

	Project: Pound Place Angmering				
	Details: Foul Drainage Calculations				Project Number: 18 031
	Produced By: MP	Date: Jan-19	Checked By: AR	Date: Jan-19	Section/Page No/Revision 1 / 1 / 3
Ref.	Calculations				Output

	Project: Pound Place Angmering			
	Details: EXTRACTS OF BUILDING REGS			Project Number: 18 031
	Produced By: MP	Date: Jan-19	Checked By:	Date:
Ref.	Calculations			Section/Page No/Revision 1 / 2 / 3
	Output			

RELEVANT EXTRACTS FROM APPROVED DOCUMENT H1 (as of May 2016)

Diagram 9 Discharge capacities of foul drains running 0.75 proportional depth

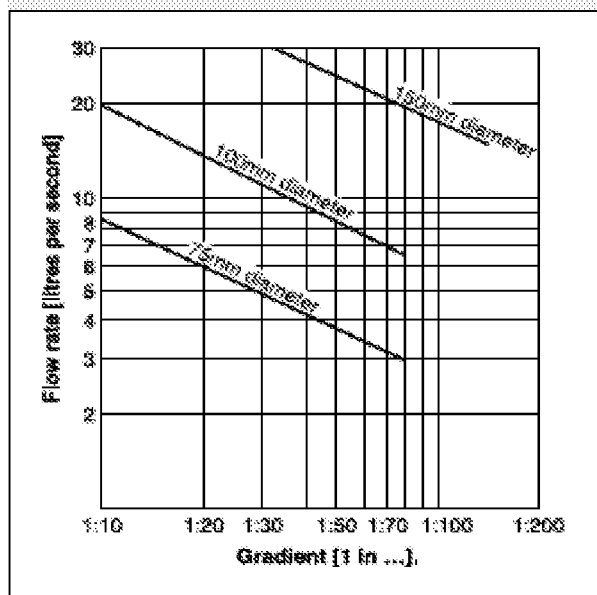


Table 6 Recommended minimum gradients for foul drains

Peak flow (litres/sec)	Pipe size (mm)	Minimum gradient (1 in ...)	Maximum capacity (litres/sec)
< 1	75	1:40	4.1
	100	1:40	8.2
> 1	75	1:80	2.8
	100	1:80*	8.3
	150	1:160†	15.0

Notes:

* Minimum of 1 WC

† Minimum of 5 WCs

Table 10 Limits of cover for thermoplastics (nominal ring stiffness SN4) pipes in any width of trench

Nominal size	Laid in fields	Laid in light roads	Laid in main roads
100mm – 300mm	0.6m – 7m	0.9m – 7m	0.9m – 7m

Notes:

- For drains and sewers less than 1.5m deep and there is a risk of excavation adjacent to the drain and depth, special calculation is necessary, see BS EN 1295.
- All pipes assumed to be in accordance with the relevant standard listed in Table 7 with nominal ring stiffness SN4; other strengths and sizes of pipe are available, consult manufacturers.
- Bedding assumed to be Class S2 with 80% compaction and average soil conditions.
- Alternative designs using different pipe strengths and/or bedding types may offer more appropriate or economic options using the procedures set out in BS EN 1295.
- Minimum depth is set to 1.5m irrespective of pipe strength to cover loss of side support from parallel excavations.

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RELEVANT EXTRACTS FROM APPROVED DOCUMENT H1 (as of May 2016)					
H1 FOUL DRAINAGE					
Table 12 Minimum dimensions for manholes					
Type	Size of largest pipe (DN)	Min. internal dimensions ¹		Min. clear opening size ²	
		Rectangular length and width	Circular diameter	Rectangular length and width	Circular diameter
Manhole					
< 1.5m deep to soffit	≤ 150	750 x 675 ³	1000 ³	750 x 675 ³	na ³
	225	1200 x 675	1200	1200 x 675 ³	
	300	1200 x 750	1200		
	>300	1800 x (DN+450)	The larger of 1800 or (DN+450)		
> 1.5m deep to soffit	≤ 225	1200 x 1000	1200	900 x 600	600
	300	1200 x 1075	1200		
	375-450	1350 x 1225	1200		
	>450	1800 x (DN+775)	The larger of 1800 or (DN+775)		
Manhole shaft ⁴					
> 3.0m deep to soffit of pipe	Steps ⁵	1050 x 800	1050	600 x 600	600
	Ladder ⁵	1200 x 800	1200		
	Winch ⁶	900 x 800	900	600 x 600	600
Notes:					
1. Larger sizes may be required for manholes on bends or where there are junctions.					
2. May be reduced to 600 by 600 where required by highway loading considerations, subject to a safe system of work being specified.					
3. Not applicable due to working space needed.					
4. Minimum height of chamber in shafted manhole 2m from benching to underside of reducing slab.					
5. Min. clear space between ladder or steps and the opposite face of the shaft should be approximately 600mm.					
6. Winch only – no steps or ladders, permanent or removable.					
7. The minimum size of any manhole serving a sewer (i.e. any drain serving more than one property) should be 1200mm x 675mm rectangular or 1200mm diameter.					
Table 13 Maximum spacing of access points in metres					
From	To Access Fitting		To Junction	To Inspection chamber	To Manhole
	Small	Large			
Start of external drain ¹	12	12	–	22	45
Rodding eye	22	22	22	45	45
Access fitting: small 150 diam. and 150 x 100	–	–	12	22	22
large 225 x 100	–	–	22	45	45
Inspection chamber shallow	22	45	22	45	45
Manhole and inspection chamber deep	–	–	–	45	90 ²
Notes:					
1. Stack or ground floor appliance					
2. May be up to 600 for man-entry size drains and sewers					

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FOUL WATER DRAINAGE FLOW RATES

BASED ON BS EN 752 - 4:1998

Type of Appliance	WC	Wash Hand Basin	Baths	Showers	Kitchen Sink	Washing Machine	Dish Washer
CARE HOME GF	38	38	2	31	2		
CARE HOME FF	35	35	2	31	2		
CARE HOME SF	7	7	1	2	0		
Total No. Provided	80	80	5	64	4	0	0
Typical Discharge Unit	1.8	0.3	0.6	0.4	0.6	0.6	0.6
Total Discharge Unit	144	24	3	25.6	2.4	0	0

TOTAL DISCHARGE UNITS FOR ALL APPLIANCES	199
FREQUENCY FACTOR FOR BUILDING USAGE (Tb C1)	0.5
TOTAL UNATTENUATED FLOW, Q =	7.05 Litres/sec

Table C.1 — Typical frequency factors (k_{DU})

Type of building	k_{DU}
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 C.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 l to 9,0 l 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.

$$Q = k_{DU} \sqrt{\sum DU} \quad (C.1)$$

where

Q is the wastewater design flow rate, in litres per second;

k_{DU} is a frequency factor, dimensionless;

DU is the discharge unit (a characteristic value of the rate of wastewater outflow of a sanitary appliance), dimensionless.