

Mr H Khan

112 London Street, Reading, RG1 2AR

Sustainable Drainage Strategy Report



East entrance to 112 London Street (Google Streetview)

7th November 2017 V4

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Version history

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V1	05.10.2016	SR	CO	Issued for approval
V2	06.10.16	CO	CO	Minor amendment
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Issue history

Version	Date	Issued to	Method
V1	05.10.16	WMG Architects, The Flatman Partnership	Email pdf
V2	06.10.16	Ditto	Ditto
V3	25.10.17	Pegasus Group	Ditto
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1. Introduction

Mr Halim Khan wishes to redevelop a former nightclub site at 112 London Street, Reading, into 6 apartments in 2 blocks. The existing building is completely constrained by adjacent buildings and is accessed from the east via a pathway between neighbouring buildings.

A planning application (Planning Application Number: 161935) has already been submitted for 10 flats but the application was refused due to scope/character.

Comments on drainage have since been received from Reading Borough Council on the previously proposed development and a future development which were supportive of the strategy and acknowledged the unsuitable conditions for infiltration:

A sustainable drainage strategy report has been submitted. The site is presently hard surfaced and otherwise covered by a predominantly flat-roofed building. There is currently no permeability directly into the ground and therefore no water flow retention. This will be improved in the development by ensuring that the open areas are permeable, bringing about an improvement in run-off rates. This is acceptable and accords with Policy CS35 and this National requirement to improve water attenuation rates.

This report considers the existing circumstances, including the existing drainage infrastructure in the area, and describes the new proposals and the proposed sustainable drainage system which incorporates more permeable areas than the previous scheme and further reduction in runoff rates.

2. Site Characteristics

The site is located at 112 London Street, Reading, RG1 2AR. The site was a former nightclub until recently.

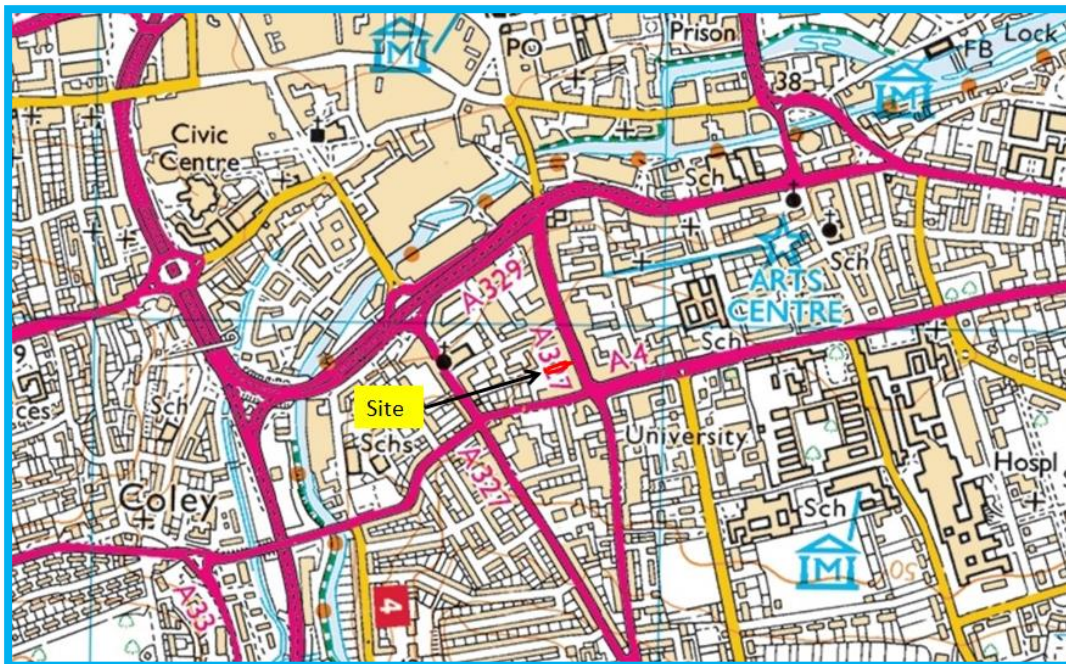


Fig 1 Site setting within the centre of Reading (Streetmap).

The site is located just south of the centre of Reading on the south of the River Kennet. It is surrounded by a mixture of commercial and residential buildings.

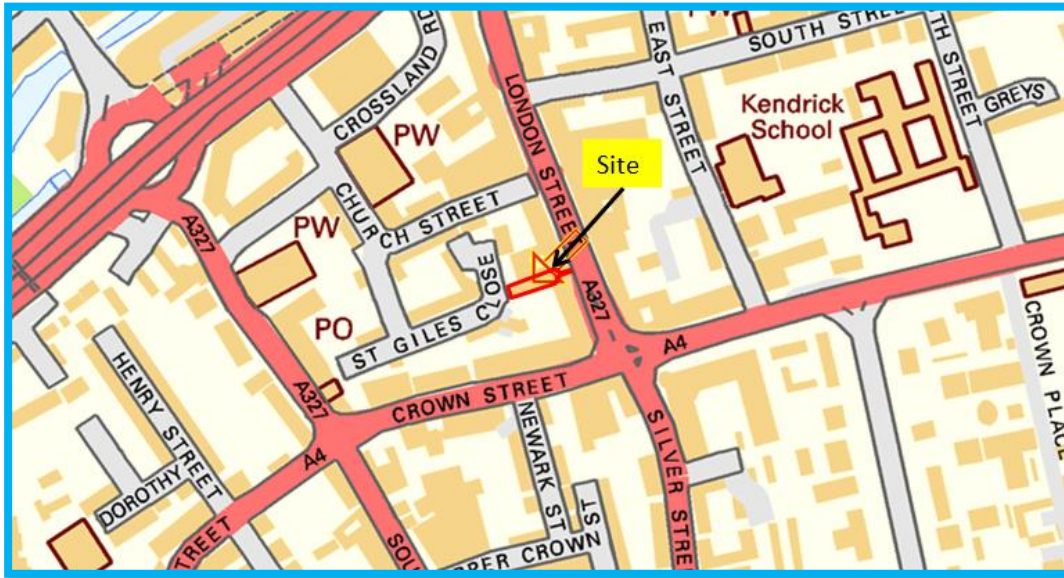


Fig 2 Site location on London Street (Streetmap).

The whole of the existing site is developed upon and is 100% impermeable. The majority of the site is a single story building recently used as a nightclub, while the east of the site is a pathway between the neighbouring buildings providing access to London Street. The existing site has a maximum length of approx. 50m east to west, and is 9.5m wide north to south, with an area of 414m². There is currently no outside area onsite apart from the narrow path against the northern boundary.

A topographic survey has been undertaken, and shows the current floor level of the site to range between 45.88m AOD in the east and 45.47m AOD in the west. The entrance passage falls towards the east, ie London Street.

The underlying geology is Lambeth Group, comprising clay, silt and sand, with the Taplow Gravel Formation above made up with sand and gravel. However, there have been buildings on the site since before 1879, and the ground is likely to be disturbed and varied through development activity, on the site and in the surroundings.

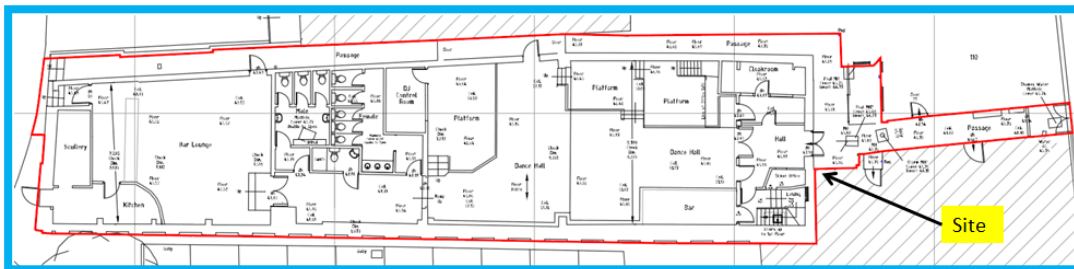


Fig 3 Topographic survey of the existing building with floor levels, ceiling levels and the layout with site boundary in red outline.

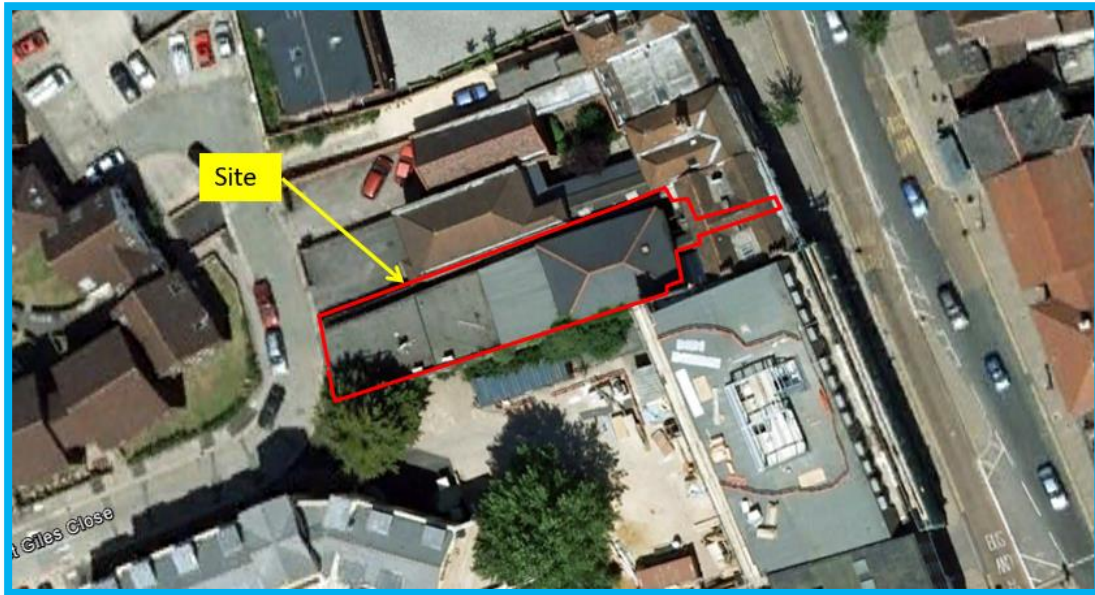


Fig 4 Satellite view of site, showing entire area impermeable (Google Earth: Infoterra Ltd. and Bluesky).

3. Proposed Development

The proposed development comprises a total of 6 apartments in 2 blocks, each with 3 floors, with open space between the buildings, and access along the north and south sides. The proposed development will be accessed through the east or west of the site, either through a pathway between buildings, as shown on the cover photo or from St Giles Close to the west.

The areas around the buildings will be permeable gardens or terraces/paving for amenity.

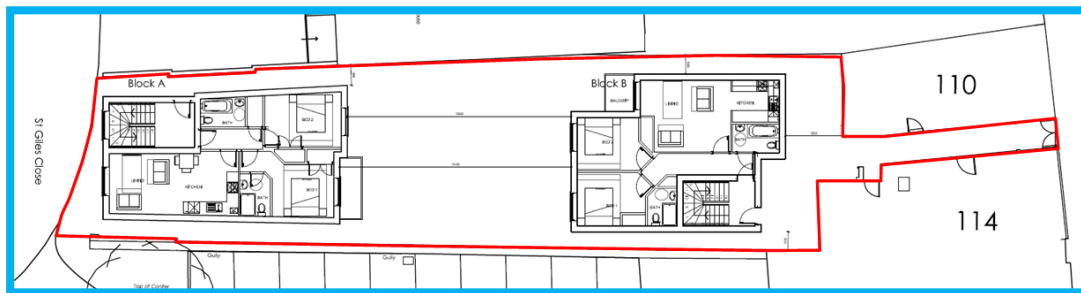


Fig 5 Proposed site layout including the open space in the centre and west. Red line is site boundary.

4. Existing Drainage

A detailed topographic survey has been undertaken of the site, followed by a drainage investigation. Thames Water sewer record plans have also been obtained.

The west of the property has a flat roof drained by rainwater downpipes which join the foul drainage from within the building flow to the east, through the pathway between 110/114 London Street (see report cover photo) and into the Thames Water network in London Street.



Fig 6 Existing rainwater drainage for the west of the site (Google Street View).

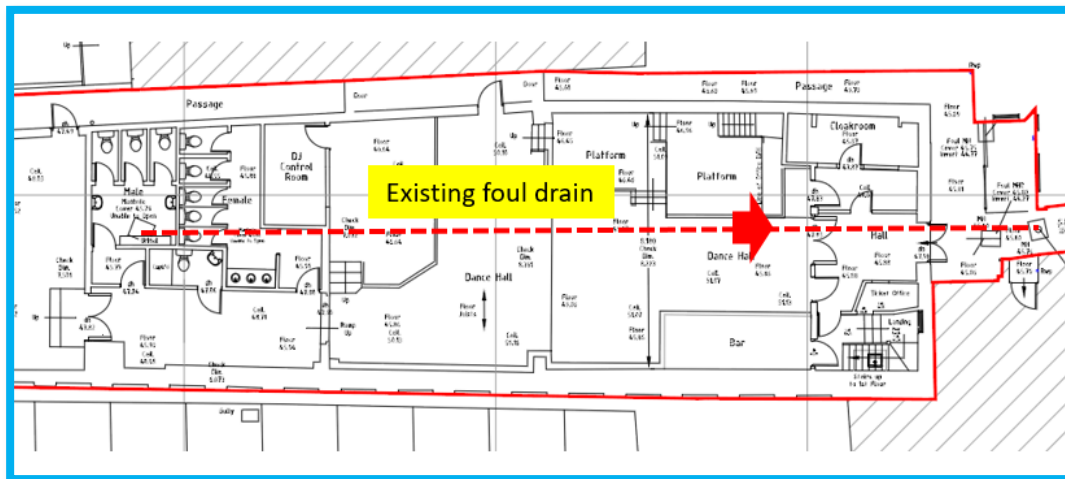


Fig 7 Existing site drainage from toilet area, falling eastwards

The narrow eastern corridor conveys the surface and foul drainage from the site (No 112) and the drainage from the adjacent properties. This makes it a very constrained route for drainage from the site and adjacent properties.

The site is in Flood Zone 1 at low risk of flooding, and there is no evidence of surface water flooding on the Environment Agency maps. This is consistent with the site being in an elevated location, and locally elevated.

5. Proposed Drainage

The proposed development will maintain the main access between buildings 110 and 114, along the corridor shown on the cover photo.

Foul drainage will be gathered in a sewer to the north of the proposed buildings, drained by gravity to the east, and connected into the existing drain serving No 112 prior to the corridor access.

The roofs are pitched in keeping with the townscape. Roof water will be gathered by rainwater downpipes serving both buildings, discharging into back inlet gulleys for silt and debris management. Rainwater will be collected by a separate surface water sewer and connect into the existing sewer prior to the corridor access.

The outlet pipe along the corridor will be inspected by CCTV survey to ensure it is in a condition capable of receiving the design flows. The pipe will be cleaned if appropriate. If essential improvements are required, no-dig solutions will be explored to resolve the issues.

Given the proximity of foundations, lack of space and headroom, it is unlikely that any excavation through the link will be compliant in terms of health and safety. It is also possible that land control would present difficulties.

The proposed development results in about 45% of the site transferring from impermeable to permeable and a consequent reduction in surface water runoff.

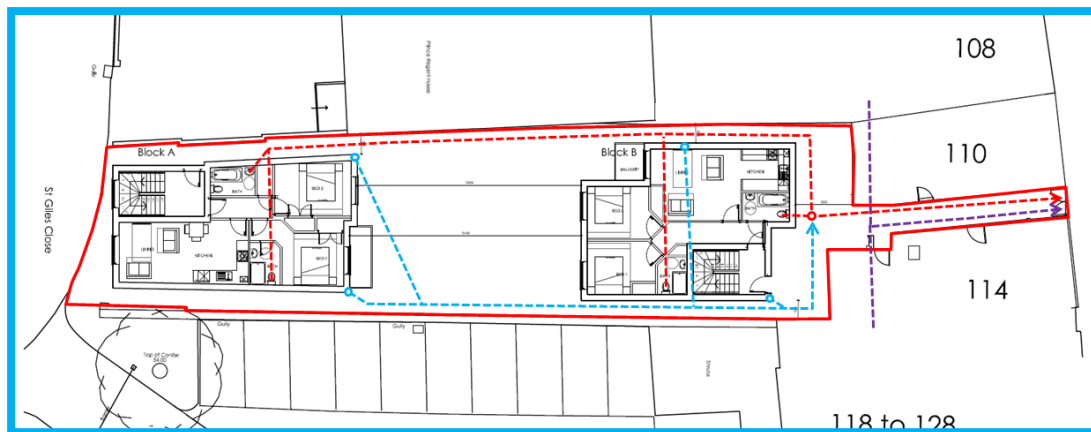


Fig 10 Indicative proposed drainage – surface water drainage shown in blue, and foul drainage in red.

6. Sustainable Drainage

Foul Drainage - In terms of foul drainage, new low water use appliances will be used. In addition, the peak flows generated by a night club with 8 WC's and a flush urinal stall will be much reduced by residential use by 6 apartments, and much less 'peaky'.

The overall consequence of the change from night club to new dwellings will be a reduced peak, and a reduced total flow, reducing the demand on the Thames Water network.

Grey water recycling was researched, but all the advice is that these systems are very much less sustainable than mains water, because water needs to be filtered, gravitated to the ground, pumped to the loft, and gravitated to the appliance – usually a WC cistern. The need for essential frequent maintenance for hair clearance etc, treatment and additional cleaning materials and bleach for hygiene purposes render such systems only suitable for commercial operations such as The Dome, 2012 Olympics, etc.

The important virtues of this development are the removal of the night club demand and introduction of low use water appliances and therefore lower peak use and lower volumes.

Surface Water Drainage – The site is 100% impermeable, and the eastern portion of the site is within another building which is roofed over, and changes are impossible.

The proposed building will incorporate permeable landscaping in the open areas. The area of permeable surfacing adds up to approx. 45% of the total site area of 414m².

The area north and south of the proposed buildings will contain the drains, which will be in gravel filled trenches, which will help to disperse surface water from the permeable surface, despite the underlying clay.

Caution has been taken not to add further runoff other than the local surface, given the proximity of ancient site and neighbouring walls, and the need to avoid soakaways within 5m of buildings, to comply with building Regulations.

Rainwater harvesting was considered, but this requires an underground tank, electricity usage to pump up to a header tank and then location of a suitable dwelling WC, where the occupier will manage the water quality, hygiene etc and clear the filters. Due to lack of available space and the additional running cost, hygiene concerns, etc, the hazards and impact outweigh the benefits – and the individual roofs would not provide a viable supply of water.

The reduction in impermeable area of 45% is over double the target of 30% to compensate for climate change effects, and is a virtue not often achieved in tight urban areas such as this.

7. Management and Maintenance

The Developer will establish a Management Company to maintain the common parts of the infrastructure which are not adopted.

The surface water drainage system in particular will incorporate silt traps, and a maintenance regime established by the designer to ensure that the drainage is inspected regularly and maintained as necessary.

8. Designing for Exceedance

The surface water runoff flow from the roofs in extreme events will overflow the gutters and land on the permeable landscaping. The runoff will then enter the back inlet gulley and given the 1.8m depth of sewer is likely to flow away by hydraulic head. If the quantity and rate exceeds the capacity of the permeable surfaces and pipes, the water will disperse to the east and west onto the public roads and flow to the River Kennet by gravity.

This approach is in accordance with the guidance given in CIRIA 695, Designing for Exceedance.

9. Conclusions and Recommendations

It is proposed to redevelop a former nightclub with 6 apartments and a garden/amenity area.

The existing site is 100% impermeable.

The proposed development will reduce the rate of runoff by approx. 45% by introducing permeable landscaping in the open areas. This is in line with comments from Reading Borough Council to increase the permeable surfaces in the site, reducing the rate of runoff from the site.

New low water use appliances will be incorporated into the buildings, reducing the foul flow, and the removal of the club will reduce the peak flows entering the Thames Water network significantly.

This report considers other sustainable drainage techniques but these are ruled out due to them placing more extreme demands on infrastructure, maintenance obligations, electricity and chemical usage, amounting to a bigger impact on the environment to deliver a safe system.

The most sustainable approach is to use the existing drainage from the site between 110 and 114 London Street, but this will be inspected, cleaned and repaired if required, using no-dig techniques.

The redevelopment of this site provides a real opportunity to bring benefits to the Thames Water network and the proposed strategy represents the most sustainable design for this site. The proposal therefore brings 'betterment' which is the objective of the NPPF.

Appendix 1 Thames Water sewer record plan
