbs

The survey shall include for all elements of Drainage Infrastructure including:

- Pipe Locations
- Pipe invert levels
- Chamber locations
- Chamber Invert Levels
- Gullies
- Headwall/Culvert Locations
- Headwall/Culvert Levels
- Position of all existing land drainage infrastructure exposed

The survey shall also include the following:

- Spot levels
- Boundaries
- Regraded subgrade formation following proof rolling and trimming
- Drainage layout.
- Elevation and location of all new pipe drainage
- Surface of installed construction layers
- Other significant features around the pitch i.e. building lines, power lines, etc.
- All levels to be tied in to a bench mark.
- The survey should be presented as an AutoCAD 2007 format drawing.

Other criteria required:

- Survey to be carried out to a scale of 1:500.
- Maximum grid of 5m to be used
- Survey levels to be to Ordnance Datum.
- Local grid may be used for Eastings and Northings.
- Survey Stations to be left in place and identified on survey drawing following completion. (At least 2 stations should use Road Nails or similar to ensure that they are not disturbed – these should be identified).
- All features within the survey envelope are to be surveyed, including spot heights in open ground. 
- Unless specified elsewhere cover levels only are required for manholes. Wherever possible manholes should be labelled as storm, foul, etc.
- Survey information is to be supplied on CD and via e-mail in both of the following formats:
  - 2D AutoCAD DWG file (Release 2007 or later).
  - 3D AutoCAD DXF or DWG file (Release 2007 or later).
Jenner Park Athletic Stadium
Synthetic 3G Football Pitch Development

- The AutoCAD file should be layered and a copy of the layer name conventions used should be supplied with the survey to allow easy identifications of features within the AutoCAD Drawing.
- 3 No. hard paper copies of the survey are required

6.2 Health and Safety File

On completion of the Works the Contractor shall complete and issue two copies of the Health and Safety File to the Employer’s Agent.

6.3 O and M Manuals –

On completion of the Works the Contractor shall provide two complete sets of the “Operating and Maintenance Manual” within 30 days of handover to the Employer’s Agent.

6.4 Operator Training

On completion of the Works the Contractor shall have completed all necessary training to enable the Club Staff to safely and effectively operate and maintain the pitch.
7.0 SERVICES

7.1 Facilities provided by the Contractor

The Contractor shall provide assistance to the Employer's Agent in carrying out his duties including the services of a competent chainman whenever required.

The Contractor shall attend monthly Progress meetings and site meetings (up to weekly) as required.

The Contractor shall provide and maintain adequate shelter accommodation for the use of all workmen. Their siting, maintenance and clearance on completion shall be to the satisfaction of the Employer’s Agent.

Toilet facilities will be provided by the Club.

The main compound area and storage area shall be established at a location within the grounds boundary as agreed with the Employer’s Agent. As a minimum requirement the following accommodation and welfare will be provided at the main site compound.

1 No site office for Contractors use with meeting room facilities
1 No welfare/mess room

The welfare unit/mess room unit shall provide the following facilities and maintain them in an acceptable clean and tidy condition within the main site compound.

a) adequately heated and lighted accommodation containing a table, chairs or
b) benches for use during meal breaks
c) facilities for heating food and providing hot water
d) adequate first aid equipment
e) a wash basin with hot and cold water

The Contractor shall agree with the Employer’s Agent the proposed layout for these accommodation units prior to mobilisation to site.

The Contractor shall supply at his own cost any temporary supply of electricity and water for the Works. The Contractor shall in the execution of the Works keep all plant and materials and all things connected with the Works in reasonably good order and shall tidy the site to the satisfaction of the Employer’s Agent.

The Contractor shall ensure that any liquid including fuel oil used on site in connection with the Works are stored in suitably labelled containers with appropriate “Hazchem” notices. Such containers shall be stored on an impermeable hardstanding in accordance with the Environment Agency's Special Requirements. Any spillages shall be disposed of at the Contractors expense to an appropriate disposal site. Any spillage of liquid, which may give rise to an environmental pollution incident, shall be reported to the Employer's Agent contained and removed immediately to an appropriate disposal site.

Allow for all measures and precautions necessary to prevent any trespass upon adjoining land or property, and to preclude any rubbish, materials, etc. from being deposited thereon

The Contractor shall allow for protecting and avoiding all damage to adjoining owners’ boundaries. The Contractor shall confine his workmen and materials, plant, etc. to the area of the Site allocated for his use to be defined on the Drawings. Traffic shall be confined to designated site roads. Utilities for use by the Contractor are not readily available on site. The Contractor will need to make his own arrangements for any supplies that he requires for the duration of the works.
8.0 **SUB-CONTRACTING**

The Contractor shall fill in on this page the name of each firm to whom he proposes to sub-let any portion of the work included in this Contract. The Contractor’s attention is drawn to the relevant Clauses in the Conditions of Contract. No alteration shall be made in the list of Sub-Contractors without prior permission in writing from the Employer’s Agent.

<table>
<thead>
<tr>
<th>Particulars of Works to be sub-let</th>
<th>Name and Address of Sub-Contractor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
9.0 **HEALTH AND SAFETY**

9.1 **Construction Design and Management (CDM) Regulations**

For the project the Contractor is required to provide a Health and Safety Policy with a statement demonstrating that due regard has been given to all aspects of Health and Safety relevant to the site and specified works.

The Contractor shall submit a Health and Safety Plan to the CDM Coordinator prior to commencing work.

The CDM Co-ordinator throughout the works will be TBC

The Pre-Tender Health and Safety Plan has been drawn up by TBC and is included in the tender documentation.


The main access points shall be permanently attended by the Contractor to supervise the movement of delivery lorries into and out of the site. When not in use or outside working hours the access point shall be securely closed and locked. Appropriate signage warning the general public of construction hazard will be established.

As a minimum all staff will be issued with the following Personal Protective Equipment (PPE)

- Protective footwear (steel toe caps and insoles to BS 1870)
- Safety helmets
- Reflective jackets or waistcoats
- Safety Glasses
- Gloves

The Contractor shall provide qualified First Aiders as appropriate and shall ensure that at any time during working hours at least one qualified First Aider is in full time attendance. The Contractor will be deemed to have included in his rates for providing a First Aider.

9.3 **Risks to Health and Safety from Materials or Substances**

The following substances Hazardous to Health have been identified that may be used on site or that may arise during construction of the works:

**Low Risk Substances**

L001 - Bituminous tapes  
L002 - Sand  
L003 - Natural Aggregates  
L008 - Dust from cutting of macadams/asphalts  
L009 - Water based admixtures

**Moderate Risk Substances**

M001 - Coated roadstone (Macadams/HRA)  
M002 - Line marking paints  
M007 - Vinyl Primers/Undercoats/Finishes  
M011 - Bituminous Joint Sealing Compounds  
M012 - Cement
Jenner Park Athletic Stadium  
Synthetic 3G Football Pitch Development

- M013 - Cementitious mortars and grouts  
- M014 - Concrete  
- M015 - Bituminous waterproof adhesive membrane  
- M016 - Bitumen cutback  
- M018 - Dust from cutting cement, concrete etc  
- M019 - Phenoxyalkanoic acid herbicides  
- M022 - Solvent based concrete curing agents

**High Risk Substances**
None identified

The Contractor shall comply with all the relevant legislation including the "Control of Substances Hazardous to Health Regulations 1999," which governs the use of the substances listed.

Suitable methods shall be taken to control dust at its source.

9.4 Newtown Football Club – Health & Safety Policy

The Contractor shall make allowance for the requirements presented within the Newtown Football Club H&S Policy. Copies are available on request from the club.

9.5 Utilities and Apparatus

The Contractor shall be expected to locate the exact position of buried services by hand digging or other appropriate means following the guidelines issued by the Utility Company, contacting them prior to commencing work where required.

The works necessitate the working under and or close to underground electricity power lines in the vicinity of the Main pitch works area. The Contractor shall execute works in this area in accordance with the requirements of the electricity company. Warning signs and markers shall be maintained in appropriate positions throughout the working period.

9.6 Safety goals or targets for the project.

There will be a requirement for the contractor to have safety goal and targets during the project these will include but not be limited to:

- All safety inductions to be prior to commencement on site
- Daily H&S inspections and recording and display of results
- Regular submission or display of Safety information
- Restrictions of working hours.

9.7 Site Operations Risk Assessments & Method Statement

Prior to the commencement of the works, the contractor shall prepare a detailed method statement for the site operations. Attention is drawn to the specific requirements. The contractor will be deemed to have included in his rates for all method statements required.

a  all site personnel are subjected to an appropriate induction course prior to commencement of work on site, covering all aspects of site work and appropriate health and safety measures in place.

b  appropriate control measures are instigated to prevent and control as necessary generation of dust and/or odours.

c  areas designated for temporary stockpiling of excavated material prior to removal from site are clearly identified.
procedure to be followed should old drain runs or any other unidentified or unspecified or unexpected materials such as contamination, be encountered during excavation or any other site works.

e appropriate measures/ precautions are to be taken to prevent the discharge of water from the site into the storm water sewage system (including water used to control dust).

f Identification of underground services

g procedures related to working at height (fence and floodlight installation) and for working on embankments.

h procedure related to setting out and surveying the works

I procedures related to drainage system installation

J procedures related to storage and unloading of materials

K procedure for dealing with made ground

9.8 Security Fencing & Access to Construction Site

The main works areas and compound areas will need to be surrounded by herras type fencing during the contract works. This will prevent public access to the working areas. The appropriate safety signage will also be put in place.

The areas adjacent to the pitch construction areas will be in normal daily use by the general public and site staff. Arrangements will need to be made for safe working procedures between the main pitch contractor and the nominated sub contractor prior to being given access to the site.
10.0 TESTS

10.1 Imported Materials

The Contractor shall submit to the Employer’s Agent a list of the suppliers from whom he proposes to purchase materials necessary for the Works and shall forward full details of the materials together with test certificates confirming the suitability as appropriate, for approval to the Employer’s Agent a minimum of twenty working days before delivery of any material to site.

The Employer’s Agent reserves the right to inspect the proposed materials at source and in this respect the Contractor shall ensure that each supplier will admit the Employer’s Agent to his premises during ordinary working hours. For the purpose of inspecting, witnessing required testing and sampling or obtaining samples of the materials.

Alternatively if required by the Employer’s Agent, the Contractor shall deliver the samples of the materials to the Employer’s Agent’s office or to a laboratory nominated by the Employer’s Agent. Samples shall be taken in accordance with the relevant British Standard where applicable.

Materials subsequently used in the works shall be consistent with the samples as tested or approved by the Employer’s Agent. Where it is necessary for the samples to be submitted to the Employer’s Agent the Contractor shall ensure that samples are supplied to the Employer’s Agent in sufficient time for them to be satisfactorily tested. The information regarding the names of the suppliers may be submitted at different times as may be convenient, but no sources of supply shall be changed without the Employer’s Agents prior approval.

10.2 General Requirements For Imported Materials

Any site derived or imported general fill material for use in the works shall be obtained from a clean identified source. The source shall have had no former use which could result in the potential for contaminating soil or controlled waters. Any imported fill material shall be clean and inert and shall not cause a risk to human health or the environment. It shall not contain chemicals that can be leached out and cause contamination of controlled waters. The Employer’s Agent reserves the right to test and to undertake specific risk assessments of any material which the Contractor proposes to import onto site. The Employer’s Agent reserves the right to reject any imported soil material based on the findings of the contamination tests and risk assessments.

Any imported general fill shall, unless otherwise instructed in writing by the Employer’s Agent or specified in the contract documentation, be naturally occurring materials commensurate with Class 2C, 2D or 6F1 as defined by Table 6/1 of the Highways Agency Specification for Highway Works, but with the specific exception of marine gravel and chalk. Marine gravel, chalk and recycled materials such as crushed concrete shall not be considered as suitable general fill.

Any material which fails to comply with the above shall be replaced with approved material at the Contractor’s own expense. The Contractor will pay the cost for all material conformance testing and any subsequent testing required in the event of a failure. Additional samples over and above this rate shall be taken as directed by the Employer’s Agent.

As a control on the quality of all materials imported onto site the Contractor shall take 5.0 kg mass samples of the material, at a rate of 1 sample for every 300m³ delivered to site. The Contractor shall then retain a sample on site and forward a sub sample to an approved laboratory for analysis to confirm compliance with the requirements of the specification. Any drainage material which fails to comply with the above Clauses, shall be replaced with approved material at the Contractor’s own expense. The cost for all drainage material conformance testing and any subsequent testing required in the event of a failure will be paid by the Contractor and should be included in his rates.

Samples and Mock-Ups

The following samples shall be submitted during the construction period for laboratory testing:
Representative reference samples of approved materials shall be retained on site by the Contractor for comparison throughout the Works.

### 10.3 Materials Sampling Procedures

**Stockpiles**

Samples of all materials used in the pitch construction shall be collected to represent the bulk stock of materials as closely as possible. Samples for testing shall be made up by collecting and aggregating samples from stockpiles. Representative samples should be taken at points one third and two thirds up the face of the pile. The samples from the collection points should be mixed together to provide a representative sample of the bulk material with a minimum weight of 5 kg.

**In Situ or Spread Materials**

Samples of materials that have been laid should be taken to provide a record of the materials actually laid on the pitch construction.

For each representative samples of the "as laid" materials on the pitches, shall be collected using a hand auger or sampling tube, taking material from the full depth of the layer at randomly selected positions. The minimum combined weight of each sample shall be 10 kg. Following each sampling exercise the samples should be forwarded immediately to Minton Treharne laboratory analysis at the address below:

Minton, Treharne & Davies Ltd  
Merton House  
Croescadarn Close  
Pentwyn  
Cardiff  
CF23 8HF  
Tel: +44 (0) 29 2054 0000

The samples should be clearly marked as below:

- For Immediate Attention  
- Jenner Park  
- Date Sample Taken  
- Location  
- Description of Material
Table 1 - Materials Testing

<table>
<thead>
<tr>
<th>Clause</th>
<th>Work, Goods or Material</th>
<th>Test</th>
<th>Frequency of Testing</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pipes and fittings for drainage and service ducts</td>
<td>Product certification BS 4962, Bs4660</td>
<td>All materials</td>
<td>Product certification scheme applies</td>
<td></td>
</tr>
<tr>
<td>Chambers, manhole steps, steel fitments, covers, grates and frames, cover bolts</td>
<td>BS Standards</td>
<td>All materials</td>
<td>Product certification scheme applies</td>
<td></td>
</tr>
<tr>
<td>Gullies and pipe junction</td>
<td>BS Standards</td>
<td>All materials</td>
<td>Product certification scheme applies</td>
<td></td>
</tr>
<tr>
<td>Water-tightness of sealed drainage joints</td>
<td>Air test</td>
<td>All pipelines with watertight joints</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seed mixtures</td>
<td>Seed Regulations</td>
<td>All seed batches</td>
<td>Compliance with seed regulations and germination test</td>
<td></td>
</tr>
<tr>
<td>Drainage aggregates</td>
<td>Particle size distribution Calcium carbonate content</td>
<td>** Bulk materials 300 m³</td>
<td>MTD Standard Operating Procedures</td>
<td></td>
</tr>
<tr>
<td>Modified MOT Type 1 Based Material</td>
<td>Particle size distribution</td>
<td>** Bulk materials 300 m³</td>
<td>MTD Standard Operating Procedures</td>
<td></td>
</tr>
</tbody>
</table>

** Bulk materials shall be sampled and tested as prepared or delivered in bulk prior to spreading.

Samples shall be taken from stockpiles prior to spreading and from the spread materials at the frequency shown in Table 1 above.

The tests of drainage aggregates etc for construction of the pitch profile shall be undertaken in accordance with MTH Standard Operating Procedures.

Tests comparable to those specified will be necessary for any equivalent work, goods or materials proposed by the Contractor.

Unless otherwise shown in this appendix, tests for work, goods and materials as scheduled under any one Clause are required for such work, goods or materials in the Works.

10.4 Preparation of Formation

CBR Testing

Where required in-situ CBR tests shall be carried out on the prepared formation of the pitch, and hard other hard standing in locations defined by the Employer’s Agent. The number of testing locations on these surfaces shall be based on an average of one test for every 500m².

Testing shall be carried out by a UKAS approved laboratory and at the expense of the Contractor. It is the Contractor’s responsibility to commission and co-ordinate all CBR testing.

Results of CBR testing shall be submitted to the Employer’s Agent at least 5 days in advance of the relevant proposed pitch or footpath construction.

Notwithstanding the above testing regime the formation surface shall be subject to inspection by the Contractor and Employer’s Agent. Material which is deemed by the Employer’s Agent to be soft or unstable and unsuitable for the preparation of a satisfactory formation shall be removed and replaced with suitable material at the contractor’s expense.

Materials and Sources of Supply

The Contractor shall provide details below of Materials and suppliers to be used in the construction of the Works.
Jenner Park Athletic Stadium
Synthetic 3G Football Pitch Development

<table>
<thead>
<tr>
<th>Materials</th>
<th>Source of Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage Infrastructure</strong></td>
<td></td>
</tr>
<tr>
<td>i) Perforated pipes</td>
<td></td>
</tr>
<tr>
<td>ii) Unperforated pipes</td>
<td></td>
</tr>
<tr>
<td>iii) Concrete Pipes</td>
<td></td>
</tr>
<tr>
<td>iv) Drainage chambers</td>
<td></td>
</tr>
<tr>
<td><strong>Aggregates</strong></td>
<td></td>
</tr>
<tr>
<td>i) Primary Drainage – Gravel backfill</td>
<td></td>
</tr>
<tr>
<td>ii) Sub-base stone</td>
<td></td>
</tr>
<tr>
<td><strong>Geotextiles</strong></td>
<td></td>
</tr>
<tr>
<td>i) Geotextile –</td>
<td></td>
</tr>
<tr>
<td>ii) Triaxial Geogrid</td>
<td></td>
</tr>
</tbody>
</table>

10.5 Construction Tolerances

The position of the internal face of any pipeline shall not deviate from that detailed in the specification, summarised in the Table below, by more than the tolerances shown.

Each operation or layer shall also be subject to confirmation that the requirements have been met in accordance with the specified tolerances, summarised below. Tolerances of the upper surfaces of the specified layers are measured deviations under a 3 metre straight edge.

Adjoining surfaces shall marry smoothly at all interfaces except where required to accommodate kerb edgings and other structures.

**Summary of Tolerances**

<table>
<thead>
<tr>
<th>No.</th>
<th>Work Area</th>
<th>Tolerances</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Drain Lines</td>
<td>Gradient +/ - 15mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Line +/ - 50mm</td>
</tr>
<tr>
<td>2</td>
<td>Formation Surface</td>
<td>+/ - 25mm</td>
</tr>
<tr>
<td>3</td>
<td>Modified Type 1 Sub-base</td>
<td>+/ - 10mm</td>
</tr>
<tr>
<td></td>
<td>Macadam Layer</td>
<td>+/ - 5mm</td>
</tr>
</tbody>
</table>
10.6 Waste Disposal

The Contractor shall be responsible for the correct disposal of all non-re-usable surplus material and shall include for undertaking Waste Acceptance Criteria Testing if required. All waste shall be disposed of in accordance with the Landfill Regulations for England and Wales at an appropriately licensed landfill facility.
Jenner Park Athletic Stadium
Synthetic 3G Football Pitch Development

11.0 SITE INFORMATION

Factual information relating to the Site and Ground Conditions established for the design and construction works is included in the Tender documents. The information is provided without comment, allowing the Tenderer to draw his own conclusions.

Documents

<table>
<thead>
<tr>
<th>Originator</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Just Solutions</td>
<td>Feasibility Study</td>
</tr>
</tbody>
</table>
12.0 SPECIFICATIONS

The following specifications shall be followed:

<table>
<thead>
<tr>
<th>Reference</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>S100</td>
<td>General Requirements</td>
</tr>
<tr>
<td>S200</td>
<td>Detailed Requirements – 3G Synthetic Football Pitch Works</td>
</tr>
<tr>
<td>S300</td>
<td>Detailed Requirements – Miscellaneous items</td>
</tr>
</tbody>
</table>
S100 GENERAL REQUIREMENTS

S101 Documents

1. The following documents form part of this Specification and shall be deemed to be part of the Specification:


- Football Association of Wales – Technical Guidance For Synthetic Football Pitches (September 2013) and subsequent revisions.

S102 Interpretation of Specification

1. Any clauses in the Specification which relate to work or materials not required by the Works shall be deemed not to apply. British Standards, Codes of Practice, and other Standards referred to in the Specification shall be those current on the date 42 days prior to the date for return of tenders.

2. Where material is specified by reference to a particular trade name or manufacturer equivalent materials will satisfy the Specification provided that they are approved by the Employer’s Agent.

2. Where material is specified by reference to British Standards, material conforming to similar European Standards shall be permitted provided that it can be shown that the material also conforms to the relevant British Standard.

S103 British Standards

1. Where an appropriate British Standard Specification or British Standard Code of Practice issued by the British Standards Institution is current at the date of the tender all goods and materials used or supplied, and all workmanship, shall either be in accordance with that standard, any equivalent European Community standard, or of a higher standard.

S104 Buried Apparatus and Utilities

1. The Contractor shall be responsible for determining the exact position of any services and utilities affected by the works. Any information provided to the Contractor shall be confirmed on site by liaising with the relevant Authority and hand digging where necessary.

S105 Site Conditions

1. The Contractor’s attention is drawn to the need to satisfy himself as to the conditions on site and is advised to visit and inspect the site prior to submitting the tender.

2. The Contractor is invited to obtain additional information relating to the ground conditions. Additional Site Investigation via exploratory holes shall be carried out in accordance with the details contained within this clause.

3. Additional exploratory holes will not extend greater than 4.0 mbgl unless approved by Employer’s Agent. The exploratory holes are to be excavated within the grounds. The exact positions of the exploratory holes shall be agreed with the Employer and the Employer’s Agent prior to excavation.

4. Spoil excavated from the exploratory holes must be placed on a temporary barrier such as plastic sheeting or wooden boards to prevent spoil contamination during excavation.
Jenner Park Athletic Stadium  
Synthetic 3G Football Pitch Development

5 Each exploratory hole location shall be checked using “Cable Avoidance” equipment for underground services prior to excavation. Once an exploratory hole has been excavated and sampled the hole shall be backfilled using the spoil. The backfilling and reinstatement shall be to the approval of the grounds staff and Employer’s Agent.

6 The Contractor is responsible for obtaining additional information he considers necessary covering such matters as the nature of the ground conditions, water levels, physical features of the site, etc.

S106 Hand Work

1 The Contractor shall allow in his pricing for hand working on parts and in conditions where the use of machinery will not produce results to the Employer’s Agent’s satisfaction even though specific reference is not made to such in the body of the Specification.

S107 Procedure

1 No variation from the sequence and nature of the works detailed in the specification will be permitted except with the prior written consent of the Employer’s Agent.

S108 Inclement Weather

1 The Works or any part thereof shall be suspended temporarily by the Employer’s Agent when, in his opinion, working conditions are unsuitable due to inclement weather.

2 Work must cease when ground conditions on site are such that puddling and/or deep rutting of the soil or any other detriment would result.

S109 Site Meetings

1 The Contractor shall attend monthly Progress meetings and up to weekly site meetings as required.

S110 Traffic Control and Pedestrian Safety

1 The Contractor shall provide and maintain all necessary road signs on public highways as required by the Employer’s Agent or by the Police and Local Authority.

2 Vehicular and pedestrian access for the public and residents to all dwellings and services adjoining the site and affected by the Contractor’s access needs and works must be maintained at all times in a manner acceptable to the Employer’s Agent.

3 The Contractor shall remove from the surface of any public or private road any earth or other materials deposited by vehicles passing to or from the Site.

4 The Contractor shall take adequate precautions to prevent the spilling of oil, petrol or diesel fuel from vehicles, plant, storage drums or tanks on any access road or the Site in general. Any spillage shall be immediately cleared and the contaminated material disposed of at an appropriately licensed landfill site, and the damage made good.

S111 Maintenance of Public and Private Roads

1 The Contractor shall be responsible for keeping clean all public roads, pavements, verges, watercourses and other areas and shall allow for all costs incurred by him in the maintenance of same and for making good at his own expense any damage thereto when carrying out the Works.

2 The Contractor shall be responsible for reinstating all access roads to their original condition of the works to the satisfaction of the Employer’s Agent. The original condition shall be determined by the Condition Survey undertaken prior to commencement.

25
Jenner Park Athletic Stadium
Synthetic 3G Football Pitch Development

S112 Traffic Regulations

1 The Contractor shall be responsible for avoiding any infringements of local traffic regulations.

S113 Delivery of Plant and Materials

1 All off loading of materials and plant including that belonging to sub-Contractors is to take place WITHIN the boundaries of the Site except by specific agreement with the Employer's Agent.

S114 Site Restrictions

1 The Contractor shall confine his workmen and materials, plant, etc. to the area of the Site allocated for his use to be defined on the Drawings. Traffic shall be confined to designated site roads.

2 The normal working hours within the site shall be Monday to Friday between 07:30 and 19:00 with no working on public holidays. Working beyond these hours will not be permitted without the approval of the Employer's Agent. Such approval shall be requested and given in writing and this ruling applies equally to nominated sub-Contractors and other operatives for whom the Contractor is responsible. A minimum of 3 day's notice is required from the Contractor when seeking such consents.

3 Restrictions on the use of the site and access are imposed by the Employer on the basis that the area will have a number of Contractors on site. If any employees of the Contractor or Sub-Contractors ignore these rules they will be required to leave the site immediately.

4 Utilities for use by the Contractor are not readily available on site. The Contractor will need to make his own arrangements for any supplies that he requires for the duration of the works.

S115 Off Site Trespass

1 Allow for all measures and precautions necessary to prevent any trespass upon adjoining land or property, and to preclude any rubbish, materials, etc. from being deposited thereon.

S116 Boundary Protection

1 The Contractor shall allow for protecting and avoiding all damage to adjoining owners' boundaries.

S117 Restriction of Advertising

1 The Contractor shall not use nor let the Site or any part thereof for any advertising purposes save only that he may exhibit his own name and address together with those of his sub-Contractors and suppliers. An Information Board shall also display the title of the Works. Such Information Boards shall be approved before erection.

S118 Programme of Works

1 Progress Charts shall be prepared by the Contractor and submitted to the Employer's Agent for approval prior to the commencement of the Works to show how the Contractor intends to execute the Works within the time stated in the Form of Tender. The Contractor shall submit to the Employer's Agent Monthly Progress Charts prior to the Monthly Progress Meetings. In the event of Extension of Time being granted in accordance with the Conditions of Contract, the Contractor shall prepare and submit revised progress charts to the Employer's Agent.
S119 Site Instructions

1 The Foreman-in-Charge shall be supplied by the Contractor with a Site Note Book in which he shall record in triplicate all site queries and all site instructions. The Employer’s Agent upon his visits will consider and deal with matters entered in the Site Notebook and will give instructions accordingly. At the end of each week the Contractor shall submit in duplicate to the Employer’s Agent any items which have been entered in the Site Notebook and which the Employer’s Agent has considered during his site visit.

S120 Temporary Works

1 The Contractor shall make all necessary temporary provision for the run-off of surface and ground water from the areas of excavation during the period between the start of the Works and the final connections to the drainage outfalls. The Contractor shall allow for compliance with the guidelines presented in:

- Pollution Prevention Guidelines – Working at Construction and Demolition Sites; PPG6 – Environment Agency.
- Pollution Prevention Guidelines – Works in, near or liable to affect Watercourses: PPG5 – Environment Agency.

2 All labour, materials and plant necessary for this purpose shall be provided by the Contractor and all costs shall be deemed to be included in his rates.

3 The Contractor shall provide and maintain all temporary access roads, sleeper tracks, storage areas, groundwater/surface water control measures or any other temporary works required during the execution of the Contract, remove the same as required and make good on completion of the Works.

4 The Contractor will be deemed to have taken due account in his Tender of the total cost of all Temporary Works necessary for the proper execution and completion of the Contract.

5 The Contractor shall not allow water to lie in any part of the Works unless required to do so under the Contract; water arising from or draining into the Works shall be drained or pumped to an approved disposal point. Drainage sumps required shall, where practicable, be located outside the area of any Permanent Works.

6 The Contractor shall take all necessary precautions to prevent any adjacent ground or watercourses from being adversely affected by loss of fines through any de-watering process.

7 The Contractor shall take all necessary precautions to prevent any ground water from entering mains to be used for the conveyance of potable water.

8 All excavations shall be kept free from water at all times and adequate pumping plant, including special de-watering equipment, shall be provided by the Contractor, who shall also make his own arrangements for the disposal of all water encountered in the excavations. All sumps shall be located clear of excavations for permanent work, and when no longer required the sumps shall be filled in with suitable material or dealt with as directed by the Employer’s Agent.

9 The Contractor will not be permitted to carry out any concreting or other constructional work unless the excavations are dry, and the excavations shall be kept free from water until the concrete has set sufficiently so as not to be damaged by water.

10 The Contractor shall ensure that so far as is practicable all constructional work is carried out in the dry and that excavations for such work are kept well drained and free from standing water. In this connection the Contractor shall construct, operate, maintain and subsequently remove temporary dams and other works of all kinds including pumping and well point dewatering plant that may be necessary to exclude water from the works while
Jenner Park Athletic Stadium
Synthetic 3G Football Pitch Development

construction is in progress. Such temporary works and plant shall not be removed without the approval of the Employer’s Agent. The Contractor’s proposals for cofferdamming and the maintenance thereof shall be submitted to the Employer’s Agent for approval prior to commencing the constructional works.

11 The following condition shall apply to the construction of cofferdams:

(i) Their internal dimensions shall be the minimum that is necessary for the execution of the works. Cofferdams shall be constructed in such a manner so as not to adversely affect the stability of the newly constructed Works.

12 The Contractor shall supply and fix all necessary timbering, steel sheeting, strutting, shoring, etc., to support the sides of excavations so as to ensure the safety of workmen, freedom from damage of any structures or services and to prevent any movement of adjacent soil. All such supports shall be maintained until the constructional work is sufficiently advanced to permit the timbering, etc. to be withdrawn.

13 Where necessary, the excavations shall be close timbered or sheeted and the Contractor will receive no additional payment for this work, even although it may have been ordered by the Employer’s Agent.

14 Where the Contractor is required to leave in position timbering or sheeting on the order of the Employer’s Agent to safeguard adjoining buildings, etc., he will be paid the schedule price for the materials used. Any timbering or sheeting not ordered by the Employer’s Agent but left in for the convenience of the Contractor will not be the subject of any additional payment.

15 Any buildings, walls, sewers, culverts, mains, cables, etc., likely to be damaged by the excavation shall be properly supported and the Contractor shall be held responsible for any damage arising in this connection. The Contractor shall be responsible for any damage to the permanent work due to inadequacy of timbering etc., and any consequential damage caused by the removal of timbering, steel sheeting or other supports from excavations.

16 The Contractor should allow for all Temporary Fencing, Planked Footways, Guard Rails, Lighting and the like as may be necessary for protecting the public, and for the proper executing of the Works as may be required by the Employer’s Agent.

S121 Restricted use of plant

1 If for any reason the Employer’s Agent is of the opinion that it is undesirable that any excavator, mechanical digger or other plant used or proposed to be used by the Contractor for the purpose of excavation should be used or that any such plant is unsuitable for use on the Works or any part of them, the Employer’s Agent may order the Contractor not to use and/or to remove the plant from the site.

S122 Police Regulations

1 The Contractor shall allow for all costs incurred by him in ascertaining and complying with Police regulations.

S123 National Insurances, Etc.

1 The Contractor shall allow for all payments and costs incurred in connection with National Insurances, contributions, levies, taxes and pensions for workpeople.

S124 Clearing the Site upon Completion

1 The Contractor shall, upon completion of the Works, clear all plant, unused materials, etc., clean all roads, drains, watercourses etc. affected by the Works and leave the whole of the Site in a clean and tidy condition acceptable to the Employer’s Agent.
Jenner Park Athletic Stadium
Synthetic 3G Football Pitch Development

S125 Protection of Services, Public Footways and Highways

1 The Contractor shall make all necessary provisions, including the supply of protective coverings, warning signs as appropriate to protect and maintain the following:

a) the public highway along the proposed access and egress routes to the site.
b) all public footways adjacent to the public highways detailed in a) above.
c) site roads where appropriate.
d) all underground services in the working area along the proposed access and egress routes in a) above.
e) all foul and storm sewer drain covers and road drainage gullies within the areas covered by a) and b) above.
f) protection for, travelling below or adjacent to all overhead services within the site.

2 The Contractor will be deemed to have included in his works the costs for supplying and maintaining all temporary cones.

S126 Control of Dust

1 The Contractor shall conduct his operations so that as far as possible any dust settles within the Site and is not carried beyond the immediate working area.

2 The Contractor shall also undertake a daily visual inspection of vehicles (if any) parked in the site compound areas and adjacent the areas of working for the presence of any settled dust.

3 The Contractor shall adjust the location of any excavation, regrading or filling operations having regard to the wind direction and speed, and shall suspend such operations altogether in the event that any such adjustment fails to prevent dust from being carried beyond the immediate working area.

4 Any stockpiles of material subject to wind whipping shall be damped down and covered to ensure satisfactory dust control.

5 The Contractor shall ensure that airborne dust is kept to a minimum by the regular use of water bowser during periods of dry weather. The Contractor shall also deploy other water spraying equipment as required to control dust emissions whenever significant fugitive dust emissions are created or are likely to be generated by site operations.

S127 Control of Noise and Vibration

1 The Contractor shall employ the best practical means to minimise noise and vibration produced by his operations and shall have regard to the recommendations in BS 5228. Noise Control on Construction and Open Sites, the Noise Abatement Act (1960) and all amendments thereto, and the Department of the Environment Advisory Leaflet No. 72 “Noise Control and Building Sites” and such subsequent publications.

2 Without prejudice to the generality of the Contractor’s obligations under the preceding paragraph, the Contractor shall comply in particular with the following requirements:

a) All vehicles and mechanical plant used for the purpose of the Works shall be fitted with effective exhaust silencers and shall be maintained in good and efficient working order.
b) all compressors shall be “sound reduced” models fitted with properly lined and sealed acoustic covers which shall be kept closed whenever the machines are in use, and all pneumatic percussive tools shall be fitted with mufflers or silencers of the type recommended by the manufacturers.

c) machines in intermittent use shall be shut down in the intervening period between work or throttled down to a minimum.

d) all pumps shall be fitted with effective exhaust silencers and shall be maintained in good and efficient working order. All de-watering pumps shall be “sound reduced” models fitted with properly lined and sealed acoustic covers.

3 The Contractor shall pay special regard to minimise noise at the site boundaries. Such measures include:

a) the location of the site offices, stockpiles and mobile noise screens.
b) limits on the amount of plant at work.
c) silencing of plant as described above.

4 The Contractor shall take suitable steps in his method of working to prevent damage to adjacent structures due to vibrations caused by executing the Works.

S128 Information Boards

1 The Contractor shall provide, maintain and remove on completion of the Works two information boards that shall be sited at the entrance to the compound and main site entrance. The information boards shall give details of the Client, Employer’s Agent and Contractor’s name together with telephone contact numbers for both office hours and out of office hours. The Information Board shall also provide details of the scheme name and completion dates. The position design and layout of these boards are to be approved by the Employer’s Agent.

S129 Photographs and Condition Survey of Existing Access Roadway, Footways and Hardstanding Area - Advanced Photographs

1 A condition survey shall be undertaken on any roads proposed to be used for contractor access prior to works commencing. The condition survey including colour photographs shall be taken in advance of the Works at locations agreed with the Club. Photographs will be taken of the existing ground surface at the main site entrance and will be used in the preparation of a pre-work highway condition survey as detailed below.

2 The Contractor shall prior to the commencement of any excavation Works, undertake a condition survey of the existing access roadway, footway and hard-standing areas. As a minimum the survey shall comprise a full photographic record of the road, footway and hardstanding surfaces, together with a written report of any damage to existing surfaces, kerbstones or manhole constructions. The Contractor should also note that complete photographic coverage of each roadway, footway and hard-standing area is required. Simple panoramic photographs will not be considered acceptable by the Employer’s Agent.

3 Two copies of the written report, together with one bound copy of the photographic record of each roadway, footway and hard-standing area shall be handed to the Employer’s Agent at least 48 hours in advance of the commencement of any excavation works. The photographs shall be colour, of a size not less than 7 inches x 5 inches and on Kodak or similar type photographic paper. A copy of the photographic negatives shall also be handed to the Employer’s Agent.
S130 Photographs and Condition Survey of Existing Access Roadway, Footways, and Hardstanding Area – Progress Photographs

1 The Contractor shall arrange to have record photographs of the Works as directed by the Employer’s Agent.

2 As a minimum requirement photographs shall be taken prior to commencement and upon completion of each main operation, such as earthworks, geotextile installation, drain installation and drainage layer installation etc.

3 The number of prints shall be 2 and the size of the prints shall be 7 inches x 5 inches.

4 Photographs shall be in colour dated and mounted in a loose-leaf album.

5 The copyrights of all photographs shall be re-vested in the Employer and prints shall be delivered to the Employer’s Agent within 7 days. The photographs shall not be used for any purpose whatsoever without the Employer’s Agents approval.

S131 Site Operations Method Statement

1 Prior to the commencement of the Works, the Contractor shall prepare a detailed method statement for the site operations. Attention is drawn to the specific requirements. The Contractor will be deemed to have included in his rates for all method statements required.

a) all site personnel are subjected to an appropriate induction course prior to commencement of work on site, covering all aspects of site work and appropriate health and safety measures in place.

b) appropriate control measures are instigated to prevent and control as necessary generation of dust and/or odours.

c) areas designated for temporary stockpiling of excavated material prior to removal from site are clearly identified.

d) procedure to be followed should old drain runs or any other unidentified or unspecified or unexpected materials be encountered during excavation or any other site works.

e) appropriate measures/precautions are to be taken to prevent the discharge of water from the site into the foul or storm water sewage system (including water used to control dust).


1 The Contractor shall carry out all operations associated with the specified works in accordance with all current legislation, including the Construction (Design and Management) Regulations 2007 (CDM) where applicable.

2 The Contractor shall ensure that his rates are adequate to meet the cost of making all necessary arrangements for the Health and Safety and welfare of all persons affected by the Construction work.

3 The main access point shall be permanently attended by the Contractor to supervise the movement of delivery lorries into and out of the site. When not in use or outside working hours the access point shall be securely closed and locked. Appropriate signage warning the general public of construction hazard will be established.
Jenner Park Athletic Stadium
Synthetic 3G Football Pitch Development

4 As a minimum all staff will be issued with the following Personal Protective Equipment (PPE).
   • Protective footwear (steel toe caps and insoles to BS 1870)
   • Safety helmets
   • Reflective jackets or waistcoats
   • Rubber gloves

5 The Contractor shall provide qualified First Aiders as appropriate and shall ensure that at any time during working hours at least one qualified First Aider is in full time attendance. The Contractor will be deemed to have included in his rates for providing a First Aider.

6 The works necessitate the relocation of overhead electricity power lines in the south-west corner of the working area. This relocation will be carried out by the electricity company and will necessitate liaising with them to provide safe access to the area.

S133 General Clearance of Infrastructure

1 The Contractor shall allow for the removal and disposal or replacement of all existing infrastructure affected by the Works.
SPECIFICATION OF WORKS

S200 3G Synthetic Football Pitch Works

S201 Scope of Works

The following works shall be discharged as part of this contract.

- Setting out
- Set up compound area
- Spray off topsoil with total herbicide
- Strip topsoil from pitch and remove from site
- Prepare hard standing area off pitch for goal storage and install gates to existing boundary fence
- Grade subsoil formation to crowned formation
- Remove inner most two lanes of the synthetic running track at the side of the new pitch
- Supply and install kerb edging to outer extent of 3G carpet
- Tie in area between kerbs and running track
- Reinstate running track where required
- Supply and install piped drainage system with lateral drains at 8.0m centres
- Supply and install silt traps and inspection chambers
- Supply and install geotextile over graded formation between drain lines
- Supply and install stone base to 350mm minimum depth
- Supply and install 40mm thick porous macadam layer
- Supply and install shockpad to minimum 20mm depth
- Supply and install FIFA 2 Star (40-50mm pile) carpet with sand and rubber infill.
- Employ FIFA accredited independent test house to undertake keystage tests during construction
- Reinstatement of any damage from plant and weather
- Reinstate compound area
- Undertake independent testing of installed carpet to FIFA 2 star standard.

S202 Transport & Preliminaries

1 The Contractor shall allow for all necessary fencing and signage in order to secure the working and site compound areas and haulage routes in order to protect members of the public from the works. It is anticipated that high visibility mesh fencing shall be used to demarcate the working areas and haul routes and that Herras (or similar) fencing shall be used for the site compound and pitch areas. The location for deep excavations (e.g. inspection chamber construction) shall be protected with Herras (or similar) fencing. The Contractor shall allow for compliance with all relevant Health and Safety regulations including the Construction Design and Management regulations (CDM) 2007. The Contractor shall allow for the provision of all welfare facilities for staff. The Contractor shall allow for the mobilisation and demobilisation of all necessary plant to complete the project. The contractor shall allow for compliance with all Conditions of Contract

S203 Design & Performance Requirements

1 The pitch shall be designed and constructed to satisfy the construction tolerances and performance requirements of the FIFA Recommended 2 Star standard. Please refer to FIFA Quality Concept for Football Turf – Handbook of Requirements (January 2012) for further details.
The playing area shall measure **100.0 m x 64.0 m + 3 m side run-offs and end run-offs** to provide a total pitch size of 106.0 m x 70.0 m inside new kerblines. Two enable construction of this pitch the inner two lanes of the existing running track will need to be removed and a new kerbline installed on the inside of the new track. The inner lane of the track (lane 3) will need to be reinstated to tie into the new kerbline.

**S204 Quality of Materials & Workmanship**

1. Where and to the extent that materials, products and workmanship are not fully specified they are to be:
   
i. Suitable for the purposes of the Works stated in, or reasonably to be inferred from, the contract documents.
   
ii. In accordance with good building and/or Engineering practice, including the relevant provisions of current British Standards.
   
iii. In accordance with **FIFA Recommended 2 Star** standard.
   
   
v. In accordance with the current edition of the Institute of Electrical Employer’s Agents Wiring Regulations.

**S205 Topsoil Strip, Stockpiling & Removal**

1. Prior to any works being undertaken a full site services check shall be undertaken. Once this has been completed and it is clear that no services will be disturbed resulting from the works then at least one week prior to starting work on site the contractor shall make arrangements to spray the grass sward over the pitch with a total non-residual herbicide, strictly according to manufacturer’s recommendations and all current legislation and Health & Safety Regulations. On absolutely no account must the herbicide be allowed to drift or otherwise affect any areas beyond designated the working boundary. A minimum of one week following spraying the upper 150mm depth of topsoil shall be cultivated with a power harrow.
   
2. The topsoil shall be stripped from the plateau area and removed from site in accordance with current waste management regulations. Following stripping the maximum height of topsoil stockpile shall be 1.5m. The Contractor shall include in his rates for haulage to and from the stockpile from the works area, and for the reinstatement or protection of ground within the stockpile footprint and associated haul routes. Soil shall be handled at low moisture content and the contractor shall maintain soil structure by minimising soil compaction and using the appropriate soil handling techniques. The depth of the topsoil strip shall be nominally 180mm and great care shall be taken to prevent subsoil being mixed with topsoil. Any subsoil identified within the stripped topsoil shall be removed at the contractor’s expense.

**S206 Formation Surface & Geotextile / Triaxial Geogrid**

1. The formation shall be regraded to the approved contractors design levels. The gradient of the regraded formation shall be no greater than 1:100 at any point within the pitch footprint. The formation surface shall be prepared to the design levels by cutting and filling plus compacting suitable subsoil. The regrading should if possible be undertaken to provide an earthworks balance so that no subsoil has to be removed from or imported onto site. If there is a requirement to export or import subsoil materials so that the design formation levels may be achieved then this will be undertaken at the contractor’s cost.
Jenner Park Athletic Stadium
Synthetic 3G Football Pitch Development

Any subsoil material to be imported onto site shall be inert and not contaminated physically and chemically.

2 Following cut/fill placement and compaction and laser grading of the subsoil. The surface shall be trimmed to a tolerance of no more than ±10 mm deviation relative to design levels. Maximum gradients shall be as detailed on the design drawings.

3 The formation surface shall be compacted using smooth drum rollers to ensure adequate compaction, aiming for a CBR of >5%. 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 excavated and re-packed with crushed rock, free from detritus material, in accordance with the Department of Transport Specification for Highway Works (Class 6F1 or 6F2). The formation surface shall be treated with a residual herbicide to minimise the risk of future weed growth. This to be applied by competent personnel in strict accordance with the Manufacturer’s instructions.

4 The contractor should allow for the possible installation of a Tensar triaxial geo-grid. The decision on where a geo-grid is required will be made following CBR testing of the pitch formation. IF a geo-grid is not installed then a separator geotextile (Terram 4000 or equivalent) will be required.

S207 Sub-base Construction

1 The sub-base shall be constructed to a minimum consolidated depth of 300mm. The sub-base aggregates shall be a reduced fines grade of crushed rock complying with the requirements of the Department of Transport Specification for Highways Work for Type 1x (DOT Type 3) sub-base materials.

2 Prior to the importation of the stone to be used for the construction of the sub-base samples shall be issued to the Employer’s Agent for inspection and comment. The proposed stone shall also be subjected to laboratory permeability testing. In addition to complying with the grading requirements of the Department of Transport Specification for Highways Work for Type 1x (DOT Type 3) sub-base materials The material shall have a permeability of no less than 3,000mm/hour when tested in the laboratory and also when tested on site.

3 Prior to importation of the material a trial area shall be set up on site and the stone will be compacted and then subjected to a flood test. The permeability of the compacted stone shall be no less than 3,000mm/hour.

Recycled materials shall only be used with permission of the Employer. All aggregates shall be porous and frost resistant; test certificates to be provided by the aggregate supplier. The installed sub-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. The surface level tolerance shall be ±10 mm of the design level and, when checked using a 3 m straight edge, there should be no deviation >10 mm. Consideration should be given to laying the final layer with a laser paver to achieve the tolerances set out above.

S208 Macadam Course (See Section S600 For detailed specification)

1 The base of the pitch shall incorporate a double layer of bitumen macadam as follows: 40 mm compacted thickness of 20 mm nominal sized aggregate open textured base course to BS EN 13108-7 and 25 mm consolidated thickness of 6 mm nominal sized aggregate open textured wearing course to BS EN 13108-7.

2 The surface shall be laid to satisfy the surface regularity requirements of the FIH Recommended Global standard. The surface level tolerance shall be ±10 mm of the design level and, when checked using a 3 m straight edge, there should be no deviation
>6 mm. No joint shall vary in level by more than 2 mm. There shall be no imperfections within the macadam wearing course.

S209 Shockpad

1 The surfacing system shall incorporate a shockpad. It is anticipated that a 20-25 mm thick proprietary in-situ rubber shockpad will be supplied and installed. However, the shockpad thickness can be varied to ensure that the overall system meets the FIFA Recommended 2-Star standard. The design life of the shock-pad shall be twenty five years. Alternative forms of shockpad will be considered.

2 The surface level tolerance shall be ±10 mm of the design level and, when checked using a 3.0 m straight edge, there should be no deviation >10mm. No joint shall vary in level by more than 2mm. There shall be no imperfections within the shockpad. At no point on the pitch shall the thickness of shockpad be less than 90% of the manufacturer’s specified thickness. The tensile strength of the shockpad when tested in accordance with BS EN 12330 shall be ≥0.1 MPa. The system shall retain elastomeric properties and remain dimensionally stable within a moisture content and temperature range commensurate with field conditions over the design life of the facility.

3 The thickness density and weight per unit area of the shockpad shall match those of the reference sample within 10% of the specified value. The shockpad shall achieve a minimum tensile strength of 0.12Mpa and elongation of 30% when tested in accordance with the methods given in EN 12230:2003 Surfaces for Sports Areas – Determination of tensile properties of synthetic sports surfaces where SBR rubber is used. The contractors shall submit a detailed method statement for laying the shockpad this must be supplied before any site works are carried out. Reference samples of the shockpad system shall be offered up for testing to the Test House prior to the installation. Any macadam must be found to have the required bearing capacity prior to any further work on this platform taking place.

   Thickness – 20m grid

   Samples for Tensile Strength and Elongation – 3 per day min 300mm by 300mm in size

S210 3G Artificial Grass Surfacing System

1 The artificial grass surfacing system shall fully comply with the FIFA Recommended 2 Star standard as set out in the FIFA Quality Concept Handbook of Requirements (January 2012).

2 The propose system will be based on a 40 to 50mm thick carpet with their recommended sand and rubber crumb infill. The carpet is to be laid over a 20- 25mm thick proprietary in-situ rubber crumb shockpad. Alternative forms of shockpad will be considered.

3 You are invited to suggest your own system based on the requirement for FIFA 2 star standard pitch, which should achieve a FIFA 2 star standard after five years of use and FIFA 1 star after eight years use. You are able to choose your carpet, infill and shockpad design options.

4 Subject to any agreed patterns of usage (including restrictions on footwear) and subject to the field operator undertaking all maintenance as specified by the surface manufacturer, using equipment approved by the surface manufactures, the surface manufacture shall warranty that the pitch will comply with the requirements of FIFA One star certification for a period of eight years based on 2,500 hours per year with 30 players per hour or a total of 600,000 playing hours, whichever comes first.

5 Subject to any agreed patterns of usage (including restrictions on footwear) and subject to the field operator undertaking all maintenance as specified by the surface manufacturer,
using equipment approved by the surface manufactures, the surface manufacture shall warranty that the pitch will comply with the requirements of FIFA Two star certification for a period of eight years based on 1,500 hours per year with 30 players per hour or a total of 225,000 playing hours, whichever comes first.

6 The artificial grass carpet shall comply with the FIFA Recommended 2 Star standard. It is anticipated that the carpet shall comprise monofilament fibres with a pile length of approximately 40mm - 50 mm. N.B. A test certificate from an accredited test house shall be provided as part of the tender submission for the proposed carpet.

7 The artificial grass carpet shall be laid in full widths across the pitch, other than where longitudinal rolls are laid to include tufted sideline markings. The method of jointing / seaming, including all in-laid line markings, shall be such that no ridge, groove or crease shall be wider than 3 mm apparent.

8 No seam width shall be within 300 mm of any permanent inlaid line.

9 Bonded joints shall be formed using jointing tape of not less than 400 mm wide and polyurethane glue applied evenly to either side of the tape to a minimum total of 300 mm.

10 There shall be no loops in the tufts, random long tufts, loose tufts, tears, holes (except for designed drainage holes) or melted areas, undulations, pile height variations or any other visual or manufacturing defect. If replacement of defective carpet is deemed necessary by the Employer or his agent, this shall involve full replacement of a length and width of carpet roll (as designed and manufactured). No patching whatsoever will be allowed.

Infilling and brushing.

11 The infill materials shall be a proprietary mixture of uniformly graded rubber granulates a combination of sand/rubber particles blended to form a stable matrix to the synthetic carpet. There shall be no rubber dust or excessive shred in the bulk materials supplied. The preferred rubber size range is 0.5mm to 1.5mm however alternative gradings may be approved by the Employer’s Agent who reserves the right to reject any suspect rubber either to be supplied or found on-site, it is in your interests therefore to have the rubber approved before placing an order. Rubber only mixtures will be similarly assessed.

12 Sand in filling shall consist of non-abrasive, non-staining, well-rounded and dust-free Particles (sub angular or sub rounded sands will be rejected) and shall match the reference sample as supplied. No chemical treatments are permitted to either bleach or coat the sand. The preferred size range is 0.2mm to 1.0mm; alternative gradings may be approved by the Employer’s Agent who reserves the right to reject any sand fill medium either to be supplied or found on-site, it is in your interests therefore to have the rubber approved before placing an order.

13 The contractor shall carry out as many filling and brushing operations as required to fill the carpet to the required depth and to provide the specified performance. The Contractor shall carry out a re-dressing of the whole pitch at six months; this should be allowed for in the tender price. The Contractor shall also make due allowance for providing extra rubber/sand to the Employer at the handover of the contract to facilitate local topping up (to be supplied in sealed bags).

Line marking.

1 Primary line markings (WHITE) shall be 100 mm wide. Line markings can a combination of be tufted or in-laid – Contractor to propose. Line markings shall be in accordance with the relevant rules of the game. Line markings shall be within 20 mm of their specified position and shall not deviate by >10 mm from a line joining their ends, nor include any sudden steps. Line edges shall be parallel and uniform. For a period of 5 years from Practical Completion each straight line marking shall remain straight within ±100 mm of a
tensioned string line joining its ends and all lines shall remain within ±150 mm of their original position as measured at practical completion. Furthermore, no line shall exhibit any sudden irregularity or deviation >75 mm over a distance of 1 m.

S212 Construction Phase Quality Monitoring

1 Throughout installation of the artificial grass surfacing system, the Contractor shall take samples of all materials as detailed in Schedule 1 and arrange for them to be sent to an independent test house for testing. The test laboratory’s report shall be submitted to the Employer prior to any interim application for payment for the artificial grass surfacing system.

2 The Contractor shall have responsibility for appointing the test house to test the pitch. The Contractor shall notify the Employer of the proposed test house for approval prior to tests being made. The test house shall be accredited by FIFA for the testing of artificial grass pitches.

3 All samples shall be coded and the areas of installed materials from which they came recorded so any defective materials can be located and replaced on site. Failure to do so may result in an entire section of work being replaced.

Schedule 1: Samples required for testing – artificial grass surfacing materials

<table>
<thead>
<tr>
<th>Component</th>
<th>Sampling</th>
<th>Tests / methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub-base</td>
<td>Assessment of CBR at five locations.</td>
<td>BS 1377</td>
</tr>
<tr>
<td>Shockpad</td>
<td>Pre-fabricated: three 300 x 300 mm samples plus one additional sample for every 1000 m².</td>
<td>BS EN 1969</td>
</tr>
<tr>
<td></td>
<td>In-situ mixed – three 300 x 300 mm samples per day of installation.</td>
<td></td>
</tr>
<tr>
<td>Tensile strength</td>
<td>Plate test</td>
<td>BS EN 12230</td>
</tr>
<tr>
<td>Shock absorption</td>
<td></td>
<td>BS EN 14808</td>
</tr>
<tr>
<td>Artificial grass carpet</td>
<td>One 500 x 500 mm section for every two rolls of carpet.</td>
<td>BS ISO 1763</td>
</tr>
<tr>
<td>Pile weight</td>
<td></td>
<td>BS ISO 8543</td>
</tr>
<tr>
<td>Pile yarn ident.</td>
<td></td>
<td>BS ISO 11357-3</td>
</tr>
<tr>
<td>Tufts unit area</td>
<td></td>
<td>BS ISO 1763</td>
</tr>
<tr>
<td>Tuft bind</td>
<td></td>
<td>BS ISO 4919</td>
</tr>
<tr>
<td>Carpet weight</td>
<td></td>
<td>BS ISO 8543</td>
</tr>
<tr>
<td>Carpet joints</td>
<td>One 1000 x 500 mm wide joint sample for each day of seaming.</td>
<td>BS EN 12228</td>
</tr>
<tr>
<td>Performance infill</td>
<td>1 kg per 1,000 kg installed</td>
<td>Particle grading</td>
</tr>
<tr>
<td>Particle shape</td>
<td></td>
<td>prEN 14955</td>
</tr>
<tr>
<td>Bulk density</td>
<td></td>
<td>BS EN 933-1</td>
</tr>
<tr>
<td>Stabilising infill</td>
<td>1 kg per 1,000 kg installed</td>
<td>Particle grading</td>
</tr>
<tr>
<td>Particle shape</td>
<td></td>
<td>prEN 14955</td>
</tr>
<tr>
<td>Bulk density</td>
<td></td>
<td>BS EN 933-1</td>
</tr>
</tbody>
</table>

4 Sampling should be scheduled to ensure that samples are fully representative of those installed over the whole pitch. Samples should be coded so any defective materials can be located and replaced on site. In-situ laid shockpad and joint samples should be left for
Jenner Park Athletic Stadium
Synthetic 3G Football Pitch Development

at least 48 hours on site exposed to the elements so they experience the same climatic conditions as the installed materials.

5. The appointed contractor must include in his tender key stage construction testing to be undertaken by a FIFA accredited independant test house which is to be approved by the Employer's Agent. The key stage testing required shall include:

- Formation and drains – levels of formation & drainage points & predictive CBRs by DCP.
- Stone Base and kerbs – dimensions, levels on stone to determine stone thickness, levels on kerbs, base stiffness by deflectometer, and indicative permeability.
- Base – levels and from that thickness, straightedge, and permeability
- Shockpad – if in-situ, straightedge and thickness
- QC testing of samples – shockpad for tensile strength, carpet and infill for Identification, seams for seam strength.

S213 Post Construction Testing

1. After approximately 2-months following construction, the pitch shall be certified as complying with the FIFA Recommended 2 Star standard. The Contractor shall also allow for re-testing after 12-months. The Contractor shall have responsibility for appointing the test house to test the pitch. The Contractor shall notify the Employer of the proposed test house, for approval, prior to tests being made. The test house shall be accredited by FIFA for the testing of artificial grass pitches. The pitch shall be tested in accordance with the requirements of the FIFA Quality Concept. Practical Completion shall not be deemed to have been achieved until the Test House confirms satisfactory performance of the pitch.

S214 Maintenance

1. The contractor shall supply detailed maintenance instructions that have been approved by the manufacturer of the artificial grass surfacing system to allow the required maintenance to be carried out. This shall include:

2. The type of brushes and drag mats to be used (by name).
3. The maximum tyre loadings indicated to protect the surface.

S215 Top-dressing

1. The contractor shall allow for a minimum of two applications of infill rubber or sand rubber mixture; one to initially brush the carpet in the first four weeks of operation which will include top dressing as necessary to ensure that a) the pitch performs as intended very early in the life of the facility b) to ensure that when tested the pitch meets the Performance requirements. Also the Contractor shall carry out re-dressing of the whole of the pitch at six months; this should be allowed for in the bid price, it is anticipated that 15 tonnes of rubber may be required for this operation to top up the pitch. The Contractor must make due allowance for providing extra rubber/sand to the proprietor at the handover of the contract, these bags will be used for local topping up and everyday maintenance.

S216 Kerbs (Detailed Specification in Section S600)

1. Precast concrete kerbs shall be hydraulically pressed complying with the requirements of BS 7263: Part 1 (14). They shall be bedded in accordance with BS 7263: Part 2 (14), on a graded ST1 concrete foundation. The dimensions of the edgings shall be a minimum of 50mm x150mm nominal.
2 All kerbs must be fitted to make due allowance for the subsequent fitting of the synthetic turf system to be utilized. Thus, an up stand of between 40mm and 50mm is necessary but must be selected by the contractor as appropriate.

S217 Drainage & Ducts General

1 A new drainage system will be installed within the pitch with 100mm dia twin walled lateral drains installed at 8.0m centres. The new drainage will be installed such that it will achieve a satisfactory discharge rate, which will cope with a 1 in 100 year rainfall event of 120 minutes duration. All run-off will be allowed to infiltrate on-site. The drainage will be connected to 150mm dia carrier pipes.

2 A perimeter drain shall support the pitch drainage this shall be not less than 150mm diameter this shall tie lateral 100mm dia lateral drains installed at not less than 7.0m centres which shall be fully connected via proper “T” piece connection to the perimeter drains.

3 The 150mm diameter pipes shall discharge into the outlet pipes at the invert levels shown on the drainage design Drawing No GTC00164-02. The contractor shall allow in his rates for installing drains through footpaths where required and the cost to do this and make good shall be included in the drainage rates.

4 Pipes for Drainage

Shall be plastic as described below: Pipes for drains shall be perforated or slotted no wider than 4mm or less than 6mm and the holes not greater than 10mm or less than 3mm diameter. Plastic pipes must comply with the requirements of BS 4962 (5). These should be used for lateral drainage and shall be 100mm diameter. 150mm dia carrier pipes shall be slotted twin walled.

5 Pipe Bedding & Infill Materials

Pipe bedding and infill materials will be clean durable granular materials complying with BS 882 (6) and shall consist of 5mm to 10mm sized angular stone with no more than 3% fines and 10% Calcium Carbonate content.

6 Pre-cast Concrete Manholes Type Structures

Pre-cast concrete manholes and silt traps type structures shall be rectangular and comply with BS 5911 Part 2000 (7). Units, which bed onto bases, shall be manufactured such that the full wall thickness is in contact with the base. For joints between units the underside of the slab, joint profiles shall be capable of withstanding applied loading from such slabs.

7 Manhole Covers and Frames

Manhole covers and frames shall be class B125 in accordance with BS EN 124 (8) and approved by the employer. The clear opening shall not be less than 650mm in any direction.

8 General

The contractor shall not be allowed to pump or discharge into any river, stream, sewer or drain without the permission of the Local Water Company and or Environment Agency.

9 Laying and Jointing of Pipes

Flexible jointed pipes will be laid on a bed of 75mm of granular materials properly compacted, the trench shall be filled with a further 150mm of similar granular materials above the barrel of the pipe. Jointing shall be carried out strictly in accordance with the
Testing of Pipes

All pipes should be tested for effectiveness before the completion of haunchings or complete backfilling.

Backfilling of Trenches

All backfilling operations shall be carried out in accordance with the Specification for Highways (3) requirements.

Rodding Eyes

Rodding eyes shall be provided for maintaining the drainage system.

Warranty

Artificial grass pitch performance. The pitch shall satisfy the performance requirements of the FIFA Recommended 2 Star standard throughout the 12 month Defects Liability Period and for a minimum of at least a further seven years.

Repairs under Warranty.

The Contractor shall undertake as part of the warranty that any remedial work or repair necessary under the terms of the Warranty in respect of failed seams or joints, or loss of adhesion will be completed within 14 days of notification in writing by the Employer. The Contractor shall further undertake as part of the Warranty that any other remedial work or repair necessary under the terms of the Warranty will be completed within 28 days of notification in writing by the Employer and that repairs will be carried out with materials identical to the original installation and at such times as may be agreed with the Employer such that the planned programme of activities shall not be affected.

The Contractor shall provide a written warranty in respect of the manufacture, installation and performance of the synthetic turf those materials selected by him/her and placed in the permanent works.

The warranty will be such that the Contractor will indemnify the client for all aspects of the works whether sub-contracted or not. In the case of the synthetic turf system the manufacturer will be expected to produce a special warranty with regard to the manufacture, installation and performance of the synthetic turf. This will be in the form of an insurance backed warranty.

In addition to the warranty requested it is a requirement of this contract that the following clear definition of the terms of what the warranty covers is accepted by the contractor. If you cannot or will not accept this warranty then your tender will not be considered.

Details of Warranty

In this warranty the following words shall have the following meanings.

‘Fade’ shall mean a significant loss or change of colour, as distinguished from a change in texture. ‘Fail’ shall mean a significantly disproportionate decrease in pile height in any one-year, (a proportionate decrease in pile height being a graduated decrease of 80% in pile height over 10 years). ‘Dimensionally Unstable’ shall mean a deviation of the inlaid line from a straight line measured between the corner points of the inlaid lines on the synthetic sports surface in excess of: 12 millimetres (25 millimetres in five a side goal areas) one year from the date of installation, and a graduated annual deviation thereafter to a
maximum of 25 millimetres (50 millimetres in five a side goal areas) five years from the
date of installation The Contractor warrants that the fibre used in the synthetic sports
surface will not Fade or Fail or become Dimensionally Unstable for a period of 5 years
from the date of installation This warranty is given subject to the following: infill (if
applicable) is of the grade, and kept at the quantity specified in the specification to this
Warranty, at all times (save where compliance with this condition is the responsibility of the
Contractor); only recommended footwear and sporting equipment, specified in the tender
by the contractor, is used by persons using the surface; only the sporting activities
specified in the tender by the contractor, are undertaken on the synthetic sports surface;
and the synthetic sports surface is not removed from where it is originally installed This
warranty does not apply to the immediate threshold to any gate or access point onto the
pitch This warranty is supplemental to the guarantees, warranties, liabilities and obligations
contained within this Agreement, but in lieu of any other express guarantees, warranties,
liabilities or obligation on the part of the Contractor in respect of the synthetic sports
surface All terms, guarantees, warranties, liabilities and obligations implied by statute
(including terms as to merchantable quality and fitness for purpose) shall be limited to the
warranty offered by the Contractor but shall be not less than a minimum of 5 years from
the date of installation

7 To make a claim under this warranty the Employer shall:

Notify the Contractor of the nature of the claim; Arrange for the synthetic sports surface to
be inspected by an independent consultant or test house in the presence of a
representative of the Employer and the Contractor; and arrange for the submission of a
sample of the synthetic sports surface to an appropriate laboratory for testing, if this is
deemed by either party to be appropriate Any dispute as to whether the Contractor is in
breach of this warranty shall be referred to expert determination, by an expert to be
appointed by agreement between the parties. The decision of an expert appointed under
shall be final and binding on the parties The Contractor and the Employer shall each pay
50% of the fees of an expert appointed. If the Contractor is found to be in breach of this
warranty, the Contractor shall at no cost to the Employer, and within 6 weeks of the breach
being established: remove the synthetic sports surface and replace it with a new synthetic
sports surface meeting the performance criteria specified in the Specification In the event
that a single roll of the synthetic sports surface Fails or Fades the Contractor shall replace
that roll with a roll that to the reasonable satisfaction of the Employer is of similarpile
characteristics in terms of both colour and pile height and appearance as the rest of the
synthetic sports surface.

S219 Pitch Maintenance at Certification

1 FIFA certification requires an audit of maintenance equipment, personnel and training.
The audit has to take place at the time the pitch is tested. It is anticipated that the
maintenance of the pitch will be undertaken by the Club’s pitch maintenance staff.
Arrangements will need to be made by the appointed contractor for the Clubs staff to be
on site at the time of test.

S220 Temporary Security Fencing

1 The contractor will be required to install and maintain temporary herras type fencing
around the pitch and compound area during the period of the contract up to completion of
the pitch works.
Jenner Park Athletic Stadium
Synthetic 3G Football Pitch Development

**S500**  Miscellaneous Items

**S501**  Goals & Flags

The contractor shall supply and install the following items:

1. **3G Football pitch**

   **Movable Goals**

   3 No sets Samba Aluminium Freestanding Mini Soccer Goals 12’ x 6’ with self weighted wheel sets. Samba product reference code G95032.

   Samba goal weblink:

   [http://www.sambasports.co.uk/aluminium-freestanding-mini-soccer-goals-12-x-6-pr-16542.html](http://www.sambasports.co.uk/aluminium-freestanding-mini-soccer-goals-12-x-6-pr-16542.html)

   1 No sets Senior 3G Stadium goals including nets and installation of sockets.

   Harrod UK goal weblink:

   [http://www.harrod.uk.com/Sports/Football/Full-Junior%20Size/Socketed%20Aluminium/Products/399Corner%20flags](http://www.harrod.uk.com/Sports/Football/Full-Junior%20Size/Socketed%20Aluminium/Products/399)

   **Corner flags**

   1 No set of corner flags (product reference: FO210) to include posts and flags. White poles and red flags required.

   Sportsequip flag web-link:

   [http://www.sportsequip.co.uk/acatalog/GroundsmansSectionCornerSidelinePoleBase.html](http://www.sportsequip.co.uk/acatalog/GroundsmansSectionCornerSidelinePoleBase.html)
S600 Hard-standing Areas Works

S601 General
1. If there is a requirement to construct hard-standing areas then the following specification shall be implemented.

S602 Hard Standing Area Buildup
1. The requirement is to install a durable surface, which shall perform well throughout the serviceable life of the synthetic systems installed. The surfacing supplier shall having undertaken the necessary preparation of the base works detailed in this specification and install the synthetic turf and polymeric track systems which meet the performance and durability requirements of this specification.

It is anticipated that the following works shall be discharged as part of the works covered by this specification as defined in this list:
- Installation of granular capping course
- Installation of granular sub-base course
- Installation of bituminous base course
- Installation of bituminous wearing course

S603 Granular Capping Course
1. This work shall consist of excavation to sub-formation levels, furnishing, spreading, and compacting capping material in accordance with the Earthworks Specification referred to below.

2. The purpose of the capping layer shall be to provide a formation layer to the base of the pitch margin with a CBR value of not less than 15%. Granular capping material shall be classed as 6F2.

S604 Granular Sub base Course
1. This work shall consist of furnishing, spreading, and compacting a sub-base layer. The Contractor shall provide a design for the hard standing areas incorporating a combination of sub-base and bituminous courses. The sub-base material shall achieve the following specification criteria.

Materials

Granular sub-base material for road sub-base shall consist of hard, durable natural/screened gravel or crushed stone, and shall be free from clay balls or other deleterious substances. Granular sub-base shall be well graded and lie within the grading envelope stated below when tested in accordance with BS 1377: Part 2: Test 9.2. The material should have a minimum 4 days soaked C.B.R. of 30 % at 95 % of maximum dry density. Organic impurities (BS .1377 Part 3 Method 3) shall not exceed 0.2%.

<table>
<thead>
<tr>
<th>SIEVE SIZE</th>
<th>PERCENTAGE PASSING</th>
</tr>
</thead>
<tbody>
<tr>
<td>63 mm</td>
<td>100</td>
</tr>
<tr>
<td>37.5 mm</td>
<td>85-100</td>
</tr>
<tr>
<td>10 mm</td>
<td>40-85</td>
</tr>
</tbody>
</table>
2 **Construction**

The granular sub-base shall be compacted to not less than 95% of the maximum dry density determined in accordance with BS 1377: Part 4 Method 3.6. Particle size analysis of soils for sieve analysis of fine and coarse aggregate shall be carried out in accordance with BS 1377:Part 2:Test 9.2. The surface on completion of compaction shall be well closed, free from movement under compaction plant and free from ridges cracks or loose material. The finished surfaces of the road sub-base shall not vary at any point more than 10 mm above or below the grade shown on Drawing No: GTC00234 07.

3 **Relevant Tests and Standards**

The following tests should be carried out and the material shall conform with the requirements stated:

<table>
<thead>
<tr>
<th>TEST</th>
<th>STANDARD</th>
<th>LIMIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sampling</td>
<td>ASTM D-75 --</td>
<td></td>
</tr>
<tr>
<td>Los Angeles Abrasion</td>
<td>ASTM C-131 or ASTM C-535</td>
<td>30 % max.</td>
</tr>
<tr>
<td>Soundness (Magnesium Sulphate Solution) 5 cycles</td>
<td>ASTM C88</td>
<td>12 %.max.</td>
</tr>
<tr>
<td>Liquid Limit</td>
<td>BS 1377:Part 2 -Test 4.5</td>
<td>35 % max.</td>
</tr>
<tr>
<td>Plasticity Index</td>
<td>BS 1377:Part 2 Test 5</td>
<td>6 max.</td>
</tr>
<tr>
<td>Compaction Test(Dry Density / Moisture Content Relationship)</td>
<td>BS 1377: Part 4 Method 3. 6min.</td>
<td>200mg/m3</td>
</tr>
<tr>
<td>C.B.R. at 95 % of Maximum dry density (96 hour soaked)</td>
<td>BS 1377: Part 4 Test 7 30 % min.</td>
<td></td>
</tr>
<tr>
<td>Field Density</td>
<td>BS 1377: Part 9:Test 2.2</td>
<td>95%min. of MDD</td>
</tr>
<tr>
<td>Linear Shrinkage</td>
<td>BS 1377: Part 2 Method 6.5</td>
<td>3 % max</td>
</tr>
<tr>
<td>Sulphate Content (Acid soluble)</td>
<td>BS 1744-1</td>
<td>0.5 % max.</td>
</tr>
<tr>
<td>Chloride Content (Acid soluble)</td>
<td>BS 1744-1</td>
<td>1% max.</td>
</tr>
</tbody>
</table>
**Jenner Park Athletic Stadium**  
**Synthetic 3G Football Pitch Development**

**S605  Bituminous Paving Courses**

1 **Description**

This work shall consist of the construction of the following hot-mix bituminous courses for the macadam hard standing areas.

- Bituminous Base Course
- Bituminous Binder Course
- Bituminous Wearing Course

2 The Contractor shall provide a design for the pitch margin pavement incorporating a combination of sub-base and bituminous courses, that achieves the following specification criteria. Bituminous Paving Courses shall consist of coarse aggregates, fine aggregates, filler material, and bitumen binder.

2 **Coarse Aggregates**

1 Coarse aggregate, which is the material retained on a 4.75 mm sieve, shall consist of crushed rock or crushed gravel. It shall be clean, hard, tough, durable and sound, and shall be of uniform quality and free from decomposed stone, shale, clay, lumps and other deleterious substances. Sampling of coarse aggregate shall be in accordance with ASTM D75.

2 Crushed gravel for use as coarse aggregate shall consist of the product obtained by crushing material that has first been screened in such a manner that not less than 90 percent of the material to be crushed is retained on an ASTM 9.5mm sieve. The percentage of partially crushed material with minimum one crushed face shall be 100% by weight. In addition, at least 85% by weight shall have all faces crushed. Coarse aggregate shall have properties which comply with the following values:

<table>
<thead>
<tr>
<th>Los Angeles Abrasion Loss (ASTM C131 or C535)</th>
<th>Base Course and Binder Course</th>
<th>30% max.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wearing Course</td>
<td>25% max.</td>
</tr>
<tr>
<td>Aggregate Crushing Value (BS 812 Part 110)</td>
<td>Base Course and Binder Course</td>
<td>25% max.</td>
</tr>
<tr>
<td></td>
<td>Wearing Course</td>
<td>20% max.</td>
</tr>
<tr>
<td>Soundness Loss (ASTM C88) (Magnesium Sulphate 5 cycles)</td>
<td>Base Course and Binder Course</td>
<td>10% max.</td>
</tr>
<tr>
<td>Flakiness Index (BS 812 Part 105.1 Sec. 105.1)</td>
<td>Base Course and Binder Course</td>
<td>30 max.</td>
</tr>
<tr>
<td></td>
<td>Wearing Course</td>
<td>25 max.</td>
</tr>
<tr>
<td>Elongation Index (BS 812 Part 105.2 Sec. 105.2)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Jenner Park Athletic Stadium  
Synthetic 3G Football Pitch Development

<table>
<thead>
<tr>
<th></th>
<th>Base Course and Binder Course</th>
<th>30% max.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wearing Course</td>
<td>25% max.</td>
</tr>
<tr>
<td>Water Absorption (ASTM C127)</td>
<td></td>
<td>2.0% max.</td>
</tr>
<tr>
<td>Acid soluble Chlorides (BS 1744-1)</td>
<td></td>
<td>0.1% max.</td>
</tr>
<tr>
<td>Acid soluble Sulphate (BS 1744-1)</td>
<td></td>
<td>0.5% max.</td>
</tr>
</tbody>
</table>

3 **Fine Aggregate**

Fine aggregate shall consist of the material passing a 4.75 mm sieve. Fine aggregate including filler shall be obtained from 100% crushed gravel or crushed rock prescreened to exclude natural uncrushed fine material or weathered unsound fines. The use of dune sand shall not be permitted. Sampling of fine aggregate shall be in accordance with ASTM D75. Fine aggregates shall have properties which comply with the following values:

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soundness Loss (ASTM C88)</td>
<td>10% max.</td>
</tr>
<tr>
<td>Plasticity Index (BS 1377: Part 2: Test 5)</td>
<td>Non Plastic</td>
</tr>
<tr>
<td>Acid Soluble Chlorides (BS 1744-1)</td>
<td>0.1% max.</td>
</tr>
<tr>
<td>Acid Soluble Sulphates (BS 1744-1)</td>
<td>0.5% max.</td>
</tr>
<tr>
<td>Water Absorption (ASTM C 128)</td>
<td>2.3% max</td>
</tr>
</tbody>
</table>

4 **Combined Aggregates**

The combined mineral aggregate shall meet the following physical requirements:

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sand Equivalent (ASTM D 2419)</td>
<td>65 minimum</td>
</tr>
<tr>
<td>determined after all processing except for addition of asphalt binder:</td>
<td></td>
</tr>
<tr>
<td>Plasticity Index (BS 1377: Part 2: Test 5)</td>
<td>Non Plastic</td>
</tr>
</tbody>
</table>

When tested according to BS EN 933-1:1997 or ASTM C-136, the combined mineral aggregate shall conform to the following:

**AGGREGATE GRADATION FOR DENSE BITUMEN MACADAM ROADBASE**

<table>
<thead>
<tr>
<th>B.S TEST SIEVE</th>
<th>AGGREGATE CRUSHED ROCK OR GRAVEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>37.5</td>
<td>95-100</td>
</tr>
<tr>
<td>28</td>
<td>70-94</td>
</tr>
<tr>
<td>14</td>
<td>56-76</td>
</tr>
</tbody>
</table>
### AGGREGATE GRADATION FOR DENSE BITUMEN MACADAM BASE COURSE

<table>
<thead>
<tr>
<th>B.S TEST SIEVE</th>
<th>AGGREGATE, CRUSHED ROCK OR GRAVEL</th>
<th>Percentage by Mass Passing for Finished Thickness of Base Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>mm</td>
<td>mm</td>
</tr>
<tr>
<td>65 - 80</td>
<td>50 - 60</td>
<td>35 - 45</td>
</tr>
<tr>
<td>50 - -</td>
<td>100</td>
<td>-</td>
</tr>
<tr>
<td>37.5</td>
<td>95 - 100</td>
<td>100</td>
</tr>
<tr>
<td>28</td>
<td>70 - 94</td>
<td>90 - 100</td>
</tr>
<tr>
<td>20</td>
<td>71 - 95</td>
<td>95 - 100</td>
</tr>
<tr>
<td>14</td>
<td>56 - 76</td>
<td>58 - 82</td>
</tr>
<tr>
<td>10</td>
<td>- - 52 - 72</td>
<td></td>
</tr>
<tr>
<td>6.3</td>
<td>44 - 60</td>
<td>44 - 60</td>
</tr>
<tr>
<td>3.35</td>
<td>32 - 46</td>
<td>32 - 46</td>
</tr>
<tr>
<td>0.300</td>
<td>7 - 21</td>
<td>7 - 21</td>
</tr>
<tr>
<td>0.075</td>
<td>2 - 8</td>
<td>2 - 8</td>
</tr>
</tbody>
</table>

### AGGREGATE GRADATION FOR DENSE BITUMEN MACADAM WEARING COURSE

<table>
<thead>
<tr>
<th>B.S TEST SIEVE</th>
<th>AGGREGATE, CRUSHED ROCK OR GRAVEL</th>
<th>Percentage by Mass Passing for Finished Thickness of Base Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>mm</td>
<td>mm</td>
</tr>
<tr>
<td>35 - 50</td>
<td>25 - 30</td>
<td>20</td>
</tr>
<tr>
<td>28 - -</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>95 - 100</td>
<td>100</td>
</tr>
<tr>
<td>14</td>
<td>70 - 90</td>
<td>95 - 100</td>
</tr>
<tr>
<td>10</td>
<td>55 - 70</td>
<td>70 - 90</td>
</tr>
<tr>
<td>6.3</td>
<td>44 - 60</td>
<td>45 - 65</td>
</tr>
<tr>
<td>3.35</td>
<td>25 - 40</td>
<td>30 - 45</td>
</tr>
</tbody>
</table>
The grading given in tables above represent the extreme limits which shall determine suitability of aggregate for use from all sources of supply. The coarse aggregate, shall show no detrimental amount of stripping when tested in accordance with ASTM D1664. The minimum value of non stripped area shall be 95%.

S606 Bitumen binder

1 General

Bitumen Binder for the “Bituminous Paving Courses” shall be penetration grade 60 – 70. Sampling shall be in accordance with ASTM D140. The bitumen shall be prepared by refining crude petroleum by suitable methods and shall be homogeneous, free from water and shall not foam when heated to 175 degrees C (347 F). Bitumen shall conform to the following requirements:

<table>
<thead>
<tr>
<th>TEST</th>
<th>ASTM</th>
<th>60 - 70 PEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Penetration at 25 deg.C 100g, 5 sec</td>
<td>D5</td>
<td>60</td>
</tr>
<tr>
<td>Flash Point, Cleveland Open Cup, deg.C.</td>
<td>D92</td>
<td>232</td>
</tr>
<tr>
<td>Ductility at 25 deg.C, cm</td>
<td>D113</td>
<td>100</td>
</tr>
<tr>
<td>Solubility trichloroethylene, %</td>
<td>D2042</td>
<td>99</td>
</tr>
<tr>
<td>Thin film oven test 3.2mm, 163 deg.C, 5 hr loss on heating, %</td>
<td>D1754</td>
<td>-</td>
</tr>
<tr>
<td>Penetration of residue % of original</td>
<td>D5</td>
<td>52</td>
</tr>
<tr>
<td>Ductility of residue at 25 deg.C, 5 cm/min, cm</td>
<td>D113</td>
<td>50</td>
</tr>
<tr>
<td>Kinematic Viscosity (Centistokes) at 135 deg.C</td>
<td>D2170</td>
<td>240</td>
</tr>
<tr>
<td>Softening Point Ring and Ball Apparatus</td>
<td>D36</td>
<td>48</td>
</tr>
</tbody>
</table>

2 Job Mix

The Contractor is responsible for providing the job standard mix appropriate for this work package. The mix design for use in the works shall be carried out in accordance with Marshall Method of Mix Design, Asphalt Institute Manual MS2. Indicative pavement thicknesses are shown in Drawing No: AAS-PAT-ARC-STD-00-DT-01954, the proposed pavement construction shall be design to an equivalent vehicle loading criteria.
The Contractor shall take as many samples of the materials and mix as he considers necessary for checking their required characteristics. When unsatisfactory results or changed conditions make it necessary, the Contractor shall establish, test and approve a new job-standard.

The bituminous paving courses shall have the properties as specified below:

<table>
<thead>
<tr>
<th>Properties</th>
<th>Bituminous Paving Course</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Base Course</td>
</tr>
<tr>
<td>Number of compaction blows each end of specimen by freely held Marshall hammer</td>
<td>75</td>
</tr>
<tr>
<td>Stability (Marshall) minimum Kg</td>
<td>900</td>
</tr>
<tr>
<td>Flow (Marshall) mm</td>
<td>2 - 4</td>
</tr>
<tr>
<td>Stiffness minimum Kg/mm</td>
<td>400</td>
</tr>
<tr>
<td>Percent air voids in mixture</td>
<td>5 - 7</td>
</tr>
<tr>
<td>Percent voids in mineral aggregate, minimum%</td>
<td>13</td>
</tr>
<tr>
<td>Percent voids filled with bitumen</td>
<td>50 - 70</td>
</tr>
<tr>
<td>Bitumen content%</td>
<td>3.3 – 4.3</td>
</tr>
<tr>
<td>Loss of Marshall stability by submerging specimens in water at 60 degrees Centigrade for 24 hours as compared to stability measured after submerging in water at 60 degrees Centigrade for 20 hours.</td>
<td>Max 20%</td>
</tr>
</tbody>
</table>

3 Compaction of Bituminous Layers

The road density requirements shall be equal to or greater than ninety eight (98) percent of the 75-blowes of Marshall density wearing course and ninety seven (97) percent of the 75-blowes of Marshall density for, base course and binder course. However, densities in excess of 101.8% shall not be permitted.

4 Surface Tolerance for Bituminous Courses

The bituminous courses shall be laid to the correct surface levels and profile as shown on the drawings, to a tolerance of +/- 6mm under a 3m straight edge.
5 Bituminous Prime Coat

Bituminous Prime Coat shall consist of supplying and applying liquid asphalt to a previously prepared and approved subgrade, sub base, aggregate base course or wet mix road-base in accordance with ASTM D140.

Material for Prime Coat shall be medium cut-back curing asphalt MC-70 to the requirements of ASTM D-2027 Prime coat shall be applied at a rate of not less than 0.7 litres per square metre and not more than 1.5 litres per square metre.

6 Bituminous Tack Coat

Bituminous tack coat shall consist of supplying and applying emulsified asphalt diluted with an equal quantity of water (1:1) to a previously prepared bituminous base course or binder course or to an existing bituminous surface. The sampling shall be in accordance with ASTM D140.

The material for bituminous tack coat shall be slow setting emulsified asphalt, grade SS-Ih (anionic) conforming to requirements of ASTM D977. The tack coat (diluted emulsion) shall be applied in quantities of not less than 0.3 litres per square metre and not more than 0.6 litres per square metre.

The application temperature for the tack shall be between 10°C and 60°C. The material should not be applied when the ambient temperature is less than 13°C or during rain, fog, and dust storms or other unsuitable weather.

S607 Concrete Kerbs

This work shall consist of the construction of kerbs in accordance with the Specifications and in conformity with the lines, grades and typical sections shown on the Drawings. These Specifications refer to precast kerbs to be constructed as part of the pitch margin package only. All Kerbs and edgings shall be hydraulically pressed and shall comply with the requirements of BS7263 Part 1. They shall be uniform in colour, free from cracks, flaws or other defects.

Kerbs shall be prepared with a concrete mixture containing not less than 400 Kg/m³ of Sulphate Resisting Portland Cement. The 28 day characteristics cube strength of the concrete shall be 40 N/mm² determined on cubes specimens, and not less than 75% of this figure after 7 days.

S608 Kerbs Laying

Elements shall be set to the lines and levels shown on the contractors design drawings. The concrete base shall be constructed of Concrete Class 25/20. Joints between radius kerbs, shall have a clear width of four (4) millimetres and be filled with a sand/cement (3:1) mortar with one fifth (1/5) part hydrated lime and sufficient water to make the mixture plastic and easily smoothed. A grooving tool shall be used to produce a smooth, circular section groove not more than three (3) millimetres deep in all joints. Joints between straight kerbs shall not be filled.

At each 9 metres along the length of the kerbs, the joint between kerbs shall be filled with an approved joint filler 10 mm thick to form an expansion joint. The filler shall extend through the kerb, bed, backing and channel, and shall be trimmed to the finished shape of the kerb and channel. Kerbs shall be laid within a tolerance of + or - 3 millimetres, at each end of an element.
APPENDICES
APPENDIX 1

TABLE 6/4 – HIGHWAYS SPECIFICATION
612 Compaction of Fill

General

1. For the purposes of Table 6/4 the following shall apply:—

i) The minimum number of passes \( N \) is the minimum number of times that each point on the surface of the layer being compacted shall be traversed by the item of compaction plant in its operating mode, or struck by power rammers or falling weight compactors. \( D \) is the maximum depth of the compacted layer.

ii) In column headed \( N \) the number of passes shown is to be doubled for material Classes 1A, 16, 2A, 26, 2C and 2D when such materials occur within 600mm of sub-formation if a capping is required, or formation. Such extra compaction shall, unless otherwise-described in Appendix 6/3, either be carried out for the full width of the embankment or, in other areas of fill which are to receive a pavement, between the outer extremities of the verges.

iii) The compaction plant in Table 6/4 is categorised in terms of static mass. The mass per metre width of roll is the total mass on the roll divided by the total roll width. Where a roller has more than one axle the category of the machine shall be determined on the basis of the axle giving the highest value of mass per metre width.

iv) A grid roller is a machine with a compacting roll or rolls constructed of heavy steel mesh of square pattern.

v) A tamping roller is a machine with a roll or rolls from which ‘feet’ project and where the projected end area of each ‘foot’ exceeds 0.01 m² and the sum of the areas of the feet exceeds 15% of the area of the cylinder swept by the ends of the feet. The requirements for tamping rollers apply to machines that have 2 rolls in tandem. If only one tamping roll traverses each point on the surface of the layer on any one pass of the machine, the minimum number of passes shall be twice the number given in Table 6/4 plus any further doubling required to satisfy (ii) above.

vi) For pneumatic-tyred rollers the mass per wheel is the total mass of the roller divided by the number of wheels.

vii) For vibratory rollers the following shall apply:—

a. Vibratory rollers are self-propelled or towed smooth-wheeled rollers having means of applying mechanical vibration to one or more rolls except that vibratory rollers employed for Method 5 compaction shall be single roll types.

b. The requirements for vibratory rollers are based on the use of the lowest gear on a self-propelled machine with mechanical transmission and a speed of 1.5-2.5 km/h for a towed machine, or a self-propelled machine with hydrostatic transmission. If higher gears or speeds are used an increased number of passes shall be provided in proportion to the increase in speed of travel.

c. Where the mechanical vibration is applied to two rolls in tandem, the minimum number of passes shall be half the number given in Table 6/4 for the appropriate mass per metre width of one vibrating roll but if one roll differs in mass per metre width from the other the number of passes shall be calculated as for the roll with the smallest value. Alternatively the minimum number of passes may be determined by treating the machine as having a single vibrating roll with a mass per metre width equal to that of the roll with the higher value.

d. Vibratory rollers operating without vibration will be classified as smooth-wheeled rollers.
Jenner Park Athletic Stadium
Synthetic 3G Football Pitch Development

e. Vibratory rollers shall be operated with their vibratory mechanism operating at the
frequency of vibration which produces the highest measurement of amplitude unless the
manufacturers recommend otherwise for the material being compacted.

f. Vibratory rollers shall be equipped or provided with devices indicating the frequency at
which the mechanism is operating and the speed of travel. Both devices shall be
capable of being read by an inspector alongside the machine.

viii) Vibrating-plate compactors are machines having a base-plate to which is attached a source
of vibration consisting of one or two eccentrically weighted shafts and:—

a. the mass per square metre of the base-plate of a vibrating-plate compactor is calculated
by dividing the total mass of the machine in its working condition by its area in contact
with the material to be compacted.

b. vibrating-plate compactors shall be operated at the frequency of vibration
recommended by the manufacturers. They shall normally be operated at travelling
speeds of less than 1 km/h but if higher speeds are necessary the number of passes
shall be increased in proportion to the increase in speed of travel.

ix) Vibro-tampers are machines in which an engine-driven reciprocating mechanism acts on a
spring system through which oscillations are set up in a base-plate.

x) Power rammers are machines which are actuated by explosions in an internal combustion
cylinder, each explosion being controlled manually by the operator.

xi) Dropping weight compactors are machines in which a dead weight is dropped from a
controlled height using a hoist mechanism and they include self propelled machines with
mechanical traversing mechanisms capable of compacting soil in trenches and close to
structures.

xii) In the case of power rammers and dropping-weight compactors one pass will be considered
as made when the compacting shoe has made one strike on the area in question.

xiii) For items marked * in the Method 3 column the roller shall be towed by track-laying tractors.
Self propelled rollers are unsuitable.

xiv) Where combinations of different types or categories of plant are used, the following shall
apply:—

a. the depth of layer shall be that for the type of plant requiring the least depth of layer,
and

b. the number of passes shall be that for the type of plant requiring the greatest number of
passes.
Jenner Park Athletic Stadium
Synthetic 3G Football Pitch Development