Northampton Kings Heath

Refurbishment of an Artificial Turf Pitch

Feasibility Report

Document Control			
Client	West Northamptonshire Council		
Site	Kings Heath Recreation Ground, Nene Way, Northampton, NN5 7NE		
Project	Refurbishment of an Artificial Turf Pitch		
SSL project code	SSL3015		
Document title	Feasibility Report		
Document control	**Revision**	**By**	**Date**
	First Issue	WB	24/11/21

Surfacing Standards Ltd . Office 2, Empingham House, Ayston Road, Uppingham, Rutland LE15 9NY
T. 01536 400 012
E. info@surfacingstandards.co.uk

www.surfacingstandards.co.uk

Associated Documents
SS3015 01 - Option 1 - 97x61 AGP
SS3015 02 - Option 2 - 106x70 AGP

1. Introduction

SSL has been commissioned to undertake appropriate site surveys and/or investigations to produce a Condition Report and outline specification and/or recommended works, accompanied by a budget estimate for the refurbishment of an artificial turf pitch at:

Kings Heath Recreation Ground, Nene Way, Northampton, NN5 7NE

The client's aspiration is to refurbish the existing derelict artificial turf pitch and build a new artificial turf pitch in its place.

This report aims to be beneficial in the decision-making process with respect to a decision whether to advance the proposed development, design development, securing necessary construction approvals and project funding. This report will form a basis for a future outline scheme design, which is critical to facilitate the production of works information and pricing documentation for the project. If a location and project is selected then further surveys, detail and information will be needed in order to progress the works along with further input from various parties and stakeholders and disciplines to enable the design and works to be more detailed with defining the scope of works and progressing the project forward.

This report has been prepared following client liaison, an initial site inspection, preliminary design work and survey information.

A variety of assumptions have been made whilst producing this report, which should be considered further during final design and project procurements stages.

Our opinion concerning perceived project risks is included within relevant sections of this study and will need to be verified and updated accordingly as the project progresses.

A RAG (Red/Amber/Green) status approach has been is presented to convey the relative risk assessed against each item and / or issue, as follows:

Table 1 – Risk Assessment Measure

RED	Immediate action needed as the issue(s) deemed to constitute a direct and significant threat to the project or present a risk to one or more party
AMBER	Issues identified that have the potential to develop into red alert status
GREEN	Items that are compliant, agreed, acceptable and present no risk to the project or the key parties

2. Site Classification / Constraints Review and Project Specific Surveys Review

2.1 Site Location

Kings Heath Recreation Ground, Nene Way, Northampton, NN5 7NE

Figure 1 – Kings Heath Site Location

2.2 Planning Context

2.2.1 Local Planning Policy

The site falls under greenspace, directly next to Kings Heath residential area within Northampton Local Plan Proposals Maps.

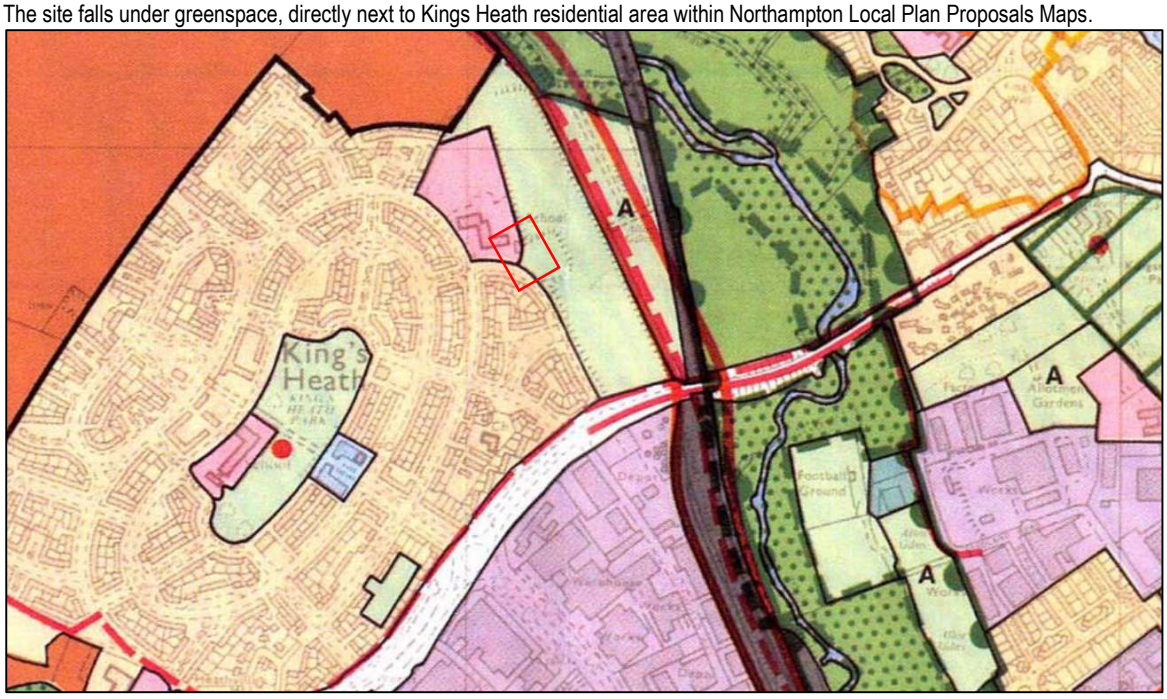

Figure 2 – Northampton Local Plan Proposals Maps

The relevant Local Planning Authority will be West Northamptonshire Council.

2.2.2 *Planning History*

No specific planning history of the artificial pitch could be found.

Planning history of the area shows that there are already development plans in place (Planning Application N/2016/0335) and progressing within the area through the local authority. Figure 3 shows this application that dates from an initial submission made in 2007 and was then added as an allocation in the Joint Core Strategy, the site was in part also allocated in 1997. The proposals show a large loss of playing fields.

The application was resubmitted in 2014 with the proposal including new pitches and reconfiguration of the existing with discussions of Kingsthorpe Jets are looking for their own site and other potential community user opportunities within the area.

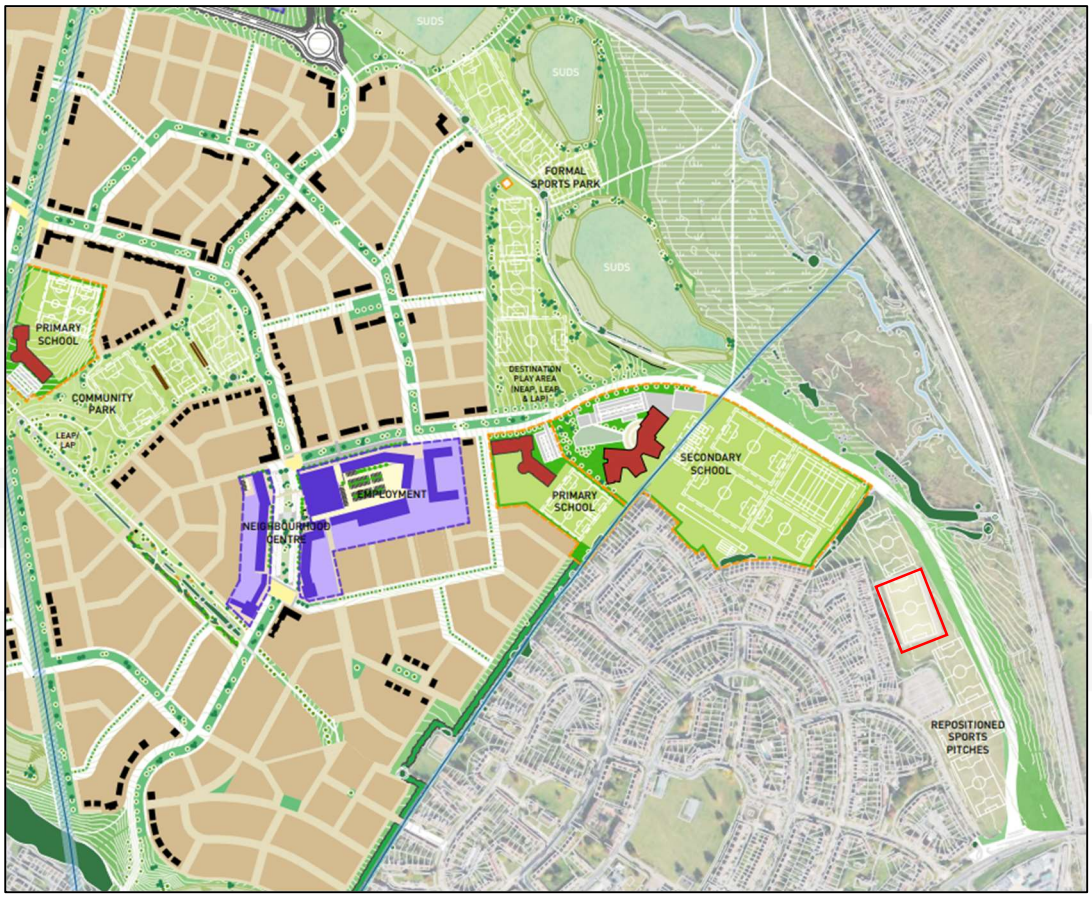

Figure 3 – Adjacent development and housing proposals

2.2.3 *Planning Process*

A planning application would be required for the development regardless of what level or type of refurbishment or redevelopment is proposed.

The sequential planning process to be following to reach a successful conclusion shall be as follows:

Table 2 – Planning process

Stage item	Activity
Research	Relevant planning policy guidance including local development plans, policies and any constraints to be considered
Pre-application	Discussions and negotiation with the Local Planning Authority (LPA) and other parties
Additional studies / surveys	Complete works as specified by the LPA to form part of the application
Public consultation (as required)	Contribute during pre-application stages
Develop application	Prepare technical information and question responses

Submit application	Via the Planning Portal
Facilitate payment	Fees to be paid by the applicant
Validation / determination date	Confirm validation and target decision timing
Officer's report	Obtain report when published, review and react to recommendations as necessary
Receive planning permission	Review
Discharge planning conditions and notices	Submit follow-on applications
Other statutory approvals / Building control	Submit similar applications

In order to assist the application for full planning permission, a Design and Access Statement (DAS) will be required to describe the project aspirations and illustrate the process that has led to the development proposal, and to explain and justify the proposal in a structured way.

The National Planning Policy Framework sets out the Government's planning policies for England and how these issues are expected to be applied to planning applications.

Guidance published by the Department for Communities and Local Government (March 2015) recommends that a DAS is a short report accompanying and supporting a planning application to illustrate the process that has led to the development proposal, and to explain the proposal in a structured way.

The level of detail required in the DAS depends on the scale and complexity of the application, and the length of the statement varies accordingly. Statements must be proportionate to the complexity of the application, but need not be long.

The DAS for a planning application should explain the design principles and concepts that have been applied to particular aspects of the proposal. These are:

- Scale
- Amount
- Layout
- Landscaping
- Appearance

In terms of the access component of the statement, this relates only to 'access to the development' should explain how access arrangements will ensure that all users will have equal and convenient access to buildings and spaces and the public transport network.

Decision making involves various stages and the consideration of issues, which are dependent on the type and size of the application but may include:

- Local and national planning policies and guidance
- The views of Council departments and external bodies
- Comments from members of the public
- The site visit by the case officer and details of what they have seen on site

An application is put forward for determination by either:

- Delegated powers – where a planning officer makes the decision
- Planning Committee – where the Planning Committee makes the decision

Risks to a successful project implementation in a planning context appear to include:

- Compliance with relevant planning policy guidance, local development plans and policies
- Adequate impact mitigation to residential neighbours (protecting visual amenity and residential amenity)
- Proposal justification, rationale and sport related benefits
- Lighting impact assessment
- Sustainable urban drainage system (SUDS) details / Flood risk assessment (FRA)
- Protection of ecology and biodiversity

- Landscape and Visual Impact (LVA)
- Noise Assessment

Biodiversity, ecology and landscaping would be relevant due to the recreational and park environment having specific planting and aesthetic features to serve this purpose. The facility already exists, and planting is young and immature so with removal and relocation / re-planting it is felt that designs for the lighting and other relevant elements can be developed to appease any concerns within this area. It would be prudent to undertake an arboricultural impact assessment, planting scheme and a preliminary ecology assessment to support a planning application for the chosen proposal regardless of the given location. Works and justification relating to a balance of ecological mitigation and enhancement plans would be prudent otherwise discussions on newer policies of biodiversity net gain could be developed and requested throughout the process.

The site and area has adequate transport connections and parking provision so it is not believed to be a planning issue and simple information to justify the use and increased traffic for the facility would suffice.

Housing is to the west and it is understood that housing is to be developed to the north location of the areas. The housing to the west is 15m away from the current pitch location. The consensus and view of parties might well be that because the pitch and its character of light and noise already exists; then the redevelopment works will not have any issues in relation to planning permission for these elements. However, it is fully anticipated that potential noise disturbance and lighting impact to residential or ecology features around the site would be held to more modern and stricter standards and requirements. A noise assessment and mitigating design features would likely be needed to aid the redevelopment of the facility. The proposed houses to the north are far enough away and the first development to this area would be a school playing field.

Modern drainage strategy requirements would need to be developed and considered to accompany a planning application and permission for the artificial turf pitch.

In planning context, it is SSL's opinion that with further survey and assessments to allow contribution towards necessary design additions and alterations would enable the project to be viable in terms of successfully gaining planning permission permitted for either design and layout option.

2.3 Site ownership / boundary details

Ownership boundary is to be confirmed, however at this stage we can confirm that all feasibility options are located onto the clients chosen site.

2.4 Sport England & Future site layout

It will be necessary to ensure that adequate grass playing pitches for summer and winter curriculum activities as well as any community access is maintained to the remaining playing field.

The future site layout is not only important for client team but also to satisfy Sport England's review of the proposal once a planning application is submitted.

Sport England will be a statutory consultee on a planning application as the proposal affects a playing field and they will complete an informed assessment of whether the proposed benefits to sport associated with development would be sufficient to outweigh the detriment associated with the impact on the playing field and satisfy their exception policy E5 of Sport England's playing fields policy 'A Sporting Future for the Playing Fields of England 1997':

> *E5 – The proposed development is for an indoor or outdoor sports facility, the provision of which would be of sufficient benefit to the development of sport as to outweigh the detriment caused by the loss of the playing field or playing fields.*

This policy statement defines in planning terms what is considered a 'playing field', which is the whole of a site that encompasses at least one playing pitch.

The aim of the policy is to ensure that there is an adequate supply of quality pitches to satisfy the current and estimated future demands of the pitch sports.

This item should be raised in relation to the larger development works and plans within the area. There are several areas proposed for new sports pitches along with redeveloping existing areas. The chosen development for this area should be innkeeping and complimentary to the wider ambitions for sports development. The playing pitch strategy for the area is out of date and the Local Football Facility Plan identifies a need for at least three further full sized pitches within the area along with mini pitches.

2.5 Soil classifications

Soilscapes online shows freely draining slightly acid but base-rich soils. This is virgin local geological information however, given the site will be a refurbishment it will evidently be "made ground" material.

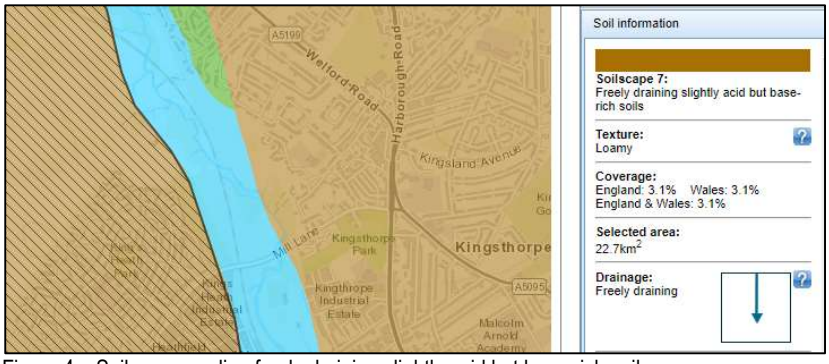

Figure 4 – Soilscapes online freely draining slightly acid but base-rich soils.

Cranfield Environment and Agrifood:

- Hydrology of Soil Type - 411d HANSLOPE - Slowly permeable calcareous clayey soils.
- Soil Parent Material - 1 Slowly permeable soils with slight seasonal waterlogging and low storage capacity over slowly permeable substrates with negligible storage capacity
- Soil Parent Material - 30 Chalky till

Local Geology results:

- *Superficial – NONE RECORDED*
- *Bedrock* - NORTHAMPTON SAND FORMATION - SANDSTONE, LIMESTONE AND IRONSTONE

Local Borehole results:
Soils generally consist of sands and sandstone within the area that are consistent with the known bedrock formation.

Soils generally consist of sands within the underlying profile. Further site specific survey works would be prudent to understand the strength of the underlying material along with efficiency of natural infiltration through BRE 365 soakaway testing.

2.6 Any historical site information / details

From past satellite imagery, it is believed that the site was developed before 2004, however its exact age is unknown.

2.7 Any known easements

No services or utility or other survey data has been completed and will need to be understood further as the project develops.

2.8 Any known rights of way

Those officially recorded are sown in figure 5 but the boundary and perimeter of the existing artificial pitch area has likely been adopted as a PROW and should not be blocked or removed as part of the development.

Figure 5 – recorded rights of way to the east away from the development location.

2.9 Coal mining records

We have reviewed the Coal Authority web site, to determine if the site is located within an area which has been affected by coal mining or brine extraction.

The web site advises the site is not located within an area affected by past or present coal mining, or minerals worked in association with coal or indeed brine extraction. We can confirm your boundary is:

- located off the coalfield

The area has no risk.

2.10 Unexploded Ordnance Risk

We have reviewed a UXO map and the area is between a low risk.

2.11 Pedestrian and vehicular access

The proposed development should not be prejudicial to the satisfactory functioning of the local highway network. There is an existing slope to the pitch from the car park which has a change in levels of 3.26m. The pathway does not currently conform to modern equality ramped slopes and requirements and is in poor condition so would likely need redevelopment as part of the overall scope of works.

The vehicular access and parking existing and would be adequate to serve a new AGP.

Further detail and information on this can be worked up in conjunction with the client, site existing parking numbers and potential community users in due course. The aim and purpose is to keep parking off of highways and safely within the designated areas. Not only for further traffic and congestion issues on the roads but to stop users having to travel over and on roads to access vehicles during traffic. Equally, green travel opportunities including walking and cycling should be promoted whenever possible to reduce the burden of car use to and from the site. Transport information should subsequently be prepared to supplement a planning application, providing sufficient information to demonstrate the proposed development will not be prejudicial to the satisfactory functioning of the highway and that additional traffic movements generated by the proposal will not result in unacceptable impacts on the highway network.

In accordance with Transport Assessment Guidelines for smaller developments, a statement to address localised transport issues should include:

- Description of development
- Description of existing networks
- Public transport accessibility
- Access for pedestrians and cyclists
- Access for those with mobility problems
- Trip and traffic generation
- Parking and deliveries
- Measures to mitigate impacts
- Maintenance and emergency access to the proposal

The unknown factor of parking numbers shall be discussed further.

2.12 Flood risk & Surface Drainage Strategy

The site falls within a Flood zone 1 (figure 6). The below illustration captured from the Environment Agency website at a scale of 1:10,000 illutrates that the proposed development area is located within both a Category 1 flood zone.

Flood zone 1 - This zone comprises land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%). The likelihood of flooding from the rivers or the sea at the proposed development site is very low.

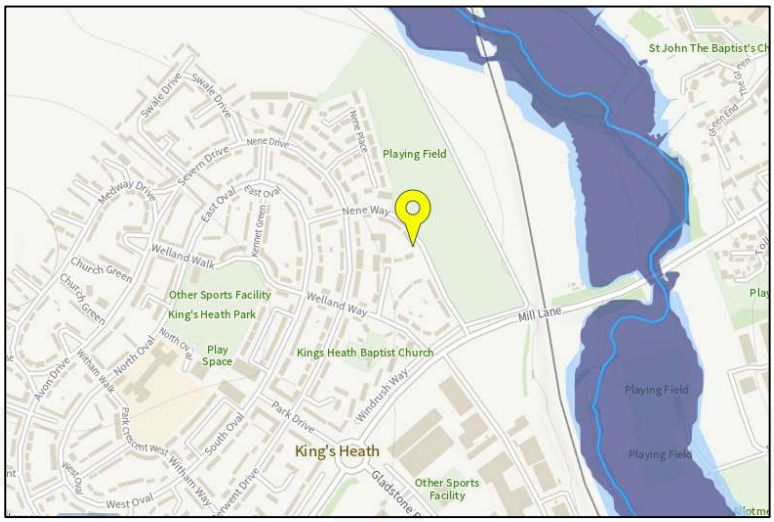

Figure 6 – Kings Heath, Nene Way, Northampton, NN5 7NE– Flood Map

The drainage to the existing area is unknown. It is assumed that drainage was blocked and covered with the amount of growth other the pitch and could not be inspected as part of these works.

Surface Water Disposal Requirements

In accordance with the National Planning Policy Framework (NPPF) and the National Planning Practice Guidance (NPPG), the site should be drained on a separate system with foul water draining to the public sewer and surface water draining in the most sustainable way.

The NPPG clearly outlines the hierarchy to be investigated by the developer when considering a surface water drainage strategy. We would ask the developer to consider the following drainage options in the following order of priority:

A. Into the ground (infiltration);

B. To a surface water body;

C. To a surface water sewer, highway drain, or another drainage system;

D. To a combined sewer.

This is necessary to promote sustainable development, secure proper drainage and to manage the risk of flooding and pollution. This condition is imposed in light of policies within the NPPF and NPPG.

Surface Water Disposal Options

A. Soak away

Further site survey works and investigation is required to ascertain if any sites are able to naturally discharge surface water through soakaway systems. A geotechnical survey and BRE365 soakaway testing will be needed and given the natural sand underlying material it is assumed that natural infiltration would be a successful means of disposal of surface water drainage.

B. Surface Water Body

Potential for watercourses further east for if natural infiltration results are not viable.

C. Surface Water Sewer

Option B is suitable and therefore this option is not required.

D. Combined Sewer

Option B is suitable and therefore this option is not required.

Surface Water Disposal Solution

The proposed development and associated surface drainage strategy from this site is such that the surface water will be managed and disposed of within the site boundary, thus complying with the Technical Guidance to the National Planning Policy Framework.

Surface Water Drainage Design

Drainage for the the artificial pitches would need to be based upon the following criteria, to maintain satisfactory system performance:

- Provide adequate functionality over a period of twenty years.
- Ensure that surface water is removed from the surface area at a rate necessary to prevent surface flooding experienced during acute rain storms and to ensure the facility will not be lost through rain at the highest intensity which may be expected to occur either once every five years or through continuous rainfall of 50mm over a 24 hour period.
- Ensure that surface water is effectively removed from the facility construction to ensure that load bearing capacity of the substrate is not weakened by an increase in moisture content or becomes more susceptible to frost damage.
- Protect the installation from influences of groundwater or surface water from surrounding areas.
- Prevent the risk of uncontrolled flooding elsewhere (to land adjacent to the development).
- Comply with all applicable Sustainable Urban Drainage System (SUDS) requirements with attenuated flows (containment within the granular pitch sub-base) incorporated wherever necessary, without affecting the performance of the pitch.

For the purposes of the feasibility works, report and costing assumptions as described above shall be made. Over time and progression of the project then further information and site surveys will need to be collated and it will be necessary to carry out drainage engineering design calculations to prepare a detailed drainage design solution for planning purposes.

2.13 Services and Utilities

No works have been collated to date and would need to be undertaken and verified in due course.

2.14 CDM Overview

Construction (Design and Management) Regulations 2015 (CDM 2015) are effective from 06 April 2015 (replacing CDM 2007) and these regulations govern the management of health, safety and welfare when undertaking construction projects.

The Health and Safety Executive has published guidance is for those who have legal duties under CDM 2015, which explains what they must or should do to comply with the law.

Any actions required should always be proportionate to the risks in the construction project.

Under CDM 2015 organisations or individuals can be one or more duty holder for a project.

The different duty holders are summarised below and the necessary role and main duties for each type may be discussed at the appropriate time:

Table 3 – CDM 2015 CDM Duty holders

Clients are organisations or individuals for whom a construction project is carried out
Designers are those, who as part of a business, prepare or modify designs for a building, product or system relating to construction work.
Principal designers** are designers appointed by the client in projects involving more than one contractor. They can be an organisation or an individual with sufficient knowledge, experience and ability to carry out the role. ** Principal designers replace the role undertaken by CDM co-ordinators under CDM 2007

Principal contractors are contractors appointed by the client to coordinate the construction phase of a project where it involves more than one contractor.
Contractors are those who do the actual construction work and can be either an individual or a company.
Workers are the people who work for or under the control of contractors on a construction site.

Key Elements

Key elements to securing construction health and safety include:

A. Managing the risks to health and safety by applying the general principles of prevention;
B. Appointing the right people and organisations at the right time;
C. Making sure everyone has the information, instruction, training and supervision they need to carry out their jobs in a way that secures health and safety;
D. Dutyholders co-operating and communicating with each other and coordinating their work; and
E. Consulting workers and engaging with them to promote and develop effective measures to secure health, safety and welfare

Notification

A project is notifiable if the construction work on a construction site is scheduled to

- Last longer than 30 working days and have more than 20 workers working simultaneously at any point in the project;
- Or exceed 500 person days.

Where a project is notifiable, the client must give notice in writing to the Health and Safety Executive as soon as is practicable before the construction phase begins.

Project parties and respective CDM responsibilities should be agreed in due course.

2.15 Topography

A topographical survey has been carried out for the pitch location and its surrounds. For the options to extend into the surrounds could lead to differing construction methods with the extended areas needing to be stripped of topsoil and weak materials and then built up or re-profiled to tie in with the existing footprint and plateau.

2.16 Operational, Management and Security

The site is unmanned with no neighbouring facilities to monitor the pitch and provide any form of security. This is clearly apparent by the derelict and condemned facility not being utilised. The poor condition of all elements highlights the need for any future works to include an associated management and changing room facility to tie in with the new AGP along with CCTV and security measures in place to retain and protect any investment.

The need for an associated building and block will come with a need for greater design, survey and M&E works and cost in due course. No information has been offered about the scope and type of facility and an associated building does not currently form part of SSL scope and remit of works. SSL will offer very vague commentary on the matter within the report.

3. Current Facility Condition

3.1 Facility Size

The current facility is sized 101.4m x 65m fence to fence with a carpet sized 97.5m x 61m. This offers 1no 95m x 58m with line markings for both hockey and football.

3.2 Age

The age of the facility is unknown, however it is understood that the facility was built prior to 2004 and therefore is over 18 years old.

3.3 Pitch Orientation

The existing artificial grass pitch follows an approximate North to South orientation, which is consistent with Sport England's recommendation that the preferred direction for the main playing direction for pitches should follow an approximate North to South orientation (between 345˚ and 15˚) due to the effect of the setting sun and to resist players affected by the sun set.

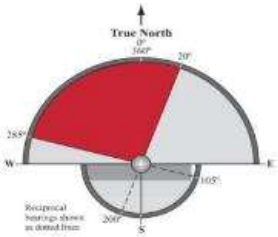

Figure 7 –Sport England's Preferred Pitch Orientation

3.4 Pitch Surfacing

Artificial Hockey Pitch

The playing surface comprises of a sand dressed artificial turf which was installed to hockey requirements. There is an excessive amount of moss growing over the pitch carpet, as can be seen below. The carpet has significant patchwork repairs and is not in a usable condition.

Figure 8-11 – The Artificial Turf Pitch at Kings Heath

3.5 Pitch Base

Underneath the surface is a 50mm layer of shockpad mixed with stone (referred to as an E-Layer) underlain with 200mm heavily compacted stone subbase. Beneath is sandy layer prior to hitting a solid formation at 0.7m depth that could not be penetrated.

Figure 12 – Shock pad depth

Figure 13 – Stone base depth

Figure 14 – sand layer up to solid material

SSL do not advise or advocate an E-Layer system. The concept of mixing stone with the rubber material for a balance of sports performance and greater structural integrity has its benefits but the mixed materials cannot be recycled, and the removal of the product comes at extremely higher costs for disposal. Equally the pad being laid directly onto a stone base layer means that not all the stone and rubber from this process would be separated and the same issue would occur.

3.6 Pitch Restraint

The artificial turf playing surface is restrained with PCC kerbs and a macadam apron. Most of the edgings have grass and weeds growing through them disguising the edge of the pitch.

3.7 Hard Standing Areas

There is a tarmac hardstanding pathway around the carpet with no fencing between the hardstanding and the carpet and a pathway leading up to the facility with a steep and non-compliant ramp / slope detail from the parking to the facility.

3.8 Storage Areas

There are no storage recesses within the pitch, however, the carpet extends over the hardstanding behind both goals.

3.9 Pitch Equipment

All equipment is damaged and derelict and needs to be removed and replaced within any development works.

3.10 Site Furniture

There is no site furniture present at the pitch

3.11 Perimeter Ball-Stop Fencing

The pitch has 3m high fencing to the surrounds, in moss green. The fencing is broken to all areas and locations and requires removal and replacing.

Figure 15 – Broken fence section behind the goal area

3.12 Floodlighting

The floodlighting system is redundant, and the electric system is damaged and in an unsafe and poor condition. It is assumed by SSL that the mains has been severed and no live feed is taken to the area. SSL advise that the council and client check this detail and make any necessary arrangements to safely decommission the area ASAP. A completely new floodlighting and electrical installation is needed.

Figure 16 – Damaged electrics

3.13 Maintenance Equipment and Storage

The site does have any equipment onsite.

3.14 Pitch Drainage

There was no evidence of drainage. As all corners of the area were heavily overgrown with vegetation and contamination it was not possible to review whether drainage was present albeit it is assumed it is in place. A manhole is noted east of the pitch to the lower end of the sports field that could be a viable drainage outfall that takes surface water drainage further east into watercourses etc. Soil profiles are likely able to offer natural infiltration with soakaway systems.

The stone subbase was tested to ascertain its permeability with a rate of 0.032mm/s / 115mm/hr. The rate in which it passes through the stone along with the compaction and potential attenuation and void space within the stone does not meet the current drainage requirements and expectations.

Both potential drainage options should be investigated further and explored to form part of the more detailed design and planning stages of the chosen project and improvements to drainage systems and attenuation to serve the pitch should be looked at further.

3.15 Pitch Markings

The pitch is marked out in white for football and yellow for hockey.

3.16 Surface Regularity

Due to the heavy contamination over the area the full pitch could not be straight edged. There were clear signs of movement and undulations within the central clear areas. Due to the nature of the underlying construction any redevelopment works would allow the undulations and movements to the surface to be rectified as part of the works.

3.17 Utilities / Local Services

Utilities and local services searches and surveys were not part of the feasibility works and scope and should form part of the ongoing progression of the project.

4. New AGP Outline Proposals

Options for the redevelopment of the AGP have been briefly discussed. The intention is to develop a 3G surface to serve football usage. It is unclear as to whether the client or relevant stakeholders would like to install a FA full sized 106m x 70m pitch or whether an FA U15/16 undersized adult pitch within the existing pitch area would be desired. SSL have developed the works based upon both options to open discussion.

Table 4 – New AGP Details

AGP Usage	
Principal sport	Football
Performance Quality Standard (PQS)	Federation Internationale de Football Association (FIFA) Quality Concept for Football Turf – Handbook of Requirements (October 2015) – FIFA Quality certification required or equivalent IMS standard.
Likely programme of use	50+ hours of use per week.
Sporting mix	To be confirmed.
Anticipated level of competition	To be confirmed.
AGP Details	
Appropriate playing surface	New playing surface system to include 3G artificial turf. Legislation is leading to alternative infill materials or mitigation of infill materials. Dependent on the time of delivery of the surface then this aspect might need to be considered further.
Pitch size	***Option One:*** Adult full sized / U15/16 AGP 97m x 61m would provide a Principal Playing Area (PPA) sized 91m x 55m (suitable for adult full sized football 11v11, U15/U16 and over 18, senior ages, football) with over-markings capable of supporting youth football development and training purposes. Potential over-markings to FA Standards: *(school confirmed they do not require FA Markings)* • 1no. 9v9 Football Pitch - 73m x 46m (blue) • 2no. 7v7 Football Pitches - 55m x 37m (yellow) • 4no. 5v5 Football Pitches - 37m x 25.42m (red)* *Smaller than recommended size, but acceptable for FA match play use. ***Option Two:*** The 11v11 AGP will provide a Principal Playing Area (PPA) sized 100m x 70m (suitable for youth 11v11 U17/U18 and over 18 (senior ages) football) with over-markings capable of supporting youth football development and training purposes. Potential over-markings to FA Standards: *(school confirmed they do not require FA Markings)* • 2no. 9v9 Football Pitch - 64m x 46m (blue)* • 2no. 7v7 Football Pitches - 55m x 37m (yellow) • 4no. 5v5 Football Pitches - 37m x 27m (red) *Smaller than recommended size, but acceptable for FA match play use. The variety of over markings should be agreed in due course, to be considered against the football development plan.

<table>
<tr><td></td><td>The variety of over markings should be agreed in due course, to be considered against the football development plan.</td></tr>
<tr><td>Hard standing area/s</td><td>Respect spectator area (generally 4m wide) adjoining a longitudinal pitch perimeter.
Technical areas</td></tr>
<tr><td>Clean access / approach</td><td>The location of a necessary hard standing pathway for pedestrians / maintenance / emergency access should connect to hard standing pavements existing and shall be developed further as the project progresses and is defined past feasibility.</td></tr>
<tr><td>Floodlighting</td><td>The new artificial lighting (floodlight) system should provide the following lighting standards, in accordance FIFA's Class II lighting requirements for varying types of play as follows:

<table><tr><th>Use</th><th>Maintained average illuminance</th><th>Uniformity (Min / Ave)</th></tr><tr><td>Competition</td><td>>200Lux</td><td>>0.6</td></tr><tr><td>Cross Play</td><td>>120Lux</td><td>>0.6</td></tr><tr><td>Training</td><td>>120Lux</td><td>No requirement</td></tr></table>
Floodlights must be designed in such a way to allow each individual section of the pitch (lateral cross pitches) to be individually programmed to facilitate economical management and prevent over lighting to pitches areas when not in use.

An LED lighting system shall be included within the design and works that will also allow 50% lighting level switching to appease potential concerns of visual impact to the surrounding areas but also reduction switching to 10% amenity lighting levels to allow users to safely vacate the facility upon completion and at the curfew.</td></tr>
<tr><td>Equipment</td><td>Including:

• Freestanding integral weighted goals (adult, youth and mini soccer).
• Freestanding corner flags.
• Dividing net system.
• Boot wipers and foot mat wells (detox units).
• Litter bins.
• Signage.</td></tr>
<tr><td>Perimeter enclosure</td><td>4.5m high rigid panel mesh ball stop fencing to the AGP perimeter with lower 1.2m high fencing to segregate the pitch from Respect spectator areas.</td></tr>
<tr><td>Maintenance provision</td><td>Including:
• Specialist maintenance equipment to facilitate consistent regular maintenance operations.
• 24 month intensive maintenance services (after care).
• Storage unit to be discussed further</td></tr>
<tr><td>AGP orientation</td><td>The main playing direction of the AGP should ideally follow a North to South orientation which is consistent with Sport England's optimum pitch orientation recommendations (285° to 20°) for rugby and association football in order to resist the effect of the setting sun blinding players before dusk; however this should not act as a bar to development.

The layout of all options does accord to this.</td></tr>
<tr><td>Details of restrictions for contractors whilst working on site</td><td>Working hours / specific delivery time / unique access requirements to be confirmed.</td></tr>
<tr><td>Details of Client's critical dates</td><td>Special events / work suspensions / critical completion dates to be confirmed.</td></tr>
<tr><td>Any other site specific details</td><td>Details which may influence the AGP installation to be confirmed.</td></tr>
</table>

Appearance:

3G Artificial Grass Playing Surface

The installed appearance of the playing surface will comprise a 3G artificial turf partially in-filled with silica sand (for stability) and performance material that can be rubber or organic materials.

This is consistent with current Football Association (FA) technical requirements and recognised as the most suitable artificial playing surface for community football and youth development.

Figure 17 – Example of 3G artificial grass installed

40mm 3G Surfacing or addition of World Rugby Specification Surface

If a 40mm 3G surface or introduction of rugby usage is chosen for either reasons of higher performance, alterations to maintenance operations or to compliment microplastic performance infill migration mitigation methods; then consideration should be taken on for the underlying Shock Pad System.

Two types of shock pad systems could be utilised underneath the surface being a pre-fabricated shock pad or an insitu laid rubber shock pad. Each hold their own merits, but the surfacing material would be specifically tested to the performance requirements when combined with these different elements. Each potential "surfacing system" would include content, such as the type / depth of shock pad, the balance / amount of sand / rubber infill material and the type of infill material.

Therefore, some surfaces may appear better quality and more cost effective but when comparing the various related shock pad components together to form the overall system; the performance and cost could be vastly different.

With regards to shock pad types then there are two options with variables amongst each:

Due to the manufacturing and engineering process to develop the pre-fabricated shock pad then the material should (there are a range of good and poor-quality systems on the market) be guaranteed for further life cycles of your artificial turf pitch and the quality standards shall remain high throughout the life span of the facility. Therefore, when the surface needs replacing in X years' time the shock pad can be retained and re-used (note that a surfacing system upon refurbishment would need to be tested to the specific shock pad and depth of the shockpad laid and it would be prudent for the site to retain O/M manuals and project information for later works to ensure other more modern systems tie in with the original shock pad laid etc).

The pre-fabricated shock pad also has less risk of delays through poor weather conditions although is still impacted during high winds and can be faster to install.

The negatives are the cost for the shock pad is usually more expensive and some systems have been known to distort, shrink or move over time during differing weather climates that is a concern to the levels and playing performance of the finished surfacing system and the friction between the surface and the shock pad is tested and known to be vastly worse than a insitu rubber shock pad that increases the movement and risk of ripples occurring in the finished surface.

Figure 18 – Example of a pre-fabricated shock pad

In-situ laid shock pad

The in-situ laid shock pad is more cost effective but takes a little longer to undertake and is more difficult to control the quality of installation as it is governed by weather and accurate mixing of materials whilst onsite. A minimum binder content of 10% is required and preferably 11% to 12% along with the depth needing to be set to match the overall surfacing system testing criteria. However, the uniformity of the binder content and its depth across the pitch could be inconsistent potentially creating weaker areas. The benefit for the application of this project is the application and laying process would enable screening over any minor undulations found within the underlying base and is generally more cost effective with minimal risk of movement, shrinkage over time.

Figure 19 – Example of an insitu laid shock pad

SBR Rubber Crumb Infill Migration Mitigation Design Features

Infill Migration Mitigation Methods could be enforced and are considered a necessity to reduce the potential for the rubber crumb infill material migrating to the surrounds of a facility that add to the issues and concerns of mircroplastic within the environment. At present nothing is strictly compulsory but are best practice and ideally utilised within the design scope of works for artificial turf pitches.

A football 3G turf will be in infilled with a stabilising material (silica sand) and a performance material (SBR - Styrene-butadiene rubber).

During the development of the project proposal, a variety of potential performance infill materials can be considered including SBR / EPDM / TPE / encapsulated SBR as well as organic materials.

Currently, SBR is the preferred performance infill material because it offers the following beneficial qualities:

- Performance
- Durable
- Economy
- No fibre content
- Recyclable

SBR Containment

As SBR is defined as a microplastic, it is vital to minimise infill loss from the area and to prevent the transfer of SBR to the environment by players or other means.

Several design details are introduced to this proposal to minimise infill loss (in accordance with The Football Association and FIFA recommendations) including:

- 0.2m and 0.5m high containment barriers installed around the FTP enclosure (built into ball stop fencing) made from 100% recycled plastic materials.

Figure 20 – Example of containment barriers

- Football boot cleaning stations.

Figure 21 – boot cleaning stations.

- Detox units to all gated entrances (steel grates with drainage outlets and waste trays).

Figure 22 – Detox units.

- Surrounding asphalt surfacing / slab paving.

Figure 23 – surfacing barriers.

- Drainage inspection chambers with waste sumps to capture any materials entering the drainage system.

Figure 24 – drainage sumps and silt traps

- Drainage filtration channels

Figure 25 – Filter channels

- 3G surfacing choices with reduced pile depths and infill volume or dense combined yarns to help contain splash and migration of material.

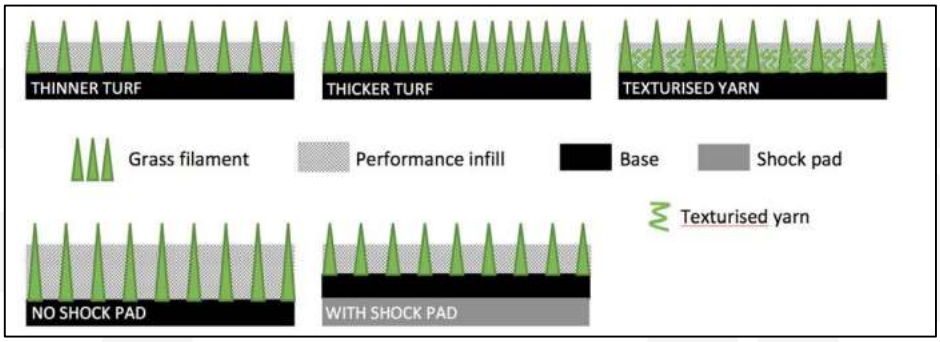

Figure 26 – 3G surfacing choice

- Operational and management features and methods.

The abovementioned methods are standard from the FA, FEDRA and ECHA. One or many of the concepts and methods can be included with further additional items such as microplastic filter channels to the perimeter of the new sports field to retain microplastics.

They range quite vastly and can be combined together can offer different results with figure 27 showing the extent of the reduction of rubber to the surrounding environment.

Figure 27 - Relative reduction of microplastic migration through introduction of design features and methodologies of working.

Many of these features should be looked into and incorporated within the through and design process for the progression of the project.

Perimeter Ball-Stop Fencing

The proposed type and quality of ball-stop fencing is consistent with technical requirements for fencing to enclose artificial sports pitches. The installed appearance of perimeter ball-stop fencing will be steel open mesh fencing containing a general 200x50mm aperture (and 66x50mm rebound aperture at lower level) and finished to polyester powder coated RAL6005 Dark Green, discreet against a rural background.

Finished fence heights will be 4.5m to the external pitch perimeter and internally within the Respect spectator area, ranging 1.2m c/w hand rail to 2m high. Perimeter fencing is necessary around an AGP to ensure the adequate long-term protection of the valuable asset for a variety of vital reasons as follows:

- To contain balls within the pitch during training, competition and recreational activities
- To protect the playing surface from contamination that will severely compromise the longevity of the artificial turf playing surface
- To help prevent unauthorised use
- To prevent vandalism

Figure 28 – *Example of perimeter ball-stop fencing (rigid mesh ball-stop fencing panel 868 gauge finished RAL6005 Dark Green)*

Floodlights (Artificial Lighting)

The installed appearance of any new LED artificial lighting system is likely to include 6no. galvanised (brushed silver coloured) sectional octagonal steel masts (15m or 16m high) and with LED luminaires and fittings finished raw aluminium.

LED for such large outdoor high-level lux lit artificial pitches is still relatively new technology and is advancing rapidly.

Hard Standing Areas (Respect Spectator Area / Clean Access Access)

The installed appearance of hard standing areaswill be grey / black coloured macadam.

Figure 29 – Example of Respect spectator area adjoining a 3G AGP

Maintenance Equipment

Regular in house and specialist maintenance of a 3G pitch is critical in regular conditions but even more so when introducing a natural organic infill material. The material requires regular decompaction that would receive better results from higher level in house maintenance equipment. The below is an example of the entry level equipment along with specialist visits and a higher range in house package. Over time and with appropriate training the higher level equipment is more cost effective.

The below are two levels of options for onoing maintence equipment with ongoing comitments and balances. The decision as to whether the site take on all maintenance operations and purchase more significant equipment needs to be balanced against resources and groundstaff capacity. An example of a well marketed and presentable maintenance unit with a note that various other suppliers and equipment are available:

- Basic Maintenance Option Range – Total Cost approx £6,000 with annual specialist visits ranging from a £2,000 to £6,000 a year.

RED Range from Technical Surfaces.

- Includes tractor unit with fixed 'winged'brushes and sweeper collector (land-driven).
- This unit will allow the site to undertake weekly brushing but nothing more.
- The sweeper collector is useful for collecting leaves and larger debris but not powerful enough to remove all debris from the surface.
- The site will still require visits from an external company to clean more vigorously from within the pile, and to apply chemical treatments. These visits would be either quarterly or monthly at a cost of approx £500 a visit ranging from £2,000 to £6,000 a year.

Figure 30 – Example of RED Range

- High Tier Maintenance Option – Total Cost above £36,650

Sports Champ from Technical Surfaces. These are the machines commonly used by maintenance companies (technical surfaces and Replay Maintenance). With this equipment no external maintenance will be required but basic monitoring and educational sessions would still be prudent (note technical surfaces still maintain Worcester Warriors annually even though they have the in house capacity and equipment). More adaptable than smaller machines as more attachments available for cleaning surfaces.

Figure 31 - SportChamp SC2D main driving unit

Figure 32 - SportChamp - Rotating Brush w/ auger

Figure 33 - SportChamp - Decompaction Head 1.3m

Figure 34 - SportChamp - Sand / Rubber Spreading Device (1400)

Spray Device 270L tank with boom arm for applying chemical to the surface.

Drag Brush added to the rear of the device to brush the fibres and smoothing any sand brought to the surface when using the opposed brushes of the sand dressed carpet.

Maintenace Operational Support

To support the maintenance and operations of the facility then modern systems could be considered and introduced. A system called intelligent play introduces cameras (compliant with standard data protection GDPR) to the lighting columns that tracks the numbersof players and usage of the facility 24/7. Along with tracking maintenance operations with alerts to inform high wear areas, requests and requirements for maintenance or issues and concerns including persons entering the field outside of permitted hours of use.

This information is accessible online to allow you to have a better understanding of how it the facility is used through the contribution your facility has made to participation in sport in the area and how it can be improved, how your investment and facility is maintained and looked after and mitigating after hours vandalism and damage to the area. The data assists with general operations and logical processes by allowing you to see the most used locations and making users move around the faiclity to spread the use and ware etc.

Further information can be seen at https://www.intelligent-play.com/. At present SSL are not aware of a competing product on the market but will update and advise as/when they become available.

Figure 35 – example of intelligent play system

Associated site features and Signage and Miscellaneous Items

It is assumed that sports equipment is already in place or the client shall procure direct, so these have not been allowed for in the works or budget. The inclusion of additional features such as signage, bootwiper brushes, bespoke logo mat to entrance areas and locations (crest or logos etc or simply plain) could be considered.

Figure 36 – Examples of Signage and Miscellaneous Items

Inclusive Access

Disabled access has been carefully considered throughout the whole design and applied wherever possible. The intention is to provide a smooth transition to and from areas within the sports ground, for use by people of all ages and abilities. The site is compatible currently for disability parking and access with appropriate circulation routes.

All pedestrian paths shall be compliant with the Equality Act 2010 regulations.

Building Development

As previous discussed SSL remit does not include any building development or works and can only at this time offer very generic commentary on the options available. No scope or brief for the building has been discussed or detailed and therefore nothing can really be offered with substance at this stage.

SSL have therefore shown a very basic and generic layout that is approx. 178sqm and would range anywhere from £2000 per square meters upwards. An allowance of £500k to cover the potential building requirement would be prudent until further detail and understanding can be sought.

5. Pre-Tender Construction Cost Estimates

5.1 Option One - Full Sized Adult Pitch & U15/16 Youth AGP - 97m x 61m

Description of Work	Cost
Contractual Requirements	£12,000
Site Establishment	£20,000
Site Clearance, Excavations, demolition, and Groundwork's (exc removal of spoil)	£95,000
Drainage	£16,000
Pitch Base Works and Hard Standing Areas	£110,000
Synthetic Turf Surfacing System	£135,000
Perimeter Ball-Stop Fencing	£65,000
Sports Equipment, Site Furniture, Signage and Sundries	£18,500
LED Electrical & Floodlighting Installation Works	£65,000
Redevelopment of ramp / slope access P.S.	£25,000
Reinstatement	£6,000
Performance Testing	£2,100
Client 5% Contingency	£28,480
Total inc Contingency exc VAT	**£598,080 + VAT**

Generic Building Development (full detail and cost to be discussed and confirmed further)	£500,000

5.2 Option Two - Full Sized 11v11 AGP - 106m x 70m

Description of Work	Cost
Contractual Requirements	£12,000
Site Establishment	£20,000
Site Clearance, Excavations and Groundwork's (exc removal of spoil)	£135,000
Drainage	£22,000
Pitch Base Works and Hard Standing Areas	£140,000
Synthetic Turf Surfacing System	£156,000
Perimeter Ball-Stop Fencing	£75,000
Sports Equipment, Site Furniture, Signage and Sundries	£20,500
LED Electrical & Floodlighting Installation Works	£75,000
Redevelopment of ramp / slope access	£25,000
Reinstatement	£6,000
Performance Testing	£2,100
Client 5% Contingency	£34,430
Total inc Contingency exc VAT	**£723,030 + VAT**

Generic Building Development (full detail and cost to be discussed and confirmed further)	£500,000

5.3 Final Recommended Works

Both layout and sized options are currently viable within the given space with option two needing to extend from the existing footprint creating a need for imported fill material that requires further thought on the option of redeveloping the area. The existing mixed aggregate and rubber E-Layer creates an expensive addition to the project regardless of the option. The vast overgrowth, vegetation and dilapidated fencing, lighting and all other existing features requiring removal with the redevelopment of the pathway creates unwanted additional works and costs. All these aspects balance the possible savings and benefits from the existing foundations and materials in place and pushes the project into that of a new build construction.

With the additional need of site office, changing facilities and security, which all have not been fully developed or considered in terms of design and cost with a provisional sum currently being adopted of £500k. These areas and elements do not form part of the SSL feasibility scope of works and should be discussed further with a greater understanding of what is required and how much it would accumulate in cost.

With the overall area wide developments taking place it might be a worthwhile exercise and consideration to incorporate the 3G pitch into the proposed new build school that is likely to include the required infrastructure and security along with consistent day time and curriculum use to serve the needs for the area and demand. If this process was considered, then the issue of the derelict and unused AGP still needs to be considered and rectified. The development of any new 3G pitch or school / housing developments would include the accumulation of vast quantities of virgin topsoil material. These developments would also require aggregate stone material so each area and site that is in close enough proximity could share sources of wanted materials to help other developments and reinstate this location back to a grassed playing field or a mix of a small harder wearing MUGA, play park and other desired local features to improve the sport, recreation and play along with improve community facilities and benefits. Again, this exercise has not been discussed or looked into but as an overall site wide consideration SSL believe it would be a desirable avenue to venture down and should be discussed further amongst the relevant parties.

SSL believe the client needs to now decide the full scope of works and the budget available prior to progressing with any option further. It would be prudent to perhaps have a teams / zoom meeting to run through the proposals with the client project team and alter /verify any aspects that they deem necessary.

5.4 Project Progression Works

To progress the project further; costs should be allowed to develop the overall design and scheme of works, including a number of site and planning specific surveys to ascertain and define the more detailed scope of works.

A general list of surveys that should be discussed and consulted with the local authority and potentially undertaken would be:

- *Utilities Search*
- *AIA survey and report*
- *Preliminary ecology survey*
- *Geotechnical survey*
- *Utility Mapping / CCTV scans of existing Drains*
- *Works to ascertain existing or new electrical supply requirements (assumed supply will be available within the adjacent building but clarity if needed).*
- *Microdrainage calculations for the AGP, building and full compliant drainage design*
- *Development of architecture works and definition of the building and security requirements for the site*
- *Development of design drawings and information for planning permission*
- *Development of design drawings, specification and tender documentation for all elements*
- *Review of tender returns from interested and competent parties*
- *Project administrative duties and project management throughout construction (pre start, progress, handover meetings with admin of variations / valuations and all JCT contractual duties).*
- *Key stage inspections throughout works to sign off progression against specification and project requirements throughout*
- *Sign off works and oversee 12 months defects period prior to signing off retention monies*

As the project is in early stages it is difficult to ascertain the full requirements and scope of works. It would be therefore be prudent to estimate required professional fees for the abovementioned works with a generic allowance of 10% of the construction budgets and costs.

End of document

Published by	Wesley Bugg, Consultant
Signature	W. Bugg
Issued	25/11/21

This report has been prepared with all reasonable care, skill and diligence by Surfacing Standards Ltd and is confidential to our Client. Surfacing Standards Ltd accepts no responsibility whatsoever to third parties to whom this report, or any part thereof, is made known. Any such party relies upon the report at their own risk.