



# **DEVELOPMENT OF THE CLOUD HOUSE AT 20 VICAR'S ROAD: DRAINAGE AND FLOOD RISK STRATEGY**

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## INTRODUCTION

This Statement addresses flood risk and drainage issues relating to the planning application for THE CLOUD HOUSE development at 20 Vicar's Road. It responds to policies CC2 and CC3 of the Camden Local Plan (2017) and Camden Planning Guidance on Water and Flooding (2019).

## FLOOD RISK INFORMATION

The attached document, Flood Map for Planning, taken from the Environment Agency website, confirms that 20 Vicars Road is in Flood Zone I, an area with a low probability of flooding. The map below (which appears in the Gov.uk Flood Map for Planning resource) shows river and sea flooding data, and – as there are no blue areas anywhere near – shows the risk of river or sea flooding is low.



The map below shows the flood risk from surface water. It shows that the site itself is 'very low risk' (i.e. no blue) and that the section of Vicar's Road directly in front of the site (with small patches of pale blue) is 'low risk'.

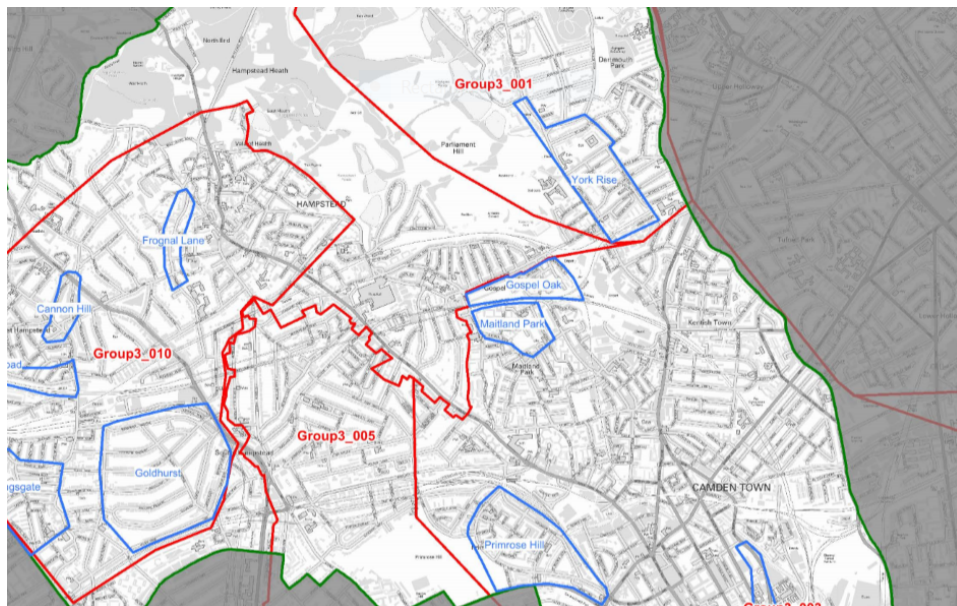




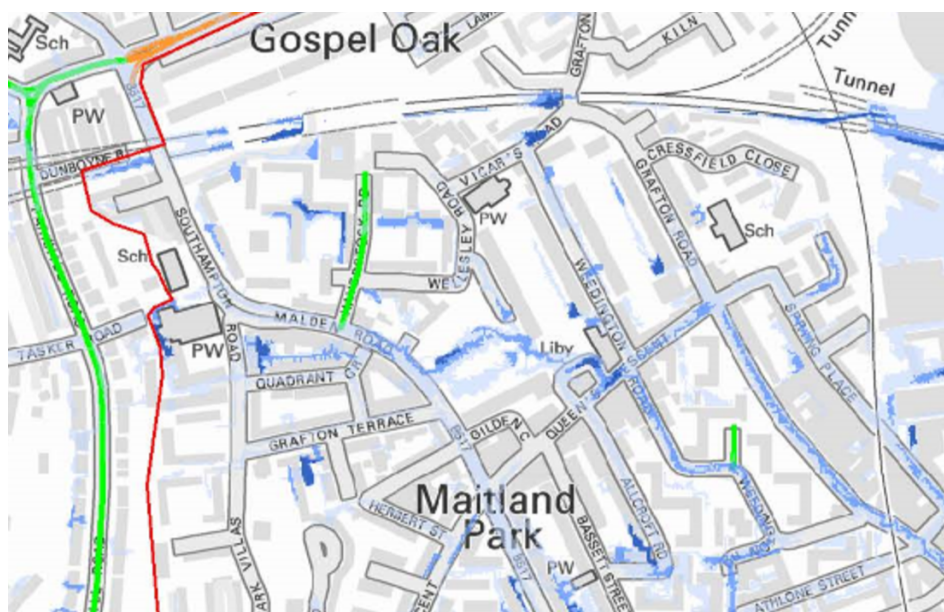
The map below shows the maximum extent of flooding from reservoirs nearby – it shows there is no risk from reservoir flooding to the site.



The map extract below is taken from the London Borough of Camden's Strategic Flood Risk Assessment (2014) (SFRA). This identifies the site as lying within the Maitland Park Local Flood Risk Zone (LFRZ). These areas are defined as discrete areas of flooding that do not exceed the national criteria for Flood Risk Areas but still affects houses, businesses and infrastructure.



While within the Maitland Park LFRZ, mapping within the 2014 SFRA indicates that the application site is at 'very low risk' of flooding (there are no blue areas on or adjoining the site) and that Vicar's Road has not suffered from historic flood risk events (see extract below).



Based on the above evidence, the application site is at VERY LOW RISK of flooding.

## POLICY

The Camden Local Plan (para.8.63) confirms that the Council will require Flood Risk Assessments in connection with planning applications for:

- all sites of 1 hectare or greater;
- all major planning applications in areas at high risk to flooding; and
- all basement development on streets identified as being at flood risk or in an area where historic underground watercourses are known to have been present, or in areas where there is an elevated risk of groundwater flooding.

The above criteria do not apply to the application for The Cloud House.

Policy CC3 of the Camden Local Plan requires that development does not increase flood risk and reduces flood risk where possible. This, it states, will be achieved through a variety of approaches, including water efficiency measures, incorporation of flood resilience in development and the use of sustainable drainage systems.

Policy CC2 also requires that development incorporates climate change adaptation measures, for example, through increasing permeable surfacing, the use of sustainable drainage systems and the incorporation of green and brown roofs.

These Policies are expanded on within Camden Planning Guidance (CPG) on Water and Flooding (2019). Amongst its key messages, the CPG expects that:

- All developments are to be water efficient by minimising water use.
- Residential developments are expected to meet the requirement of 110 litres per person per day (including 5 litres for external water use).
- All developments are to maximise the re-use of water.
- Developments must not increase the risk of flooding and are required to put in place mitigation measures where there is known to be a risk of flooding. This includes the incorporation of Sustainable Urban Drainage (SUDs) measures.

The following sections outline the measures incorporated within the development to address the requirements of the above policies.

## **PROPOSED WATER EFFICIENCY MEASURES**

The development will incorporate the following water efficient features and equipment, which will allow for the capturing, retaining and re-use of surface water and grey water on-site:

The plumbing system for each of the houses will be designed for maximum water efficiency:

- Each will include an Aquawiser GW 210 complete grey water recycling system (see details below);
- All toilets will be dual flush, resulting in lower water usage;
- All taps will be new models, which do not drip;
- The internal water efficiency of each house within the development will be sufficient to target a consumption of no more than 105 litres per person per day, in excess of the Camden Local Plan requirement and in line with the London Plan's requirement.

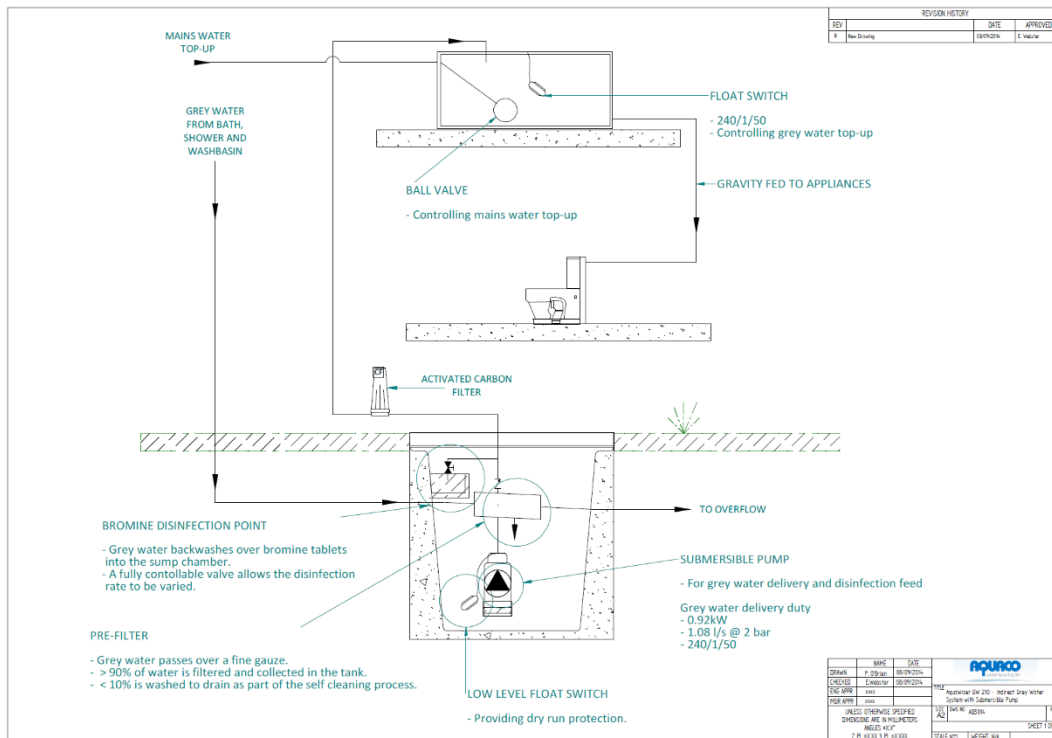
## **HOW THE GREY WATER RECYCLING SYSTEM WILL WORK**

The Aquaco Residential Grey Water Recycling System involves the collection of basin, bath and shower water which is then filtered, disinfected and recycled with a treatment for the use of toilet flushing. The quantity of water used for hand basins, showers and baths is similar to that used for toilet flushing, so water consumption can be reduced by 50%.

The benefits of this grey water recycling system are:

- Less mains water consumption.
- Reduced environmental impact.
- No reliance on rainfall.

Water is collected from the wash hand basins, showers and baths via a separate dedicated grey water stack. This goes underground into a normal DN100 soil pipe and is connected into the pre-built underground Aquawiser tank grey water inlet (there'll be a tank installed underground in each front garden, at No 20 and 20A). The water enters the tank into the pre-filter. The pre-filter removes large particulates from the grey water preventing it from entering into the tank chamber, excess water and particulates are passed to drain via the Aquawiser tank overflow. Once the water is in the tank chamber, it is disinfected using the bromine disinfection chamber, which circulates a portion of the water over bromine tablets, disinfecting the water ready for final filtration and use. The tank contains a pump which is used to pump water to the roof header tank (to be built into the kitchen areas of both No 20 and 20A). Prior to entering the header tank the water passes through an activated carbon filter, which removes discolouration, particulates and excess bromine. The water is then distributed to the point-of-use via gravity from the header tank. In the event that there is insufficient treated grey water available, a mechanical ball valve in the header tank will automatically top up the system with mains water via a Category 5, type AB air gap, providing full continuity of supply.



## PROPOSED SUSTAINABLE DRAINAGE MEASURES

The development will incorporate sustainable drainage systems, as well as using the main sewer, including:

- Slot drains on terraces and in gardens to allow rainwater infiltration into soil below;
- Flower beds, window boxes and planters containing plants which will soak up water;
- Box hedging with 40cm of soil beneath it, acting as a green roof for the bespoke bin and bike stores in the front gardens;
- Un-mortared porous herringbone recycled brick paving in the front gardens, back gardens and the school alleyway – this will allow rainwater to drain into soil below;
- Rainwater tanks in the front gardens, back gardens, and on the roof terrace, from which water will be drawn for watering the plants.
- A green roof on 20A, able to manage rainwater on its surface with a pattern of holes and waterproof membranes, providing light-weight drainage and storage for rainwater. NB. The upper filter fleece supports the growing medium and prevents substrate fines from blocking the reservoir but allows percolation of rainwater. The reservoir core holds a predetermined amount of rainwater whilst allowing excess water to pass through percolation holes to the base layer. The base felt layer provides physical protection to the waterproofing but also attenuates run-off to regulate flow to outlets and drains during flash floods and storms.

## FLOOD RESILIENCE

It is very unlikely that the development will be flooded (see maps above) but if it were to happen, the building would be well-equipped to cope:

### EXTERNAL MEASURES TO REDUCE THE RISK OF FLOODING

- There are slot drains in front of every door and window at ground level to allow rain water to drain into soil below and prevent it entering the building;

- There is un-mortared porous herringbone recycled brick paving in the front gardens, back gardens and the school alleyway – which will allow rainwater to drain into soil below and prevent it entering the building;
- There are rainwater tanks (referred to as water butts on the application drawings) in the front gardens, back gardens, and on the roof terrace, helping to limit excess water entering the building;
- There is a green roof on 20A (plus other planting, and hedging on top of the bin/bike stores), which will soak up a lot of excess water, and help to prevent water entering the building.

## INTERNAL MEASURES TO COPE WITH POTENTIAL FLOODING

- There is no self-contained basement dwelling in either property.
- Floors have been specified as painted concrete, meaning they're easily moppable – there would be no need to replace expensive floor coverings.
- Openable floor to ceiling glass doors at ground floor level mean that after flooding it would be easy to release the water, without having to use pumps.
- If water were to come into the building, electrical sockets are not likely to be affected, as they will all be installed between 450mm and 1200mm above floor level;
- The main living / dining / kitchen space in each house is on the top floor, which would be unaffected by flooding, so it would be possible to continue living there even if there were a flood;
- In No 20, there are two bedrooms on the first floor which could be used if the ground floor flooded;
- In 20A, there is a sitting room on the first floor, which could be used as an emergency bedroom if the ground floor flooded;
- Both houses have access to a flat roof terrace, which would be accessible to the fire brigade via an extended ladder, if an escape from the roof were necessary – and both houses also have openable tall glass doors at the front (south side) of the building on both first and second floor levels – which could also be used as escape routes if necessary.