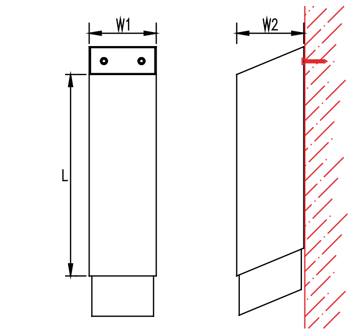
Standard Pipe Length

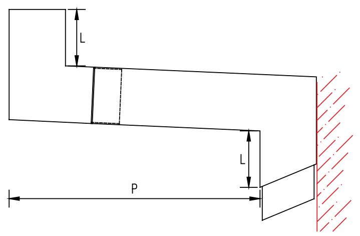
dim (mm)	Ref: FF/3x3	FF/4x3
W1	76	102
W2	76	76
T	2	2
L	TO 3,000	TO 3,000
dim (mm)	Ref: FF/4x4	FF/6x6
W1	100	150
W2	100	150
T	2	3
L	TO 3,000	TO 3,000



Eaves Offset

dim (mm)	Ref: FFOF/3x3	FFOF/4x3
P	TO 3,000	TO 3,000
L	100	100
dim (mm)	Ref: FFOF/4x4	FFOF/6x6
P	TO 3,000	TO 3,000
L	100	100

Available in standard 92.5, 112.5 and 135 degree, other angles available

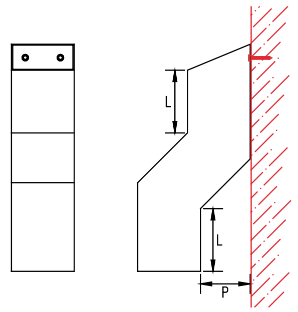


Plinth Offset

To bring flush-fix pipe away from wall to permit connection to drain.

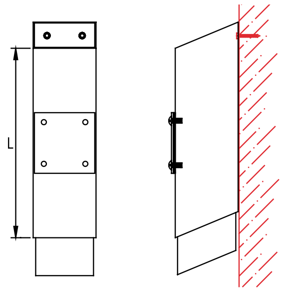
dim (mm)	Ref: FFPO/3x3	FFPO/4x3
P	TO 150	TO 150
L	100	100
dim (mm)	Ref: FFPO/4x4	FFPO/6x6
P	TO 150	TO 150
L	100	100

Available in standard 135 degree, other angles available



Access Pipe/Rodding Eye

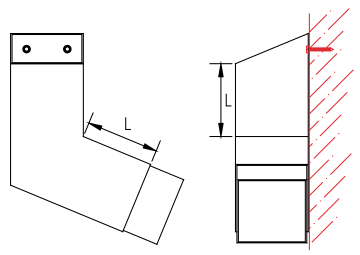
dim (mm)	Ref: FFAP/3x3	FFAP/4x3
L	300	300
dim (mm)	Ref: FFAP/4x4	FFAP/6x6
L	300	300



Bend

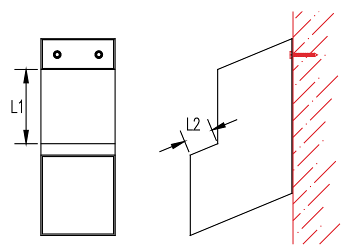
dim (mm)	Ref: FFBE/3x3	FFBE/4x3
L	100	100
dim (mm)	Ref: FFBE/4x4	FFBE/6x6
L	100	100

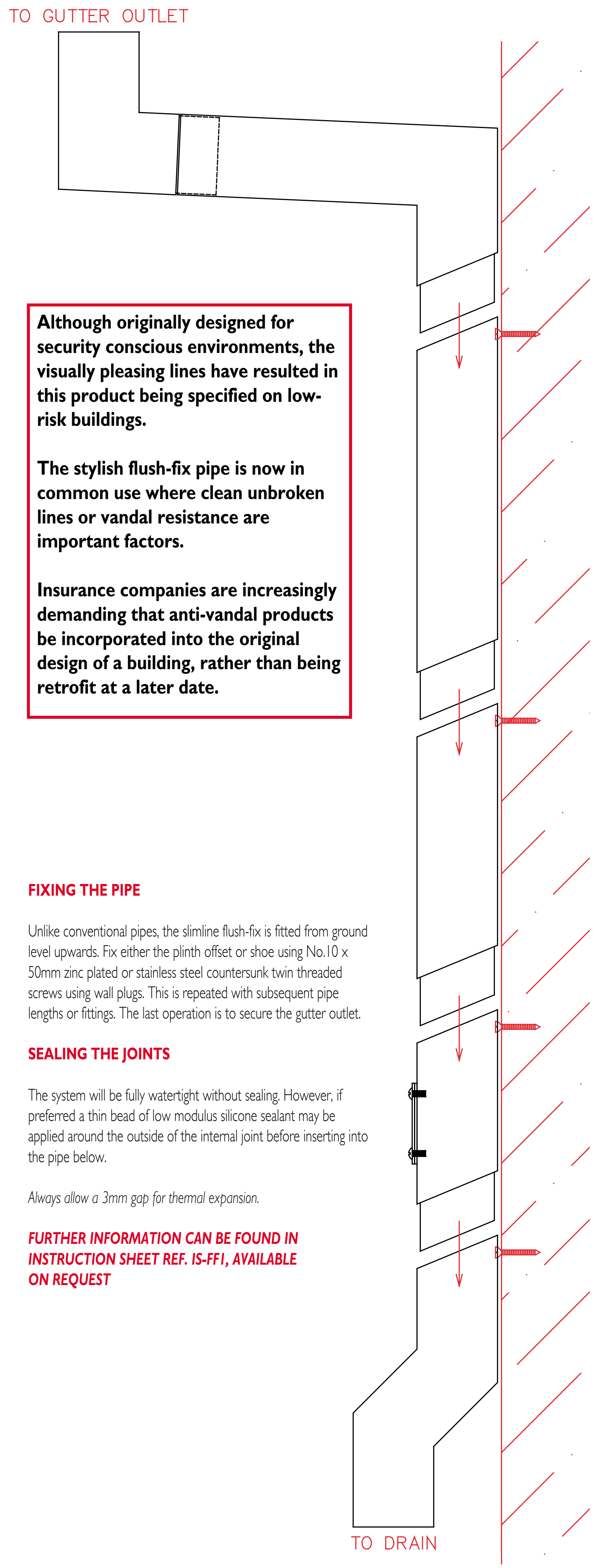
Available in standard 92.5, 112.5 and 135 degree, other angles available.
Bend to right indicated, other orientations available.



Shoe

dim (mm)	Ref: FFSH/3x3	FFSH/4x3
L1	100	100
L2	40	40
dim (mm)	Ref: FFSH/4x4	FFSH/6x6
L1	100	100
L2	40	40





Although originally designed for security conscious environments, the visually pleasing lines have resulted in this product being specified on low-risk buildings.

The stylish flush-fix pipe is now in common use where clean unbroken lines or vandal resistance are important factors.

Insurance companies are increasingly demanding that anti-vandal products be incorporated into the original design of a building, rather than being retrofit at a later date.

FIXING THE PIPE

Unlike conventional pipes, the slimline flush-fix is fitted from ground level upwards. Fix either the plinth offset or shoe using No.10 x 50mm zinc plated or stainless steel countersunk twin threaded screws using wall plugs. This is repeated with subsequent pipe lengths or fittings. The last operation is to secure the gutter outlet.

SEALING THE JOINTS

The system will be fully watertight without sealing. However, if preferred a thin bead of low modulus silicone sealant may be applied around the outside of the internal joint before inserting into the pipe below.

Always allow a 3mm gap for thermal expansion.

FURTHER INFORMATION CAN BE FOUND IN INSTRUCTION SHEET REF. IS-FF1, AVAILABLE ON REQUEST

RAINWATER DRAINAGE SYSTEM DESIGN PRINCIPLES

As part of the Guttermaster service, our expertise in the design of rainwater systems has prompted many specifiers to call on our assistance at the early stages of the design.

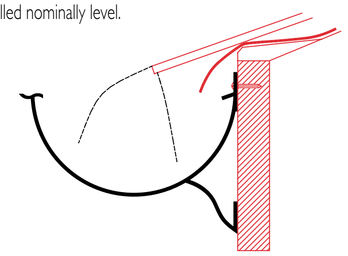
All our systems are designed in accordance with BS EN 12056-3:2000

GUTTER FALL

Guttermaster gutter systems are designed to be installed nominally level.

ROOF EDGE POSITION

The spread of water as it leaves the roof edge is dependent on rainfall rate, roof covering and pitch. In most instances the gutter should be fixed centrally below the roof edge, as close as is practical to it.



PRODUCT SELECTION

Depending on the design requirements of the rainwater system, it is possible to select the preferred profile, gutter size and rainwater pipe to effectively drain the roof. The capacities of various gutter and pipe combinations are shown below.

SNOW

Gutters designed with adequate capacity for rainwater flow are deemed to have sufficient capacity for the draining of melting snow. However, all rainwater systems risk the possibility of becoming blocked by frozen snow or damaged by the sheer weight of snow sliding from a pitched roof.

Selected Guttermaster systems offer additional support and strengthening if the building so requires. Where there is a possibility of sliding snow causing damage to people or property below, snow guards should be fitted to pitched roofs.

Please contact our Technical Department for further guidance.

LIGHTNING PROTECTION

Selected Guttermaster systems can be used as part of a building's lightning protection system, utilising our "lightning link" system.

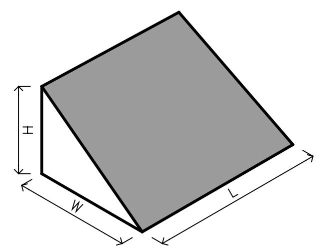
Rainwater pipes are not generally considered suitable as lightning conductors, and it is recommended that continuous lightning tapes be used. These can be concealed behind rainwater pipes if required.

Further guidance can be found in BS6651: Protection of structures against lightning.

FOUR SIMPLE STEPS TO THE SUCCESSFUL DESIGN OF A RAINWATER DRAINAGE SYSTEM.

1.CALCULATE THE EFFECTIVE ROOF AREA (A)

The effective roof area (A) is calculated from the equation given below, which includes an allowance for wind driven rain at 26° to the vertical:



$$A = L \times W + \frac{(L \times H)}{2}$$

2. ESTABLISH THE RAINFALL INTENSITY (R)

BS EN 12056-3:2000 recommends that statistical rainwater data be used. However, where this is not possible, it is generally accepted that a rainfall intensity (R) of 0.02 (litres/second)/m2 may be used.

3. ESTABLISH THE RISK FACTOR (C)

A risk factor should be established based on the following information.

	C
Eaves gutters	1.0
Eaves gutter where overflow is undesirable	1.5
Non-eaves gutters where overflow would spill into the building	2.0
Non-eaves gutters in critical applications	3.0

4. CALCULATE THE VOLUME OF WATER TO BE DRAINED FROM THE ROOF (Q)

The total rate of rainwater flow (Q) in litres/second is calculated from the following equation:

$$Q = A \times R \times C$$

CAPACITIES (LITRES / SECOND) GUTTER PROFILES	FREE FLOW CAPACITY	CIRCULAR PIPE 63	76	102	152	SQUARE & RECTANGULAR PIPE 76x76	102x76	100 x 100	150x150
125 x 100 Moulded No. 46 gutter (MG5 x 4)	2.37	1.62	2.40	4.01	–	3.00	4.02	5.02	–
150 x 100 Moulded No. 46 gutter (MG6 x 4)	3.08	1.62	2.40	4.01	–	3.00	4.02	5.02	–
200 x 150 Moulded No. 46 gutter (MG8 x 6)	8.60	2.05	3.03	5.46	12.13	3.78	5.08	6.82	14.93
100 x 75 Rectangular box gutter (RG4 x 3)	2.02	1.42	2.04	–	–	2.55	2.98	–	–
125 x 100 Rectangular box gutter (RG5 x 4)	3.91	1.65	2.44	4.21	–	3.04	4.09	5.26	–
150 x 100 Rectangular box gutter (RG6 x 4)	4.68	1.65	2.44	4.21	6.32	3.04	4.09	5.26	7.79
150 x 150 Rectangular box gutter (RG6 x 6)	8.63	2.02	2.98	5.38	11.60	3.73	5.01	6.72	14.31
200 x 150 Rectangular box gutter (RG8 x 6)	11.47	2.02	2.98	5.38	12.10	3.73	5.01	6.72	14.71
300 x 200 Rectangular box gutter (RG12 x 8)	26.47	2.33	3.44	6.21	13.97	4.31	5.78	7.76	16.99
135mm Serpentine HR gutter (SG/135)	1.34	1.23	1.65	1.98	–	2.06	2.43	2.48	–
175mm Serpentine HR gutter (SG/175)	2.57	1.49	2.18	3.47	4.75	2.72	3.69	4.34	6.01
140mm Deep-run gutter (DG/140)	2.19	1.42	2.07	3.03	–	2.59	3.51	3.79	–