

5.18. The Barkham Brook is considered of medium importance for the discharge of surface water runoff as is the River Loddon into which the discharge ultimately outfalls and is therefore considered appropriate for the discharge of surface water from the development site.

Priority 4: Discharged to a surface water sewer, or another piped surface water drainage system

5.19. As this is further down than the hierarchy than a connection to a surface water body or watercourse, this has not been considered within the assessment.

Priority 5: Discharged to a combined sewer

5.20. There are no combined water sewers and drains within the vicinity of the site. As this is further down than the hierarchy than a connection to a surface water body or watercourse, this has not been considered within the assessment.

5.21. The proposed surface water drainage strategy has followed the priority list and will discharge surface water in accordance with Priority 3. The design is therefore considered to be compliant with Standard 1.

Standard 2: Management of Everyday Rainfall (Interception)

5.22. The new Standard 2 requires all development to "apply a 'SuDS approach' so that at least the first 5mm of rainfall for the majority of rainfall events does not result in runoff from the site to surface waters or piped drainage systems."

5.23. The overall surface water drainage strategy intended to serve the masterplan is proposed to be split into 4 separate parcels / catchments (1 to 4), see Figure 5-1 above, although they all ultimately drain through a single outfall. The runoff from the parcels will all be discharged through a minimum of 2 no. detention basins where interception will be provided. The basins have been provisionally sized to assume 60% of each catchment is impermeable.

5.24. As the site is underlain by London Clay Formation, it is not feasible to provide formal infiltration measures. However, as groundwater is anticipated to be low, it is possible to include unlined detention basins to provide interception through small amounts of infiltration.

5.25. However, as a conservative measure, an assessment of lined detention basins has been undertaken to demonstrate that the interception requirements for Standard 2 can be provided where no natural infiltration occurs.

Lined Storage/Detention Basins

5.26. It is proposed that lined basins contain a layer of at least 500mm of suitable base material, which will ensure the basins are suitable for interception for impermeable surface areas up to 5 times the base of the vegetated surface area receiving the runoff, in accordance with the National Standards for SuDS.

5.27. The area of the basin that is assumed to contribute to interception of runoff shall be below the outlet level of the basin. Generally, outfall levels from detention basins will be set 100mm to 150mm above the lowest point of a detention basin.

5.28. As the design progresses, it is possible that some basins may be terraced to achieve multi-functional benefits where the lower area of the basin will be used for interception. However, for simplicity, it is assumed that the entire base of the storage/detention basins sits 100mm to 150mm below the outfall pipe. Table 5-2 below sets out the interception requirement for each basin.

Table 5-2: Interception for Proposed Basins

	A	B	C	D	
Basin	Approx. Imp. Area (ha)	Base Area of Basin (ha)	5 Times Base Area (ha) (5 x B)	Remaining Imp Area to be Intercepted (ha) (A-C)	Min level of outfall above base of basin (mm) (D x 5mm/B)
1	3.67	0.15	0.75	2.92	97
2	1.71	0.25	1.25	0.46	92
3	1.67	0.09	0.45	1.22	67
4	N/A	0.19	0.95	N/A	N/A
5	N/A	0.20	1.00	N/A	N/A
6	2.76	0.10	0.50	2.26	113
Approximate Contributing Areas / Parcel / Basin Basin 1 – 50% Parcel 3 Basin 2 – 100% Parcel 1 + 50% Parcel 3 Basin 3 – 50% Parcel 4 Basin 6 – 100% Parcel 2 + 50% Parcel 4					

5.29. The above approach is very conservative and does not allow for the additional basin areas or SuDS elements used across the development site, such as permeable paving, swales, infiltration trenches, bioretention areas etc. to be proposed within the development parcels. Conveyance swales, integrated within the landscaping, will be able to capture and treat surface water runoff before it is ultimately discharged to the storage/detention basins before out falling into the wider watercourses throughout the site.

5.30. In addition, features such as tree-pits will intercept water for natural irrigation of the landscaping and therefore remove some of the runoff from the network prior to it reaching the wider network.

5.31. Given the conservative assessment above it is considered that the surface water drainage design is considered compliant with Standard 2.

Standard 3: Management of Extreme Rainfall and Flooding

5.32. This standard requires the development undertakes "a 'SuDS approach' shall be adopted to address the management of development runoff during extreme rainfall, including allowances for climate change and urban creep".

Pre and Post Development Impermeable Area

5.33. The developable area equates to approximately 18.23 hectares of which the entirety is completely Greenfield. The post-development changes increase the impermeable area through the introduction of the residential units and associated infrastructure. However, there is no Masterplan at this stage of the design process and, as such, a conservative amount of impermeable development has been allowed for in the assessment of the management of surface water runoff.

5.34. A summary of this conservative change in impermeable area across the site is provided in Table 5-3 below.

Table 5-3: Summary of Pre- and Post-Development Impermeable Areas

site Ref.	Total Area (ha)	Impermeable Area (ha)	Permeable Area (ha)	% Impermeable
Pre-Development	18.23 ha	0.000 ha	18.23 ha	0 %
Post-Development	18.23 ha	10.94 ha	7.68 ha	60 %

Urban Creep

5.35. The proposed development of 660no. units over a developable area of 18 ha would equate to a density of 32 dwellings/ha. In accordance with the Local Authority SuDS Officer Organization (LASOO) an Urban Creep Factor of 8% should be applied to the residential development at the

site. As there is no Masterplan available at this stage, it is not possible to determine the actual value for Urban Creep.

5.36. However, it is considered reasonable to conclude that the urban creep will be represented within the estimated 60% impermeable area across the development site and has therefore been considered appropriately at this stage.

Proposed Discharge Rates

5.37. Greenfield runoff rates for the developable area, and individual parcels, have been determined using the ICP SuDS Mean Annual Flow Method with a summary of the results provided in Table 5-4 below with the calculations provided in **Appendix D**.

Table 5-4: Greenfield Runoff Rates

Scenario	Area	$Q_{Bar.}$	$Q_{1yr.}$	$Q_{30yr.}$	$Q_{100yr.}$
Developable Area	18.23 ha	80.1 l/s	68.1 l/s	181.5 l/s	255.5 l/s
<i>Parcel 1</i>	3.32 ha	14.6 l/s	12.4 l/s	33.1 l/s	46.5 l/s
<i>Parcel 2</i>	3.64 ha	16.0 l/s	13.6 l/s	36.2 l/s	51.0 l/s
<i>Parcel 3</i>	5.69 ha	25.0 l/s	21.2 l/s	56.7 l/s	79.7 l/s
<i>Parcel 4</i>	5.58 ha	24.5 l/s	20.8 l/s	55.6 l/s	78.2 l/s

5.38. The proposals are to discharge the development at the 1 in 1-year Greenfield runoff rate for all storms up to and including the 1 in 100-year storm event with an allowance of 40% for climate change. This therefore equates to a maximum discharge rate of 68.1 l/s from the development site. This will be provided through outfalls into the Barkham Brook to the south of the proposed development parcels.

Proposed Surface Water Attenuation

5.39. In order to facilitate the 1 in 1-year Greenfield runoff rate for all storms up to and including the 1 in 100-year storm event with an allowance of 40% for climate change, it is necessary to provide attenuation across the site for the surface water runoff.

5.40. The Causeway Flow design software has been utilised to conservatively calculate the preliminary storage requirements for the 1 in 100-year + 40% climate change allowance storm event based on an impermeable area of 10.94 ha and a discharge rate of 68.1 l/s. The maximum calculated storage volume for the development site is 9,054m³, as shown in Figure 5-2 below.

Storage Estimate	
Return Period (years)	100
Climate Change (%)	40
Impermeable Area (ha)	10.940
Peak Discharge (l/s)	68.100
Infiltration Coefficient (m/hr) (leave blank if no infiltration)	
Required Storage (m³)	Calc
from	7462
to	9054
With infiltration (m³)	
from	
to	

Figure 5-2: Screenshot of Causeway Flow Storage Estimate Function

5.41. As such, it is proposed to utilise a combination of larger storage and conveyance features in the form of swales and detention basins working in coordination with permeable paving and smaller scale rainwater harvesting and bio-retention features. The majority of the storage will be provided within the detention basins with the full drainage design, including hydraulic connectivity, to be detailed upon finalisation of the site Masterplan at a later stage.

5.42. The provisional drainage strategy layout, identifying the basins and outfall location, is provided in **Appendix E**.

Long Term Storage

5.43. As the proposals are to discharge the surface water runoff for the development site to the 1 in 1-year Greenfield runoff rate, it is not necessary to consider long term storage.

Exceedance Routes

5.44. As a result of heavy or extreme storm events, it is sometimes unavoidable for the capacity of sewers and other drainage systems to be exceeded. Drainage exceedance will occur when the rate of surface water runoff exceeds the inlet capacity of the drainage system, when the receiving water or pipe system becomes overloaded, blocked or when the outfall is restricted due to flood levels in the receiving water.

5.45. A detailed levels strategy will be undertaken at a later stage it is proposed that exceedance flows will be retained within the road network and towards the detention basin and Barkham Brook to ensure the properties are not affected by these flows.

5.46. Given the above approach, the surface water drainage design is considered compliant with Standard 3.

Standard 4: Water Quality

5.47. The recommended stage of treatment in terms of water quality will be provided through the aforementioned SuDS features. In line with the SuDS Manual C753, Tables 26.2 and 26.3, the pollution hazard and mitigation indices associated with residential roofs can be mitigated by the provision of SuDS features.

5.48. A summary of the pollution hazard and mitigation indices associated to the development proposals has been conservatively provided in Table 5-5 below. This demonstrates that the basin alone provides enough

treatment to the runoff without any consideration given to the upstream SuDS features which will provide a greater level of treatment upstream.

Table 5-5: CIRIA C753 SuDS Mitigation Indices

For surface water discharge from Residential Parking Areas and Low Traffic Roads <300 traffic movements/day			
	Required mitigation indices		
Source	TSS	Metals	Hydrocarbons
Low	0.5	0.4	0.4
Type of SuDS Component Provided			
Detention Basin	0.5	0.5	0.6
Total	0.5	0.5	0.6
Check	+0.0	+0.1	+0.2

5.49. Given the treatment indices applied, coupled with the additional treatment due to the wider SuDS features to be incorporated within the parcels design which has conservatively not been applied, it is considered the potential pollutants are managed and the design is therefore considered compliant with Standard 4.

Standard 5: Amenity

5.50. This standard considers the aesthetic and recreational value of the SuDS features, making them enjoyable and beneficial for the community.

5.51. The proposed SuDS strategy incorporates an above ground attenuation basins which has been designed to incorporate it into the landscaping of the proposed development and SANG. The attenuation basin will be seeded with the same mix as the proposed landscaping across the development and reflects the local context of the area.

5.52. In addition, access to the site by foot, from the south, has been incorporated within the basin with the proposed footpath linking in with the basin therefore providing amenity and interaction between the SuDS features and the occupants of the site.

5.53. The above measures comply with the requirements of Standard 5 and are therefore considered appropriate.

Standard 6: Biodiversity

5.54. Standard 6 of the National Standards for SuDS requires all surface water drainage system to add biodiversity value by:

- creating diverse, self-sustaining, resilient local ecosystems which contribute to net gains in biodiversity
- supporting and promoting natural local habitat and species, for example, through local nature recovery strategies (LNRS)
- contributing to the delivery of local biodiversity strategies
- contributing to habitat connectivity

5.55. The proposed SuDS strategy has been considered as part of the wider landscaping of the proposed development, which has been developed with biodiversity in mind, and is in line with CIRIA guidance and LLFA requirements. There are no significant ecology constraints on site which would have an influence on the positioning of the proposed SuDS.

5.56. The main SuDS features on site will be an attenuation basin which will enhance biodiversity through the selection of appropriate plant species providing a beneficial habitat for invertebrates which in turn will provide a prey resource for bats and birds.

5.57. There are limited additional measures that can be incorporated across the site within the drainage strategy but the above measures are considered compliant with Standard 6.

Standard 7: Design of Drainage for Construction, Operation, Maintenance, Decommissioning and Structural Integrity

5.58. This standard covers the entire lifecycle of the SuDS, from initial design to eventual decommissioning, ensuring long-term functionality and safety.

5.59. The drainage design has been produced with consideration to longer term construction methods, to ensure that the proposals are deliverable. This includes details on the levels of the associated drainage works, alongside appropriate specification of materials and design to ensure that the proposals remain operational for the lifetime of the development.

5.60. The maintenance of all SuDS components will be in accord with the best practices and the CIRIA Manual C753. The responsibility will lie with a Management Company appointed by the developer. The name of the Management Company is to be advised at a later date.

5.61. The design is considered deliverable in a sustainable and safe manner and, as such, is considered compliant with Standard 7.

Foul Water Strategy

5.62. Refer to **Appendix E** for the drawing no. 2303262-ACE-XX-XX-DR-C-0301A, showing the preliminary Drainage strategy.

5.63. As the existing site is greenfield, it will currently generate no foul water demand, nor have an existing connection to the sewer network or similar.

5.64. The proposed number of residential units is 660 units plus elderly care accommodation , and following capacity check with Thames Water it was confirmed that the 375mm diameter sewers to the east of the main development have available capacity. Refer to **Appendix F** for capacity response letter from Thames Water.

5.65. The strategy for the development is to drain the entire development to the east; this will discharge via a pump station beneath the brook and into the agreed existing 375mm sewers. Refer to **Appendix E** for more high-level drainage concept.

6. Conclusions

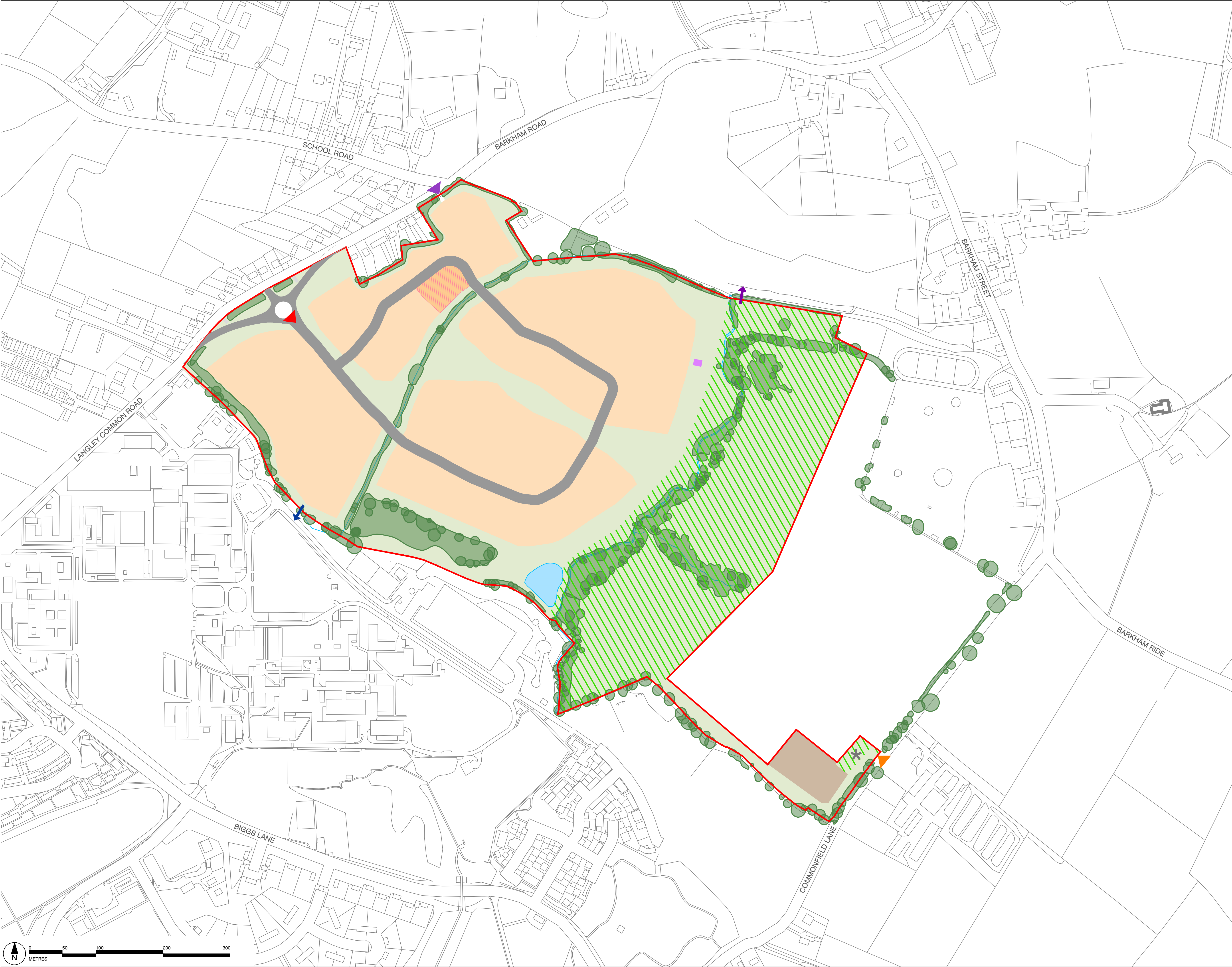
- 6.1. Ardent Consulting Engineers has been appointed by Crest Nicholson Ltd to provide a Flood Risk Assessment and Drainage Strategy in support of an outline planning application for the phased development at Barkham Square, Arborfield.
- 6.2. The proposals are for the phased development of up to 660 residential dwellings (C3 Use Class) and elderly care accommodation at the land north of Arborfield Green, Arborfield, Wokingham.
- 6.3. This FRA considers the current policy relating to flood risk, including the National Planning Policy Framework and local flood risk policy.
- 6.4. The Environment Agency's Flood Map for Planning indicates that part of the site, along the eastern part, is within Flood Zones 2 and 3 associated with the Barkham Brook. Hydraulic model data was obtained from the Environment Agency which confirmed the development will not be located within the flood extent for the 100 year + CC extent for the central or higher central allowances. A sequential approach was undertaken in order to locate residential buildings outside the flood outline and allow the proposed open space areas to flood.
- 6.5. Surface water run-off will be managed as part of the proposed surface water drainage strategy. Therefore, the risk of pluvial flooding is assessed as 'low'. All other sources of flooding are assessed as low.
- 6.6. A sustainable drainage system has been designed to incorporate detention basins along with the proposals for wider SuDS features upon development of the Masterplan. Storm water attenuation is provided for all storms up to and including the 1 in 100-year critical event (including a 40% allowance for climate change) and has been shown to be compliant with the National Standard for SuDS Policy Requirements.
- 6.7. The proposed number of residential units is 660 units plus elderly care accommodation, and following capacity check with Thames Water it was confirmed that the 375mm diameter sewers to the east of the main development have available capacity.

6.8. The foul water strategy for the development is to drain the entire development to the east; this will discharge via a pump station beneath the brook and into the agreed existing 375mm sewers.

6.9. In conclusion, the proposals are consistent with the aims of NPPF and PPG along with the aims of the Strategic Flood Risk Assessment (including the broader strategic planning requirements of Wokingham Borough Council).

Appendix A

Illustrative Parameter Plan



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LEGEND:

- APPLICATION BOUNDARY
- EXISTING
 - EXISTING VEGETATION
 - EXISTING DITCH
 - EXISTING WATERCOURSE
 - EXISTING POND
- PROPOSED
 - RESIDENTIAL DEVELOPMENT
 - ELDERLY CARE
 - PUBLIC OPEN SPACE
 - ALLOTMENTS
 - SUITABLE ALTERNATIVE NATURAL GREENSPACE (SANG)
 - SANG CAR PARK
 - ROAD INFRASTRUCTURE EXACT ALIGNMENT SUBJECT TO DEVIATION +/-10M
 - VEHICULAR ACCESS
 - ALLOTMENT AND SANG CAR PARK ACCESS
 - EMERGENCY VEHICLE ACCESS
 - NON VEHICULAR ACCESS POINTS
 - NON VEHICULAR ARBORFIELD GREEN ACCESS POINT CONNECTION PROVIDED UP TO THE BOUNDARY
 - INDICATIVE FOUL WATER PUMPING STATION LOCATION

J	Updated application boundary	24/02/26
I	Access arrows updated	17/02/26
H	Updates to Land Owner comments	27/01/26
G	Updated note in key	28/11/25
F	Increased NDA & updated site boundary	29/08/25
E	Updates to Crest comments	21/08/25
D	Updates to client and LPA comments	24/06/25
C	Updated with pump station location	29/11/24
B	Updated application boundary	21/11/24
A	Updated to Rapley comments	15/08/24
Rev	Description	Date

Purpose of Issue

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Client

CREST NICHOLSON

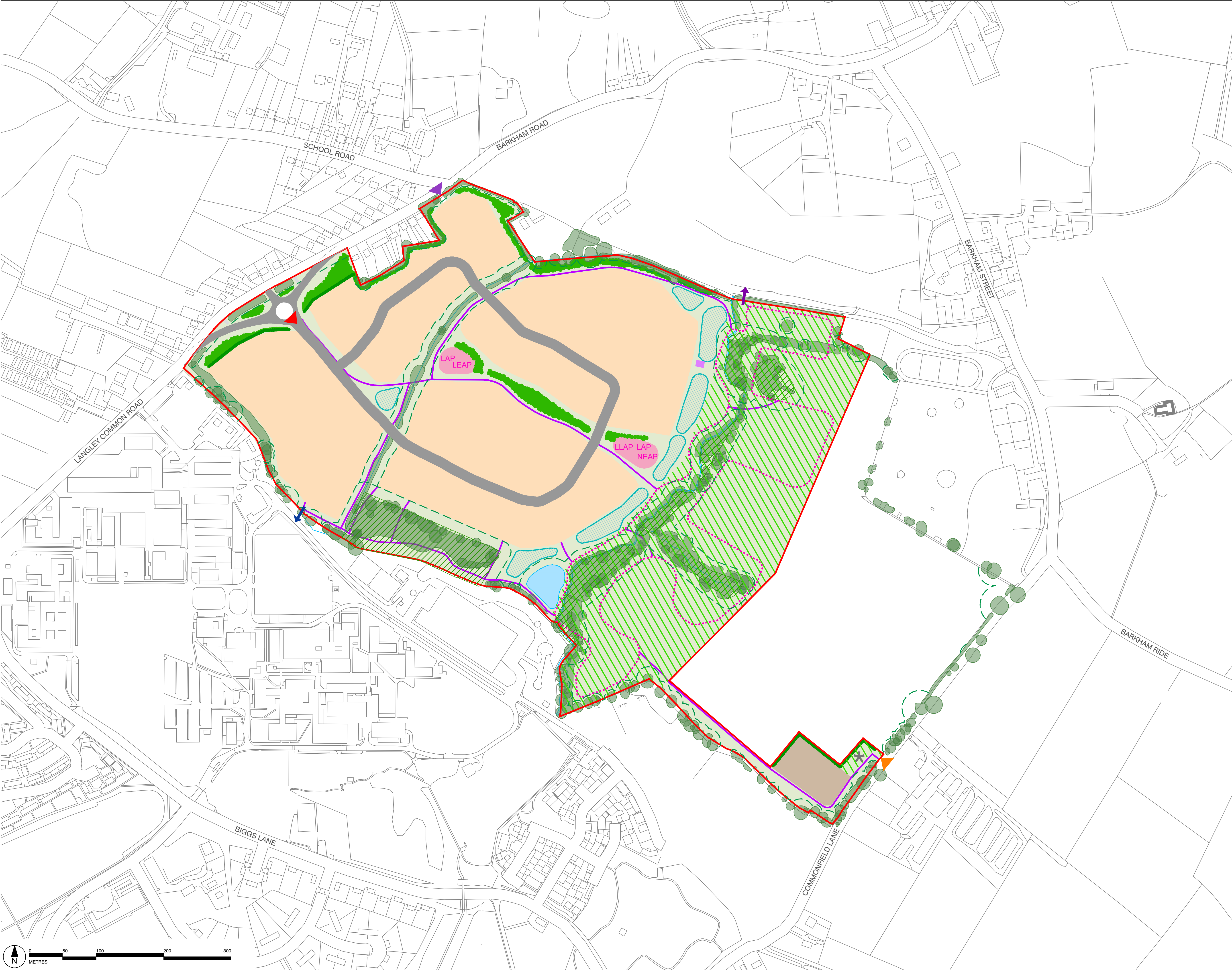
Project

BARKHAM SQUARE

Drawing Title

PARAMETER PLAN - LAND USE

Drawn EW	Checked MP	Approved RW	Date 09/08/2024
Job No. 23.0016	Scale 1:2500	Sheet Size A1	Revision J
Drawing Number BMD.23.0016.DR.P005			



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- APPLICATION BOUNDARY
- EXISTING
 - EXISTING ANCIENT WOODLAND
 - EXISTING VEGETATION
 - OFFSETS FROM VEGETATION & WATER
REFER TO S&P TOP NL 2020-011 BARKHAM SQUARE DWG AND NATURAL ENGLAND GUIDANCE
 - EXISTING DITCH
 - EXISTING WATERCOURSE
 - EXISTING POND
- PROPOSED
 - RESIDENTIAL DEVELOPMENT / ELDERLY CARE
 - INDICATIVE SUDS
 - PUBLIC OPEN SPACE
 - ALLOTMENTS
 - PROVISION FOR PLAY
NEIGHBOURHOOD EQUIPPED AREAS OF PLAY (NEAP), LOCALLY EQUIPPED AREAS OF PLAY (LEAP), LOCAL LANDSCAPED AREAS OF PLAY (LLAP), LOCAL AREAS OF PLAY (LAP)
 - SUITABLE ALTERNATIVE NATURAL GREENSPACE (SANG)
 - SANG CAR PARK
 - BUFFER/SCREENING PLANTING
 - HEDGEROW
 - SANG FOOTPATH
 - FOOTPATH OR PEDESTRIAN/CYCLE ROUTE
 - ROAD INFRASTRUCTURE
EXACT ALIGNMENT SUBJECT TO DEVIATION +/-150M
 - VEHICULAR ACCESS
 - ALLOTMENT AND SANG CAR PARK ACCESS
 - EMERGENCY VEHICLE ACCESS
 - NON VEHICULAR ACCESS POINTS
 - NON VEHICULAR ARBORFIELD GREEN ACCESS POINT
CONNECTION PROVIDED UP TO THE BOUNDARY
 - INDICATIVE FOUL WATER PUMPING STATION LOCATION

K	Updated application boundary	24/02/26
J	Access arrows updated	17/02/26
I	Updates to Land Owner comments	27/01/26
H	Updated note in key	28/11/25
G	Increased NDA and updated site boundary	29/08/25
F	Updates to Crest comments	21/08/25
E	Updates to client and LPA comments	23/06/25
D	Updated with pump station location	29/11/24
C	Updated application boundary	21/11/24
B	Updates to pedestrian/cycle route	05/09/24
A	Updated to Rapley comments	15/08/24
Rev	Description	Date

Purpose of Issue

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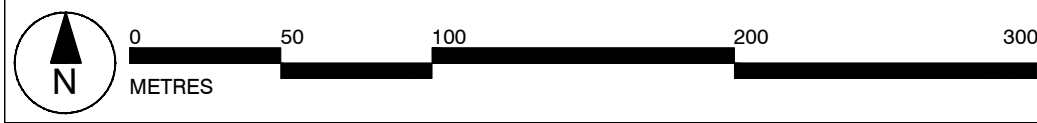
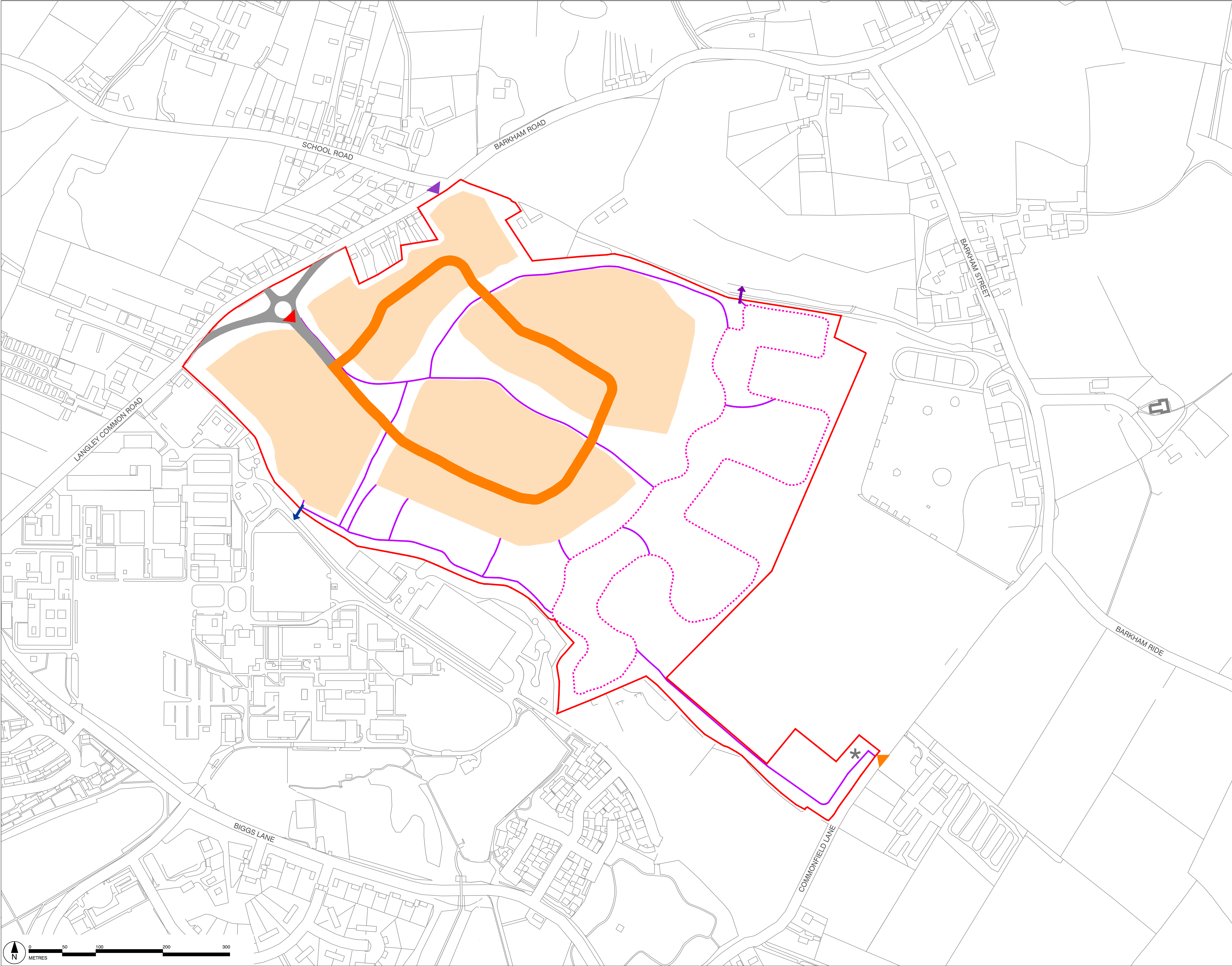
Project

BARKHAM SQUARE

Drawing Title

PARAMETER PLAN - GREEN INFRASTRUCTURE

Drawn	Checked	Approved	Date
EW	MP	RW	09/08/2024
Job No.	Scale	Sheet Size	Revision
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Drawing Number			
BMD.23.0016.DR.P006			



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- APPLICATION BOUNDARY
- PROPOSED
 - RESIDENTIAL DEVELOPMENT
 - PRIMARY ACCESS ROAD
EXACT ALIGNMENT SUBJECT TO DEVIATION +/-10M
 - SECONDARY ROAD
EXACT ALIGNMENT SUBJECT TO DEVIATION +/-10M
 - VEHICULAR ACCESS
 - ALLOTMENT AND SANG CAR PARK ACCESS
 - EMERGENCY VEHICLE ACCESS
 - NON VEHICULAR ACCESS POINTS
 - NON VEHICULAR ARBORFIELD GREEN ACCESS POINT
CONNECTION PROVIDED UP TO THE BOUNDARY
 - SANG FOOTPATH
 - SANG CAR PARK
 - FOOTPATH OR PEDESTRIAN/CYCLE ROUTE

J	Updated application boundary	24/02/26
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C	Updated with pump station location	29/11/24
B	Updated application boundary	21/11/24
A	Updates to pedestrian/cycle route	05/09/24
Rev	Description	Date

Purpose of Issue

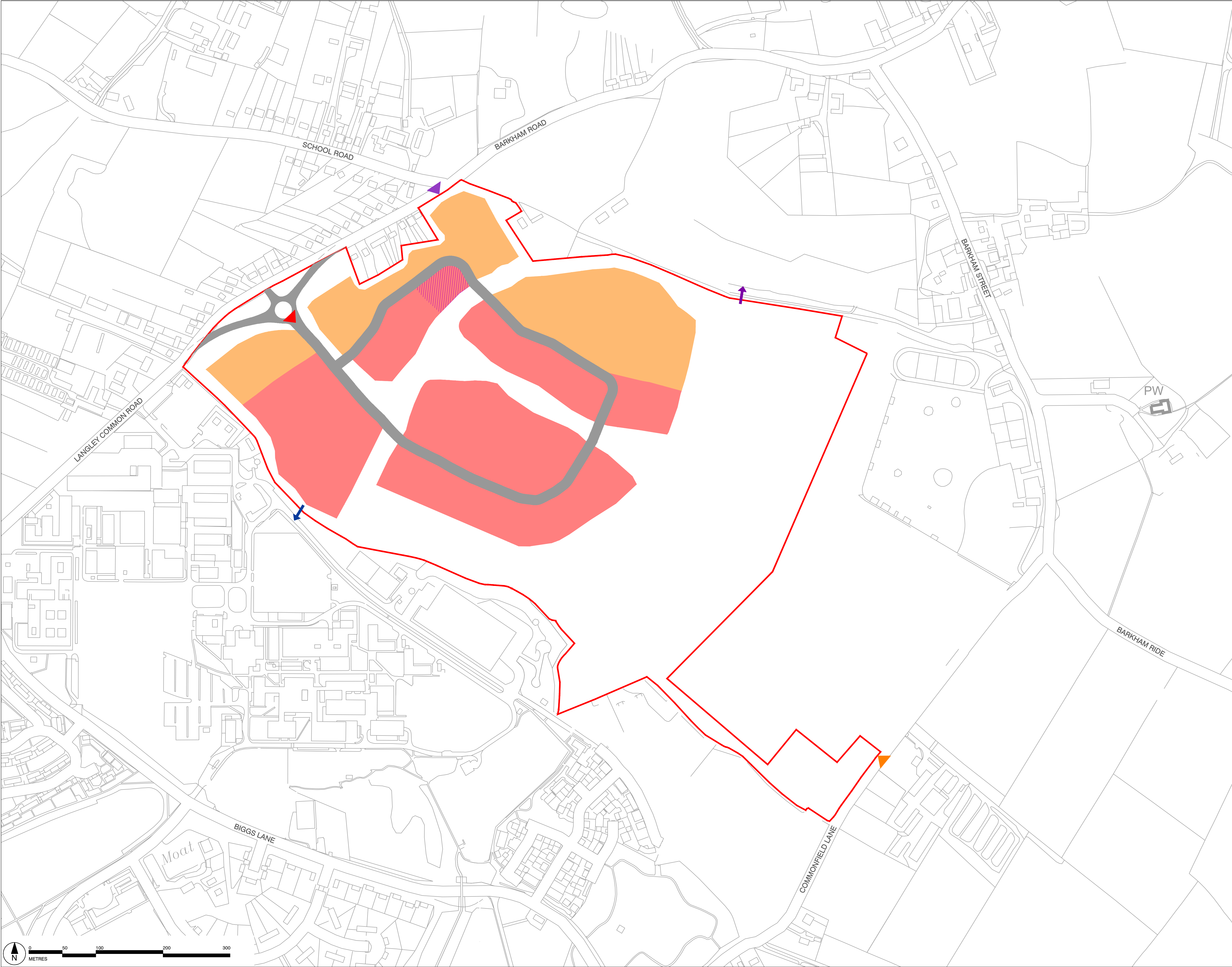
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Client

Project			
BARKHAM SQUARE			
Drawing Title			
PARAMETER PLAN - ACCESS & MOVEMENT			
Drawn	Checked	Approved	Date
EW	MP	RW	09/08/2024
Job No.	Scale	Sheet Size	Revision
23.0016	1:2500	A1	J
Drawing Number			
BMD.23.0016.DR.P007			



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APPLICATION BOUNDARY

PROPOSED

RESIDENTIAL
UP TO 2.5 STOREY

RESIDENTIAL
UP TO 3 STOREY

RESIDENTIAL ELDERLY CARE
UP TO 3 STOREY

ROAD INFRASTRUCTURE
EXACT ALIGNMENT SUBJECT TO DEVIATION +/-10M

VEHICULAR ACCESS

ALLOTMENT AND SANG CAR PARK ACCESS

EMERGENCY VEHICLE ACCESS

NON VEHICULAR ACCESS POINTS

NON VEHICULAR ARBORFIELD GREEN ACCESS POINT
CONNECTION PROVIDED UP TO THE BOUNDARY

I	Updated application boundary	24/02/26
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CREST NICHOLSON

Project
BARKHAM SQUARE

Drawing Title
PARAMETER PLAN - BUILDING HEIGHTS

Drawn EW	Checked MP	Approved RW	Date 09/08/2024
Job No. 23.0016	Scale 1:2500	Sheet Size A1	Revision
Drawing Number BMD.23.0016.DR.P008			I

Appendix B

Borehole Records



7729 6619 SU 76 NE 54

Holst Soil Engineering Limited										Borehole No.
BOREHOLE LOG										21
Contract No. SI1449/F2758					Sheet 1 of 1					
Location Arborfield					Chainage					
Client Department of the Environment					Ground Level 52.85m AOD.					
Method of Boring Percussion					Date 12.12.73					
Diameter of Borehole 0.15m										

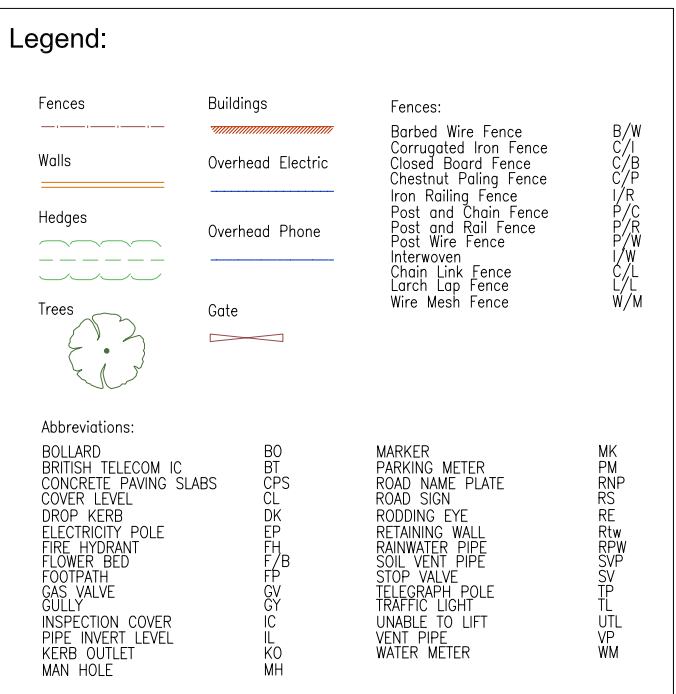
Description of Strata	Legend	Depth below G.L.(m)	Thickness of Strata(m)	Type of Sample	c KN/sq.m	Ø deg	m.c. %	γ Kg/cum	N
MADE GROUND Brick fragments in clay.		0.70	0.70	0.75					
Firm grey silty CLAY.		2.00	1.30	2.50	24	0	24.5	1990	
Firm brown sandy CLAY.		4.00	2.00	4.00	134	0	22.5	2040	
Firm grey silty CLAY.		6.00	2.00	5.50					

Type of Sample ☐ Undisturbed Sample ☐ Disturbed Sample <input type="triangle"/> Water Sample I Penetration Test c Apparent Cohesion	Ø Angle of Friction m.c. Moisture Content γ Bulk Density N S.P.T. Value	Remarks (Observations of Ground Water etc) Water first struck 4.10m Water levels are subject to seasonal or tidal variations and should not be taken as constant
---	--	--

Appendix C

Topographic Survey

Grid coordinates are based on an OS GNSS system on a plane grid with a scale factor of 1.0000.



To an OS GNSS Datum

Client

Berkham Square

Barkham Square
Arlington, VA 22204-4400

Arbortfield

Drawing Title

Topographical Survey

Topographical Survey
Overall Sheet

Overall Sheet

Job No.	2304011	Old Job No.
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Drawing Number	Revision Suffix
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CN/2304011/O

Scale	Date
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Not to Scale	August 2023
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Appendix D

Greenfield Runoff Rate Calculations

Ardent Consulting Engineers		Page 1
3rd Fl, The Hallmark Building 52-56 Leadenhall Street London, EC3M sJE	2303262 Barkham Arborfield Greenfield Rates - DA	
Date 01/06/2025 File	Designed by LB Checked by CC	
Innovyze Source Control 2020.1		

ICP SUDS Mean Annual Flood

Input

Return Period (years)	2	SAAR (mm)	700	Urban	0.000
Area (ha)	18.230	Soil	0.450	Region Number	Region 6

Results 1/s

QBAR Rural	80.1
QBAR Urban	80.1
Q2 years	70.6
Q1 year	68.1
Q30 years	181.5
Q100 years	255.5

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Ardent Consulting Engineers		Page 1
3rd Fl, The Hallmark Building 52-56 Leadenhall Street London, EC3M sJE	2303262 Barkahm Arborfield Greenfield Rates - P1	
Date 01/06/2025 File	Designed by LB Checked by CC	
Innovyze		Source Control 2020.1

ICP SUDS Mean Annual Flood

Input

Return Period (years) 2 SAAR (mm) 700 Urban 0.000
Area (ha) 3.320 Soil 0.450 Region Number Region 6

Results 1/s

QBAR Rural 14.6
QBAR Urban 14.6

Q2 years 12.8

Q1 year 12.4
Q30 years 33.1
Q100 years 46.5

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Date 01/06/2025 File	Designed by LB Checked by CC	
Innovyze Source Control 2020.1		

ICP SUDS Mean Annual Flood

Input

Return Period (years)	2	SAAR (mm)	700	Urban	0.000
Area (ha)	3.640	Soil	0.450	Region Number	Region 6

Results 1/s

QBAR Rural	16.0
QBAR Urban	16.0
Q2 years	14.1
Q1 year	13.6
Q30 years	36.2
Q100 years	51.0

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3rd Fl, The Hallmark Building 52-56 Leadenhall Street London, EC3M sJE	2303262 Barkham Arborfield Greenfield Rates - P3	
Date 01/06/2025 File	Designed by LB Checked by CC	
Innovyze		Source Control 2020.1

ICP SUDS Mean Annual Flood

Input

Return Period (years) 2 SAAR (mm) 700 Urban 0.000
Area (ha) 5.690 Soil 0.450 Region Number Region 6

Results 1/s

QBAR Rural 25.0
QBAR Urban 25.0

Q2 years 22.0

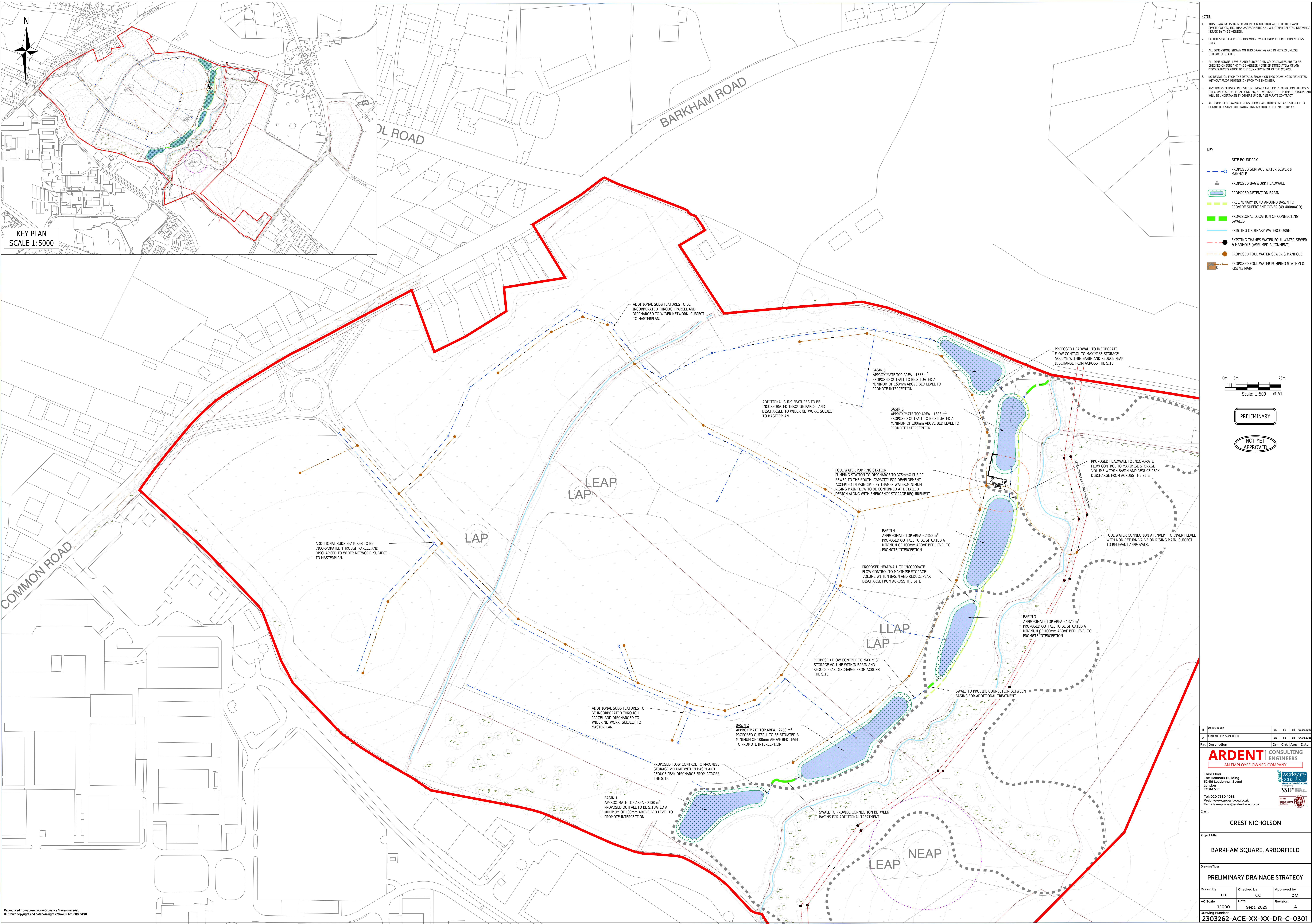
Q1 year 21.2
Q30 years 56.7
Q100 years 79.7

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Ardent Consulting Engineers		Page 1
3rd Fl, The Hallmark Building 52-56 Leadenhall Street London, EC3M sJE	2303262 Barham Arborfield Greenfield Rates - P4	
Date 01/06/2025 File	Designed by LB Checked by CC	
Innovyze		Source Control 2020.1
<u>ICP SUDS Mean Annual Flood</u> Input Return Period (years) 2 SAAR (mm) 700 Urban 0.000 Area (ha) 5.580 Soil 0.450 Region Number Region 6 Results 1/s QBAR Rural 24.5 QBAR Urban 24.5 Q2 years 21.6 Q1 year 20.8 Q30 years 55.6 Q100 years 78.2		
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Appendix E

Preliminary Drainage Strategy Drawing



- NOTES:**
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE RELEVANT SPECIFICATION, INC. RISK ASSESSMENTS AND ALL OTHER RELATED DRAWINGS ISSUED BY THE ENGINEER.
 - DO NOT SCALE FROM THIS DRAWING. WORK FROM FIGURED DIMENSIONS ONLY.
 - ALL DIMENSIONS SHOWN ON THIS DRAWING ARE IN METRES UNLESS OTHERWISE STATED.
 - ALL DIMENSIONS, LEVELS AND SURVEY GRID CO-ORDINATES ARE TO BE CHECKED ON SITE AND THE ENGINEER NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES PRIOR TO THE COMMENCEMENT OF THE WORKS.
 - NO DEVIATION FROM THE DETAILS SHOWN ON THIS DRAWING IS PERMITTED WITHOUT PRIOR PERMISSION FROM THE ENGINEER.
 - ANY WORKS OUTSIDE RED SITE BOUNDARY ARE FOR INFORMATION PURPOSES ONLY. UNLESS SPECIFICALLY NOTED, ALL WORKS OUTSIDE THE SITE BOUNDARY WILL BE UNDERTAKEN BY OTHERS UNDER A SEPARATE CONTRACT.
 - ALL PROPOSED DRAINAGE RUNS SHOWN ARE INDICATIVE AND SUBJECT TO DETAILED DESIGN FOLLOWING FINALIZATION OF THE MASTERPLAN.



PRELIMINARY

NOT YET APPROVED

B	REVIEWED RLB	LE	LB	LB	04.03.2024
A	ROAD AND PIPES AMENDED	LE	LB	LB	04.02.2024

Rev Description

Rev	Description	Drn	Chk	App	Date
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Client

CREST NICHOLSON

Project Title:
BARKHAM SQUARE, ARBORFIELD

Drawing Title:
PRELIMINARY DRAINAGE STRATEGY

Drawn by	LB	Checked by	CC	Approved by	DM
AO Scale	1:1000	Date	Sept. 2025	Revision	A
Drawing Number	2503262-ACE-XX-XX-DR-C-0301				

Appendix F

Foul Water Capacity Response (Thames Water)



Josh Haddow

Ardent Consulting Engineers
The Hallmark Building
52-56 Leadenhall Street
London
EC3M 5JE



02 September 2025

Pre-planning enquiry: Confirmation of sufficient capacity

Site Address: Barkham Square, Barkham Street, Wokingham, RG40 4PN

Dear Josh,

Thank you for providing information on your proposed development of 660 houses and a 50-bed care home. Foul water to discharge via gravity into manhole SU7766**7401** or SU7766**7404** on 375mm foul sewers.

We have completed the assessment of the foul water flows based on the information submitted in your application with the purpose of assessing sewerage capacity within the existing Thames Water sewer network.

Foul Water

If your proposals progress in line with the details you've provided, we're pleased to confirm that there will be sufficient sewerage capacity in the adjacent foul water sewer network to serve your development.

This confirmation is valid for 12 months or for the life of any planning approval that this information is used to support, to a maximum of three years.

You'll need to keep us informed of any changes to your design – for example, an increase in the number or density of homes. Such changes could mean there is no longer sufficient capacity.

Surface Water

Surface water capacity was not assessed in this application.

In accordance with the Building Act 2000 Clause H3.3, positive connection of surface water to a public sewer will only be consented when it can be demonstrated that the hierarchy of disposal methods have been examined and proven to be impracticable. Before we can consider your surface water needs, you'll need written approval from the lead local flood authority that you have followed the sequential approach to the disposal of surface water and considered all practical means.

The disposal hierarchy being:

- 1) rainwater use as a resource (for example rainwater harvesting, blue roofs for irrigation)
- 2) rainwater infiltration to ground at or close to source
- 3) rainwater attenuation in green infrastructure features for gradual release (for example green roofs, rain gardens)
- 4) rainwater discharge direct to a watercourse (unless not appropriate)
- 5) controlled rainwater discharge to a surface water sewer or drain
- 6) controlled rainwater discharge to a combined sewer.

Where connection to the public sewerage network is required to manage surface water flows, we will accept these flows at a discharge rate in line with CIRIA's best practice guide on SuDS or that stated within the sites planning approval.

Where disposal of surface water is other than to a public sewer, then the applicant shall ensure that approval for the discharge has been obtained from the appropriate authorities.

Capacity at STW?

The receiving network is served by Arborfield STW which has capacity concerns and is planned for upgrade. Please visit our [website](#) for updates on the site specific upgrades.

What happens next?

Please make sure you submit your connection application, giving us at least 21 days' notice of the date you wish to make your new connections.

Please see our [FAQ's leaflet](#) for additional information.

If you have any further questions, please contact us.

Yours sincerely,

Jiahang Yu

Adoptions & Pre-Planning Engineer
Developer Services