Landowner Statement
Old Lyonians Sports Ground, Pinner View, Harrow

Introduction

This statement is written by the Old Lyonian Association (the 'Association') in our capacity as the landowner to support a full planning application for the redevelopment of the Old Lyonians Sports Ground (the 'Site') to provide new homes alongside a new Community Hub providing flexible community and co-working space and public open space.

Following receipt of pre-application advice from London Borough of Harrow in March 2023, we have been asked by Zed Homes Ltd to provide additional detail in respect of the history of our former use of the Site for outdoor sports facilities.

We trust that our statement addresses in full the LPA's concerns in relation to loss of open space as set out in paragraphs 1.1 – 1.15 of their March 2023 advice and supports the case for compliance with the relevant Development Management Policies in respect of existing and proposed open space and community/sport facilities.

Please note that this Statement has been prepared based on the historic information that is available and to the best of the knowledge of the current members of the Association's Council.

History of Ownership and Use

The John Lyon School was founded in 1876 as a school for local boys, forming a Lower School to Harrow School. The two schools continue to have close ties being part of the same Foundation. The school is located in Harrow on the Hill, where it has been located since it was founded.

The Association, formed of former pupils of the school to promote ongoing contact and friendship between the former pupils of the John Lyon School, held its first social event in 1891. The Association continues to have a close relationship with the school, actively participating in school events and offering career counselling to existing pupils. It is estimated that their current membership is around 3,500 people.

The stated purposes of the Association are:

- To provide for the means of recreation and entertainment of members of the Association,
- To promote friendship and fellowship between Old Lyonians; and
- The furtherance of the interests of the School and Old Lyonians

To this end the Association sought a plot of land to enable them to meet their needs and fulfill their purposes. In order to enable the purchase of the Pinner View site for sporting, recreational and society activity The Old Lyonian Athletic Club Limited was formed in 1921 View, with the subsequent installation of two full sized association football pitches, a cricket square with 10 wickets, a wooden pavilion for use as changing rooms and a licensed bar. Later, two grass tennis courts were added and two clay tennis courts which in the 1980s were converted to a pétanque court.

The premises were exclusively available to ex-pupils and ex-teachers of John Lyon School along with their respective spouses, in return for which an annual subscription was due.

The facilities were extensively used as follows:

- 4 football teams (plus occasional 5th XI and/or veterans), playing on Saturday between October and March from around 1930 until 2015.
- 2 cricket teams playing Saturday and Sunday April until September until 2014.
- Tennis Club from April to September until 1985.
- Pétanque (from 1985 until 2019) playing evenings in summer.
- An Annual Fair until 1980.
- Licensed bar open evenings Monday to Saturday, lunchtime Saturday and Sunday.
- Multiple social events all year round, such as an annual members' dinner, class and year reunions, networking events, quiz nights.

The original pavilion was replaced with a newer structure in 1965 with a projected realistic lifespan of 40 years. This still exists on the Site today, albeit now being beyond economic repair, having well exceeded its life expectancy.

The tennis club ceased functioning in 1985 due to lack of members and Pétanque (played mostly by non-old Lyonians) was introduced in 1985, to assist revenues.

In around 2010, in order to boost income, the Association procured the Acorn Montessori School (the School) to rent the building. They occupied the hall within the building until 2021. They did not use the grounds around the building.

From 2016 until 2021 we also let the Site to Pinner View Sports and Social Club (the Club), which had been formed by the existing Pétanque Society with approximately 30 members. The School became a sub-tenant of the Club at that point. The Club used the Site for pétanque, archery and

social events during this period. They did not use any part of the Site as a playing field during their tenancy. The land has not been used for any regular organised sports use as a playing field since 2015.

Since 2021 we have let the site at a nominal rental to a local charity, Harrow Carers, who use the building as a day centre.

Viability of Existing Outdoor Sports Facilities

Following changes in legislation (such as the smoking ban and tighter drink driving rules), and significant societal changes, such as school-leavers not returning to the local area after finishing university because of the high cost of housing in the London area, we began to notice a significant reduction in sporting activity from established members, particularly from the 1970s onwards.

Notwithstanding this, our operation remained somewhat financially viable for many years as non-ex-pupils and verified associates were accepted from the 1980s as sports playing members rather than just full Association members. This new membership eventually accounted for approximately 30% of the overall participation in organised sports.

In addition to the decrease in participation, the sports pitch drainage system was noticeably malfunctioning by the 1980s, which resulted in poor playing surfaces, cancelled fixtures and player dissatisfaction, leading to expenditure of around £10,000 on slit drainage in 1986.

Unfortunately, despite the significant sum paid to rectify the drainage issue, the matter was not resolved, and further research showed that a complete relaying of the main undersoil drainage, plus relevelling of the pitches, would cost considerably more. Financially this was not feasible for the Association, who had always operated on no better than a break-even basis.

In 1985, the cricket section of the Association merged with 'Glacier Cricket Club' with the view of boosting membership due to reduced 'Old Lyonians' participation as described above. The merged cricket club continued playing under the name 'Old Lyonian Cricket Club' until 2015, supporting two teams in local cricket leagues throughout that period.

The square and outfield were maintained by a groundsman to the best of his abilities during that period, but both deteriorated gradually during that time. The poor drainage during the football season led to an uneven and cracked outfield during the summer, and whilst annual preseason treatment of the square kept it operable, it came to the point where it needed completely relaying to be safe to play on. This in turn led to members leaving the cricket club.

By this time the club had reached a stage where it was becoming clear that it would be impossible to support the cost of the groundsman and remedial works from the ongoing income.

By 2009 the Association revenues were below the levels required to maintain the facilities and therefore the Association Council started to look more seriously into the possibility of selling the site as previous attempts had been slightly half-hearted.

In 2015 the cricket section of the Association ceased to function due to lack of members. This left football being the only sport then continuing to use the Site, albeit on a poor playing surface that led to many postponed fixtures during the winter and fixture congestion in the Spring, which inevitably damaged the surfaces even further.

The poor quality of the playing surface together with the number of postponed matches resulting in the decreasing playing membership was placing the football club in a critical position being in danger of losing their membership of The Southern Amateur League which in turn would undoubtedly have led to the football club following the cricket club in disbanding.

In reaction to the difficulties faced above, the then President held discussions with the Head of the John Lyon School which resulted in an offer to relocate the football section to use the existing school facilities on Sudbury Hill, which is also within the London Borough of Harrow. The school proposed taking over certain administrative duties in respect of events (annual dinners/reunions). In the context of 1. the worsening condition of the pitches and pavilion at the Site, for which funds were not available to do the necessary improvement works, 2. active membership of the Association having further declined, which significantly reduced the income of the Association, together with 3. the unsustainable running costs of the Pinner View site, this provided a very welcome lifeline to secure the short-term future of The Association.

A lease was put in place for a period of 10 years at a nominal rental in order for the Association to become established on the understanding that as part of the agreement with The School The Association contributed capital to the refurbishment of a pavilion at the Sudbury Hill end of the site which has become the Associations new clubhouse (albeit subject to ongoing use by The School).

This initial lease is without security of tenure and is due to expire in 2025 and so it has become a priority to secure funds from the sale of Pinner View to secure The Association's future at Sudbury when a more commercial relationship will be required by The School

As a result, at the end of the football season in April 2015 all of the Association's organised sporting and social activities were ceased at the Site and were relocated to the John Lyon School playing fields in Sudbury Hill under a formal lease. The football pitches and cricket square have not been used or maintained at Pinner View since April 2015.

From 2015 the Site was maintained by the Pinner View Sports and Social Club until 2021. Their activities were limited to pétanque and archery, together with socialising, as they maintained a license to serve alcohol. They did not use any part of the site as a playing field during their tenancy.

The tenancy of the Nursery School from 2010 to 2021 went someway to covering the revenue gap between costs and income. However, the Nursery School ended their sub-tenancy, and the resulting loss of income led to the Pinner View Sports and Social Club also ending their tenancy and it went into liquidation in 2021.

Since 2021, the Harrow Carers charity have been tenants on a 'peppercorn rent', to ensure the premises are occupied and minimally maintained (by the tenant). They have a rolling annual lease outside of the 1954 Act, with a 6 month notice period. They mainly use the building as a day centre, and occasionally the grounds, for general leisure activities. They operate as a charity serving a specific part of the community and license part of the building to other community groups for evening and weekend activities. For the avoidance of doubt, the Association does not profit from this tenancy, and this is not a sustainable long term solution for the Site.

Proposed Sale of the Site

All of the events described above, eventually led to the decision to sell the Site, for the following cumulative reasons:

- Reduced membership and activity resulted in insufficient income to support the day-to-day upkeep of the grounds to an acceptable standard (including the cost of employing a groundsman and the materials and equipment necessary).

- There were insufficient funds available to undertake the extensive works needed to improve the drainage of the Site to meet the high standards required by the relevant sports.

- The building was falling into a poor state, with no funds to invest in its upkeep so that it could be used for any social functions.

- It is no longer possible to achieve a commercial rent for the building and the wider site in its current condition, with no funds available to invest in improving it.

- The income generated by the bar was not sufficient to justify keeping it running and employ staff.

- By disposing of it, they can put the funds raised towards securing the future of the organisation and other activities. As this is their only asset, it is essential that they can achieve the best value for its sale to enable this.

Stimpsons Commercial was appointed in 2009 to approach their local contacts to see who might be interested in acquiring the Site. The Site was never put on the open market. Since 2009 there have been discussions with several interested parties regarding the grounds, each time referred through Stimpsons.

A broad marketing campaign was specifically not requested in the knowledge that the commercial property market is one huge grapevine and the availability of Pinner View would become widely known about which proved to be the case.

As a result, a number of redevelopment proposals have been promoted over recent years in an attempt to secure the site. However, each of these has failed, either because the proposed development was not viable, or it did not represent a scheme that the Council could support.

Residential development schemes have been pursued by Buxton Homes in 2009/10 and Fairview Homes in 2014, who both signed option agreements but both parties abandoned their proposed developments after initial discussions with the Council. Neither reached the stage of a formal pre-application meeting or any written advice. These proposals were both for mainstream housing schemes with standard house types. Neither scheme included the substantial provision of public open space, sports facilities and Community Hub that is now proposed by Zed Homes.

The Education Funding Agency approached us in 2015 with a view to locating a Foundation primary school on the Site. The Mariposa School got as far as appointing a Head Teacher and inviting applications from prospective parents. However, Harrow Council took the view that no primary school was required in this location and would not support the scheme. It also did not get as far as a formal pre-application meeting. Whilst this use would have enabled a larger proportion of the Site to be retained as open space, it would still have been kept private for use by the school.

David Lloyd Leisure approached us in 2019 with plans for a leisure complex with swimming pool and open space. They offered an outside running track, which would be made available to the community. However, this project was also abandoned following two separate pre-application submissions and discussion with Harrow Council. The principle of development was objected to with a major concern being the loss of open space with a perception that there was insufficient public benefit to outweigh the harm caused by the loss.

Other approaches prior to 2020 include a proposed Jewish School although they found an alternate location.

Also, approaches were from The Chairman of Wealdstone Football Club as a site for their Academy although it quickly became apparent that the level of investment required could only result in a very modest offer which would not enable The Association to achieve their aim of securing their future.

Most recently Zed Homes Ltd approached us through a local land agent, initially in 2018. They subsequently contacted us again with the current proposal in 2021.

Following many years of negotiations to sell the Site, there has been no proceedable interest. It remains no longer financially viable to continue to run the Site as a sports and social club. The

Site has become a financial burden and liability for the Association and the decision has been taken by the Association membership that it should dispose of the Site.

The Old Lyonian Association is sadly yet another example of a private sports club that are unable to support their grounds. There is endless evidence of similar clubs failing over the years and the prospect of selling to a private body who could provide the level of investment required to continue its current use and enable the Association to secure its future is fanciful.

Intentions for the Funds Raised from the Sale

The stated purposes of the Association are ONLY:

- To provide for the means of recreation and entertainment of members of the Association,
- To promote friendship and fellowship between Old Lyonians; and
- The furtherance of the interests of the School and Old Lyonians.

The intention of the proposed sale is to secure sufficient funds to be securely invested to provide annual income to fulfill the Associations obligations.

There is no provision for officers of The Association to award or distribute funds to any individuals or bodies except those identified above namely The Old Lyonian Association and The John Lyon School.

The sale of the ground, and associated income, are existential issues for The Old Lyonian Association. Without income to support the administration of and sporting facilities of the Association, the Association will be unable to fulfill its obligations, and will cease to exist. The Officers of the Association are duty bound to try to prevent this scenario.

All decisions regarding future use of funds raised by the sale of the Site are subject to approval by the members of the Association, but could include some or all of the following, which conform to the stated objectives of the Association:

A. Securing the long-term future of the sports section (currently men's football) by commercial agreement with John Lyon School.

B. Securing the long-term administrative duties of running the Association, by commercial agreement with John Lyon School.

C. With any surplus, funding bursaries at John Lyon School for underprivileged children from within the Borough of Harrow.

In order to ensure we can act in the best interests of the Association it is necessary to optimise the value of the Site and reinvest that money, as set out above.

After payment of tax due from a sale it is anticipated that the net proceeds once cautiously invested could generate an annual consistent income in the order of £120,000 per annum.

The cost of paying for a full-time member of staff at The Alumini office currently located at The School together with the rental for the ground and pavilion and support to various Old Lyonian activities is estimated to cost at least £80,000 per annum.

Whilst any decision as to what might be done with surplus income would be subject to an EGM, The Association Council will recommend that monies be put to The John Lyon School Bursary Fund for the education of local children.

As above however final decisions will be subject to membership approval via an EGM.

As a result, we consider the only option is to sell it. It can then be redeveloped to include replacement facilities that meet the expectations of a modern community, facilitated by an appropriate level of housing development. The proposal by Zed Homes would release what is currently a private site to be accessible for use by the local community.

Statement Prepared by the Old Lyonian Association Council Members
April 2024

MICHAEL SHWARTZ CONSTRUCTION

Michael shwartz construction limited

Rev: ***A***
Submission Date: ***22-Apr-24***

Tender Summary:

Lyaonia project

Preliminaries:		
Time related charges, supervision, accommodation, etc. (excludes demolition period)		£161,865.00
Measured Works:		
Works as detailed on the attached measure pages		£5,299,031.90
Sub-total		£5,460,896.90
Adjustments		
Main Contractors Discount	5.0%	-£273,044.85
Lump sum discount (where applicable)		£0.00
Tender Total	~~**Lump sum fixed price**~~**/Remeasurable**	**£5,187,852.06**

Notes:

1 This quotation and all associated attachments are subject to contract.
2 All rates and prices are exclusive of VAT.
3 The rates and prices included within our quotation are fixed until the following date: ***22-Apr-24***
4 The following lead-in period is required prior to any works commencing on site: ***4 weeks***
5 General Tender notes and clarifications are as attached, together with any specific notes on the relevant BQ page, which are all deemed to form part of the above quotation.
7 Retention where applicable shall be subject to a first release on practical completion of the sub-contract works, with the balance due 12 months thereafter.
8 We have assumed that valuations will be submitted on a fortnightly basis, with payments made within 14 days.

MICHAEL SHWARTZ
CONSTRUCTION

Groundwork e-Enquiry					
Ref	**Description**	**Quantity**	**Units**	**Rate**	**Value (i,e,z,n)**
	C DEMOLITION				
	ALTERATIONS - SPOT ITEMS				
	excavation of 800mm plus removing the soil from the site				
3/1/A	remove from the site Non hazardous soil	8164.8	m3	£45.00	£367,416.00
	remove from the site hazardous soil	3499.2	m3	£200.00	£699,840.00
	remove the old draining system	810	m	£22.50	£18,225.00
	C DEMOLITION				
	existing building on site including the foundation	1		£10,000.00	£10,000.00
	D GROUNDWORK				
	FILLING				
	importing over PH7.5 soil count 300mm	9914.4	m3	£67.50	£669,222.00
	importing gavel / sand	3645	m3	£73.20	£266,814.00
	replacing the existing building that on site with a new one	3767.4	Sqft	£321.00	£1,209,335.40
	2 football pitches 45 / 90	2	nr	£850,000.00	£1,700,000.00
	cricket pitch 20.12 / 3.05	1	nr	£65,000.00	£65,000.00
	SUDS and drain system under the 2 football pitch up to the main road to connect to the main system	2430	m2	£120.65	£293,179.50
	Earthwork support				
	To faces of excavation				
Total					£5,299,031.90

Schedule Of Daywork Rates

GENERAL NOTES:

1 All rates in this schedule are nett. Main contract discounts do not apply to works valued under this schedule.
2 Hire rates for both labour and plant are for items already working on site and available for use.
3 Materials will be charged at the gross invoice cost plus 20% to cover overheads and profit.
4 If there is a requirement for special items they will be charged at cost plus 20%.
5 Items of plant hired to the main contractor for his own use and under his supervision are deemed to be hired under the Contractors Plant Association conditions (C.P.A. conditions) and the main contractor is responsible for any loss or damage caused by the plant or for losses caused by theft.

LABOUR RATES:

All rates are based on a 9 hour working day (10 hour shift less breaks)

Non productive overtime to be charged at an additional 100% after 6pm in the evening Monday to Friday and all day for Saturdays, Sundays & Bank Holidays.

Foreman	£45.00
Engineer (excluding equipment)	£45.00
Plant fitter (excluding equipment)	£45.00
Charge hand/ganger	£40.00
Bricklayer	£38.00
Carpenter	£38.00
Groundworker	£35.00
Machine Driver	£35.00
Steelfixer	£35.00
Pipe layer	£35.00
Paver / kerblayer	£35.00
Banksman/traffic marshall	£28.00
Concrete finisher	£28.00
Chainman	£28.00
Skilled Labourer	£22.50

PLANT RATES:

All plant is to be charged in accordance with the C.E.C.A. Schedule of Dayworks carried out Incidental to Contract Works (August 2011)

All cleaning and damages are chargeable upon return.

MICHAEL SHWARTZ CONSTRUCTION

LYONIAN GROUND

PRELIMS BREAKDOWN

42 wks

DESCRIPTION	NOTES/DETAILS	Week no.		Dates		%	Total/ Durn.	Unit	Rate per unit	Total Value
		On	Off	On	Off					
Management/Staff										
Contracts Manager	Visiting only						42	wks	£880.00	£36,960.00
Project Manager						60%	42	wks	£2,310.00	£58,212.00
Snr Site Engineer	Visiting only					60%	42	wks	£2,062.50	£51,975.00
Setting Out Engineer								wks	£1,925.00	
Supervisior/black hat E.O.						60%	42	wks	£1,320.00	£33,264.00
E.O. for as-built surveys	Incl in measure							wks	£1,925.00	
Admin assistant/document controller						60%	42	wks	£275.00	£6,930.00
Safety Officer/H&S visits							21	nr	£385.00	£8,085.00
Labour Adjustments										
Subsistance	NA							wks		
Travel allowance	NA							wks	£660.00	
General attendant labourer	NA							wks	£990.00	
Accomodation										
Site offices	Assumed by Others							wks	£93.50	
H & S Office	Assumed by Others							wks	£82.50	
Drying Room	Assumed by Others							wks	£104.50	
Canteen	Assumed by Others							wks	£121.00	
WC Block	Assumed by Others							wks	£121.00	
Oasis Unit & maintenance	Assumed by Others							wks		
Storage sheds							42	wks	£154.00	£6,468.00
Water connections	Assumed by Others							item		
Electric connections	Assumed by Others							item		
Erection & dismantling Charges	Assumed by Others							nr		
Furniture	Assumed by Others							wks		
Compound Fence / Hoarding	Assumed by Others							item		
Hardstanding	Assumed by Others							m^2		
Paths	Assumed by Others							m^2		
Scaffold deck and stairs	Assumed by Others							wks		
Office Equipment										
Cost of calls							42	wks	£38.50	£1,617.00
Computer & printer							1	item	£550.00	£550.00
Photocopier/scanner/fax							1	item	£220.00	£220.00
Copier paper / Consumables							1	item	£220.00	£220.00
Testing										
Sample panels	Assumed by Others							item		
Concrete cubes	Included in BQ							item		

LYONIAN GROUND

PRELIMS BREAKDOWN

42 wks

DESCRIPTION	NOTES/DETAILS	Week no. On	Week no. Off	Dates On	Dates Off	%	Total/ Durn.	Unit	Rate per unit	Total Value
Temporary Works										
Perimeter hoarding to the site	Assumed by Others							item		
Maintenance of last item	Assumed by Others							wks		
Gates	Assumed by Others							nr		
Adaptions	Assumed by Others							wks		
Notice board client	Assumed by Others							nr		
Notice board OCL							1	nr	£385.00	£385.00
Directional/warning signage	Assumed by Others							item		
Roads	Assumed by Others							m^2		
Hardstandings	Assumed by Others							m^2		
Crossovers	Assumed by Others							m^2		
Temp infill to openings	Assumed by Others							item		
110v power to work areas	Assumed by Others							item		
Scaffolding/Barriers/Access										
Safety/walkway Barriers	Assumed by Others							item		
Scaffold towers	NA							item		
Scissor lift	NA							wks		
Scaffold externally/folding platforms	Assumed by Others							item		
Advanced guardrail system	NA							item		
Lift shaft platforms	NA							item		
Cantilevered platforms	NA							wks		
Leading edge protection	2+1 floors @ £2.75/m						1	item		
E.O. for extended height panels:	NA							item		
E.O. for debris netting:	NA							item		
E.O. for edge of slab fixings:	NA							item		
Transport										
Equipment to and from site		42		560	23520.00		3	nr		£70,560.00
General transport	NA							wks		
Formwork transport	NA							nr		
Dewatering										
General dewatering	NA							item		
2" pump, hoses and fuel	NA							wks		
4" pump, hoses and fuel	NA							wks		
6" pump, hoses and fuel	NA							wks		
Concrete Plant/items										
Concrete mixer	NA							wks		
Mobile concrete pumps							2	nr	£1,265.00	£2,530.00
Concrete placing boom	NA							wks		
Concrete pumps - static	NA							wks		
Concrete pump lines (m)	NA							wks		
Pump driver/linesman	NA							wks		
Stop ends	£15.00 per m							m		
Finishing & making good	Included in unit rates							item		

LYONIAN GROUND

PRELIMS BREAKDOWN

42 wks

DESCRIPTION	NOTES/DETAILS	Week no.		Dates		%	Total/ Durn.	Unit	Rate per unit	Total Value
		On	Off	On	Off					
General Plant Items										
Forklift & operator	By others if required							wks		
Excavator & driver	Included in unit rates							wks		
Dumper	Included in unit rates							wks		
Roller	Included in unit rates							wks		
Compressor	Included in unit rates							wks		
Water hoses	Included in unit rates							item		
Generator	NA							wks		
Generator Transport	NA							item		
Generator Fuel	NA							wks		
Boat skip	Included in unit rates							wks		
Fuel bowser	Included in unit rates							wks		
Surveying equipment	Included in unit rates							wks		
Repairs & losses							1	item	£1,100.00	£1,100.00
Small Tools							42	wks	£110.00	£4,620.00
H&S equipment & consumables							42	wks	£110.00	£4,620.00
Rubbish skips	Assumed by others							nr		
Condition specific requirements										
Curing/heating	Included in unit rates							item		
Tarpaulins	Included in unit rates							item		
Mats & blankets	Included in unit rates							item		
Winter working allowance	NA							item		
Road cleaning										
Mini-sweeper	Assumed by Others							nr		
Road Sweeper	Assumed by Others							nr		
Wheel washer	Assumed by Others							item		
Jet washer							42	wks	£137.50	£5,775.00
Special Items										
Security Guard	Assumed by Others							wks		
Swipe Card System	Assumed by Others							item		
Turn styles	Assumed by Others							item		
CCTV	Assumed by Others							item		
Delivery coordinator	Assumed by Others							wks		
Traffic/pedestrian management	Assumed by Others							item		
Striking and clearing site										
Supervision during striking period	NA							item		
Back propping	NA							item		
Other										
Special insurances/PI	EXCLUDED							item		
Bonds/warranties	EXCLUDED							item		
Principle Contractor role	EXCLUDED							item		
										£294,091.00

Energy Statement

Design stage

Old Lyonian

Harrow
HA1 4QF

ZEDHOMES

zedPower™
zero fossil energy developments

Contents

Appendix

1.0 Executive Summary

1. This document details the carbon dioxide (CO_2) emissions reduction measures adopted by the proposed development and gives an overview of the design proposals that will ensure the development operates in an energy efficient manner over the lifespan of the scheme and comply with the net zero target 2050
2. The document also includes energy calculation for two masterplan options, in order to present most efficient proposal in respect to energy consumption and production,
3. This application proposes the erection of 56 low carbon dwellings with associated garden and solar PV roof, and redevelopment of existing community building.
4. The proposed strategy has been based around the objectives of the Harrow Local Plan core strategy; therefore represents best practice in meeting the required standards of energy efficiency and carbon dioxide (CO_2) emissions reduction
5. The proposed energy strategy is based upon the principles of the Energy Hierarchy on the basis that it is preferable to reduce carbon dioxide emissions through reduced energy consumption above de-carbonisation through alternative energy sources.

This document details the carbon dioxide emissions reduction measure proposed for the development, and provides details of the proposed strategy, which will ensure the development operates in a sustainable manner over the lifespan of the scheme.

The report is structured to meet these guidelines as follows:

Section 2 presents an introduction to the development proposal, including the location, scale of development and master plan overview.

Section 3 discusses the planning context and policies which are relevant to development's energy efficiency;

Section 4 discusses the development response to the policy drivers for energy; and followed by a summary of the development's design response.

Section 5 presents energy calculation for each proposal including dwellings' energy consumption and renewal energy storage.

Section 6 includes the carbon emission calculation of each proposal which meets the Part L building regulations minimum carbon emission reduction

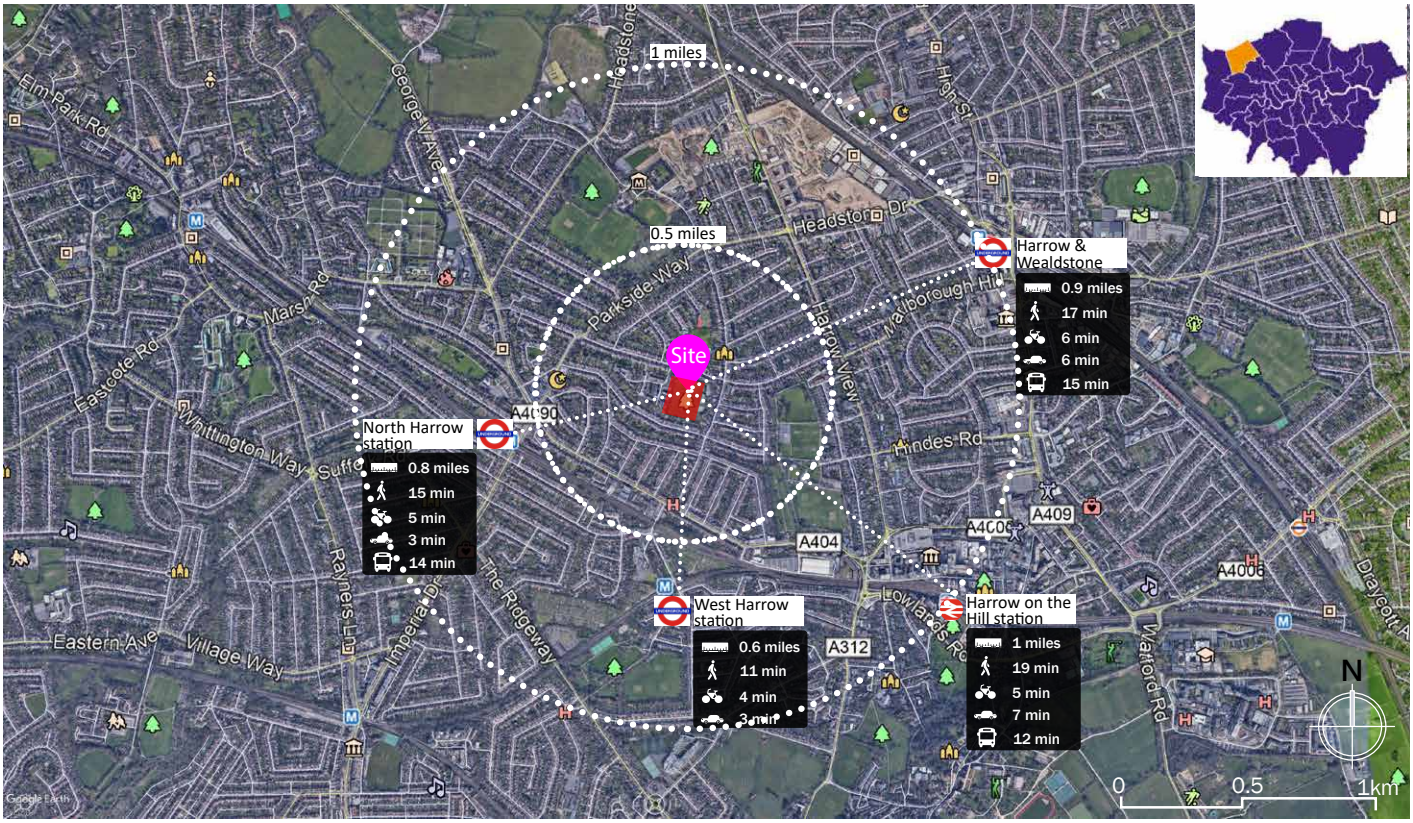
Section 7 summarises the analysis on the basis of net zero target 2050 and Part L building regulation 2023 minimum carbon emission reduction targets.

2.0 Introduction

Site and surrounding

The site is situated in 12th largest borough in London - Harrow, located in the north west. Harrow is a classic outer London Borough comprising inter-war suburbs, Metroland Town centres and surviving village centres. Frequent train services provide access to London Euston and London Marylebone within 20 minutes, alongside services to other parts of the south east; Underground services provide direct access into central London and beyond.

There are a multitude of essential amenities on nearby Pinner Road and Harrow on the Hill town centre is within 15-17 mins walking distance from the site. The site is situated between Kingsfield Ave to its north, Pinner View to its east and Canterbury road to its south.



Design approach

- **Exceeding Building Standards:** Zedpower houses are designed to be modern and contemporary, built from traditional materials in a sustainable construction system. The system combines an energy efficient modular frame structure with an integrated solar PV panel roof.
- **Exceptional low Carbon Credentials:** The system uses simple and adaptable plans which create convenient internal layouts for any plot orientation.
- **Design Flexibility:** the proposal focuses on maximising the use of UK sourced materials to minimise the carbon footprint.

Proposed Development

The proposed development provides 56 new homes all with gardens, retains a playing field for children up to 16 and there is a clubhouse / village hall / changing room for the wider community.

The playing field is accessible to children in the surrounding streets - providing far more communal open space than is available today. The playing field provides both green open space for sport and exercise as well as providing the feel of a traditional village green

Proposed Masterplan

Total Site Area(m^2)	24737
Total Area of Green Open Space(m^2)	11715
Publicly Accessible Green Open Area(m^2)	10117
Communal Private Green Open Area(m^2)	1598

Total Housing units	56
2 Bed	25
3 Bed	24
4 Bed	7

Total New Development = 33 %

Total Retained Green area = 67%

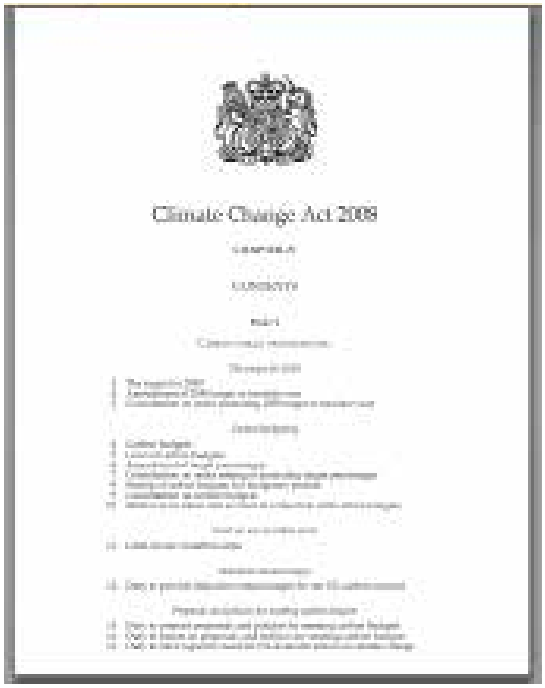
3.0 Planning Regulatory and Context

Sustainable development approaches are incorporated within policy and regulation at a national and local level, as set out below.

National

Climate Change Act 2008

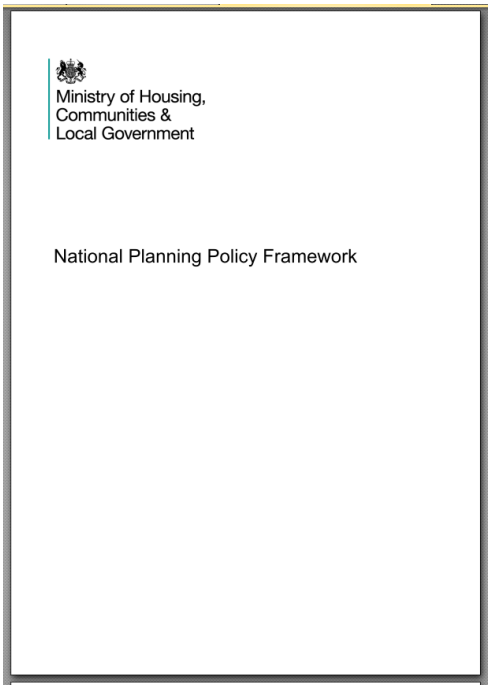
The Climate Change Act 2008 is the basis for the UK's approach to tackling and responding to climate change. It requires that emissions of carbon dioxide and other greenhouse gases are reduced and that climate change risks are adapted to.


Climate Change Act 2008

The Climate Change Act commits the UK government by law to reducing greenhouse gas emissions by at least 100% of 1990 levels (net zero) by 2050. This includes reducing emissions from the devolved administrations (Scotland, Wales and Northern Ireland), which currently account for about 20% of the UK's emissions. The 100% target was based on advice from the CCC's 2019 report, 'Net Zero – The UK's contribution to stopping global warming'.

National Planning Policy Framework

The Department for Communities and Local Government determines national policies on different aspects of planning and the rules that govern the operation of the system accordingly through the National Planning Policy Framework (NPPF), 2023.

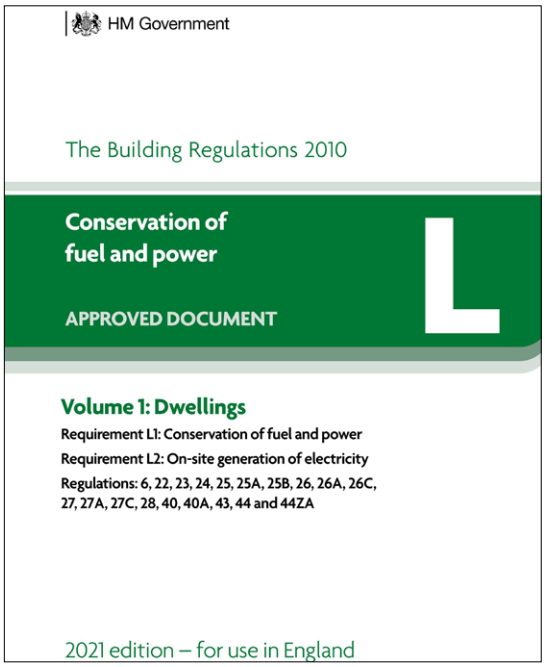

Ministry of Housing, Communities & Local Government

National Planning Policy Framework

As per the NPPF 2023, section " Achieving sustainable development', At a very high level, the objective of sustainable development can be summarised as meeting the needs of the present without compromising the ability of future generations to meet their own needs. At a similarly high level, members of the United Nations – including the United Kingdom– have agreed to pursue the 17 Global Goals for Sustainable Development in theperiod to 2030. These address social progress, economic well-being and environmental protection

Approved Document L1A:2023

This provides the methodology for new build, domestic buildings to meet current energy efficiency standards, including backstop U-values, carbon dioxide emissions calculations and minimising the risk of overheating. Carbon dioxide emissions reductions are prescribed for 'regulated' emissions only, and relate to heating, hot water, lighting, auxiliary and cooling (where specified). Emissions from domestic appliances (cooking, for example) are considered to be unregulated emissions, and are excluded from the analysis.

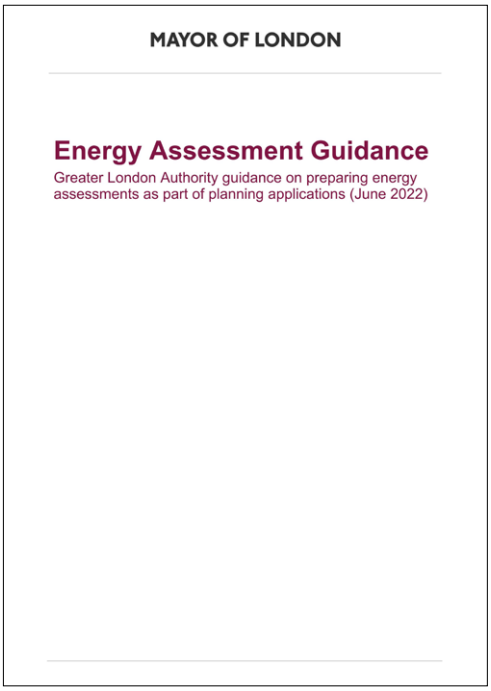


Energy Assessment Guidance, 2022

The Mayor of London has declared a climate emergency and has set an ambition for London to be net zero-carbon. This means all new buildings must be net zerocarbon.

According to Energy Assessment guidance,

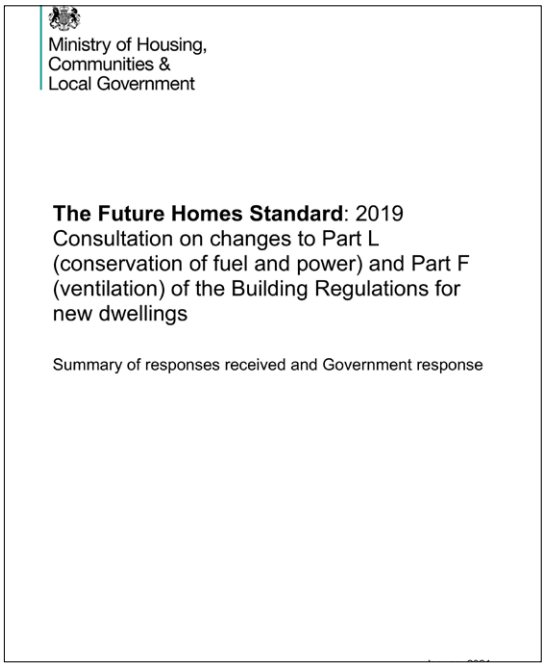
- **Net Zero Target:** major developments are required to achieve net zero-carbon by following the energy hierarchy (Policy SI 2). This means that regulated carbon emissions should be reduced so they are as close as possible to zero.
- **Energy storage**: thermal and electrical energy storage, if appropriate, as part of a flexibility solution to reduce peak demands. Energy storage interfacing with the demand and the renewables generation on site.
- **Renewables generation and integration:** optimising opportunities to incorporate renewable energy technologies and integrating renewable technology with other components of the system including storage, electric vehicle (EV) charging, control systems, energy management systems etc



Future Home Standards 2019

The UK was the first major world economy to pass a net zero emissions target into law. This target, which was recommended by the Committee on Climate Change, is one of the most ambitious in the world and requires the UK to bring all greenhouse gas emissions to net zero by 2050.

- From 2025, new homes built to the Future Homes Standard will have carbon dioxide emissions at least 75%-80% lower than those built to current Building Regulations standards.
- Introducing the Future Homes Standard will ensure that the homes this country needs will be fit for the future, better for the environment and affordable for consumers to heat, with low carbon heating and very high fabric standards.
- All homes will be 'zero carbon ready', becoming zero carbon homes over time as the electricity grid decarbonises, without the need for further costly retrofitting work.


Ministry of Housing, Communities & Local Government

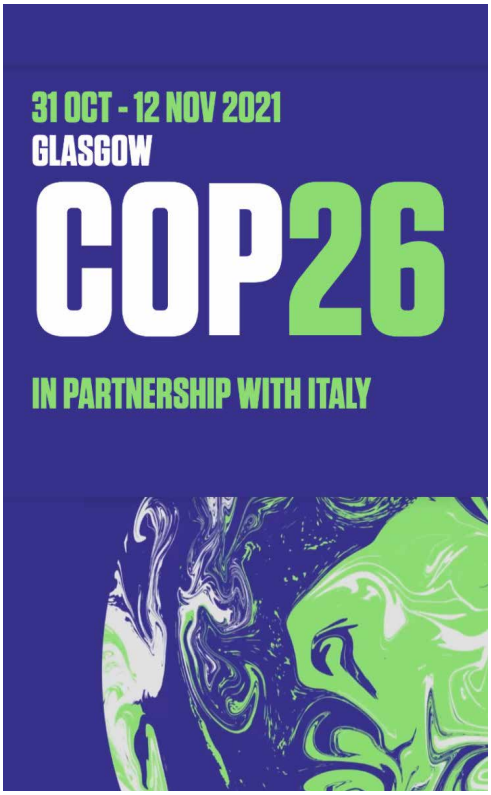
The Future Homes Standard: 2019 Consultation on changes to Part L (conservation of fuel and power) and Part F (ventilation) of the Building Regulations for new dwellings

Summary of responses received and Government response

COP 26 Sustainability Governing Principles

Design approach has to be guided by our COP26 Sustainability Governing Principles:

- Actively manage potential impacts on the environment and local community and identify opportunities to deliver environmental and social value
- Provide an accessible and inclusive setting for all
- Encourage healthy living
- Ensure a safe and secure atmosphere
- Encourage more sustainable behaviour
- Promote the use of responsible sources and responsible use of resources throughout the supply chain
- Leave a positive legacy



Local

Harrow Local Plan (Core Strategy) 2006-2031

The London Plan emphasises that development proposals should make a contribution to minimising carbon dioxide emissions in conjunction with the following energy hierarchy:

"Minimisation of energy use in the construction, use and lifespan of the redevelopment should be an underlying design principle. The development should identify how adaptation for climate change and water related issues has been accommodated within the scheme."

The new development should be of high quality design making the most of opportunities for energy conservation, renewable energy provision and water recycling.

1. minimise use and consumption of energy sources including fossil fuels;
2. minimise the use and consumption of water;
3. minimise the adverse effects on water quality;
4. seek design that promotes the most sustainable form of development;
5. seek design which utilises sustainable construction technologies;
6. incorporate facilities for recycling of water and waste;
7. include a commitment to climate change adaptation and mitigation that discusses water
8. related adaptation options at design stage;
9. manage and seek to reduce air, light, soil and noise pollution levels; and
10. facilitate the remediation of previously contaminated land through development.

All new development will be expected to comply with the updated national standards on sustainable development, as delivered through the revised standards in the Code for Sustainable Homes and BREEAM standards for non-residential buildings. Major development schemes will be expected to adhere to the principles of BREEAM Communities to incorporate sustainable principles and best practice into the design.

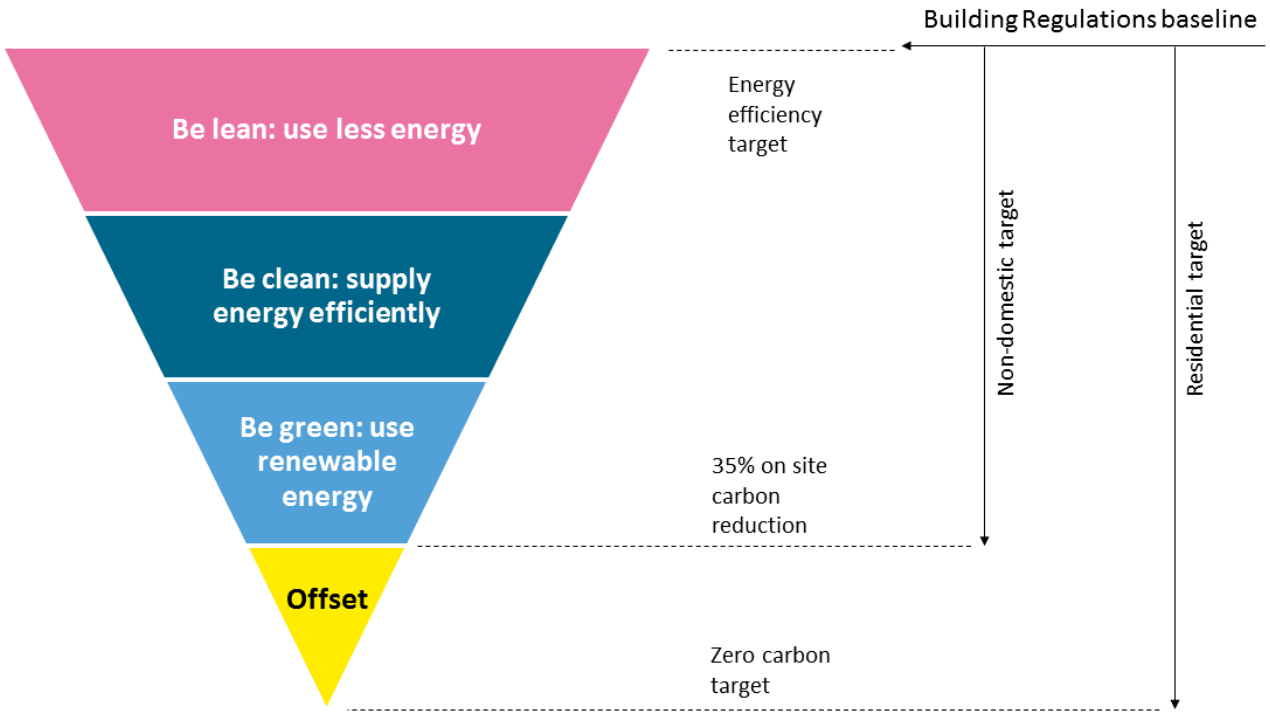
4.0 Energy Hierarchy

With reference to the policy requirements, guidance and industry best practice detailed in Section 3, a comprehensive energy and carbon dioxide (CO 2) emissions assessment has been carried out for the proposed development. The energy performance of the scheme has been analysed and evaluated to target the low-carbon standard, withmore than 97~133% reduction in regulated CO2 emissions compared with Part L1A:2023 of the Building Regulations, accounting for economic, technical and functional feasibility.

The proposed energy strategy is based upon the principles of the Energy Hierarchy on the basis that it is preferable to reduce carbon dioxide emissions through reduced energy consumption above decarbonisation through alternative energy sources.

The tiers of the Energy Hierarchy are:

- Be Lean Use less energy
- Be Clean Supply energy efficiently
- Be Green Use renewable energy



The following sections include a breakdown of measures proposed at each stage of the energy hierarchy, including a renewable energy options study, and a calculation of the regulated CO2 savings achieved for the proposed scheme.

‘Be Lean’ (Use Less Energy)

- Within the first stage of the energy hierarchy, it is proposed to incorporate high levels of passive and energy efficient design measures in order to reduce the development’s energy consumption and associated CO_2 emissions.
- It is technically possible to exceed Building Regulations requirements through demand reduction measures alone and the proposed development includes a wide range of energy efficiency measures, intended to reduce energy demand.
- The following U-values are proposed as a means of limiting heat loss through the apartment building fabric.

Building Fabric Element	Part L1A:2023 backstop U values (W/m^2k)	Proposed U values
Ground Floor	0.18	0.12
External Wall	0.26	0.13
Roof	0.16	0.12
Windows	1.6 (including frame)	0.79 (including frame)
Roof-Light	2.2(including frame)	1.1 (including frame)

Window & Door :

- The glazing will be triple glazed, argon filled with a low emissivity coating. Although this has yet to be formally specified, it is expected that window U-values will be 0.79 W/m^2K or better (including frame), with a g-value of 0.57 and light transmission of ~70% to improve natural daylight penetration.
- roof-lights are also to be incorporated to provide daylight and sunlight to the kitchen, bedroom and living area Although this is yet to be formally specified, it is expected that the roof-lights will be triple glazed, argon filled with a low emissivity coating, and will have a U-value of 1.1 W/m 2 K or better (including frame), with a g-value of 0.52 and light transmission of ~70% to improve natural daylight penetration.

Ventilation and Air Permeability

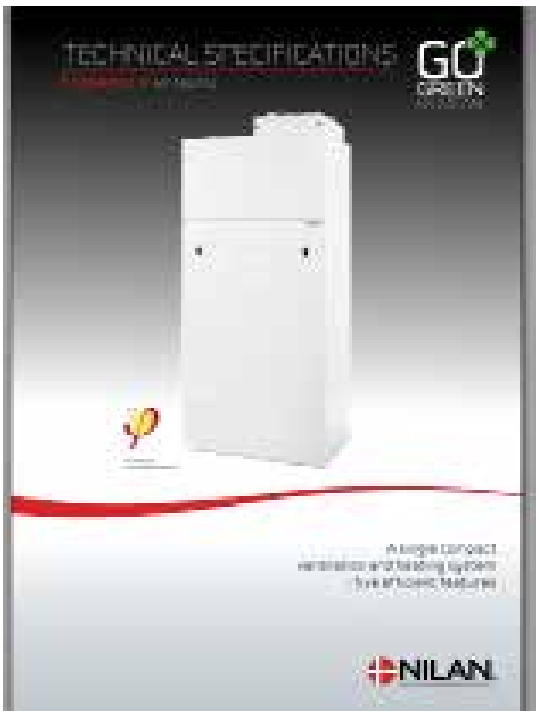
- A high level of air tightness is proposed, where a level of 1.5m 3 /h/m 2 or below shall be targeted, meaning that air infiltration between the internal and the external environment will be largely controlled, and space heating/cooling demand further reduced. The levels of air tightness specified within the SAP calculations are based on the specific volumes and exposed surface areas of the tested dwellings, with an air change rate of 1ach deemed achievable.

The other significant means of heat loss from dwellings

- is due to thermal (or cold) bridging. This is typically a construction detail which has higher thermal conductivity than the surrounding materials, creating a path of least resistance for heat transfer. Thermal bridges result in an overall reduction in thermal resistance of the building elements and should be designed out where possible to minimise unwanted heat loss. In order to minimise heat loss through thermal bridges, accredited construction details have been assumed, with an equivalent y-value of 0.05 for dwelling.
- High efficiency plant, equipment and controls are proposed to limit the energy consumed in order to provide the required level of indoor environmental performance and control. Performance efficiency values were tested and improved in energy models to benchmark the resulting predicted CO2 reduction.
- Low energy LED lighting will be installed throughout the residential apartments.

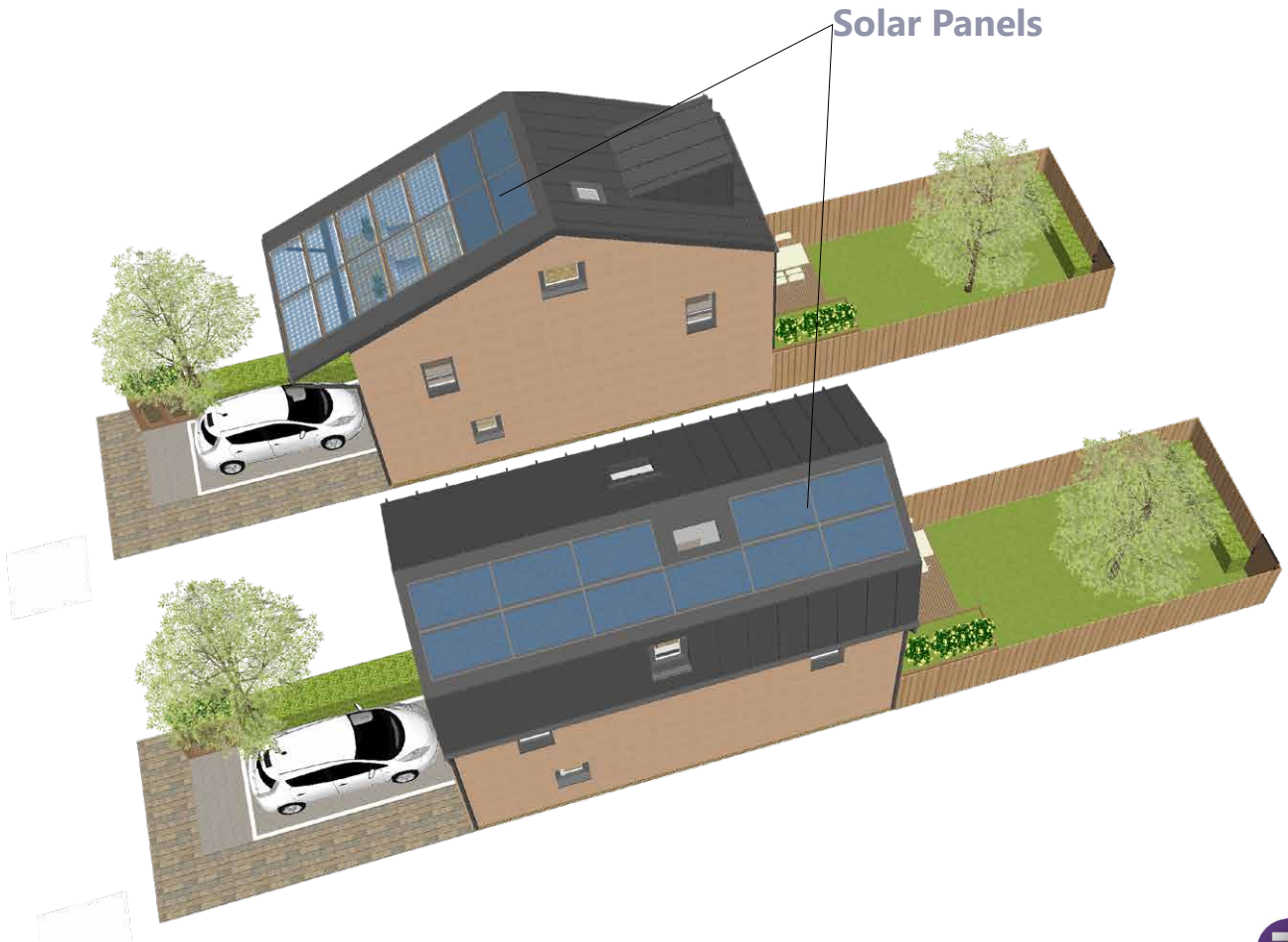
Heating

- Although residential units are provided with opening windows to mitigate against overheating, outside air will be provided via mechanical ventilation with heat recovery (MVHR), with a specific fan power (SFP) of 0.73 W/l/s. A heat exchanger with an efficiency of >90% has also been specified. These efficiencies are higher than those set out in the Domestic Building Services Compliance Guide.
- Heating will be controlled via a programmer and at least two room thermostats.



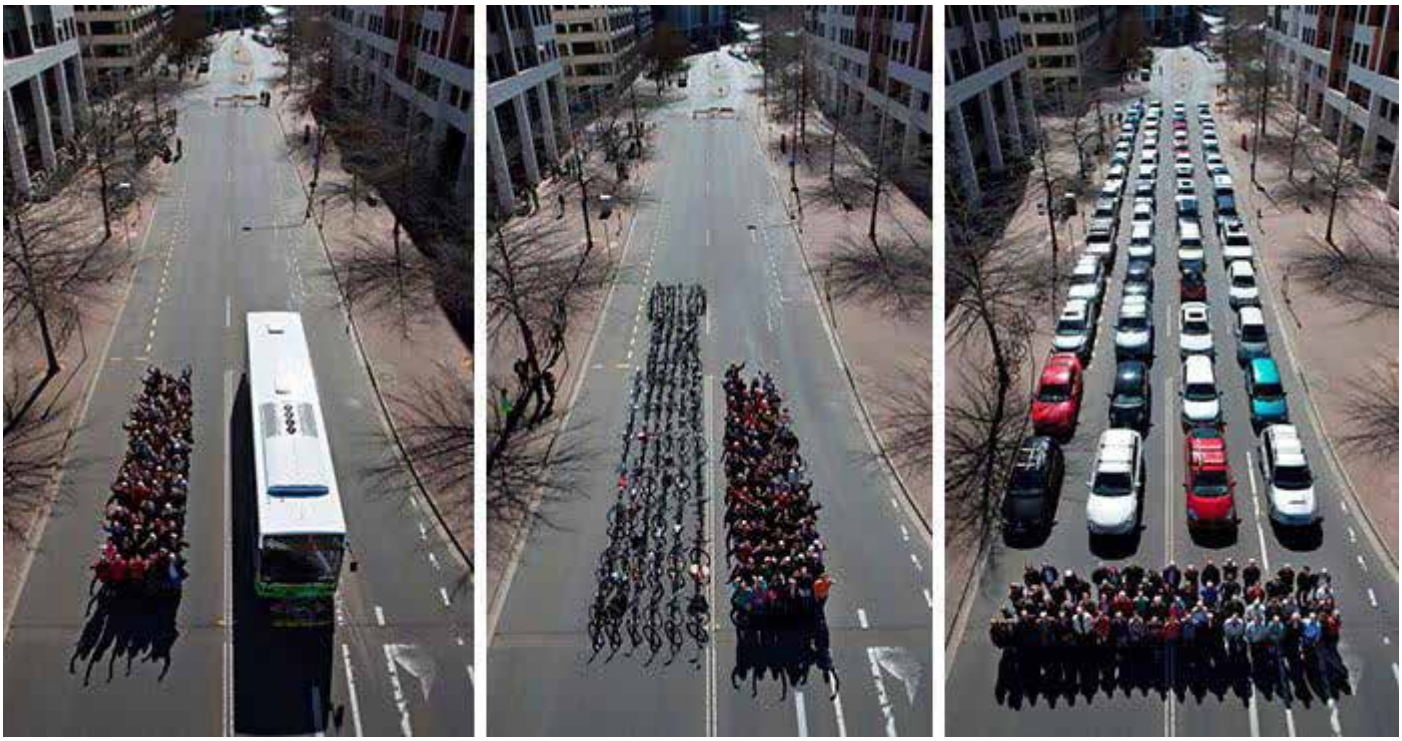
‘Be Green’ (Utilise Renewable Technologies)

- Air Source Heat Pumps (ASHP) - given the site location and lack of local existing or proposed heat networks, it is proposed that air source heat pump (ASHP) technology is incorporated within the development. It is expected that highly efficient, individual Nilan Compact P systems will be employed to serve both the space and water heating demands of each dwelling. This system also provides mechanical ventilation with heat recovery (MVHR) and includes a reversible cooling unit, allowing for the provision of comfort cooling. Typical manufacturer specifications for the proposed system quote a heating coefficient of performance of approximately 4.2. The specified system is quiet in operation, though it is recommended that measures to further mitigate the sound produced by the external component of the proposed system are considered during detailed design. In addition to this, the proposed system provides an element of cooling, which has been accounted for within the SAP calculations by assuming an Energy Efficiency Ratio (EER) of 3.
- Photovoltaics (PV) – this technology is considered to be appropriate for the proposed development, and will be employed to generate renewable electricity onsite. Full details of the proposed PV arrays, areas, locations and outputs are provided below.
- The roof area of each dwelling is proposed to house PV panels. The PV coverage extends to all reasonably available roof space that is unshaded. Each PV panel will have power rating of 445KWp and a dimension of 1.945m x 1.205, providing 5.3MWh~8.9MWh per dwelling (annual output). Panels will be oriented to face south west, at 25° to the horizontal to maximise output per panel.



Electric Vehical : Nissan Leaf

- The energy consumption of the Nissan Leaf / mile = 0.27KWh/mile
- 950 kwh is 3,518 miles in a Nissan Leaf. This small amount to be allocated to the community hub and use it to charge e-scooters and communal e-bikes. A Bird electric rental e-scooter uses 27 watt-hours per mile, allowing 35,000 miles of communal e-scooter use. This equates to 625 miles / year for each of the 56 Old Lyonians village households. If local car journeys of 1.6 miles to the underground / or local shops and back were replaced by e-scooter use – this would avoid 360 car journeys / year / household with associated reduction in air pollution and CO2 footprint.



The road space required to move 69 people using public transport, bicyles and private motor vehicles

5.0 Energy Calculation

Masterplan - Option K

Introducing Smart controls to switch heating system when the rooms are not being used. This reduces the total area for energy consumption by 1/3rd. There area for total consumption could be for example: 2 Bed 3 Storey (79-79/3) = 26.3sqm

Zone		Housetype	Area	consumption area/ house	Total number	Total area (sqm)
•••••	A East-West Orientation	2 Bed	79	26.3	19	1501
		3 Bed	107	35.6	18	1926
		4 Bed	118.5	39.5	1	118.5
•••••	B South Orientation	2 Bed	104	35	6	624
		3 Bed	110	36	6	660
		4 Bed	159	53	6	954

Zero Bill Homes

Total consumption

Zone	Housetype	kWh/sqm	Consumption area/ house	Total number	Total Consumtion
A East-West Orientation	2 Bed	55	26.3	19	27483.5
	3 Bed	55	35.6	18	35244
	4 Bed	55	39.5	1	2172.5
B South Orientation	2 Bed	55	35	6	11550
	3 Bed	55	36	6	11880
	4 Bed	55	53	6	17490
Total consumption of all the houses on site					105820

Annual energy requirements of the E-Car (Nissan Leaf)	Total number of homes	Total Consumtion
950KWh	56	53200

Total Consumption of the houses including EV Car charging (kWh/annum)	159020

Total Production

Zone	Housetype	PV/house	Production/ house	Total number	Total Consumtion
A East-West Orientation	2 Bed	12	5340	19	101460
	3 Bed	12	5340	18	96120
	4 Bed	12	5340	1	5340
B South Orientation	2 Bed	12	5340	6	32040
	3 Bed	12	5340	6	32040
	4 Bed	20	8900	6	53400

Total Production from the PV panels on site kWh/annum	320400

Surplus Energy kWh/annum	161380

The peak monocrystalline PV array should generate **320400kWh / annum** of electricity in the south east of England

The total annual electric demand could be as low as **159020kWh / annum.**

No gas and no solid fuel is supplied to the building.

This suggests a net annual surplus of **161380 kwh / annum** of zero carbon renewable electricity could be generated by the total development

In the UK over the year 2020 — 1 kWh of grid electricity had a footprint of 0.233 kgCO2

This suggests that the annual surplus renewable electric output [161980 kWh / annum x 0.233 kgCo2/ kWh] after meeting the buildings own needs - when exported to the UK electric grid would save 37601.54kg of CO2/ year in avoided consumption from the carbon intensive national grid. This can be described as a modest annual carbon credit that can gradually offset the embodied Co2 of the initial non timber construction elements.

Community Hub

Total Production				
Community Hub				
Peak W/ panel	PV Nos	Production/ panel	No of buildings	Total production
445	96	42720	1	42720
Total Production kWh/ annum				42720

Community Hub is proposed to be a self sustaining building and an income generator plus charge a public e-scooter or e-bike pool

Single Nissan Leaf Energy consumption/ miles 0.27KWh

Considering 3/4th of the annual production from Community Hub is used for self consumption,
Surplus Energy= 42720/4 = 10680 kWh/ annum

Pool vehicle miles in a Nissan Leaf at Community Hub could provide 10680/0.27=39555.5miles

6.0 Carbon Compliance

Energy modelling of the proposed scheme has been undertaken using the Standard Assessment Procedure (SAP) for one of the each proposed housetypes. This is shown in the images below, with further details given in Table below

South Orientation

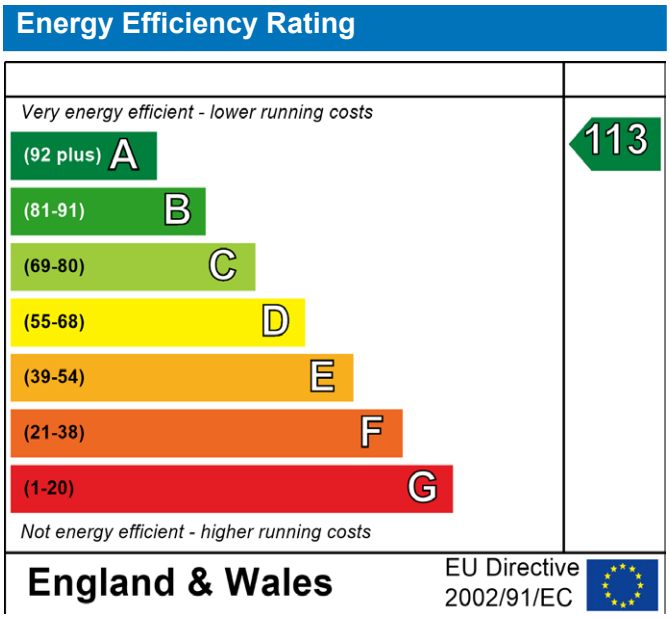
3-Bed Homes

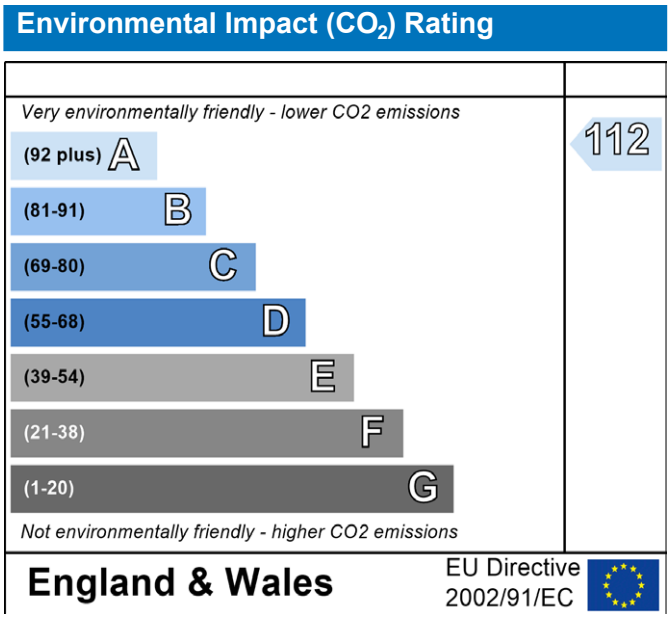
Mid Terrace

3 Storey 3 Bed
With PV Roof
North/ South Facing

Key Plan

Dwelling Aspects	TER: Baseline: Part L 2013 Emissions ($kgCO_2$/sqm per annum)	DER: Proposed 'Be Green' Emissions ($kgCO_2$/m2 per annum)	Emission Savings ($kgCO_2$/sqm per annum)	Emission Savings (%)
2 sides	22.26	-11.50	33.76	151





South Orientation

2-Bed Homes
Semi Detached

3 Storey 2 Bed
With PV Roof
North/ South Facing

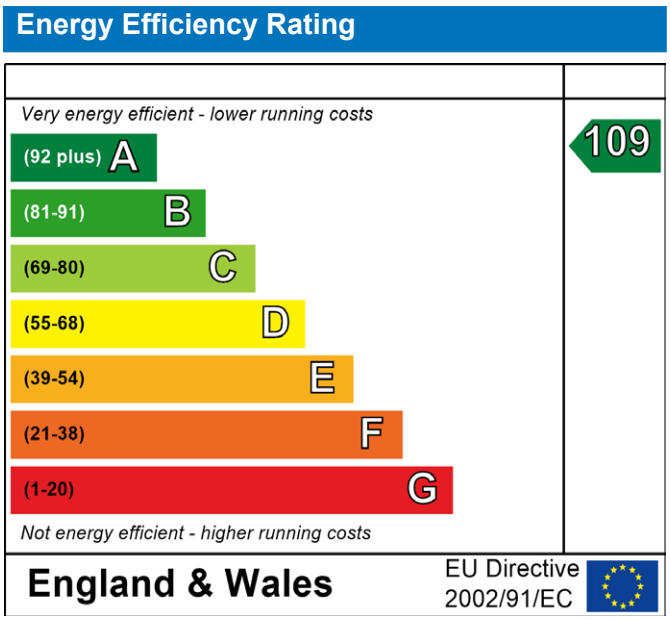
Key Plan

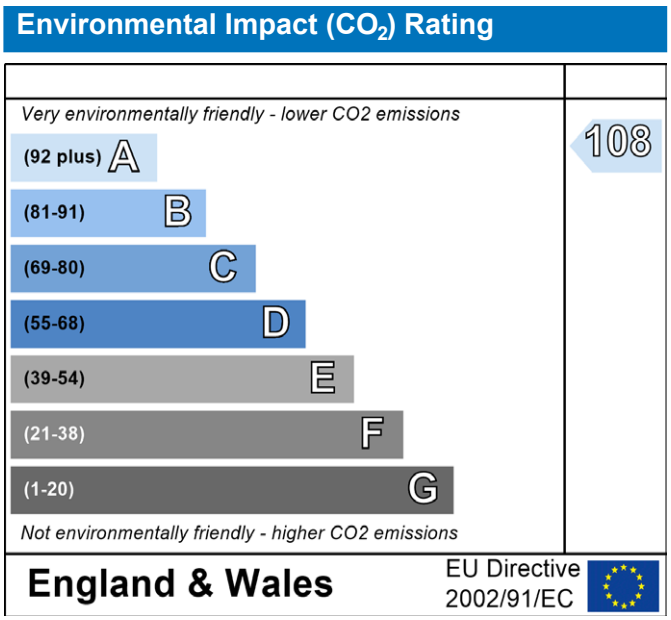
Side wall facing West

Dwelling Aspects	TER: Baseline: Part L 2013 Emissions ($kgCO_2$/sqm per annum)	DER: Proposed 'Be Green' Emissions ($kgCO_2$/m2 per annum)	Emission Savings ($kgCO_2$/sqm per annum)	Emission Savings (%)
3 sides	25.96	-7.64	33.6	129.4

Side wall facing East

Dwelling Aspects	TER: Baseline: Part L 2013 Emissions ($kgCO_2$/sqm per annum)	DER: Proposed 'Be Green' Emissions ($kgCO_2$/m2 per annum)	Emission Savings ($kgCO_2$/sqm per annum)	Emission Savings (%)
3 sides	25.96	-7.64	33.6	129.4





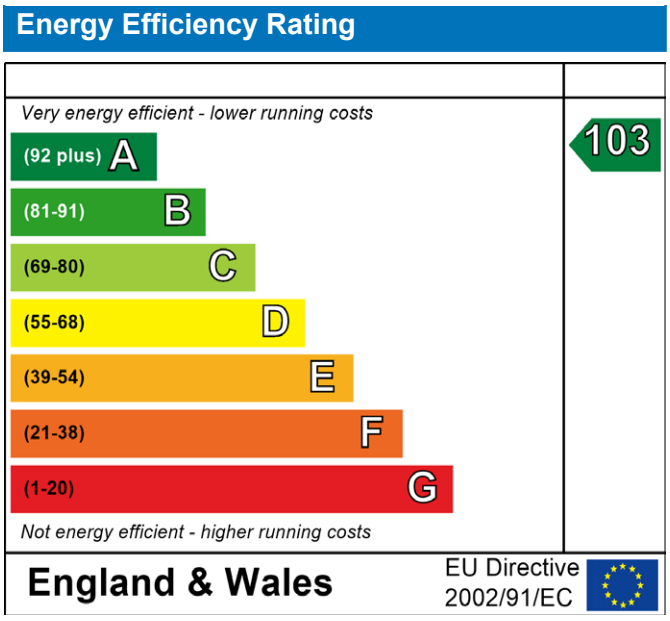
East- West Orientation

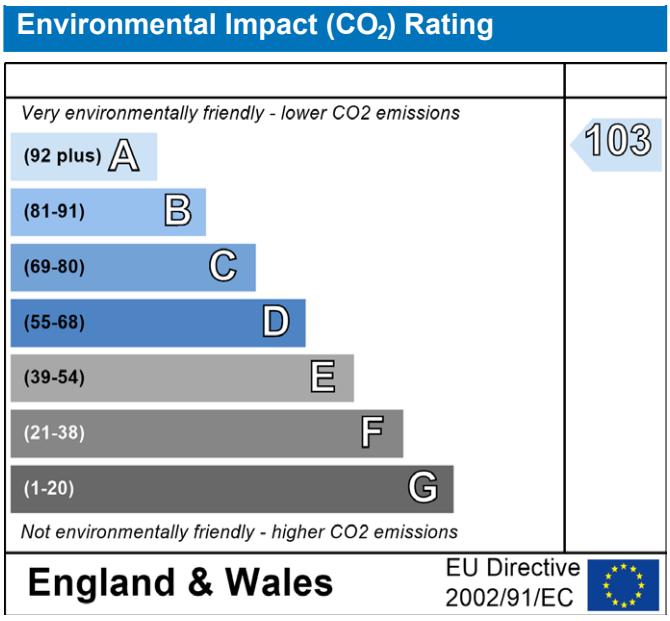
2-Bed Homes
Mid Terrace

3 Storey 2 Bed
With PV Roof
East/ West Facing

Key Plan

Dwelling Aspects	TER: Baseline: Part L 2013 Emissions ($kgCO_2$/sqm per annum)	DER: Proposed 'Be Green' Emissions ($kgCO_2$/m2 per annum)	Emission Savings ($kgCO_2$/sqm per annum)	Emission Savings (%)
2 sides	19.88	-1.22	21.1	106





East- West Orientation

3-Bed Homes

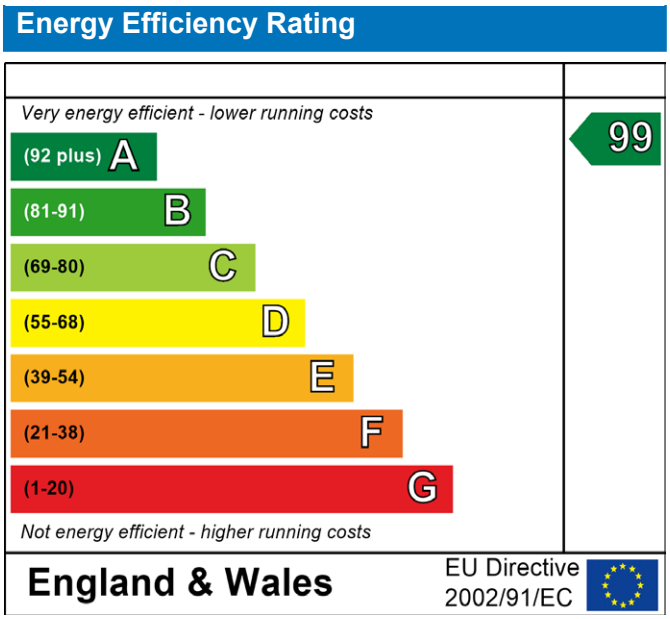
Mid Terrace

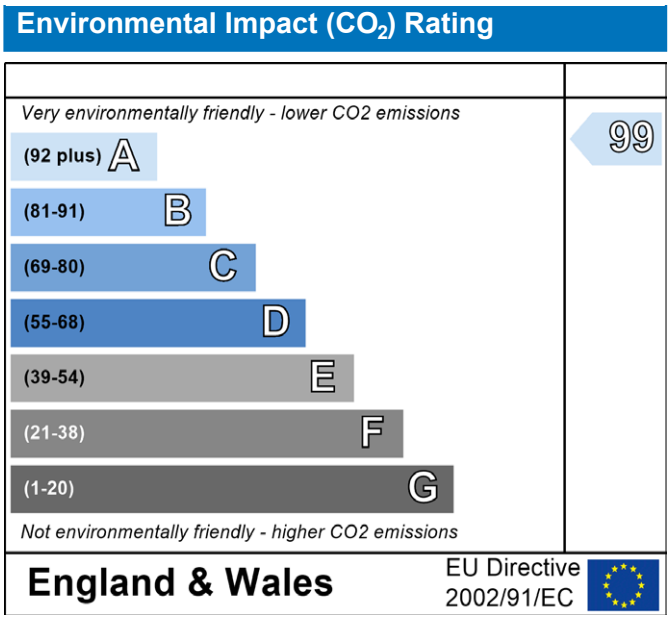
3 Storey 3 Bed
With PV Roof
East/ West Facing

Key Plan

Side wall facing South

Dwelling Aspects	TER: Baseline: Part L 2013 Emissions ($kgCO_2$/sqm per annum)	DER: Proposed 'Be Green' Emissions ($kgCO_2$/m2 per annum)	Emission Savings ($kgCO_2$/sqm per annum)	Emission Savings (%)
2 sides	22.3	2.33	19.97	89.5





East- West Orientation

3-Bed Homes

Semi Detached

3 Storey 3 Bed
With PV Roof
North/ South Facing

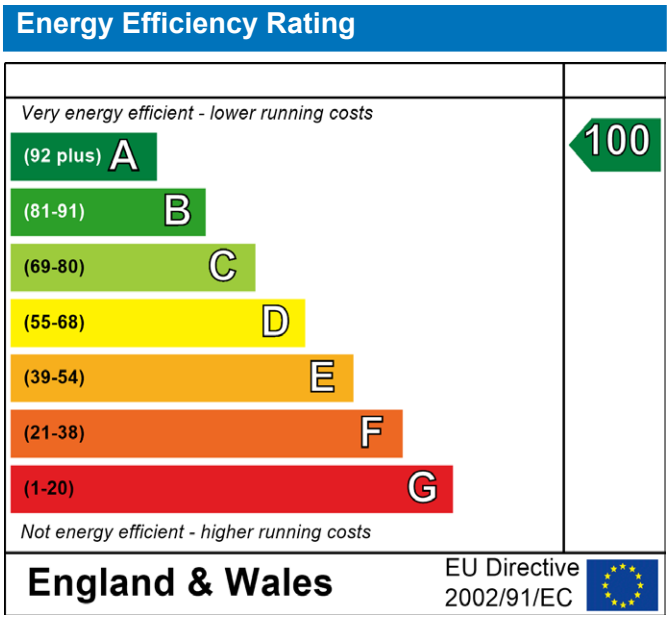
Key Plan

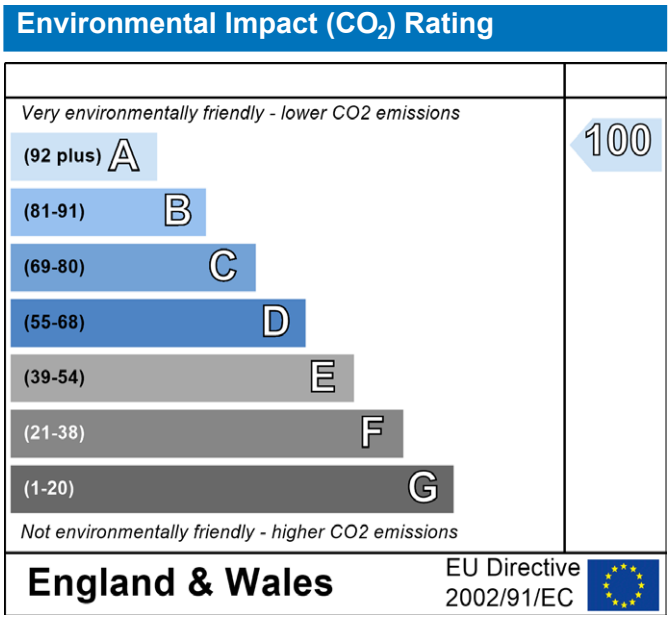
Side wall facing South

Dwelling Aspects	TER: Baseline: Part L 2013 Emissions ($kgCO_2$/sqm per annum)	DER: Proposed 'Be Green' Emissions ($kgCO_2$/m2 per annum)	Emission Savings ($kgCO_2$/sqm per annum)	Emission Savings (%)
3 sides	22.48	1.79	20.69	92.03

Side wall facing North

Dwelling Aspects	TER: Baseline: Part L 2013 Emissions ($kgCO_2$/sqm per annum)	DER: Proposed 'Be Green' Emissions ($kgCO_2$/m2 per annum)	Emission Savings ($kgCO_2$/sqm per annum)	Emission Savings (%)
3 sides	23.07	2.17	20.9	90.5





7.0 Summary

This Energy Statement provides an overview as to how the proposed development of Old Lyonian Harrow, HA1 4QF, contributes to achieve carbon dioxide emission reductions and gives an overview of the design proposals that will ensure the development operates in an energy efficient manner over the lifespan of the schemes.

- **Compliance with Energy Hierarchy:** Consideration has been given to the Sustainable design and construction, in accordance witht the Harrow Local Plan in the formulation of this statement, and therefore represents best practice in achieving as well as exceeding the required standards of energy efficiency and reduction of carbon dioxide (CO2) emissions.
- **Surpassing Minimum Carbon Emission Reduction Part L Building Regulations:** The proposal energy strategy surpasses the minimum carbon emission reduction for new dwellings of 31% and estimates an on site reduction of more than 88%~151% reduction in carbon dioxide emissions compared to the Part L:2023 baseline through on-site means alone, thus meeting the Low-carbon target.
- **Development focuses on Net Zero 2050:** The proposal focuses on meeting the requirements of net zero target and climate change by strategic reduction greenhouse gas emissions, such as through its location, orientation and design
- **Use of Renewal Energy:** The proposal focuses on identifying suitable areas for renewable and low carbon energy sources as well as supporting infrastructure.
- **Surplus Energy production to charge V2G Car pool:** Surplus energy of 10680 kWh(Community hub) + 161380kWh is estimated in the proposed masterplan, which can contibute to charging a car pool with V to G for approximately 650918.5miles.
- **Meets the Future Home Standards 2019:** The development proposal meets and excels the future home standards:
    - Exceeding the required carbon emission reduction of 75% as the proposals estimates the on-site carbon emission 88~151% lower.
    - Affordable housing by encouraging by material from sustainable sources and reduced footprint
- **Follows the COP 26 Sustainability principles, 2021:** The proposal focuses on community involvement and healthy living. The community hub and central open area provides social spaces and encourages inclusive settings.

Overall, the proposals for the scheme are in line with the principles of sustainable development as well as the policy requirements of the NPPF and Local Council, Future Home Standards 2019, and COP26 Net Zero targets and will provide a development that seeks to promote these principles in operation.

8.0 Appendix 1

ZEDROOF Output Report-The Old Lyonian Site

2-Bed

GLOBAL SOLAR ATLAS
BY WORLD BANK GROUP

PV ELECTRICITY AND SOLAR RADIATION

PV system configuration

Pv system: **Small residential**
Azimuth of PV panels: **193°**
Tilt of PV panels: **25°**
Installed capacity: **6.23 kWp**

Key Plan

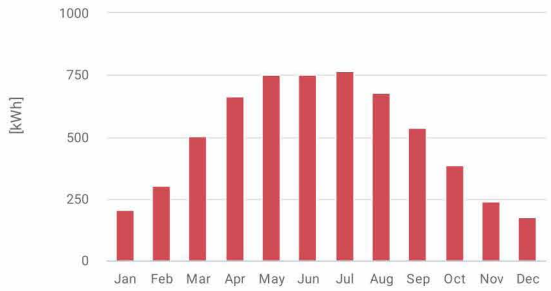
Annual averages

Total photovoltaic power output and Global tilted irradiation

5.958	1180.1
MWh per year	kWh/m^2 per year

Monthly averages

Total photovoltaic power output



Average hourly profiles

Total photovoltaic power output [kWh]

UTC+01

Average hourly profiles

Total photovoltaic power output [kWh]

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0 - 1												
1 - 2												
2 - 3												
3 - 4												
4 - 5					0	0	0					
5 - 6				0	0	0	0	0				
6 - 7			0	0	1	1	1	0	0			
7 - 8		0	0	1	1	1	1	1	1	0		
8 - 9	0	0	1	2	2	2	2	2	1	1	0	0
9 - 10	1	1	2	2	2	2	2	2	2	1	1	1
10 - 11	1	1	2	3	3	3	3	2	2	2	1	1
11 - 12	1	2	2	3	3	3	3	3	2	2	2	1
12 - 13	1	2	2	3	3	3	3	3	2	2	1	1
13 - 14	1	2	2	3	3	3	3	3	2	2	1	1
14 - 15	1	1	2	2	2	2	2	2	2	1	1	1
15 - 16	0	1	1	2	2	2	2	2	1	1	0	0
16 - 17		0	1	1	1	2	2	1	1	0		
17 - 18			0	1	1	1	1	1	0			
18 - 19				0	0	0	0	0				
19 - 20					0	0	0					
20 - 21												
21 - 22												
22 - 23												
23 - 24												
Sum	7	11	16	22	24	25	25	22	18	12	8	6

3-Bed

GLOBAL SOLAR ATLAS

BY WORLD BANK GROUP

PV ELECTRICITY AND SOLAR RADIATION

PV system configuration

Pv system: **Small residential**

Azimuth of PV panels: **193°**

Tilt of PV panels: **25°**

Installed capacity: **6.23 kWp**

Key Plan

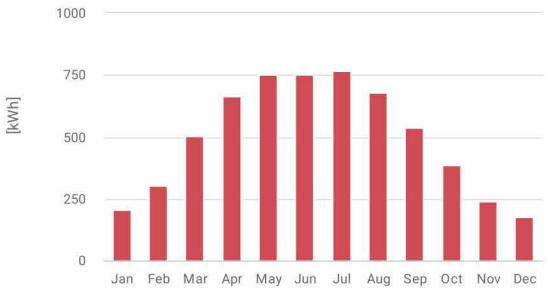
Annual averages

Total photovoltaic power output and Global tilted irradiation

5.958	1180.1
MWh per year	kWh/m^2 per year

Monthly averages

Total photovoltaic power output



Average hourly profiles

Total photovoltaic power output [kWh]

UTC+01

Average hourly profiles

Total photovoltaic power output [kWh]

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0 - 1												
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2 - 3												
3 - 4												
4 - 5					0	0	0					
5 - 6				0	0	0	0	0				
6 - 7			0	0	1	1	1	0	0			
7 - 8		0	0	1	1	1	1	1	1	0		
8 - 9	0	0	1	2	2	2	2	2	1	1	0	0
9 - 10	1	1	2	2	2	2	2	2	2	1	1	1
10 - 11	1	1	2	3	3	3	3	2	2	2	1	1
11 - 12	1	2	2	3	3	3	3	3	2	2	2	1
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16 - 17		0	1	1	1	2	2	1	1	0		
17 - 18			0	1	1	1	1	1	0			
18 - 19				0	0	0	0	0				
19 - 20					0	0	0					
20 - 21												
21 - 22												
22 - 23												
23 - 24												
Sum	7	11	16	22	24	25	25	22	18	12	8	6

4-Bed

GLOBAL SOLAR ATLAS

BY WORLD BANK GROUP

PV ELECTRICITY AND SOLAR RADIATION

PV system configuration

Pv system: **Small residential**

Azimuth of PV panels: **193°**

Tilt of PV panels: **25°**

Installed capacity: **8.9 kWp**

Key Plan

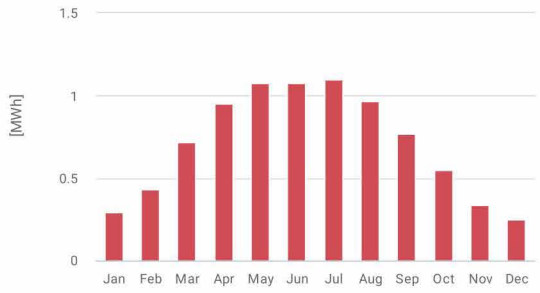
Annual averages

Total photovoltaic power output and Global tilted irradiation

8.511	1180.1
MWh per year	kWh/m^2 per year

Monthly averages

Total photovoltaic power output



Average hourly profiles

Total photovoltaic power output [kWh]

UTC+01

Average hourly profiles

Total photovoltaic power output [kWh]

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1 - 2												
2 - 3												
3 - 4												
4 - 5					0	0	0					
5 - 6				0	0	0	0	0				
6 - 7			0	0	1	1	1	1	0			
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15 - 16	1	1	2	3	3	3	3	3	2	1	0	0
16 - 17		0	1	2	2	2	2	2	1	0		
17 - 18			0	1	1	1	1	1	0			
18 - 19				0	0	1	1	0				
19 - 20					0	0	0					
20 - 21												
21 - 22												
22 - 23												
23 - 24												
Sum	9	16	23	32	35	36	35	31	26	18	11	8

2-Bed

GLOBAL SOLAR ATLAS

BY WORLD BANK GROUP

PV ELECTRICITY AND SOLAR RADIATION

PV system configuration

Pv system: **Small residential**

Azimuth of PV panels: **193°**

Tilt of PV panels: **25°**

Installed capacity: **4.89 kWp**

Key Plan

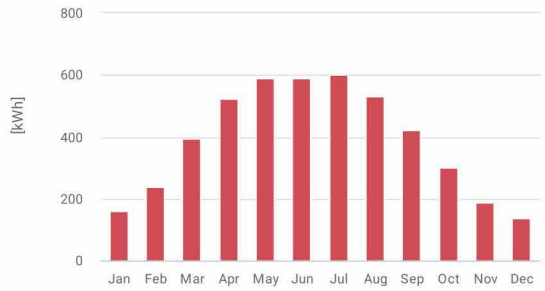
Annual averages

Total photovoltaic power output and Global tilted irradiation

4.676	1180.1
MWh per year	kWh/m^2 per year

Monthly averages

Total photovoltaic power output



Average hourly profiles

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Average hourly profiles

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5 - 6				0	0	0	0	0				
6 - 7			0	0	0	1	0	0	0			
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13 - 14	1	1	2	2	2	2	2	2	2	1	1	1
14 - 15	1	1	1	2	2	2	2	2	1	1	1	0
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16 - 17		0	1	1	1	1	1	1	1	0		
17 - 18			0	0	1	1	1	1	0			
18 - 19				0	0	0	0	0				
19 - 20					0	0	0					
20 - 21												
21 - 22												
22 - 23												
23 - 24												
Sum	5	9	13	17	19	20	19	17	14	10	6	4

3-Bed

GLOBAL SOLAR ATLAS

BY WORLD BANK GROUP

PV ELECTRICITY AND SOLAR RADIATION

PV system configuration

Pv system: **Small residential**

Azimuth of PV panels: **193°**

Tilt of PV panels: **25°**

Installed capacity: **4.89 kWp**

Key Plan

Annual averages

Total photovoltaic power output and Global tilted irradiation

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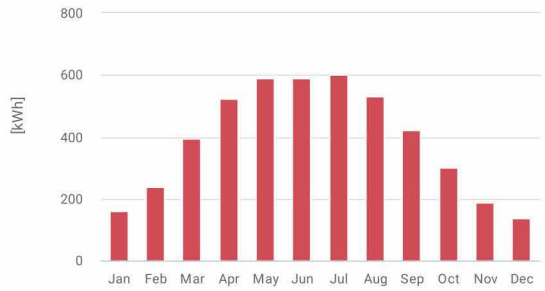
MWh per year	kWh/m^2 per year

Monthly averages

Total photovoltaic power output



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13 - 14	1	1	2	2	2	2	2	2	2	1	1	1
14 - 15	1	1	1	2	2	2	2	2	1	1	1	0
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16 - 17		0	1	1	1	1	1	1	1	0		
17 - 18			0	0	1	1	1	1	0			
18 - 19				0	0	0	0	0				
19 - 20					0	0	0					
20 - 21												
21 - 22												
22 - 23												
23 - 24												
Sum	5	9	13	17	19	20	19	17	14	10	6	4

OLD LYONIAN SPORTS AND SOCIAL CLUB, HARROW - HA1 4QF

ECOLOGY TECHNICAL NOTE - 6th JUNE 2022

Introduction

- On the 26th April 2022, ACD Environmental Ltd carried out a walkover and Preliminary Roost Assessment (PRA) of the Old Lyonian Sports and Social Club, Harrow, hereafter referred to as 'the Application Site'.
- The Application Site is located in the large town of Harrow, situated in Greater London. Harrow lies 8.7km south of Watford. The area immediately surrounding the Application Site is predominantly urban residential houses with associated roads and gardens. A number of other small patches of undeveloped urban greenspace are present within a 2km radius of the Application Site.

Image 1. Red line boundary of the Application Site.

- The Application Site will be subject to a planning application for a residential development with associated access with Harrow London Borough Council.

Data Search

Designated sites

- A search using MAGIC maps and data provided by Greenspace Information for Greater London (GiGL) found no statutory sites within 2 km of the Application Site.
- A search conducted by GiGL found there to be 13 non-statutory sites within 5km of the Application Site. The closest Site of Importance for Nature Conservation (SINC) is Harrow Cemetery, a cemetery with flower-rich grassland important for being one of very few accessible wildlife sites in the area which lies 0.5km to the southeast of the Application Site.
- A search using MAGIC maps Found the Application Site to be within the Impact Risk Zone (IRZ) of three Sites of Special Scientific Interest (SSSI's): Ruislip Woods 4km west, Bentley Priory 3.8km north, and Brent Reservoir 6.8km east of the Application Site.

Notable Species

- GiGL found one record of great crested newt *Triturus cristatus* within 2km of the Application Site. This record was from June 2020 and lies 1.1km northeast from the Application Site.
- GiGL found 28 records of reptiles within 2km of the Application Site. Of these records 23 were slow worm *Anguilis fragilis* with the closest situated 1km southwest of the Application Site and most recently being found in August 2020 also to the southwest. Two of the records were of common lizard *Zootoca vivipara* with the closest situated 1.9km to the south and most recently recorded in 2007 also to the south. Three of the records were of grass snake *Natrix helvetica* with the closest situated 1.9km south of the Application Site and the most recent being from June 2007 also south.
- GiGL found 48 records of bats consisting of seven species. The closest record was situated 0.2km northeast the Application Site from 2019, and the most recent record was from July 2020 and lies 1.7km to the northeast. A Magicmaps search found one European protected species licence had been granted within 2km of the Application Site. This was to allow damage to a common pipistrelle *Pipistrellus pipistrellus* resting place between 2017 and 2019 (licence number: 2017-31900-EPS-MIT).
- No records of hazel dormouse *Muscardinus avellanarius* were found by GiGL within 2km of the Application Site.

Habitats

Buildings

- There are two buildings present within the Application Site. The main building comprises the Sports and Social Club (**Appendix 1**) which is a large wooden panelled building with large windows comprised predominantly of a hall with adjoining rooms with no loft space present. The PRA of this building found a number of potential bat roosting features (PRF's) (**Appendix 1**) which could be used as opportunistic roosts and so has been assessed as low potential for roosting bats. One feature was found on each of the east and west sides of the building, with a further three found on the southern fascia. The features comprised holes in the eaves and wooden panelling leading to cavities in both cases. The second building is a metal shipping container which was assessed as being negligible potential for roosting bats but did have a large patch of ivy *Hedera helix* which could provide habitat for nesting birds (Photograph 7).

Dense and scattered scrub

- Dense scrub is present across most of the boundary habitat with particularly large areas in the corners of the Application Site, especially in the southeastern corner. The dense scrub found in some of the northern boundary, the southeastern corner and south and west

boundaries is comprised of predominantly bramble *Rubus fruiticosus* and also features cleavers *Gallium aparine,* and bindweed *Concolvulus* sp.. The northwestern corner of the Application Site and part of the northern boundary have scrub comprising large stands of semi-mature blackthorn *Prunus spinosa.*

- This habitat provides opportunities for nesting birds, and reptiles.
- There are some areas of scattered scrub in the boundary vegetation primarily forming understorey to treelines on the southern boundary of the Application Site, with some present in the southeastern corner and on the northern boundary.

Poor semi-improved grassland

- The dominant habitat type on the Application Site is poor semi-improved grassland which is present in a large area in the centre of the Application Site. The grassland comprises common grass and herbaceous species such as cock's foot *Dactylis glomerata*, annual meadow grass *Poa annua*, creeping buttercup *Ranunculus repens*, ribwort plantain *Plantego lanceolata,* and daisy *Bellis perennis*, which has been heavily managed to have a uniform, short sward which is grass dominant.

Semi-improved grassland

- There are two areas of semi-improved grassland along the eastern boundary. The first is south of the existing social club building and appears to be less heavily managed due to comprising a slope down towards the area of hardstanding with species such as cinquefoil *Potentilla reptans*, dandelion *Taraxacum* sp., and ribwort plantain being more dominant than in the poor semi-improved grassland. There is also an area of semi-improved grassland within the area of dense scrub in the southeastern corner of the Application Site. The ground was uneven in this area and the sward length indicated it had not been managed allowing more herbaceous species such as bluebell *Hyacynthoides non-scripta*, nettle *Urtica dioica*, cleavers, and dock *Rumex* sp. to be prevalent.
- These areas, especially the area in the southeastern corner have potential to support reptiles.

Treelines and hedgerows

- Treelines are present on the northern, southern, and western boundaries with a short treeline present in the southeastern corner. The southern and western boundaries comprise predominantly semi-mature, mature, and some sapling cherry *Prunus* sp. and some silver birch. The northern treeline has a number of mature oak *Quercus robur* and ash *Fraxinus excelsior* trees which have features such as fallen limb scars, rot holes and lifted bark that would make them suitable for roosting bats (two with moderate suitability and four with low suitability for roosting bats).
- The treelines on all boundaries provide habitat for nesting birds and the many cherry *Prunus* sp. trees along the south and western boundaries provide food for foraging birds.
- There are two native species poor hedgerows within the Application Site. One is adjacent to the hardstanding, which comprises the car park and is predominantly mature privet *Ligustrum vulgare* in composition. The other is adjacent to the main building and is ornamental consisting of holly *Ilex aquifolium*, barberry *Berberis vulgaris*, and viburnum *Viburnum* sp.. These hedgerows provide opportunities for nesting birds.

Recommendations

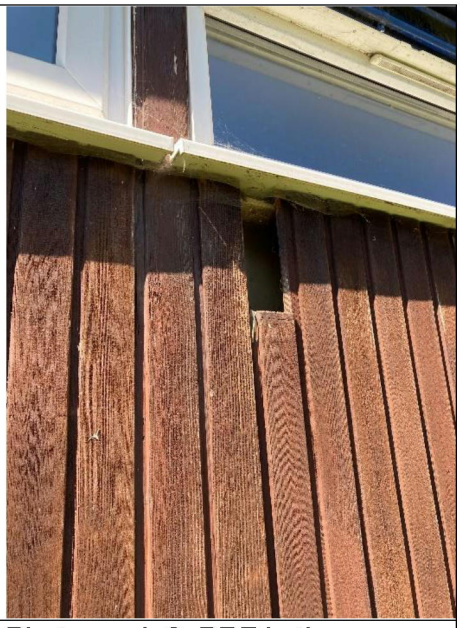
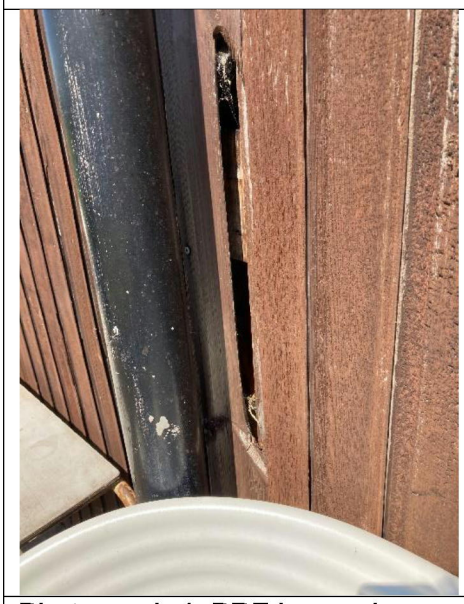
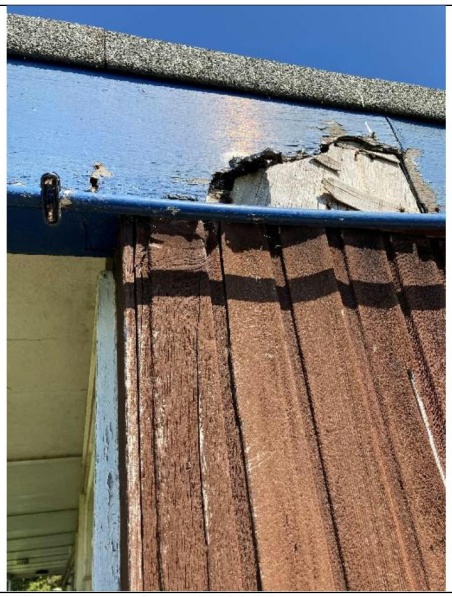
- Based on the results of the data search, further surveys to determine the presence/ likely absence of reptiles would not be needed providing specific areas of boundary habitat can be retained as part of the scheme and protected moving forwards. This includes the southeastern corner of the Application Site where there is a mosaic of dense and scattered scrub with semi-improved grassland. If areas of suitable habitat need to be removed, Reasonable Avoidance Measures (RAMs) should be put in place to ensure there is no harm to reptiles.
- Due to the location of the Application Site within a built-up area, lack of connectivity to other suitable habitat and lack of records of hazel dormouse within 2km of the Application Site, hazel dormouse are considered likely absent and need not be considered a constraint moving forward.
- The PRA of the existing buildings found the main building to be of low suitability for roosting bats and therefore it will require a minimum of one emergence survey conducted during the peak survey period (May-September) with a further two emergence/ re-entry surveys and an EPS licence required should bats be found.
- The PRA of the trees present in the boundary habitats found multiple trees with roosting bat potential. Should any of these trees need to be removed, further surveys will be required (comprising endoscoping of PRFs and then possibly emergence surveys). Ideally the northern boundary of the Application Site would be avoided in the design stage as this is where the majority of the trees with potential roosting features are found. Should this not be possible, lighting should be carefully designed to minimise the impact on bats along this linear feature.
- The boundary habitats (scrub and trees) as well as the thick ivy on the storage container provide opportunities for nesting birds which would need to be considered should clearance of these habitats occur.

Conclusions

- A number of further surveys may be required prior to planning permission being granted on this Application Site. However, many of the constraints regarding protected species can be designed around during the design stage and therefore will not require further surveys.
- This technical note will need to be superseded by an Ecological Impact Assessment Report containing more detailed results of the surveys and a full assessment of impacts to achieve full planning permission.
- The data search found the Application Site to be within the IRZ of three SSSI's but residential developments were not listed as requiring the LPA to contact Natural England so this is not a constraint moving forward.
- So long as the above considerations are taken into account, there are unlikely to be any significant constraints to this development going ahead.

APPENDIX 1: PHASE 1 HABITAT PLAN

APPENDIX 2: PHOTOGRAPHS

		
Photograph 1. Ornamental hedge on east side of main building.	Photograph 2. PRF on eaves of west side of main building.	Photograph 3. PRF in the wooden boarding of the east side of the main building.
		
Photograph 4. PRF in wooden paneling of south side of main building.	Photograph 5. PRF into roof cavity / eaves of south side of main building.	Photograph 6. PRF into roof cavity / eaves of south side of main building.

HEAD OFFICE Rodbourne Rail Business Centre, Grange Lane, Malmesbury SN16 0ES t: 01666 825646
Courtyard House, Mill Lane, Godalming GU7 1EY t: 01483 425714
Suite 6, Crescent House, Yonge Close, Eastleigh SO50 9SX t: 02382 026300
9 Brownlow Road, Cambridge, CB4 3NG t: 07825 868654
[redacted] www.acdenvironmental.co.uk

Registered Office: Construction House, Runwell Road, Wickford, Essex SS11 7HQ
Co Reg No: 8058718 VAT No: 223 8883 86

		
Photograph 7. Small existing shipping container with ivy growth.		

Project Name	: Old Lyonian Sports Ground, Harrow
Job No	: 21-269
Note Title	: Flood Risk Assessment and Drainage Strategy Pre-Application Scoping Note
Author	: MSS
Checked	: NA
Approved	: GG
Date	: November 2022

1.0 INTRODUCTION

1.1.1 Odyssey has been commissioned by Zed Homes to provide flood risk and drainage advice in support of a forthcoming pre-application meeting for the site at Old Lyonian Sports Ground in Harrow. The development comprises an initial proposal of up to 69 dwellings, a community hub and a public open space.

1.1.2 This technical note provides high-level flood risk and drainage strategy information regarding the proposed development to inform a pre-application submission.

2.0 EXISTING SITE CONDITIONS

2.1 Site Location

2.1.1 The site is located approximately 1.3 kilometres (km) north-west of the Harrow-on-the-Hill train station. The Ordnance Survey (OS) grid reference for the centre of the site is 514265E, 188804N, and the nearest postcode for the site is HA1 4QF. A site location plan is presented in **Appendix A**.

2.1.2 The site is currently mostly greenfield with an existing community building, boulodrome and a parking area on the western side of the site. The site is bounded by residential units to the north, east, and south, and commercial units to the west.

2.1.3 The development proposals for the site comprise two options; Option K consists of 60 units, a community hub and public open space, and Option L consists of 69 dwellings, a community hub and public open space. The proposed site layout schemes are presented in **Appendix A**.

2.2 Topography

2.2.1 A topographical survey was completed in June 2021 by Sumo Services. The site slopes broadly from north-east to south, with the highest point at 56.84 metres Above Ordnance Datum (m AOD) in the north-east corner of the site, and the lowest at 53.35m AOD near the centre point along the southern boundary of the site. The topographical survey is presented in **Appendix B**.

2.3 Hydrology

2.3.1 The nearest Environment Agency (EA) Main River is the Yeading Brook, situated approximately 710 metres (m) west of the site boundary at its nearest point.

2.3.2 It is noted there are no ditches or watercourses in close proximity to the site.

2.4 Geology and Hydrogeology

2.4.1 British Geological Survey (BGS) online mapping (accessed October 2022) indicates the site is underlain by a bedrock of London Clay Formation (clay, silt and sand). BGS mapping indicates superficial deposits of Alluvium (clay, silt, sand and gravel) are present over the southern-most extents of the site. The BGS online mapping is presented in **Appendix C**.

2.4.2 BGS hydrogeology mapping shows the site lies within the Thames Group, described as *"rocks with essentially no groundwater"*, and summarised as a *"predominantly clayey sequence up to 140m thick confining underlying aquifers. Occasional springs at base have very hard water".*

2.4.3 There are no borehole scan records on the BGS database that were taken on the site, however there are borehole records from the development of the railway line within 450m of the site which are located within the same bedrock type.

2.4.4 Scan TQ18NW326 was recorded approximately 425m south of the site, and shows the following layers:

- Ground level – 0.40m below ground level (bgl) – *"Loose black silty clayey sand and gravel"*;
- 0.40m – 1.20m bgl – *"Dark brown slightly silty clayey very sand gravel"*;
- 1.20m – 2.70m bgl – *"Stiff brown gravelly clay"*;
- 2.70m – 3.00m bgl – *"Firm dark grey black silty clay"*;
- 3.00m – 3.50m bgl – *"Firm greenish grey brown clay"*;
- 3.50m – 6.10m bgl – *"Firm to stiff brown with grey mottling clay"*.

2.4.5 It is noted that groundwater was not struck in the borehole.

2.4.6 Groundwater mapping published by the Environment Agency (EA) shows the site is not located within any of the EA's Groundwater Source Protection Zones (SPZs). Nevertheless, the development would adhere to the EA's *"Approach to Groundwater Protection"* to ensure that groundwater quality is maintained and improved where possible across the site.

2.5 Existing Drainage Regime

2.5.1 Thames Water sewer records show there are public surface water sewers present within the roads surrounding the site. The Thames Water sewer records are presented in **Appendix D**.

2.5.2 Thames Water records also show public foul water sewer networks within the roads surrounding the site. There are no sewers recorded on the site.

2.5.3 As the developable area for this site is less than 50 ha, the Institute of Hydrology (IoH) Report 124 Flood Estimation for Smaller Catchments (1994) method is suitable to estimate greenfield peak flow rates (50 ha is used in the formula and the flow rate is linearly interpolated based on the ratio of the development area). This methodology is approved in the Construction Industry Research and Information Association (CIRIA) C753 SuDS Manual; the parameters used are presented in **Table 2.1**.

Table 2.1: Interim Code of Practice Sustainable Drainage Systems (SuDS) Parameters

Parameter	Value	Unit
SAAR	673	Millimetres (mm)
Soil Index	0.450	-
Region	6	-
Urban	0.000	-

2.5.4 **Table 2.2** summarises the estimated greenfield discharge rates for the approximate impermeable area of the proposed development (1.36ha).

Table 2.2: Existing Surface Water Discharge Rates

Return Period	Existing Greenfield Discharge Rates from Site (litres per second (l/s))	Existing Greenfield Discharge Rates per Hectare (l/s/ha)
Q_{BAR}	5.7	4.2
Q_1	4.9	3.6
Q_{30}	12.9	9.5
Q_{100}	18.2	13.4

2.5.5 As the site is currently in a developed state, brownfield rates have also been calculated using Flood Estimation Handbook (FEH) data. The runoff rates for the existing impermeable area (0.183ha) are shown in **Table 2.3**.

Table 2.3: Estimated Total Brownfield Surface Water Discharge Rates

Return Period	Estimated Brownfield Discharge Rates from site (l/s)
Q1	22.2
Q2	28.7
Q30	57.5
Q100	79.2

3.0 SOURCES OF FLOOD RISK

3.1 Fluvial Flooding

3.1.1 Fluvial flooding is caused by flows in rivers or streams exceeding the capacity of the river channel and spilling into the floodplain. Fluvial flooding can also occur on designated floodplain land after a period of heavy rainfall.

3.1.2 The EA's Flood Map for Planning (accessed October 2022) shows the site is entirely located within Flood Zone 1; land assessed as having *"less than a 1 in 1,000 annual probability of river or sea flooding (<0.1% Annual Exceedance Probability [AEP])"*. The EA Flood Map for Planning mapping is presented in **Appendix E**.

3.1.3 The flood risk vulnerability classification of residential dwellings is deemed as 'more vulnerable'. In accordance with the Planning Practice Guidance (PPG), development of this nature in Flood Zone 1 is acceptable.

3.1.4 The risk of flooding from fluvial sources is considered to be low.

3.2 Surface Water Flooding

3.2.1 Surface water (pluvial) flooding is caused by rainfall levels exceeding the natural infiltration properties of the surrounding soils. Flooding can occur where there is a lack of a formalised drainage system, or as a result of a poorly designed or maintained sewer system. Flooding can also occur owing to the absence of a natural method of drainage such as watercourses or ditches, or where soil infiltration rates are low. Flooding often results in ponding of water at low points or when surface water flow routes are blocked by an obstruction.

3.2.2 The EA's Risk of Flooding from Surface Water (RoFSW) mapping shows the site is mostly at *"very low"* risk of surface water flooding. There is a section along the southern boundary at *"low"*, *"medium"* and *"high"* risk. The EA RoFSW mapping is presented in **Appendix E**.

3.2.3 The risk of flooding from pluvial sources is considered to be low.

3.3 Groundwater Flooding

3.3.1 Groundwater flooding is caused by the emergence of water originating from sub-surface permeable strata. A groundwater flood event results from a rise in groundwater level sufficient for the water table to intersect the ground surface and inundate low lying land. Periods of prolonged rainfall may also be a cause of groundwater flooding, with aquifers and soils becoming saturated.

3.3.2 Groundwater was recorded to have not been struck in a borehole in the vicinity of the site.

3.3.3 The West London Strategic Flood Risk Assessment (SFRA) Susceptibility to Groundwater Flooding mapping shows the site is located within an area with a less than 25% likelihood of groundwater flooding.

3.3.4 The West London SFRA Increased Potential for Elevated Groundwater mapping shows the south part of the site has increased potential for elevated groundwater, which corresponds with the area shown at risk of surface water flooding. The groundwater flooding map is presented in **Appendix E.**

3.3.5 The risk of flooding from groundwater is considered to be low.

3.4 Sewer Infrastructure Flooding

3.4.1 Flooding can occur owing to the failure of existing foul or surface water drainage infrastructure. If flows within the drainage system exceed the designed capacity or foreign matter causes blockages, overflow to the surface can occur, leading to flooding.

3.4.2 The West London SFRA Sewer Flooding Records mapping shows the site is not located in an area where there have been any recorded incidents of sewer flooding. The Sewer Flooding Records mapping is presented in **Appendix E**.

3.4.3 The risk of sewer flooding is considered low.

3.5 Flooding from Artificial Sources

3.5.1 Failure and overtopping of reservoirs and navigable water bodies, and failure of water mains, constitute the primary means of flooding from artificial sources.

3.5.2 The EA's Flood Risk from Reservoirs mapping indicates the site is not located within the maximum extent of flooding. The EA Flood Risk from Reservoirs mapping is presented in A**ppendix E.**

3.5.3 The risk of flooding from artificial sources is considered low.

4.0 SURFACE WATER DRAINAGE STRATEGY

4.1 Surface Water Drainage Strategy Requirements

4.1.1 Any surface water drainage strategy must demonstrate the proposed development would be drained in a sustainable manner, commensurate with local and national policy. The National Planning Policy Framework (NPPF) requires that flood risk to land and property is not increased as a result of new development.

4.2 Proposed Surface Water Drainage Strategy

4.2.1 A surface water drainage strategy would be developed for the site.

4.2.2 In accordance with the drainage hierarchy set out within the PPG, the most-preferred option for discharging surface water is *"into the ground (infiltration)"*. However, the use of infiltrating SuDS

may not be feasible due to the underlying geological conditions, unless intrusive ground investigations confirm otherwise. Infiltration testing and groundwater monitoring would be carried out prior to detailed design to determine the viability of using infiltration, and the drainage design would be updated accordingly.

4.2.3 The second most-preferred option in the drainage hierarchy is *"to a surface water body"*. There are no watercourses or ditches within the vicinity of the site.

4.2.4 The third most-preferred option in the drainage hierarchy is *"to a surface water sewer"*. It is proposed to discharge surface water by gravity to the Thames Water public surface water sewer, with a proposed connection into manhole 1707, located in Apsley Close to the west of the site. The connection would be subject to approval by Thames Water.

4.2.5 SuDS measures such as permeable paving, cellular storage tanks and attenuation basins would be designed to attenuate the surface water generated by the proposed development, prioritising open SuDS features. These SuDS measures will be designed to attenuate surface water flows from all rainfall events up to and including the 1 in 100 year plus 40% climate change storm, in line with the latest guidance. An additional 10% roof area allowance will be included to account for urban creep.

4.2.6 Surface water discharge from the site will be controlled through the use of flow control devices, to ensure that proposed discharge is restricted to Qbar for all storm events up to and including the design flood event. Discharging at Qbar will provide significant betterment compared to the estimated existing flow rates from the site.

4.2.7 No built development would be proposed within the surface water flooding extents and managing the surface water runoff from the site may improve the surface water flooding extents along the southern boundary of the site.

4.2.8 Exceedance flows would be considered. The exceedance flows would be routed within the roads, and the proposed site levels would ensure any exceedance flows would be diverted around the new dwellings.

4.2.9 There are no major flood risks to the development. The proposed development will not be located within the existing surface water flood risk extents, and will not exacerbate the existing scenario. Both site layout options provide adequate space for appropriate SuDS.

4.3 Water Quality

4.3.1 Water quality is a key component of a SuDS system. Steps would be taken to ensure that water quality, both on site and leaving the site, is not negatively impacted by the proposed development. This would be achieved through the incorporation of suitable SuDS features that provide adequate water quality treatment, in accordance with the indicative SuDS pollution and mitigation indices set out in the CIRIA SuDS Manual (2015) C753.

4.4 SuDS Maintenance Requirements

4.4.1 Maintenance of the drainage system and SuDS features would be carried out in accordance with the manufacturer guidance and through an approved maintenance management plan to minimise the residual flood risk of drainage system blockage.

4.4.2 Maintenance would be the responsibility of the developer to assign, however the *"operation and maintenance requirements for permeable paving"*, *"operation and maintenance requirements for cellular storage tanks"* and *"operation and maintenance requirements for detention basins"* tables have been extracted from The SuDS Manual and are presented in **Appendix F**.

5.0 FOUL WATER DRAINAGE STRATEGY

5.1.1 Peak design discharges for the development would be calculated based on Sewerage Sector Guidance:

Residential domestic flow = 4000 litres/dwelling/day (peak)

5.1.2 The foul drainage strategy would be designed to connect by gravity into the existing Thames Water public foul sewer manhole 1703, located in Apsley Close to the west of the site. The new connection would be subject to approval by Thames Water.

5.1.3 Thames Water has a duty to improve its network to cater for proposed developments. This is funded via increased infrastructure charges to developers. Should there be a requirement for offsite improvement works, Thames Water would programme these works with due regard to the build programme of the proposed development.

6.0 CONCLUSION

6.1.1 Odyssey has been commissioned by Zed Homes to provide flood risk and drainage advice in support of residential development at the Old Lyonian Sports Ground in Harrow.

6.1.2 According to EA records, the site lies within Flood Zone 1 for fluvial flooding. The site is mostly at *"very low"* risk of surface water flooding, although there is a section along the southern boundary at *"low"*, *"medium"* and *"high"* risk.

6.1.3 SuDS measures such as permeable paving, cellular storage tanks and attenuation basins would be designed to attenuate the surface water generated by the proposed development. These SuDS measures would be designed to attenuate surface water flows from all rainfall events up to and including the 1 in 100 year plus 40% climate change storm in line with the latest guidance. An additional 10% roof area allowance would be included to account for urban creep. It is proposed to discharge surface water by gravity to the Thames Water public surface water sewer in Apsley Close to the west of the site.

6.1.4 Surface water discharge would be restricted to Qbar for all storm events up and including the design flood event.

6.1.5 The foul drainage strategy would be designed to connect by gravity into the existing Thames Water public foul sewer located in Apsley Close to the west of the site. The new connection would be subject to approval by Thames Water.

6.1.6 This Technical Note has provided high-level flood risk and drainage information to inform a pre-application submission for the proposed development.

6.1.7 There are no major flood risks to the development. The proposed development will not be located within the existing surface water flood risk extents, and will not exacerbate the existing scenario. Both site layout options provide adequate space for appropriate SuDS.

APPENDIX A

Site Location Plan and Site Layout Plan

Section
3.1 Masterplan Option - K

Total Site Area(m2)	24737
Total Area of Green Open Space(m2)	13203
Total Area of Publicly Accessible Green Open Space(m2)	11288
Total Area of Communal Private Green Open Space(m2)	1915
Total No of Units	60
No of 2-bed Houses	23
No of 3-bed Houses	29
No of 4-bed Houses	8

Community Hub

Private Green Open Space

Publicly Accessible Green Open Space

Main Site Entrance

Pedestrian Access Points

Possible Pedestrian Access Points

2 Bed Unit

3 Bed Unit

4 Bed Unit

Section
3.1 Masterplan Option - L

Total Site Area(m2)	24737
Total Area of Green Open Space(m2)	11550
Total Area of Publicly Accessible Green Open Space(m2)	9544
Total Area of Communal Private Green Open Space(m2)	2006
Total No of Units	69
No of 2-bed Houses	23
No of 3-bed Houses	36
No of 4-bed Houses	10

Community Hub

Private Green Open Space

Publicly Accessible Green Open Space

Main Site Entrance

Pedestrian Access Points

Possible Pedestrian Access Points

2 Bed Unit

3 Bed Unit

4 Bed Unit

APPENDIX B

Topographical Survey

188900 mN

188880 mN

188860 mN

188840 mN

188820 mN

188800 mN

5514160 ME

5514180 ME

5514200 ME

5514220 ME

5514240 ME

5514260 ME

5514280 ME

CBF 1.8H

ASSUMED LINE

CBF 1.8H

CBF 2.0H

ASSUMED LINE

CBF 2.0H

UNKNOWN
D 0.6
S 16
H 10

DENSE VEGETATION

DENSE VEGETATION

ASSUMED LINE

56.36

56.30

56.32

56.37

56.51

56.60

56.71

56.65

56.56

56.23

56.24

56.23

56.26

56.27

56.28

56.29

56.31

56.08

55.99

56.02

56.03

56.03

GRASS

203A
56.19

55.98

55.99

55.85

55.81

55.86

55.86

55.92

55.90

55.65

55.56

55.81

55.82

55.74

55.60

55.69

DENSE VEGETATION

55.60

55.66

55.58

201
55.68

55.55

55.47

GRASS

55.47

UNKNOWN
D 0.7
S 15
H 10

55.29

55.16

55.15

55.11

GRASS

55.18

55.16

UNKNOWN
D 0.6
S 12
H 11

55.07

WIRE LASH

ASSUMED LINE

01

A1 @ SCALE 1:200

ABBREVIATIONS

AB	Air Brick	DH	Duct Height	PRF	Post & Rail Fence
B	Bollard or Bottom Height	DP	Down Pipe	PWF	Post & Wire Fence
BB	Belisha Beacon	ECB	Electricity Control Box	R	Render
BD	Back Drop	ELEC	Electricity	RAD	Radiator
BH	Borehole or Beam Height	EP	Electricity Pole	RE	Rodding Eye
BL	Bed Level	FB	Flower Bed	RG	Rough Ground
BP	Brick Pavlors	FH	Fire Hydrant	RS	Road Sign
BRW	Brick Retaining Wall	FL	Floor Level	RSJ	Rolled Steel Joist
BS	Bus Stop	G	Gully	RWP	Rain Water Pipe
BT	British Telecom	GV	Gas Valve	S	Spread or Stone
BTCB	BT Control Box	H	Height in Metres	SC	Stop Cock
BW	Brick Wall	H	Window Head Height	SL	Soffit Level or Skylight
BWF	Barbed Wire Fence	HT	Height	SP	Arch Springer Height
C	Window Cill Height	IC	Inspection Cover	SPS	Stone Paving Slabs
CB	Control Box	IL	Invert Level	SW	Stone Wall
CBF	Close Boarded Fence	IRF	Iron Railing Fence	TCSU	Traffic Control
CBW	Concrete Block Wall	IWF	Interwoven Fence	T	Top Heights
CCB	Cable TV Control Box	KO	Kerb Outlet	TL	Traffic Light
CIF	Corrugated Iron Fence	L	Light	TP	Telephone Pole
CL	Cover Level	LP	Lamp Post	TPS	Tactile Paving Slabs
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Bottom

Drop Kerbs
Overhead Detail
Change in Elevation
Fences
Overhead Cables
Change in Surface
Edge of Vegetation

2.25 — Floor to Ceiling Height

2.28 F — False Ceiling Height

Gate

Survey Station

Foul Water Sewer
Surface Water Sewer
Combined Sewer

LEVEL NOTE.

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Dwg. No.	921278_1	Job No.	921278

Client

MICHAEL SHWARTZ GROUP

Dwg. Title

LAND SURVEY

Project Title

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HARROW

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02

A1 @ SCALE 1:200

ABBREVIATIONS

AB	Air Brick	DH	Duct Height	PRF	Post & Rail Fence
B	Bollard or Bottom Height	DP	Down Pipe	PWF	Post & Wire Fence
BB	Belisha Beacon	ECB	Electricity Control Box	R	Render
BD	Back Drop	ELEC	Electricity	RAD	Radiator
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CW	Concrete Wall	PL	Pavement Light	WV	Water Valve
D	Diameter or Doors	PM	Parking Meter	ø	Diameter

Top / Banks / Bottom — Floor to Ceiling Height (3.28) — False Ceiling Height (3.28) F

Drop Kerbs — Gate

Overhead Detail — Survey Station

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Fences — Surface Water Sewer

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Change in Surface

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Change in Surface
Edge of Vegetation

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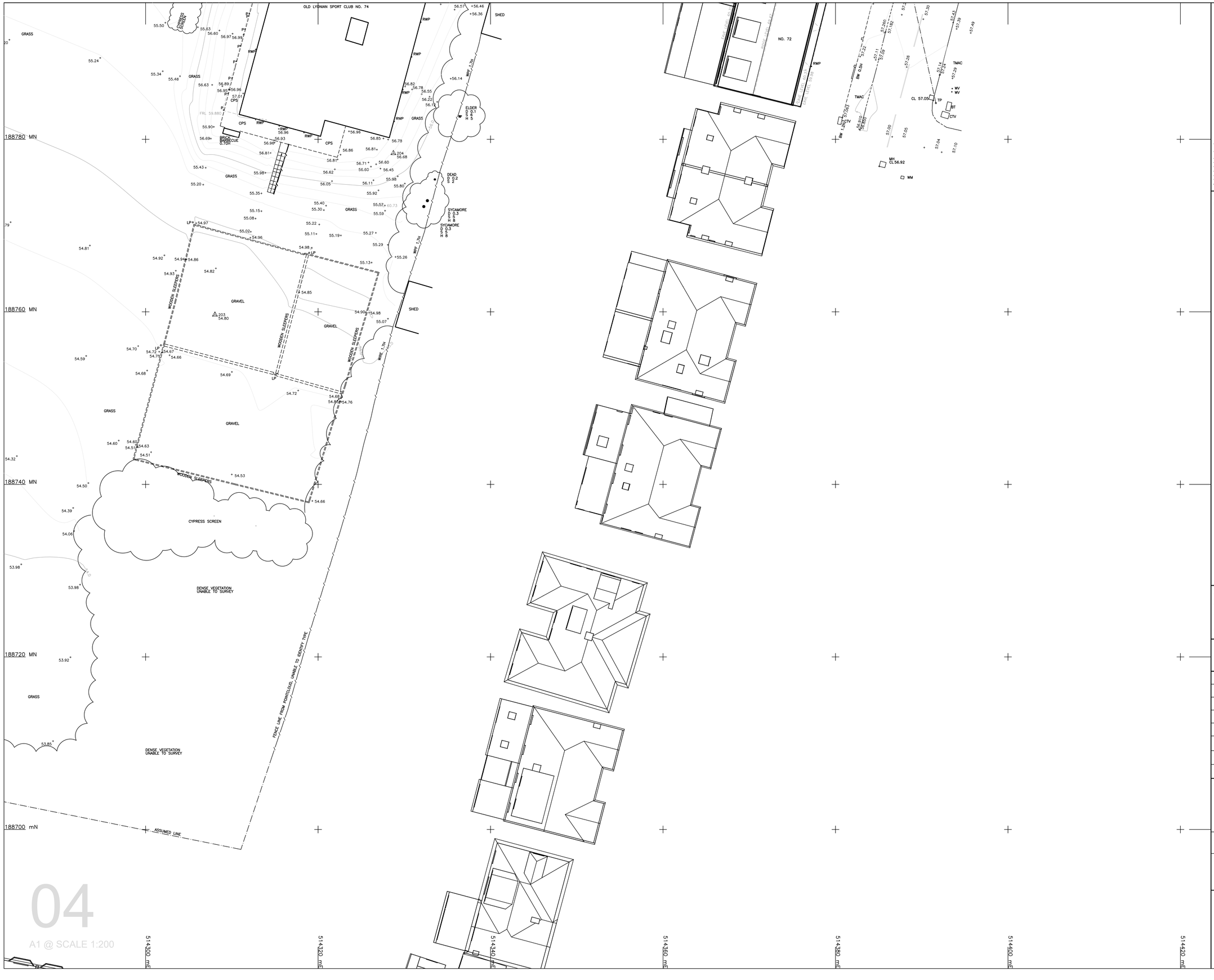

04

A1 @ SCALE 1:200

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Tree types shown on this drawing cannot be guaranteed and if critical should be verified by an arboriculturist.
Tree spreads and diameters are averages unless otherwise indicated.
This plan has been produced for the client detailed below or their appointed agent to an agreed specification and defines the limit of APR Services liability

THE SURVEY ASSOCIATION

Revisions	Date

Date JUNE 2021	Drawn ML
Scale 1:200	Checked UNCHECKED
Dwg. No. 921278_4	Job No. 921278

Client

MICHAEL SHWARTZ GROUP

Dwg. Title

LAND SURVEY

Project Title

OLD LYONIAN SPORTS CLUB
HARROW

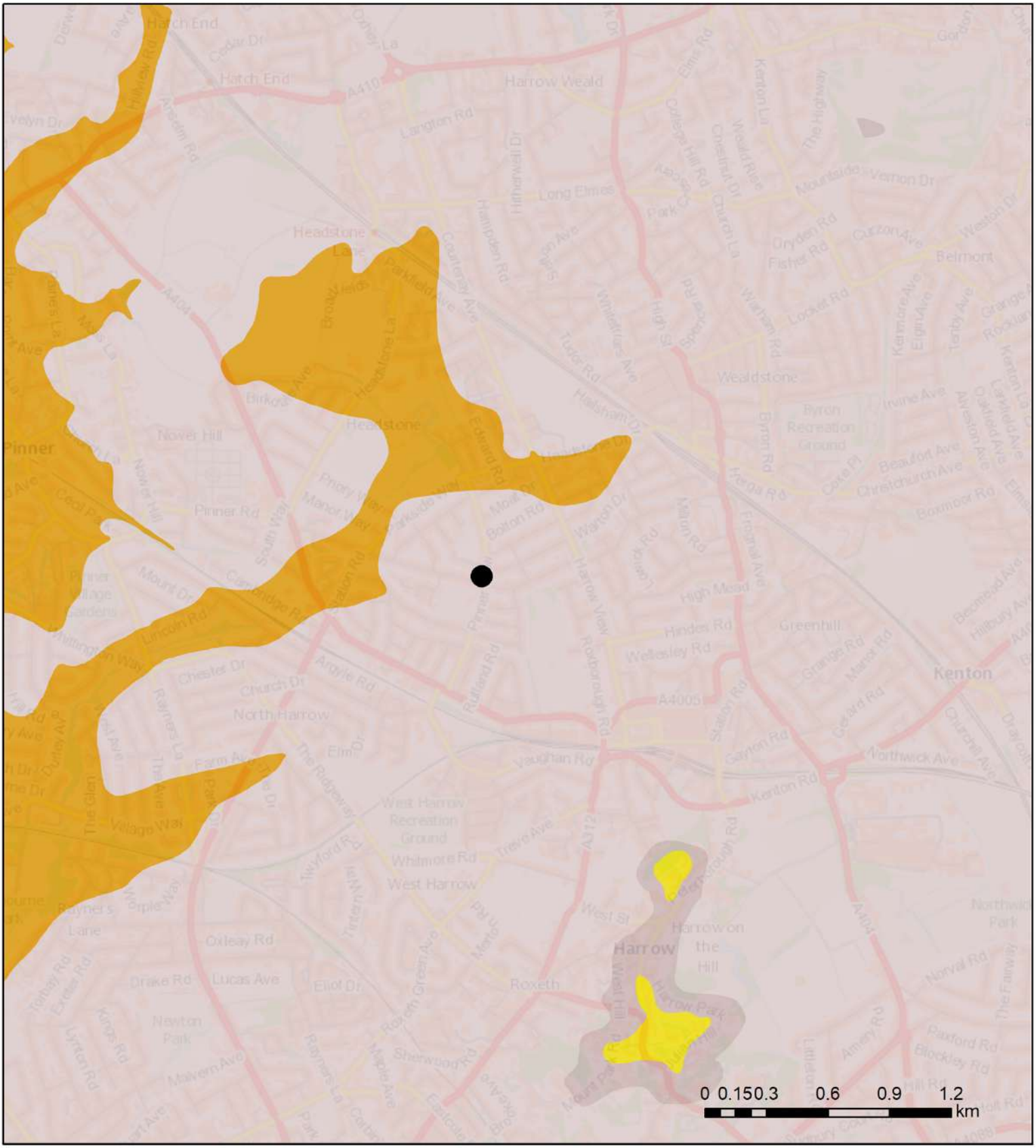
SUMO SERVICES
SOUTH EAST Ltd.
BLOCK B, FIRST FLOOR
QUEENS ROAD
BARNET
HERTS.
EN5 4DL
TEL: 0203 044 2973
FAX: 0845 408 0653
www.sumoservices.com

APPENDIX C

British Geological Survey Records

Bedrock

British Geological Survey



Map Key

Bedrock geology 1:50,000 scale

LONDON CLAY FORMATION - CLAY, SILT AND SAND

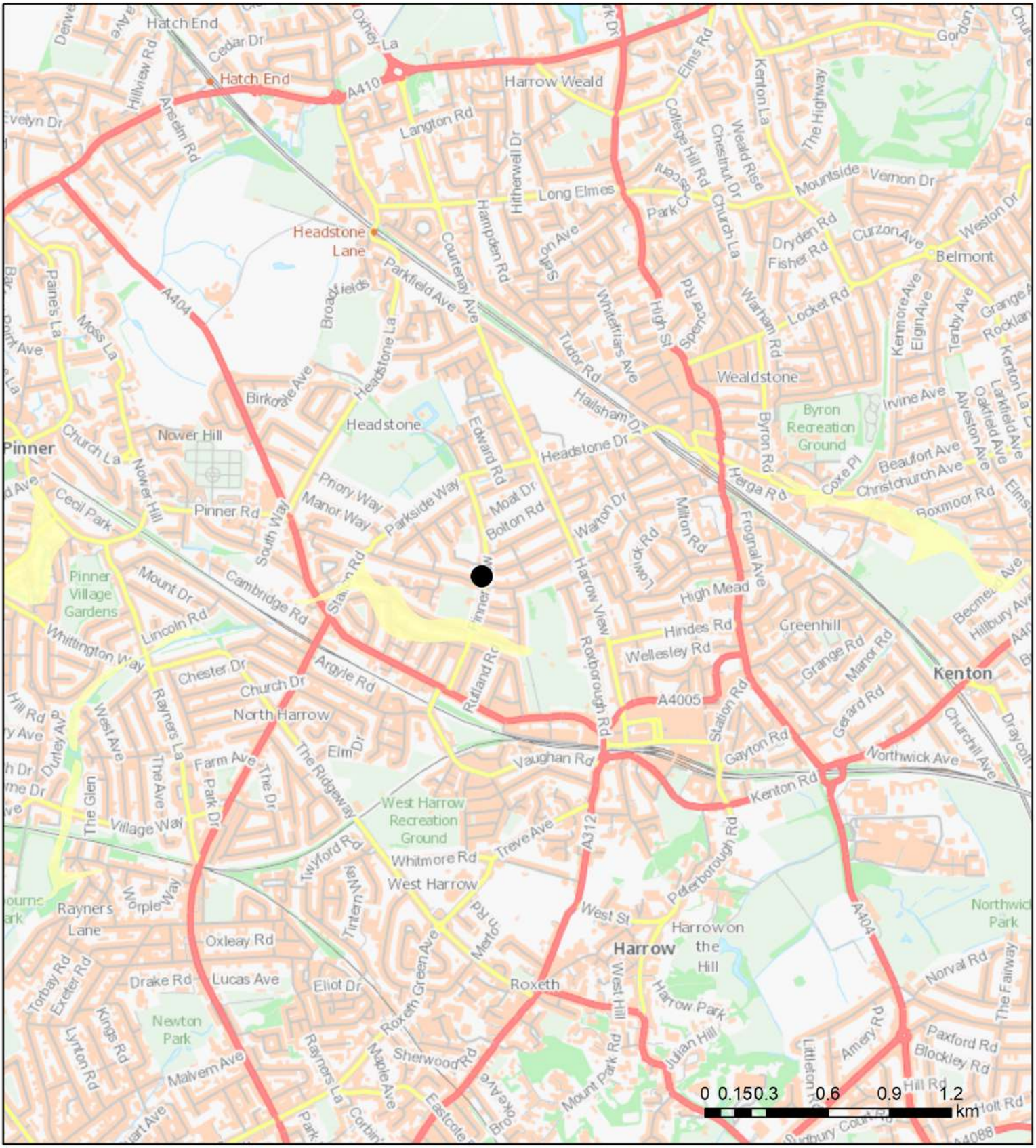
CLAYGATE MEMBER - CLAY, SILT AND SAND

BAGSHOT FORMATION - SAND

LAMBETH GROUP - CLAY, SILT AND SAND

Superficial Deposits

British Geological Survey



Map Key

Superficial deposits 1:50,000 scale

- SAND AND GRAVEL OF UNCERTAIN AGE AND ORIGIN - SAND AND GRAVEL
- STANMORE GRAVEL FORMATION - SAND AND GRAVEL
- ALLUVIUM - CLAY, SILT, SAND AND GRAVEL
- TAPLOW GRAVEL MEMBER - SAND AND GRAVEL
- BLACK PARK GRAVEL MEMBER - SAND AND GRAVEL
- RIVER TERRACE DEPOSITS (UNDIFFERENTIATED) - SAND AND GRAVEL
- LYNCH HILL GRAVEL MEMBER - SAND AND GRAVEL
- DOLLIS HILL GRAVEL MEMBER - SAND AND GRAVEL

Hydrogeology

British Geological Survey

Map Key

Hydrogeology 1:625,000 scale

Aquifers with significant intergranular flow

Highly productive aquifer

Moderately productive aquifer

Low productivity aquifer

Aquifers in which flow is virtually all through fractures and other discontinuities

Highly productive aquifer

Moderately productive aquifer

Low productivity aquifer

Rocks with essentially no groundwater

APPENDIX D

Thames Water Records

Asset location search

Property Searches

Odyssey Markides
Tuscany House Tuscany House

BASINGSTOKE
RG21 4AF

Search address supplied Old Lyonian Sports and Social Club
Pinner View
Harrow
HA1 4QF

Your reference 21-269

Our reference ALS/ALS Standard/2022_4720659

Search date 20 September 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: Old Lyonian Sports and Social Club, Pinner View, Harrow, HA1 4QF

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: [redacted]
Web: www.thameswater-propertysearches.co.uk

Asset location search

Thames Water Property Searches

Waste Water Services

Please provide a copy extract from the public sewer map.

The following quartiles have been printed as they fall within Thames' sewerage area:

TQ1488NW
TQ1488NE
TQ1489SW

Enclosed is a map showing the approximate lines of our sewers. Our plans do not show sewer connections from individual properties or any sewers not owned by Thames Water unless specifically annotated otherwise. Records such as "private" pipework are in some cases available from the Building Control Department of the relevant Local Authority.

Where the Local Authority does not hold such plans it might be advisable to consult the property deeds for the site or contact neighbouring landowners.

This report relates only to sewerage apparatus of Thames Water Utilities Ltd, it does not disclose details of cables and or communications equipment that may be running through or around such apparatus.

The sewer level information contained in this response represents all of the level data available in our existing records. Should you require any further Information, please refer to the relevant section within the 'Further Contacts' page found later in this document.

For your guidance:

- The Company is not generally responsible for rivers, watercourses, ponds, culverts or highway drains. If any of these are shown on the copy extract they are shown for information only.
- Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an 'as constructed' record. It is recommended these details be checked with the developer.

Clean Water Services

Please provide a copy extract from the public water main map.

Following examination of our statutory maps, Thames Water has been unable to find any plans of water mains within this area. If you require a connection to the public

water supply system, please write to:

New Connections / Diversions
Thames Water
Network Services Business Centre
Brentford
Middlesex
TW8 0EE

Tel: 0845 850 2777
Fax: 0207 713 3858
Email: developer.services@thameswater.co.uk

The following quartiles have not been printed as they are out of Thames' water catchment area. For details of the assets requested please contact the water company indicated below:

TQ1488NW Affinity Water
TQ1488NE Affinity Water
TQ1489SW Affinity Water

Affinity Water Ltd
Tamblin Way
Hatfield
AL10 9EZ

Tel: 0345 3572401

For your guidance:

- Assets other than vested water mains may be shown on the plan, for information only.
- If an extract of the public water main record is enclosed, this will show known public water mains in the vicinity of the property. It should be possible to estimate the likely length and route of any private water supply pipe connecting the property to the public water network.

Payment for this Search

A charge will be added to your suppliers account.

Further contacts:

Waste Water queries

Should you require verification of the invert levels of public sewers, by site measurement, you will need to approach the relevant Thames Water Area Network Office for permission to lift the appropriate covers. This permission will usually involve you completing a TWOSA form. For further information please contact our Customer Centre on Tel: 0845 920 0800. Alternatively, a survey can be arranged, for a fee, through our Customer Centre on the above number.

If you have any questions regarding sewer connections, budget estimates, diversions, building over issues or any other questions regarding operational issues please direct them to our service desk. Which can be contacted by writing to:

Developer Services (Waste Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

Clean Water queries

Should you require any advice concerning clean water operational issues or clean water connections, please contact:

Developer Services (Clean Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

Asset Location Search Sewer Map - ALS/ALS Standard/2022_4720659

TQ1488NW

The width of the displayed area is 500m and the centre of the map is located at OS coordinates 514250,188750

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
45AH	n/a	n/a
45AE	n/a	n/a
45GA	n/a	n/a
45AI	n/a	n/a
45AD	n/a	n/a
45AF	n/a	n/a
46AI	n/a	n/a
46AJ	n/a	n/a
46BA	n/a	n/a
462A	n/a	n/a
46BC	n/a	n/a
46DC	n/a	n/a
46EF	n/a	n/a
46DE	n/a	n/a
46DD	n/a	n/a
46DF	n/a	n/a
46DG	n/a	n/a
46DH	n/a	n/a
46DI	n/a	n/a
46DJ	n/a	n/a
46EA	n/a	n/a
46AD	n/a	n/a
46AE	n/a	n/a
46AF	n/a	n/a
46AG	n/a	n/a
46AJ	n/a	n/a
46AI	n/a	n/a
46AK	n/a	n/a
461L	n/a	n/a
46AM	n/a	n/a
46AN	n/a	n/a
46AO	n/a	n/a
45FG	n/a	n/a
4501	54.43	52.99
4502	54.42	53.16
451C	n/a	n/a
451B	n/a	n/a
451D	n/a	n/a
45DG	n/a	n/a
45CC	n/a	n/a
45CD	n/a	n/a
45CE	n/a	n/a
45CF	n/a	n/a
45CG	n/a	n/a
45CH	n/a	n/a
45DF	n/a	n/a
451E	n/a	n/a
45CI	n/a	n/a
45CJ	n/a	n/a
45DA	n/a	n/a
45DB	n/a	n/a
45DC	n/a	n/a
451F	n/a	n/a
46GC	n/a	n/a
46BB	n/a	n/a
46GD	n/a	n/a
46BD	n/a	n/a
46GF	n/a	n/a
46EG	n/a	n/a
46AH	n/a	n/a
46FB	n/a	n/a
46AP	n/a	n/a
46FD	n/a	n/a
46FA	n/a	n/a
46FF	n/a	n/a
46AV	n/a	n/a
46AD	n/a	n/a
46FP	n/a	n/a
46AW	n/a	n/a
47FQ	n/a	n/a
47CJ	n/a	n/a
47CI	n/a	n/a
47CH	n/a	n/a
47CG	n/a	n/a
47CF	n/a	n/a
471C	n/a	n/a
47CE	n/a	n/a
47BE	n/a	n/a
47BD	n/a	n/a
47BF	n/a	n/a
47BG	n/a	n/a
47BH	n/a	n/a
47ID	n/a	n/a
45FF	n/a	n/a
45FE	n/a	n/a
45FD	n/a	n/a
45FC	n/a	n/a
44BH	n/a	n/a
081D	n/a	n/a
n/a	n/a	n/a
081B	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
081A	n/a	n/a
091A	n/a	n/a
09AE	n/a	n/a
09AC	n/a	n/a
291A	n/a	n/a
29EF	n/a	n/a
291B	n/a	n/a
29EI	n/a	n/a
29EH	n/a	n/a
29EJ	n/a	n/a
29FA	n/a	1.05
29EG	n/a	n/a
47IC	n/a	n/a
47IE	n/a	n/a
47IB	n/a	n/a
47EI	n/a	n/a
47FA	n/a	n/a
47EJ	n/a	n/a
47FC	n/a	n/a
47FB	n/a	n/a
47FD	n/a	n/a
47IF	n/a	n/a
47JF	n/a	n/a
47FI	n/a	n/a
4701	59.82	57.98
4702	59.82	58.39
47FE	n/a	n/a
47HA	n/a	n/a
47HC	n/a	n/a
47AF	n/a	n/a
47AG	n/a	n/a
3704	56.88	55.47
3702	56.88	55.08
47HB	n/a	n/a
47DH	n/a	n/a
47DG	n/a	n/a
47DF	n/a	n/a
48AC	n/a	n/a
49CM	n/a	n/a
49AD	n/a	n/a
49CN	n/a	n/a
49AE	n/a	n/a
59EB	n/a	n/a
59EA	n/a	n/a
59EJ	n/a	n/a
59EI	n/a	n/a
4903	60.01	57.79
4906	59.88	58.47
4802	60.82	58.84
4801	60.76	59.26
481B	n/a	n/a
38AG	n/a	n/a
4803	59.6	57.95
481A	n/a	n/a
4901	59.87	57.3
491Y	n/a	n/a
49EL	n/a	n/a
49EK	n/a	n/a
39BE	n/a	n/a
39BF	n/a	n/a
49CJ	n/a	n/a
49CG	n/a	n/a
49CK	n/a	n/a
59CF	n/a	n/a
59EM	n/a	n/a
49CO	n/a	n/a
59EL	n/a	n/a
491U	n/a	n/a
4902	60.81	58.86
4904	60.93	59.26
59CH	n/a	n/a
59DX	n/a	n/a
59DZ	n/a	n/a
49AF	n/a	n/a
29CH	n/a	n/a
29BF	n/a	n/a
29FJ	n/a	n/a
29BG	n/a	n/a
29BI	n/a	n/a
29BH	n/a	n/a
28AG	n/a	n/a
29FI	n/a	n/a
28AF	n/a	n/a
29AG	n/a	n/a
2901	57.65	55.92
28AE	n/a	n/a
29AF	n/a	n/a
29BC	n/a	n/a
38AB	n/a	n/a
39BH	n/a	n/a
38AI	n/a	n/a
38AJ	n/a	n/a
3901	57.83	56.04

[redacted]

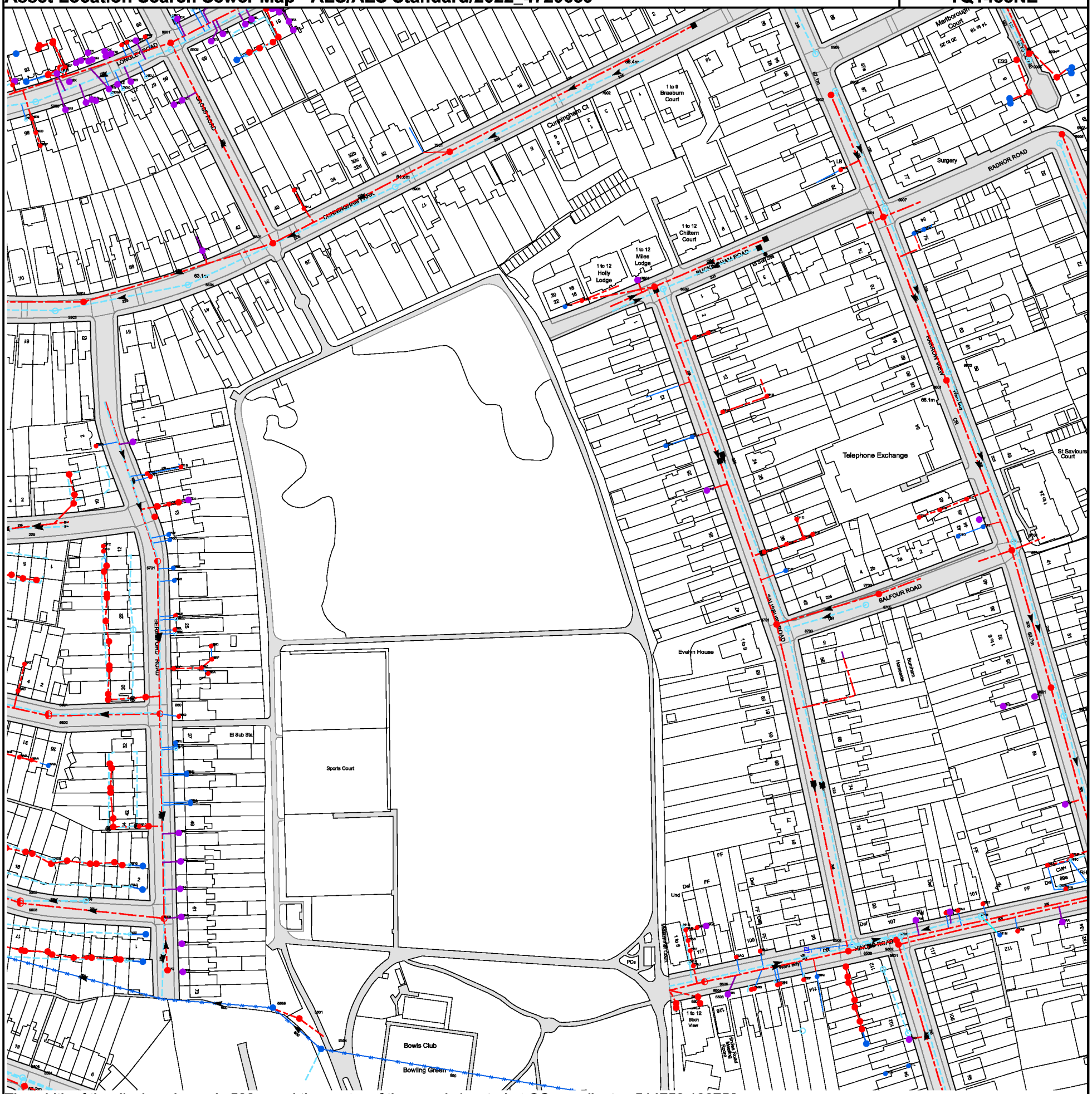
Manhole Reference	Manhole Cover Level	Manhole Invert Level
39BG	n/a	n/a
38AH	n/a	n/a
29CF	n/a	n/a
29CG	n/a	n/a
29CD	n/a	n/a
19BC	n/a	n/a
29CC	n/a	n/a
19CA	n/a	n/a
29CB	n/a	n/a
1901	55.17	53.4
1902	55.1	53.44
19DH	n/a	n/a
19FA	n/a	n/a
29DI	n/a	n/a
19EJ	n/a	n/a
19DE	n/a	n/a
19GA	n/a	n/a
19DF	n/a	n/a
19DG	n/a	n/a
19EI	n/a	n/a
19EH	n/a	n/a
19GF	n/a	n/a
1705	53.37	52.13
07BR	n/a	n/a
07AH	n/a	n/a
07AG	n/a	n/a
07AV	n/a	n/a
07BB	n/a	n/a
07BA	n/a	n/a
07AX	n/a	n/a
07AZ	n/a	n/a
07AY	n/a	n/a
07BC	n/a	n/a
07BH	n/a	n/a
1703	54.11	52.71
07BE	n/a	n/a
1706	54.11	52.74
07BG	n/a	n/a
07BF	n/a	n/a
07AT	n/a	n/a
1707	54.34	52.99
0808	53.38	52.56
1804	55.85	54.88
1801	56.12	55.05
1805	54.91	52.81
1802	54.99	53.58
181E	n/a	n/a
181D	n/a	n/a
0806	52.55	51.68
091B	n/a	n/a
0803	52.55	51.56
0804	52.85	51.68
0810	53.61	52.6
0807	53.61	52.08
0805	53.61	51.82
0809	53.79	52.07
1803	54.22	52.31
19BE	n/a	n/a
19BF	n/a	n/a
19BG	n/a	n/a
19BH	n/a	n/a
19BI	n/a	n/a
19BJ	n/a	n/a
1806	55.4	n/a
181C	n/a	n/a
181A	n/a	n/a
181B	n/a	n/a
1807	56	55.05
181F	n/a	n/a
2903	57.22	55.61
29CE	n/a	n/a
29FE	n/a	n/a
2904	57.29	55.7
09DH	n/a	n/a
09GA	n/a	n/a
09DF	n/a	n/a
09FJ	n/a	n/a
0903	52.82	50.93
0901	52.87	50.66
09BH	n/a	n/a
09BI	n/a	n/a
09FI	n/a	n/a
09FH	n/a	n/a
09CA	n/a	n/a
09CB	n/a	n/a
09EJ	n/a	n/a
09EI	n/a	n/a
09EH	n/a	n/a
09CC	n/a	n/a
09CD	n/a	n/a
19GC	n/a	n/a
19GB	n/a	n/a
07AG	n/a	.5

Manhole Reference	Manhole Cover Level	Manhole Invert Level
07AH	n/a	n/a
07AI	n/a	n/a
0703	51.22	49.47
0702	51.31	49.37
07AO	n/a	n/a
07AQ	n/a	n/a
07AS	n/a	n/a
07AR	n/a	n/a
0801	52.34	51.23
0802	52.46	51.5
081C	n/a	n/a
07AM	n/a	n/a
07AJ	n/a	n/a
07AL	n/a	n/a
07AK	n/a	n/a
09DG	n/a	n/a
09DE	n/a	n/a
0902	52.38	50.33
0904	52.35	50.59
09GG	n/a	n/a
09GB	n/a	n/a
09HB	n/a	n/a
09HA	n/a	n/a
36BD	n/a	n/a
36BB	n/a	n/a
46ED	n/a	n/a
46EI	n/a	n/a
46FF	n/a	n/a
36CD	n/a	n/a
46EB	n/a	n/a
46EH	n/a	n/a
36CG	n/a	n/a
46EC	n/a	n/a
46FD	n/a	n/a
46FE	n/a	n/a
36CA	n/a	n/a
36BJ	n/a	n/a
36CB	n/a	n/a
36CC	n/a	n/a
36CF	n/a	n/a
36HG	n/a	n/a
46FH	n/a	n/a
46FJ	n/a	n/a
361D	n/a	n/a
361E	n/a	n/a
36HE	n/a	n/a
46FI	n/a	n/a
36HF	n/a	n/a
47CA	n/a	n/a
471B	n/a	n/a
47BJ	n/a	n/a
47BI	n/a	n/a
3504	54	52.99
351O	n/a	n/a
451G	n/a	n/a
451H	n/a	n/a
351V	n/a	n/a
351R	n/a	n/a
351W	n/a	n/a
351S	n/a	n/a
351T	n/a	n/a
351U	n/a	n/a
3506	53.71	52.95
45DJ	n/a	n/a
45DD	n/a	n/a
45EB	n/a	n/a
45DE	n/a	n/a
45EA	n/a	n/a
36AF	n/a	n/a
36AG	n/a	n/a
36AH	n/a	n/a
36AI	n/a	n/a
46BG	n/a	n/a
36AJ	n/a	n/a
46CA	n/a	n/a
36BA	n/a	n/a
46BE	n/a	n/a
461Z	n/a	n/a
36BC	n/a	n/a
3503	54.56	53.26
351D	n/a	n/a
351C	n/a	n/a
351B	n/a	n/a

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Asset Location Search Sewer Map - ALS/ALS Standard/2022_4720659

TQ1488NE



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 514750,188750

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
9905	64.75	63.4
9903	64.72	63.19
99BH	n/a	n/a
99BG	n/a	n/a
99BF	n/a	n/a
99BB	n/a	n/a
99BJ	n/a	n/a
99BI	n/a	n/a
9906	64.52	63.6
99BE	n/a	n/a
9904	64.49	62.94
9502	60.56	56.41
9503	60.52	58.82
05AW	n/a	n/a
905AV	n/a	n/a
05AE	n/a	n/a
05AU	n/a	n/a
951N	n/a	n/a
05AT	n/a	n/a
951M	n/a	n/a
05AS	n/a	n/a
961A	n/a	n/a
951B	n/a	n/a
05AR	n/a	n/a
961F	n/a	n/a
951A	n/a	n/a
961C	n/a	n/a
961B	n/a	n/a
951C	n/a	n/a
9602	62.92	61.4
961D	n/a	n/a
961E	n/a	n/a
9601	63.23	60.38
9702	64.37	63.11
9701	64.6	61.53
9706	64.59	62.86
971D	n/a	n/a
971E	n/a	n/a
971F	n/a	n/a
971A	n/a	n/a
971B	n/a	n/a
971C	n/a	n/a
9801	66.13	63.5
9802	66.13	64.79
981B	n/a	n/a
981A	n/a	n/a
9901	67.83	65.36
9907	67.82	66.72
85AT	n/a	n/a
85AU	n/a	n/a
85AV	n/a	n/a
8504	n/a	n/a
8503	n/a	n/a
8505	58.97	57.41
85AW	n/a	n/a
85BA	n/a	n/a
85AQ	n/a	n/a
851I	n/a	n/a
85BB	n/a	n/a
85AP	n/a	n/a
85BD	n/a	n/a
85BE	n/a	n/a
85BJ	n/a	n/a
85BF	n/a	n/a
85BG	n/a	n/a
85DD	n/a	n/a
85DF	n/a	n/a
8506	60.12	56.97
85DC	n/a	n/a
8508	60.18	58.81
85DB	n/a	n/a
85DA	n/a	n/a
85CA	n/a	n/a
85CJ	n/a	n/a
85CI	n/a	n/a
781A	n/a	n/a
781B	n/a	n/a
8802	69.61	68.35
7801	69.6	67.95
781C	n/a	n/a
891A	n/a	n/a
8902	67.69	66.37
8904	67.56	66.64
7902	66.5	65.11
8903	66.62	64.86
6901	64.64	63.17
7901	65.3	62.19
56BH	n/a	n/a
56BL	n/a	n/a
56BN	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
56BP	n/a	n/a
56BR	n/a	n/a
57AF	n/a	n/a
571B	n/a	n/a
57FH	n/a	n/a
56AZ	n/a	n/a
56BD	n/a	n/a
56BF	n/a	n/a
871A	n/a	n/a
881A	n/a	n/a
881E	n/a	n/a
871B	n/a	n/a
881D	n/a	n/a
881C	n/a	n/a
871G	n/a	n/a
881B	n/a	n/a
8701	64.06	62.36
871C	n/a	n/a
871F	n/a	n/a
8703	64.02	n/a
871D	n/a	n/a
871E	n/a	n/a
871H	n/a	n/a
8705	64.38	63.33
60EB	n/a	n/a
59BM	n/a	n/a
60EA	n/a	n/a
59BL	n/a	n/a
60DX	n/a	n/a
59BO	n/a	n/a
59BI	n/a	n/a
59BN	n/a	n/a
59BK	n/a	n/a
69BB	n/a	n/a
60DR	n/a	n/a
59CX	n/a	n/a
60DW	n/a	n/a
60DQ	n/a	n/a
56EG	n/a	n/a
55DH	n/a	n/a
56FG	n/a	n/a
55CI	n/a	n/a
55AC	n/a	n/a
55AB	n/a	n/a
55CD	n/a	n/a
56FF	n/a	n/a
55CH	n/a	n/a
5502	55.79	53.98
551J	n/a	n/a
55FH	n/a	n/a
55FG	n/a	n/a
55FK	n/a	n/a
55FL	n/a	n/a
55FN	n/a	n/a
6589	n/a	n/a
6501	56.12	55.53
6504	56.07	54.96
8502	n/a	n/a
8501	n/a	n/a
851Q	n/a	n/a
85AR	n/a	n/a
85AS	n/a	n/a
851R	n/a	n/a
59ES	n/a	n/a
59DS	n/a	n/a
59DM	n/a	n/a
591Z	n/a	n/a
59BR	n/a	n/a
59DO	n/a	n/a
59DW	n/a	n/a
59BS	n/a	n/a
59BQ	n/a	n/a
59BP	n/a	n/a
59DU	n/a	n/a
5901	61.82	n/a
5902	61.79	60.26
59EC	n/a	n/a
59ED	n/a	n/a
5804	63.17	61.17
581A	n/a	n/a
60DV	n/a	n/a
60DU	n/a	n/a
69AG	n/a	n/a
69AH	n/a	n/a
69AI	n/a	n/a
69AJ	n/a	n/a
6801	63.72	60.46
69BA	n/a	n/a
691I	n/a	n/a
691J	n/a	n/a
57FE	n/a	n/a
5803	62.23	60.04
57BE	n/a	n/a

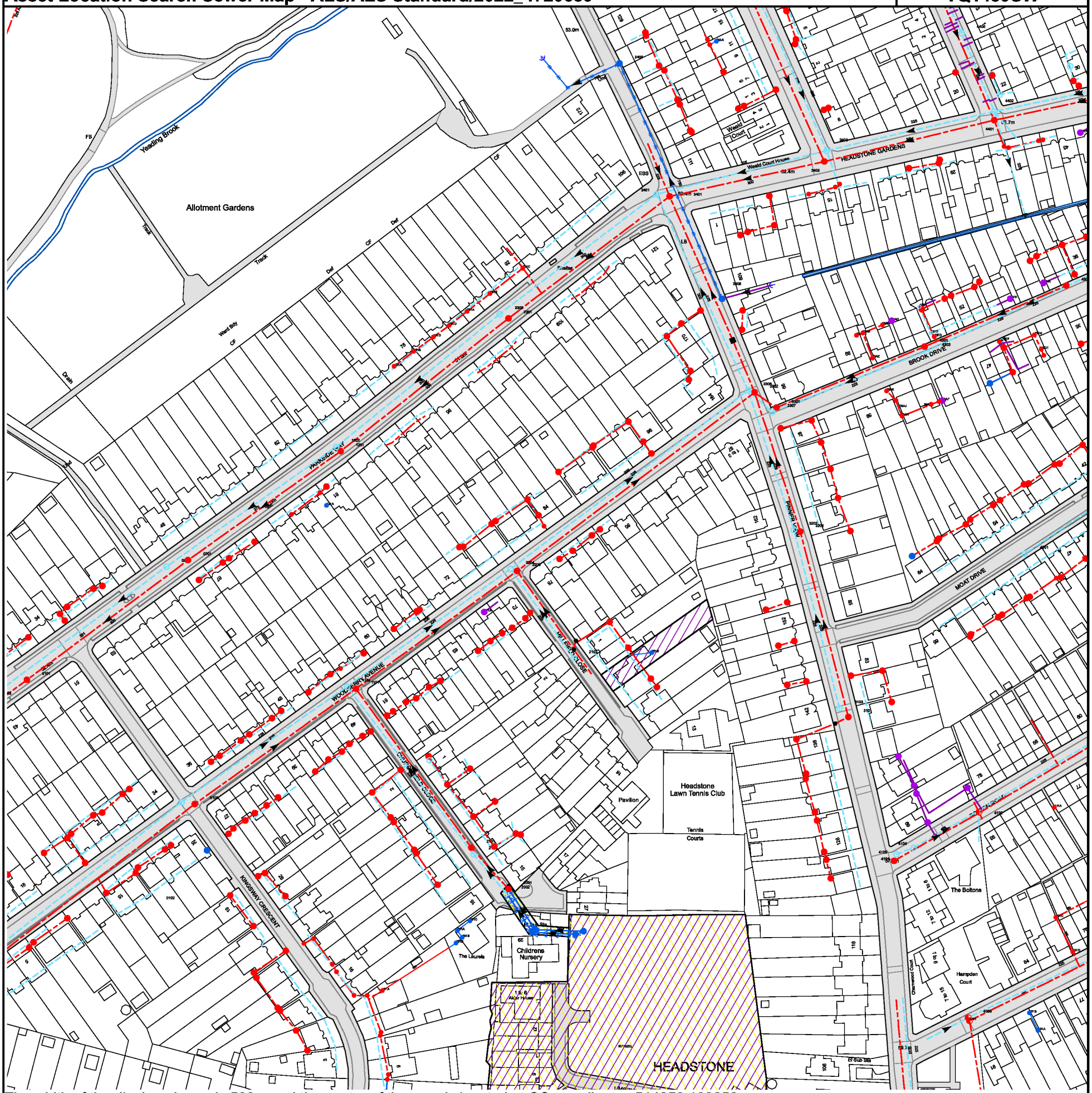
Manhole Reference	Manhole Cover Level	Manhole Invert Level
57BG	n/a	n/a
57BF	n/a	n/a
57GA	n/a	n/a
57FE	n/a	n/a
57FF	n/a	n/a
57DH	n/a	n/a
57EA	n/a	n/a
57DG	n/a	n/a
57DJ	n/a	n/a
57DI	n/a	n/a
57EB	n/a	n/a
56AE	n/a	n/a
57FA	n/a	n/a
57EH	n/a	n/a
57FC	n/a	n/a
57FE	n/a	n/a
57BD	n/a	n/a
57AG	n/a	n/a
5701	60.05	58.19
57GF	n/a	n/a
57FG	n/a	n/a
57GD	n/a	n/a
56BT	n/a	n/a
56AY	n/a	n/a
59EN	n/a	n/a
5903	n/a	n/a
59EO	n/a	n/a
59AE	n/a	n/a
59BE	n/a	n/a
59EP	n/a	n/a
59BB	n/a	n/a
59AH	n/a	n/a
59BF	n/a	n/a
59AF	n/a	n/a
59BZ	n/a	n/a
59AI	n/a	n/a
59BJ	n/a	n/a
59EF	n/a	n/a
59EQ	n/a	n/a
59BX	n/a	n/a
59DA	n/a	n/a
59DE	n/a	n/a
5801	62.46	60.35
59DC	n/a	n/a
59DI	n/a	n/a
59BV	n/a	n/a
591S	n/a	n/a
59BU	n/a	n/a
59DG	n/a	n/a
59DK	n/a	n/a
59DQ	n/a	n/a
55FE	n/a	n/a
56CE	n/a	n/a
55FQ	n/a	n/a
56CF	n/a	n/a
56CD	n/a	n/a
55FC	n/a	n/a
55FA	n/a	n/a
56CC	n/a	n/a
56CB	n/a	n/a
55FS	n/a	n/a
55FU	n/a	n/a
56CA	n/a	n/a
56AB	n/a	n/a
56BJ	n/a	n/a
56AA	n/a	n/a
55FY	n/a	n/a
55FW	n/a	n/a
561L	n/a	n/a
56BG	n/a	n/a
5602	56.47	n/a
5601	57.59	n/a
5604	56.47	n/a
56AH	n/a	n/a
56AI	n/a	n/a
56AG	n/a	n/a
56BA	n/a	n/a
56AF	n/a	n/a
56FE	n/a	n/a
5505	54.68	n/a
5503	54.68	n/a
55CC	n/a	n/a
55CB	n/a	n/a
56FD	n/a	n/a
56FC	n/a	n/a
55CA	n/a	n/a
56FB	n/a	n/a
55BJ	n/a	n/a
56DE	n/a	n/a
56FA	n/a	n/a
55BI	n/a	n/a
5509	n/a	n/a
55DG	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
56EJ	n/a	n/a
55BH	n/a	n/a
56EI	n/a	n/a
56EH	n/a	n/a
55BG	n/a	n/a
55BF	n/a	n/a
56AC	n/a	n/a
56AS	n/a	n/a
56AT	n/a	n/a
57FF	n/a	n/a
5506	n/a	n/a
5501	55.26	n/a
951K	n/a	n/a
951L	n/a	n/a
951O	n/a	n/a
95BA	n/a	n/a
95BC	n/a	n/a
9501	60.54	56.59
57FG	n/a	n/a
59EH	n/a	n/a
59BA	n/a	n/a
49CP	n/a	n/a
59JD	n/a	n/a
59CQ	n/a	n/a

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Asset Location Search Sewer Map - ALS/ALS Standard/2022_4720659

TQ1489SW



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 514250,189250

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
411A	n/a	n/a
43DC	n/a	n/a
43DE	n/a	n/a
43DE	n/a	n/a
43BE	n/a	n/a
43FC	n/a	n/a
43FP	n/a	n/a
43FM	n/a	n/a
43FF	n/a	n/a
4302	52.61	51.31
53HK	n/a	n/a
43AJ	n/a	n/a
43EH	n/a	n/a
43EG	n/a	n/a
43AI	n/a	n/a
43AH	n/a	n/a
43EI	n/a	n/a
44CD	n/a	n/a
44CG	n/a	n/a
44CC	n/a	n/a
44CB	n/a	n/a
441A	n/a	n/a
44FE	n/a	n/a
44EC	n/a	n/a
44EB	n/a	n/a
44EI	n/a	n/a
42EB	n/a	n/a
42EC	n/a	n/a
42ED	n/a	n/a
42EE	n/a	n/a
42EF	n/a	n/a
42EG	n/a	n/a
42EH	n/a	n/a
42EI	n/a	n/a
4201	55.23	53.93
42BJ	n/a	n/a
42CA	n/a	n/a
42CB	n/a	n/a
42CC	n/a	n/a
42CD	n/a	n/a
42CF	n/a	n/a
42CE	n/a	n/a
43DD	n/a	n/a
10FA	n/a	n/a
10FH	n/a	n/a
10FI	n/a	n/a
10FJ	n/a	n/a
10GB	n/a	n/a
10GA	n/a	n/a
101A	n/a	n/a
10GC	n/a	n/a
10GD	n/a	n/a
10EC	n/a	n/a
201D	n/a	n/a
10EB	n/a	n/a
201B	n/a	n/a
201A	n/a	n/a
201C	n/a	n/a
21AF	n/a	n/a
221B	n/a	n/a
22AD	n/a	n/a
34AI	n/a	n/a
34AJ	n/a	n/a
33AB	n/a	n/a
33AC	n/a	n/a
33AD	n/a	n/a
44AJ	n/a	n/a
431E	n/a	n/a
43FC	n/a	n/a
431D	n/a	n/a
44BA	n/a	n/a
44BB	n/a	n/a
43FB	n/a	n/a
43FA	n/a	n/a
44DD	n/a	n/a
4405	n/a	n/a
43EJ	n/a	n/a
43EF	n/a	n/a
44FD	n/a	n/a
44FC	n/a	n/a
4401	52.96	50.45
4402	52.9	51.07
401A	n/a	n/a
4001	59.61	58.53
4003	59.61	57.37
401B	n/a	n/a
401D	n/a	n/a
401C	n/a	n/a
30AD	n/a	n/a
4101	57.8	56.2

Manhole Reference	Manhole Cover Level	Manhole Invert Level
31BH	n/a	n/a
4105	57.83	56.48
31BI	n/a	n/a
4104	57.7	56.25
31CB	n/a	n/a
31CC	n/a	n/a
31DB	n/a	n/a
31CA	n/a	n/a
31BJ	n/a	n/a
32AH	n/a	n/a
32AG	n/a	n/a
3103	56.1	54.24
3101	56.15	54.26
32AF	n/a	n/a
31AD	n/a	n/a
41AF	n/a	n/a
41AE	n/a	n/a
4109	n/a	n/a
42AB	n/a	n/a
4110	n/a	n/a
4108	n/a	n/a
4107	n/a	n/a
42BE	n/a	n/a
42BF	n/a	n/a
42BG	n/a	n/a
4106	n/a	n/a
42DJ	n/a	n/a
42BH	n/a	n/a
42EA	n/a	n/a
4102	57.388	55.148
42BI	n/a	n/a
22DG	n/a	n/a
22DD	n/a	n/a
22DE	n/a	n/a
32AI	n/a	n/a
22DF	n/a	n/a
33AD	n/a	n/a
23EJ	n/a	n/a
33AC	n/a	n/a
33AH	n/a	n/a
3307	52.61	51.04
3301	52.61	50.73
33AH	n/a	n/a
33AG	n/a	n/a
33AF	n/a	n/a
33AJ	n/a	n/a
3302	52.39	50.43
33AK	n/a	n/a
3306	52.46	50.8
43DB	n/a	n/a
33CF	n/a	n/a
33CG	n/a	n/a
33AE	n/a	n/a
4303	52.84	51.32
4301	52.86	51.02
43FD	n/a	n/a
33CH	n/a	n/a
33AA	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
33ED	n/a	n/a
33CI	n/a	n/a
33CJ	n/a	n/a
33EC	n/a	n/a
3305	52.13	51.13
231C	n/a	n/a
33AJ	n/a	n/a
33BA	n/a	n/a
33BB	n/a	n/a
3401	52.35	49.99
34EH	n/a	n/a
2401	52.34	50.4
34AH	n/a	n/a
3402	52.66	50.16
3403	52.65	50.74
34GB	n/a	n/a
34GA	n/a	n/a
34HA	n/a	n/a
34DJ	n/a	n/a
34GJ	n/a	n/a
34EA	n/a	n/a
34FJ	n/a	n/a
34FI	n/a	n/a
34EB	n/a	n/a
34DI	n/a	n/a
34FH	n/a	n/a
34FG	n/a	n/a
22BI	n/a	n/a
21CA	n/a	n/a
2203	53.07	50.97
22BJ	n/a	n/a
22FB	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
22CA	n/a	n/a
22FC	n/a	n/a
22FD	n/a	n/a
22DC	n/a	n/a
22HC	n/a	n/a
22HB	n/a	n/a
2103	54.43	52.75
22HA	n/a	n/a
22GJ	n/a	n/a
22AE	n/a	n/a
21AE	n/a	n/a
32BH	n/a	n/a
32BF	n/a	n/a
31DC	n/a	n/a
32BI	n/a	n/a
3202	53.71	51.77
32BG	n/a	n/a
31CD	n/a	n/a
3201	53.8	51.9
12BA	n/a	n/a
22BF	n/a	n/a
22BG	n/a	n/a
22BH	n/a	n/a
12AJ	n/a	n/a
221A	n/a	n/a
12BD	n/a	n/a
12BB	n/a	n/a
12BE	n/a	n/a
2204	53.01	51.33
22EH	n/a	n/a
22EI	n/a	n/a
22EJ	n/a	n/a
22FA	n/a	n/a
121A	n/a	n/a
12DI	n/a	n/a
12DJ	n/a	n/a
1201	51.26	49.38
1202	51.3	49.72
131A	n/a	n/a
131B	n/a	n/a
131D	n/a	n/a
231D	n/a	n/a
2301	51.73	49.68
2302	51.79	50.05
231A	n/a	n/a
231B	n/a	n/a
11IE	n/a	n/a
11IF	n/a	n/a
21BJ	n/a	n/a
21BI	n/a	n/a
11IG	n/a	n/a
21BH	n/a	n/a
11FB	n/a	n/a
11IH	n/a	n/a
21BG	n/a	n/a
11CG	n/a	n/a
11FC	n/a	n/a
11CD	n/a	n/a
11FD	n/a	n/a
11FE	n/a	n/a
11FF	n/a	n/a
11FG	n/a	n/a
11HD	n/a	n/a
11HC	n/a	n/a
11HB	n/a	n/a
11HA	n/a	n/a
11BG	n/a	n/a
1101	53.57	51.34
11GJ	n/a	n/a
1102	53.51	51.65
11GI	n/a	n/a
11BH	n/a	n/a
11BI	n/a	n/a
10BA	n/a	n/a
10BB	n/a	n/a
10BC	n/a	n/a
10BD	n/a	n/a
n/a	n/a	n/a
10CE	n/a	n/a
10DG	n/a	n/a
2002	56.64	55.16
2001	56.62	54.93
10GG	n/a	n/a
10DH	n/a	n/a
11CI	n/a	n/a
2102	56.02	54.54
11IC	n/a	n/a
11ID	n/a	n/a
2101	55.96	54.26
21CB	n/a	n/a
21EG	n/a	n/a
10AH	n/a	n/a
10AI	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
10AJ	n/a	n/a
01BI	n/a	n/a
02CD	n/a	n/a
01BJ	n/a	n/a
02BI	n/a	n/a
01CA	n/a	n/a
01CB	n/a	n/a
0202	51.84	49.41
0102	53.65	52.11
0201	51.71	49.11
0103	53.69	51.78
02DA	n/a	n/a
01AE	n/a	n/a
01AF	n/a	n/a
02DB	n/a	n/a
11EH	n/a	n/a
12EF	n/a	n/a
11EG	n/a	n/a
11AI	n/a	n/a
11EF	n/a	n/a
11BB	n/a	n/a
12EG	n/a	n/a
11EE	n/a	n/a
11ED	n/a	n/a
11BA	n/a	n/a
11EC	n/a	n/a
11AJ	n/a	n/a
12DH	n/a	n/a
01CC	n/a	n/a
00BI	n/a	n/a
01EB	n/a	n/a
01EA	n/a	n/a
01DJ	n/a	n/a
01DI	n/a	n/a
01DE	n/a	n/a
10CF	n/a	n/a
0101	52.41	48.79
02BA	n/a	n/a
02BJ	n/a	n/a
02CA	n/a	n/a
02CE	n/a	n/a
00CH	n/a	n/a
00CG	n/a	n/a
00CF	n/a	n/a
00AH	n/a	n/a
01BF	n/a	n/a
01BG	n/a	n/a
01BH	n/a	n/a
2405	52.96	50.61
34DH	n/a	n/a
34CC	n/a	n/a
341A	n/a	n/a
34CB	n/a	n/a
34DG	n/a	n/a
24BF	n/a	n/a
24BE	n/a	n/a
34CA	n/a	n/a
34BJ	n/a	n/a

Asset Location Search - Sewer Key

Public Sewer Types (Operated and maintained by Thames Water)

Foul Sewer: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.

Surface Water Sewer: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.

Combined Sewer: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.

- Storm Sewer
- Sludge Sewer
- Foul Trunk Sewer
- Surface Trunk Sewer
- Combined Trunk Sewer
- Foul Rising Main
- Surface Water Rising Main
- Combined Rising Main
- Vacuum
- Thames Water Proposed
- Vent Pipe
- Gallery

Other Sewer Types (Not operated and maintained by Thames Water)

- Sewer
- Culverted Watercourse
- Proposed
- Decommissioned Sewer
- Content of this drainage network is currently unknown
- Ownership of this drainage network is currently unknown

Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

- Air Valve
- Meter
- Dam Chase
- Vent
- Fitting

Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

- Ancillary
- Drop Pipe
- Control Valve
- Weir

End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol. Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

- Inlet
- Outfall
- Undefined End

Other Symbols

Symbols used on maps which do not fall under other general categories.

- Change of Characteristic Indicator
- Public / Private Pumping Station
- Invert Level
- Summit

Areas

Lines denoting areas of underground surveys, etc.

- Agreement
- Chamber
- Operational Site

Ducts or Crossings

- Casement

Ducts may contain high voltage cables. Please check with Thames Water.

- Conduit Bridge
- Subway
- Tunnel

Notes:

1) All levels associated with the plans are to Ordnance Datum Newlyn.
2) All measurements on the plan are metric.
3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate the direction of flow.
4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.
5) 'na' or '0' on a manhole indicates that data is unavailable.
6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimeters. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement.

If you are unsure about any text or symbology, please contact Property Searches on 0800 009 4540.

Terms and Conditions

All sales are made in accordance with Thames Water Utilities Limited (TWUL) standard terms and conditions unless previously agreed in writing.

1. All goods remain in the property of Thames Water Utilities Ltd until full payment is received.
2. Provision of service will be in accordance with all legal requirements and published TWUL policies.
3. All invoices are strictly due for payment 14 days from due date of the invoice. Any other terms must be accepted/agreed in writing prior to provision of goods or service, or will be held to be invalid.
4. Thames Water does not accept post-dated cheques-any cheques received will be processed for payment on date of receipt.
5. In case of dispute TWUL`s terms and conditions shall apply.
6. Penalty interest may be invoked by TWUL in the event of unjustifiable payment delay. Interest charges will be in line with UK Statute Law 'The Late Payment of Commercial Debts (Interest) Act 1998'.
7. Interest will be charged in line with current Court Interest Charges, if legal action is taken.
8. A charge may be made at the discretion of the company for increased administration costs.

A copy of Thames Water's standard terms and conditions are available from the Commercial Billing Team (cashoperations@thameswater.co.uk).

We publish several Codes of Practice including a guaranteed standards scheme. You can obtain copies of these leaflets by calling us on 0800 316 9800

If you are unhappy with our service you can speak to your original goods or customer service provider. If you are not satisfied with the response, your complaint will be reviewed by the Customer Services Director. You can write to her at: Thames Water Utilities Ltd. PO Box 492, Swindon, SN38 8TU.

If the Goods or Services covered by this invoice falls under the regulation of the 1991 Water Industry Act, and you remain dissatisfied you can refer your complaint to Consumer Council for Water on 0121 345 1000 or write to them at Consumer Council for Water, 1st Floor, Victoria Square House, Victoria Square, Birmingham, B2 4AJ.

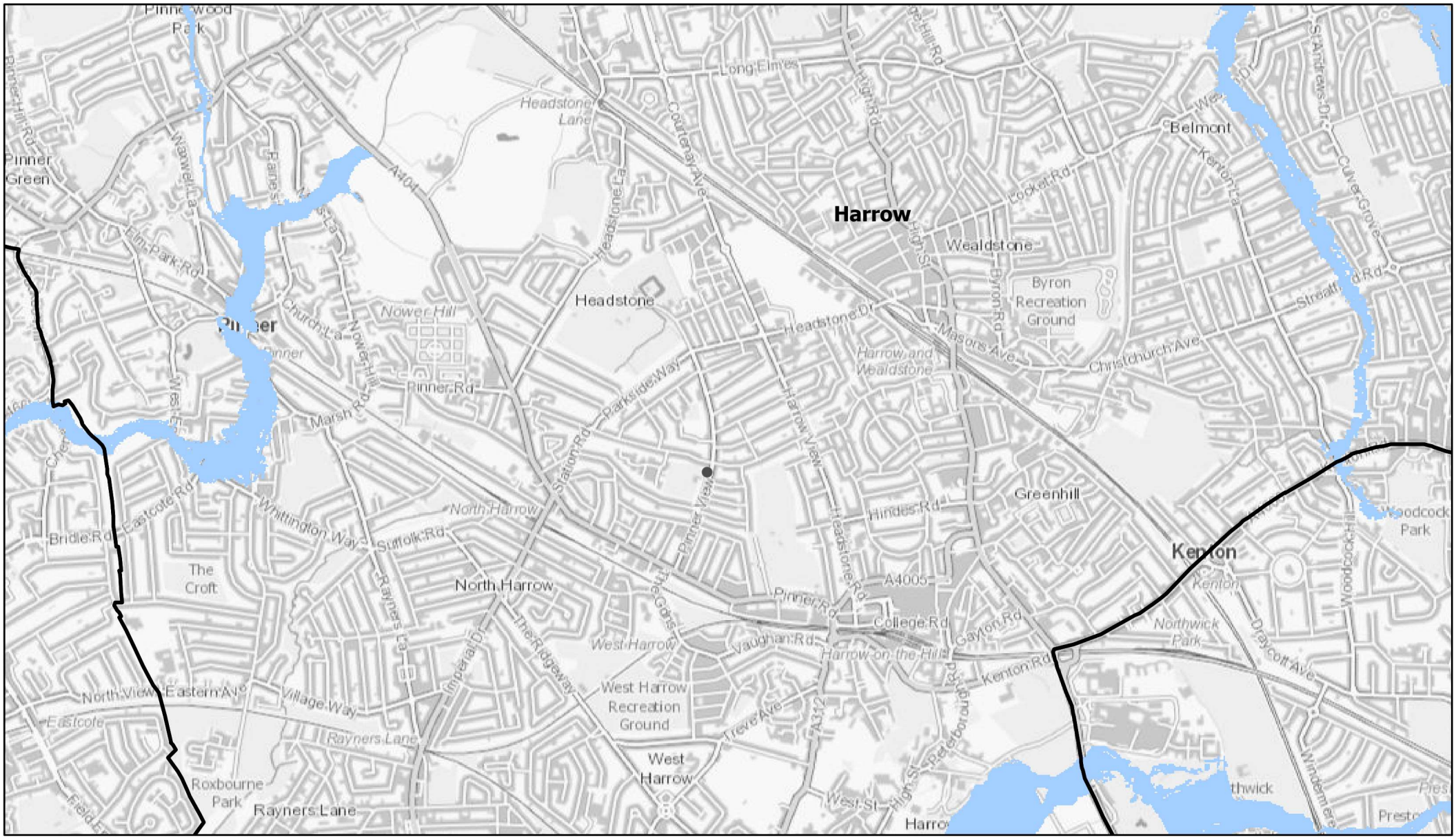
Ways to pay your bill

Credit Card	**BACS Payment**	**Telephone Banking**	**Cheque**
Call **0800 009 4540** quoting your invoice number starting CBA or ADS / OSS	Account number **90478703** Sort code **60-00-01** A remittance advice must be sent to: **Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW.** or email **ps.billing@thameswater.co.uk**	By calling your bank and quoting: Account number **90478703** Sort code **60-00-01** and your invoice number	Made payable to '**Thames Water Utilities Ltd**' Write your Thames Water account number on the back. Send to: **Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW** or by DX to **151280 Slough 13**

APPENDIX E

Flood Mapping

West London SFRA



9/16/2022, 5:13:15 PM

1:25,000

0 0.2 0.4 0.8 mi

0 0.33 0.65 1.3 km

Borough Boundary

Study Area Boundary

Maximum extent of flooding

Risk_of_Flooding_from_Reservoirs_Maximum_Flood_Extent

London Boroughs of Brent, Barnet, Harrow, Hillingdon, Hounslow and Ealing

West London SFRA

9/16/2022, 5:17:51 PM

Borough Boundary

Study Area Boundary

<VALUE: Extent Risk_of_Flooding_from_Surface_Water_Extent_3_3_percent_annual_chance

1:2,500

0 0.02 0.04 0.08 mi

0 0.03 0.07 0.13 km

West London SFRA

9/16/2022, 5:23:11 PM

Borough Boundary

Study Area Boundary

Thames Water 2017 - Sewer Flooding Records (No. of Instances)

0

1 - 20

1:10,000

0 0.07 0.15 0.3 mi

0 0.13 0.25 0.5 km

London Boroughs of Brent, Barnet, Harrow, Hillingdon, Hounslow and Ealing

Flood map for planning

Your reference	Location (easting/northing)	Created
Old Lyonian Sports Club	**514256/188790**	**15 Sep 2022 12:48**

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

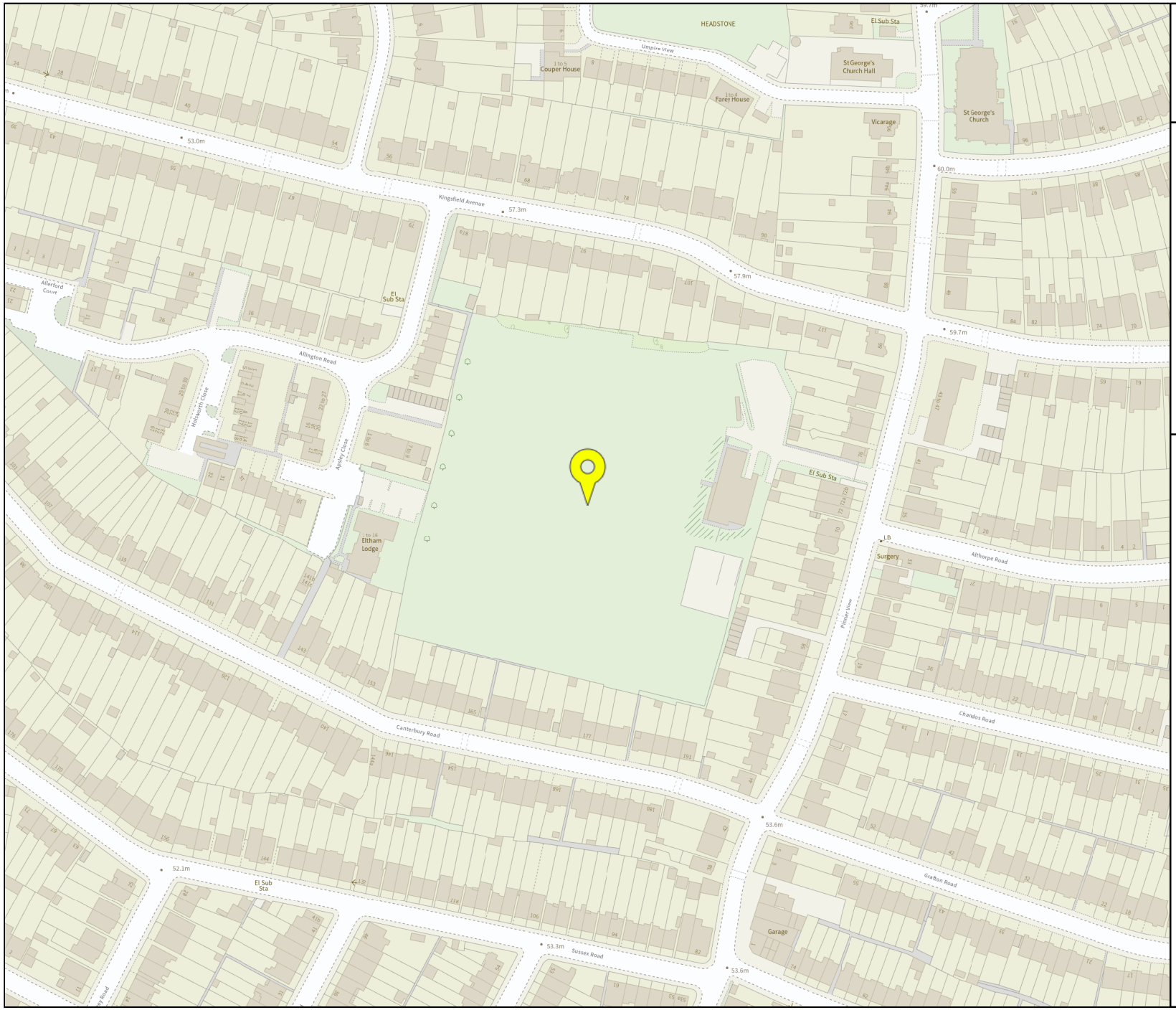
You will need to do a flood risk assessment if your site is **any of the following:**

- 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
Old Lyonian Sports Club

Location (easting/northing)
514256/188790

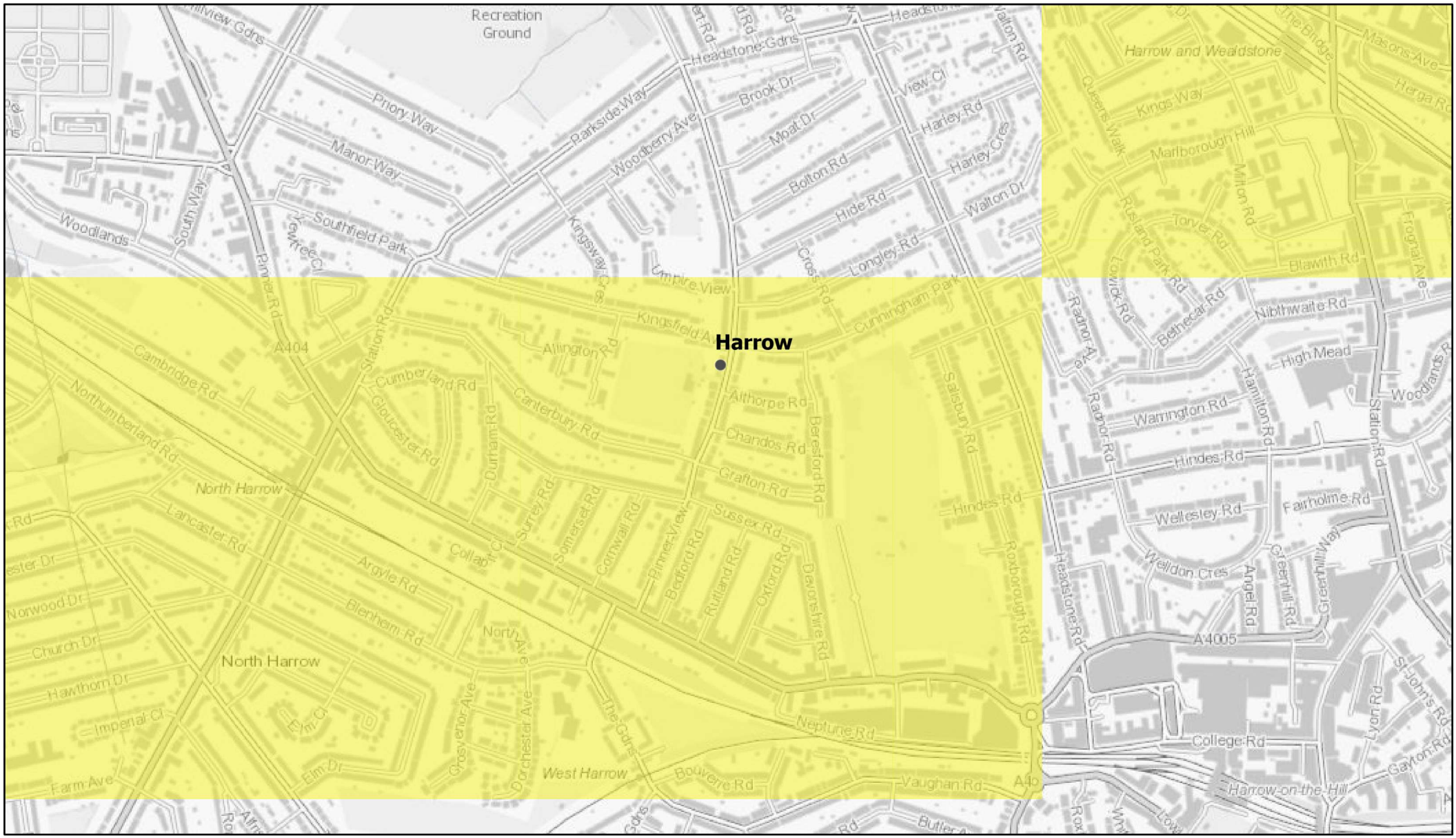
Scale
1:2500

Created
15 Sep 2022 12:48

- 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

West London SFRA



9/16/2022, 5:22:22 PM

Borough Boundary

Study Area Boundary

EA 2017 - Susceptiblity to Groundwater Flooding

< 25%

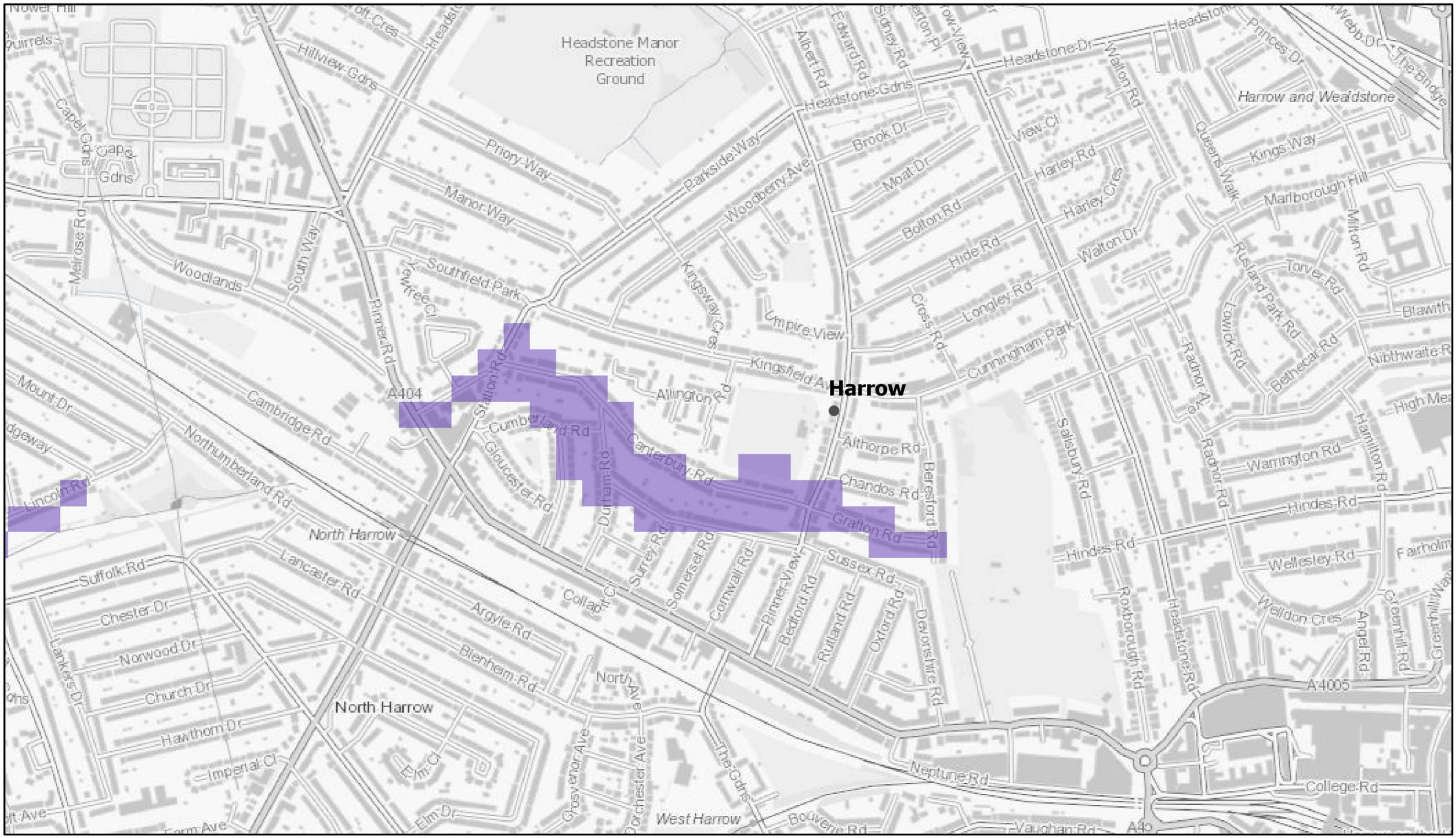
1:10,000

0 0.07 0.15 0.3 mi

0 0.13 0.25 0.5 km

London Boroughs of Brent, Barnet, Harrow, Hillingdon, Hounslow and Ealing

West London SFRA



9/16/2022, 5:12:17 PM

Borough Boundary

Study Area Boundary

GLA 2011 - Increased Potential for Elevated Groundwater

Permeable Superficial

1:10,000

0 0.07 0.15 0.3 mi

0 0.13 0.25 0.5 km

London Boroughs of Brent, Barnet, Harrow, Hillingdon, Hounslow and Ealing

APPENDIX F

Maintenance Schedules

TABLE 20.15 Operation and maintenance requirements for pervious pavements

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphospate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	Three-monthly, 48 h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

Many of the specific maintenance activities for pervious pavements can be undertaken as part of a general site cleaning contract (many car parks or roads are swept to remove litter and for visual reasons to keep them tidy) and therefore, if litter management is already required at site, this should have marginal cost implications.

Generally, pervious pavements require less frequent gritting in winter to prevent ice formation. There is also less risk of ice formation after snow melt, as the melt water drains directly into the underlying sub-base and does not have chance to refreeze. A slight frost may occur more frequently on the surface of pervious pavements compared to adjacent impermeable surfaces, but this is only likely to last for a few hours. It does not happen in all installations and, if necessary, this can be dealt with by application of salt. It is not likely to pose a hazard to vehicle movements.

▶ Generic health and safety guidance is presented in **Chapter 36**.

CDM 2015 requires designers to ensure that all maintenance risks have been identified, eliminated, reduced and/or controlled where appropriate. This information will be required as part of the health and safety file.

TABLE 22.1 Operation and maintenance requirements for detention basins

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter and debris	Monthly
	Cut grass – for spillways and access routes	Monthly (during growing season), or as required
	Cut grass – meadow grass in and around basin	Half yearly (spring – before nesting season, and autumn)
	Manage other vegetation and remove nuisance plants	Monthly (at start, then as required)
	Inspect inlets, outlets and overflows for blockages, and clear if required.	Monthly
	Inspect banksides, structures, pipework etc for evidence of physical damage	Monthly
	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies.	Monthly (for first year), then annually or as required
	Check any penstocks and other mechanical devices	Annually
	Tidy all dead growth before start of growing season	Annually
	Remove sediment from inlets, outlet and forebay	Annually (or as required)
	Manage wetland plants in outlet pool – where provided	Annually (as set out in Chapter 23)
Occasional maintenance	Reseed areas of poor vegetation growth	As required
	Prune and trim any trees and remove cuttings	Every 2 years, or as required
	Remove sediment from inlets, outlets, forebay and main basin when required	Every 5 years, or as required (likely to be minimal requirements where effective upstream source control is provided)
Remedial actions	Repair erosion or other damage by reseeding or re-turfing	As required
	Realignment of rip-rap	As required
	Repair/rehabilitation of inlets, outlets and overflows	As required
	Relevel uneven surfaces and reinstate design levels	As required

22.13 REFERENCE

KENNARD, M F, HOSKINS, C G and FLETCHER, M (1996) *Small embankment reservoirs*, R161, CIRIA, London, UK (ISBN: 978-0-86017-461-5). Go to: **www.ciria.org**

Statutes

Reservoir Act 1975 (c.23)

Health and Safety at Work (etc) Act 1974 (c.37)

Building Act 1984 (c.55)

Flood and Water Management Act 2010 (c.29)

Construction (Design and Management) Regulations (CDM) 2015

TABLE 21.3 Operation and maintenance requirements for attenuation storage tanks

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other matter; remove and replace surface infiltration medium as necessary.	Annually
	Remove sediment from pre-treatment structures and/or internal forebays	Annually, or as required
Remedial actions	Repair/rehabilitate inlets, outlet, overflows and vents	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required

21.14 REFERENCES

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DfT (2009) *Manual of contract documents for highway works. Volume 1: Series 600 Earthworks*, HMSO, London, UK. Go to: **http://tinyurl.com/phx5yj**