AKSWard®

CONSTRUCTION CONSULTANTS

Land at Kings Copse Avenue, Hedge End

Flood Risk Assessment & Drainage Strategy

Prepared for

Land at Kings Copse Avenue,
Hedge End,
SO30 0PP

December 2024

Document name: KCC-AKSW-ZZ-ZZ-RP-C-0001

Rev: P05

TABLE of CONTENTS

1 INTRODUCTION 4
2 EXISTING SITE INFORMATION 5
2.1 Site Location 5
2.2 Existing Site Description 5
2.3 Source Protection Zone 6
2.4 Existing Geology and Hydrogeology 6
2.5 Surrounding Hydrology 7
3 PROPOSED DEVELOPMENT INFORMATION 9
3.1 Proposed Development Description 9
4 PLANNING POLICY 10
4.1 Introduction 10
4.2 National Planning Policy Framework 10
4.3 Local Policies 10
4.4 Statutory Authority Consultation 10
5 PLANNING POLICY CONTEXT 11
5.1 Introduction 11
5.2 Flood Zones 11
5.3 Flood Risk Vulnerability Classification 11
5.4 Flood Risk Vulnerability and Flood Zone Compatibility 13
5.5 Sequential Test & Exception Test 13
5.6 Meeting with the LLFA 13
6 FLOOD RISK 14
6.1 Flooding from Seas (Tidal) 14
6.2 Flooding from Rivers (Fluvial) 14
6.3 Flooding from Surface Water (Pluvial) 14
6.4 Flooding from Groundwater 15
6.5 Flooding from Public Sewers/Highway Drains 16
6.6 Flooding from Artificial Sources 16
6.7 Peak River Flow Flood Allowance for Climate Change 17
6.8 High ++ Allowances for Climate Change 17
6.9 Peak Rainfall Intensity Allowance for Climate Change 17
6.10 Urban Creep 17
7 PROPOSED DRAINAGE STRATEGY 18
7.1 Sustainable Drainage Systems (SuDS) 18
7.2 Surface Water Drainage Strategy 19
7.3 Surcharged Outfall 19
7.4 Surface Water Discharge Quality 20
7.5 Proposed Foul Drainage Strategy 22
7.6 Maintenance and Management of the Drainage Systems and SuDS Features 22
8 CONCLUSION 23
8.1 Conclusion 23
APPENDIX A Topographical Survey

APPENDIX B Proposed Architect Site Layout
APPENDIX C PRE-Application LLFA Comments
APPENDIX D Proposed Drainage Design
APPENDIX E Proposed Surface Water Calculations
APPENDIX F Greenfield Run-Off Rates
APPENDIX G Flood Exceedence Plan and Levels Design
APPENDIX H Asset Map
APPENDIX I Foul Drainage Calculations
APPENDIX J Drainage Maintenance Plan
APPENDIX K Flood Map Data

List of Tables

Table 1 – Flood Zones 11
Table 2 - Flood Risk Vulnerability Classification 11
Table 3 - Flood Risk Vulnerability and Flood Zone Compatibility 13
Table 4 – Existing Development Surface Coverage 19
Table 5 – Proposed Permeable and Impermeable Surface Areas 19
Table 6 – Pollution Hazzard Indices for Different Land Use Classifications 21
Table 7 – Indicative SuDS Mitigation Indices for Discharges to Surface Waters 22

List of Figures

Figure 1 - Site Location Plan 5
Figure 2 - Source Protection Zone Lay-out 6
Figure 3 - Underlying Bedrock Formation 6
Figure 4 – Underlying Superficial Deposits 7
Figure 5 - Aquifer Designation Map 7
Figure 6 - EA River Map Extract (2025) 8
Figure 7 - EA Flood Zone Map (2025) 14
Figure 8 – Location of OWC and Hedge End Stream 15
Figure 9 - EA Long Term Flood Risk Map (2025) 15

Revision	Amendments	Prepared By	Checked	Date
P01	Initial Issue	George Adam	Adam Smith	20.12.24
P02	Planning Issue	George Adam	King Leung	23.09.25
P03	Planning Response	George Adam	King Leung	01.12.25
P04	Client Comments Update	George Adam	Stephen Gibbs	17.12.25
P05	Flood Maps Updated	George Adam	King Leung	06.01.26

1 INTRODUCTION

1.1.1 AKSWard Ltd has been commissioned by **Eastleigh Borough Council (the 'Client')** to outline a Flood Risk Assessment (FRA) and Drainage Strategy Report for the development of a new residential site.

1.1.2 The aim of this FRA and Drainage Strategy is to assess flood risk and review the potential options for the discharge of surface and foul water from the site. The report will also review how SuDS could be incorporated into the designs to promote sustainable design. The Drainage Strategy will also review the potential impact of the development on flooding in the surrounding area and the measures that could be incorporated as part of the design to mitigate the potential risk.

1.1.3 This FRA and Drainage Strategy Report has been compiled with the consultation of Southern water (SW) and Hampshire County Council (HCC) who act as the Lead Local Flood Authority (LLFA) within the area. A desktop review of the local drainage policies has also been undertaken.

1.1.4 Information used in preparing this FRA was obtained from the following sources and Statutory Consultees:

(i) Environment Agency (EA) Flood Map

(ii) EA Main River Map

(iii) EA Long Term Flooding Map

(iv) Hampshire Local Flood Risk Management Strategy (LFRMS) (2018)

(v) Partnership for South Hampshire Level 1 Strategic Flood Risk Assessment (SFRA), Part 8 (2023)

(vi) SW Asset Maps

2 EXISTING SITE INFORMATION

2.1 Site Location

2.1.1 The proposed scheme will be a new residential development. Please refer to Figure 1, below. The development site is located within the EBC.

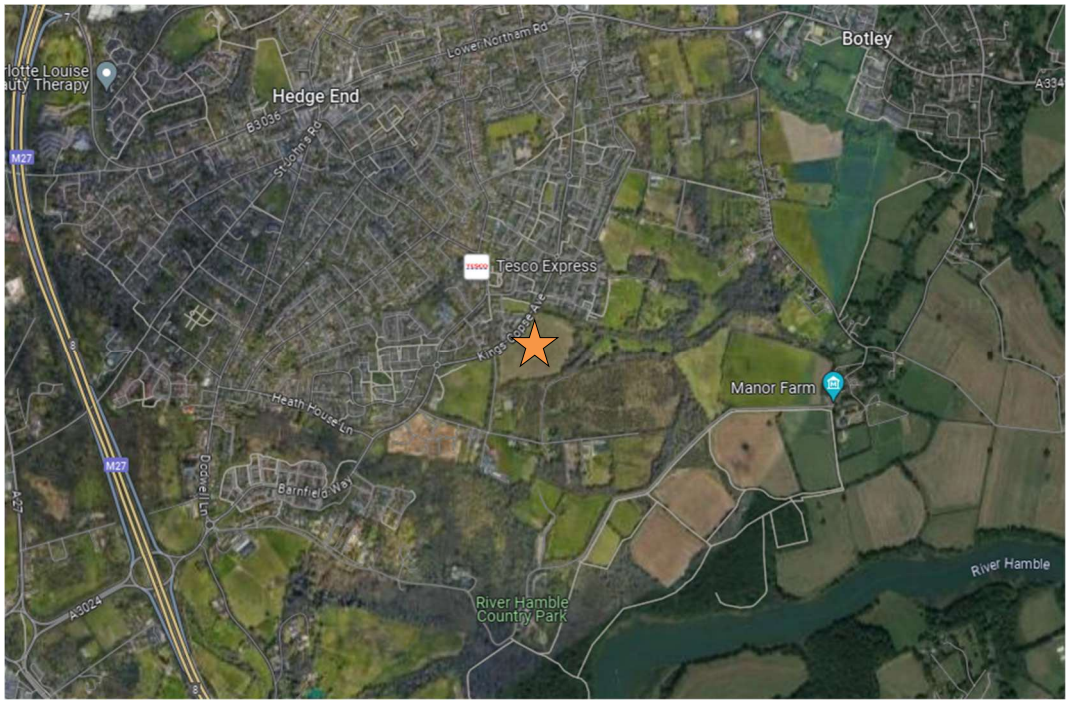


Figure 1 - Site Location Plan

2.2 Existing Site Description

2.2.1 The existing site is a greenfield site, which comprises an overall area of approximately 69,621m^2 (6.962ha), which is agricultural farmland. The surrounding areas are also agricultural farmland.

2.2.2 The approximate OS Grid Location for the development site is E: 449851, N: 112014.

2.2.3 A topographical survey of the site has been provided to AKSWard. Refer to **Appendix A.**

2.2.4 The Topography of the site shows an overall slope downwards towards the north-eastern corner of the site. An ordinary watercourse (OWC) begins within the site and stretches across the north of the site. There is also a main river which is known as the Hedge End Stream. The OWC connects to Hedge End stream in the north-eastern part of the site.

2.2.5 To the North of the site there is also a Site of Importance for Nature Conservation (SINC) where the OWC flows. The site proposals will need to consider the preservation of this SINC. Running south to North there is an ESSO pipeline running through the site. This has a buffer zone around for construction. Where any crossings may occur, the correct permissions will be required from the relevant authority.

2.3 Source Protection Zone

2.3.1 The extract of the latest ground water designation maps, obtained from the EA, shows the site (marked by the orange star) is located away from any source protection zones as seen in Figure 2.

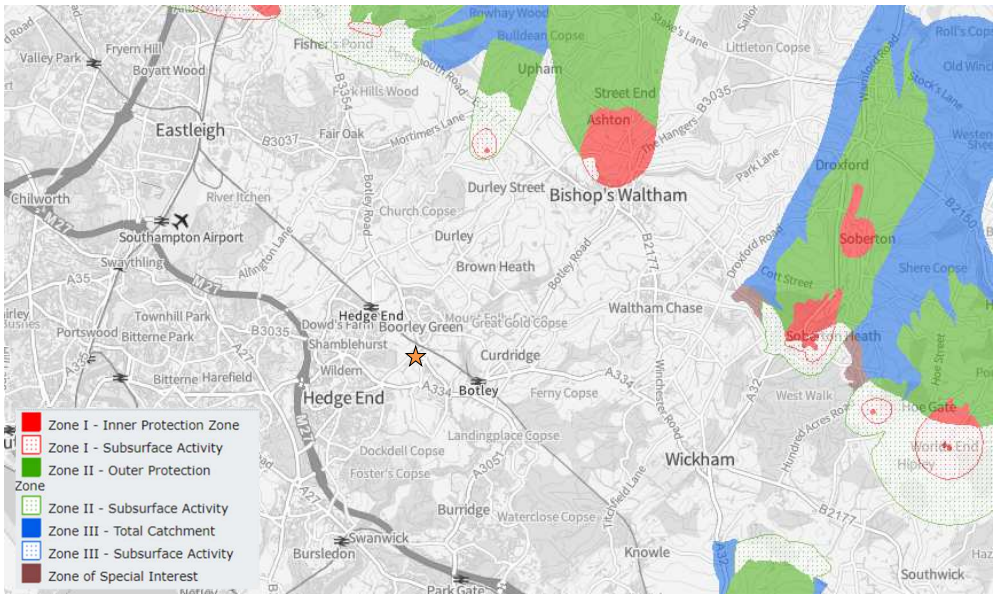


Figure 2 - Source Protection Zone Lay-out

2.4 Existing Geology and Hydrogeology

2.4.1 Having reviewed the existing British Geological Society (BGS) online mapping, the existing site is shown to be located in an area underlain by London Clay Formation, Silt and Sand. Please refer to Figure 3 below, which details the existing bedrock formation and the site location.

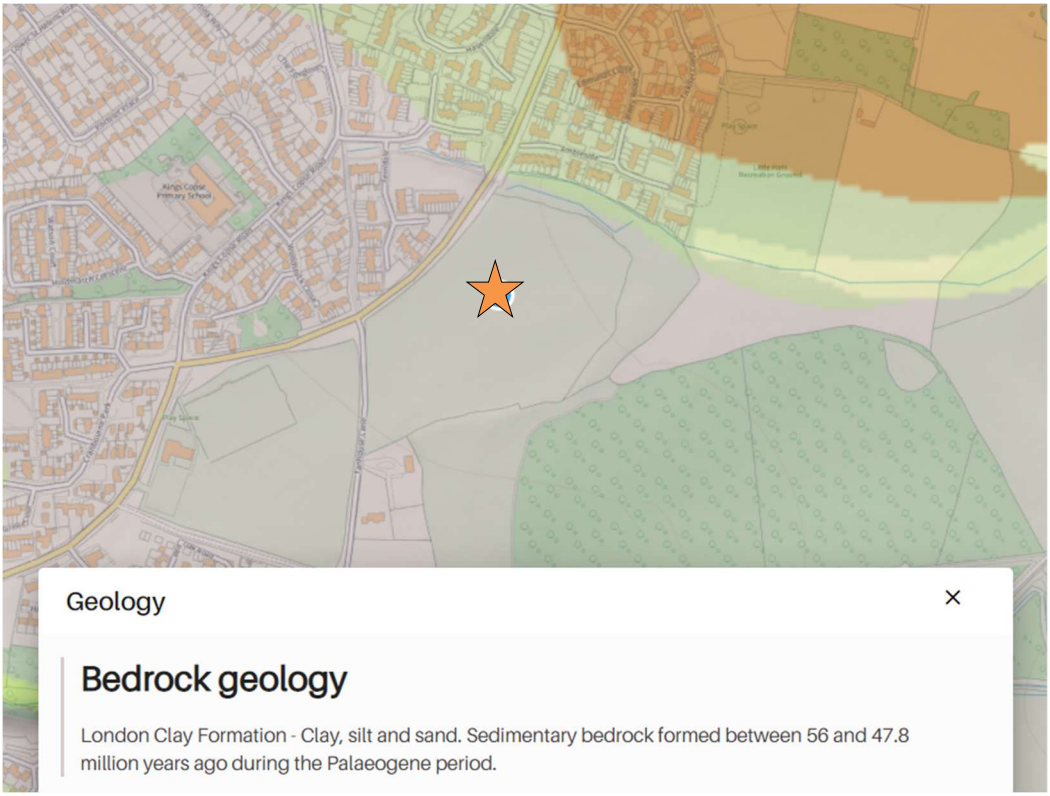


Figure 3 - Underlying Bedrock Formation

2.4.2 According to the BGS online mapping, within the nearby unnamed main river Alluvium Clay, Silt, Sand and Gravel. There are no superficial deposits to be found within our site extents, as shown in Figure 4 below (orange star at site location).

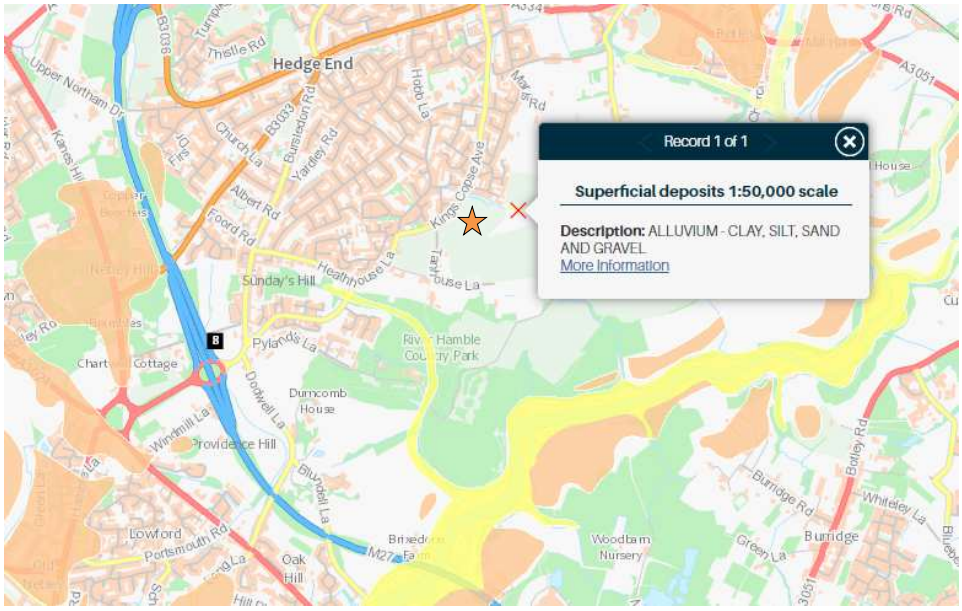


Figure 4 – Underlying Superficial Deposits

2.4.3 The site is not located above any aquifer (bedrock), as detailed in figure 5, below (orange star at site location).

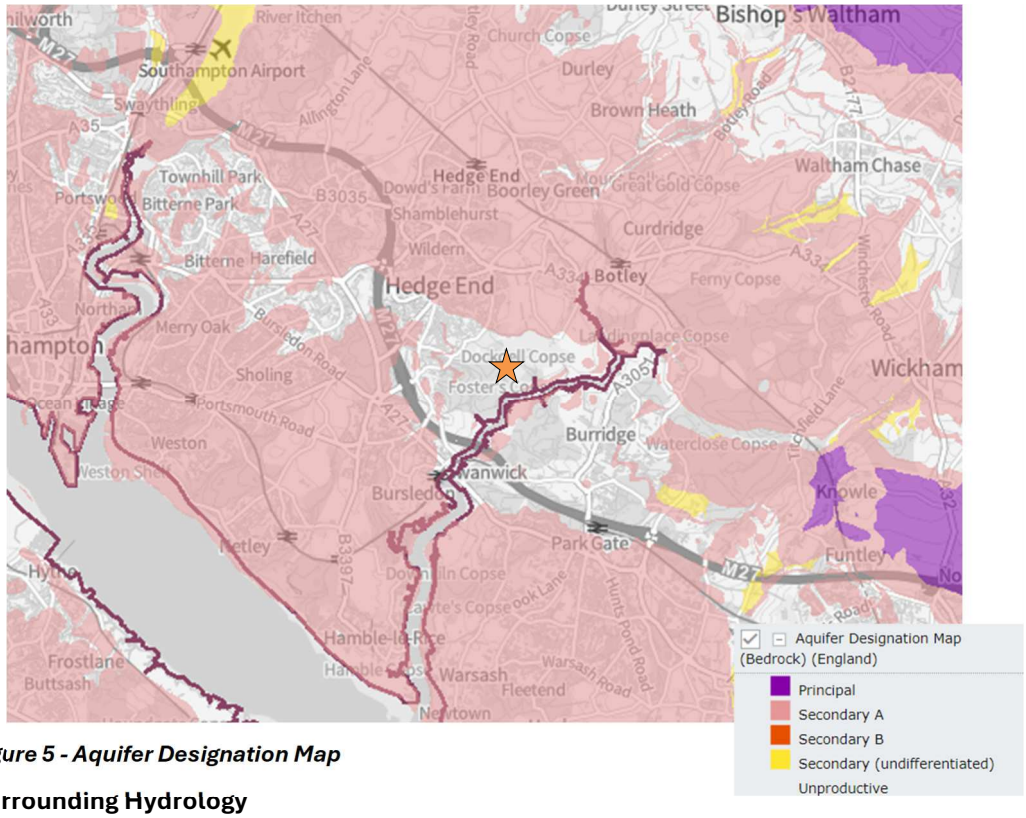


Figure 5 - Aquifer Designation Map

2.5 Surrounding Hydrology

2.5.1 There is an OWC that runs through the North-easterly boundary of the site. This establishes a connection into the river Hamble approximately 1km east of the site. Please refer to figure 6, below, (orange star at the proposed site) which is an extract from the EA online mapping tool.

2.5.2 A Site Visit Confirmed that this OWC originates onsite and does not collect from areas outside of the site boundary. This OWC has an embankment on the south side. This embankment separates the OWC from the proposed works on the site.

The site visit confirmed that the OWC joins the EA main river downstream and is kept wholly within the SINC, away from the proposed buildings.



Figure 6 - EA River Map Extract (2025)

3 PROPOSED DEVELOPMENT INFORMATION

3.1 Proposed Development Description

3.1.1 The proposed development will include the of a new 195-unit residential site compiled up of detached, semi-detached, terraced housing and a number of blocks of flats. Please see **Appendix B** for the Architectural layout plan.

3.1.2 The proposed development will be accessed from Kings Copse Avenue from the west of the site.

3.1.3 The site will have its surface water collected and treated for its relevant pollution levels before discharging from the site. An appropriate mitigation system should be used to treat the water compared to the site usage.

3.1.4 Surface water shall be discharged from the site into the EA river Adjacent.

3.1.5 The site will have its foul water collected and directed to connect to the existing public sewer located within Kings Copse Avenue to the north of the site.

4 PLANNING POLICY

4.1 Introduction

4.1.1 The proposed development will be designed in accordance with the requirements as set out in the National Planning Policy Framework (NPPF) 2024, the Strategic Flood Risk Assessment (SFRA) for Eastleigh Borough Council (EBC) as well as Hampshire's LFRMS 2018.

4.2 National Planning Policy Framework

4.2.1 Section 14 of the NPPF outlines the requirements for determining if a Flood Risk Assessment is required to be undertaken for new developments. A site-specific FRA should be provided for all sites which are located in Flood Zone 2 and 3.

4.2.2 An FRA should be provided for sites located in Flood Zone 1 where:

- The development site area > 1ha.
- The site has been identified by the EA or LLFA as being located within a Critical Drainage Area (CDA); or
- The site has been identified in an SFRA as being at increased flood risk in future; or
- Land that may be subject to other sources of flooding, where its development would introduce a more vulnerable use.

4.2.3 The development site is partially located within Flood Zones 2 and 3 with the majority of the site held within Flood Zone 1 in accordance with the EA flood maps. Therefore, the development is subject to an FRA. The overall development area is **69,621m^2 (6.962ha)**.

4.2.4 The NPPF sets out the strategy throughout the UK for future development. The key policy provision states that:

- 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.
- Strategic policies should be informed by a strategic flood risk assessment and should manage flood risk from all sources. They should consider cumulative impacts in, or affecting, local areas susceptible to flooding, and take account of advice from the Environment Agency and other relevant flood risk management authorities, such as lead local flood authorities and internal drainage boards.
- All plans should apply a sequential, risk-based approach to the location of development – taking into account the current and future impacts of climate change so as to avoid, where possible, flood risk to people and property.

4.3 Local Policies

4.3.1 The EA have provided a series of technical appendices providing additional information of flood management control & risks within and around the site.

4.3.2 This FRA has been produced in line with the above-mentioned documentation.

4.4 Statutory Authority Consultation

4.4.1 The site is located within an area served by SW, who have been contacted in relation to this site.

5 PLANNING POLICY CONTEXT

5.1 Introduction

5.1.1 A site-specific FRA should be carried out to demonstrate how flood risk will be managed now and over the development's lifetime, taking into account climate change and with regards to the vulnerability of its users.

5.1.2 In order to adequately consider and demonstrate how the flood risk will be managed, we need to identify what the probability is of the site flooding, what the site is going to be used for, the associated flood risk vulnerability, and the compatibility between the flood risk vulnerability and the flood zones.

5.1.3 This section details how the planning policy is applied to this site-specific FRA. Items highlighted in 'Orange' in the following tables detail the site-specific information.

5.1.4 For further flood map details please refer to Appendix K for the EA Flood Information.

5.2 Flood Zones

5.2.1 The flood zones refer to the probability of river and sea flooding, ignoring the presence of defences.

Table 1 – Flood Zones

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

5.2.2 The particular flood zone(s) for the development are detailed on the EA 'Flood Risk Assessment Data', please see Section 7 of this report.

5.3 Flood Risk Vulnerability Classification

5.3.1 The different types of flood risk vulnerability classifications are detailed in Table 2 below:

Table 2 - Flood Risk Vulnerability Classification

Classification	Description
Essential Infrastructure	• Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk. • Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood. • Wind turbines.

Classification	Description
Highly Vulnerable	• Police and ambulance stations; fire stations and command centres; telecommunications installations required to be operational during flooding. • Emergency dispersal points. • Basement dwellings. • Caravans, mobile homes and park homes intended for permanent residential use. • Installations requiring hazardous substances consent. (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as 'Essential Infrastructure').
More Vulnerable	• Hospitals • Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels. • Buildings used for residential houses, student halls of residence, drinking establishments, nightclubs and hotels. • Non–residential uses for health services, nurseries and educational establishments. • Landfill* and sites used for waste management facilities for hazardous waste. • Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.
Less Vulnerable	• Police, ambulance and fire stations which are not required to be operational during flooding. • Buildings used for shops; financial, professional and other services; restaurants, cafes and hot food takeaways; offices; general industry, storage and distribution; non-residential institutions not included in the 'more vulnerable' class; and assembly and leisure. • Land and buildings used for agriculture and forestry. • Waste treatment (except landfill* and hazardous waste facilities). • Minerals working and processing (except for sand and gravel working). • Water treatment works which do not need to remain operational during times of flood. • Sewage treatment works, if adequate measures to control pollution and manage sewage during flooding events are in place.
Water Compatible	• Flood control infrastructure. • Water transmission infrastructure and pumping stations. • Sewage transmission infrastructure and pumping stations. • Sand and gravel working. • Docks, marinas and wharves. • Navigation facilities. • Ministry of Defence installations. • Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. • Water-based recreation (excluding sleeping accommodation). • Lifeguard and coastguard stations. • Amenity open space • Nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms. • Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

5.4 Flood Risk Vulnerability and Flood Zone Compatibility

Table 3 - Flood Risk Vulnerability and Flood Zone Compatibility

	Flood Risk Vulnerability Classification				
Flood Zone	**Essential Infra**	**Highly Vulnerable**	**More Vulnerable**	**Less Vulnerable**	**Water Compatible**
Flood Zone 1	✓	✓	✓	✓	✓
Flood Zone 2	×	✓	✓	✓	✓
Flood Zone 3a†	Exception Test	×	Exception Test	✓	✓
Flood Zone 3b*	Exception Test	×	×	×	✓*

✓ Development Appropriate

× Development Should not be Permitted

† Essential Infrastructure should be designed and constructed to remain operational and safe in times of flood

* In Flood Zone 3b (functional floodplain) essential infrastructure that has to be there and has passed the Exception Test, and water-compatible uses, should be designed and constructed to:

- remain operational and safe for users in times of flood.
- result in no net loss of floodplain storage.
- not impede water flows and not increase flood risk elsewhere.

5.4.1 Due to having the Hedge end Stream run through the north of the site, during storms within our red line boundary, EA flood maps highlight areas within Flood zones 2, 3a and 3b. When reviewing the construction site location, the construction boundary does not overlap any of these flood zones. For this reason, we can apply the site to being within Flood zone 1 only.

5.5 Sequential Test & Exception Test

5.5.1 Where the construction site does not lie within flood zones 2 or 3, an exception test is not necessary, and the site would be acceptable in terms of vulnerability. For the properties closest on site, it would be deemed necessary to analyse the proposed layout/design to ensure that they do remain out of risk for the potential of flooding.

5.6 Meeting with the LLFA

5.6.1 On Tuesday 29th October 2024, a pre-application meeting was held with the LLFA at Hampshire County Council. During this meeting we discussed the following strategy to which we received verbal acknowledgement that they are happy with the proposed works. We received a few comments. Please refer to **Appendix C**.

5.6.2 On Tuesday 16th September 2025, A secondary meeting was held with the LLFA where the update in design and strategy meant the previous ruling was not 100% representative of the new design. Within this second meeting, the design was again verbally acknowledged as acceptable and was also able to tick off some of the comments prior.

6 FLOOD RISK

6.1 Flooding from Seas (Tidal)

6.1.1 The site is located near the River Hamble, which is subject to tidal flows. However, the unnamed main river which serves as an ancillary connection eventually flows into the River Hamble, this will not be affected by tidal flows.

6.2 Flooding from Rivers (Fluvial)

6.2.1 With the Hedge End Stream, some of the site lies within flood zones 2 and 3. Based on the construction area of the site lying outside of these zones we can consider the site to be within flood zone 1 for fluvial flooding. With the offset of the site, the proposed ground levels will be raised where in proximity to flood zones 2 and 3. This will aid in the reduction of risk of flooding. Please see Figure 7 below, which details the EA flood map zone at the location of the site.

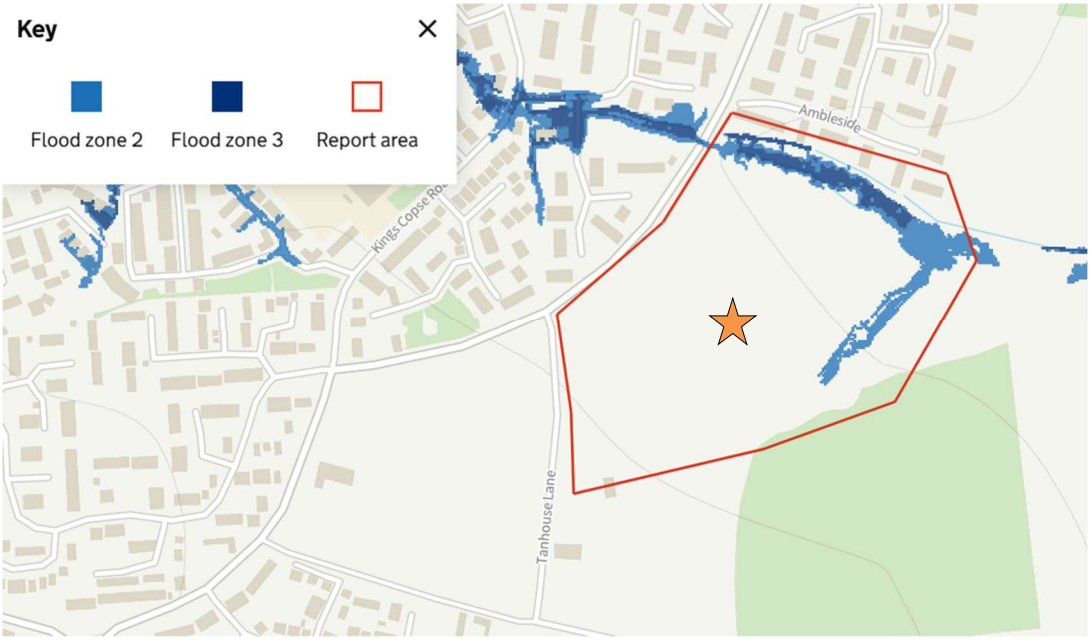


Figure 7 - EA Flood Zone Map (2025)

6.2.2 The construction area is roughly 15m away from flood zones 2-3b. At these closest locations the proposed ground levels are going to be raised around 1.5m to the existing ground levels aiding in the protection of the site from flooding. This careful placement ensures all relevant planning and conservation legislation requirement are compliant.

6.2.3 The future potential flood risk from rivers and watercourses has been assessed as ***Low***.

6.3 Flooding from Surface Water (Pluvial)

6.3.1 In the event of excessive rainfall, where the ground has become saturated and rainfall is not able to infiltrate into the ground, the overland flow would typically flow towards the nearest watercourse/ditch. This runoff can cause localised flooding before discharging to the watercourse/ditch.

6.3.2 The terrain gently slopes towards the northeastern corner which constitutes the site's lowest elevation point. The sloping landscape directly influences the surface water runoff patterns directing the flow towards the unnamed main river which is situated within the site boundary running the length of the north/north-east boundary.

To the North of the Site at the OWC, there is a large embankment between the OWC and the proposed site. This OWC stars within the site and connects to the Hedge end stream in the northeast of the site. The OWC is taking flows from our land only and will not be altered as a result of our proposed development. Please see the image below for reference of locations of the OWC to the Hedge End stream.

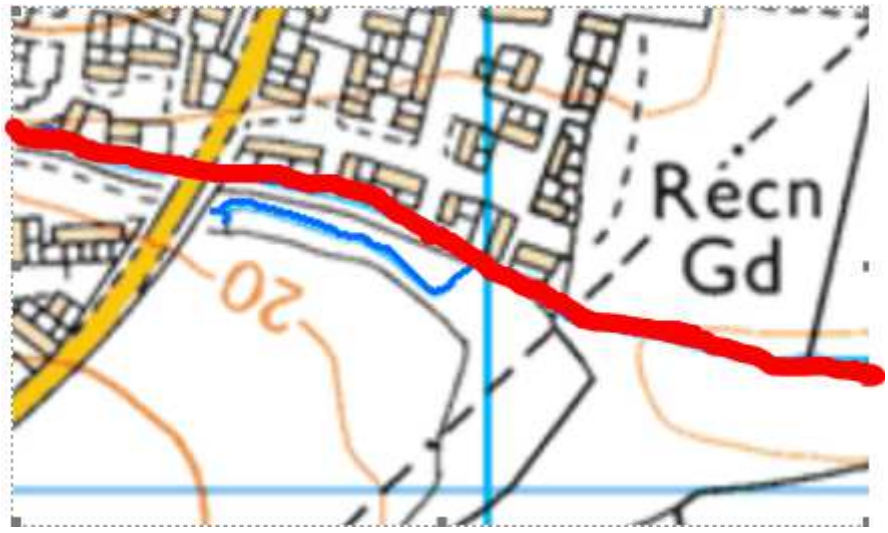


Figure 8 – Location of OWC and Hedge End Stream

6.3.3 In the south-western corner there has been historical issues with surface water runoff flowing over Tanhouse Lane. The proposed roads and kerb lines in this area will divert runoff from this area to reduce surface runoff at this location.

6.3.4 During the LLFA meetings, it was discussed about a potential surface water outfall from the site onto Tanhouse lane. After this meeting a site visit debunked the evidence and showed no outfalls in this location.

6.3.5 The EA Surface Water Flood Map confirms that the risk from surface water flooding is low for the site as shown in Figure 8.

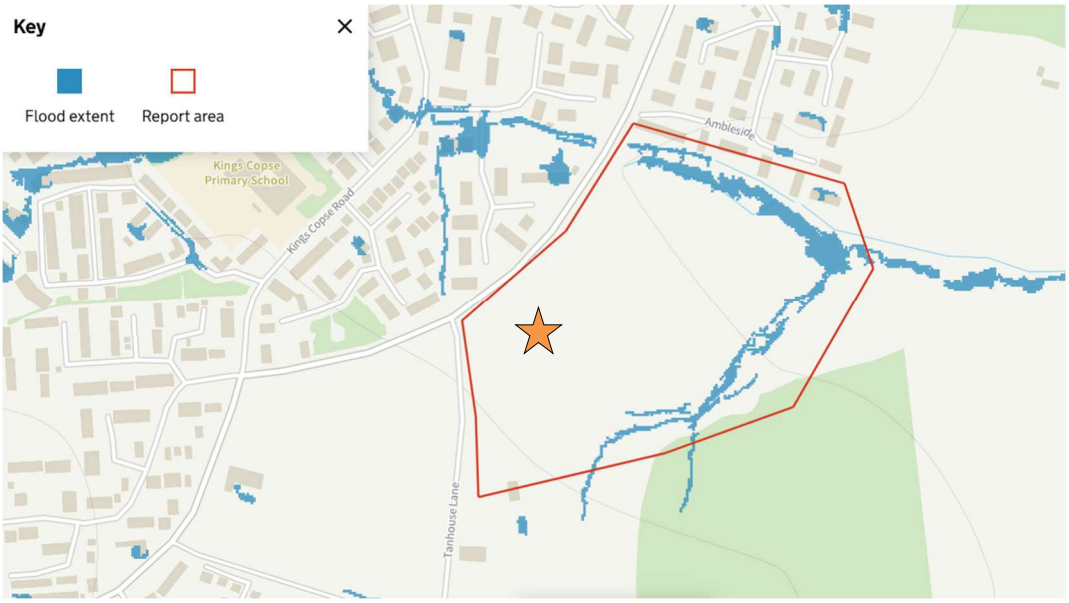


Figure 9 - EA Long Term Flood Risk Map (2025)

6.4 Flooding from Groundwater

6.4.1 There are typically seven sources, or mechanisms, of groundwater flooding. These were described by Defra (Jacobs 2007) as:

- The rise of typically high groundwater levels to extreme levels due to prolonged extreme rainfall;
- The rise of groundwater levels in aquifers in hydraulic continuity with high in-bank river levels or extreme tidal conditions;

- The increase in groundwater levels and change of ground water flow paths due to artificial obstructions or pathways, like foundations, and the loss of natural storage and drainage paths;
- Rising groundwater levels due to a reduction in ground water extraction in Urban areas;
- Rising groundwater levels due to leaking sewers, drains and water mains;
- Faulty borehole headworks or casings causing upward leakage of groundwater through confining layers driven by artesian heads; and
- Subsidence of the ground surface below the current groundwater level.

6.4.2 Of the above-mentioned potential causes of groundwater flooding, the first two are directly affected as a result of environmental conditions. The remaining five potential causes of groundwater flooding are mainly the result of man-made activities, or the stopping of such activities.

6.4.3 There are no works currently being undertaken at the development site or planned to be undertaken at the development site that would have an impact on the five man-made causes of ground water flooding. As such, this FRA will review the impact on groundwater flooding based on the environmental conditions at the site.

6.4.4 The topography shows a significant change in levels falling in a north-easterly direction. The discharge of the site is based in the Northeast corner and situated at the lowest point for the construction area. the outfall has an invert level of 15.640mAOD. the level for the site and closest to the outfall is 20.600mAOD. this has a hight difference of around 5.0m. During flood events the flood water level would rise to 17.000mAOD which would be 3.5m below the proposed site.

6.4.5 Groundwater flooding from extreme water level rise at the development site is unlikely.

6.5 Flooding from Public Sewers/Highway Drains

6.5.1 Sewer flooding can occur when sewer systems become overloaded. Flooding usually happens when either; flood water backs up in the pipes and surcharges into low lying area or where the capacity of the system is exceeded and water discharges from the manholes and runs overland.

6.5.2 It has traditionally been thought that in areas where the groundwater level is high, the risk of groundwater entering the sewer network through pipe joints and cracks is high. As a result, the capacity of the pipe network is reduced. As has been discussed above in Section 6.4, the risk of groundwater flooding to the development site area is low and as such, the risk of sewer flooding is also low.

6.5.3 Modern construction techniques and Building Regulations stipulate that the foul water sewer system is to be installed watertight to prevent the ingress of ground water to the foul water system.

6.5.4 Reviewing the SFRA, within section 3.5 it discusses the historic flooding. Within sections 3.5.13 and 3.5.14 it labels the locations of sewer flooding which did not highlight areas associated with our site. The Proposed site has a very low risk of internal flooding from the ingress of ground water to the system. Further to this, the risk of internal foul water flooding to the development is considered low.

6.6 Flooding from Artificial Sources

6.6.1 There are no reservoirs located nearby the following site and so there is a low risk of flooding from the failure of reservoirs in the surrounding area.

6.7 Peak River Flow Flood Allowance for Climate Change

6.7.1 The site is located within the vicinity of the Hedge End stream. This is a main river, but its water levels are much lower than the proposed site. The provision on checking the site will not be adversely affected by flooding from a surcharged outfall should be made to determine the need for a Peak River Flow Flood Allowance.

6.7.2 The flood water level for our discharge location for a 1:100 year storm is 17.00mAOD. the lowest level of our development site is 20.00mAOD. this gives 3.0m of height for flooding to surcharge before the site is at risk. The top of ponds to the north and east are at 19.600 with 300mm freeboards each. This should create a furher buffer of storage if the outfall is surcharged.

6.8 High ++ Allowances for Climate Change

6.8.1 The EA defines High ++ Allowances as to "only apply in assessments for developments that are very sensitive to flood risk, and with lifetimes beyond the end of the century. For example, infrastructure projects or developments that significantly change existing settlement patterns. This includes urban extensions and new settlements." Although the life expectancy of the proposed development will extend into the next century, we do not believe that this development meets the requirements for a High ++ Allowance and as such have not included for this allowance.

6.9 Peak Rainfall Intensity Allowance for Climate Change

6.9.1 Having reviewed the EA Table 2 – "Peak Rainfall Intensity Allowance in Small and Urban Catchments", we have assumed a climate change allowance of 40% increase for the proposed onsite surface water drainage design. Please refer to Section 7 for a detailed assessment of the proposed surface water drainage strategy for the development.

6.10 Urban Creep

6.10.1 Urban Creep has been managed with the design for the future planning of extensions increasing the total roof/hardstanding area of the site. The Use of 10% of roof areas has been implemented into the strategy.

6.10.2 The total roof area equates to roughly 0.9ha of the hardstanding areas. This is equivalent of 34% of the 2.62ha total hardstanding areas rounding up to 40%. This equates to an additional 4% of additional area to be applied to the calculations.

6.10.3 This additional area is shown on the calculations within **Appendix E**.

7 PROPOSED DRAINAGE STRATEGY

7.1 Sustainable Drainage Systems (SuDS)

7.1.1 The SuDS manual (Ciria C753) identifies that “Surface water is a valuable resource, and this should be reflected in the way it is managed and used in the built environment. It can add to and enhance biodiversity, beauty, tranquillity and the natural aesthetic of buildings, places and landscapes and it can help make them more resilient to the changing climate”.

7.1.2 The Philosophy for the use of utilising SuDS is to maximise the benefits and minimise the negative impacts of surface water run-off from developed areas. The approach that SuDS takes on is to reduce the quantity and velocity of surface water from a developed area to manage pollution and downstream flood risk.

7.1.3 This approach is achieved by harvesting, infiltrating, slowing, storing, conveying and treating run-off on site and where possible, on the surface rather than underground. The implementation of SuDS mimics as closely as possible the natural drainage of the site before the development.

7.1.4 SUDS provide a flexible approach to drainage, with a wide range of components from soakaways to large-scale basins or ponds. The individual techniques should be used in a management train that reinforces and, where possible, follows the natural pattern of drainage. The management train incorporates a hierarchy of techniques. These are:

- **Prevention** – the use of good site design and housekeeping measures on individual sites to prevent runoff and pollution (examples include minimising paved areas and the use of sweeping to remove surface dust from car parks),
- **Source control** – control of runoff at or very near its source (such as the use of rainwater harvesting, pervious pavements, green roofs or soakaways for individual houses).
- **Site control** – management of water from several sub-catchments (including routeing water from roofs and car parks to one large soakaway or infiltration basin for the whole site).
- **Regional control** – management of runoff from several sites, typically in a detention pond or wetland.

7.1.5 Adopting a holistic approach towards surface water drainage provides the benefits of combined water quality and quantity control, as well as increased amenity value. This is accomplished by managing the increased flows and pollution from surface water runoff that can arise from development. Ideally, the system should utilise a management train and should achieve equal standing in all three of these areas. However, specific site considerations may mean that a balance of benefits is not always achieved.

7.1.6 The priority for the discharge of surface water run-off should be:

- Infiltration;
- Discharge to surface waters;
- Discharge to a surface water sewer, highway drain or another drainage system;
- Discharge to a combined sewer.

7.1.7 As demonstrated in 2.4.2, BGS Mapping shows that the geology of the site is clay so infiltration techniques would not be a viable option for the disposal of surface water. As the existing site currently discharges in part to the Hedge End Stream, it is proposed to mimic existing conditions and continue to discharge surface water to the Hedge End Stream. This is illustrated within the proposed drainage layout, please see **Appendix D**.

7.1.8 In order to manage surface water sustainably, the use of SuDS is recommended. There are a number of different options available. Various SuDS systems have been assessed to determine their suitability for the proposed development site.

7.1.9 Based on the above assessment, the outline drainage strategy for the development could include some of the following SuDS features within the design (subject to detail design and agreement with the local authority, LLFA and the EA):

- Pervious Pavements;
- Rainwater Gardens;
- Attenuation Ponds.

7.2 Surface Water Drainage Strategy

7.2.1 The surface water for houses and flat will be collected via a system of rainwater pipes. Roads and footpaths will discharge into road gullies, permeable paving or rainwater gardens.

7.2.2 Please see Table 4 and Table 5 to show the comparison in permeable/impermeable areas, below:

Table 4 – Existing Development Surface Coverage

Item	Description	Area (m^2)
1.	Existing Permeable Area	0
2.	Existing Impermeable Area	69,621
Total		69,621m^2

7.2.3 proposed permeable and impermeable areas for the development site are summarised below in table 5:

Table 5 – Proposed Permeable and Impermeable Surface Areas

Item	Description	Area (m^2)
1.	Development Permeable Area	43,421
2.	Development Impermeable Area	26,200
Total		69,621m^2

7.2.4 The water shall travel through the internal network that flows through a series of detention basins with the flow rates being control via a series of flow control devices throughout the site. Please refer to **Appendix E** for the surface water calculations

7.2.5 The site shall discharge into the onsite watercourse to the northeast. Where the site is previously a greenfield site, the discharge rate shall be kept to the QBar value. The green field rates are as follows:

QBAR: 21.88 l/s

1 in 1 year (QBAR) return period: 18.60 l/s

1 in 30 years return period (3.3% AEP): 50.30 l/s

1 in 100 years return period (1% AEP): 69.80 l/s

7.2.6 Greenfield Runoff rates have been estimated using the UK SuDS greenfield estimation tool and can be viewed in **Appendix F.**

7.2.7 Where the drainage will need to cross through the SINC to reach the outfall location. The strategy has been positioned as to minimise the impact on this area and keep as much drainage out of it where feasible.

7.2.8 Where the surface water drainage layout crosses the ESSO lines, it has been designed to go over the pipes with enough space as to not encroach on the no dig/buffer zone the pipeline requires. The appropriate authorities have been contacted to be granted permission to work over their lines.

7.3 Surcharged Outfall

7.3.1 The flood water level during a 1 in 100-year storm rises to 17.000mAOD at the outfall location. The current outfall invert level is 15.640mAOD. After a 1 in 100-year storm it could be expected that the lowest 1.36m of the network will be submerged.

7.3.2 It is expected that if another storm was to occur the site would have fooding occur to which there would be an addition of 31.5l/s added to the flooded area. this equates to an addition of 3,024m3 of water each hour.

7.3.3 Please see **Appendix G** for the exceedance flow path and Site Levels demonstrating the route overland flow would take for the proposed site.

7.3.4 Within the Flood exceedance, the red arrows demark the route surface water would take if blockages within the network were to occur at low points within the working site area.

7.4 Surface Water Discharge Quality

7.4.1 The quality of surface water collected and discharged to the surrounding environment, by direct discharge to watercourses or by infiltration into the ground water, should be managed such that the receiving bodies are protected from pollution. The implementation and installation of suitable SuDS features within the overall surface water drainage network can improve water quality through the removal of pollutants.

7.4.2 'The SuDS Manual' (CIRIA 753) has been developed which includes details of the pollution hazard indices for various land uses. The types of pollution hazards assessed include Total Suspended Solids (TSS), Metals and Hydrocarbons. The pollution indices range between 0 (no pollution) and 1 (high pollution) and are included in Table 26.2 of the SuDS Manual as replicated in table 6.

7.4.3 The various SuDS features available have been assessed for their suitability and effectiveness for the removal of pollutants from surface water discharge within table 7. These pollution mitigation indices are included in Table 26.3 of the SuDS Manual.

7.4.4 In order to deliver sufficient treatment, the proposed SuDS features should provide a total pollution mitigation index equal to or that exceed the pollution hazard index for each contaminant type. (The pollution mitigation and pollution index should always be assessed for each contaminant type) The proposed development site has been assessed, and the relevant pollution indices present on the developed site have been highlighted below in 'Orange' in table 6, which is reproduced from Table 26.2 of the SuDS Manual.

Table 6 – Pollution Hazzard Indices for Different Land Use Classifications

Land Use	Pollution Hazzard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Residential Roofs	Very Low	0.2	0.2	0.05
Other roofs (typically commercial/industrial)	Low	0.3	0.2-0.8 (where metal has the potential to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (e.g. Cul de sacs, home-zones and general access roads) and non-residential car parking with infrequent change (e.g. schools, offices) i.e.<300 traffic movements per day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (e.g. hospitals, retail), all roads except low traffic roads and trunk roads/motorways1	Medium	0.7	0.6	0.7
Sites with heavy pollution (e.g. haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemical and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured: industrial sites: trunk roads and motoreways[1]	High	0.8[2]	0.8[2]	0.9[2]

Note [1] **Motorways and Trunk roads should follow the guidance and risk assessment process set out in Highways Agency (2009).**

Note [2] These should only be used if considered appropriate as part of a detailed risk assessment – required for all these land use types table 4.3. When dealing with high hazard sites, the environmental regulator should first be consulted for pre-permitting advice.

This will help determine the most appropriate approach to the development of a design solution

7.4.5 The layout of the proposed development site and the availability of open space within the development allows for the inclusion of a number of different SuDS features to control both the discharge volume and water quality. The proposed SuDS features that have been included in the surface water drainage strategy have been highlighted below in 'Orange in Table 7. (This table is reproduced from Table 26.3 of the SuDS Manual).

Table 7 – Indicative SuDS Mitigation Indices for Discharges to Surface Waters

Type of SuDS Component	Mitigation Indicies[1]		
	TSS	Metals	Hydrocarbons
Filter strips	0.4	0.4	0.4
Filter drain	0.4[2]	0.4	0.4
Swale	0.5	0.6	0.6
Bioretention System	0.8	0.8	0.8
Permeable Pavement	0.7	0.6	0.7
Detention Basin	0.5	0.5	0.6
Pond[4]	0.7[3]	0.7	0.5
Wetland	0.8[3]	0.8	0.8
Proprietary Treatment systems [5,6]	These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing area.		

7.4.6 The proposed surface water drainage treatment system is considered suitable and sufficient to allow for the discharge to the proposed outfall.

7.4.7 As an extra form of treatment where the site discharges to a watercourse, all water that is collected should pass through at least two forms of treatment before it reaches the outfall with most of the site passing through three separate treatments.

7.5 Proposed Foul Drainage Strategy

7.5.1 There is an existing Ø300mm public foul sewer network running across the north of the development site. Please refer to the Asset Map in **Appendix H**.

7.5.2 It is proposed that the site's foul will connect to the existing foul sewer via gravity.

7.5.3 The proposed site will be adding 100% new foul flow rates. This will substantially increase the flow rates. Please see attached within **Appendix I** the foul calculations for the proposed site.

7.6 Maintenance and Management of the Drainage Systems and SuDS Features

7.6.1 All drainage components will be managed privately onsite.

7.6.2 A Surface Water Management and Maintenance Strategy is included with this report in **Appendix J**, which details the requirements for maintenance and also the responsibility for the management and maintenance for the drainage system.

8 CONCLUSION

8.1 Conclusion

8.1.1 Compliance across all planning policies will be adhered to follow the requirements set by the NPPF, Eastleigh Borough Council's Strategic Flood Risk Assessment and Hampshire's Local Flood Risk Management Strategy. The proposed development is situated primarily within Flood Zone 1 and whilst incorporating robust mitigation measures the proposals align with the principle of directing the proposed development away from any high-risk areas and ensuring safety and longevity for the entirety of the site's lifetime.

8.1.2 The majority of the development is located within Flood Zone 1, which is characterized by a low probability of flooding (less than 1 in 100 annual probability). A small portion of the site lies within Flood Zone 3a, indicating a higher risk of flooding. However, the proposed structures do not fall within the Flood Zone 3a area, ensuring that the most vulnerable parts of the site remain outside high-risk zones.

8.1.3 Flooding from Tidal and Fluvial, Surface water and Groundwater is considered low/very low for the proposed site.

8.1.4 The development proposed for this site should not be precluded based on flood risk grounds.

8.1.5 Mitigation measures that the development will adopt and make provisions for would be for the management of surface water including collection, treatment and the control of discharge rates.

8.1.6 Surface water run-off shall be collected via, rainwater pipes, gullies, permeable paving and rain gardens. It shall then be directed through a series of detention ponds before discharging into the local watercourse at the calculated greenfield run-off rates.

8.1.7 Onsite Storage for storm water shall be contained via the detention basins, permeable sub-bases of parking spaces and the rainwater gardens. Storage should have the capacity to hold the run-off from a 1 in a 100-year storm +40% Climate Change.

8.1.8 Foul water shall be collected and discharged via gravity into the existing public sewer network to the North of the Site.

APPENDIX A
TOPOGRAPHICAL SURVEY

TREES

A	Ash
AL	Alder
AP	Apple
B	Beech
C	Cedar
CB	Copper Beech
CH	Cherry
CY	Cypress
E	Elm
EL	Elder
EU	Eucalyptus
F	Fir
FM	Field Maple
FR	Fruit
HZ	Hazel
HC	Horse Chestnut
HO	Holm Oak
HW	Hawthorn
HY	Holly
JM	Japanese Maple
LB	Laburnum
LM	Lime
LO	Locust Tree
LR	Laurel
M	Maple
MG	Magnolia
OK	Oak
P	Pine
PA	Palm
PL	Plane
PM	Plum
PO	Poplar
PP	Pissardii Plum
PR	Pear
R	Redwood
RD	Red Oak
RH	Rhododendron
RO	Rowan
SB	Silver Birch
SC	Sweet Chestnut
SP	Scots Pine
SU	Spruce
SY	Sycamore
U	Unidentified
W	Willow
WN	Walnut
Y	Yew

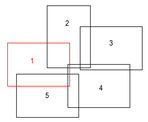
Species / Dia / Spread (max) / Ht
e.g. OK / 0.6 / 8 / 15

ABBREVIATIONS

BT	British Telecom
BOL	Bollard
CB	Control Box
CL	Cover Level
CTV	Cable Television
EL	Electric
EP	Electricity Pole
FH	Fire Hydrant
GSV	Gas Stop Valve
HT	Height
HVC	High Voltage Cable
IC	Inspection Cover
IL	Invert Level
LP	Lamp Post
MH	Man-Hole
MKR	Marker
MW	Monitoring Well
O/H	Overhead
G	Road Gully
PB	Post Box
PC	Pram Crossing
RNP	Road Name Plate
RS	Road Sign
SA	Soakaway
ST	Stay / Strut
SV	Stop Valve (Unidentified)
TB	Telephone Box
TC	Telecom
TH	Trial Hole
TL	Traffic Light
TP	Telegraph Pole
UTL	Unable to Lift
VP	Vent pipe
WM	Water Meter
WSV	Water Stop Valve

FENCES

BWF	Barbed Wire Fence
CBF	Closed Board Fence
CF	Concrete Post
CPF	Chestnut Paling Fence
CWF	Chicken Wire Fence
IRF	Iron Railing Fence
PKF	Picket Fence
PRF	Post & Rail Fence
PWF	Post & Wire Fence
SCF	Security Fence
SP	Steel Post
WMF	Wire Mesh Fence
WPF	Wood Panel Fence



NOTES;

LAND SURVEY INFORMATION

GENERAL DETAIL — LOCAL PLANE METRIC RELATED TO OS NATIONAL GRID
SURVEY TECHNIQUE — GNSS RTK/RTN
SURVEY EQUIPMENT — TRIMBLE R12i GNSS RECEIVER
CONFIGURATION — OSTN 15 TRANSFORMATION

LOCAL SCALE FACTOR AT ORIGIN OF SURVEY = 1.000

Survey Technique: Global Navigation Satellite Systems Real Time Kinematic Rover Technique (GNSS RTK) using the Ordnance Survey Active Geodetic Network (OSAGN) RTN Service. Survey Equipment: Trimble R12i GNSS Receiver. Configuration: OSTN 15 Transformation. Survey Accuracy: Horizontal ± 0.02m, Vertical ± 0.04m. Survey Datum: Ordnance Survey National Grid (OSGB36). Survey Scale Factor: 1.000. Survey Origin: Eastings 446,000, Northings 112,000. Survey Extents: 1,000m East, 1,000m North.

Maptec Surveys Ltd has taken all reasonable steps to ensure that the information shown on this plan is correct. However, Maptec Surveys Ltd cannot accept responsibility for any inaccuracies in the information provided by any third party. Where applicable, depth information of underground services/features is approximate only. Maptec Surveys Ltd recommends that trial holes are undertaken to confirm the exact location and depth of all underground services/features prior to the commencement of any excavation work. Maptec Surveys Ltd cannot be held responsible for any loss, damage or injury arising from the use of this survey information.

If the location or depth of services/features is of particular importance to you, then trial holes should be undertaken. Any discrepancies must be notified to Maptec Surveys Ltd immediately. Maptec Surveys Ltd cannot be held responsible for any loss, damage or injury arising from discrepancies that are not notified to us within 5 days of receipt of this survey.

Maptec Surveys Ltd is not liable for any topographical survey that has not been undertaken by us. Any boundaries relating to ownership information shown on this survey are indicative only and should not be relied upon for the purposes of a boundary dispute. Where applicable, depth information of underground services/features is approximate only. Maptec Surveys Ltd recommends that trial holes are undertaken to confirm the exact location and depth of all underground services/features prior to the commencement of any excavation work. Maptec Surveys Ltd cannot be held responsible for any loss, damage or injury arising from the use of this survey information.

If the location or depth of services/features is of particular importance to you, then trial holes should be undertaken. Any discrepancies must be notified to Maptec Surveys Ltd immediately. Maptec Surveys Ltd cannot be held responsible for any loss, damage or injury arising from discrepancies that are not notified to us within 5 days of receipt of this survey.

ABBREVIATIONS (Local & Utilities)

AP ADVANCE PASTE	HL FLC
AR AIR VALVE	HP PIPELINE MARKER
BB BACK BOX	HV POLYMERIC VALVE
BC BACK CHANNEL	IC INSPECTION CHAMBER
BH CATHODIC BH	IM IRON MAIN
BM BENCH MARK	IP IRON PIPE (WATER)
BPC BRONZE TRACING CAVER	IR SURVEY MONUMENT
BV BOUNDARY VALVE	JB JUNCTION BOX
CB CONTROL BOX	LC LIGHT CABLE
CC CAST IRON	LP LIGHT POLE
CH CHANNEL	MH MANHOLE
CMH CHAMBER	MP MILE POST (GAS)
CON CONCRETE	MS MAST
CP CATHODIC PROTECTION	NB NON RETURN VALVE
CR CABLE RISER	OT TANK FROM RECORDS
CT CABLE TURNED	PC PLASTIC COVER
d DEPTH	PD PLASTIC DUCT
DA DRAIN	PE POLYETHYLENE
DC DUCT OF RECORDS	PH PLASTIC PHONE CLAMP
DP DUCT OF PIPES	PM PLASTIC MARKER POST
EB ELECTRICITY BOX	PO PIPELINE TO OWN WORKS
ES DATA BOX	PP PIPELINE TO PIER
FC FLOOR COVER	PR PIPELINE TO PIER
FL FLOOR LEVEL	PT PIPELINE TO TRACE
FP FLOOR PLATE	PU PIPELINE TO USER
G GRATING OF TRACE	RP REST POST
GB GAS BOX	SB SERVICE BOX (GAS)
GC GAS CHAMBER	SC WATER CAPS
GI INSPECTION CHAMBER	SD WATER METER
GM GAS MAIN	SP WATER POST
GV GAS VALVE	TP TEST WATER PIPE
HC LAMP POLE	TRACE PIPES
HD HAND HOLE	TRACE CABLES
HH HAND HOLE	GAS MAINS AND PIPES
HM HOUSE NUMBER	GAS CLOSE BOUNDARY PIPES
HP HYDRAULIC POWER	GAS OTHER LOW PRESS PIPES
HT HEATING	GAS OTHER LOW PRESS
HV HIGH VOLTAGE	GAS OTHER MED PRESS
HY POLYTHYLENE	GAS OTHER HIGH PRESS
HY PIPES FIBRE	GAS OTHER MEDIUM PRESS
	GAS OTHER PRESS

BSI PAS128 Quality Levels (Standard in England)

QL-A: Precise location of utility apparatus determined from trial excavation and non-contact detection methods.
QL-B: Location of utility apparatus determined from non-contact detection methods.
QL-C: Location of utility apparatus determined from records.
QL-D: Location of utility apparatus unknown.

KEY



REV	DATE	DESCRIPTION

SHEET LAYOUT

JOB No.	23295_F
SCALE	1:200
SURVEYED	TM
DRAWN	TM
CHECKED	
SHEET	1 OF 1
DATE	26/10/23
SURVEY TYPE	
DRAINAGE	☒
UTILITY	☒

MAPTEC SURVEYS
Specialists in Underground Surveying.
Office:
Unit 5 Vantage Park
Goodwood Drive
Sparkford Somerset
BA22 7FQ
enquiries@maptecsurveys.co.uk
www.maptecsurveys.co.uk

446900mE 446975mE 447050mE 447125mE 447200mE

112075mN 112050mN 112025mN 112000mN 111975mN

REVISION A - APRIL 2024

Drawing updated to show;
8" Gas Pipeline - Located by SGN
12" Esso Pipeline - Located by Fisher German
Old 10" LinePipeline - Located by Fisher German
10" West London Pipeline (Avalon Fuel Only) - Located by Fisher German

NOTES

This survey grid has been related to OS National Grid using a flat earth projection and metric scale factor of 1, centred on Station GPS1. Levels are related to OS datum determined from the National GPS Network using OSGM15.

The position and height of adjacent buildings have been obtained using higher level reflectorless measurement and may not take account of single storey extensions or conservatories below the level of sight.

Geomatic Surveyors
siteline
Unit E, Woodside
34 Parham Drive
Eastleigh
SO50 4NU
t: 023 8081 1081
w: siteline.co.uk

EASTLEIGH BOROUGH COUNCIL	Client
LAND AT KINGS COPSE AVENUE HEDGE END, HAMPSHIRE	Contract
TOPOGRAPHICAL AND UTILITY SURVEY	Title
644KC02A (Sheet 1 of 5)	Drawing Number
OCTOBER 2023	Date
1:200 (at A0)	Scale
MB/MU	Surveyor(s)

TREES

A Ash
AL Alder
AP Apple
B Beech
C Cedar
CB Copper Beech
CH Cherry
CY Cypress
E Elm
EL Elder
EU Eucalyptus
F Fir
FM Field Maple
FR Fruit
HZ Hazel
HC Horse Chestnut
HO Holm Oak
HW Hawthorn
HY Holly
JM Japanese Maple
LB Laburnum
LM Lime
LO Locust Tree
LR Laurel
M Maple
MG Magnolia
OK Oak
P Pine
PA Palm
PL Plane
PM Plum
PO Poplar
PP Pissardii Plum
PR Pear
R Redwood
RD Red Oak
RH Rhododendron
RO Rowan
SB Silver Birch
SC Sweet Chestnut
SP Scots Pine
SU Spruce
SY Sycamore
U Unidentified
W Willow
WN Walnut
Y Yew


Species / Dia / Spread (max) / Ht
e.g. OK / 0.6 / 8 / 15

ABBREVIATIONS

BT British Telecom
BOL Bollard
CB Control Box
CL Cover Level
CTV Cable Television
EL Electric
EP Electricity Pole
FH Fire Hydrant
GSV Gas Stop Valve
HT Height
HVC High Voltage Cable
IC Inspection Cover
IL Invert Level
LP Lamp Post
MH Man-Hole
MKR Marker
MW Monitoring Well
O/H Overhead
G Road Gully
PB Post Box
PC Pram Crossing
RNP Road Name Plate
RS Road Sign
S/A Soakaway
ST Stay / Strut
SV Stop Valve (Unidentified)
TB Telephone Box
TC Telecom
TH Trial Hole
TL Traffic Light
TP Telegraph Pole
UTL Unable to Lift
VP Vent pipe
WM Water Meter
WSV Water Stop Valve

FENCES

BWF Barbed Wire Fence
CBF Closed Board Fence
CP Concrete Post
CPF Chestnut Paling Fence
CWF Chicken Wire Fence
IRF Iron Railing Fence
PKF Picket Fence
PRF Post & Rail Fence
PWF Post & Wire Fence
SCF Security Fence
SP Steel Post
WMF Wire Mesh Fence
WPF Wood Panel Fence



REVISION A - APRIL 2024

Drawing updated to show:
8" Gas Pipeline - Located by SGN
12" Esso Pipeline - Located by Fisher German
Old 10" LinePipeline - Located by Fisher German
10" West London Pipeline (Aviation Fuel Only) - Located by Fisher German

NOTES

The survey grid has been related to OS National Grid using a flat earth projection and metric scale factor of 1, centred on Station GPS1. Levels are related to OS datum determined from the National GPS Network using OSGM15.

The position and height of adjacent buildings have been obtained using higher level reflectorless measurement and may not take account of single storey extensions or conservatories below the line of sight.

Geomatic Surveyors	siteline Unit E, Woodside 34 Parham Drive Eastleigh SO50 4NU t: 023 8081 1081 w: siteline.co.uk
EASTLEIGH BOROUGH COUNCIL	Client
LAND AT KINGS COPSE AVENUE HEDGE END, HAMPSHIRE	Contract
TOPOGRAPHICAL AND UTILITY SURVEY	Title
644KC02A (Sheet 2 of 5)	Drawing Number
OCTOBER 2023	Date
1:200 (at A0)	Scale
MB/MU	Surveyor(s)

FENCES

BWF	Barbed Wire Fence
CBF	Closed Board Fence
CF	Concrete Post
CPF	Chestnut Paling Fence
CWF	Chicken Wire Fence
IRF	Iron Railing Fence
PKF	Picket Fence
PRF	Post & Rail Fence
PWF	Post & Wire Fence
SCF	Security Fence
SP	Steel Post
WMF	Wire Mesh Fence
WPF	Wood Panel Fence

ABBREVIATIONS

BT	British Telecom
BOL	Bollard
CB	Control Box
CL	Cover Level
CTV	Cable Television
EL	Electric
EP	Electricity Pole
FH	Fire Hydrant
GSV	Gas Stop Valve
HT	Height
HVC	High Voltage Cable
IC	Inspection Cover
IL	Invert Level
LP	Lamp Post
MH	Man-Hole
MKR	Marker
MW	Monitoring Well
O/H	Overhead
G	Road Gully
PB	Post Box
PC	Pram Crossing
RNP	Road Name Plate
RS	Road Sign
S/A	Soakaway
ST	Stay / Strut
SV	Stop Valve (Unidentified)
TB	Telephone Box
TC	Telecom
TH	Trial Hole
TL	Traffic Light
TP	Telegraph Pole
UTL	Unable to Lift
VP	Vent pipe
WM	Water Meter
WSV	Water Stop Valve

TREES

A	Ash
AL	Alder
AP	Apple
B	Beech
C	Cedar
CB	Copper Beech
CH	Cherry
CY	Cypress
E	Elm
EL	Elder
EU	Eucalyptus
F	Fir
FM	Field Maple
FR	Fruit
HZ	Hazel
HC	Horse Chestnut
HO	Holm Oak
HW	Hawthorn
HY	Holly
JM	Japanese Maple
LB	Laburnum
LM	Lime
LO	Locust Tree
LR	Laurel
M	Maple
MG	Magnolia
OK	Oak
P	Pine
PA	Palm
PL	Plane
PM	Plum
PO	Poplar
PP	Pissardii Plum
PR	Pear
R	Redwood
RD	Red Oak
RH	Rhododendron
RO	Rowan
SB	Silver Birch
SC	Sweet Chestnut
SP	Scots Pine
SU	Spruce
SY	Sycamore
U	Unidentified
W	Willow
WN	Walnut
Y	Yew

Species / Dia / Spread (max) / Ht
e.g. OK / 0.6 / 8 / 15

SURVEY STATION INFORMATION

Name	Easting	Northing	Height	Type
GPS2	449830.210	112173.070	23.278	NAIL
KC9	449856.110	112243.602	23.498	NAIL
KC2	449660.939	112023.636	27.834	NAIL
KC8	449846.063	112187.034	20.286	NAIL
M6	449831.418	112093.152	22.912	PEG
M5	449694.356	111913.965	30.250	NAIL
M9	449779.447	111926.360	27.500	PEG
M10	449825.146	111952.382	24.501	PEG
M11	449826.146	111870.878	21.797	PEG
M12	449949.406	111955.978	20.431	PEG
M13	449997.371	112002.756	18.609	PEG
M14	450022.393	112059.781	17.066	PEG
M15	449998.220	112140.390	17.713	PEG
M16	449958.224	112140.590	17.713	PEG
M17	449920.596	112158.411	18.159	PEG
M18	449887.819	112163.223	18.419	PEG
M1	449779.479	112099.191	25.020	NAIL
M2	449780.271	112099.219	24.979	PEG
M4	449744.593	112061.467	26.303	NAIL
M7	449744.593	112061.467	26.303	NAIL
M8	449868.471	111872.199	30.826	NAIL
M19	449866.335	112171.427	20.548	PEG
M20	449840.190	112171.966	19.551	PEG

NOTES;

LAND SURVEY INFORMATION
DATA: LOCAL PLANE GRIDS RELATED TO O.S NATIONAL GRID
GENERAL DATUM: GROUND INFORMATION IS RELATIVE TO ORDNANCE DATUM NEWLYN
ORIGINAL SITE SURVEY CARRIED OUT BY MAPTEC SURVEYS (SOUTH) LTD

UTILITY SERVICES SURVEY INFORMATION
Electromagnetic Detector Ground Penetrating Radar techniques have been used to locate/map underground utilities and boundaries where possible. Where Ground Penetrating Radar Type 51 (GSI) has been undertaken and utilised for this survey, Any GLIDL 92/93 data provided (e.g. pipe sizes and depths) is based on information held by statutory records information bodies and landowners.

Maptec Surveys Ltd is not liable for any topographical survey that has not been undertaken by us. Any inaccuracies resulting from the information provided to us by third parties and any loss or cost to us or to others over is the liability of the customer. Maptec Surveys shall not be responsible for any inaccuracies, omissions, errors, misinterpretations or omissions in the information received from third parties. Although Maptec Surveys Ltd endeavours to provide accurate and reliable information, 100% accuracy can not be guaranteed. Any dispute shown to be caused as a result of incorrect information received, unless otherwise agreed.

If the location or depth of services/features is of particular importance to a project then it is strongly advised that discussions are held with Maptec Surveys Ltd regarding any additional investigations that may be required. Please refer to our terms and conditions should be undertaken to verify survey results.

ABBREVIATIONS (Land & Utilities)

AP ANTENNA MAST	FL FLAT
AV AIR VALVE	FH FIRE HOOD
B BOLLARD	FP FIRE PROTECTION COVERING
BH BOREHOLE	FR FLEXIBLE PIPE
BS BUS STOP	FRP FIBRE REINFORCED PIPE
BW BUS WAITING SHELTER	FTC FIBRE TELEPHONE CABLE
CAT CABLE TV CABLE (CAT)	G GRID LINE
CB CONTROL BOX	GL GLOBE LEVEL
CC CABLE CHAMBER	GP GAS PIPE
CL CLOSED LEVEL	GRP GAS, WATER MAIN
CP CONCRETE POST	GV GAS VALVE
CP CABLE TV	TBB TELEPHONE BRICK MARK
CPF CHESTNUT PALING FENCE	TBM TEMPORARY BENCH MARK
CTV CABLE TELEVISION	TC TELECOMMS CABLE
E ELECTRIC	TL TRAFFIC LIGHT
EP ELECTRICITY POLE	TP TELEGRAPH POLE
EW ELECTRIC WATER	TRP TRAFFIC RADIO POLE
FH FIRE HYDRANT	UTL UNABLE TO LIFT
FP FLAG POLE	VP VENT PIPE
FW FOUL WATER	WM WATER METER
GAS GAS MAIN	WSV WATER STOP VALVE
GV GAS VALVE	WW WATER WELL
HP HYDRAULIC POST	WP WOOD PANEL FENCE
HV HIGH VOLTAGE	WMF WIRE MESH FENCE
IC INSPECTION COVER	WPF WOOD PANEL FENCE
IL INVERT LEVEL	
LP LAMP POST	
MH MAN HOLE	
MKR MARKER	
MW MONITORING WELL	
O/H OVERHEAD	
OHL OVERHEAD LINE	
P POLE	
PB POST BOX	
PC PRAM CROSSING	
PCP PROTECTIVE CONCRETE POST	
PO POST OFFICE	
PP PISSARDII PLUM	
PPC PROTECTIVE PLASTIC COVER	
PR PEAR	
PRF PLASTIC RAIL FENCE	
PWF POST & WIRE FENCE	
R REDWOOD	
RD RED OAK	
RH RHODODENDRON	
RO ROWAN	
RP ROAD PLATE	
RS ROAD SIGN	
S/A SOAKAWAY	
SB SILVER BIRCH	
SC SWEET CHESTNUT	
SCF SECURITY FENCE	
SP SCOTS PINE	
SP STEEL POST	
SU SPRUCE	
SY SYCAMORE	
TB TELEPHONE BOX	
TC TELECOM	
TH TRIAL HOLE	
TL TRAFFIC LIGHT	
TP TELEGRAPH POLE	
UTL UNABLE TO LIFT	
VP VENT PIPE	
W WILLOW	
WM WATER METER	
WN WALNUT	
WSV WATER STOP VALVE	
Y YEW	

WSI PAS128 Quality Levels (Attached to Drawing)
QL-A Precise 3D position of utility established by excavation and trial hole.
QL-B Detected and 3D position established using appropriate equipment.
QL-C Detected and 2D position established using appropriate equipment.
QL-D Data compiled from existing records.

KEY

	CCTV / CABLE TELEVISION
	COMMS/ SIGNALS
	COMPRESSED AIR
	DUCTING
	EARTH CABLE
	ELECTRIC CABLE
	END OF TRACE
	FOUL DRAINAGE
	FUEL PIPE
	GAS PIPE
	GRADE LINE
	HEATING
	INFRANT TEL PIPE
	PLANTING AREA
	PRIVATE DRAIN
	SURFACE DRAINAGE
	SURVEY BOUNDARY
	TELECOM CABLE
	TRAFFIC LIGHTS
	UNKNOWN
	VARIOUS RECORDED
	WAS PIPE
	WATER PIPE

ST STRUT / GUARD
S.S. STEEL GUARD

A SURVEY AND INFORMATION IS CORRECT AND ACCURATE FOR PURPOSES OF THIS PLAN ONLY AT THE DATE OF SURVEY. ANY ALTERATIONS TO THE SITE AFTER THIS DATE WILL NOT BE REFLECTED ON THIS PLAN. THIS PLAN IS NOT TO BE SCALED. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM DRAWING.

ISSUE	DATE	DESCRIPTION

SHEET LAYOUT

CLIENT: Siteline
JOB No: 23295_F
REV:
TITLE: Land At Kings Copse Avenue Hedge End Hampshire
SCALE: 1:200
SURVEYED: TM
DRAWN: TM
DATE: 26/10/23
SHEET: 1 OF 1
SURVEY TYPE:
DRAINAGE
UTILITY

MAPTEC SURVEYS
Specialists in Underground Surveying.

Office:
Unit 5 Vantage Park
Old Gloucester Rd
Speedgate Somerset
BA22 7FQ

enquiries@maptecsurveys.co.uk
www.maptecsurveys.co.uk

REVISION A - APRIL 2024
Drawing updated to show:
8" Gas Pipeline - Located by SGN
12" Esso Pipeline - Located by Fisher German
Old 10" LinePipeline - Located by Fisher German.
10" West London Pipeline (Aviation Fuel Only) - Located by Fisher German

NOTES

The survey grid has been related to OS National Grid using a flat earth projection and metric scale factor of 1, centred on Station GPS1. Levels are related to OS datum determined from the National GPS Network using OSGM15.

The position and height of adjacent buildings have been obtained using higher level reflectorless measurement and may not take account of single storey extensions or conservatories below the line of sight.

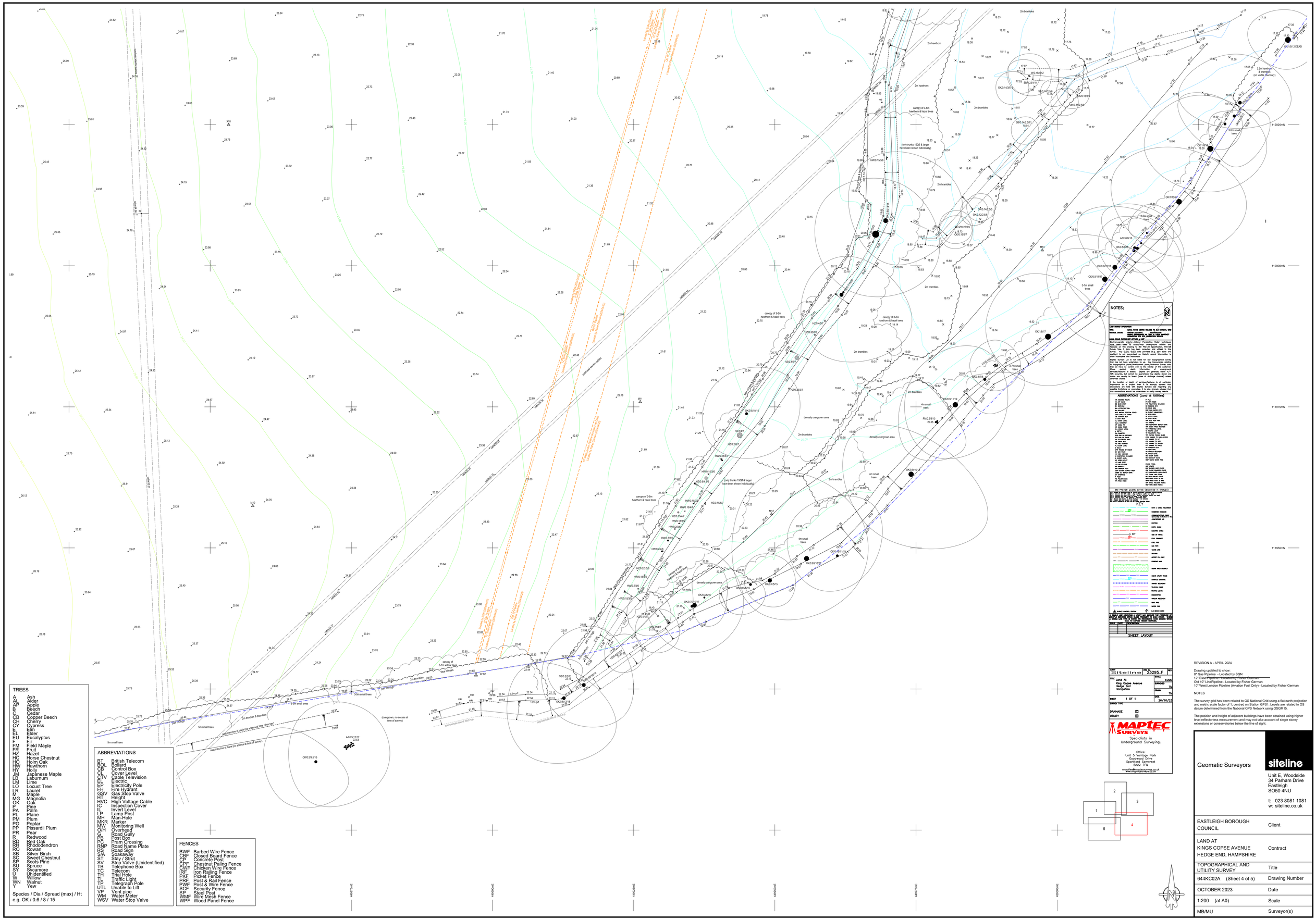
Geomatic Surveyors

siteline

Unit E, Woodside
34 Parham Drive
Eastleigh
SO50 4NU

t: 023 8081 1081
w: siteline.co.uk

EASTLEIGH BOROUGH COUNCIL	Client
LAND AT KINGS COPSE AVENUE HEDGE END, HAMPSHIRE	Contract
TOPOGRAPHICAL AND UTILITY SURVEY	Title
644KC02A (Sheet 3 of 5)	Drawing Number
OCTOBER 2023	Date
1:200 (at A0)	Scale
MB/MU	Surveyor(s)


NOTES;
LAND SURVEY INFORMATION
DATUM: OSGB36
LOCAL PLANE INFORMATION
ABBREVIATIONS (Land & Utilities)
BS 5930:2015 Quality Levels (Displayed in Datum)
KEY
SHEET LAYOUT
Siteline
Land At
King Copse Avenue
Hedge End
Hampshire
1 OF 1
28/10/23
SURVEY TYPE
DRAINAGE
UTILITY
MAPTEC SURVEYS
Specialists in
Underground Surveying.
Office:
Unit 5 Vantage Park
Gosport Drive
Sparrowhawk Somerset
BA22 7TG
enquiries@maptecsurveys.co.uk
www.maptecsurveys.co.uk
TREES
A Ash
AL Alder
AP Apple
B Beech
C Cedar
CB Copper Beech
CH Cherry
CY Cypress
E Elm
EL Elder
EU Eucalyptus
F Fir
FM Field Maple
FR Fruit
HZ Hazel
HC Horse Chestnut
HO Holm Oak
HW Hawthorn
HY Holly
JM Japanese Maple
LB Laburnum
LM Lime
LO Locust Tree
LR Laurel
M Maple
MG Magnolia
OK Oak
P Pine
PA Palm
PL Plane
PM Plum
PO Poplar
PP Pissardii Plum
PR Pear
R Redwood
RD Red Oak
RH Rhododendron
RO Rowan
SB Silver Birch
SC Sweet Chestnut
SP Scots Pine
SU Spruce
SY Sycamore
U Unidentified
W Willow
WN Walnut
Y Yew
Species / Dia / Spread (max) / Ht
e.g. OK / 0.6 / 8 / 15
ABBREVIATIONS
BT British Telecom
BOL Bollard
CB Control Box
CL Cover Level
CTV Cable Television
EL Electric
EP Electricity Pole
FH Fire Hydrant
GSV Gas Stop Valve
HT Height
HVC High Voltage Cable
IC Inspection Cover
IL Invert Level
LP Lamp Post
MH Man-Hole
MKR Marker
MW Monitoring Well
O/H Overhead
G Road Gully
PB Post Box
PC Pram Crossing
RNP Road Name Plate
RS Road Sign
S/A Soakaway
ST Stay / Strut
SV Stop Valve (Unidentified)
TB Telephone Box
TC Telecom
TH Trial Hole
TL Traffic Light
TP Telegraph Pole
UTL Unable to Lift
VP Vent pipe
WM Water Meter
WSV Water Stop Valve
FENCES
BWF Barbed Wire Fence
CBF Closed Board Fence
CP Concrete Post
CPF Chestnut Paling Fence
CWF Chicken Wire Fence
IRF Iron Railing Fence
PKF Picket Fence
PRF Post & Rail Fence
PWF Post & Wire Fence
SCF Security Fence
SP Steel Post
WMF Wire Mesh Fence
WPF Wood Panel Fence
Geomatic Surveyors
siteline
Unit E, Woodside
34 Parham Drive
Eastleigh
SO50 4NU
t: 023 8081 1081
w: siteline.co.uk
EASTLEIGH BOROUGH COUNCIL — Client
LAND AT KINGS COPSE AVENUE HEDGE END, HAMPSHIRE — Contract
TOPOGRAPHICAL AND UTILITY SURVEY — Title
644KC02A (Sheet 4 of 5) — Drawing Number
OCTOBER 2023 — Date
1:200 (at A0) — Scale
MB/MU — Surveyor(s)
REVISION A - APRIL 2024
Drawing updated to show:
8" Gas Pipeline - Located by SGN
12" Esso Pipeline - Located by Fisher German
Old 12" LineFpipeline - Located by Fisher German.
10" West London Pipeline (Aviation Fuel Only) - Located by Fisher German
NOTES
The survey grid has been related to OS National Grid using a flat earth projection and metric scale factor of 1, centred on Station GPS1. Levels are related to OS datum determined from the National GPS Network using OSGM15.
The position and height of adjacent buildings have been obtained using higher level reflectorless measurement and may not take account of single storey extensions or conservatories below the line of sight.
112025mN
112000mN
111975mN
111950mN
446975mE
446900mE
446925mE
446950mE
446975mE
450000mE

TREES

A	Ash
AL	Alder
AP	Apple
B	Beech
C	Cedar
CB	Copper Beech
CH	Cherry
CY	Cypress
E	Elm
EL	Elder
EU	Eucalyptus
F	Fir
FM	Field Maple
FR	Fruit
HZ	Hazel
HC	Horse Chestnut
HO	Holm Oak
HW	Hawthorn
HY	Holly
JM	Japanese Maple
LB	Laburnum
LM	Lime
LO	Locust Tree
LR	Laurel
M	Maple
MG	Magnolia
OK	Oak
P	Pine
PA	Palm
PL	Plane
PM	Plum
PO	Poplar
PP	Pissardii Plum
PR	Pear
R	Redwood
RD	Red Oak
RH	Rhododendron
RO	Rowan
SB	Silver Birch
SC	Sweet Chestnut
SP	Scots Pine
SU	Spruce
SY	Sycamore
U	Unidentified
W	Willow
WN	Walnut
Y	Yew

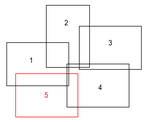
Species / Dia / Spread (max) / Ht
e.g. OK / 0.6 / 8 / 15

ABBREVIATIONS

BT	British Telecom
BOL	Bollard
CB	Control Box
CL	Cover Level
CTV	Cable Television
EL	Electric
EP	Electricity Pole
FH	Fire Hydrant
GSV	Gas Stop Valve
HT	Height
HVC	High Voltage Cable
IC	Inspection Cover
IL	Invert Level
LP	Lamp Post
MH	Man-Hole
MKR	Marker
MW	Monitoring Well
O/H	Overhead
G	Road Gully
PB	Post Box
PC	Pram Crossing
RNP	Road Name Plate
RS	Road Sign
SA	Soakaway
ST	Stay / Strut
SV	Stop Valve (Unidentified)
TB	Telephone Box
TC	Telecom
TH	Trial Hole
TL	Traffic Light
TP	Telegraph Pole
UTL	Unable to Lift
VP	Vent pipe
WM	Water Meter
WSV	Water Stop Valve

FENCES

BWF	Barbed Wire Fence
CBF	Closed Board Fence
CF	Concrete Post
CPF	Chestnut Paling Fence
CWF	Chicken Wire Fence
IRF	Iron Railing Fence
PKF	Picket Fence
PRF	Post & Rail Fence
PWF	Post & Wire Fence
SCF	Security Fence
SP	Steel Post
WMF	Wire Mesh Fence
WPF	Wood Panel Fence



111950mN

111925mN

111900mN

111875mN

NOTES;

LAND SURVEY INFORMATION

DATA: LEGAL PLANS WERE RELIED TO 0.5 METRES, AND
VERTICAL DATUM: ORDNANCE DATUM NEWLYN
COORDINATES: OSGB 36 (NATIONAL GRID)

LEGAL ROAD ENCROACHMENT OPINION as at:

Utility/Underground services information: Underground services have been plotted from as built drawings supplied by the relevant utility authorities via the statutory NJUG Plan128 Specification. Plan128 requires that utilities are plotted to an accuracy of ±300mm for this survey. No GUDG 10x20 data provided (e.g. pipe sizes and positions) is not guaranteed as historic record information is sometimes inaccurate.

Maptec Surveys Ltd is not liable for any topographical survey that has not been undertaken by us. Any inaccuracies relating to topographical plans/levels/grid plans/Ordnance Survey data are not the responsibility of Maptec Surveys Ltd. Please note: Where buried depth information of underground services/features is shown, Depths are generally within +/- 0.2m of the actual depth. Where depths are not shown, the position of the service are usually to invert (base of drainage channel) unless otherwise stated.

If the location or depth of services/features is of particular importance to a project then it is strongly advised that discussions are held with Maptec Surveys Ltd regarding any requirements for trial excavations. Any trial excavations carried out by third parties should be undertaken to verify survey results.

ABBREVIATIONS (Land & Utilities)

AP ARRIVED WATER	PL POLE
BP BP PUMP	PO POST HOOD
BT BT MANHOLE	PT PETROL FILLERS
BY BOYDELL	RE RODDING EYE
BYC BOYDELL CAP	RM RISING MAIN
BYL BOYDELL	SHT TEST TANK WATER PIPE
BYS BOYDELL TELECOM COVER	SL SURVEY UNDERCOVER
CB CONTROL BOX	SP SOIL PIPE
CL CONTROL BOX	SV WATER VALVE
CC CONTROL CABINET	TC TELECOM
CL COVER LEVEL	TOP SOIL / SOFT PIPE
CP CABLE POST	TP TELEGRAPH
CT CABLE TEST	TRA TEMPORARY BENCH MARK
CV CABLE VALVE	TS TRIAL PITS FROM SECURICE
D DRAIN / DIAL	TT TRIAL TRENCH
E EARTH	TL TRAFFIC LIGHT
EB ELECTRIC BOX	TV TELEVISION
ESB END OF RECORDS	TPS TATTLE PHONE SLAVE
EP ELECTRICITY POLE	UTL UNABLE TO LIFT
GP GATEPOST POLE	UTR UNABLE TO REF
GV GATE VALVE	UTS UNABLE TO SEE
HP HYDRANT POST	UTT UNABLE TO TRACE
IL FLOOR LEVEL	UTP UNABLE TO PASS
IP IRON PIPE	VP VENT PIPE
KPB TRACED BY RADAR	VT VENT PIPE
L LAMP POST	WB WATER BOUNDARY
LV GAS VALVE	WC WATER CAP
M INSPECTION CHAMBER	WH WATER METER
MH MAN HOLE	WSV WATER STOP VALVE
OG GRID GULLY	WWP WASTE WATER PIPE
OP OPTICAL POST	
P LOW VOLTAGE	POLE TYPES:
PB POST BOX	WP WOOD POLE
PC WARNING POST	WPP WOODEN METAL POLE
PCB CLOSE BOARD FENCE	CSP CLOSE WOODEN POLE
PCF CHESTNUT PALING FENCE	MP METAL POLE
PF PLANT LIFT POST	LP LAMP POST
PG PICKET FENCE	MPP METAL POLE PAINTED
PL POLYETHENE	MPG METAL POLE GALV
PP STEEL POST	WPP WOOD POLE PAINTED
	WPC WOOD POLE CREOSOTED
	WPP WOOD PAINTED POLE
	WPC WOOD CREOSOTED POLE

BSI PAS128 Quality Levels (displayed in linetype)

QL-A Where the use of an electromagnetic detection method to record the presence and position of underground utility apparatus has been employed and the utility apparatus detected has been positively identified from trace, inspection or other means.
QL-B Where the use of an electromagnetic detection method to record the presence and position of underground utility apparatus has been employed but not all the utility apparatus detected has been positively identified from trace, inspection or other means.
QL-C Where information has been obtained only from the application of one or more surface feature detection methods.
QL-D Where information has been obtained only from existing records.

KEY

100	CCTV / CABLE TELEVISION
	CHAMBER, DRAINAGE
	CONSTRUCTION LINES / CONSTRUCTION LINES
	CONTRACTORS JAR
	DUCTING
	EARTH CABLE
EDF	ELECTRIC CABLE
100	END OF TRACE
	FUEL DRAINAGE
	FUEL PIPE
	GAS PIPE
	MAINS LAID
	MARKING
	OFFSET FILL PIPE
	PUMPING MAIN
	ROADS AREA ASPHALT
	ROADS UTILITY TRACE
	SURFACE DRAINAGE
	SURVEY BOUNDARY
	TELECOM CABLE
	TRAFFIC LIGHTS
	UNIDENTIFIED
	VARIOUS RECORDED
	VENT PIPE
	WATER PIPE

BURIED CONTROL SYSTEMS — CC RECORD MARK

IT SHOULD NOT BE ASSUMED A UTILITY HAS BEEN LOCATED BY THE ABSENCE OF SURFACE MARKINGS. ALL UTILITIES SHOULD BE CONTACTED TO CONFIRM THE PRESENCE OR ABSENCE OF THEIR APPARATUS.

ISSUE	DATE	DESCRIPTION

SHEET LAYOUT

CLIENT	siteline	REF No. 23295_F
TITLE	Land At King Copse Avenue Hedge End Hompshire	SCALE 1:200 SURVEYED TH DRAWN TH DATE 26/10/23
SHEET	1 OF 1	

SURVEY TYPE

DRAINAGE ☒
UTILITY ☒

MAPTEC SURVEYS

Specialists in
Underground Surveying.

Office:
Unit 5 Vantage Park
Goodwood Drive
Sporkford Somerset
BA22 7FQ

enquiries@maptecsurveys.co.uk
www.maptecsurveys.co.uk

4469050mE
4469075mE
4469100mE
4469125mE
4469150mE
4469175mE
4469200mE
4469225mE

REVISION A - APRIL 2024

Drawing updated to show:
8" Gas Pipeline - Located by SGN
12" Esso Pipeline - Located by Fisher German
Old 10" LinePipeline - Located by Fisher German
10" West London Pipeline (Aviation Fuel Only) - Located by Fisher German

NOTES

The survey grid has been related to OS National Grid using a flat earth projection and metric scale factor of 1, centred on Station GPS1. Levels are related to OS datum determined from the National GPS Network using OSGM15.

The position and height of adjacent buildings have been obtained using higher level reflectorless measurement and may not take account of single storey extensions or conservatories below the line of sight.

Geomatic Surveyors

siteline

Unit E, Woodside
34 Parham Drive
Eastleigh
SO50 4NU

t: 023 8081 1081
w: siteline.co.uk

EASTLEIGH BOROUGH COUNCIL	Client
LAND AT KINGS COPSE AVENUE HEDGE END, HAMPSHIRE	Contract
TOPOGRAPHICAL AND UTILITY SURVEY	Title
644KC02A (Sheet 5 of 5)	Drawing Number
OCTOBER 2023	Date
1:200 (at A0)	Scale
MB/MU	Surveyor(s)

APPENDIX B
PROPOSED ARCHITECT SITE LAYOUT

North boundary elevation

East boundary elevation

South boundary elevation

West boundary elevation

A

B

C

D

E

F

Notes

1. This drawing is the copyright of MH Architects Ltd
2. Do not scale this drawing except for Local Authority planning purposes
3. All dimensions must be checked on site by the contractor prior to commencement of the works.

Client Approval

X	A - Approved
X	B - Approved with comments
X	C - Do not use

Rev.	Revision Note/Purpose of Issue	Drw By	Date	Chk By	Date
A	Issued for Information [First Issue]	MW	16.11.23	HJG	16.11.23

Schedule of accommodation

plot	type house	sqm GIA	height	BBC name
1	4B5P	134.7	3.0	UU
2	4B5P	134.7	3.0	TT
3	3B4P	73.6	2.0	W
4	4B5P	134.7	3.0	TT
5	4B5P	134.7	3.5	UU
6	3B5P	113.7	2.5	NN BEDDOOR
7	2B4P	79.8	2.0	BB
8	2B4P	79.8	2.0	BB
9	4B5P	134.7	3.5	UU
10	3B5P	113.7	2.5	NN
11	2B4P	79.8	2.0	BB
12	2B4P	79.8	2.0	BB
13	4B5P	134.7	3.0	TT
14	4B5P	134.7	3.0	TT
15	2B4P	79.8	2.0	BB
16	2B4P	79.8	2.0	BB
17	3B5P	113.7	2.5	NN BEDDOOR
18	3B5P	113.7	2.5	NN
19	2B4P	79.8	2.0	BB
20	2B4P	79.8	2.0	BB
21	3B5P	113.7	2.5	NN BEDDOOR
22	2B4P	73.6	2.0	W
23	2B4P	79.8	2.0	BB
24	2B4P	79.8	2.0	BB
25	2B4P	79.8	2.0	BB
26	3B5P	103.5	2.0	GG
27	3B5P	103.5	2.0	GG
28	3B5P	103.5	2.0	GG
29	3B5P	103.5	2.0	GG
30	4B5P	134.7	3.0	UU
31	4B5P	134.7	3.0	JJ
32	4B5P	134.7	3.0	JJ
33	4B5P	134.7	3.0	JJ
34	4B5P	134.7	3.0	JJ
35	3B5P	111.6	2.5	II
36	2B4P	79.8	2.0	BB
37	3B5P	111.6	2.5	II
38	3B5P	111.6	2.5	II
39	2B4P	79.8	2.0	BB
40	3B5P	111.6	2.5	II
41	3B5P	111.6	2.5	II
42	2B4P	79.8	2.0	BB
43	3B5P	111.6	2.5	II
44	3B5P	111.6	2.5	II
45	2B4P	79.8	2.0	BB
46	2B4P	79.8	2.0	BB
47	3B5P	111.6	2.5	II
48	3B5P	113.7	2.5	NN BEDDOOR
49	3B5P	113.7	2.5	NN BEDDOOR
50	3B5P	113.7	2.5	NN
51	2B4P	79.8	2.0	BB
52	2B4P	79.8	2.0	BB
53	2B4P	79.8	2.0	BB
54	2B4P	79.8	2.0	BB
55	3B5P	113.7	2.5	NN
56	3B5P	113.7	2.5	NN
57	2B4P	79.8	2.0	BB
58	3B5P	113.7	2.5	NN
59	2B4P	79.8	2.0	BB
60	2B4P	79.8	2.0	BB
61	2B4P	79.8	2.0	BB
62	2B4P	79.8	2.0	BB
63	2B4P	79.8	2.0	BB
64	2B4P	79.8	2.0	BB
65	3B5P	103.5	2.0	GG
66	3B5P	103.5	2.0	GG
67	3B5P	113.7	2.5	NN

Schedule of accommodation

plot		type	sqm GIA		
		flat		height	form
GD	GD		70.4	GF	
G1	B1	1B2P	50.1	GF	
G2	B2	2B3P	70.4	GF	M4(3)
G3	B3	2B4P	70.1	GF	
G4	B4	1B2P	50.3	GF	
G5	B5	2B4P	74.4	GF	
G6	B6	1B2P	50.1	FF	
G7	B7	2B4P	70.4	FF	
G8	B8	2B4P	70.1	FF	
G9	B9	1B2P	50.3	FF	
C00	B10	2B4P	74.4	FF	
C01	B11	2B4P	70.4	FF	
C02	B12	1B2P	50.1	SF	
C03	B13	2B4P	70.4	SF	
C04	B14	2B4P	70.1	SF	
C05	B15	1B2P	50.3	SF	
C06	B16	2B4P	74.4	SF	
C07	B17	2B4P	70.4	SF	
C08	B18	2B4P	70.4	TF	
C09	B19	2B4P	70.1	TF	
G20	B20	1B2P	50.3	TF	
C21	B21	2B4P	70.4	TF	
GD	A0		50.0	GF	
D1	A1	1b2p	53.1	GF	
D2	A2	1b2p	50.0	GF	
D3	A3	1b2p	50.0	GF	
D4	A4	1b2p	50.3	GF	
D5	A5	2b3p	70.4	GF	M4(3)
D6	A6	1b2p	50.1	GF	
D7	A7	1b2p	50.0	FF	
D8	A8	1b2p	53.1	FF	
D9	A9	1b2p	50.0	FF	
D10	A10	1b2p	50.0	FF	
D11	A11	1b2p	50.3	FF	
D12	A12	2b4p	70.4	FF	
D13	A13	1b2p	50.1	SF	
D14	A14	1b2p	50.0	SF	
D15	A15	1b2p	53.1	SF	
D16	A16	1b2p	50.0	SF	
D17	A17	1b2p	50.0	SF	
D18	A18	1b2p	50.3	SF	
D19	A19	2b4p	70.4	SF	
D20	A20	1b2p	50.1	TF	
D21	A21	2b4p	71.6	TF	
D22	A22	2b4p	70.4	TF	
D23	A23	1b2p	50.3	TF	
D24	A24	2b4p	70.4	TF	

Site Plan 1:500 @ A1

1:500

Client

Eastleigh Borough Council

Job title

Kings Copse Avenue

Drawing title

Proposed Site Plan

Drawn	Date	Checked	Date	Scale at A1
JDM	JUNE 25	HJG	JUNE 25	1:500

Job No.	Pro.	Org.	Zone	Level	Type	Role	No.	Rev.
22-148	KCA	MHA	ZZ	XX	DR	A	0003	C01

Purpose of Issue

PLANNING

Ground Floor Bicentennial Building
Southern Gate Chichester
West Sussex PO19 8EZ

t. 01243 774748
e. admin@mharchitects.co.uk
www.mharchitects.co.uk

Limited Company
Registered in England No.1994233

ARCHITECTS

APPENDIX C
PRE-APPLICATION LLFA COMMENTS

Site Location:	Kings Copse Avenue, Hedge End
Site Reference:	SWM-PRE/2024/0531
Review Date:	29/10/2024
Reviewer:	SR
Authorised:	SR
Total No. Pages	2

Proposal Description:

The site is a proposed residential development site consisting of approximately 200 houses that includes associated services floorspace, car parking and landscaping

Site Background				
Pre-development status		Greenfield		
Modelled Flood Risk		**Historic Flooding - split by data owner**		
Fluvial Flood Zone 2	Y	Highways	Y	Blocked drainage (remote from site)
Fluvial Flood Zone 3	Y	LLFA	Y	Watercourse subsidence issues to north of site
Surface Water High	Y	Environment Agency	N	
Surface Water Medium	Y	**Watercourses**		
Surface Water Low	Y	Main River		Y (to north of site)
Groundwater risk zone		Ordinary Watercourse		Y (as tributary to main river)
Priority Area	Y	**Predominant Geology**		*London Clay*

Name of Documents Reviewed	**Document reference No.**
Drainage Layout	AKSW-XX-XX-DR-C-9200 P03
Revised Drainage Layout	Reviewed on screen during meeting

Summary of submission, key points requiring assessment, response to specific developer queries

Overall, the surface water drainge strategy appears appropriate and we would have no objection to the proposed discharge point. Further information will be required as detailed below to support the application however the points highlighted during the meeting appear to be manageable.

Discussions were held regarding a potential alternative discharge point to effectively flood an area of adjoining land owned by the applicant to formalise wetlands. This is potentially acceptable but further assessment would be required to ensure flood risk is not increased elsewhere.

There is currently a proposed chamber shown within ordinary watercourse. This would need to be moved and further information provided to show that there is sufficient offset beneath the base of the watercourse. The watercourse appears to require maintenance and could be considered as an appropriate point of discharge. There is a suspected field drain cutting through the embankment on Tanhouse Lane which needs to be addressed to avoid water flowing onto the highway. Land drainage should be reviewed to direct this towards the watercourse.

A flood risk assessment and drainage strategy will be required to review additional details and this can be reviewed prior to a formal planning submission.

Review of Proposals

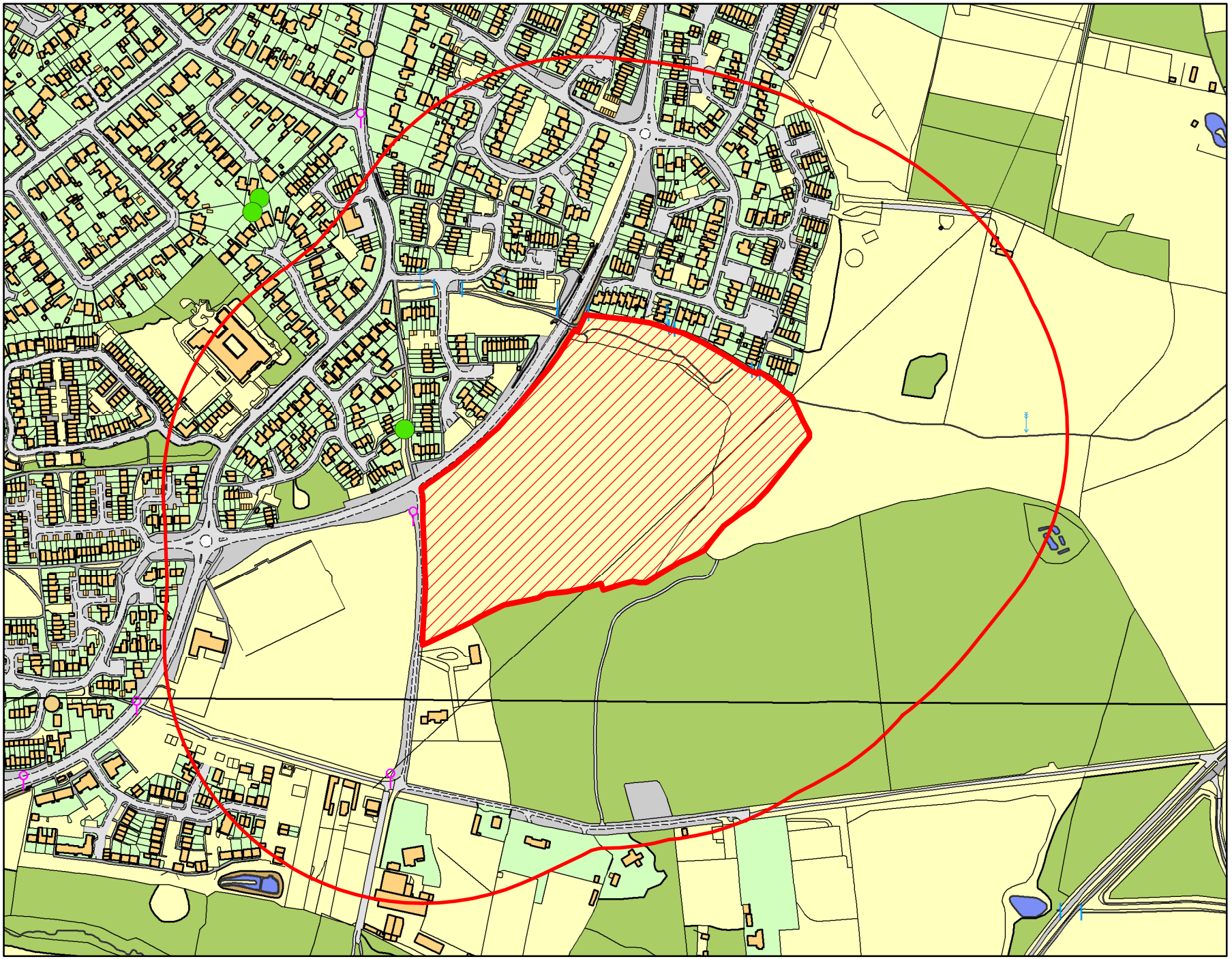
The following sections review the information provided in line with our guidance and checklist and provide commentary as to the suitability of the information if it was submitted for planning. If no relevant information is provided then guidance is included on what should be submitted for planning. Any key issues identified are highlighted for further discussion however this is based soley on the information submitted

Information Category	RAG	Commentary
Existing site conditions		A topographic survey has been included within the drainage layout and is generally sufficient to identify key features within and bounding the site. Clarity is needed in relation to the site boundary and the main river particularly in relation to riparian responsibilities although it has been confirmed that the applicant will be responsible up to the 1/2 way point of the main river. A flood risk assessment / statement is required detailing the current risk of all sources of flooding. The existing drainage mechanisms / systems should be detailed together with the existing runoff rates and volumes. It should be noted that there have been significant issues to the north of the site where the volume and velocity of flows exiting the culvert have led to the undermining of the river banks and caused the collapse of one of the adjacent gardens.It is understood that the applicant is fully aware of these issues and the associated background information. To the south of the site, it is known that there is a regular flow of water from the Tan House Lane junction and across Kings Copse Ave. It is suspected that this is linked to the balancing pond on the corner and / or flows from Tan House Lane. A feature has been identified through streetview that may be a historic land drainage outfall from the development site which should be investigated.
Site Investigation Report		A site investigation report is required setting out the geology and if infiltration is feasible, testing to BRE365 together with groundwater monitoring / assessment. Given the geological characteristics and location of the watercourse, it is not expected that infiltration will be viable for surface water discharge.
Review of flood risk on site		An assessment of flood risk should be included within a Flood Risk Assessment / Statement. If flood risk areas (from any source) are identified, it must be demonstrated that the proposals can be delivered without encroaching on these areas. If the flood risk areas are deemed inaccurate, modelling will be required before changes can be accepted. If development is proposed in these areas without modelling, compensation areas will be required and details on how the topography will be altered to ensure new development is not at risk. Modelling may also be required to support this. Some surface water overland flow routes are identified within the proposed housing areas to the south of the site. Although considered low risk, exceedance routing will need to be assessed to maintain these flow paths.
Drainage Strategy		A drainage strategy drawing has been provided to demonstrate how the site is to be drained. Further information will be required to evidence the proposed discharge rate, discharge location and sufficient information on the drainage features to demonstrate it is viable within the site constraints without increasing the risk of flooding. The discharge mechanism needs to demonstrate adherence to the drainage hierarchy. An updated plan was shown during the pre-app meeting identifying the proposed use of detention basins along the north and west sides of the development. The potential interaction of these features with areas of flood risk will require assessment and potential 'compensation areas' if flood risk areas are affected.
Discharge Rate		The proposed discharge rate must be stated with a comparison to the equivalent greenfield discharge rate for the different return periods taking into account any specific policy requirements
Drawings		A surface water drainage layout is required showing drainage features of sufficient capacity, in appropriate locations with due regard to flood risk areas, topography, and connectivity to discharge locations. Level information and dimensions should be provided where appropriate. The current drainage layout provides a good level of detail but it has not been possible to review the details of the SuDS features.
Calculations		Hydraulic calculations are required produced using industry-standard software, demonstrating a suitable storage estimate and that post-development runoff rates and volumes do not exceed pre-development runoff rates and volumes for 1:1, 1:30, 1:100 + climate change. These must be based on network assessment as opposed to source control. These must include an appropriate allowance for urban creep and climate change. The risk of a surcharged outfall will need to be considered. We would recommend that the 1:30 storm, usually with 6 hr duration, should be reviewed to assess the impacts of a surcharged outfall however once information is received from the EA, this may inform the most appropriate storm durations. It is known that this is a flashy catchment so a shorter storm duration may be appropriate.

Water Quality		An assessment is required in accordance with the simple index approach (for the LLFA) but also taking into account the specific requirements of EBC. 3 naturalised treatment processes will be required. If proprietary treatment systems are proposed these must be supported with manufacturer's specification detailing performance
Exceedance flows		A pre and post development plan is required to indicate overland flow routes based on the topography / built levels and demonstrating flows will not be directed in new locations and affecting properties. Flows within the development must be routed away from new properties. Details of finished floor levels, road camber and kerb heights may be required.
Further permissions required		Culverting of watercourses must be restricted to where access is required only, and consent sought from the relevant authority. The applicant must ensure other bodies are consulted on proposals as required i.e. Environment Agency (main rivers) / Water companies
Maintenance		A schedule of maintenance tasks, to include descriptions, frequencies, and the responsible parties for maintaining each part of the drainage system (including any adoption agreements) and any watercourses is required. This should also consider access requirements and any easements necessary
Compliance with Policies		The policies within the Catchment Plans need to be reviewed to ensure compliance of the proposals.

Refer to Planning Guidance for Developers for additional information regarding the specific requirements dependant on type of planning application being applied for

RAG assessment			
Considered sufficient for a planning submission		Acceptable in principle but further detail required	
No information provided		principles submitted considered unsuitable / inadequate	



Legend

- 250m buffer
- Site
- No Value

Hampshire Flood Enquiries

enq_status_name

- Resolved Flood Enquiry
- No Maintenance Work Required

Historic Flood Information Request

Historic Flooding Records

AKS Ward

Kings Copse Close

Notes:

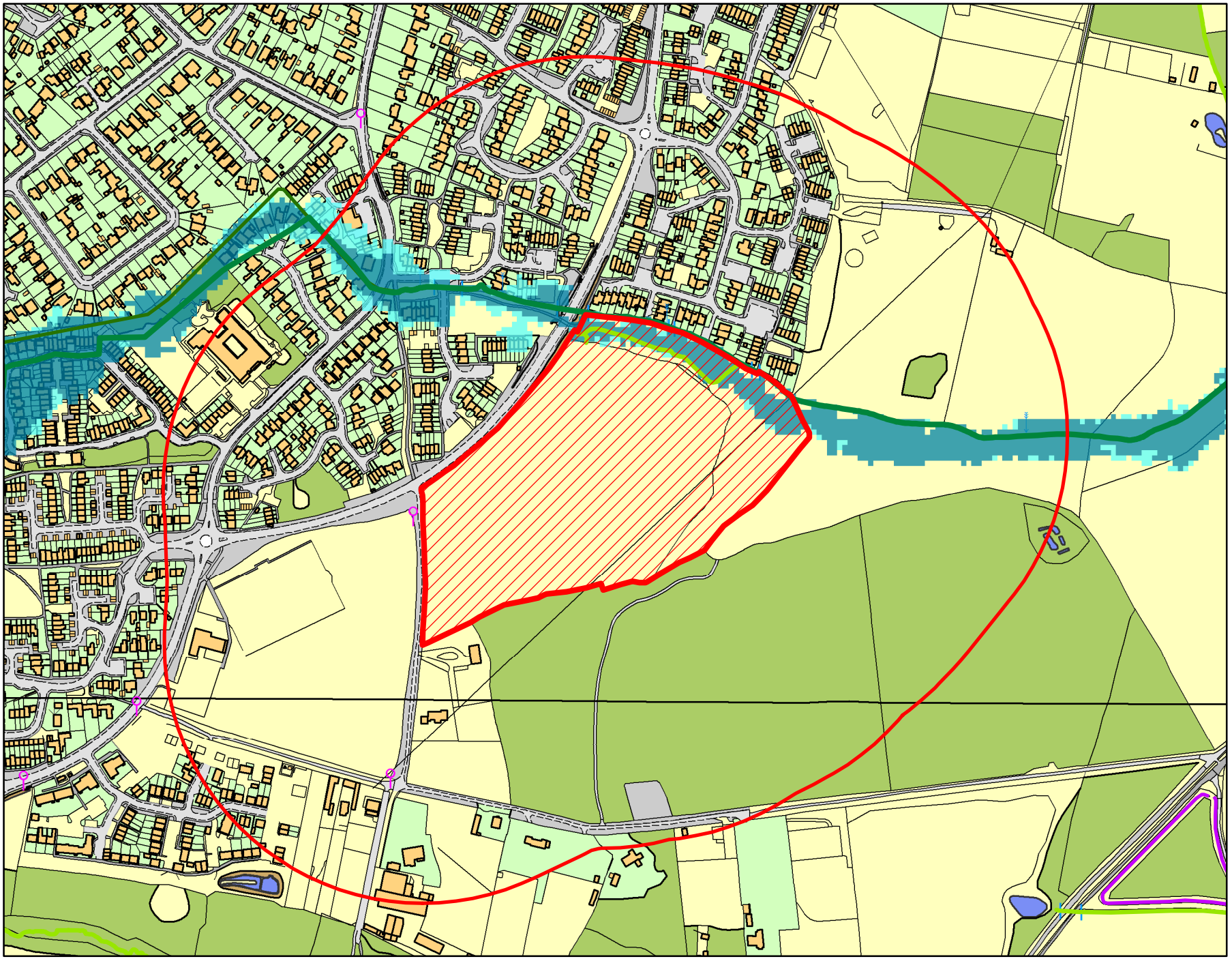
0 0.1 0.2 Kilometers

© Crown copyright and database rights 2020 Ordnance Survey [100019180]
© Environment Agency 2020, All Rights Reserved
© Natural England 2020, reproduced with the permission of Natural England

1:5,000

Date:	01/11/2024	Sheet:	1 of 1
Revision:	1	Initials:	pdb

Hampshire County Council



Legend

- 250m buffer
- Site
- Main River (as defined by EA)
- non main river

mainriv

- FRM Indicative Main River
- Detailed River Network - Offline Drainage
- Flood Zone 3
- Flood Zone 2

Historic Flood Information Request

EA Flood Zones and Detailed River Network

AKS Ward

Kings Copse Close

Notes:

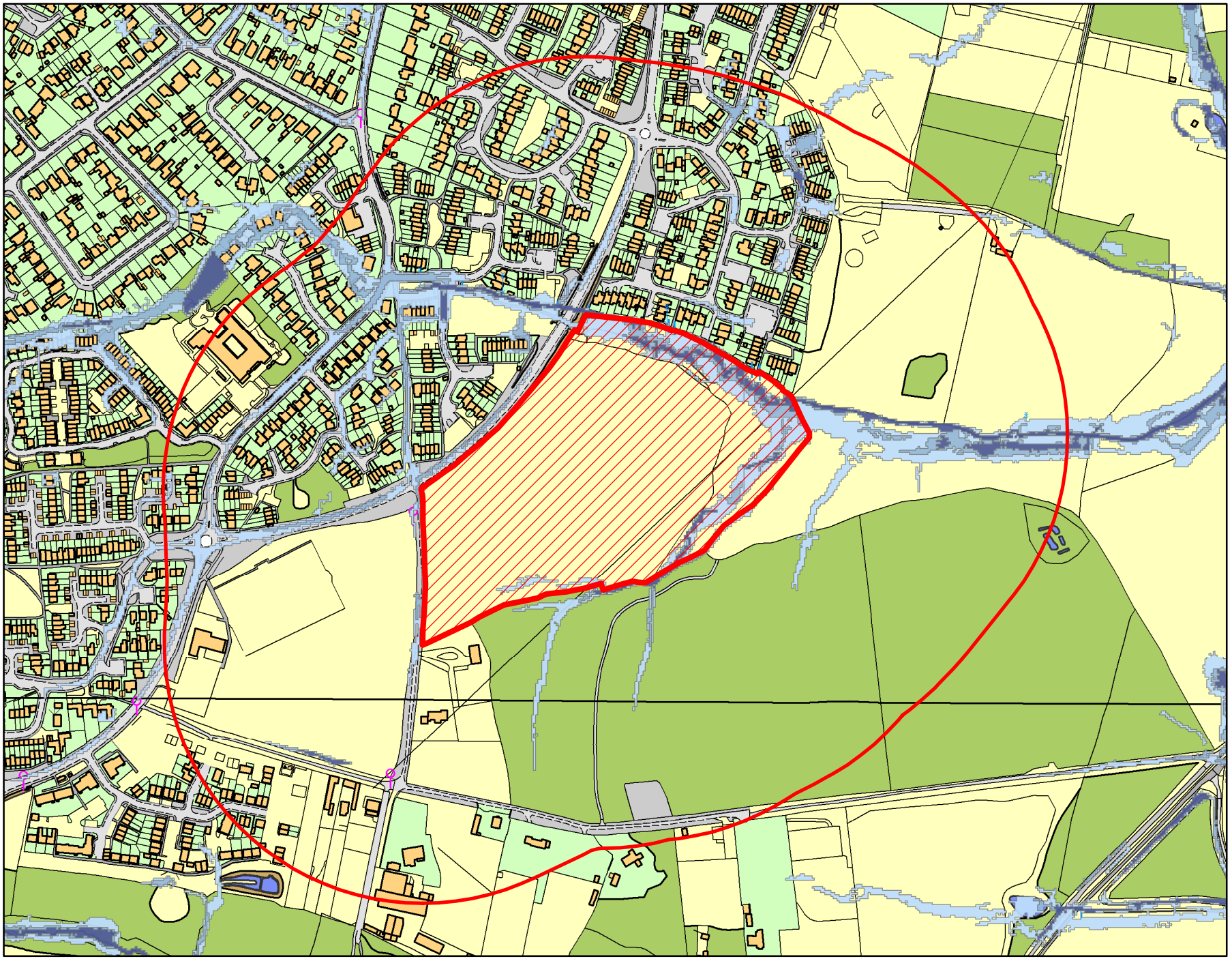
0 0.1 0.2
Kilometers

© Crown copyright and database rights 2020 Ordnance Survey [100019180]
© Environment Agency 2020, All Rights Reserved
© Natural England 2020, reproduced with the permission of Natural England

1:5,000

Date:	01/11/2024	Sheet:	1 of 1
Revision:	1	Initials:	pdb

Hampshire County Council



Legend

- 250m buffer
- Site
- Flood Maps for Surface Water (High)
- Flood Maps for Surface Water (Medium)
- Flood Maps for Surface Water (Low)

Historic Flood Information Request

Flood Map for Surface Water

AKS Ward

Kings Copse Close

Notes:

0 0.1 0.2
Kilometers

© Crown copyright and database rights 2020 Ordnance Survey [100019180]
© Environment Agency 2020, All Rights Reserved
© Natural England 2020, reproduced with the permission of Natural England

1:5,000

Date:	01/11/2024	Sheet:	1 of 1
Revision:	1	Initials:	pdb

Hampshire County Council

Site Location:	Kings Copse Avenue, Hedge End
Site Reference:	SWM-PRE/2024/0531
Review Date:	16/09/2025
Reviewer:	SR
Authorised:	SR
Total No. Pages	1

Proposal Description:

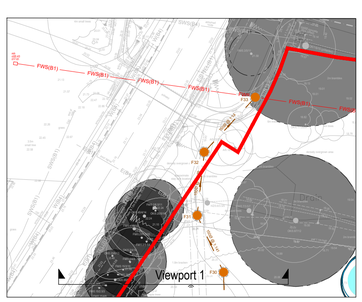
Proposed residential development site consisting of approximately 200 houses that includes associated services floorspace, car parking and landscaping.

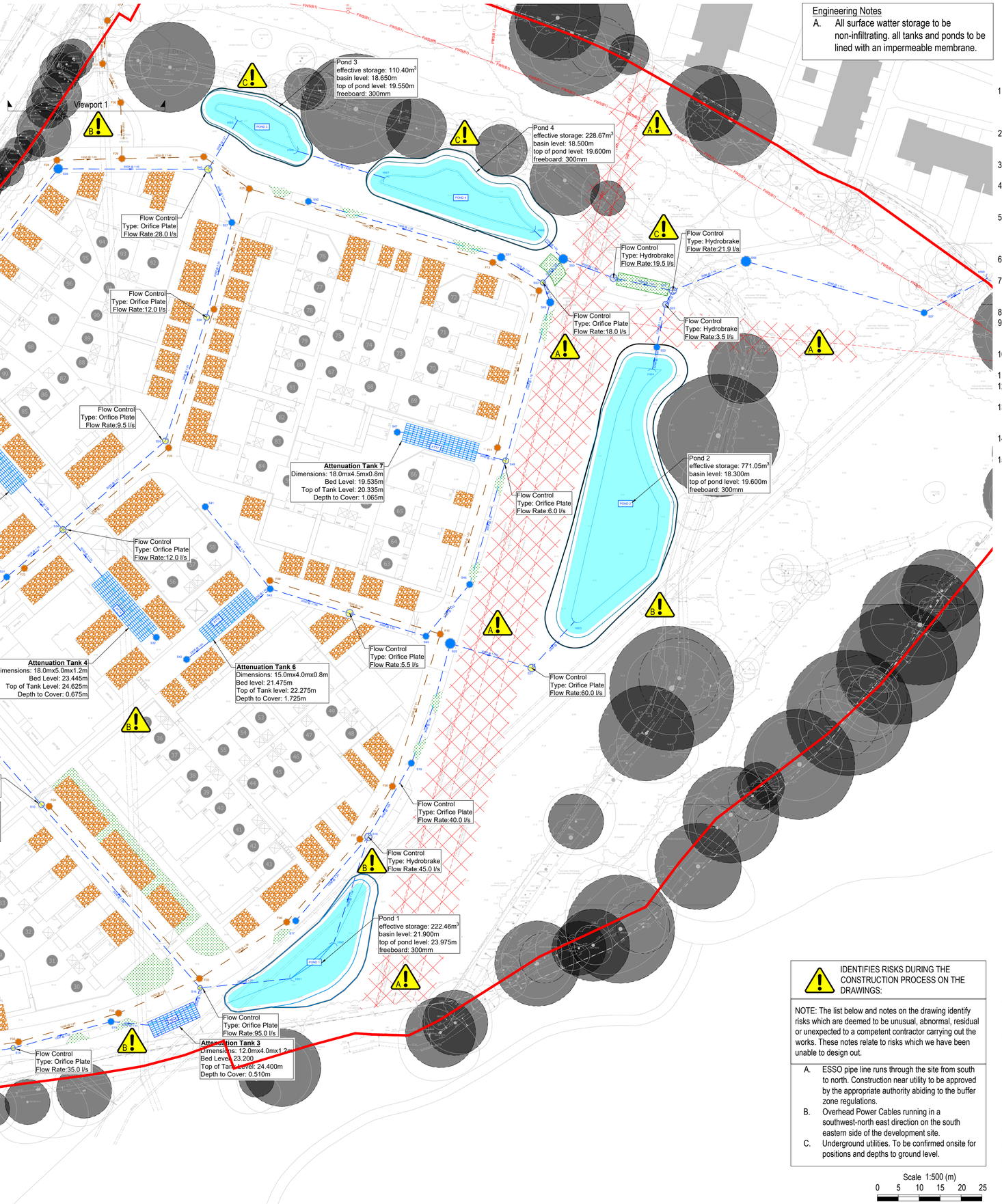
Follow on meeting following initial pre-application discussion

Summary of submission, key points requiring assessment, response to specific developer queries

The general principles of the proposals are the same as previously identified however the layout has changed which has amended the drainage layout.
There is proposed to be some land raising due to constraints on site i.e. Esso pipeline which needs to be crossed by the drainage. Crossings here have been minimised and a minimum cover between drainage and pipeline maintained. Land raising will need to be assessed to ensure this does not increase risk to the surrounding area, particularly Kings Copse Road and Tanhouse Lane. It has been noted that additional drainage will be considered where required.
It is proposed to discharge at Qbar however it was noted that consideration needs to be given to the permeable areas that will be intercepted by the drainage network and this should be incorporated into the calculations and QBar assessment (with the appropriate factors). This is particularly important given the land raising.
It was previously highlighted that there was a potential land drain outfall to Tanhouse Lane. This has been investigated further and it has been confirmed that there is no outfall from the site in this area.
The drainage proposals are utilising ponds where feasible however some attenuation crates are proposed to provide sufficient storage. All features will be lined due to the high groundwater level but bouyancy will need to be checked. There is minor flooding identified at the 1:100 + climate change but this is minimal. While the volume of flooding identified is not causing concern, more work will need to be done in relation to the localised low spots to ensure there is a route for exceedance flows to continue without causing risk to properties.
A mix of hydrobrakes and orifice plates are proposed to control flows and it was noted that these should be 48mm diameter or above to reduce the risk of blockage.
There was discussion about the smallest pond which is heavily constrined with the site layout and boundary. This is also very close to the road so safety will need to be considered. While a pond would be preferred, other options can be considered if a suitable design can not be found.
The ponds will be designed in accordance with the SuDS manual and currently have the full 300mm freeboard allowance. No grills are currently proposed but this will be assessed in relation to the blockage risk. It is not considered that security grills are required given the small pipe sizes. Any grills must be angled to allow for maintenance.
It was noted that the new SuDS standards will be enforced from January 2026. If the submission is made prior to this time then the current standards will be followed

APPENDIX D
PROPOSED DRAINAGE DESIGN





Engineering Notes

A. All surface watter storage to be non-infiltrating. all tanks and ponds to be lined with an impermeable membrane.

This drawing is the property of AKSWard Limited. The drawing is issued on the condition that it is not copied, reproduced, retained or disclosed to any unauthorised person, either wholly or in part without the written consent of AKSWard Limited.
Do NOT scale from this drawing. AKSWard takes no responsibility for errors during photographic reproduction or printing. Any discrepancy's are to be reported to the engineer immediately.

GENERAL NOTES

1. All setting out to be in accordance with the Architects drawings. Any discrepancies between the Engineers and the Architects drawings to be referred to the Architect before proceeding. Dimensions must not be scaled.
2. All drainage to be installed in accordance with relevant Building Regulations documents and Current Sewers for Adoption where applicable.
3. Connections to Public sewers to be agreed and inspected by Water Authority.
4. Invert level, size and cover levels to existing manholes and sewers to be checked prior to any construction. Any discrepancies to be reported immediately.
5. Invert to base of soil stack bends to be 450mm below lowest branch connection for up to 3 storeys buildings. For buildings up to 5 storeys the invert to base of soil stack bends should be not less than 750mm.
6. All RWP and Foul Water drain point setting out is to be confirmed by Architect.
7. All RWP & SVP sizes & setting out by Architect / M&E Engineer. All below ground connections to match above ground outlet size, Min 100/110mm diameter.
8. Foul drains to project 100mm above finished floor level.
9. All internal Manholes and Inspection Chambers to have double sealed recessed covers to suit floor finishes by Architect.
10. All external covers in footpaths and roads in non tarmac areas to have recessed trays to suit the paving material.
11. Refer to drainage specification for pipe materials.
12. All pipework to be 100/110Ø UNO. Refer to note 7 connection sizes.
13. All foul and surface water drainage stacks to have above ground rodding access, refer to above ground drainage layout by others.
14. This drawing has been produced in colour and should be reproduced in colour for clarity.
15. A CCTV Survey and report in WINCAN format for all new drainage will be required before the "As Built" drawings will be issued.

Legend

- Proposed SW Pipe
- Proposed SW Perforated Pipe
- Proposed FW Pipe
- Permeable Paving
- Raingarden
- Geocellular Tank (AquaCell)
- Proposed Effective Pond Storage Area
- SW Manhole (PCC Rings)
- FW Manhole (PCC Rings)
- SW Flow Control Manhole (Hydrobrake)
- SW Flow Control Manhole (Orifice Plate)
- Existing Manholes
- Existing Foul Sewer
- Site Boundary
- Tree Root Protection Zone

Rev.	Amendment	Dm	Chkd	Date
P10	Updated to Suit Client Comments	GA	SG	17.12.25
P09	Updated to Suit Planning Queries	GA	KL	27.11.25
P08	Updated to Suit LLFA Comments	GA	KL	23.09.25
P07	Updated to suit Revised Layout	GA	KL	11.09.25
P06	Full Design Pack	GA	KL	30.01.25
P05	Updated to suit latest comments	GA	AS	20.12.24
P04	Updated to latest layout	CJ	AS	11.09.24
P03	Updated Foul Outfall	CJ	AS	29.08.24
P02	Updated drainage routes	CJ	AS	25.07.24
P01	Initial issue	CJ	AS	09.07.24

Drg. Status **PRELIMINARY** Suitability **S3**

IDENTIFIES RISKS DURING THE CONSTRUCTION PROCESS ON THE DRAWINGS:

NOTE: The list below and notes on the drawing identify risks which are deemed to be unusual, abnormal, residual or unexpected to a competent contractor carrying out the works. These notes relate to risks which we have been unable to design out.

A. ESSO pipe line runs through the site from south to north. Construction near utility to be approved by the appropriate authority abiding to the buffer zone regulations.
B. Overhead Power Cables running in a southwest-north east direction on the south eastern side of the development site.
C. Underground utilities. To be confirmed onsite for positions and depths to ground level.

Scale 1:500 (m)
0 5 10 15 20 25

AKSWard²
CONSTRUCTION CONSULTANTS
10 Bonhill Street
London
EC2A 4PE
■ London
□ Hitchin
□ Oxford
□ Southampton
Tel: 020 7236 0161
e-mail: london@aksward.com
web: www.aksward.com

Client **Eastleigh Borough Council**

Project **Kings Copse Close**

Title **Below Ground Drainage Layout**

Reviewed Scheme	AS	Date	09.07.2024
Reviewed Final		Date	
Scales at A1	1:500	Project No.	L241014

Project Ref.	Originator	Zone	Level	Type	Role	Drg No.	Rev.
KCA	AKSW	XX	XX	DR	C	9200	P10

A

This drawing is the property of AKSWard Limited. The drawing is issued on the condition that it is not copied, reproduced, retained or disclosed to any unauthorised person, either wholly or in part without the written consent of AKSWard Limited.
Do NOT scale from this drawing. AKSWard takes no responsibility for errors during photographic reproduction or printing. Any discrepancy's are to be reported to the engineer immediately.

GENERAL NOTES

1. All setting out to be in accordance with the Architects drawings. Any discrepancies between the Engineers and the Architects drawings to be referred to the Architect before proceeding. Dimensions must not be scaled.
2. All drainage to be installed in accordance with relevant Building Regulations documents and Current Sewers for Adoption where applicable.
3. Connections to Public sewers to be agreed and inspected by Water Authority.
4. Invert level, size and cover levels to existing manholes and sewers to be checked prior to any construction. Any discrepancies to be reported immediately.
5. Invert to base of soil stack bends to be 450mm below lowest branch connection for up to 3 storeys buildings. For buildings up to 5 storeys the invert to base of soil stack bends should be not less than 750mm.
6. All RWP and Foul Water drain point setting out is to be confirmed by Architect.
7. All RWP & SVP sizes & setting out by Architect / M&E Engineer. All below ground connections to match above ground outlet size, Min 100/110mm diameter.
8. Foul drains to project 100mm above finished floor level.
9. All internal Manholes and Inspection Chambers to have double sealed recessed covers to suit floor finishes by Architect.
10. All external covers in footpaths and roads in non tarmac areas to have recessed trays to suit the paving material.
11. Refer to drainage specification for pipe materials.
12. All pipework to be 100/110Ø UNO. Refer to note 7 connection sizes.
13. All foul and surface water drainage stacks to have above ground rodding access, refer to above ground drainage layout by others.
14. This drawing has been produced in colour and should be reproduced in colour for clarity.
15. A CCTV Survey and report in WINCAN format for all new drainage will be required before the "As Built" drawings will be issued.

FOUL MANHOLE SCHEDULE

MH No.	COVER LEVEL (m)	INVERT LEVEL (m)	DEPTH TO SOFFIT (m)	MH DIAMETER (mm)	MH TYPE	MH COVER GRADE	EASTING (m)	NORTHING (m)
F1	26.690	25.340	1.200	1200	C	D400	449772.386	111914.997
F2	26.420	24.840	1.430	1200	C	D400	449811.876	111921.154
F3	26.620	24.270	1.200	1200	C	D400	449835.760	111927.997
F4	26.630	25.280	1.200	1200	C	D400	449818.801	111977.850
F5	24.900	23.550	1.200	1200	C	D400	449855.674	111936.128
F6	24.280	22.930	1.200	1200	C	D400	449875.910	111949.764
F7	23.630	22.280	1.200	1200	C	D400	449893.393	111969.580
F8	23.270	21.920	1.200	1200	C	D400	449901.162	111982.178
F9	23.500	22.150	1.200	1200	C	D400	449871.900	112031.327
F10	24.310	21.500	2.660	1200	B	D400	449912.588	112018.543
F11	20.840	19.490	1.200	1200	C	D400	449926.253	112063.086
F12	20.000	18.850	1.000	1200	C	D400	449936.151	112100.566
F13	20.250	18.760	1.340	1200	C	D400	449925.128	112107.311
F14	28.650	27.300	1.200	1200	C	D400	449736.461	111961.585
F15	28.290	26.500	1.640	1200	B	D400	449756.270	111978.954
F16	28.300	26.300	1.850	1200	B	D400	449751.673	111984.295
F17	28.040	26.600	1.290	1200	C	D400	449709.451	112020.402
F18	27.670	26.200	1.320	1200	C	D400	449726.173	112034.782
F19	26.360	25.000	1.210	1200	C	D400	449750.677	112056.276
F20	27.550	24.250	3.150	1200	A	D400	449786.764	112014.907
F21	27.200	24.150	2.900	1200	B	D400	449796.457	112019.626
F22	26.200	23.400	2.650	1200	B	D400	449813.263	112034.252
F23	24.310	21.300	2.860	1200	B	D400	449847.716	112063.029
F24	22.890	19.700	3.04	1200	A	D400	449858.535	112096.110
F25	21.920	18.335	3.435	1200	A	D400	449866.969	112124.916
F26	21.880	18.246	3.484	1200	A	D400	449856.118	112132.556
F27	24.650	21.000	3.500	1200	A	D400	449776.870	112079.245
F28	22.220	19.000	3.070	1200	A	D400	449820.088	112132.473
F29	21.920	18.135	3.635	1200	A	D400	449837.140	112133.981
F30	21.300	18.050	3.100	1200	A	D400	449836.257	112145.983
F31	20.370	17.980	2.600	1200	B	D400	449831.834	112154.766
F32	20.120	17.910	2.060	1200	B	D400	449833.111	112165.101
F33	19.600	17.021	2.429	1200	B	D400	449841.432	112174.039

SURFACE WATER MANHOLE SCHEDULE

MH No.	COVER LEVEL (m)	INVERT LEVEL (m)	DEPTH TO SOFFIT (m)	MH DIAMETER (mm)	MH TYPE	FLOW CONTROL (l/s)	MH COVER GRADE	EASTING (m)	NORTHING (m)
S1	29.630	28.330	1.150	1200	C	–	D400	449706.426	111934.396
S2	29.240	27.950	1.140	1200	C	–	D400	449705.248	111958.272
S3	28.660	27.150	1.360	1200	C	–	D400	449735.826	111959.782
S4	27.440	26.015	1.200	1200	C	–	D400	449781.427	111952.939
S5	28.230	25.700	2.305	1200	B	–	D400	449758.724	111979.316
S6	27.750	26.325	1.200	1200	C	–	D400	449730.581	112010.954
S7	28.250	25.650	2.375	1800	B	6.0 (Orifice)	D400	449754.679	111984.017
S8	27.640	25.200	2.215	1200	B	–	D400	449785.011	112011.098
S9	27.590	25.120	2.245	1200	B	–	D400	449791.114	112008.031
S10	26.700	24.500	1.975	1200	B	45.0 (Orifice)	D400	449817.324	111977.785
S11	29.170	27.860	1.160	1200	C	–	D400	449724.460	111893.041
S12	28.250	26.940	1.160	1200	C	–	D400	449752.900	111907.050
S13	27.600	26.310	1.140	1200	C	–	D400	449774.388	111913.827
S14	26.430	25.120	1.160	1350	C	35.0 (Orifice)	D400	449810.581	111919.663
S15	25.680	24.300	1.230	1200	C	–	D400	449833.957	111925.999
S16	24.910	23.010	1.675	1200	B	95.0 (Orifice)	D400	449855.234	111934.034
S17	24.210	22.800	1.260	1200	C	–	D400	449878.066	111950.064
S18	23.560	21.700	1.560	2100	B	45.0 (Hydrobrake)	D400	449895.415	111970.129
S19	23.190	21.400	1.490	1200	C	–	D400	449905.686	111987.734
S20	22.280	20.800	1.180	2100	C	–	D400	449914.978	112016.304
S21	22.100	20.700	1.100	2100	C	60.0 (Orifice)	D400	449934.402	112010.461
S22	19.600	18.250	1.125	1200	C	–	D400	449964.317	112087.079
S23	19.600	18.150	1.225	1200	C	3.5 (Hydrobrake)	D400	449966.385	112097.259
S24	28.470	27.130	1.190	1200	C	–	D400	449701.492	112001.511
S25	28.260	26.910	1.200	1200	C	–	D400	449705.125	112014.003
S26	27.870	26.520	1.200	1200	C	–	D400	449723.271	112030.153
S27	26.430	25.125	1.005	1200	C	–	D400	449751.022	112054.292
S28	26.900	25.000	1.600	1200	B	–	D400	449763.187	112040.169
S29	27.590	24.750	2.540	1200	B	–	D400	449784.112	112015.218
S30	27.200	24.650	2.250	1200	B	–	D400	449796.842	112021.513
S31	26.430	24.500	1.630	1200	B	–	D400	449809.047	112032.184
S32	24.990	23.690	1.000	1200	C	–	D400	449844.780	112017.768
S33	25.650	23.900	1.450	1200	C	–	D400	449800.019	112070.181
S34	25.690	23.395	1.995	1800	B	12.0 (Orifice)	D400	449822.482	112043.492
S35	24.320	22.605	1.415	1200	C	9.5 (Orifice)	D400	449846.929	112064.682
S36	23.020	21.315	1.405	1200	C	12.0 (Orifice)	D400	449856.755	112094.208
S37	22.200	20.495	1.405	1200	C	–	D400	449862.811	112116.846
S38	24.370	23.080	1.065	1200	C	–	D400	449784.383	112082.658
S39	22.260	20.000	1.960	1800	B	–	D400	449821.348	112129.677
S40	21.930	19.200	2.430	2100	B	28.0 (Orifice)	D400	449857.194	112129.554
S41	24.050	20.750	1.075	1200	C	–	D400	449856.470	112048.960
S42	24.220	21.590	2.405	1200	B	–	D400	449857.581	112017.182
S43	23.530	21.200	2.105	1200	B	–	D400	449871.967	112029.347
S44	22.970	21.000	1.670	2100	B	5.5 (Orifice)	D400	449890.930	112023.537
S45	22.320	20.800	1.220	1200	C	–	D400	449909.166	112018.052
S46	21.910	20.540	1.145	1200	C	–	D400	449919.610	112030.399
S47	21.860	19.900	1.735	1200	B	–	D400	449902.335	112066.827
S48	20.890	19.100	1.490	1200	C	6.0 (Orifice)	D400	449928.207	112059.939
S49	20.020	18.600	1.120	1500	C	–	D400	449938.857	112097.782
S50	21.520	20.220	1.150	1200	C	–	D400	449881.109	112121.893
S51	20.170	18.900	1.120	1500	C	–	D400	449927.113	112108.565
S52	19.950	18.500	1.225	1500	C	18.0 (Orifice)	D400	449937.081	112102.513
S53	19.800	18.350	1.150	1800	C	–	D400	449941.966	112108.155
S54	19.800	18.300	1.200	1800	C	19.5 (Hydrobrake)	D400	449953.953	112103.630
S55	18.800	17.300	1.200	2100	C	21.9 (Hydrobrake)	D400	449968.110	112100.571
S56	17.400	15.950	1.150	2100	C	–	D400	449985.610	112107.579
S57	16.550	15.650	0.600	1200	C	–	D400	450028.127	112095.301
HW1	23.990	21.900	1.863	–	–	–	–	449876.831	111936.242
HW2	23.990	21.900	1.938	–	–	–	–	449887.134	111944.742
HW3	19.600	18.300	1.000	–	–	–	–	449944.632	112021.525
HW4	19.600	18.300	1.075	–	–	–	–	449963.245	112081.804
HW5	19.650	18.550	0.800	–	–	–	–	449864.201	112141.255
HW6	19.650	18.550	0.800	–	–	–	–	449878.430	112133.910
HW7	19.600	18.500	0.800	–	–	–	–	449899.393	112127.493
HW8	19.600	18.500	0.875	–	–	–	–	449935.032	112114.946
HW9	16.000	15.560	0.140	–	–	–	–	450043.212	112103.563

Rev.	Amendment	Dm	Chkd	Date
P07	Updated to Suit Client Comments	GA	SG	17.12.25
P06	Updated to Suit Planning Queries	GA	KL	27.11.25
P05	Updated to Suit LLFA Comments	GA	KL	23.09.25
P04	Updated to Suit Revised Layout	GA	KL	12.09.25
P03	Updated to latest layout	CJ	AS	11.09.24
P02	Updated drainage routes	CJ	AS	25.07.24
P01	Initial Issue	CJ	AS	09.07.24

Drg. Status **PRELIMINARY** Suitability **S2**

AKSWard²
CONSTRUCTION CONSULTANTS

10 Bonhill Street
London
EC2A 4PE

■ London
☐ Hitchin
☐ Oxford
☐ Southampton

Tel: 020 7236 0161
e-mail: london@aksward.com
web: www.aksward.com

Client **Eastleigh Borough Council**

Project **Kings Copse Close**

Title **Manhole Schedule**

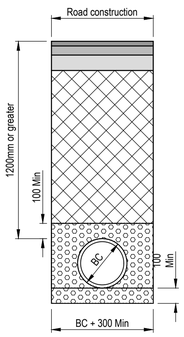
Reviewed Scheme AS Date 09.07.2024
Reviewed Final Date
Scales at A1 NA Project No. **L241014**

Project Ref.	Originator	Zone	Level	Type	Role	Drg No.	Rev.
KCA	AKSW	XX	XX	DR	C	9210	P07

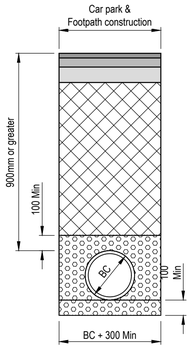
This drawing is the property of AKSWard Limited. The drawing is issued on the condition that it is not copied, reproduced, retained or disclosed to any unauthorised person, either wholly or in part without the written consent of AKSWard Limited.
Do NOT scale from this drawing. AKSWard takes no responsibility for errors during photographic reproduction or printing. Any discrepancy's are to be reported to the engineer immediately.

GENERAL NOTES

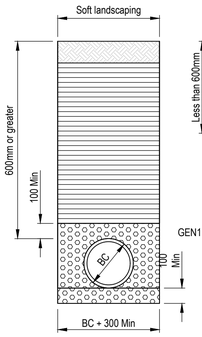
1. All setting out to be in accordance with the Architects drawings. Any discrepancies between the Engineers and the Architects drawings to be referred to the Architect before proceeding. Dimensions must not be scaled.
2. All drainage to be installed in accordance with relevant Building Regulations documents and Sewers for Adoption 7 where applicable.
3. Connections to Public sewers to be agreed and inspected by Water Authority.



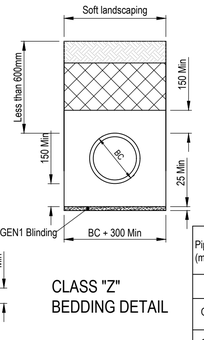
CLASS "P" BEDDING DETAIL



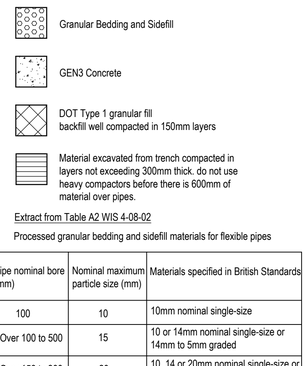
CLASS "P" BEDDING DETAIL



CLASS "P" BEDDING DETAIL



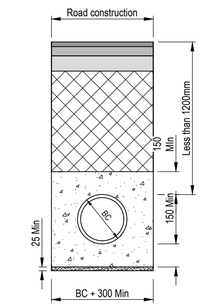
CLASS "Z" BEDDING DETAIL



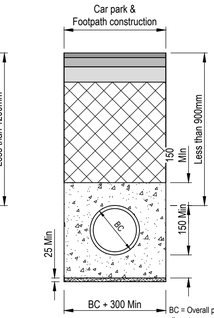
Extract from Table A2 WIS 4-08-02

Processed granular bedding and sidefill materials for flexible pipes

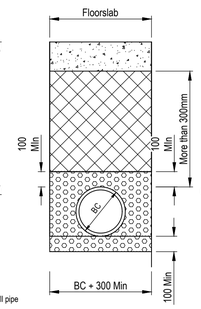
Pipe nominal bore (mm)	Nominal maximum particle size (mm)	Materials specified in British Standards
100	10	10mm nominal single-size
Over 100 to 500	15	10 or 14mm nominal single-size or 14mm to 5mm graded
Over 150 to 300	20	10, 14 or 20mm nominal single-size or 14mm to 5mm graded or 20mm to 5mm graded
Over 300 to 550	20	14 or 20mm nominal single-size or 14mm to 5mm graded or 20mm to 5mm graded
Over 550	40	14, 20 or 40mm nominal single-size or 14mm to 5mm graded or 20mm to 5mm graded or 40mm to 5mm graded



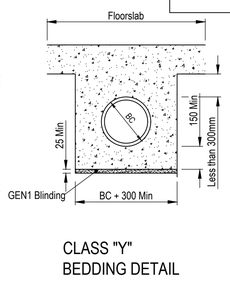
CLASS "Z" BEDDING DETAIL



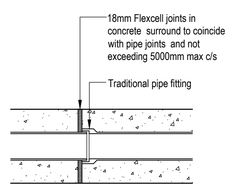
CLASS "Z" BEDDING DETAIL



CLASS "W" BEDDING DETAIL

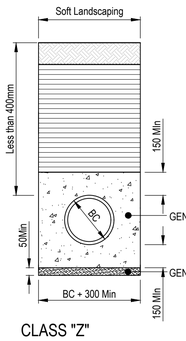


CLASS "Y" BEDDING DETAIL

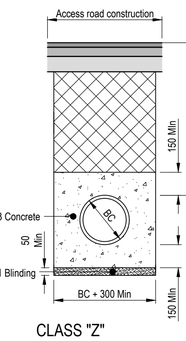


FLEXIBLE JOINTS IN CLASS "Z" and "Y" CONCRETE SURROUND

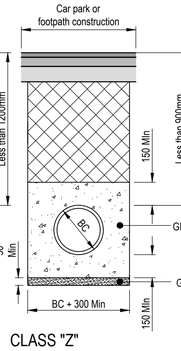
PLASTIC PIPES DETAIL



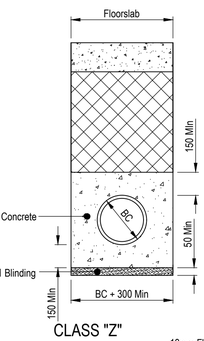
CLASS "Z" BEDDING DETAIL



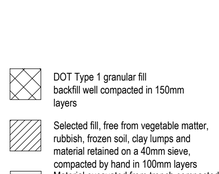
CLASS "Z" BEDDING DETAIL

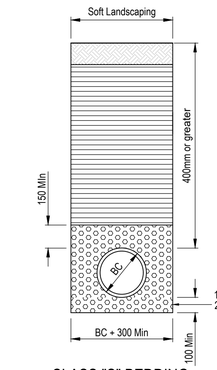


CLASS "Z" BEDDING DETAIL

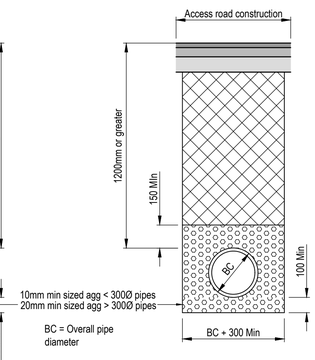


CLASS "Z" BEDDING DETAIL

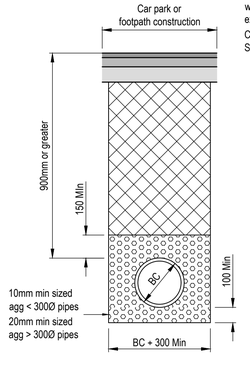




CLASS "S" BEDDING DETAIL

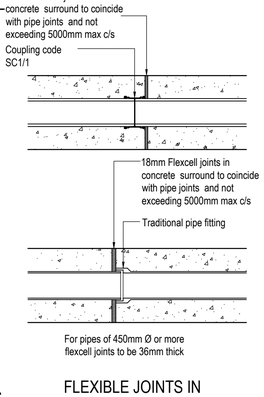


CLASS "S" BEDDING DETAIL

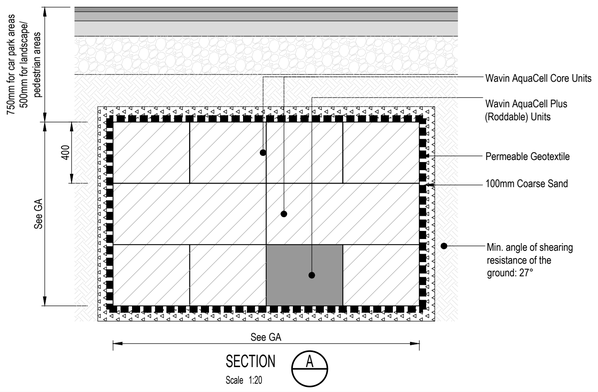


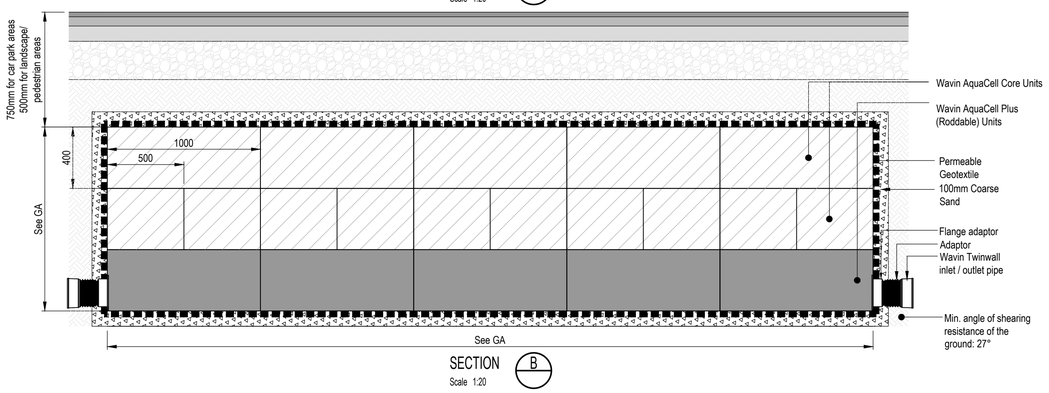
CLASS "S" BEDDING DETAIL

CLAY PIPES DETAIL

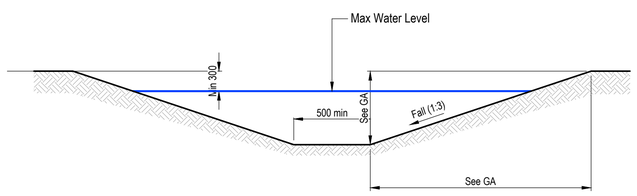


FLEXIBLE JOINTS IN CLASS "Z" CONCRETE SURROUND

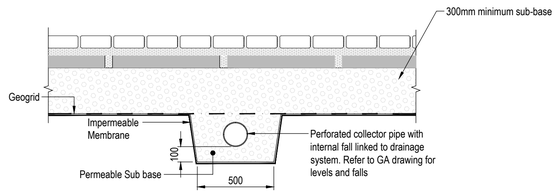




WAVIN CELLULAR SOAKAWAY / ATTENUATION TANK

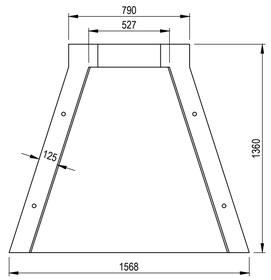


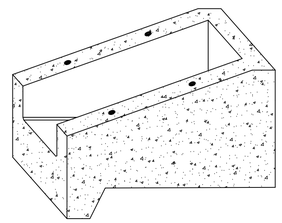
Typical Pond Detail

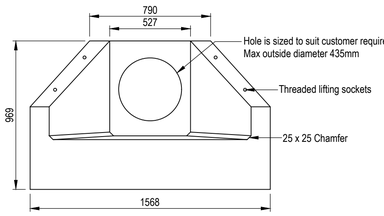


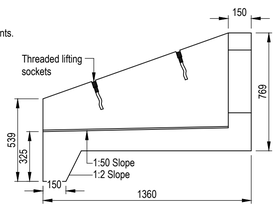
Typical Section Through Permeable Paving &Perforated Pipe

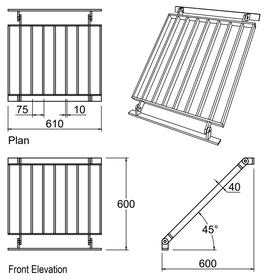
Scale 1:20











SMALL PRECAST HEADWALL

Scale 1:20

45° TRASH SCREE (Up To 300Ø Pipes)

Scale 1:20

Rev.	Amendment	Drn	Chkd	Date
P04	Updated to Suit LLFA Comments	GA	KL	23.09.25
P03	Updated to Suit Revised Layout	GA	KL	12.09.25
P02	Full Design Pack	GA	KL	30.01.25
P01	Initial Issue	MW	AS	09.07.24

Drg. Status **PRELIMINARY** Suitability **S3**

AKSWard
CONSTRUCTION CONSULTANTS

10 Bonhill Street
London
EC2A 4PE

■ London
☐ Hitchin
☐ Oxford
☐ Southampton

Tel: 020 7236 0161
e-mail: london@aksward.com
web: www.aksward.com

Client **Eastleigh Borough Council**

Project **Kings Copse Close**

Title **Typical Drainage Details Sheet 1**

Reviewed Scheme AS Date 09.07.24

Reviewed Final Date

Scales at A1 NTS Project No. **L241014**

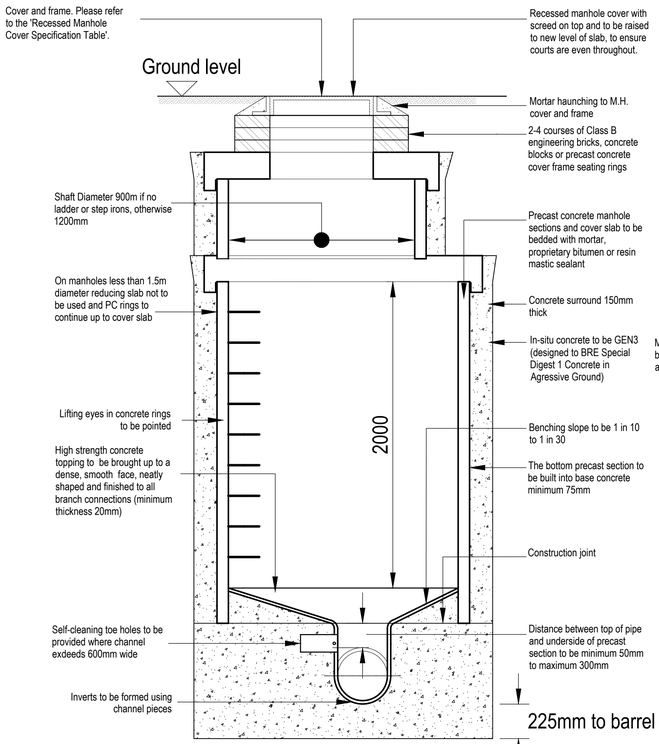
Project Ref. Originator Zone Level Type Role Drg No. Rev.

KCA-AKSW-XX-XX-DR-C-9251 P04

This drawing is the property of AKSWard Limited. The drawing is issued on the condition that it is not copied, reproduced, retained or disclosed to any unauthorised person, either wholly or in part without the written consent of AKSWard Limited.
Do NOT scale from this drawing. AKSWard takes no responsibility for errors during photographic reproduction or printing. Any discrepancy's are to be reported to the engineer immediately.

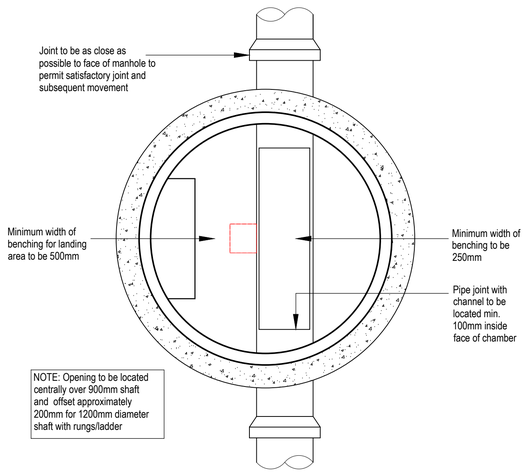
GENERAL NOTES

1. All setting out to be in accordance with the Architects drawings. Any discrepancies between the Engineers and the Architects drawings to be referred to the Architect before proceeding. Dimensions must not be scaled.
2. All drainage to be installed in accordance with relevant Building Regulations documents and Sewers for Adoption 7 where applicable.
3. Connections to Public sewers to be agreed and inspected by Water Authority.



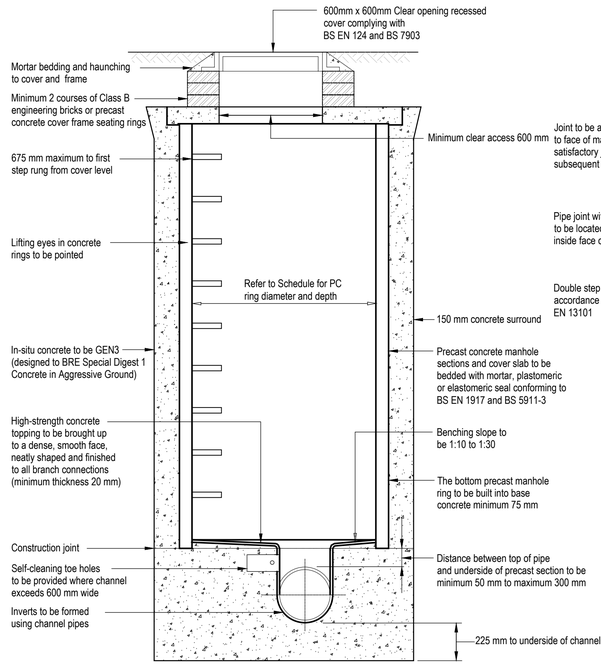
TYPICAL MANHOLE DETAIL - TYPE A

Maximum depth from cover level to soffit of pipe 6.0 m
Scale 1:20



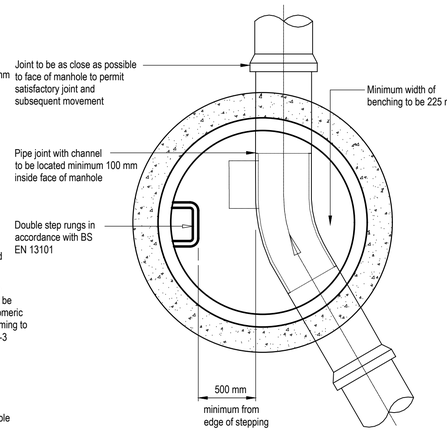
NOTE: Opening to be located centrally over 900mm shaft and offset approximately 200mm for 1200mm diameter shaft with rungs/ladder

Diameter of largest pipe in manhole (mm)	Internal diameter of manhole (mm)
<375	1200
375-700	1500
700-900	1800
>900	CONSULT UNDERTAKER



TYPICAL MANHOLE DETAIL - TYPE B

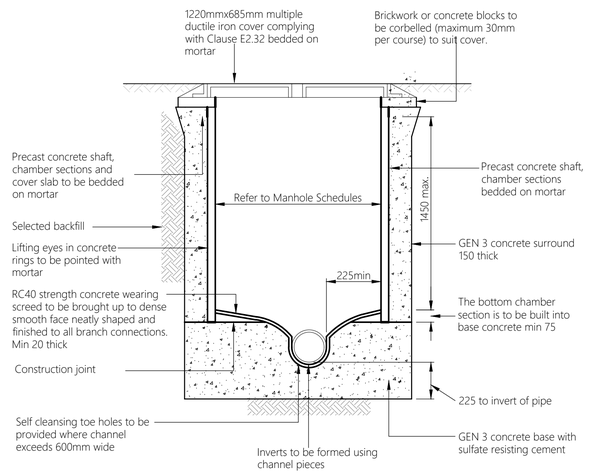
Maximum depth from cover level to soffit of pipe 3.0 m
Scale 1:20



Rigid pipes built into manhole should have a flexible joint as close as feasible to the external face of the structure and the length of the next rocker pipe should be as shown.

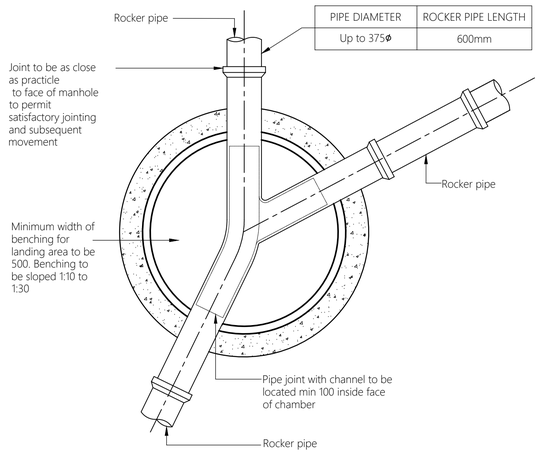
Nominal diameter (mm)	Maximum effective length (m)
150 - 600	0.6
601 - 750	1.00
over 750	1.25

All pipes entering the bottom of the manhole to have soffits level UNO.

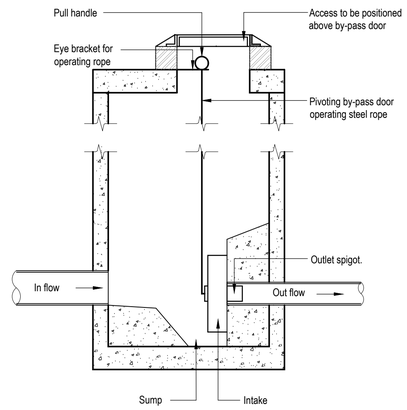


TYPICAL MANHOLE DETAIL - TYPE c

Maximum depth from cover level to soffit of pipe 1.5 m
Scale 1:20

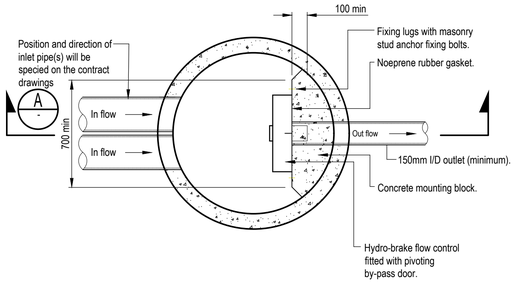


PIPE DIAMETER	ROCKER PIPE LENGTH
Up to 375ϕ	600mm



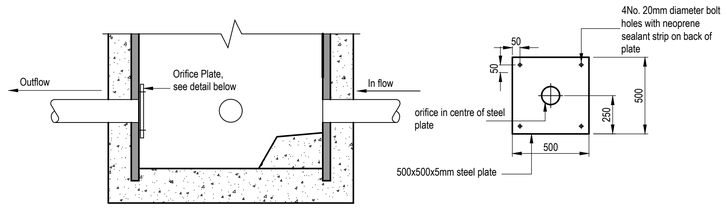
SECTION A-A

Scale 1:20



HYDROBRAKE FLOW CONTROL CHAMBER

Scale 1:20



TYPICAL ORIFICE PLATE DETAIL

Scale 1:20

P04	Updated to Suit LLFA Comments	GA KL	23.09.25
P03	Updated to Suit Revised Layout	GA KL	12.09.25
P02	Full Design Pack	GA KL	30.01.25
P01	Initial Issue	MW AS	09.07.24
Rev.	Amendment	Drn Chkd	Date

Drg. Status **PRELIMINARY** Suitability **S3**

AKSWard
CONSTRUCTION CONSULTANTS
10 Bonhill Street
London
EC2A 4PE
■ London
□ Hitchin
□ Oxford
□ Southampton
Tel: 020 7236 0161
e-mail: london@aksward.com
web: www.aksward.com

Client **Eastleigh Borough Council**

Project **Kings Copse Close**

Title **Typical Drainage Details Sheet 2**

Reviewed Scheme AS Date 09.07.2024
Reviewed Final Date
Scales at A1 NTS Project No. **L241014**

Project Ref. KCA · Originator AKSW · Zone XX · Level XX · Type DR · Role C · Drg No. 9252 _ Rev. P04

APPENDIX E
PROPOSED SURFACE WATER CALCULATIONS

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	2	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.000
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Add Inflow (l/s)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S01	0.026	5.00		29.630	1200	449706.426	111934.396	1.300
S02	0.004	5.00		29.240	1200	449705.248	111958.272	1.290
S03	0.100	5.00		28.660	1200	449735.826	111959.782	1.510
S04	0.040	5.00		27.440	1200	449781.427	111952.939	1.425
S05	0.078	5.00		28.230	1200	449758.724	111979.316	2.530
S06	0.015	5.00		27.750	1200	449730.581	112010.954	1.425
S07	0.039	5.00		28.250	1800	449754.679	111984.017	2.600
S08	0.045	5.00		27.640	1200	449785.011	112011.098	2.440
S09				27.590	1200	449791.114	112008.031	2.470
S10	0.076	5.00		26.700	1200	449817.324	111977.785	2.200
S11	0.038	5.00		29.170	1200	449724.460	111893.041	1.310
S12	0.052	5.00		28.250	1200	449752.900	111907.050	1.310
S13				27.600	1200	449774.388	111913.827	1.290
S14	0.038	5.00		26.430	1350	449810.581	111919.663	1.310
S15	0.085	5.00		25.680	1200	449833.957	111925.999	1.380
S16	0.211	5.00		24.910	1200	449855.234	111934.034	1.900
S17	0.028	5.00		24.210	1200	449878.066	111950.064	1.410
S18	0.019	5.00		23.560	2100	449895.415	111970.129	1.860
S19	0.050	5.00		23.190	1200	449905.686	111987.734	1.790
S20	0.081	5.00		22.280	2100	449914.978	112016.304	1.480
S21				22.100	2100	449934.402	112010.461	1.400
S22				19.600	1200	449964.317	112087.079	1.350
S23				19.600	1200	449966.385	112097.259	1.450
S24	0.016	5.00		28.470	1200	449701.492	112001.511	1.340
S25				28.260	1200	449705.125	112014.003	1.350
S26	0.058	5.00		27.870	1200	449723.271	112030.153	1.350
S27	0.037	5.00		26.430	1200	449751.022	112054.292	1.305
S28	0.069	5.00		26.900	1200	449763.187	112040.169	1.900
S29	0.058	5.00		27.590	1200	449784.112	112015.218	2.840
S30				27.200	1200	449796.842	112021.513	2.550
S31	0.015	5.00		26.430	1200	449809.047	112032.184	1.930
S32	0.110	5.00		24.990	1200	449844.780	112017.768	1.300
S33	0.107	5.00		25.650	1200	449800.019	112070.181	1.750
S34	0.045	5.00		25.690	1800	449822.482	112043.492	2.295
S35	0.055	5.00		24.320	1200	449846.929	112064.682	1.715
S36	0.080	5.00		23.020	1200	449856.755	112094.208	1.705
S37	0.075	5.00		22.200	1200	449862.811	112116.846	1.705
S38	0.026	5.00		24.370	1200	449784.383	112082.658	1.290
S39	0.106	5.00		22.260	1800	449821.348	112129.677	2.260
S40	0.073	5.00		21.930	2100	449857.194	112129.554	2.730
S41	0.016	5.00		24.050	1200	449856.470	112048.960	1.300

Flow+ v14.0 Copyright © 1988-2025 Causeway Technologies Ltd

Nodes

Name	Area (ha)	T of E (mins)	Add Inflow (l/s)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S42	0.039	5.00		24.220	1200	449857.581	112017.182	2.630
S43	0.059	5.00		23.530	1200	449871.967	112029.347	2.330
S44	0.045	5.00		22.970	2100	449890.930	112023.537	1.970
S45				22.320	1200	449909.166	112018.052	1.520
S46	0.013	5.00		21.910	1200	449919.610	112030.399	1.370
S47		5.00		21.860	1200	449902.335	112066.827	1.960
S48	0.098	5.00		20.890	1200	449928.207	112059.939	1.790
S49	0.061	5.00		20.020	1500	449938.857	112097.782	1.420
S50		5.00		21.520	1200	449881.109	112121.893	1.300
S51	0.071	5.00		20.170	1500	449927.113	112108.565	1.270
S52				19.950	1500	449937.081	112102.513	1.450
S53	0.031	5.00		19.800	1800	449942.128	112105.526	1.450
S54				19.800	1800	449953.081	112101.344	1.500
S55				18.800	2100	449968.110	112100.571	1.500
S56				17.400	2100	449985.610	112107.579	1.450
S57			31.5	16.550	1200	450028.127	112095.301	0.975
HW1	0.044			23.988	1	449876.831	111936.242	2.088
HW2		5.00		23.988	1	449887.134	111944.742	2.088
HW3	0.027			19.600	1	449944.632	112021.525	1.300
HW4		5.00		19.600	1	449963.245	112081.804	1.300
HW5	0.049			19.650	1	449864.201	112141.255	1.100
HW6		5.00		19.650	1	449878.430	112133.910	1.100
HW7	0.112			19.600	1	449899.393	112127.493	1.100
HW8		5.00		19.600	1	449935.032	112114.946	1.100
HW9				16.000	450	450043.212	112103.563	0.515
ATT1				27.600		449766.727	111966.829	1.770
ATT2				27.950		449742.667	111994.837	2.000
ATT3				24.910		449848.989	111926.443	1.710
ATT4				25.300		449825.853	112038.847	1.855
ATT5				25.680		449818.205	112047.831	2.195
ATT6				24.000		449862.705	112021.528	2.600
ATT7				21.400		449913.435	112063.693	1.865

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
Rainfall Events	Singular	Skip Steady State	x
FSR Region	England and Wales	Drain Down Time (mins)	10080
M5-60 (mm)	20.000	Additional Storage (m³/ha)	0.0
Ratio-R	0.400	Starting Level (m)	
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

Flow+ v14.0 Copyright © 1988-2025 Causeway Technologies Ltd

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	0	0	0
100	40	4	0

Node S07 Online Orifice Control

Flap Valve	x	Design Depth (m)	1.500	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	6.0		
Invert Level (m)	25.650	Diameter (m)	0.048		

Node S10 Online Orifice Control

Flap Valve	x	Design Depth (m)	1.300	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	45.0		
Invert Level (m)	24.500	Diameter (m)	0.139		

Node S16 Online Orifice Control

Flap Valve	x	Design Depth (m)	2.000	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	95.0		
Invert Level (m)	23.010	Diameter (m)	0.181		

Node S14 Online Orifice Control

Flap Valve	x	Design Depth (m)	1.300	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	35.0		
Invert Level (m)	25.120	Diameter (m)	0.122		

Node S44 Online Orifice Control

Flap Valve	x	Design Depth (m)	1.300	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	5.5		
Invert Level (m)	21.000	Diameter (m)	0.048		

Node S21 Online Orifice Control

Flap Valve	x	Design Depth (m)	1.300	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	60.0		
Invert Level (m)	20.700	Diameter (m)	0.161		

Node S34 Online Orifice Control

Flap Valve	x	Design Depth (m)	1.600	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	12.0		
Invert Level (m)	23.395	Diameter (m)	0.067		

Node S35 Online Orifice Control

Flap Valve	x	Design Depth (m)	1.300	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	9.5		
Invert Level (m)	22.605	Diameter (m)	0.058		

Flow+ v14.0 Copyright © 1988-2025 Causeway Technologies Ltd

Node S36 Online Orifice Control

Flap Valve	x	Design Depth (m)	1.300	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	12.0		
Invert Level (m)	21.315	Diameter (m)	0.071		

Node S40 Online Orifice Control

Flap Valve	x	Design Depth (m)	1.500	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	28.0		
Invert Level (m)	19.200	Diameter (m)	0.105		

Node S48 Online Orifice Control

Flap Valve	x	Design Depth (m)	1.300	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	6.0		
Invert Level (m)	19.100	Diameter (m)	0.050		

Node S52 Online Orifice Control

Flap Valve	x	Design Depth (m)	1.300	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	18.0		
Invert Level (m)	18.500	Diameter (m)	0.087		

Node S18 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	21.700	Product Number	CTL-SHE-0278-4500-1300-4500
Design Depth (m)	1.300	Min Outlet Diameter (m)	0.300
Design Flow (l/s)	45.0	Min Node Diameter (mm)	2100

Node S23 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	18.150	Product Number	CTL-SHE-0084-3500-1300-3500
Design Depth (m)	1.300	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	3.5	Min Node Diameter (mm)	1200

Node S54 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	18.300	Product Number	CTL-SHE-0194-1950-1200-1950
Design Depth (m)	1.200	Min Outlet Diameter (m)	0.225
Design Flow (l/s)	19.5	Min Node Diameter (mm)	1500

Node S55 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	17.300	Product Number	CTL-SHE-0203-2190-1300-2190
Design Depth (m)	1.300	Min Outlet Diameter (m)	0.225
Design Flow (l/s)	21.9	Min Node Diameter (mm)	1800

Flow+ v14.0 Copyright © 1988-2025 Causeway Technologies Ltd

Node HW2 Pond Storage Structure

Invert Level (m) 21.900 | Time to half empty (mins) 68 | Analyse flow through structure x

Inlets
HW1

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	124.2	2.085	124.2	2.086	0.0

Node HW4 Pond Storage Structure

Invert Level (m) 18.300 | Time to half empty (mins) 2520 | Analyse flow through structure x

Inlets
HW3

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	771.7	1.300	769.9	1.301	0.0

Node HW6 Pond Storage Structure

Invert Level (m) 18.550 | Time to half empty (mins) 440 | Analyse flow through structure x

Inlets
HW5

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	147.2	1.050	147.2	1.051	0.0

Node HW8 Pond Storage Structure

Invert Level (m) 18.500 | Time to half empty (mins) 464 | Analyse flow through structure x

Inlets
HW7

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	304.5	1.050	304.5	1.051	0.0

Node ATT1 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	25.830	Depth (m)	0.800
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	244	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	4.000	Number Required	1
Porosity	0.95	Pit Length (m)	18.000		

Node ATT2 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	25.950	Depth (m)	0.800
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	208	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	4.000	Number Required	1
Porosity	0.95	Pit Length (m)	18.000		

Flow+ v14.0 Copyright © 1988-2025 Causeway Technologies Ltd

Node ATT3 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	23.200	Depth (m)	1.200
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	22	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	4.000	Number Required	1
Porosity	1.00	Pit Length (m)	12.000		

Node ATT4 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	23.445	Depth (m)	1.200
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	332	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	5.000	Number Required	1
Porosity	0.95	Pit Length (m)	18.000		

Node ATT5 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	23.485	Depth (m)	1.200
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	320	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	5.000	Number Required	1
Porosity	0.95	Pit Length (m)	19.000		

Node ATT6 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	21.400	Depth (m)	0.800
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	96	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	4.000	Number Required	1
Porosity	0.95	Pit Length (m)	15.000		

Node ATT7 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	19.535	Depth (m)	0.800
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	208	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	4.500	Number Required	1
Porosity	0.95	Pit Length (m)	18.000		

Node S01 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	28.830	Depth (m)	0.400
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	5.000	Number Required	1
Porosity	0.30	Pit Length (m)	16.000		

Node S03 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	27.860	Depth (m)	0.400
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	5.000	Number Required	2
Porosity	0.30	Pit Length (m)	20.500		

Node S05 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	27.430	Depth (m)	0.400
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	21.000	Number Required	2
Porosity	0.30	Pit Length (m)	5.000		

Flow+ v14.0 Copyright © 1988-2025 Causeway Technologies Ltd

Node S04 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	26.640	Depth (m)	0.400
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	40	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	25.000	Number Required	1
Porosity	0.30	Pit Length (m)	5.000		

Node S07 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	27.450	Depth (m)	0.400
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	5.000	Number Required	1
Porosity	0.30	Pit Length (m)	22.000		

Node S06 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	26.950	Depth (m)	0.400
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	28	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	5.000	Number Required	1
Porosity	0.30	Pit Length (m)	20.000		

Node S08 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	26.840	Depth (m)	0.400
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	5.000	Number Required	1
Porosity	0.30	Pit Length (m)	25.000		

Node S12 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	27.450	Depth (m)	0.400
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	3	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	5.000	Number Required	1
Porosity	0.30	Pit Length (m)	15.000		

Node S14 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	25.630	Depth (m)	0.400
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	7	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	5.000	Number Required	1
Porosity	0.30	Pit Length (m)	25.000		

Node S16 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	24.110	Depth (m)	0.400
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	15	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	5.000	Number Required	2
Porosity	0.30	Pit Length (m)	29.000		

Node S17 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	23.410	Depth (m)	0.400
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	5.000	Number Required	1
Porosity	0.30	Pit Length (m)	5.000		

Flow+ v14.0 Copyright © 1988-2025 Causeway Technologies Ltd

Node S18 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	22.460	Depth (m)	0.400
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	5.000	Number Required	1
Porosity	0.30	Pit Length (m)	12.000		

Node S19 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	22.290	Depth (m)	0.400
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	5.000	Number Required	1
Porosity	0.30	Pit Length (m)	13.000		

Node S42 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	23.420	Depth (m)	0.400
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	5.000	Number Required	1
Porosity	0.30	Pit Length (m)	15.000		

Node S43 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	22.730	Depth (m)	0.400
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	5.000	Number Required	1
Porosity	0.30	Pit Length (m)	22.500		

Node S44 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	22.170	Depth (m)	0.400
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	26	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	5.000	Number Required	1
Porosity	0.30	Pit Length (m)	15.000		

Node S20 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	21.480	Depth (m)	0.400
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	10	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	5.000	Number Required	3
Porosity	0.30	Pit Length (m)	12.000		

Node S25 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	27.460	Depth (m)	0.400
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	5.000	Number Required	1
Porosity	0.30	Pit Length (m)	8.000		

Node S28 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	26.100	Depth (m)	0.400
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	5.000	Number Required	2
Porosity	0.30	Pit Length (m)	8.500		

Flow+ v14.0 Copyright © 1988-2025 Causeway Technologies Ltd

Node S34 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	24.890	Depth (m)	0.400
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	5.000	Number Required	2
Porosity	0.30	Pit Length (m)	12.500		

Node S32 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	24.190	Depth (m)	0.400
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	114	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	5.000	Number Required	2
Porosity	0.30	Pit Length (m)	20.500		

Node S33 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	24.850	Depth (m)	0.400
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	5.000	Number Required	2
Porosity	0.30	Pit Length (m)	21.000		

Node S35 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	23.520	Depth (m)	0.400
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	242	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	5.000	Number Required	2
Porosity	0.30	Pit Length (m)	15.000		

Node S36 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	22.220	Depth (m)	0.400
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	78	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	5.000	Number Required	2
Porosity	0.30	Pit Length (m)	22.500		

Node S37 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	21.400	Depth (m)	0.400
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	18	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	5.000	Number Required	2
Porosity	0.30	Pit Length (m)	17.500		

Node S39 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	21.460	Depth (m)	0.400
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	20	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	5.000	Number Required	1
Porosity	0.30	Pit Length (m)	24.000		

Node S40 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	21.130	Depth (m)	0.400
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	14	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	5.000	Number Required	1
Porosity	0.30	Pit Length (m)	15.000		

Flow+ v14.0 Copyright © 1988-2025 Causeway Technologies Ltd

Node S48 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	20.090	Depth (m)	0.400
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	92	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	5.000	Number Required	1
Porosity	0.30	Pit Length (m)	5.000		

Node S49 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	19.220	Depth (m)	0.400
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	34	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	5.000	Number Required	1
Porosity	0.30	Pit Length (m)	10.000		

Node S51 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	19.370	Depth (m)	0.400
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	28	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	5.000	Number Required	1
Porosity	0.30	Pit Length (m)	28.000		

Flow+ v14.0 Copyright © 1988-2025 Causeway Technologies Ltd

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.97%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S01	10	28.378	0.048	4.7	0.0539	0.0000	OK
15 minute winter	S02	11	27.995	0.045	5.4	0.0514	0.0000	OK
15 minute winter	S03	10	27.218	0.068	23.3	0.0774	0.0000	OK
120 minute winter	S04	112	26.099	0.083	2.3	0.0944	0.0000	OK
120 minute winter	S05	110	26.098	0.398	12.0	0.4505	0.0000	SURCHARGED
15 minute winter	S06	9	26.358	0.033	2.7	0.0373	0.0000	OK
120 minute winter	S07	110	26.098	0.448	9.5	1.1404	0.0000	SURCHARGED
15 minute winter	S08	10	25.272	0.072	10.9	0.0818	0.0000	OK
15 minute winter	S09	11	25.182	0.062	10.7	0.0696	0.0000	OK
15 minute winter	S10	11	24.884	0.384	24.4	0.4345	0.0000	SURCHARGED
15 minute winter	S11	10	27.908	0.048	6.9	0.0547	0.0000	OK
15 minute winter	S12	10	27.023	0.083	16.3	0.0935	0.0000	OK
15 minute winter	S13	11	26.385	0.075	16.0	0.0844	0.0000	OK
15 minute winter	S14	12	25.632	0.512	22.6	0.8102	0.0000	SURCHARGED
15 minute winter	S15	11	24.375	0.075	34.4	0.0851	0.0000	OK
15 minute winter	S16	14	23.535	0.525	58.4	0.5936	0.0000	SURCHARGED
15 minute winter	S17	10	22.838	0.038	5.1	0.0428	0.0000	OK
60 minute winter	S18	56	21.937	0.237	19.4	0.8209	0.0000	OK
30 minute summer	S19	19	21.479	0.079	24.5	0.0899	0.0000	OK
30 minute winter	S20	21	21.089	0.289	35.2	1.0004	0.0000	OK
30 minute winter	S21	22	21.071	0.371	29.6	1.2841	0.0000	SURCHARGED
720 minute winter	S22	720	18.529	0.279	8.0	0.3157	0.0000	SURCHARGED
720 minute winter	S23	720	18.528	0.378	5.9	0.4280	0.0000	SURCHARGED
15 minute winter	S24	10	27.167	0.037	2.9	0.0415	0.0000	OK
15 minute winter	S25	11	26.946	0.036	2.9	0.0404	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S01	SPN1.000	S02	4.7	1.010	0.208	0.1103	
15 minute winter	S02	SPN1.001	S03	5.3	1.194	0.194	0.1362	
15 minute winter	S03	SPN1.002	S05	23.2	0.778	0.202	0.7518	
120 minute winter	S04	SPN2.000	ATT1	2.3	0.692	0.046	0.5376	
120 minute winter	S05	SPN1.003	S07	7.3	0.382	0.157	0.2467	
15 minute winter	S06	SPN3.000	ATT2	2.8	1.341	0.039	0.1283	
120 minute winter	S07	SPN1.004	S08	3.1	0.728	0.056	0.2083	
15 minute winter	S08	SPN1.005	S09	10.7	1.090	0.190	0.0672	
15 minute winter	S09	SPN1.006	S10	10.7	0.463	0.165	0.9718	
15 minute winter	S10	SPN1.007	S16	22.4	0.724	0.267	1.5108	
15 minute winter	S11	SPN4.000	S12	6.8	0.923	0.224	0.2353	
15 minute winter	S12	SPN4.001	S13	16.0	1.723	0.538	0.2098	
15 minute winter	S13	SPN4.002	S14	16.0	1.058	0.496	0.4830	
15 minute winter	S14	SPN4.003	S15	20.1	1.837	0.643	0.2655	
15 minute winter	S15	SPN4.004	ATT3	34.4	2.938	0.243	0.3862	
15 minute winter	S16	SPN1.008	HW1	44.8	3.124	0.379	0.5893	
15 minute winter	S17	SPN5.000	S18	5.0	0.831	0.139	0.2796	
60 minute winter	S18	SPN1.010	S19	19.4	1.381	0.144	0.2864	
30 minute summer	S19	SPN1.011	S20	24.5	1.121	0.156	1.2130	
30 minute winter	S20	SPN1.012	S21	29.6	0.624	0.381	1.4200	
30 minute winter	S21	SPN1.013	HW3	29.2	4.892	0.066	0.1781	
720 minute winter	S22	SPN1.015	S23	5.9	0.231	0.115	0.4131	
720 minute winter	S23	SPN1.016	S55	3.4	1.997	0.015	0.0616	
15 minute winter	S24	SPN6.000	S25	2.9	0.879	0.123	0.0423	
15 minute winter	S25	SPN6.001	S26	2.8	0.529	0.124	0.1309	

Flow+ v14.0 Copyright © 1988-2025 Causeway Technologies Ltd

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.97%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S26	10	26.587	0.067	13.4	0.0756	0.0000	OK
15 minute winter	S27	10	25.224	0.099	19.7	0.1118	0.0000	OK
15 minute winter	S28	10	25.121	0.121	32.0	0.1363	0.0000	OK
15 minute winter	S29	11	24.904	0.154	41.9	0.1741	0.0000	OK
15 minute winter	S30	11	24.793	0.143	42.2	0.1619	0.0000	OK
15 minute winter	S31	11	24.581	0.081	44.9	0.0912	0.0000	OK
15 minute winter	S32	10	23.779	0.089	20.0	0.1010	0.0000	OK
15 minute winter	S33	9	23.981	0.081	19.5	0.0916	0.0000	OK
120 minute winter	S34	104	23.777	0.382	17.1	0.9733	0.0000	SURCHARGED
60 minute winter	S35	43	23.516	0.911	9.2	1.0299	0.0000	SURCHARGED
30 minute winter	S36	25	22.240	0.925	16.9	2.4449	0.0000	SURCHARGED
30 minute winter	S37	24	20.600	0.105	19.8	0.1191	0.0000	OK
15 minute winter	S38	10	23.110	0.030	4.7	0.0344	0.0000	OK
30 minute winter	S39	23	20.608	0.608	25.8	1.5483	0.0000	SURCHARGED
30 minute winter	S40	24	20.601	1.401	43.4	4.8520	0.0000	SURCHARGED
15 minute winter	S41	10	22.773	0.023	2.9	0.0261	0.0000	OK
15 minute winter	S42	10	21.640	0.050	7.1	0.0571	0.0000	OK
60 minute winter	S43	49	21.554	0.354	7.5	0.4004	0.0000	SURCHARGED
60 minute winter	S44	49	21.553	0.553	6.0	1.9171	0.0000	SURCHARGED
60 minute winter	S45	51	20.834	0.034	3.5	0.0386	0.0000	OK
15 minute winter	S46	11	20.571	0.031	5.5	0.0354	0.0000	OK
15 minute summer	S47	1	19.900	0.000	0.0	0.0000	0.0000	OK
120 minute winter	S48	120	19.682	0.582	9.5	0.6585	0.0000	SURCHARGED
15 minute winter	S49	14	19.174	0.574	18.7	1.0142	0.0000	SURCHARGED
15 minute summer	S50	1	20.220	0.000	0.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S26	SPN6.002	S27	13.0	1.745	0.394	0.2749	
15 minute winter	S27	SPN6.003	S28	19.5	0.840	0.215	0.4350	
15 minute winter	S28	SPN6.004	S29	31.8	1.014	0.327	1.0222	
15 minute winter	S29	SPN6.005	S30	42.2	1.213	0.453	0.4939	
15 minute winter	S30	SPN6.006	S31	42.3	1.767	0.396	0.3924	
15 minute winter	S31	SPN6.007	S34	44.9	1.357	0.160	0.6465	
15 minute winter	S32	SPN7.000	ATT4	19.9	1.453	0.193	0.8495	
15 minute winter	S33	SPN8.000	ATT5	19.6	1.821	0.147	0.6863	
120 minute winter	S34	SPN6.008	S35	5.6	0.270	0.032	1.4355	
60 minute winter	S35	SPN6.009	S36	6.6	0.278	0.029	1.1666	
30 minute winter	S36	SPN6.010	S37	9.9	1.706	0.047	0.3336	
30 minute winter	S37	SPN6.011	S40	19.7	0.753	0.058	0.6424	
15 minute winter	S38	SPN9.000	S39	4.6	1.373	0.039	1.2755	
30 minute winter	S39	SPN9.001	S40	16.5	0.514	0.099	2.5243	
30 minute winter	S40	SPN6.012	HW5	26.6	2.227	0.109	0.3089	
15 minute winter	S41	SPN10.000	S43	2.9	0.341	0.022	0.5237	
15 minute winter	S42	SPN11.000	ATT6	7.0	1.090	0.103	0.0434	
60 minute winter	S43	SPN10.001	S44	3.2	0.469	0.078	0.7888	
60 minute winter	S44	SPN10.002	S45	3.5	0.746	0.030	0.0884	
60 minute winter	S45	SPN10.003	S46	3.5	0.959	0.025	0.0603	
15 minute winter	S46	SPN10.004	S48	5.5	0.125	0.023	1.1428	
15 minute summer	S47	SPN12.000	ATT7	0.0	0.000	0.000	0.0537	
120 minute winter	S48	SPN10.005	S49	3.9	0.835	0.031	1.4762	
15 minute winter	S49	SPN10.006	S52	9.5	0.566	0.061	0.3558	
15 minute summer	S50	SPN13.000	S51	0.0	0.000	0.000	0.4216	

Flow+ v14.0 Copyright © 1988-2025 Causeway Technologies Ltd

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.97%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute winter	S51	23	19.184	0.284	9.9	0.5022	0.0000	SURCHARGED
15 minute winter	S52	14	19.173	0.673	17.1	1.1892	0.0000	SURCHARGED
60 minute winter	S53	66	18.666	0.316	40.8	0.8030	0.0000	SURCHARGED
60 minute winter	S54	66	18.667	0.367	27.5	0.9335	0.0000	SURCHARGED
240 minute winter	S55	232	18.418	1.118	22.7	3.8714	0.0000	SURCHARGED
480 minute winter	S56	288	16.052	0.102	21.8	0.3521	0.0000	OK
480 minute winter	S57	288	15.744	0.169	53.3	0.1909	0.0000	OK
60 minute winter	HW1	55	22.300	0.400	42.5	0.0000	0.0000	OK
60 minute winter	HW2	55	22.280	0.380	28.4	48.4477	0.0000	SURCHARGED
720 minute winter	HW3	705	18.534	0.234	14.7	0.0000	0.0000	OK
720 minute winter	HW4	720	18.530	0.230	8.9	178.8385	0.0000	SURCHARGED
120 minute winter	HW5	86	18.707	0.157	24.1	0.0000	0.0000	OK
120 minute winter	HW6	88	18.690	0.140	22.3	21.9127	0.0000	OK
120 minute winter	HW7	108	18.669	0.169	26.3	0.0000	0.0000	OK
120 minute winter	HW8	110	18.658	0.158	25.3	49.7205	0.0000	OK
480 minute winter	HW9	288	15.640	0.155	53.3	0.0000	0.0000	OK
120 minute winter	ATT1	112	26.098	0.268	11.2	18.3548	0.0000	SURCHARGED
120 minute winter	ATT2	110	26.098	0.148	7.3	10.1293	0.0000	OK
15 minute winter	ATT3	15	23.552	0.352	51.3	16.9164	0.0000	SURCHARGED
120 minute winter	ATT4	104	23.777	0.332	12.2	28.4242	0.0000	SURCHARGED
120 minute winter	ATT5	104	23.777	0.292	12.7	26.3925	0.0000	OK
60 minute winter	ATT6	49	21.554	0.154	11.0	8.7884	0.0000	OK
120 minute winter	ATT7	120	19.682	0.147	5.6	11.3383	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute winter	S51	SPN13.001	S52	9.0	1.014	0.346	0.2053	
15 minute winter	S52	SPN10.007	S53	12.4	0.692	0.070	0.1916	
60 minute winter	S53	SPN6.015	S54	27.5	0.477	0.380	0.8256	
60 minute winter	S54	SPN6.016	S55	19.4	1.157	0.067	0.6242	
240 minute winter	S55	SPN1.017	S56	21.8	1.506	0.073	0.2802	
480 minute winter	S56	SPN1.018	S57	21.8	1.060	0.239	0.9118	
480 minute winter	S57	SPN1.019	HW9	53.3	1.171	0.370	0.7835	20580.4
60 minute winter	HW2	SPN1.009	S18	18.6	1.056	1.213	0.4701	
720 minute winter	HW4	SPN1.014	S22	8.0	0.656	0.159	0.2141	
120 minute winter	HW6	SPN6.013	HW7	21.4	0.959	0.406	0.7685	
120 minute winter	HW8	SPN6.014	S53	24.5	0.627	0.196	0.6366	
120 minute winter	ATT1	SPN2.001	S05	-9.2	0.302	-0.189	0.5898	
120 minute winter	ATT2	SPN3.001	S07	-6.4	-0.228	-0.091	0.5454	
15 minute winter	ATT3	SPN4.005	S16	30.5	0.784	0.421	0.3909	
120 minute winter	ATT4	SPN7.001	S34	13.3	0.423	0.129	0.4041	
120 minute winter	ATT5	SPN8.001	S34	15.1	0.546	0.111	0.4276	
60 minute winter	ATT6	SPN11.001	S43	-7.8	0.304	-0.116	0.4168	
120 minute winter	ATT7	SPN12.001	S48	-5.6	-0.201	-0.064	0.5130	

Flow+ v14.0 Copyright © 1988-2025 Causeway Technologies Ltd

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.97%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S01	10	28.398	0.068	9.0	0.0769	0.0000	OK
15 minute winter	S02	11	28.014	0.064	10.3	0.0729	0.0000	OK
15 minute winter	S03	10	27.247	0.097	44.5	0.1093	0.0000	OK
180 minute winter	S04	172	26.371	0.356	3.2	0.4025	0.0000	SURCHARGED
180 minute winter	S05	172	26.371	0.671	16.6	0.7586	0.0000	SURCHARGED
180 minute winter	S06	172	26.371	0.046	1.2	0.0515	0.0000	OK
180 minute winter	S07	172	26.370	0.720	12.6	1.8333	0.0000	SURCHARGED
15 minute winter	S08	12	25.358	0.158	18.8	0.1788	0.0000	OK
15 minute winter	S09	12	25.358	0.238	17.3	0.2695	0.0000	SURCHARGED
15 minute winter	S10	11	25.324	0.824	40.8	0.9316	0.0000	SURCHARGED
15 minute winter	S11	10	27.928	0.068	13.1	0.0774	0.0000	OK
15 minute winter	S12	12	27.206	0.266	31.0	0.3003	0.0000	SURCHARGED
15 minute winter	S13	12	26.623	0.313	27.4	0.3541	0.0000	SURCHARGED
15 minute winter	S14	15	25.760	0.640	38.1	5.8117	0.0000	SURCHARGED
15 minute winter	S15	10	24.392	0.092	50.4	0.1044	0.0000	OK
30 minute winter	S16	24	24.020	1.010	87.2	1.1421	0.0000	SURCHARGED
15 minute winter	S17	10	22.853	0.053	9.7	0.0596	0.0000	OK
120 minute winter	S18	102	21.990	0.290	27.2	1.0038	0.0000	OK
30 minute winter	S19	22	21.517	0.117	36.2	0.1319	0.0000	OK
15 minute winter	S20	13	21.503	0.703	66.9	3.7255	0.0000	SURCHARGED
30 minute winter	S21	22	21.459	0.759	48.1	2.6297	0.0000	SURCHARGED
960 minute winter	S22	990	18.784	0.534	7.9	0.6035	0.0000	SURCHARGED
960 minute winter	S23	990	18.783	0.633	8.7	0.7160	0.0000	SURCHARGED
15 minute winter	S24	10	27.182	0.052	5.5	0.0583	0.0000	OK
15 minute winter	S25	10	26.960	0.050	5.4	0.0562	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S01	SPN1.000	S02	8.9	1.191	0.397	0.1787	
15 minute winter	S02	SPN1.001	S03	10.1	1.421	0.369	0.2181	
15 minute winter	S03	SPN1.002	S05	44.3	1.358	0.387	0.8435	
180 minute winter	S04	SPN2.000	ATT1	2.8	0.718	0.056	0.8043	
180 minute winter	S05	SPN1.003	S07	9.5	0.380	0.203	0.2467	
180 minute winter	S06	SPN3.000	ATT2	1.2	0.720	0.017	0.4584	
180 minute winter	S07	SPN1.004	S08	4.0	0.780	0.072	0.2486	
15 minute winter	S08	SPN1.005	S09	17.3	1.229	0.308	0.2376	
15 minute winter	S09	SPN1.006	S10	19.8	0.567	0.306	1.5917	
15 minute winter	S10	SPN1.007	S16	34.1	1.036	0.407	1.6401	
15 minute winter	S11	SPN4.000	S12	13.0	1.032	0.427	0.4014	
15 minute winter	S12	SPN4.001	S13	27.4	1.833	0.919	0.3967	
15 minute winter	S13	SPN4.002	S14	25.9	1.484	0.807	0.6454	
15 minute winter	S14	SPN4.003	S15	22.9	1.884	0.731	0.2940	
15 minute winter	S15	SPN4.004	ATT3	50.3	3.057	0.356	0.4142	
30 minute winter	S16	SPN1.008	HW1	64.6	2.887	0.547	0.6654	
15 minute winter	S17	SPN5.000	S18	9.6	0.842	0.264	0.3067	
120 minute winter	S18	SPN1.010	S19	27.2	1.515	0.202	0.3667	
30 minute winter	S19	SPN1.011	S20	36.1	1.121	0.229	1.4379	
15 minute winter	S20	SPN1.012	S21	51.9	0.736	0.667	1.4284	
30 minute winter	S21	SPN1.013	HW3	44.6	5.280	0.100	0.4375	
960 minute winter	S22	SPN1.015	S23	8.7	0.272	0.170	0.4131	
960 minute winter	S23	SPN1.016	S55	3.5	1.997	0.016	0.1485	
15 minute winter	S24	SPN6.000	S25	5.4	1.044	0.235	0.0679	
15 minute winter	S25	SPN6.001	S26	5.3	0.609	0.237	0.2143	

Flow+ v14.0 Copyright © 1988-2025 Causeway Technologies Ltd

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.97%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S26	10	26.621	0.101	25.4	0.1138	0.0000	OK
15 minute winter	S27	10	25.271	0.146	37.5	0.1646	0.0000	OK
15 minute winter	S28	10	25.178	0.178	61.0	0.2012	0.0000	OK
15 minute winter	S29	11	24.990	0.240	80.0	0.2719	0.0000	OK
15 minute winter	S30	11	24.862	0.212	80.2	0.2394	0.0000	OK
15 minute winter	S31	11	24.613	0.113	85.4	0.1275	0.0000	OK
180 minute winter	S32	172	24.143	0.453	8.8	0.5120	0.0000	SURCHARGED
180 minute winter	S33	172	24.143	0.243	8.5	0.2745	0.0000	OK
180 minute winter	S34	172	24.143	0.748	23.8	1.9027	0.0000	SURCHARGED
120 minute winter	S35	120	23.657	1.052	10.8	7.3865	0.0000	SURCHARGED
60 minute winter	S36	48	22.340	1.025	20.8	9.2692	0.0000	SURCHARGED
30 minute winter	S37	24	21.420	0.925	33.5	2.1111	0.0000	SURCHARGED
15 minute winter	S38	10	23.122	0.042	9.0	0.0473	0.0000	OK
30 minute winter	S39	25	21.420	1.420	35.1	3.6139	0.0000	SURCHARGED
30 minute winter	S40	25	21.416	2.216	74.8	14.1156	0.0000	SURCHARGED
15 minute winter	S41	10	22.781	0.031	5.5	0.0355	0.0000	OK
60 minute winter	S42	59	21.811	0.221	6.9	0.2498	0.0000	OK
60 minute winter	S43	59	21.810	0.610	16.2	0.6903	0.0000	SURCHARGED
60 minute winter	S44	58	21.809	0.809	7.9	2.8037	0.0000	SURCHARGED
60 minute winter	S45	62	20.838	0.038	4.2	0.0425	0.0000	OK
15 minute winter	S46	10	20.577	0.037	8.1	0.0421	0.0000	OK
180 minute winter	S47	180	19.912	0.012	0.0	0.0135	0.0000	OK
180 minute winter	S48	180	19.912	0.812	12.4	0.9182	0.0000	SURCHARGED
30 minute winter	S49	24	19.415	0.815	22.7	4.3782	0.0000	SURCHARGED
15 minute summer	S50	1	20.220	0.000	0.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S26	SPN6.002	S27	24.7	2.021	0.748	0.4516	
15 minute winter	S27	SPN6.003	S28	37.1	0.967	0.409	0.7213	
15 minute winter	S28	SPN6.004	S29	60.5	1.158	0.622	1.6870	
15 minute winter	S29	SPN6.005	S30	80.2	1.409	0.862	0.8071	
15 minute winter	S30	SPN6.006	S31	80.5	2.071	0.753	0.6267	
15 minute winter	S31	SPN6.007	S34	85.4	1.653	0.305	0.8305	
180 minute winter	S32	SPN7.000	ATT4	8.1	0.872	0.078	1.9949	
180 minute winter	S33	SPN8.000	ATT5	8.5	1.030	0.064	1.8941	
180 minute winter	S34	SPN6.008	S35	6.5	0.258	0.037	2.1966	
120 minute winter	S35	SPN6.009	S36	7.1	0.278	0.031	1.1704	
60 minute winter	S36	SPN6.010	S37	11.1	1.731	0.053	0.9542	
30 minute winter	S37	SPN6.011	S40	27.2	0.892	0.080	0.9784	
15 minute winter	S38	SPN9.000	S39	8.9	1.401	0.076	1.3409	
30 minute winter	S39	SPN9.001	S40	29.2	0.535	0.175	2.5243	
30 minute winter	S40	SPN6.012	HW5	33.7	2.350	0.138	0.4243	
15 minute winter	S41	SPN10.000	S43	5.5	0.360	0.042	0.5389	
60 minute winter	S42	SPN11.000	ATT6	7.8	1.028	0.114	0.2666	
60 minute winter	S43	SPN10.001	S44	4.0	0.513	0.097	0.7888	
60 minute winter	S44	SPN10.002	S45	4.2	0.790	0.037	0.1018	
60 minute winter	S45	SPN10.003	S46	4.2	1.022	0.030	0.0699	
15 minute winter	S46	SPN10.004	S48	8.0	0.176	0.033	1.1602	
180 minute winter	S47	SPN12.000	ATT7	0.0	-0.001	0.000	0.2340	
180 minute winter	S48	SPN10.005	S49	5.2	0.714	0.041	2.0922	
30 minute winter	S49	SPN10.006	S52	16.1	0.548	0.103	0.3558	
15 minute summer	S50	SPN13.000	S51	0.0	0.000	0.000	0.4216	

Flow+ v14.0 Copyright © 1988-2025 Causeway Technologies Ltd

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.97%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute winter	S51	25	19.429	0.529	18.9	3.4239	0.0000	SURCHARGED
30 minute winter	S52	24	19.415	0.915	16.1	1.6162	0.0000	SURCHARGED
180 minute winter	S53	180	18.850	0.500	30.2	1.2736	0.0000	SURCHARGED
180 minute winter	S54	180	18.845	0.545	27.0	1.3864	0.0000	SURCHARGED
360 minute winter	S55	360	18.583	1.283	22.8	4.4457	0.0000	FLOOD RISK
600 minute winter	S56	285	16.052	0.102	21.8	0.3521	0.0000	OK
600 minute winter	S57	285	15.744	0.169	53.3	0.1909	0.0000	OK
120 minute winter	HW1	102	22.701	0.801	53.5	0.0000	0.0000	OK
120 minute winter	HW2	102	22.673	0.773	37.1	97.7313	0.0000	SURCHARGED
960 minute winter	HW3	975	18.789	0.489	18.4	0.0000	0.0000	OK
960 minute winter	HW4	990	18.784	0.484	10.7	375.2441	0.0000	SURCHARGED
180 minute winter	HW5	180	18.885	0.335	31.2	0.0000	0.0000	OK
180 minute winter	HW6	180	18.870	0.320	27.9	48.2344	0.0000	SURCHARGED
180 minute winter	HW7	180	18.866	0.366	33.7	0.0000	0.0000	OK
180 minute winter	HW8	180	18.853	0.353	22.8	109.4952	0.0000	SURCHARGED
600 minute winter	HW9	285	15.640	0.155	53.3	0.0000	0.0000	OK
180 minute winter	ATT1	172	26.371	0.541	9.7	36.9932	0.0000	SURCHARGED
180 minute winter	ATT2	172	26.370	0.420	10.1	28.7573	0.0000	SURCHARGED
30 minute winter	ATT3	25	24.049	0.849	71.6	40.7516	0.0000	SURCHARGED
180 minute winter	ATT4	172	24.143	0.698	16.8	59.6471	0.0000	SURCHARGED
180 minute winter	ATT5	172	24.143	0.658	17.6	59.3504	0.0000	SURCHARGED
60 minute winter	ATT6	59	21.811	0.411	22.1	23.4075	0.0000	SURCHARGED
180 minute winter	ATT7	180	19.912	0.377	8.3	29.0033	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute winter	S51	SPN13.001	S52	14.9	1.047	0.570	0.2053	
30 minute winter	S52	SPN10.007	S53	29.9	0.725	0.168	0.3706	
180 minute winter	S53	SPN6.015	S54	27.0	0.384	0.374	0.8256	
180 minute winter	S54	SPN6.016	S55	19.5	1.028	0.068	1.0236	
360 minute winter	S55	SPN1.017	S56	21.8	1.501	0.073	0.2801	
600 minute winter	S56	SPN1.018	S57	21.8	1.060	0.239	0.9118	
600 minute winter	S57	SPN1.019	HW9	53.3	1.171	0.370	0.7835	21359.0
120 minute winter	HW2	SPN1.009	S18	26.2	1.491	1.711	0.4701	
960 minute winter	HW4	SPN1.014	S22	5.8	0.659	0.115	0.2141	
180 minute winter	HW6	SPN6.013	HW7	24.8	0.876	0.471	1.5438	
180 minute winter	HW8	SPN6.014	S53	18.2	0.629	0.145	0.8305	
180 minute winter	ATT1	SPN2.001	S05	-6.9	0.300	-0.142	0.5898	
180 minute winter	ATT2	SPN3.001	S07	-9.0	-0.238	-0.126	0.6430	
30 minute winter	ATT3	SPN4.005	S16	43.6	1.096	0.602	0.3909	
180 minute winter	ATT4	SPN7.001	S34	-10.9	-0.333	-0.105	0.4041	
180 minute winter	ATT5	SPN8.001	S34	15.7	0.556	0.116	0.4291	
60 minute winter	ATT6	SPN11.001	S43	-15.3	-0.393	-0.228	0.4821	
180 minute winter	ATT7	SPN12.001	S48	-8.3	-0.220	-0.094	0.6062	

Flow+ v14.0 Copyright © 1988-2025 Causeway Technologies Ltd

Results for 100 year +40% CC +4% A Critical Storm Duration. Lowest mass balance: 99.97%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S01	10	28.432	0.102	17.0	0.1155	0.0000	OK
15 minute winter	S02	10	28.044	0.094	19.4	0.1068	0.0000	OK
180 minute winter	S03	176	27.432	0.282	19.8	0.3186	0.0000	SURCHARGED
180 minute winter	S04	176	27.432	1.417	20.8	16.6396	0.0000	FLOOD RISK
180 minute winter	S05	176	27.431	1.731	31.7	2.0376	0.0000	SURCHARGED
180 minute winter	S06	172	27.430	1.105	9.8	13.2802	0.0000	SURCHARGED
180 minute winter	S07	176	27.430	1.780	23.6	4.5296	0.0000	SURCHARGED
15 minute winter	S08	13	26.569	1.369	31.3	1.5488	0.0000	SURCHARGED
15 minute winter	S09	13	26.554	1.434	26.2	1.6222	0.0000	SURCHARGED
15 minute winter	S10	12	26.499	1.999	58.2	2.2609	0.0000	FLOOD RISK
15 minute winter	S11	11	28.193	0.333	24.8	0.3768	0.0000	SURCHARGED
15 minute winter	S12	14	27.713	0.773	55.0	6.8011	0.0000	SURCHARGED
15 minute winter	S13	15	27.007	0.697	30.0	0.7882	0.0000	SURCHARGED
30 minute winter	S14	30	26.004	0.884	47.2	15.3118	0.0000	SURCHARGED
60 minute winter	S15	46	24.859	0.559	52.1	0.6320	0.0000	SURCHARGED
60 minute winter	S16	46	24.739	1.729	130.5	36.8421	0.0000	FLOOD RISK
15 minute winter	S17	10	22.875	0.075	18.3	0.0848	0.0000	OK
120 minute winter	S18	116	22.056	0.356	37.6	1.2337	0.0000	SURCHARGED
30 minute winter	S19	23	21.837	0.437	60.7	0.4937	0.0000	SURCHARGED
30 minute winter	S20	24	21.791	0.991	98.6	20.2256	0.0000	SURCHARGED
30 minute winter	S21	24	21.728	1.028	53.2	3.5626	0.0000	SURCHARGED
1440 minute winter	S22	1560	19.349	1.099	7.2	1.2434	0.0000	FLOOD RISK
1440 minute winter	S23	1560	19.349	1.199	7.1	1.3560	0.0000	FLOOD RISK
15 minute winter	S24	12	27.500	0.370	10.5	0.4187	0.0000	SURCHARGED
15 minute winter	S25	12	27.463	0.553	14.1	0.6611	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S01	SPN1.000	S02	16.8	1.374	0.748	0.2922	
15 minute winter	S02	SPN1.001	S03	19.4	1.590	0.706	0.3963	
180 minute winter	S03	SPN1.002	S05	19.8	0.676	0.173	1.1970	
180 minute winter	S04	SPN2.000	ATT1	-16.9	0.844	-0.340	0.8043	
180 minute winter	S05	SPN1.003	S07	18.7	0.469	0.400	0.2467	
180 minute winter	S06	SPN3.000	ATT2	-8.9	0.846	-0.126	0.8012	
180 minute winter	S07	SPN1.004	S08	6.3	0.880	0.116	0.3367	
15 minute winter	S08	SPN1.005	S09	26.2	1.262	0.465	0.2716	
15 minute winter	S09	SPN1.006	S10	28.7	0.722	0.443	1.5917	
15 minute winter	S10	SPN1.007	S16	50.5	1.270	0.604	2.3024	
15 minute winter	S11	SPN4.000	S12	22.3	1.280	0.732	0.5581	
15 minute winter	S12	SPN4.001	S13	30.0	1.835	1.006	0.3967	
15 minute winter	S13	SPN4.002	S14	28.7	1.629	0.891	0.6454	
30 minute winter	S14	SPN4.003	S15	28.8	1.897	0.920	0.4264	
60 minute winter	S15	SPN4.004	ATT3	51.8	2.655	0.367	0.5981	
60 minute winter	S16	SPN1.008	HW1	78.7	2.843	0.666	0.8634	
15 minute winter	S17	SPN5.000	S18	18.2	1.203	0.499	0.3503	
120 minute winter	S18	SPN1.010	S19	37.6	1.650	0.279	0.9399	
30 minute winter	S19	SPN1.011	S20	58.1	1.121	0.369	2.1156	
30 minute winter	S20	SPN1.012	S21	53.2	0.755	0.684	1.4284	
30 minute winter	S21	SPN1.013	HW3	52.7	5.354	0.118	0.5871	
1440 minute winter	S22	SPN1.015	S23	7.1	0.237	0.139	0.4131	
1440 minute winter	S23	SPN1.016	S55	3.4	1.997	0.015	0.1485	
15 minute winter	S24	SPN6.000	S25	10.6	1.211	0.457	0.2290	
15 minute winter	S25	SPN6.001	S26	14.7	0.835	0.652	0.4277	

Flow+ v14.0 Copyright © 1988-2025 Causeway Technologies Ltd

Results for 100 year +40% CC +4% A Critical Storm Duration. Lowest mass balance: 99.97%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S26	12	27.430	0.910	44.8	1.0296	0.0000	SURCHARGED
15 minute winter	S27	11	25.779	0.654	56.8	0.7394	0.0000	SURCHARGED
15 minute winter	S28	11	25.711	0.711	99.3	0.8040	0.0000	SURCHARGED
15 minute winter	S29	11	25.388	0.638	135.0	0.7220	0.0000	SURCHARGED
15 minute winter	S30	11	25.076	0.426	134.9	0.4821	0.0000	SURCHARGED
240 minute winter	S31	184	24.995	0.495	30.9	0.5602	0.0000	SURCHARGED
240 minute winter	S32	184	24.990	1.300	15.8	26.1318	12.8944	FLOOD
240 minute winter	S33	184	24.998	1.098	14.9	10.5922	0.0000	SURCHARGED
240 minute winter	S34	184	24.994	1.599	36.3	7.9883	0.0000	SURCHARGED
240 minute winter	S35	168	24.320	1.715	13.5	19.9847	0.7030	FLOOD
120 minute winter	S36	114	22.728	1.413	23.8	28.6651	0.0000	FLOOD RISK
60 minute winter	S37	47	21.898	1.403	53.3	22.6390	0.0000	SURCHARGED
15 minute winter	S38	10	23.137	0.057	17.0	0.0649	0.0000	OK
60 minute winter	S39	46	21.907	1.907	44.6	19.2895	0.0000	SURCHARGED
60 minute winter	S40	47	21.893	2.693	74.6	18.3502	0.0000	FLOOD RISK
15 minute winter	S41	10	22.793	0.043	10.5	0.0486	0.0000	OK
120 minute winter	S42	110	22.540	0.950	8.1	1.0749	0.0000	SURCHARGED
120 minute winter	S43	110	22.540	1.340	18.7	1.5157	0.0000	SURCHARGED
120 minute winter	S44	110	22.539	1.539	18.8	13.6329	0.0000	SURCHARGED
240 minute winter	S45	220	20.894	0.094	5.6	0.1066	0.0000	OK
240 minute winter	S46	220	20.892	0.352	6.4	0.3978	0.0000	SURCHARGED
240 minute winter	S47	232	20.891	0.991	1.2	1.1205	0.0000	SURCHARGED
240 minute winter	S48	220	20.890	1.790	18.0	5.0320	1.1607	FLOOD
60 minute winter	S49	47	19.812	1.212	24.1	8.1561	0.0000	FLOOD RISK
15 minute summer	S50	1	20.220	0.000	0.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S26	SPN6.002	S27	37.1	2.108	1.122	0.6475	
15 minute winter	S27	SPN6.003	S28	58.0	1.079	0.639	1.3126	
15 minute winter	S28	SPN6.004	S29	99.3	1.410	1.021	2.2931	
15 minute winter	S29	SPN6.005	S30	134.9	1.916	1.449	1.0000	
15 minute winter	S30	SPN6.006	S31	134.7	2.147	1.261	0.9122	
240 minute winter	S31	SPN6.007	S34	30.8	0.624	0.110	1.2366	
240 minute winter	S32	SPN7.000	ATT4	12.9	0.923	0.125	1.9949	
240 minute winter	S33	SPN8.000	ATT5	12.9	1.072	0.096	2.0291	
240 minute winter	S34	SPN6.008	S35	8.5	0.265	0.049	2.2782	
240 minute winter	S35	SPN6.009	S36	9.1	0.277	0.040	1.1846	
120 minute winter	S36	SPN6.010	S37	12.5	1.790	0.060	1.6502	
60 minute winter	S37	SPN6.011	S40	28.9	0.852	0.085	0.9784	
15 minute winter	S38	SPN9.000	S39	16.8	1.519	0.143	1.4275	
60 minute winter	S39	SPN9.001	S40	31.3	0.519	0.188	2.5243	
60 minute winter	S40	SPN6.012	HW5	37.2	2.352	0.153	0.5806	
15 minute winter	S41	SPN10.000	S43	10.4	0.384	0.080	0.5629	
120 minute winter	S42	SPN11.000	ATT6	8.9	0.898	0.131	0.2672	
120 minute winter	S43	SPN10.001	S44	12.9	0.479	0.314	0.7888	
120 minute winter	S44	SPN10.002	S45	5.9	0.869	0.052	0.1289	
240 minute winter	S45	SPN10.003	S46	5.6	1.094	0.040	0.7223	
240 minute winter	S46	SPN10.004	S48	6.4	0.142	0.026	2.1665	
240 minute winter	S47	SPN12.000	ATT7	-1.2	-0.029	-0.013	0.4587	
240 minute winter	S48	SPN10.005	S49	6.1	0.633	0.049	2.7684	
60 minute winter	S49	SPN10.006	S52	20.1	0.500	0.128	0.3558	
15 minute summer	S50	SPN13.000	S51	0.0	0.000	0.000	0.4216	

Flow+ v14.0 Copyright © 1988-2025 Causeway Technologies Ltd

Results for 100 year +40% CC +4% A Critical Storm Duration. Lowest mass balance: 99.97%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	S51	47	19.834	0.934	25.1	18.4919	0.0000	SURCHARGED
60 minute winter	S52	47	19.811	1.311	20.1	2.3166	0.0000	FLOOD RISK
360 minute winter	S53	368	19.283	0.933	26.6	2.3745	0.0000	SURCHARGED
360 minute winter	S54	368	19.278	0.978	27.7	2.4879	0.0000	SURCHARGED
960 minute winter	S55	765	18.784	1.484	22.9	5.1420	0.0000	FLOOD RISK
960 minute winter	S56	765	16.054	0.104	22.9	0.3610	0.0000	OK
960 minute winter	S57	765	15.746	0.171	54.4	0.1930	0.0000	OK
120 minute winter	HW1	122	23.410	1.510	78.1	0.0000	0.0000	OK
120 minute winter	HW2	122	23.373	1.473	52.1	185.2386	0.0000	SURCHARGED
1440 minute winter	HW3	1560	19.355	1.055	25.1	0.0000	0.0000	OK
1440 minute winter	HW4	1560	19.350	1.050	14.1	811.4287	0.0000	FLOOD RISK
360 minute winter	HW5	360	19.320	0.770	36.0	0.0000	0.0000	OK
360 minute winter	HW6	368	19.303	0.753	29.4	112.0314	0.0000	SURCHARGED
360 minute winter	HW7	368	19.299	0.799	32.4	0.0000	0.0000	OK
360 minute winter	HW8	368	19.285	0.785	20.9	241.2314	0.0000	SURCHARGED
960 minute winter	HW9	765	15.642	0.157	54.4	0.0000	0.0000	OK
180 minute winter	ATT1	176	27.431	1.601	19.8	54.7542	0.0000	FLOOD RISK
180 minute winter	ATT2	176	27.430	1.480	19.8	54.7542	0.0000	SURCHARGED
60 minute winter	ATT3	46	24.788	1.588	76.8	57.6240	0.0000	FLOOD RISK
240 minute winter	ATT4	184	24.993	1.548	25.8	102.6428	0.0000	SURCHARGED
240 minute winter	ATT5	184	24.995	1.510	27.2	108.3451	0.0000	SURCHARGED
120 minute winter	ATT6	110	22.540	1.140	25.2	45.6285	0.0000	SURCHARGED
240 minute winter	ATT7	232	20.890	1.355	13.7	61.5985	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute winter	S51	SPN13.001	S52	12.9	1.041	0.495	0.2053	
60 minute winter	S52	SPN10.007	S53	30.2	0.724	0.170	0.4139	
360 minute winter	S53	SPN6.015	S54	27.7	0.393	0.383	0.8256	
360 minute winter	S54	SPN6.016	S55	19.5	0.962	0.068	1.0597	
960 minute winter	S55	SPN1.017	S56	22.9	1.520	0.077	0.2899	
960 minute winter	S56	SPN1.018	S57	22.9	1.074	0.251	0.9431	
960 minute winter	S57	SPN1.019	HW9	54.4	1.177	0.377	0.7948	23302.9
120 minute winter	HW2	SPN1.009	S18	36.5	2.074	2.380	0.4701	
1440 minute winter	HW4	SPN1.014	S22	7.1	0.642	0.141	0.2141	
360 minute winter	HW6	SPN6.013	HW7	23.4	0.843	0.445	1.5438	
360 minute winter	HW8	SPN6.014	S53	25.2	0.628	0.201	0.8305	
180 minute winter	ATT1	SPN2.001	S05	-17.4	-0.438	-0.358	0.5898	
180 minute winter	ATT2	SPN3.001	S07	-18.1	-0.455	-0.255	0.6430	
60 minute winter	ATT3	SPN4.005	S16	43.5	1.093	0.600	0.3909	
240 minute winter	ATT4	SPN7.001	S34	-22.0	0.389	-0.212	0.4041	
240 minute winter	ATT5	SPN8.001	S34	-15.0	0.438	-0.111	0.4291	
120 minute winter	ATT6	SPN11.001	S43	-17.6	-0.443	-0.263	0.4821	
240 minute winter	ATT7	SPN12.001	S48	-13.7	-0.344	-0.155	0.6062	

Flow+ v14.0 Copyright © 1988-2025 Causeway Technologies Ltd

APPENDIX F
GREENFIELD RUN-OFF RATES

Greenfield runoff rate estimation tool

www.uksuds.com | Greenfield runoff rate estimation tool (https://www.uksuds.com/)

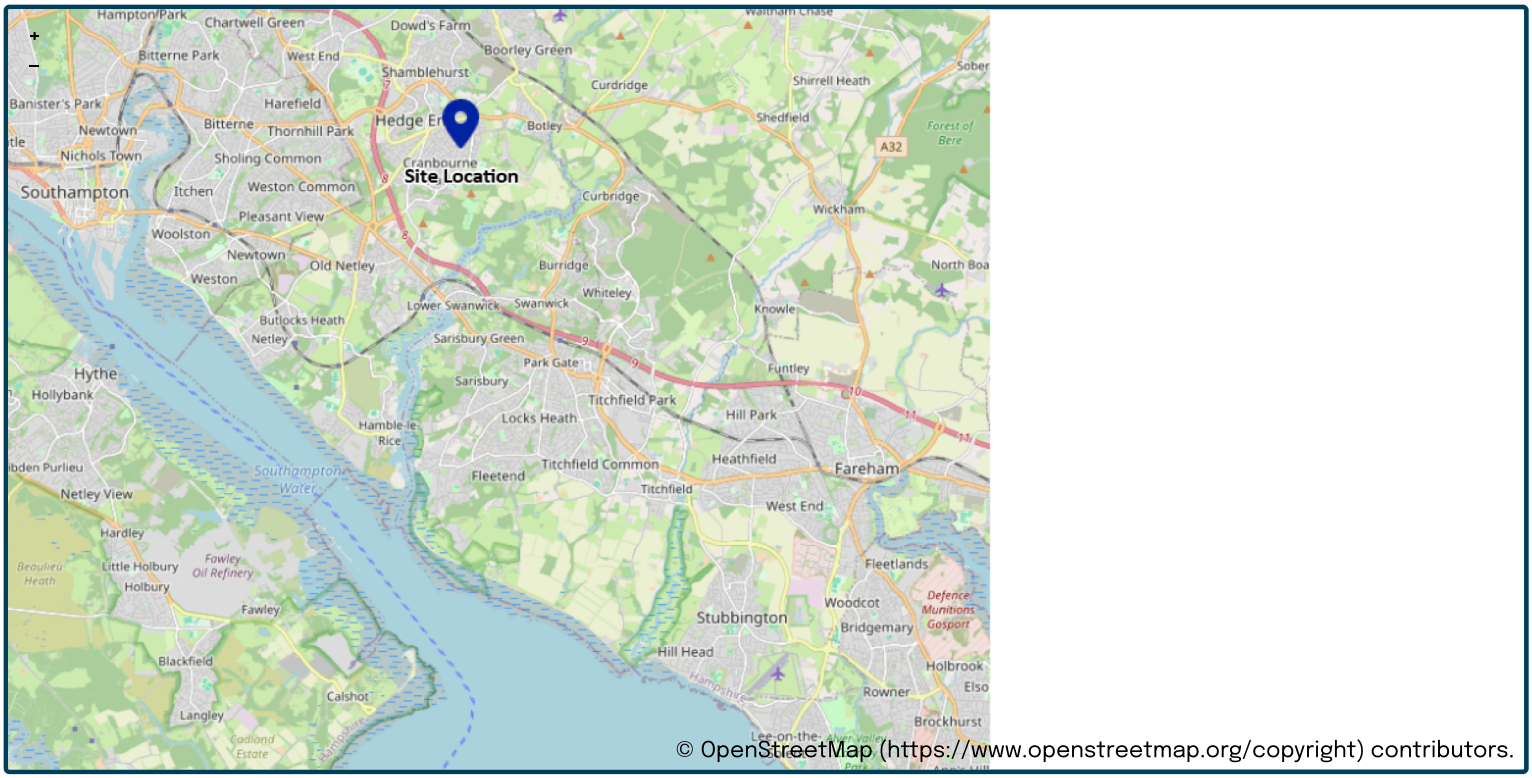
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Project details

Date	23/09/2025
Calculated by	George Adam
Reference	L241014
Model version	2.1.2

Location

Site name	Kings Copse Avenue
Site location	Southampton



Site easting (British National Grid)	449719
Site northing (British National Grid)	112121

Site details

Total site area (ha)	2.62 ha

We use cookies on this site to enhance your user experience

By clicking the Accept button, you agree to us doing so.

OK, I AGREE MORE INFO

Greenfield runoff

Method

Method	FEH statistical

FEH statistical

	My value		Map value
SAAR (mm)	795 mm		795
BFIHOST	.236		
QMed-QBar conversion	1.136		1.136
QMed (l/s)	19.26 l/s		
QBar (FEH statistical) (l/s)	21.88 l/s		

Growth curve factors

	My value		Map value
Hydrological region	7		7
1 year growth factor	0.85		
2 year growth factor	0.88		
10 year growth factor	1.62		
30 year growth factor	2.3		
100 year growth factor	3.19		
200 year growth factor	3.74		

Results

Method	FEH statistical
Flow rate 1 year (l/s)	18.6 l/s
Flow rate 2 year (l/s)	19.3 l/s
Flow rate 10 years (l/s)	35.4 l/s
Flow rate 30 years (l/s)	50.3 l/s
Flow rate 100 years (l/s)	69.8 l/s
Flow rate 200 years (l/s)	81.8 l/s

Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent 'zero' figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

Disclaimer

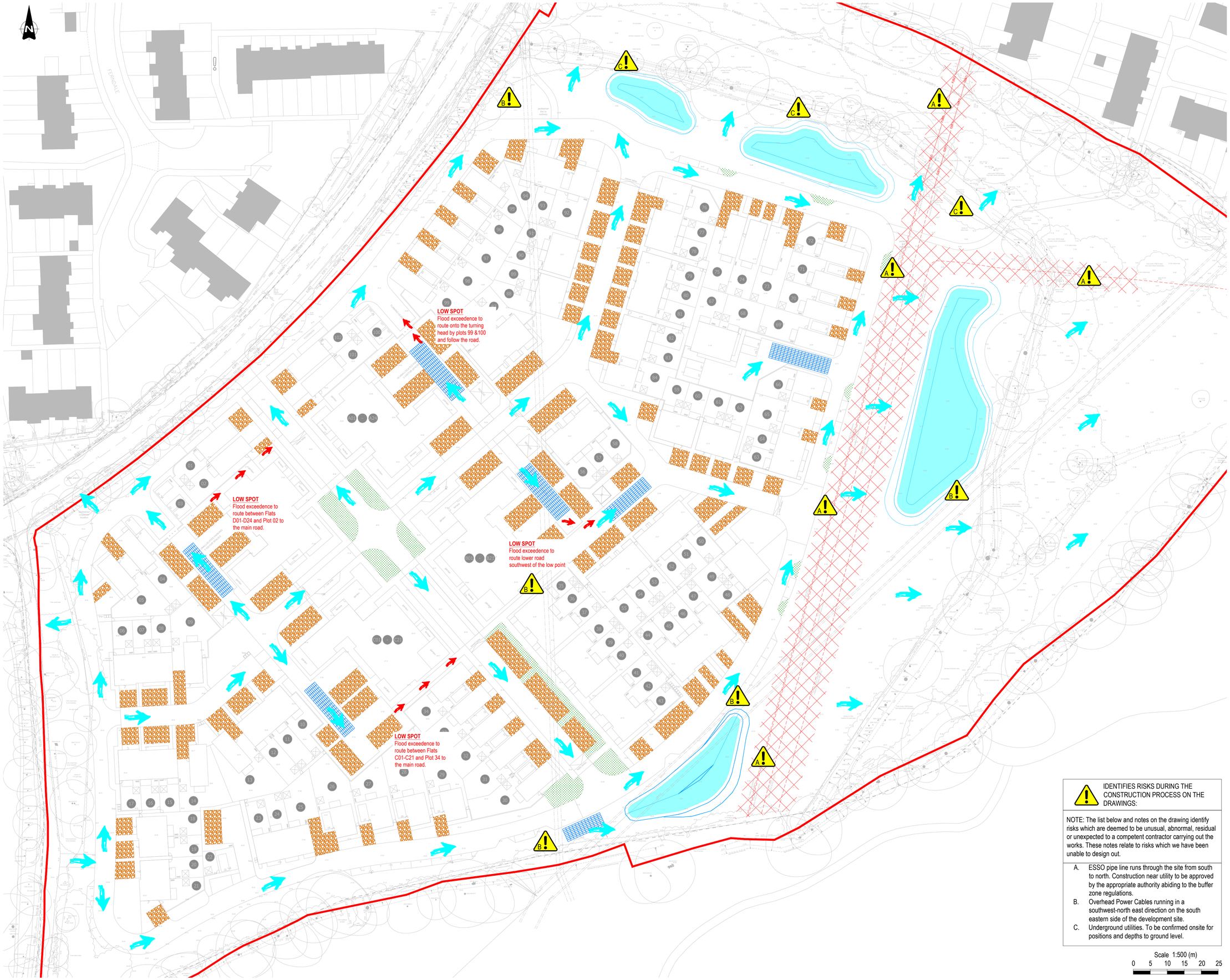
This report was produced using the Greenfield runoff rate estimation tool (2.1.2) developed by HR Wallingford and available at uksuds.com (https://www.uksuds.com/). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at uksuds.com/terms-conditions (https://www.uksuds.com/terms-conditions). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

We use cookies on this site to enhance your user experience

By clicking the Accept button, you agree to us doing so.

APPENDIX G

FLOOD EXCEEDENCE PLAN AND LEVELS DESIGN



This drawing is the property of AKSWard Limited. The drawing is issued on the condition that it is not copied, reproduced, retained or disclosed to any unauthorised person, either wholly or in part without the written consent of AKSWard Limited.
Do NOT scale from this drawing. AKSWard takes no responsibility for errors during photographic reproduction or printing. Any discrepancy's are to be reported to the engineer immediately.

GENERAL NOTES

1. All setting out to be in accordance with the Architects drawings. Any discrepancies between the Engineers and the Architects drawings to be referred to the Architect before proceeding. Dimensions must not be scaled.
2. All drainage to be installed in accordance with relevant Building Regulations documents and Current Sewers for Adoption where applicable.
3. Connections to Public sewers to be agreed and inspected by Water Authority.
4. Invert level, size and cover levels to existing manholes and sewers to be checked prior to any construction. Any discrepancies to be reported immediately.
5. Invert to base of soil stack bends to be 450mm below lowest branch connection for up to 3 storeys buildings. For buildings up to 5 storeys the invert to base of soil stack bends should be not less than 750mm.
6. All RWP and Foul Water drain point setting out is to be confirmed by Architect.
7. All RWP & SVP sizes & setting out by Architect / M&E Engineer. All below ground connections to match above ground outlet size, Min 100/110mm diameter.
8. Foul drains to project 100mm above finished floor level.
9. All internal Manholes and Inspection Chambers to have double sealed recessed covers to suit floor finishes by Architect.
10. All external covers in footpaths and roads in non tarmac areas to have recessed trays to suit the paving material.
11. Refer to drainage specification for pipe materials.
12. All pipework to be 100/110Ø UNO. Refer to note 7 connection sizes.
13. All foul and surface water drainage stacks to have above ground rodding access, refer to above ground drainage layout by others.
14. This drawing has been produced in colour and should be reproduced in colour for clarity.
15. A CCTV Survey and report in WINCAN format for all new drainage will be required before the "As Built" drawings will be issued.

Key

- Exceedence flow route
- Low Point Exceedence flow route
- Redline Boundary

IDENTIFIES RISKS DURING THE CONSTRUCTION PROCESS ON THE DRAWINGS:

NOTE: The list below and notes on the drawing identify risks which are deemed to be unusual, abnormal, residual or unexpected to a competent contractor carrying out the works. These notes relate to risks which we have been unable to design out.

A. ESSO pipe line runs through the site from south to north. Construction near utility to be approved by the appropriate authority abiding to the buffer zone regulations.
B. Overhead Power Cables running in a southwest-north east direction on the south eastern side of the development site.
C. Underground utilities. To be confirmed onsite for positions and depths to ground level.

Scale 1:500 (m)
0 5 10 15 20 25

Rev.	Amendment	Dm	Chkd	Date
P05	Updated to Suit Planning Queries	GA	KL	28.11.25
P04	Updated to Suit LLFA Comments	GA	KL	23.09.25
P03	Updated to Suit Revised Layout	GA	KL	12.09.25
P02	Full Design Pack	GA	KL	30.01.25
P01	Initial issue	GA	JF	20.11.24

Drg. Status **PRELIMINARY** Suitability **S3**

AKSWard²
CONSTRUCTION CONSULTANTS
10 Bonhill Street
London
EC2A 4PE
Tel: 020 7236 0161
e-mail: london@aksward.com
web: www.aksward.com
■ London
□ Hitchin
□ Oxford
□ Southampton

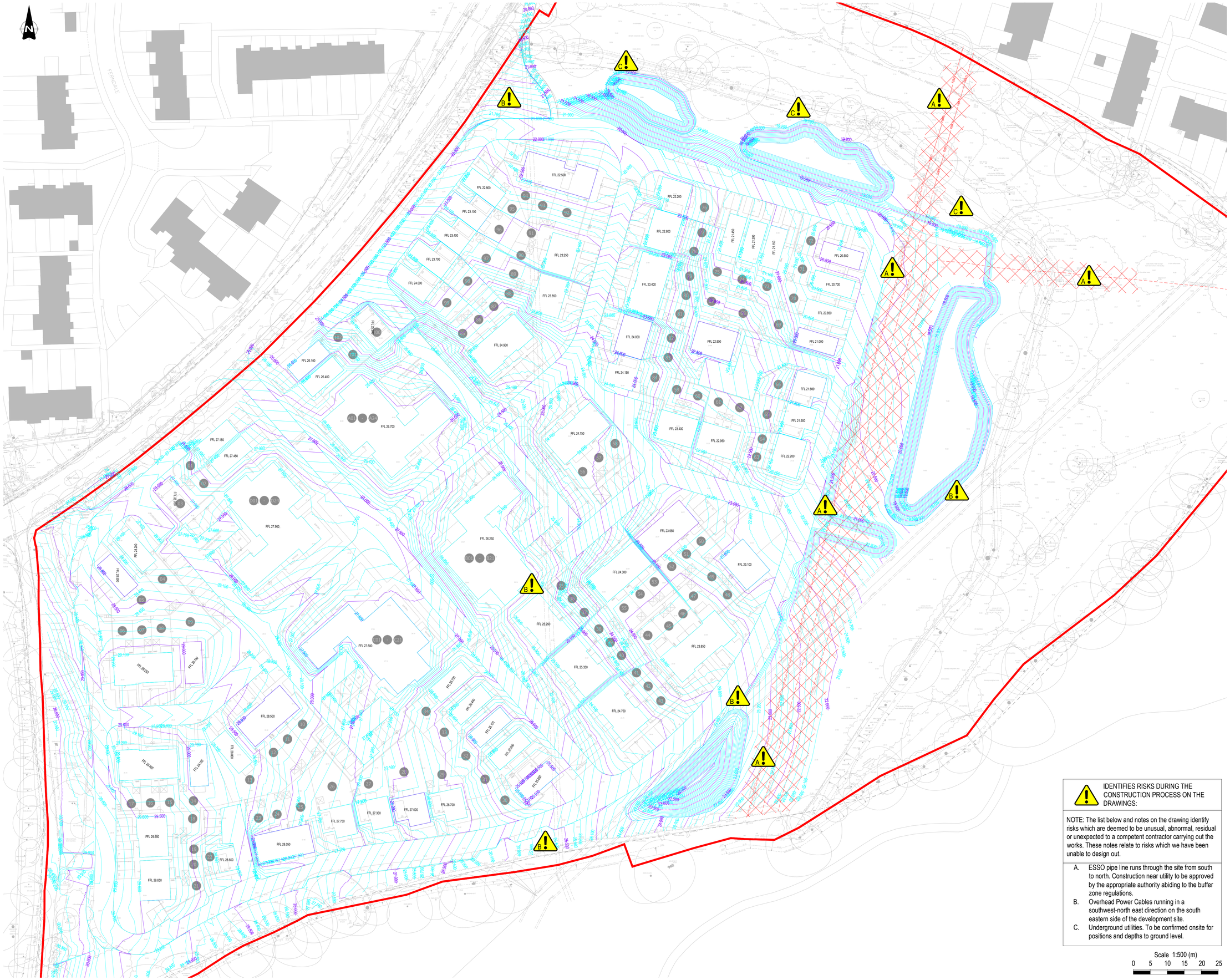
Client **Eastleigh Borough Council**

Project **Kings Copse Close**

Title **Flow Exceedance Plan**

Reviewed Scheme	AS	Date	20.12.2024
Reviewed Final		Date	
Scales at A1	1:500	Project No.	L241014

Project Ref.	Originator	Zone	Level	Type	Role	Drg No.	Rev.
KCA	AKSW	XX	XX	DR	C	9300	P05



This drawing is the property of AKSWard Limited. The drawing is issued on the condition that it is not copied, reproduced, retained or disclosed to any unauthorised person, either wholly or in part without the written consent of AKSWard Limited.
Do NOT scale from this drawing. AKSWard takes no responsibility for errors during photographic reproduction or printing. Any discrepancy's are to be reported to the engineer immediately.

GENERAL NOTES

1. All setting out to be in accordance with the Architects drawings. Any discrepancies between the Engineers and the Architects drawings to be referred to the Architect before proceeding. Dimensions must not be scaled.
2. The existing suface has been created from 23295_F by Maptec Surveys. The proposed surface has been created from 22-148 0003 P04 by MH Architects
3. Construction depths used: Buildings 525mm under FFL 650mm under roads, 450mm under footpaths.
4. No bulking factor has been included in these calculations.
5. It is assumed that all material is suitable for re-use. The figures below identify a total cut or fill value and do not allow for any volume(s) of possible contamination that would need to be removed from site.
6. No allowance has been given for foundations, services or drainage.

Legend

- xx.xxx — Major Contours (every 0.5m)
- xx.xxx — Minor Contours (every 0.1m)

IDENTIFIES RISKS DURING THE CONSTRUCTION PROCESS ON THE DRAWINGS:

NOTE: The list below and notes on the drawing identify risks which are deemed to be unusual, abnormal, residual or unexpected to a competent contractor carrying out the works. These notes relate to risks which we have been unable to design out.

A. ESSO pipe line runs through the site from south to north. Construction near utility to be approved by the appropriate authority abiding to the buffer zone regulations.
B. Overhead Power Cables running in a southwest-north east direction on the south eastern side of the development site.
C. Underground utilities. To be confirmed onsite for positions and depths to ground level.

Scale 1:500 (m)
0 5 10 15 20 25

Rev.	Amendment	Dm	Chkd	Date
P05	Updated to Suit LLFA Comments	GA	KL	23.09.25
P04	Updated to Suit Revised Layout	GA	KL	12.09.25
P03	Full Design Pack	GA	KL	30.01.25
P02	Updated to latest layout	CJ	AS	24.09.24
P01	Initial issue	CJ	AS	25.07.24

Drg. Status **PRELIMINARY** Suitability **S3**

AKSWard²
CONSTRUCTION CONSULTANTS

10 Bonhill Street
London
EC2A 4PE

■ London
□ Hitchin
□ Oxford
□ Southampton

Tel: 020 7236 0161
e-mail: london@aksward.com
web: www.aksward.com

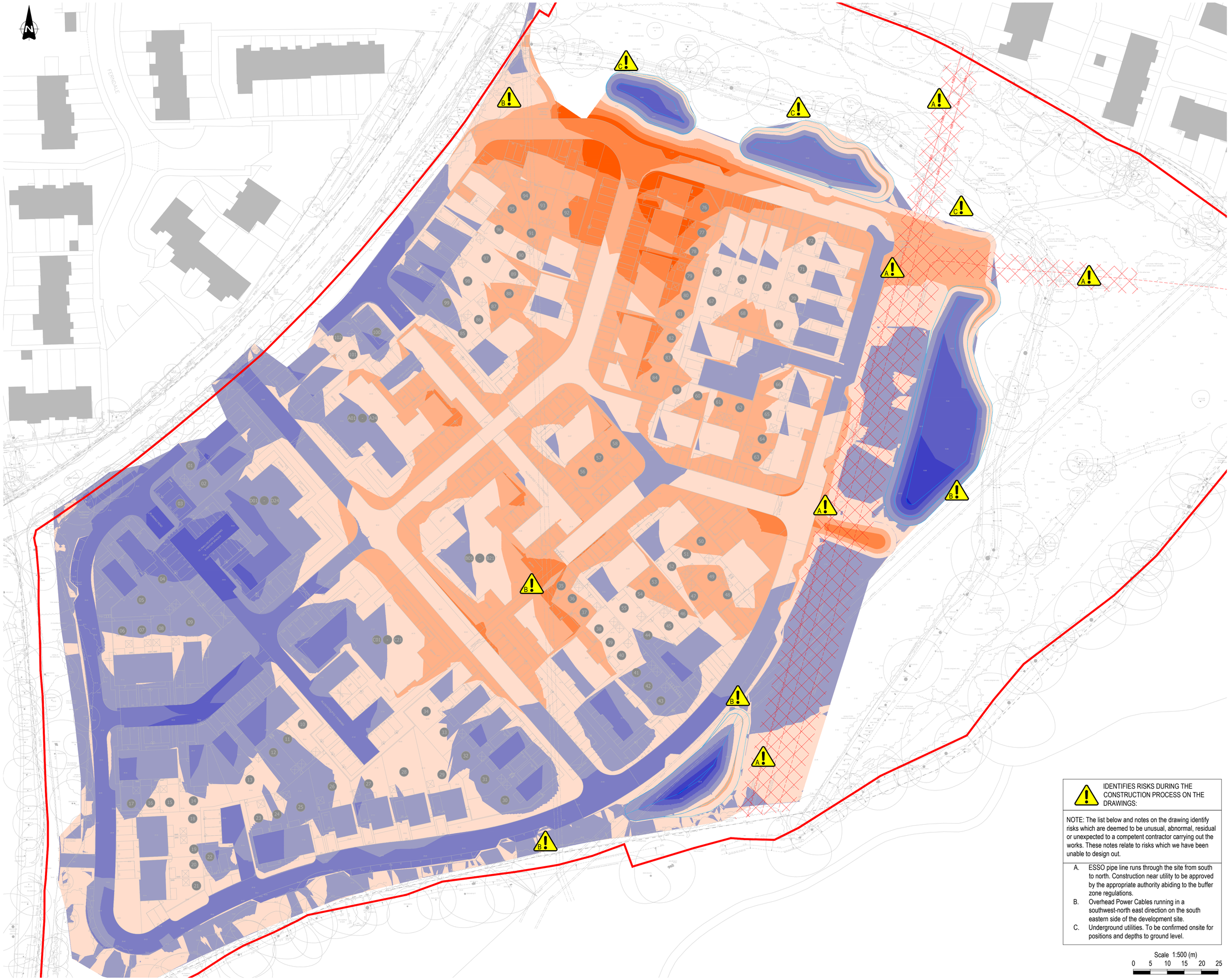
Client **Eastleigh Borough Council**

Project **Kings Copse Close**

Title **Contours And Levels Plan**

Reviewed Scheme 09.07.24 Date AS
Reviewed Final Date
Scales at A1 1:500 Project No. **L241014**

Project Ref.	Originator	Zone	Level	Type	Role	Drg No.	Rev.
KCA	AKSW	XX	XX	DR	C	9100	P05



This drawing is the property of AKSWard Limited. The drawing is issued on the condition that it is not copied, reproduced, retained or disclosed to any unauthorised person, either wholly or in part without the written consent of AKSWard Limited.
Do NOT scale from this drawing. AKSWard takes no responsibility for errors during photographic reproduction or printing. Any discrepancy's are to be reported to the engineer immediately.

GENERAL NOTES

1. All setting out to be in accordance with the Architects drawings. Any discrepancies between the Engineers and the Architects drawings to be referred to the Architect before proceeding. Dimensions must not be scaled.
2. The existing suface has been created from 23295_F by Maptec Surveys. The proposed surface has been created from 22-148 0003 P04 by MH Architects
3. Construction depths used: Buildings 525mm under FFL 650mm under roads, 450mm under footpaths.
4. No bulking factor has been included in these calculations.
5. It is assumed that all material is suitable for re-use. The figures below identify a total cut or fill value and do not allow for any volume(s) of possible contamination that would need to be removed from site.
6. No allowance has been given for foundations, services or drainage.

Height Bands

- Fill 1.5m - 2m
- Fill 1m - 1.5m
- Fill 0.5m - 1m
- Fill 0m - 0.5m
- Cut 0m - 0.5m
- Cut 0.5m - 1m
- Cut 1m - 1.5m
- Cut 1.5m - 2m
- Cut 2m - 2.5m

Total Cut:	7,500.49m³
Total Fill:	12,287.36m³
Net Fill:	4,786.87m³

IDENTIFIES RISKS DURING THE CONSTRUCTION PROCESS ON THE DRAWINGS:

NOTE: The list below and notes on the drawing identify risks which are deemed to be unusual, abnormal, residual or unexpected to a competent contractor carrying out the works. These notes relate to risks which we have been unable to design out.

A. ESSO pipe line runs through the site from south to north. Construction near utility to be approved by the appropriate authority abiding to the buffer zone regulations.
B. Overhead Power Cables running in a southwest-north east direction on the south eastern side of the development site.
C. Underground utilities. To be confirmed onsite for positions and depths to ground level.

Scale 1:500 (m)
0 5 10 15 20 25

Rev.	Amendment	Drn	Chkd	Date
P05	Updated to Suit Client Comments	GA	SG	17.12.25
P04	Updated to Suit LLFA Comments	GA	KL	23.09.25
P03	Updated to Suit Revised Layout	GA	KL	12.09.25
P02	Full Design Pack	GA	KL	30.01.25
P01	Initial issue	CJ	AS	25.07.24

Drg. Status **PRELIMINARY** Suitability **S3**

AKSWard
CONSTRUCTION CONSULTANTS

10 Bonhill Street
London
EC2A 4PE

- London
- Hitchin
- Oxford
- Southampton

Tel: 020 7236 0161
e-mail: london@aksward.com
web: www.aksward.com

Client **Eastleigh Borough Council**

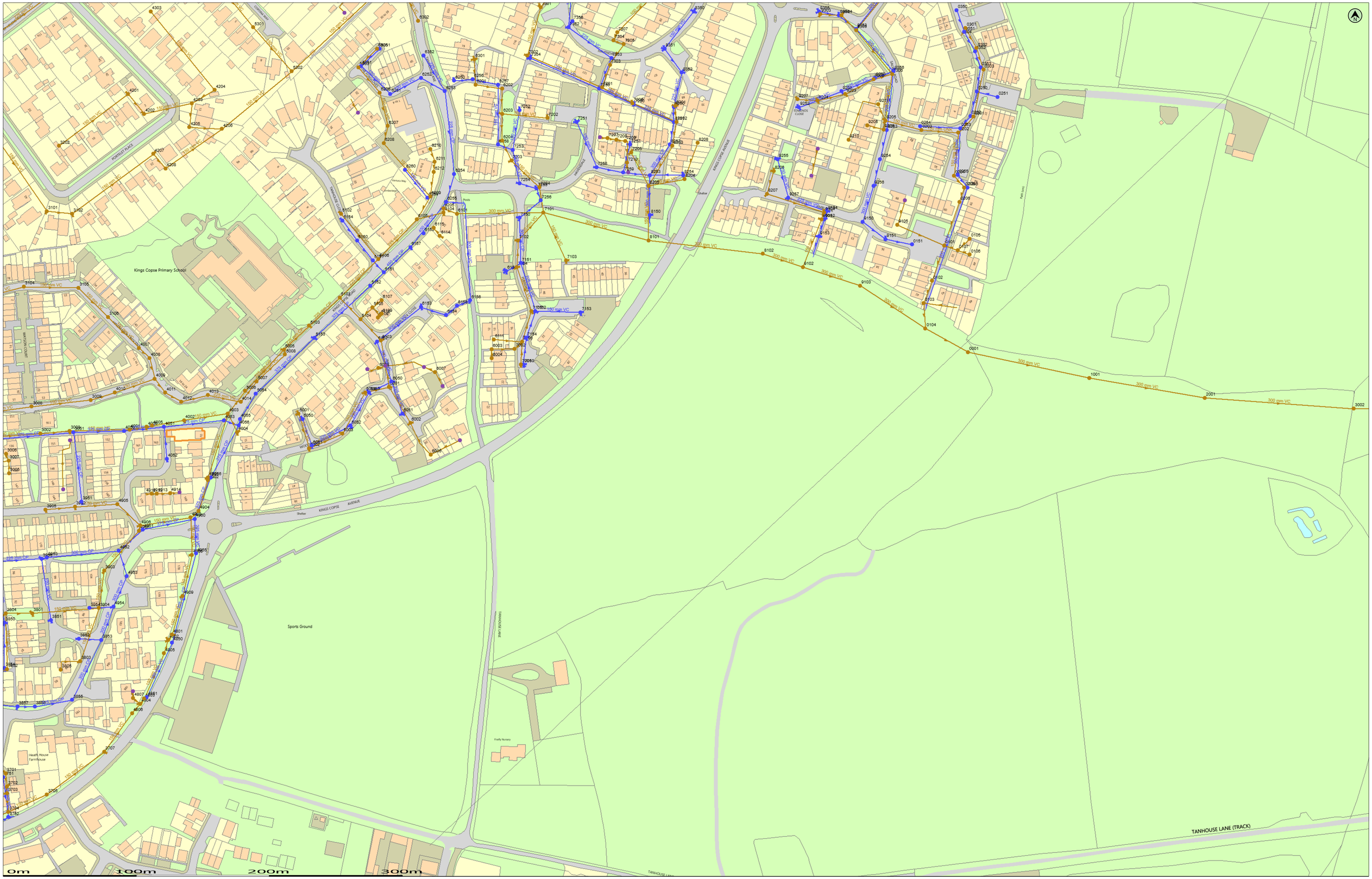
Project **Kings Copse Close**

Title **Cut and Fill to Formation Level**

Reviewed Scheme	AS	Date	09.07.2024
Reviewed Final		Date	
Scales at A1	1:500	Project No.	L241014

Project Ref.	Originator	Zone	Level	Type	Role	Drg No.	Rev.
KCA	AKSW	XX	XX	DR	C	9110	P05

APPENDIX H
ASSET MAP



(c) Crown copyright and database rights 2024 Ordnance Survey 100031673 | Date: 05/07/24 | Scale: 1:1250 | Map Centre: 449833,112028 | Data updated: 25/06/24 | Our Ref: 1513125 - 1 | Wastewater Plan A1 Powered by digdat

The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site. This plan is produced by Southern Water Services Ltd (c) Crown copyright and database rights 2024 Ordnance Survey 100031673 .This map is to be used for the purposes of viewing the location of Southern Water plant only. Any other uses of the map data or further copies is not permitted.

WARNING: BAC pipes are constructed of Bonded Asbestos Cement.

WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement.

Foul Gravity Sewer | Combined Gravity Sewer | Culverted Water Course or Treated Effluent | Surface Water Gravity Sewer | Rising Main, Vaccum or Syphon

Combined Outfall | Foul Outfall | Surface Water Outfall | Surface Water Inlet

Combined Pumping Station | Surface Water Pumping Station | Foul Pumping Station | Water Treatment Works | Section 104 Area | Building Over Agreement Area

Foul Manhole | Combined Manhole | Surface Water Manhole | Side Entry Manhole, Decantation Chamber, Dummy Manhole or Surface Water Soakaway

max.waddup@aksward.com

Kings Copse - ALP

WATER for LIFE from Southern Water.

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
0001	F	16.65	14.23	
0101	F	0.00	0.00	
0102	F	0.00	0.00	
0103	F	0.00	0.00	
0104	F	0.00	0.00	
0105	F	0.00	0.00	
0106	F	0.00	0.00	
0107	F	0.00	0.00	
0201	F	0.00	0.00	
0202	F	0.00	0.00	
0203	F	0.00	0.00	
0204	F	0.00	0.00	
0205	F	0.00	0.00	
0206	F	0.00	0.00	
0301	F	0.00	0.00	
0302	F	0.00	0.00	
0303	F	0.00	0.00	
0304	F	0.00	0.00	
1001	F	15.43	13.17	
2001	F	14.50	12.30	
3002	F	33.77	32.29	
3002	F	13.77	11.40	
3003	F	33.58	32.03	
3005	F	0.00	0.00	
3006	F	0.00	0.00	
3007	F	0.00	0.00	
3008	F	31.34	29.08	
3009	F	30.87	28.58	
3101	F	30.10	29.11	
3102	F	29.91	28.97	
3104	F	30.48	28.80	
3105	F	29.93	28.53	
3106	F	30.05	28.32	
3202	F	0.00	0.00	
3701	F	42.45	41.21	
3702	F	42.39	40.76	
3703	F	42.41	40.46	
3704	F	42.08	38.54	
3705	F	0.00	0.00	
3707	F	37.79	35.84	
3801	F	38.63	36.79	
3802	F	41.36	40.01	
3803	F	37.35	35.87	
3804	F	39.29	37.62	
3805	F	0.00	0.00	
3902	F	35.13	34.19	
3903	F	36.42	34.55	
3904	F	36.84	35.17	
3905	F	35.39	34.84	
4001	F	33.07	31.41	
4002	F	32.60	30.86	
4003	F	31.27	29.64	
4004	F	31.77	29.88	
4005	F	32.95	31.24	
4006	F	32.99	31.27	
4007	F	30.22	28.10	
4008	F	30.27	28.04	
4009	F	30.36	27.93	
4010	F	30.68	28.36	
4011	F	30.43	27.78	
4012	F	30.50	27.62	
4013	F	30.61	27.39	
4014	F	30.50	27.11	
4201	F	0.00	0.00	
4202	F	29.49	28.12	
4203	F	0.00	0.00	
4204	F	27.20	0.00	
4205	F	0.00	0.00	
4206	F	26.43	0.00	
4207	F	28.91	27.69	
4208	F	28.48	0.00	
4303	F	0.00	0.00	
4801	F	35.37	33.32	
4802	F	35.62	33.46	
4803	F	36.71	34.72	
4804	F	36.75	34.86	
4805	F	35.91	33.66	
4806	F	37.13	35.15	
4807	F	0.00	0.00	
4901	F	32.78	30.93	
4902	F	32.89	31.00	
4903	F	33.80	31.71	
4904	F	33.69	31.58	
4905	F	34.79	0.00	
4906	F	34.81	33.03	
4907	F	34.81	33.11	
4908	F	34.06	32.13	
4909	F	34.67	32.85	
4911	F	0.00	0.00	
4912	F	0.00	0.00	
4913	F	0.00	0.00	
4914	F	0.00	0.00	
5001	F	29.65	28.42	
5002	F	29.95	28.07	
5003	F	28.67	27.17	
5004	F	27.06	25.35	
5005	F	28.68	26.54	
5006	F	30.45	28.93	
5007	F	29.87	26.89	
5008	F	28.62	26.56	
5101	F	25.36	23.48	
5102	F	25.04	23.41	
5103	F	27.36	25.36	
5104	F	0.00	0.00	
5105	F	0.00	0.00	

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
5301	F	0.00	0.00	
5302	F	0.00	0.00	
5303	F	24.95	0.00	
6001	F	26.17	0.00	
6002	F	26.73	24.95	
6003	F	0.00	0.00	
6004	F	0.00	0.00	
6005	F	0.00	0.00	
6006	F	0.00	0.00	
6007	F	0.00	0.00	
6101	F	0.00	0.00	
6103	F	25.65	24.29	
6104	F	22.34	19.69	
6105	F	22.41	20.09	
6106	F	23.47	21.46	
6107	F	0.00	0.00	
6108	F	0.00	0.00	
6109	F	0.00	0.00	
6110	F	0.00	0.00	
6111	F	0.00	0.00	
6114	F	0.00	0.00	
6115	F	0.00	0.00	
6201	F	25.90	24.50	
6202	F	25.82	23.33	
6203	F	24.14	23.04	
6204	F	23.93	21.26	
6205	F	22.25	19.56	
6206	F	24.52	0.00	
6207	F	23.80	0.00	
6208	F	23.17	0.00	
6209	F	22.42	0.00	
6210	F	0.00	0.00	
6211	F	0.00	0.00	
6212	F	0.00	0.00	
6301	F	26.42	24.99	
6302	F	26.03	0.00	
6305	F	25.60	0.00	
7001	F	25.30	23.72	
7002	F	0.00	0.00	
7101	F	21.31	18.51	
7102	F	21.31	19.60	
7103	F	21.84	19.49	
7104	F	22.08	20.03	
7105	F	23.30	21.35	
7106	F	24.33	22.63	
7201	F	28.11	24.41	
7202	F	0.00	0.00	
7203	F	22.64	20.64	
7204	F	21.67	19.74	
7205	F	23.19	20.96	
7206	F	26.23	23.53	
7207	F	0.00	0.00	
7208	F	0.00	0.00	
7209	F	0.00	0.00	
7210	F	0.00	0.00	
7301	F	30.05	26.38	
7302	F	28.41	25.21	
7303	F	29.90	26.54	
7304	F	0.00	0.00	
7305	F	0.00	0.00	
7307	F	0.00	0.00	
8101	F	20.38	17.51	
8102	F	18.56	16.22	
8201	F	25.59	23.47	
8202	F	24.36	21.72	
8203	F	23.44	21.09	
8204	F	22.24	21.01	
8205	F	21.79	0.00	
8206	F	21.22	19.67	
8207	F	20.66	18.77	
8208	F	0.00	0.00	
9101	F	20.06	17.82	
9102	F	18.04	15.82	
9103	F	17.60	15.33	
9104	F	20.21	17.93	
9105	F	0.00	0.00	
9202	F	21.95	20.11	
9203	F	22.35	20.57	
9204	F	22.78	21.16	
9205	F	21.68	18.97	
9207	F	23.02	21.58	
9208	F	0.00	0.00	
9209	F	0.00	0.00	
9210	F	0.00	0.00	
9211	F	0.00	0.00	
9303	F	24.05	22.22	
9304	F	23.30	21.46	
9305	F	22.68	19.63	
9306	F	21.69	19.14	
0151	S	0.00	0.00	
0250	S	0.00	0.00	
0251	S	0.00	0.00	
0252	S	0.00	0.00	
0253	S	0.00	0.00	
0254	S	0.00	0.00	
0255	S	0.00	0.00	
0256	S	0.00	0.00	
0350	S	0.00	0.00	
0351	S	0.00	0.00	
0352	S	0.00	0.00	
0353	S	0.00	0.00	
3051	S	33.61	32.37	
3752	S	0.00	0.00	
3850	S	39.67	38.54	
3851	S	38.06	36.95	

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
3852	S	37.06	35.92	
3853	S	37.01	35.33	
3854	S	41.54	40.24	
3855	S	38.37	36.71	
3856	S	40.62	38.85	
3857	S	41.55	39.69	
3951	S	35.08	33.76	
3953	S	37.12	35.32	
3954	S	37.04	36.02	
3956	S	37.12	35.37	
4050	S	33.13	31.75	
4051	S	32.91	31.18	
4052	S	33.66	32.24	
4053	S	31.55	30.33	
4055	S	31.13	29.84	
4056	S	31.35	29.98	
4850	S	35.56	33.16	
4851	S	36.71	34.38	
4950	S	33.75	31.32	
4951	S	34.75	32.64	
4952	S	35.63	33.91	
4953	S	35.75	34.15	
4954	S	36.45	34.80	
4955	S	33.94	31.80	
4956	S	32.75	30.64	
5050	S	29.72	28.18	
5051	S	29.87	27.26	
5052	S	28.31	26.22	
5053	S	26.87	24.92	
5054	S	30.21	29.11	
5150	S	24.18	23.33	
5151	S	23.59	22.99	
5152	S	24.35	23.11	
5153	S	27.49	26.54	
5154	S	24.88	23.68	
5351	S	24.97	0.00	
6050	S	26.07	23.99	
6051	S	26.49	24.26	
6150	S	22.34	21.01	
6151	S	23.70	22.56	
6152	S	25.72	23.87	
6153	S	23.70	22.40	
6154	S	23.74	22.23	
6155	S	23.44	22.01	
6156	S	22.92	21.87	
6157	S	22.78	0.00	
6158	S	0.00	0.00	
6250	S	25.86	0.00	
6251	S	24.47	0.00	
6252	S	24.97	0.00	
6253	S	24.07	0.00	
6254	S	22.23	0.00	
6255	S	22.24	0.00	
6256	S	26.03	0.00	
6257	S	25.87	0.00	
6258	S	23.76	0.00	
6259	S	22.28	0.00	
6260	S	23.06	0.00	
6351	S	25.60	0.00	
6352	S	25.32	0.00	
7050	S	25.35	24.03	
7150	S	21.19	20.20	
7151	S	21.94	20.35	
7152	S	23.29	21.70	
7153	S	23.35	22.13	
7154	S	24.19	22.82	
7250	S	28.05	24.93	
7251	S	25.60	23.66	
7252	S	25.74	23.59	
7253	S	23.04	21.05	
7254	S	21.59	20.53	
7255	S	21.62	20.32	
7256	S	21.32	0.00	
7257	S	23.86	22.17	
7258	S	23.19	21.87	
7259	S	22.74	21.18	
7260	S	26.16	23.90	
7352	S	30.75	25.71	
7353	S	30.11	25.30	
7354	S	28.49	25.85	
7356	S	0.00	0.00	
8150	S	20.44	19.10	
8250	S	25.41	23.63	
8251	S	24.31	21.99	
8252	S	23.41	21.52	
8253	S	22.09	20.93	
8254	S	22.32	21.28	
8350	S	29.30	26.33	
8351	S	29.26	25.78	
8352	S	27.45	25.09	
9150	S	19.87	18.53	
9151	S	19.38	18.10	
9152	S	20.03	18.09	
9153	S	19.71	17.82	
9154	S	20.25	18.26	
9250	S	21.90	20.29	
9251	S	22.39	20.84	
9252	S	22.87	21.65	
9253	S	21.70	19.18	
9254	S	21.54	19.03	
9255	S	22.07	20.01	
9256	S	20.86	18.88	
9257	S	20.53	19.01	
9353	S	22.66	19.91	
9354	S	23.37	21.79	

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
9355	S	21.67	20.12	
9356	S	24.12	21.79	

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

APPENDIX I
FOUL DRAINAGE CALCULATIONS

CALCULATIONS

Company:	AKSWard	Office:	London
Sheet No:	1	Project No:	L241014
By:	George Adam	Date:	23.09.25
Checked:		Date:	

Project Title: **Kings Copse Avenue**

Calculations Title: **Existing Foul Flow Estimate** **Summary Sheet**

LOCATION	CALCULATIONS				OPTIONS
	Foul water discharge from proposed development to adjacent public sewers calculated based on water consumption method in accordance to Sewers for Adoption 6th Edition, Urban Drainage by Butler & Davies and Thames Water guidelines.				
	Residential - Number of Units	=	**195**		
	Hotel - Number of Bedrooms	=	**0**		
	Hostel - Number of Beds	=	**0**		
	Student Accommodation - Number of Beds	=	**0**		
	Offices - Floor Area	=	**0**		
	Shops - Floor Area	=	**0**		
	Cinema - Floor Area / Number of Seats	=	**0**	= **0**	
	Gym - Number of Persons	=	**0**		
	Day School - Number of Pupils	=	**0**		
	Boarding School - Number of Pupils	=	**0**		
	Hospital - Number of Beds	=	**0**		
	Nursing Home - Number of Beds	=	**0**		
	Restaurant - Number of Customers	=	**0**	= **0**	
	Pub / Club - Floor Area / No. of Customers	=	**0**	= **0**	
	Industrial Manufactoring - Floor Area	=	**0**		
	Industrial Commercial - Floor Area	=	**0**		
	TOTAL FOUL WATER DISCHARGE	=	**8.97**	**l/s**	

APPENDIX J
DRAINAGE MAINTENANCE PLAN

Contents

Drainage Maintenance Plan

Revision	Description	By	Checked / Approved	Date
P01	First Issue	George Adam	Adam Smith	20.12.24
P02	Planning Issue	George Adam	King Leung	23.09.25

SuDS Drainage Maintenance Plan

AKSWard Limited has been instructed on behalf of Eastleigh Borough Council to provide a drainage Maintenance plan for the proposed construction of a 195-unit Residential Site. The focus of this report is to inform the inspection and maintenance of the new drainage features within the project design looking at the post construction period of the Development life.

Drainage Feature	Maintenance Actions	Monitoring Plan
Drainage Channels/Gullies	Inspections to be frequent and thorough ensuring that all components are in satisfactory conditions and any debris/silt build up is removed to ensure the network can optimally operate. Inspections are to span out to include the drainage component surround so that the adjacent paving/surround will not have a negative consequence on the drainage component's ability to perform. At every inspection, channels should be jetted and gully traps to be cleaned out and pipes jittered with traps correctly fitted back afterwards.	Inspect every six months or after every storm
Manhole, Inspection Chamber, Rodding Eyes and Pipes	Inspection chambers will be checked every six months for the accumulation of debris and silt and cleaned as necessary. Inspection of pipes and joints for structural integrity, damage, leaks to be undertaken every 6 months of after a large storm. Any defects to be remedially actioned promptly.	Inspect every six months or after a large storm.
Permeable paving/permeable sub-base	Permeable paving to be inspected three times a year (end of winter, mid-summer and in autumn at the end of leaf fall) or after a large storm. Brushing and washing of paving to be actioned during inspections, checking that the grout is not blocked or ponding. Weeds to be removed via appropriate means, ensure to check manufacturing guidelines on weed/vegetation removal. Checking of any depressed, rutting or broken blocks and remediating any defects in the paving area during each inspection.	Every three months or after a large storm
Rain Garden	Inspection of rain garden for the accumulation of debris and silt to be checked every three months, cleaned as necessary.	Inspect every three months or after a large storm. Grass maintenance over 3 periods of the year.

	Maintenance of grass within the raingarden to be maintained over 3 periods of the year. At the start of summer around end of April/beginning of May; mid-summer around July and end of summer around end of September/beginning of October. Maintenance of planting within the rain garden to be every three months or as frequent as plant species requires.	Planting maintenance every three months or as required.
Detention Basin	Inspection of basin for the accumulation of debris and silt to be checked every six months, cleaned as necessary. Inspection of inlets, outlets, overflows and banks/structures to be every six months or after a large storm for evidence of damage. Repairs to be as and when required. Inspection of grass length to be maintained over 3 periods of the year. At the start of summer around end of April/beginning of May; mid-summer around July and end of summer around end of September/beginning of October.	Inspect every six months or after a large storm. Grass maintenance over 3 periods of the year
Flow Control Chamber (hydrobrake & Orifice Plate)	Chambers to be inspected every 3 months for the accumulation of debris posing a blockage potential. Cleaned as per manufacturing recommendation. Chambers to be inspected 3 months or after a large storm to check that the flow control device is for any damaged. Remedial action to be actioned if damage to be reported	Inspect every three months or after a large storm.
Soakaway Cellular Tanks	Inspection and identify and areas that are not operating correctly. If required take remedial action. Inspect all inlets, outlets, overflows and vents to ensure they are in good working condition and operating as designed. Survey inside of tank for sediment build up and remove if necessary	Inspect every month for 3 months then annually Inspect for sediment every 5 years or as required

APPENDIX K
FLOOD MAP DATA

Flood risk assessment data

Location of site: 449866 / 112068 (shown as easting and northing coordinates)
Document created on: 23 December 2025
This information was previously known as a product 4.
Customer reference number: FFM98HR7HY8P / EIR2025/44254

Map showing the location that flood risk assessment data has been requested for.



How to use this information

You can use this information as part of a flood risk assessment for a planning application. To do this, you should include it in the appendix of your flood risk assessment.

We recommend that you work with a flood risk consultant to get your flood risk assessment.

Included in this document

In this document you'll find:

- how to find information about surface water and other sources of flooding
- information on the models used
- definitions for the terminology used throughout
- flood map for planning (rivers and the sea)
- past floods
- flood defences and attributes
- information to help you assess if there is a reduced flood risk from rivers and the sea because of defences
- modelled data
- information about strategic flood risk assessments
- information about this data
- information about flood risk activity permits
- help and advice

Surface water and other sources of flooding

When using the surface water map on the check your long term flood risk service the following considerations apply:

- surface water extents are suitable for use in planning
- surface water climate change scenarios may help to inform risk assessments, but the available data fall short of what is required to assess planned development
- surface water depth information should not be used for planning purposes

To find out about other factors that might affect the flood risk of this location, you should also check:

- reservoir flood risk
- groundwater flood risk - you could use the British Geological Survey groundwater flooding data, groundwater: current status and flood risk and the guide on mining and groundwater constraints for development - further information may be available from the lead local flood authority (LLFA)
- your local planning authority's SFRA, which includes future flood risk

Your Lead Local Flood Authority is Hampshire County.

For information about sewer flooding, contact the relevant water company for the area.

About the models used

Model name: JFLOW
Scenario(s): Defences removed fluvial
Date: 2008

This model contains the most relevant data for your area of interest.

Terminology used

Annual exceedance probability (AEP)

This refers to the probability of a flood event occurring in any year. The probability is expressed as a percentage. For example, a large flood which is calculated to have a 1% chance of occuring in any one year, is described as 1% AEP.

Metres above ordnance datum (mAOD)

All flood levels are given in metres above ordnance datum which is defined as the mean sea level at Newlyn, Cornwall.

Flood map for planning (rivers and the sea)

Your selected location is in flood zone 3.

Flood zone 3 shows the area at risk of flooding for an undefended flood event with a:

- 0.5% or greater probability of occurring in any year for flooding from the sea
- 1% or greater probability of occurring in any year for fluvial (river) flooding

Flood zone 2 shows the area at risk of flooding for an undefended flood event with:

- between a 0.1% and 0.5% probability of occurring in any year for flooding from the sea
- between a 0.1% and 1% probability of occurring in any year for fluvial (river) flooding

It's important to remember that the flood zones on this map:

- refer to the land at risk of flooding and do not refer to individual properties
- refer to the probability of river and sea flooding, ignoring the presence of defences
- do not take into account potential impacts of climate change



© Environment Agency copyright and/or database rights 2025. All rights reserved. © Crown copyright and database rights 2025 AC0000807064.

Environment Agency

Flood map for planning

Location (easting/northing)
449866/112068

Scale
1:10,000

Created
23 Dec 2025

- Selected area
- Main river
- Flood Zone 3
- Flood Zone 2

0 100 200 300 400 500
metres

Past floods

Past flood events included in this document

The recorded flood outlines included in this document are for areas of land local to your site location that have been flooded by any of these sources:

- ephemeral water
- main rivers
- ordinary watercourses
- the sea
- unknown

Data limitations

The outlines do not include flooding from:

- drainage where rainfall has led to surface water ponding or overland runoff
- artificial, water-bearing sewer, water supply and wastewater treatment pipelines

Changes to flood defences

The defences (also known as assets) that were in place may also have changed. For example, assets may have been built more recently than the last recorded flood outline.

What the recorded flood outlines dataset is

The recorded flood outlines are a geographical information system (GIS) data layer that show our verified records of areas that have flooded in the past from:

- rivers
- the sea
- groundwater
- surface water

Download the complete recorded flood outlines dataset, which includes data quality flags for outlines recorded after April 2020. This indicates the confidence we have in an outline.

Get flood information from other organisations

Contact Hampshire County Lead Local Flood Authority (LLFA) and your drainage board to get information about past flooding caused by surface water or drainage systems.



© Environment Agency copyright and/or database rights 2025. All rights reserved. © Crown copyright and database rights 2025 AC0000807064.

Environment Agency

Past floods

Location (easting/northing)
449866/112068

Scale
1:10,000

Created
23 Dec 2025

Selected area

Main river

Date of flood event

November, 1975

0 100 200 300 400 500
metres

Data on past flood events

Start date	End date	Source of flood	Cause of flood	Affects location
5 November 1975	5 November 1975	main river	unknown	No

Flood defences and attributes

The flood defences map shows the location of the flood defences present.

The flood defences data table shows the type of defences, their condition and the standard of protection. It shows the height above sea level of the top of the flood defence (crest level). The height is In mAOD which is the metres above the mean sea level at Newlyn, Cornwall.

It's important to remember that flood defence data may not be updated on a regular basis. The information here is based on the best available data.

Use this information:

- to help you assess if there is a reduced flood risk for this location because of defences
- with any information in the modelled data section to find out the impact of defences on flood risk



© Environment Agency copyright and/or database rights 2025. All rights reserved. © Crown copyright and database rights 2025 AC0000807064.

Environment Agency

Flood defences

Location (easting/northing)
449866/112068

Scale
1:7,500

Created
23 Dec 2025

- Selected area
- Main river
- Flood defence

0 100 200 300
metres

Flood defences data

Label	Asset ID	Asset Type	Standard of protection (years)	Current condition	Downstream actual crest level (mAOD)	Upstream actual crest level (mAOD)	Effective crest level (mAOD)
1	403678	Engineered High Ground					
2	403677	Engineered High Ground					

Any blank cells show where a particular value has not been recorded for an asset.

Modelled data

This section provides details of different scenarios we have modelled and includes the following (where available):

- outline maps showing the area at risk from flooding in different modelled scenarios
- map(s) showing the approximate water levels for the return period with the largest flood extent for a scenario and table(s) of sample points providing details of the flood risk for different return periods

Climate change

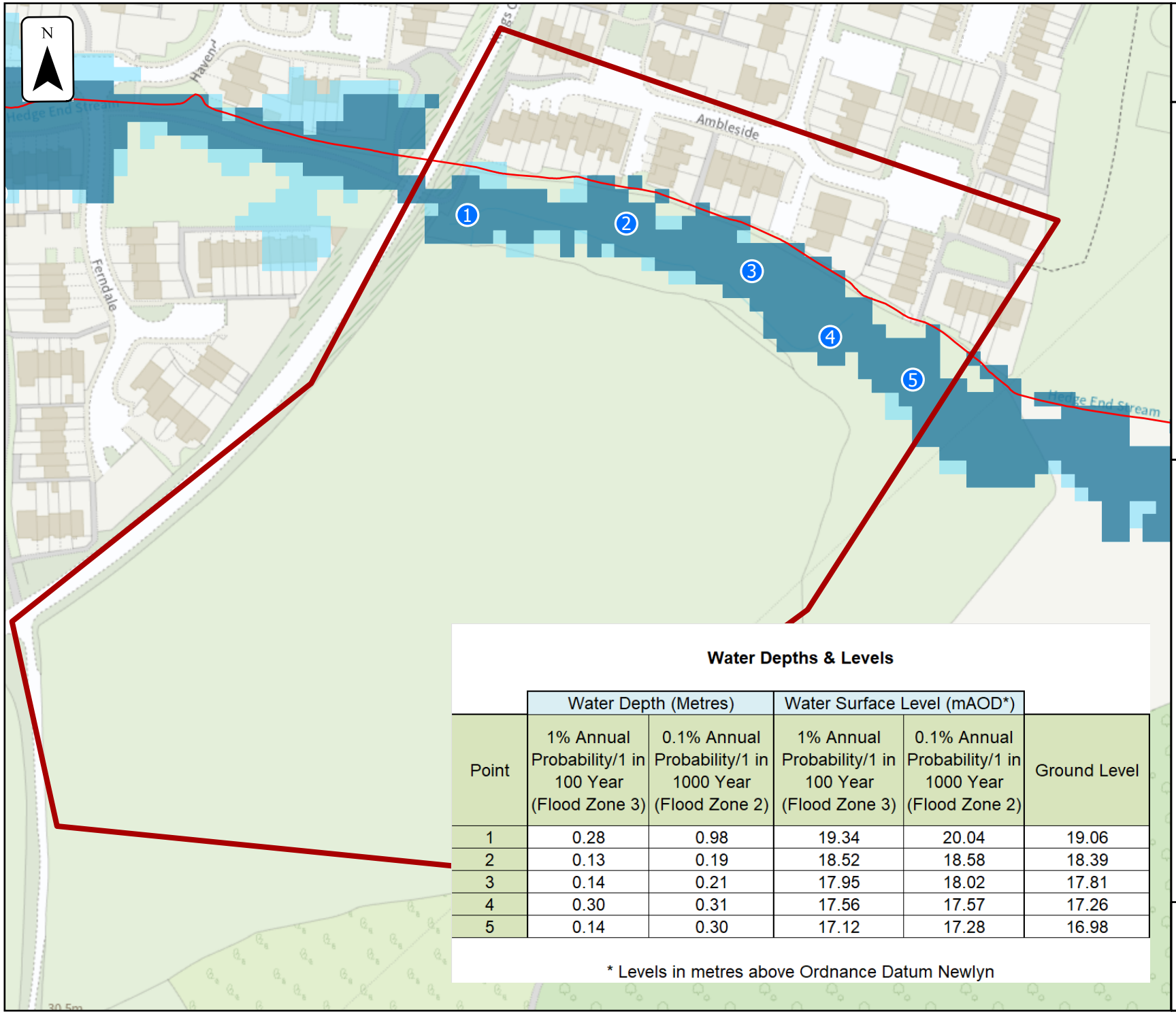
The climate change data included in the models may not include the latest flood risk assessment climate change allowances. Where the new allowances are not available you will need to consider this data and factor in the new allowances to demonstrate the development will be safe from flooding.

The Environment Agency will incorporate the new allowances into future modelling studies. For now, it's your responsibility to demonstrate that new developments will be safe in flood risk terms for their lifetime.

Modelled scenarios

The following scenarios are included:

- Defences removed modelled fluvial: risk of flooding from the rivers where flood defences have been removed



Environment Agency

Flood Levels

Location (easting/northing)
449866/112068

Scale:
1:1,900

Created
23 Dec 2025

Model Name
2008 JFLOW Modelling

- Location Points
- Selected area
- Main River
- Flood zone 3
- Flood Zone 2

0 15 30 60 90
Metres

Water Depths & Levels

Point	Water Depth (Metres)		Water Surface Level (mAOD*)		Ground Level
	1% Annual Probability/1 in 100 Year (Flood Zone 3)	0.1% Annual Probability/1 in 1000 Year (Flood Zone 2)	1% Annual Probability/1 in 100 Year (Flood Zone 3)	0.1% Annual Probability/1 in 1000 Year (Flood Zone 2)	
1	0.28	0.98	19.34	20.04	19.06
2	0.13	0.19	18.52	18.58	18.39
3	0.14	0.21	17.95	18.02	17.81
4	0.30	0.31	17.56	17.57	17.26
5	0.14	0.30	17.12	17.28	16.98

* Levels in metres above Ordnance Datum Newlyn

Strategic flood risk assessments

We recommend that you check the relevant local authority's strategic flood risk assessment (SFRA) as part of your work to prepare a site specific flood risk assessment.

This should give you information about:

- the potential impacts of climate change in this catchment
- areas defined as functional floodplain
- flooding from other sources, such as surface water, ground water and reservoirs

Your Lead Local Flood Authority is Hampshire County.

About this data

This data has been generated by strategic scale flood models and is not intended for use at the individual property scale. If you're intending to use this data as part of a flood risk assessment, please include an appropriate modelling tolerance as part of your assessment. The Environment Agency regularly updates its modelling. We recommend that you check the data provided is the most recent, before submitting your flood risk assessment.

Flood risk activity permits

Under the Environmental Permitting (England and Wales) Regulations 2016 some developments may require an environmental permit for flood risk activities from the Environment Agency. This includes any permanent or temporary works that are in, over, under, or nearby a designated main river or flood defence structure.

Find out more about flood risk activity permits

Help and advice

Contact the Solent and South Downs Environment Agency team at ssdenquiries@environment-agency.gov.uk for:

- more information about getting a product 5, 6, 7 or 8
- general help and advice about the site you're requesting data for