

	Project THAMES QUARTER, READING				Job Ref. T/17/2008	
	Section FOUL PUMP, FLOW & STORAGE CALCULATION				Sheet no./rev. FS 1	
	Calc. by SGJ	Date 07/02/2019	Chk'd by WL	Date 07/02/2019	App'd by PB	Date 07/02/2019

FOUL WATER PROPOSAL.

The existing development, which is to be demolished, uses a pumped foul water system due to the public sewers being at relatively shallow depth and the need for onsite drainage to be deeper to avoid services.

The foul pumping main currently outfalls into the 225mm diameter foul public sewer at Node Ref 8901 situated within King's Meadow Road.

A new pumping unit will be provided to cater for flows generated by the new development of 338 residential apartments, together with existing flows generated by the adjacent existing office development known as "Napier Court". The flows will be pumped to a short length of gravity pipework which will discharge into public sewer at Node Ref 8901, replacing the existing pumped connection.

Accommodation Schedule for new 338 unit Residential Building

Apartment	Units	Equiv Population / Unit	Total
Studio	38	1.5	57
1 Bed	106	1.5	159
1 Bed duplex	1	1.5	1.5
2 Bed / 3 person	69	3.5	241.5
2 Bed / 4 person	101	4.5	454.5
2 Bed / 4 person duplex	5	4.5	22.5
3 Bed	16	3.5	56
3 Bed duplex	2	3.5	7
TOTAL	338		999

Using average usage rate of 160 litres/day/person x DWF peaking factor of 6. The peak discharge rate from the residential development equates to.

$$999 \times 160 \times 6 / 24 / 3600 = \underline{\underline{11.1 \text{ litres/sec}}}$$

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Napier Court,

Peak discharge rate, calculated using Discharge Unit Method

Table 1. Typical frequency factors (kDU)

Type of Building	kDU
Dwelling, guesthouse, office (intermittent use)	0.5
Hospital, school, restaurant, hotel (frequent use)	0.7
Toilets and/or shower open to the public (congested use)	1.0
Laboratory buildings (special use)	1.2

Table 2. Typical values of discharge units (DU)

Type of appliance	DU
Washbasin, shower	0.3 to 0.6
Urinal	0.3 to 0.8
Bath, kitchen sink	0.8 to 1.3
Dishwasher	0.2 to 0.8
Household washing machine	0.5 to 0.8
Commercial washing machine	1.0 to 1.5
WCs (4.0 litre to 9.0 litre cistern)	1.2 to 2.5
Floor drains (DN 50 to DN 100)	0.6 to 2.0

The discharge unit will depend on the type of drainage system inside the building and the size of the appliance. Where no specific information is available, the higher value should be used.

<u>Appliance</u>	<u>Quantity</u>	<u>Discharge Unit</u>	<u>Total</u>
WC	40	1.6	64.0
WHB	30	0.4	12.0
Urinals	8	0.5	4.0
Showers	10	0.4	4.0
Sinks	6	1.0	6.0
			90.0

Total Site Foul Discharge (Q)

KDU= 0.50

$0.5\sqrt{\Sigma \text{ DU}}$

Q = 4.74 l/sec

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Thrfr; Total peak discharge rate:-

338 Unit Building = 11.1

Napier Court = 4.74

Total = 15.84 l/sec

FOUL WATER STORAGE

As a precaution against potential flooding during plant or power failure, the pumping facility shall include sufficient storage volume to accommodate foul water flows during the failure.

The size of the tank shall be based on:

Sewers for adoption requirement of 160 litres / property

Plus an allowance of 1 hour peak flow rate (4.74 l/s) for the commercial properties at Napier Court

Thrfr; Total storage volume required = $338 \times 160 + 4.74 \times 3600 = 71144$ litres (**71.15 m³**)

This storage volume can be provided within the wet well (circa 5.0 m³) in conjunction with an ancillary storage tank of volume = 70 m³