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Uniclass	G581
CI/SfB	(52.5)

October 2010

Alumasc

Harmer Roof Outlets

Roof Drainage Systems

alumasc
EXTERIOR BUILDING PRODUCTS

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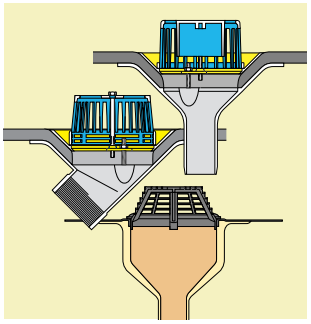

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About Alumasc

Alumasc Exterior Building Products Ltd

Alumasc Exterior Building Products (Alumasc) is a leading supplier of premium products and systems for specification, generating an annual turnover in excess of £26 million. The Company has been a major force in the UK construction industry for over 35 years, during which time Alumasc products and systems have been used on some of Europe's most prestigious buildings.

The company is part of the Alumasc Group plc. The Group has over 800 employees, generating turnover in excess of £93 million. The aim is to focus on high quality, environmentally responsible building products within the construction arena in order to deliver first class customer service, long-term solutions and lasting relationships.

By pursuing sustainable building products, systems and manufacturing processes, Alumasc aims to offer specifiers a wide choice of design alternatives, with long-term peace of mind. Recognised brands such as Harmer, Apex, Derbigum, ZinCo, Hydrotech, Firestone and M.R., together with Alumasc's well-known architectural rainwater range have been independently certified, and in some cases have a lifespan in excess of 60 years or for the life of the building.

Alumasc brands are divided into distinct but interrelated groups:

- Rainwater
- Drainage
- Waterproofing
- Façades

Services and Support

Alumasc leads the way in the field of construction product and system manufacture and the delivery of proven solutions. This success is founded on four key areas:

Premium Products

A constantly evolving range of quality proven, world class products and systems, fully accredited to UK, European and North American Standards.

Technical Support

Comprehensive data for specification and use of all products and systems is available in published form, and on the company website. This is backed up by proactive project support, led by specialist area managers and using the latest CAD and calculation technology.

National Stockists

Alumasc rainwater and drainage products are available through a national network of stockists. This allows close control over all matters to ensure first class customer service.

Warranties

Alumasc products come with company backed assurance as to their quality, life expectancy and suitability for purpose, ensuring long-term peace of mind for specifiers and end users.

Quality and Sustainability

Quality: ISO 9001: 2008

Alumasc operates a quality management system which is independently audited to ISO 9001: 2008. The ISO 9001 framework governs the management of many aspects of Alumasc support services, manufacturing and transport operations. Alumasc extends quality management to its network of approved installers for single source accountability and peace of mind.

Environment: ISO 14001: 2004

Alumasc's manufacturing sites are audited to the ISO 14001:2004 Environmental Management Standard. Alumasc is committed to achieving improvements across all of its operating sites, not only as a good neighbour to the surroundings of manufacturing plants, but in the responsible sourcing of raw materials and monitoring of the impact on the environment as a whole.

BREEAM Standards

The BREEAM points system promotes the use of sustainable materials and allows designers to differentiate between products with true ecological credentials and those not achieving the benchmark.

Alumasc's aluminium roof outlets are part of the range of high scoring Alumasc solutions.

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EXTERIOR BUILDING PRODUCTS

CENTRE FOR ASSESMENT LTD ISO 9001

BSI

Harmer Roof Drainage Systems

Introduction

Harmer Roof metal and insulated rainwater outlet systems, offer comprehensive and innovative drainage solutions for all types of flat roof, including those carrying vehicular traffic, and also for low pitch industrial roofing.

All products are manufactured in accordance with certificated quality management systems to the requirements of International Standard BS EN ISO 9001: 2008 – Registration Nos Q 06401 and FM 35898, and British Standard BS 5750: Part 2.

The outlets may be used with, or kept independent of Harmer SML internal pipework which is described in a separate brochure.

Harmer Roof rainwater outlet systems are available in three key groups - Harmer AV, Harmer Detail and Harmer Insulated.

Harmer AV

AV Vertical Spigot or Screw Outlets

Harmer Roof AV Vertical Spigot and Screw outlets provide anti-vortex performance within an economic range of general purpose outlets. They are diecast in LM6 aluminium silicon alloy to BS 1490: 1988. AV outlets are designed for connection to individual downpipes and should not be used in managed rainwater systems.

AV Outlet (Vertical Spigot shown)

AV Retro-Gulley Outlets

Harmer Roof AV Retro-Gulley outlets incorporate anti-vortex performance and are designed for flat roof upgrading without necessitating removal of the old rainwater outlet. The body is diecast in LM6 aluminium silicon alloy as above. The Retro-Gulley aluminium tail pipe connects direct into the existing pipework via the old outlet.

AV Retro-Gulley Outlet

AV Multi-Gulley Outlets

Harmer Roof AV Multi-Gulley outlets incorporate an adjustable spigot that can be rotated to suit any angle of outflow from horizontal to vertical. Interchangeable spigots provide for 75mm or 100mm pipe connections. Bodies and spigots are diecast in LM6 aluminium silicon alloy to BS 1490: 1988.

AV Multi-Gulley Outlet

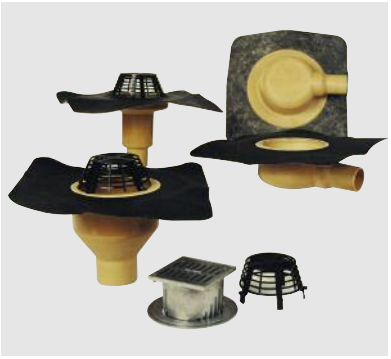
Harmer Detail

Harmer Roof Detail outlets comprise a range designed to solve problematic detailing requirements. The range includes two way, balcony, car park and gulley outlets. Detail outlets are diecast in LM6 aluminium silicon alloy to BS 1490: 1988.

Detail Outlets

Harmer Insulated

Harmer Roof Insulated outlets have a rigid polyurethane foam body with high insulation value. They are ideal for installation in flat roofs to avoid any possibility of condensation forming as a result of cold bridging.



Insulated Outlets

Accessories

There is also a comprehensive range of accessories for Harmer metal and detail systems to ensure the successful installation of Harmer rainwater outlets in most types of roof construction.

Features and Key Benefits

All Harmer Roof metal and insulated rainwater outlets are designed and manufactured to ensure trouble free performance over a long period, in whatever type of roof construction they are incorporated.

Metal Rainwater Outlets

The principal design features and benefits of the Harmer metal rainwater outlet range, which comprises the AV and Detail outlets, are listed below.

Components

- An outlet body with a deep integral sump for controlled flow of water into the pipe.
- Fixing of the waterproof membrane by a clamping ring ensures total integrity of seal.
- Domical grates for Harmer Detail outlets permit a free flow of rainwater while preventing loose chippings or debris from entering the outlet.
- Domical grates for Harmer AV outlets also incorporate a patented baffle to prevent water swirl and air entrapment enabling the outlet to drain at 90% of pipe capacity and up to 40% more roof area than conventional gravity outlets.
- The side fixing of the clamping ring and domical grate to the outlet body, for both Detail and AV grates, ensures that the throat is completely unobstructed to facilitate rodding.
- Optional flat grates are available for trafficked areas.
- Extension pieces can be fitted to gratings in deep set structures.

Materials

Aluminium outlets

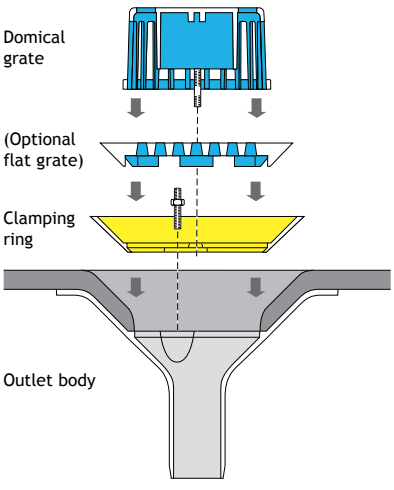
- These are cast in aluminium silicon alloy LM6 to BS 1490:1970 and are suitable for most types of flat roof.
- The aluminium alloy is light in weight and therefore easy to handle on site and during installation. This lightness also makes aluminium outlets suitable for a wide range of lightweight roof decks.
- The alloy is stronger and less brittle than cast iron and is particularly resistant to corrosion, even in marine conditions.

Gunmetal outlets

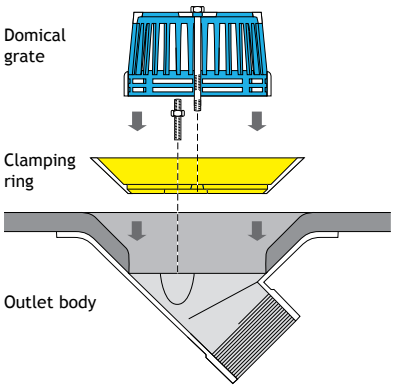
- These are cast in leaded gunmetal 85/5/5/5 to BS 1400-LG2-C. Gunmetal outlets are designed for connection to copper pipework and for installation in copper or lead-clad roofs.

Optional insulation

- A foamed insulation jacket is available for vertical spigot and vertical screw outlets only.



AV Outlet

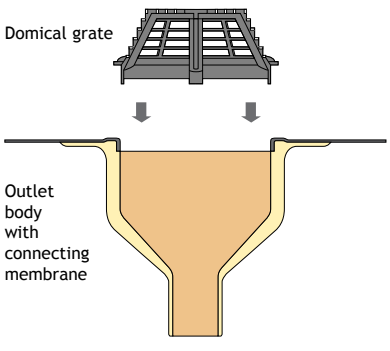


Detail Outlet

Insulated Rainwater Outlets

The principal design features and benefits of the Harmer Insulated rainwater outlet range are listed below.

- A one-piece polyurethane foam body which provides a completely watertight connection between roof membrane and rainwater pipe.
- The outlets are available with a flexible connecting membrane fused to the outlet body, which is then sealed to either single or multi-layer roof membrane systems.
- As an alternative to the connecting membrane, a clamping ring is available for sealing specialised single-ply membranes into the outlet mouth.
- A domical grate permits a free flow of rainwater while preventing loose chippings or debris from entering the outlet.
- The high insulation value of these outlets eliminates the possibility of condensation on the underside of the outlet when used in warm roof constructions.
- Insulated outlets can also be supplied with a heat sensor protected electric element to give the highest measure of protection against ice and snow blockage, and are particularly suitable for installation in areas of permanent shadow or north facing aspects.



Insulated Outlet

Product Selector and Pipe Connection

Harmer AV Outlets

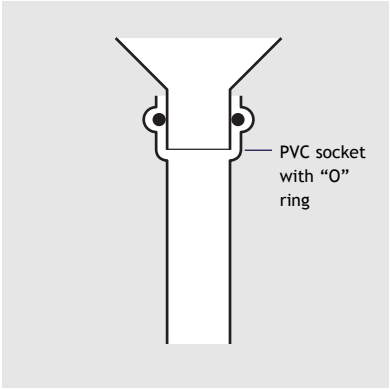
Outlet Type	Code Ref	Pipe Dia (mm)	See Page	Pipe Material & Connection Type		
				Cast Iron	HDPE	uPVC
Vertical Spigot	AV200	50	11	SML coupling	SML coupling	Post formed socket
	AV300	75	11	SML coupling	SML coupling	"O" ring socket
	AV400	100	11	SML coupling	SML coupling	"O" ring socket
	AV600	150	11	SML coupling	SML coupling	"O" ring socket
Vertical Screw	AV200T	50	12	2ADP + SML coupling	2ADP + SML coupling	Harmer adaptor 2ADP
	AV300T	75	12	3ADP + SML coupling	3ADP + SML coupling	Harmer adaptor 3ADP
	AV400T	100	12	4ADP + SML coupling	4ADP + SML coupling	Harmer adaptor 4ADP
	AV600T	150	12	6ADP + SML coupling	6ADP + SML coupling	Harmer adaptor 6ADP
Retro-Gulley	RAV75	75	13	Harmer pipe seal	n/a	Harmer pipe seal
	RAV100	100	13	Harmer pipe seal	n/a	Harmer pipe seal
Multi-Gulley	MAV75	75	14	SML coupling	SML coupling	"O" ring socket
	MAV100	100	14	SML coupling	SML coupling	"O" ring socket

Harmer Detail Outlets

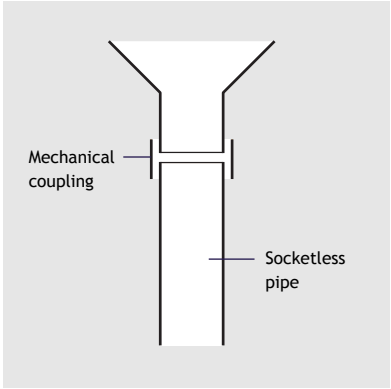
Outlet Type	Code Ref	Pipe Dia (mm)	See Page	Pipe Material & Connection Type		
				Cast Iron	HDPE	uPVC
45° Spigot	245	50	16	SML coupling	SML coupling	Post formed socket
	345	75	16	SML coupling	SML coupling	Post formed socket
	445	100	16	SML coupling	SML coupling	Post formed socket
45° Screw	245T	50	17	2ADP + SML coupling	2ADP + SML coupling	Harmer adaptor 2ADP
	345T	75	17	2ADP + SML coupling	2ADP + SML coupling	Harmer adaptor 3ADP
	445T	100	17	2ADP + SML coupling	2ADP + SML coupling	Harmer adaptor 4ADP
90° Spigot	290	50	18	SML coupling	SML coupling	Post formed socket
	390	75	18	SML coupling	SML coupling	"O" ring socket
	490	100	18	SML coupling	SML coupling	"O" ring socket
90° Screw	290T	50	19	2ADP + SML coupling	2ADP + SML coupling	Harmer adaptor 2ADP
	390T	75	19	3ADP + SML coupling	3ADP + SML coupling	Harmer adaptor 3ADP
	490T	100	19	4ADP + SML coupling	4ADP + SML coupling	Harmer adaptor 4ADP
	690T	150	19	6ADP + SML coupling	6ADP + SML coupling	Harmer adaptor 6ADP
Two-Way	2TW-M	50	20	2ADP + SML coupling	2ADP + SML coupling	Harmer adaptor 2ADP
	2TW	50	20	2ADP + SML coupling	2ADP + SML coupling	Harmer adaptor 2ADP
	3TW	75	20	3ADP + SML coupling	3ADP + SML coupling	Harmer adaptor 3ADP
	4TW	100	20	4ADP + SML coupling	4ADP + SML coupling	Harmer adaptor 4ADP
	6TW	150	20	6ADP + SML coupling	6ADP + SML coupling	Harmer adaptor 6ADP
Balcony	2BO	50	21	SML coupling	SML coupling	Post formed socket
	3BO	75	21	SML coupling	SML coupling	"O" ring socket
	4B0	100	21	SML coupling	SML coupling	"O" ring socket
Gulley	3GO	75	22	SML coupling	SML coupling	"O" ring socket
	4GO	100	22	SML coupling	SML coupling	"O" ring socket
Car Park	400T/CP	100	23	4ADP + SML coupling	4ADP + SML coupling	Harmer adaptor 4ADP
	600T/CP	150	23	6ADP + SML coupling	6ADP + SML coupling	Harmer adaptor 6ADP

Harmer Insulated Outlets

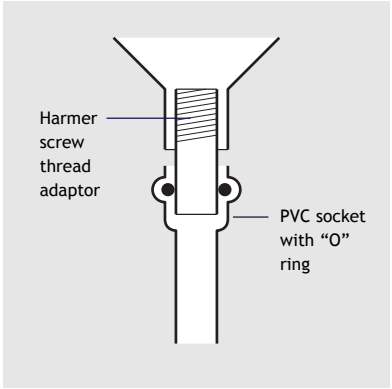
Outlet Type	Code Ref	Pipe Dia (mm)	See Page	Pipe Material & Connection Type		
				Cast Iron	HDPE	uPVC
Vertical Spigot	1000	75	29	SML coupling	SML coupling	"O" ring socket
	1001	100	29	SML coupling	SML coupling	"O" ring socket
	1003	150	29	SML coupling	SML coupling	"O" ring socket
	1004	75	29	SML coupling	SML coupling	"O" ring socket
	1005	100	29	SML coupling	SML coupling	"O" ring socket
	1007	150	29	SML coupling	SML coupling	"O" ring socket
Horizontal Spigot	1008	75	30	SML coupling	SML coupling	"O" ring socket
	1009	100	30	SML coupling	SML coupling	"O" ring socket
	1011	75	30	SML coupling	SML coupling	"O" ring socket
	1012	100	30	SML coupling	SML coupling	"O" ring socket
Graduated Spigot	1017	75	31	SML coupling	SML coupling	"O" ring socket
		100	31	SML coupling	SML coupling	"O" ring socket



Metal or insulated spigot outlet to PVC pipework (See note 3)



Metal spigot outlet to cast iron and HDPE pipework



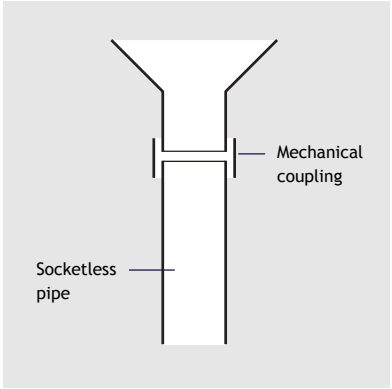
Metal screw outlet to PVC pipework

Notes

1 Domical grates are supplied as standard.
To specify flat grate add /F to code reference.

2 Gunmetal outlets should be specified for use with copper pipework and copper or lead-clad roofing.

3 Connection of 45° spigoted gunmetal outlets, 45° spigoted aluminium outlets and 50mm 90° spigot outlets to pvc pipework requires the use of a socket fitting (eg Key Terrain 126 post formed socket), which is heat shrunk, with an "O" ring in position, over the spigot of the outlet. In such cases it is simpler, and therefore preferable, to use a screw outlet with Harmer screw thread adaptor, thus avoiding the need for a heat shrunk connection.



Insulated spigot outlet to cast iron and HDPE pipework

Product Range Summary

Harmer AV Outlets

A range of general purpose flat roof outlets

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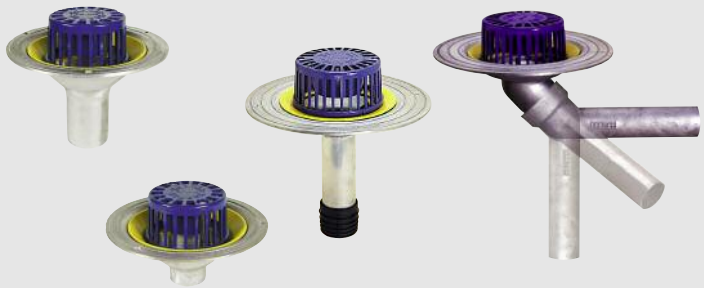

Harmer Detail Outlets

Designed to solve problematic detailing requirement

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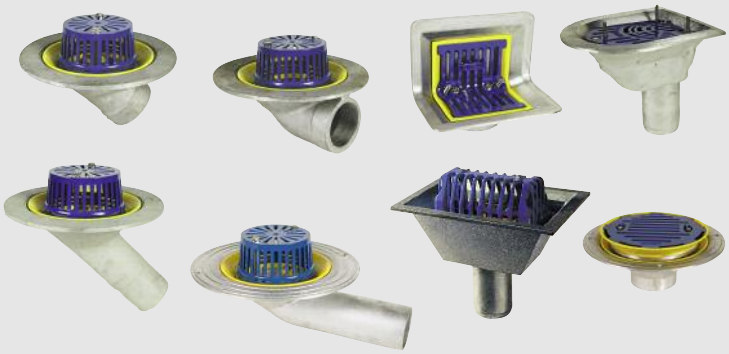


Accessories - Metal Outlets

Pages 24-26

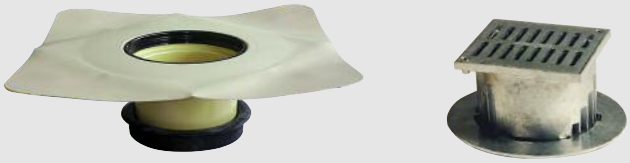
Harmer Insulated Outlets

Designed with high insulation value to avoid condensation resulting from cold bridging

Pages 28-32

Accessories - Insulated Outlets

Page 32



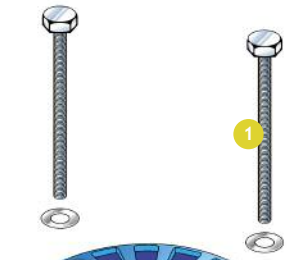
Metal Rainwater Outlets

Introduction to AV Outlets

Main Characteristics

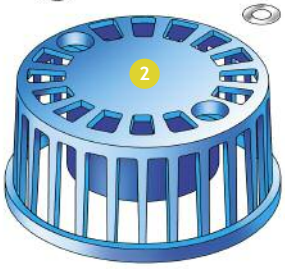
Harmer rainwater outlets provide, with the Harmer Roof AV range, anti-vortex performance from an economic, general purpose range of outlets. Harmer Roof AV incorporates a patented baffle within the grating, to prevent water swirl and air entrapment, enabling the outlet to drain at 90% of its pipe capacity.

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.



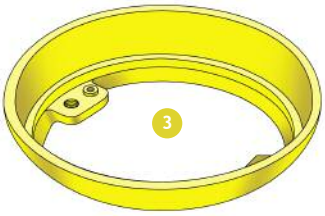
1 Bolts and Washers

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.
- Harmer 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.

Vertical Spigot Outlets

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.

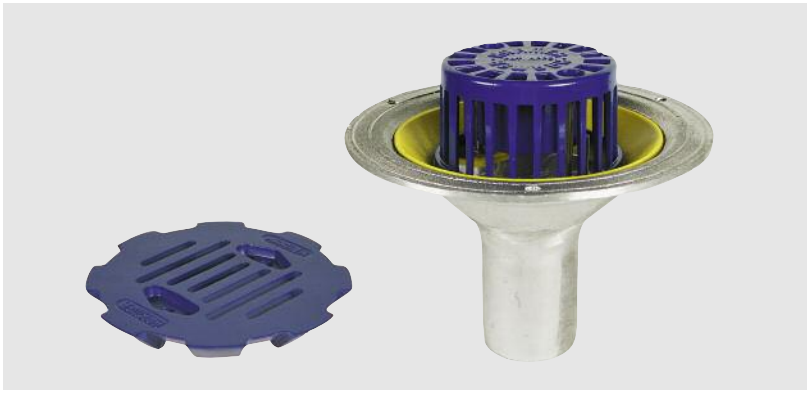
Connection to Pipework

Vertical Spigot outlets are suitable for direct connection to:

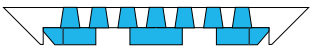
- Cast iron pipework to EN 877 and BS 416: 1973 with appropriate coupling.
- HDPE pipework with appropriate coupling.
- PVC O-ring socketed pipe to BS 4514: 1983 (300, 400 and 600 outlets only).

Grates

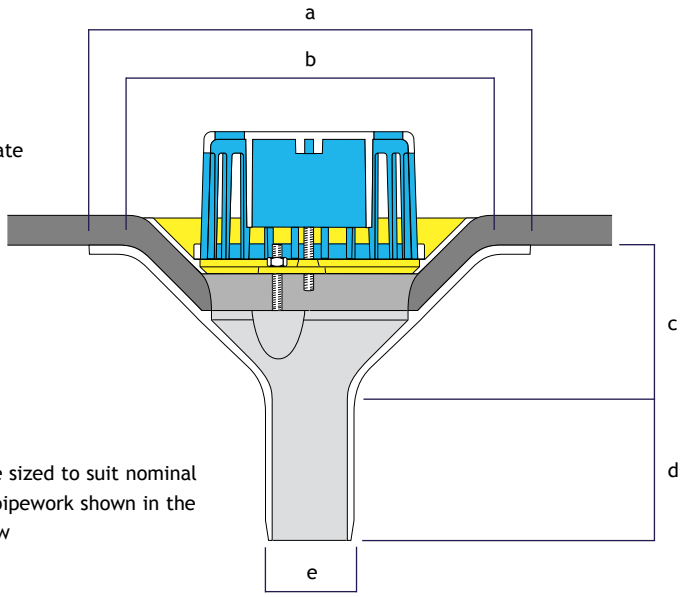
Harmer AV rainwater outlets are designed to receive either domical or flat grates. Flat grates should be used if the outlet occurs in an area which is subject to pedestrian traffic. These grates are also designed for use in inverted roof constructions, where paving slabs on special Harmer paving slab 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

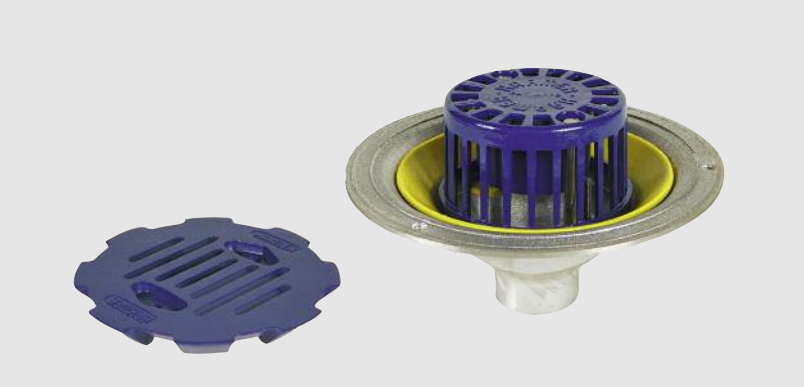
Table of Dimensions

Outlet ordering code (For flat grate, add /F to code reference)	AV200	AV300	AV400	AV600
	(mm)	(mm)	(mm)	(mm)
Pipe dia (nominal)	50	75	100	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.

Vertical Screw Outlets

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.

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.

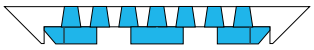
Screw outlets are particularly recommended where a connection to the outlet occurs within the thickness of a concrete slab. In such cases, a threaded connection will create a completely gas-tight seal within the slab.

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).

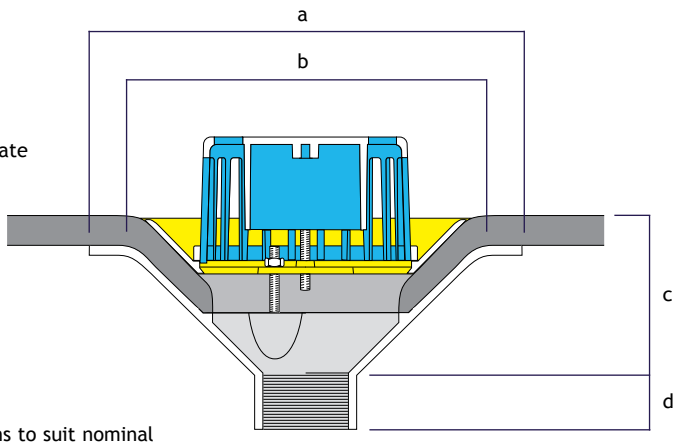
Grates

Harmer AV rainwater outlets are designed to receive either domical or 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)	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 Outlets

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.

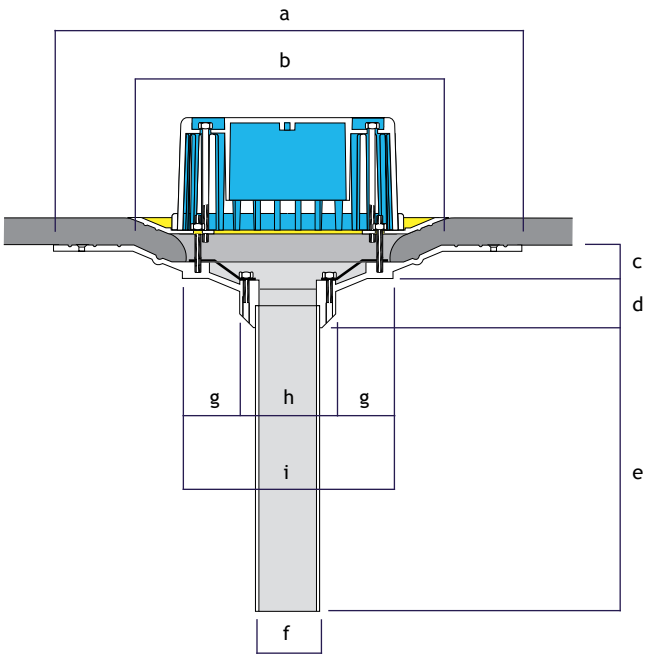
An LM6 aluminium silicon clamping ring, also has a ridged under-surface for improved bond with roofing membranes.

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.

Multi-Gulley Outlets

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.

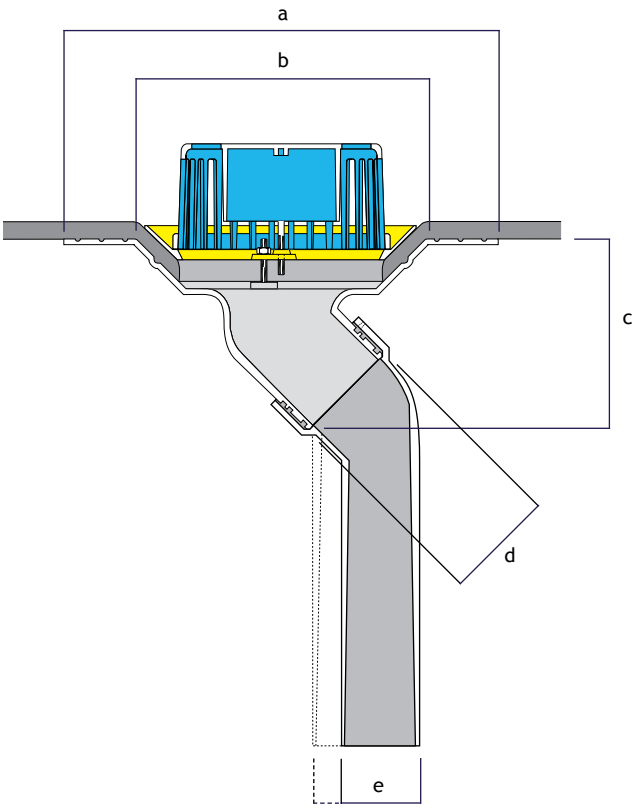


Table of Dimensions

Outlet ordering code (For flat grate, add /F to code reference)	**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.

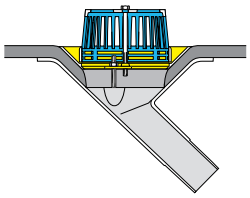
Introduction to Harmer Detail Outlets

Main Characteristics

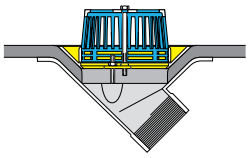
The Harmer Roof Detail range includes outlets to cover all the awkward detailing situations that occur in building design and in refurbishment.

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

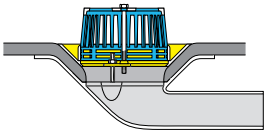
- Integral and generously proportioned sump ensures an adequate head of water for a steady flow into the rainwater pipe.
- Clamp fixing of the waterproof membrane to the sides of the sump completely eliminates any risk of leakage through capillary action or back pressure.
- Elimination of flashings means 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.



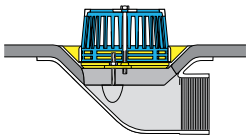
45° Spigot Outlet



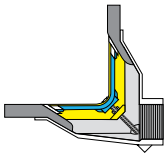
45° Screw Outlet



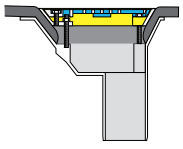
90° Spigot Outlet



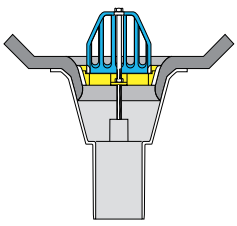
90° Screw Outlet



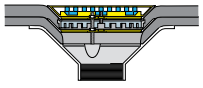
Two-way Outlet



Balcony Outlet



Gulley Outlet



Car Park Outlet

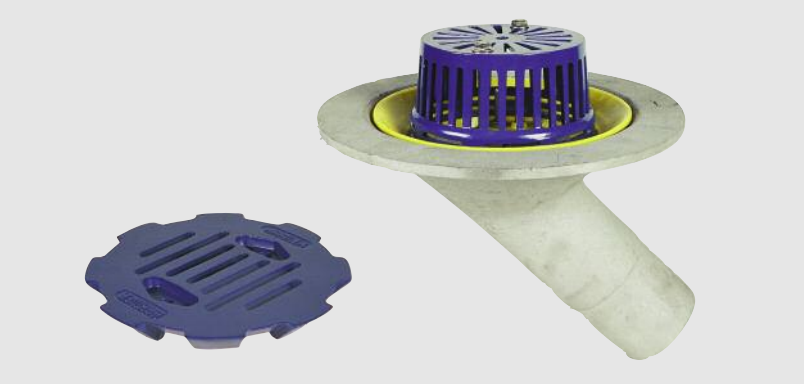
Areas of Application

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.

45° Spigot Outlets

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:

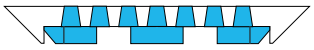
- Cast iron pipework to EN 877 and BS 416: 1973 with appropriate coupling.
- HDPE pipework with appropriate coupling.

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.

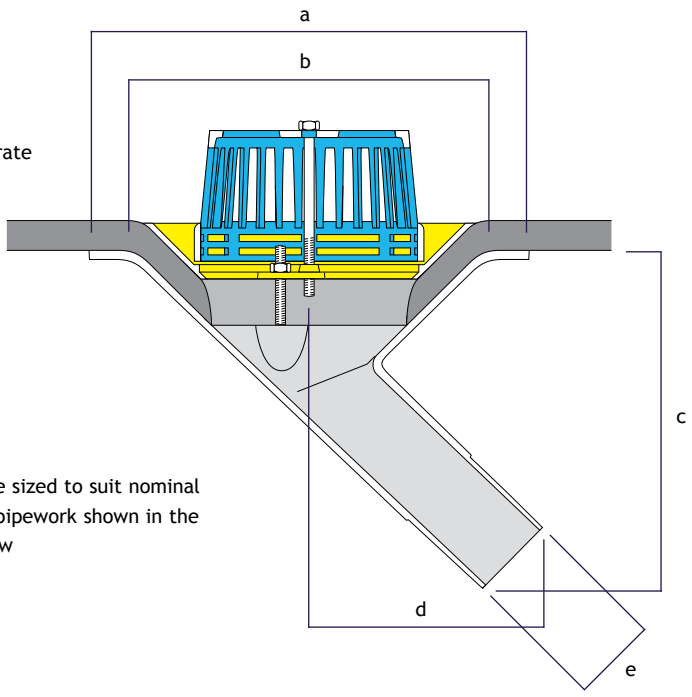
Grates

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

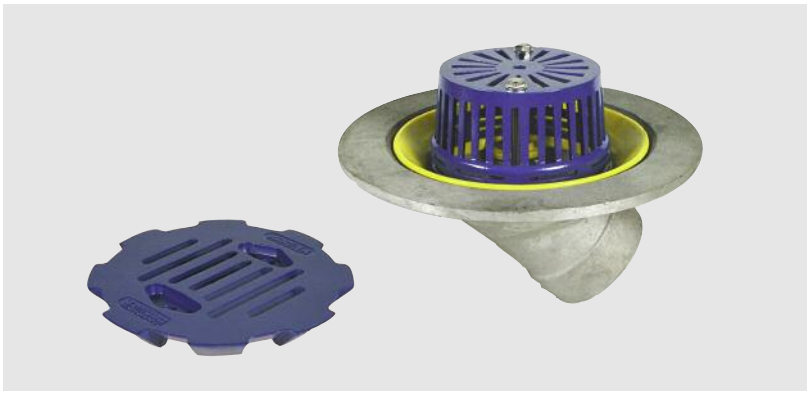
Table of Dimensions

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 Outlets

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.

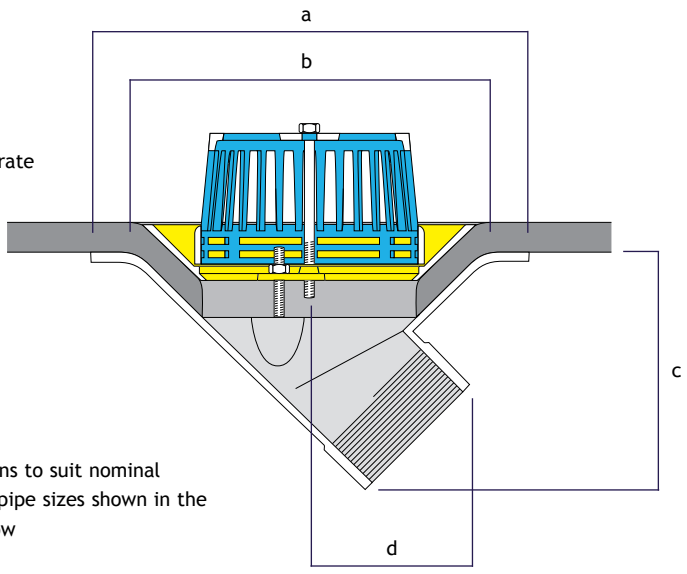
Harmer Roof Detail screw outlets can be connected to socketed and socketless cast iron pipework, HDPE pipework and PVC pipework by means of the Harmer Roof Screw Threaded Adaptor with appropriate coupling. (See pages 6 and 26).

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
Pipe dia (nominal)	(mm) 50	(mm) 75	(mm) 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.

90° Spigot Outlets

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

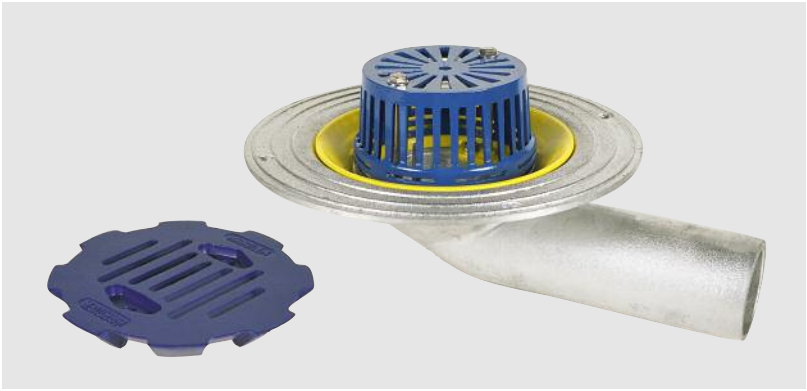
90° Spigot outlets are suitable for direct connection to:

- 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).

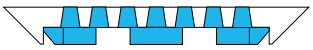
If the connection to the pipework occurs within the thickness of a concrete slab, Harmer Roof Detail 90° Screw outlets are recommended.

Grates

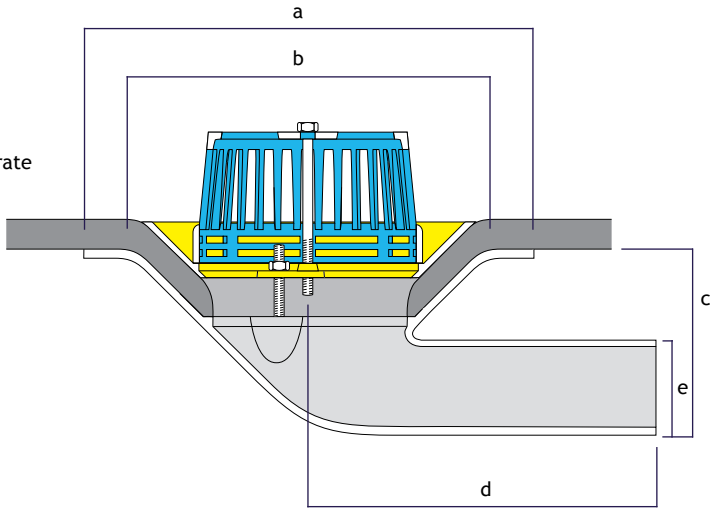
Harmer Roof Detail 90° Spigot outlets are designed to receive either domical or flat grates. Flat grates should be used if the outlet occurs in an area which is subject to pedestrian traffic. These grates are also designed for use in inverted roof constructions, where paving slabs on special Harmer paving 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.

90º Screw Outlets

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 90º 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

90º 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.

90º 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.

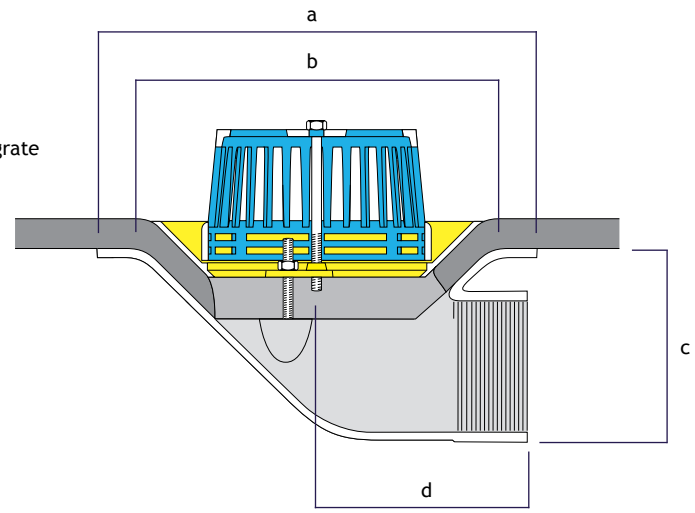
Harmer Roof Detail screw outlets can be connected to socketed and socketless cast iron pipework, HDPE pipework and PVC pipework by means of the Harmer Roof Screw Threaded Adaptor with appropriate coupling. (See pages 6 and 26).

Grates

Harmer Roof Detail 90º 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
	(mm)	(mm)	(mm)	(mm)
Pipe dia (nominal)	50	75	100	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.

Two-Way Outlets

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.

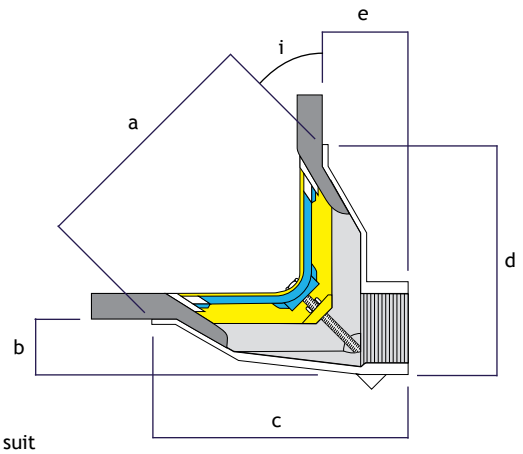
Gunmetal outlets are the same design as aluminium but are cast in 85/5/5/5 leaded gunmetal to BS EN 1982: 1999 - CC491K.

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

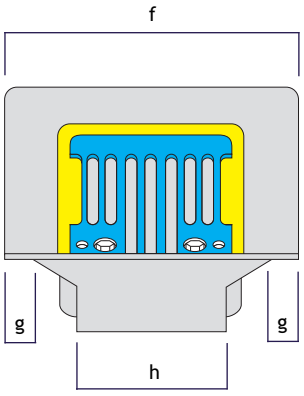


Table of Dimensions

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 Outlets

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.

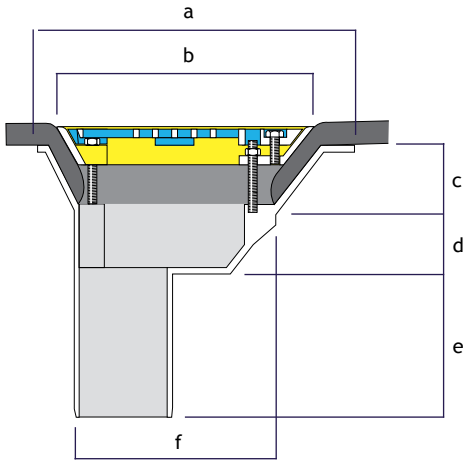
Connection to Pipework

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

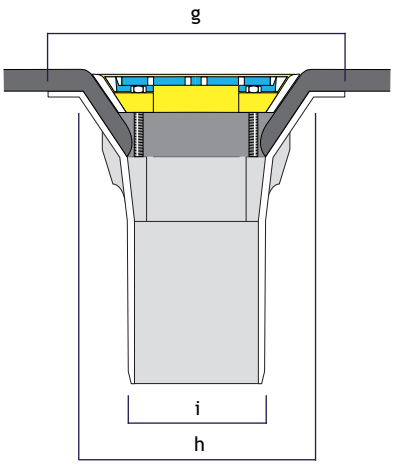


Table of Dimensions

Outlet ordering code	2BO	3BO	4BO
	(mm)	(mm)	(mm)
Pipe dia (nominal)	50	75	100
a	270	270	270
b	229	229	229
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

Gulley Outlets

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.

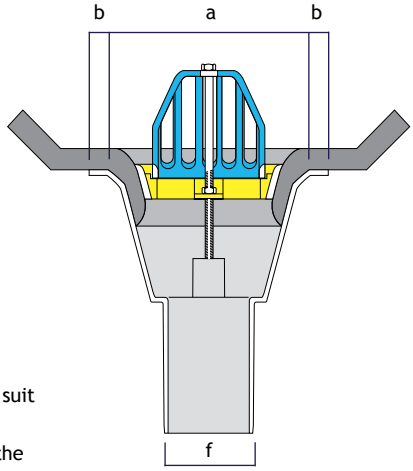
Gunmetal outlets are the same design as aluminium but are cast in 85/5/5/5 leaded gunmetal to BS EN 1982: 1999 - CC491K.

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

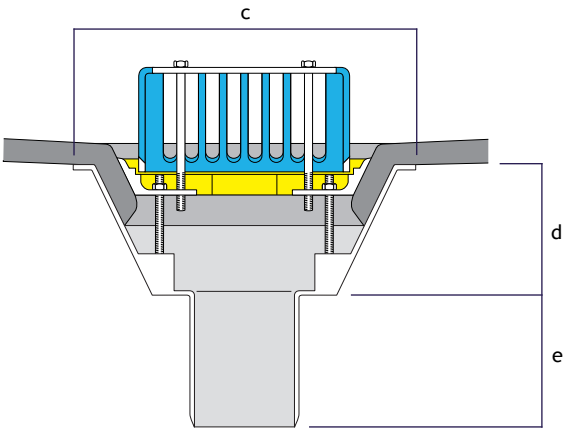


Table of Dimensions

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 Outlets

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.

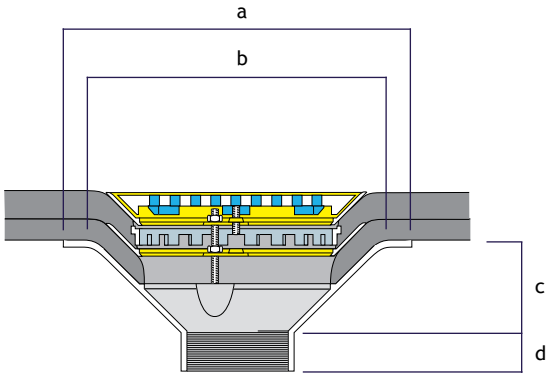


Table of Dimensions

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

Accessories - Metal Outlets

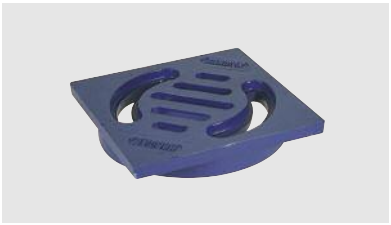
A range of accessories is available for use in connection with Harmer Roof metal rainwater outlets. The accessories are designed to permit the installation of Harmer Roof metal outlets in both typical and less standard roof constructions - warm roofs, inverted roofs, terrace applications, and concealed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

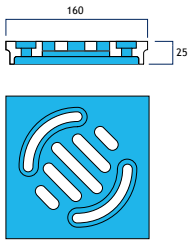
Materials

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.

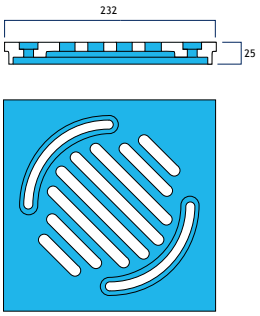
Balcony Outlet Extension Piece BO/EP

Gulley Outlet Extension Piece GO/EP

Terrace Grates (Used With Circular Grate Extension Pieces Below)

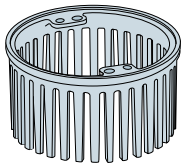


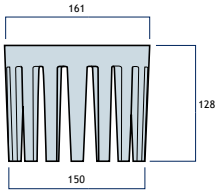
Code reference: **23TG**
(For use with Extension Piece **23EP**)



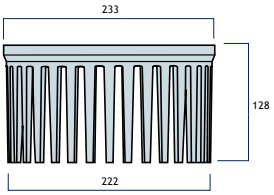
Code reference: **46TG**
(For use with Extension Piece **46EP**)

Grate Extension Pieces Used With AV and Circular Detail Outlets



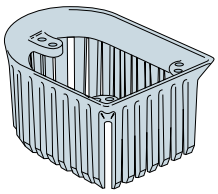


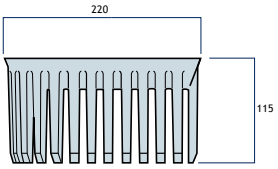
Extension piece code reference: **23EP**



Extension piece code reference: **46EP**

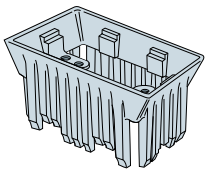
Grate Extension Piece Used With Detail Balcony Outlets

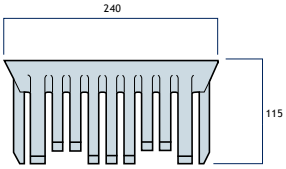




Balcony outlet extension piece code reference: **BO/EP**

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 - Metal Outlets

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:

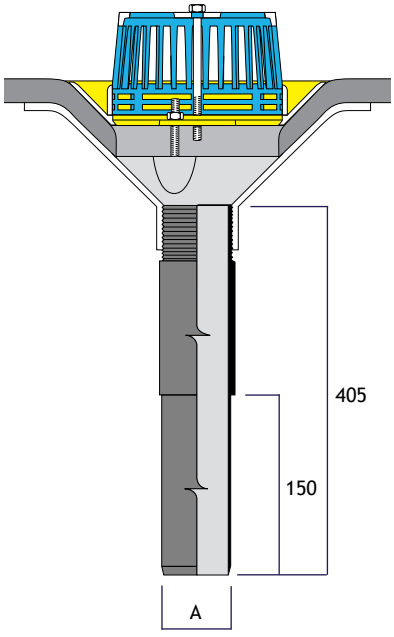
- Cast iron pipework to EN 877 and BS 416: 1973.
- HDPE pipework with appropriate couplings.
- PVC O-ring socketed pipe to BS 4514: 1983.

Table of Dimensions

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

Note:
Screw Thread Adaptors 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 the Screw Thread Adaptor varies in diameter, and is shown in the table below.

Can also be made to order, maximum 600mm long.

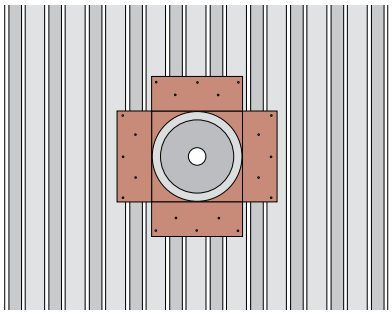
Metal Deck Support Plates

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.

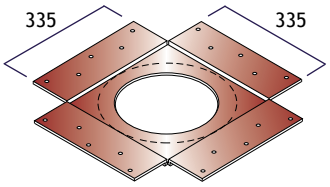
The Support Plates incorporate pre-punched holes for ease of fixing. Two sizes are available. The 335 x 335mm plate will suit 50 and 75mm metal outlets and all insulated outlets. The 415 x 415mm plate is designed for all 100 and 150mm metal outlets.

Materials

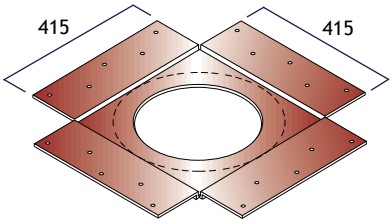
The Support Plates are manufactured from 1.5mm (16 gauge) steel sheet, finished in red oxide. They are suitable for installation in all types of metal deck roofing.



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



Code reference **SP1**



Code reference **SP2**

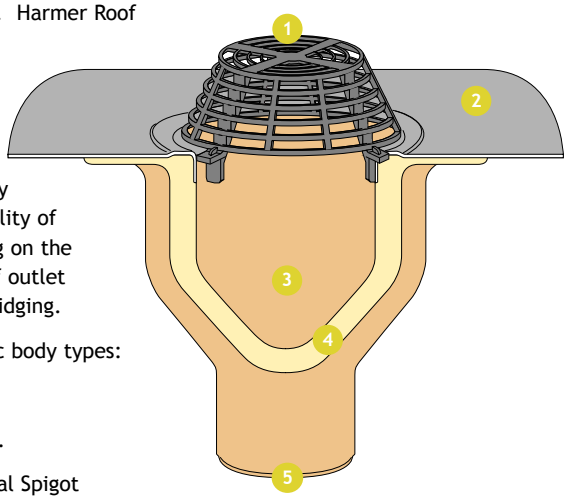
Insulated Rainwater Outlets

Introduction to Harmer Insulated Outlets

Main Characteristics

Performance

Harmer Roof Insulated outlets are based on a rigid polyurethane foam body, with high insulation value. Harmer Roof Insulated outlets are therefore ideal for installation in cold and warm roofs, where the requirement is to completely eliminate any possibility of condensation forming on the underside of the roof outlet as a result of cold bridging.



1. Polyamid Domical Grate
   Push-fitted into outlet body
2. Flexible Connecting Membrane
   Designed to form a waterproof seal with the main roofing membrane
3. Integral Sump and Pipe Connection
   Ensures the free flow of rainwater and facilitates easy rodding
4. One-Piece Polyurethane Foam Body
   Designed to reduce heat loss and prevent condensation
5. Spigot Connection

There are three basic body types:

- Vertical Spigot
- Horizontal Spigot.
- Graduated Vertical Spigot

An elastomeric bitumen connecting membrane is fused to the polyurethane body and is used for bonding to three-layer felts, torch-on roofing and hot asphalt. Alternative membrane specifications are available for PVC, EPDM, TPO and EB roofing.

The outlets are supplied with a black polyamid domical grate as standard.

The domical grate is simply push-fitted into the mouth of the outlet. It is easily removable for rodding which is further simplified by the unobstructed throat.

A range of accessories is also available to extend the range of roof constructions suitable for Insulated outlets.

Key Benefits of Harmer Roof Insulated Outlets:

Reduction of Heat Loss

- Consistent with upgradings in the Building Regulations regarding flat roof U values, the high insulation value of the outlet body cuts down on heat loss.

One-Piece Leakproof Design

- One piece polyurethane foam body provides a completely watertight connection between roof membrane and rainwater pipe.
- Insulated outlets are available with a flexible connecting membrane fused to the outlet body. The outlet membrane is sealed to the flat roof waterproof membrane, creating a completely watertight connection with either bituminous or single ply roofing systems.

Unobstructed Rainwater Flow

- Insulated outlets incorporate a polyamid domical grate which permits a free flow of rainwater while preventing loose chippings or debris from entering the outlet. A flat grate option is available for certain types of application.

Optional Heating Element

- For the highest measure of protection against ice and snow blockage and condensation problems, Harmer Roof insulated outlets can be supplied with a heat sensor protected electric element moulded into the body of the outlet. The element is controlled by a heat sensor with a 1 metre length of cable for connection to an on-site 24 volt power transformer.
- Heated outlets are particularly suitable for installation in areas of permanent shadow and north facing aspects.

Vertical Spigot Outlets

The Harmer Roof Insulated Vertical Spigot outlet comprises a rigid foamed polyurethane body 22mm thick and a 495mm square elastomeric bitumen connecting membrane fused to the body of the outlet. This membrane bonds to three-layer felts, torch-on roofing and hot asphalt.

Alternative connecting membrane specifications are available for bonding to PVC, EPDM, TPO and EB roofing.

The outlets are supplied with a black polyamid domical grate as standard. An aluminium flat grate is also available, but should be used only in inverted roof constructions where the outlet is covered by paving on Harmer Modulock or Uni-Ring raised supports.

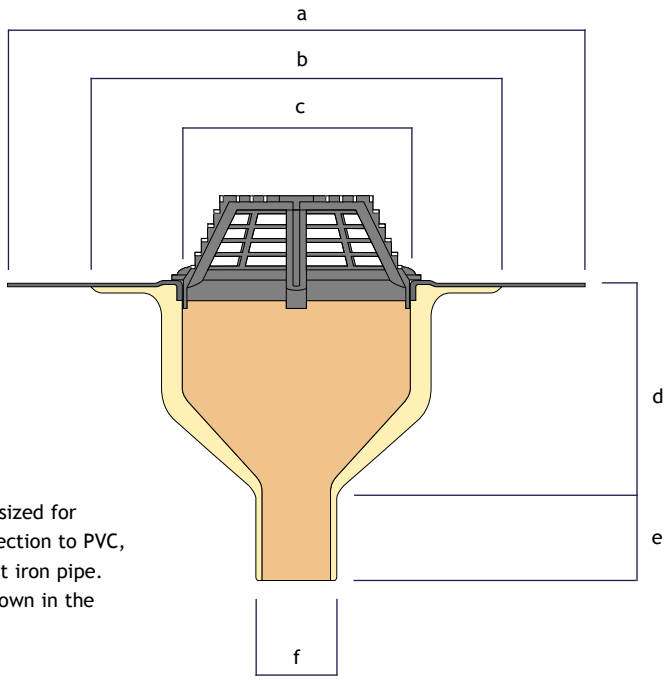
Heated outlets

An optional electric heating element** moulded into the outlet body can also be supplied.

Connection to Pipework

Vertical Spigot outlets are suitable for connection to:

- Socketed and socketless cast iron pipework to BS 416: 1973 and EN 887. Socketed pipework will require cold caulking or PVC to cast iron adaptors.
- HDPE pipework with appropriate coupling.
- PVC “O” ring socketed soil grade pipe to BS 4514: 1983. Connection can be made directly, or with heat-shrink adaptors where necessary.



Spigots are sized for direct connection to PVC, HDPE or cast iron pipe. Sizes are shown in the table below

Table of Dimensions

Outlet ordering code (For flat grate, add /F to code reference)	1000* 1004**	1001* 1005**	1003* 1007**
Pipe dia (nominal)	(mm) 75	(mm) 100	(mm) 150
a	495	495	492
b	339	339	335
c	192	192	192
d	180	180	180
e	69	69	69
f	83	110	160

* insulated outlet **heated outlet

Note:
A range of accessories is available for use with special detail requirements.
See page 32.

Horizontal Spigot Outlets

The Harmer Roof Insulated Horizontal Spigot outlet comprises a rigid foamed polyurethane body 22mm thick and a 495mm square elastomeric bitumen connecting membrane fused to the body of the outlet. This membrane bonds to three-layer felts, torch-on roofing and hot asphalt.

Alternative connecting membrane specifications are available for bonding to PVC, EPDM, TPO and EB roofing.

The outlets are supplied with a black polyamid domical grate as standard. An aluminium flat grate is also available, but should be used only in inverted roof constructions where the outlet is covered by paving on Harmer Modulock or Uni-Ring raised supports.

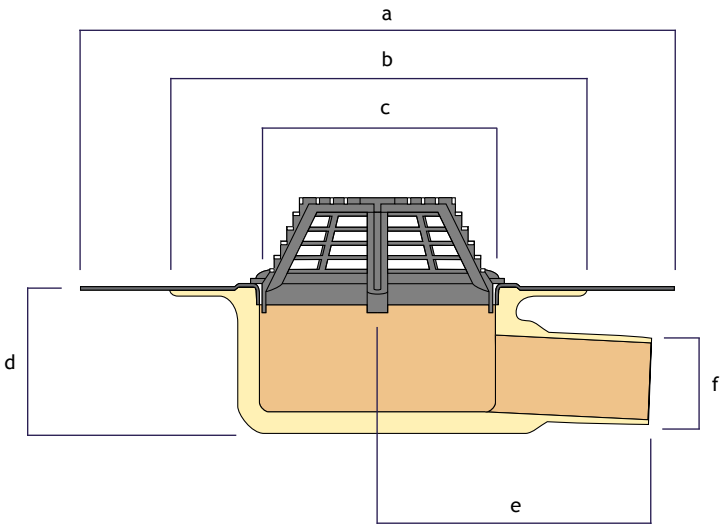
Heated outlets

An optional electric heating element** moulded into the outlet body can also be supplied.

Connection to Pipework

Horizontal Spigot outlets are suitable for connection to:

- Socketed and socketless cast iron pipework to BS 416: 1973 and EN 887. Socketed pipework will require cold caulking or PVC to cast iron adaptors.
- HDPE pipework with appropriate coupling.
- PVC “O” ring socketed soil grade pipe to BS 4514: 1983. Connection can be made directly, or with heat-shrink adaptors where necessary.



Spigots sized for direct connection to PVC, HDPE or cast iron pipe. Sizes shown in the table below

Table of Dimensions

Outlet ordering code (For flat grate, add /F to code reference)	**1008*** **1011****	**1009*** **1012****
	(mm)	(mm)
Pipe dia (nominal)	75	100
a	495	495
b	325	325
c	192	192
d	120	140
e	225	225
f	83	110

* insulated outlet **heated outlet

Note:
A range of accessories is available for use with special detail requirements.
See page 32.

Graduated Vertical Spigot Outlets

The Harmer Roof Graduated Vertical Spigot outlet is an economy version of the Harmer Roof Insulated Vertical Spigot outlet.

Graduated Vertical Spigot outlets are particularly suitable for:

- Roof constructions which allow only a shallow outlet bowl.
- Cold roofs - where the formation of condensation on the underside of the outlet within the 'cold' roof void is unlikely, as in the case of a warm roof design.

Materials

The thickness of the foamed polyurethane body is reduced from 22mm to 11mm. A 495mm square elastomeric bitumen connecting membrane is fused to the body of the outlet, and is bonded to three-layer felts, torch-on roofing or hot asphalt.

Alternative connecting membrane specifications are available for bonding to PVC, EPDM, TPO and EB roofing.

The outlets are supplied with a black polyamid domical grate as standard.

Heated outlets

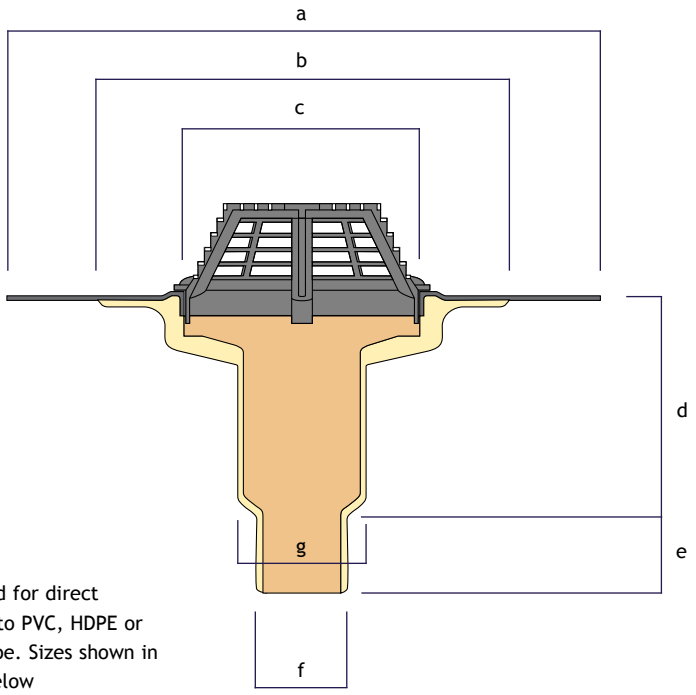
A heated version of the graduated spigot is **not** available.

Connection to Pipework

Graduated Vertical Spigot outlets are suitable for connection to:

- Socketed and socketless cast iron pipework to BS 416: 1973 and EN 887. Socketed pipework will require cold caulking or PVC to cast iron adaptors.
- HDPE pipework with appropriate coupling.
- PVC "O" ring socketed soil grade pipe to BS 4514: 1983.

Each outlet is suitable for connection to either 75mm or 100mm pipework. When connecting to 100mm pipe, the 75mm section of the spigot should be cut off. This can be done on site with a fine-toothed saw.



Spigots sized for direct connection to PVC, HDPE or cast iron pipe. Sizes shown in the table below

Table of Dimensions

Outlet ordering code (For flat grate, add /F to code reference)	**1017**
Pipe dia (nominal)	(mm) 75 or 100
a	495
b	320
c	192
d	164
e	81
f	83
g	110

Note:
A range of accessories is available for use with special detail requirements.
See page 32.

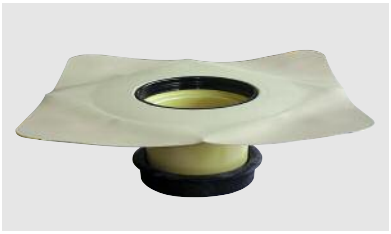
Accessories - Insulated Outlets

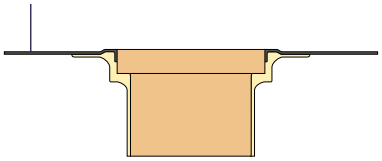
A range of accessories is available for use in connection with Harmer Roof insulated outlets. The accessories are designed to permit the installation of Harmer Roof insulated outlets in both typical and less standard roof constructions - warm roofs, inverted roofs, terrace applications, and concealed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

Extension Piece

Extension Pieces are for use in warm roof constructions, where the waterproof membrane occurs above the level of the roof deck. They are suitable for insulation thicknesses of 50-120mm.

The Extension Piece is available with a choice of connecting membranes.





Code reference 1014

Connection to Outlet

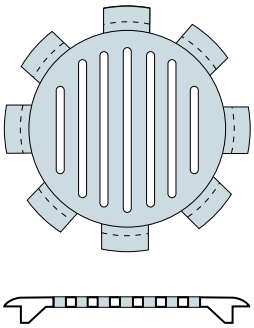
The Extension Piece is sealed into the mouth of the insulated outlet by means of a neoprene seal. See application detail on page 41 showing Extension Piece with EB connecting membrane bonded to three-layer roofing felt.

The black polyamid domical grate is simply push-fitted in the mouth of the Extension Piece.

Flat Grate

Aluminium Flat Grates are also available specifically for installation under paving slabs set on Harmer Modulock or Uni-Ring raised supports. These supports enable rainwater to drain away under paving slabs ballasting the insulation on inverted roofs. Because the grate occurs under the paving slabs, there is no obstruction whatsoever of the paved area. Rainwater simply drains away between the paving slab joints and into the outlets beneath.

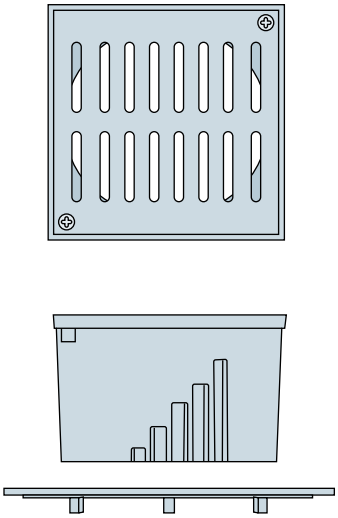
Insulated outlet Flat Grates should not be used where they would be exposed to pedestrian traffic. In such situations, the Harmer Roof Terrace Kit should be used.



Code reference for grate — use suffix /F after outlet codes if flat grate is required

Terrace Kit

Designed for terrace-type applications exposed to pedestrian traffic. The aluminium alloy Terrace Kit consists of a circular fitting ring which is positioned over the mouth of the outlet. The terrace grate then rests on the ring and can be adjusted up or down to 10 different heights, from 30 to 90mm, to suit varying thicknesses of insulation and surface finish.

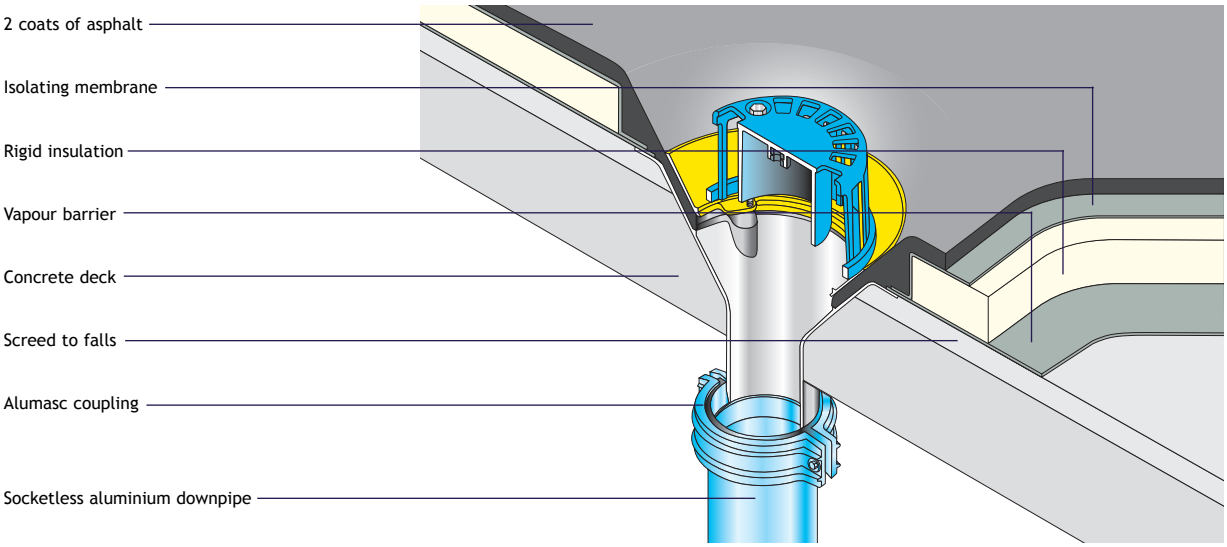


Code reference 1016

Application Details and Installation

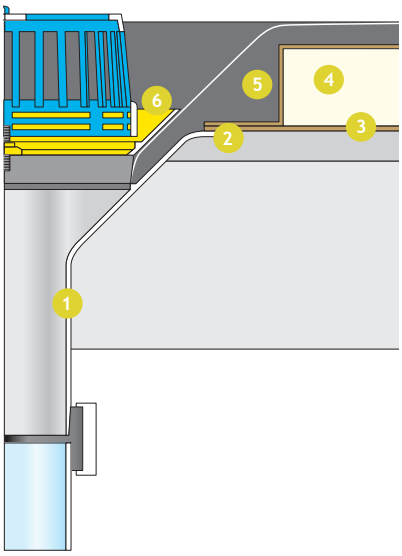
Metal Rainwater Outlets

Harmer AV Vertical Spigot Outlet in Warm Roof

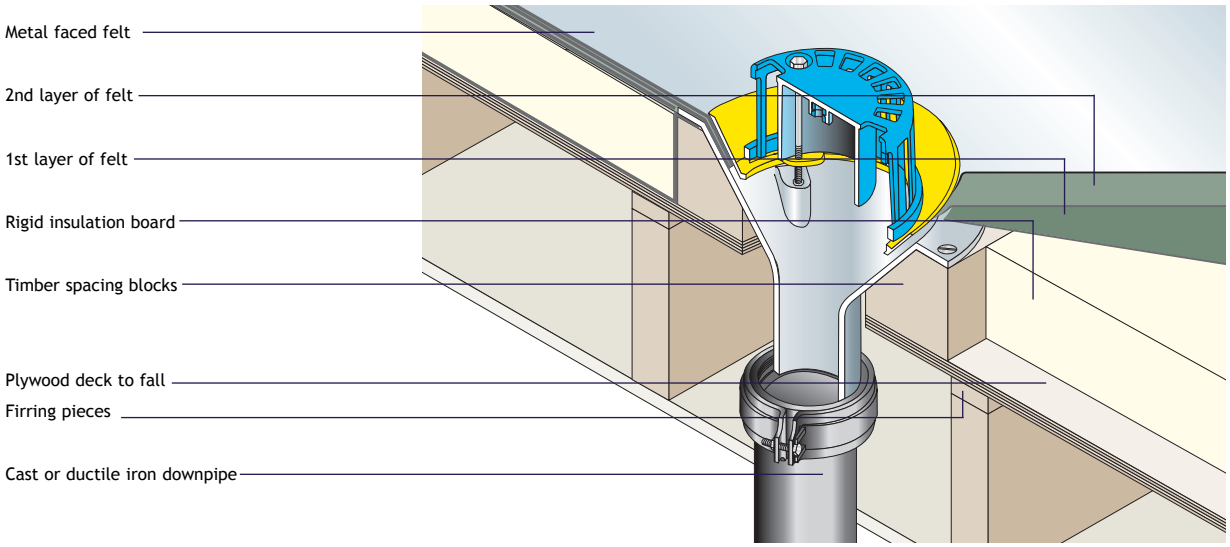


Sitework

1. Position outlet with rim 25mm above slab and grout into pre-formed hole.
2. Lay sand/cement screed to falls to finish flush with outlet rim.
3. Lay vapour barrier to lap edge of outlet rim.
4. Bond rigid insulation board to vapour barrier.
5. Prime roof outlet flange with bitumen primer, then lay isolating membrane and 2 coats of asphalt. Dress asphalt into outlet.
6. Bolt down clamping ring and outlet grate.

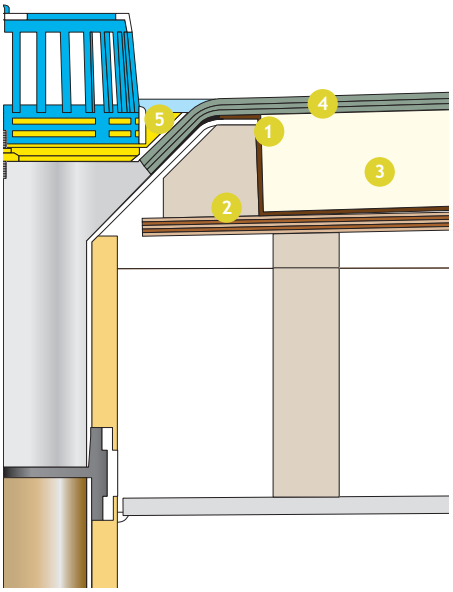


Harmer AV Vertical Spigot Outlet in Warm Roof



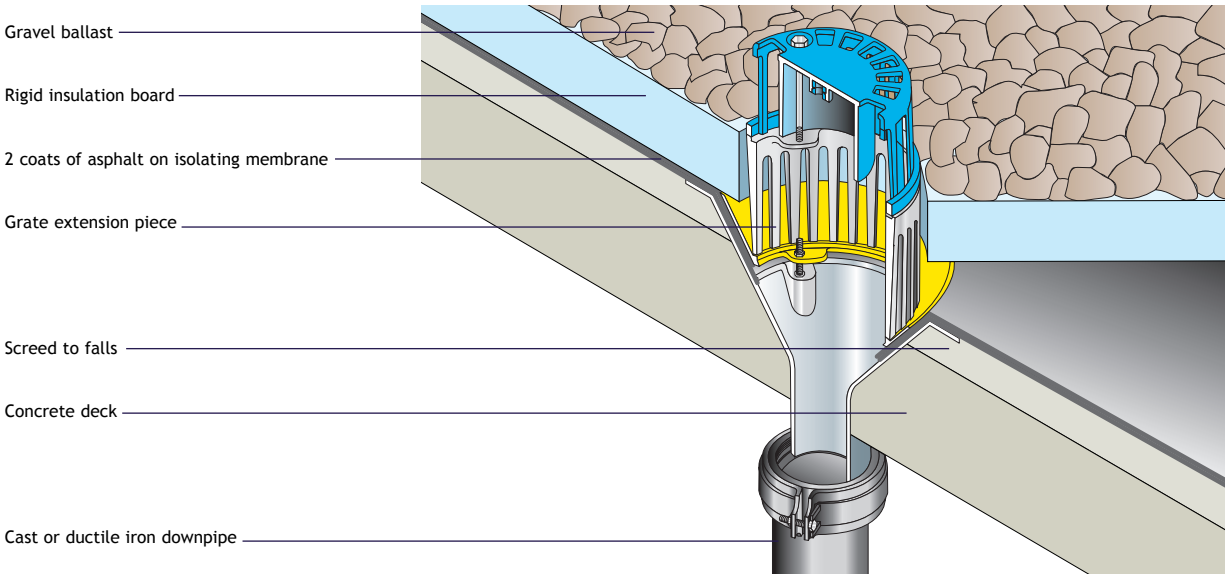
Sitework

1. Drill countersunk holes in outlet rim and screw to preservative treated timber spacing blocks.
2. Place outlet in pre-formed hole and secure by screwing through the deck into the spacing blocks.
3. Lay vapour barrier and rigid insulation board.
4. Lay three layer felt. Cut circular hole in each layer of felt and dress into outlet.
5. Bolt down clamping ring and grate.



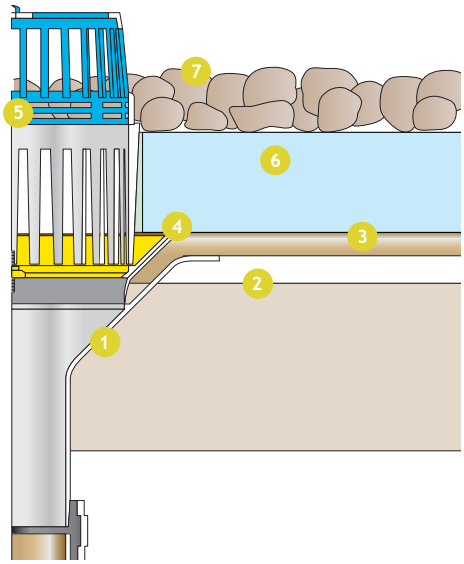
Metal Rainwater Outlets

Harmer AV Vertical Spigot Outlet and Extension Piece in Inverted Roof

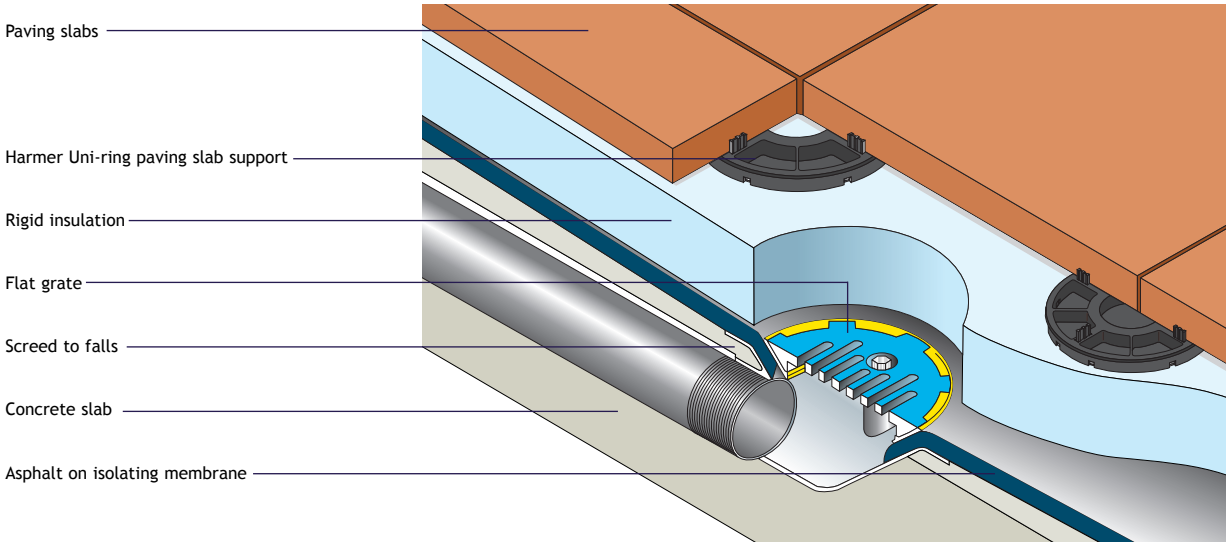


Sitework

1. Position outlet with rim 25mm above slab and grout into pre-formed hole.
2. Lay sand/cement screed to falls to finish flush with outlet rim.
3. Prime roof outlet flange with bitumen primer, then lay isolating membrane and 2 coats of asphalt. Dress asphalt into outlet.
4. Bolt down clamping ring.
5. Bolt extension piece and grate in position.
6. Lay insulation board leaving circular hole over outlet.
7. Lay protective gravel ballast.

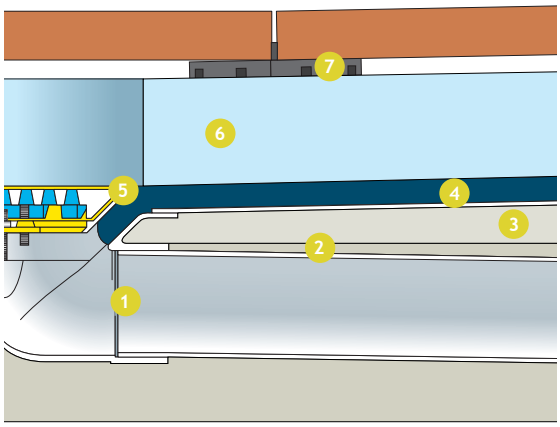


Harmer AV 90° Screw Outlet in Inverted Roof With Insulation Ballasted By Paving Slabs on Harmer Uni-ring Paving Slab Supports



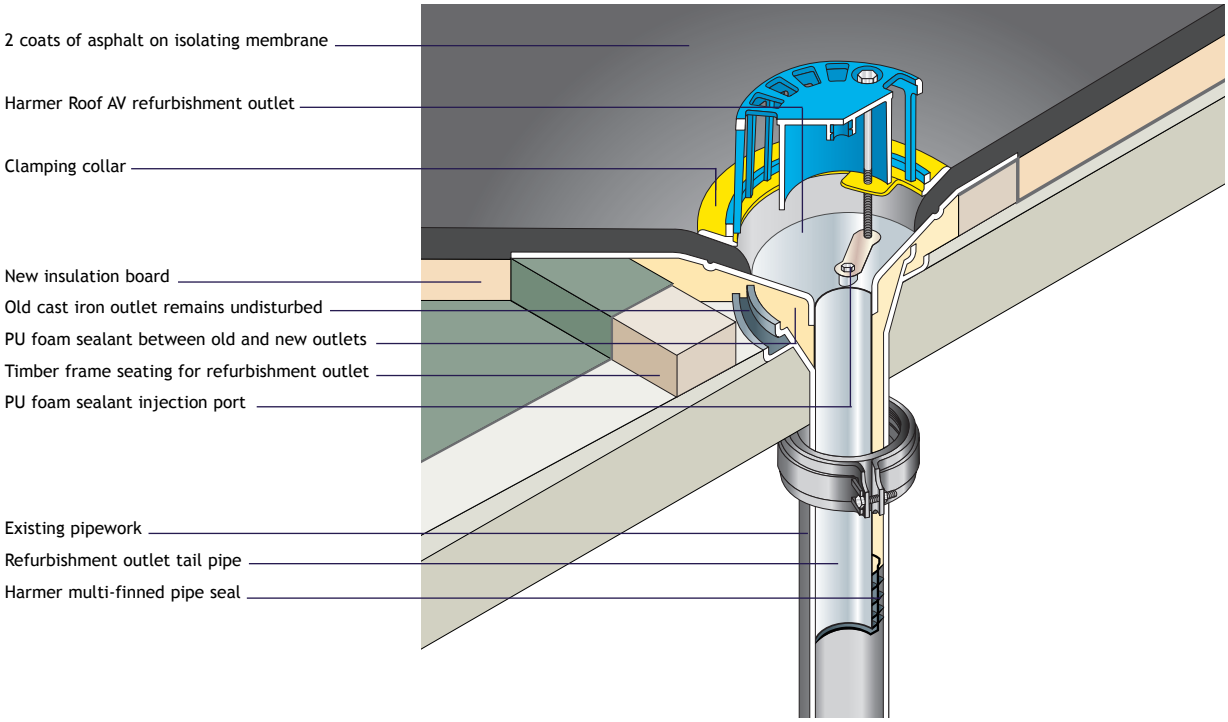
Sitework

1. Screw outlet to steel pipework, place in position and test for leaks. Outlet rim to be min 25mm above finished slab level.
2. Cast concrete slab.
3. Lay sand/cement screed to falls to finish flush with outlet rim.
4. Prime roof outlet flange with bitumen primer, then lay isolating membrane and 2 coat asphalt. Dress asphalt into outlet.
5. Bolt down clamping ring and flat grate.
6. Lay rigid insulation board, leaving hole over outlet grate.
7. Place paving slabs on Harmer Uni-ring paving slab supports.



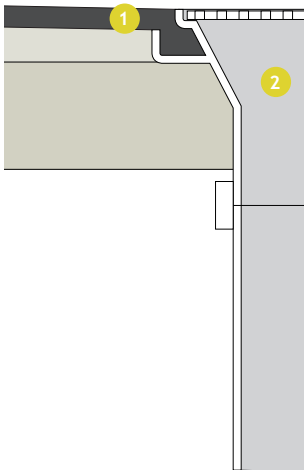
Metal Rainwater Outlets

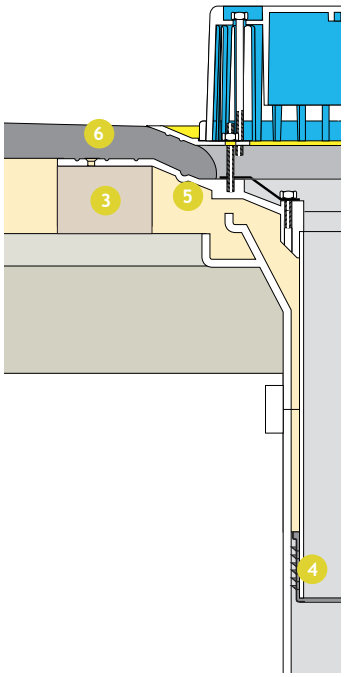
Harmer AV Retro-Gulley Roof Refurbishment Retaining Existing Cast Iron Outlet



Sitework

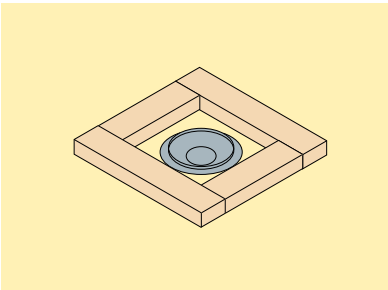
1. Remove old asphalt. Leave existing cast iron outlet and pipework in position.
2. Wire brush inside surfaces of old outlet and pipework, and flush through with clean water.
3. Form timber frame around old roof outlet. Lay vapour barrier and insulation.
4. Check for clearance and shorten tail pipe of Harmer Retro Gulley as necessary. Flush through again with clean water. Fit rubber pipe seal.
5. Install Harmer Retro Gulley and inject PU foam between new and old outlet.
6. Lay isolating membrane and two coats of asphalt dressed into Harmer Retro Gulley. Bolt clamping ring and grate in position.



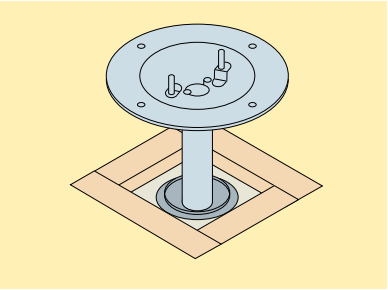


Installing Harmer AV Retro-Gulley

1. Strip all roof coverings back to deck level. Wire brush old outlet and flush with clean water.

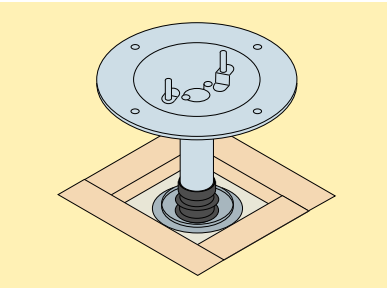


2. Form timber frame around old roof outlet, lay vapour barrier/insulation board (35mm+).

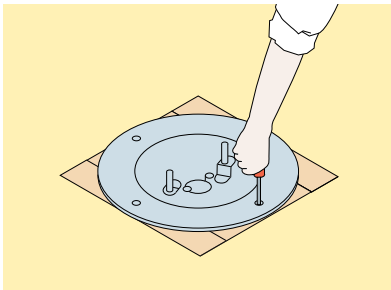


3. Check clearance, and cut tail pipe to required length if necessary.

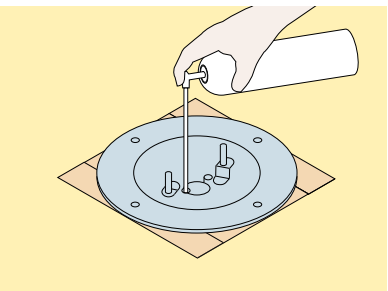
4. Once correct length of tail pipe has been established fit Harmer pipe seal.



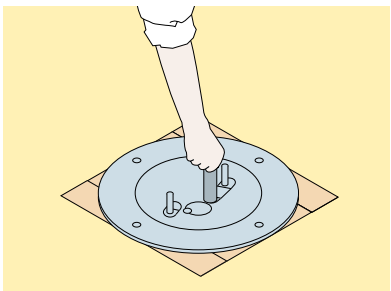
5. Repeat clean water flush. Insert tail pipe into existing pipework with flange seated on timber frame.



6. Secure flange by screw-fixing through pre-drilled holes.



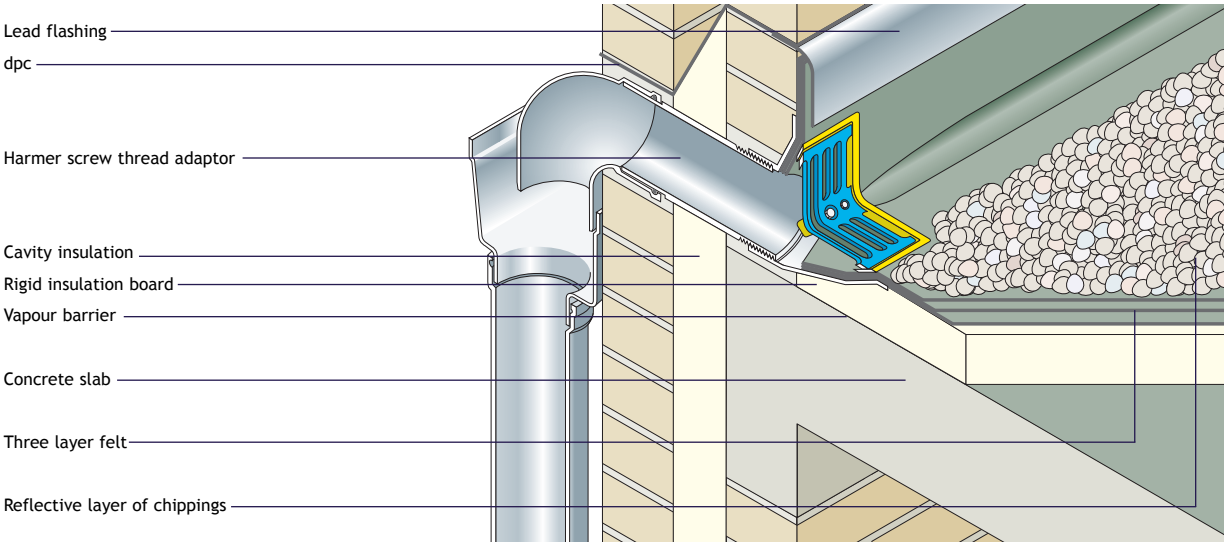
7. Inject HARMER PU foam in one injection port for up to 5 seconds. Wipe away surplus foam.



8. Close off port openings with the captive screws and washers. Complete weatherproofing and clamping ring/grate installation.

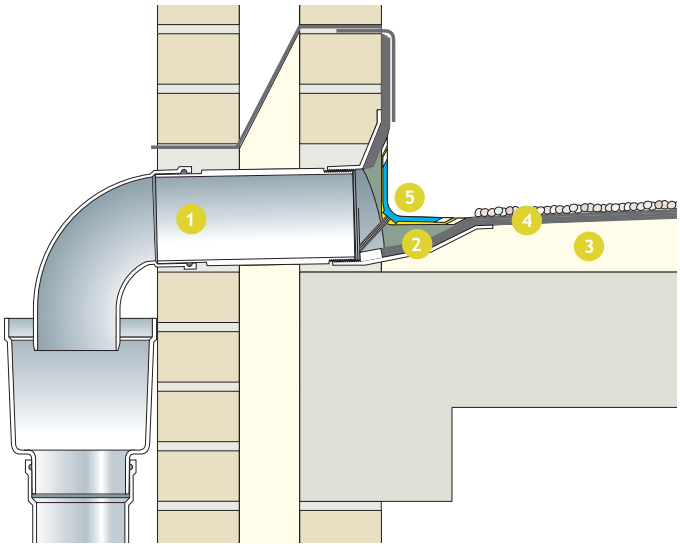
Metal Rainwater Outlets

Harmer Detail Two-Way Outlet Installed to Provide Horizontal Take-off From Balcony



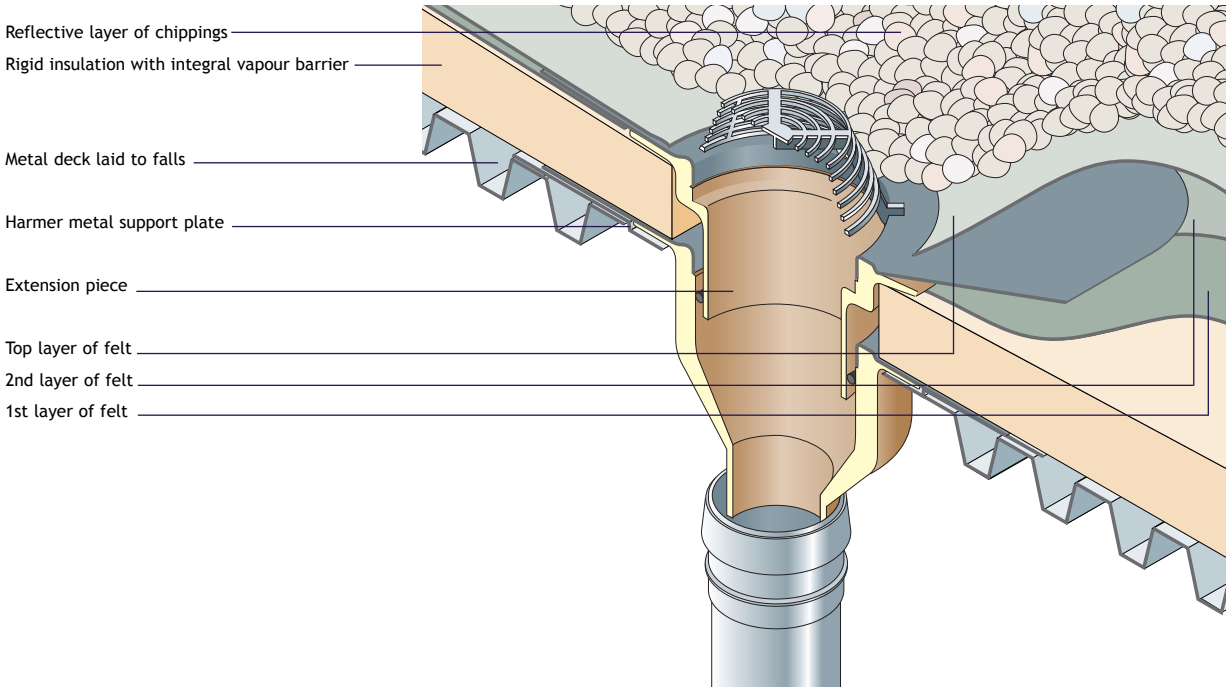
Sitework

1. Screw Harmer screw thread adaptor to outlet. Cut to length and fit 92.5° bend.
2. Build outlet in position so that horizontal rim will be level with insulation, and vertical rim flush with brickwork. Ensure that there is a 2.5° fall in direction of run-off.
3. Lay vapour barrier and rigid insulation board. Cut around outlet as necessary.
4. Lay three layer felt, dressing into mouth of outlet.
5. Bolt down clamping ring and grate.



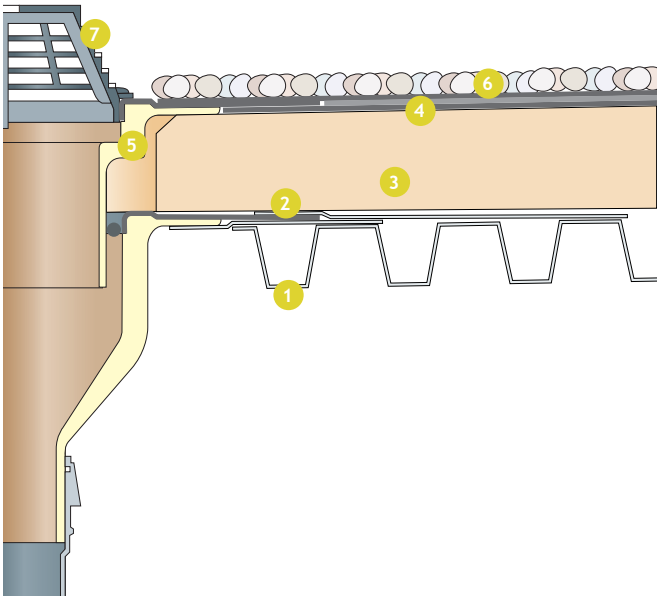
Insulated Rainwater Outlets

Harmer Insulated Outlet and Extension Piece With Connecting Membrane in Metal Deck Warm Roof



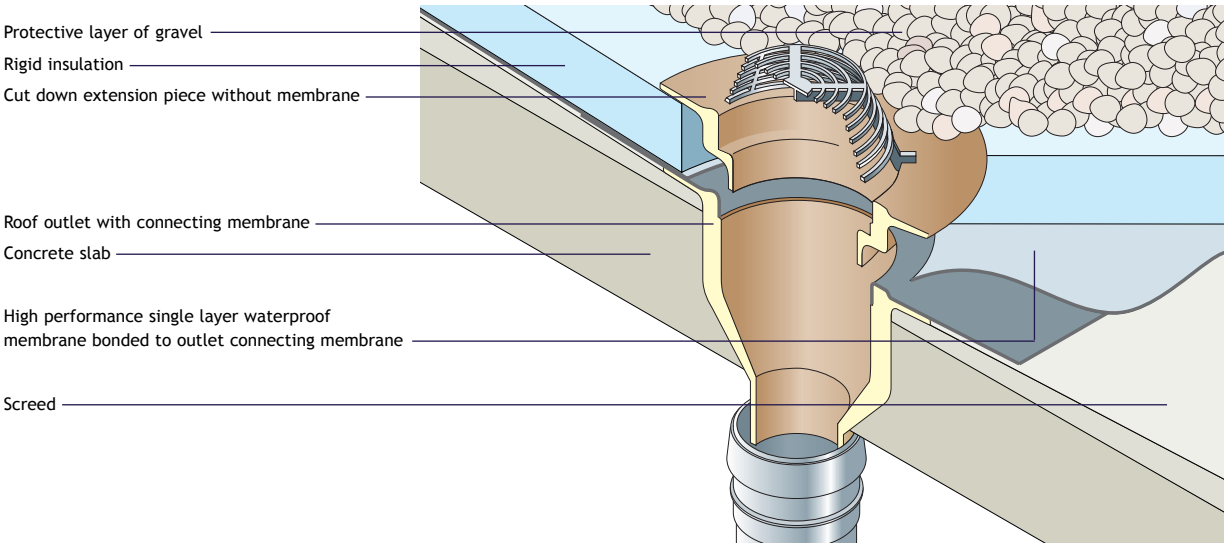
Sitework

1. Fix metal deck to falls and Harmer metal support plate.
2. Position outlet in hole, bonding connecting membrane to metal deck with bitumen.
3. Bond insulation with integral vapour barrier to metal decking and roof outlet membrane. Cut circular hole in insulation board around outlet.
4. Lay first layer of felt. Cut circular hole in felt as shown.
5. Press raising ring in position and bond its membrane to first layer of felt.
6. Lay 2nd and 3rd layers of felt. Carefully cut back as shown, leaving 20mm clearance around outlet mouth.
7. Position domical gravel guard grating.



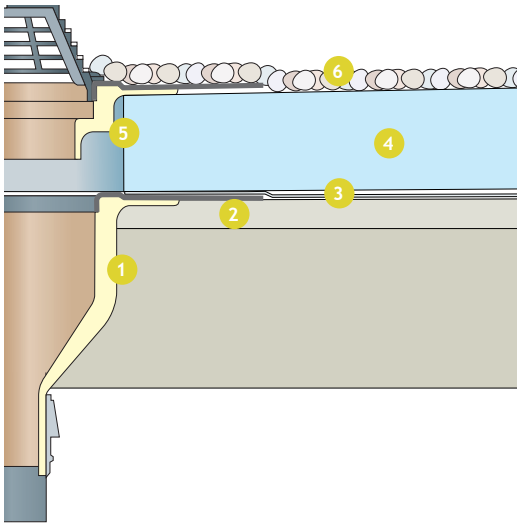
Insulated Rainwater Outlets

Harmer Insulated Outlet With Connecting Membrane and Cut Down Extension Piece in Inverted Roof



Sitework

1. Position roof outlet with rim 25mm above slab and grout into pre-formed hole.
2. Lay sand/cement screed to falls, to finish flush with outlet rim.
3. Lay waterproof membrane. Bond to integral roof outlet membrane.
4. Lay rigid insulation board, leaving circular hole over outlet.
5. Position cut-down extension piece with domical grating.
6. Lay protective gravel ballast.



Performance Data and Specification

Performance Data

Harmer AV Outlets

Pipe Dia	Outlet Type	Code Ref	BS EN 12056: 3: 2000 Flow Rates (litres/sec)	
			Domed Grate	Flat Grate
50mm	Vertical Spigot	AV200	1.69	1.69
	Vertical Screw	AV200T	1.69	1.69
75mm	Vertical Spigot	AV300	4.97	4.97
	Vertical Screw	AV300T	4.97	4.97
	Multi-Gulley	MAV75	4.97	4.97
	Retro-Gulley	RAV75	4.63	4.63
100mm	Vertical Spigot	AV400	10.71	10.71
	Vertical Screw	AV400T	10.71	10.71
	Multi-Gulley	MAV100	9.00	–
	Retro-Gulley	RAV100	4.63	4.63
150mm	Vertical Spigot	AV600	14.07	15.61
	Vertical Screw	AV600T	13.51	15.55

Harmer Detail Outlets

Pipe Dia	Outlet Type	Code Ref	BS EN 12056: 3: 2000 Flow Rates (litres/sec)	
			Domed Grate	Flat Grate
50mm	45° Spigot	245	1.69	1.69
	45° Screw	245T	1.69	1.69
	90° Spigot	290	1.69	1.69
	90° Screw	290T	1.69	1.69
	Mini Two-Way	2TW-M (horizontal discharge)	–	1.13
	Mini Two-Way	2TW-M (vertical discharge)	–	1.69
	Standard Two-Way	2TW (horizontal discharge)	–	1.69
	Standard Two-Way	2TW (vertical discharge)	–	1.69
	Balcony Spigot	2BO	–	1.69
75mm	45° Spigot	345	4.97	4.97
	45° Screw	345T	4.97	4.97
	90° Spigot	390	3.31	3.62
	90° Screw	390T	3.39	3.65
	Standard Two-Way	3TW (horizontal discharge)	–	1.47
	Standard Two-Way	3TW (vertical discharge)	–	3.94
	Balcony Spigot	3BO	–	4.97
	Gulley Outlet	3GO	4.97	–
100mm	45° Spigot	445	10.66	10.71
	45° Screw	445T	10.71	10.69
	90° Spigot	490	7.19	6.82
	90° Screw	490T	7.29	6.93
	Standard Two-Way	4TW (horizontal discharge)	–	2.05
	Standard Two-Way	4TW (vertical discharge)	–	6.00
	Balcony Spigot	4BO	–	8.41
	Gulley Outlet	4GO	10.41	–
150mm	90° Screw	690T	10.01	11.81
	Standard Two-Way	6TW (horizontal discharge)	–	2.91
	Standard Two-Way	6TW (vertical discharge)	–	6.37

Harmer Insulated Outlets

Pipe Dia	Outlet Type	Code Ref	BS EN 12056: 3: 2000 Flow Rates (litres/sec)	
			Domed Grate	Flat Grate
75mm	Vertical Spigot	1000	4.97	–
	Heated Vertical Spigot	1004	4.97	–
	Horizontal Spigot	1008	3.49	–
	Heated Horizontal Spigot	1011	3.49	–
	Graduated Vertical Spigot	1017	4.97	–
100mm	Vertical Spigot	1001	6.53	–
	Heated Vertical Spigot	1005	6.53	–
	Horizontal Spigot	1009	6.10	–
	Heated Horizontal Spigot	1012	6.10	–
	Graduated Vertical Spigot	1017	6.88	–
150mm	Vertical Spigot	1003	6.49	–
	Heated Vertical Spigot	1007	6.49	–

Figures in these tables are based on the requirements of BS EN 12056.

1. Flow rates are in litres per second.
2. Head of water is 35mm.
3. Performances are given within $^1/_3$ rainwater pipe capacity limits as required by BS EN 12056.
4. For regional rainfall characteristics contact Alumasc Technical Services.
5. For variable outlet performances specific to depth of water and rainfall intensity, contact Alumasc Technical Services.

All flow tests have been determined by laboratory testing carried out at Salford University's Department of Civil Engineering.

When designing a rainwater scheme:

- Incorporate a back-up outlet to prevent failure through blockage even though a single outlet may be sufficient for the flow.
- Do not design to absolute outlet capacities, but create a factor of safety of 10% to allow for greater than designed-for storm intensities.
- Before site completion or handover ensure that all outlets have been correctly installed.
- Check that clamps are tight, and grates are fitted and secure.
- Always ensure that outlets are inspected for blockages and cleaned out not less than twice yearly.

Specification

The following is a checklist of rainwater outlet components to assist the specifier with the correct selection of parts.

Harmer Roof rainwater outlets assemblies can be varied to suit specific applications by selecting compatible components. The checklist below links these components into complete product assemblies with code numbers, all of which are cross-referenced to the preceding pages.

Choice of Material

Grade LM6 Cast Aluminium
OR
Leaded Gunmetal should be specified wherever lead or copper roofing materials are being used.

Body Type

Spigot
Screw Threaded

Choice of Outlet

AV Outlet (pages 11 to 14)
Detail Outlet (pages 16 to 23)
Insulated Outlet (pages 29 to 31)

Grating Assembly

Domical Grate (fitted as standard)
Flat Grate (suffix product code /F)
Terrace Grate (pages 24, 25 and 32)
Extension Piece (pages 24, 25 and 32)

Accessories

Threaded Spigot Adaptor (page 26)
Metal Deck Support Plate (page 26)

Model Specification Clauses

Supply and install.....no. Harmer Roof AV cast aluminium, 100mm nominal bore, vertical spigot rainwater outlets type AV400 each comprising domical grate, spigot body and clamp ring.

OR

Supply and install.....no. Harmer Roof Detail leaded gunmetal, 75mm nominal bore, 90º screw threaded rainwater outlets type 390T/F each comprising flat grate, screw thread body and clamp ring, complete with ABS plastic screw threaded pipe adaptor type 3ADP.

OR

Supply and install.....no. Harmer Roof Insulated, 100mm nominal bore, horizontal spigot rainwater outlets type 1009EB complete with Extension Piece type 1014EB all to be supplied with factory fitted EB bitumen bonding flange and adjustable aluminium Terrace Grate assembly type 1016.

All as manufactured by Alumasc Exterior Building Products Ltd., White House Works, Bold Road, Sutton, St. Helens, Merseyside, WA9 4JG.

Alumasc Premium Products - All Brands

Alumasc provides an unrivalled range of premium products for building exteriors and drainage, along with high levels of technical expertise and project support. Our wealth of experience combined with networks of approved installers, merchant stockists and a choice of warranty options ensures we provide appropriate product and system solutions for all types of buildings.

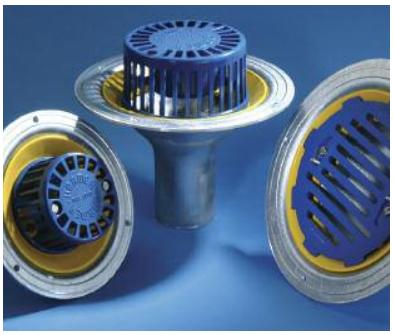
Alumasc is the UK's leading manufacturer of aluminium rainwater systems and offers a complete range of gutters, downpipes and fascia/soffits for both contemporary and traditional architecture.

Alumasc's cast iron rainwater system is for historic and restoration sites, with bespoke designs available to match or replace existing installations.

Rainwater

- Aluminium Rainwater Systems
- Aluminium Fascias, Soffits and Copings
- Cast Iron Rainwater Systems

www.alumascrainwater.co.uk



Alumasc's Harmer brand provides market leading solutions for rainwater handling and building drainage.

Aluminium roof, floor and shower drains are complemented by specialist drainage ranges in plastic. A choice of cast iron pipework systems is available for internal and rainwater drainage. Specialist rainwater management systems and paving and deck supports are also available.

Drainage

- Roof, Floor and Shower Drains
- Cast Iron Soil & Waste Systems
- Rainwater Management Systems
- Paving and Decking Supports

www.alumascdrainage.co.uk

Alumasc is a specialist provider of world class waterproofing and green roof systems.

The range includes Derbigum high performance flat roof membranes, Firestone TPO and EPDM single ply membranes, Hydrotech structural waterproofing and ZinCo Extensive, Biodiverse, Semi-intensive and Intensive green roofs.

Waterproofing

- Flat Roof Membranes
- Single Ply Membranes
- Structural Waterproofing
- Green Roof Systems

www.alumascwaterproofing.co.uk

Alumasc is a specialist in the design and development of thermally efficient insulated render systems. Alumasc's external wall insulation systems are available with a choice of insulating material and silicone, mineral or polymer-modified decorative render finishes.

Facades

- External Wall Insulation
- Render Only Systems
- Brick Slips & Specialist Systems
- Decorative Coatings

www.alumascfacades.co.uk

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- Rainwater
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