Metal Rainwater Outlets

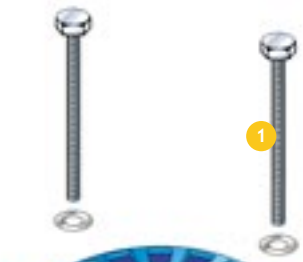
Introduction to Anti-Vortex Outlets

Main Characteristics

Enhanced Performance

Harmer rainwater outlets provide, with the Harmer Roof AV range, anti-vortex performance from an economic, general purpose range of outlets. Harmer Roof AV incorporates a patented baffle within the grating, to prevent water swirl and air entrapment, enabling the outlet to drain at 90% of its pipe capacity.

The performance of AV outlets accelerates as the depth of water at the outlet or rainfall intensity increases. The unique high flow performance of Harmer Roof AV outlets demands that each outlet is connected to a dedicated or individual rainwater stack. AV outlets should be used for securing optimum performance when connected to individual downpipes, and not as part of a managed rainwater system.



1 Bolts and Washers

Stainless steel

2 AV Grate

Tamper proof, secured to clamping ring by two pocketed stainless steel bolts

3 Clamping Ring

Designed to secure the waterproof membrane to the outlet body, it is fixed to the outlet body with two stainless steel fixing studs

4 Outlet Body

Screwed, through flange, to supporting structure

Key Benefits of the Harmer Roof AV Range:

- Drains up to 40% more roof area than conventional gravity outlet.
- AV can be used with any connecting pipework material, and all popular pipework sizes.
- Easy installation into roofs and gutters using bituminous and single ply waterproofing systems.
- High flow performance with increasing head of water at the outlet.
- Ensures 90% efficiency of outlet capacity.
- Special retro-gulley for flat roof refurbishment is also available.
- Multi-gulley available for angled discharge.

Anti-Vortex Outlets

Vertical Spigot Outlet

Harmer Roof AV Vertical Spigot rainwater outlets are designed for use with flat roof structures using either insitu cast concrete, timber and lightweight metal deck construction. Harmer Roof outlets are ideal for connection to continuous waterproofing systems using single ply membranes, mastic asphalt or high performance built up felt.

Materials

Harmer Roof AV Vertical Spigot outlets are available in cast aluminium or gunmetal. Gunmetal outlets should be specified for copper or lead-clad roofs,or slate roofs using copper nails.

Aluminium outlets are cast in LM6 aluminium silicon alloy to BS 1490: 1988.

Gunmetal outlets are the same design as aluminium but are cast in 85/5/5/5 leaded gunmetal to BS EN 1982: 1999 - CC491K.

Foamed insulation is available as an option for both aluminium and gunmetal vertical spigot outlets.

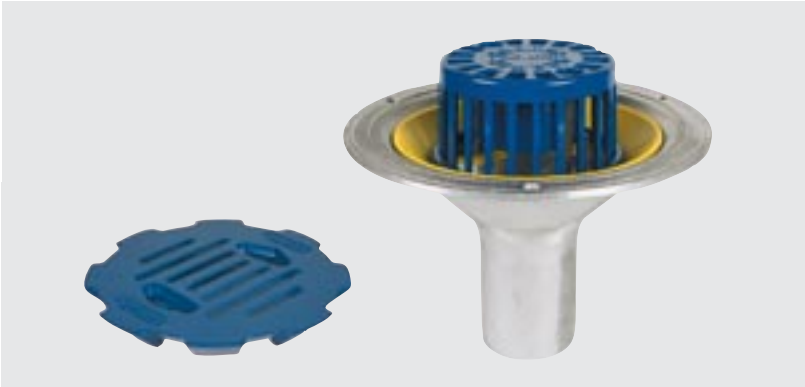
Connection to Pipework

Vertical Spigot outlets are suitable for direct connection to:

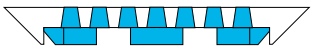
- Cast iron pipework to EN 877 and BS 416: 1973 with appropriate coupling.
- HDPE pipework with appropriate coupling.
- PVC O-ring socketed pipe to BS 4514: 1983 (300, 400 and 600 outlets only).

Grates

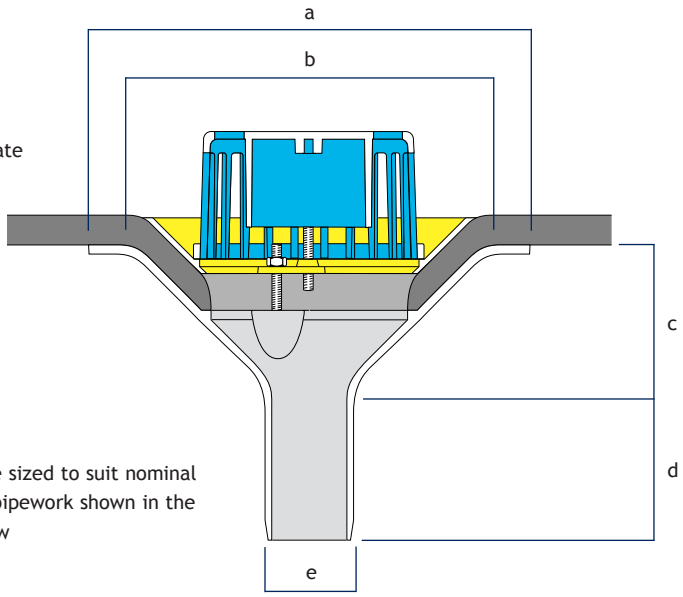
Harmer AV rainwater outlets are designed to receive either domical or flate grates. Flat grates should be used if the outlet occurs in an area which is subject to pedestrian traffic. These grates are also designed for use in inverted roof constructions, where paving slabs on special Harmer paving slab supports are used to ballast the insulation. Rainwater drains between the open joints of the paving to the concealed outlets beneath.



Flat grate (optional)



Domical grate



Spigots are sized to suit nominal diameter pipework shown in the table below

Table of Dimensions

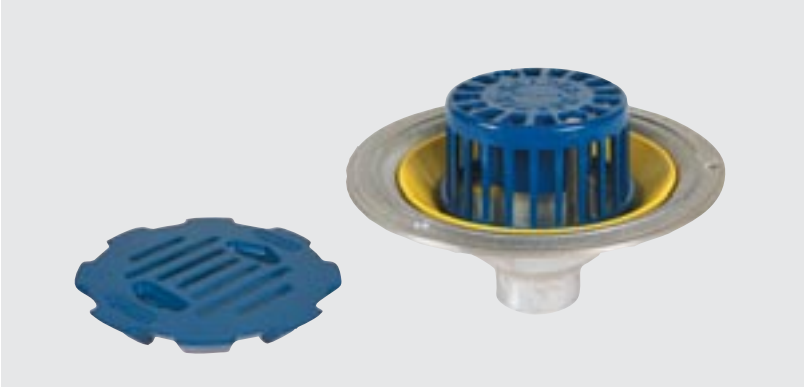
Outlet ordering code (For flat grate, add /F to code reference)	AV200	AV300	AV400	AV600
Pipe dia (nominal)	(mm) 50	(mm) 75	(mm) 100	(mm) 150
a	292	292	380	380
b	233	233	305	305
c	98	88	122	98
d	98	108	122	145
e	60	83	110	160

Note:
A range of accessories is available for use with special detail requirements.
See pages 24-26.

Anti-Vortex Outlets

Vertical Screw Outlet

Harmer Roof AV Vertical Screw rainwater outlets are designed for use with flat roof structures using either insitu cast concrete, timber and lightweight metal deck construction. Harmer Roof outlets are ideal for connection to continuous waterproofing systems using single ply membranes, mastic asphalt or high performance built up felt.



Materials

Harmer Roof AV Vertical Screw outlets are available in cast aluminium or gunmetal. Gunmetal outlets should be specified for copper, lead-clad roofs and for connection to copper pipework, or slate roofs using copper nails.

Aluminium outlets are cast in LM6 aluminium silicon alloy to BS 1490: 1988.

Gunmetal outlets are the same design as aluminium but are cast in 85/5/5/5 leaded gunmetal to BS EN 1982: 1999 - CC491K.

Optional foamed insulation is available for both aluminium and gunmetal outlets.

Connection to Pipework

Vertical Screw outlets have a female socket with parallel thread to BS 21: 1985 for direct connection to threaded tube conforming with BS 1387:1985. This tube is supplied with BS 21: 1985 taper male thread which ensures a completely watertight joint when screwed home into the socket outlet.

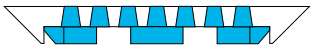
Screw outlets are particularly recommended where a connection to the outlet occurs within the thickness of a concrete slab. In such cases, a threaded connection will create a completely gas-tight seal within the slab.

Harmer Roof AV screw outlets can be connected to socketed and socketless cast iron pipework, HDPE pipework and PVC pipework by means of the Harmer Roof screw threaded adaptor with appropriate coupling. (See pages 6 and 26).

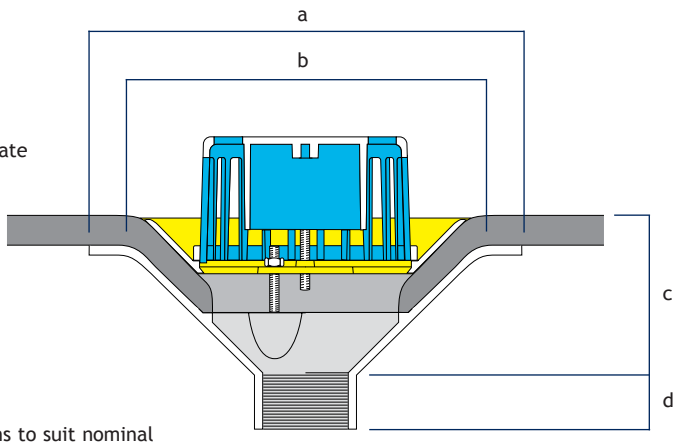
Grates

Harmer AV rainwater outlets are designed to receive either domical or flate grates. Flat grates should be used if the outlet occurs in an area which is subject to pedestrian traffic. These grates are also designed for use in inverted roof constructions, where paving slabs on special Harmer paving slab supports are used to ballast the insulation. Rainwater drains between the open joints of the paving to the concealed outlets beneath.

Flat grate (optional)



Domical grate



Connections to suit nominal diameter pipe sizes shown in the table below

Table of Dimensions

Outlet ordering code (For flat grate, add /F to code reference)	AV200T	AV300T	AV400T	AV600T
Pipe dia (nominal)	(mm) 50	(mm) 75	(mm) 100	(mm) 150
a	292	292	380	380
b	234	234	305	305
c	86	76	95	76
d	35	45	38	38

Note:
A range of accessories is available for use with special detail requirements. See pages 24-26.

Retro-Gulley Outlet

Harmer Roof AV Retro-Gulley outlets are designed to fit within the existing outlet and pipework of the roof which is being upgraded.

The use of AV increases flow performance at the outlet location regardless of pipe diameter downsizing by introduction of the retropipe.

There is no need to remove the old rainwater outlet.

Because of minimal disturbance and the ease with which the Retro-Gulley is fitted, it represents an extremely cost-effective and efficient solution to flat roof upgrading.

Materials

The outlet body is in diecast LM6 aluminium silicon alloy to BS 1490: 1988, and incorporates a welded 300mm aluminium tail pipe. The tail pipe, cut to the required length, is simply inserted through the existing outlet, into existing pipework, and sealed by means of the Harmer Roof AV special multi-fin pipe seal. This seal creates a watertight junction between existing pipework and the Retro-Gulley tail pipe.

The outlet body's wide fixing flange incorporates concentric grooves which enhance the bond with roofing felts or asphalt.

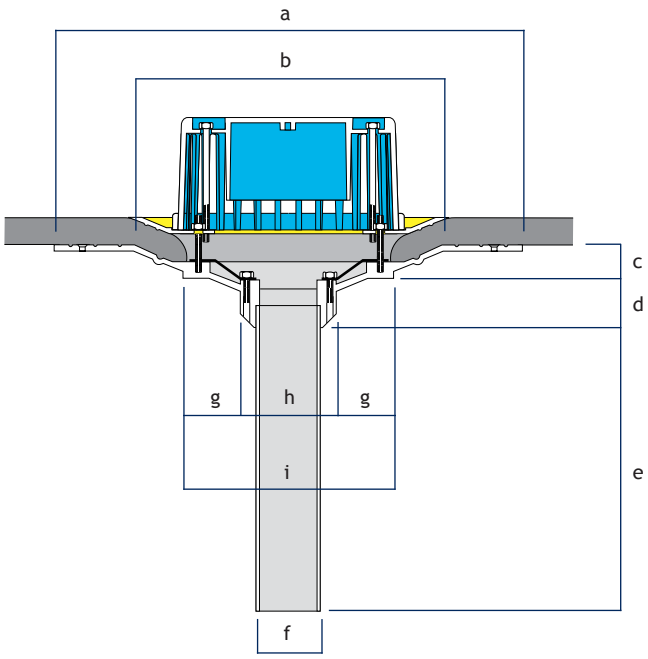
An LM6 aluminium silicon clamping ring, also has a ridged under-surface for improved bond with roofing membranes.

Two sealable ports in the outlet body are designed for injection of PU foam to fill the void between old and new outlet.

Connection to Pipework

The Retro-Gulley may be used for any type of warm roof refurbishment and with any flat roof waterproofing system. 75mm and 100mm pipework options are available, and will accommodate variations on pipe internal diameter from PVC through to cast iron pipe systems.

The AV Retro-Gulley has been designed in conjunction with the Flat Roofing Contractors Advisory Board.



Existing Pipe Diameter Ranges Suitable for Connection to AV Retro-Gulley

Outlet ordering code	Existing pipework internal diameter (mm)
RAV75	71.5 – 78.5
RAV100	97.0 – 104.0

Table of Dimensions

Outlet ordering code	RAV75	RAV100
	(mm)	(mm)
Pipe dia (nominal)	75	100
a	456	456
b	304	304
c	34	34
d	46	46
e	266	266
f	63.5	88.9
g	55	42
h	95	120
i	205	205

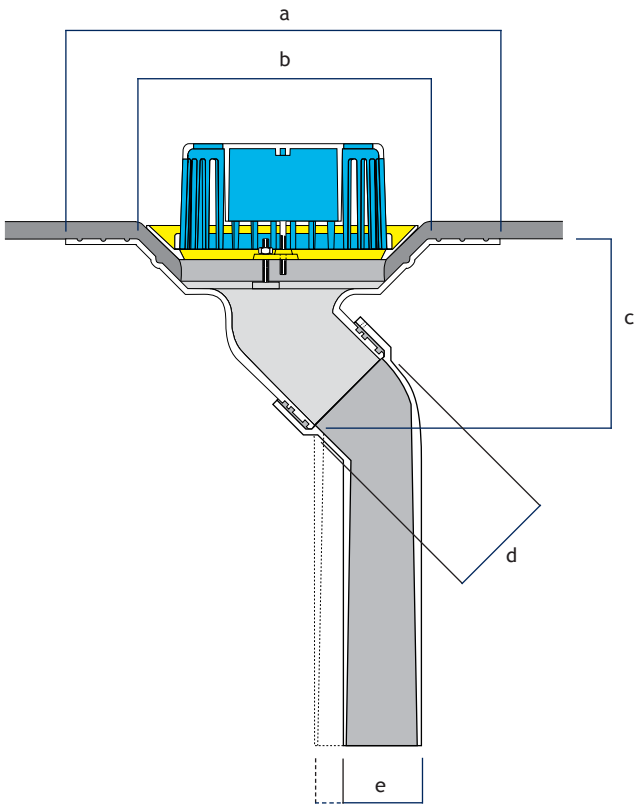
Note:
A range of accessories is available for use with special detail requirements.
See pages 24-26.

Anti-Vortex Outlets

Multi-Gulley Outlet

Harmer Roof AV Multi-Gulley outlets are designed to provide multidirectional drainage. Rotated on site, the interchangeable spigot pipe allows for any angled outflow from vertical to horizontal. This flexibility also affords easier alignment of pipe systems.

Interchangeable spigots lock onto the single size outlet body, yet enable connections to 75mm or 100mm pipework to be made. The special sump design of the outlet body works in conjunction with the anti-vortex grate to provide optimum rainwater movement. The Multi-Gulley has been designed in close co-operation with the Flat Roofing Contractors Advisory Board. The fixing design extends the use of the Multi-Gulley to built-up roofing, single ply and mastic asphalt waterproofing.



Materials

Harmer Roof AV Multi-Gulley outlets are only available in cast aluminium.

Aluminium outlets are cast in LM6 aluminium silicon alloy to BS 1490:1988

Connection to pipework

The Multi-Gulley outlets are suitable for direct connection to:

- Cast iron pipework to EN 877 and BS 416: 1973 with appropriate coupling.
- HDPE pipework with appropriate coupling.
- PVC O-ring socketed pipe to BS 4514: 1983.

Table of Dimensions

Outlet ordering code	MAV75	MAV100
	(mm)	(mm)
Pipe dia (nominal)	75	100
a	460	460
b	305	305
c	201	201
d	115	115
e	83	110

Note:
A range of accessories is available for use with special detail requirements.
See pages 24-26.

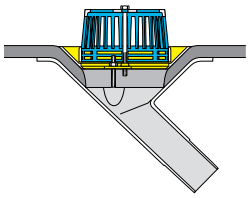
Introduction to Detail Outlets

Main Characteristics

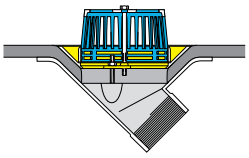
The Harmer Roof Detail range includes outlets to cover all the awkward detailing situations that occur in building design and in refurbishment.

Harmer Roof Detail outlets incorporate all the key features inherent in the Alumasc design approach to trouble-free flat roof drainage:

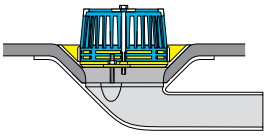
- Integral and generously proportioned sump ensures an adequate head of water for a steady flow into the rainwater pipe.
- Clamp fixing of the waterproof membrane to the sides of the sump completely eliminates any risk of leakage through capillary action or back pressure.
- Elimination of flashings means there is nothing which might reduce the effective bore of the rainwater pipe and restrict the flow of water.
- Connection to all standard sizes of pipework.



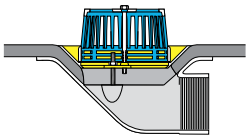
45° Spigot Outlet



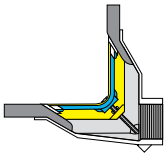
45° Screw Outlet



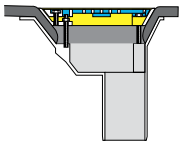
90° Spigot Outlet



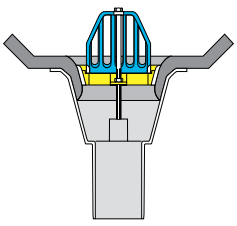
90° Screw Outlet



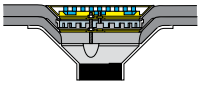
Two-way Outlet



Balcony Outlet



Gulley Outlet



Car Park Outlet

Areas of Application

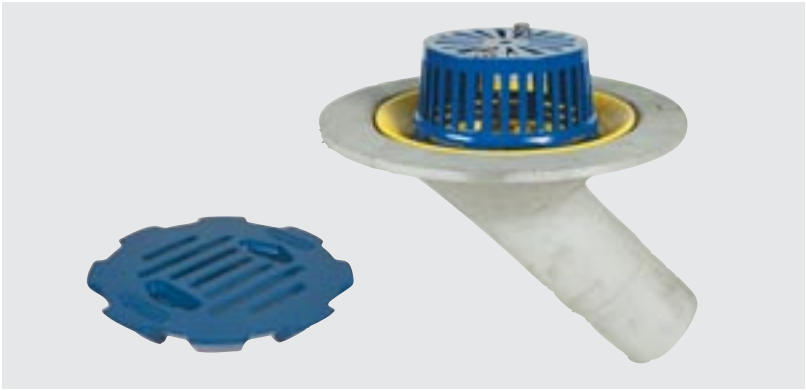
Harmer Roof Detail includes outlets specially designed for the following situations:

- Spigot or Screw threaded aluminium outlets cast in LM6 aluminium alloy for connection to drainage pipework at 45° and 90°.
- Two-way screw threaded outlets cast in LM6 aluminium alloy for connection to pipework through a parapet. Two-way outlets can be installed to provide either vertical or horizontal take-off, and are particularly suitable for parapet type applications.
- Balcony spigot outlets cast in LM6 aluminium alloy for balcony drainage or similar applications. Supplied with a flat grate the balcony outlet is ideal for use in areas of pedestrian access. Grates can be hole punched to receive 50, 75 or 100mm diameter rainwater down pipes.
- Gulley spigot outlets cast in LM6 aluminium alloy for narrow gutter and gulley drainage where an outlet narrower than the standard AV outlet is required.
- Screw threaded car park and service deck drains cast in LM6 aluminium alloy for drainage requirements in multi-level car park and utility areas.
- All patterns of outlets can be manufactured in cast gunmetal alloy, reference CC491K, where outlet installation is required near to or within copper or lead roofing systems.

Detail Outlets

45° Spigot Outlet

Harmer Roof Detail 45° Spigot rainwater outlets are designed for use with flat roof structures using either insitu cast concrete, timber and lightweight metal deck construction. Harmer Roof outlets are ideal for connection to continuous waterproofing systems using single ply membranes, mastic asphalt or high performance built up felt.



Materials

Harmer Roof Detail 45° Spigot outlets are available in cast aluminium or gunmetal. Gunmetal outlets should be specified for copper, lead-clad roofs or slate roofs using copper nails.

Aluminium outlets are cast in LM6 aluminium silicon alloy to BS 1490: 1988.

Gunmetal outlets are the same design as aluminium but are cast in 85/5/5/5 leaded gunmetal to BS EN 1982: 1999 - CC491K.

Connection to Pipework

45° Spigot outlets are suitable for direct connection to:

- Cast iron pipework to EN 877 and BS 416: 1973 with appropriate coupling.
- HDPE pipework with appropriate coupling.

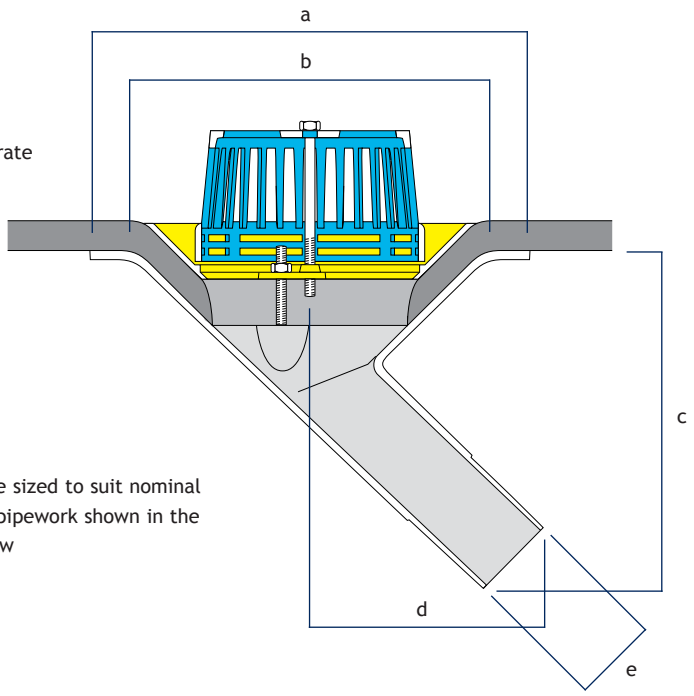
Connection to PVC O-ring socketed pipe to BS 4514: 1983 can be made by means of a proprietary post-formed socket. The socket is preformed onto the PVC pipework and then heat-shrunk over the spigot of the outlet with an O-ring in position. However a simpler, and thus preferred solution in such cases, is to use a Harmer Roof Detail 45° Screw outlet with Harmer Roof Screw Thread Adaptor.

Grates

Harmer Roof Detail 45° Spigot outlets are designed to receive either domical or flat grates. Flat grates should be used if the outlet occurs in an area which is subject to pedestrian traffic. These grates are also designed for use in inverted roof constructions, where paving slabs on special Harmer paving slab supports are used to ballast the insulation. Rainwater drains between the open joints of the paving to the concealed outlets beneath.

Flat grate (optional)

Domical grate



Spigots are sized to suit nominal diameter pipework shown in the table below

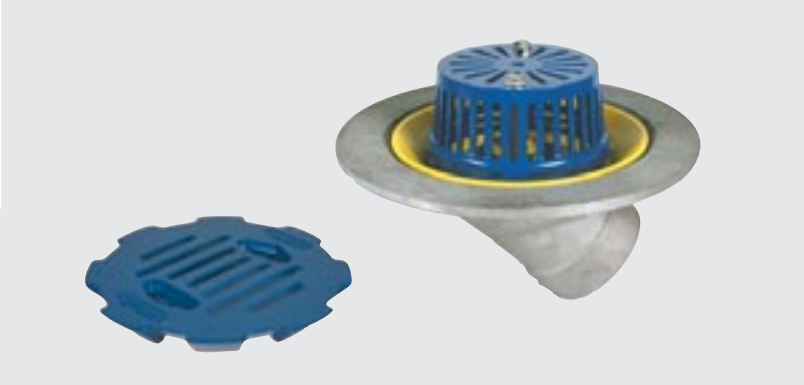
Table of Dimensions

Outlet ordering code (For flat grate, add /F to code reference)	245	345	445
Pipe dia (nominal)	(mm) 50	(mm) 75	(mm) 100
a	305	305	372
b	229	229	305
c	229	235	273
d	175	175	191
e	62	87	114

Note:
A range of accessories is available for use with special detail requirements.
See pages 24-26.

45° Screw Outlet

Harmer Roof Detail 45° Screw rainwater outlets are designed for use with flat roof structures using either insitu cast concrete, timber and lightweight metal deck construction. Harmer Roof outlets are ideal for connection to continuous waterproofing systems using single ply membranes, mastic asphalt or high performance built up felt.



Materials

Harmer Roof Detail 45° Screw outlets are available in cast aluminium or gunmetal. Gunmetal outlets should be specified for copper, lead-clad roofs or slate roofs using copper nails.

Aluminium outlets are cast in LM6 aluminium silicon alloy to BS 1490: 1988.

Gunmetal outlets are the same design as aluminium but are cast in 85/5/5/5 leaded gunmetal to BS EN 1982: 1999 - CC491K.

Connection to Pipework

45° Screw outlets have a female socket with parallel thread to BS 21:1985 for direct connection to threaded tube conforming with BS 1387: 1985. This tube is supplied with BS 21: 1985 taper male thread which ensures a completely watertight joint when screwed home into the socket outlet.

45° Screw outlets are particularly recommended where a connection to the outlet occurs within the thickness of a concrete slab. In such cases a threaded connection will create a completely gas-tight seal within the slab.

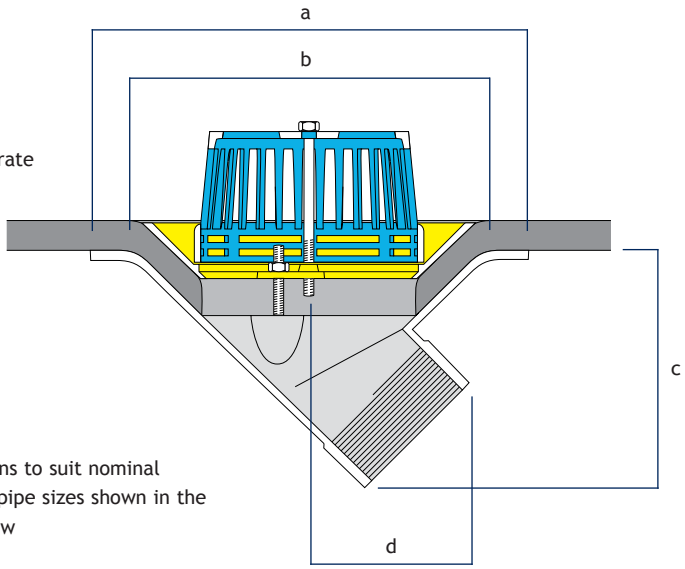
Harmer Roof AV screw outlets can be connected to socketed and socketless cast iron pipework, HDPE pipework and PVC pipework by means of the Harmer Roof Screw Threaded Adaptor with appropriate coupling. (See pages 6 and 26).

Grates

Harmer Roof Detail 45° Screw outlets are designed to receive either domical or flat grates. Flat grates should be used if the outlet occurs in an area which is subject to pedestrian traffic. These grates are also designed for use in inverted roof constructions, where paving slabs on special Harmer paving slab supports are used to ballast the insulation. Rainwater drains between the open joints of the paving of the concealed outlets beneath.

Flat grate (optional)

Domical grate



Connections to suit nominal diameter pipe sizes shown in the table below

Table of Dimensions

Outlet ordering code (For flat grate, add /F to code reference)	245T	345T	445T
	(mm)	(mm)	(mm)
Pipe dia (nominal)	50	75	100
a	305	305	372
b	229	229	305
c	159	159	186
d	109	109	113

Note:
A range of accessories is available for use with special detail requirements.
See pages 24-26.

Detail Outlets

90° Spigot Outlet

Harmer Roof Detail 90° Spigot rainwater outlets are designed for use with flat roof structures using either insitu cast concrete, timber and lightweight metal deck construction. Harmer Roof outlets are ideal for connection to continuous waterproofing systems using single ply membranes, mastic asphalt or high performance built up felt.

Materials

Harmer Roof Detail 90° Spigot outlets are available in cast aluminium or gunmetal. Gunmetal outlets should be specified for copper, lead-clad roofs or slate roofs using copper nails.

Aluminium outlets are cast in LM6 aluminium silicon alloy to BS 1490: 1988.

Gunmetal outlets are the same design as aluminium but are cast in 85/5/5/5 leaded gunmetal to BS EN 1982: 1999 - CC491K.

Connection to Pipework

90° Spigot outlets are suitable for direct connection to:

- Cast iron pipework to EN 877 and BS 416: 1973 with appropriate coupling.
- HDPE pipework with appropriate coupling.
- PVC O-ring socketed pipe to BS 4514: 1983 (390 and 490 outlets only).

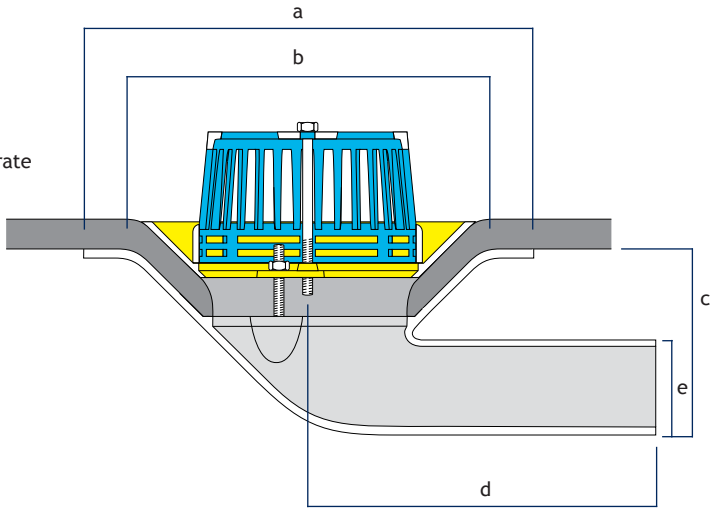
If the connection to the pipework occurs within the thickness of a concrete slab, Harmer Roof Detail 90° Screw outlets are recommended.

Grates

Harmer Roof Detail 90° Spigot outlets are designed to receive either domical or flat grates. Flat grates should be used if the outlet occurs in an area which is subject to pedestrian traffic. These grates are also designed for use in inverted roof constructions, where paving slabs on special Harmer paving slab supports are used to ballast the insulation. Rainwater drains between the open joints of the paving to the concealed outlets beneath.

Flat grate (optional)

Domical grate



Spigots are sized to suit nominal diameter pipework shown in the table below

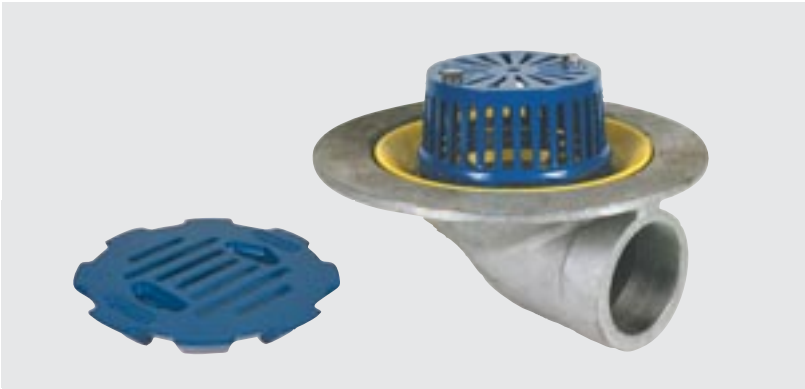
Table of Dimensions

Outlet ordering code (For flat grate, add /F to code reference)	290	390	490
Pipe dia (nominal)	(mm) 50	(mm) 75	(mm) 100
a	305	329	405
b	229	229	305
c	124	121	142
d	232	267	285
e	62	83	110

Note:
A range of accessories is available for use with special detail requirements.
See pages 24-26.

90° Screw Outlet

Harmer Roof Detail 90° Screw rainwater outlets are designed for use with flat roof structures using either insitu cast concrete, timber and lightweight metal deck construction. Harmer Roof outlets are ideal for connection to continuous waterproofing systems using single ply membranes, mastic asphalt or high performance built up felt.



Materials

Harmer Roof Detail 90° Screw outlets are available in cast aluminium or gunmetal. Gunmetal outlets should be specified for copper, lead-clad roofs or slate roofs using copper nails.

Aluminium outlets are cast in LM6 aluminium silicon alloy to BS 1490: 1988.

Gunmetal outlets are the same design as aluminium but are cast in 85/5/5/5 leaded gunmetal to BS EN 1982: 1999 - CC491K.

Connection to Pipework

90° Screw outlets have a female socket with parallel thread to BS 21: 1985 for direct connection to threaded tube conforming with BS 1387: 1985. This tube is supplied with BS 21: 1985 taper male thread which ensures a completely watertight joint when screwed home into the socket outlet.

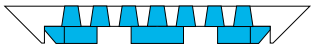
90° Screw outlets are particularly recommended where a connection to the outlet occurs within the thickness of a concrete slab. In such cases a threaded connection will create a completely gas-tight seal within the slab.

Harmer Roof AV screw outlets can be connected to socketed and socketless cast iron pipework, HDPE pipework and PVC pipework by means of the Harmer Roof Screw Threaded Adaptor with appropriate coupling. (See pages 6 and 26).

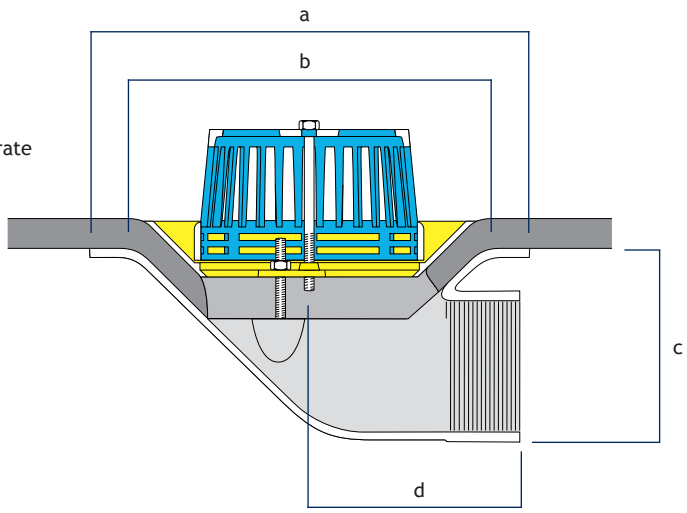
Grates

Harmer Roof Detail 90° Screw outlets are designed to receive either domical or flat grates. Flat grates should be used if the outlet occurs in an area which is subject to pedestrian traffic. These grates are also designed for use in inverted roof constructions, where paving slabs on special Harmer paving slab supports are used to ballast the insulation. Rainwater drains between the open joints of the paving to the concealed outlets beneath.

Flat grate (optional)



Domical grate



Connections to suit nominal diameter pipe sizes shown in the table below

Table of Dimensions

Outlet ordering code (For flat grate, add /F to code reference)	290T	390T	490T	690T
Pipe dia (nominal)	(mm) 50	(mm) 75	(mm) 100	(mm) 150
a	305	305	356	356
b	229	229	305	305
c	127	127	172	225
d	140	140	152	152

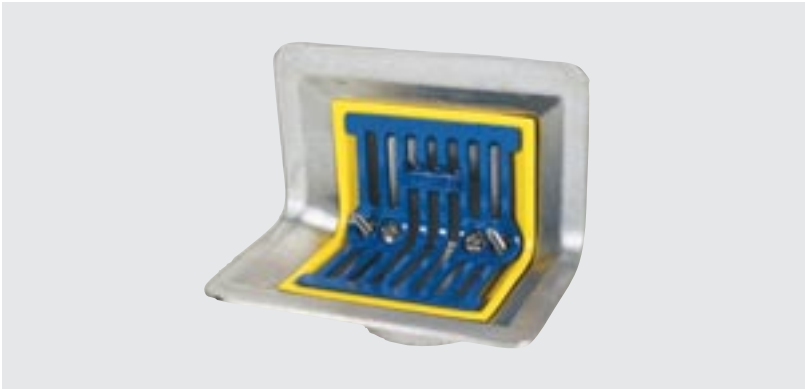
Note:
A range of accessories is available for use with special detail requirements.
See pages 24-26.

Detail Outlets

Two-Way Outlet

Harmer Roof Detail Two-Way outlets are designed for applications where an angle is formed by the intersection of vertical and horizontal surfaces (for example, where a balcony or roof meets a parapet wall). They can be installed to provide either vertical or horizontal take-off.

Two types are available, the regular Two-Way and the mini Two-Way outlet. The latter is specially designed for connection to 50mm pipework in situations where the drainage requirement is small, such as domestic balconies.



Materials

Two-Way outlets are available in cast aluminium or gun metal. Gunmetal outlets should be specified for copper or lead-clad roofs and for connection to copper pipework. Two-way outlets are supplied with screw connection only.

Aluminium outlets are cast in LM6 aluminium silicon alloy to BS 1490: 1988.

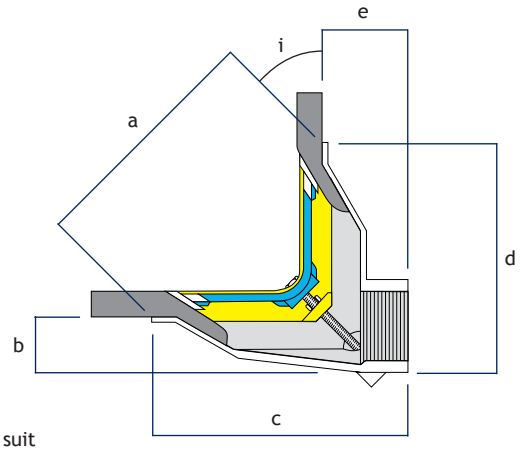
Gunmetal outlets are the same design as aluminium but are cast in 85/5/5/5 leaded gunmetal to BS EN 1982: 1999 - CC491K.

Connection to Pipework

Two-Way outlets have a female socket with parallel thread to BS 21: 1985 for direct connection to threaded tube conforming with BS 1387: 1985. This tube is supplied with BS 21: 1985 taper male thread which ensures a completely watertight joint when screwed home into the socket outlet.

Screw outlets are particularly recommended where a connection to the outlet occurs within the thickness of a concrete slab. In such cases a threaded connection, achieved by use of a Harmer Roof Screw Thread Adaptor, will create a completely gas-tight seal within the slab.

Harmer Two-Way outlets can be connected to socketed and socketless cast iron pipework, HDPE pipework and PVC pipework by means of the Harmer Roof Screw Threaded Adaptor with appropriate coupling. (See pages 6 and 26).



Connections to suit nominal diameter pipe sizes shown in the table below

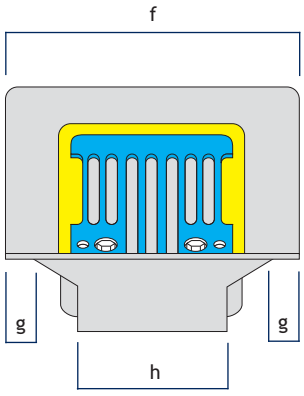


Table of Dimensions

Outlet ordering code	2TW-M	2TW	3TW	4TW	6TW
	(mm)	(mm)	(mm)	(mm)	(mm)
Pipe dia (nominal)	50	50	75	100	150
a	125	204	204	204	280
b	42	50	50	50	45
c	140	214	214	214	265
d	130	191	191	191	250
e	52	70	70	70	73
f	190	255	255	255	316
g	10	20	20	20	25
h	75	75	107	130	181
i	45°	45°	45°	45°	45°

Balcony Outlet

Harmer Roof Detail Balcony outlets are designed for use with concrete balcony structures and are fitted with flat grates for safe drainage in pedestrian accessed areas. The gratings of these outlets can be punched out to receive an incoming rainwater pipe from above thus providing for local as well as continuous drainage in series. Harmer Balcony outlets are ideal for connection to single ply membranes, mastic asphalt or high performance built up felt.

Materials

Harmer Roof Detail Balcony outlets are available in cast aluminium or gunmetal. Gunmetal outlets should be specified for copper or lead-clad roofs for connection to copper pipework.

Aluminium outlets are cast in LM6 aluminium silicon alloy to BS 1490: 1988.

Gunmetal outlets are the same design as aluminium but are cast in 85/5/5/5 leaded gunmetal to BS EN 1982: 1999 - CC491K.

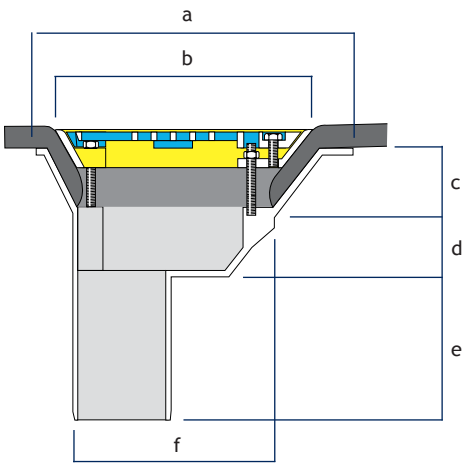
Connection to Pipework

Balcony outlets are suitable for direct connection to:

- Cast iron pipework to BS 416: 1973 or EN 877.
- PVC O-ring socketed pipe to BS 4514: 1983 (3BO and 4BO outlets only).

Flat grates can be supplied with hole punched out to receive 50, 75 or 100mm nominal bore rainwater downpipes. If pre-punched grates are required, add /2H, /3H or /4H to the code reference when ordering. Alternatively, the hole can be cut on site by the installer.

The Balcony outlet can be used with an extension piece. (See pages 24 and 25).



Spigots are sized to suit nominal diameter pipework shown in the table below

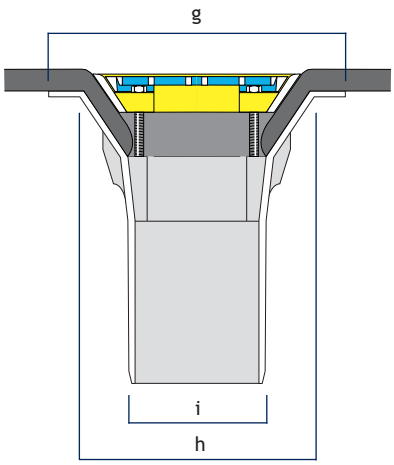


Table of Dimensions

Outlet ordering code	2BO	3BO	4BO
	(mm)	(mm)	(mm)
Pipe dia (nominal)	50	75	100
a	270	205	205
b	205	229	305
c	52	52	52
d	58	58	58
e	125	125	125
f	180	180	180
g	242	242	242
h	186	186	186
i	60	83	110

Detail Outlets

Gulley Outlet

Harmer Roof Detail Gulley outlets should be used in roof constructions incorporating formed drainage channels. They are specially designed to suit restricted width gulleys which are too narrow for standard outlets.

Materials

Gulley outlets are available in cast aluminium or gunmetal. Gunmetal outlets should be specified for copper or lead-clad roofs and for connection to copper pipework.

Aluminium outlets are cast in LM6 aluminium silicon alloy to BS 1490: 1988.

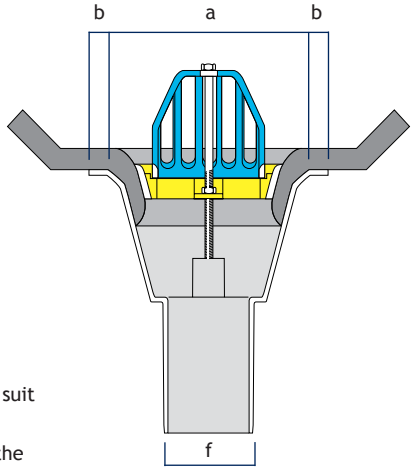
Gunmetal outlets are the same design as aluminium but are cast in 85/5/5/5 leaded gunmetal to BS EN 1982: 1999 - CC491K.

Connection to Pipework

Gulley outlets have a vertical spigot and are suitable for direct connection to:

- Cast iron pipework to BS 416: 1973 or EN 877.
- PVC O-ring socketed pipe to BS 4514: 1983.

The Gulley outlet can be used with an Extension Piece. (See pages 24 and 25).



Spigots are sized to suit nominal diameter pipework shown in the table below

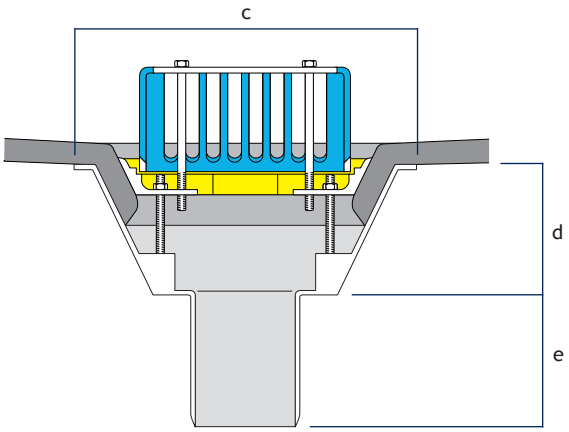


Table of Dimensions

Outlet ordering code	3GO	4GO
	(mm)	(mm)
Pipe dia (nominal)	75	100
a	188	188
b	20	20
c	334	334
d	121	121
e	130	130
f	83	110

Car Park Outlet

Harmer Roof Detail Car Park outlets have been specially designed for installation in parking decks for cars and light commercial vehicles (ie, where there is a maximum single wheel loading of 1 tonne and total weight of approximately 255 kg/m^2).

The screw body is available in two types, flanged and flangeless. The latter is for use in situations that do not require a waterproof membrane or seal.

Materials

Car Park outlets consist of an aluminium vertical screw body with raising ring, two clamping rings and standard flat grate.

Connection to Pipework

The outlet body has a female socket with parallel thread to BS 21: 1985 for direct connection to threaded tube conforming with BS 1387: 1985.

Where the outlet is to be connected to socketed or socketless cast iron pipework, or PVC pipework, Alumasc will supply a special ABS adaptor in a length to suit the thickness of the deck construction. The adaptor is taper-threaded externally at one end to BS 21: 1985, and chamfered at the other end to BS 4514: 1983 spigot dimensions.

The adaptor spigots are suitable for direct connection to:

- Cast iron pipework to BS 416: 1973 or EN 877.
- PVC O-ring socketed pipe to BS 4514: 1983.

Harmer Roof Detail Car Park outlets are designed for installation into either insulated or uninsulated decks.

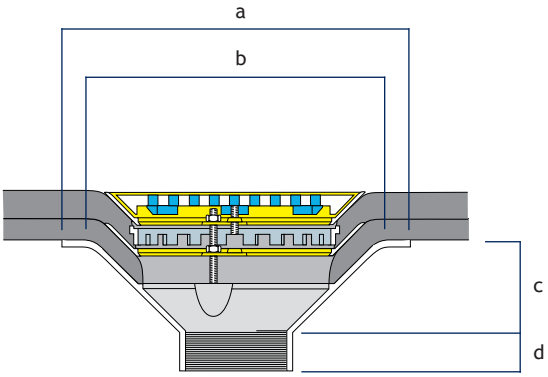


Table of Dimensions

Outlet ordering code	Flanged 400T/CP	Flanged 600T/CP	Flangeless 400T/DD	Flangeless 600T/DD
	(mm)	(mm)	(mm)	(mm)
Pipe dia (nominal)	100	100	150	150
a	380	380	–	–
b	305	305	305	305
c	95	76	95	76
d	38	38	38	38

Accessories

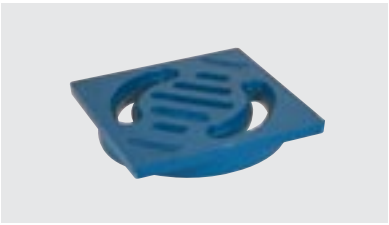
A range of accessories is available for use in connection with Harmer Roof metal rainwater outlets. The accessories are designed to permit the installation of Harmer Roof metal outlets in both typical and less standard roof constructions - warm roofs, inverted roofs, terrace applications, and concealed under raised paving slabs.

Terrace Grates

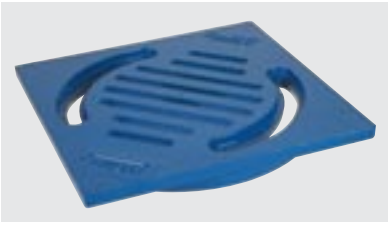
Terrace Grates are designed for installation in terrace tiles or brick paviors. They should be used in connection with Grate Extension Pieces which raise the Terrace Grate to the level of the paved surface. The radius slots in the grate allow for movement through 90° permitting adjustment to suit surrounding paving prior to final tightening.

Materials

Terrace Grates are available in LM6 aluminium silicon alloy to BS 1490: 1988 or 85/5/5/5 leaded gunmetal to BS EN 1982: 1999 - CC491K for use with aluminium or gunmetal outlets respectively.



Terrace Grate 23TG



Terrace Grate 46TG

Grate Extension Pieces Group 1

This group of Grate Extension Pieces is used with the following types of outlet:

- AV Vertical Spigot.
- AV Vertical Screw.
- AV Retro-Gulley.
- AV Multi-Gulley.
- Detail 45° and 90° Spigot.
- Detail 45° and 90° Screw.

They are for applications where it is necessary to raise the level of the grate above the body of the outlet such as in inverted roof construction.

Materials

Grate Extension Pieces are available in LM6 aluminium silicon alloy to BS 1490: 1988 or 85/5/5/5 leaded gunmetal to BS EN 1982: 1999 - CC491K for use with aluminium or gunmetal outlets respectively.

Connection to Outlet

The Grate Extension Pieces will accept domical grates and terrace grates but not standard flat grates. Terrace Grates can be used only in connection with grate extension pieces. The extension pieces can be cut down if necessary to suit the thickness of paving or tiles. This can be done easily on site with a hacksaw, or, if required, extension pieces can be trimmed prior to delivery.

Grate Extension Pieces are supplied with one set of stainless steel extension studs per outlet.

Grate Extension Piece 23EP

Grate Extension Piece 46EP

Grate Extension Pieces Group 2

This group of Grate Extension Pieces is used with the following types of outlet:

- Detail Balcony.
- Detail Gulley.

These Grate Extension Pieces perform the same function as those for AV outlets, and Detail 45°/90° Spigot and Screw outlets.

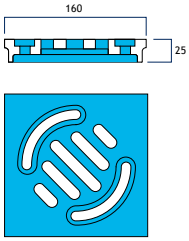
Materials

Both Balcony and Gulley outlet extension pieces are available in LM6 aluminium silicon alloy to BS 1490: 1988 or 85/5/5/5 leaded gunmetal to BS 1400: 1985 for use with aluminium or gunmetal outlets respectively.

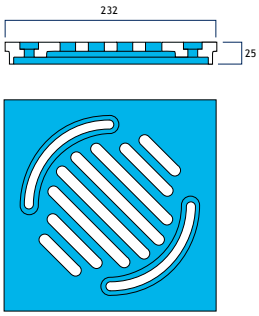
Balcony Outlet Extension Piece BO/EP

Gulley Outlet Extension Piece GO/EP

Terrace Grates (Used With Circular Grate Extension Pieces Below)

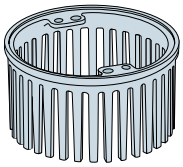


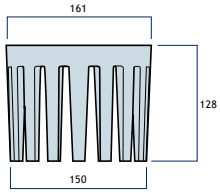
Code reference: **23TG**
(For use with Extension Piece **23EP**)



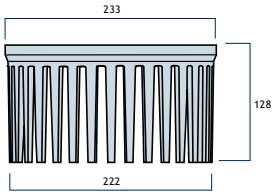
Code reference: **46TG**
(For use with Extension Piece **46EP**)

Grate Extension Pieces Used With AV and Circular Detail Outlets



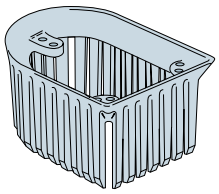


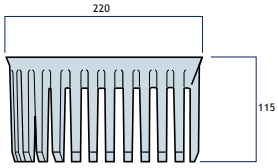
Extension piece code reference: **23EP**



Extension piece code reference: **46EP**

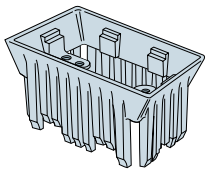
Grate Extension Piece Used With Detail Balcony Outlets

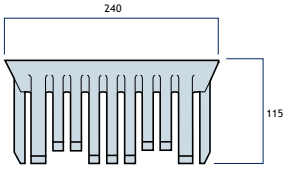




Balcony outlet extension piece code reference: **BO/EP**

Grate Extension Piece Used With Detail Gulley Outlets





Gulley outlet extension piece code reference: **GO/EP**

Matching Outlets With Accessories

Accessory code reference	Outlet code reference
23EP	AV Outlets
	AV 200, AV300, AV200T, AV300T
	Detail Outlets
	245, 345, 245T, 345T, 290, 390, 290T, 390T
46EP	AV Outlets
	AV400, AV600, AV400T, AV600T, RAV75, RAV100, MAV75, MAV100
	Detail Outlets
	445, 445T, 490, 490T, 690T
BO/EP	Detail Outlets
	2BO, 3BO, 4BO
GO/EP	Detail Outlets
	3GO, 4GO

Accessories

Screw Thread to Spigot Adaptor

The Screw Thread Adaptor has been designed to facilitate the connection of Harmer Roof AV and Detail screw-threaded metal rainwater outlets to PVC pipework. The adaptor is suitable for connection with all types of pipe systems and presents an economic alternative to using a short length of steel gas tube to BS 1387: 1985 in the case of cast iron socketed or socketless systems. (See page 6).

Materials

The Screw Thread Adaptor, made of ABS plastic, is supplied in 305mm lengths, taper-threaded externally at one end to BS 21: 1985 and chamfered at the other end to BS 4514: 1983 spigot dimensions. Sizes are available to suit 50, 75, 100 and 150mm nominal bore pipework.

Connection to Pipework

The Screw Thread Adaptor is screwed into the base of the outlet using a ptfe tape to obtain a gas-tight seal. The spigot end of the adaptor can then be connected to the pipe socket. If necessary, the length of the spigot end of the adaptor can be reduced by cutting as required with a fine toothed saw.

The spigots of Harmer Roof Screw Thread Adaptors are suitable for direct connection to:

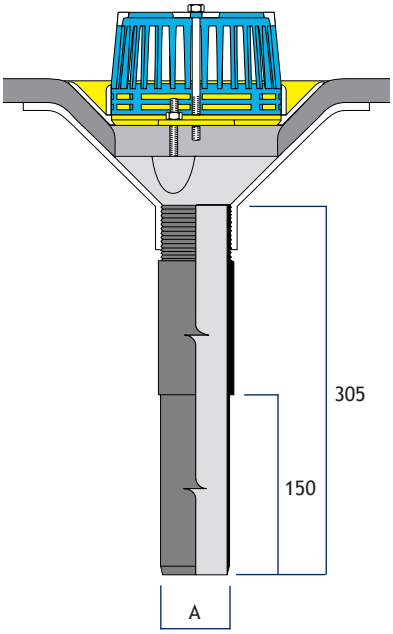
- Cast iron pipework to EN 877 and BS 416: 1973.
- HDPE pipework with appropriate couplings.
- PVC O-ring socketed pipe to BS 4514: 1983.

Table of Dimensions

Code reference	Nominal bore A (mm)
2ADP	50
3ADP	75
4ADP	100
6ADP	150

Note:
Screw Tread Adpators are available with a longer tail for use in deep slabs. Add **L** to code reference and state required length.

Screw Thread Adaptors
2ADP, 3ADP, 4ADP and 6ADP



The nominal bore A of theScrew Thread Adaptor varies in diameter, and is shown in the table below.

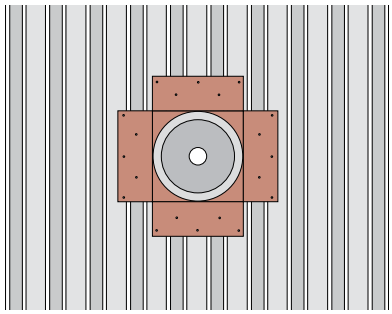
Metal Deck Support Plates

Harmer Roof pressed Metal Support Plates are recommended for use where Harmer Roof metal and insulated rainwater outlets are installed in metal deck roof construction. They are designed to provide a secure and stable junction between roof deck and rainwater outlet.

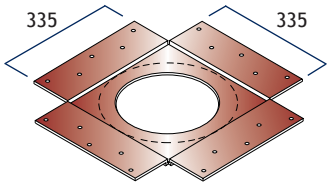
The Support Plates incorporate pre-punched holes for ease of fixing. Two sizes are available. The 335 x 335mm plate will suit 50 and 75mm metal outlets and all insulated outlets. The 415 x 415mm plate is designed for all 100 and 150mm metal outlets.

Materials

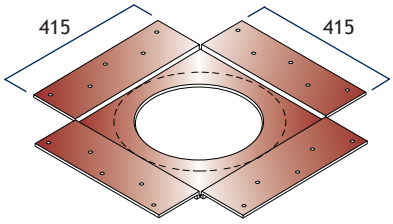
The Support Plates are manufactured from 1.5mm (16 gauge) steel sheet, finished in red oxide. They are suitable for installation in all types of metal deck roofing.



Plan view of Harmer outlet body in the Metal Deck Support Plate fixed to the structural metal deck.



Code reference **SP1**



Code reference **SP2**