

<p>Calculating design rainfall</p> <p>Values of design rainfall, R, can be determined using Figure 1 and Tables 1 and 2 for different storm durations with a 10 year return period. The notation</p> <p>MX-D min</p> <p>is used to identify the storm, where:</p> <p>X = the return period in years: D = the storm duration in minutes.</p> <p>The 10 year return period rainfall of 15 minute duration, known as M10-15 min, or the M10-30 min rainfall, is calculated as follows:</p> <p>From the map in Figure 1, determine the rainfall ratio, r, for the location of the soakaway (interpolating between contours). Use this in Table 1 to give the factor Z1 for the calculation of the 5 year return period rainfall total, M5-D min, for different storm durations, D.</p> <p>The basis of the calculation is the M5-60 min rainfall: this can be taken to be 20 mm for all parts of the United Kingdom.</p> <p>M5-D min rainfall = M5-60 min rainfall x Z1 = 20 mm x Z1</p> <p>M10-D min = M5-D min x Z2 where Z2 is found from Table 2.</p> <p>For example, If, for the soakaway location, r on Figure 1 = 0.42, the M5-15 min can be found as follows: M5-15 min rainfall = 20 mm x Z1 (for 15 min duration)</p>	<p>Read Z1 from Table 1 in the column for the required rainfall duration, D, (eg 15 minutes), and interpolate for the appropriate rainfall ratio, r, at the site: (eg D = 15 min; r = 0.42; Z1 = 0.64) = 20 mm x 0.64</p> <p>M5-15 min rainfall = 12.8 mm</p> <p>M5-30 min rainfall = M5-60 min rainfall x Z1 (for 30 min duration) = 20 mm x 0.81 = 16.2 mm</p> <p>The required 10 year return period rainfalls used in the soakaway design are calculated by interpolating the growth factors Z2 from Table 2.</p> <p>For example, M10-15 min rainfall = M5-15 min rainfall x Z2 = 12.8 mm x 1.23 (for England and Wales) = 15.7 mm</p> <p>M10-30 min rainfall = 16.2 mm x 1.24 = 20.1 mm</p> <p>This procedure to determine the 10 year rainfalls must be used because the basic data are available only for 5 year returns.</p>
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Table 1 Values of Factor Z1 for rainfall duration D and ratio r

Rainfall duration D										
r	Minutes				Hours					
	5	10	15	30	1	2	4	6	10	24
0.12	0.22	0.34	0.45	0.67	1.00	1.48	2.17	2.75	3.70	6.00
0.15	0.25	0.38	0.48	0.69	1.00	1.42	2.02	2.46	3.23	4.90
0.18	0.27	0.41	0.51	0.71	1.00	1.36	1.86	2.25	2.86	4.30
0.21	0.29	0.43	0.54	0.73	1.00	1.33	1.77	2.12	2.62	3.60
0.24	0.31	0.46	0.56	0.75	1.00	1.30	1.71	2.00	2.40	3.35
0.27	0.33	0.48	0.58	0.76	1.00	1.27	1.64	1.88	2.24	3.10
0.30	0.34	0.49	0.59	0.77	1.00	1.25	1.57	1.78	2.12	2.84
0.33	0.35	0.50	0.61	0.78	1.00	1.23	1.53	1.73	2.04	2.60
0.36	0.36	0.51	0.62	0.79	1.00	1.22	1.48	1.67	1.90	2.42
0.39	0.37	0.52	0.63	0.80	1.00	1.21	1.46	1.62	1.82	2.28
0.42	0.38	0.53	0.64	0.81	1.00	1.20	1.42	1.57	1.74	2.16
0.45	0.39	0.54	0.65	0.82	1.00	1.19	1.38	1.51	1.68	2.03