



DRAINAGE SYSTEMS

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CI/SfB
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May 2012

Harmer Roof Drainage

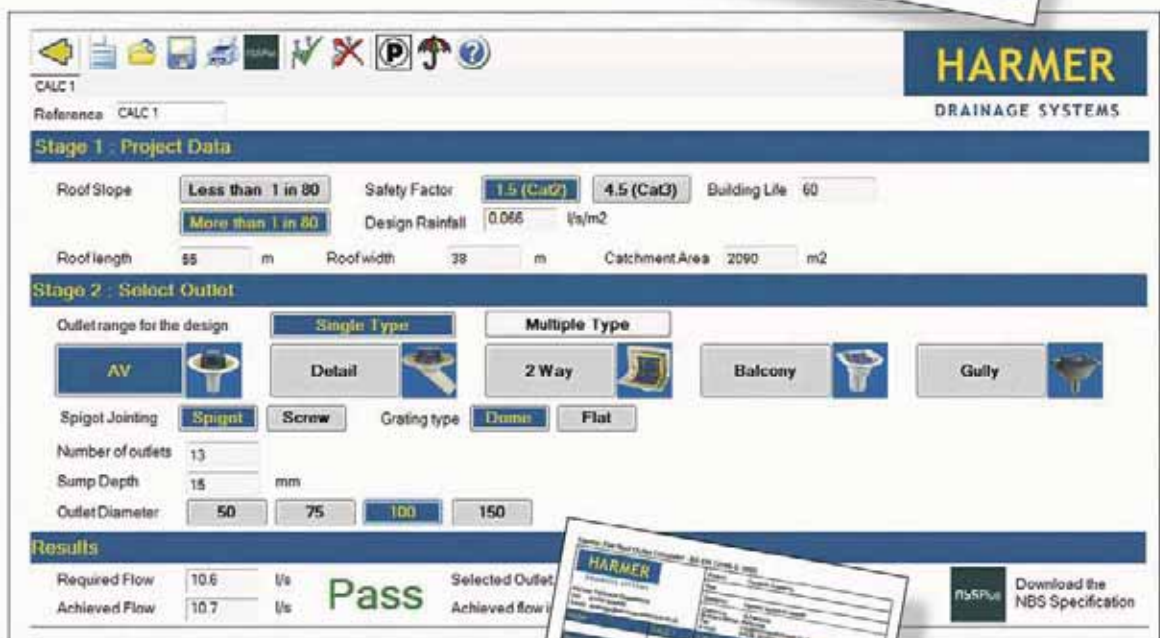
Roof Outlets, Roof Channel Drains and Raised Deck Supports



Maintaining a Flow of Information

www.harmerdrainage.co.uk

The Harmer drainage website provides a wealth of information on all aspects of Harmer Drainage and compatible products. Also included are FAQs, file downloads for NBS specification clauses, COSHH information, a CAD library, and much more.



Drainage Design Calculator

Architects and Building Services Engineers can now design and quantify all their Rainwater Drainage requirements using Alumasc's dedicated design software.

Key Features

- Category 2 and 3 Flat Roof Drainage Calculator linked in to local rainfall data
- Rainwater Drainage Drawing tool integrating Quantities Schedule
- Eaves Drainage Gutter sizing and pipe calculator for Cast and Contemporary gutter types
- Hyperlinks to Product Literature, DWG files and application specific NBS Specification Clauses



Technical Support

Harmer drainage products are backed-up by comprehensive technical literature and by hands-on project support starting with technical and design advice, and extending through site installation to recommendation of appropriate maintenance regimes. Implementation is led by the Alumasc Drainage Manager appointed to the project.

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Alumasc and Harmer - An Introduction

Alumasc Exterior Building Products is part of the Alumasc Group plc. The Group has over 800 employees, generating turnover of around £110 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.

About Alumasc and Harmer

Alumasc Exterior Building Products (Alumasc) is a leading supplier of premium products and systems for specification. The Company has been a major force in the UK construction industry for 70 years, during which time Alumasc products and systems have been used on some of Europe's most prestigious buildings.

Harmer is the leading name associated with flat roof rainwater drainage with over 40 years experience, maintaining a programme of continual development in the efficiency and performance of rainwater outlet design.

Alumasc ensures a high quality of product specification and installation, delivering risk-free, zero-defect solutions. The Company's commitment to making ongoing improvements is demonstrated through its accreditation to the ISO 14001: 2004 Environmental Management Standard.

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, Armaseam 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.

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 support on a project basis, led by specialist area managers and using the latest CAD and calculation technology.

Approved Stockists

Delivery of Alumasc products is controlled through a network of approved suppliers. This allows close control over all matters to ensure first class customer service.

Warranties

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



Quality and Sustainability

In addition to complying with environmental legislation, Alumasc is committed to developing its own measures to limit the adverse effects of its activities on the environment. To this end, Alumasc operates an environmental policy that fully integrates all aspects of company activities.



Quality

Alumasc operates a quality assurance management system which is independently audited to BS EN ISO 9001: 2008. Alumasc extends this quality management to its network of Stockists, for single source accountability and peace of mind.

Individual products and systems are certified by the British Board of Agrément.



ISO 9001: 2008

The ISO 9001 framework governs the management of many aspects of Alumasc support services, manufacturing and transport operations.

Alumasc is committed to continual development and, along with the ISO 14001: 2004 Environmental Management Standard, ISO 9001 provides the tools to monitor and feed back information from all areas of the business to ensure a first class service is maintained.

Sustainability

Alumasc actively pursues sustainability in the full range of products and systems the company offers through its accreditation to the ISO 14001: 2004 Environmental Management Standard. Alumasc, its partners and its suppliers are committed to putting consideration for the built and wider environment at the core of all aspects of their current business and future development.

ISO 14001: 2004

Alumasc's manufacturing sites at St Helens and Burton Latimer are independently audited to the ISO 14001: 2004 Environmental Management Standard.

Alumasc is committed to achieving improvements, not only as a good neighbour to the surroundings of their manufacturing plants, but in the responsible sourcing of raw materials and monitoring of the impact on the environment as a whole.

Development

Alumasc has within its portfolio a bedrock of environmentally sound products.

Development of these existing products and good practices is central to the success of Alumasc and key to the way in which it provides its proven solutions. Equally, the basis for any new and innovative development is grounded in the knowledge and experience Alumasc has of its core manufacturing materials.

BRE Green Guide to Specification

Ratings for building materials given in the BRE Green Guide to Specification allow designers to choose those products or construction methods with the least environmental impact.

High quality, long lasting products reduce the significant environmental and monetary cost of replacement during service life. Alumasc goods are able to contribute fully to achieving BREEAM credits for responsible sourcing of materials and as part of an overall water management scheme.



Harmer Roof Drainage Systems - Overview

The Harmer Roof range offers an unrivalled choice of rainwater outlets which combine innovative engineering and high performance materials for use with all types of waterproofing systems and building construction.



Introduction

Harmer is a leading brand in the building drainage market. Built on the philosophy of continual development and striving for excellence, the Harmer range continues to evolve to meet the changing needs of the construction industry and the environmental challenges of climate change. The extraordinary weather patterns that are being experienced around the world are putting extreme pressures on rainwater drainage systems. With over 40 years experience in the field of roof drainage, Harmer has an unrivalled track record in delivering technically sophisticated roof outlets that ensure trouble-free performance and ease of installation.

The new Harmer Roof rainwater outlet range consists of aluminium, cast iron, stainless steel and insulated polyurethane outlets. This range of materials and innovative designs provide a comprehensive choice of rainwater outlets that are suitable for all types of roof applications.

Architects and specifiers can be confident in specifying Harmer. For complex design calculations where multiple roof designs and building use factors need to be considered, Harmer's Technical Services department is able to advise.

Harmer Roof Drainage Systems - Overview

Architectural design, and advances in roofing materials have transformed the use of flat roofs in recent years. Harmer's extensive range of rainwater outlets and raised deck supports offers great flexibility of choice for designers to optimise the spatial use of the building roof.

Application

Harmer offers a wide range of roof drainage products suited to different types of roof construction including structural concrete, metal deck, timber deck, warm roof, cold roof, green roof and inverted roof. A secure connection between the waterproofing membrane and rainwater outlet is critical. Harmer Roof outlets can be used with all types of membrane including asphalt, built-up felt, single ply and wet-applied systems.

Flat and Low Pitched Roofs

The Harmer Roof range is suitable for all types of flat and low pitch roofs. Harmer's patented AV aluminium range provides optimum flow performance minimising the number of outlets. The anti-vortex effect accelerates as the depth of water at the outlet, or rainfall intensity, increases ensuring effective water disposal even in extreme weather. Installations are covered to suit most applications.

For copper or lead clad roof applications where the risk of bi-metallic corrosion is high, a comprehensive range of cast iron outlets is available in Medium Sump, Large Sump and Two-Way Parapet configurations.

Car Parks, Factories and Workshops

Load bearing applications where rainwater outlets are exposed to vehicular traffic are catered for in both cast iron and aluminium. Ductile iron grates have a load rating up to 12.5 tonnes.

Balconies

Adaptable solutions are available for drainage of balcony areas in aluminium, cast iron and stainless steel. The new Harmer aluminium shallow sump balcony outlet provides an unobtrusive design solution in new and refurbishment projects. The extensive grate options further enhance the functionality and appearance of the drain for use with paving supports, sand or cement bedding and epoxy resin coverings. The Harmer Balcony range can be combined with Alumasc architectural rainwater products where colour matching and bespoke manufacture opens up endless design possibilities.

Roof Terraces

A wide range of hard and soft landscaping materials can now be installed on roof areas to combine ecological benefits with strong visual enhancement and recreational use. Harmer provides a comprehensive range of drainage solutions for such applications by combining its traditional ranges with new innovative products. The Harmer Modulock system is an innovative solution for raised deck drainage on green roofs, terraces, walkways and ballasted flat roof construction. The range comprises raised paving supports and drainage channels that can be used in combination or individually to provide a versatile drainage system.

Materials

The Harmer Roof range consists of premium quality materials chosen for their inherent strength and durability, for ease of installation and long-life service.

Aluminium

Aluminium is durable and strong. It is also weatherproof and unaffected by UV light, ensuring optimal performance over its lifetime. Renowned for high quality, the Harmer Roof aluminium range is manufactured from marine grade aluminium alloy which has excellent corrosion resistance.

Cast Iron and Ductile Iron

Cast iron is strong, durable and widely used in drainage applications. Ductile iron is used for its tensile strength in load bearing applications. The Harmer Roof cast iron range combines both these materials to optimise product performance.

Stainless Steel and Galvanised Steel

Stainless steel is a corrosion-resistant metal that is both strong and aesthetically pleasing. Galvanised steel combines high performance and value engineering for use in many types of application. The Harmer Modulock Channel Drain system is available in both materials to suit individual project requirements.

Polypropylene and Polyurethane

Polyurethane materials are used where insulated outlets are required to eliminate condensation in warm roof construction. The Harmer Roof range combines the use of UV-stable polypropylene domical grates with other low-maintenance materials.

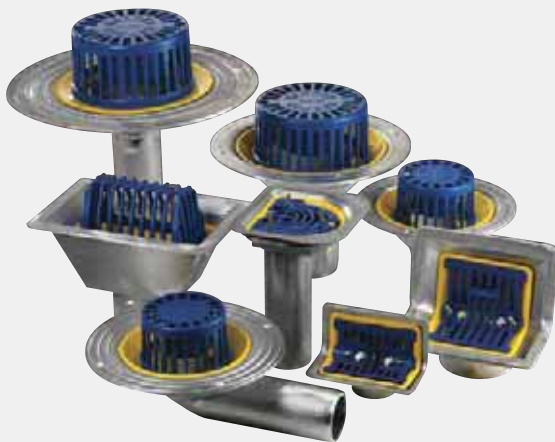


Harmer Roof Drainage Systems - Range Summary

The Harmer Roof drainage system provides a single source for innovative drainage solutions that are designed to perform and engineered to last. The comprehensive range of materials and product permutations have been carefully selected to provide maximum flexibility of choice for architects and specifiers.

Modern construction demands an accurate selection of products which are fit for purpose. Peace of mind is always assured with Harmer where important design considerations such as rainfall intensity, building use and life cycle requirements are factored into the design parameters of the products to ensure trouble-free performance.

The Harmer Roof range is separated into 5 distinct product categories for ease of reference and selection.



Harmer Roof Aluminium

Harmer Roof Aluminium is a high performance rainwater drainage system suitable for all types of flat roof application. The Harmer AV range provides advanced flow characteristics for optimum rainwater disposal. Outlets for specific applications, such as two-way, car park and balcony outlets, can be found under the Harmer Detail range.

See pages 12 to 41



Harmer Roof Cast Iron

Harmer Roof Cast Iron provides a wide variety of product configurations for use in all types of drainage installations. The cast iron permits the use of copper or lead roofing materials and is ideally suited for load bearing applications with vehicular traffic.

See pages 42 to 57

Harmer Roof Drainage Systems - Range Summary

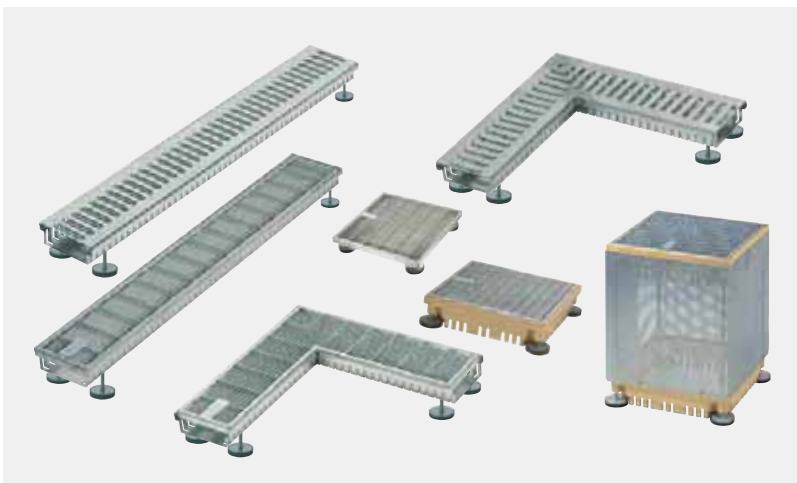
High quality materials like aluminium, cast iron and stainless steel have a proven track record in roof drainage applications where the integrity of the connection between the waterproofing membrane and roof outlet is critical to sustainable long-term use.



Harmer Roof Insulated

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

See pages 58 to 65



Harmer Roof Modulock Channel Drainage

Harmer Roof Modulock Channel Drainage system provides a versatile drainage solution for collection of rainwater in raised deck structures such as terraces, balconies and landscaped roofs. Available in either Stainless Steel or Galvanised Steel.

See pages 66 to 75



Harmer Roof Modulock Raised Deck Supports

A fully engineered self-levelling raised pedestal system for supporting paving slabs and timber decking in a variety of heights from substrate that allows percolation of rainwater. Designed to meet a wide variety of situations, including terraces, walkways, balconies and landscaped roof construction.

See pages 76 to 85

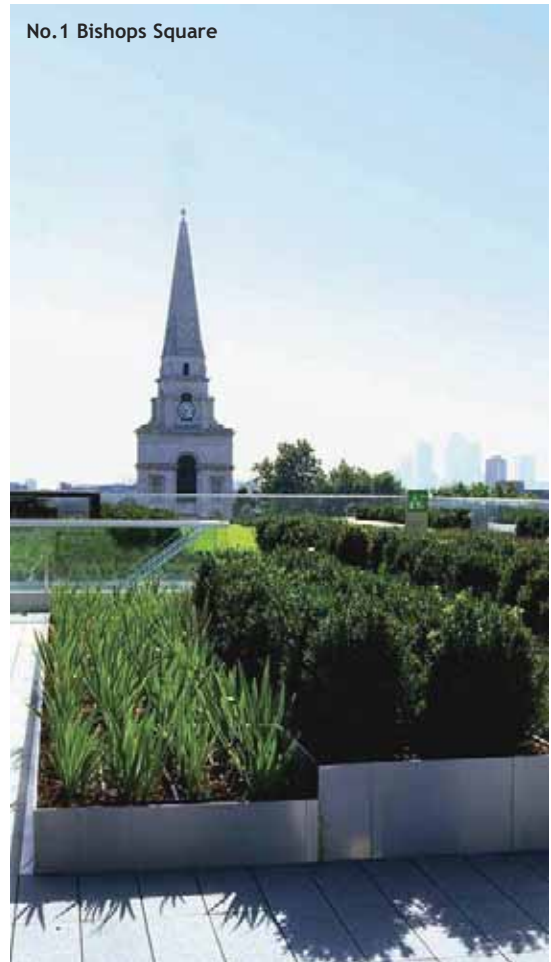
Harmer Roof Drainage Systems - Project Gallery

The Harmer Roof range offers an unrivalled choice of rainwater outlets which combine innovative engineering and high performance materials for use with all types of waterproofing systems and building construction, including commercial, residential, civil, health, transport and sport projects.

Castle Quay Shopping Centre



No.1 Bishops Square



Walsgrave Hospital



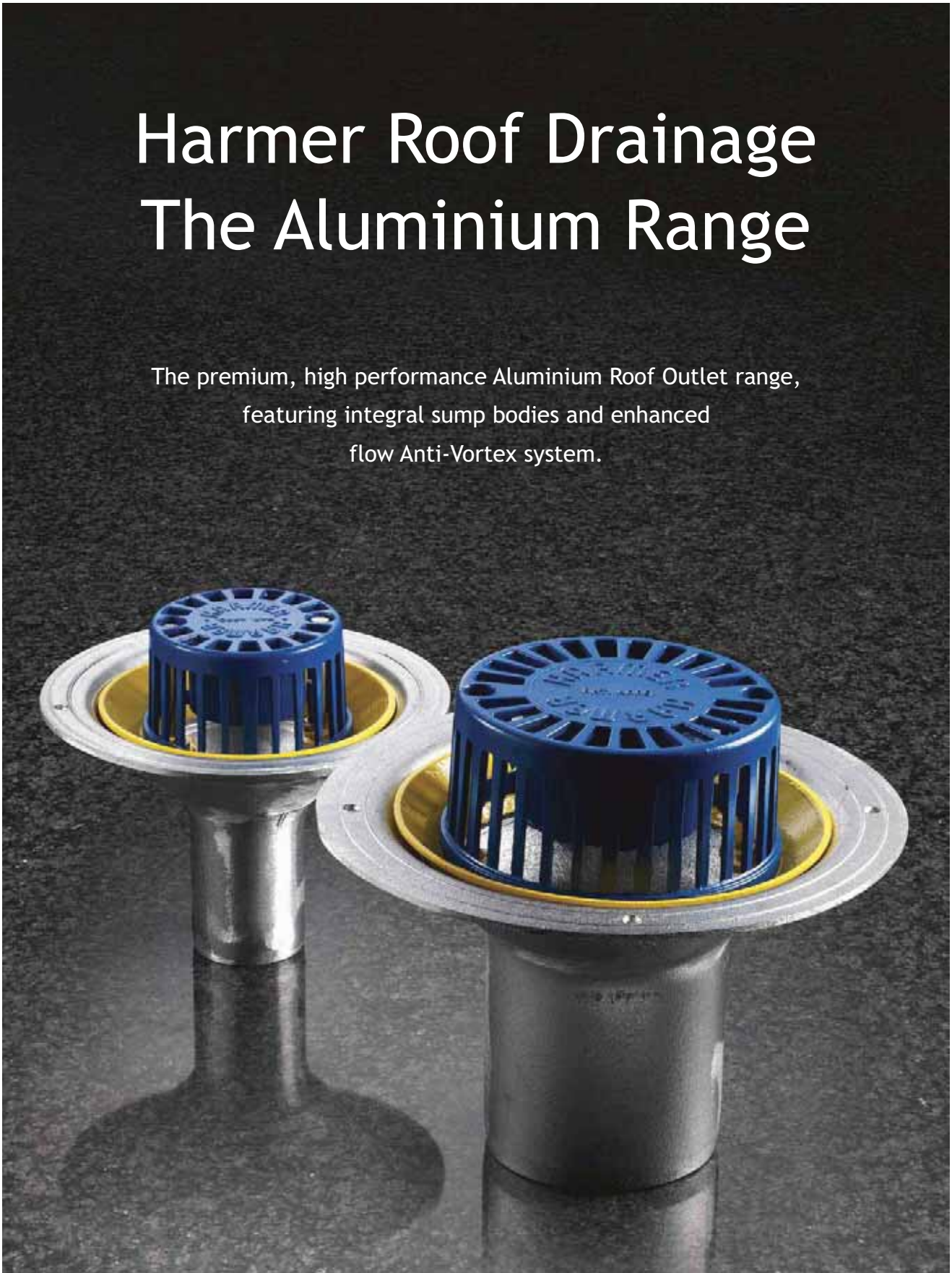
Harmer Roof Drainage Systems - Project Gallery



Project Listing ■ Institute of Life Sciences, Swansea ■ Gloucester Quays, Gloucester ■ Mossley Mill, Northern Ireland

Harmer Roof Drainage The Aluminium Range

The premium, high performance Aluminium Roof Outlet range,
featuring integral sump bodies and enhanced
flow Anti-Vortex system.



Aluminium Roof Outlets - Benefits

Harmer Aluminium Roof Outlets are hydraulically engineered to ensure trouble-free performance in excess of building life, whilst offering versatility and choice for architects, specifiers and consultants.

Compliances

- The Harmer Roof Aluminium range is cast in aluminium silicon alloy LM6 to BS EN 1676, BS EN 1559, BS EN 1706 and BS EN 1559, and are suitable for most types of flat roof drainage applications
- Drainage flow performance to BS EN 12056

High Flow Performance

- An outlet body with a deep integral sump for controlled flow of water into pipe
- Domical grates for Harmer AV outlets incorporate a patented baffle to prevent water swirl and air entrapment enabling the outlet to drain at optimum pipe capacity. The AV system provides complete reassurance which is critical to building drainage design

Robust and Secure

- Aluminium has a light weight-to-strength ratio, which means it is strong yet economical. The reduced weight provides benefits in material transportation and application
- Application of the waterproof membrane by a clamping ring ensures total integrity of seal
- Optional flat grates are available for trafficked and terraced areas

A Choice of Body and Grates

- A wide choice of standard drain body variations with spigot and threaded outlet connection, for vertical, horizontal or 45° discharge
- The shallow sump balcony outlets incorporate Stainless Steel and Nickel Bronze grate options for enhanced appearance with alternative deck finishes

Low Maintenance

- Domical grates for Harmer outlets permit a free flow of rainwater while preventing loose chippings or debris from entering the outlet
- The offset fixings of the clamping ring and domical grate to the outlet body, for both Detail and AV grates, ensures that the throat is completely unobstructed for optimised flow and to facilitate rodding

Easy and Quick to Install

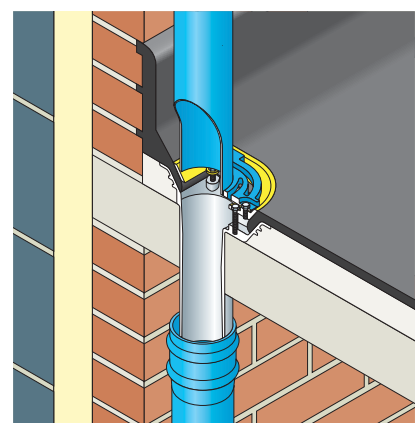
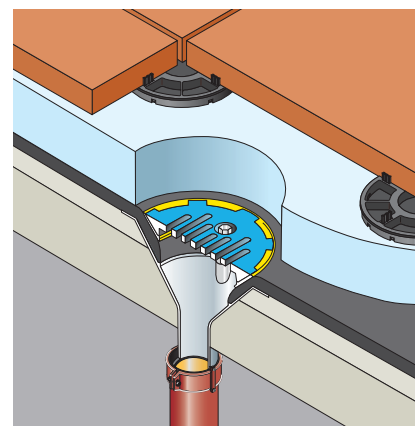
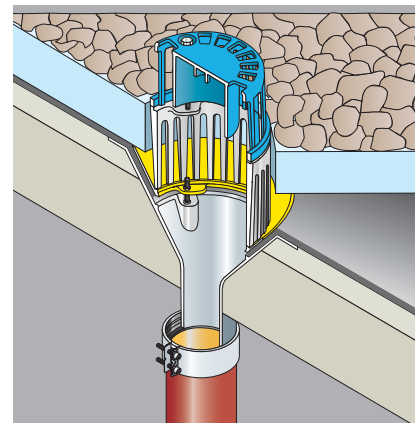
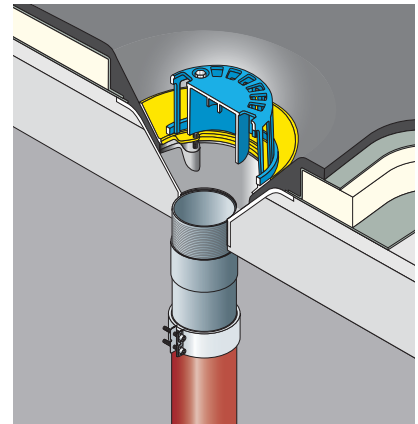
- The aluminium alloy is light in weight and therefore easy to handle on site and during installation. This lightness also makes aluminium outlets suitable for a wide range of lightweight roof decks
- A wide range of standard accessories such as extension pieces, pipe adaptors and grates are available to ensure successful installation of Harmer rainwater outlets in most types of roof construction

Value for Money

- Diecast in LM6 aluminium alloy which has excellent resistance to corrosion under both atmospheric and marine conditions
- Clamps and grates are polyester powder coated to BBA-approved standard to further increase protection and extend product life

Sustainable

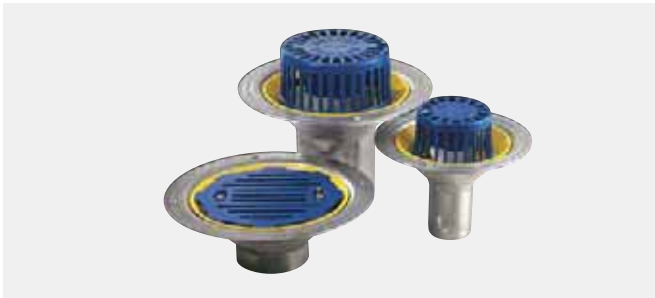
- Aluminium is 100% recyclable making it a cost effective, sustainable material
- End of life Harmer Roof aluminium outlets can be recast into new aluminium products



Aluminium Roof Outlets - Product Range Summary

Harmer Aluminium Roof Outlets offer a wide choice of outlet designs that cater for most types of building drainage applications. Harmer AV rainwater outlets provide optimum flow performance even in extreme rainfall conditions.

AV Outlets



AV Vertical Spigot or Threaded Outlets

Harmer Roof AV Vertical Spigot and Threaded outlets provide anti-vortex performance within an economic range of general purpose outlets. Designed for connection to downpipes on a gravity system.

See page 15.

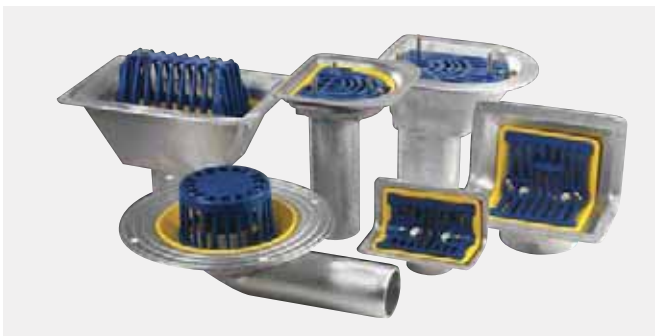


AV Retro-Gulley Outlets

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 Retro-Gulley aluminium tail pipe connects directly into the existing pipework via the old outlet.

See page 18.

Detail Outlets



Harmer Roof Detail outlets comprise a range designed to solve problematic detailing requirements.

The range includes 45° and 90° threaded or spigot outlets, used with either domical or flat grates.

Also included are two-way, balcony, car park and gulley outlets.

See page 19.

Accessories and Pipe Connections



There is a range of accessories for Harmer aluminium AV and Detail systems to ensure the successful installation of Harmer rainwater outlets in most types of roof construction.

The range includes threaded spigot adaptors, metal deck support plates, overflow outlets and couplings.

See page 32.

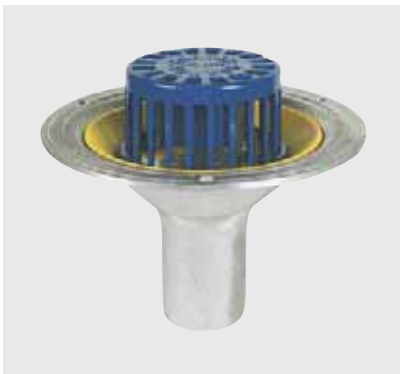
Aluminium Roof Outlets - Introduction to AV Outlets

The Harmer AV range offers unrivalled flow characteristics and has a proven track record for reliable performance.

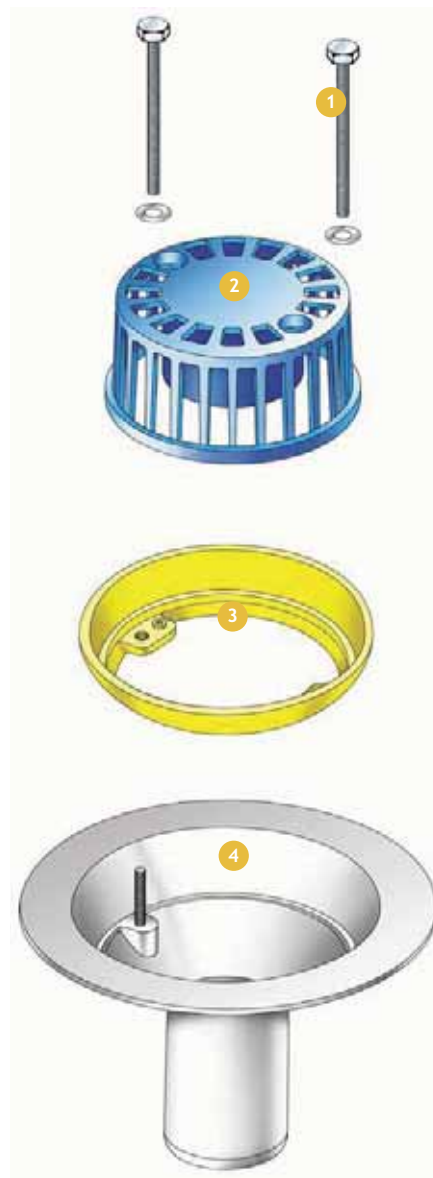
Main Characteristics

Enhanced Performance

Harmer rainwater outlets provide, with the Harmer Roof AV range, anti-vortex performance from an economic, general purpose range of outlets. Harmer Roof AV incorporates a patented baffle within the grating, to prevent water swirl and air entrapment, enabling the outlet to drain at optimum 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 downpipes on a gravity 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, the clamping ring is fixed to the outlet body with two stainless steel fixing studs

4 Outlet Body

Deep sump body is secured through flange to supporting structure

Key Benefits of the Harmer AV Roof Outlet Range

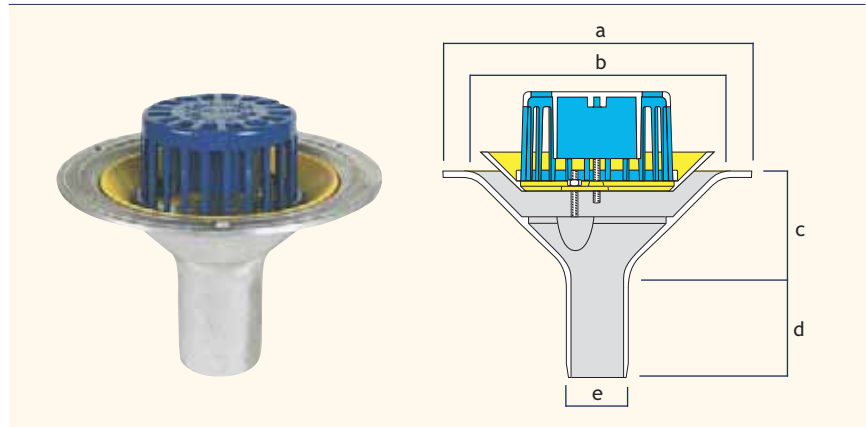
- Drains more roof area than conventional gravity outlet.
- Harmer AV can be used with any connecting pipework material, and all popular pipework sizes.
- Easy installation into roofs and gutters using bituminous, single ply and wet-applied waterproofing systems.
- High flow performance with increasing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

Aluminium Roof Outlets - AV Vertical Outlets

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

Vertical Spigot Outlet - Domical Grate

Vertical Spigot outlets are suitable for direct connection to cast iron pipework to BS EN 877 and BS 416, HDPE pipework and PVC O-ring socketed pipe to BS 4514 and BS EN 1329-1 (AV300, AV400 and AV600 outlets only). Please see pipework connections on page 34 for appropriate Harmer coupling selection.



Flow Rate Note 1 (applies to all tables)
Flow rates are in litres per second to rainwater pipe capacity limits of BS EN 12056. Contact Harmer Technical Services for variable outlet performance to specific depth of water and rainfall intensity.

Outlet Size (mm)	a (mm)	b (mm)	c (mm)	d (mm)	e (mm)	Flow Rate ¹ (l/s)	Weight (kg)	Product Code
50	292	233	98	98	60	1.69	2.5	AV200
75	292	233	88	108	83	4.97	2.7	AV300
100	380	305	122	122	110	10.71	4.9	AV400
150	380	305	98	145	160	14.07	5.0	AV600

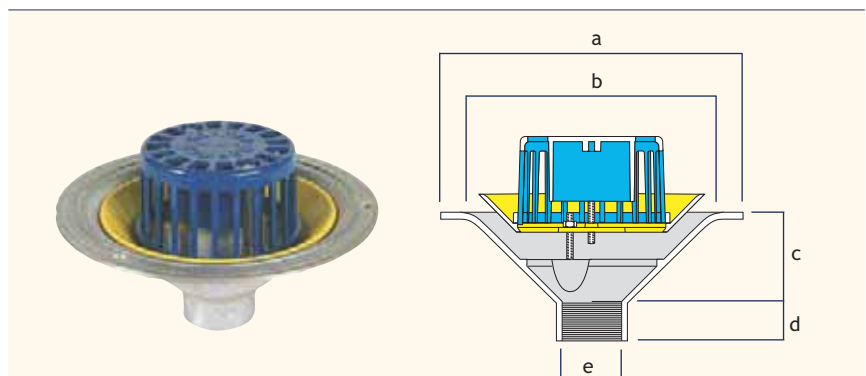
For flat grate versions add suffix /F to the product code (See page 17)

A range of accessories is available for use with special detail requirements (See pages 17, 32 and 33)

Vertical Threaded Outlet - Domical Grate

Vertical Threaded outlets have a female socket with parallel thread to BS EN 10226-1 for direct connection to threaded tube conforming with BS EN 10226-1. This tube is supplied with BS EN 10255 taper male thread which ensures a completely watertight joint when screwed home into the socket outlet. Threaded 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 gastight seal within the slab.

Harmer Roof AV threaded outlets can be connected to socketed and socketless cast iron pipework, HDPE pipework and PVC pipework by means of the Harmer Roof Threaded Spigot Adaptor with appropriate Harmer coupling. (See page 33).



Outlet Size (mm)	a (mm)	b (mm)	c (mm)	d (mm)	e (BSP)	Flow Rate ¹ (l/s)	Weight (kg)	Product Code
50	292	234	86	35	2"	1.69	2.3	AV200T
75	292	234	76	45	3"	4.97	2.3	AV300T
100	380	305	95	38	4"	10.71	4.5	AV400T
150	380	305	76	38	6"	13.51	4.5	AV600T

For flat grate versions add suffix /F to the product code (See page 17)

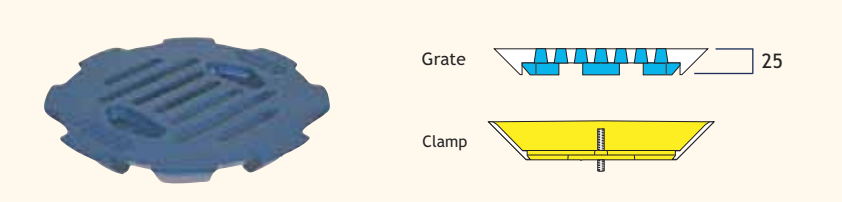
A range of accessories is available for use with special detail requirements (See pages 17, 32 and 33)

Aluminium Roof Outlets - AV Vertical Outlets

Flat Grate

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 with Harmer Modulock drainage system where concealed rainwater outlets are used. (See page 38)

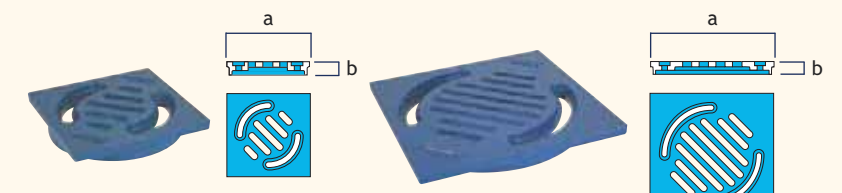
To specify or order, add suffix /F to the product codes on page 16, e.g 100mm Vertical Spigot outlet with Flat Grate: AV400/F.



Outlet Size (kg)	Flow Rate (l/s) ¹	Load Rating (tonne)	Weight (kg)	Suffix
50	1.69	1.5	0.8	/F
75	4.97	1.5	0.8	/F
100	10.71	1.5	1.2	/F
150	15.55	1.5	1.2	/F

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.



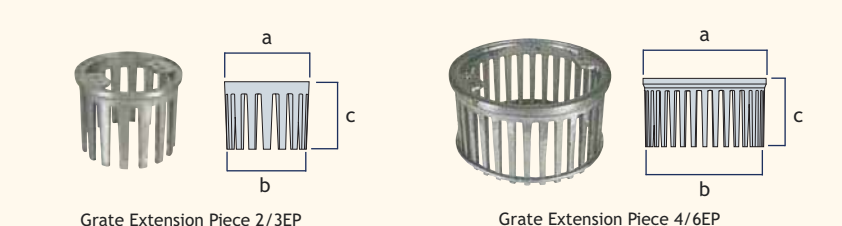
Outlet Size (mm)	a (mm)	b (mm)	Flow Rate ¹ (l/s)	Load Rating (tonne)	Weight (kg)	Product Code
50	150	25	1.69	1.5	0.7	2/3TG
75	150	25	4.97	1.5	0.7	2/3TG
100	232	25	10.71	1.5	1.6	4/6TG
150	232	25	15.55	1.5	1.6	4/6TG

Grate Extension Pieces

Grate Extension Pieces 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. (See page 38)

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.



Outlet Size (mm)	a (mm)	b (mm)	c (mm)	Weight (kg)	Product Code
50	161	150	128	0.7	2/3EP
75	161	150	128	0.7	2/3EP
100	233	222	128	1.3	4/6EP
150	233	222	128	1.3	4/6EP

Aluminium Roof Outlets - AV 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. 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.

Application

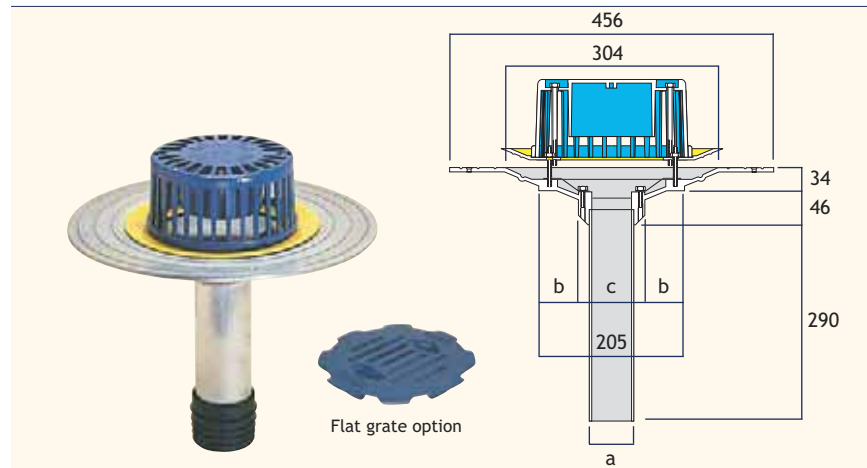
The use of AV increases flow performance at the outlet location regardless of pipe diameter downsizing.

There is no need to remove the old rainwater outlet.

The outlet body is in diecast LM6 aluminium silicon alloy to BS EN 1706, 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.



Outlet Size (mm)	a (mm)	b (mm)	c (mm)	Flow Rates ¹ (l/s)	Weights (mm)	Product Code
75	63.5	55	95	4.63	5.4	RAV75
100	88.9	42	120	5.53	4.9	RAV100
150	88.9	42	120	5.53	4.9	RAV150

For flat grate version add suffix /F to the product code

A range of accessories is available for use with special detail requirements (See pages 17, 32 and 33)

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

Existing pipework internal diameter (mm)	Product Code
71.5 - 78.5	RAV75
97.0 - 104.0	RAV100
145 - 155	RAV150

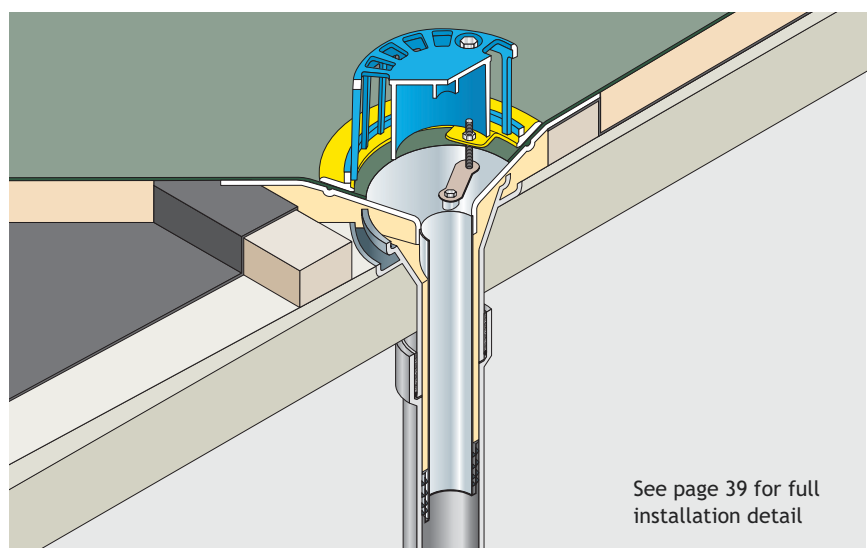
Connection to Pipework

The Retro-Gulley may be used for any type of warm roof refurbishment and with any flat roof waterproofing system. 75mm, 100mm and 150mm 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 Alliance (FRA).

Flow Rate Note 1 (applies to table)

Flow rates are in litres per second to rainwater pipe capacity limits of BS EN 12056. Contact Harmer Technical Services for variable outlet performance to specific depth of water and rainfall intensity.



See page 39 for full installation detail

Aluminium Roof Outlets - Introduction to Detail Outlets

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

Main Characteristics

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.

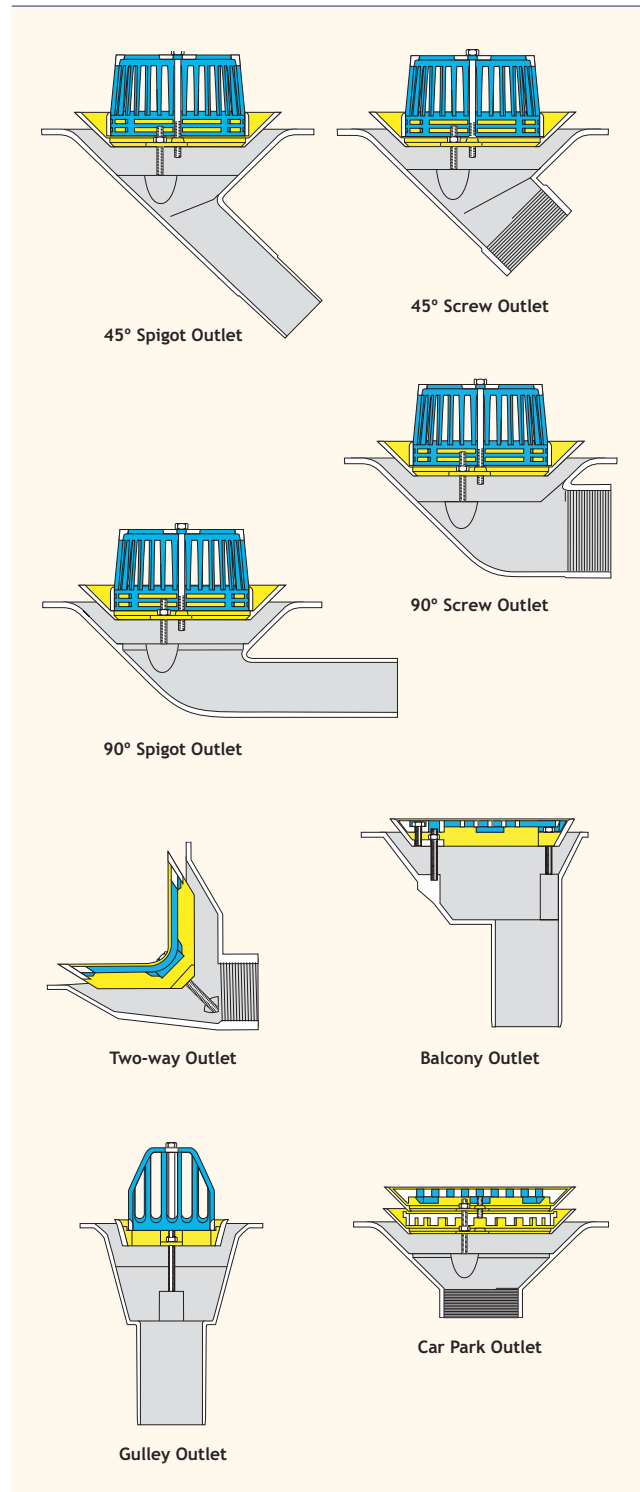
Areas of Application

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.
- Gully spigot outlets cast in LM6 aluminium alloy for narrow gutter and gully 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.

Bespoke Manufacture

Rainwater outlets can be modified to have extended pipework as well as pipe conversions to co-ordinate with Alumasc colour coated, external rainwater pipe systems. Contact Harmer Technical Department for all bespoke requirements.

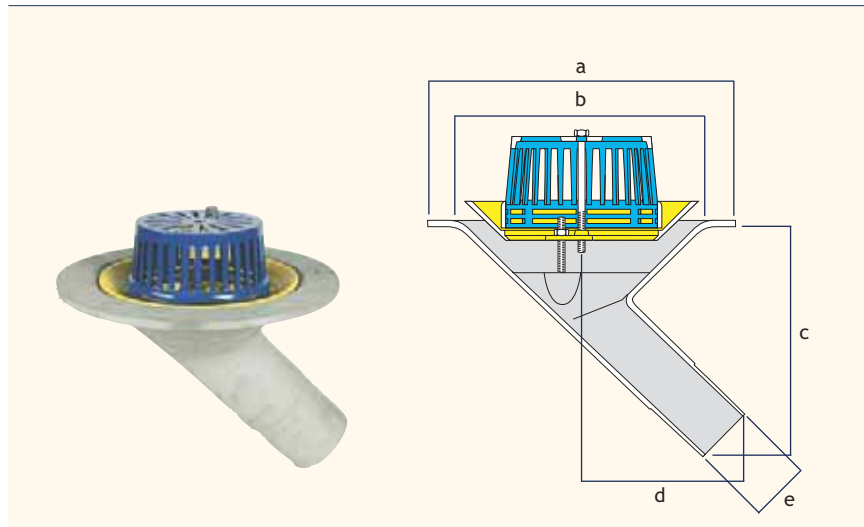


Aluminium Roof Outlets - 45° Detail Outlets

Harmer Roof 45° Detail 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.

45° Spigot Outlet - Domical Grate

45° Spigot outlets are suitable for connection to cast iron pipework to BS EN 877 and BS 416, HDPE pipework and PVC pipe to BS 4514 and BS EN 1329-1. Please see pipework connections on page 34 for appropriate Harmer coupling selection.



Flow Rate Note 1 (applies to all tables)

Flow rates are in litres per second to rainwater pipe capacity limits of BS EN 12056. Contact Harmer Technical Services for variable outlet performance to specific depth of water and rainfall intensity.

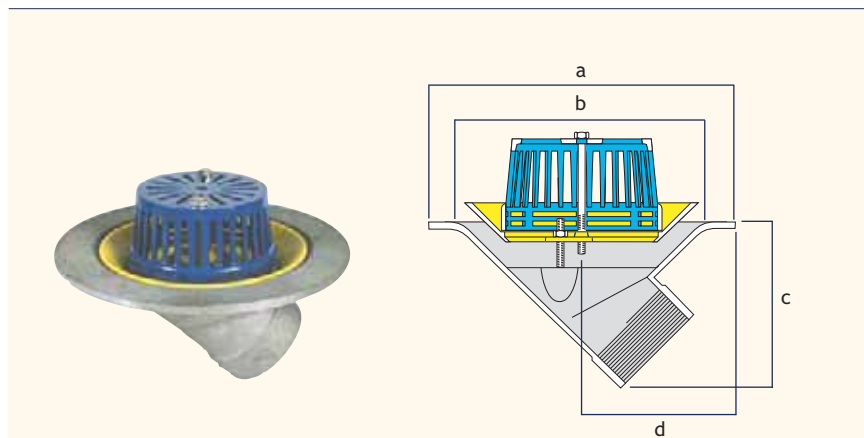
Outlet Size (mm)	a (mm)	b (mm)	c (mm)	d (mm)	e (mm)	Flow Rate ¹ (l/s)	Weight (kg)	Product Code
50	305	229	229	175	62	1.69	3.6	245
75	305	229	235	175	87	4.97	4.2	345
100	372	305	273	191	114	10.66	6.0	445

For flat grate versions add suffix /F to the product code (See page 21)

A range of accessories is available for use with special detail requirements (See pages 21, 32 and 33)

45° Threaded Outlet - Domical Grate

45° Screw outlets have a female socket with parallel thread to BS EN 10226-1 for direct connection to threaded tube conforming with BS EN 10226-1. This tube is supplied with BS EN 10255 taper male thread which ensures a completely watertight joint when screwed home into the socket outlet. Threaded 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 gastight seal within the slab. Harmer Roof AV threaded outlets can be connected to socketed and socketless cast iron pipework, HDPE pipework and PVC pipework by means of the Harmer Roof Threaded Spigot Adaptor with appropriate Harmer coupling. (See page 33).



Outlet Size (mm)	a (mm)	b (mm)	c (mm)	d (mm)	Flow Rate ¹ (l/s)	Weight (kg)	Product Code
50	305	229	159	109	1.69	3.8	245T
75	305	229	159	109	4.97	3.5	345T
100	372	305	186	113	10.71	6.0	445T

For flat grate versions add suffix /F to the product code (See page 21)

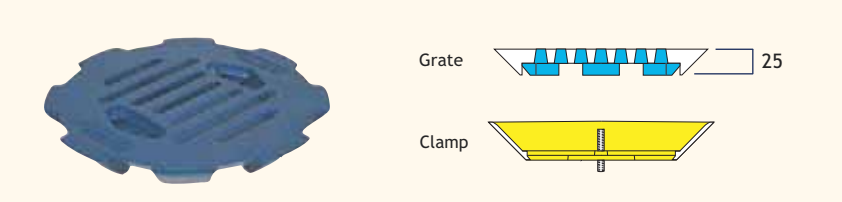
A range of accessories is available for use with special detail requirements (See pages 21, 32 and 33)

Aluminium Roof Outlets - 45° Detail Outlets

Flat Grate

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 with Harmer Modulock drainage system where concealed rainwater outlets are used. (See page 38)

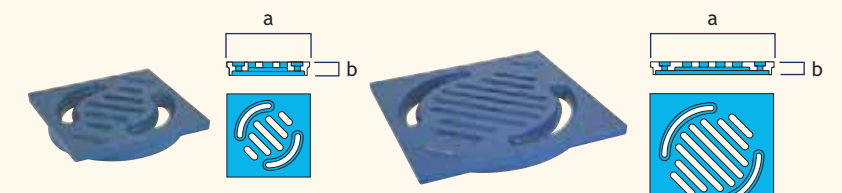
To specify or order, add suffix /F to the product codes on page 20, e.g 100mm 45° Spigot outlet with Flat Grate: 445/F.



Outlet Size (kg)	Flow Rate ¹ (l/s)	Load Rating (tonne)	Weight (kg)	Suffix
50	1.69	1.5	0.8	/F
75	4.97	1.5	0.8	/F
100	10.71	1.5	1.2	/F
150	15.55	1.5	1.2	/F

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.



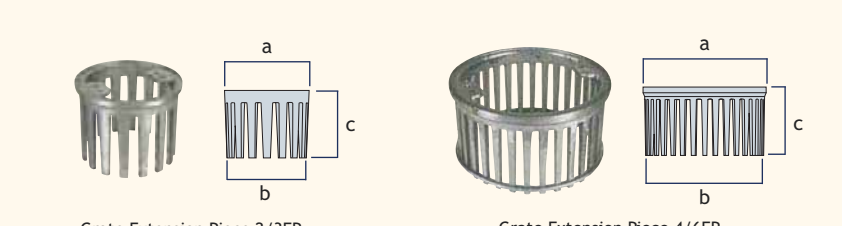
Outlet Size (mm)	a (mm)	b (mm)	Flow Rate ¹ (l/s)	Load Rating (tonne)	Weight (kg)	Product Code
50	150	25	1.69	1.5	0.7	2/3TG
75	150	25	4.97	1.5	0.7	2/3TG
100	232	25	10.71	1.5	1.6	4/6TG
150	232	25	15.55	1.5	1.6	4/6TG

Grate Extension Pieces

Grate Extension Pieces 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. (See page 38)

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.



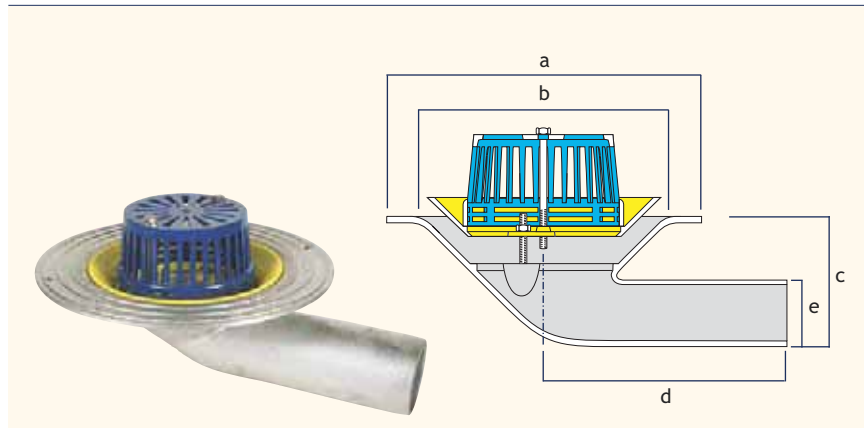
Outlet Size (mm)	a (mm)	b (mm)	c (mm)	Weight (kg)	Product Code
50	161	150	128	0.7	2/3EP
75	161	150	128	0.7	2/3EP
100	233	222	128	1.3	4/6EP
150	233	222	128	1.3	4/6EP

Aluminium Roof Outlets - 90° Detail Outlets

Harmer Roof 90° Detail 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.

90° Spigot Outlet - Domical Grate

90° Spigot outlets are suitable for direct connection to cast iron pipework to BS EN 877 and BS 416, HDPE pipework and PVC O-ring socketed pipe to BS 4514 and BS EN 1329-1. Please see pipework connections on page 34 for appropriate Harmer coupling selection.



Flow Rate Note 1 (applies to all tables)

Flow rates are in litres per second to rainwater pipe capacity limits of BS EN 12056. Contact Harmer Technical Services for variable outlet performance to specific depth of water and rainfall intensity.

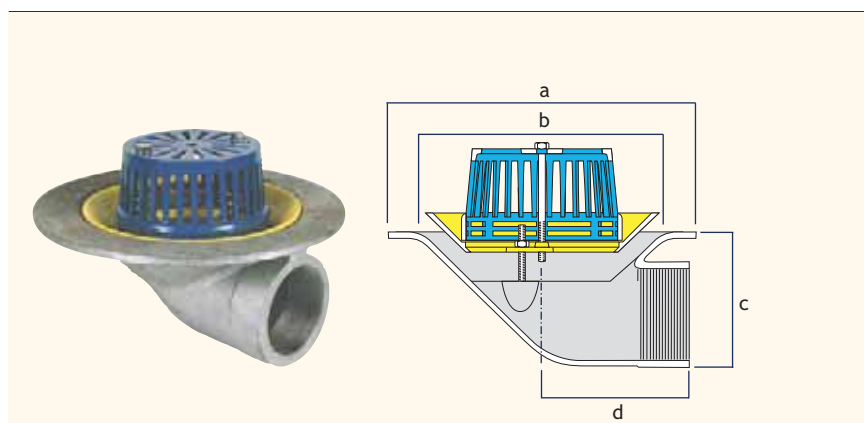
Outlet Size (mm)	a (mm)	b (mm)	c (mm)	d (mm)	e (mm)	Flow Rate ¹ (l/s)	Weight (kg)	Product Code
50	305	229	124	232	62	1.69	4.0	290
75	329	229	121	267	83	3.31	3.8	390
100	450	305	142	285	110	7.19	5.5	490

For flat grate versions add suffix /F to the product code (See page 23)

A range of accessories is available for use with special detail requirements (See pages 23, 32 and 33)

90° Threaded Outlet - Domical Grate

90° Screw outlets have a female socket with parallel thread to BS EN 10226-1 for direct connection to threaded tube conforming with BS EN 10226-1. This tube is supplied with BS EN 10255 taper male thread which ensures a completely watertight joint when screwed home into the socket outlet. Threaded 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 gastight seal within the slab. Harmer Roof AV threaded outlets can be connected to socketed and socketless cast iron pipework, HDPE pipework and PVC pipework by means of the Harmer Roof Threaded Spigot Adaptor with appropriate Harmer coupling. (See page 33).



Outlet Size (mm)	a (mm)	b (mm)	c (mm)	d (mm)	Flow Rate ¹ (l/s)	Weight (kg)	Product Code
50	305	229	127	140	1.69	3.9	290T
75	305	229	127	140	3.39	3.7	390T
100	356	305	172	152	7.29	5.5	490T
150	356	305	225	152	10.01	7.0	690T

For flat grate versions add suffix /F to the product code (See page 23)

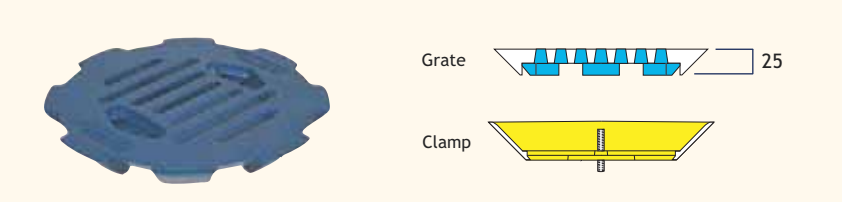
A range of accessories is available for use with special detail requirements (See pages 23, 32 and 33)

Aluminium Roof Outlets - 90° Detail Outlets

Flat Grate

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 with Harmer Modulock drainage system where concealed rainwater outlets are used. (See page 38)

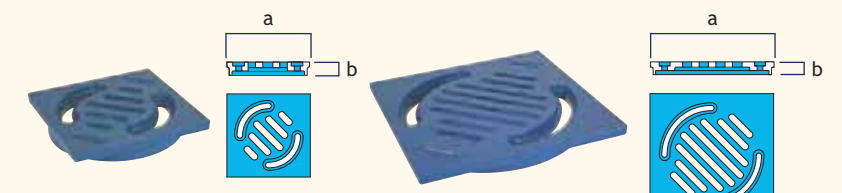
To specify or order, add suffix /F to the product codes on page 22, e.g 100mm 90° Spigot outlet with Flat Grate: 490/F.



Outlet Size (kg)	Flow Rate ¹ (l/s)	Load Rating (tonne)	Weight (kg)	Suffix
50	1.69	1.5	0.8	/F
75	4.97	1.5	0.8	/F
100	10.71	1.5	1.2	/F
150	15.55	1.5	1.2	/F

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.



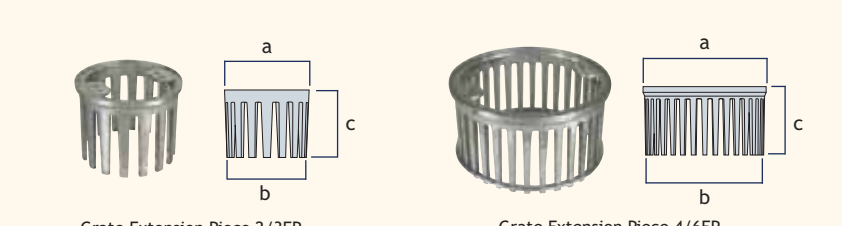
Outlet Size (mm)	a (mm)	b (mm)	Flow Rate ¹ (l/s)	Load Rating (tonne)	Weight (kg)	Product Code
50	150	25	1.69	1.5	0.7	2/3TG
75	150	25	4.97	1.5	0.7	2/3TG
100	232	25	10.71	1.5	1.6	4/6TG
150	232	25	15.55	1.5	1.6	4/6TG

Grate Extension Pieces

Grate Extension Pieces 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. (See page 38)

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.



Outlet Size (mm)	a (mm)	b (mm)	c (mm)	Weight (kg)	Product Code
50	161	150	128	0.7	2/3EP
75	161	150	128	0.7	2/3EP
100	233	222	128	1.3	4/6EP
150	233	222	128	1.3	4/6EP

Aluminium Roof Outlets - Two-Way Detail Outlets

Harmer Roof Two-Way Detail 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 run-off and are suitable for use with most types of waterproofing membrane.

Two-Way Detail Outlets

Two-Way Detail outlets have a female socket with parallel thread to BS EN 10226-1 for direct connection to threaded tube conforming with BS EN 10226-1. This tube is supplied with BS EN 10255 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 Threaded Spigot Adaptor, will create a completely gas-tight seal within the slab. Harmer Two-Way Detail outlets can be connected to socketed and socketless cast iron pipework, HDPE pipework and PVC pipework by means of the Harmer Roof Threaded Spigot Adaptor with appropriate Harmer coupling. (See page 33).

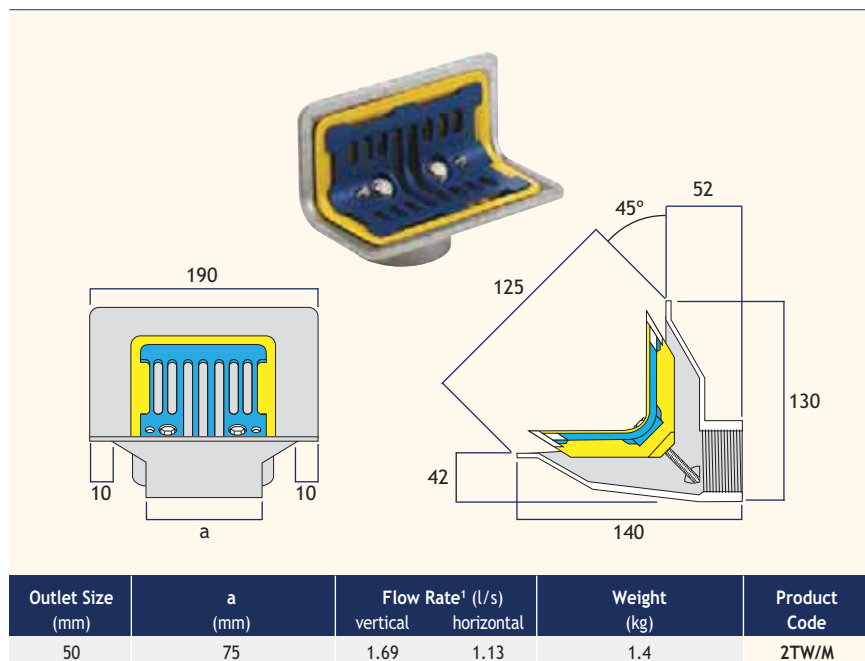


Mini Two-Way

Specially designed for connection to 50mm pipework in situations where the drainage requirement is small, such as domestic balconies. Outlet connection is 2" BSP thread.

Flow Rate Note 1 (applies to all tables)

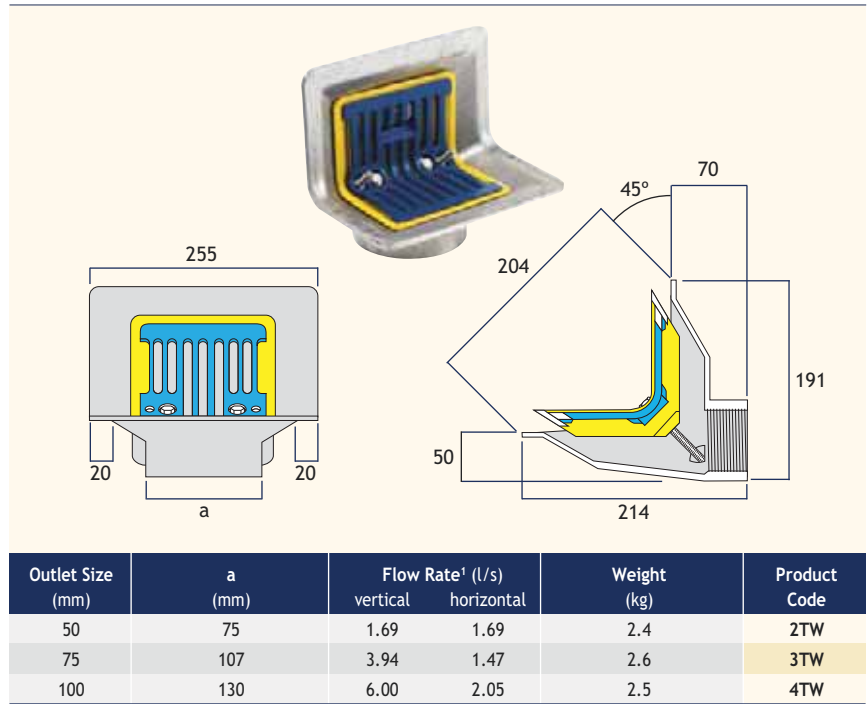
Flow rates are in litres per second to rainwater pipe capacity limits of BS EN 12056. Contact Harmer Technical Services for variable outlet performance to specific depth of water and rainfall intensity.



Aluminium Roof Outlets - Two-Way Detail Outlets

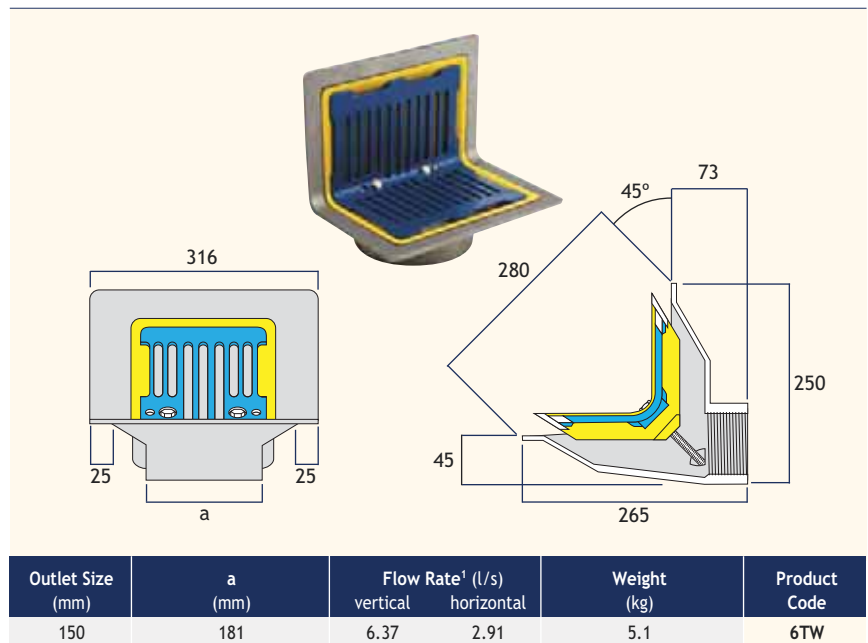
Regular Two-Way

The Regular Two-Way is designed for use in many applications, the sump is compact yet provides adequate drainage for most parapet applications, it has three outlet options in 2", 3", and 4" BSP thread.



Large Two-Way

The Large Two-Way is designed for use on large surface drainage areas where 150mm outlets are required. Outlet connection is 6" BSP thread.



Aluminium Roof Outlets - Parapet Downspouts

Harmer Roof Parapet Downspouts are designed to effectively discharge rainwater away from the building and avoid the problem of rainwater backtrack to the face of the wall. Parapet Downspouts can also be used in conjunction with parapet overflows.

Introduction

Harmer Roof Parapet Downspouts provide an attractive means of directing water away from the face of the building in such a way as to prevent the backtrack of rainwater from causing unsightly staining and damage.

Harmer Roof Parapet Downspouts can be used in combination with Alumasc rainwater pipes and hoppers and when colour co-ordinated, add to the finished appearance of the building.

Application

Downspouts are ideally suited for use with Harmer Detail Two-Way outlets fitted with Harmer Threaded Spigot Adaptors. They can also provide a discreet means of discharge when used with parapet overflows.

Material - Siliconised Cast Aluminium LM6
Material - Cast Iron

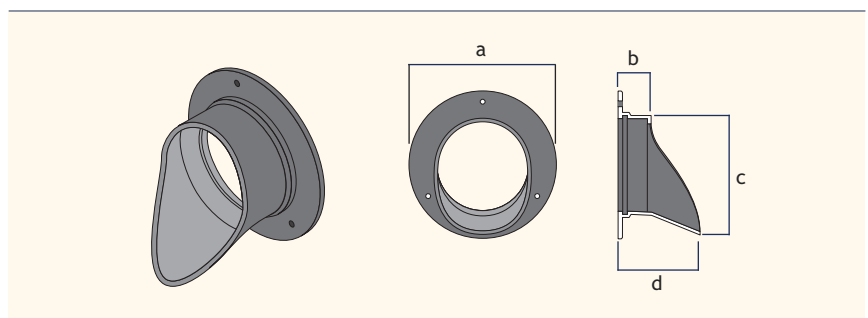
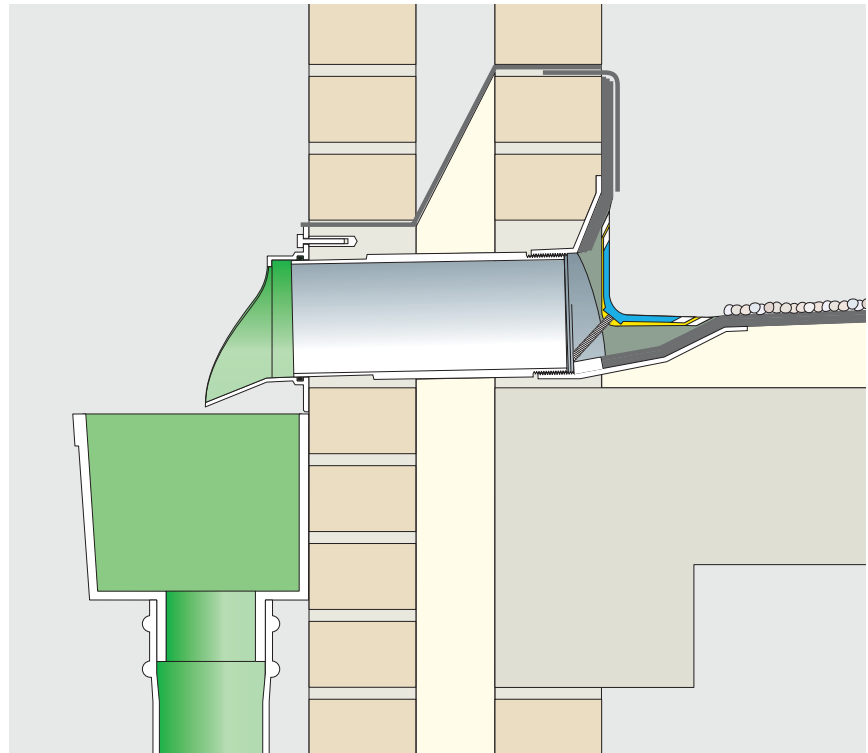
Finish

Aluminum downspouts are supplied in mill finish cast aluminium. Polyester powder coated finishes in Alumasc's standard colours are available to match external building finishes or colour coated rainwater pipes and hoppers.

Cast iron downspouts are supplied as standard in primed finish for painting on site or can be painted black by Alumasc to co-ordinate with other cast iron rainwater goods.

Connection

For ease of installation and perfect alignment, Harmer Downspouts push-fit connect to standard 110mm diameter plain ended pipe using an "O" ring seal and mechanical fixing into masonry.



Outlet Size (mm)	Material	a (mm)	b (mm)	c (mm)	d (mm)	Weight (kg)	Product Code
100	Aluminium	180	40	146	100	0.5	ADS/4*
100	Cast Iron	180	40	146	100	1.4	CDS/4

*Also available in polyester powder coated finish to Alumasc standard colour range or RAL.

Aluminium Roof Outlets - Car Park Detail Outlets

Harmer Roof Car Park Detail 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 1.5 tonne). The threaded body is available in two types, flanged and flangeless.

Car Park Outlet Flanged

Harmer Roof Car Park Detail outlets provide the ideal drainage and installation solution where car park deck drainage is required in either asphalted concrete deck or float finish concrete decks.

The Flanged Car Park outlets are designed to be cast insitu and feature a double clamp arrangement to allow the individual attachment of the wearing course and the waterproofing course that are applied to the concrete deck.

Load rating L15 - 1.5 tonne

Outlet Size (mm)	a (mm)	b (mm)	c (mm)	d (mm)	Flow Rate ¹ (l/s)	Weight (kg)	Product Code
100	380	305	95	38	10.71	5.0	400CP
150	380	305	76	38	15.55	5.1	600CP

Car Park Outlet Flangeless

Flangeless Car Park Detail outlets are also designed for cast insitu slab construction where waterproofing is not required. They feature a combined clamp and grate arrangement which is securely bolted to the body of the outlet. The combination of clamp and grate as a single unit generally improves strength and stability as well as providing quick and easy access to pipework.

Load rating L15 - 1.5 tonne

Outlet Size (mm)	a (mm)	b (mm)	c (mm)	Flow Rate ¹ (l/s)	Weight (kg)	Product Code
100	305	95	38	10.71	4.9	400T/DD
150	305	76	38	15.55	5.0	600T/DD

Connections

The use of Harmer Adaptors for both Flanged and Flangeless Car Park Detail outlets provides a convenient solution for pipe connection through a structural concrete deck. A special length Adaptor is available where the depth of the concrete deck is greater than a standard Adaptor length.

Car Park Outlets have a female socket with parallel thread to BS EN 10226-1 for direct connection to threaded tube conforming with BS EN 10255. The tube must be threaded in accordance with BS EN 10226-1 taper male thread to ensure a completely watertight joint when screwed home into the socket of the outlet. Threaded outlets are particularly recommended where a connection to the outlet occurs within the thickness of the concrete slab. In such cases, a threaded connection will create a completely gastight seal within the slab. Harmer Roof Detail Car Park outlets can be connected to socketless cast iron pipework conforming to BS EN 877 as well as socketed PVCu and HDPE systems by means of the Harmer Roof Threaded Spigot Adaptor with appropriate Harmer coupling. (See page 33)

Flow Rate Note 1 (applies to all tables)

Flow rates are in litres per second to rainwater pipe capacity limits of BS EN 12056. Contact Harmer Technical Services for variable outlet performance to specific depth of water and rainfall intensity.

Aluminium Roof Outlets - Balcony Detail Outlets

Harmer Roof Balcony Detail outlets are designed for use with concrete balcony structures and are fitted with flat grates for safe drainage in pedestrian accessed areas. Balconies provide valuable living space and optimising the spatial use of balcony areas for recreational and environmental benefits is beneficial to both new build and refurbishment projects.

Introduction

The range consists of the traditional large sump outlet and a NEW shallow sump range which incorporates a wide selection of grating options in Stainless Steel and Nickel Bronze for use with epoxy resin finishes and tiled areas. Harmer Balcony outlets are ideal for use with all types of waterproofing membranes including mastic asphalt, elastomeric felts, liquid plastics and most single ply systems.

The Harmer Balcony range can be combined with Alumasc rainwater products to provide continuous drainage in series on multi-storey buildings. Colour matching and bespoke manufacture of the rainwater system are catered for through Alumasc's made to order service.

The balcony outlet range is also suitable for use with the Modulock range of drainage channels and paving supports in areas where level access or permeable drainage is required.



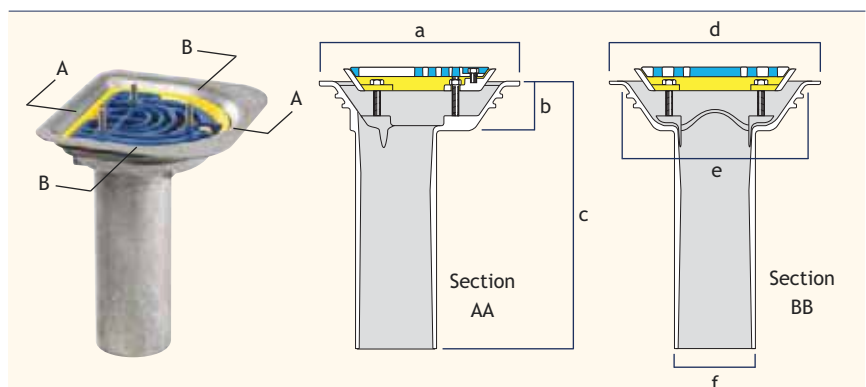
Mini Balcony Outlet

The new Harmer aluminium mini balcony outlet provides an unobtrusive solution for use on balcony applications. The shallow 50mm sump is designed to avoid interference with steel reinforcement and is easily installed in new and refurbishment applications. The standard range consists of 63mm and 83mm diameter outlet sizes. Other Round, Square and Rectangular outlet connections for use with Alumasc rainwater systems are available on request.

Standard Grate

Similar in function to the deep sump Harmer Detail Balcony outlet, the grating fits level with the clamping ring regardless of the thickness of waterproofing membrane.

Rainwater pipes from upper level balconies can either freely discharge over the grating or the cut-outs in the grating can be removed on site to allow the rainwater pipe to discharge within the sump area. (See application detail on page 40)



Flow Rate Note 1 (applies to all tables)

Flow rates are in litres per second to rainwater pipe capacity limits of BS EN 12056. Contact Harmer Technical Services for variable outlet performance to specific depth of water and rainfall intensity.

Outlet Size (mm)	a (mm)	b (mm)	c (mm)	d (mm)	e (mm)	f (mm)	Flow Rate ¹ (l/s)	Load (tonne)	Weight (kg)	Product Code
50	197.5	50	270	215	185	63	1.7	0.3	1.6	2B0/M
75	197.5	50	270	215	185	83	4.8	0.3z	1.7	3B0/M

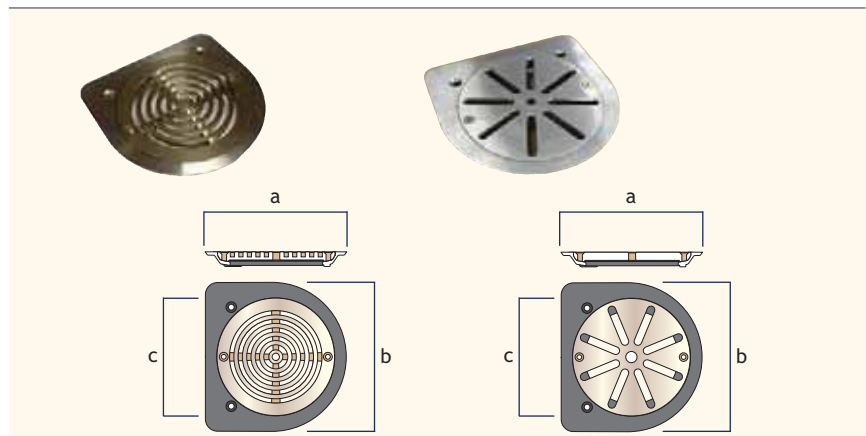
Aluminium Roof Outlets - Balcony Detail Outlets

Fixed Height Grate Options

For added quality and finished appearance of any Harmer Mini Balcony outlet installation, a choice of stainless steel or nickel bronze gratings can be fitted.

After waterproofing to the outlet and the clamp ring has been fastened down, an adaptor bezel is fitted to the clamp ring which allows for the fitting of a Star pattern or Concentric Ring grate.

Gratings are available in stainless steel or nickel bronze.



Material	Grate Type	a (mm)	b (mm)	c (mm)	Flow Rate ¹ (l/s)	Load Class	Weight (kg)	Product Code
Stainless steel	Star	165.5	175	137.5	3.3*	K3	1.1	/SS
Stainless steel	Concentric ring	165.5	175	137.5	2.1*	K3	1.1	/RS
Nickel bronze	Star	165.5	175	137.5	3.3*	K3	1.1	/SN
Nickel bronze	Concentric ring	165.5	175	137.5	2.1*	K3	1.1	/RN

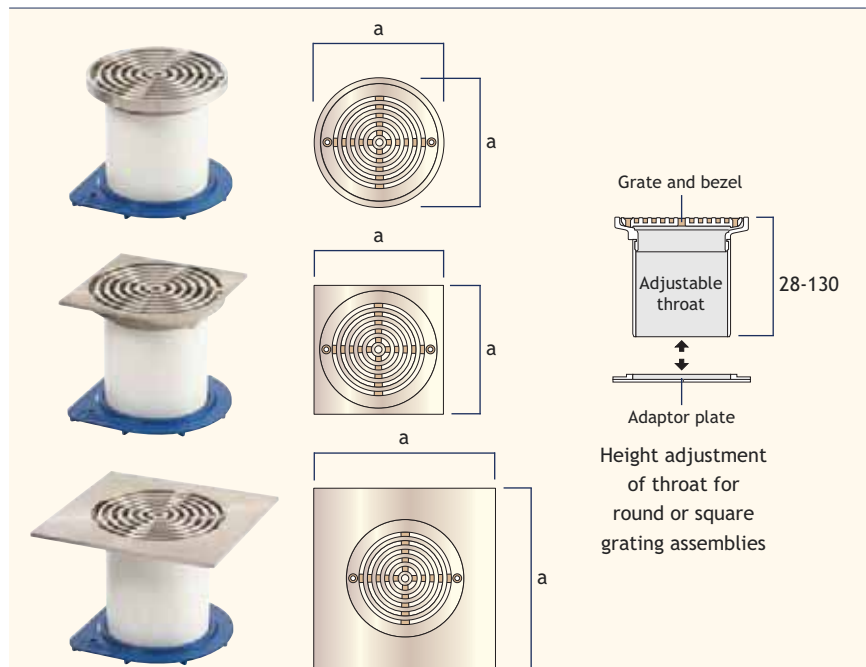
*Flow rate on 2B0/M is restricted to 1.69 l/s in accordance with BS EN 12056 pipe capacity

Adjustable Height Grate Options

In addition to fixed height grates, height adjustable grates and bezels in stainless steel or nickel bronze are also available.

After waterproofing to the balcony outlet and the clamp ring has been fastened down, an adaptor plate is fitted to the clamp ring which allows for the insertion of a height adjustable throat complete with round or square grating assembly.

The standard plastic throat can be cut down to the required height of paved or tiled surrounds. This is particularly useful where paving slabs are being laid on Harmer Modulock Raised Deck Supports.



Material	Grate Type	a (mm)	Flow Rate ¹ (l/s)	Load Class	Weight (kg)	Product Code
Stainless steel	Round 150mm	150	3.3*	K3	1.3	/C15S
Stainless steel	Square 150mm	150	3.3*	K3	1.3	/S15S
Stainless steel	Square 200mm	200	3.3*	K3	1.8	/S20S
Nickel bronze	Round 150mm	150	3.3*	K3	1.3	/C15N
Nickel bronze	Square 150mm	150	3.3*	K3	1.3	/S15N
Nickel bronze	Square 200mm	200	3.3*	K3	1.8	/S20N

*Flow rate on 2B0/M is restricted to 1.69 l/s in accordance with BS EN 12056 pipe capacity

Aluminium Roof Outlets - Balcony Detail Outlets

The Large Balcony outlet is ideal for use where larger balcony water catchment areas dictate the discharge requirements.

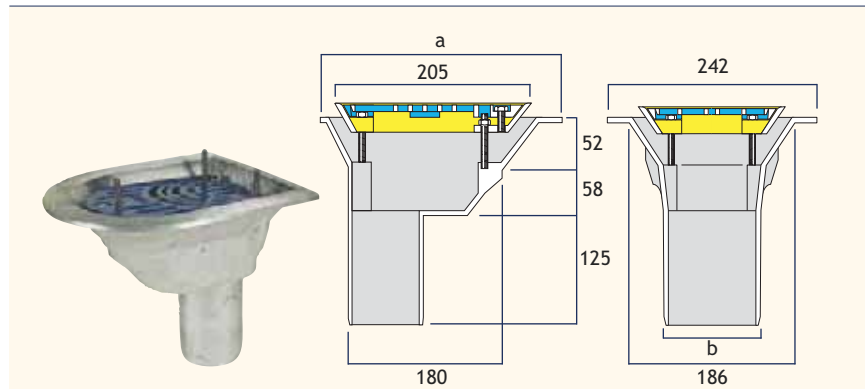
Large Balcony Outlet

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.

Please see pipework connections on page 34 for appropriate Harmer coupling.



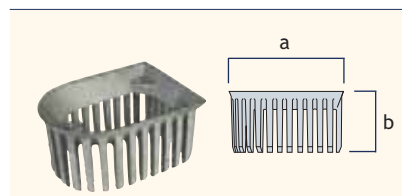
Outlet Size (mm)	a (mm)	b (mm)	Flow Rate ¹ (l/s)	Weight (kg)	Product Code
50	270	60	1.69	2.8	2BO
75	229	83	4.97	3.1	3BO
100	305	110	8.41	3.3	4BO

Grate Extension Piece

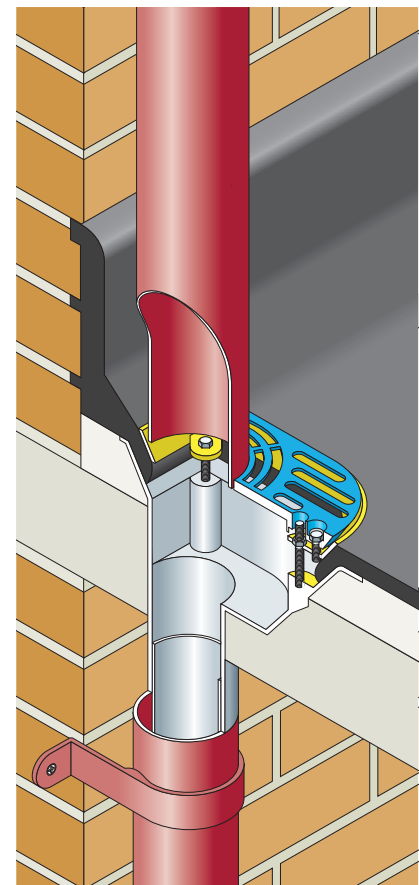
The Grate Extension Piece is for applications where it is necessary to raise the level of the grate above the body of the outlet such as in inverted roof construction.

The extension piece 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.

The Grate Extension Piece is supplied with one set of stainless steel extension studs per outlet.



Outlet Size (mm)	a (mm)	b (mm)	Product Code
50	220	115	BO/EP
75	220	115	BO/EP
100	220	115	BO/EP



Flow Rate Note 1 (applies to all tables)

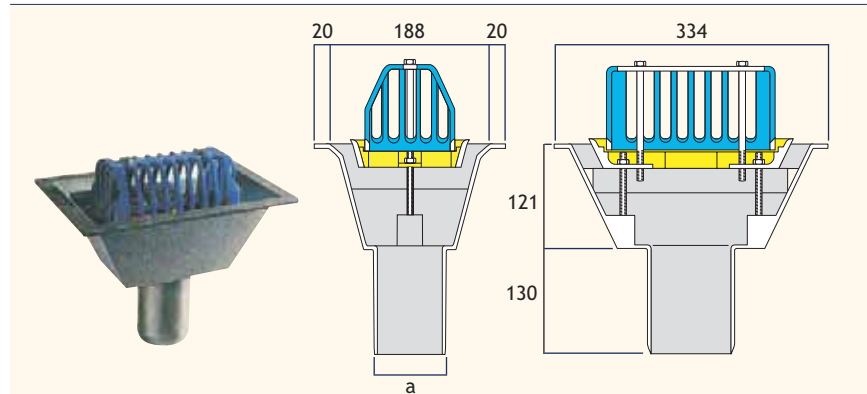
Flow rates are in litres per second to rainwater pipe capacity limits of BS EN 12056. Contact Harmer Technical Services for variable outlet performance to specific depth of water and rainfall intensity.

Aluminium Roof Outlets - Gulley Detail Outlets

Harmer Roof Gulley Detail 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.

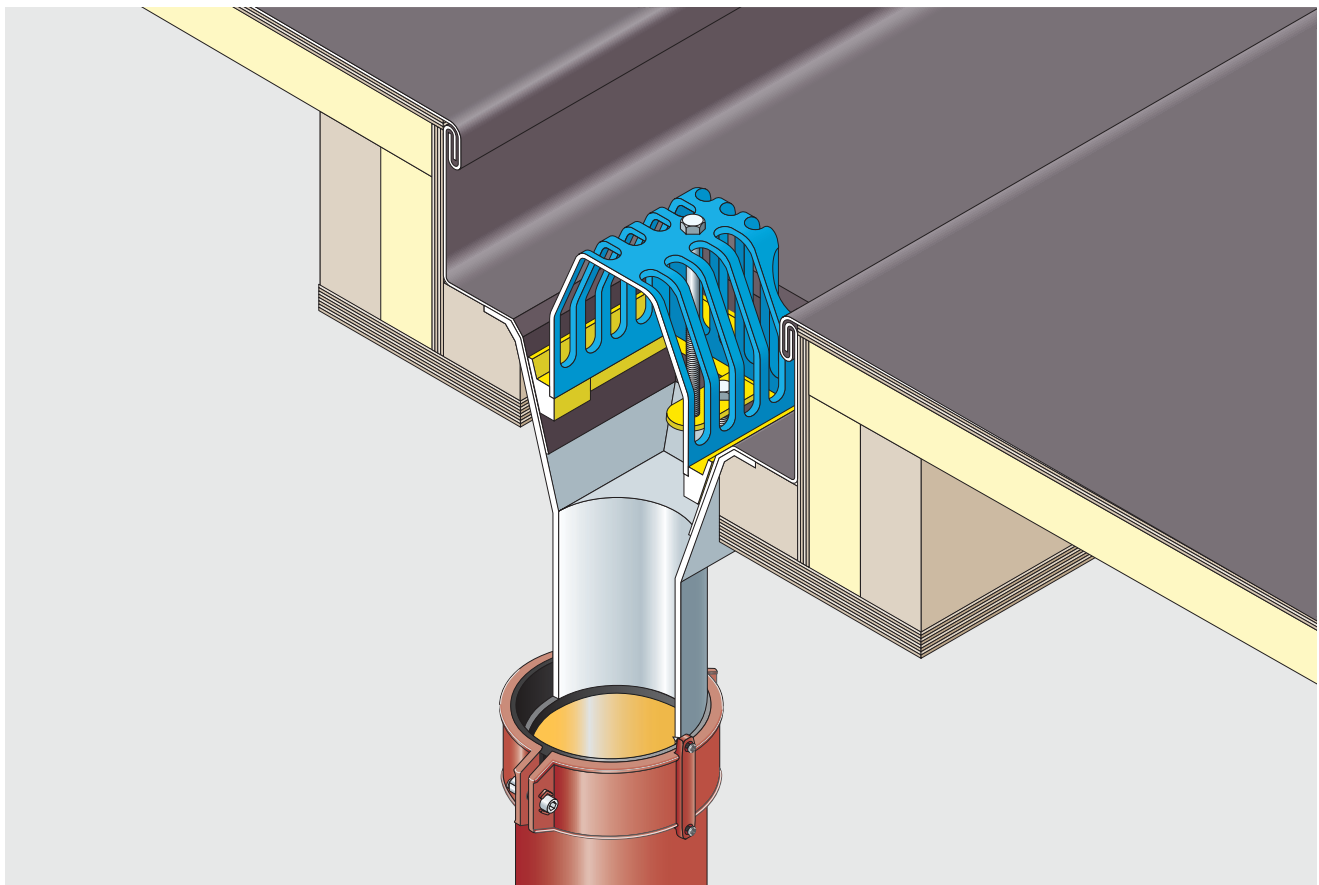
Gulley Outlet

Gulley outlets are suitable for direct connection to: Cast iron pipework to BS EN 877 and BS 416, HDPE pipework and PVC O-ring socketed pipework to BS 4514 (3GO and 4GO outlets). Please see pipework connections on page 34 for appropriate Harmer coupling.



Outlet Size (mm)	a (mm)	Flow Rate ¹ (l/s)	Weight (kg)	Product Code
75	83	4.97	3.7	3GO
100	110	10.41	3.9	4GO

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



Aluminium Roof Outlets - Accessories and Connections

Harmer Couplings

For appropriate couplings selection refer to the pipe connections table on page 34.



Coupling Type	Pipe Dia (mm)	Product Code
SML Ductile Iron	50	235849
SML Ductile Iron	100	235357
SML Ductile Iron	150	235358
SML Duo	50	3140/50
SML Duo	100	3140/100
SML Duo	150	3140/150
SML Adaptor	75	3151/070075

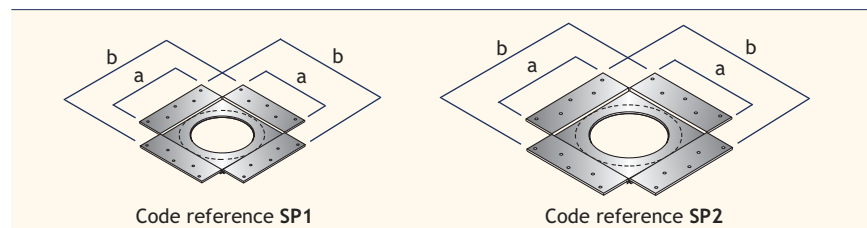
Metal Deck Support Plates

Harmer Roof pressed Metal Deck 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.

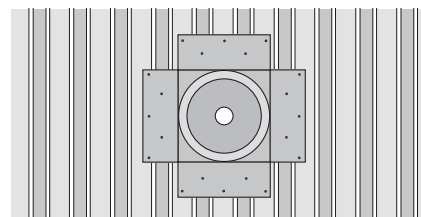
The Support Plates incorporate pre-punched holes for ease of fixing. Two sizes are available. The 335 x 335mm plate will suit 50 and 75mm metal outlets and all insulated outlets. The 415 x 415mm plate is designed for all 100 and 150mm metal outlets.

Materials

The Support Plates are manufactured from 2mm galvanised steel sheet, finished in epoxy primer. They are suitable for installation in all types of metal deck roofing.



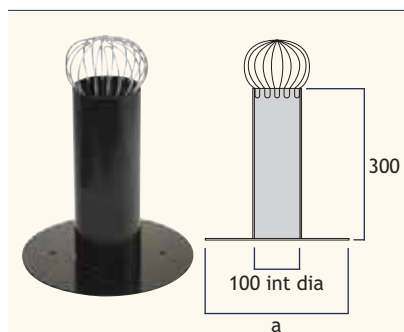
Outlet Type	a (mm)	b (mm)	Weight (kg)	Product Code
AV200 and AV300	335	490	2.7	SP1
AV400 and AV600	415	570	3.5	SP2



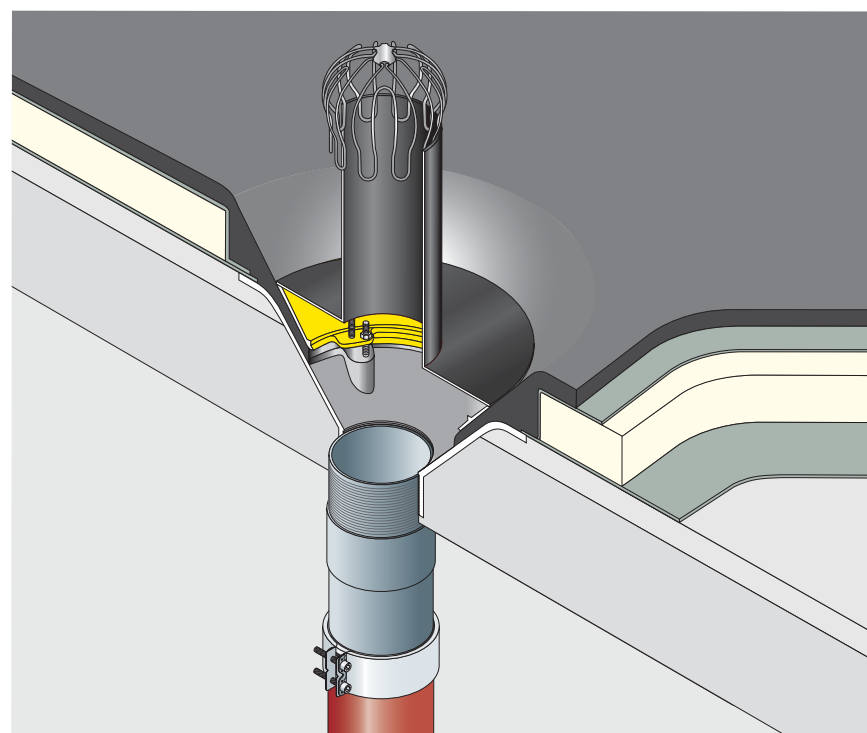
Plan view of Harmer outlet body in the Metal Deck Support Plate fixed to the structural metal deck.

Overflow Outlet

The Overflow assembly simply bolts onto the clamp where the grate normally sits. Made from aluminium, the overflow is easily cut to the required length on site. The balloon grate can be re-fitted back into the overflow inlet to protect the outlet from debris.



Outlet Type	a (mm)	Weight (kg)	Product Code
AV200 and AV300	212	0.5	OF/23
AV400 and AV600	290	0.6	OF/46



Aluminium Roof Outlets - Accessories and Connections

Threaded Spigot Adaptors

The Threaded Spigot Adaptor has been designed to facilitate the connection of Harmer Roof AV and Detail threaded aluminium rainwater outlets to all types of pipe systems and presents an economic alternative to using a short length of steel gas tube to BS EN 10255 in the case of cast iron socketed or socketless systems.

Materials

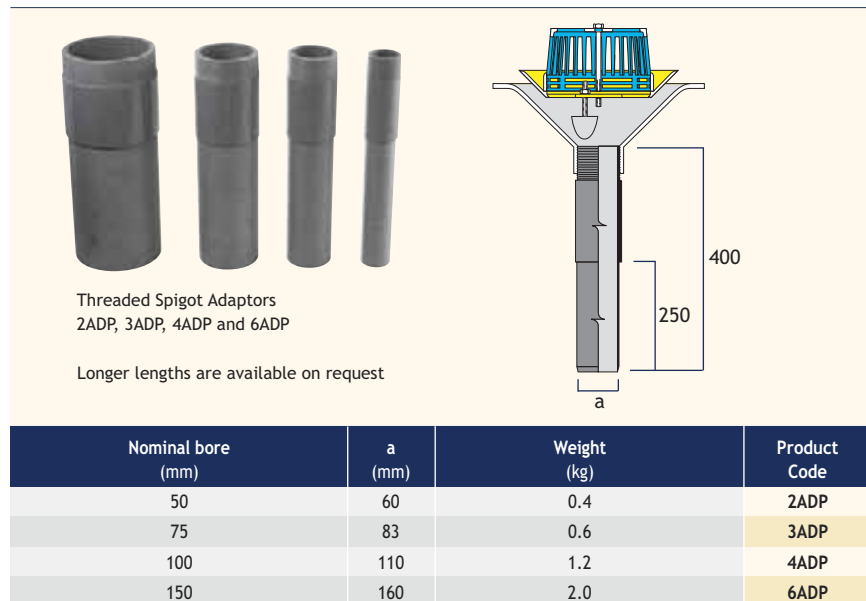
The Threaded Spigot Adaptor, made of ABS plastic, is supplied in 400mm lengths, taper-threaded externally at one end to BS EN 10226-1 and chamfered at the other end to BS 4514 and BS EN 1329-1 spigot dimensions. Sizes are available to suit 50, 75, 100 and 150mm nominal bore pipework.

Connection to Pipework

The Threaded Spigot Adaptor is screwed into the base of the outlet using a PTFE tape or silicone sealant 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 the Threaded Spigot Adaptors are suitable for direct connection to cast iron pipework to BS EN 877 and BS 416, HDPE pipework with appropriate Harmer couplings, PVC O-ring socketed pipe to BS EN 1329.

Refer to pipework connections on page 34. for appropriate couplings selection.



Fitting the Harmer Threaded Spigot Adaptor

Materials

- A cast aluminium body with female parallel threaded boss
- A 400mm long taper male threaded pipe sized for Standard BSP onward connection
- PTFE tape or silicone sealant

Preparation

- Wear protective (latex) gloves to avoid risk of injury or contamination during materials handling
- Process will require pipe chains for tightening the adapter into the outlet
- Degreasing agent and fine bristle brush
- Paper towels (this last relates to Method 2)

Connecting Adapter - Method 1

Using PTFE tape:

1. Inspect all threads and ensure they are free of dirt, grease and foreign matter.
2. Apply sufficient PTFE tape to the taper male threaded end of the adapter. This requires care as too much tape will limit the amount of travel within the parallel thread of the outlet and too little may prevent an effective seal.
3. Securely tighten the adapter into the outlet, using chains or similar equipment.

Connecting Adapter - Method 2



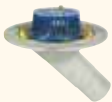

Using silicone sealant (DOW CORNING 791 recommended):

1. Inspect all threads and ensure they are free of dirt and foreign matter.
2. Allow for ventilation and degrease the threads of the outlet using a degreasing agent and fine brush.
3. Using paper towels ensure that threads are dry.
4. Apply a liberal coating of silicone sealant to the threads of the outlet and adapter and immediately tighten using chains or similar equipment.
5. A surplus of sealant will squeeze out indicating that all the thread void areas have filled.
6. Clean up with paper towels and dispose of appropriately.
7. Follow guidance cure advice on silicone product before subjecting outlet to water test.

For method 1 and 2 it is recommended that a Standing Water Test is undertaken before installation.

Aluminium Roof Outlets - Accessories and Connections

Pipe Connections

Outlet Type (mm)	Nominal Size (mm)	Outlet Dia (mm)	Pipe Material and Connection Type			
			Cast Iron EN877	Stainless Steel	HDPE	PVCu
Vertical Spigot 	50	60	SML Duo Coupling	Post formed socket or Flexible coupling	Duo Coupling	Post formed socket or Flexible coupling
	75	83	SML Adaptor Coupling	"O" ring socket or SML Duo Coupling	SML Adaptor Coupling	"O" ring socket or SML Duo Coupling
	100	110	SML Duo Coupling	"O" ring socket or SML Duo Coupling	SML Duo Coupling	"O" ring socket or SML Duo Coupling
	150	160	SML Duo Coupling	"O" ring socket or SML Duo Coupling	SML Duo Coupling	"O" ring socket or SML Duo Coupling
90° Spigot 	50	62	Post formed socket or Flexible coupling	Post formed socket or Flexible coupling	Post formed socket or Flexible coupling	Post formed socket or Flexible coupling
	75	83	SML Duo Coupling	SML Duo Coupling	SML Duo Coupling	"O" ring socket or SML Duo Coupling
	100	110	SML Duo Coupling	SML Duo Coupling	SML Duo Coupling	"O" ring socket or SML Duo Coupling
Note: Connection to some 90° spigot outlets requires a heat shrink socket. In such cases it may be simpler to use a threaded outlet						
45° Spigot 	50	62	Post formed socket or Flexible coupling	Post formed socket or Flexible coupling	Post formed socket or Flexible coupling	Post formed socket or Flexible coupling
	75	87	Post formed socket or Flexible coupling	Post formed socket or Flexible coupling	Post formed socket or Flexible coupling	Post formed socket or Flexible coupling
	100	114	Post formed socket or Flexible coupling	Post formed socket or Flexible coupling	Post formed socket or Flexible coupling	Post formed socket or Flexible coupling
Note: Connection to some 45° spigot outlets requires a heat shrink socket. In such cases it may be simpler to use a threaded outlet						
Threaded 	50	2" BSP	2ADP + SML Duo Coupling	2ADP to Post formed socket or Flexible coupling	2ADP to Post formed socket or Flexible coupling	2ADP to Post formed socket or Flexible coupling
	75	3" BSP	3ADP + SML Adapter Coupling	3ADP to "O" ring socket or SML Duo Coupling	3ADP + SML Adaptor Coupling	3ADP to "O" ring socket or SML Duo Coupling
	100	4" BSP	4ADP + SML Duo Coupling	4ADP to "O" ring socket or SML Duo Coupling	4ADP + SML Duo Coupling	4ADP to "O" ring socket or SML Duo Coupling
	150	6" BSP	6ADP + SML Duo Coupling	6ADP to "O" ring socket or SML Duo Coupling	6ADP + SML Duo Coupling	6ADP to "O" ring socket or SML Duo Coupling

Aluminium Roof Outlets - NBS Specification

A typical NBS Specification for Harmer Aluminium Roof Outlets. A full range of NBS specifications and roof drainage calculators are available via the Harmer online NBS Specification Builder at www.harmerdrainage.co.uk. For project specific specification advice, contact Harmer Technical Services.



R10 Gravity Rainwater Drainage Systems

GENERAL

- 110 GRAVITY RAINWATER DRAINAGE SYSTEM
- Roof Outlets, Pipework and Accessories: As per detail sections below

SYSTEM PERFORMANCE

- 210 DESIGN
- Design: Complete the design of the rainwater drainage system
 - Standard: To BSEN12056-3:2000, clauses 3-7 and National Annexes
 - Proposals: Submit Drawings, technical information, calculations and manufacture's literature

PRODUCTS

- 365 HARMER ALUMINIUM ROOF OUTLETS
- Manufacturer: Alumasc Exterior Building Products Ltd,
White House Works, Bold Road, Sutton
St Helens, Merseyside WA9 4JG
Tel: 01744 648400, Fax: 01744 648401.
Email: info@alumasc-exteriors.co.uk

Outlet: Harmer AV Aluminium

Type: AV Spigot Outlets

Grate Type: Domed Grate

Size: 150mm

Product Code: AV600

Reference: Harmer Roof Outlets

Accessories: Flat grate, domed grate, trafficable grate



Create Harmer Drainage NBS specifications by selecting the required product range, profile, size and finish by visiting: www.harmerdrainage.co.uk



Drainage Design Calculator

Architects and Building Services Engineers can now design and quantify all their Rainwater Drainage requirements using Alumasc's dedicated design software.

Key Features

- Category 2 and 3 Flat Roof Drainage Calculator linked in to local rainfall data
- Rainwater Drainage Drawing tool integrating Quantities Schedule
- Eaves Drainage Gutter sizing and pipe calculator for Cast and Contemporary gutter types
- Hyperlinks to Product Literature, DWG files and application specific NBS Specification Clauses



Aluminium Roof Outlets - Installation

Introduction

The Harmer Roof Aluminium range of outlets are designed for use with flat roof structures using either insitu cast concrete, timber or lightweight metal deck construction. Harmer Roof outlets are ideal for connection to continuous waterproofing systems using mastic asphalt, high performance built-up felt, wet-applied waterproofing systems and most types of single ply membranes.

The Harmer range of outlets incorporate all the key features inherent in the Harmer design approach to trouble-free flat roof drainage.

Components

Harmer aluminium roof outlets are made up of three base components:

Body

An outlet body with integral sump for controlled flow of water into the pipe.

Clamping Ring

The clamping ring is designed to compress the waterproof membrane against the outlet body to ensure total integrity of seal. The side fixing of the clamping ring and domical grate to the outlet body, for both AV and Detail outlet types, ensures that the throat is completely unobstructed to optimise flow and facilitate rodding.

Grate

Domical grates permit a free flow of rainwater while preventing loose chippings or debris from entering the outlet. Flat grates are used for trafficked and pedestrian areas.

An important feature of both the Domical and Flat grate fixture is that it can be removed without disturbing the clamping ring and waterproof seal of the roofing membrane.

Site detailing is taken care of with a range of accessories which are designed for use in different types of applications. Accessories include, Extension Pieces, Terrace Grates, Support Plates, Overflows and Downspouts.

Materials

All Harmer aluminium outlets are cast using LM6 aluminium silicon alloy, this grade of alloy exhibits excellent resistance to corrosion under both ordinary atmospheric and marine conditions making it suitable for most types of flat roof applications.

The aluminium alloy is light in weight and therefore easy to handle on site and during installation. The alloy is stronger and less brittle than cast iron. This lightness also makes aluminium outlets suitable for a wide range of lightweight roof decks.

For copper or lead-clad roofs, where there is a risk of bi-metallic corrosion with aluminium, therefore the Harmer Roof Cast Iron range should be used.

Installation and Sitework

Each site application will require careful assessment by the installer.

Consideration must be given to the type of outlet, roof construction and pipework connection that is used. The general principal of installation is common to all Harmer outlets and the following guidance should be used.

- Threaded outlets using threaded spigot adaptors must be leak tested prior to fixing to the roof structure.
- Position outlet in the roof construction so that the roof substrate is flush with outlet rim and ensure that the roof has adequate falls to the outlet.
- Depending on the type of waterproofing membrane, degrease or prime the inside of the outlet body as per roof membrane manufacturer's recommendation i.e. for asphalt, prime the outlet with bitumen.
- Dress the waterproof membrane into the outlet making sure that adequate material is available for full surface contact between the clamping ring and the outlet body. Bolt down the clamping ring ensuring that equal pressure is applied to the bolts.
- Fix the Grate to the clamping ring using the bolts provided.
- Flood test the outlet in accordance with good practice and commission the rainwater system.

Typical application details are shown on pages 37-41. For further advice on installation, contact Harmer Technical Helpline 01744 648400.

Care and Maintenance

Maintenance is a key aspect of reliable, low cost operation.

Before completion of any drainage scheme:

- Check if Overflows have been provided
- Anticipate blockage, never have a single rainwater outlet
- Once the rainwater outlets have been installed they should be inspected to ensure that all parts have been correctly fitted, that no parts are missing and that nuts and bolts are tight and secure.
- Remove tacks, nails and screws left by other trades. These will damage the membrane if trodden on.

Every flat roof must have an inspection plan:

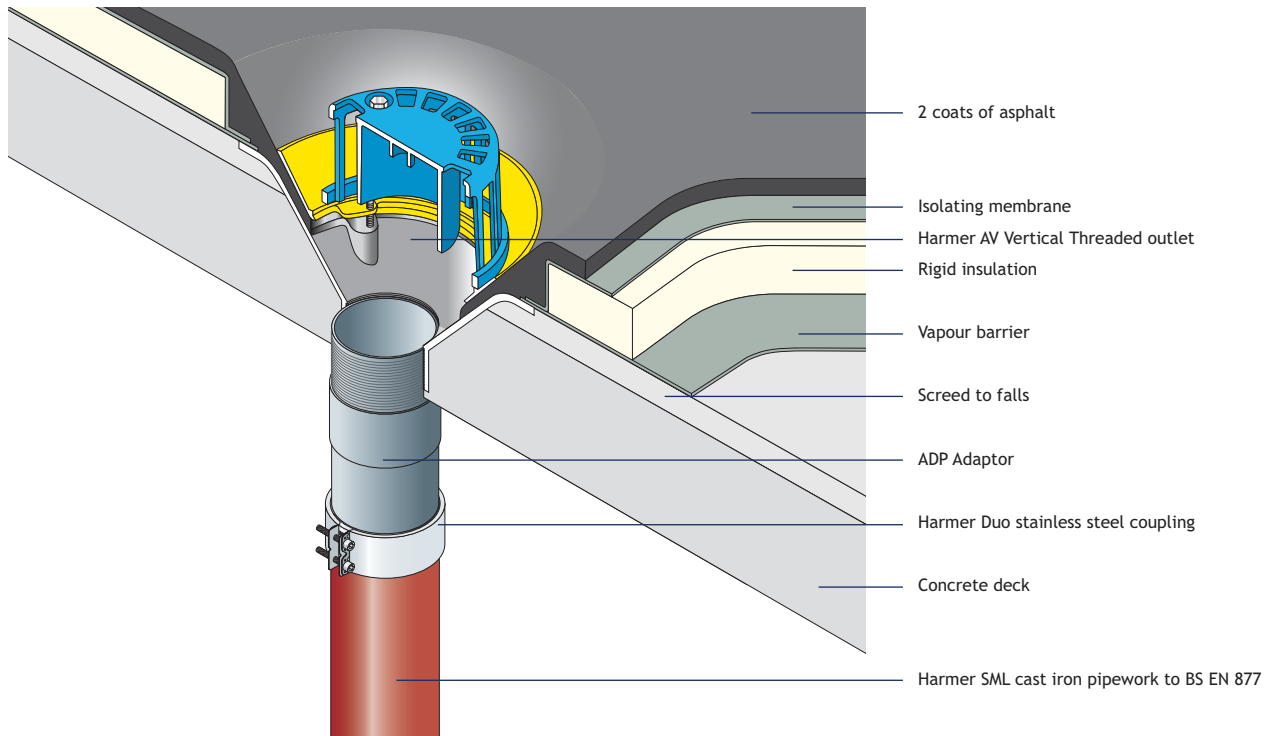
- Inspection of the outlets should be on a regular basis and generally not less than twice annually - Autumn and Spring.
- In locations with nearby trees, leaf congestion will require more frequent clearance
- Plastic bags blown onto the roof will wash to an outlet position and block the strainer.
- Airborne grit and fines will silt up the inlets to the outlet and restrict flow.
- Remove silt and remove leaves
- Check overflows have leaf guards fitted
- Clear any blockages immediately to ensure system does not overflow.

Health & Safety

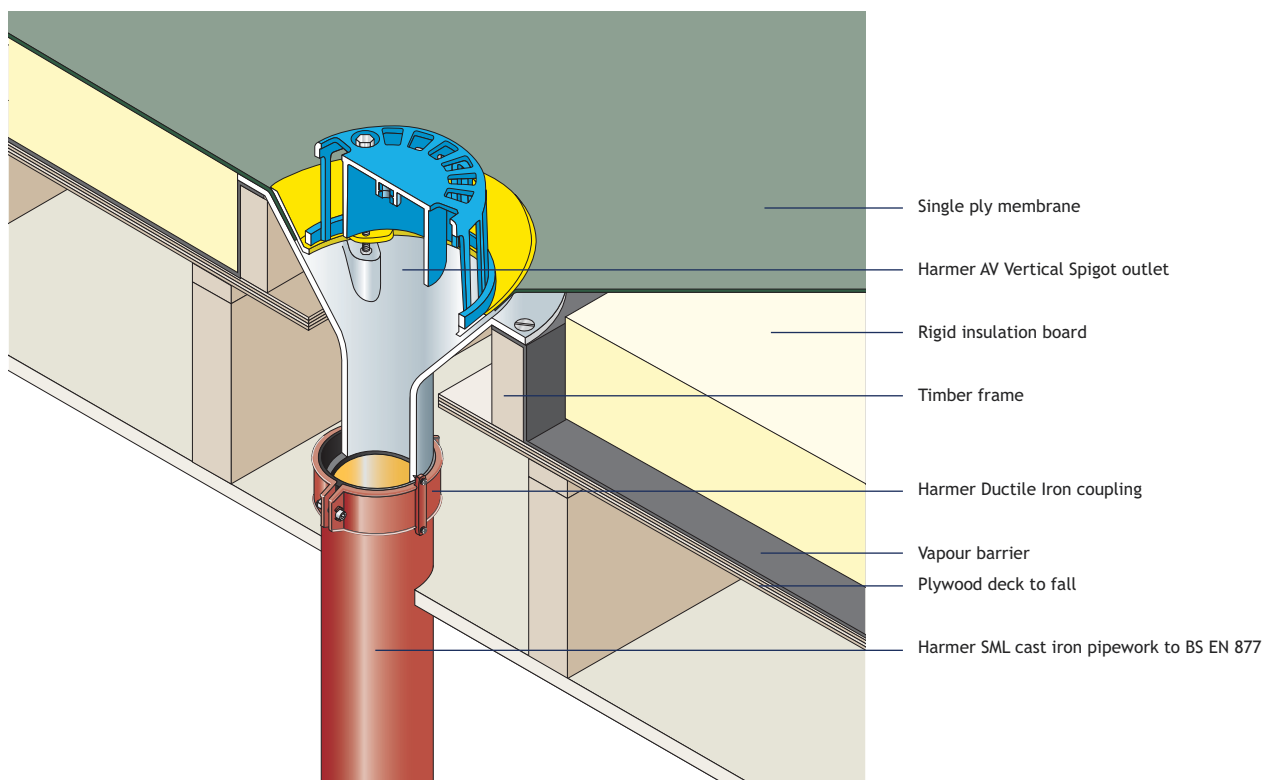
Always refer to current Health & Safety legislation, safe systems of work and the relevant material safety data sheets.

Aluminium Roof Outlets - Application Details

Harmer AV Vertical Threaded Outlet in Warm Roof Concrete Deck Construction with Asphalt Waterproofing

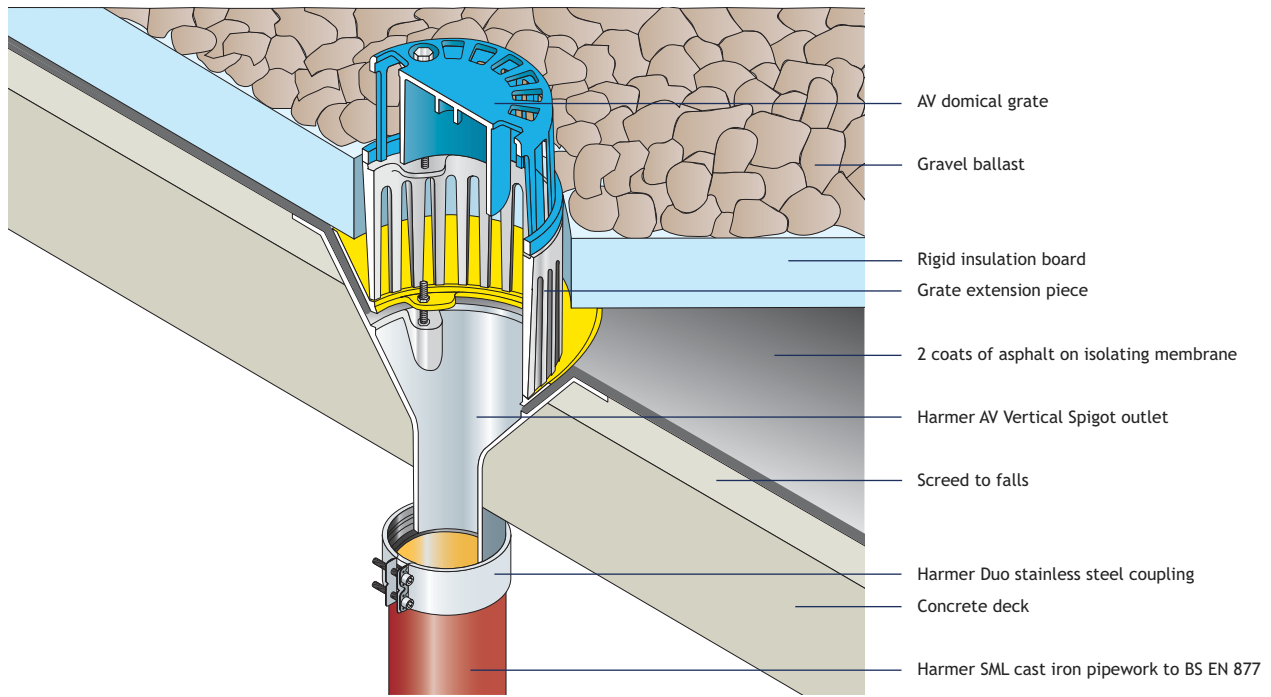


Harmer AV Vertical Spigot Outlet in Warm Roof Timber Deck Construction with Single Ply Waterproof Membrane

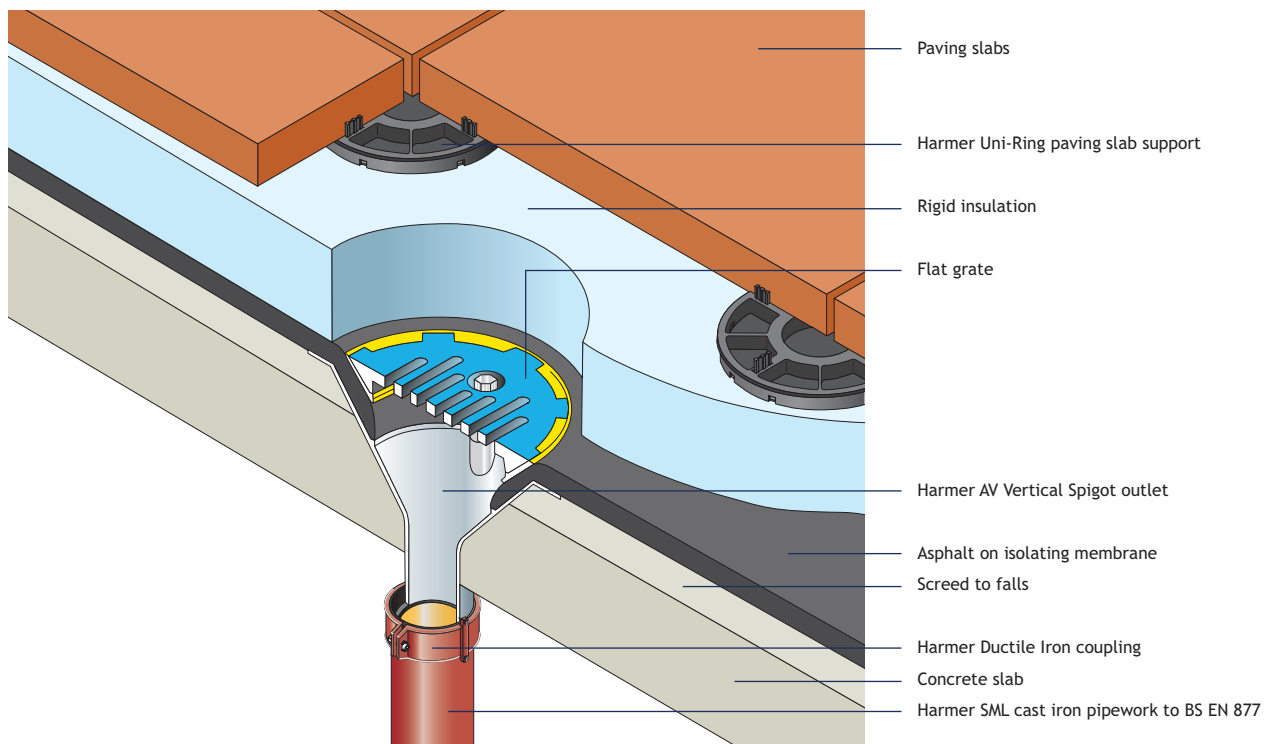


Aluminium Roof Outlets - Application Details

Harmer AV Vertical Spigot Outlet and Extension Piece in Inverted Roof Concrete Deck Construction

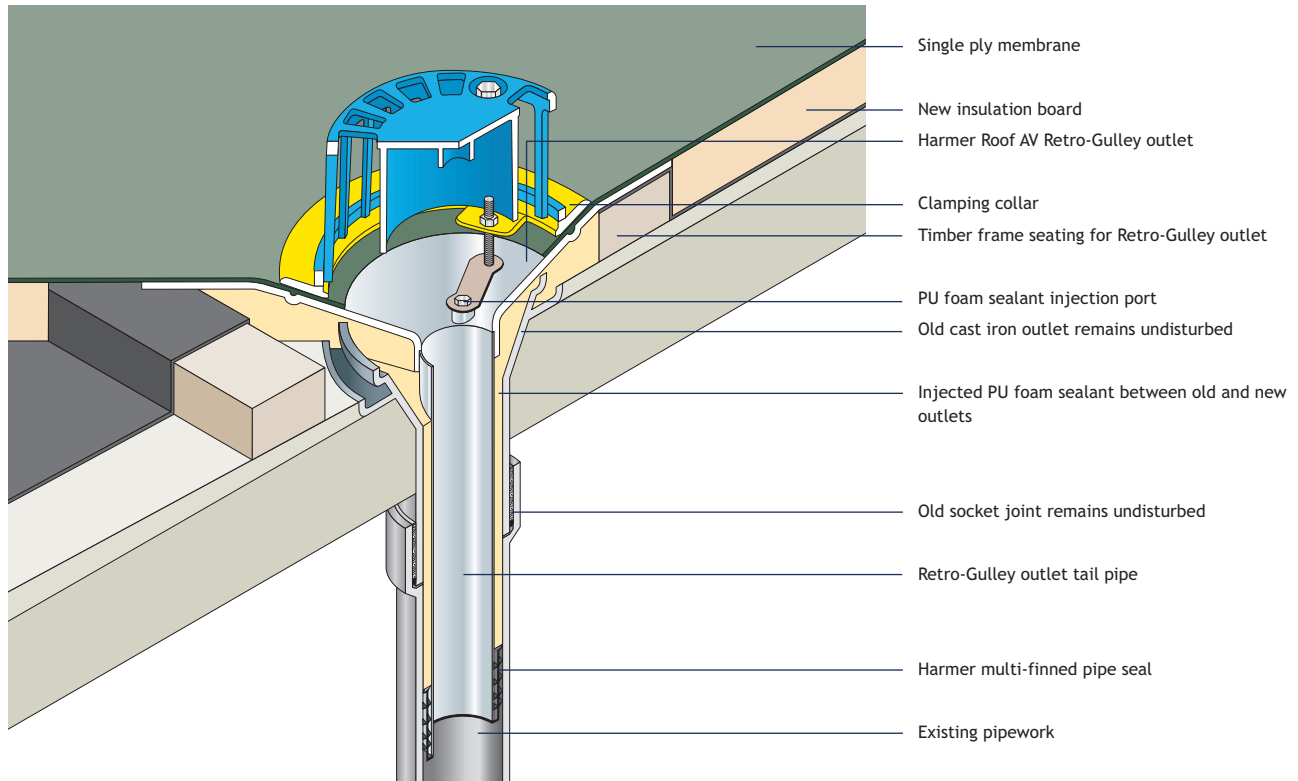


Harmer AV Vertical Spigot Outlet with Flat Grate in Inverted Roof Concrete Deck Construction with Paving Slabs on Uni-Ring Raised Floor Supports



Aluminium Roof Outlets - Application Details

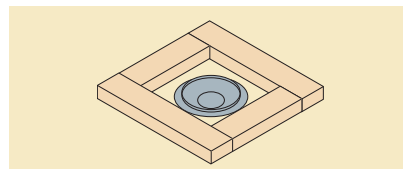
Harmer AV Retro-Gulley Roof Refurbishment, Retaining Existing Cast Iron Outlet



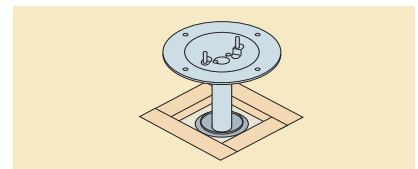
Installing Harmer AV Retro-Gulley



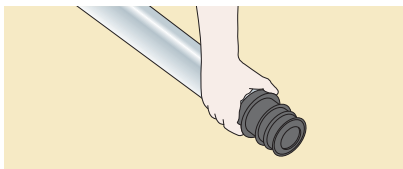
1. Strip all roof coverings back to deck level. Wire brush old outlet and flush with clean water.



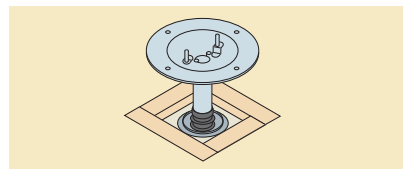
2. Form timber frame around old roof outlet, lay vapour barrier/insulation board (35mm+).



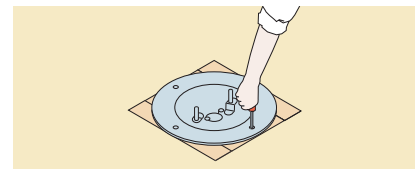
3. Check clearance, and cut tail pipe to required length if necessary.



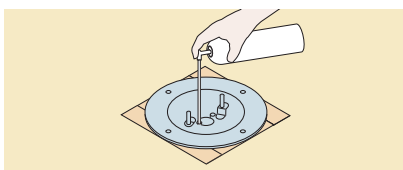
4. Once correct length of tail pipe has been established fit Harmer pipe seal.



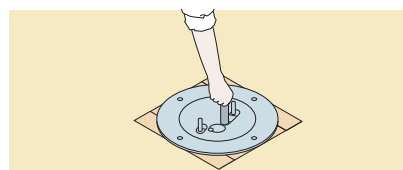
5. Repeat clean water flush. Insert tail pipe into existing pipework with flange seated on timber frame.



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



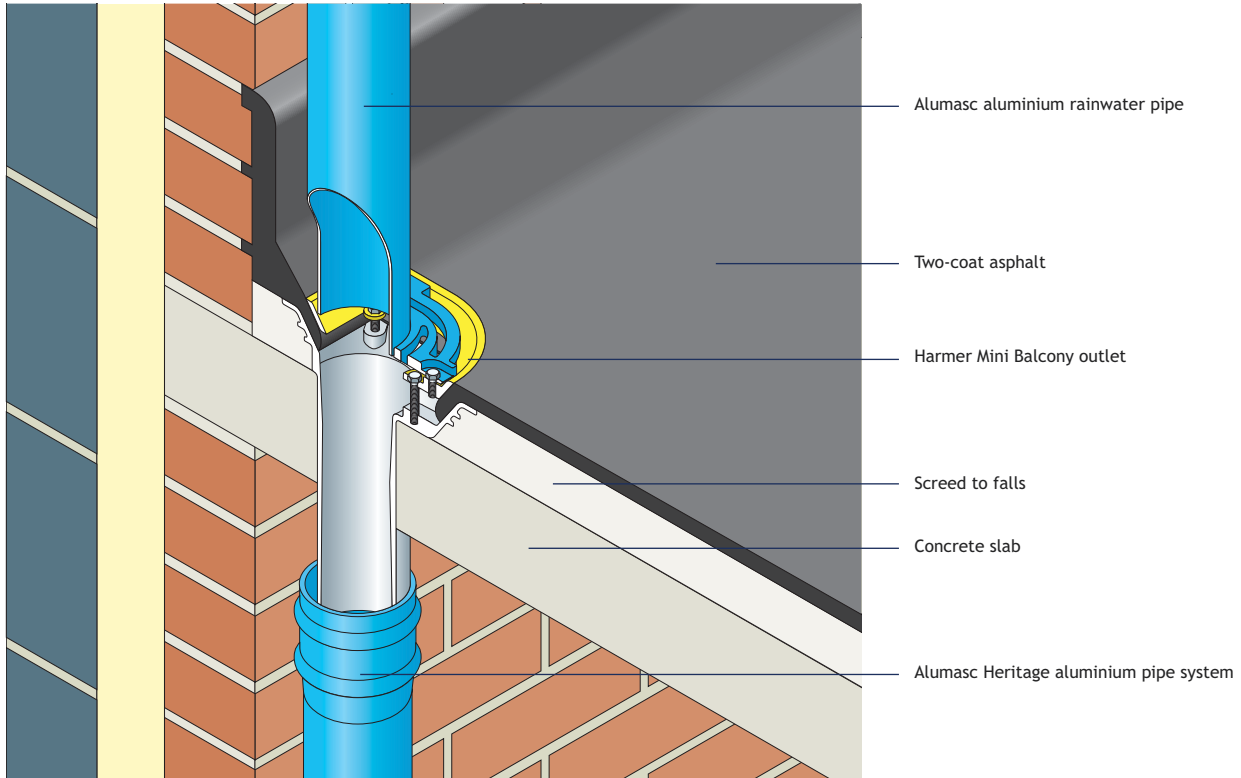
7. Inject intumescent PU foam in one injection port for up to 5 seconds. Wipe away surplus foam.



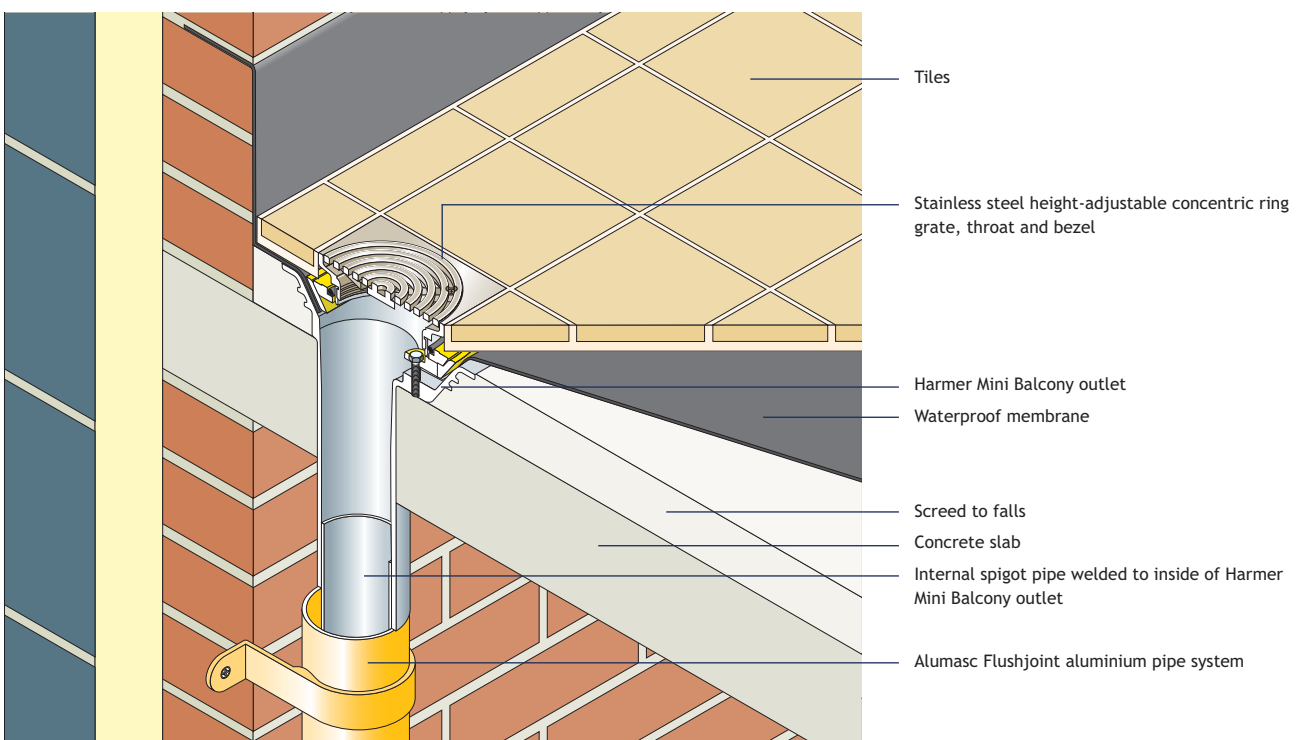
8. Close off port openings with the captive screws and washers. Complete weatherproofing and clamping ring/grate installation.

Aluminium Roof Outlets - Application Details

Harmer Mini Balcony Outlet with Standard Grate

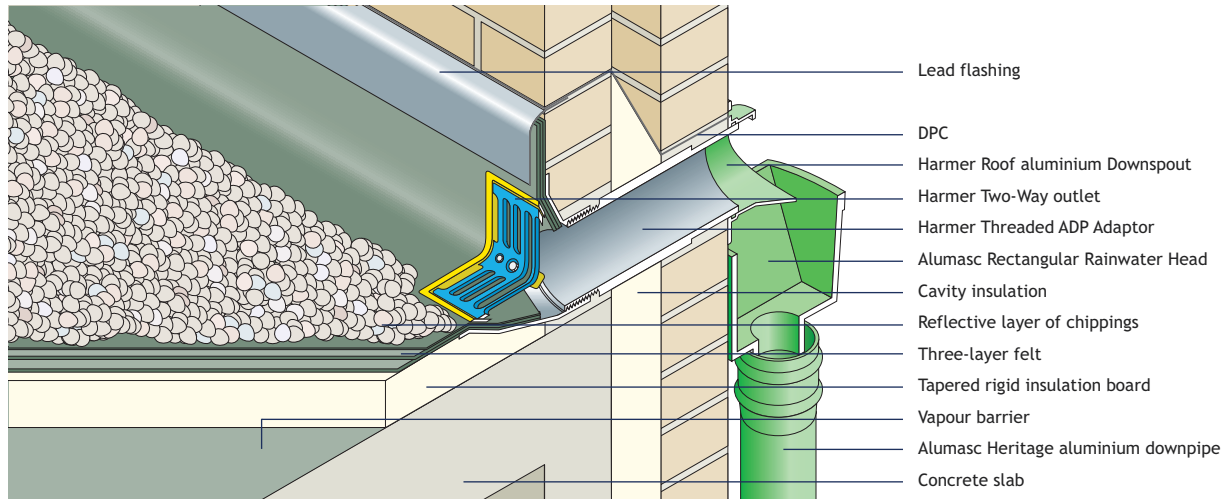


Harmer Mini Balcony Outlet with Stainless Steel Tile Grate

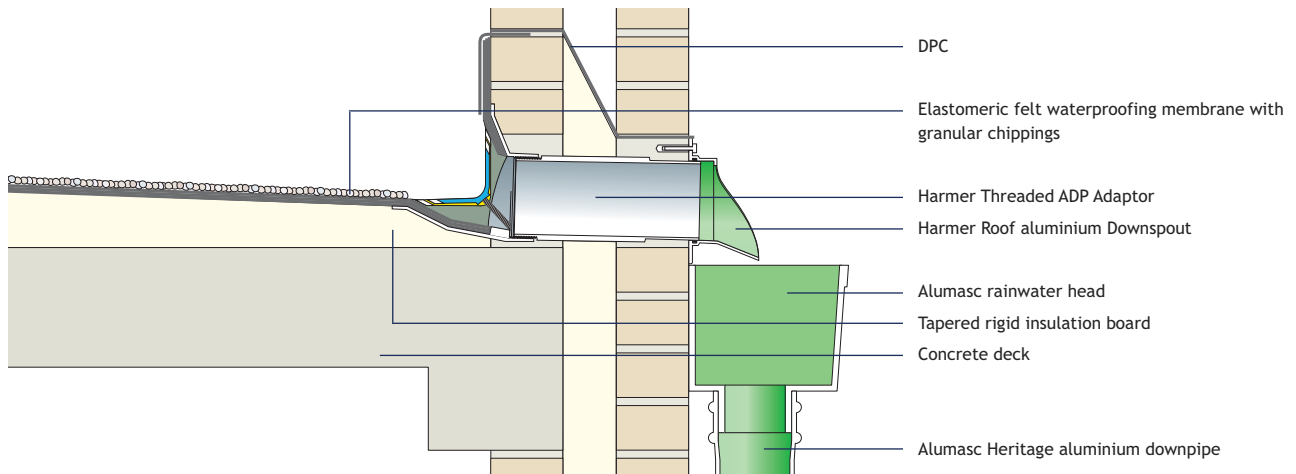


Aluminium Roof Outlets - Application Details

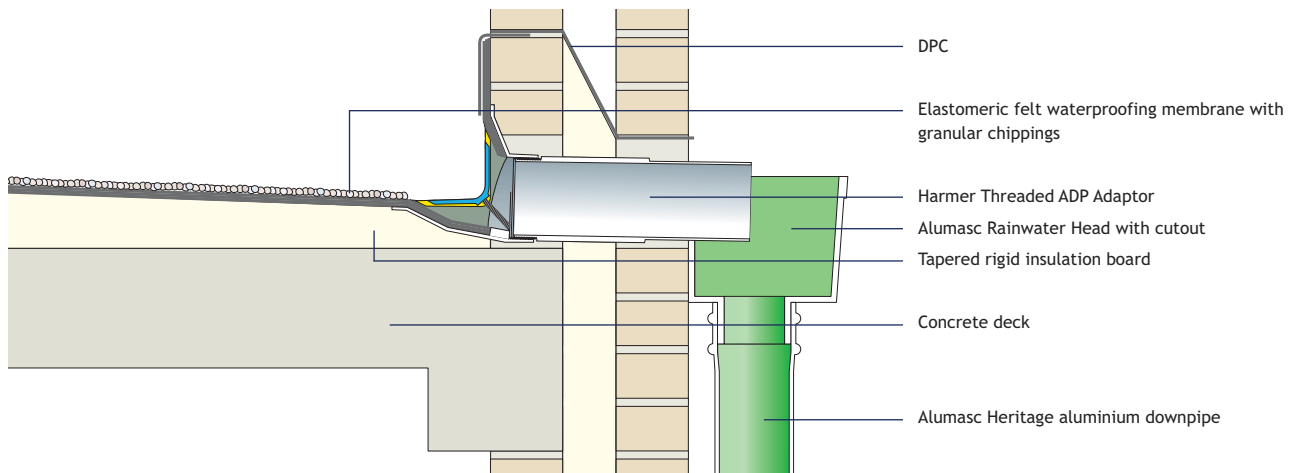
Harmer Two-Way Outlet in Warm Roof Concrete Deck Construction



Section Showing Rainwater Discharge Via Downspout

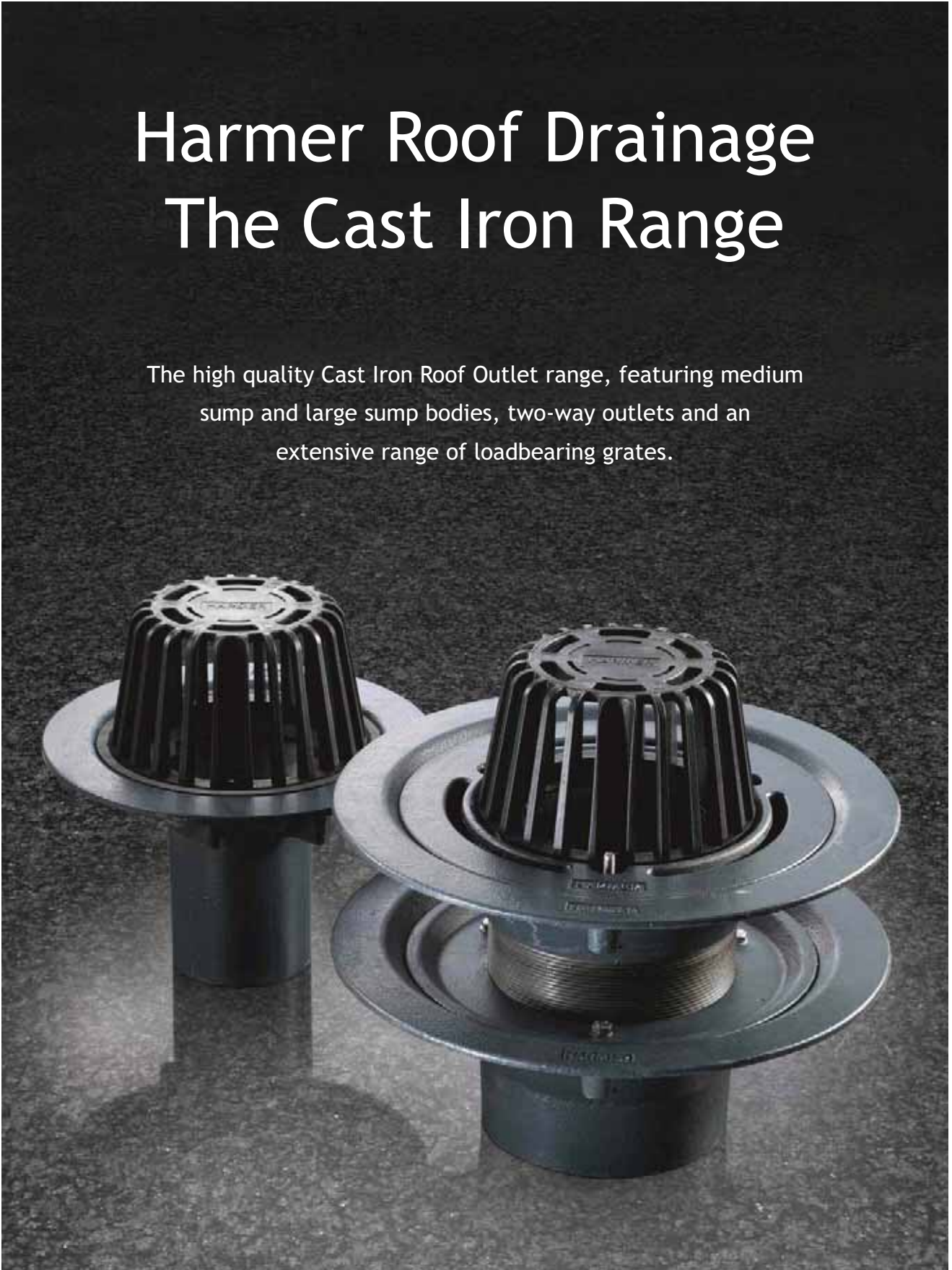


Section Showing Rainwater Discharge Via ADP Adaptor



Harmer Roof Drainage The Cast Iron Range

The high quality Cast Iron Roof Outlet range, featuring medium sump and large sump bodies, two-way outlets and an extensive range of loadbearing grates.



Cast Iron Roof Outlets - Benefits

Harmer Cast Iron Roof outlets provide a practical solution to many building drainage applications. Inherently strong, cast iron is an ideal choice for load-bearing applications.

Compliances

- The Harmer Roof Cast Iron range is cast to BS EN 1561 and are suitable for most types of flat roof drainage applications
- Designated load rating up to 12.5 tonnes
- Drainage flow performance to BS EN 12056-3

Flow Performance

- Medium and Large Sump outlet bodies are available with varying flow rate capacity to discharge requirements and building design
- Two-Way Parapet outlets and Downspouts are available for connection to external rainwater systems

Robust and Secure

- The crystallised nature of cast iron gives the material very high strength and robustness. Once installed, cast iron components resist impact damage even in exposed areas, such as vehicular trafficked areas
- Cast iron is inherently durable and can be used in conjunction with copper and lead clad roofs with reduced risk of bi-metallic corrosion
- All Harmer cast iron clamps and grates are surface treated using a sherardizing zinc coating process which provides an extremely hard wearing anti-corrosive finish

A Choice of Body and Grates

- A wide choice of standard drain body variations with spigot and threaded outlet connection, for vertical and horizontal discharge
- Fully secured grating options available for vehicular applications

Low Maintenance

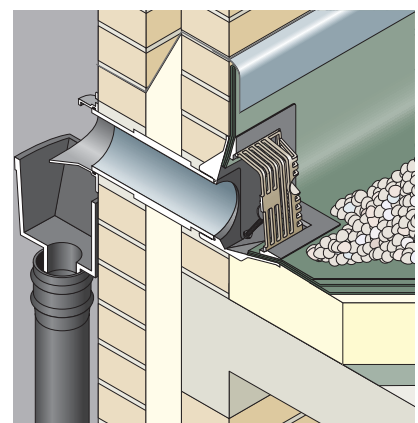
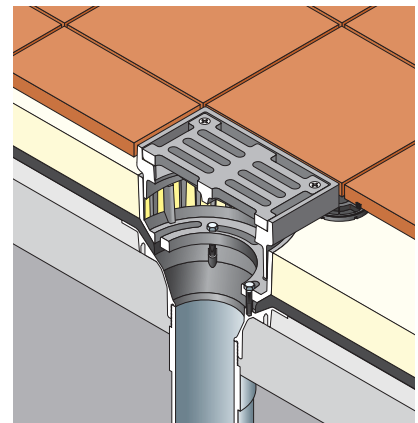
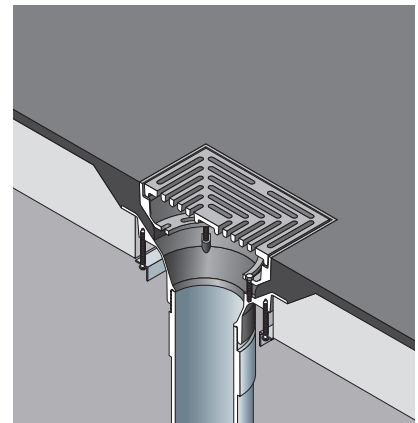
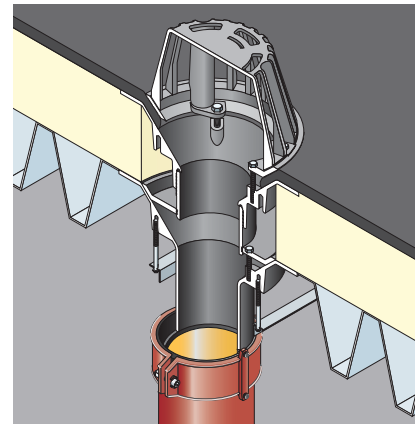
- Domical grates made from UV-stable polypropylene to give long life service. Domical grate types are designed to permit a free flow of rainwater while preventing loose chippings or debris from entering the outlet
- The side fixing of the clamping ring and domical grate to the outlet body ensures that the throat is completely unobstructed to facilitate rodding

Easy and Quick to Install

- A wide range of standard accessories such as extension pieces, pipe adaptors and grates are available to ensure successful installation of Harmer rainwater outlets in most types of roof construction

Sustainable

- Cast iron has a proven track record for its longevity over the lifetime of the building
- Cast iron is 100% recyclable, therefore end of life Harmer Cast Iron outlets can be returned to the furnace to make new cast iron products



Cast Iron Roof Outlets - Product Range Summary

The Harmer Cast Iron range of roof outlets provide the ideal drainage combinations to accommodate insitu construction, drainage performance and finishes.

Medium Sump Outlets



The Harmer cast iron medium sump range is a compact outlet body in vertical and horizontal variations for connection to 50, 75 and 100mm pipe work. Vertical bodies come with either spigot or threaded outlets and horizontal body versions are available in threaded only. A comprehensive range of grates is available for use in different types of application including load bearing circular and square grates which are suitable for areas with vehicular access.

See page 46.

Large Sump Outlets



The Harmer cast iron large sump range provides a deep outlet sump for 100 and 150mm vertical pipe connection. The outlets are threaded to 4" and 6" BSP and can be used with Harmer adaptors for connection to Cast Iron, HDPE, PVCu and Stainless Steel pipework systems.

A comprehensive range of grates is available for use in different types of application including heavy duty ductile iron circular and square grates which are suitable for areas with vehicular access.

See page 48.

Cast Iron Roof Outlets - Product Range Summary

Harmer Cast Iron rainwater outlets provide the ideal drainage solution in conjunction with ease of installation, practical aesthetics and choice of metals.

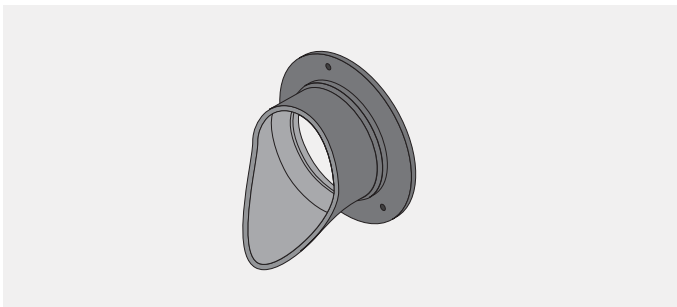
Two-Way Outlets



The Harmer cast iron Two-Way outlet is unobtrusive and suitable for use in a parapet wall construction. It can be used vertically or horizontally for connecting to 50, 75 and 100mm pipework making it suitable for use in balcony installations. A choice of flat or rectangular grates design is available in cast iron, nickel bronze or aluminium.

See page 50.

Parapet Downspout



Parapet Downspout is ideal for use with Two-Way outlets or for use as emergency overflow discharge points around the building façade. The push-fit design allows easy connection and alignment of the spout to direct water away from the building façade into the external rainwater system.

See page 51.

Accessories and Pipe Connections



A comprehensive range of accessories for the Harmer Cast Iron Roof outlet system is available for successful installation of the Harmer rainwater outlets in most types of roof construction.

The range includes gravel guards, underdeck clamp fixtures, overflow outlets, threaded adaptors, pipe couplings and metal deck support plates

See page 52.

Cast Iron Roof Outlets - Medium Sump

Harmer Cast Iron Medium Sump roof outlets comprise of a compact integral sump body available in 50, 75 and 100mm outlet sizes for vertical or horizontal pipework connection.

Vertical Spigot Outlet - Domical Grate

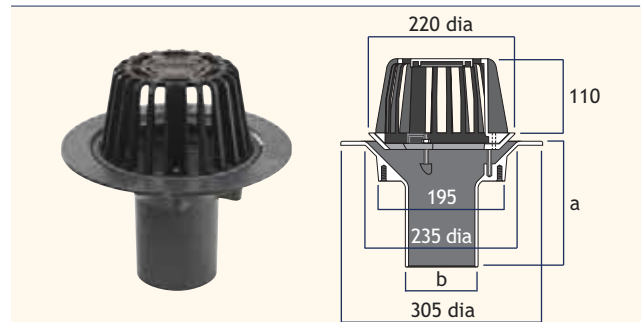
Vertical Spigot outlets are suitable for direct connection to cast iron pipework to BS EN 877 and BS 416, HDPE pipework and PVC O-ring socketed pipe to BS 4514 and BS EN1329-1. Please see pipework connections on page 53 for appropriate Harmer coupling selection.

Note:

- For Flat Grate version add suffix /F to the product code (see page 47)
- A range of accessories is available for use with special detail requirements (See page 47 and 52)

Flow Rate Note 1 (applies to all tables)

Flow rates are in litres per second to rainwater pipe capacity limits of BS EN 12056. Contact Harmer Technical Services for variable outlet performance to specific depth of water and rainfall intensity.



Outlet Size (mm nominal)	a (mm)	b (mm)	Flow Rate ¹ (l/s)	Weight (kg)	Product Code
50*	220	60	1.69	7.2	C200
75*	220	83	4.97	7.8	C300
100	190	110	4.97	6.7	C400

*50 and 75mm spigot outlets are supplied with reducer pieces for assembly on site.

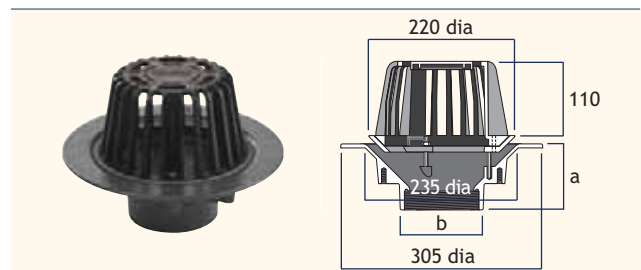
Vertical Threaded Outlet - Domical Grate

Vertical Threaded outlets have a female socket with parallel BSP thread suitable for connection to male BSP threaded pipe. Threaded outlets are 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 threaded outlets can be connected to socketed and socketless cast iron, HDPE and PVC pipework by means of the Harmer Threaded Spigot Adaptor with appropriate Harmer coupling. (See page 53).

Note:

- For Flat Grate version add suffix /F to the product code (see page 47)
- A range of accessories is available for use with special detail requirements (See page 47 and 52)



Outlet Size (mm nominal)	a (mm)	b (BSP)	Flow Rate ¹ (l/s)	Weight (kg)	Product Code
50*	112	2"	1.69	7.6	C200T
75*	112	3"	4.97	6.8	C300T
100	100	4"	4.97	5.5	C400T

*50 and 75mm threaded outlets are supplied with reducer pieces for assembly on site.

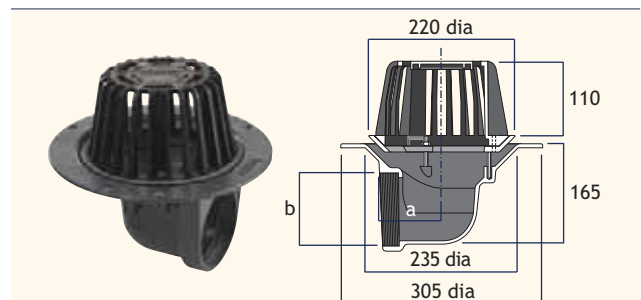
Horizontal Threaded Outlet - Domical Grate

Horizontal Threaded outlets have a female socket with parallel BSP thread suitable for connection to male BSP threaded pipe. Threaded outlets are 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 threaded outlets can be connected to socketed and socketless cast iron, HDPE and PVC pipework by means of the Harmer Threaded Spigot Adaptor with appropriate Harmer coupling. (See page 53).

Note:

- For Flat Grate version add suffix /F to the product code (see page 47)
- A range of accessories is available for use with special detail requirements (See page 47 and 52)



Outlet Size (mm nominal)	a (mm)	b (BSP)	Flow Rate ¹ (l/s)	Weight (kg)	Product Code
50*	105	2"	1.69	9.0	C290T
75*	105	3"	4.97	8.2	C390T
100	90	4"	4.97	7.0	C490T

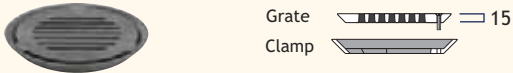
*50 and 75mm threaded outlets are supplied with reducer pieces for assembly on site.

Cast Iron Roof Outlets - Medium Sump Grates, Extension Pieces, & Double Flange Body Options

The Harmer cast iron medium sump roof outlet range has options for use with specific types of drainage application and building design. To specify or order, add the correct suffix code to the appropriate body type on page 46. For example, 100mm Vertical Spigot Outlet with Flat Grate: C400/F.

Flat Grate

For use in areas with pedestrian traffic or light vehicle traffic (excluding forklift) in commercially used premises. These grates are also designed for use with Harmer Modulock Raised Floor Supports where concealed rainwater outlets are used.

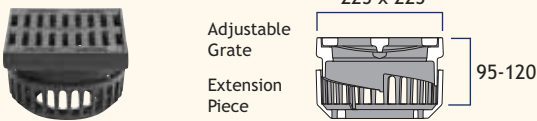


Circular Grate Material	Flow Rate ¹ (l/s)	Load Rating (tonne)	Weight (kg)	Suffix
Sherardized Ductile Iron	6.30*	1.5	1.3	/F

*For 50 and 75mm outlets maximum pipe capacity to BS EN 12056 applies.

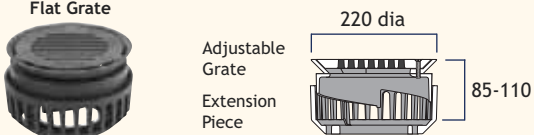
Extension Piece with Adjustable Height Grates

For use in inverted roofs and no fines screed areas with pedestrian or vehicle traffic (refer to load class). Waterproofing is achieved at the outlet body flange with the extension piece allowing permeable drainage into the outlet. Height adjustable grating assembly allows use with varying thicknesses of insulation and roof finish. See page 57 for application details.



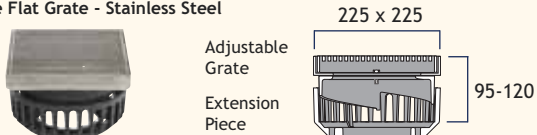
Square Grate Material	Flow Rate ¹ (l/s)	Load Rating (tonne)	Weight (kg)	Suffix
Sherardized Ductile Iron	6.30*	12.5	9.7	/ESD

*For 50 and 75mm outlets maximum pipe capacity to BS EN 12056 applies.



Circular Grate Material	Flow Rate ¹ (l/s)	Load Rating (tonne)	Weight (kg)	Suffix
Sherardized Ductile Iron	6.30*	1.5	5.5	/ECD

*For 50 and 75mm outlets maximum pipe capacity to BS EN 12056 applies.



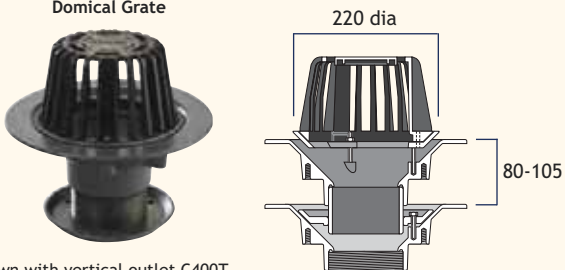
Square Grate Material (5mm aperture)	Flow Rate ¹ (l/s)	Load Rating (tonne)	Weight (kg)	Suffix
Stainless Steel	6.30*	12.5	7.8	/ESS

*For 50 and 75mm outlets maximum pipe capacity to BS EN 12056 applies.

Double Flange Variable Height Bodies

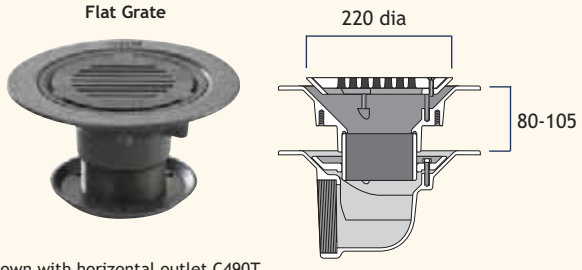
For use in loadbearing warm roof applications. Double flange construction allows fine adjustment for use with insulation thicknesses between 80-100mm.

See page 56 for application details. For other insulation thicknesses, please contact Harmer Technical Helpline.



Domical Grate Material	Flow Rate ¹ (l/s)	Load Rating (tonne)	Weight (kg)	Suffix
Polypropylene	4.97*	n/a	6.4	/D

*For 50 and 75mm outlets maximum pipe capacity to BS EN 12056 applies.



Flat Grate Material	Flow Rate ¹ (l/s)	Load Rating (tonne)	Weight (kg)	Suffix
Sherardized Ductile Iron	6.30*	1.5	7.7	/DF

*For 50 and 75mm outlets maximum pipe capacity to BS EN 12056 applies.

Cast Iron Roof Outlets - Large Sump

Harmer Cast Iron Large Sump rainwater outlets comprise of a deep sump integral body ideal for heavy duty locations such as car park decks requiring the inherent strength of cast iron. Threaded pipe sizes include 100mm and 150mm diameters for vertical pipework connections.

Vertical Threaded Outlet - Domical Grate

Vertical Threaded outlets have a female socket with parallel BSP thread suitable for connection to male BSP threaded pipe. Threaded 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.

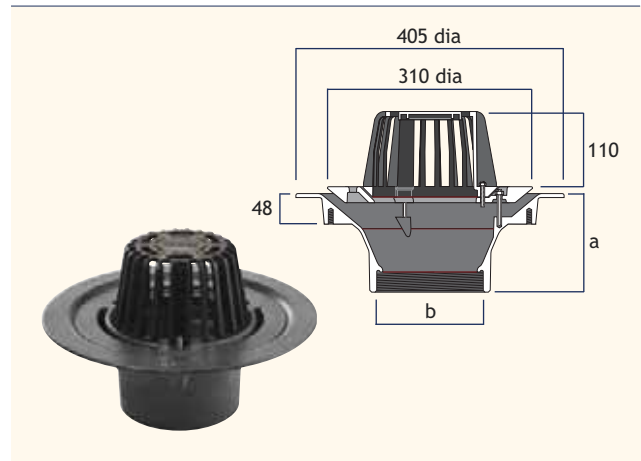
Harmer threaded outlets can be connected to socketed and socketless cast iron, HDPE and PVC pipework by means of the Harmer Threaded Spigot Adaptor with appropriate Harmer coupling. (See page 53).

Note:

A range of accessories is available for use with special detail requirements (See page 49 and 52)

Flow Rate Note 1 (applies to all tables)

Flow rates are in litres per second to rainwater pipe capacity limits of BS EN 12056. Contact Harmer Technical Services for variable outlet performance to specific depth of water and rainfall intensity.



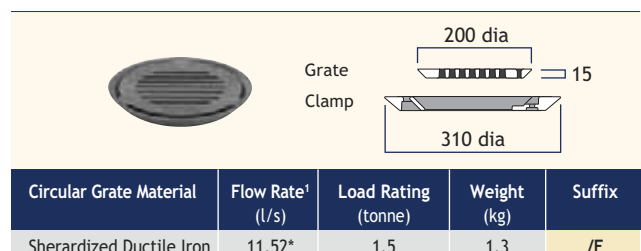
Outlet Size (mm nominal)	a (mm)	b (BSP)	Flow Rate ¹ (l/s)	Load Rating	Weight (kg)	Product Code
100	154	4"	8.56	n/a	14.3	C400LT
150	154	6"	10.35	n/a	12.6	C600LT

Alternative Grate Options

Alternative Flat Grate permutations are available to suit various applications. To specify or order, simply add the below suffix to the above product code. For example, 150mm Vertical Threaded Outlet with Square Flat Grate: C600LT/S.

Flat Grate

For use in areas with pedestrian traffic or light vehicle traffic (excluding forklift) in commercially used premises. These grates are also designed for use with Harmer Modulock Paving Supports where concealed rainwater outlets are used.

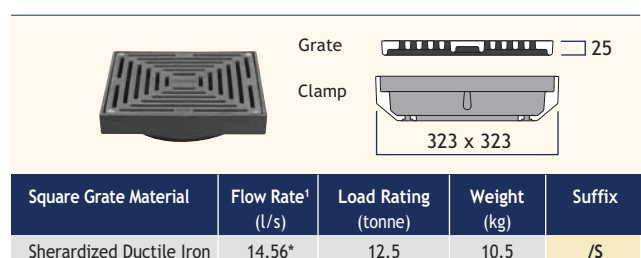


Circular Grate Material	Flow Rate ¹ (l/s)	Load Rating (tonne)	Weight (kg)	Suffix
Sherdized Ductile Iron	11.52*	1.5	1.3	/F

*For 100mm outlet size, maximum pipe capacity to BS EN 12056 applies.

Square Flat Grate

325 x 325mm Square Flat Grate is made of ductile iron and has a load rating of 12.5 tonnes. For use in areas with vehicular access, such as car parks, factories and workshops. The clamping collar extends above the outlet body to accommodate adequate thickness of concrete or asphalt finish around the grate surround. The clamping collar can also be rotated to suit paving alignment.



Square Grate Material	Flow Rate ¹ (l/s)	Load Rating (tonne)	Weight (kg)	Suffix
Sherdized Ductile Iron	14.56*	12.5	10.5	/S

*For 100mm outlet size, maximum pipe capacity to BS EN 12056 applies.

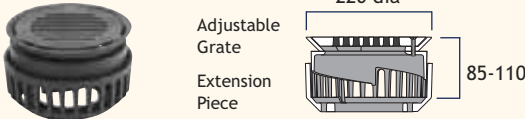
Cast Iron Roof Outlets - Large Sump Grates, Extension Pieces & Double Flange Body Options

The Harmer cast iron large sump roof outlet range has options for use with specific types of drainage application and building design. To specify or order, add the correct suffix code to the appropriate body type on page 48. For example, 150mm Vertical Threaded Outlet with Stainless Steel Adjustable Height Grate: C600LT/ESS.

Extension Piece with Adjustable Height Grates

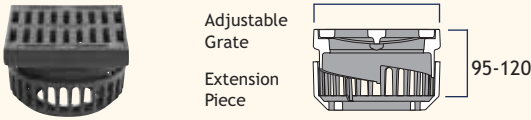
For use in inverted roofs and no fines screed areas with pedestrian or vehicle traffic (refer to load class). Waterproofing is achieved at the outlet body flange with the extension piece allowing permeable drainage into the outlet. Height adjustable grating assembly allows use with varying thicknesses of insulation and roof finish. See page 57 for application details.

Flat Grate 220 dia



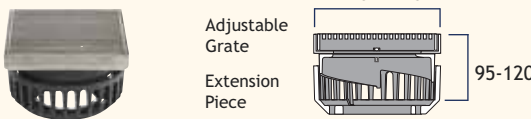
Circular Grate Material	Flow Rate ¹ (l/s)	Load Rating (tonne)	Weight (kg)	Suffix
Sherardized Ductile Iron	6.3	1.5	6.6	/ECD

Square Flat Grate - Ductile Iron 225 x 225



Square Grate Material	Flow Rate ¹ (l/s)	Load Rating (tonne)	Weight (kg)	Suffix
Sherardized Ductile Iron	6.3	12.5	9.7	/ESD

Square Flat Grate - Stainless Steel 225 x 225

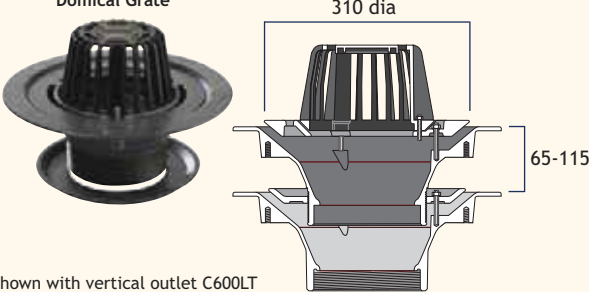


Square Grate Material (5mm aperture)	Flow Rate ¹ (l/s)	Load Rating (tonne)	Weight (kg)	Suffix
Stainless Steel	6.3	12.5	8.9	/ESS

Double Flange Variable Height Bodies

For use in loadbearing warm roof applications. Double flange construction allows fine adjustment for use with insulation thicknesses between 65-115mm. For other insulation thicknesses, please contact Harmer Technical Helpline.

Domical Grate 310 dia

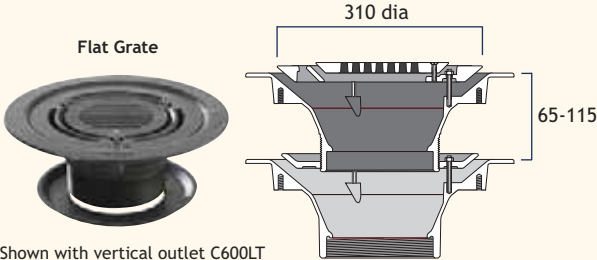


Shown with vertical outlet C600LT

Domical Grate Material	Flow Rate ¹ (l/s)	Load Rating (tonne)	Weight (kg)	Suffix
Polypropylene	10.35*	n/a	10.9	/D

*For 100mm outlet size, maximum pipe capacity to BS EN 12056 applies.

Flat Grate 310 dia

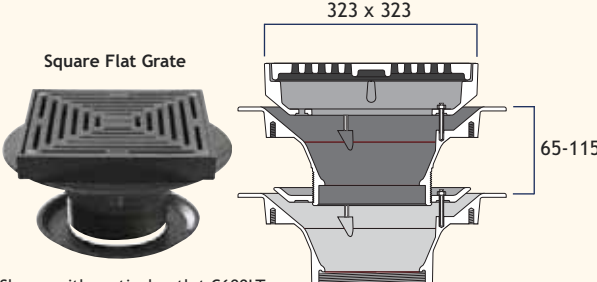


Shown with vertical outlet C600LT

Flat Grate Material	Flow Rate ¹ (l/s)	Load Rating (tonne)	Weight (kg)	Suffix
Sherardized Ductile Iron	11.52*	1.5	12.2	/DF

*For 100mm outlet size, maximum pipe capacity to BS EN 12056 applies.

Square Flat Grate 323 x 323



Shown with vertical outlet C600LT

Flat Grate Material	Flow Rate ¹ (l/s)	Load Rating (tonne)	Weight (kg)	Suffix
Sherardized Ductile Iron	14.56*	12.5	21.0	/DS

*For 100mm outlet size, maximum pipe capacity to BS EN 12056 applies.

Cast Iron Roof Outlets - Two-Way

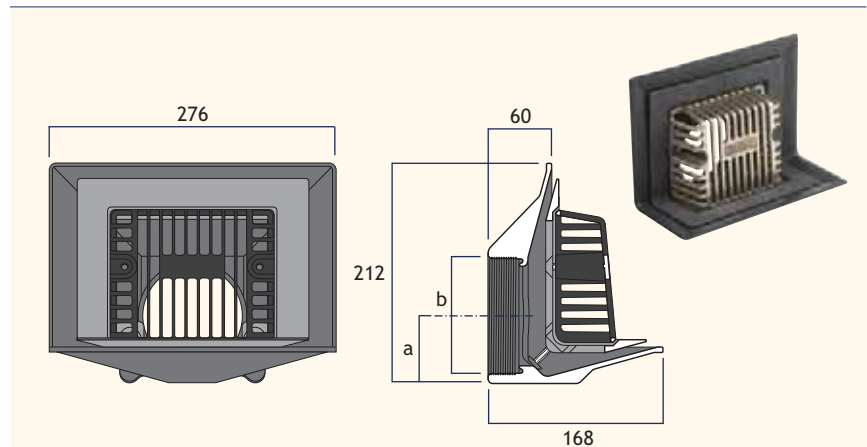
The Harmer cast iron Two-Way outlet is designed for applications where an angle is formed by the intersection of vertical and horizontal surfaces (for example, where a balcony or roof meets a parapet wall). They can be installed to provide either vertical or horizontal run-off.

Two-Way Outlet - Rectangular Grate

Two-Way Outlet with Rectangular Grate is suitable for use in the majority of parapet wall applications in either horizontal or vertical run-off. Two-Way outlets are available in 50, 75 and 100mm diameter outlet sizes. The outlet has a female socket with parallel BSP thread suitable for connection to male BSP threaded pipe and is usually used in conjunction with Harmer Threaded Spigot Adaptors and Downspouts. (See pages 51 and 53)

Rectangular Grates are available in Cast Iron (painted black), Nickel Bronze or Mill Finish Aluminium. Aluminium grates can be polyester powder coated to order - please contact Harmer Technical Helpline.

Flow Rate Note 1 (applies to all tables)
Flow rates are in litres per second to rainwater pipe capacity limits of BS EN 12056. Contact Harmer Technical Services for variable outlet performance to specific depth of water and rainfall intensity.

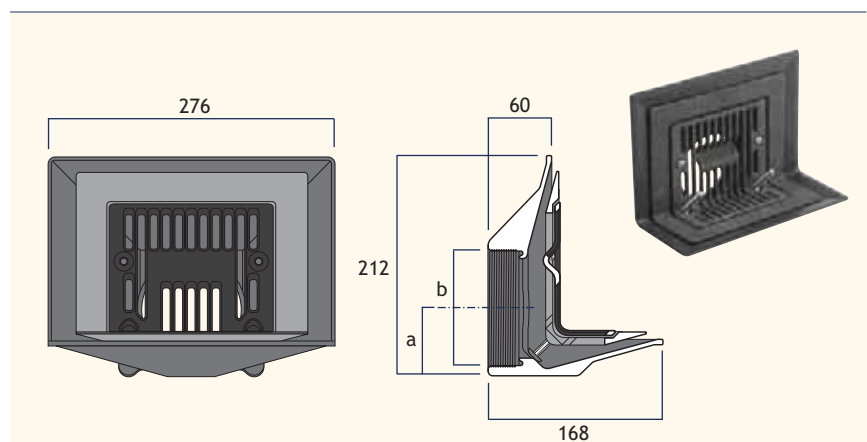


Outlet Size (mm)	Grate Material	a (mm)	b (BSP)	Flow Rate ¹ (l/s)		Load Rating (tonne)	Weight (kg)	Product Code
				vertical	horizontal			
50	Cast iron	38	2"	1.4	0.7	0.3	5.9	CTW2/RC
50	Nickel bronze	38	2"	1.4	0.7	0.3	6.1	CTW2/RN
50	Aluminium	38	2"	1.4	0.7	0.3	5.2	CTW2/RA
75	Cast iron	52	3"	2.6	0.8	0.3	5.8	CTW3/RC
75	Nickel bronze	52	3"	2.6	0.8	0.3	6.0	CTW3/RN
75	Aluminium	52	3"	2.6	0.8	0.3	5.1	CTW3/RA
100	Cast iron	65	4"	2.6	0.8	0.3	5.7	CTW4/RC
100	Nickel bronze	65	4"	2.6	0.8	0.3	5.8	CTW4/RN
100	Aluminium	65	4"	2.6	0.8	0.3	4.9	CTW4/RA

Two-Way Outlet - Flat Grate

Two-Way Outlet with Flat Grate is suitable for use in the majority of parapet wall applications in either horizontal or vertical run-off. Two-Way outlets are available in 50, 75 and 100mm diameter outlet sizes. The outlet has a female socket with parallel BSP thread suitable for connection to male BSP threaded pipe and is usually used in conjunction with Harmer Threaded Spigot Adaptors and Downspouts. (See pages 51 and 53)

Flat Grates are available in Cast Iron (painted black).



Outlet Size (mm)	Grate Material	a (mm)	b (BSP)	Flow Rate ¹ (l/s)		Load Rating (tonne)	Weight (kg)	Product Code
				vertical	horizontal			
50	Cast iron	38	2"	1.4	0.7	0.3	5.8	CTW2/FC
75	Cast iron	52	3"	2.6	0.8	0.3	5.7	CTW2/FC
100	Cast iron	65	4"	2.6	0.8	0.3	5.5	CTW2/FC

Cast Iron Roof Outlets - Parapet Downspouts

Harmer Roof Parapet Downspouts provide an attractive means of directing water away from the face of the building to prevent the backtrack of rainwater from causing unsightly staining and damage. Harmer Roof Parapet Downspouts can be used in combination with Alumasc rainwater pipes and hoppers, and can be colour co-ordinated.

Application

Downspouts are ideally suited for use with Harmer Detail Two-Way Outlets fitted with Harmer Threaded Adaptors. They can also provide a discreet means of discharge when used with parapet overflows.

Material - Cast Iron

Material - Siliconised Cast Aluminium LM6

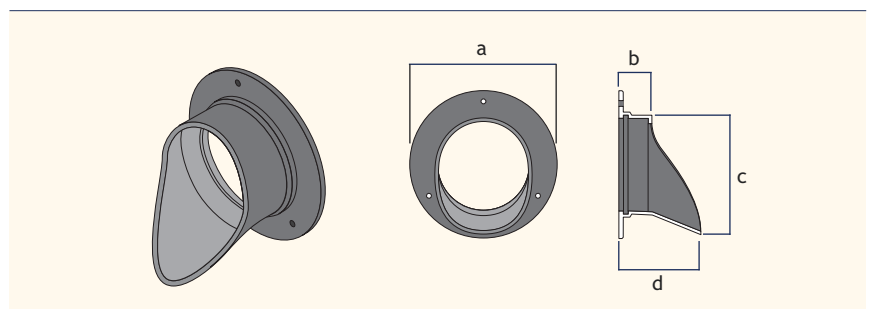
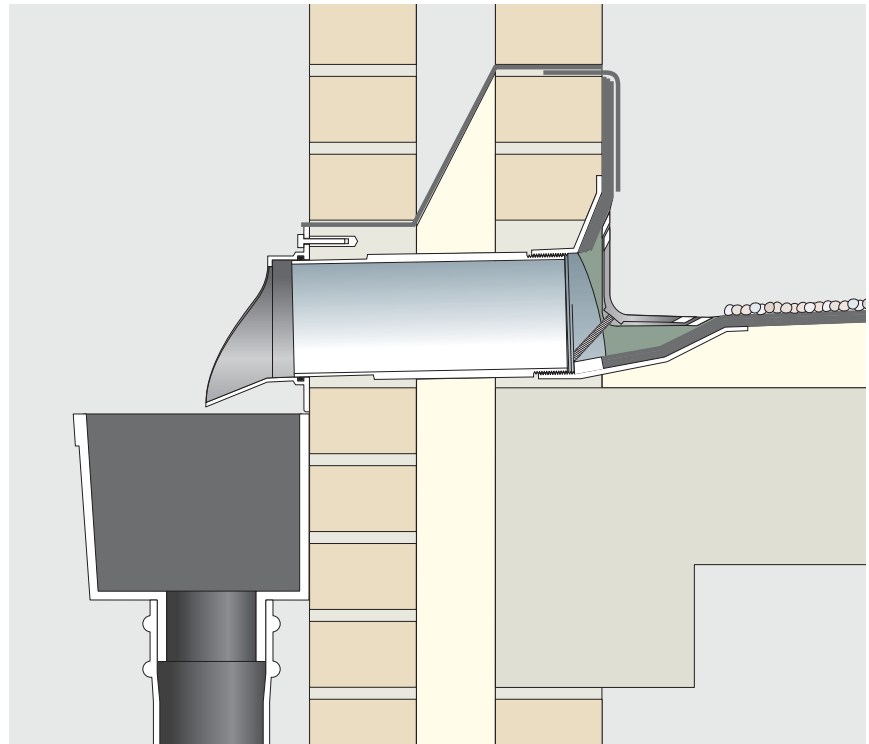
Finish

Cast iron downspouts are supplied as standard in primed finish for painting on site or can be painted black by Alumasc to co-ordinate with other cast iron rainwater goods.

Aluminum downspouts are supplied in mill finish cast aluminium. Polyester powder coated finishes in Alumasc's standard colours are available to match external building finishes or colour coated rainwater pipes and hoppers.

Connection

For ease of installation and perfect alignment, Harmer Downspouts push-fit connect to standard 110 diameter plain ended pipe using an "O" ring seal and mechanical fixing into masonry.

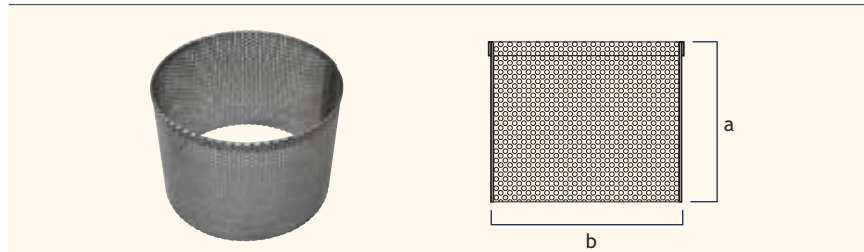


Outlet Size (mm)	Material	a (mm)	b (mm)	c (mm)	d (mm)	Weight (kg)	Product Code
100	Aluminium	180	40	146	100	0.5	ADS/4
100	Cast Iron	180	40	146	100	1.4	CDS/4

Cast Iron Roof Outlets - Accessories and Connections

Gravel Guard

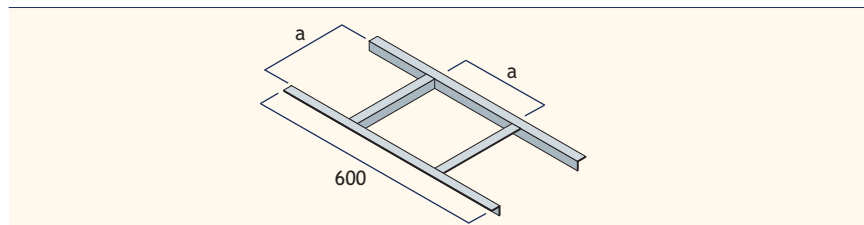
Made of stainless steel, the Gravel Guard is used with Domical Grates on roofs with gravel finish to prevent ingress of insulation and gravel into the outlet. Other lengths are available to order.



Outlet Size (nominal)	a (mm)	b (mm)	Weight (kg)	Product Code
Medium Sump	150	200	0.5	C4/GG/15
Medium Sump	200	200	0.6	C4/GG/20
Large Sump	150	305	0.8	C6/GG/15
Large Sump	200	305	0.9	C6/GG/20

Underdeck Clamp

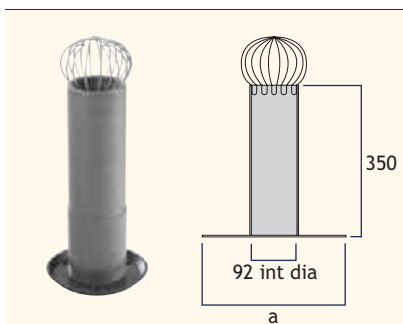
The Underdeck Clamp is used to secure cast iron outlet body to roof deck (cannot be used with horizontal outlet).



Outlet Size (nominal)	Material (mm)	a (mm)	Weight (kg)	Product Code
Medium Sump	Mild steel	175	1.7	C4/UC
Medium Sump	Stainless steel	175	2.1	C4/UC/SS
Large Sump	Mild steel	300	2.0	C6/UC
Large Sump	Stainless steel	300	2.4	C6/UC/SS

Overflow Outlet

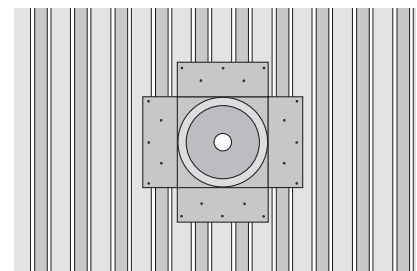
For use where overflow outlets are required. The overflow assembly simply bolts onto the rainwater outlet where the clamp normally sits. Made from ABS, the overflow is easily cut to the required length on site. The balloon grating can be re-fitted back into the overflow inlet to protect the outlet from debris.



Outlet Type	a (mm)	Weight (kg)	Product Code
Medium Sump	200	2.6	C4/OF

Metal Deck Support Plates

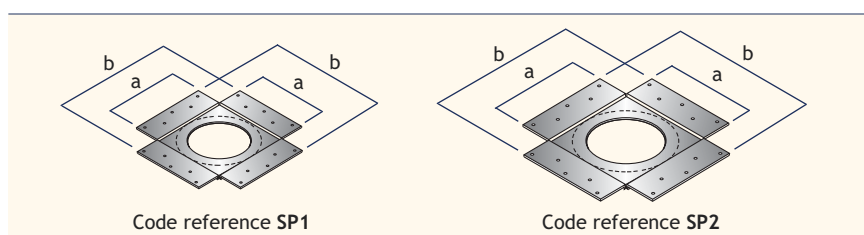
Recommended for use where Harmer cast iron rainwater outlets are installed in metal deck roofs. They are designed to provide a secure and stable junction between the roof deck and rainwater outlet.



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

Materials

The Support Plates are manufactured from 2mm galvanised steel sheet, finished in epoxy primer. They are suitable for installation in all types of metal deck roofing.



Outlet Size (nominal)	a (mm)	b (mm)	Weight (kg)	Product Code
Medium Sump	335	490	2.7	SP1
Large Sump	415	570	3.5	SP2

Cast Iron Roof Outlets - Accessories and Connections

Threaded Spigot Adaptors

The Threaded Spigot Adaptor has been designed to facilitate the connection of Harmer Roof Cast Iron 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 in the case of cast iron socketed or socketless systems. (See page 6).

Materials

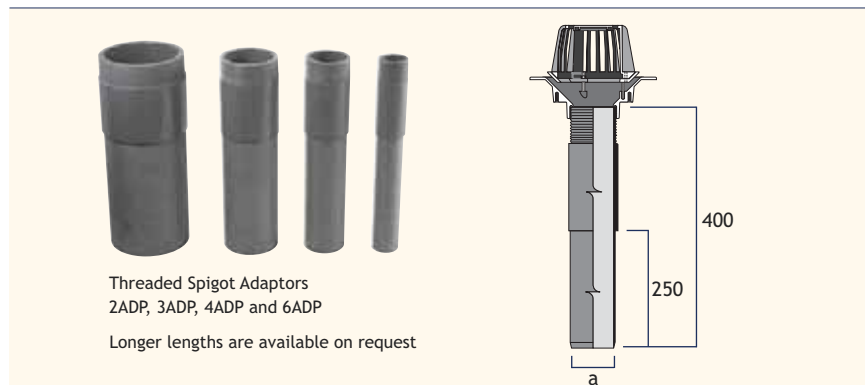
The Threaded Spigot Adaptor, made of ABS plastic, is supplied in 400mm lengths, taper-threaded externally at one end to BS EN 10226-1 and chamfered at the other end to BS 4514 spigot dimensions. Sizes are available to suit 50, 75, 100 and 150mm nominal bore pipework.

Connection to Pipework

The Threaded Spigot Adaptor is screwed into the base of the outlet using silicone sealant 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 Threaded Spigot Adaptors are suitable for direct connection to cast iron pipework to BS EN 877 and BS 416, HDPE pipework with appropriate Harmer couplings, PVC O-ring socketed pipe to BS 4514.

Refer to the pipe connections table below.



Threaded Spigot Adaptors
2ADP, 3ADP, 4ADP and 6ADP
Longer lengths are available on request

Nominal bore (mm)	a (mm)	Weight (kg)	Product Code
50	60	0.4	2ADP
75	83	0.6	3ADP
100	110	1.2	4ADP
150	160	2.0	6ADP

For fitting the Harmer Threaded Spigot Adaptor see page 33, Method 2.



Couplings

For appropriate couplings selection refer to the pipe connections table below.



Coupling Type	Pipe Dia (mm)	Product Code
SML Ductile Iron	50	235849
SML Ductile Iron	100	235357
SML Ductile Iron	150	235358
SML Duo	50	3140/50
SML Duo	100	3140/100
SML Duo	150	3140/150
SML Adaptor	75	3151/070075

Pipe Connections

Outlet Type (mm)	Nominal Size (mm)	Outlet Dia (mm)	Pipe Material and Connection Type			
			Cast Iron EN877	Stainless Steel	HDPE	PVCu
 Vertical Spigot	50	60	SML Duo coupling	Post formed socket OR flexible coupling	Duo coupling	Post formed socket OR flexible coupling
	75	83	SML Adaptor coupling	"O" ring socket OR SML Duo coupling	SML Adaptor coupling	"O" ring socket OR SML Duo coupling
	100	110	SML Duo coupling	"O" ring socket OR SML Duo coupling	SML Duo coupling	"O" ring socket OR SML Duo coupling
 Threaded	50	2"BSP	2ADP + SML Duo coupling	2ADP to Post formed socket OR flexible coupling	2ADP to cast formed socket OR flexible coupling	2ADP to Post formed socket OR flexible coupling
	75	3"BSP	3ADP + SML Adapter coupling	3ADP to "O" ring socket OR SML Duo coupling	3ADP + SML Adaptor coupling	3ADP to "O" ring socket OR SML Duo coupling
	100	4"BSP	4ADP + SML Duo coupling	4ADP to "O" ring socket OR SML Duo coupling	4ADP + SML Duo coupling	4ADP to "O" ring socket OR SML Duo coupling
	150	6"BSP	6ADP + SML Duo coupling	6ADP to P "O" ring socket OR SML Duo coupling	6ADP + SML Duo coupling	6ADP to "O" ring socket OR SML Duo coupling

Cast Iron Roof Outlets - NBS Specification

A typical NBS Specification for Harmer Cast Iron Roof Outlets. A full range of NBS specifications and roof drainage calculators are available via the Harmers online NBS Specification Builder at www.harmerdrainage.co.uk For project specific specification advice, contact Harmer Technical Services.

NBSPlus

R10 Gravity Rainwater Drainage Systems

GENERAL

- 110 GRAVITY RAINWATER DRAINAGE SYSTEM
- Roof Outlets, Pipework and Accessories: As per detail sections below

SYSTEM PERFORMANCE

- 210 DESIGN
- Design: Complete the design of the rainwater drainage system
 - Standard: To BSEN12056-3:2000, clauses 3-7 and National Annexes
 - Proposals: Submit Drawings, technical information, calculations and manufacture's literature

PRODUCTS

365 HARMER CAST IRON ROOF OUTLETS

Manufacturer: Alumasc Exterior Building Products Ltd,
White House Works, Bold Road, Sutton
St Helens, Merseyside WA9 4JG
Tel: 01744 648400, Fax: 01744 648401.
Email: info@alumasc-exteriors.co.uk

Outlet: Harmer Cast Iron

Type: Spigot Outlets

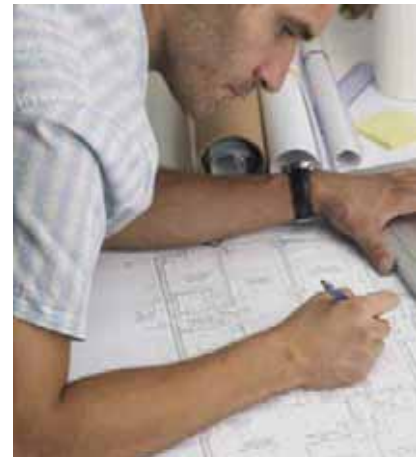
Grate Type: Domed Grate

Size: 150mm

Product Code: C600LT

Reference: Harmer Roof Cast Iron

Accessories: Flat grate, domed grate, trafficable grate



Create Harmer Drainage NBS specifications by selecting the required product range, profile, size and finish by visiting: www.harmerdrainage.co.uk



Drainage Design Calculator

Architects and Building Services Engineers can now design and quantify all their Rainwater Drainage requirements using Alumasc's dedicated design software.

Key Features

- Category 2 and 3 Flat Roof Drainage Calculator linked in to local rainfall data
- Rainwater Drainage Drawing tool integrating Quantities Schedule
- Eaves Drainage Gutter sizing and pipe calculator for Cast and Contemporary gutter types
- Hyperlinks to Product Literature, DWG files and application specific NBS Specification Clauses



Cast Iron Roof Outlets - Installation

Introduction

The Harmer Roof Cast Iron range of outlets are designed for use with flat roof structures using either insitu cast concrete, timber or lightweight metal deck construction. Harmer Roof outlets are ideal for connection to continuous waterproofing systems using mastic asphalt, high performance built-up felt, wet-applied waterproofing systems and most types of single ply membranes.

The Harmer range of outlets incorporate all the key features inherent in the Harmer design approach to trouble-free flat roof drainage.

Components

Harmer cast iron roof outlets are made up of three base components:

Body

An outlet body with integral sump for controlled flow of water into the pipe.

Clamping Ring

The clamping ring is designed to compress the waterproof membrane against the outlet body to ensure total integrity of seal. The side fixing of the clamping ring and domical grate to the outlet body ensures that the throat is completely unobstructed to optimise flow and facilitate rodding.

Grate

Domical grates permit a free flow of rainwater while preventing loose chippings or debris from entering the outlet. Flat grates are used for trafficked and pedestrian areas.

An important feature of both the Domical and Flat grate fixture is that it can be removed without disturbing the clamping ring and waterproof seal of the roofing membrane.

Site detailing is taken care of with a range of accessories which are designed for use in different types of applications. Accessories include, Extension Pieces, Adjustable Height Grates, Double Flange Variable Height Bodies, Support Plates, Gravel Guards, Pipe Adaptors, Overflows and Downspouts.

Materials

All Harmer cast iron components are cast to material grade EN-GJL-200 to BS EN1561, ductile iron components are cast to material grade EN GJS-450-10 to EN1563.

Installation and Sitework

Each site application will require careful assessment by the installer.

Consideration must be given to the type of outlet, roof construction and pipework connection that is used. The general principal of installation is common to all Harmer outlets and the following guidance should be used.

- Threaded outlets using threaded spigot adaptors must be leak tested prior to fixing to the roof structure.
- Position outlet in the roof construction so that the roof substrate is flush with outlet rim and ensure that the roof has adequate falls to the outlet.
- Depending on the type of waterproofing membrane, degrease or prime the inside of the outlet body as per roof membrane manufacturer's recommendation i.e. for asphalt, prime the outlet with bitumen.
- Dress the waterproof membrane into the outlet making sure that adequate material is available for full surface contact between the clamping ring and the outlet body. Bolt down the clamping ring ensuring that equal pressure is applied to the bolts.
- Fix the Grate to the clamping ring using the bolts provided.
- Flood test the outlet in accordance with good practice and commission the rainwater system.

Typical application details are shown on pages 56-57. For further advice on installation, contact Harmer Technical Helpline 01744 648400.

Care and Maintenance

Maintenance is a key aspect of reliable, low cost operation.

Before completion of any drainage scheme:

- Check if overflows have been provided
- Anticipate blockage, never have a single rainwater outlet
- Once the rainwater outlets have been installed they should be inspected to ensure that all parts have been correctly fitted, that no parts are missing and that nuts and bolts are tight and secure.
- Remove tacks, nails and screws left by other trades. These will damage the membrane if trodden on.

Every flat roof must have an inspection plan:

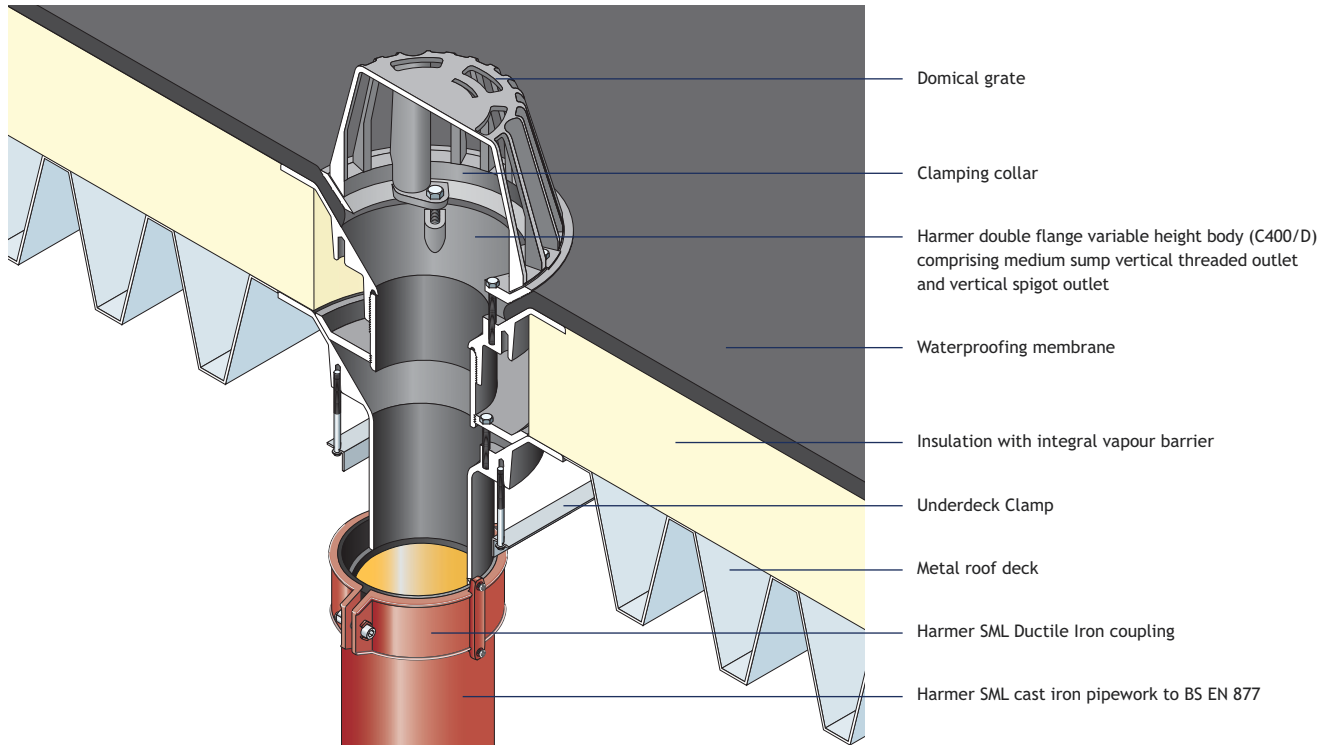
- Inspection of the outlets should be on a regular basis and generally not less than twice annually - Autumn and Spring.
- In locations with nearby trees, leaf congestion will require more frequent clearance
- Plastic bags blown onto the roof will wash to an outlet position and block the strainer.
- Airborne grit and fines will silt up the inlets to the outlet and restrict flow.
- Remove silt and remove leaves
- Check overflows have leaf guards fitted
- Clear any blockages immediately to ensure system does not overflow.

Health & Safety

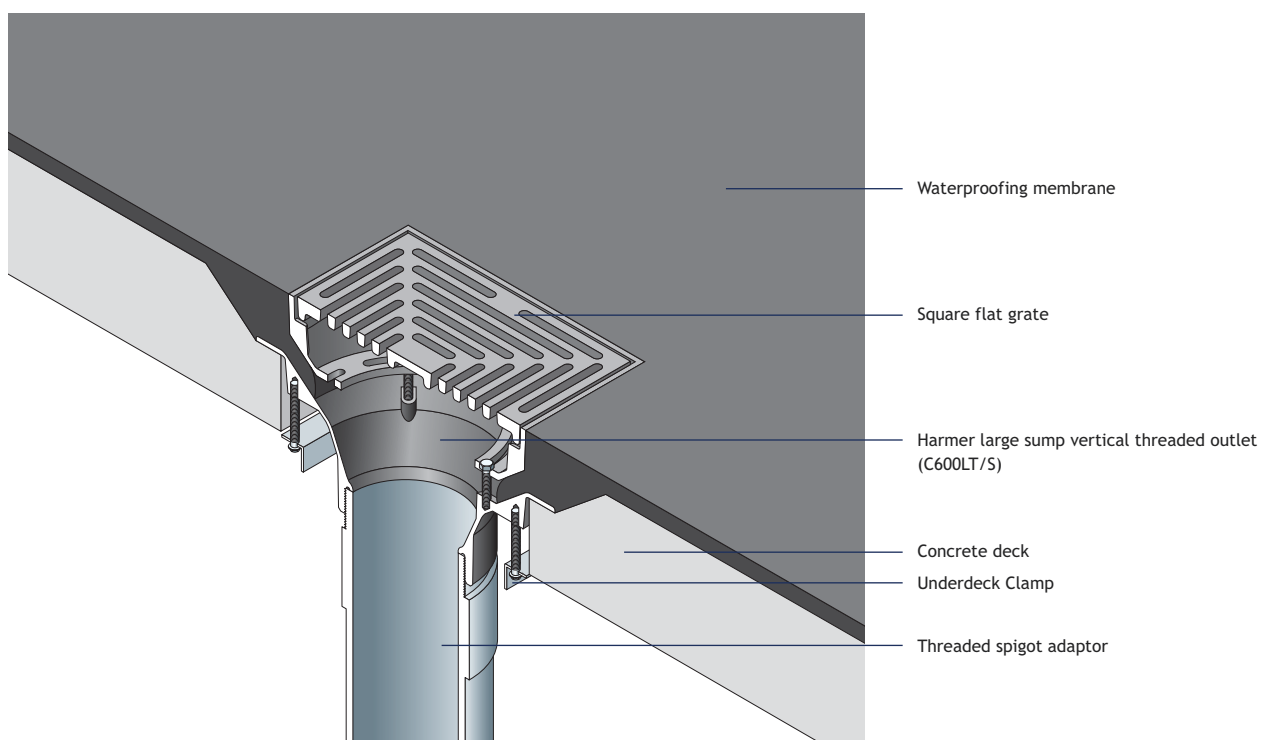
Always refer to current Health & Safety legislation, safe systems of work and the relevant material safety data sheets.

Cast Iron Roof Outlets - Application Details

Harmer Medium Sump Vertical Spigot Double Flanged Outlet in Warm Roof Metal Deck Construction

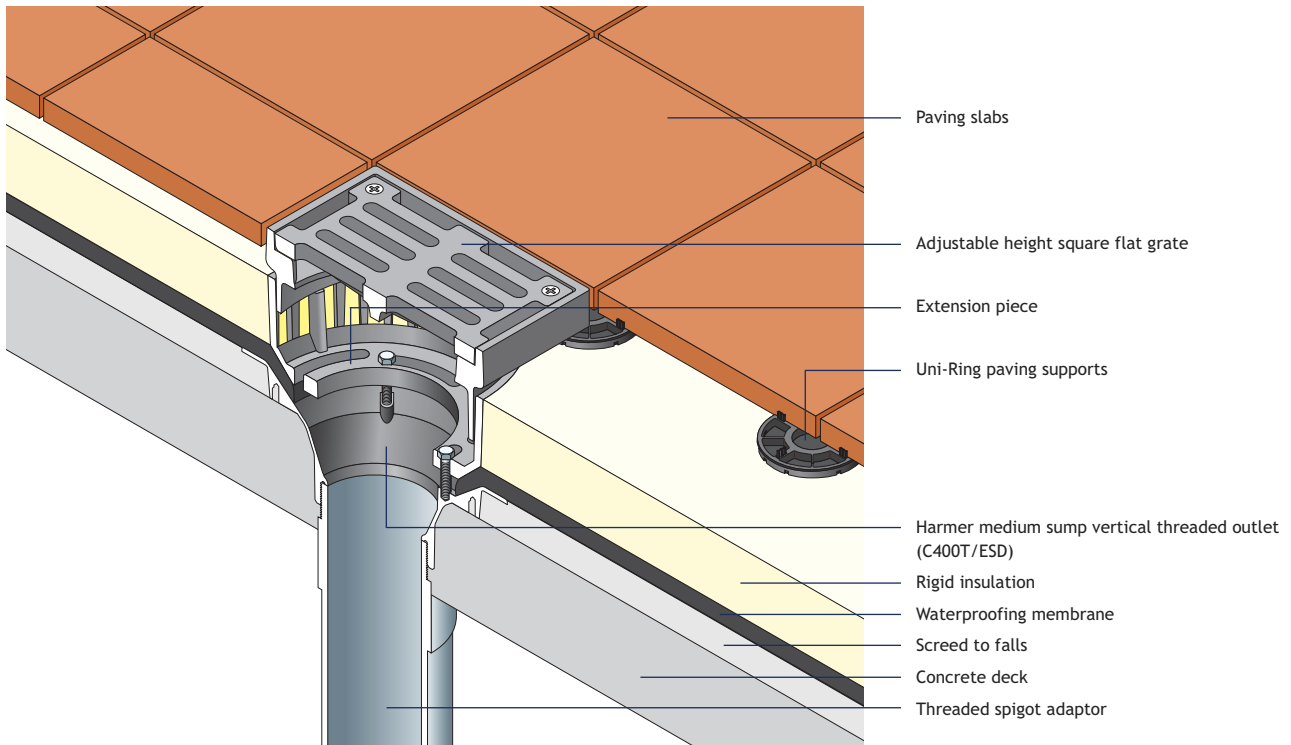


Harmer Large Sump Vertical Threaded Outlet with Square Grate in Cold Roof Concrete Deck Construction

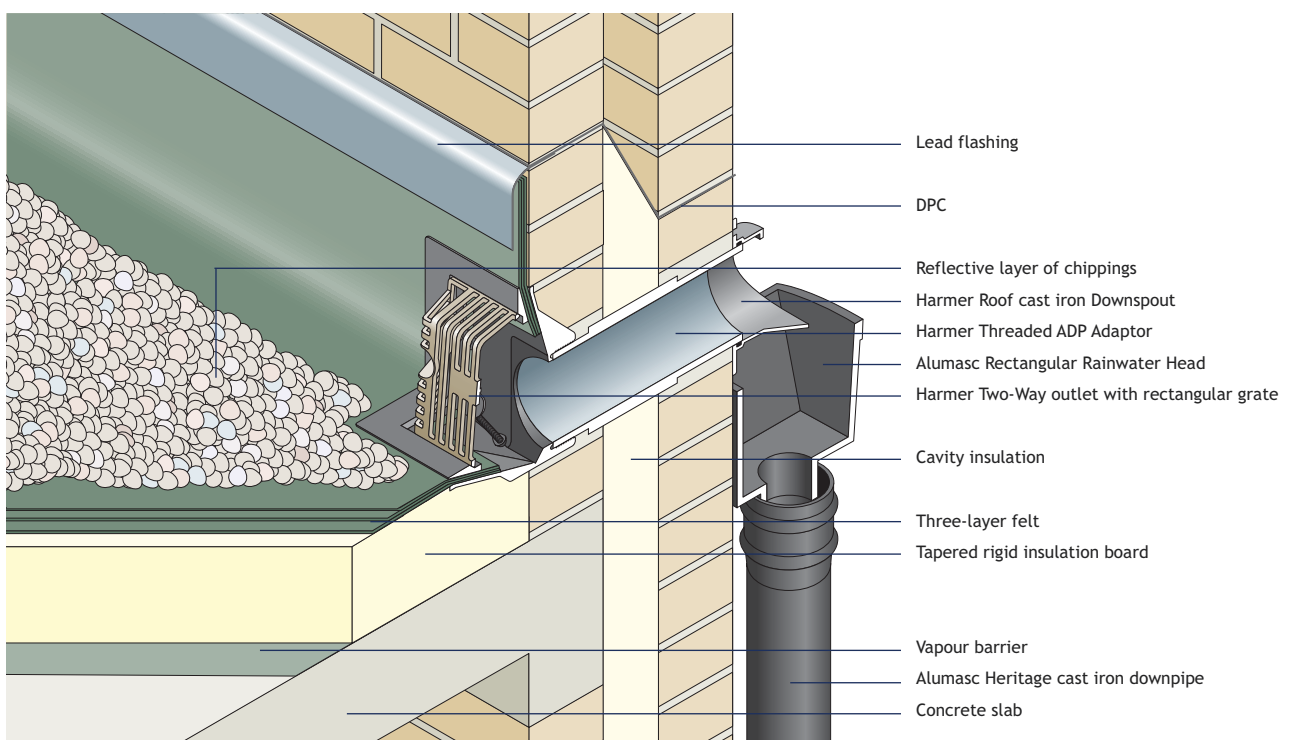


Cast Iron Roof Outlets - Application Details

Harmer Medium Sump Vertical Threaded Outlet with Square Grate in Inverted Roof Concrete Deck Construction

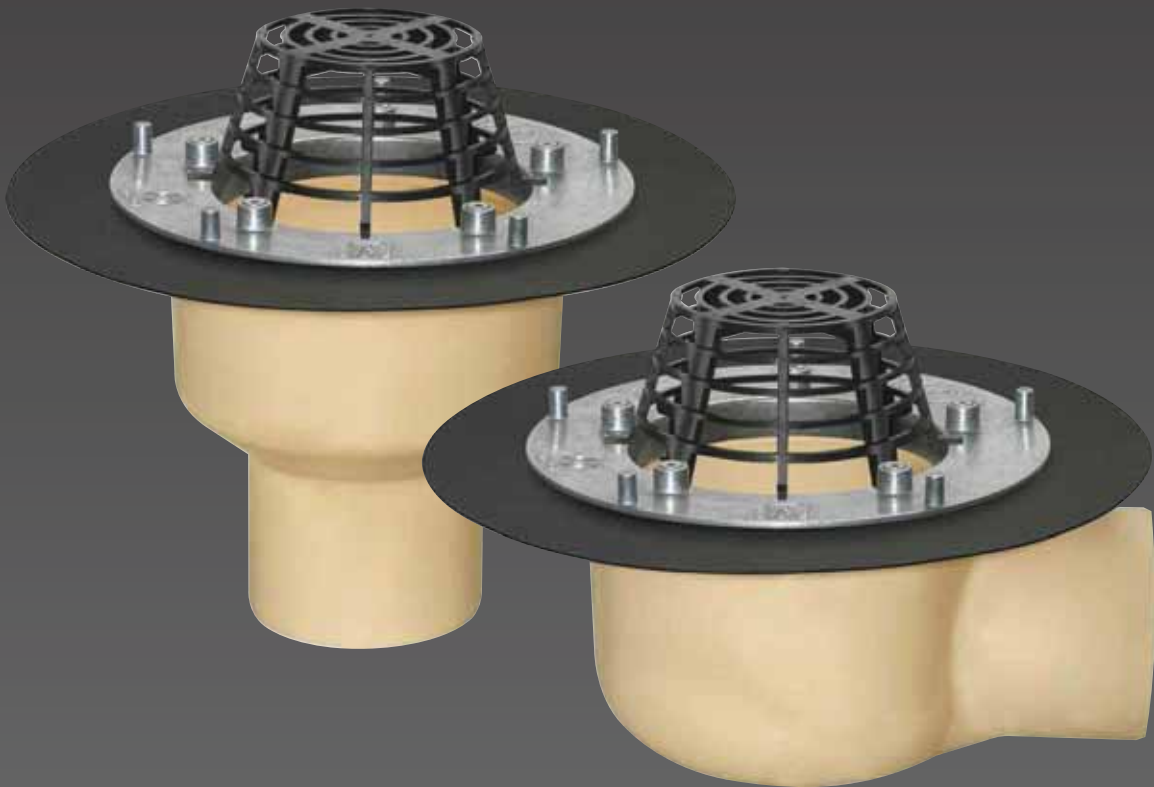


Harmer Two-Way Outlet in Warm Roof Concrete Deck Construction



Harmer Roof Drainage The Insulated Range

The high insulation, rigid polyurethane foam body range of roof outlets that eliminate any possibility of condensation as a result of thermal bridging.



Insulated Roof Outlets - Benefits

Harmer Roof Insulated outlets are based on a rigid polyurethane foam body, with high insulation value.

Main Characteristics

Performance

Harmer Roof Insulated outlets are 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.

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

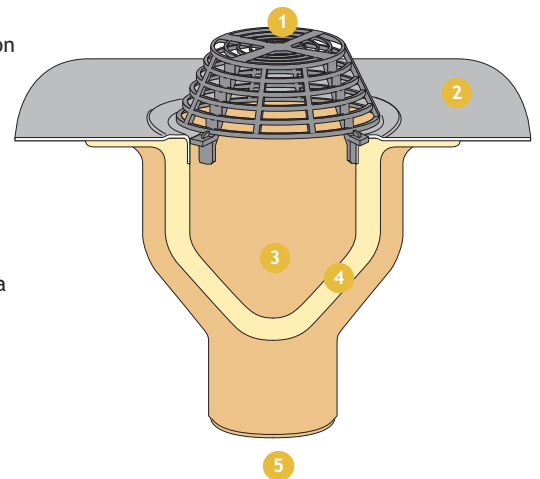
- One piece polyurethane foam body provides a completely watertight connection between roof membrane and rainwater pipe.
- Insulated outlets are available with a flexible connecting membrane fused to the outlet body. The outlet membrane is sealed to the flat roof waterproof membrane, creating a completely 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 a 240V supply.
- Heated outlets are particularly suitable for installation in areas of permanent shadow and north facing aspects.



- 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**

Insulated Roof Outlets - Product Range Summary

Outlets with Elastomeric Membrane Connection



Harmer Roof Insulated outlets with an elastomeric membrane connection, is a range that includes vertical spigot outlets, shallow sump graduated vertical spigot outlets and horizontal spigot outlets.

See page 61.

Outlets with Screw Flange Connection



Harmer Roof Insulated outlets with a screw flange connection, is a range that includes vertical and horizontal spigot outlets.

See page 62.

Accessories



Harmer Roof Insulated outlet accessories include a flat circular grate, extension pieces, and a terrace kit consisting of a circular ring fitting and square grate.

See page 63.

Insulated Roof Outlets - Product Tables

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

Vertical Spigot Outlet – Elastomeric Membrane

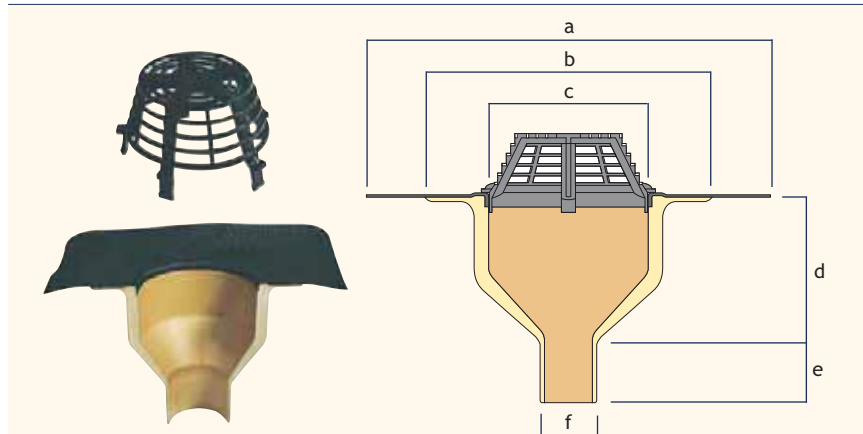
The Harmer Roof Insulated Vertical Spigot outlet comprises a rigid foamed polyurethane body 22mm thick and a 495mm square elastomeric bitumen connecting membrane fused to the body of the outlet. This membrane bonds to three-layer felts, torch-on roofing and hot asphalt.

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

Connection to Pipework

Vertical Spigot outlets are suitable for connection to:

- Plain ended cast iron pipework with appropriate Harmer coupling.
- HDPE pipework with appropriate Harmer coupling.
- PVC “O” ring socketed soil grade pipe to BS 4514: 1983. Connection can be made directly, or with heat-shrink adaptors where necessary.



Outlet Size (mm)	a (mm)	b (mm)	c (mm)	d (mm)	e (mm)	f (mm)	Flow Rate ¹ (l/s)	Product Code	
								Unheated	Heated
75	495	339	192	180	69	75	4.97	1000*	1004*
100	495	339	192	180	69	110	6.53	1001*	1005*
150	492	335	192	122	69	160	6.49	1003*	1007*

* To specify or order please add the appropriate membrane code to the product code as follows: EB - Elastomeric membrane (1000EB), PVC - PVC membrane (1000PVC), DM - EPDM membrane (1000DM). Other membranes available on request.

For flat grate, add /F to code reference.

A range of accessories is available for use with special detail requirements (See pages 63).

Flow Rate Note 1 (applies to all tables)

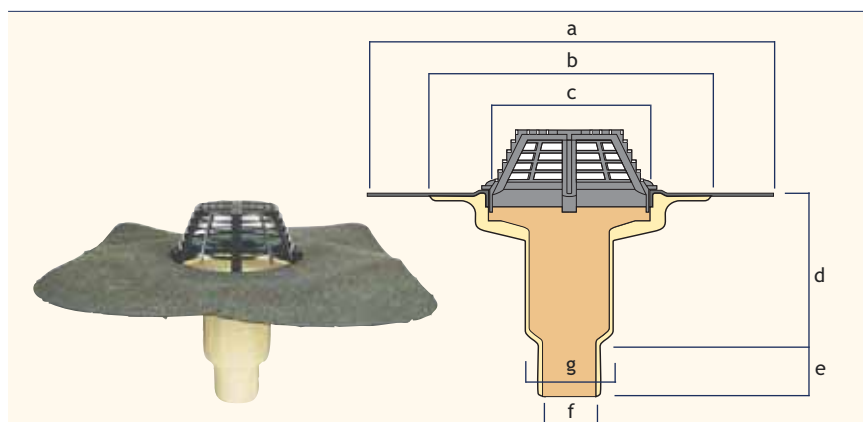
Flow rates are in litres per second to rainwater pipe capacity limits of BS EN 12056. Contact Harmer Technical Services for variable outlet performance to specific depth of water and rainfall intensity.

Shallow Sump Graduated Vertical Spigot Outlet – Elastomeric Membrane

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.



Outlet Size (mm)	a (mm)	b (mm)	c (mm)	d (mm)	e (mm)	f (mm)	g (mm)	Flow Rate ¹ (l/s)	Product Code
75** or 100***	495	320	192	164	81	75	110	4.97** and 6.88***	1017*

* To specify or order please add the appropriate membrane code to the product code as follows: EB - Elastomeric membrane (1000EB), PVC - PVC membrane (1000PVC), DM - EPDM membrane (1000DM). Other membranes available on request.

For flat grate, add /F to code reference.

A range of accessories is available for use with special detail requirements (See pages 63).

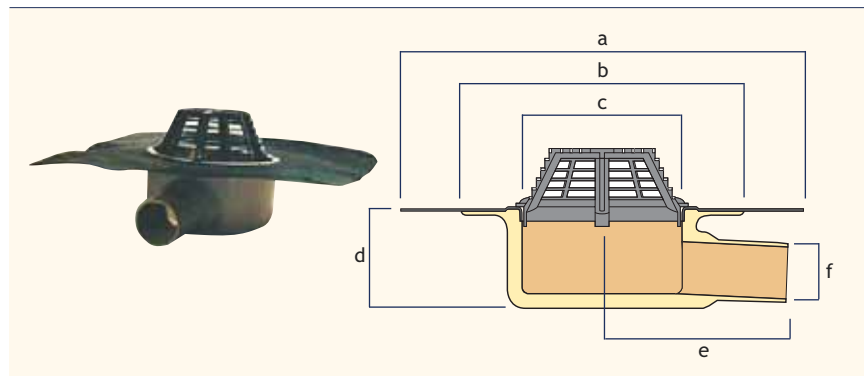
Insulated Roof Outlets - Product Tables

Horizontal Spigot Outlet – Elastomeric Membrane

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.



Outlet Size (mm)	a (mm)	b (mm)	c (mm)	d (mm)	e (mm)	f (mm)	Flow Rate ¹ (l/s)	Product Code	
								Unheated	Heated
75	495	335	192	120	225	75	3.49	1008*	1011*
100	495	335	192	140	225	110	6.10	1009*	1012*

* To specify or order please add the appropriate membrane code to the product code as follows:
EB - Elastomeric membrane (1000EB), PVC - PVC membrane (1000PVC), DM - EPDM membrane (1000DM).
Other membranes available on request.

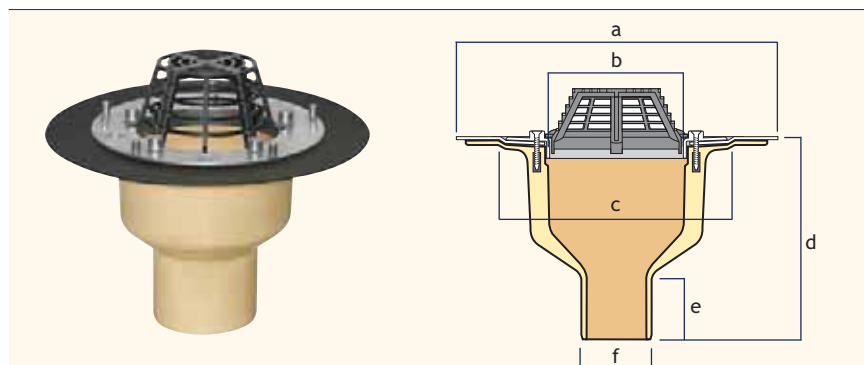
For flat grate, add /F to code reference.

A range of accessories is available for use with special detail requirements (See pages 63).

Vertical Spigot Outlet - Screw Flange

The Harmer Roof Insulated Vertical Spigot Outlet comprises a rigid foamed polyurethane body 22mm thick and an aluminium screw flange. The screw flange is used to clamp the roof membrane securely to the outlet.

The outlets are supplied with a black polyamid domical grate.



Outlet Size (mm)	a (mm)	b (mm)	c (mm)	d (mm)	e (mm)	f (mm)	Flow Rate ¹ (l/s)	Product Code	
								Unheated	Heated
75	320	144	250	210	63	75	4.97	1502*	1503*
100	320	144	250	210	75	110	6.53	1504*	1505*

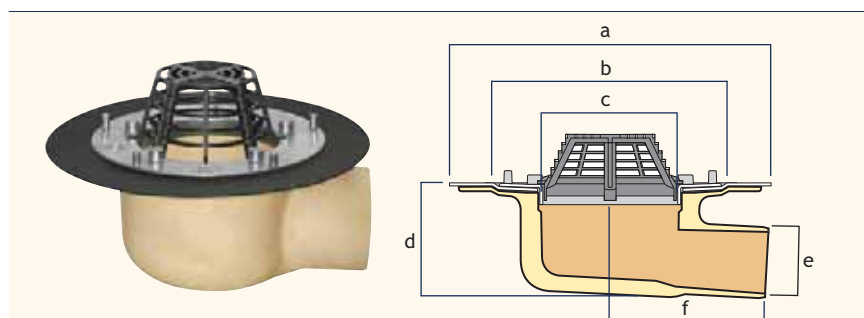
Flow Rate Note 1 (applies to all tables)

Flow rates are in litres per second to rainwater pipe capacity limits of BS EN 12056. Contact Harmer Technical Services for variable outlet performance to specific depth of water and rainfall intensity.

Horizontal Spigot Outlet - Screw Flange

The Harmer Roof Insulated Horizontal Spigot Outlet comprises a rigid foamed polyurethane body 22mm thick and an aluminium screw flange. The screw flange is used to clamp the roof membrane securely to the outlet.

The outlets are supplied with a black polyamid domical grate.



Outlet Size (mm)	a (mm)	b (mm)	c (mm)	d (mm)	e (mm)	f (mm)	Flow Rate ¹ (l/s)	Product Code	
								Unheated	Heated
75	320	250	146	117	75	165	3.49	1514*	1515*
100	320	335	192	140	110	162	6.10	1516*	1517*

Insulated Roof Outlets - Accessories

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.

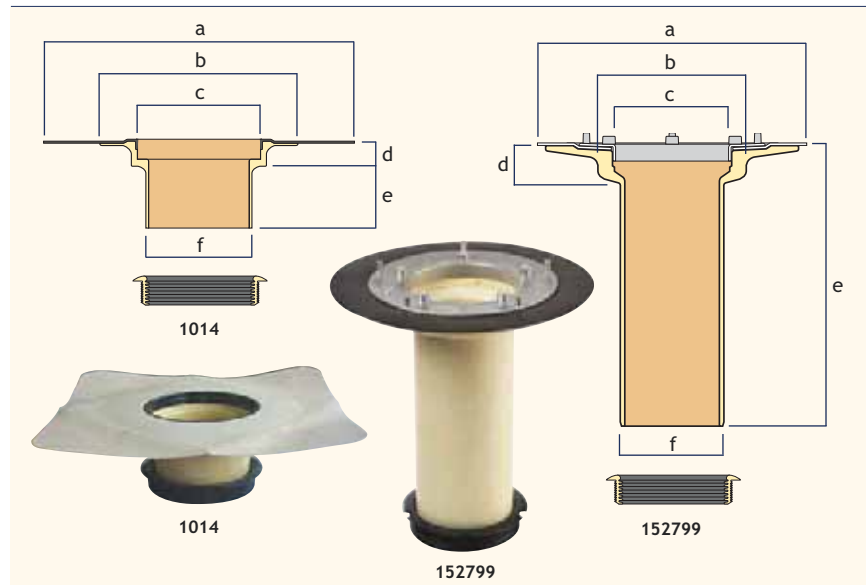
Extension Pieces

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 50-335mm.

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

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 65 showing Extension Piece with EB connecting membrane bonded to three-layer roofing felt.



For Use With	a (mm)	b (mm)	c (mm)	d (mm)	e (mm)	f (mm)	Product Code
Membrane outlets	459	340	189	50	204	170	1014
Screw flange outlets	320	188	146	50	355	132	152799

Extension Pieces are sized for direct connection to Spigots.

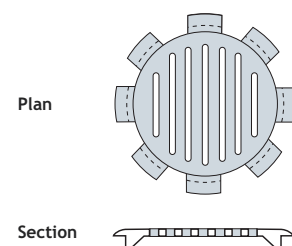
Flat Grate

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. Instead, the Harmer Roof Terrace Kit should be used.

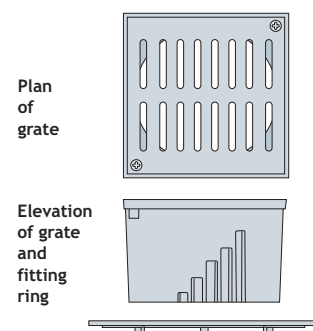
Code reference for grate – use suffix /F after outlet codes if flat grate is required

Flat Grates and Terrace Kits cannot be used with screw flange outlets.



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 34mm to 100mm, to suit varying thicknesses of insulation and surface finish.



Insulated Roof Outlets - NBS Specification

A typical NBS Specification for Harmer Insulated Roof Outlets. A full range of NBS specifications and roof drainage calculators are available via Alumasc's online NBS Specification Builder at www.harmerdrainage.co.uk
For project specific specification advice, contact Harmer Technical Services.

NBSPlus

R10 Gravity Rainwater Drainage Systems

GENERAL

- 110 GRAVITY RAINWATER DRAINAGE SYSTEM
- Roof Outlets, Pipework and Accessories: As per detail sections below

SYSTEM PERFORMANCE

- 210 DESIGN
- Design: Complete the design of the rainwater drainage system
 - Standard: To BSEN12056-3:2000, clauses 3-7 and National Annexes
 - Proposals: Submit Drawings, technical information, calculations and manufacture's literature

PRODUCTS

365 HARMER INSULATED ROOF OUTLETS

Manufacturer: Alumasc Exterior Building Products Ltd,
White House Works, Bold Road, Sutton
St Helens, Merseyside WA9 4JG
Tel: 01744 648400, Fax: 01744 648401.
Email: info@alumasc-exteriors.co.uk

Outlet: Harmer Insulated Rigid PU

Type: Insulated Spigot Outlets

Size: 75mm

Product Code: 1000 (specify membrane type if used with single ply)

Reference: Harmer Roof Outlets

Accessories: Flat grate, domed grate, trafficable grate



Create Harmer Drainage NBS specifications by selecting the required product range, profile, size and finish by visiting: www.harmerdrainage.co.uk



Drainage Design Calculator

Architects and Building Services Engineers can now design and quantify all their Rainwater Drainage requirements using Alumasc's dedicated design software.

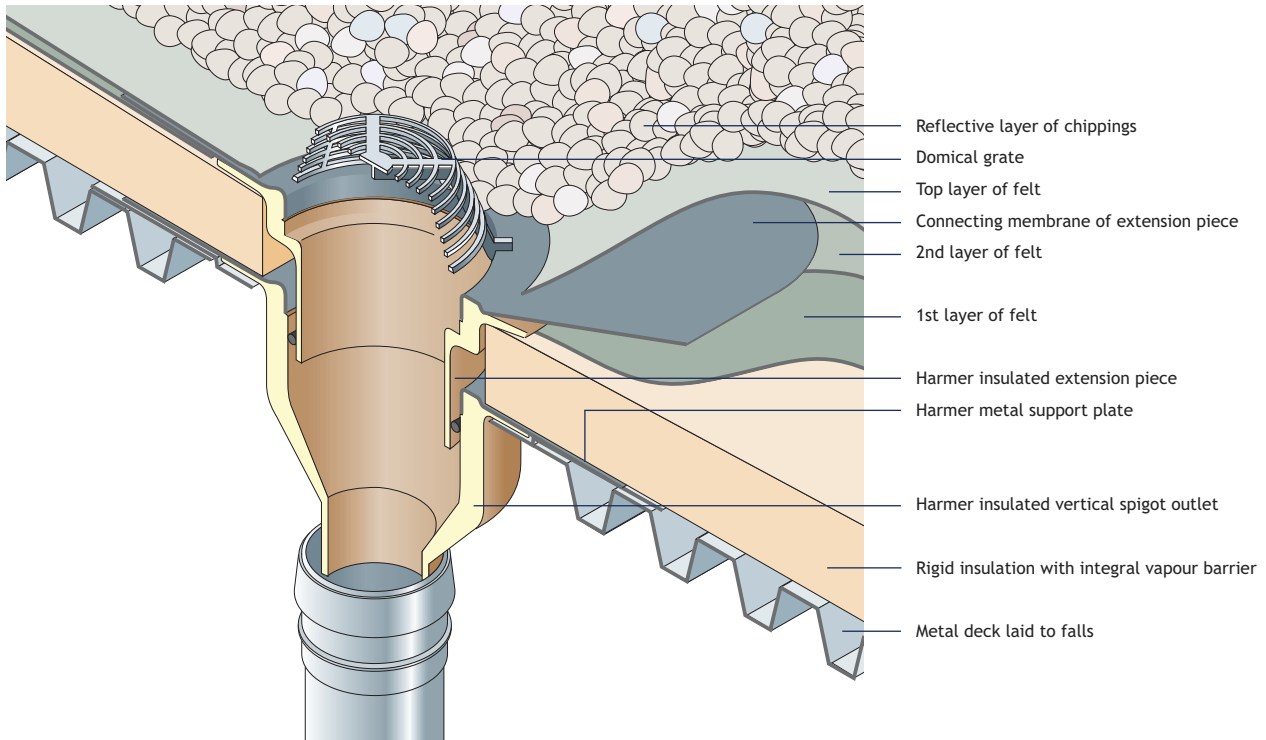
Key Features

- Category 2 and 3 Flat Roof Drainage Calculator linked in to local rainfall data
- Rainwater Drainage Drawing tool integrating Quantities Schedule
- Eaves Drainage Gutter sizing and pipe calculator for Cast and Contemporary gutter types
- Hyperlinks to Product Literature, DWG files and application specific NBS Specification Clauses

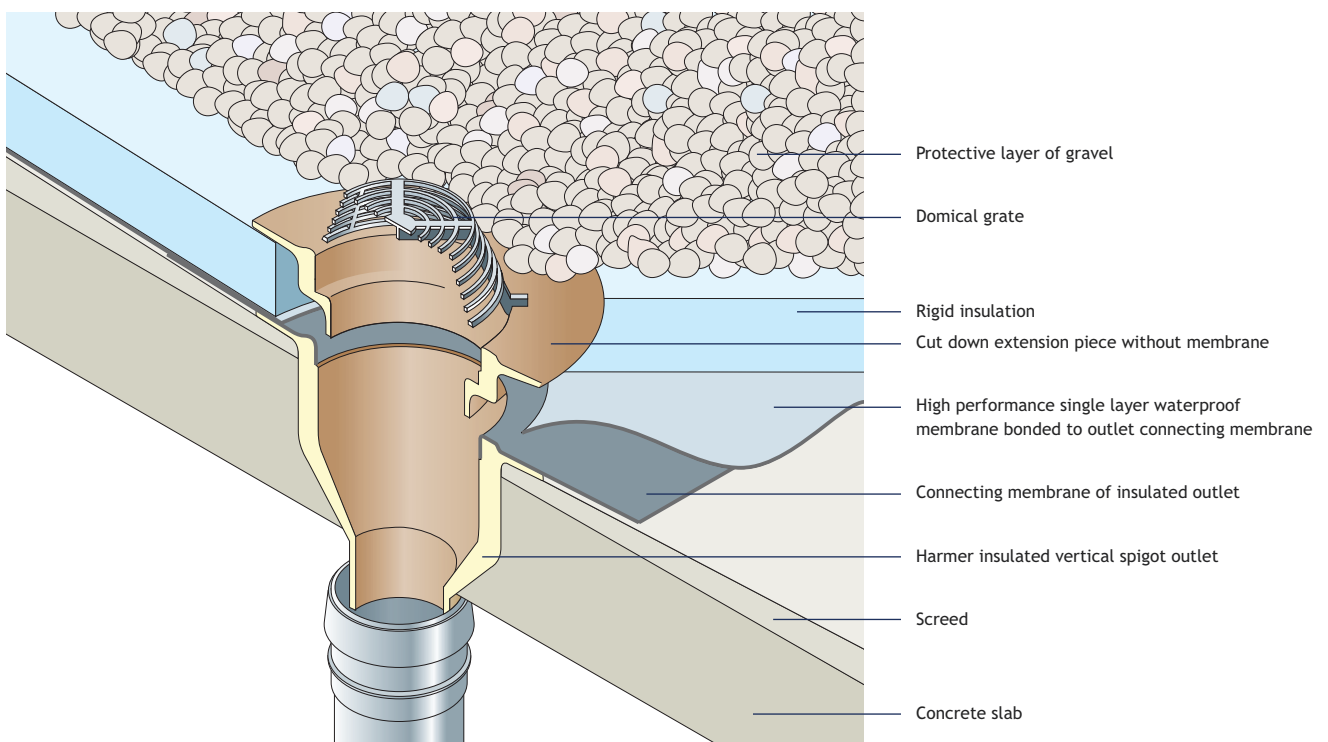


Insulated Roof Outlets - Application Details

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



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



Harmer Roof Drainage The Modulock Channel Drain Range

The advanced, linear, steel drainage range for use
within a raised deck structure.

Combining threshold drainage with the level access requirements
of Part M, it can be used in its own right, or especially with
Harmer Modulock Raised Deck Supports.



Modulock Roof Channel Drains - Benefits

Harmer Modulock Channel Drain is a highly versatile line drainage system designed to provide the ideal level access drainage solution where rainwater run-off and percolation are required to be intercepted at the perimeter of a building or across thresholds and points of access into and out of a building.

Compliances

- Harmer Modulock Channel Drains ensure Level Access compliance with pedestrian loadings to Class K3 in accordance with Approved Document M access to buildings and other regional requirements

Safety

- A drainage system that intercepts rainwater and improves safety at point of access

Economy

- A system of utmost simplicity consisting of shallow lengths of channel in a choice of three different depths laid direct or supported on height adjustable feet for additional height and cross fall correction

Protection

- Buildings are protected from weathering at the vulnerable point where hard surface meets structure. Ponding water is prevented and freeze thaw attack on masonry is eliminated

Performance

- Modulock Channels form part of the overall rainwater drainage plan for most types of flat roof or deck construction including balconies and terraces within pedestrian areas permitting K3 Class loading

Versatility

- Modulock slot sided channels can be used on podium decks, terraces and balcony areas in conjunction with Harmer Rainwater Outlets and Modulock Pedestal Support systems

Compatibility

- Harmer Modulock Channel Drains are used on all types of raised deck construction where drainage at the façade and across entrances is a requirement. Compatible with inverted roof, warm roof, Green roof and podium deck construction

Application

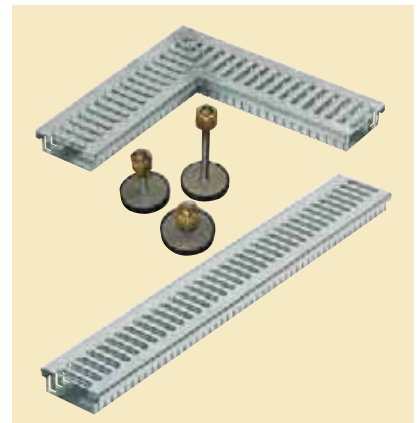
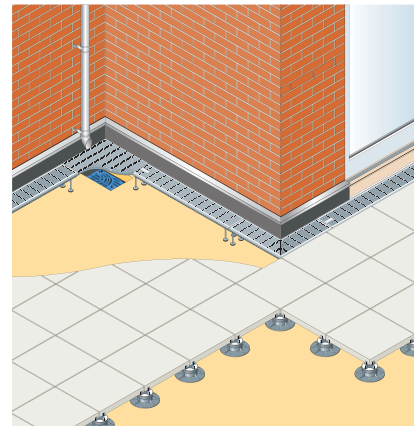
- A rainwater channel system in three sizes consisting of slotted sides with either a grill or slotted grating. Rainwater runoff is collected at hard surface level whilst percolation is relieved at membrane level

Material

- Channels and gratings are available in Grade 304 stainless steel or galvanised mild steel

Installation

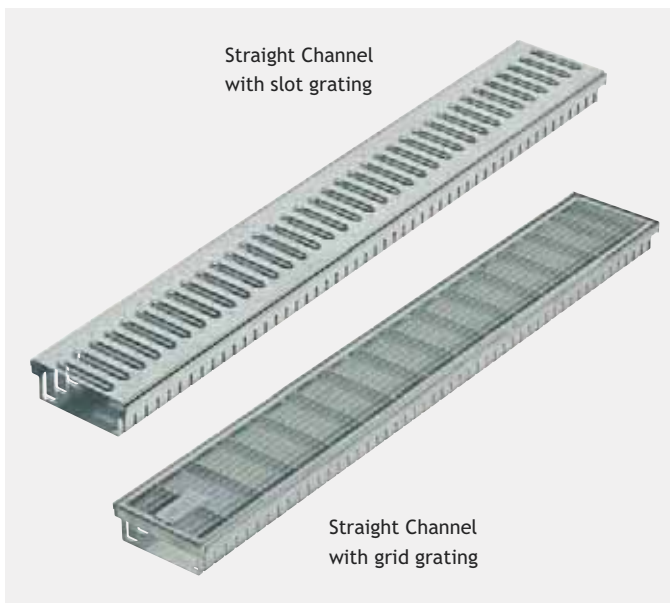
- Straight line end to end installation with simple location clips ensures the system is fully stable whilst butt joint, factory manufactured or site formed irregular angles accommodate change in direction. Height adjustable feet elevate and correct cross falls and any irregularities in the supporting surface.



Modulock Roof Channel Drains - Product Range Summary

The Harmer Modulock Channel Drainage range offers an efficient drainage solution that meets the need for Part M access compliance and the requirements for lasting quality and cost control. The range is available in a choice of two materials, stainless steel or galvanised mild steel.

Straight Channel Lengths and Gratings



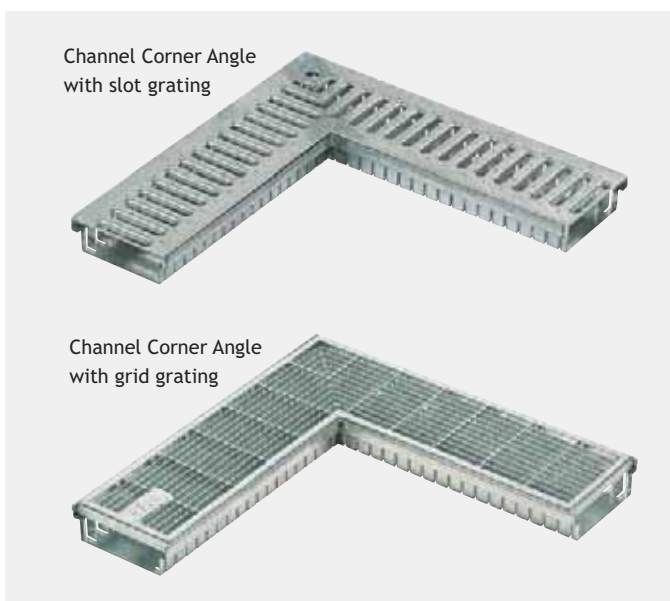
1000mm long x 150mm wide straight length shallow channels in three different heights of 30mm, 40mm and 50mm manufactured in stainless steel Grade 304 or galvanised mild steel.

Slot or 9mm x 64mm grid gratings Load Class K3 are available in stainless steel Grade 304 or galvanised mild steel.

Channel lengths are butt joined using an elongated strip that overlaps the join. The ends of the strip are site folded so as to fit through preformed slots in the side of the channel and then folded over to secure.

See page 70.

90° Channel Corner Angles and Gratings



Prefabricated 90° corners 500mm x 500mm x 150mm wide shallow slotted channels in three different heights of 30mm, 40mm and 50mm manufactured in stainless steel Grade 304 or galvanised mild steel, complete with slot or 9mm x 64mm grid gratings.

Channel corners are butt joined using an elongated strip that overlaps the join. The ends of the strip are site folded so as to fit through preformed slots in the side of the channel and then folded over to secure.

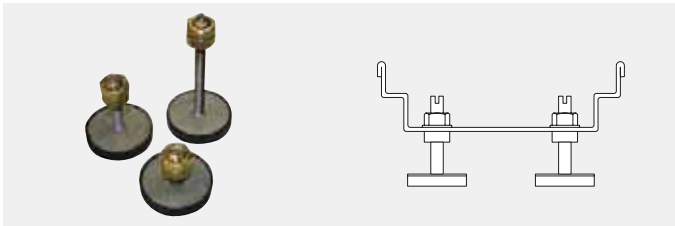
Alternatively, 90° corners can be butt formed or cut on site.

See page 70.

Modulock Roof Channel Drains - Product Range Summary

Gratings are available in the same choice of materials and with the added choice of either a grid or slot profile. The systems can be laid directly on the structural deck or fitted with height adjustable feet according to the build up required, and are rated Load Class K3.

Height Adjusters



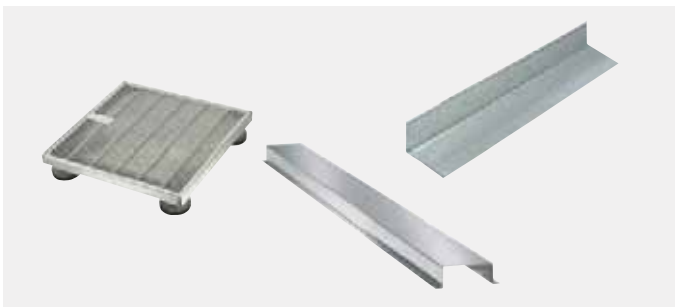
A choice of three different threaded adjusters provide additional height and correction for accurate levelling to thresholds and finishes over a range of 50mm to 150mm. See page 71.

End Stops



End Stops produced with elongated flanges are site folded so as to fit through preformed slots in the side of the channel and then folded over to secure. See page 71.

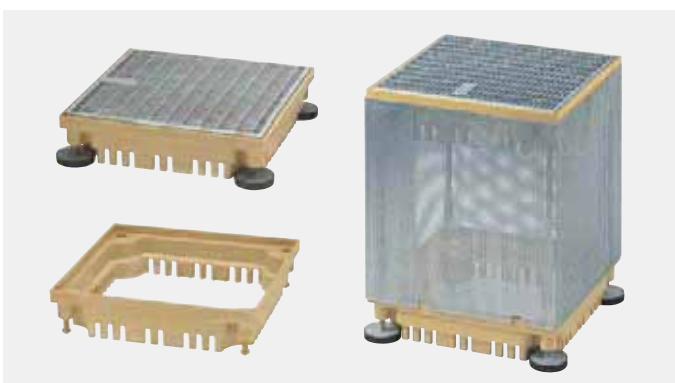
Standard Accessories



There is a range of accessories for the Modulock Channel Drain system to ensure its successful installation in most types of roof construction.

The range includes access chamber, gravel guard and drainage duct. See page 71.

Green Roof Accessories



There is a range of accessories for the Modulock Channel Drain system to ensure its successful installation in most types of roof construction.

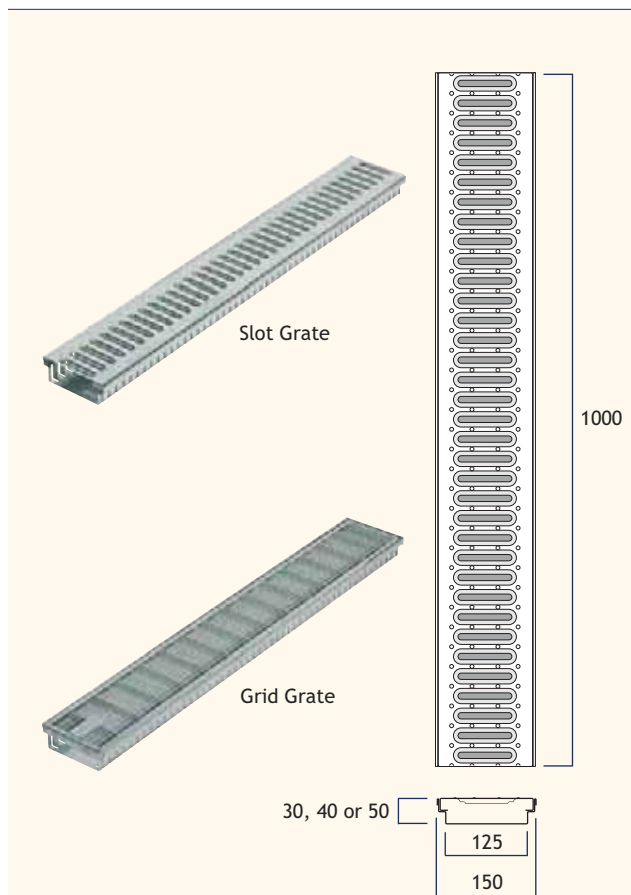
The range includes an adjustable height access chamber, access chamber extension and 600mm high perforated access chamber also with height adjustability. See page 72.

Modulock Roof Channel Drains - Product Tables

Harmer Modulock is an open-sided modular channel system designed for perimeter drainage over inverted roof and warm roof construction. Instantaneous rainwater run-off is intercepted at finished surface level whilst percolating water from surrounding construction is ducted away to drainage outlets.

Straight Channel Lengths and Gratings

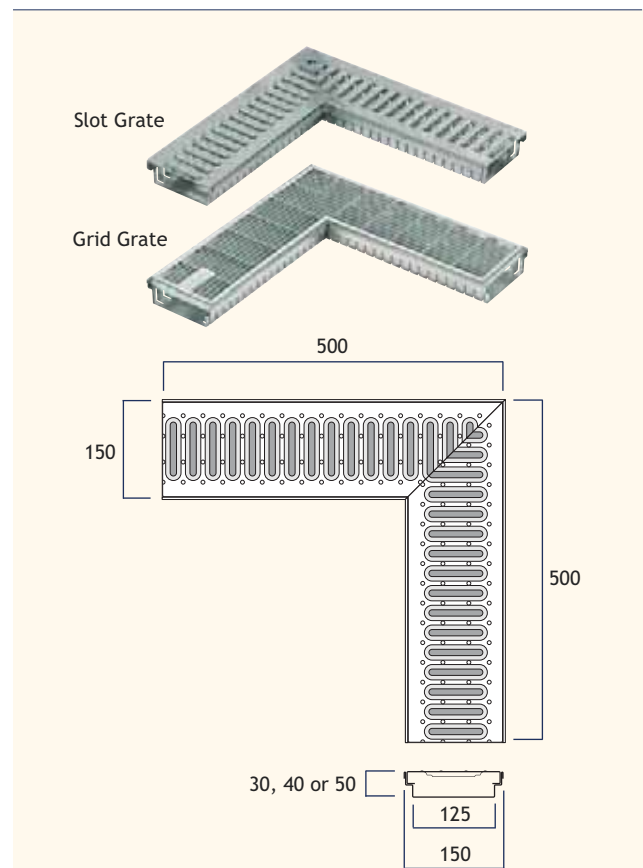
Modulock Channel Drains are in 1 metre lengths and 150mm wide, available in galvanised steel or stainless steel. Grates are also in both these materials, in either a slot or grid format.



Channel Depth (mm)	Material	Grate Type	Product Code
30	Galvanised steel	Slot	MD30G/1M/S
40	Galvanised steel	Slot	MD40G/1M/S
50	Galvanised steel	Slot	MD50G/1M/S
30	Galvanised steel	Grid	MD30G/1M/G
40	Galvanised steel	Grid	MD40G/1M/G
50	Galvanised steel	Grid	MD50G/1M/G
30	Stainless steel	Slot	MD30S/1M/S
40	Stainless steel	Slot	MD40S/1M/S
50	Stainless steel	Slot	MD50S/1M/S
30	Stainless steel	Grid	MD30S/1M/G
40	Stainless steel	Grid	MD40S/1M/G
50	Stainless steel	Grid	MD50S/1M/G

90° Channel Corner Angles and Grating

Modulock Channel Drain prefabricated Corner Angles are 500mm x 500mm x 150mm wide, available in galvanised steel or stainless steel. Grates are also in both these materials, in either a slot or grid format. 90° corners can also be butt formed or cut on site.



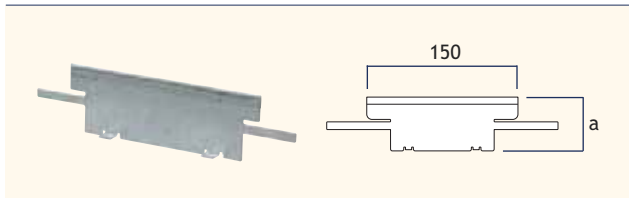
Channel Depth (mm)	Material	Grate Type	Product Code
30	Galvanised steel	Slot	MD30G/90/S
40	Galvanised steel	Slot	MD40G/90/S
50	Galvanised steel	Slot	MD50G/90/S
30	Galvanised steel	Grid	MD30G/90/G
40	Galvanised steel	Grid	MD40G/90/G
50	Galvanised steel	Grid	MD50G/90/G
30	Stainless steel	Slot	MD30S/90/S
40	Stainless steel	Slot	MD40S/90/S
50	Stainless steel	Slot	MD50S/90/S
30	Stainless steel	Grid	MD30S/90/G
40	Stainless steel	Grid	MD40S/90/G
50	Stainless steel	Grid	MD50S/90/G

Modulock Roof Channel Drains - Product Tables

The Modulock Roof Channel system consists of channels and fittings that can provide height adjustment and access points over rainwater outlets. Inverted roof gravel guards retain ballast at edge detailing whilst buried ducts convey concealed drainage.

End Stops

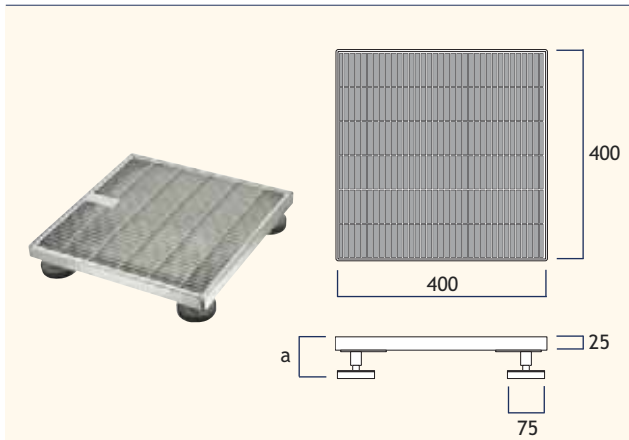
End stops are important to the channel drainage system by preventing leaves and wind-blown rubbish from congesting the waterway. Vermin are prevented from using the channel as a means of escape.



To Suit Channel Depth a (mm)	Material	Product Code
30	Galvanised steel	MD30G/SE
40	Galvanised steel	MD40G/SE
50	Galvanised steel	MD50G/SE
30	Stainless steel	MD30S/SE
40	Stainless steel	MD40S/SE
50	Stainless steel	MD50S/SE

Access Cover

Rainwater outlet access frame 400mm x 400mm and Load Class L15 with removable grate and fitted with height adjustable feet.

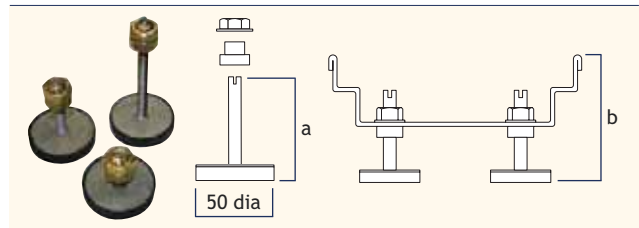


Height Adjustment Range a (mm)	Grate Type	Material	Product Code
52 - 124*	Grid	Galvanised steel	MD400G/AC
52 - 124*	Grid	Stainless steel	MD400S/AC

*Order appropriate height adjusters MD/5090, MD/65110 or MD/105150.

Height Adjusters

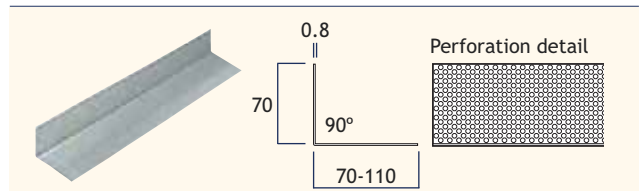
Modulock Channels can be supported directly on the structural deck or supported on height adjusters for raised paving, varying from 50mm to 150mm.



Height a (mm)	Height Adjustment Range b (mm)	Product Code
40	50 - 90	MD/5090
60	65 - 110	MD/65110
100	105 - 150	MD/105150

Gravel Guard (Perforated)

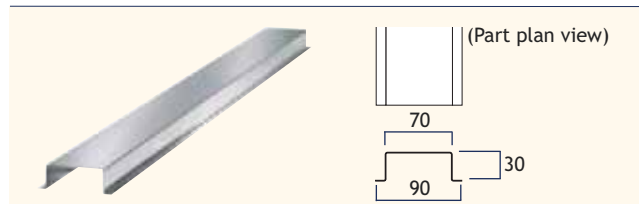
Slotted galvanised steel retaining strip 70mm to 110mm upstand for edge detailing to channel sections where gravel ballast is required.



Material	Length (mm)	Product Code
Galvanized steel	1000	MD/GG

Drainage Duct

Slotted duct in 30mm x 70mm galvanised steel used in conjunction with Access Chamber, is laid within deck build-up to connect between channels and rainwater outlet positions; used as an economical alternative to channels.

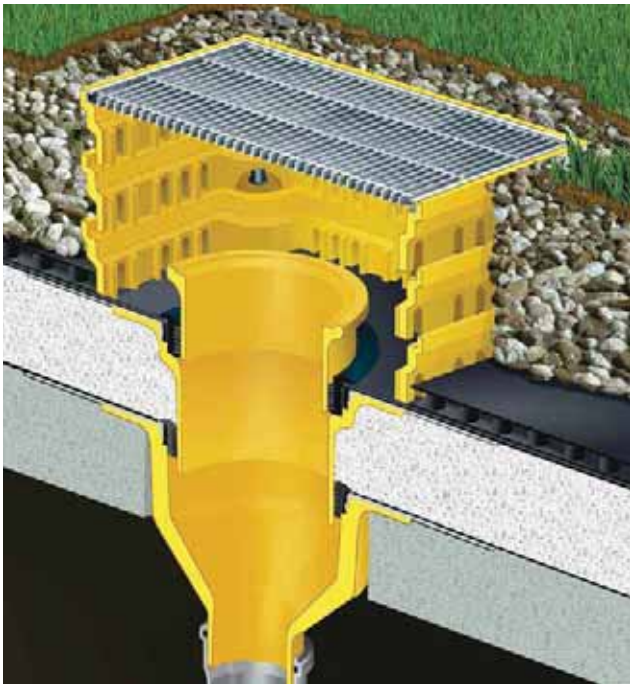


Material	Length (mm)	Product Code
Galvanized steel	1000	MD/DD

Modulock Roof Channel Drains - Product Tables

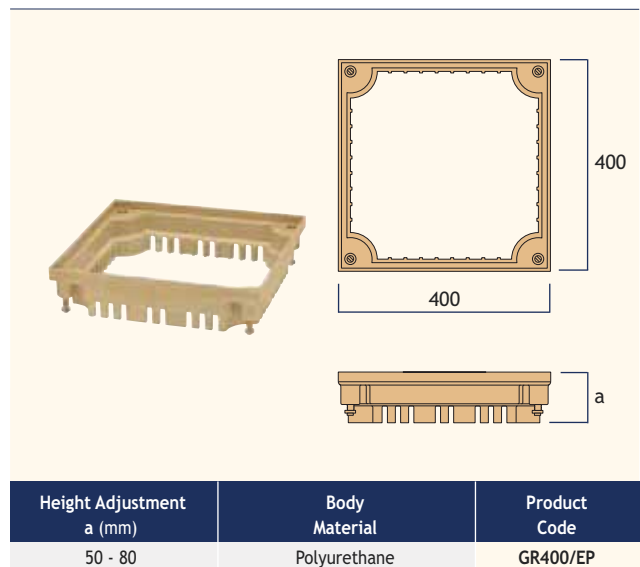
Green Roof Accessories

Harmer Green Roof Access Chambers are suitable for use with most Harmer Roof outlets. The Access Chamber provides an ideal solution for access to rainwater outlets for inspection and maintenance. It also acts as a collection point for surface water drainage and structural level drainage of the green roof.



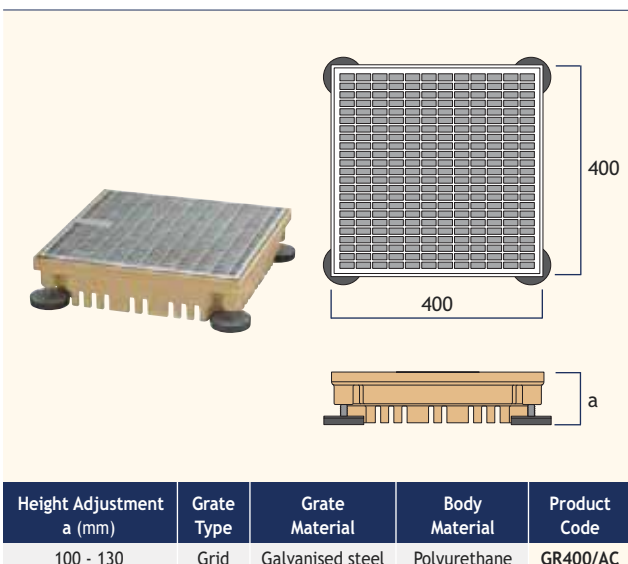
Access Chamber Extension Piece

Stackable PU access frame extension 400mm x 400mm with height adjustment 50mm to 80mm.



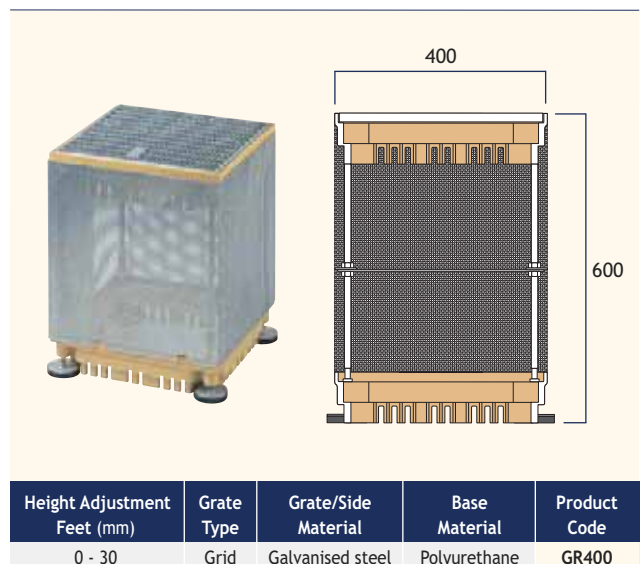
Adjustable Access Cover

Moulded PU access frame 400mm x 400mm with galvanised mild steel 9mm x 32mm aperture grating and fitted with adjustable feet for fine height adjustment on-site. Can be combined with Access Chamber Extension Piece to raise the height in increments of 50-80mm.



Access Chamber

Moulded PU access frame 400mm x 400mm with galvanised mild steel 9mm x 32mm aperture grating. The perforated 600mm high chamber can be cut down on site to 220mm. Adjustable feet also allow fine height adjustment during installation.



Modulock Roof Channel Drains - NBS Specification

A typical NBS Specification for Harmer Modulock Channel Drains. A full range of NBS specifications and roof drainage calculators are available via the Harmer online NBS Specification Builder at www.harmerdrainage.co.uk For project specific specification advice, contact Harmer Technical Services.



R10 Gravity Rainwater Drainage Systems

GENERAL

- 110 GRAVITY RAINWATER DRAINAGE SYSTEM
- Roof Outlets, Pipework and Accessories: As per detail sections below

SYSTEM PERFORMANCE

- 210 DESIGN
- Design: Complete the design of the rainwater drainage system
 - Standard: To BSEN12056-3:2000, clauses 3-7 and National Annexes
 - Proposals: Submit Drawings, technical information, calculations and manufacture's literature

PRODUCTS

- 365 HARMER MODULOCK CHANNEL DRAINAGE SYSTEM
- Manufacturer: Alumasc Exterior Building Products Ltd,
White House Works, Bold Road, Sutton
St Helens, Merseyside WA9 4JG
Tel: 01744 648400, Fax: 01744 648401.
Email: info@alumasc-exteriors.co.uk

Outlet: Harmer Stainless Steel channel drain

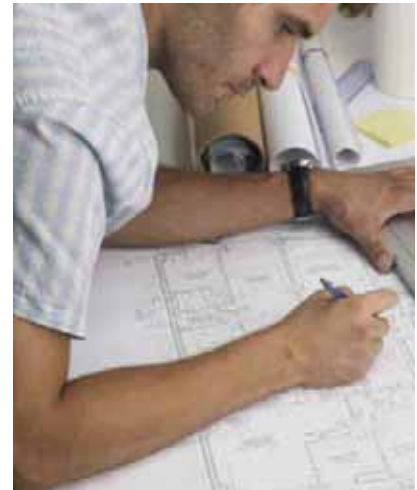
Grate Type: Slotted

Size: 150mm wide x 50mm deep x 1000mm long - height adjustable 105mm to 150mm

Product Code: Channel type MD50S/1M/S Height Adjuster MD/105150

Reference: Harmer Modulock Channel Drains

Accessories: Slotted grate, grill. Height adjuster



Create Harmer Drainage NBS specifications by selecting the required product range, profile, size and finish by visiting: www.harmerdrainage.co.uk



Drainage Design Calculator

Architects and Building Services Engineers can now design and quantify all their Rainwater Drainage requirements using Alumasc's dedicated design software.

Key Features

- Category 2 and 3 Flat Roof Drainage Calculator linked in to local rainfall data
- Rainwater Drainage Drawing tool integrating Quantities Schedule
- Eaves Drainage Gutter sizing and pipe calculator for Cast and Contemporary gutter types
- Hyperlinks to Product Literature, DWG files and application specific NBS Specification Clauses



Modulock Roof Channel Drains - Installation

Installation notes for each Harmer Modulock Channel component are detailed below.

Beginning Work

Ensure all working surfaces are accessible and free from rubbish.

Channels Laid Level

- Ensure channels are the required depth and metal type
- Where a corner exists start from this point
- Lay level 90° corner component or form simple 90° butt joint
- Fit jointing clip as each channel is laid
- Where necessary position access chamber over rainwater outlet
- Lay channel and site cut to up to access chamber
- At end of run fit end cap by inserting into channel and folding elongated flanges

Channels Laid to Fall

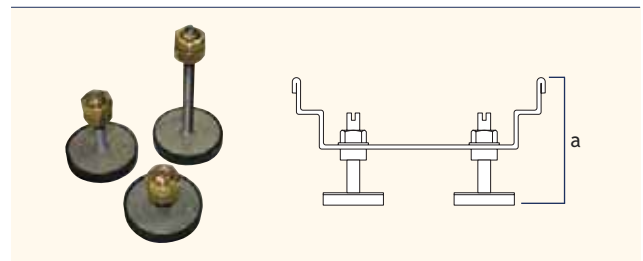
- Ensure channels are the required depth and metal type
- Establish length of run and degree of fall
- Fit adjustable feet into base of channel according to maximum stability
- Where a corner exists start from this point
- Adjust feet to required height
- Lay level 90° corner component or form simple 90° butt joint
- Fit jointing clip as each channel is laid
- Where necessary position access chamber over rainwater outlet
- Lay channel and site cut to up to access chamber
- At end of run fit end cap by inserting into channel and folding elongated flanges

NOTE

Where galvanised steel has been cut, immediately apply a coating of cold galvanise paint to all exposed, clean surfaces.

Height Adjuster Selection

Modulock Channels can be supported directly on the structural deck or supported on height adjusters for raised paving, varying from 50mm to 150mm.



Channel Depth (mm)	Channel Type	Height Adjuster Product Code		
		MD/5090	MD/65110	MD/105150
Stainless Steel		Height Adjustment Range a (mm)		
30	MD30S/1M/S	50 - 70	65 - 90	105 - 130
30	MD30S/1M/G	60 - 70	80 - 90	120 - 130
40	MD40S/1M/S	60 - 80	65 - 100	105 - 140
40	MD40S/1M/G	60 - 80	80 - 100	120 - 140
50	MD50S/1M/S	70 - 90	70 - 110	105 - 150
50	MD50S/1M/G	70 - 90	80 - 110	120 - 150
Galvanised Steel		Height Adjustment Range a (mm)		
30	MD30G/1M/S	50 - 70	65 - 90	105 - 130
30	MD30G/1M/G	60 - 70	80 - 90	120 - 130
40	MD40G/1M/S	60 - 80	65 - 100	105 - 140
40	MD40G/1M/G	60 - 80	80 - 100	120 - 140
50	MD50G/1M/S	70 - 90	70 - 110	105 - 150
50	MD50G/1M/G	70 - 90	80 - 110	120 - 150

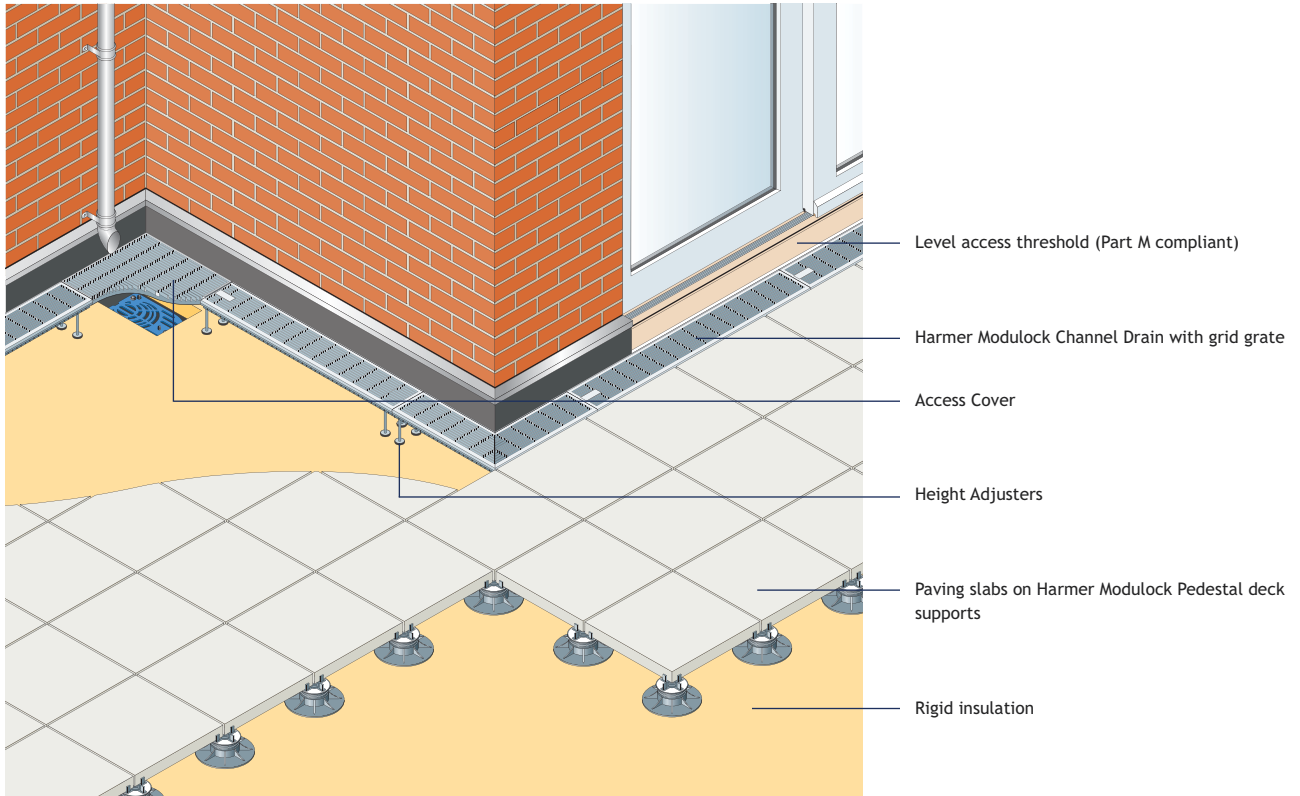
Care and Maintenance

Harmer Modulock Channels only require minimum maintenance but periodic inspection and in areas where leaf congestion might occur it is advisable keep the channels free from blockage.

- Carry out a visual inspection bi-annually
- Protect hands with industrial gloves when installing and inspecting
- Clear any builders rubbish from inside the drain
- Grates should only be cleaned with plastic brush
- Jetting or flushing may be necessary, check outlet positions
- DO NOT USE bleach type drain cleaners or brick cleaning acids otherwise galvanised surfaces will be seriously damaged.

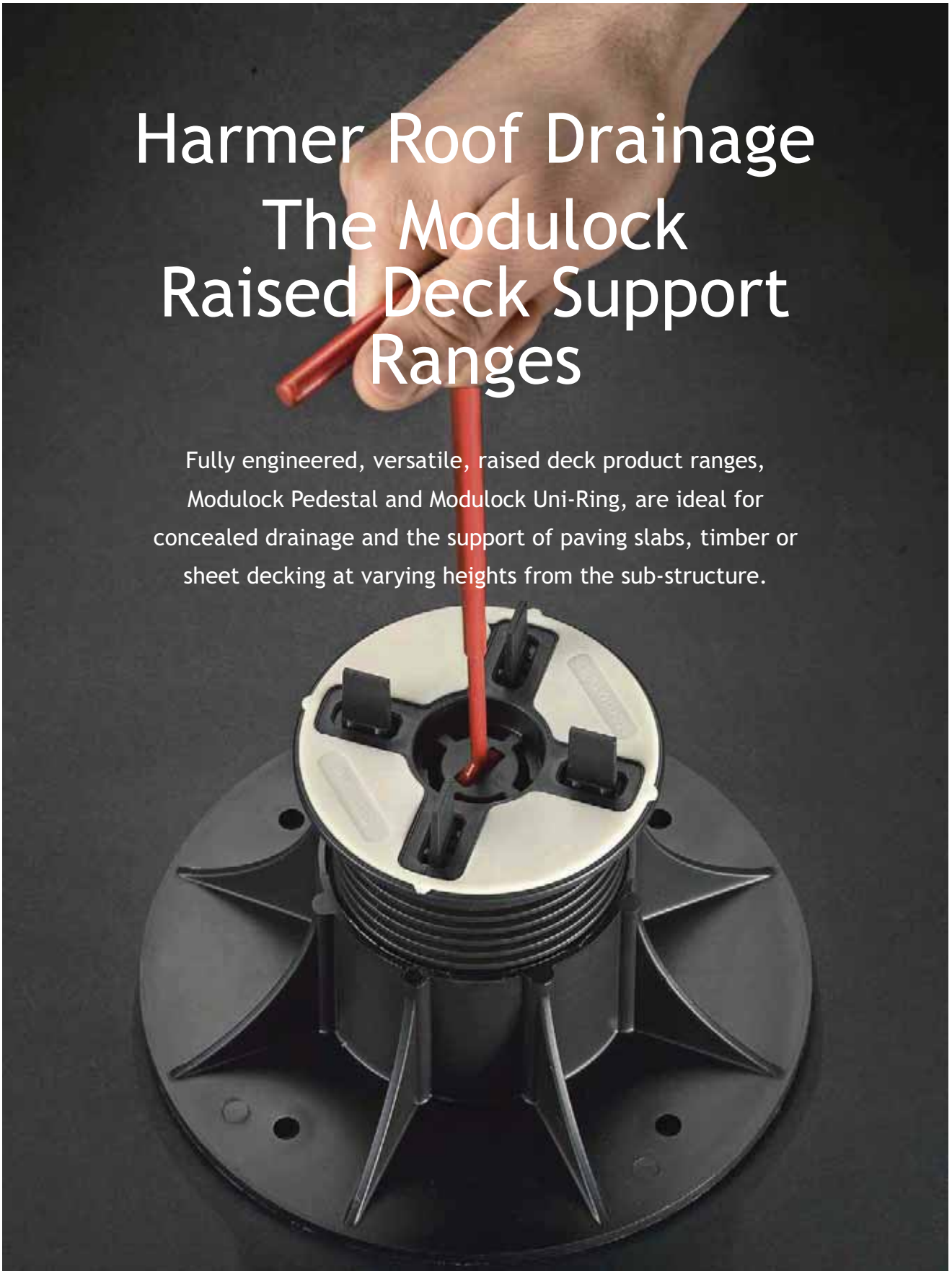
Modulock Roof Channel Drains - Application Details

Level Access Threshold



Harmer Roof Drainage The Modulock Raised Deck Support Ranges

Fully engineered, versatile, raised deck product ranges, Modulock Pedestal and Modulock Uni-Ring, are ideal for concealed drainage and the support of paving slabs, timber or sheet decking at varying heights from the sub-structure.



Modulock Raised Deck Supports - Benefits

The Modulock Pedestal and Modulock Uni-Ring raised deck supports are designed for use in terraces, walkways, balconies and ballasted flat roof constructions.

Modulock Pedestal - Adjustable Height

- Wide range of height adjustment from 37.5mm - 550mm
- Fine adjustment for both height and level are possible

Self-Levelling Head

- The Modulock Pedestal self-levelling head compensates for gradients up to 5°
- Made of polypropylene and rubber to provide an anti-noise and anti-slip bedding surface



Self-Locating

- Locating blades on Modulock Pedestal self-levelling head assist positioning of slabs and maintaining open joints when required
- Locating blades can be removed if required

Compatibility

- Harmer Modulock Pedestal and Uni-Ring product ranges are fully compatible with the Modulock Channel Drain range

Robust

- Resistant to temperatures from -40° to +120°C
- UV stable and resistant to acids

Installation

- Modulock Pedestal and Modulock Uni-Ring are quick and easy to install, and provide fast, efficient drainage through the open joints of the slabs to the concealed drainage way below.

Modulock Uni-Ring/Uni-Plus - Height Supports

- Uni-Ring gives a fixed height of 16mm. Shims offer fine adjustment in increments of 3mm
- Uni-Plus provides adjustment of 25-40mm



Modulock Raised Deck Supports - Product Range Summary

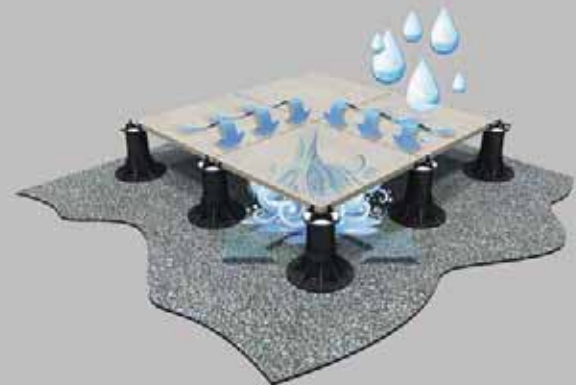
Modulock Pedestal Adjustable Height Supports



Modulock Pedestal comprises 14 basic modules, each with supporting head and base component, allowing a wide range of void heights. Modules are used either individually or in combination to give floor voids ranging from 37.5mm to 550mm.

A stable sub-base and an adequate means of surface water drainage are virtually the only prerequisites for the use of the Modulock Pedestal system. Irregular, stepped, uneven or sloping sub-bases can usually be easily surmounted by the system resulting in a new level raised floor.

See page 80.



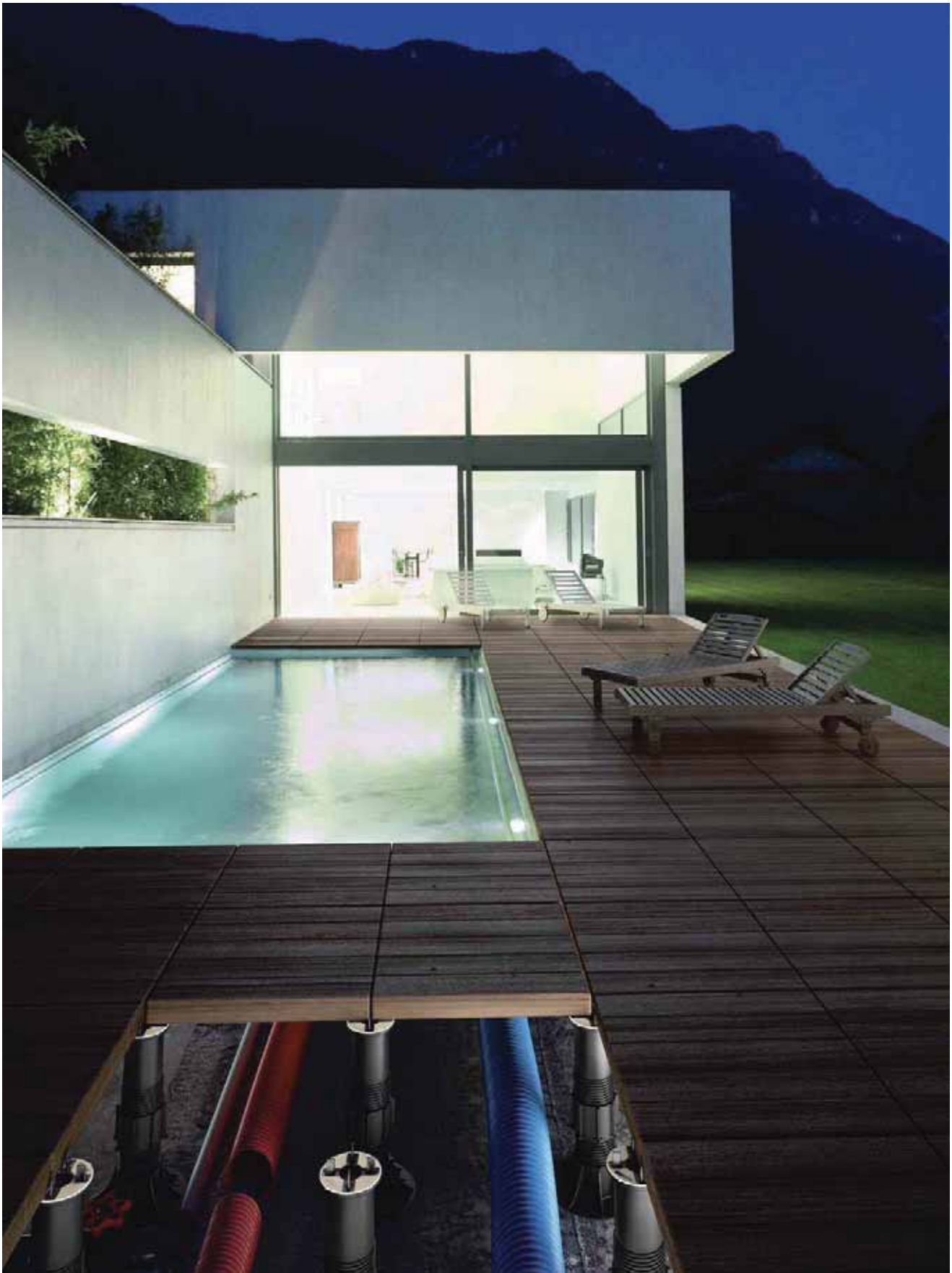
Modulock Uni-Ring Height Supports



A versatile and economic range for concealed drainage beneath paving slabs. The basic Modulock Uni-Ring system within the range is based on shallow injection moulded polyethylene rings that are positioned to support adjoining slabs at each corner whilst maintaining open joints for drainage. It includes shims for fine height adjustment.

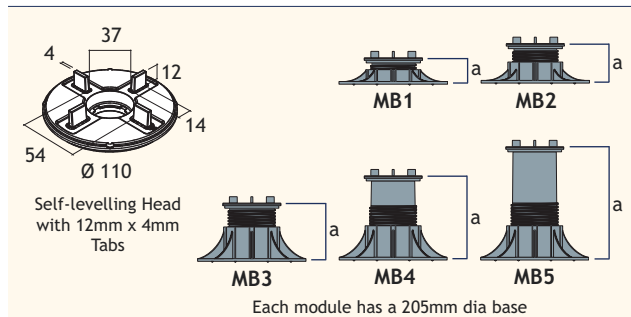
Modulock Uni-Plus is part of the Uni-Ring system and provides adjustment of between 25 - 40mm. See page 81.

Modulock Raised Deck Supports - Product Range Summary

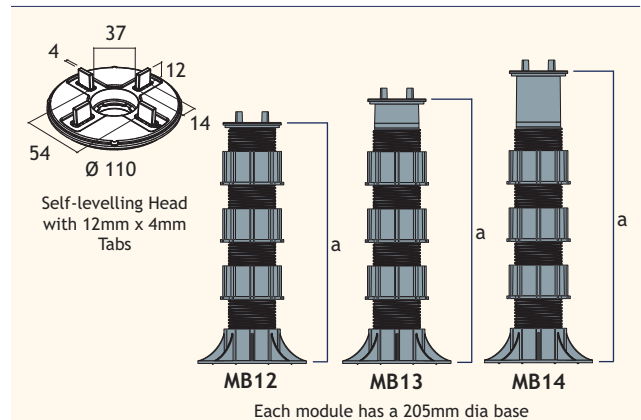


Modulock Raised Deck Supports - Pedestal

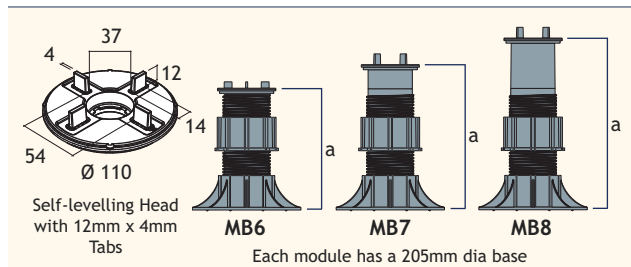
The Pedestal range of deck supports provides a comprehensive range of adjustment from 37.5mm to 550mm. The system features self-levelling heads with a variety of dividers for preset drainage gaps in supported paving as well as heads without dividers for screw fixing decking battens. An extended key allows for fine adjustment of supports after slab laying.



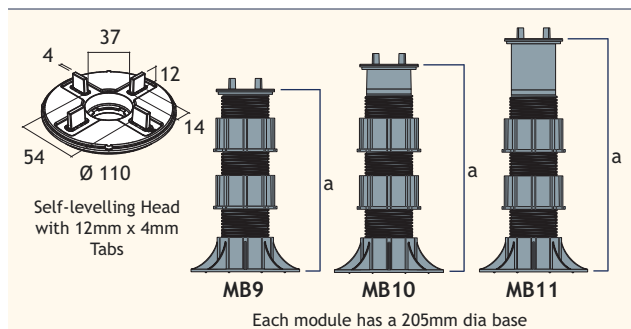
Module Combination Type	Height Adjustment a (mm)	Product Code
Module without extension coupler	37.5 - 50	MB1
Module without extension coupler	50 - 75	MB2
Module without extension coupler	75 - 120	MB3
Module without extension coupler	120 - 170	MB4
Module without extension coupler	170 - 215	MB5



Module Combination Type	Height Adjustment a (mm)	Product Code
Module with 3 extension couplers	270 - 455	MB12
Module with 3 extension couplers	315 - 500	MB13
Module with 3 extension couplers	365 - 550	MB14

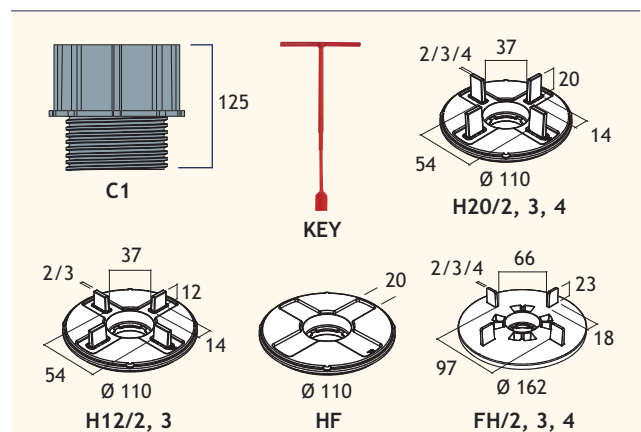


Module Combination Type	Height Adjustment a (mm)	Product Code
Module with 1 extension coupler	140 - 230	MB6
Module with 1 extension coupler	185 - 275	MB7
Module with 1 extension coupler	235 - 325	MB8



Module Combination Type	Height Adjustment a (mm)	Product Code
Module with 2 extension couplers	205 - 345	MB9
Module with 2 extension couplers	250 - 385	MB10
Module with 2 extension couplers	300 - 400	MB11

Optional Accessories



Component Options	Product Code
Extension Coupler	C1
Self-levelling Head with 20mm x 2mm Tabs	H20/2
Self-levelling Head with 20mm x 3mm Tabs	H20/3
Self-levelling Head with 20mm x 4mm Tabs	H20/4
Self-levelling Head with 12mm x 2mm Tabs	H12/2
Self-levelling Head with 12mm x 3mm Tabs	H12/3
Self-levelling Flat Head	H/F
Fixed Head with 23mm x 2mm Tabs	FH/2
Fixed Head with 23mm x 3mm Tabs	FH/3
Fixed Head with 23mm x 4mm Tabs	FH/4
Adjustment Key	KEY

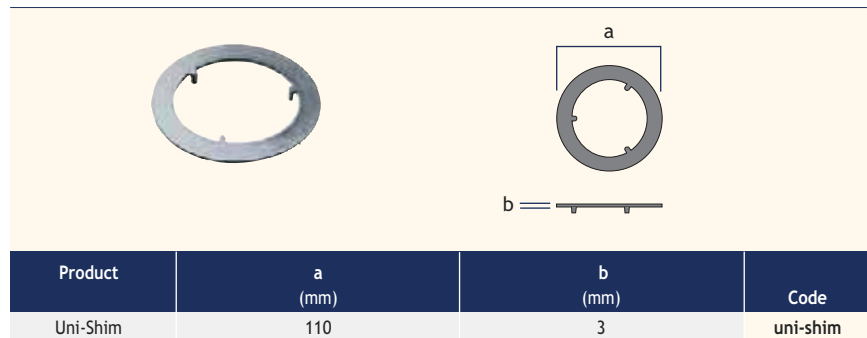
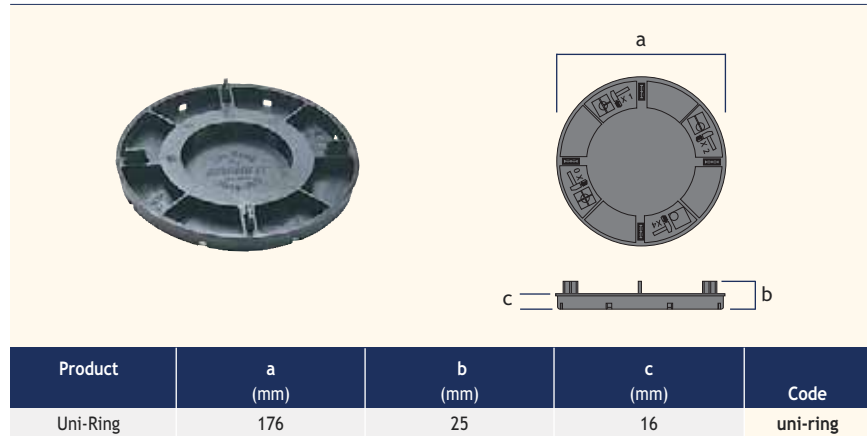
Modulock Raised Deck Supports - Uni-Ring and Uni-Plus

Uni-Ring and Uni-Plus are versatile and economic paving supports. Uni-Ring supports provide a 16mm deck void and can be stacked in combination with 3mm Uni-Shims for additional height correction. Uni-Plus is a low level height adjustable system providing 25mm to 40mm of adjustment.

Uni-Ring

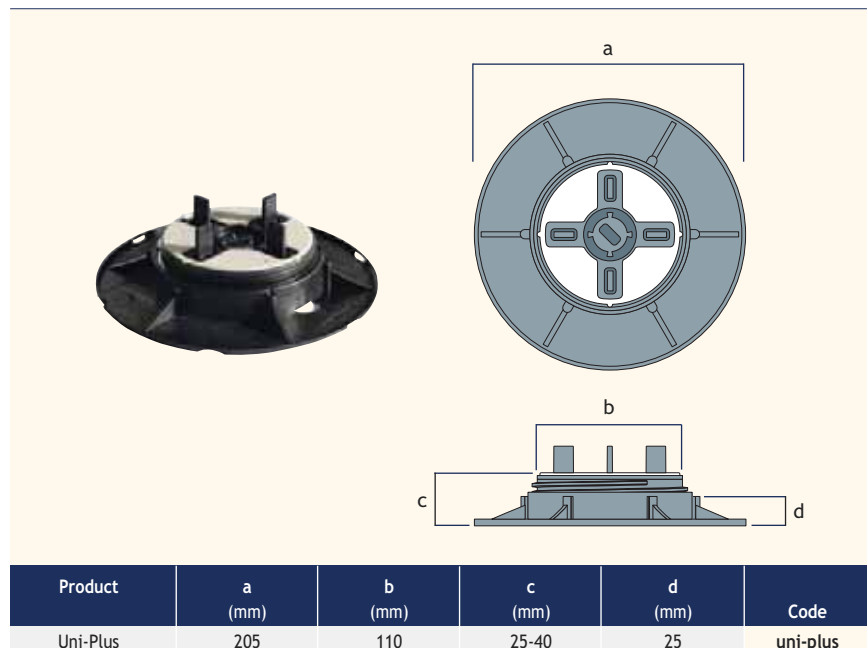
Harmer Uni-Ring is quick and easy to install, and provides fast, efficient drainage through the open joints of the slabs to the concealed drainage below. The system is ideal for any waterproofed substructure and especially for inverted roof constructions where ballasted insulation is laid onto the waterproofing layer of the flat roof. Traditional bedding and grouting materials are not required, and once installed, the paving slabs can be easily lifted for simple inspection of the drainage outlets and for substructure maintenance.

- Ring with collapsible spacers
- Height adjustment shims
- A maximum of two Uni-Shims can be used per Uni-Ring



Uni-Plus

Harmer Uni-Plus is an economical low level height adjustable system that is adjusted on a screw mechanism to provide height adjustments of 25mm to 40mm. The head features collapsible spacers for ease of installation in corners and perimeter wall situations. Uni-Plus is suitable for use where the floating deck is to be laid parallel to the roof deck i.e. does not have any slope correcting features.



Modulock Raised Deck Supports - NBS Specification

A typical NBS Specification for Harmer Modulock raised deck supports.

A full range of NBS specifications and roof drainage calculators are available via the Harmer online NBS Specification Builder at www.harmerdrainage.co.uk

For project specific specification advice, contact Harmer Technical Services.

NBSPlus

J41 Reinforced Bitumen Membrane Roof Coverings

GENERAL

110 REINFORCED BITUMEN MEMBRANE ROOF COVERINGS ALUMASC WATERPROOFING MEMBRANE SYSTEM

SYSTEM PERFORMANCE

210 GENERAL

- Secure, free draining and weathertight

PRODUCTS

467 SUPPORT SYSTEMS FOR PRECAST CONCRETE PAVING SLABS

Manufacturer: Alumasc Exterior Building Products Ltd,
White House Works, Bold Road, Sutton
St Helens, Merseyside WA9 4JG
Tel: 01744 648400, Fax: 01744 648401.
Email: info@alumasc-exteriors.co.uk

Type: Adjustable deck supports

Size: MB1: 32-50 mm high/MB2: 50-75 mm high/MB3: 75-120 mm high/MB4: 120-200 mm high/MB5: 190-270 mm

Product Code: MB1 -MB5

Reference: Harmer Deck Modulock

Accessories: Levelers



Create Harmer Modulock NBS specifications by selecting the required product range, profile, size and finish by visiting: www.harmerdrainage.co.uk

Design Support

Harmer has developed dedicated design software to assist architects, specifiers and contract engineers to quantify the exact specification and detailed layout of Modulock Pedestals on a project. Complex roof layouts with multiple falls and awkward detailing can also be calculated. Simply send through your CAD drawings to Harmer's Technical Department and we will do the rest.

Key Features

- Design software is AutoCAD-compatible allowing seamless interpretation of project design
- Multiple roof areas and complex roof layouts can be mapped using colour-coded layout to show the exact specification and height requirement of each Modulock Pedestal
- Assists specification by accurately quantifying the exact number and type of Modulock Pedestals required on a project
- Improves the interface between designers and installer through accurate specification and product selection

Contact: modulock@alumasc-exteriors.co.uk



Modulock Raised Deck Supports - Installation

Harmer Pedestal

A stable sub-base and, in the case of exposed external use, an adequate means of surface water drainage are virtually the only prerequisites for the use of the Harmer Modulock system. Irregular, stepped, uneven or sloping sub-bases can usually be easily surmounted by the system resulting in a new level raised floor.

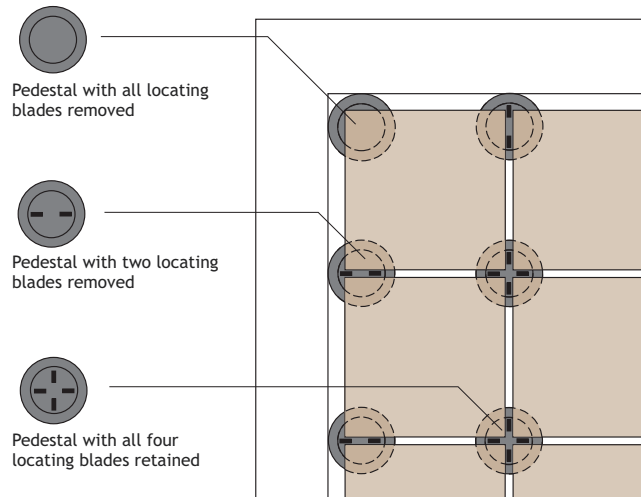
The broad sequences of installation are illustrated in relation to a typical paved pedestrian deck erected over an existing drained sub-base.

Installation Sequence

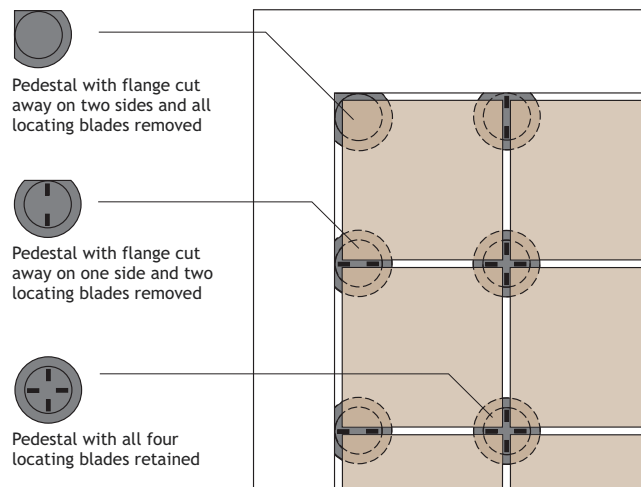
1. Check condition of sub-base, waterproofing and drainage points. Rectify any defects and clear drainage outlets as a preliminary measure.
2. Set out pattern of pedestal supports, selected to suit new deck height and paving modules.
3. Use supporting heads with linear blade configurations at edges of deck and at any intermediate surface interruptions.
4. Adjust pedestal screwjacks to the approximate height required, checking for level and alignment.
5. Finalise the layout of the pedestals. For convenience, use a lightweight template for checking positions and to avoid undue lifting of heavy paving slabs.
6. Proceed to lay the paving slabs, ensuring that each slab corner is firmly seated on the pedestal head and butted up to the locating blades.
7. Final adjustment to level can be made by using the adjustment key.

Alternative Edge Details

1. With wide open joint at perimeter.



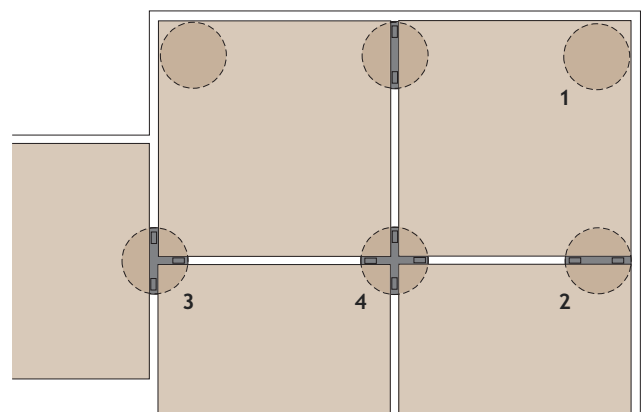
2. With narrow open joint at perimeter.



Harmer Uni-Ring

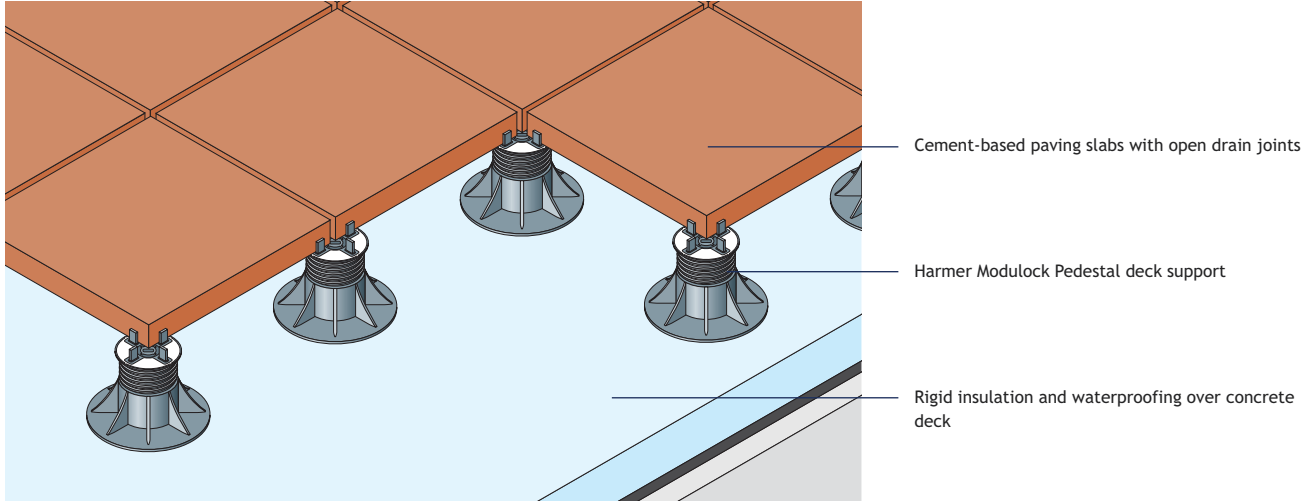
1. All four optional spacers hammered down flush with ring at perimeter of enclosing wall or parapet.
2. Two optional spacers hammered down at junction of two slabs.
3. One optional spacer hammered down at junction of three slabs.
4. All four optional spacers left upstanding at junction of four slabs.

Harmer Uni-Ring can accommodate a variety of paving slab thicknesses. The unit sizes, spanning capacity and loading of the slabs will determine the spacing and layout pattern of a paving slab support system.

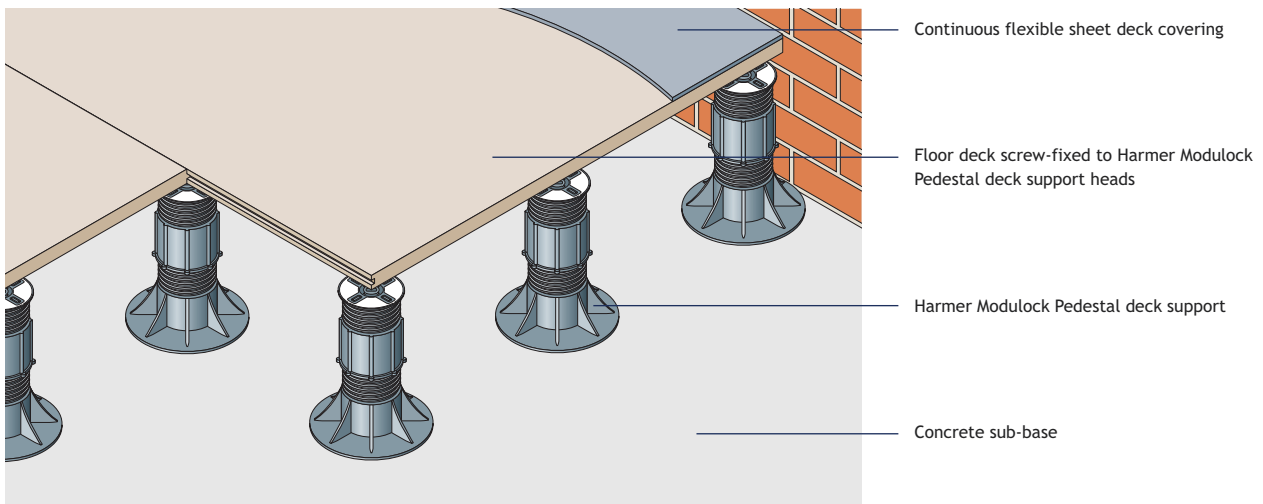


Modulock Raised Deck Supports - Application Details

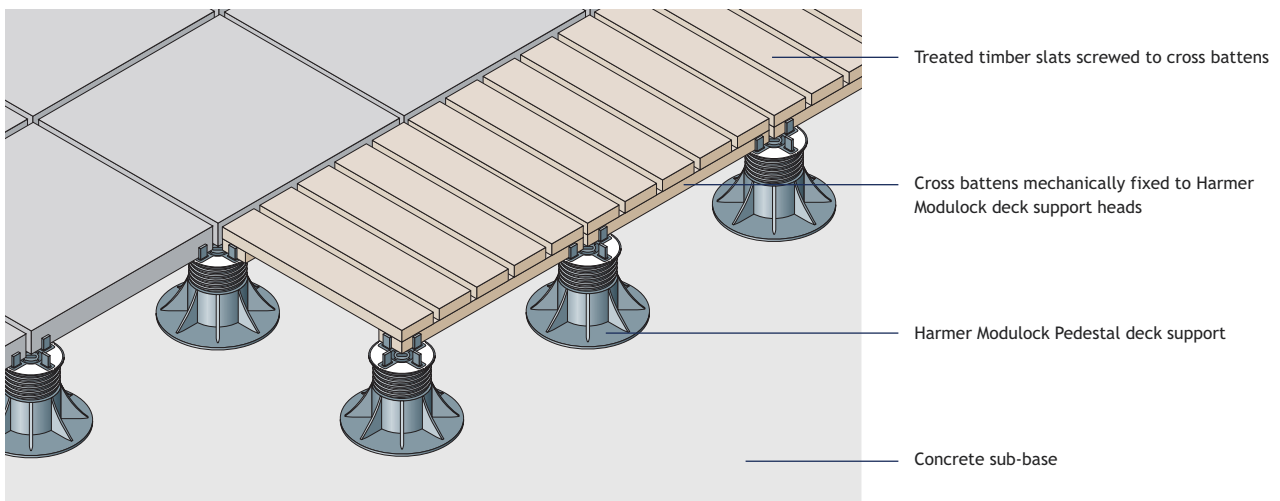
Paving Slabs with Open Joints on Harmer Modulock Pedestal



Sheet Decking on Harmer Modulock Pedestal

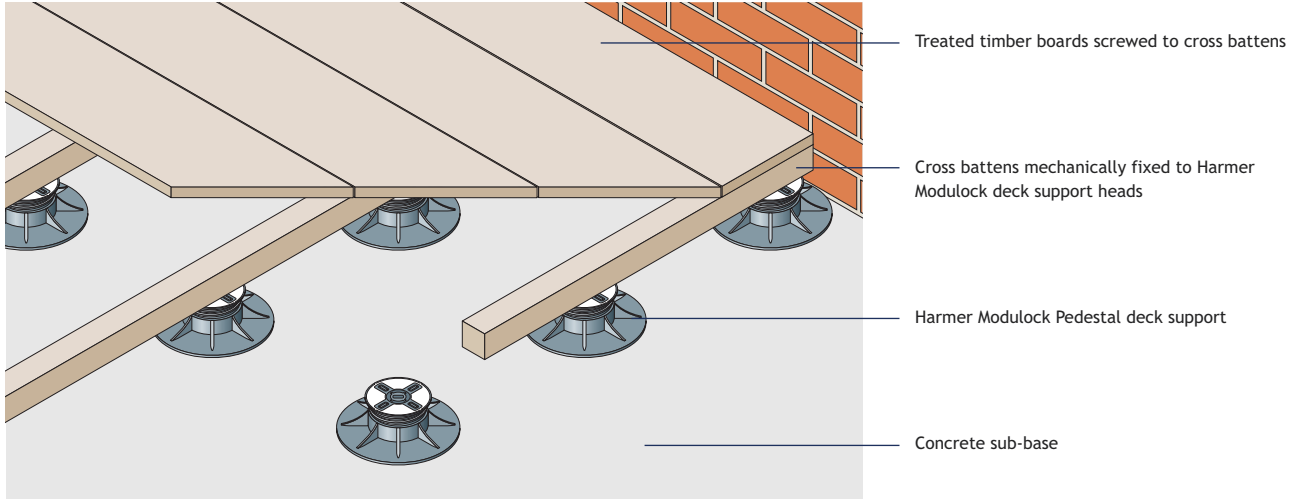


Timber Slats on Battens on Harmer Modulock Pedestal

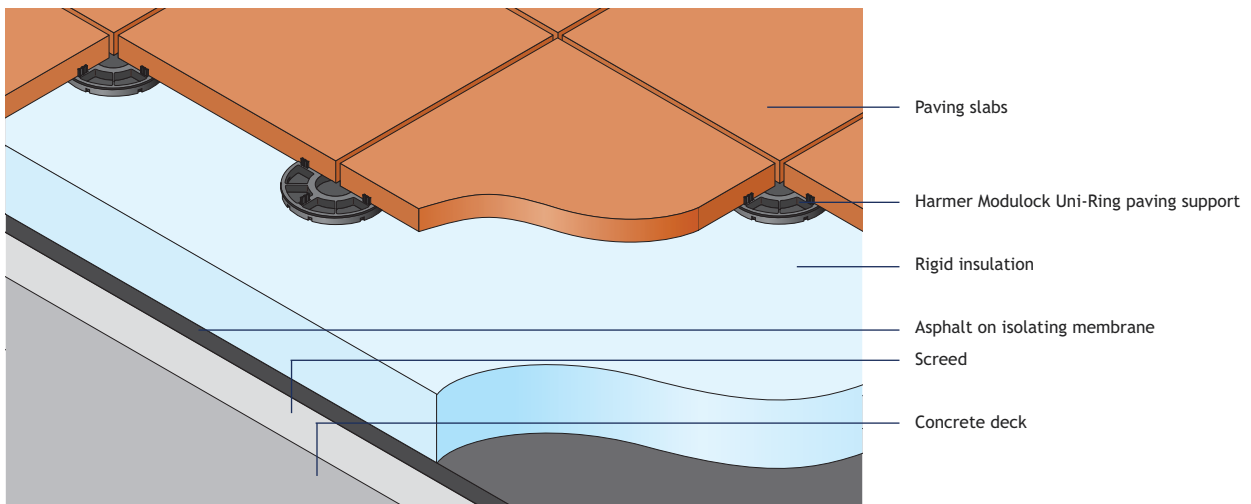


Modulock Raised Deck Supports - Application Details

Open Jointed Boards on Battens on Harmer Modulock Pedestal



Paving Slabs on Harmer Modulock Uni-Ring



Other Harmer Drainage Products

In addition to Harmer Roof Outlets, Roof Channel Drains and Raised Deck Supports, Alumasc offers the complementary drainage systems, shown below.

For detailed information on these systems, please contact Alumasc Technical Services or visit the Alumasc Drainage website.

Harmer SML Soil and Waste System



Harmer SML is a lightweight, dry-jointed cast iron soil and waste system that is Agrément certified and fully compliant with BS EN 877. This high performance pipework system combines an excellent fire classification with the latest acoustic performance requirements for building materials. Harmer SML has a proven track record of use over the lifetime of the building and is manufactured using 95% recycled material.

The Harmer SML system consists of coated, socketless cast iron pipes and fittings simply joined with either ductile iron or stainless steel rubber-lined couplings, allowing ease of installation. The range also includes bracketry for restraining the pipework vertically and supporting it horizontally, along with a choice of special connectors for linking with other materials.

Key Features

- Agrément certified
- Meets European Standard BS EN 877
- Excellent noise attenuation
- Non-combustible
- High tensile strength
- Choice of ductile or stainless steel couplings
- Secure socketless fixing between pipe and fitting
- Quick to assemble, low maintenance, and 100% recyclable



Harmer SML Pipes



Harmer SML Couplings

Harmer Floor and Shower Drains



Drain Bodies in polyester powder coated aluminium, together with elegant grates, combine to create a range of floor and shower drains to suit virtually any interior drainage application and all types of flooring.

Harmer Floor and Shower Drains show marked advances in design sophistication and performance. With minimum complexity, they are versatile and efficient. Straightforward installation methods mean Harmer Floor and Shower Drains are synonymous with speed and cost effectiveness in any application.

Finely engineered manufacture and enhanced features bring many benefits, including corrosion resistance and durability, with smooth and attractive finishes that are tough and hygienic. Harmer Floor and Shower Drains are available either trapped or untrapped. The range of grates includes stainless steel and nickel bronze, available in a choice of attractive finishes.



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.



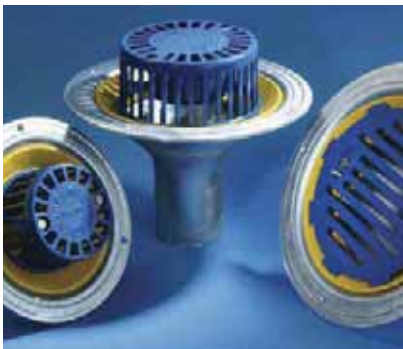
Alumasc is the UK's leading manufacturer of aluminium rainwater systems and offers a complete range of gutters, downpipes and fascia/soffits for both contemporary and traditional architecture.

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

ALUMASC

RAINWATER SYSTEMS

- 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.

HARMER

DRAINAGE SYSTEMS

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

ALUMASC

ROOFING SYSTEMS

- 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.

ALUMASC

INSULATED RENDERS

- External Wall Insulation
 - Render Only Systems
 - Brick Slips & Specialist Systems
 - Decorative Coatings
- www.alumascfacades.co.uk

HARMER

DRAINAGE SYSTEMS

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