

South Thamesmead Phase 2 The Link Outdoor Gym London, SE2 9AN

Flood Risk Assessment

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Acronyms	
AOD	Above Ordnance Datum
CIRIA	Construction Industry Research and Information Association
DCG	Design and Construction Guidance
DEFRA	Department for Environment, Food and Rural Affairs
EA	Environment Agency
FRA	Flood Risk Assessment
LLFA	Lead Local Flood Authority
NPPF	National Planning Policy Framework
PPG	Planning Practice Guidance
SFRA	Strategic Flood Risk Assessment
SWMP	Surface Water Management Plan

1 Introduction

Price & Myers have been commissioned to undertake a Flood Risk Assessment (FRA) for The Link Outdoor Gym at South Thamesmead Phase 2, Thamesmead, London Borough of Bexley.

The National Planning Policy Framework (NPPF) states that an appropriate FRA will be required for all development proposals of 1 ha or greater in Flood Zone 1 and for any development within Flood Zones 2 or 3.

The EA's flood map for planning shows that the site is located in Flood Zone 3, therefore this assessment will focus on the flood risk to the site from rivers and the sea.

1.1 Relevant Policy

This FRA has been carried out in accordance with the NPPF and the accompanying Planning Practice Guidance (PPG) "Flood Risk and Coastal Change". This FRA also incorporates advice and guidance from the Environment Agency (EA), the London Borough of Bexley Strategic Flood Risk Assessment (SFRA) (November 2020) and CIRIA documents.

2 Site Description and Location

The site is located within Southmere Park within the London Borough of Bexley. The site is centred on the grid reference 547470, 180105 and the site postcode is SE2 9AN.



Figure 2.1: Site location

The site is bounded by Southmere Lake to the south, the Lakeside Event Centre to the west, a car park to the north and the South Thamesmead Phase 2 development to the west.

The application area is covered with lawn and the site levels slope from north to south towards the lake. A topographical survey is available within Appendix A. A group of trees are located to the north side of the gym area on the top of the slope, outside the application area.

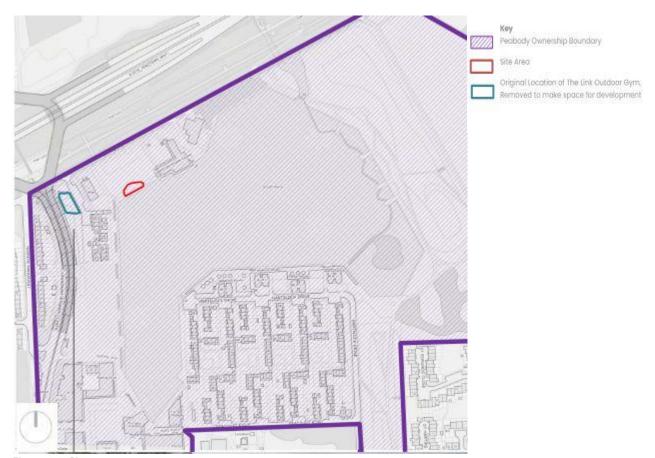


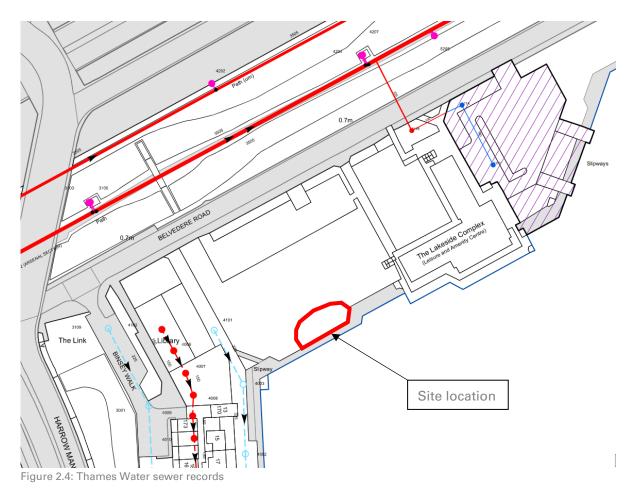
Figure 2.2: Site area



Figure 2.3: Existing site, showing site boundary

2.1 Existing Drainage

There is no existing drainage located within the site boundary. The Thames Water sewer records (available in Appendix B) show that the nearest public sewers are located within the South Thamesmead Phase 2 development to the west. An extract from the sewer records is shown in Figure 2.4 below.



3 Development Proposal

The proposed works are limited to relocating gym equipment, the installation of a new exercise station and providing a safety surface for the gym equipment. The safety surface is a grass matta product, which will be in green and allow the grass to grow through, reducing the visual impact of the works on the existing slope. No works are proposed to the existing trees and all works are outside of the root protection area of the trees. All residents have access to the gym area via an existing pedestrian path. The proposed development plans are available in full in Appendix C.

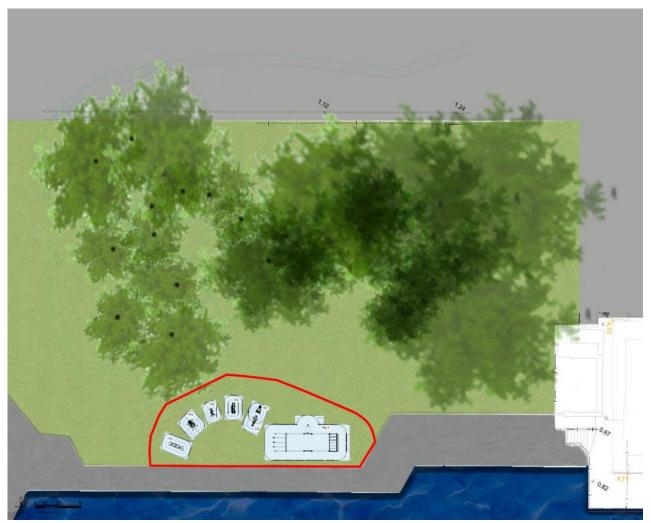


Figure 3.1: Proposed layout

4 Flood Risk Assessment

4.1 Flood Risk from Rivers and the Sea

The EA's flood map for planning shows that the site is located in Flood Zone 3 and is at risk of flooding from the River Thames which is tidal at this location. Land in this flood zone is assessed as having annual probability of tidal flooding greater than 0.5%. The site is also in Flood Zone 3 associated with the Marsh Dykes. Land in this flood zone is assessed as having an annual probability of river flooding greater than 1%.

The EA's maps suggests that the site is located in an area which benefits from flood defences, however the EA's website also states that not all defences are shown on the map.

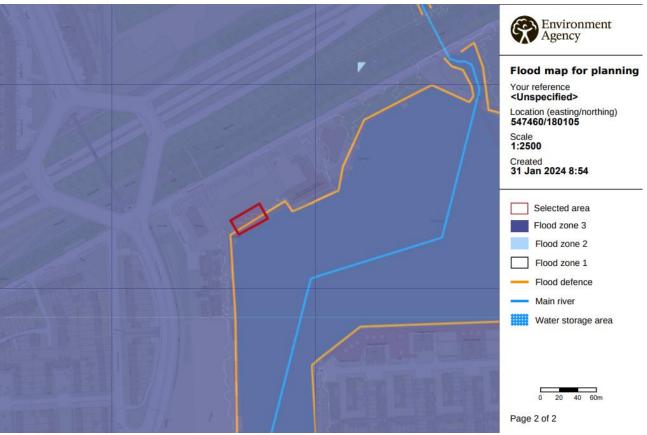


Figure 4.1: EA Flood Map for Planning

The EA's Product 4 information for the River Thames shows that the nearest upstream Node to the site is 3.7. The Extreme Water Level for this node is 6.01m AOD and will be increased to 6.95m AOD and 7.46m AOD by 2120 and 2170 respectively, due to climate change. The information shows that the current flood defence level is set at 7.10m AOD and will be increased to 8.20m AOD in the future to allow for climate change. Therefore, the actual risk of flooding from the River Thames is very low, as the flood defences currently protect and will continue to protect the site in the future.

The Marsh Dyke is located to the south of the site and is shown as a main river in Figure 4.1. The Marsh Dykes Modelling was completed in May 2020 by JBA Consulting. The outputs from this integrated model shows the flood extents from multiple sources, in the case of Marsh Dykes, flood risk from fluvial, pluvial runoff (surface water) and sewers. Extracts from the modelling are included within Figure 4.2 below.

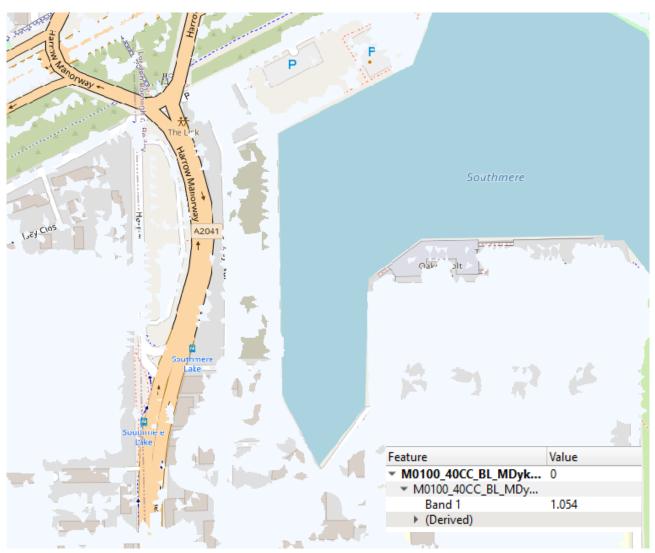


Figure 4.2: Marsh Dyke Flood Levels

The model shows that the 100 year plus 40% climate change flood level is 1.054m AOD. The site levels vary from approximately 0.8m AOD to -0.3m AOD meaning the site is at risk of flooding from the Marsh Dykes.

Flood mitigation measures are discussed in Section 5 of this report.

4.2 Sequential and Exception Tests

4.2.1 Sequential Test

In accordance with the NPPF, inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where

development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere. The proposed development is classified as "Water Compatible" which is appropriate in Flood Zone 3a, as Table 4.1 shows. However, the NPPF states that the Sequential Approach must be adopted within the site, locating the most vulnerable elements of the development in areas of lowest flood risk.

Flood Risk Vulnerability Classification		Essential	Water	Highly	More	Less
		Infrastructure	Compatible	Vulnerable	Vulnerable	Vulnerable
	Zone 2	✓	✓	Exception	✓	√
Zone				test required		
Zo	Zone 3a	Exception test	✓	×	Exception	✓
Flood		required			test required	
Flo	Zone 3b	Exception test	✓	x	×	×
	Functional	required				
	Floodplain					

Key: ✓ Development is appropriate.

Table 4.1: Flood Risk Vulnerability and Flood Zone Compatibility from PPG "Flood Risk and Coastal Change" Table 3

Since the entire site areas is within an area at high risk of flooding, the Sequential Test can be considered to assess if the proposed development can be located elsewhere. The proposed development is for the relocation of outdoor gym equipment which serves a specific development which is within Flood Zone 3 in its entirety. It is therefore not practical to relocate the gym equipment to another site.

4.3 Flood Risk from Groundwater

Groundwater flooding occurs when water underground that is usually held in the rocks and soil (known as the water table) gets so high that it flows above the surface. The EA flood risk summary for the area states that groundwater flooding is possible in the local area when groundwater levels are high.

The impact of groundwater flooding on the proposed development is considered to be low.

4.4 Flood Risk from Surface Water and Overland Flows

Surface water flooding occurs when intense rainfall is unable to soak into the ground or enter a drainage system due to blockages or the capacity of the system being exceeded. Overland flows can also be generated by burst water mains, failed dams and any failure in a system storing or transferring water.

The EA's indicative Surface Water Flooding Map, available in Figure 4.2 below, shows that the site is at very low risk of surface water flooding which means that the chance of flooding is less than 0.1% each year.

[×] Development should not be permitted.



Extent of flooding from surface water

High Medium Low Very Low

Figure 4.2: Environment Agency Surface Water Flood Risk Map

4.5 Flood Risk from Reservoirs

The EA provides information on flood risk from reservoirs. The map showing the maximum extent of flooding from reservoirs was updated in 2021 and now shows the combined effects of flooding from reservoirs and rivers. Figure 4.3 shows that the site is not at risk of reservoir flooding when river levels are normal.



Maximum extent of flooding from reservoirs:

when river levels are normal when there is also flooding from rivers

Figure 4.3: Environment Agency Risk of Reservoir Flooding Map

4.6 Flood Risk from Sewers

Sewer flooding occurs when the flow entering the sewerage network is greater than the capacity of the sewers. There are no public sewers located within the vicinity of the site and so the risk of flooding from sewers is considered to be very low.

5 Safe Access and Egress

In accordance with the PPG, a safe access to an area outside the floodplain must be provided for all new developments. Safe access should remain available at all times during the lifetime of the development. Therefore, the impact of climate change must be considered in the assessment.

In the event of a flood event associated with the Marsh Dyke, site users will be able to safely exit the site and seek refuge in the area to the north of the development where the ground levels are greater than the 100 year plus 40% climate change flood level of 1.054m AOD.

6 Surface Water Drainage

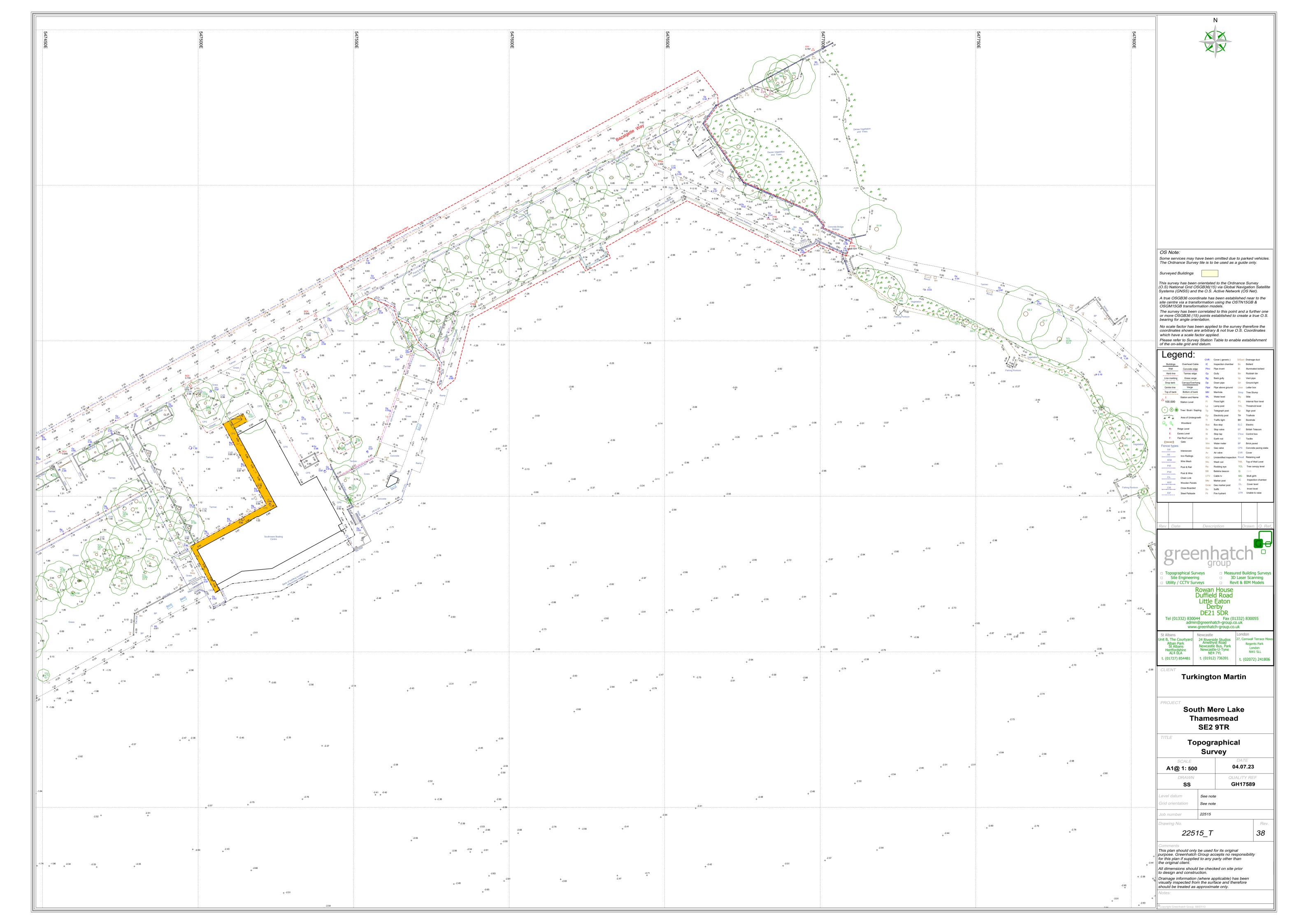
The existing site is greenfield and does not have any formal surface water drainage.

The proposals are for the gym equipment to be located on a safety surface which allows grass to grow through. Therefore, positive surface water drainage is not required and the site will continue to drain in the same way.

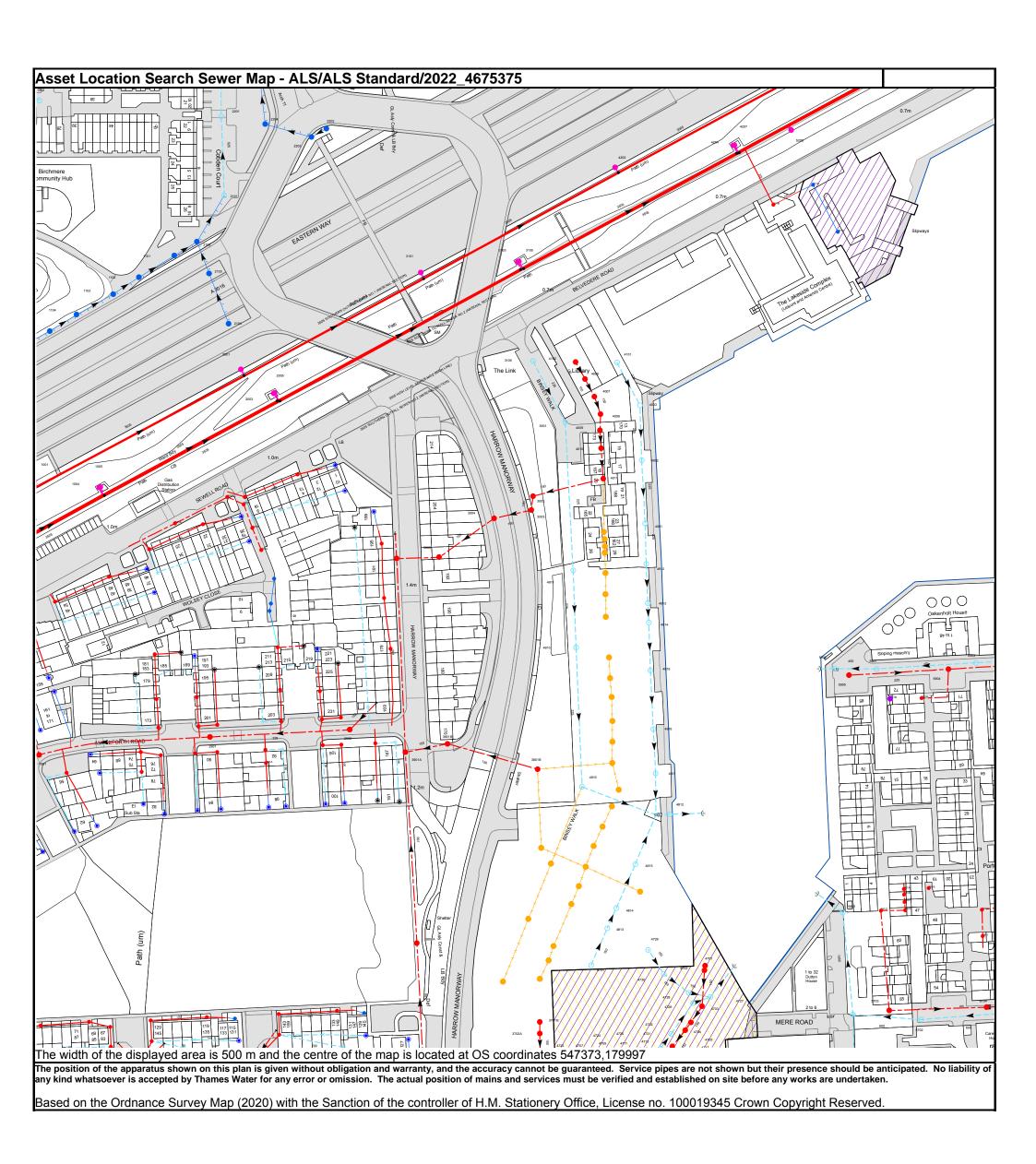
7 Conclusions

- The site is located within Southmere Park within the London Borough of Bexley. The site is centred on the grid reference 547470, 180105 and the site postcode is SE2 9AN.
- The proposed works are limited to relocating gym equipment, the installation of a new exercise station and providing a safety surface for the gym equipment.
- The EA's flood map for planning shows that the site is located in Flood Zone 3 and is at risk of flooding from the River Thames which is tidal at this location. Land in this flood zone is assessed as having annual probability of tidal flooding greater than 0.5%. The site is also in Flood Zone 3 associated with the Marsh Dykes. Land in this flood zone is assessed as having an annual probability of river flooding greater than 1%.
- This development is classed as a 'water-compatible development' which is classified as appropriate in Flood Zone 3 according to the NPPG.
- The proposals are for the gym equipment to be located on a safety surface which allows grass to grow through. Therefore, positive surface water drainage is not required and the site will continue to drain in the same way.

Appendix A Topographical Survey



Appendix B **Thames Water Sewer Records**



<u>Thames Water Utilities Ltd</u>, Property Searches, PO Box 3189, Slough SL1 4W, DX 151280 Slough 13 T 0800 009 4540 <u>E searches@thameswater.co.uk</u> I <u>www.thameswater-propertysearches.co.uk</u>

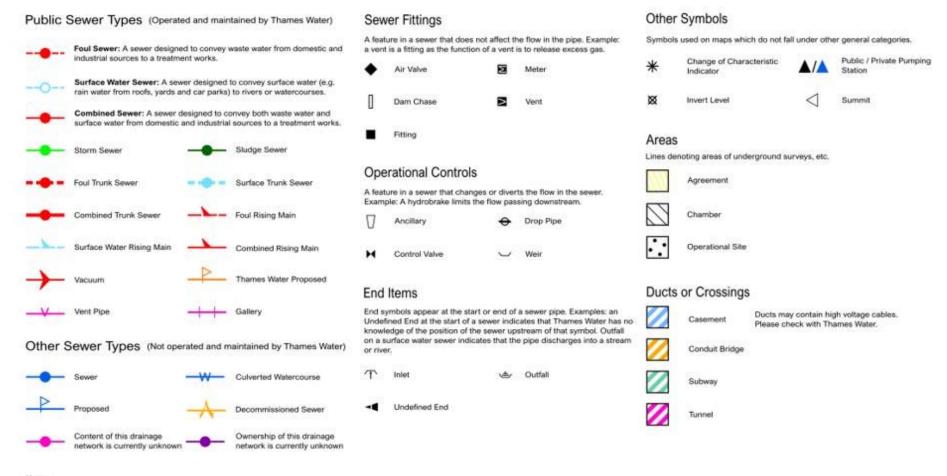
Manhole Reference	Manhole Cover Level	Manhole Invert Level
1105	n/a	n/a
2104	n/a	n/a
1104 1103	n/a n/a	n/a n/a
1102	n/a	n/a
2103	n/a	n/a
1101	n/a	n/a
2102	n/a	n/a
2101 2203	.96 n/a	99 n/a
2202	n/a	n/a
2204	n/a	n/a
2201	1.04	-1.06
1202	.72	63
29ZR 30ZX	n/a n/a	n/a n/a
39ZS	n/a	n/a
3006	n/a	n/a
3101	n/a	n/a
3005 3004	3.88 1.23	-1.97 -1.67
3103	n/a	n/a
3105	n/a	n/a
3003	1.23	-1.56
3002	2.84	-1.54
3109	.65	49
3001 4911	.68 1.03	6 93
4102	1.06	93 19
4006	1.04	33
4007	1.05	71
4009	1.06	94
4008 4010	1.11 1.6	83 52
4010	1.6 1.03	52 -1.27
4913	.69	-1.15
4912	.66	-1.12
4001	.67	n/a
4002	.69	n/a
4003 4101	.67 .72	72 58
511C	.69	93
511B	.97	n/a
511A	.7	-1.3
4202	n/a	n/a
4204 4207	n/a n/a	n/a n/a
5205	n/a	n/a
19VY	n/a	n/a
29XC	n/a	n/a
19VZ	n/a	n/a
29XB 19VW	n/a n/a	n/a n/a
29XA	n/a	n/a
19VQ	n/a	n/a
19WT	n/a	n/a
20WV	n/a	n/a
201A 10YX	n/a n/a	n/a n/a
201B	n/a	n/a
20WQ	n/a	n/a
101A	n/a	n/a
20XX 201C	n/a	n/a
201C 20XY	n/a n/a	n/a n/a
201D	n/a	n/a
20XV	n/a	n/a
1004	n/a	n/a
1005	n/a	n/a
20WZ 2003	n/a n/a	n/a n/a
2005	n/a	n/a
2001	1.61	n/a
5801	n/a	n/a
5701 591D	n/a	n/a
581D 5703	n/a .81	n/a -1.84
581F	n/a	n/a
581C	n/a	n/a
5702	n/a	n/a
681H	n/a	n/a
681I 6704	n/a 64	n/a -2.04
4815	.64 .63	-2.04 n/a
4914	.7	-1.14
4915	.68	-1.23
4916	.67	-1.36
4811	.68	-1.48
4812 5902	.38 n/a	7 n/a
5905	.63	n/a -1.79
1 3333		

Manhole Reference	Manhole Cover Level	Manhole Invert Level
5901	n/a	n/a
591B	n/a	n/a
581A	n/a	n/a
581E	n/a	n/a
591A 581B	n/a n/a	n/a n/a
5904	.61	-2.05
6903	n/a	n/a
4721	.9	-1.72
4717	.98	42
4722	.78	-1.73
4705	.97	28
4704	.96	22
4703	1.01	12
4726	.87	n/a
4727	.97	n/a
4728 4730	.74 .65	72
4702	1.19	49 .21
4701	1.18	.21
4731	.73	39
4729	.53	31
4813	.67	44
4814	.67	55
27TR	n/a	n/a
27UZ	n/a	n/a
3801A	1.54	-2.8
3701B	1.07	2
3702A	1.09	25
29QW 29WZ	n/a	n/a
29WZ 2902	n/a .67	n/a 91
29YW	.07 n/a	n/a
29XZ	n/a	n/a
29ZV	n/a	n/a
39YX	n/a	n/a
39ZV	n/a	n/a
3901A	1.12	-2.88
3901B	2.07	-1.83
3801B	3.19	-1.38
4910	.61	-1.13
4810	.79	-1.53
27VW	n/a	n/a
27VQ 27VT	n/a	n/a
27V1 27UV	n/a n/a	n/a n/a
27UU	n/a	n/a
27TZ	n/a	n/a
27UW	n/a	n/a
18ZQ	n/a	n/a
28ZR	n/a	n/a
18YZ	n/a	n/a
18XS	n/a	n/a
281A	n/a	n/a
18VT	n/a	n/a
1801 20YW	.71 n/a	-1.85
29XW 19ZX	n/a n/a	n/a n/a
29XX	n/a	n/a
29XT	n/a	n/a
29XU	n/a	n/a
29XR	n/a	n/a
2901	.73	-1.33
19YT	n/a	n/a
19YS	n/a	n/a
29VY	n/a	n/a
29VZ	n/a	n/a
29TW	n/a	n/a
29TV 29QV	n/a n/a	n/a n/a
19WY	n/a	n/a n/a
29UZ	n/a	n/a
29YE	n/a	n/a
29SR	n/a	n/a
19XV	n/a	n/a
29SY	n/a	n/a
17UZ	n/a	n/a
17UY	n/a	n/a
17UQ	n/a	n/a
17UT	n/a	n/a
17UV	n/a	n/a
17UU 17TY	n/a n/a	n/a n/a
'' '	n/a	n/a
The position of the apparatus shown on this plan i	s given without obligation and warranty, and the acc	curacy cannot be guaranteed. Service nines are not
	iability of any kind whatsoever is accented by Thames	,

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 Key



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.
- 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.

Appendix C Proposed Development Plans

Scale Barin m 1:1250

NOTES:

This drawing is to be read in conjunction with all relevant contract documentation from the design team, with any conflicting information to be brought to the attention of Turkington Martin Landscape Architects in writing before commencing on site.

 The contractor is to check and verify all levels and dimensions before construction. Any discrepancies are to be brought to the attention of Turkington Martin Landscape Architects in writing before commencing on site.

3. All dimensions in mm, unless otherwise stated.4. Do not scale from this drawing.

All sub base and concrete design and specification to engineer's details. All diagrams provided here are purely indicative.

6. Waterproofing of any element to be specified by

7. All proprietary products shall be installed in accordance with manufacturers written instructions.

Plant numbers are an indication only and plants should be ordered to suit site areas in accordance with scheduled plant densities.

Any proposed plant substitution shall be agreed with the landscape architect prior to ordering.

Existing Gym Location



turkington martin

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CLIENT Peabody

PROJECT TITLE
The Links GYM

DRAWING TITLE
Existing Gym Location Plan
DRAWING STATUS

For Planning

DRAWING SCALE: D

PAPER SIZE :

DRAWN BY: DRAWN DATE:

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TS 202

DRAWING NUMBER: LK616-TML-ZZ-00-DR-L-0220

PO1

Turkington Martin LANDSCAPE ARCHITECTS



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CLIENT Peabody

PROJECT TITLE

The Links GYM DRAWING TITLE

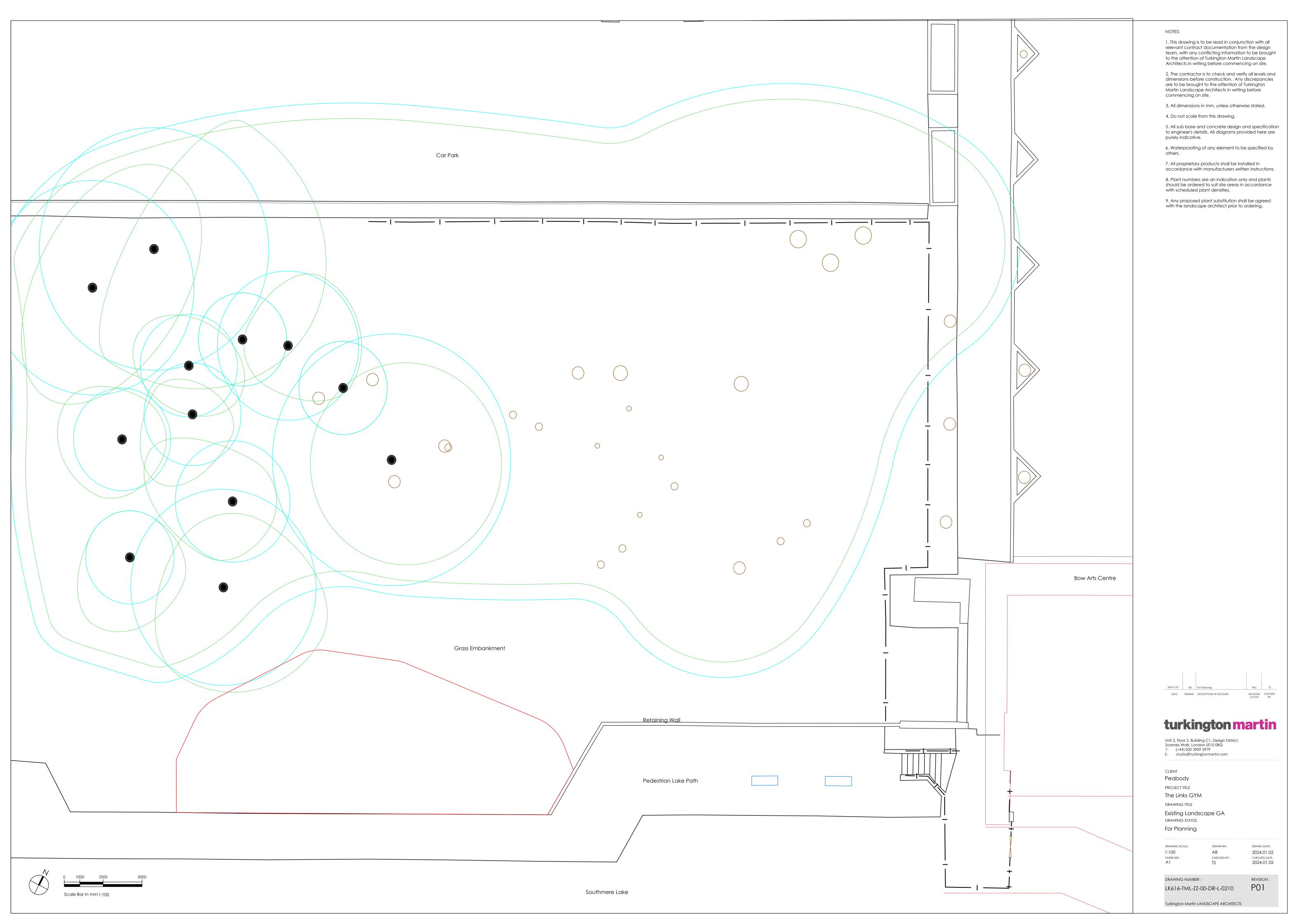
Location Plan DRAWING STATUS For Planning

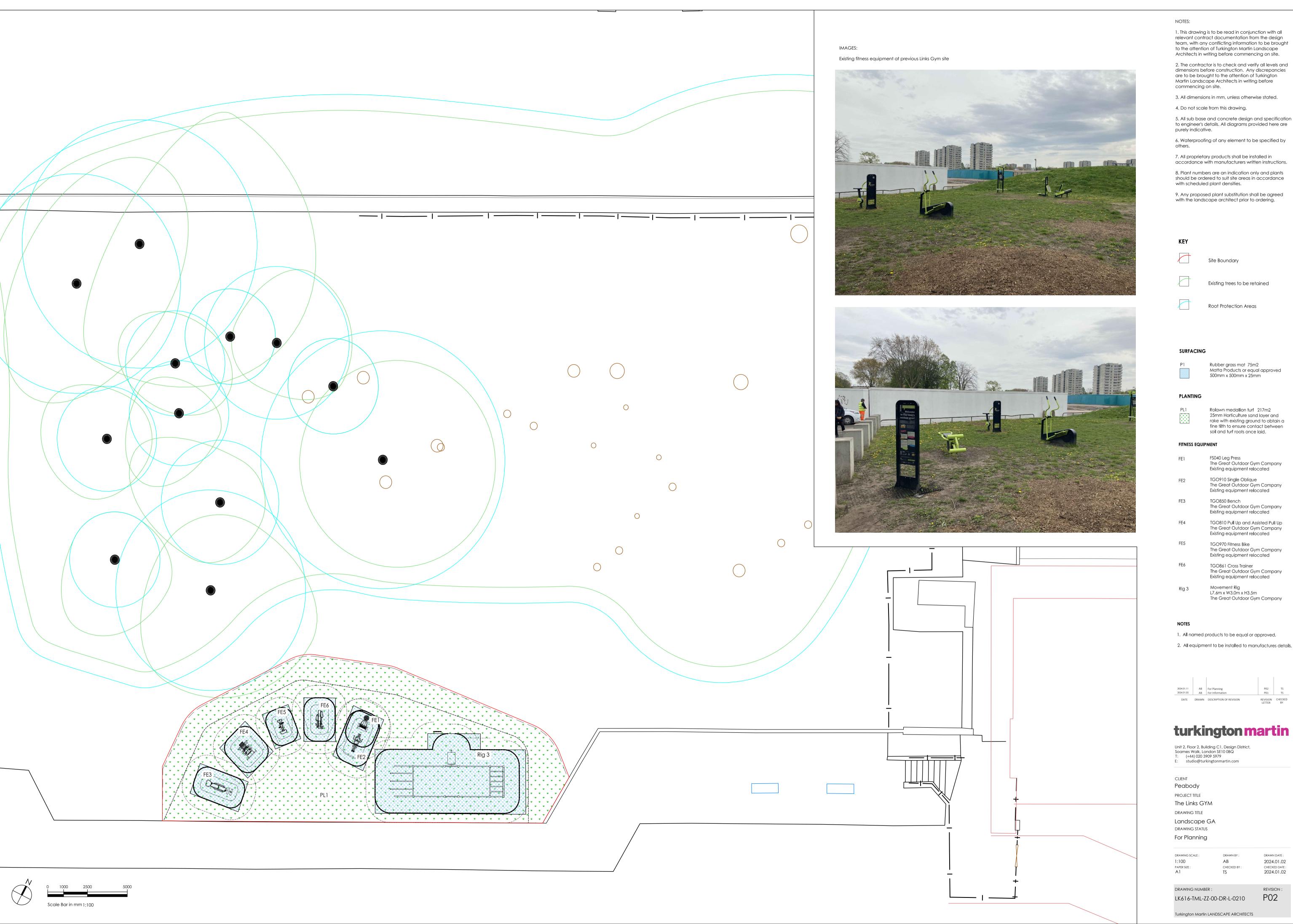
DRAWING SCALE: PAPER SIZE :

2024.01.02 CHECKED DATE: 2024.01.02 REVISION:

DRAWING NUMBER: LK616-TML-ZZ-00-DR-L-0250

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6. Waterproofing of any element to be specified by

8. Plant numbers are an indication only and plants should be ordered to suit site areas in accordance with scheduled plant densities.

9. Any proposed plant substitution shall be agreed

500mm x 500mm x 25mm

25mm Horticulture sand layer and rake with existing ground to obtain a fine tilth to ensure contact between soil and turf roots once laid.

FS040 Leg Press The Great Outdoor Gym Company

The Great Outdoor Gym Company

The Great Outdoor Gym Company

Existing equipment relocated

Existing equipment relocated

TGO861 Cross Trainer The Great Outdoor Gym Company

Existing equipment relocated

All named products to be equal or approved.

2. All equipment to be installed to manufactures details.

2024.01.02

2024.01.02

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REVISION:

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