Applied ENERGY

CLERKENWELL LIFESTYLE (UK)

15 - 29 EYRE STREET HILL, LONDON EC1R 5DZ

WATER INFRASTRUCTURE REPORT

PLANNING CONDITION 28

1.0 INTRODUCTION

This document has been prepared to provide details of the potable water system, fixtures and fittings proposed within the development to discharge planning condition 28 for the Vine Hill Hotel at 15-29 Eyre Street, London EC1R 5DZ.

2.0 PLANNING CONDITION

Pre-commencement Planning Condition 28 states:-

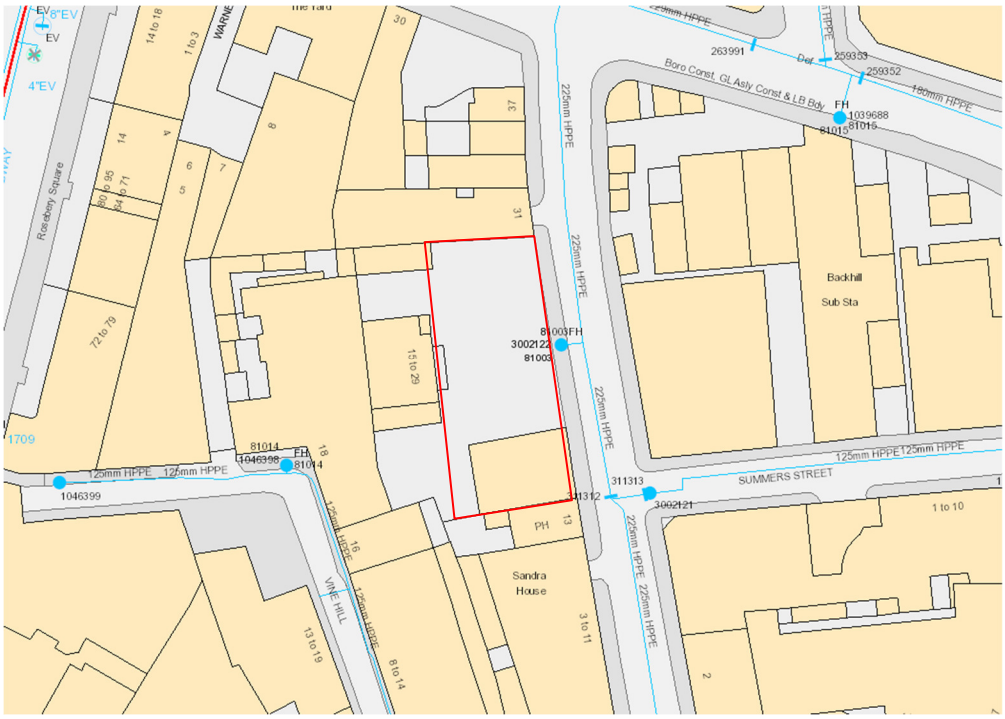
"*Prior to the commencement of above ground works, an impact studies of the existing water supply infrastructure shall be submitted to and approved in writing by the Local Planning Authority in consultation with Thames Water. The study shall identify any new additional capacity required in the system and suitable connection point.*"

With the following reasoning: -

"To ensure the water supply infrastructure has sufficient capacity to copy with the additional demand in accordance with the requirements of Policy A5 of the Camden Local Plan 2017."

3.0 EXISTING INFRASTRUCTURE

According to the record information received from Thames Water the nearest potable water mains is the 225mm diameter supply running within the Eyre Street Hill as shown on the below. An existing 225mm dia supply current feeds the site.



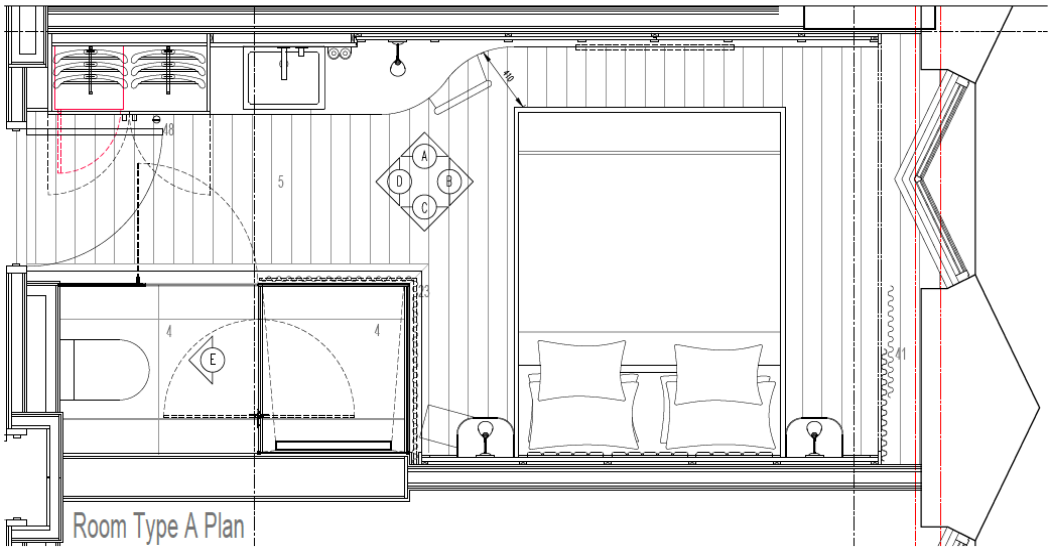
4.0 PROPOSAL

The proposed building consists of a 153 bed hotel and nine 2 and 3 bedrooms flats over seven storeys. The ground floor is mainly occupied by the hotel food & beverage, back of house and some plant. The residential block ground floor areas are occupied by the main entrance, under croft open space with bin storage and the cycle store. Both building parts are arranged in a semidetached and share one of the escape staircases and the Fire Fighting Lift.

The building is located on the plot used as a car park for the office building at 18 Vine Hill. The main façade together with the hotel and the residential block are located alongside the Eyre Street Hill as shown above.

4.1 Hotel Guestrooms

Each hotel guestroom is self-contained and provided with an ensuite shower and toilet room. The wash hand basin is separate from the bathroom and located within the room. The hotel typical guestroom arrangement is shown below.



4.2 Residential Flats

The residential block consist of mixture of different sizes flat consisting showers and bathrooms as indicated in the below table.

	Kitchen	Bathroom	Shower	WC
1st Floor – Apartment 1	1	1	1	2
2nd Floor – Apartment 2	1	2	0	2
3rd Floor – Apartment 3	1	2	0	2
4th Floor – Apartment 4	1	2	0	2
5th Floor – Apartment 5	1	2	0	2
6th Floor – Apartment 7	1	1	0	1
6th Floor – Apartment 8	1	1	0	1
7th Floor – Apartment 9	1	1	0	1
Total	**9**	**12**	**1**	**13**

5.0 WATER DEMAND

5.1 Incoming supplies

Both parts of the new development are of different use type and are treated as separate buildings in terms of incoming services. Two new separate incoming supplies have been applied for with Thames Water.

5.2 Hotel Water Demand

Daily water usage for hotels are sized based on the figures provided in Table 2 of the Institute of Plumbing Guide as shown below. The proposed hotel would be expected to consume approx 200 litres of water per bedroom per day, which equals 30,600 litres per day.

***Table 2** Daily water demand*

Type of Building	Litres	Criteria/Unit
Dwellings		
- 1 bedroom	210	Bedroom
- 2 bedroom	130	Bedroom
- 3+ bedrooms	100	Bedroom
- Student en-suite	100	Bedroom
- Student, communal	90	Bed space
- Nurses Home	120	Bed space
- Children's Home	135	Bed space
- Elderly sheltered	120	Bedroom
- Elderly Care Home	135	Bed space
- Prison	150	Inmate
Hotels		
- Budget	135	Bedroom
- Travel Inn/Lodge	150av	Bedroom
- 4/5 Star Luxury	200	Bedroom

However, this data is based on sanitary ware data of over 10 years ago and the fact that the hotel is only provided with showers, the actual water usage is expected to be much lower. With the loading units for a both being over double that of a shower, it is proposed that the estimated overall daily water usage will be 20% lower and therefore 24,480 litres.

***Table 15** Loading units*

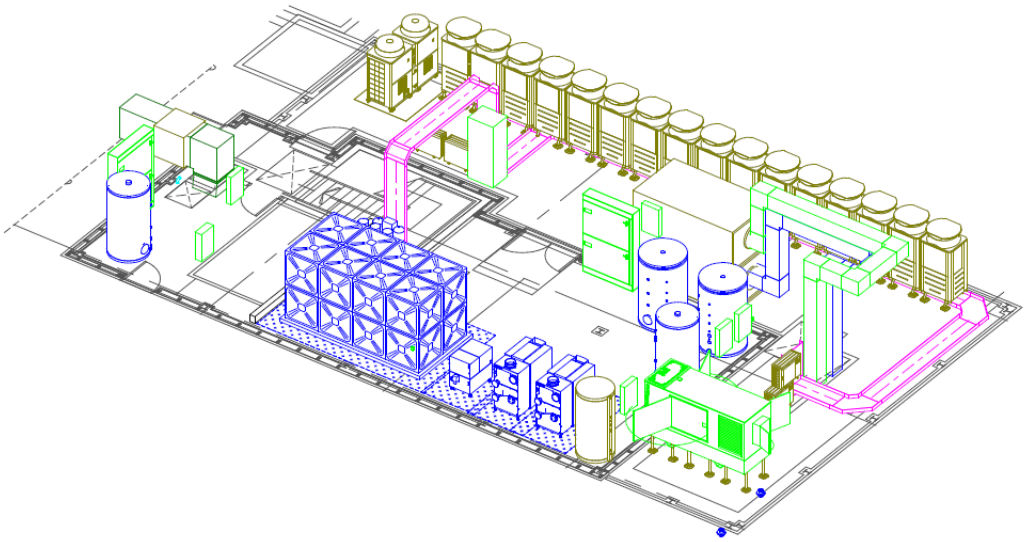
Type of appliance	Frequency of use		
	Low	Med	High
Basin, 15mm sep. taps	1	2	4
Basin, 2 × 8mm mix. tap	1	1	2
Sink, 15mm sep/mix tap	2	5	10
Sink, 20mm sep/mix tap	-	7	-
Bath,15mm sep/mix/tap	4	8	16
Bath, 20mm sep/mix tap	-	11	-
WC Suite, 6.litre cistern	1	2	5
Shower, 15mm head	2	3	6

Due to commercial nature of the hotel the highest water draw off are present during the morning and evening peak times and therefore it is a common practice to provide on site cold water storage tank, sized to meet the 50% of the daily water demand as shown in below table 3.

***Table 3** Period of storage*

Type of Building	% of the daily demand
Hospitals	50%
Nursing Homes	50%
Dwellings	0 - 50%
Hotels, Hostels	50%
Offices	0 - 50%
Shops	0 - 25%
Library, Museum, Art Galleries	0 - 25%
Cinema, Theatre	0 - 25%
Bars, night-club	0 - 25%
Sports Facilities	0 - 25%
Schools, Colleges, Universities	50%
Boarding Schools	50%

Based on the above the hotel is to be provided with a onsite storage tank with a Nett capacity of 12.3m^3 located in the roof plantroom as shown below.



To protect the hotel in case of disruption in water supply from the mains network the incoming cold water mains has been sized allowing for replenish the tank in approximately 2 hours.

On that basis the incoming cold water supply requested from Thames Water is 1.7 l/s.

5.3 Residential Water Demand

Daily water usage for residential dwellings is sized based on summarising the loading units for all appliances for medium use as provided in Table 15 of the Institute of Plumbing Guide as shown below.

***Table 15** Loading units*

Type of appliance	Frequency of use		
	Low	Med	High
Basin, 15mm sep. taps	1	2	4
Basin, 2 × 8mm mix. tap	1	1	2
Sink, 15mm sep/mix tap	2	5	10
Sink, 20mm sep/mix tap	-	7	-
Bath,15mm sep/mix/tap	4	8	16
Bath, 20mm sep/mix tap	-	11	-
WC Suite, 6.litre cistern	1	2	5
Shower, 15mm head	2	3	6
Urinal, single bowl/stall	-	1	-
Bidet, 15mm mix tap	1	1	-
Hand Spray, 15mm	-	1	-
Bucket sink, 15mm taps	-	1	-
Slop Hopper, cistern only	-	3	-
Slop Hopper, cistern/taps	-	5	-
Clothes washing m/c, dom.	2	-	-
Dishwasher m/c domestic	2	-	-

Based on the outlets within each room and area, the loading units for the residential element total 231. This equates to a peak flow rate of 1.4 l/s, based on Figure B.1. of BS EN 806-3.

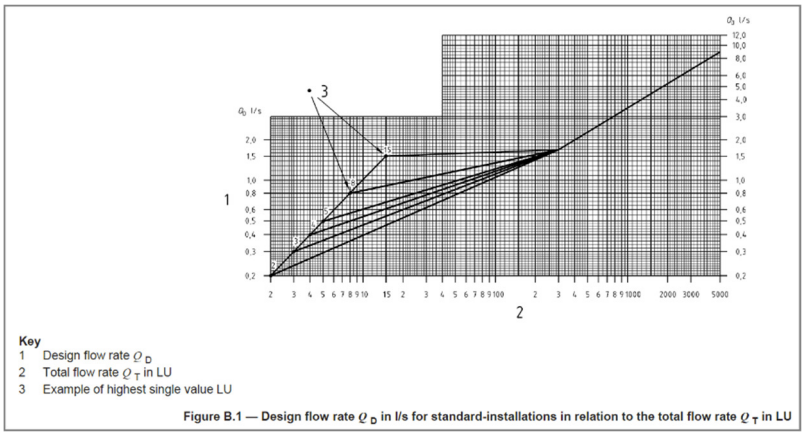
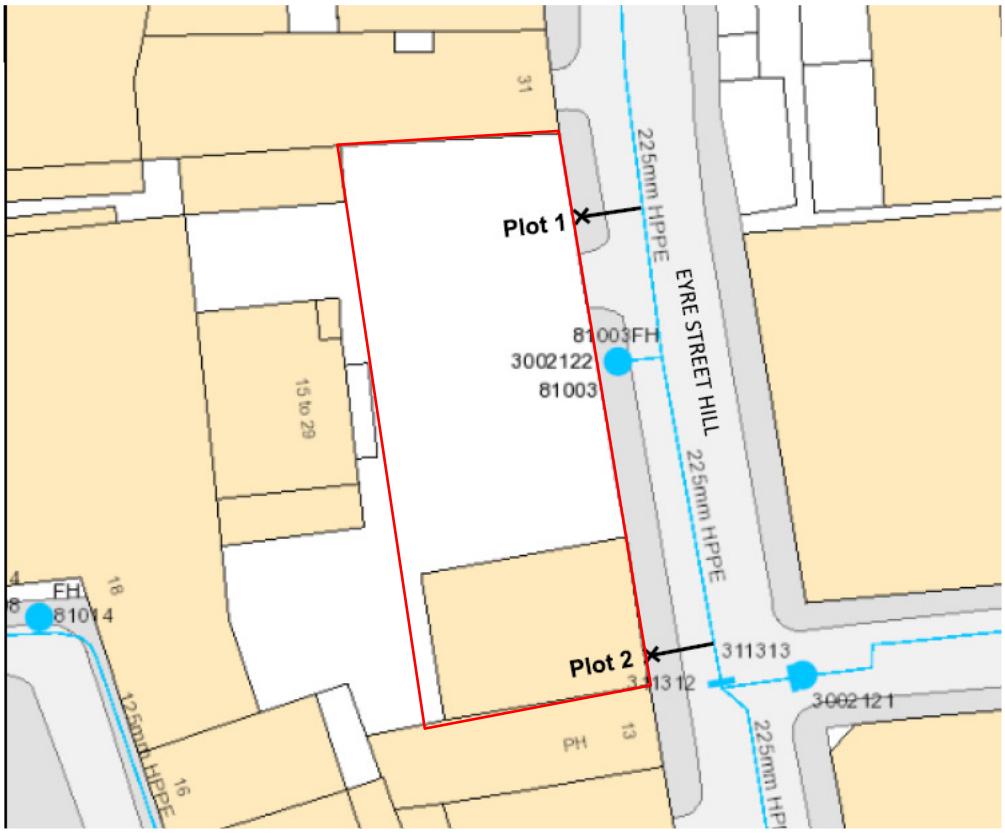


Figure B.1 — Design flow rate Q_D in l/s for standard-installations in relation to the total flow rate Q_T in LU

Due to the building height, a break tank and booster pump set are being provided to ensure sufficient water pressure is available for the flats on the upper floors. This is just a break tank to separate the mains from the pump set and does not provide any on site storage to reduce the flow rate. Therefore, the incoming cold water supply requested from Thames Water is 1.4 l/s.

6.0 WATER MAINS CAPACITY

Mains water flow and pressure test was carried out by the sprinkler specialist Ultra Surefire on 27th August 2020 to establish the water network suitability for a mains pressure sprinkler system for the residential block. The test was carried out at the hydrant point nearest to the suite, as shown on the below picture, with Thames Water representative also present during the tests.



The test confirmed that the maximum water flow achieved was 1,800 litres per minute at 2.9 bar pressure.

The full test result report can be seen in Appendix A of this report.

7.0 CONCLUSIONS

Given that the estimated total cold water demand for both sites is 3.1 l/s and the town mains measured maximum capacity is 1,800 l/s it is envisaged that the impact of the Vine Hill Development on the water infrastructure is negligible.

Thames Water have assessed the new development and provided a formal quotation, which has since been paid, hence it is deemed that Thames Water are satisfied that the development can be accommodated on the existing network infrastructure. They have noted infrastructure charges on the quote and identified suitable connection points. A copy of the quote is appended to this report.

On this basis, condition 28 can be discharged.

APPENDIX A MAINS WATER FLOW TEST RESULTS

Ultra Surefire Ltd
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: 0345 600 8330
: info@ultrasurefire.co.uk
: www.ultrasurefire.co.uk

REPORT OF TEST

TAKEN ON 27 AUGUST 2020 AT 11-12.00 HOURS

ON THE EXISTING 225mm TOWNS MAIN

FIRE HYDRANT FLOW AND PRESSURE TEST

15 - 29 Eyre Street Hill, London EC1R 5DZ

To test a main for a proposed installation, a pressure gauge is fixed on one hydrant and a flow gauge fixed on a second hydrant on the same main, or branch.

The following results were obtained:-

Flow	Pressure
100 litres/min	3.0 Bars
200 litres/min	3.0 Bars
375 litres/min	2.9 Bars
540 litres/min	2.9 Bars
725 litres/min	2.9 Bars
1000 litres/min	2.9 Bars
Full flow was 1800 litres/min	2.9 Bars
Hydrant Closed	3.0 Bars

The requirements for Towns Main installation pressure and flows for this residential property to BS9251 Cat 2 are as follows based on a highest sprinkler 26m above ground level:

3.6 bar @ 140 litres/min is required

Conclusion

The towns main flow and pressure are **not** satisfactory to supply the installation at the required flows for the installation based on the test carried out at the time because the flow was achieved at a lesser pressure than required.

We would recommend that a sprinkler pump and tank is provided for the system or that a connection is taken from a boosted cold water main at each level, provided the BCWS tank has the required capacity with infill from the street water mains as tested.

Test carried out by Ultra Surefire Ltd.

As we have no control over your water authorities, we cannot accept any responsibility for future Towns Main pressures and flows.