St. George's Hill Lawn Tennis Club, Weybridge

6793

Padel Courts - Drainage Strategy & Flood Risk Assessment

March 2023

REPORT NO: 6793-FUR-ZZ-XX-RP-D-0902

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Revision	Date	Issue Status	Prepared by	Checked by
P01	14.03.23	For Planning	HP	LF

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1 Introduction

This document comprises a Flood Risk Assessment in accordance with the National Planning Policy Framework (NPPF) including its technical guidance in support of a planning application for the redevelopment of an existing pair of tennis courts within the tennis club grounds at St. George's Hill Lawn Tennis Club (HLTC), into a new padel courts enclosure, which proposes 3 new courts.

Furness Partnership have been commissioned to identify and set out the principles of approaching and managing flood risk pertaining to the proposed development at St George's HLTC.

The objective of this FRA is to:

1) Collect and review available information to make a qualitative assessment of all sources of flooding to the development including drainage infrastructure; fluvial and tidal sources; groundwater sources and artificial sources.
2) Assess the flood risk to the application site under existing and post-development conditions; and
3) Outline any mitigating measures needed to meet the requirement of the NPPF.

1.1 Data Sources / References

Data collected during the course of this assessment is presented in Table 1 below:

Purpose	Source	Data
Identification of Existing Flood Risk	Elmbridge Borough Council Level 1 Strategic Flood Risk Assessment (SFRA), March 2018	Strategic assessment of flood risk across the Borough of Elmbridge
	Surrey County Council Local Flood Risk Management Strategy	Details of Country wide flood risk and mitigation measures
	Environment Agency	Site specific flood risk mapping
Identification of Historical Flooding	Surrey County Council Local Flood Risk Management Strategy	Details of Historic flooding
	Environment Agency	Historic flood risk mapping
Identification of Existing Drainage	Thames Water Sewer records	Identification of the publicly owned drainage system near the application site
	CCTV Survey	Identification of the private drainage system within the application site

Table 1 Sources of Data Reviewed

2 Site Description and Location

2.1 Location

The site (see Figure 1 below) is located at St. George's Hill Lawn Tennis Club, Weybridge, KT13 0LL. The site is bounded by residential properties on all sides. Further afield, St. George's Hill is found to the south, Burhill Golf Clubs to the East, and Weybridge to the North and West, and the M25 Motorway Orbital to the West. The proposed area of development is located to the eastern end of the Lawn Tennis Club plot. It can be accessed from both East Road to the east and Warreners Lane to the west.

Figure 1 Site Location

2.2 Existing Development

The site is rectangular in shape, comprising an area of approximately 1,564m^2. The site is comprised of a 2no. grass tennis courts. The sites operations fall within the leisure category. There is also a cottage at the northern end of the site, which is currently vacant, and a small shed to the west of this.

2.3 Proposed Development

The scheme proposes to re-surface and re-purpose the existing tennis courts and part of the existing access road, and install acoustic walling to make way for three new padel courts. A new grounds worker shed is also proposed to the northern side of the new padel courts. A new pedestrian access route runs along the southern edge of the new court enclosure.

2.4 Topography

Site levels are currently fairly flat, with an average ground level of +48.35m AOD, ranging from approximately +48.16m to +48.48m within the proposed site area.

2.5 Hydrology

There are no watercourses located within the site boundary. A lake, Warren Pond, is located approximately 60m south of the site. To the east, the River Mole is located about 120m away, which is a tributary of the River Thames. A small water feature / ditch is located to the east of the site, running behind the gardens of the homes on East Road.

The current drainage flow paths follow a north to south direction, which can be seen in Figure 2 below.

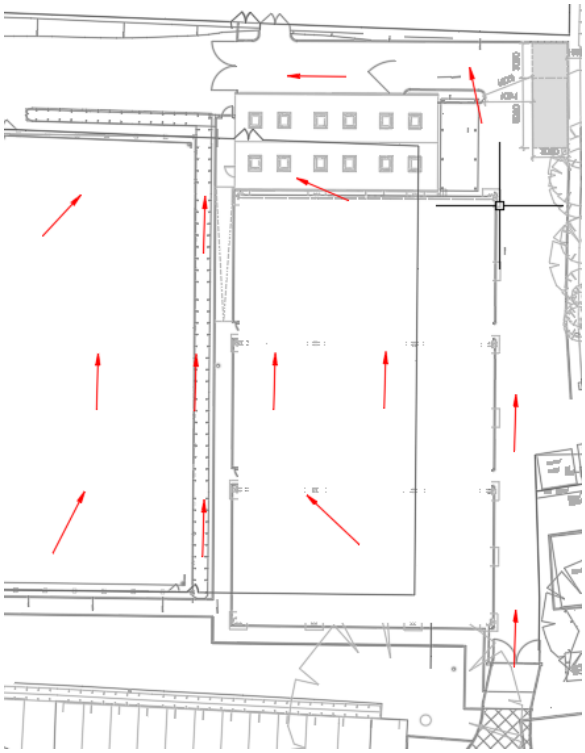

Figure 2 Existing Drainage Flow Paths

2.6 Geology

According to the British Geological Survey 'Geology' viewer tool, the site has a bedrock geology of 'Bagshot Formation – Sand', which is mostly composed of composed of fine to coarse-grained sand that is frequently micaceous and locally clayey, with sparse glauconite and sparse seams of gravel. BGS also confirms the site is not likely to be underlain by superficial deposits.

A Phase 1 desk study undertaken by arc environmental in July 2022, advises that limited depths of made ground is likely to be present considering the current and historical uses of the site, and is expected to comprise disturbed natural strata with man-made debris e.g., brick, concrete etc.

The desk study also finds a borehole log from close by to the site, (approx. 160m southeast), which found orange/brown to yellow slightly gravelly slightly clayey fine to medium sand to depths of circa 3.50m overlying stiff fissured dark grey slightly sandy clay to depths of circa 10.0m.
An intrusive site investigation has not yet been undertaken.

Figure 3 BGS Site Geology Map

2.6.1 Groundwater

Groundwater levels are not currently known.

According to the Landmark data obtained for the desk study, the bedrock of the site lies above a Secondary A Aquifer and the superficial strata is listed as unproductive. The site is not within a Source Protection Zone.

3 Policy Context

3.1 National Planning Policy Framework

The National Planning Policy Framework (latest version issued in July 2021) Section 14 paragraphs 159 – 169, outline the latest guidance on Planning and Flood Risk. The policy outlines:

- The need to avoid inappropriate development in areas at risk of flooding and direct development instead to low-risk areas.
- The use of the Sequential Test and Exception Test as appropriate, consideration of all flood risks and consideration of safeguarding land for current or future flood management.
- A site-specific Flood Risk Assessment should be produced as appropriate.

The NPPF retains a risk-based approach to planning and defines 3 zones: zone 1, zone 2 and zone 3 (further split into zone 3a and zone 3b), as the basis for applying the Sequential Test to proposed developments. The purpose of the Sequential Test is to guide development to those areas at less risk of flooding, as it is expected that the extent of these areas will grow with climate change. For the purpose of applying the Sequential Test and quantifying flood risk from fluvial and tidal source, flood zones are defined as per Figure 4 below:

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding.(Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

Figure 4 Classification of Flood Zones

3.1.1 Sequential Test

The existing site is used for leisure purposes, and is in Flood Zone 1. As there is not a proposed change of use, the site is categorised as 'Less Vulnerable.'

Figure 5 shows the classification of flood risk vulnerability and flood zone compatibility according to the Technical Guidance of NPPF i.e., the Sequential Test required for all planned development. The scheme is considered appropriate within the designated flood zone for the site, therefore, based on this classification, the Exception Test is not required.

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	Exception Test required †	✗	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	✗	✗	✗	✓*

Key:

✓ Development is appropriate

✗ Development should not be permitted.

Figure 5 Sequential Test

3.2 Flood and Water Management Act

The Flood and Water Management Act (FWMA) 2010 outlines roles and responsibilities for the implementation of Sustainable Drainage Systems (SuDs) in developments. Drainage systems must comply with national standards. Surrey County Council is the Lead Local Flood Authority (LLFA) for the development area and in accordance with the FWMA are responsible for coordinating the management of flood risk from surface, groundwater, and ordinary watercourses. The LLFA acts a statutory consultee on Surface Water and SuDs proposals.

3.3 Surrey Local Flood Risk Management Strategy 2017-2032

Surrey is a County at high risk of flooding with a high number of properties at risk from fluvial and surface water sources. It has experienced several major flood incidents in the last ten years, with much of this occurring in the floodplain of the lower River Thames and its tributaries. The Surrey Flood Risk Management Strategy sets out core objectives that will be required to be undertaken and outlines specific actions to try to reduce the flood risk to the people inhabiting and working in Surrey.

3.4 Elmbridge Borough Council Level 1 Strategic Flood Risk Assessment

The Strategic Flood Risk Assessment (SFRA) report for Elmbridge was carried out by AECOM in 2015. The SFRA provides an overview of the Borough in terms of overall flood risk, identifying areas at risk of flooding from all sources (including groundwater, surface water, foul sewer flooding, main fluvial and tidal flooding) whilst assessing the variation in flood risk across the Borough.

3.5 Surrey County Council Preliminary Flood Risk Assessment

The Preliminary Flood Risk Assessment (PFRA) was published in June 2011 for Surrey County Council. The aim of the PFRA was to provide an extensive overview of historic and potential future flooding over the administrative area of Surrey (includes Elmbridge, Epsom and Ewell, Guildford, Runnymede, Reigate & Banstead, Waverly and Woking Borough Councils, and Mole Valley and Tandridge District Councils) so that along with data from other County Councils, a national picture of flooding could be developed by the Environment Agency. The PFRA also address the identification and mapping of possible future flood risk sites for the County.

4 Definitions of Types of Flood Hazard

4.1 Fluvial and Tidal Flood Risk

River (fluvial) flooding takes place when a river's capacity is exceeded and it bursts its banks, forcing the overtopping water onto surrounding land.

The application site lies within Flood Zone 1, as identified within the Environment Agency's online flood zone mapping (Figure 6 and Appendix C). This indicates that the application site has been assessed as having less than a 0.1% annual probability (1 in 1000-year chance) of river or sea flooding, i.e., a low probability of flooding.

The closest watercourse to the site is the River Mole, located approximately 1.5km away to the East. The site is not in the floodplain of the River Mole, and hence, is at very low risk of flooding from this source or any other fluvial source.

The site is not at risk of tidal flooding.

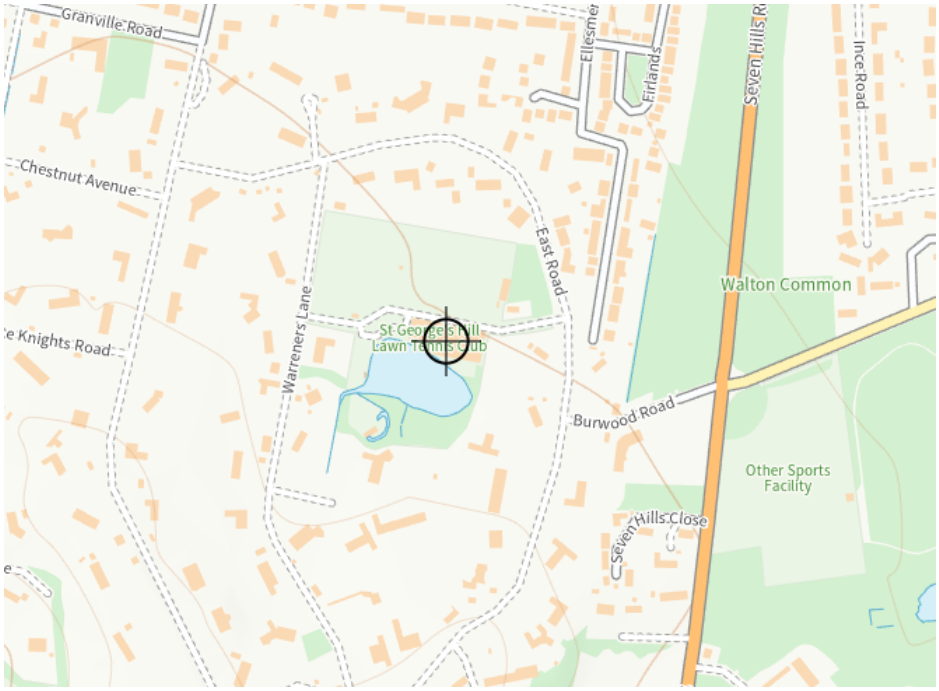

Figure 6 Flooding from Rivers and the Sea

4.2 Flooding from Artificial Sources

Artificial flood sources include raised channels such as canals or storage features such as ponds and reservoirs.

The largest storage feature is to the south of the site, Warren Pond, which is at high risk of flooding from surface water, which means there is a greater than 3.3% chance of flooding here each year; although this is expected as it is a dedicated storage feature, built at a lower level than its surroundings.

The EA flood mapping also confirms that the site is not at risk of flooding from reservoirs.

4.3 Groundwater Flooding

The desk study cites groundwater flooding maps produced by the British Geological Survey for the area, and identifies the central/southwest area of the site may have the potential to undergo groundwater flooding, both below ground and at surface level. The property to the northwest and east also may be prone to groundwater flooding below ground level.

The Elmbridge SFRA notes that most of the settlement area is within a low groundwater flooding risk category, and that the majority of the area has a groundwater table that is more than 5m below ground level. However, this reduced to less than 3m in the central Weybridge area.

4.4 Sewer Flooding

There are no public surface water sewers within the site boundary, and it is assumed that the private surface water sewers are owned and maintained by the current property owner. As noted in the Elmbridge Borough Council Level 1 SFRA, the TWUL Register has recorded 1-5 properties as experiencing internal sewer flooding in the St George's Hill area, and 1-7 properties with external sewer flooding.

The likelihood of sewer flooding may change over time due to increases in development, changing the extent of impermeable areas draining to a sewer, and climate change affecting rainfall patterns. As a result, sewer flooding may become more frequent in the future.

4.5 Overland Flooding

Overland flooding is caused when water does not penetrate into the ground due to the surface being impermeable (not porous). It also occurs when the ground is already saturated or because drains are not functional or overwhelmed, for example, during short, intense storms. This leaves the water with nowhere to go to and as a result, it will remain or flow on the surface.

The EA has produced a flood map for Surface Water for the application site and surrounding area, as shown in Figure 7 below, which shows that the site is a low-risk area when considering surface water flooding, and hence, overland flooding.

Figure 7 Flooding from surface water

4.6 Climate Change

Climate change can affect flood risk in several ways e.g., impact on river flows, sea levels, rainfall intensity, wave height and wind speed. Therefore, the risk of flooding is likely to increase in the future. Climate change allowances are predictions of anticipated change for:

- peak river flow
- peak rainfall intensity
- sea level rise
- offshore wind speed and extreme wave height.

Considering this development will likely have a life of over fifty years, is in Flood Zone 1 and classified as 'less vulnerable', the 'Mole Management Catchment' peak rainfall central allowance of 25% climate change has been applied for the proposed drainage strategy design.

5 Surface Water Management and SuDS

5.1 Existing Surface Water Drainage

According to the Thames Water asset plans (Appendix D), the closest public sewers are located on East Road and Warreners Lane. On East Road a 225mm diameter surface water sewer runs south to north and then discharges to an unknown outfall just south of the entrance to St. George's Hill LTC. To the north of the adjacent car park, a 150mm diameter surface water sewer runs along East Road, and then connects into a 225mm diameter sewer coming round from Warreners Lane.

It is assumed the tennis court is served by perimeter channel drains, which then discharge to the existing 175mm diameter surface water sewer in the access road to the immediate right of the site, which flows

in a northern direction alongside the existing tennis court, then westerly to connect into an existing manhole. This manhole then discharges via a 175mm going north towards further tennis courts within the Club complex. The existing drainage layout and connections has been assumed from the topographical survey.

A combined topographical / CCTV survey has been commissioned and the plans can be found in Appendix E.

The existing site comprises the following areas, which has been compared with the proposed development areas:

	Existing (m^2)	Proposed (m^2)
Roofs	165	941
Hardstanding	489	535
Soft landscaping	910	88
TOTAL	**1,564**	**1,564**

Table 2 Comparison of Existing and Proposed Site Areas

The greenfield runoff rates for the site have been obtained from the UK SuDS 'Greenfield Runoff Rate Estimation' tool, and are presented in Table 3 below, and Appendix F.

Return Period	Greenfield Runoff Rate (l/s)
1 in 1 year	0.15
1 in 30 year	0.41
1 in 100 year	0.57
1 in 200 year	0.67

Table 3 Greenfield Runoff Rates

The existing brownfield runoff rate has been estimated using the standard Building Regulations Part H method, as below:

Total catchment area: 1,564m^2

Peak rainfall intensity: 0.014L/s/m^2 (as advised in Building Regulation Approved Part H)

Brownfield runoff rate: 1564 x 0.014 = 21.9L/s

5.2 Evaluation of Sustainable Drainage Systems

In accordance with best practice and requirements set out in the NPPF, and guidance from the Environment Agency, and DEFRA, SuDS should be utilised where possible within the planned development. It is proposed to utilise SuDS as is deemed feasible, following the hierarchy for disposal and treatment as outlined below in Table 4. A summary of comments has been provided for each method with regards to this specific development:

SuDS Hierarchy (most to least preferred)	
METHOD	**COMMENTS**
Discharge into the ground	Not feasible due to deep areas of made ground and silty clay below made ground; low infiltration rates likely

Discharge into a surface water body	No surface water bodies around site, Warren Pond at higher level than site
Discharge into a surface water sewer	Feasible due to presence of private drains within site, which connect to Thames Water sewers
Discharge into a combined sewer	Not required

Table 4 SuDS Hierarchy Summary

5.3 Proposed Surface Water Drainage Strategy

The initial volume of attenuation required has been based on the site's brownfield runoff rate, bettered by 50%, as below:

'Bettered' site runoff rate target = 10.9L/s (min. 50%)

As the 1 in 100-year greenfield runoff rate for the site area is very low, for the purposes of this drainage strategy, and to ensure any vortex flow control does not clog and works efficiently, the restricted flow rate has been set at a minimal 2L/s.

The proposed surface water drainage strategy will comprise a series of new rainwater pipes for the padel court dome roof, and new groundworkers shed, along with a gully for the machine washdown area. The surface water from the padel dome and new shed will discharge into the proposed Permavoid 150 sub-base storage (150mm deep sub-base) via diffuser units, and then discharges at a restricted rate of 2L/s into the existing 175mm diameter sewer. The surface water falling on the existing hard landscaped areas will drain as existing, into gullies and channel drains.

A new SDS Aqua-filter will be fitted just upstream of the diverted drain connection into the existing manhole, to ensure adequate treatment of runoff from both roof and hard landscaping areas.

The proposed courts dome will sit on top of an existing surface water drain, which will need to be diverted east slightly into the existing access road, and associated incoming connections and manholes to be re-connected via new drains.

This has been modelled in InfoDrainage, for all storms up to and including the 1 in 100 year +25% climate change durations, using the values listed below.

- Developable Area (whole site): 0.1564 ha
- SAAR: 625 mm
- Soil Percentage Runoff (SPR): 0.3
- Hydrological Region: 6
- Hydro-brake flow rate: 2L/s

The model produces no flooding for any storm analysed. The final minimum attenuation volume required is 50m^3. The proposed strategy can be found in Appendix H, and InfoDrainage model results in Appendix I.

In case of exceedance flows i.e., greater than the critical 1 in 100-year plus climate change storm, it is expected that any surface flooding that occurs, will simply sit within the kerbed areas of the existing hard landscaping areas, until the rainwater pipes have drained down enough to accommodate the additional rainfall. Considering the wider area around the tennis club, the topography of the land

generally falls in a north-easterly direction, eventually finding its way to the River Thames tributary, River Mole. Although the detailed external levels strategy has yet to be concluded, it is expected that it will follow the existing patterns i.e., the proposed strategy will continue to implement the existing overland flow route, with surface water runoff flowing to the northern end of the site.

It should be noted that the drainage proposals in this report are outline only and further refinement and assessment may be necessary as part of the detailed design stage.

5.3.1 Stormwater Treatment Management Train and Runoff Quality

The Surface Water treatment provided by the SuDS features will ensure that the runoff is of sufficient quality so as not to impact the receiving system.

In keeping with the CIRIA SuDS Manual philosophy, the drainage strategy proposed aims to reduce any potential pollution risk to the receiving surface water sewers. In terms of designing for amenity and biodiversity, due to the nature of the site, there is little opportunity or value in proposing any methods to enhance either criterion, and hence, they will not be considered further.

As per Section 26 of the SuDS Manual:

'*The risk posed by surface water runoff to the receiving environment is a function of:*

- *The pollution hazard at a particular site (i.e., the pollutant source)*
- *The effectiveness of SuDS treatment components in reducing levels of pollutants to environmentally acceptable levels, and/or the effectiveness of underlying soil layers in protecting the receiving groundwater (i.e., the pollutant pathway)*
- *The sensitivity of the receiving environment (i.e., the environmental receptor).*'

To ensure the design complies with the required pollution mitigation, adequate treatment of the contributing areas will need to be provided.

The following equation needs to be complied with, for each SuDS type used:

Total SuDS mitigation index ≥ Pollution hazard index

To ensure the stormwater quality is as high as possible prior to entering the sewer network, we propose to utilise gullies and channel drains with appropriate sump units that will collect/manage any debris or silt falling into the system. Following this, attenuation of the stormwater will occur, which then gets pulled through into the Hydro-brake flow control chamber and then the proposed SDS Aqua -Filter which will filter out over 80% of suspended solids, silt, hydrocarbons, nutrients and heavy metals that may have contaminated the site.

The Simple Index Approach has been used to assess the pollution risk for this site's SuDS strategy. According to Table 26.2 'Pollution hazard indices for different land use classifications' of the SuDS Manual, the site can be classified within the following categories:

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydrocarbons
1 Residential roofs	Very low	0.2	0.2	0.05

2	Other roofs	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from roof)	0.05
3	Individual property driveways, residential car parks, low traffic roads, and non-residential car parking with infrequent change i.e. < 300 traffic movements/day	Low	0.5	0.4	0.4
4	Commercial yard and delivery areas, non-residential car parking with frequent change, all roads except low traffic roads and trunk roads/motorways	Medium	0.7	0.6	0.7
5	Sites with heavy pollution, sites where chemicals and fuels are to be delivered, handled, stored, used or manufactured, industrial sites; trunk roads and motorways	High	0.8	0.8	0.9

Table 5 Pollution Hazard Indices

The roofs of the site would fall under category 2 - 'other roofs', and the access roads would fall under category 4. Category 4 figures will be used for this check as it encompasses a higher level of pollution risk.

The following data will be used for surface water discharge to local surface waters, which has been obtained from the manufacturer, SDS:

	Mitigation indices		
Type of SuDS component	***TSS***	***Metals***	***Hydrocarbons***
Proprietary treatment systems - SDS Aqua-Filter	0.8	0.8	0.7

Table 6 SDS Aqua-Filter Mitigation Indices

Therefore, for the proposed SuDS strategy, the following mitigation indices will apply:

RWP/gully/channel drain > Permavoid 150 sub-base attenuation > SDS Aqua Filter > Existing Sewer Network

	Pollution hazard indices	**SuDS mitigation indices – SDS Aqua-Filter**	**Total SuDS Mitigation indices**	**Mitigation ≥ Pollution hazard?**
TSS	0.7	0.8	0.8	Yes

Metals	0.6	0.8	0.8	Yes
Hydrocarbons	0.7	0.7	0.7	Yes

Table 7 Treatment Train Pollution Mitigation Indices

Therefore, the proposed treatment train is considered acceptable.

5.3.2 SuDS Maintenance Regime

The maintenance and management schedule required for the proposed SuDS on site should follow the below guidelines, to ensure the risk of flooding i.e., failure of the system, is reduced and even eliminated for the lifetime of the system.

Maintenance will be in accordance with Sewerage Sector Guidance Appendix C document (May 2021), the guidance of CIRIA SuDS Manual C753 and other established best practices.

The SuDS and drainage infrastructure on site will be maintained by the developer for the maintenance period after completion and handover. Long term, the owner or a site management company will be responsible for the ongoing maintenance of the SuDS infrastructure. Table 8 outlines the Maintenance Schedule required for the site; however, it should be noted that for the first 3 months post practical completion and handover, maintenance should be carried out every month at a minimum. Regular maintenance schedule reviewing may be required to keep up with best practice and ensure the SuDS are remaining effective.

The developer is responsible for providing the SuDS Maintenance Plan and O&M Manual to the site Management team. The O&M manual shall be handed over to each subsequent owner of the site, and within that pack should be included any relevant engineering drawings for ease.

Drainage Infrastructure Item	**General maintenance**	**Responsibility**
Drainage pipework	Jet and clean as necessary	Site owner/Management Company
Manholes/silt traps/catchpits/gullies/ channel drains	Remove cover annually to check for any sign of blockage and (jet) clean as necessary. Empty sumps as required.	Site owner/Management Company
SDS Aqua-filter	Bi-annual visual inspection, remove any significant large debris/litter. Servicing as per manufacturer recommendations.	Site owner/Management Company
Hydro-brake flow control	Monthly visual inspection; Servicing as per manufacturer recommendations.	Site owner/Management Company

Table 8 Maintenance Schedule

6 Impact of the scheme on Flood Risk and Mitigation Measures

6.1 Proposed Development Impact

Through the use of SuDS compliant design philosophies, with regards to runoff and volume control, and stormwater treatment for adequate water quality, the proposed development adequately reduces the flood risk to the receiving surface water drainage network, and also ensures the water quality being discharged is to the required standards so as not to negatively affect downstream water

environments. Below is a breakdown of how the proposed development may affect the existing flood risk to the site, and any mitigation measures that may be required will be discussed.

Mitigation against Tidal and Fluvial Flooding

The site is considered to be at low risk of tidal and fluvial flooding. The introduction of new SUDs features - surface water attenuation and near to source flow control devices will have a positive impact on the local storm water network by providing betterment to the runoff rate from the site.

Mitigation against Groundwater Flooding

As the proposed drainage strategy does not incorporate any infiltration or groundwater recharge, the level of groundwater is not expected to rise due to the development, and hence, flood risk will not increase.

Mitigation against Pluvial and Sewer Flooding

The proposed site drainage will better the existing surface water runoff rate, by reducing the total discharge rate from the site, and hence, it is not expected that the risk of sewer flooding will increase.

7 Foul Water Strategy

There is an existing 150mm diameter foul sewer running through west to east across the club site, just to the south of the padel court enclosure. It is proposed that the groundskeeper shed foul water will discharge into this sewer via a new manhole.

The finished floor level of the shed is +48.20m, and the invert level of the sewer manhole we propose to connect into is approximately +48.21. This means the foul water will need to be pumped into the new manhole. A duty-standby pump is proposed within the footprint of the shed, and will pump foul to a new manhole on the existing sewer. This then connects to a foul/combined sewer in East Road. The new foul drainage will pick up waste from several WC's, showers and handwash basins, and kitchen sink waste from inside the shed.

All foul drainage will be designed to Building Regulations Part H, and BS 752 standards.

8 Conclusions

The redevelopment proposes to re-surface 2no existing tennis courts, and replace these with a new padel court dome enclosure. A small groundskeeper shed is also proposed to the immediate north of the enclosure. Access to the site will remain the same.

Environment Agency mapping shows that majority of site lies in Flood Zone 1 (Low Risk). It was also found that the site has a low risk of flooding from all other sources.

The site is considered 'less vulnerable' with respect to flood risk in line with NPPF guidelines. The proposed development is not required to undertake the exception test as less vulnerable uses are deemed 'appropriate development' in Flood Zone 1.

A below ground attenuation tank of minimum volume 50m^3 is proposed to attenuate surface water flows from the roofs of the new groundskeeper shed and padel court dome, which will then flow at a restricted rate of 2L/s into the existing 175mm diameter surface water sewer to the north of the site. This is a greater than 50% bettered flow rate in comparison to the existing brownfield runoff rate. The existing access road hardstanding will drain as existing.

The existing 150/175mm diameter surface water sewer which runs along the length of the dome will need to be diverted to the east to avoid running under the proposed dome – the proposed drainage strategy will then connect into this diverted drain via a new surface water chamber.

The groundskeeper shed will require a foul water pump to remove all foul waste, and discharge it into the existing foul water sewer that runs west to east across the wider site.

Through the implementation of the sub-base storage, and other proprietary systems, this flood risk assessment has concluded that the proposed development neither increases the site's runoff rate nor the potential for flood risk or flooding from the site.

APPENDIX A – Existing Site Plan

Existing Site Plan

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Rev	Date	Description	By	Chk
P01	07.07.22	SGHRA Submission	GL	JM

SGHRA SUBMISSION

DB3

LEEDS
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CLIENT
ST. GEORGE'S HILL LAWN TENNIS CLUB

PROJECT
FITNESS BUILDING

TITLE
EXISTING SITE PLAN

CREATION DATE	SCALE @ A1	DRN	CHK	STATUS
06/24/22	1 : 200	GL	JM	S0

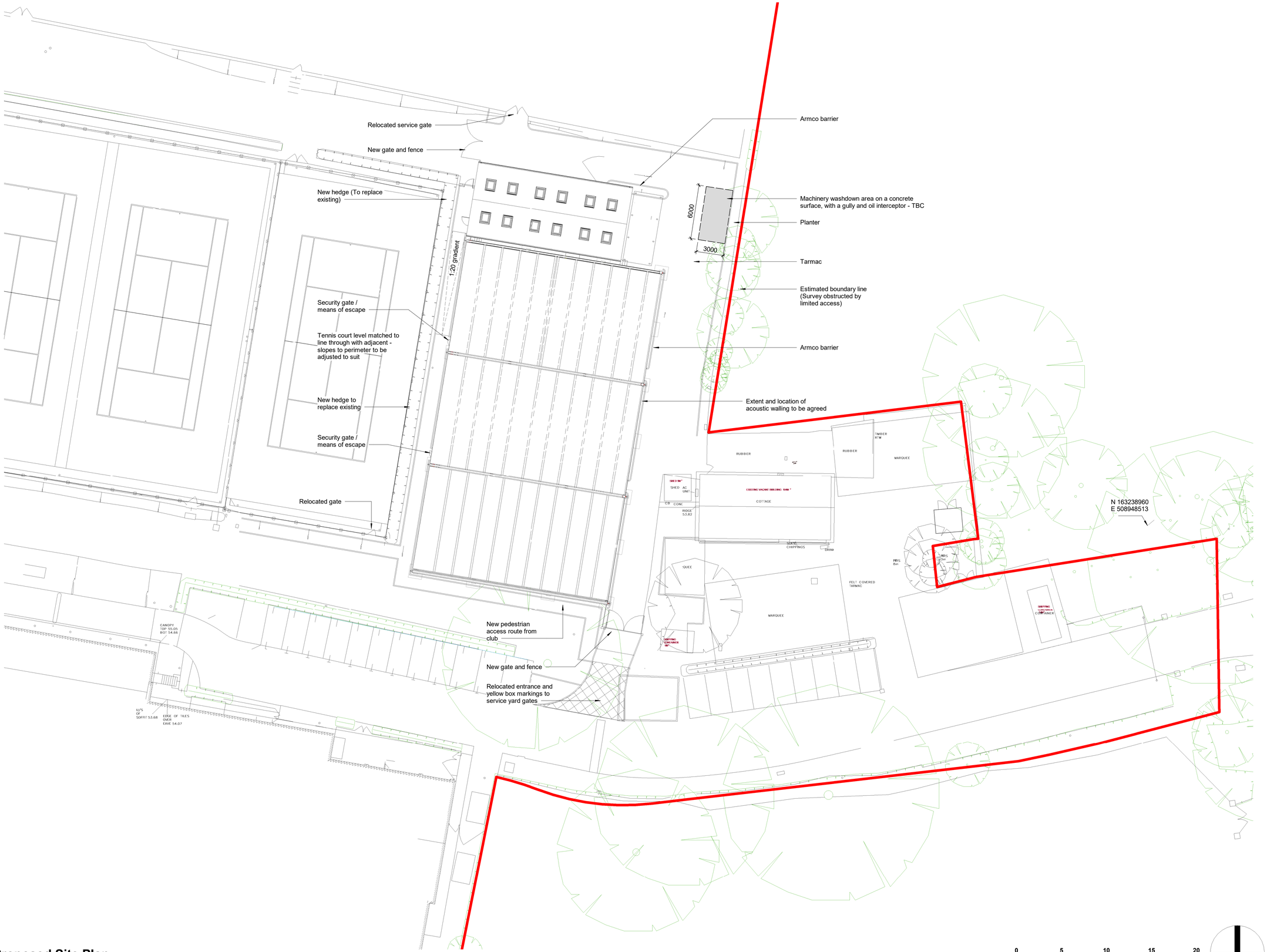
SHEET NO.
15764 - DB3 - B01 - ZZ - DR - A - 90001

REVISION
P01

PROJECT NO|ORIGINATOR|ZONE|LEVEL|TYPE|ROLE|NUMBER

PLOT DATE|07/07/2022 14:17:15

APPENDIX B – Proposed Site Plan



Proposed Site Plan

1 : 200

1:200 0 5 10 15 20 m

Rev	Date	Description	By	Chk
P04	14.03.23	Revised as instructed via 08.03.23 email	VG	JM
P03	07.03.23	Issued for Planning	VG	JM
P02	02.03.23	Updated as per 23/02/2023 email	VG	JM
P01	07.07.22	SGHRA Submission	GL	JM

PLANNING

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CLIENT
ST. GEORGE'S HILL LAWN TENNIS CLUB

PROJECT
PADEL COURT ENCLOSURE

TITLE
PROPOSED SITE PLAN - PADEL COURT

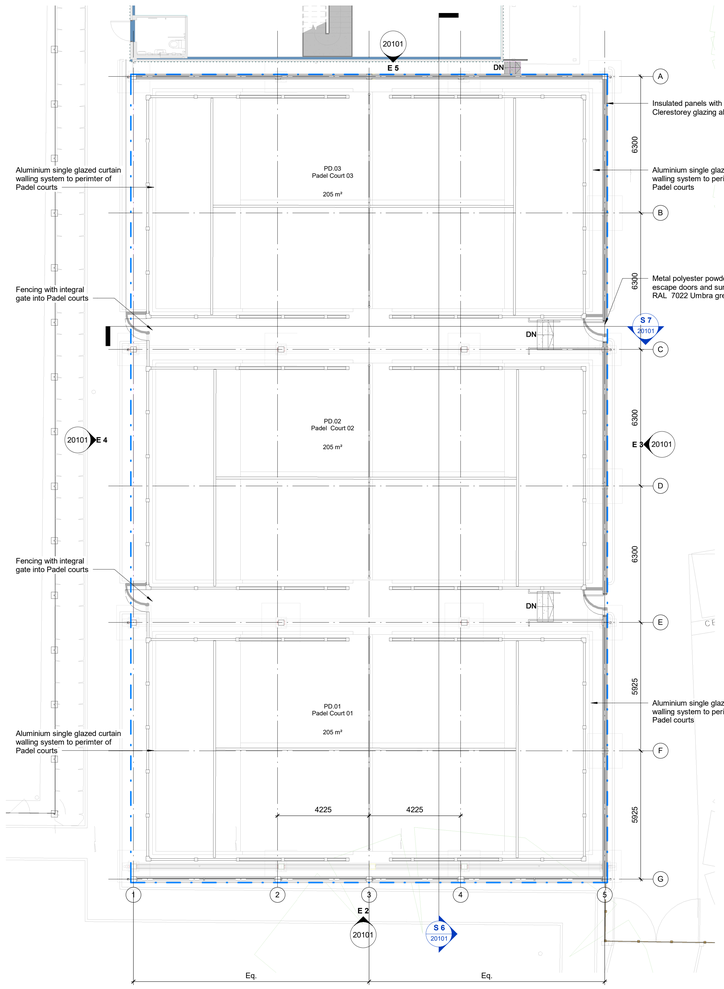
CREATION DATE	SCALE @ A1	DRN	CHK	STATUS
06/24/22	1 : 200	GL	JM	S0

SHEET NO.
16365 - DB3 - S01 - ZZ - DR - A - 90200

REVISION
P04

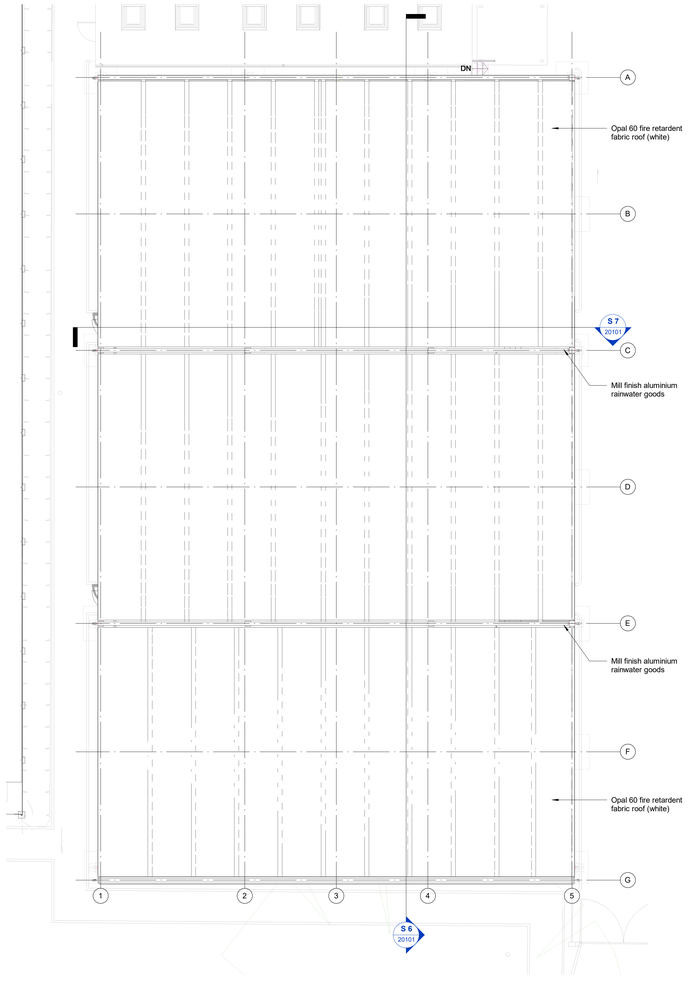
PROJECT NO:ORIGINATOR:ZONE:LEVEL:TYPE:PC:ROLE:NUMBER

PLOT DATE: 14/03/2023 09:35:53



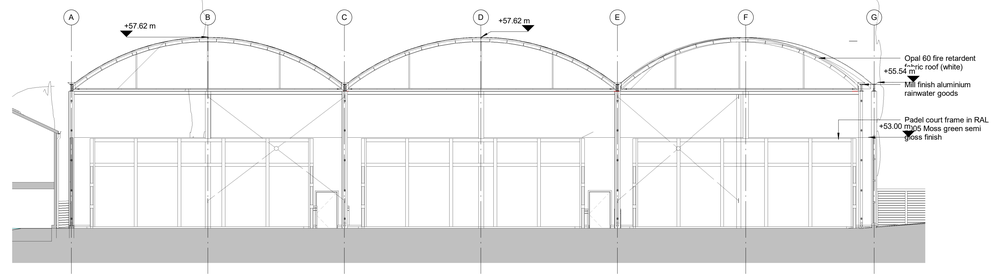
GA Padel Court Ground Floor

1 : 100



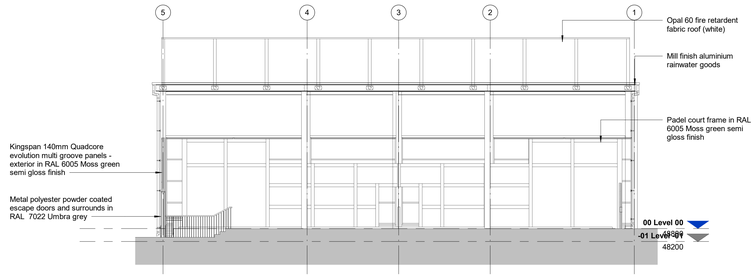
GA Padel Court Roof Plan

1 : 100



Section AA

1 : 100



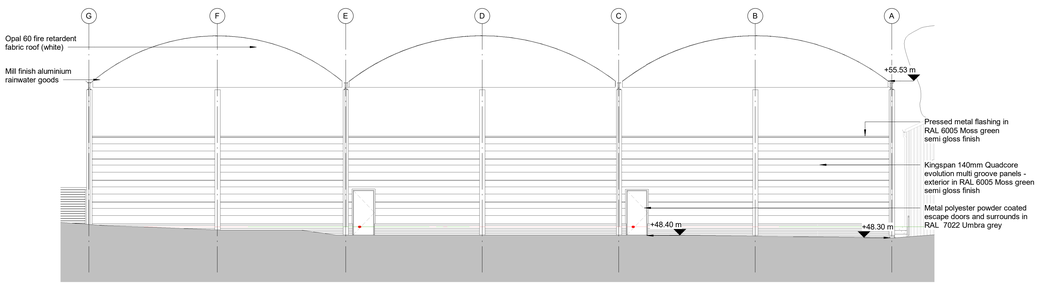
Section BB

1 : 100

Padel Court Key Plan

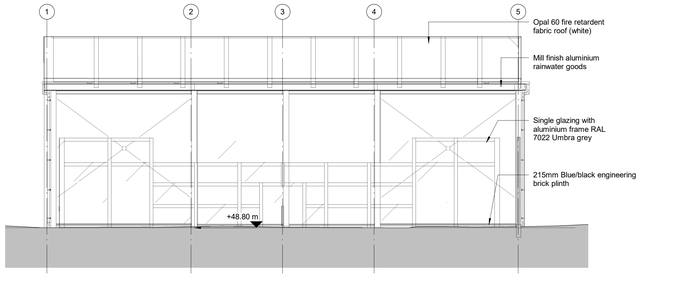
1 : 500

Proposed Padel Court total GEFA - 795.4m²



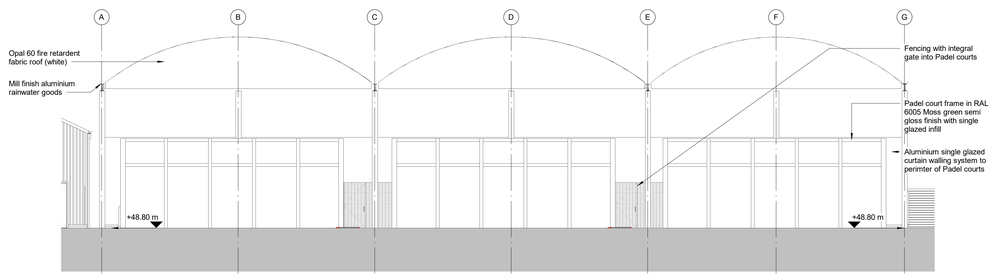
East Elevation - Padel Court

1 : 100



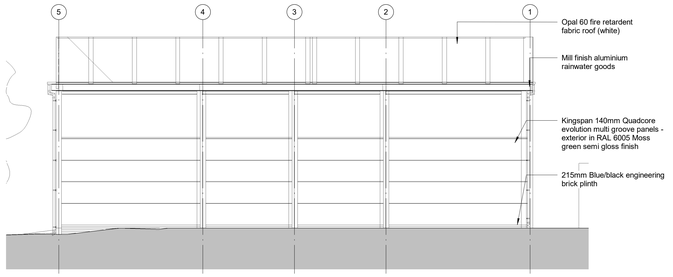
South Elevation - Padel Court

1 : 100



West Elevation - Padel Court

1 : 100



North Elevation - Padel Court

1 : 100

1:100 0 2 4 6 8 10 m

1:500 0 10 20 30 40 50 m

P04	17.02.23	Corridor around courts increased to 800mm	VG	JM
P03	12.10.22	GEFA Updated	JK	JM
P02	08.07.22	Padel Court GEFA Added	GL	JM
P01	07.07.22	SGHRA Submission	GL	JM
Rev	Date	Description	By	Chk

SGHRA SUBMISSION

DB3

LEEDS
10 South Parade, Leeds, LS1 5QS
Tel: 0113 244 2931 www.darntonb3.com

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PROJECT
PADEL COURT ENCLOSURE

TITLE
GA PADEL ENCLOSURE

CREATION DATE	SCALE @ A0	DRN	CHK	STATUS
06/24/22	As indicated	GL	JM	S0

SHEET NO. **16365 - DB3 - S01 - XX - DR - A - 20101** REVISION **P04**

PROJECT ACCORDING TO RTC ZONE/LEVEL/TYPE/ROLE/NUMBER

PLOT DATE 7/26/2023 12:40:26

APPENDIX C – EA Flood Map for Planning

Flood map for planning

Your reference	Location (easting/northing)	Created
<Unspecified>	**508823/163202**	**25 May 2022 16:21**

Your selected location is in flood zone 1, an area with a low probability of flooding.

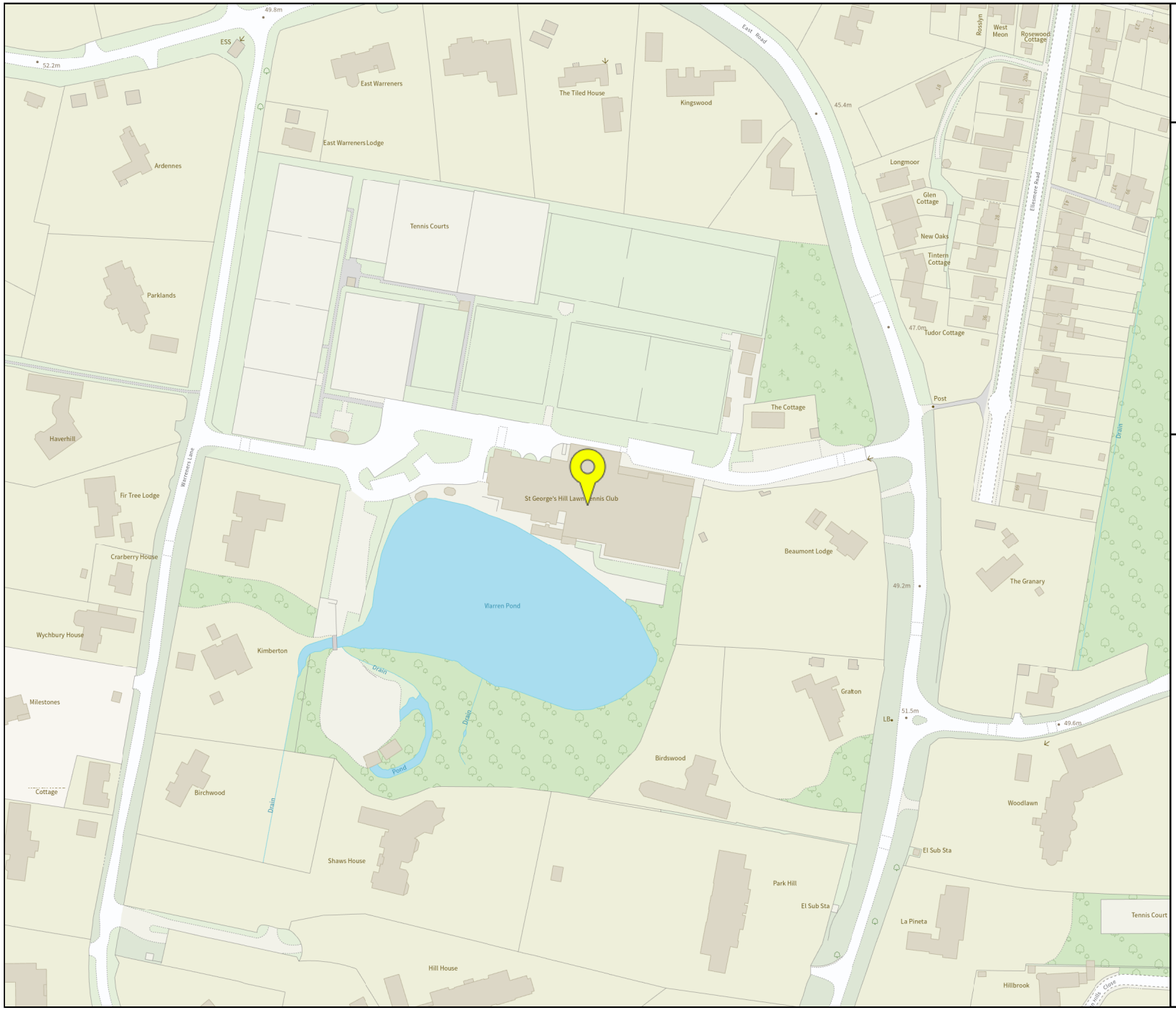
You will need to do a flood risk assessment if your site is **any of the following:**

- bigger that 1 hectare (ha)
- In an area with critical drainage problems as notified by the Environment Agency
- identified as being at increased flood risk in future by the local authority's strategic flood risk assessment
- at risk from other sources of flooding (such as surface water or reservoirs) and its development would increase the vulnerability of its use (such as constructing an office on an undeveloped site or converting a shop to a dwelling)

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.



Environment Agency

Flood map for planning

Your reference
<Unspecified>

Location (easting/northing)
508823/163202

Scale
1:2500

Created
25 May 2022 16:21

- Selected point
- Flood zone 3
- Flood zone 3: areas benefitting from flood defences
- Flood zone 2
- Flood zone 1
- Flood defence
- Main river
- Water storage area

0 20 40 60m

APPENDIX D – Thames Water Asset Plan

Asset location search

Property Searches

CHECKED

Atkins Ltd
Stats Enquiries Team The Hub
500Park Avenue
BRISTOL
BS32 4RZ

Search address supplied Site at East Road, Warreners Lane, Weybridge
KT13 0LL

Your reference 114442

Our reference ALS/ALS Standard/2022_4747541

Search date 9 November 2022

Knowledge of features below the surface is essential for every development

The benefits of this knowledge not only include ensuring due diligence and avoiding risk, but also being able to ascertain the feasibility of any development.

Did you know that Thames Water Property Searches can also provide a variety of utility searches including a more comprehensive view of utility providers' assets (across up to 35-45 different providers), as well as more focused searches relating to specific major utility companies such as National Grid (gas and electric).

Contact us to find out more.

Thames Water Utilities Ltd
Property Searches, PO Box 3189, Slough SL1 4WW
DX 151280 Slough 13

searches@thameswater.co.uk
www.thameswater-propertysearches.co.uk

0800 009 4540

Asset location search

Property Searches

Search address supplied: Site at East Road, Warreners Lane, Weybridge, KT13 0LL

Dear Sir / Madam

An Asset Location Search is recommended when undertaking a site development. It is essential to obtain information on the size and location of clean water and sewerage assets to safeguard against expensive damage and allow cost-effective service design.

The following records were searched in compiling this report: - the map of public sewers & the map of waterworks. Thames Water Utilities Ltd (TWUL) holds all of these.

This searchprovides maps showing the position, size of Thames Water assets close to the proposed development and also manhole cover and invert levels, where available.

Please note that none of the charges made for this report relate to the provision of Ordnance Survey mapping information. The replies contained in this letter are given following inspection of the public service records available to this company. No responsibility can be accepted for any error or omission in the replies.

You should be aware that the information contained on these plans is current only on the day that the plans are issued. The plans should only be used for the duration of the work that is being carried out at the present time. Under no circumstances should this data be copied or transmitted to parties other than those for whom the current work is being carried out.

Thames Water do update these service plans on a regular basis and failure to observe the above conditions could lead to damage arising to new or diverted services at a later date.

Contact Us

If you have any further queries regarding this enquiry please feel free to contact a member of the team on 0800 009 4540, or use the address below:

Thames Water Utilities Ltd
Property Searches
PO Box 3189
Slough
SL1 4WW

Email: searches@thameswater.co.uk
Web: www.thameswater-propertysearches.co.uk