THE COACH HOUSE
(REAR OF) 8 STATION ROAD

PRE-COMMENCEMENT
CONDITION 5
RESPONSE TO EHO

i. Detail on the likely contaminants associated with the rainwater harvesting system,

Rainwater harvesting systems, including those made by brands like Freeflush, are generally designed to provide clean, usable water. However, contaminants can still enter the system from various sources. Here are some likely contaminants associated with rainwater harvesting systems:

1. **Debris and Organic Matter**: Leaves, twigs, bird droppings, and other organic material can accumulate on the roof and wash into the collection system.
2. **Pathogens**: Bacteria, viruses, and protozoa can be present in rainwater due to animal faeces, bird droppings, or decaying organic matter. Common pathogens include E. coli, Salmonella, and Legionella.
3. **Heavy Metals**: Roof materials and atmospheric deposition can contribute metals like lead, zinc, copper, and cadmium to the harvested rainwater.
4. **Chemical Contaminants**: Pollutants from the atmosphere, such as pesticides, herbicides, or industrial chemicals, can dissolve in rainwater. Roofing materials, paints, and sealants can also leach chemicals into the water.
5. **Sediment and Particulate Matter**: Dust, pollen, and fine particles can accumulate in the rainwater tank if not properly filtered out.
6. **Algae and Biofilm**: Algae can grow in the rainwater tank if it's exposed to sunlight, and biofilms can form on surfaces within the system, contributing to microbial contamination.
7. **Roofing Material Leachates**: Depending on the type of roof (asphalt, metal, treated wood, etc.), chemicals can leach into the rainwater, contributing to water quality issues.
8. **Mosquito Larvae**: If the system is not properly sealed, mosquitoes can breed in standing water, leading to contamination by larvae.

Proper maintenance, including regular cleaning of gutters, downspouts, first-flush diverters, and tanks, as well as appropriate filtration and disinfection, can significantly reduce these contaminants and improve the safety and quality of the harvested rainwater.

ii. Detail on what type of treatment that will be installed on the supply with information clearly indicating that it is appropriate for the amount of water being used and the likely contaminants.

A first flush filter will be used on the inlet of the downpipes. However as this is not popular in the UK (they don't work well with drizzle) it will need to be tested before long term application.
A screening filter will, therefore, be incorporated on the inlet of the tank.
A skimming overflow will be incorporated in the tank to remove floating debris and potential hydrocarbons
A calmed inlet will be incorporated in the tank to prevent long term sedimentation to remain undisturbed
A floating intake will be incorporated on the pump to ensure water is extracted from the clarified zone
A fine nylon and steel filter will be fitted on the rising main downstream of the pump

A UV sized for the flow rate ~ 30lpm will be fitted to the rising main and will incorporate a solenoid shut off valve in the event the UV lamp fails. The UV lamp will have a visible hour display and audible alarm for lamp change.

iii. Detail on the proposed sampling and testing regime, undertaken in accordance with Private Water Supplies (England) Regulations 2016 (or subsequent superseding equivalent), and taking into account the likely contaminants, as detailed above, along with detail on how any failure of any samples will be investigated and managed.

The Private Water Supplies (England) Regulations 2016 set out the requirements for sampling and testing private water supplies to ensure they are safe for human consumption. To comply with these regulations when assessing a rainwater harvesting system, a sampling and testing regime should be implemented. Below is a proposed regime tailored to the proposed Freeflush rainwater harvesting system:

1. Sampling Frequency
The frequency of sampling depends on the volume of water used and whether the supply is used for human consumption:

- **Small Supplies (<10 m^3/day or serving fewer than 50 people)**: At least once every 5 years, or more frequently if deemed necessary by a risk assessment.
- **Large Supplies (>10 m^3/day or serving more than 50 people)**: At least once a year.
- **Domestic Purposes or Food Production Use**: Minimum of once annually.

2. Sampling Points

- **Collection Point (Tank Outlet)**: To assess the quality of stored water.
- **Point of Use**: To check the water quality after filtration and any treatment process.
- **Pre-Treatment (Gutter/Downpipe)**: To determine contaminant levels entering the system.

3. Parameters to Test
Testing should cover both basic and additional parameters based on risk assessment results:
Basic Parameters:

- **Microbiological Tests**: Total Coliforms, E. coli, Enterococci
- **Physicochemical Tests**: pH, Turbidity, Conductivity, Colour
- **Aesthetic Parameters**: Odour, Taste

Additional Parameters (Based on Risk Assessment):

- **Heavy Metals**: Lead, Zinc, Copper, Cadmium
- **Chemical Contaminants**: Pesticides, PAHs (Polycyclic Aromatic Hydrocarbons)
- **Pathogens**: Legionella (if water is stored or used in a way that could cause aerosolisation)
- **Disinfection By-Products**: Chlorine residuals, if disinfection is used
- **Nitrate and Nitrite**: Especially if nearby agriculture is present.

4. Sampling Protocol

- Use sterile containers for microbiological sampling.
- Avoid sample contamination; ensure equipment is clean and personnel follow proper hygiene protocols.
- Samples should be taken under representative conditions, ensuring normal operation of the water supply system.
- Transport samples to a certified laboratory promptly, maintaining a proper temperature (usually between 2-8°C).

5. Laboratory Analysis

- Tests should be conducted by laboratories accredited to ISO 17025 for drinking water analysis.
- Ensure methods are in line with those prescribed or recognised by the Private Water Supplies Regulations.

6. Risk Assessment and Review

- Conduct an initial risk assessment to identify potential sources of contamination.
- Review the risk assessment annually or whenever there is a significant change in the system or the environment.
- Use the results of monitoring to validate and update the risk assessment.

7. Corrective Actions

- If results exceed prescribed limits, take immediate action to investigate and rectify the cause.
- Implement treatment, maintenance, or system modifications as required.
- Notify users of the water supply if water is found to be non-compliant.

8. Record Keeping

- Property owner to maintain detailed records of sampling dates, locations, results, and any actions taken.
- Ensure records are available for inspection by the local authority upon request.

Following this regime will help ensure compliance with the Private Water Supplies (England) Regulations 2016 and maintain the safety and quality of rainwater harvested for use.

iv. Detail on the maintenance, servicing and cleaning of the tanks, water treatment equipment, pumps, all pipework etc for the lifetime of the development along with regularity of servicing/ maintenance and clarification what steps will be taken in the event of equipment failure. This should include any re-activation of the system after it has been out of use due to lack of rainfall/ use.

	Description	Frequency	Notes
Downpipe Inlet filters	visible / accessible and so periodic cleaning required	Monthly depending on locale and debris deposition	
Tank filter	Accessible	Monthly	Consider auto backwash feature
Tank cleaning	Accessible	3 yearly/ inspection yearly	Consider upstream silt trap
Pump filters (nylon/steel)	Visible/ accessible	Steel filter incorporates backwash feature - typically monthly backwash. Nylon filter 6 month to yearly depending on blinding	Consider auto backwash feature
UV lamps	Visible/ accessible w/ audible alarm	As per lamp hour counter	

After periods of inactivity the tank should be chlorine dosed and the pipework flushed.

v. Details, including a plan or schematic, showing the supply – storage tanks, treatment etc, and means to record the total water consumption of each unit

Refer to dwg no 3_200003B Schematic, 3_200002B for design context and attached detailed Freeflush schematics for each.

vi. Detail on the continuity of supply during dry periods extending beyond 35 days.

In this extreme event a Bowser arrangement will be implemented so that the system will be filled up to its 100% capacity (ie 7500litres).
Contact details of proposed licensed water suppliers are

- Greens H20
  01256 674559
- info@greensh2o.co.uk
- Kingsland Business, Lutyens Close, Lychpit, Chineham, RG24 8AG

and

Water Direct
0345 345 1725
CO62NS(depots also in Thruxton, Mansfield and Ascot)

There is also the option of an arrangement with statutory water undertaker Thames Water, Developer Services should these not be available at the time

NB A 110mm connection has been provided adjacent to the front pedestrian entrance. This will feed directly to the rain water tank turret.

vii. Arrangements for keeping written records of all sampling, results of analysis, inspection, cleaning, and maintenance.

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