

APPENDIX 5

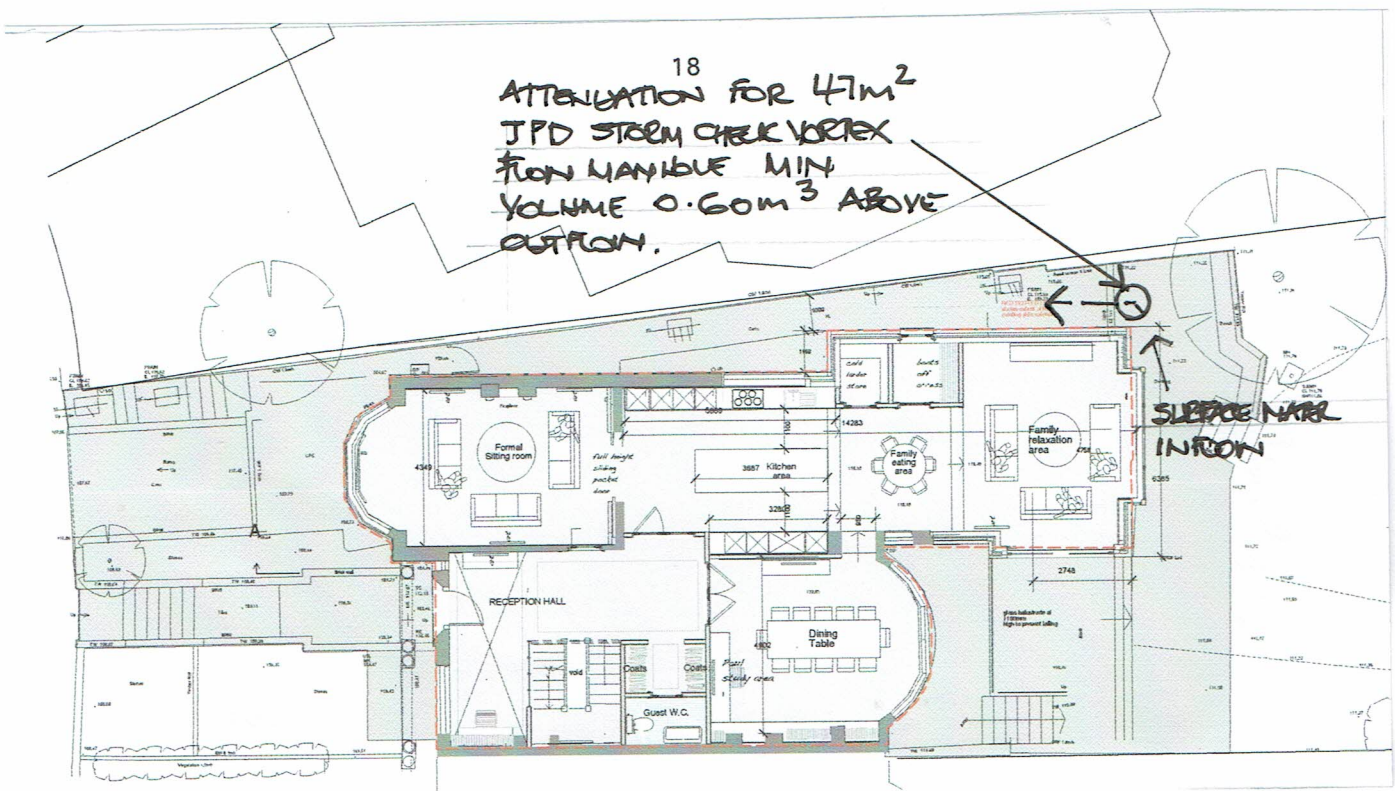
ATTENUATION OF ADDITIONAL SURFACE WATER

**ATTENUATION OF SURFACE WATER
FROM ADDITIONAL 47m² OF IMPERMEABLE AREA.**

Additional f impermeable area is 47m². Soils are practically impermeable, so surface water collected from additional area will be attenuated before being discharged into existing combined system.

Surface water will be discharged to a JPD Storm Check Vortex Flow Manhole with a minimum volume above discharge level of 0.6m³.

Volume of attenuation required for additional surface water is calculated based upon an allowable controlled flow of 1litre/sec into the existing system, see following calculations.





MasterDrain
SW

Vincent & Rymill Structural Engineers

www.vincentrymill.co.uk

Lakeside Country Club
Frimley Green
Camberley GU16 6PT
Tel:01252 834242 Fax:
email: frimley@vincentrymill.co.uk

Job No.		
Sheet no. 1		
Date 23/12/18		
By TV	Checked	Reviewed

Project 16 ROSECROFT AVE
Title ATTENUATION FOR ADDITIONAL AREA

Data:-

FSR Hydrology:-

Location = Hampstead
M5-60 (mm) = 21.2
Soil index = 0.45
Return period = 100
UCWI = 69.3

Grid reference = TQ2686
r = 0.44
SAAR (mm/yr) = 660
WRAP = 4
Climate change = 40

Clayey, or loamy over clayey soils with an impermeable layer at shallow depth.

Runoff factor (RF) = 79.0, calculated from:-

$$\text{Runoff factor} = (0.829 \times \text{PIMP}) + (25 \times \text{SOIL}) + (0.078 \times \text{UCWI}) - 20.7$$

where

$$\text{PIMP} = \frac{\text{Impervious Area} \times 100}{(\text{Impervious Area} + \text{Pervious Area})}$$

UCWI = Calculated value for Wetness Index

Design data:-

Imperv. area = 47 m²
Total area (TA) = 47 m²
Allowed discharge rate = 1.000 l/s
Additional flow = 0.00 l/s

Pervious area = 0 m²
Equiv area = 37 m² (TA x RF)
Areal reduction factor = 1.000
Climate change factor = 40

Calculated data:-

Time to max = 9.0 mins
Rainfall at max = 200.96 mm/hr
Pipeline storage = 0.0 m³
Offline storage = 0.0 m³

Calculated storage volume = 0.6 m³
Allowed discharge rate = 1.000 l/s
Available MH storage = 0.0 m³

Fixed 6 hour data:-

Rainfall event = 6 hours
Rainfall rate = 14.00 mm/hr

Calculated storage volume = 0.0 m³
Allowed discharge rate = 1.000 l/s

Rainfall intensities calculated using the Wallingford Procedure

Storage lengths for initial calculation (x 1.1, 1.2, 1.3 or 1.5 as above if required) :-

Diam	Len	Diam	Len	Ovoid	Len	Box culvert	Len
100	73.8	1125	0.6	400 x 600	3.2	500 x 500	2.3
150	32.8	1200	0.5	600 x 900	1.4	500 x 750	1.5
225	14.6	1275	0.5	800 x 1200	0.8	500 x 1000	1.2
300	8.2	1350	0.4			750 x 1000	0.8
375	5.2	1425	0.4			750 x 1200	0.6
450	3.6	1500	0.3			750 x 1500	0.5
525	2.7	1575	0.3			1000 x 1000	0.6
600	2.0	1650	0.3			1000 x 1200	0.5
675	1.6	1725	0.2			1000 x 1500	0.4
750	1.3	1800	0.2			1000 x 1800	0.3
825	1.1	1875	0.2			1000 x 2000	0.3
900	0.9	1950	0.2			1500 x 1500	0.3
975	0.8	2025	0.2			1500 x 1800	0.2
1050	0.7	2100	0.2			1500 x 2000	0.2



Vincent & Rymill Structural Engineers

www.vincentrymill.co.uk

Lakeside Country Club
Frimley Green
Camberley GU16 6PT
Tel:01252 834242 Fax:
email: frimley@vincentrymill.co.uk

Job No.		
Sheet no. 2		
Date 23/12/18		
By	Checked	Reviewed
TV		

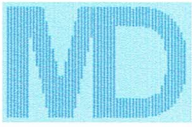
MasterDrain
SW

Project **16 ROSECROFT AVE**
Title **ATTENUATION FOR ADDITIONAL AREA**

Data:-

Time (mins)	Rain mm/hr	Inflow (m3)	Outflow (m3)	Balance (m3)
10	190.0	1.179	0.600	0.579
20	128.0	1.582	1.200	0.382
30	98.0	1.823	1.800	0.023
40	81.0	1.994	2.400	0.000
50	69.0	2.126	3.000	0.000
60	60.0	2.235	3.600	0.000
70	54.0	2.326	4.200	0.000
80	49.0	2.405	4.800	0.000
90	44.0	2.475	5.400	0.000
100	41.0	2.537	6.000	0.000
110	38.0	2.593	6.600	0.000
120	36.0	2.645	7.200	0.000
130	33.0	2.692	7.800	0.000
140	32.0	2.735	8.400	0.000
150	30.0	2.775	9.000	0.000
160	28.0	2.812	9.600	0.000
170	27.0	2.847	10.200	0.000
180	26.0	2.880	10.800	0.000
190	25.0	2.911	11.400	0.000
200	24.0	2.940	12.000	0.000
210	23.0	2.968	12.600	0.000
220	22.0	2.994	13.200	0.000
230	21.0	3.019	13.800	0.000
240	20.0	3.043	14.400	0.000
250	20.0	3.066	15.000	0.000
260	19.0	3.090	15.600	0.000
270	19.0	3.113	16.200	0.000
280	18.0	3.135	16.800	0.000
290	18.0	3.156	17.400	0.000
300	17.0	3.177	18.000	0.000
310	17.0	3.197	18.600	0.000
320	16.0	3.217	19.200	0.000
330	16.0	3.236	19.800	0.000
340	15.0	3.255	20.400	0.000
350	15.0	3.273	21.000	0.000
360	15.0	3.291	21.600	0.000
370	14.0	3.308	22.200	0.000
380	14.0	3.325	22.800	0.000
390	14.0	3.341	23.400	0.000
400	14.0	3.357	24.000	0.000
410	13.0	3.373	24.600	0.000
420	13.0	3.389	25.200	0.000
430	13.0	3.404	25.800	0.000
440	13.0	3.418	26.400	0.000
450	12.0	3.433	27.000	0.000
460	12.0	3.447	27.600	0.000
470	12.0	3.461	28.200	0.000
480	12.0	3.475	28.800	0.000
490	12.0	3.488	29.400	0.000
500	11.0	3.501	30.000	0.000
510	11.0	3.514	30.600	0.000
520	11.0	3.527	31.200	0.000
530	11.0	3.540	31.800	0.000
540	11.0	3.552	32.400	0.000
550	10.0	3.564	33.000	0.000
560	10.0	3.576	33.600	0.000
570	10.0	3.588	34.200	0.000
580	10.0	3.600	34.800	0.000
590	10.0	3.611	35.400	0.000
600	10.0	3.622	36.000	0.000

Storage volume (m³) = 0.6 m³



Job No.		
Sheet no. 3		
Date 23/12/18		
By TV	Checked	Reviewed

MasterDrain
SW

Project 16 ROSECROFT AVE

Title ATTENUATION FOR ADDITIONAL AREA

