RAINWATER CALCULATION

BS EN 12056-3:2000

Date: 29/06/2021 *Ref:* *RWC-243573-1*

CLIENT

DARE ODUYE

PROJECT

BRAMLEY HOUSE

CLIENT REF

42923

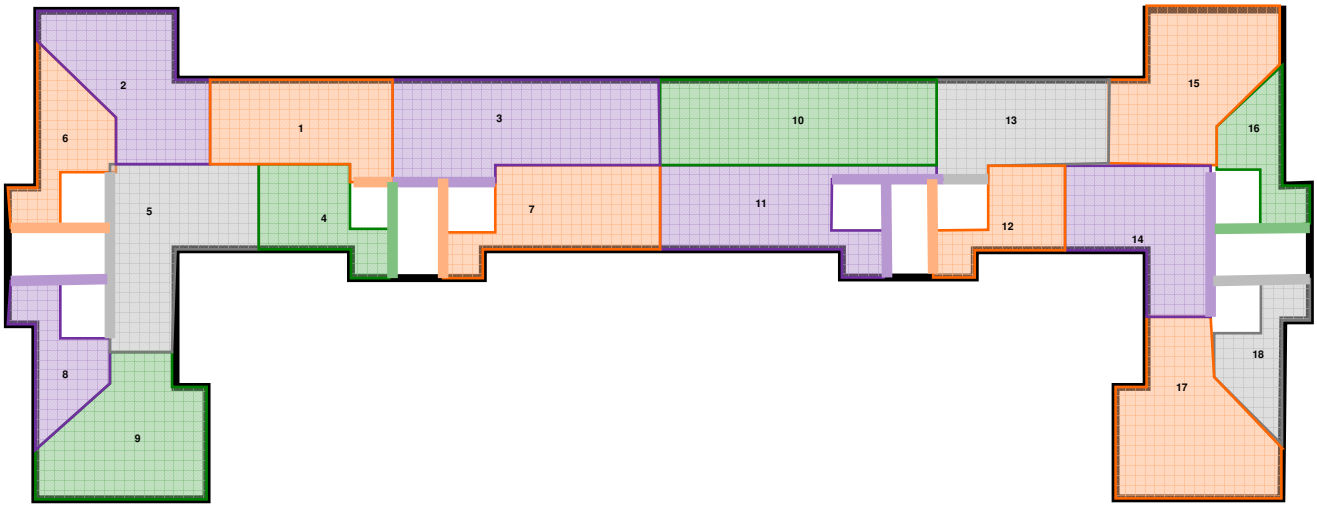
Report by: **Paul Reeves**

Design life: **60 years**

Location: Bramley Road
London W10 6SX

Calculations based on BS EN 12056-3:2000 including National Annex NB for the UK.
Input data is as provided by the client, who is assumed to have provided this data according to the provisions of BS EN 12056-3:2000, and it is the responsibility of the user of this report to check that the data has been correctly interpreted within it.
The calculations require appropriate outlet positioning for validity, and that positioning is beyond the scope of this report.
Any results given are particular to the products with the codes shown and the calculations will be invalid for substitutions.
The information contained in this report is given in good faith but without liability to the provider.

CATCHMENT AREA PLAN



Key to plan

- Shaded and labelled areas show catchment areas considered
- Heavy coloured lines along the edge of an area show an adjacent vertical draining to that area
- Arrows show flow from one area to another, to be considered as part of the drainage of the area it flows to

REPORT SUMMARY

Peak flow for Category 1: 0.021 l/s/m², Category 2: 0.058 l/s/m², Category 3: 0.071 l/s/m²

FLOW ANALYSIS FOR 1

Main catchment area: 40 m²
Peak flow: 2.49 l/s
Outlets: 1no FO-PARAPET-110 + ParaDrain (40mm sump)

FLOW ANALYSIS FOR 2

Main catchment area: 43 m²
Peak flow: 2.49 l/s
Outlets: 1no FO-PARAPET-110 + ParaDrain (40mm sump)

FLOW ANALYSIS FOR 3

Main catchment area: 60 m²
Peak flow: 3.92 l/s
Outlets: 1no FO-PARAPET-SQ-200 SBS + ParaDrain (40mm sump)

FLOW ANALYSIS FOR 4

Main catchment area: 24 m²
Peak flow: 1.8 l/s
Outlets: 1no FO-PARAPET-110 + ParaDrain (40mm sump)

FLOW ANALYSIS FOR 5

Main catchment area: 47 m²
Peak flow: 3.44 l/s
Outlets: 1no FO-PARAPET-SQ-200 SBS + ParaDrain (40mm sump)

FLOW ANALYSIS FOR 6

Main catchment area: 24 m²
Peak flow: 1.83 l/s
Outlets: 1no FO-PARAPET-110 + ParaDrain (40mm sump)

Report Summary continued

FLOW ANALYSIS FOR 7

Main catchment area: 40 m²

Peak flow: 2.73 l/s

Outlets: 1no FO-PARAPET-110 + ParaDrain (40mm sump)

FLOW ANALYSIS FOR 8

Main catchment area: 21 m²

Peak flow: 1.64 l/s

Outlets: 1no FO-PARAPET-110 + ParaDrain (40mm sump)

FLOW ANALYSIS FOR 9

Main catchment area: 47 m²

Peak flow: 2.73 l/s

Outlets: 1no FO-PARAPET-110 + ParaDrain (40mm sump)

FLOW ANALYSIS FOR 10

Main catchment area: 58 m²

Peak flow: 3.36 l/s

Outlets: 1no FO-PARAPET-SQ-200 SBS + ParaDrain (40mm sump)

FLOW ANALYSIS FOR 11

Main catchment area: 45 m²

Peak flow: 3.51 l/s

Outlets: 1no FO-PARAPET-SQ-200 SBS + ParaDrain (40mm sump)

FLOW ANALYSIS FOR 12

Main catchment area: 22 m²

Peak flow: 1.69 l/s

Outlets: 1no FO-PARAPET-110 + ParaDrain (40mm sump)

Report Summary continued

FLOW ANALYSIS FOR 13

Main catchment area: 38 m²

Peak flow: 2.39 l/s

Outlets: 1no FO-PARAPET-110 + ParaDrain (40mm sump)

FLOW ANALYSIS FOR 14

Main catchment area: 41 m²

Peak flow: 2.99 l/s

Outlets: 1no FO-PARAPET-SQ-200 SBS + ParaDrain (40mm sump)

FLOW ANALYSIS FOR 15

Main catchment area: 49 m²

Peak flow: 2.84 l/s

Outlets: 1no FO-PARAPET-SQ-200 SBS + ParaDrain (40mm sump)

FLOW ANALYSIS FOR 16

Main catchment area: 18 m²

Peak flow: 1.45 l/s

Outlets: 1no FO-PARAPET-110 + ParaDrain (40mm sump)

FLOW ANALYSIS FOR 17

Main catchment area: 52 m²

Peak flow: 3.02 l/s

Outlets: 1no FO-PARAPET-SQ-200 SBS + ParaDrain (40mm sump)

FLOW ANALYSIS FOR 18

Main catchment area: 19 m²

Peak flow: 1.52 l/s

Outlets: 1no FO-PARAPET-110 + ParaDrain (40mm sump)

RAINFALL ANALYSIS

Location used as a basis for rainfall data (postcode general area)	**W10**
Rainfall depth for a 2 minute duration storm event with return period of 5 years (2 min M5)	**4mm**

Rainfall category	**1**	**2**	**3**
Period considered, in years	1	60	60
Safety factor for category	1	1.5	4.5
Effective return period for calculation, in years	1	90	270
Rainfall return period for 2 minute duration storm event	M1	M90	M270
Rainfall depth in 2 minute storm, in millimeters	2.56	7	8.48
Conversion factor from millimeters to l/s/m²	120	120	120
Peak rainfall for 2 minute duration storm event, in l/s/m²	**0.021**	**0.058**	**0.071**

Rainfall category	**1**	**2**	**3**
Peak rainfall used for calculation, in l/s/m²	**0.021**	**0.058**	**0.071**

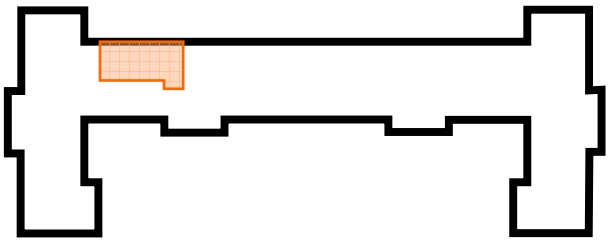
Rainfall Categories

Category 1 is the minimum accepted by BS EN 12056-3:2000, and assumes the greatest flow to be allowed for is during the peak storm expected in one average year. This is generally used for totally flat roof areas, where it is assumed that the design caters for excess flow that may occur at other times; by alternative run-off, by being able to structurally withstand the weight of standing water, or if the flow is attenuated such that the theoretical peak flow is impossible in practice.

Category 2 is used as standard wherever it cannot be assumed that flow rates beyond the calculated level are acceptable, and therefore only exceptional events should be beyond the scope of the calculation. The basis for this is the peak flow to be expected within 1.5 times the building's expected lifespan, corresponding to a 50% chance that flow beyond this will ever occur within the design life of the building.

Category 3 is for "high importance" buildings where flow rates beyond those calculated for are likely to have unacceptable consequences. The basis for this is the peak flow to be expected within 4.5 times the building's expected lifespan, corresponding to a 20% chance of excess flow for the entire design life of the building.

FLOW ANALYSIS FOR 1



Rainfall category	**2**
Rainfall (l/s/m²)	**0.058**

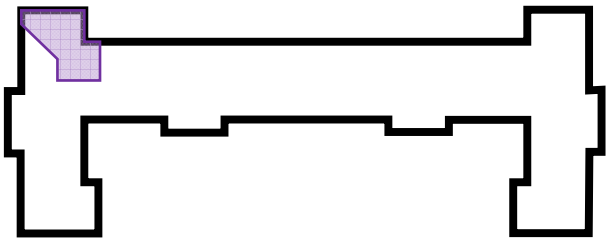
	Area (m²)	Flow (l/s)
Main catchment	40	2.3
Adjacent vertical	3	0.2
Total		2.5

Scheme 1

Outlet	FO-PARAPET-110	
Leafguard	ParaDrain	
Sump depth	40	mm
Pipe size	100	mm
Flow per outlet	2.83	l/s
Pipe flow limit	10.70	l/s
Effective flow	**2.83**	**l/s**
Number of outlets	1	
Total flow via outlets	**2.8**	**l/s**

Total flow achieved **2.8** **l/s, to meet total catchment area requirement of** **2.5** **l/s**

FLOW ANALYSIS FOR 2



Rainfall category	**2**
Rainfall (l/s/m²)	**0.058**

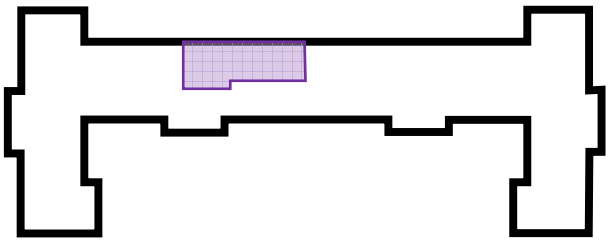
	Area (m²)	Flow (l/s)
Main catchment	43	2.5
Total		2.5

Scheme 1

Outlet	FO-PARAPET-110	
Leafguard	ParaDrain	
Sump depth	40	mm
Pipe size	100	mm
Flow per outlet	2.83	l/s
Pipe flow limit	10.70	l/s
Effective flow	**2.83**	**l/s**
Number of outlets	1	
Total flow via outlets	**2.8**	**l/s**

Total flow achieved **2.8** **l/s, to meet total catchment area requirement of** **2.5** **l/s**

FLOW ANALYSIS FOR 3



Rainfall category	**2**
Rainfall (l/s/m²)	**0.058**

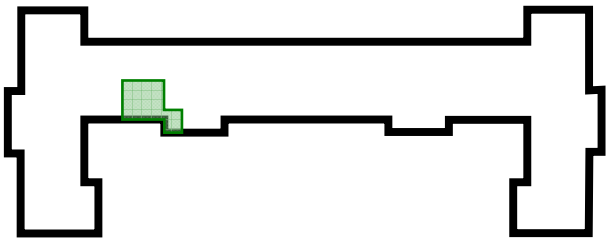
	Area (m²)	Flow (l/s)
Main catchment	60	3.5
Adjacent vertical	7.6	0.4
Total		3.9

Scheme 1

Outlet	FO-PARAPET-SQ-200 SBS	
Leafguard	ParaDrain	
Sump depth	40	mm
Pipe size	100	mm
Flow per outlet	5.40	l/s
Pipe flow limit	10.70	l/s
Effective flow	**5.40**	**l/s**
Number of outlets	1	
Total flow via outlets	**5.4**	**l/s**

Total flow achieved **5.4** **l/s, to meet total catchment area requirement of** **3.9** **l/s**

FLOW ANALYSIS FOR 4



Rainfall category	**2**
Rainfall (l/s/m²)	**0.058**

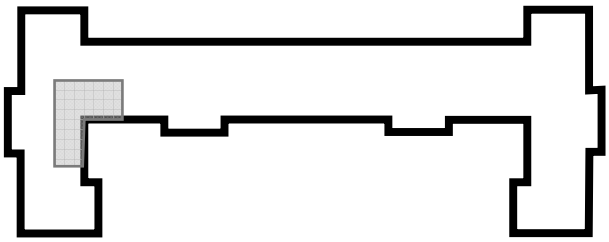
	Area (m²)	Flow (l/s)
Main catchment	24	1.4
Adjacent vertical	7	0.4
Total		1.8

Scheme 1

Outlet	FO-PARAPET-110	
Leafguard	ParaDrain	
Sump depth	40	mm
Pipe size	100	mm
Flow per outlet	2.83	l/s
Pipe flow limit	10.70	l/s
Effective flow	**2.83**	**l/s**
Number of outlets	1	
Total flow via outlets	**2.8**	**l/s**

Total flow achieved **2.8** **l/s, to meet total catchment area requirement of** **1.8** **l/s**

FLOW ANALYSIS FOR 5



Rainfall category	**2**
Rainfall (l/s/m²)	**0.058**

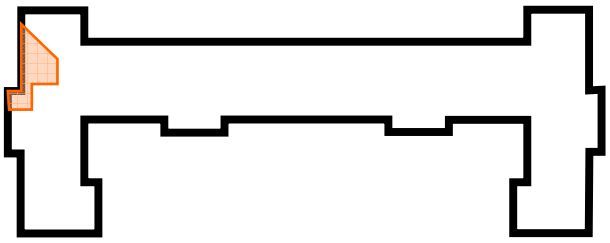
	Area (m²)	Flow (l/s)
Main catchment	47	2.7
Adjacent vertical	12.3	0.7
Total		3.4

Scheme 1

Outlet	FO-PARAPET-SQ-200 SBS	
Leafguard	ParaDrain	
Sump depth	40	mm
Pipe size	100	mm
Flow per outlet	5.40	l/s
Pipe flow limit	10.70	l/s
Effective flow	**5.40**	**l/s**
Number of outlets	1	
Total flow via outlets	**5.4**	**l/s**

Total flow achieved **5.4** **l/s, to meet total catchment area requirement of** **3.4** **l/s**

FLOW ANALYSIS FOR 6



Rainfall category	**2**
Rainfall (l/s/m²)	**0.058**

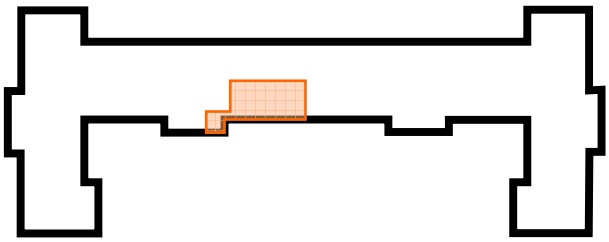
	Area (m²)	Flow (l/s)
Main catchment	24	1.4
Adjacent vertical	7.5	0.4
Total		1.8

Scheme 1

Outlet	FO-PARAPET-110	
Leafguard	ParaDrain	
Sump depth	40	mm
Pipe size	100	mm
Flow per outlet	2.83	l/s
Pipe flow limit	10.70	l/s
Effective flow	**2.83**	**l/s**
Number of outlets	1	
Total flow via outlets	**2.8**	**l/s**

Total flow achieved **2.8** **l/s, to meet total catchment area requirement of** **1.8** **l/s**

FLOW ANALYSIS FOR 7



Rainfall category	**2**
Rainfall (l/s/m²)	**0.058**

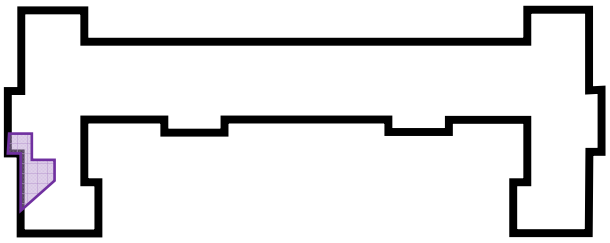
	Area (m²)	Flow (l/s)
Main catchment	40	2.3
Adjacent vertical	7	0.4
Total		2.7

Scheme 1

Outlet	FO-PARAPET-110	
Leafguard	ParaDrain	
Sump depth	40	mm
Pipe size	100	mm
Flow per outlet	2.83	l/s
Pipe flow limit	10.70	l/s
Effective flow	**2.83**	**l/s**
Number of outlets	1	
Total flow via outlets	**2.8**	**l/s**

Total flow achieved **2.8** **l/s, to meet total catchment area requirement of** **2.7** **l/s**

FLOW ANALYSIS FOR 8



Rainfall category	**2**
Rainfall (l/s/m²)	**0.058**

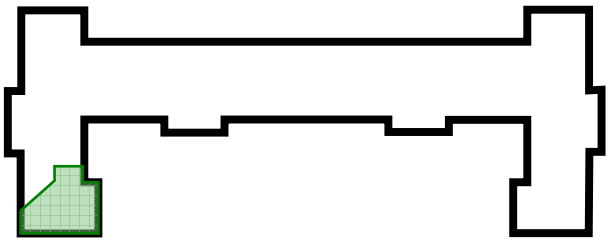
	Area (m²)	Flow (l/s)
Main catchment	21	1.2
Adjacent vertical	7.2	0.4
Total		1.6

Scheme 1

Outlet	FO-PARAPET-110	
Leafguard	ParaDrain	
Sump depth	40	mm
Pipe size	100	mm
Flow per outlet	2.83	l/s
Pipe flow limit	10.70	l/s
Effective flow	**2.83**	**l/s**
Number of outlets	1	
Total flow via outlets	**2.8**	**l/s**

Total flow achieved **2.8** **l/s, to meet total catchment area requirement of** **1.6** **l/s**

FLOW ANALYSIS FOR 9



Rainfall category	**2**
Rainfall (l/s/m²)	**0.058**

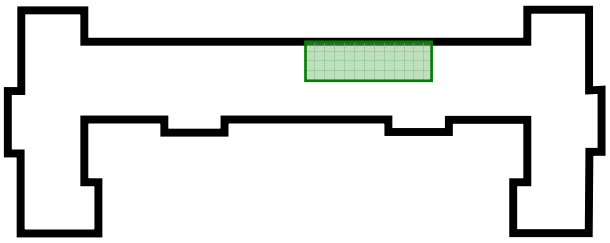
	Area (m²)	Flow (l/s)
Main catchment	47	2.7
Total		2.7

Scheme 1

Outlet	FO-PARAPET-110	
Leafguard	ParaDrain	
Sump depth	40	mm
Pipe size	100	mm
Flow per outlet	2.83	l/s
Pipe flow limit	10.70	l/s
Effective flow	**2.83**	**l/s**
Number of outlets	1	
Total flow via outlets	**2.8**	**l/s**

Total flow achieved **2.8** **l/s, to meet total catchment area requirement of** **2.7** **l/s**

FLOW ANALYSIS FOR 10



Rainfall category	**2**
Rainfall (l/s/m²)	**0.058**

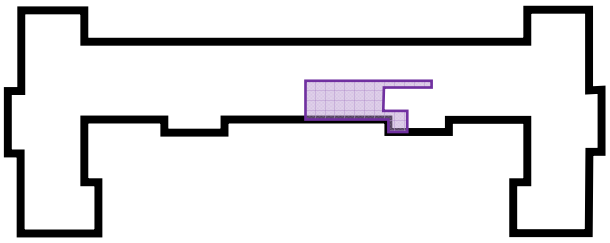
	Area (m²)	Flow (l/s)
Main catchment	58	3.4
Total		3.4

Scheme 1

Outlet	FO-PARAPET-SQ-200 SBS	
Leafguard	ParaDrain	
Sump depth	40	mm
Pipe size	100	mm
Flow per outlet	5.40	l/s
Pipe flow limit	10.70	l/s
Effective flow	**5.40**	**l/s**
Number of outlets	1	
Total flow via outlets	**5.4**	**l/s**

Total flow achieved **5.4** **l/s, to meet total catchment area requirement of** **3.4** **l/s**

FLOW ANALYSIS FOR 11



Rainfall category	**2**
Rainfall (l/s/m²)	**0.058**

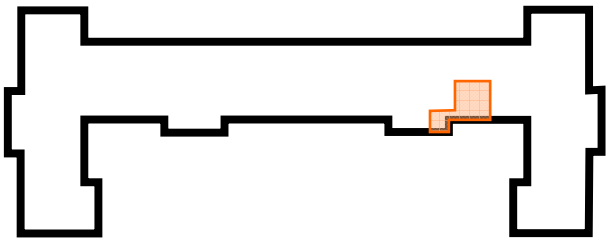
	Area (m²)	Flow (l/s)
Main catchment	45	2.6
Adjacent vertical	7	0.4
Adjacent vertical	8.4	0.5
Total		3.5

Scheme 1

Outlet	FO-PARAPET-SQ-200 SBS	
Leafguard	ParaDrain	
Sump depth	40	mm
Pipe size	100	mm
Flow per outlet	5.40	l/s
Pipe flow limit	10.70	l/s
Effective flow	**5.40**	**l/s**
Number of outlets	1	
Total flow via outlets	**5.4**	**l/s**

Total flow achieved **5.4** **l/s, to meet total catchment area requirement of** **3.5** **l/s**

FLOW ANALYSIS FOR 12



Rainfall category	**2**
Rainfall (l/s/m²)	**0.058**

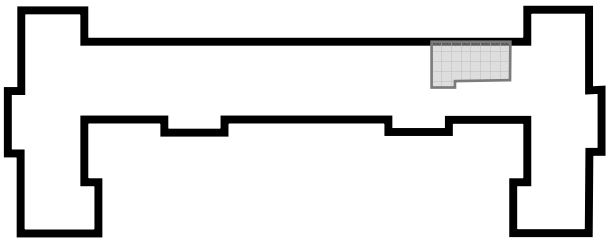
	Area (m²)	Flow (l/s)
Main catchment	22	1.3
Adjacent vertical	7	0.4
Total		1.7

Scheme 1

Outlet	FO-PARAPET-110	
Leafguard	ParaDrain	
Sump depth	40	mm
Pipe size	100	mm
Flow per outlet	2.83	l/s
Pipe flow limit	10.70	l/s
Effective flow	**2.83**	**l/s**
Number of outlets	1	
Total flow via outlets	**2.8**	**l/s**

Total flow achieved **2.8** **l/s, to meet total catchment area requirement of** **1.7** **l/s**

FLOW ANALYSIS FOR 13



Rainfall category	**2**
Rainfall (l/s/m²)	**0.058**

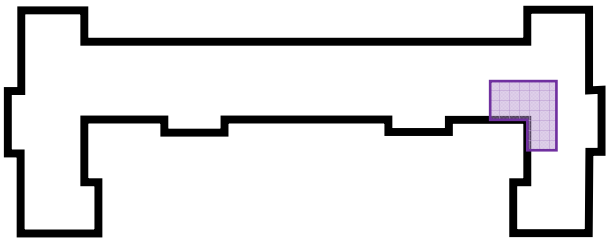
	Area (m²)	Flow (l/s)
Main catchment	38	2.2
Adjacent vertical	3.3	0.2
Total		2.4

Scheme 1

Outlet	FO-PARAPET-110	
Leafguard	ParaDrain	
Sump depth	40	mm
Pipe size	100	mm
Flow per outlet	2.83	l/s
Pipe flow limit	10.70	l/s
Effective flow	**2.83**	**l/s**
Number of outlets	1	
Total flow via outlets	**2.8**	**l/s**

Total flow achieved **2.8** **l/s, to meet total catchment area requirement of** **2.4** **l/s**

FLOW ANALYSIS FOR 14



Rainfall category	**2**
Rainfall (l/s/m²)	**0.058**

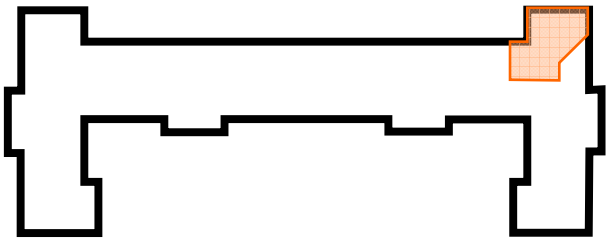
	Area (m²)	Flow (l/s)
Main catchment	41	2.4
Adjacent vertical	10.6	0.6
Total		3.0

Scheme 1

Outlet	FO-PARAPET-SQ-200 SBS	
Leafguard	ParaDrain	
Sump depth	40	mm
Pipe size	100	mm
Flow per outlet	5.40	l/s
Pipe flow limit	10.70	l/s
Effective flow	**5.40**	**l/s**
Number of outlets	1	
Total flow via outlets	**5.4**	**l/s**

Total flow achieved **5.4** **l/s, to meet total catchment area requirement of** **3.0** **l/s**

FLOW ANALYSIS FOR 15



Rainfall category	**2**
Rainfall (l/s/m²)	**0.058**

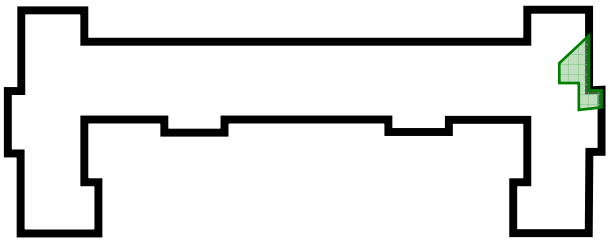
	Area (m²)	Flow (l/s)
Main catchment	49	2.8
Total		2.8

Scheme 1

Outlet	FO-PARAPET-SQ-200 SBS	
Leafguard	ParaDrain	
Sump depth	40	mm
Pipe size	100	mm
Flow per outlet	5.40	l/s
Pipe flow limit	10.70	l/s
Effective flow	**5.40**	**l/s**
Number of outlets	1	
Total flow via outlets	**5.4**	**l/s**

Total flow achieved **5.4** **l/s, to meet total catchment area requirement of** **2.8** **l/s**

FLOW ANALYSIS FOR 16



Rainfall category	**2**
Rainfall (l/s/m²)	**0.058**

	Area (m²)	Flow (l/s)
Main catchment	18	1.0
Adjacent vertical	7	0.4
Total		1.5

Scheme 1

Outlet	FO-PARAPET-110	
Leafguard	ParaDrain	
Sump depth	40	mm
Pipe size	100	mm
Flow per outlet	2.83	l/s
Pipe flow limit	10.70	l/s
Effective flow	**2.83**	**l/s**
Number of outlets	1	
Total flow via outlets	**2.8**	**l/s**

Total flow achieved **2.8** **l/s, to meet total catchment area requirement of** **1.5** **l/s**