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DRAINAGE STRATEGY

for

Proposed Development

Wind In The Willows
Islandstone Lane
Hurst
RG10 0RJ

For

Mr Giles

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Our Ref: 16698

May 2024

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registered in England, No. 10284146. A list of directors may be seen at our Soham Offices.
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1. INTRODUCTION

- 1.1. We were instructed by the site owner, Mr Giles, to prepare a drainage strategy covering the surface and foul water from a proposed development giving six separate traveller pitches all served by a tarmac surfaced existing entrance, currently used for one mobile home.
- 1.2. The site was inspected by my colleague, Stuart Warner. Whilst on site he supervised tests to establish the permeability of the soils. The trial pits indicated that the London Clay was of low permeability. Permeability tests were carried out, but the water drained away so slowly that no meaningful results could be obtained.
- 1.3. Photographs of the site are pasted into the report to illustrate the text.
- 1.4. The site had previously been visited by the Author. He has considerable experience in assessing sites for development.
- 1.5. This report is prepared in accordance with our Conditions of Appointment, attached as Appendix A, solely for use of our client Mr Henry Giles.

2. SITE DESCRIPTION AND FINDINGS OF WALKOVER

- 2.1. The site is visually flat, but we took no levels to confirm this. Our client, Mr Giles, commissioned a topographic survey carried out to Ordnance Datum. A copy of the survey is attached as Appendix B.
- 2.2. The British Geological survey notes the site as underlain by London Clay.
- 2.3. Trial holes found a thin upper layer of Sand. Pasted below are photographs of the trial holes. These illustrate that London Clay is found at shallow level and groundwater seeped into the pits at about 800mm below ground level. The upper layers containing the sand and silt were slightly more permeable than the London Clay at depth.



Trial Hole 1

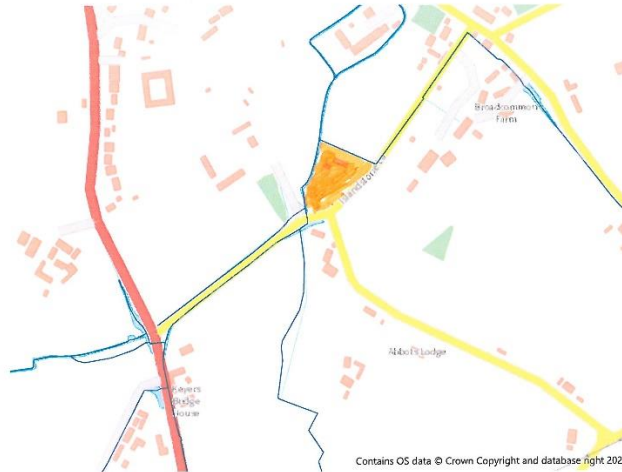


Trial Hole 2



Trial Hole 3

- 2.4. The north and west boundaries are defined by Main Rivers. Pasted below is an extract of the Main River Plan with the site coloured in orange.



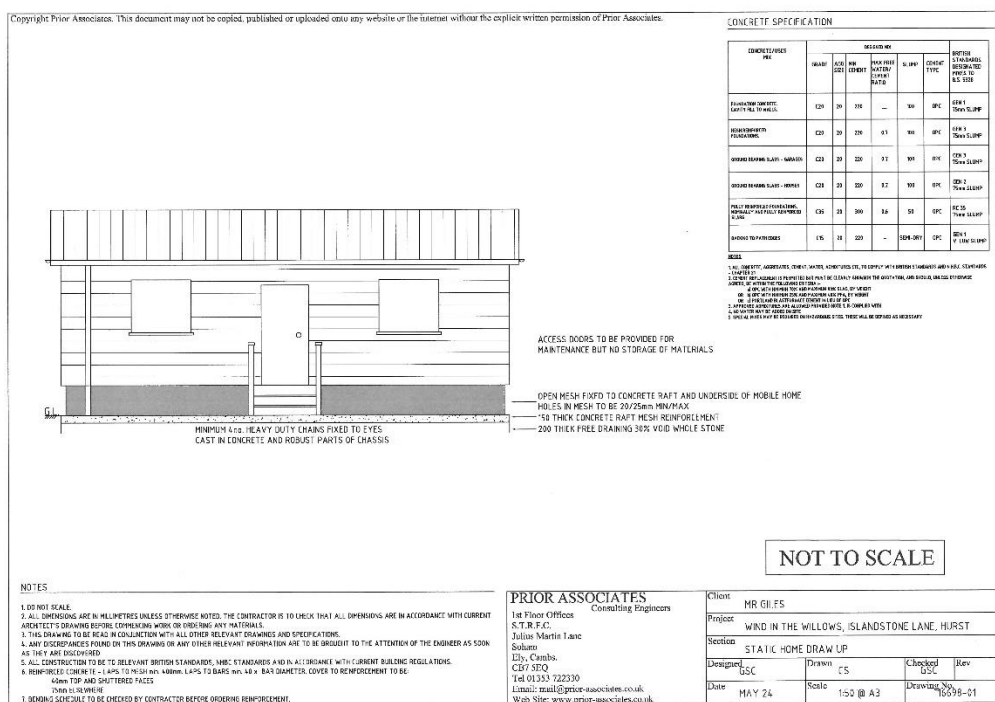
- 2.5. Photographs pasted below show typical perimeter detail with the substantial trees. Buildings within the site are not shown as all the buildings, except the dayroom, are to be removed when the development goes ahead.



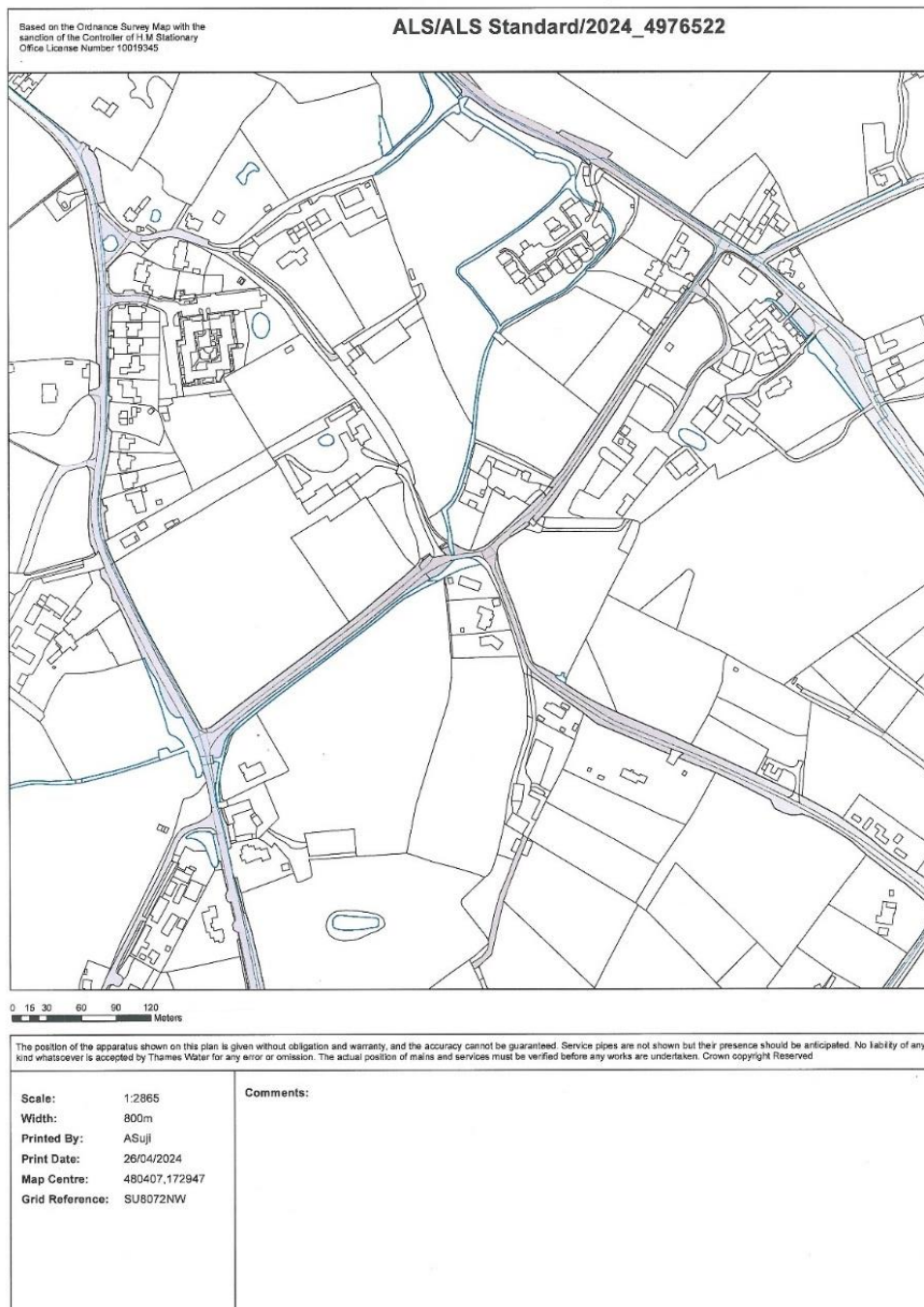


3. GROUND CONDITIONS AND EXISTING DRAINAGE PATTERNS

- 3.1. The ground conditions indicated by the British Geological survey are the total absence of any superficial deposits with a bedrock of London Clay. The site investigation carried out by ourselves to assess the permeability of the ground found that there was a superficial deposit of a Silty Sand. See paragraph 2.3.
- 3.2. The site currently does not suffer from surface water flooding. The Silty Sand must dissipate the water into the surrounding main river. Illustrated below (16698/01) is the proposal to support the mobile homes mirroring the current surface water drainage.



- 3.4. The foul drainage could be dealt with either by a specific treatment plant designed for the site or by a rising main to the main sewer.
- 3.5. In Appendix C is the quote for the treatment plant. The manufacturer was told to design the system to discharge into a watercourse with low flows.
- 3.6. The information received from Thames Water regarding their sewers is pasted below. The drainage on the site is likely to be at an invert of approximately 36.0 metres AOD, thus too low to fall by gravity to the main sewer. A rising main together with a dissipation chamber will be required. The cost is prohibitive.





Asset Location Search - Water Key

Water Pipes (Operated & Maintained by Thames Water)

- Distribution Main:** The most common pipe shown on water maps. With few exceptions, domestic connections are only made to distribution mains.
- Trunk Main:** A main carrying water from a source of supply to a treatment plant or reservoir, or from one treatment plant or reservoir to another. Also a main transferring water in bulk to smaller water mains used for supplying individual customers.
- Supply Main:** A supply main indicates that the water main is used as a supply for a single property or group of properties.
- Fire Main:** Where a pipe is used as a fire supply, the word FIRE will be displayed along the pipe.
- Metered Pipe:** A metered main indicates that the pipe in question supplies water for a single property or group of properties and that quantity of water passing through the pipe is metered even though there may be no meter symbol shown.
- Transmission Tunnel:** A very large diameter water pipe. Most tunnels are buried very deep underground. These pipes are not expected to affect the structural integrity of buildings shown on the map provided.
- Proposed Main:** A main that is still in the planning stages or in the process of being built. More details of the proposed main and its reference number are generally included near the main.

PIPE DIAMETER	DEPTH BELOW GROUND
Up to 300mm (12")	900mm (3')
300mm - 600mm (12" - 24")	1100mm (3' 6")
600mm and larger (24" plus)	1200mm (4')

Valves

- General Purpose Valve
- Air Valve
- Pressure Control Valve
- Customer Valve

Hydrants

- Single Hydrant

Meters

- Meter

End Items

Symbol indicating what happens at the end of a water main

- Blank Flange
- Capped End
- Emptying Pit
- Undefined End
- Manifold
- Customer Supply
- Fire Supply

Operational Sites

- Booster Station
- Other
- Other (Proposed)
- Pumping Station
- Service Reservoir
- Shaft Inspection
- Treatment Works
- Unknown
- Water Tower

Other Symbols

- Data Logger
- Casement: Ducts may contain high voltage cables. Please check with Thames Water.

Other Water Pipes (Not Operated or Maintained by Thames Water)

- Other Water Company Main:** Occasionally other water company water pipes may overlap the border of our own water coverage area. These mains are displayed in purple and in most cases have the owner of the pipe displayed along them.
- Private Main:** Indicates that the water main in question is not owned by Thames Water. These mains normally have last associated with them indicating the diameter and owner of the pipe.

4. PROPOSED SURFACE WATER DRAINAGE

- 4.1. Any solution for surface water drainage should follow SUDS principles and at the same time provide a site reasonably free of surface water puddling.
- 4.2. Pasted below is the summary sheet produced by the Government website giving guidance on all types of flooding. You will note that this indicates the surface water flooding risk for this site is medium risk.

[< Back](#)

[Search for another address](#)

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Rivers and sea risk	Low risk Low risk means that this area has a chance of flooding of between 0.1% and 1% each year.
Surface water risk	Medium risk Medium risk means that this area has a chance of flooding of between 1% and 3.3% each year. Lead local flood authorities (LLFA) manage the risk from surface water flooding and may hold more detailed information. Your LLFA is Wokingham .
Reservoir risk	Flooding from reservoirs is unlikely in this area
Groundwater risk	Flooding from groundwater is unlikely in this area

- 4.3. Ideally any surface water scheme should be at least as efficient as the existing system and preferably more so to reduce the risk of flooding off site.

4.4. Consideration of SUDS Drainage

- 4.4.1. The aim of any SUDS drainage scheme is to be the most sustainable scheme possible. Below is a table indicating the sustainability of different techniques.

Most Sustainable	SUDS Technique	Flood Reduction	Pollution Reduction	Landscape and Wildlife Benefit
	Living Roofs	*	*	*
	Basins and Ponds - Constructed wetlands - Balancing ponds - Detention basins - Retention ponds	*	*	*
	Filter strips and swales	*	*	*
	Infiltration devices - Soakaways - Infiltration trenches and basins		*	*
	Permeable surfaces and filter drains - Gravelled areas - Solid paving blocks - Porous pavements	*	*	
	Tanked systems - Oversized pipes/tanks - Storm cells	*		
Least Sustainable				

Considering each option in turn we conclude as follows:

- 4.4.2. Living Roofs – Living roofs are not suitable on a ‘flat’ site with roofs some 3 to 4 metres off the ground. They require maintenance; thus, access needs a completely different style of dwelling built on a steeply sloping site so that the roof can be walked onto. We consider on this scheme such maintenance could not be safely carried out. Further the use of mobile homes will preclude living roofs as they are too heavy.
- 4.4.3. Basins and Ponds – Basins and ponds cannot usually be accommodated on small sites. There is a double problem to overcome in that they occupy a large land area that is usually not available and secondly there is a safety issue with the possibility of children falling into ponds and drowning.
- 4.4.4. Filter Strips and swales – As with basins and ponds, these need substantial land areas, and presents like risks to children.
- 4.4.5. Infiltration devices, soakaways, infiltration trenches and basins – Usually on small sites such as this, the only option of these proposals is soakaways. Here, permeability tests demonstrate that the ground is virtually impermeable at depth.

- 4.4.6. Permeable surfaces – Gravelled areas throughout are often unsuitable for small rural sites due to the spillage of gravel, but some permeable paving is a useful option and will be employed here at the boundaries to provide a ‘trap’ at the entrance to stop gravel migrating onto the public road. Areas of permeable paving will be detailed close to the houses to ensure disabled access.
- 4.4.7. Tanked systems, oversized pipes/tanks and storm cells – This system is only suitable if there is an outlet for the water, which here there is not.
- 4.4.8. Respecting the SUDS hierarchy, no individual SUDS scheme is applicable.
- 4.4.9. With mobile homes the rainwater from the roofs is carried to the ground by downpipes, being left to discharge at ground level.
- 4.4.10. The units are sat on concrete raft. To ensure the proposal mimics the current system a permeable layer will be placed below the raft.
- 4.4.11. Topsoil is to be removed and replaced with wholestone that has a 30% void See section 3.2 for an illustration of these proposals.
- 4.4.12. The area proposed for development is about 2300 sqm. The 300mm average thick layer of stone will give a storage volume of 210 cu m. Hence the proposed works will give a modest improvement to the locality, reducing the flood risk on and off site.
- 4.4.13. The method of disposal of surface water cannot be modelled mathematically. It is not confined.
- 4.4.14. Soakaways are usually 5 metres from a building. This is to limit the risk of washout of the soil beneath the foundations. Here the London Clay will not wash out and if deeper layers of sand were subject to washout the mobile home jacks would be reset. The probability is low as the water is not concentrated to pits.

5. CONSTRUCTION PHASE

- 5.1. No special provision is needed for the construction phase, but Method Statements should be prepared and followed to avoid spills into water courses.

6. FOUL WATER DISPOSAL

6.1. A package treatment plant will be provided. Typical details are shown in clause 3.4.



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G S Cutting, BSc. CEng. FICE
For and on behalf of Prior Associates



Appendix A

Conditions of Appointment

Appendix B

Topographical Survey

Appendix C

T T Quote