

HARMER[®]

BUILDING DRAINAGE

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July 2017

Harmer Roof Drainage

Roof Outlets, Roof Channel Drains and Raised Deck Supports

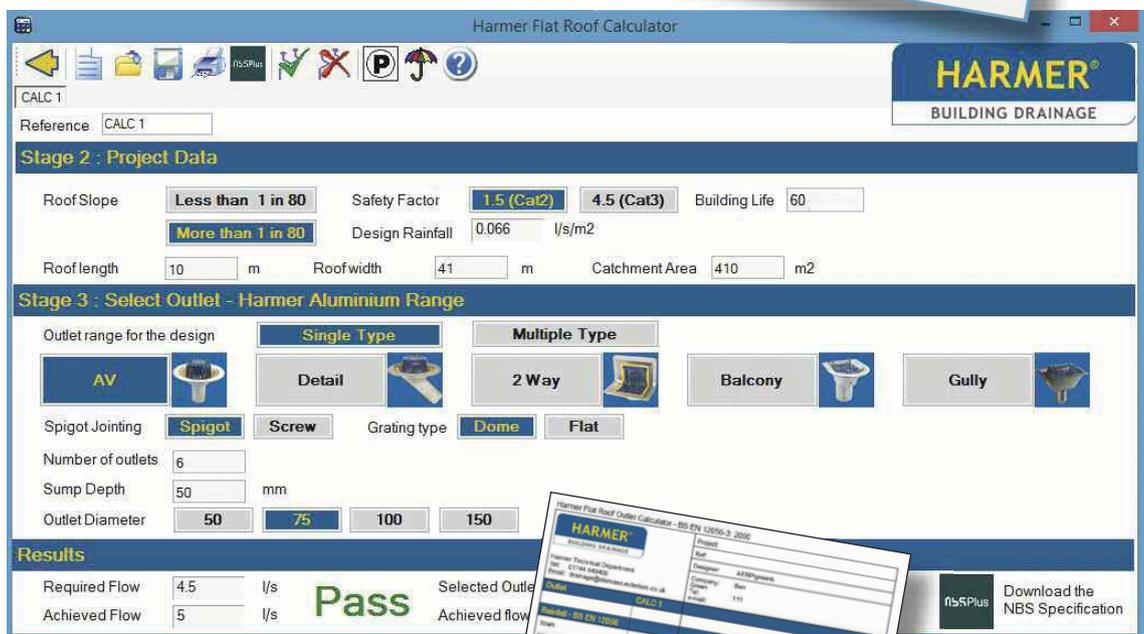
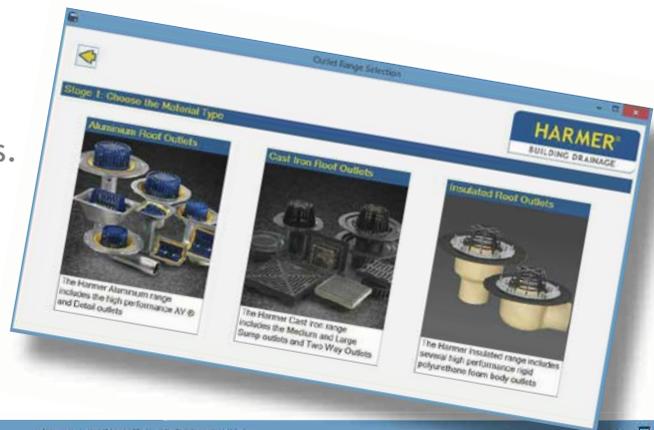
Technical Brochure



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.

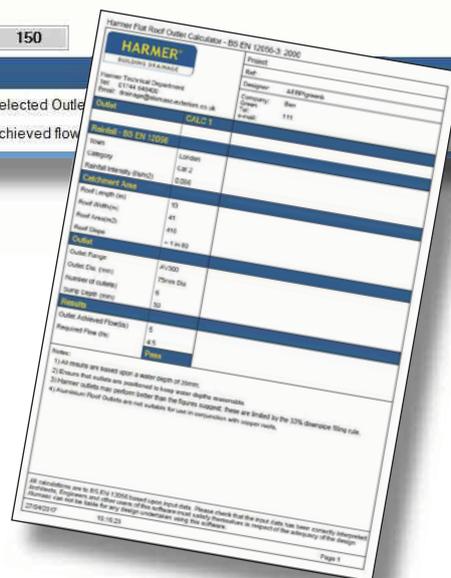


Drainage Design Calculator

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.

Contents

Introduction

■ Alumasc and Harmer	4
■ Quality and Sustainability	5
■ Harmer Roof Drainage Systems - Overview	6
■ Harmer Roof Drainage Systems - Range Summary	8
■ Harmer Roof Drainage Systems - Project Gallery	10

Aluminium Roof Outlets

■ Introduction	12
■ Benefits	13
■ Product Range Summary	14
■ Introduction to AV Outlets	15
■ AV Vertical Outlets	16
■ AV Retro-Gully Outlets	18
■ Introduction to Detail Outlets	19
■ 45° Detail Outlets	20
■ 90° Detail Outlets	22
■ Car Park Detail Outlets	24
■ Balcony Detail Outlets	25
■ Gully Detail Outlets	28
■ Two-Way Detail Outlets	29
■ Parapet Downspouts	31
■ Accessories and Connections	32
■ NBS Specification	35
■ Installation	36
■ Application Details	37

Aluminium Roof Outlets - Bespoke Solutions

■ Introduction	42
■ Application Detail 1	44
■ Application Detail 2	45

Cast Iron Roof Outlets

■ Introduction	46
■ Benefits	47
■ Product Range Summary	48
■ Medium Sump	50
■ Large Sump	52
■ Two-Way	54
■ Balcony	55
■ Parapet Downspouts	56
■ Accessories and Connections	57
■ NBS Specification	60
■ Installation	61
■ Application Details	62

Insulated Roof Outlets

■ Introduction	64
■ Benefits	65
■ Product Range Summary	66
■ Product Tables	67
■ Accessories	70
■ NBS Specification	71
■ Application Details	72

Modulock Roof Channel Drains

■ Introduction	74
■ Benefits	75
■ Product Range Summary	76
■ Product Tables	78
■ NBS Specification	86
■ Installation	87
■ Application Details	89

Modulock Raised Deck Supports

■ Introduction	90
■ Benefits	91
■ Product Range Summary	92
■ Modulock Pedestal	94
■ Modulock Uni-Ring and Uni-Plus	96
■ NBS Specification	98
■ Installation	99
■ Application Details	100

Other Harmer Drainage Products

Alumasc Water Management Solutions



Alumasc and Harmer - An Introduction

Alumasc Water Management Solutions (AWMS) is a part of the Alumasc Group plc. The Group has over 500 employees, generating a turnover of around £92 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, technical support, long-term sustainable solutions and lasting relationships.



About Alumasc

Alumasc is a UK-based supplier of premium building products. The majority of the group's business is in the area of sustainable building products which enable customers to manage energy and water use in the built environment.

All Alumasc businesses have strong UK market positions within their own individual market niches and several are market leaders. Alumasc sustains this strong strategic positioning by offering customers quality products, service and trust. For certain brands, Alumasc is seeking to leverage UK successes in international markets, with particular focus in America, the Middle and Far East, and Europe.

Alumasc fosters an entrepreneurial, achievement orientated culture whereby businesses are encouraged to innovate and respond quickly to local market needs within a cohesive group strategic and management framework. Alumasc businesses also benefit from the group's financial strength.



Alumasc Water Management Solutions (AWMS) is the new name in the industry for proven water management. It's a new joined-up brand that harnesses the expertise of five trusted brands in water management:



Alumasc has been promoting the efficient use, retention, recycling and disposal of water within the built environment for over 80 years. Now, it combines the knowledge and unique benefits of these four brands to provide one simple solution in water management.

BIM Overview

Alumasc have now created BIM (Building Information Modelling) files for the core Harmer Building Drainage Range.

All AWMS BIM files to date have been created using Autodesk Revit 2014, allowing users the freedom to work in Revit 2014 or more recent versions of the software. BIM files created are Revit 'Family' files.

All of the AWMS Harmer BIM files are modelled to achieve an accurate external space envelope and connection detail, but with file sizes that increase with model detail, they have been stripped of non-essential details such as logos, small radii, internal strengthening ribs, fasteners & fixings.



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 three 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 BIM calculation technology.

Approved Stockists

AWMS products are sold through a global network of approved suppliers.



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

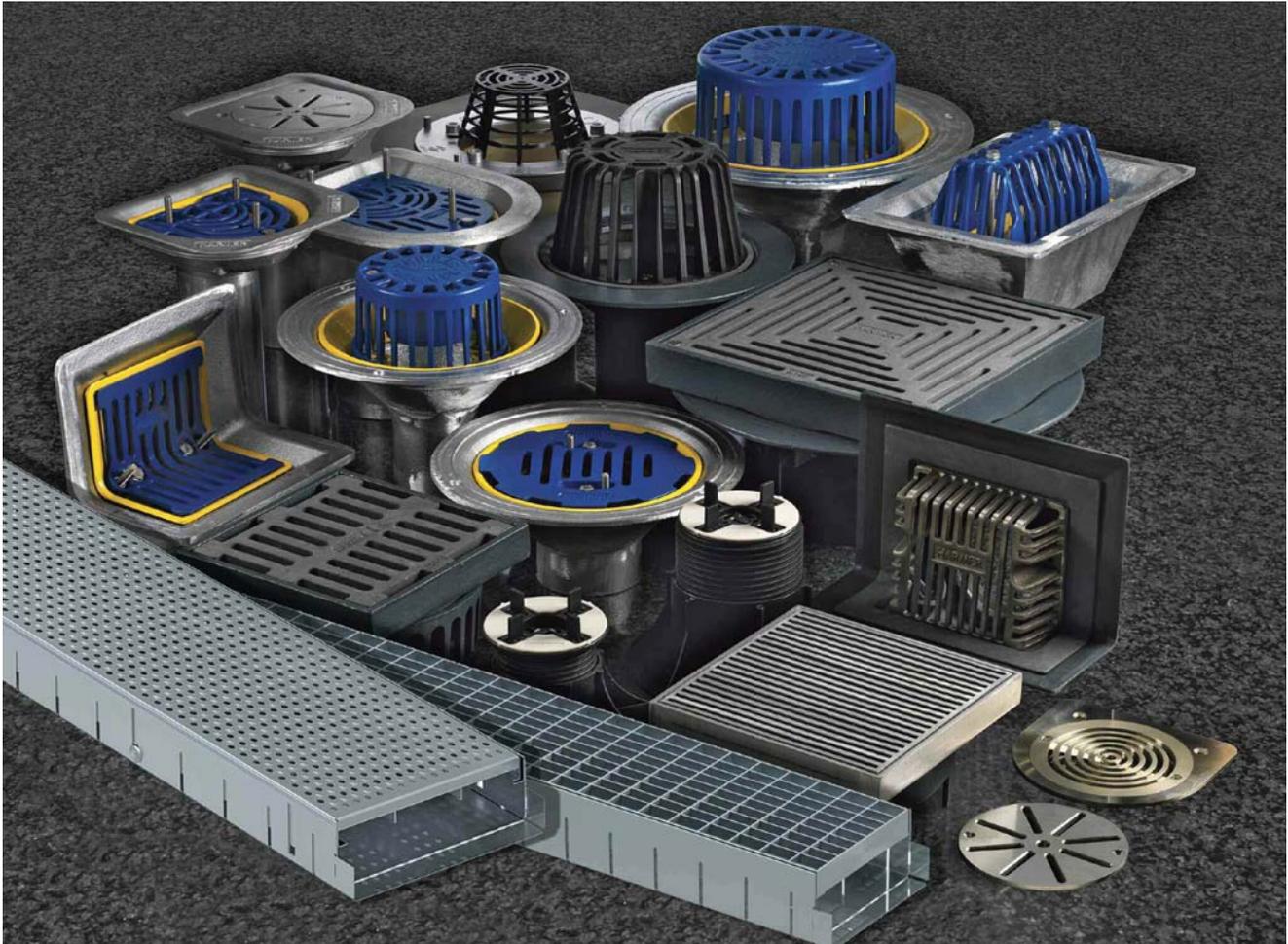
The Green Guide to Specification provides easy-to-use guidance on making the best environmental choices when selecting construction materials and components. Materials and components are assessed in terms of their environmental impacts, within comparable specifications, across their entire life cycles. This accessible and reliable information has been put together to assist those involved in the design, construction and management of buildings to reduce the environmental impacts of their properties.

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 and channels 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 Harmer Roof drainage range consists of aluminium, cast iron and insulated polyurethane outlets, and stainless steel and galvanised steel channels. This range of materials and innovative designs provides a comprehensive choice of rainwater outlets and channels 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 for exceptional performance 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 has 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 Aluminium - Bespoke Solutions

Non-standard pipe and rainwater outlet configurations can be manufactured on a bespoke basis to suit the most complicated of design requirements.

See pages 42 to 45



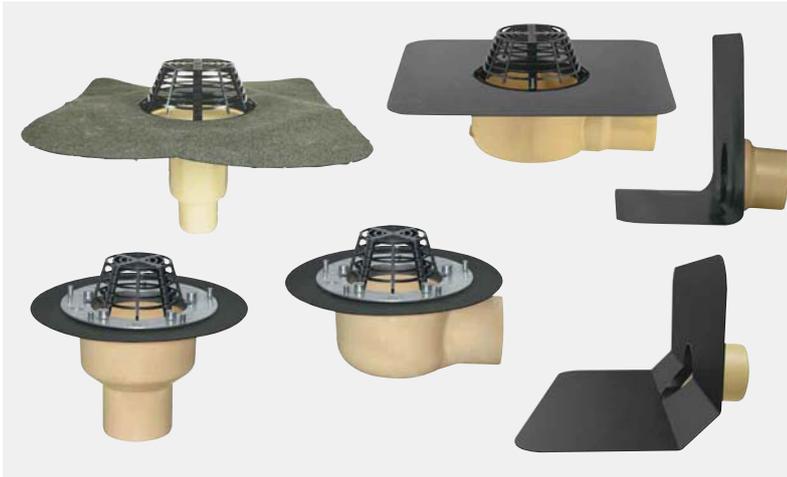
Harmer Roof Cast Iron

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 46 to 63

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 thermal bridging.

See pages 64 to 73



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. Two Harmer Roof Slot Channel ranges are also available. The systems are made in either Stainless Steel or Galvanised Steel.

See pages 74 to 89



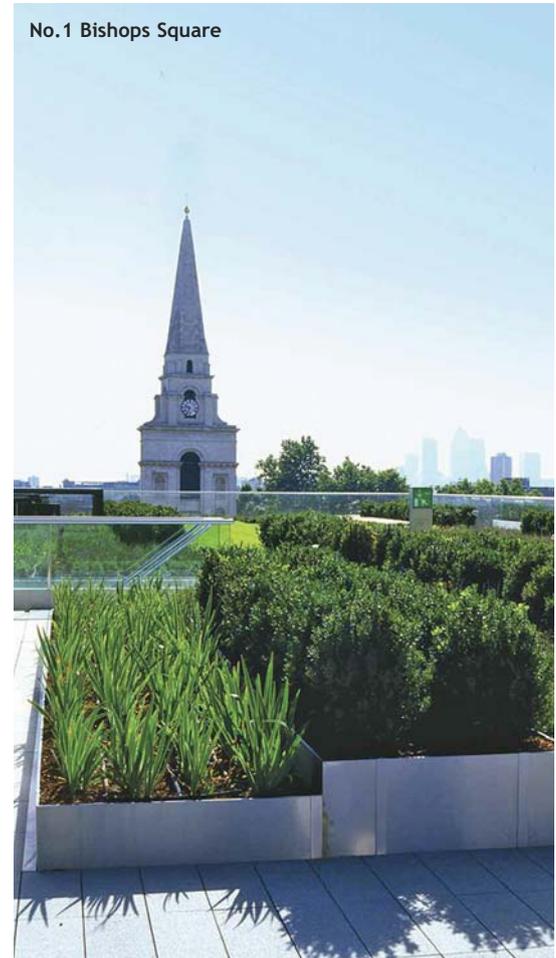
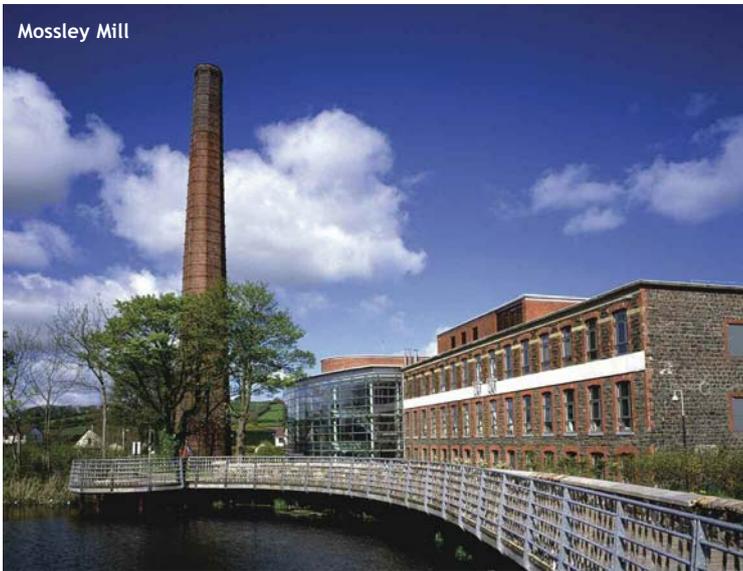
Harmer Roof Modulock Raised Deck Supports

A fully engineered range of pedestal supports for paving slabs and timber decking in a variety of heights from the substrate that allows percolation of rainwater. They are designed to suit a wide variety of applications, including terraces, walkways, balconies and landscaped roof construction. The Pedestal range includes self-levelling heads and a special timber decking head. Uni-Ring and Uni-Plus are economical paving supports, used where self-levelling adjustment is not required.

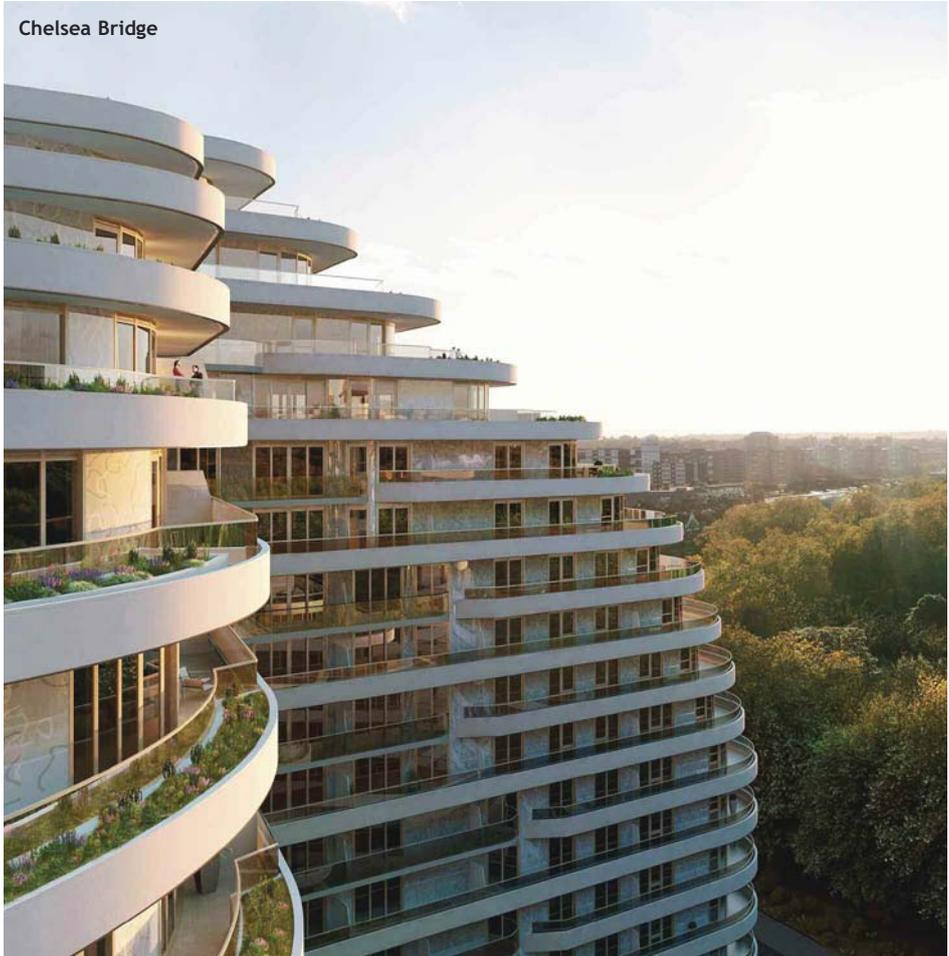
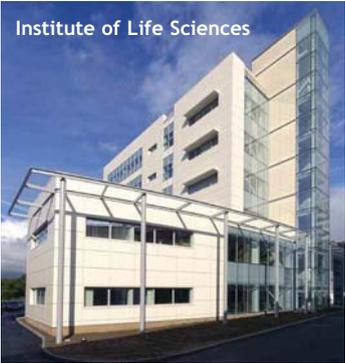
See pages 90 to 101

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.



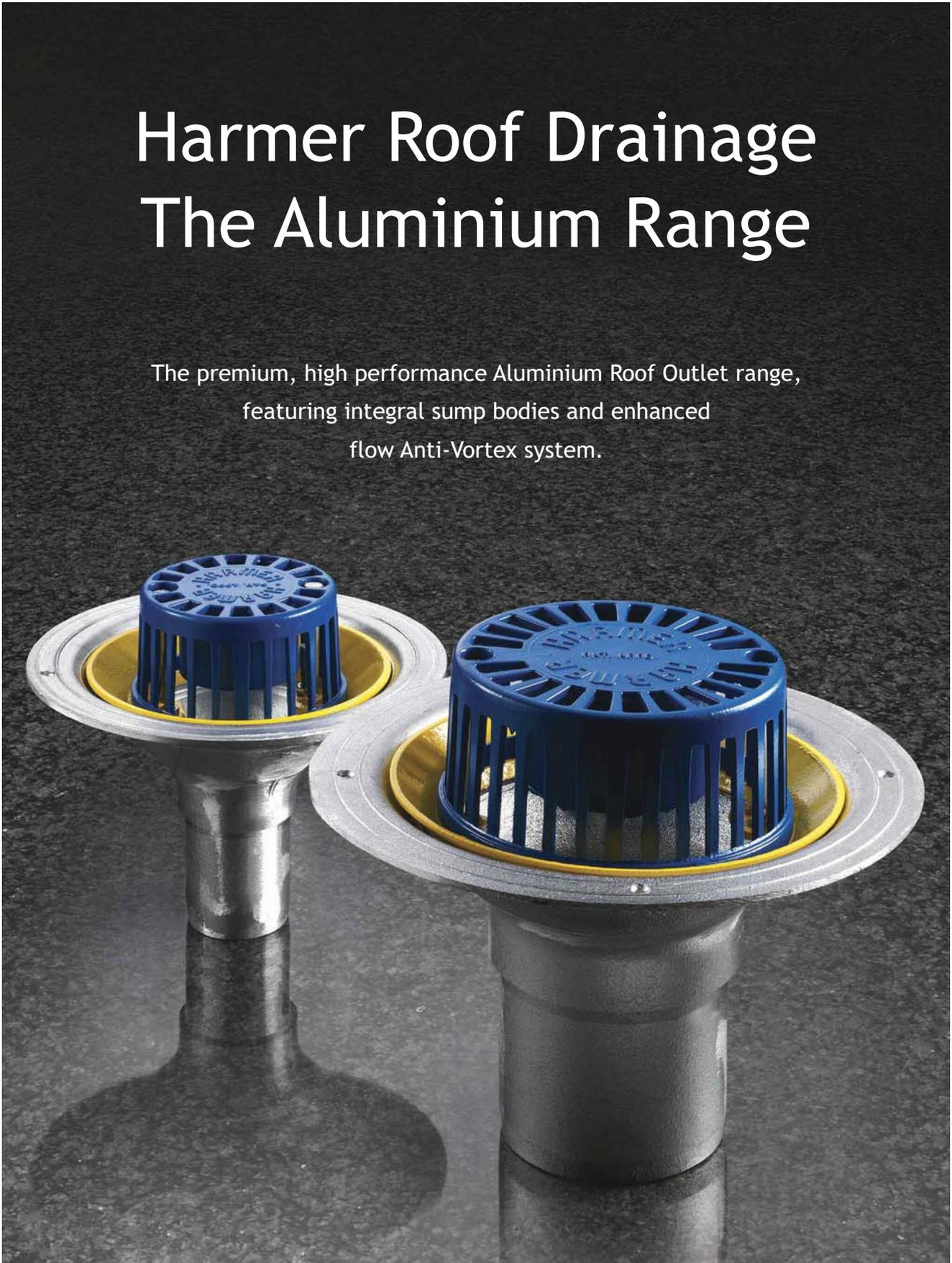
Harmer Roof Drainage Systems - Project Gallery



Project Listing ■ Institute of Life Sciences, Swansea ■ Gloucester Quays, Gloucester ■ Chelsea Bridge, London

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 and BS EN 1706, 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

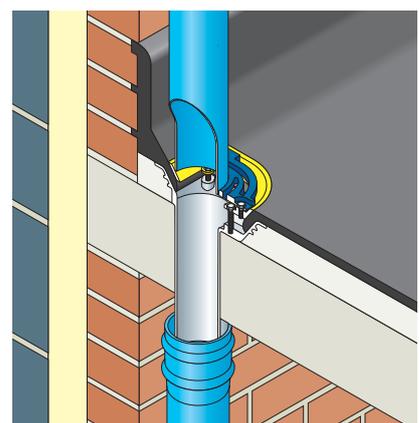
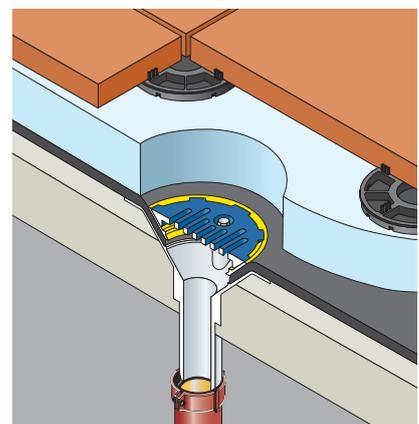
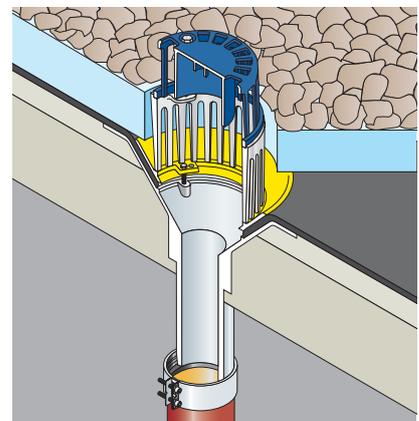
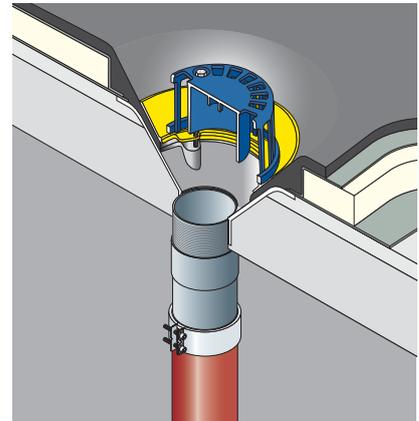
- The aluminium alloy is light in weight and therefore easy to handle on site and during installation. This lightness also makes aluminium outlets suitable for a wide range of lightweight roof decks.
- A wide range of standard accessories such as extension pieces, pipe adaptors and grates is available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

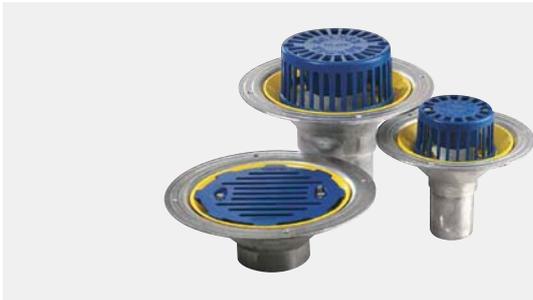
- Aluminium is 100% recyclable making it a cost effective, sustainable material.
- End of life Harmer Roof aluminium outlets can be recast into new aluminium products.
- Life expectancy of aluminium:
40 years for rural/suburban areas, up to 25 years for industrial/marine areas.



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. Additionally, non-standard pipe and rainwater outlet configurations can be made on a bespoke basis to suit complicated designs.

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.

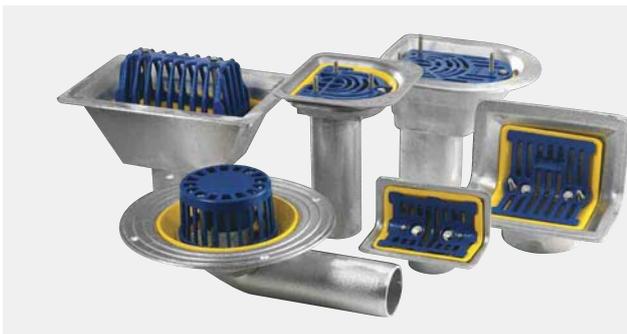


AV Retro-Gully Outlets

Harmer Roof AV Retro-Gully outlets incorporate anti-vortex performance and are designed for flat roof upgrading without necessitating removal of the old rainwater outlet. The Retro-Gully 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 gully 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

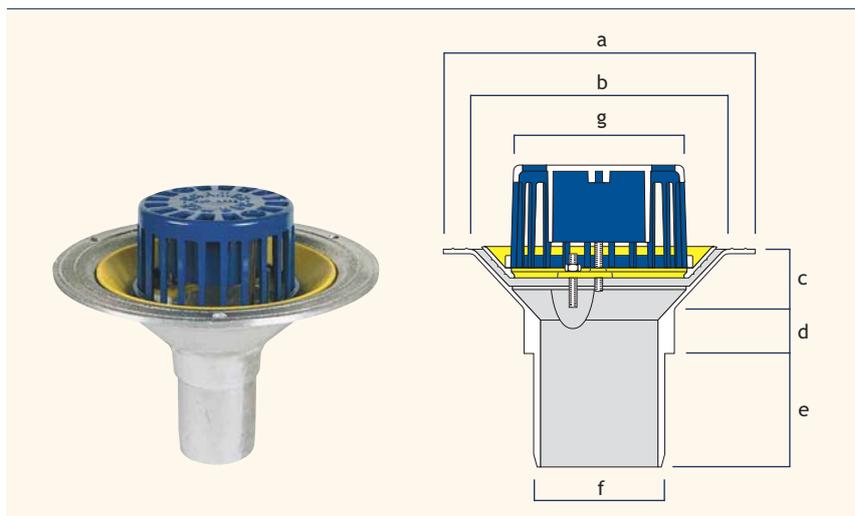
- Drains more roof area than conventional gravity outlet.
- Harmer AV can be used with any connecting pipework material, and all popular pipework sizes.
- Easy installation into roofs and gutters using bituminous, single ply and wet-applied waterproofing systems.
- High flow performance with increasing 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 Harmer couplings available (page 32).



Flow Rate Note 1 (applies to all tables)

Flow rates are in litres per second based on flow rate test data. Where tested flow rates are greater than pipe capacity limits of BS EN 12056, the pipe capacity limit has been shown. 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)	g (mm)	Flow Rate ¹ (l/s)	Weight (kg)	Product Code
50	292	239	74	47.5	50	73	137	1.69	2.5	AV200
75	292	239	74	47.5	75	83	137	4.97	2.7	AV300
100	380	305	94.5	39	114	110	210	10.71	4.9	AV400
150	380	305	65.5	53	129	160	210	14.07	5.0	AV600

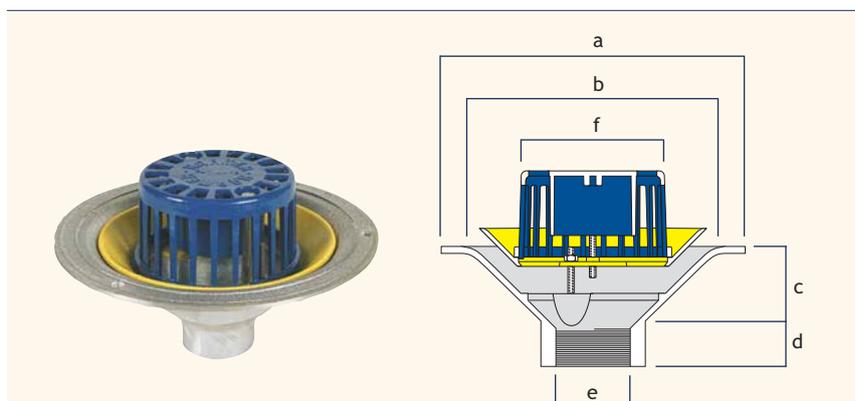
For flat grate versions add suffix /F to the product code (See page 17)

A range of accessories is available for use with special detail requirements (See pages 17, 32 and 34)

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 (page 34) with appropriate Harmer coupling (page 32).



Outlet Size (mm)	a (mm)	b (mm)	c (mm)	d (mm)	e (BSP)	f (mm)	Flow Rate ¹ (l/s)	Weight (kg)	Product Code
50	292	239	74	47.5	2"	137	1.69	2.3	AV200T
75	292	239	74	47.5	3"	137	4.97	2.3	AV300T
100	380	305	94.5	39	4"	210	10.71	4.5	AV400T
150	380	305	65.5	53	6"	210	14.07	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 34)

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)	a	Flow Rate (l/s) ¹	Load Rating (tonne)	Weight (kg)	Suffix
50	200	1.69	1.5	0.8	/F
75	200	4.97	1.5	0.8	/F
100	270	10.71	1.5	1.2	/F
150	270	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.

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

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

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 heights 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

Aluminium Roof Outlets - AV Retro-Gully Outlets

Harmer Roof AV Retro-Gully 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-Gully tail pipe. The outlet body's wide fixing flange incorporates concentric grooves which enhance the bond with roofing felts or asphalt.

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

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

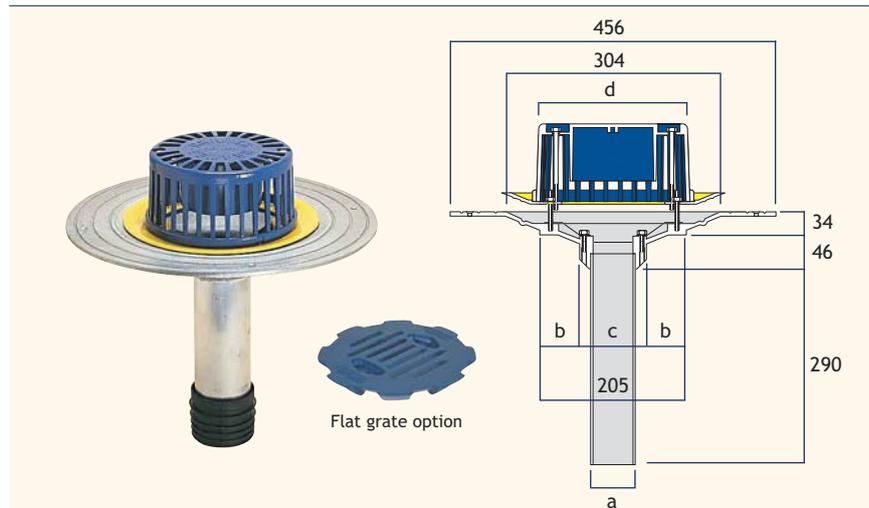
Connection to Pipework

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

The AV Retro-Gully 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 based on flow rate test data. Where tested flow rates are greater than pipe capacity limits of BS EN 12056, the pipe capacity limit has been shown. Contact Harmer Technical Services for variable outlet performance to specific depth of water and rainfall intensity.



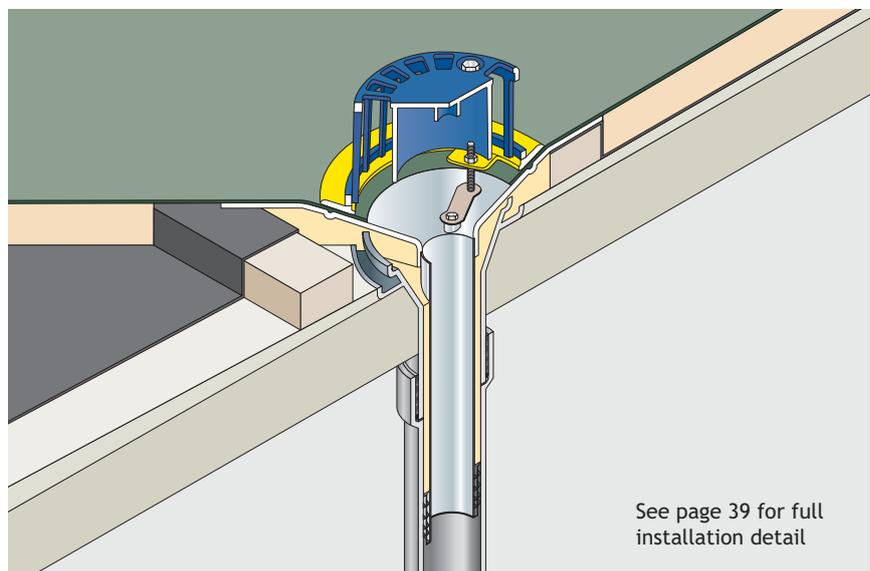
Outlet Size (mm)	a (mm)	b (mm)	c (mm)	d (mm)	Flow Rates ¹ (l/s)	Weights (mm)	Product Code
75	63.5	55	95	137	4.63	5.4	RAV75
100	88.9	42	120	210	5.53	4.9	RAV100

For flat grate version 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 34)

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

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



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.

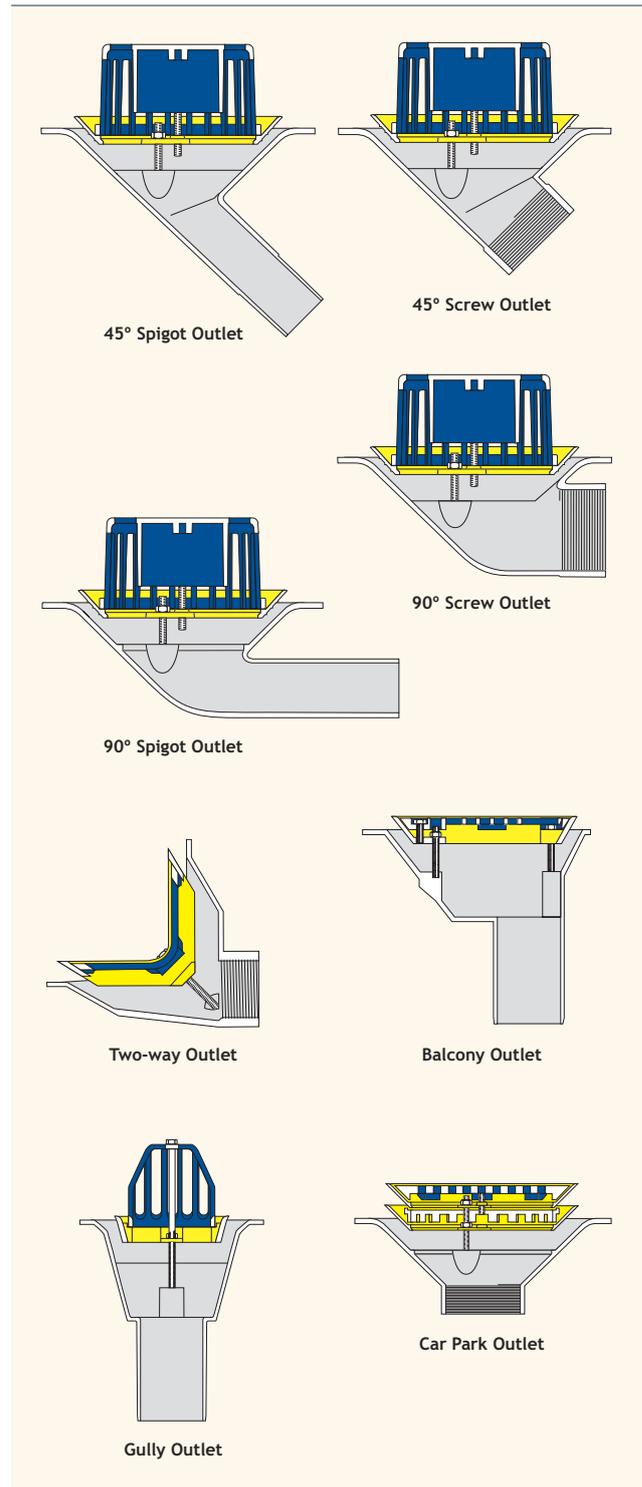
Areas of Application

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.

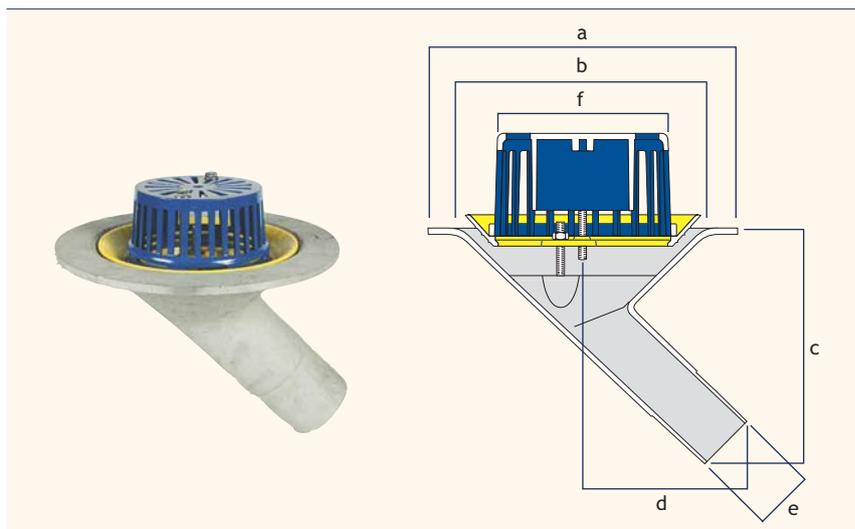


Aluminium Roof Outlets - 45° Detail Outlets

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 Harmer couplings available (page 32).



Flow Rate Note 1 (applies to all tables)
Flow rates are in litres per second based on flow rate test data. Where tested flow rates are greater than pipe capacity limits of BS EN 12056, the pipe capacity limit has been shown. Contact Harmer Technical Services for variable outlet performance to specific depth of water and rainfall intensity.

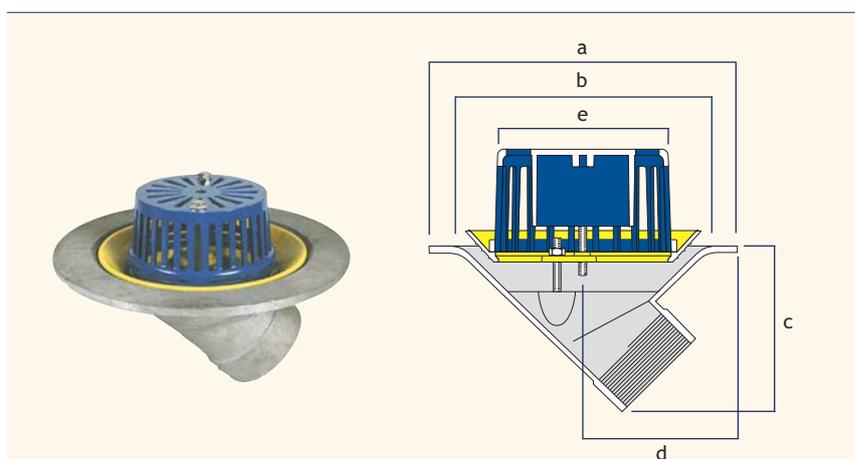
Outlet Size (mm)	a (mm)	b (mm)	c (mm)	d (mm)	e (mm)	f (mm)	Flow Rate ¹ (l/s)	Weight (kg)	Product Code
50	305	229	229	175	62	137	1.69	3.6	245
75	305	229	235	175	87	137	4.97	4.2	345
100	372	305	273	191	114	210	10.66	6.0	445

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 34)

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 (page 34) with appropriate Harmer coupling (page 32).



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	159	109	137	1.69	3.8	245T
75	305	229	159	109	137	4.97	3.5	345T
100	372	305	186	113	210	10.71	6.0	445T

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

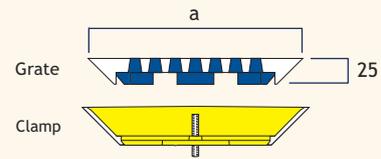
A range of accessories is available for use with special detail requirements (See pages 21, 32 and 34)

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 Vertical Spigot outlet with Flat Grate: AV400/F.



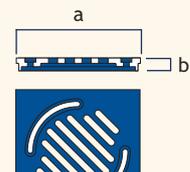
Outlet Size (kg)	a	Flow Rate (l/s) ¹	Load Rating (tonne)	Weight (kg)	Suffix
50	200	1.69	1.5	0.8	/F
75	200	4.97	1.5	0.8	/F
100	270	10.71	1.5	1.2	/F
150	270	15.55	1.5	1.2	/F

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.



Terrace Grate 2/3TG
(For use with Extension Piece 2/3EP)



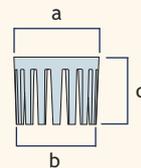
Terrace Grate 4/6TG
(For use with Extension Piece 4/6EP)

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

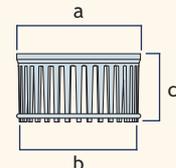
Grate Extension Pieces

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 Piece 2/3EP

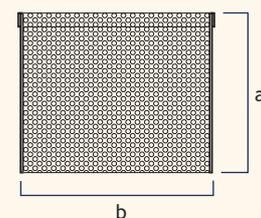


Grate Extension Piece 4/6EP

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

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 heights are available to order.



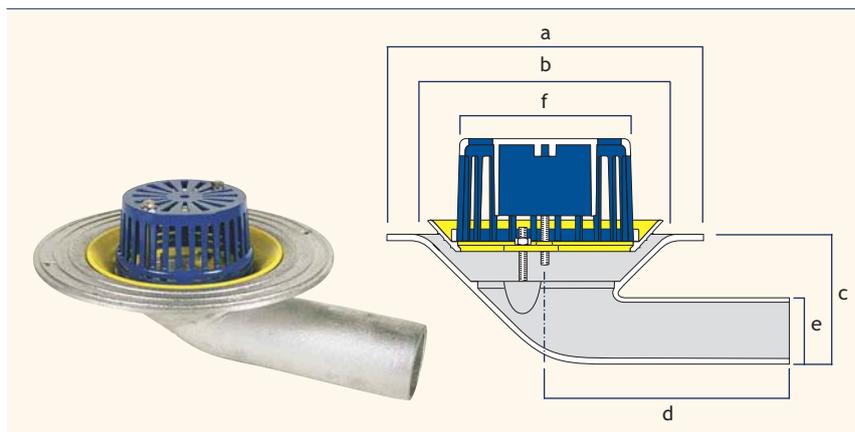
Outlet Size (nominal)	a (mm)	b (mm)	Weight (kg)	Product Code
Medium Sump	150	200	0.5	C4/GG/15
Medium Sump	200	200	0.6	C4/GG/20
Large Sump	150	305	0.8	C6/GG/15
Large Sump	200	305	0.9	C6/GG/20

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 Harmer couplings available (page 32).



Outlet Size (mm)	a (mm)	b (mm)	c (mm)	d (mm)	e (mm)	f (mm)	Flow Rate ¹ (l/s)	Weight (kg)	Product Code
50	305	229	124	232	62	137	1.69	4.0	290
75	329	229	121	267	83	137	3.31	3.8	390
100	405	305	142	285	110	210	7.19	5.5	490

Flow Rate Note 1 (applies to all tables)

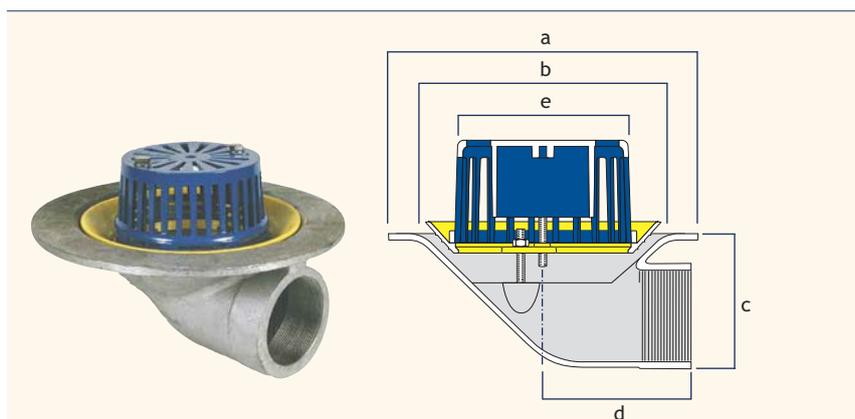
Flow rates are in litres per second based on flow rate test data. Where tested flow rates are greater than pipe capacity limits of BS EN 12056, the pipe capacity limit has been shown. Contact Harmer Technical Services for variable outlet performance to specific depth of water and rainfall intensity.

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 34)

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 (page 34) with appropriate Harmer coupling (page 32).



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	127	140	137	1.69	3.9	290T
75	305	229	127	140	137	3.39	3.7	390T
100	356	305	172	152	210	7.29	5.5	490T
150	356	305	225	152	210	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 34)

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 Vertical Spigot outlet with Flat Grate: AV400/F.

Outlet Size (kg)	a	Flow Rate (l/s) ¹	Load Rating (tonne)	Weight (kg)	Suffix
50	200	1.69	1.5	0.8	/F
75	200	4.97	1.5	0.8	/F
100	270	10.71	1.5	1.2	/F
150	270	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.

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

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 heights 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

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)	e (mm)	Flow Rate ¹ (l/s)	Weight (kg)	Product Code
100	380	305	95	38	288	10.71	5.0	400CP
150	380	305	76	38	288	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)	d (mm)	Flow Rate ¹ (l/s)	Weight (kg)	Product Code
100	305	95	38	288	10.71	4.9	400T/DD
150	305	76	38	288	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 (page 34) with appropriate Harmer coupling (page 32).

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 additional living space both in new build and refurbishment projects. AWMS can manufacture bespoke products especially for modern balconies on high-rise commercial developments.

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 Detail range can be combined with Alumasc rainwater products including Flushjoint and Heritage pipework 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.



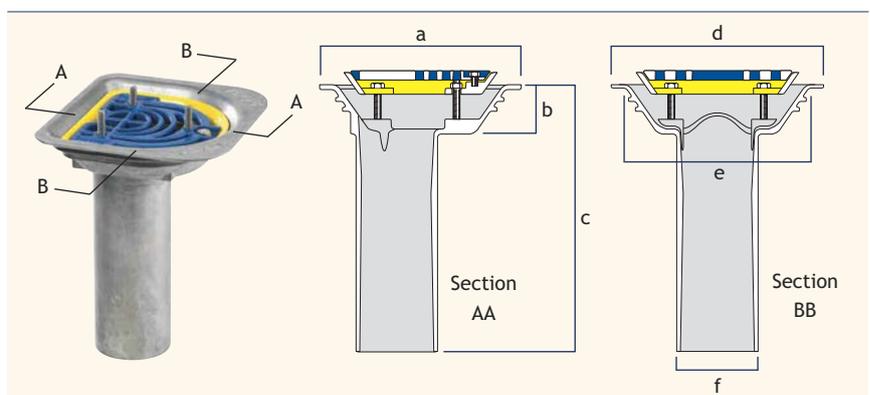
Mini Balcony Outlet

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 table)

Flow rates are in litres per second based on flow rate test data. Where tested flow rates are greater than pipe capacity limits of BS EN 12056, the pipe capacity limit has been shown. 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	2BO/M
75	197.5	50	270	215	185	83	4.8	0.3	1.7	3BO/M

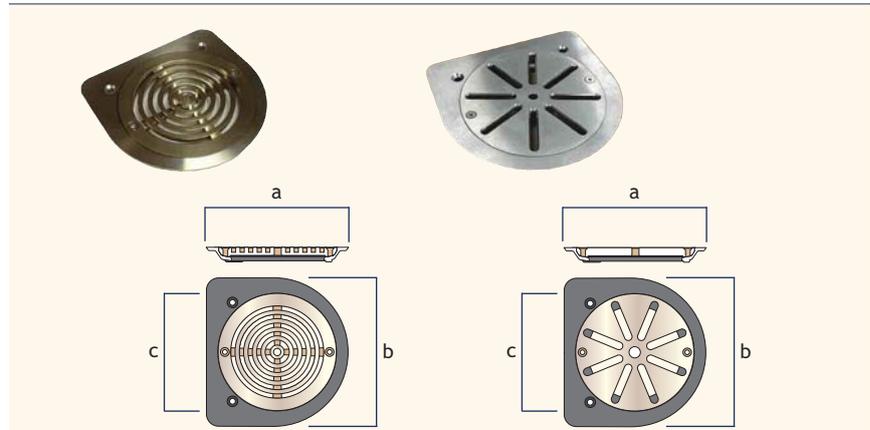
Aluminium Roof Outlets - Balcony Detail Outlets

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

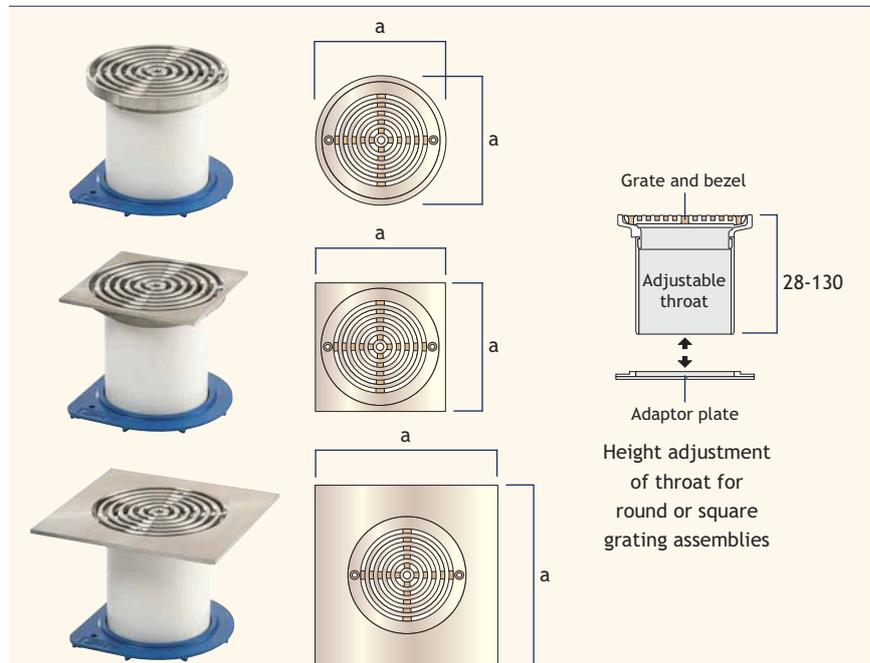
*Flow rate on 2BO/M is restricted to 1.69 l/s in accordance with BS EN 12056 pipe capacity

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 2BO/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).

Balcony outlets can also be connected to Alumasc's aluminium Flushjoint and Heritage rainwater pipes.

Flat grates can be supplied with holes punched out to receive 50, 75 or 100mm nominal bore rainwater downpipes. When ordering pre-punched grates, add the following suffixes shown in blue to the product codes:

2BO/**2H** for 50mm pipe
3BO/**3H** for 75mm pipe
4BO/**4H** for 100mm pipe

Alternatively, where grates are not supplied pre-punched, the hole can be cut on site by the installer.

The Balcony outlet can be used with an extension piece.

Please see Harmer couplings available (page 32).

Grate Extension Piece

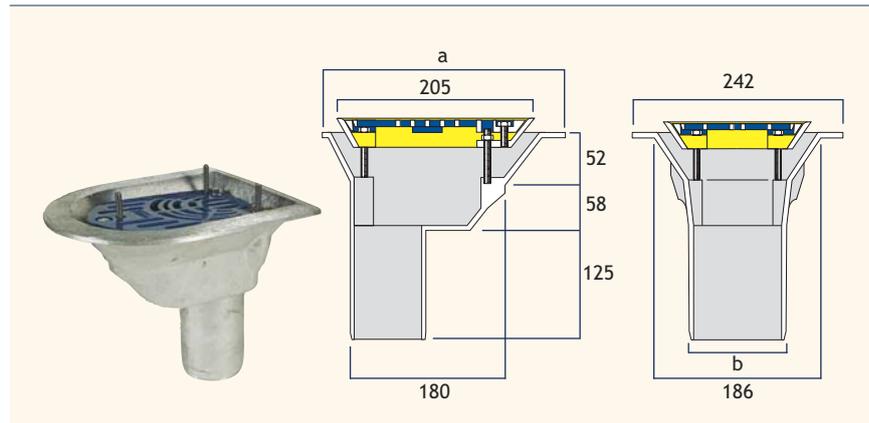
The Grate Extension Piece is for applications where it is necessary to raise the level of the grate above the body of the outlet such as in inverted roof construction.

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.

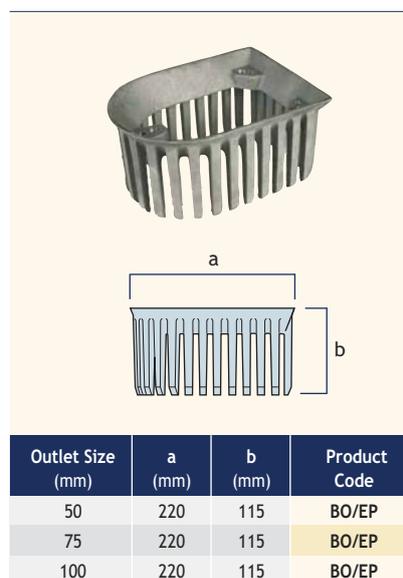
The Grate Extension Piece is supplied with one set of stainless steel extension studs per outlet.

Flow Rate Note 1 (applies to table)

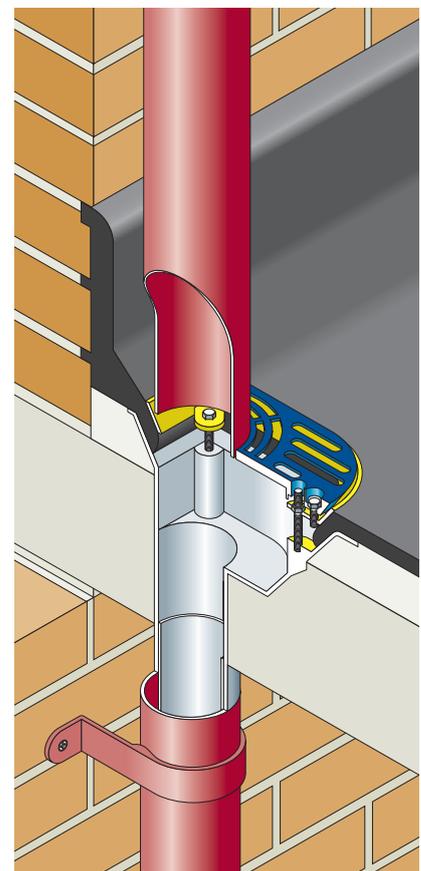
Flow rates are in litres per second based on flow rate test data. Where tested flow rates are greater than pipe capacity limits of BS EN 12056, the pipe capacity limit has been shown. Contact Harmer Technical Services for variable outlet performance to specific depth of water and rainfall intensity.



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	270	83	4.97	3.1	3BO
100	270	110	8.41	3.3	4BO



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



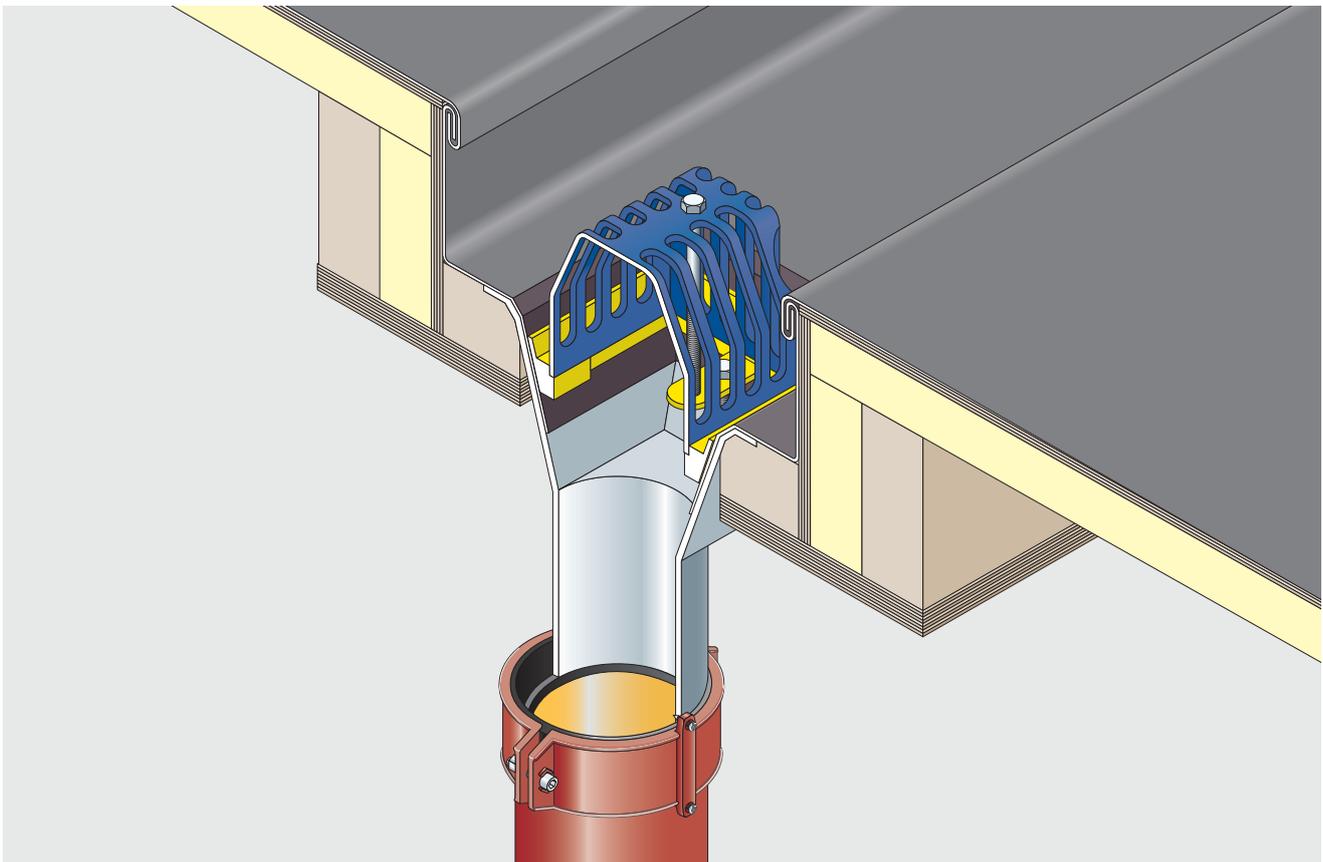
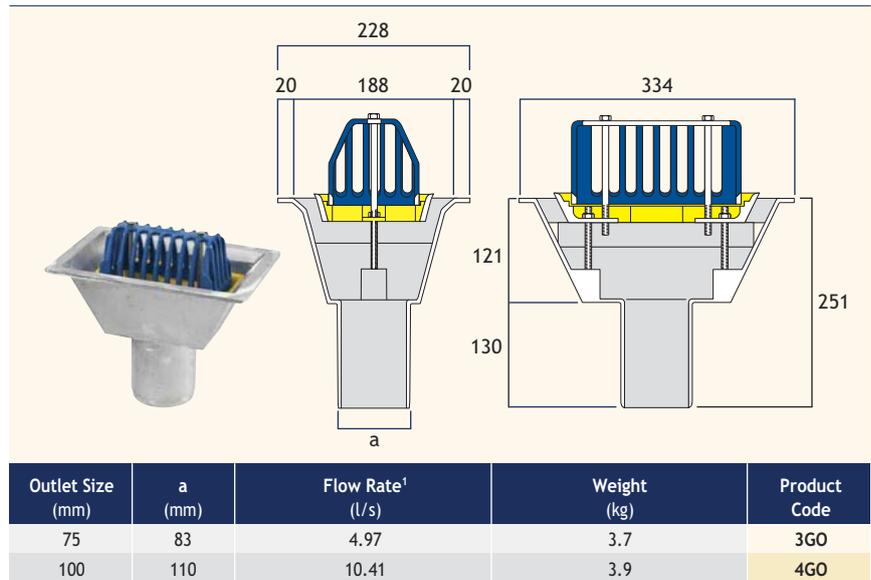
Aluminium Roof Outlets - Gully Detail Outlets

Harmer Roof Gully Detail outlets should be used in roof constructions incorporating formed drainage channels. They are specially designed to suit internal flat roof gutters.

Gully Outlet

Gully 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 Harmer couplings available (page 32).

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



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 (page 34) with appropriate Harmer coupling (page 32).

A welded spigot version of the Two-Way Detail outlet can also be manufactured on request.

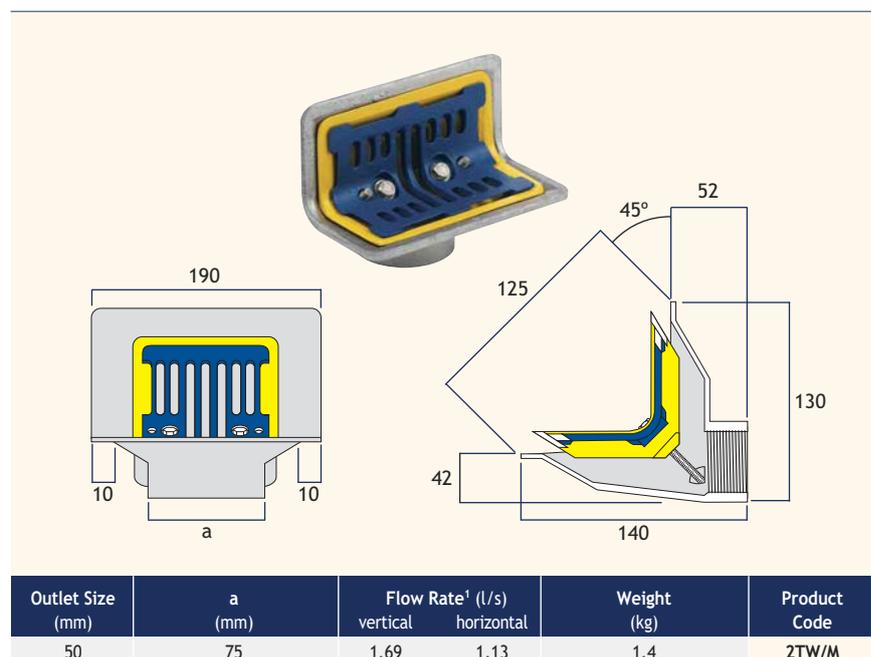


Mini Two-Way

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 table)

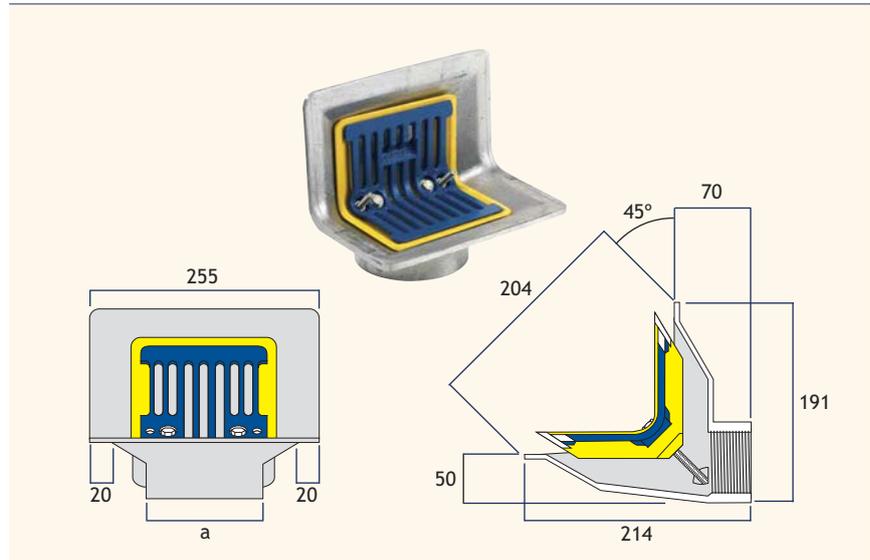
Flow rates are in litres per second based on flow rate test data. Where tested flow rates are greater than pipe capacity limits of BS EN 12056, the pipe capacity limit has been shown. Contact Harmer Technical Services for variable outlet performance to specific depth of water and rainfall intensity.



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, and it has three outlet options in 2", 3", and 4" BSP thread.



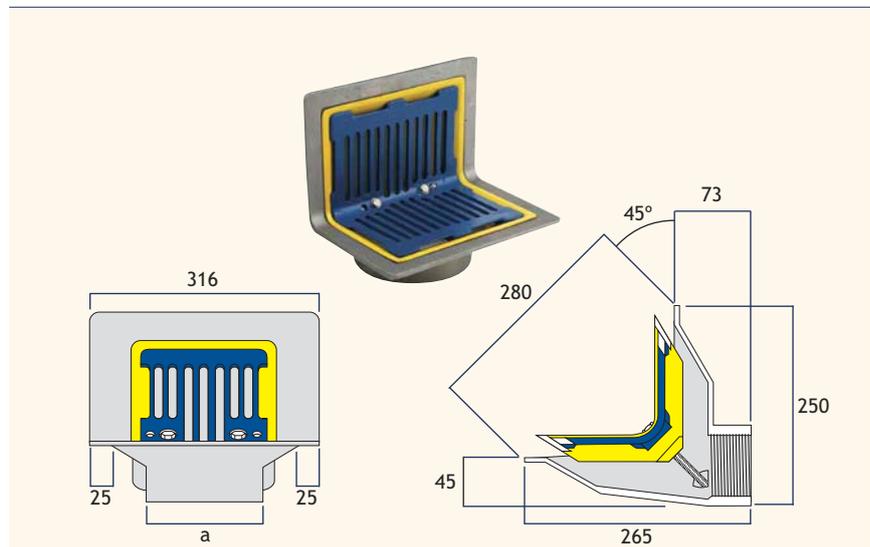
Note on special modifications

Roof outlets can have special modifications applied such as welded aluminium tail pipe to eliminate the typical jointing detail as associated within a concrete slab. Please refer to page 43.

Outlet Size (mm)	a (mm)	Flow Rate ¹ (l/s)		Weight (kg)	Product Code
		vertical	horizontal		
50	75	1.69	1.69	2.4	2TW
75	107	3.94	1.47	2.6	3TW
100	130	6.00	2.05	2.5	4TW

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.



Outlet Size (mm)	a (mm)	Flow Rate ¹ (l/s)		Weight (kg)	Product Code
		vertical	horizontal		
150	181	6.37	2.91	5.1	6TW

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's Flushjoint and Heritage rainwater pipes as well as hoppers, and when colour co-ordinated, will 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.

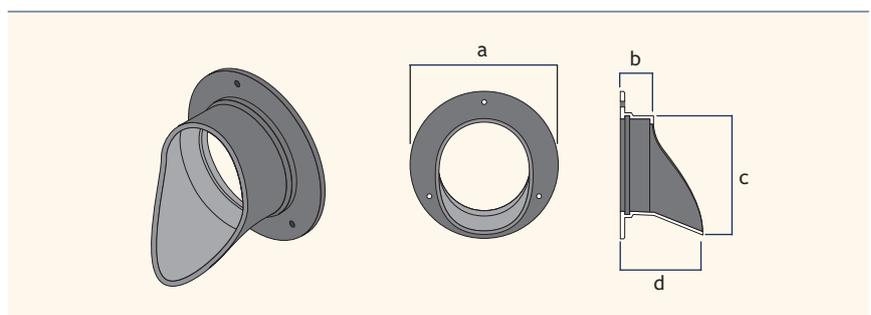
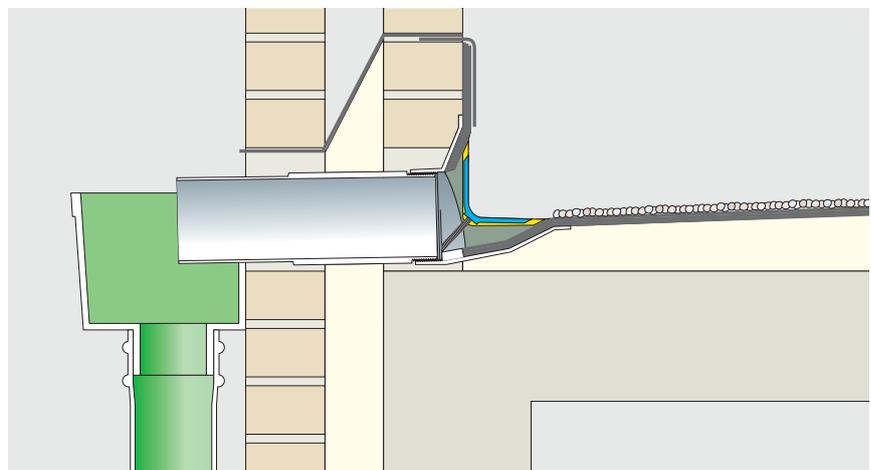
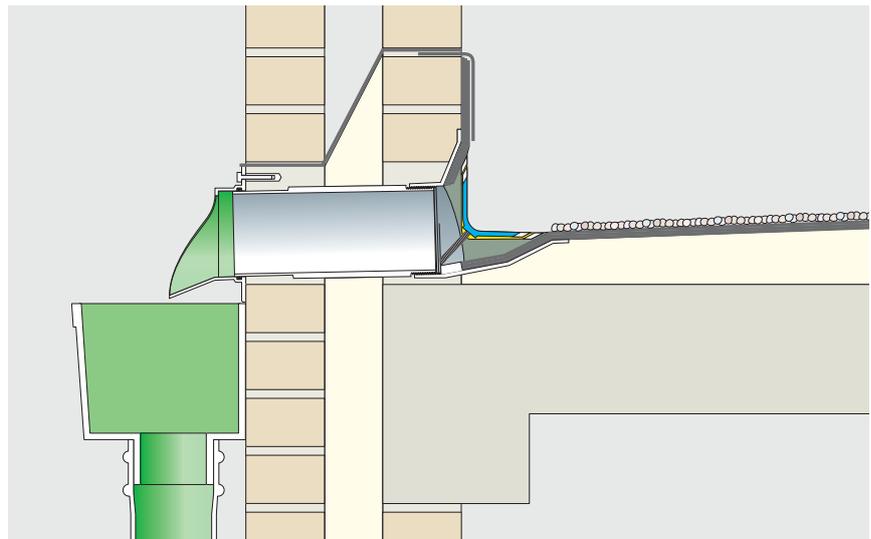
Material - Siliconised Cast Aluminium LM6

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.

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*

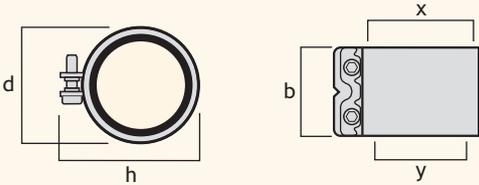
*Also available in polyester powder coated finish to Alumasc standard colour range or RAL.

Aluminium Roof Outlets - Accessories and Connections

Harmer Couplings

	Ductile Iron		Duo
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	

Adaptor Couplings

							
Adapts lightweight 'soil' to conventional 'drain'							
Pipe Dia (mm)	Bolts	d	h	b	x	y	Product Code
70	2	95	110	70	83-84	75-76	3151/070075
100	2	130	145	70	116-119	108-113	3102/100
150	4	180	215	70	168	159	3102/150

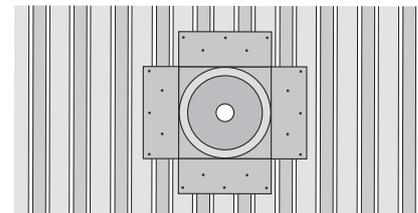
Metal Deck Support Plates

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.

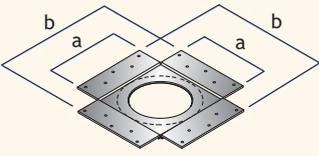
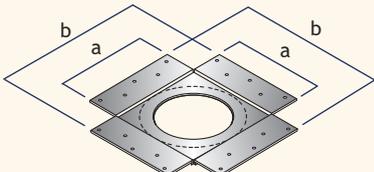
The Support Plates incorporate pre-punched holes for ease of fixing. Two sizes are available. The 335 x 335mm plate will suit 50 and 75mm metal outlets and all insulated outlets. The 415 x 415mm plate is designed for all 100 and 150mm metal outlets.

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.



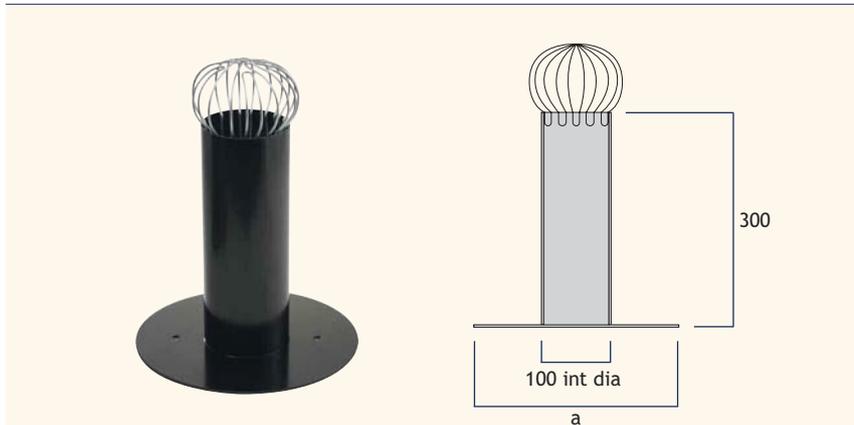
Plan view of Harmer outlet body in the Metal Deck Support Plate fixed to the structural metal deck.

				
Code reference SP1	Code reference SP2			
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

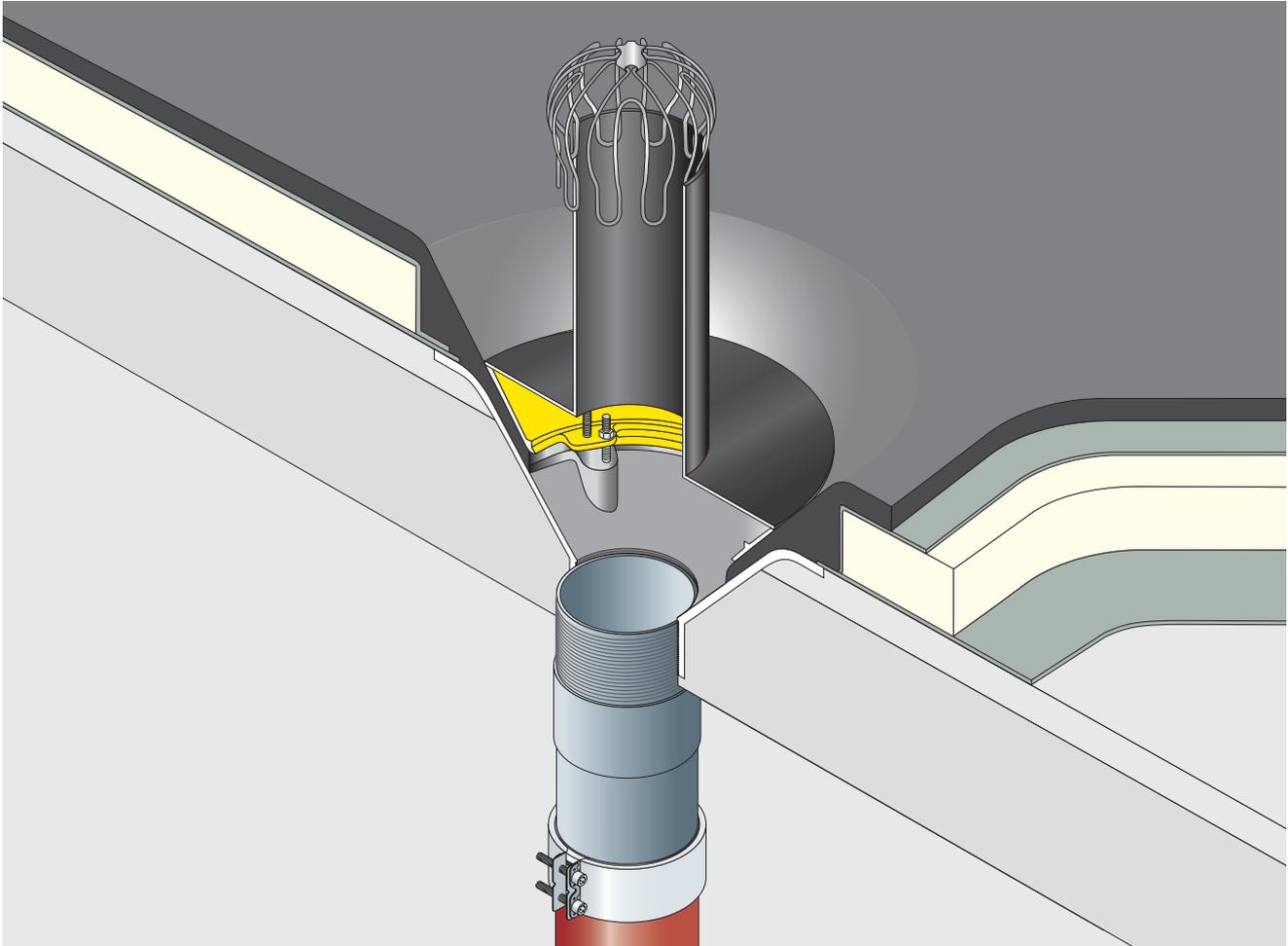
Aluminium Roof Outlets - Accessories and Connections

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

Threaded Spigot Adaptors in ABS plastic are 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.

Please see Harmer couplings available (page 32).



Nominal bore (mm)	a (mm)	Length (mm)	Weight (kg)	Product Code
50	55	400	0.4	2ADP
50	55	600	0.6	2ADP/600
75	83	400	0.6	3ADP
75	83	600	0.9	3ADP/600
100	110	400	1.2	4ADP
100	110	600	1.8	4ADP/600
150	160	400	2.0	6ADP
150	160	600	3.0	6ADP/600

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 - 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 Water Management Solutions,
Station Road, Burton Latimer,
Kettering, NN15 5JP
Tel: 01536 383810
Website: www.harmerdrainage.co.uk, Email: info@alumascwms.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

NBS Specification Builder	
Product Type	Harmer Roof Outlets
Outlet	Harmer AV Aluminium
Type	AV Spigot Outlets
Grate Type	Domed Grate
Size	150mm



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, 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 01536 383810.

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:

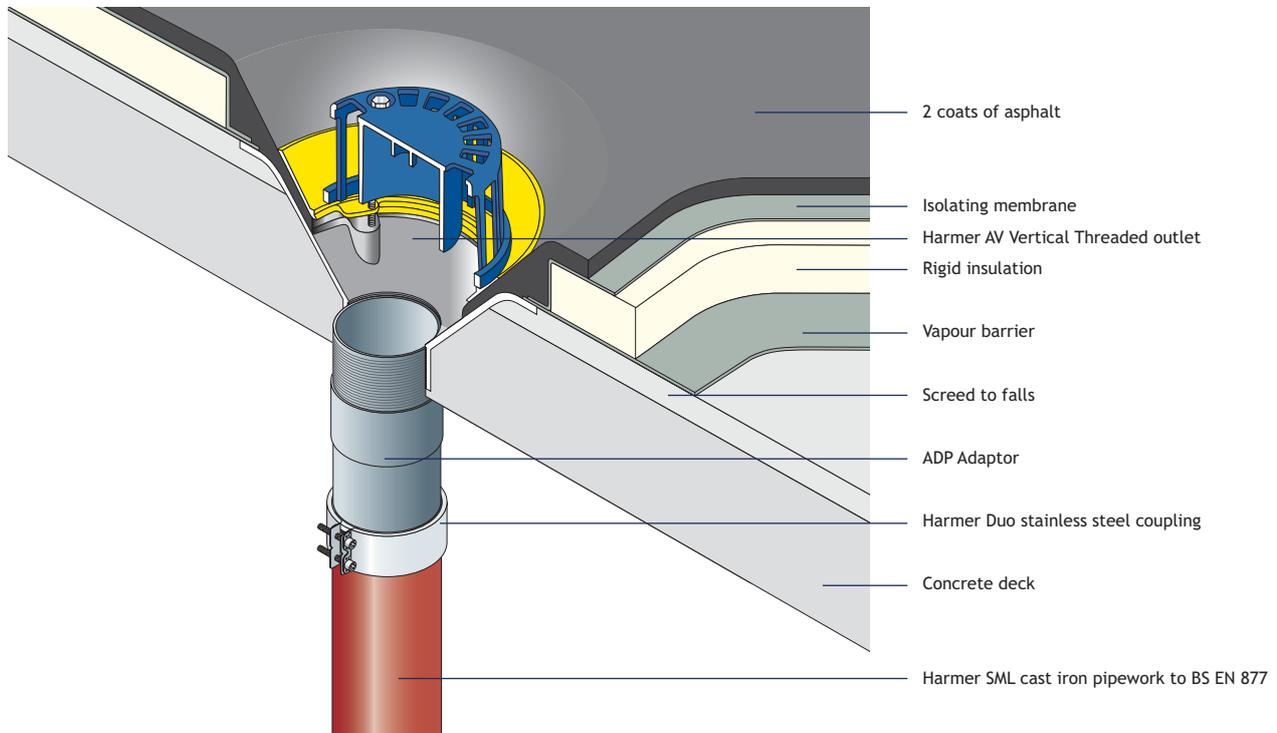
- Inspection of the outlets should be on a regular basis and generally not less than twice annually - Autumn and Spring.
- In locations with nearby trees, leaf congestion will require more frequent clearance.
- Plastic bags blown onto the roof will wash to an outlet position and block the strainer.
- 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

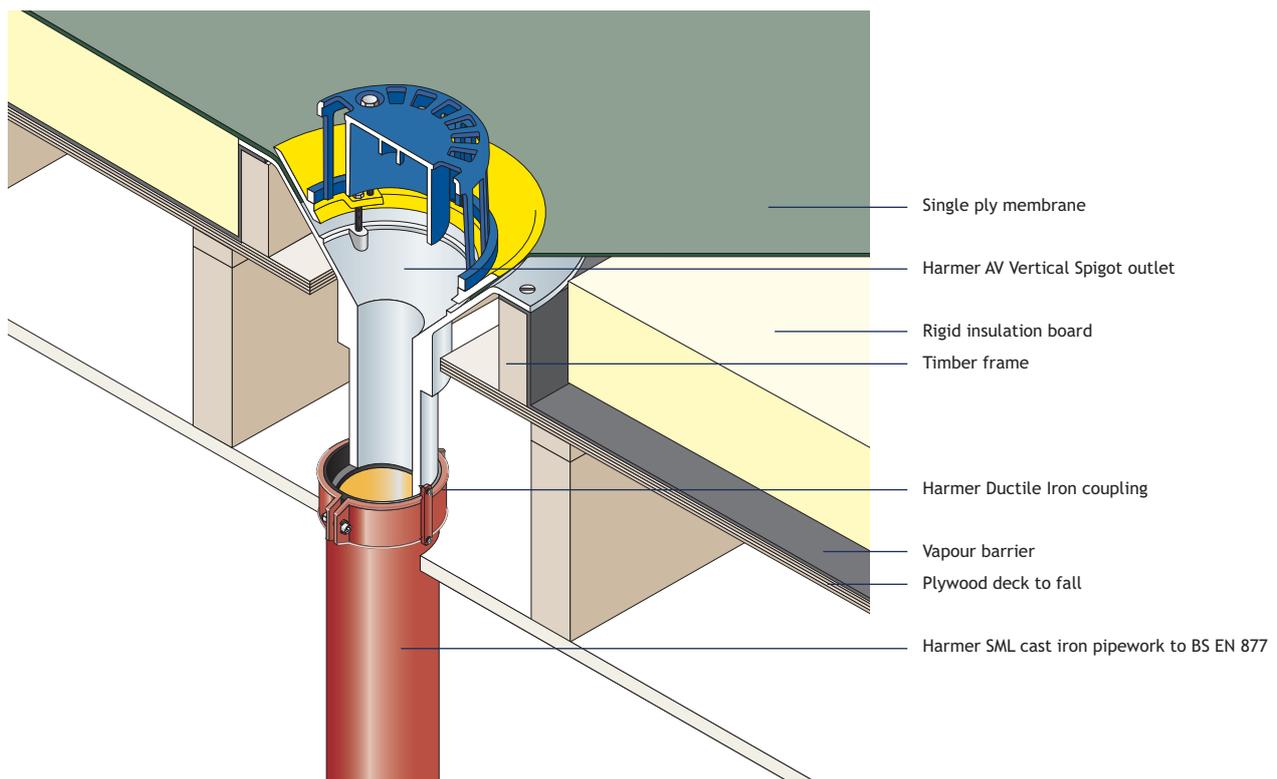
Always refer to current Health & Safety legislation, safe systems of work and the relevant material safety data sheets.

Aluminium Roof Outlets - Application Details

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

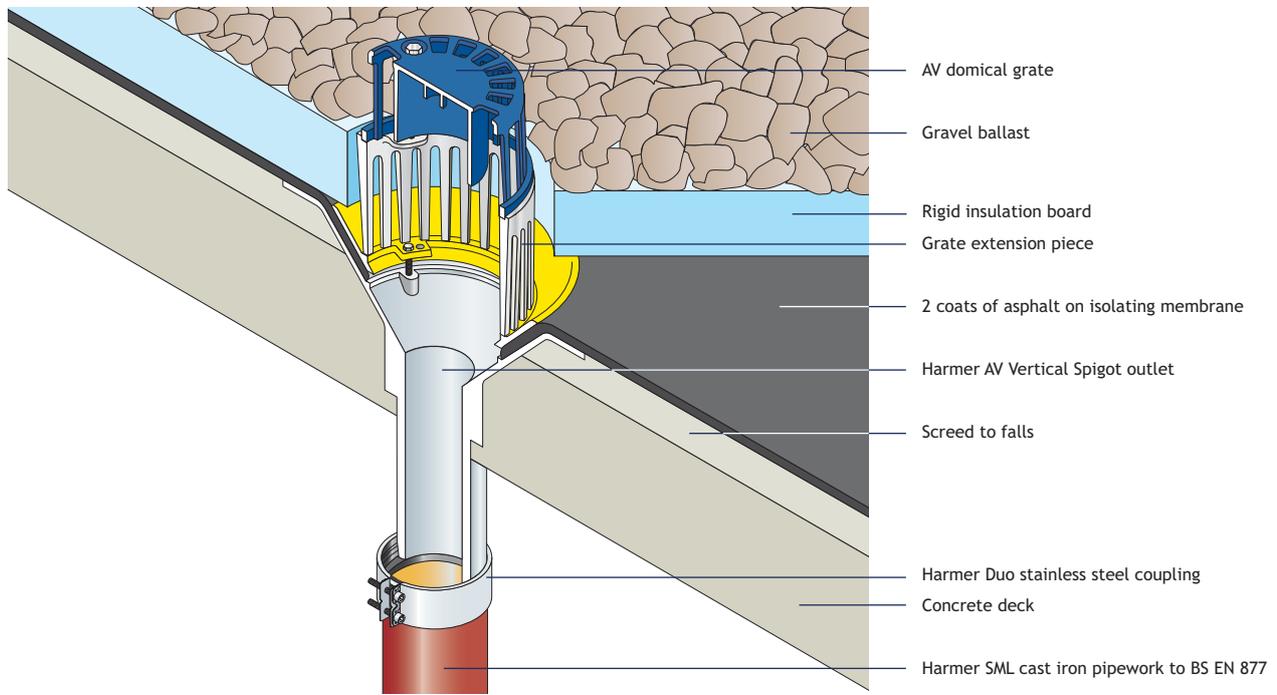


Harmer AV Vertical Spigot Outlet in Warm Roof Timber Deck Construction with Single Ply Waterproof Membrane

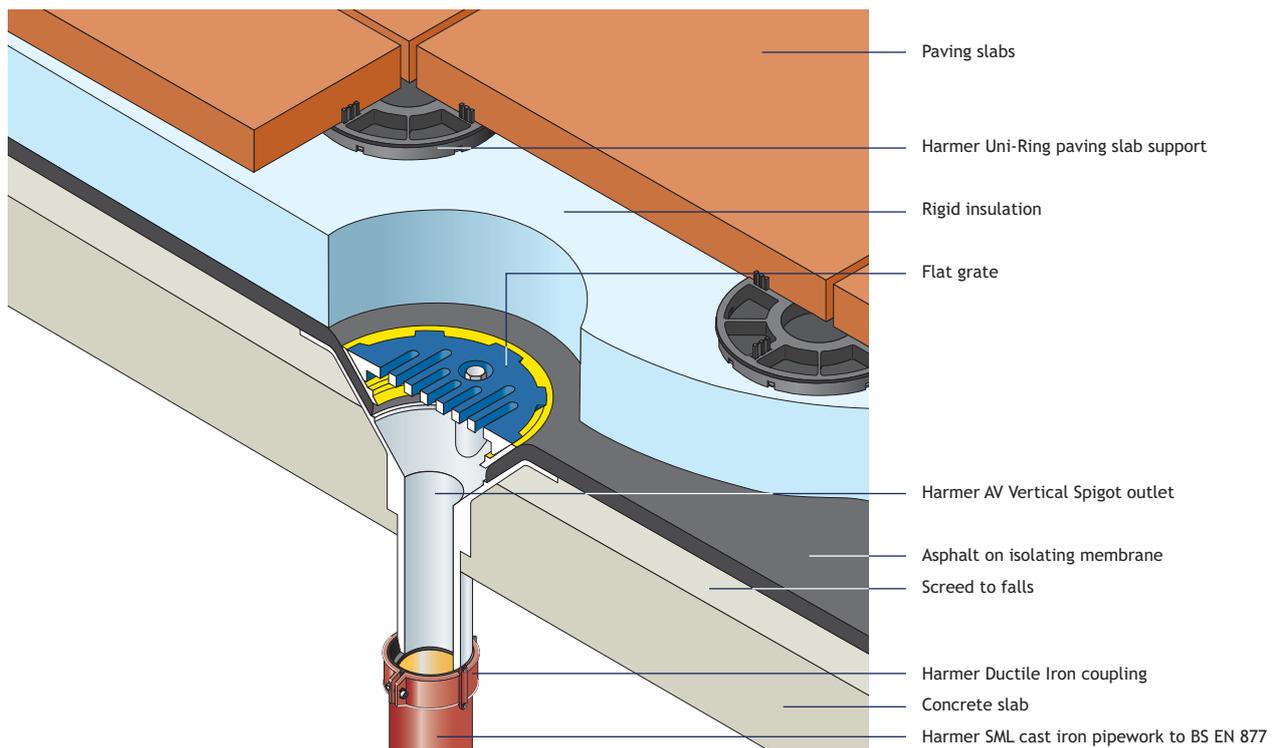


Aluminium Roof Outlets - Application Details

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

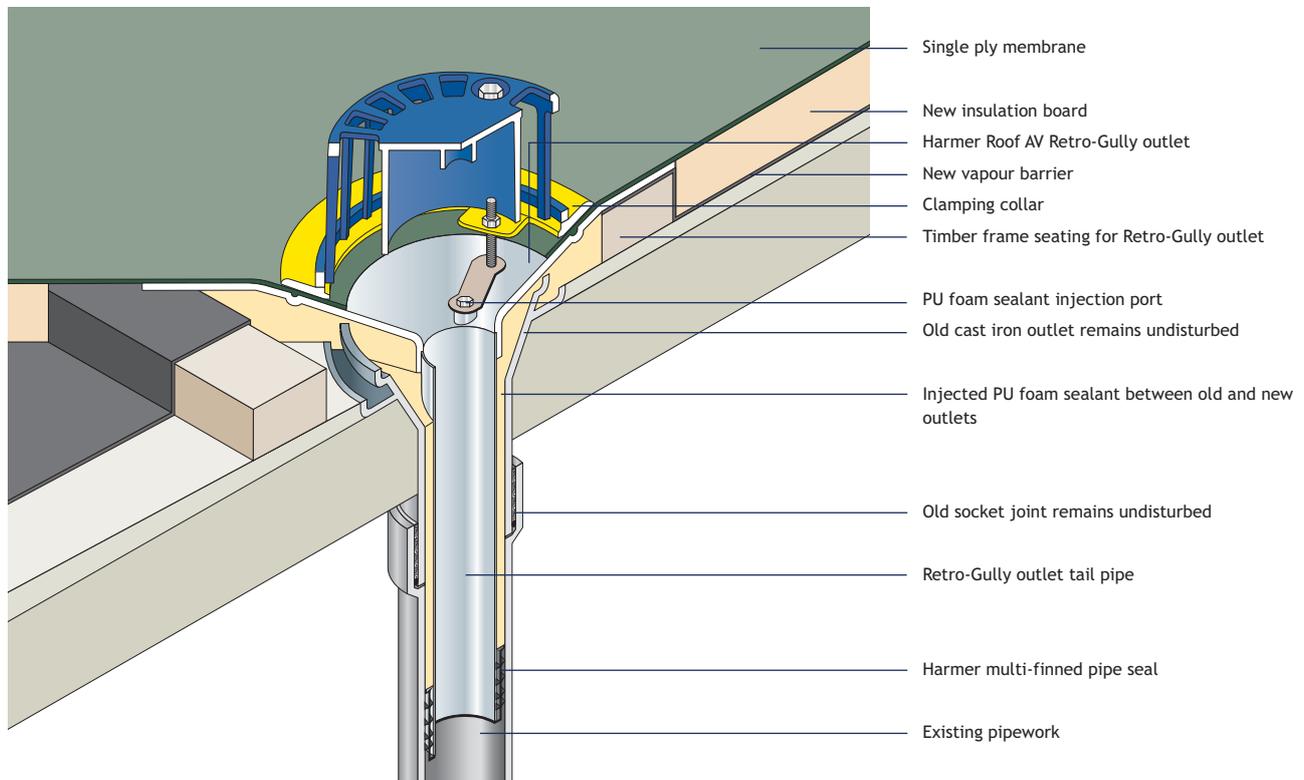


Harmer AV Vertical Spigot Outlet with Flat Grate in Inverted Roof Concrete Deck Construction with Paving Slabs on Uni-Ring Raised Deck Supports



Aluminium Roof Outlets - Application Details

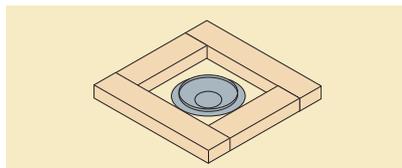
Harmer AV Retro-Gully Roof Refurbishment, Retaining Existing Cast Iron Outlet



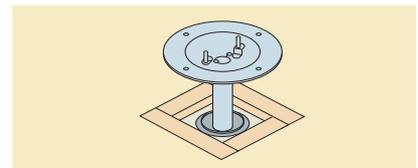
Installing Harmer AV Retro-Gully



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



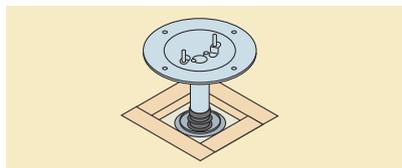
2. Form timber frame around old roof outlet, lay vapour barrier/insulation board (35mm+).



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



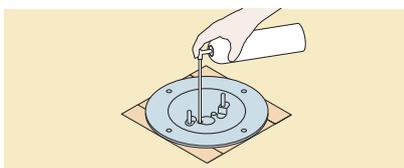
4. Once correct length of tail pipe has been established fit Harmer multi-finned pipe seal.



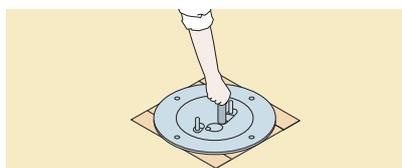
5. Repeat clean water flush. Insert tail pipe into existing pipework with flange seated on timber frame.



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



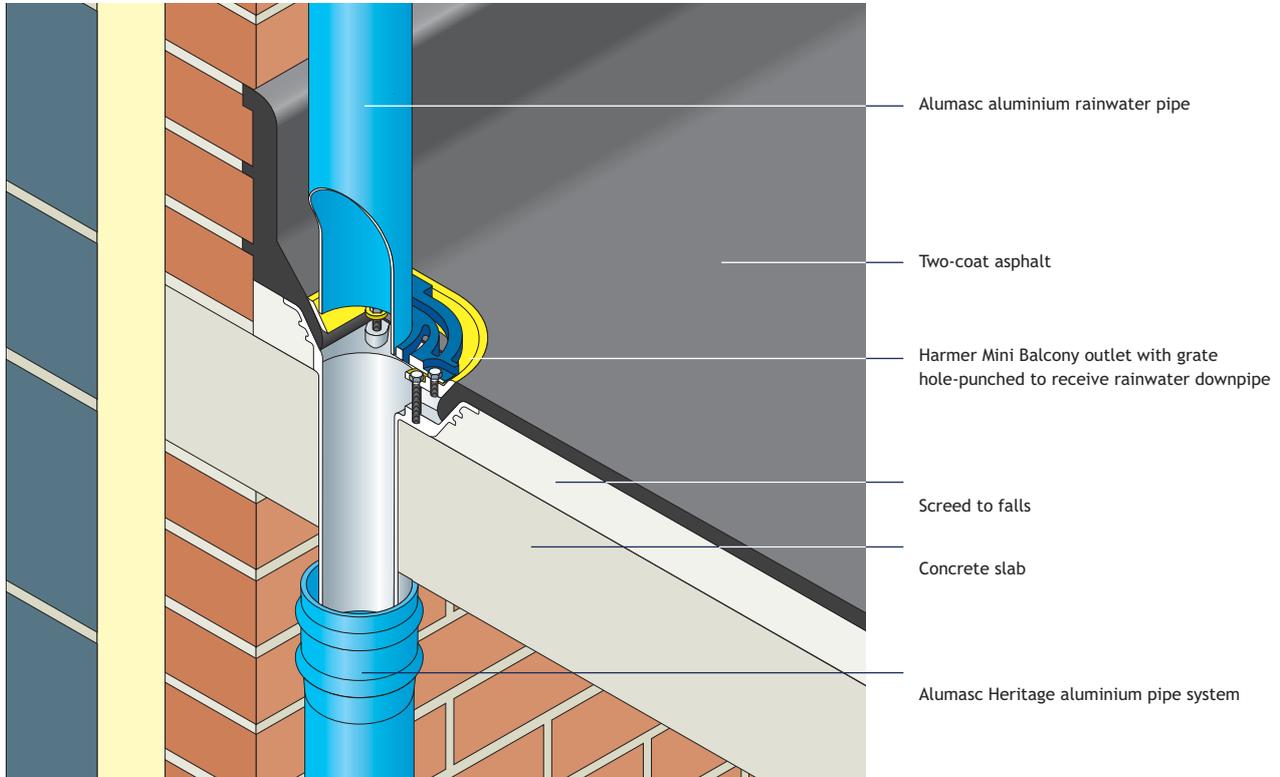
7. Inject intumescent PU foam in one injection port for up to 5 seconds. Wipe away surplus foam.



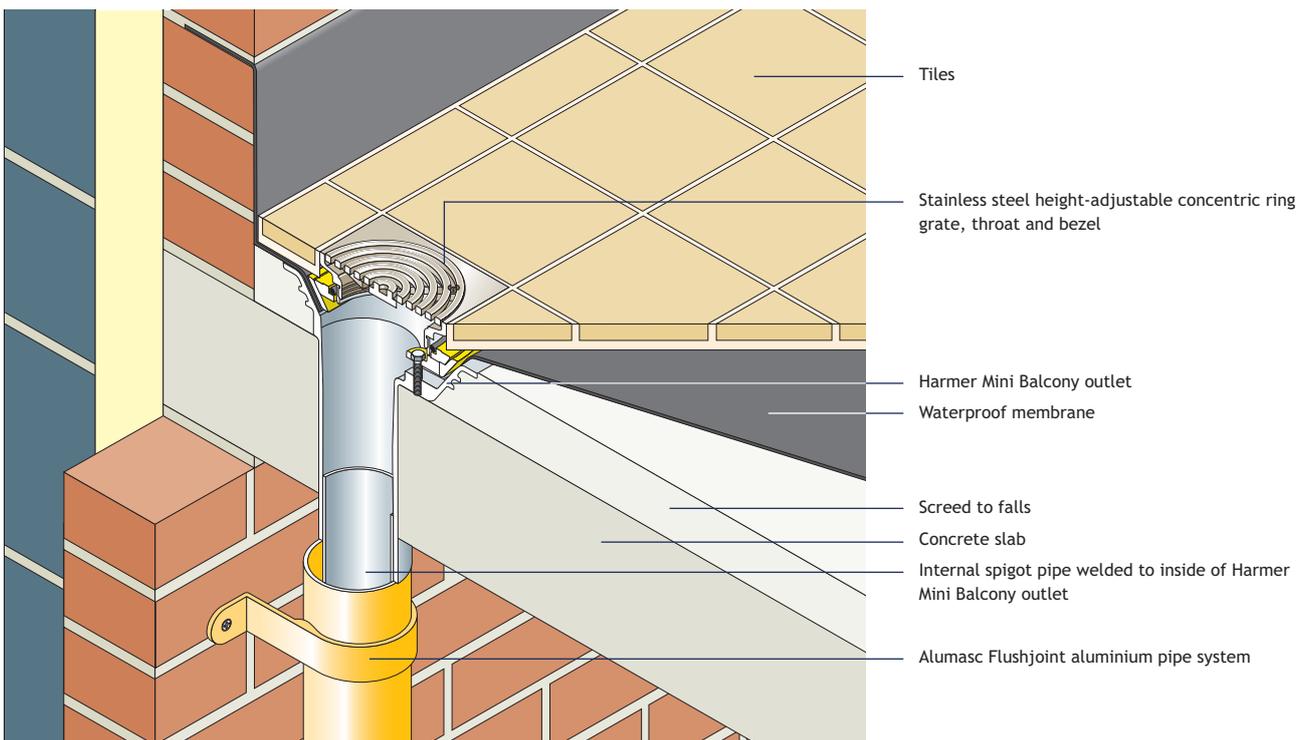
8. Close off port openings with the captive screws and washers. Complete weatherproofing and clamping ring/grate installation.

Aluminium Roof Outlets - Application Details

Harmer Mini Balcony Outlet with Standard Grate

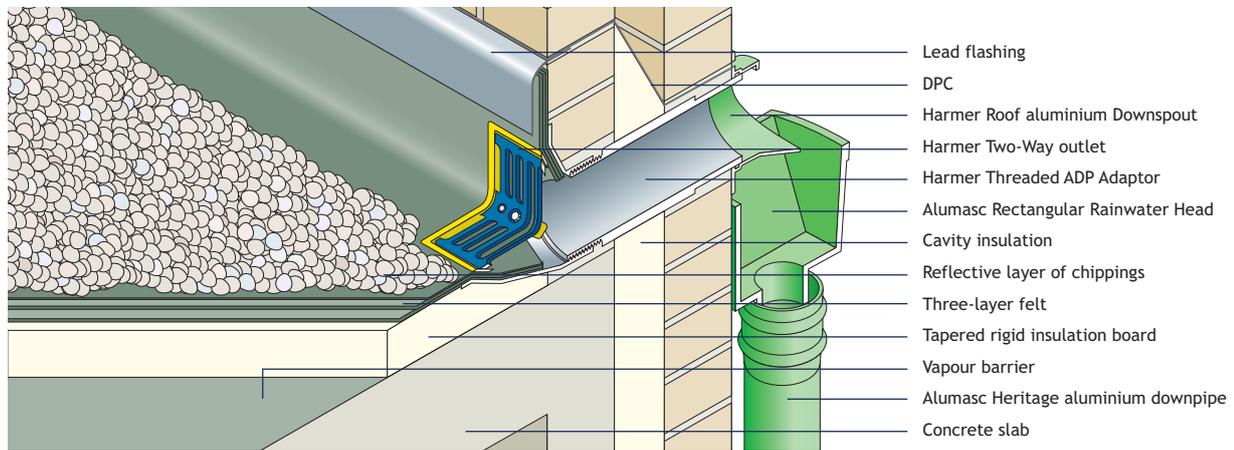


Harmer Mini Balcony Outlet with Stainless Steel Tile Grate

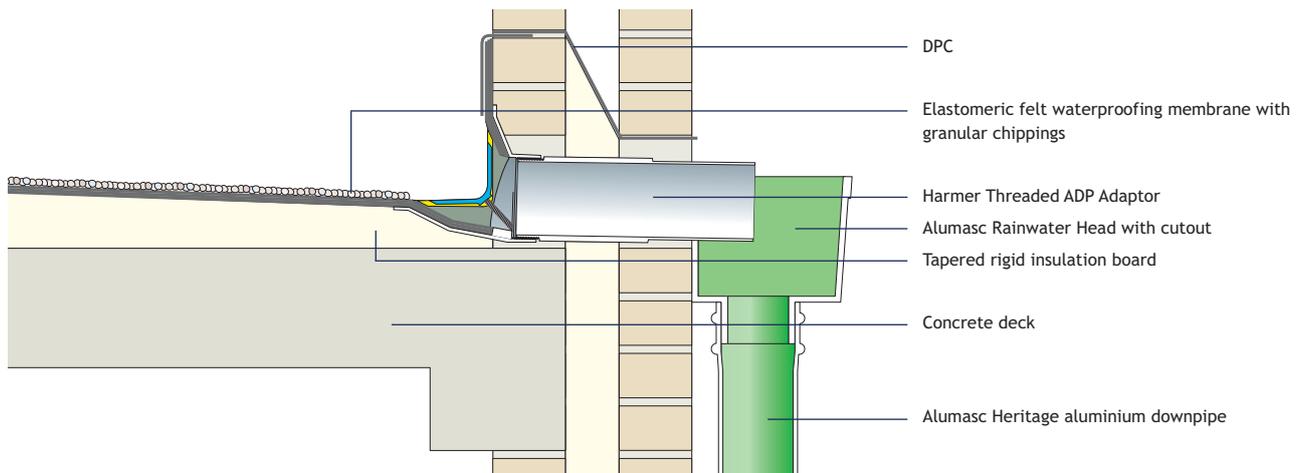


Aluminium Roof Outlets - Application Details

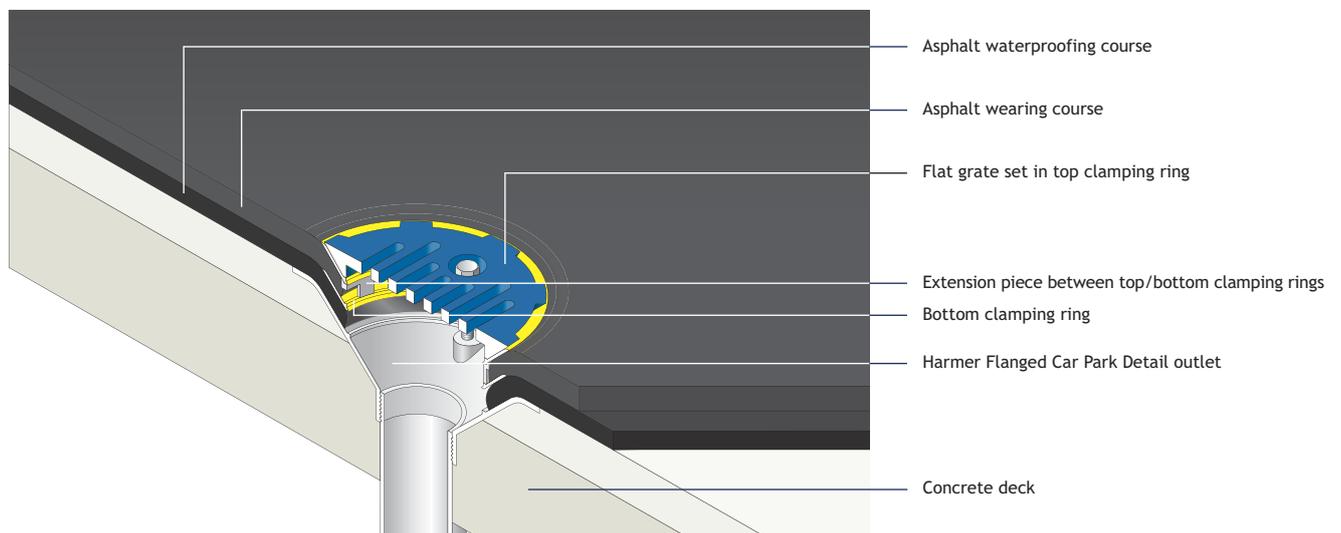
Harmer Two-Way Outlet in Warm Roof Concrete Deck Construction



Harmer Two-Way Outlet Section Showing Rainwater Discharge Via ADP Adaptor



Harmer Flanged Car Park Detail Outlet with Flat Grate

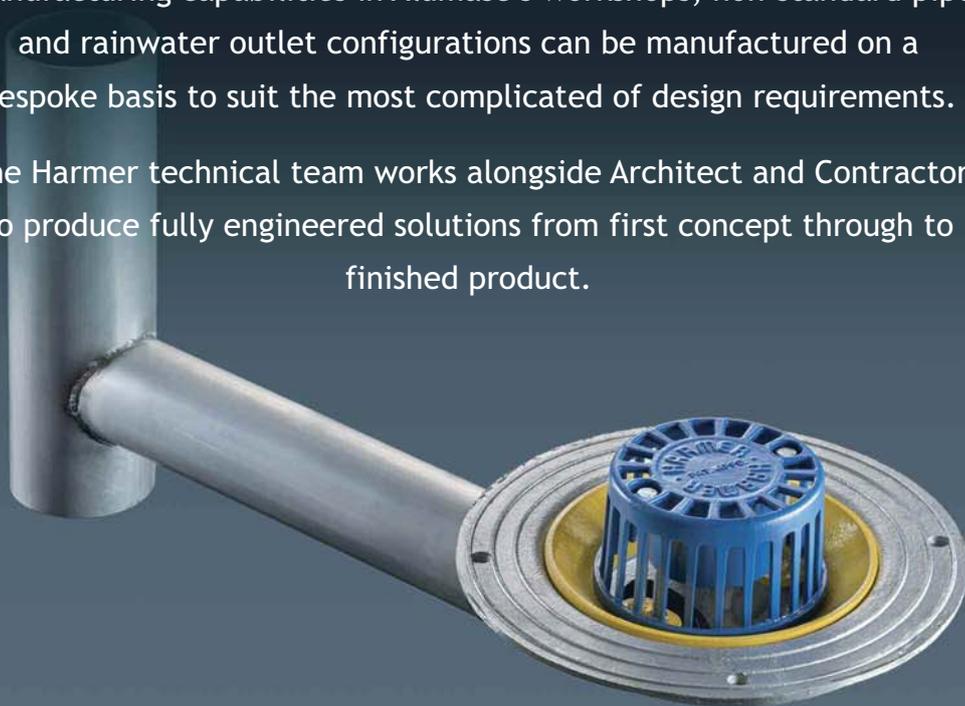


Harmer Roof Drainage The Bespoke Service

The Harmer range of roof drainage products is amongst the widest available anywhere in the marketplace. But the variety of drainage conditions encountered in modern refurbishment and newbuild work means that a standard rainwater outlet will not always be available to address a particular detailing requirement. In such circumstances, a bespoke solution is the only answer.

By combining Harmer technical expertise with the advanced manufacturing capabilities in Alumasc's workshops, non-standard pipe and rainwater outlet configurations can be manufactured on a bespoke basis to suit the most complicated of design requirements.

The Harmer technical team works alongside Architect and Contractor to produce fully engineered solutions from first concept through to finished product.



Aluminium Roof Outlets - Bespoke Solutions Introduction

No matter what the drainage problem - we have the answer

We have an extensive portfolio of successful past solutions in situations where a bespoke rainwater drainage design was the only answer. Our innovative, problem-solving specials cover a myriad of applications in which a bespoke design creates a drainage solution in applications that would otherwise be unworkable. Our special designs have solved problems with overflow, pipework configurations, flow rates, practical constructional issues, problems with the location of pipework, compliance with Building Regulations  and conformity with the requirements of bodies such as the National Housebuilding Council (NHBC).

Our development of flush-mounted scupper drains, for example, provides a drainage solution in situations where achieving adequate coverage of the reinforcement within the slab is a potential problem issue.

Specially fabricated 'out of the box' unit for draining twin rainwater outlets into a single drainage stack - Harmer AV outlets welded to an Alumasc Flushjoint extruded aluminium downpipe.



In some circumstances, there may not be sufficient depth of cover for the reinforcement to allow installation of a standard two-way parapet outlet. Our bespoke flush-mounted scupper drains offer the solution by leaving the slab and reinforcement undisturbed.

Whatever the drainage problem you face, the Harmer specialist team is here to assist. We work alongside architect and contractor to produce a fully engineered solution from first concept though to finished solution. Whatever the problem, our expert team evaluates and devises an efficient solution - a unique service that gives designers confidence that all drainage issues are effectively dealt with and any potential problems solved.



Meeting NHBC requirements

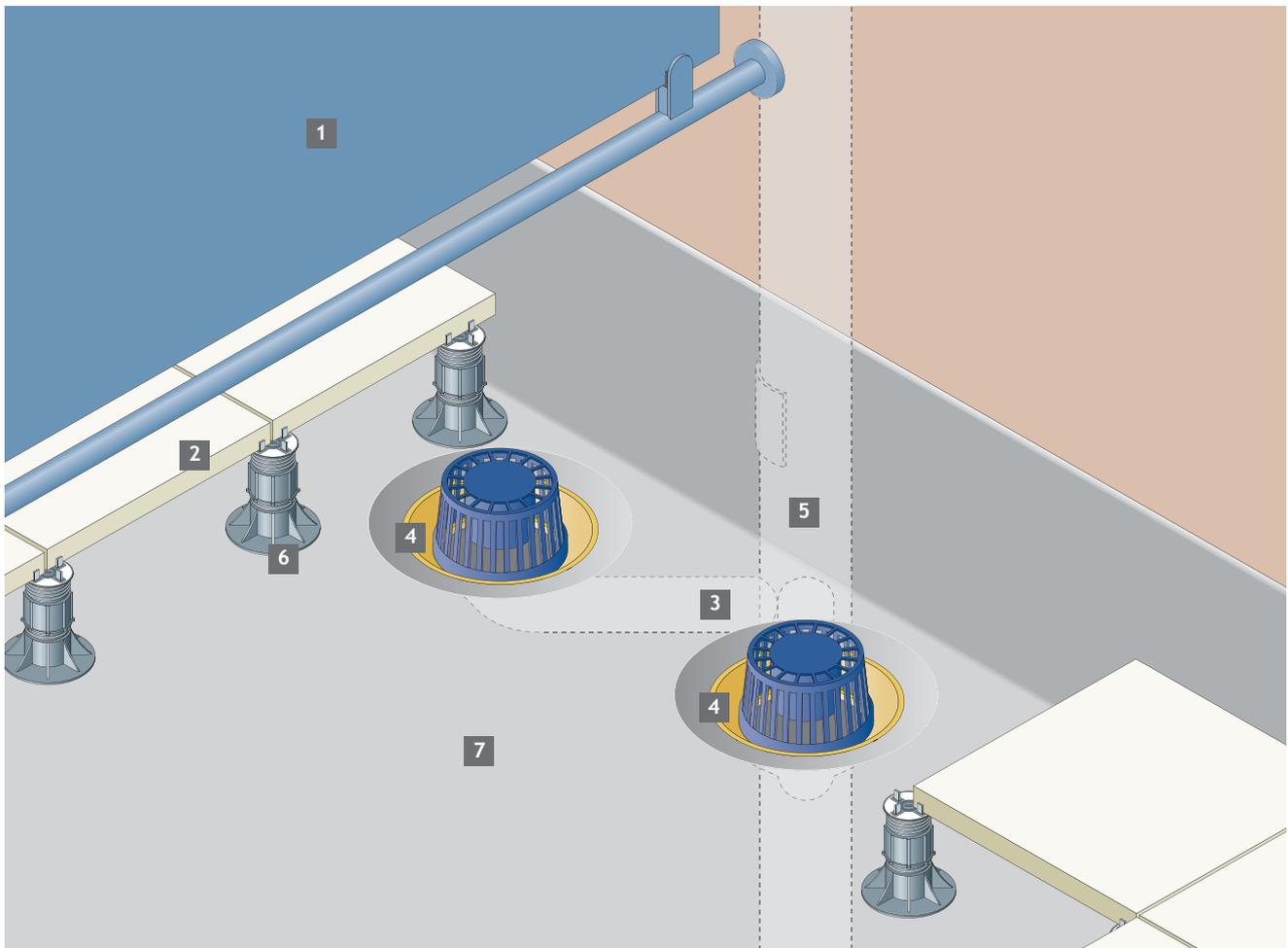
Our bespoke service has provided practical ways of complying with NHBC requirements. Where flat roofs of balconies have an upstand on all sides, NHBC requires provision of an overflow outlet in the event of other outlets becoming blocked. The Harmer design team has designed a baffle that is factory-welded to the clamping ring of a standard rainwater outlet, creating an overflow outlet that allows water build-up to drain freely before flooding danger level is reached (see left).

- 1** Bespoke baffle, factory-welded to the clamping collar. Baffle height designed to coincide with the flooding danger level



Aluminium Roof Outlets - Bespoke Solutions

Application Detail 1



Harmer bespoke solution for draining two adjoining balconies separated by a privacy screen

Design challenge

Draining paired balconies to a shared rainwater stack in multi-storey construction.

Unique and innovative Harmer solution

Two Harmer 90 degree horizontal spigot outlets (Code ref 390) welded into a shared rainwater stack. A fully fabricated assembly with rodding access door and connection spigot designed to connect to a ducted rainwater pipe system.

Commentary

This drainage solution was devised specifically to drain paired balconies in a multi-storey construction. A privacy screen separates two adjacent balconies, which share a rainwater downpipe located within a recess. The downpipe is 110mm in diameter to accommodate a high flow demand from the balconies in the multi-storey arrangement, and also drains water from the flat roof of the building. The rainwater outlets use 75mm diameter pipework, not so much for flow demand but because it is preferable to 50mm pipework, which may be susceptible to blockage. The balconies are overdecked and the outlets are fitted with domical grates that fit within the void between the decking and the structural deck.

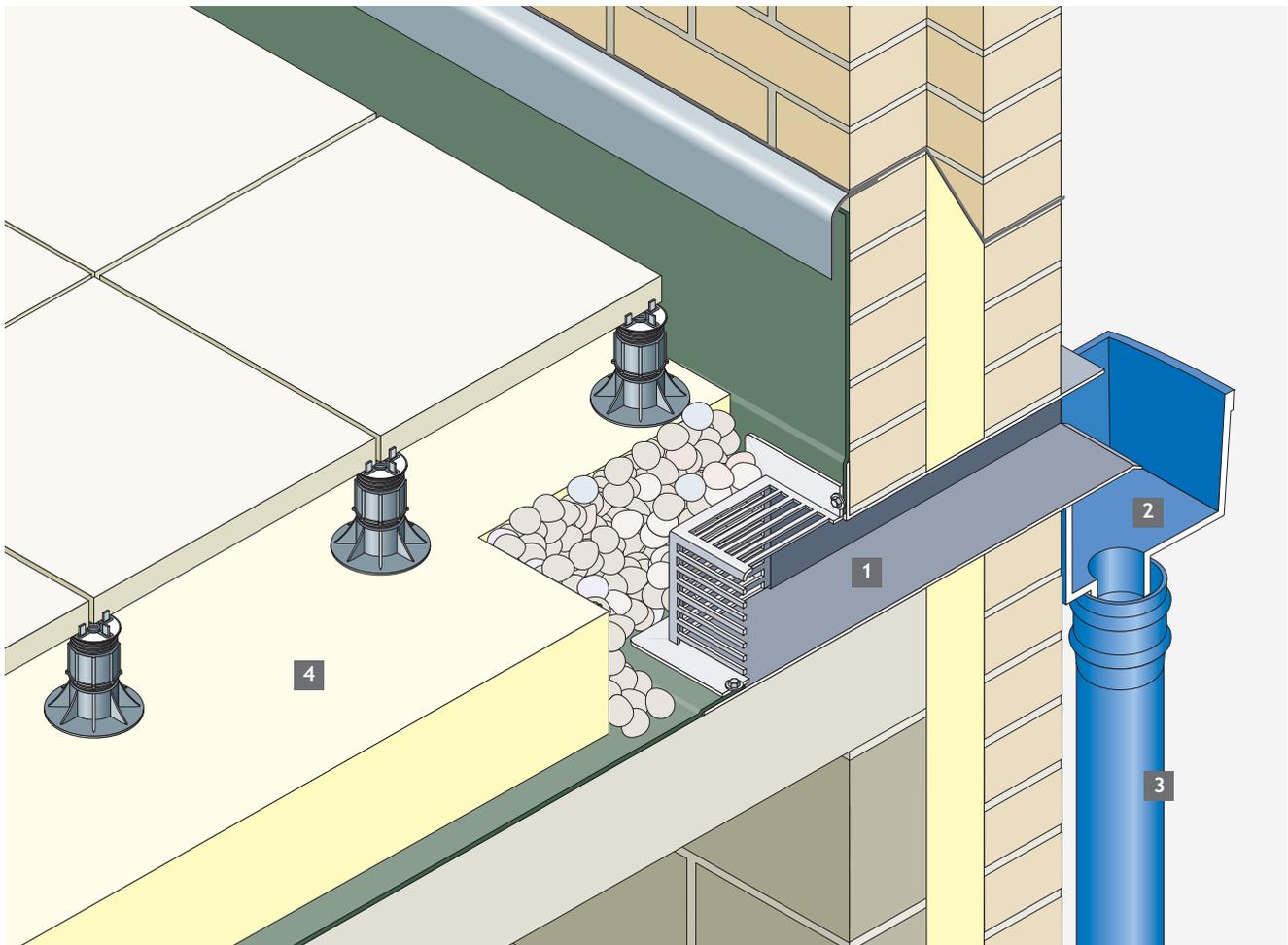
Each twin outlet assembly has been manufactured as an individual 'out-of-the-box' item, complete with rodding access door and spigot for connection to the principal rainwater stack above and below each balcony.

- 1 Privacy screen between balconies
- 2 Raised paving overdecking
- 3 Pipework welded to outlet spigots and central stack
- 4 Harmer horizontal spigot outlets
- 5 Alumasc Flushjoint central drainage stack
- 6 Modulock Pedestal raised deck supports
- 7 Structural deck and waterproofing



Aluminium Roof Outlets - Bespoke Solutions

Application Detail 2



Retrofit Harmer bespoke scupper drain installation for drainage at a parapet without disturbing the existing concrete slab

Design challenge

Need for a retro installation of parapet drainage where installing a standard two-way outlet was not feasible through fear of exposing the existing deck reinforcement.

Unique and innovative Harmer solution

A special scupper drain design with flanged connection to avoid risks associated with disturbing the existing concrete slab.

Commentary

Several special scupper drain designs were developed for different parapet drainage conditions on the same project. Each scupper drain was carefully sized to meet a required high flow rate.

All the special scupper drains were designed with a generous flange for waterproofing and non-intrusive, flush-mounted installation. This meant that the concrete slab could remain undisturbed, without scabbling, which could reduce cover on the reinforcement. The scupper drain designs also allowed for fitting of a clamping collar for the waterproof membrane, and a grate.

- 1 Harmer bespoke scupper drain surface-mounted to existing parapet wall
- 2 Out-take to rainwater head
- 3 Alumasc Heritage cast aluminium circular downpipe and rectangular rainwater head
- 4 Existing warm roof



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, balcony 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 is suitable for 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 connections, for vertical and horizontal discharge.
- Fully secured grating options available for vehicular applications.
- The new balcony outlets with flat and aperture grate options.

Low Maintenance

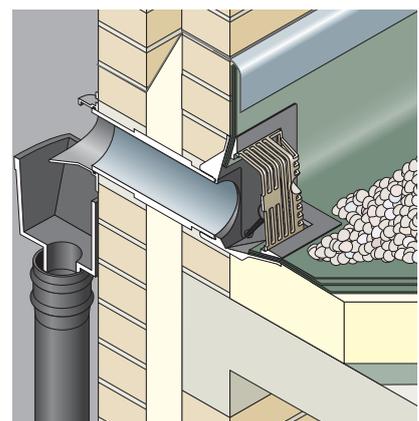
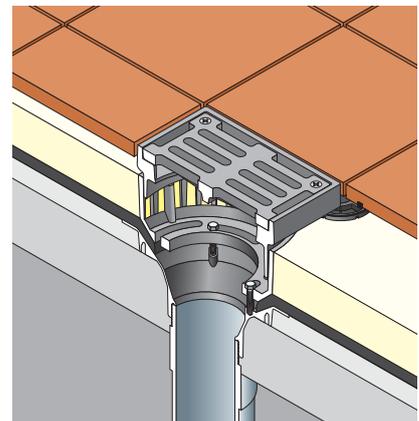
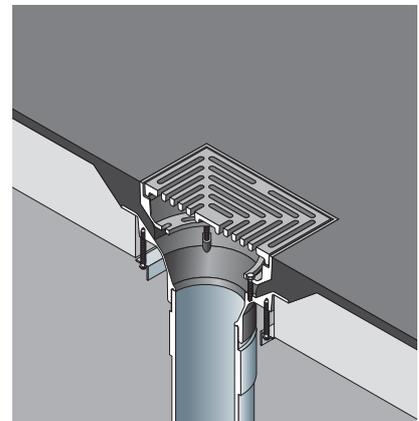
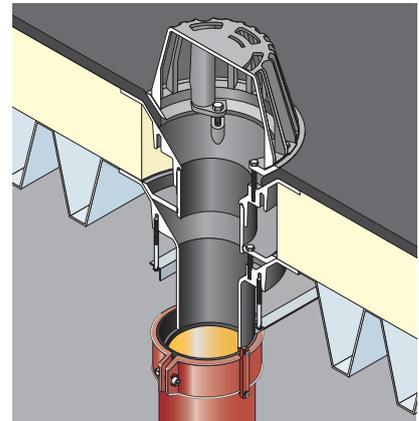
- Domical grates made from UV-stable polypropylene to give long life service. Domical grate types are designed to permit a free flow of rainwater while preventing loose chippings or debris from entering the outlet.
- The side fixing of the clamping ring and domical grate to the outlet body ensures that 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 provides the ideal drainage combinations to accommodate insitu construction, drainage performance and finishes.

Medium Sump Outlets



The Harmer cast iron medium sump range comprises compact outlet bodies in vertical and horizontal variations for connection to 50, 75 and 100mm pipework. 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 domical grates and load bearing circular and square grates which are suitable for areas with vehicular access.

See page 50.

Large Sump Outlets



The Harmer cast iron large sump range provides deep outlet sump bodies for 100 and 150mm vertical pipe connections. 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 domical grates, and heavy duty ductile iron circular and square grates which are suitable for areas with vehicular access.

See page 528.

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 is available in cast iron, nickel bronze or aluminium.

See page 54.

Balcony Outlets



The Harmer cast iron Balcony outlet is available with spigot or threaded connections, and come with a choice of full or aperture grates.

The threaded versions can accommodate standard Harmer ADP adaptors.

The aperture grate allows for easy removal without any need to touch the associated rwp.

See page 55.

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 57.

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

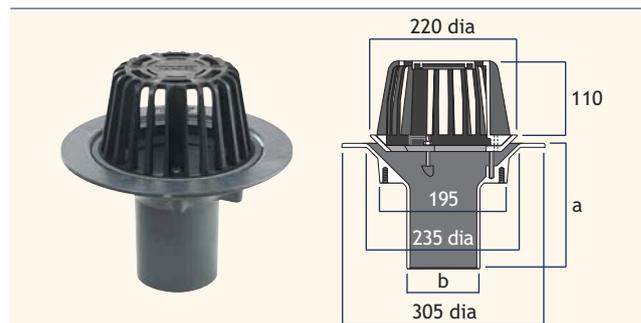
Vertical Spigot outlets are suitable for direct connection to cast iron pipework to BS EN 877 and BS 416, HDPE pipework and PVC O-ring socketed pipe to BS 4514 and BS EN1329-1. Please see pipework connections on page 58 for appropriate Harmer coupling selection.

Note:

- For Flat Grate version add suffix /F to the product code (see page 51)
- A range of accessories is available for use with special detail requirements (See page 51, 57 and 58)

Flow Rate Note 1 (applies to all tables)

Flow rates are in litres per second based on flow rate test data. Where tested flow rates are greater than pipe capacity limits of BS EN 12056, the pipe capacity limit has been shown. 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.

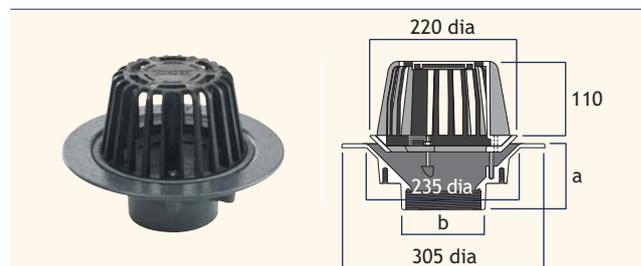
Vertical Threaded Outlet - Domical Grate

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 (page 57) with appropriate Harmer coupling (page 58).

Note:

- For Flat Grate version add suffix /F to the product code (see page 51)
- A range of accessories is available for use with special detail requirements (See page 51, 57, 58 and 59)



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.

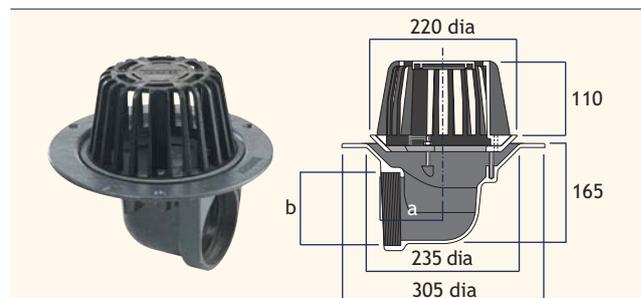
Horizontal Threaded Outlet - Domical Grate

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 (page 57) with appropriate Harmer coupling (page 58).

Note:

- For Flat Grate version add suffix /F to the product code (see page 51)
- A range of accessories is available for use with special detail requirements (See page 51, 57, 58 and 59)



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 50. 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 Deck 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 62 for application details.

Square Flat Grate - Ductile Iron

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 Flat Grate

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 Flat Grate - Stainless Steel

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 626 for application details. For other insulation thicknesses, please contact Harmer Technical Helpline.

Domical Grate

Shown with vertical outlet C400T

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.

Circular Flat Grate

Shown with horizontal outlet C490T

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.

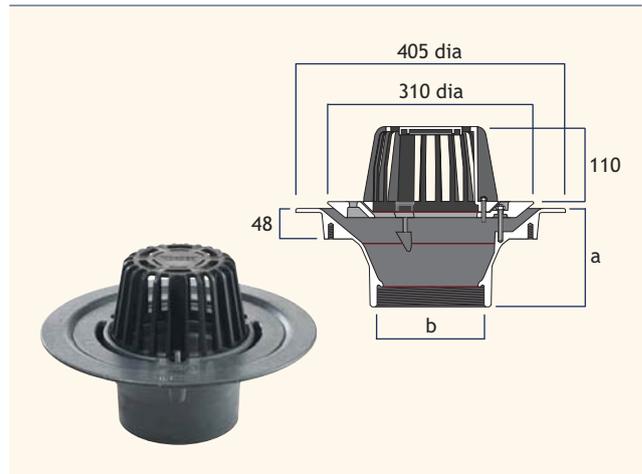
Harmer threaded outlets can be connected to socketed and socketless cast iron, HDPE and PVC pipework by means of the Harmer Threaded Spigot Adaptor (page 57) with appropriate Harmer coupling (page 58).

Note:

A range of accessories is available for use with special detail requirements (See page 53, 57, 58 and 59)

Flow Rate Note 1 (applies to all tables)

Flow rates are in litres per second based on flow rate test data. Where tested flow rates are greater than pipe capacity limits of BS EN 12056, the pipe capacity limit has been shown. 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

Grate Options

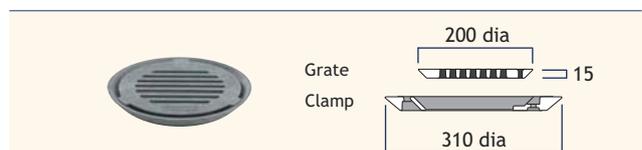
Two Flat Grate options are available, Circular and Square, to suit various applications.

To specify or order, simply add the suffixes shown in the tables below to the product codes shown in the table above.

For example, 150mm Vertical Threaded Outlet with Square Flat Grate: C600LT/S.

Circular 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 Deck Paving Supports where concealed rainwater outlets are used.

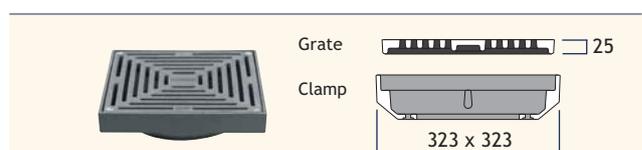


Circular Grate Material	Flow Rate ¹ (l/s)	Load Rating (tonne)	Weight (kg)	Suffix
Sherardized Ductile Iron	11.52*	1.5	1.3	/F

*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
Sherardized Ductile Iron	14.56*	12.5	10.5	/S

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

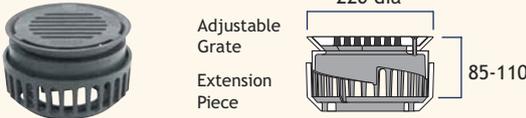
Cast Iron Roof Outlets - Large Sump Grates, Extension Pieces & Double Flange Body Options

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 52. 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 62 for application details.

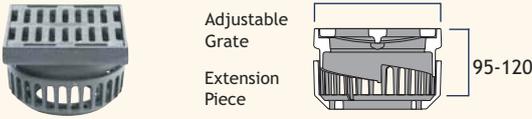
Circular Flat Grate



220 dia
Adjustable Grate
Extension Piece
85-110

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

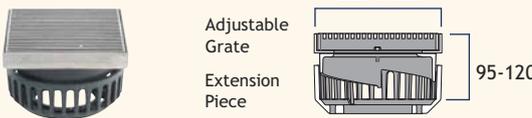
Square Flat Grate - Ductile Iron



225 x 225
Adjustable Grate
Extension Piece
95-120

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



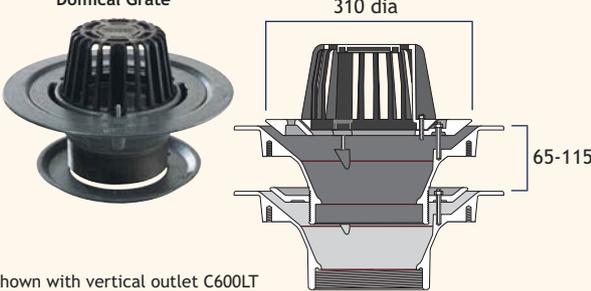
225 x 225
Adjustable Grate
Extension Piece
95-120

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



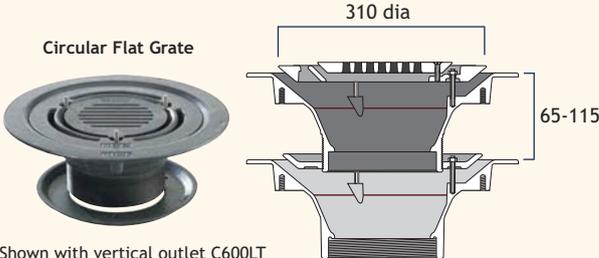
310 dia
65-115

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.

Circular Flat Grate



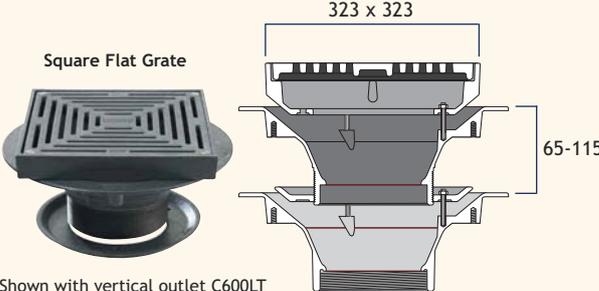
310 dia
65-115

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
65-115

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.

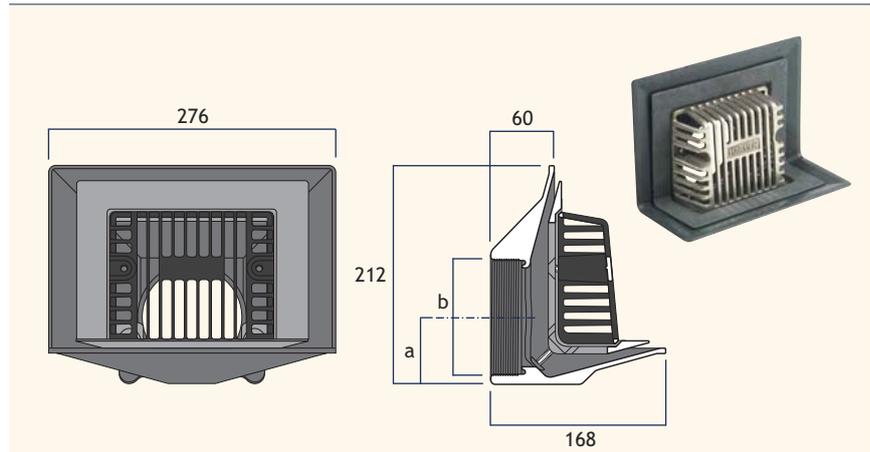
Two-Way Outlet - Rectangular Grate

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 (page 57) and Downspouts (page 56).

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 based on flow rate test data. Where tested flow rates are greater than pipe capacity limits of BS EN 12056, the pipe capacity limit has been shown. Contact Harmer Technical Services for variable outlet performance to specific depth of water and rainfall intensity.

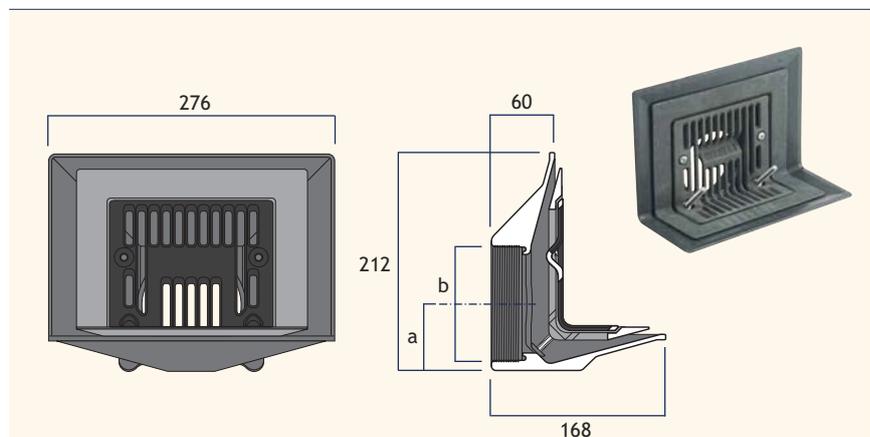


Outlet Size (mm)	Grate Material	a (mm)	b (BSP)	Flow Rate ¹ (l/s)		Load Rating (tonne)	Weight (kg)	Product Code
				vertical	horizontal			
50	Cast iron	38	2"	1.4	0.7	0.3	5.9	CTW2/RC
50	Nickel bronze	38	2"	1.4	0.7	0.3	6.1	CTW2/RN
50	Aluminium	38	2"	1.4	0.7	0.3	5.2	CTW2/RA
75	Cast iron	52	3"	2.6	0.8	0.3	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 (page 57) and Downspouts (page 56).

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	CTW3/FC
100	Cast iron	65	4"	2.6	0.8	0.3	5.5	CTW4/FC

Cast Iron Roof Outlets - Balcony

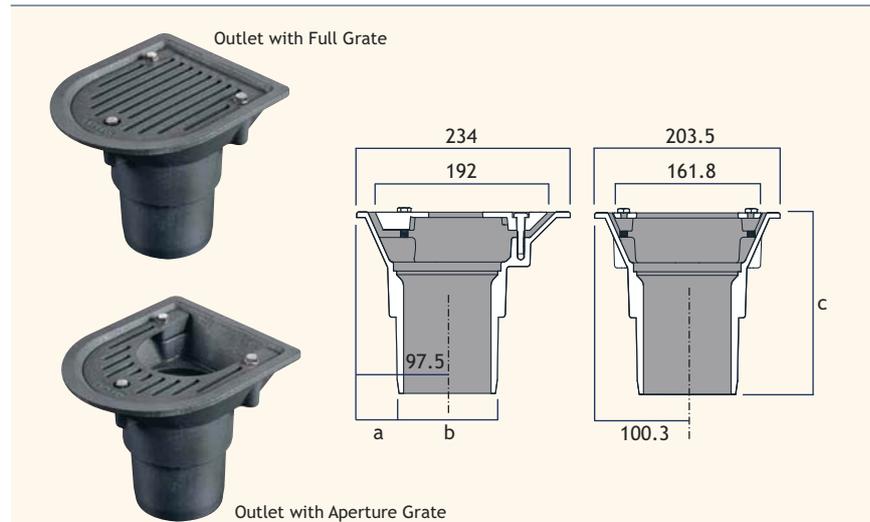
The Harmer Cast Iron Balcony outlet is designed for use with concrete structures whereby a flat grate is required for either a pedestrian accessed area or as internal perimeter drainage for vehicular traffic areas that necessitates the inherent strength of cast iron. This comprises of a medium sump and a clamping grate.

Balcony Outlet - Spigot Connection

The vertical spigot options are suitable for direct connection to cast iron pipework to BS EN 877 and BS 416, HDPE and PVC O-ring socketed pipe to BS 4514 and BS EN1329-1.

Balcony Outlet Grates

Can be used in areas with pedestrian or light traffic (excluding forklift) in commercially used premises. This has been designed to act as a drainage grate and clamp as a single one part component that is secured to the outlet body using stainless steel bolts and washers as provided. Two options are available as either a full or aperture grate. The aperture grate allows for 100mm nominal bore pipework from a higher level to finish within the outlet body. The grate can then be removed for inspection and/or maintenance without the need to move the higher level pipework.

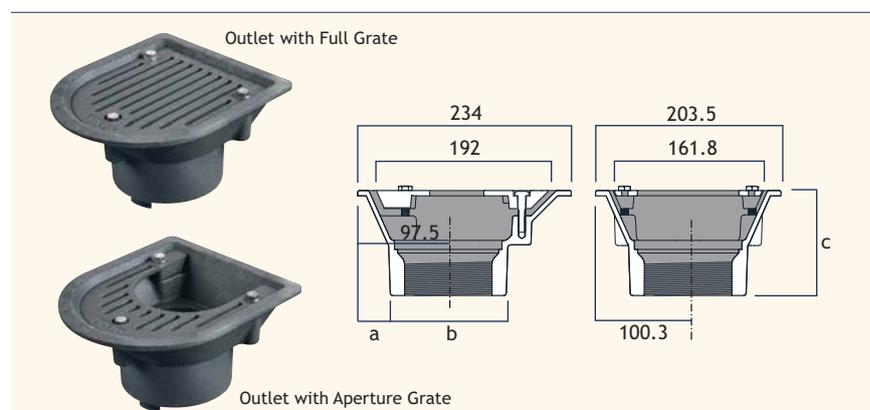


Outlet Size (mm)	Grate Type	a (mm)	b (mm)	c (mm)	Flow Rate ¹ (l/s)	Weight (kg)	Product Code
50	Full	69.5	60.0	231.0	1.7	8.26	C2B0
50	Aperture	69.5	60.0	231.0	1.7	8.12	C2B0/4
75	Full	58.0	82.0	231.0	5.0	7.38	C3B0
75	Aperture	58.02	82.0	231.0	5.0	7.17	C3B0/4
100	Full	44.35	110.0	200.0	5.8	6.54	C4B0
100	Aperture	44.35	110.0	200.0	5.8	6.40	C4B0/4

Balcony Outlet - Threaded BSP Connection

The vertical threaded options 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 (page 57) with the appropriate Harmer coupling (page 58).



Outlet Size (BSP)	Grate Type	a (mm)	b (mm)	c (mm)	Flow Rate ¹ (l/s)	Weight (kg)	Product Code
2"	Full	36	127.3	121.0	1.7	6.63	C2B0/T
2"	Aperture	36	127.3	121.0	1.7	6.31	C2B0/T/4
3"	Full	36	127.3	121.0	5.0	5.81	C3B0/T
3"	Aperture	36	127.3	121.0	5.0	5.49	C3B0/T/4
4"	Full	36	127.3	116.0	5.8	4.63	C4B0/T
4"	Aperture	36	127.3	116.0	5.8	4.31	C4B0/T/4

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.

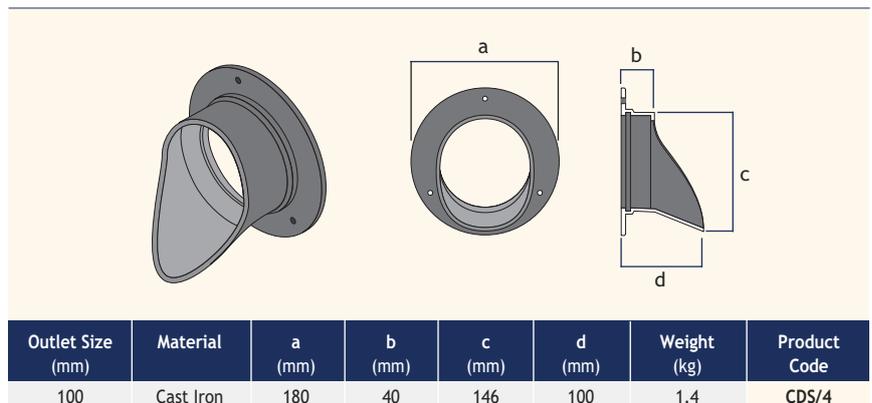
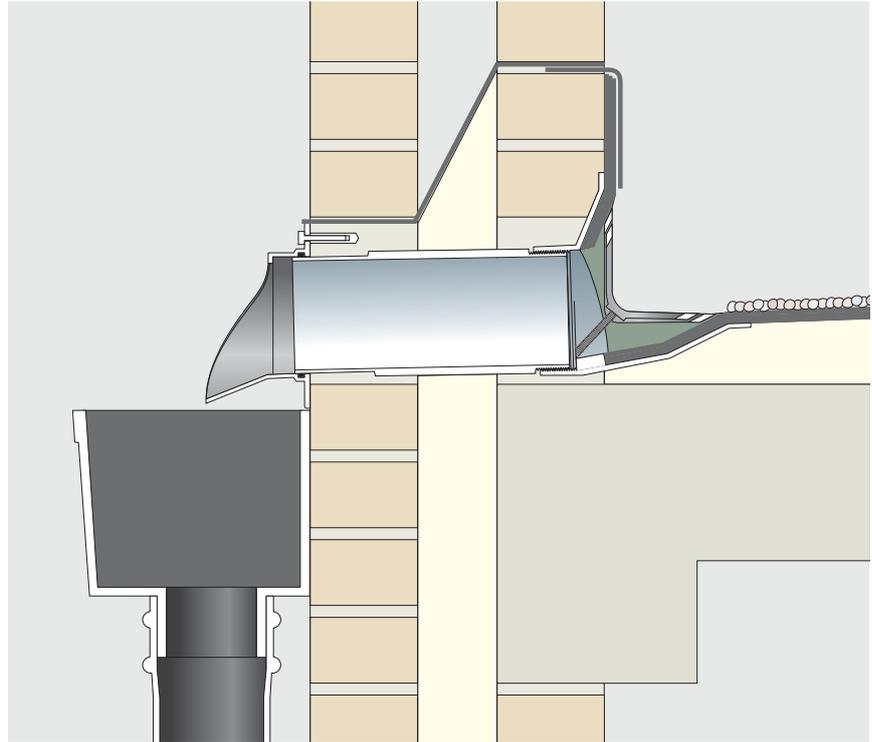
Material - Cast Iron

Finish

Cast iron downspouts are supplied as standard in primed finish for painting on site, or in a choice of colour finishes as available in the Alumasc range of 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.



Cast Iron 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 cast iron 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

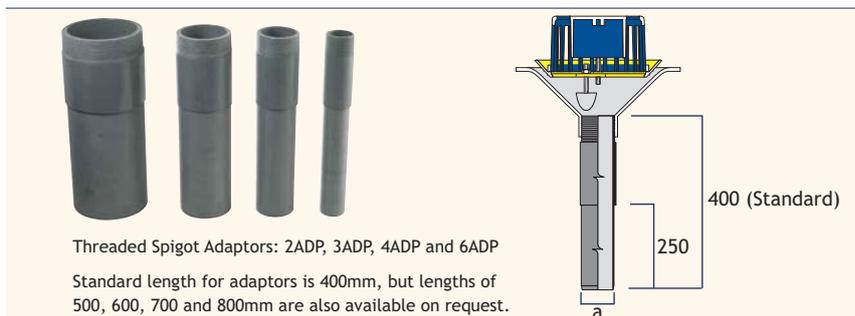
Threaded Spigot Adaptors in ABS plastic are supplied in 400mm lengths, taper-threaded externally at one end to BS EN 10226-1 and chamfered at the other end to BS 4514 and BS EN 1329-1 spigot dimensions. Sizes are available to suit 50, 75, 100 and 150mm nominal bore pipework.

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 58. for appropriate couplings selection.



Threaded Spigot Adaptors: 2ADP, 3ADP, 4ADP and 6ADP
Standard length for adaptors is 400mm, but lengths of 500, 600, 700 and 800mm are also available on request.

Nominal bore (mm)	a (mm)	Length (mm)	Weight (kg)	Product Code
50	55	400	0.4	2ADP
50	55	600	0.6	2ADP/600
75	83	400	0.6	3ADP
75	83	600	0.9	3ADP/600
100	110	400	1.2	4ADP
100	110	600	1.8	4ADP/600
150	160	400	2.0	6ADP
150	160	600	3.0	6ADP/600

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):

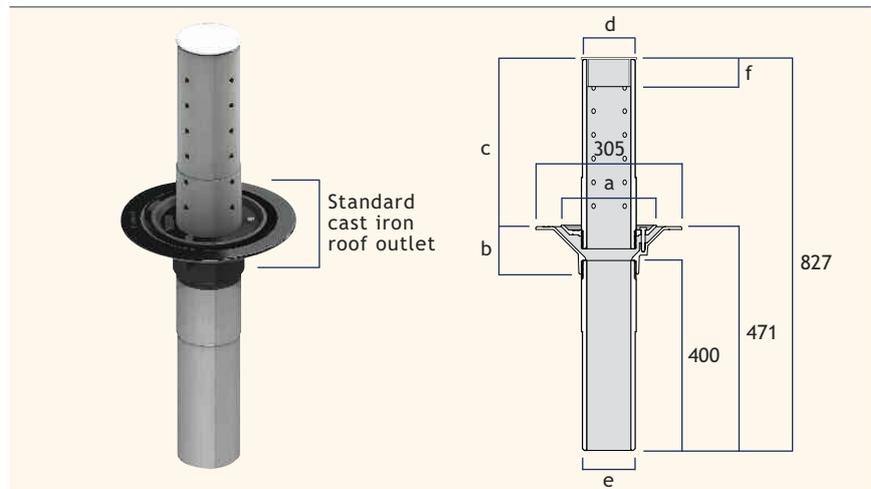
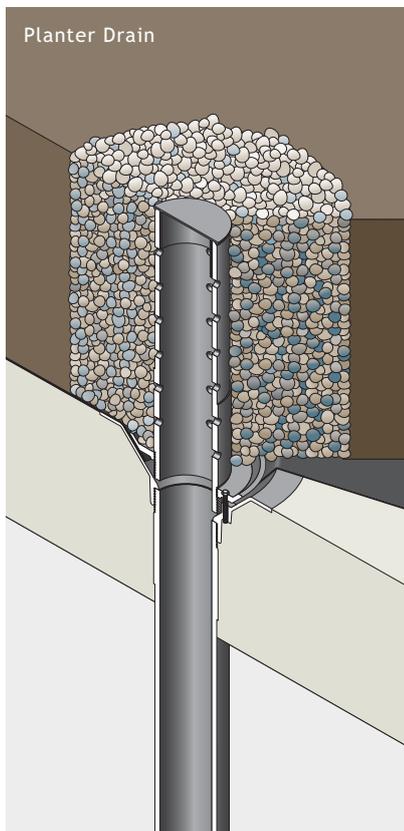
1. Inspect all threads and ensure they are free of dirt and foreign matter.
2. Allow for ventilation and degrease the threads of the outlet using a degreasing agent and fine brush.
3. Using paper towels ensure that threads are dry.
4. Apply a liberal coating of silicone sealant to the threads of the 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.

Cast Iron Roof Outlets - Accessories and Connections

Planter Drain

The Planter Drain consists of a number of parts to be assembled on site using a standard Harmer cast iron roof outlet, ABS adaptor, ABS perforated upstand pipe and an aluminium closure top cap. The perforated standpipe design will allow for slow release of excessive water and moisture as a consequence of rainfall intensity and regular maintenance to hydrate and maintain soil quality in typical green roof applications.



Outlet Type	a (mm)	b (mm)	c (mm)	d (mm)	e (mm)	f (mm)	Weight (kg)	Product Code
Planter Drain	200	100	355	115	110	60	7.9	BVT100/PLANT

Harmer 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

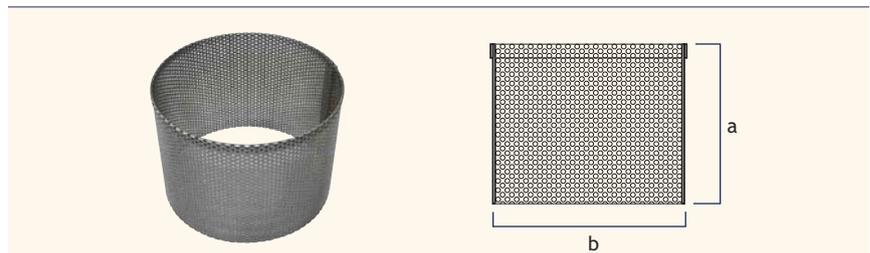
Pipe Connections

Outlet Type	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	SML 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 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 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 - Accessories and Connections

Gravel Guard

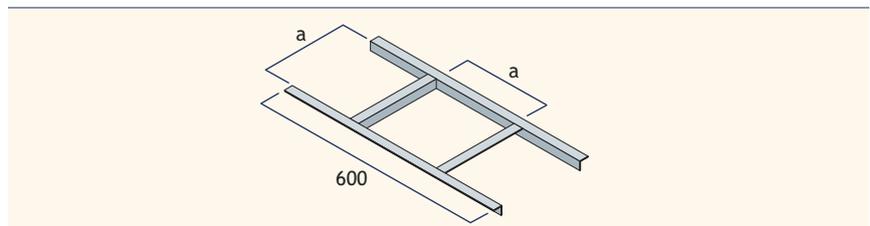
Made of stainless steel, the Gravel Guard is used with Domical Grates on roofs with gravel finish to prevent ingress of insulation and gravel into the outlet. Other heights are available to order.



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.



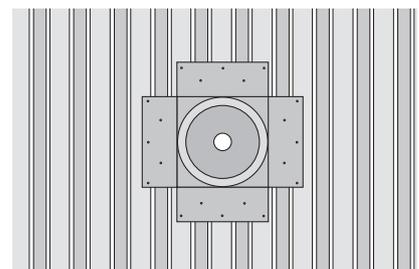
Outlet Type	a (mm)	Weight (kg)	Product Code
Medium Sump	200	2.6	C4/OF

Metal Deck Support Plates

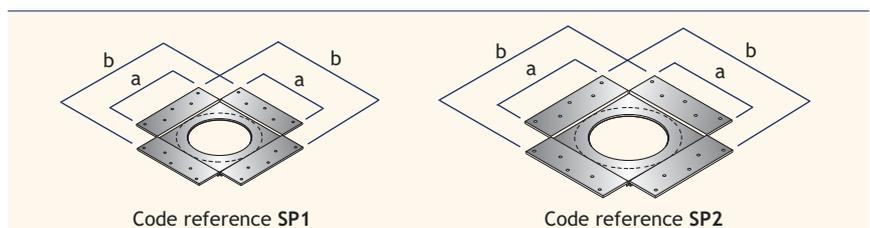
Recommended for use where Harmer cast iron rainwater outlets are installed in metal deck roofs. They are designed to provide a secure and stable junction between the roof deck and rainwater outlet.

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.



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



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 - 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 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 CAST IRON ROOF OUTLETS

Manufacturer: Alumasc Water Management Solutions,
 Station Road, Burton Latimer,
 Kettering, NN15 5JP
 Tel: 01536 383810
 Website: www.harmerdrainage.co.uk, Email: info@alumascwms.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 62-63. For further advice on installation, contact Harmer Technical Helpline 01536 383810.

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:

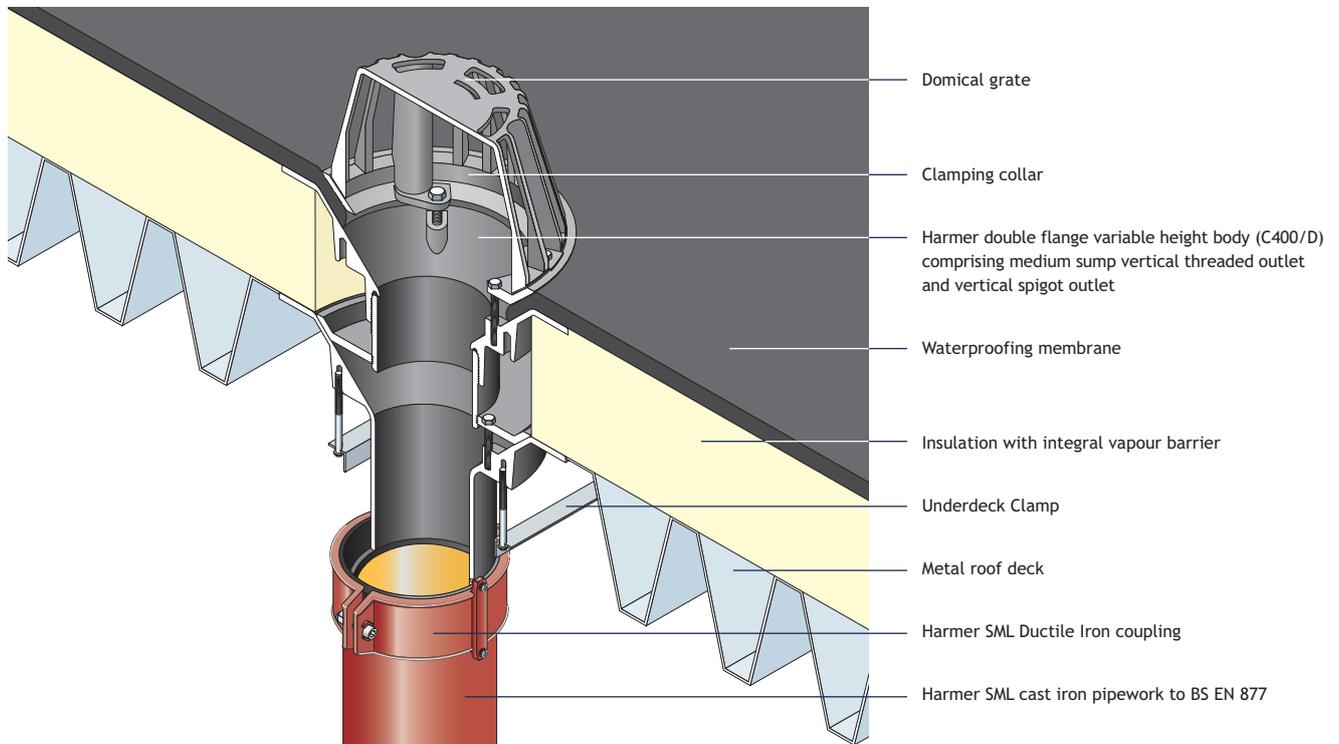
- Inspection of the outlets should be on a regular basis and generally not less than twice annually - Autumn and Spring.
- In locations with nearby trees, leaf congestion will require more frequent clearance.
- Plastic bags blown onto the roof will wash to an outlet position and block the strainer.
- 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

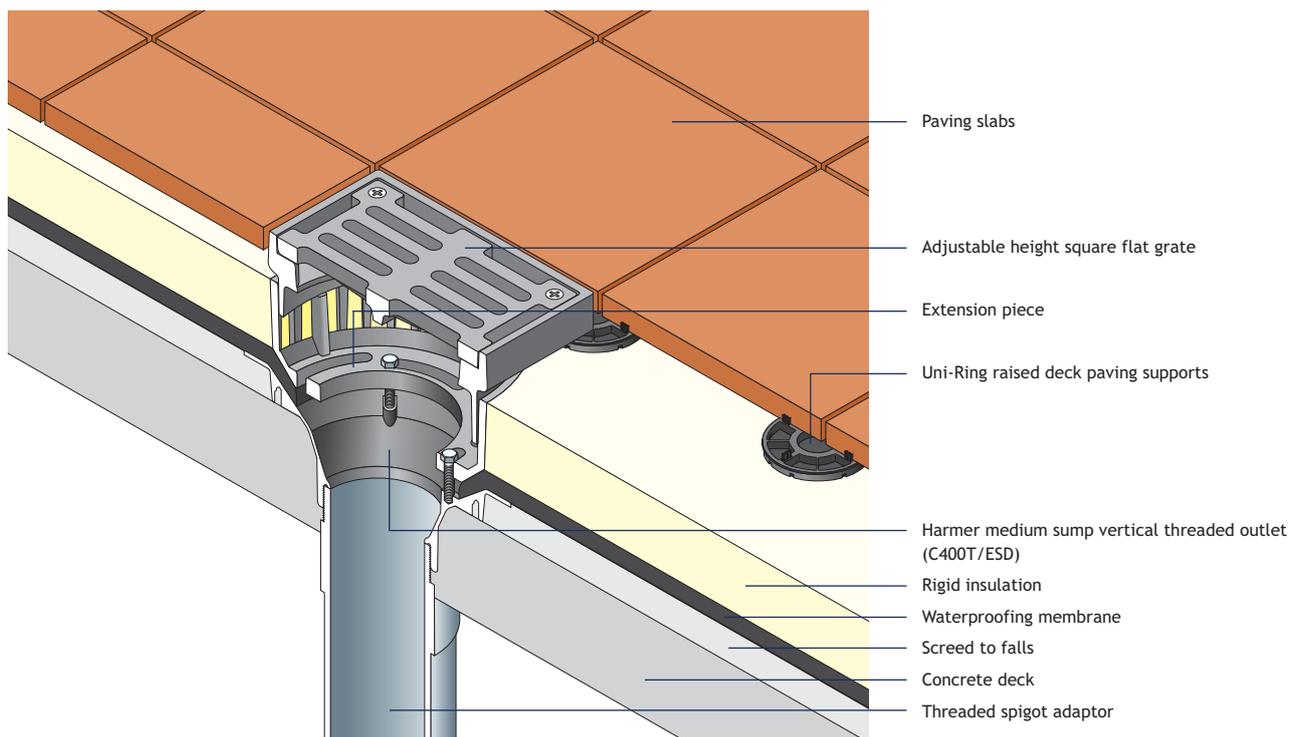
Always refer to current Health & Safety legislation, safe systems of work and the relevant material safety data sheets.

Cast Iron Roof Outlets - Application Details

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

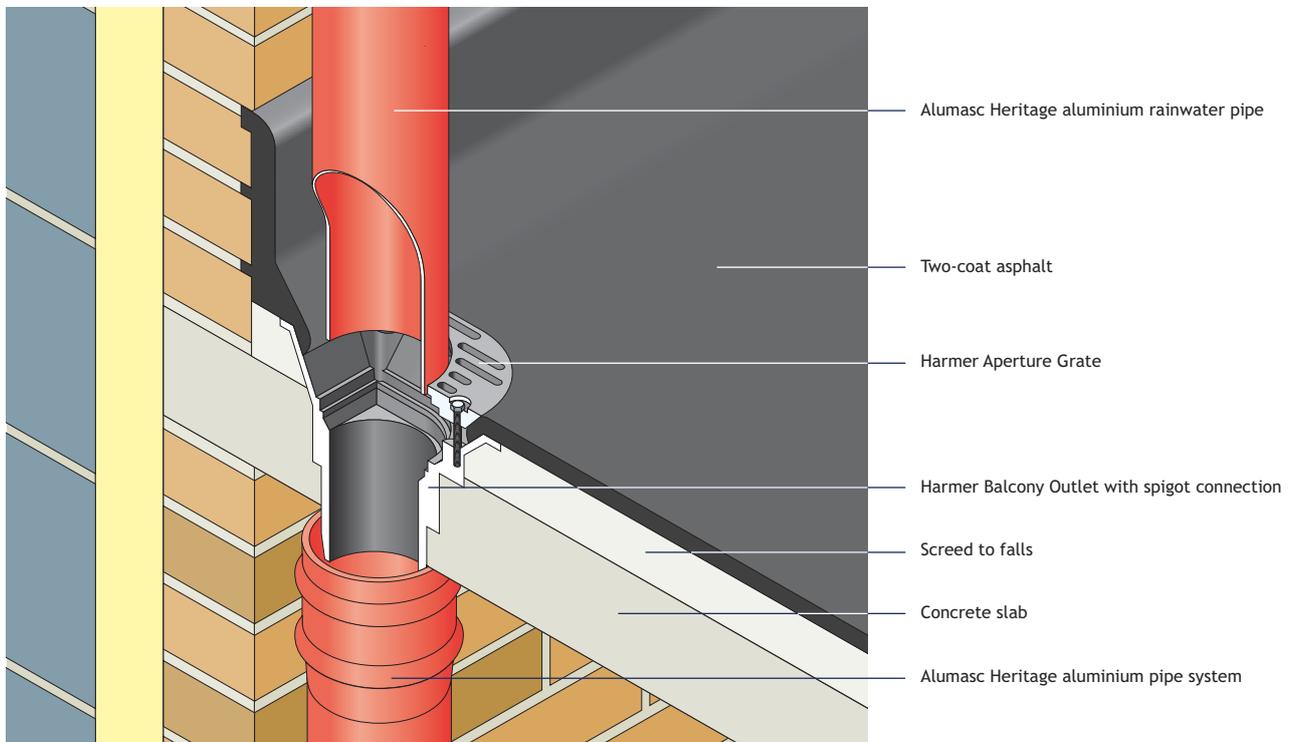


Harmer Medium Sump Vertical Threaded Outlet with Square Grate in Inverted Roof Concrete Deck Construction

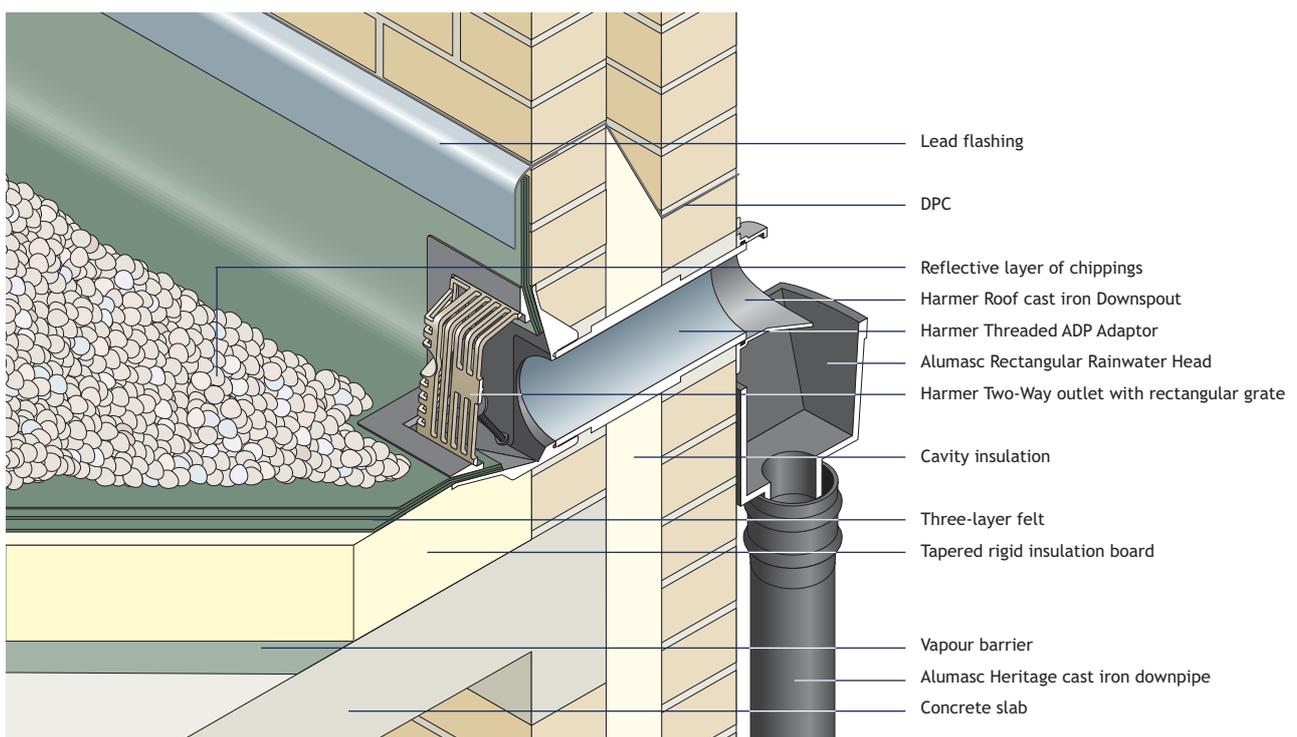


Cast Iron Roof Outlets - Application Details

Harmer Balcony Spigot Outlet with Aperture Gate in 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 thermal 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 vertical and horizontal spigot outlet bodies are also available with a screw flange connection that clamps the main waterproofing membrane to the outlet body.



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

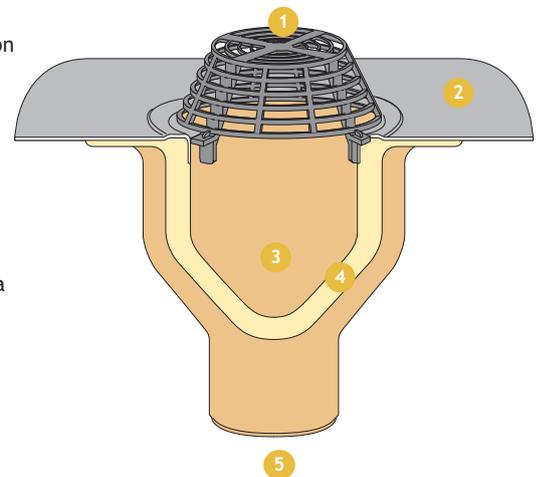
- One piece polyurethane foam body provides a completely watertight connection between roof membrane and rainwater pipe.
- Insulated outlets are available with a flexible connecting membrane fused to the outlet body. The outlet membrane is sealed to the flat roof waterproof membrane, creating a completely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

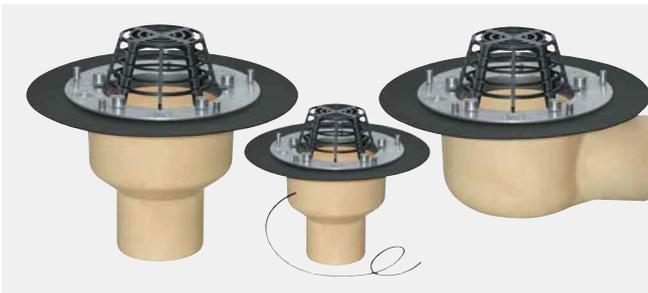


Harmer Roof Insulated outlets, with a choice of elastomeric, PVC or EPDM membrane connections, is a range that includes vertical spigot outlets, shallow sump graduated vertical spigot outlets and horizontal spigot outlets. The membrane bonds to three-layer felts, torch-on roofing and hot asphalt.

Outlets can be supplied with a heat sensor protected electric element moulded into the body.

See page 67.

Outlets with Screw Flange Connection



Harmer Roof Insulated outlets, with a screw flange connection, is a range that includes vertical and horizontal spigot outlets. The screw flange is used to clamp the main roof membrane securely to the outlet.

Both outlet types can be supplied with a heat sensor protected electric element moulded into the body.

See page 68.

SitaEasy Outlets



Harmer SitaEasy insulated outlets is a range that includes a standard right angled outlet, a 45° variant, and a horizontal emergency overflow outlet.

Each outlet has a fused connecting membrane using a choice of PVC, EPDM, TPO or EB materials.

See page 69.

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 70.

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 – with Membrane

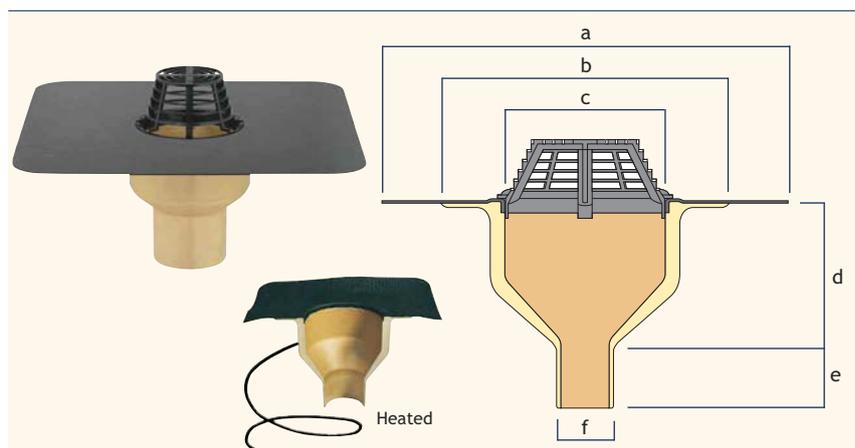
The Harmer Roof Insulated Vertical Spigot outlet comprises a rigid foamed polyurethane body 22mm thick and a 495mm square elastomeric bitumen connecting membrane fused to the body of the outlet. This membrane bonds to three-layer felts, torch-on roofing and hot asphalt.

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	7.4	1001*	1005*
150	495	335	192	122	69	160	7.2	1003*	1007*

* To specify or order please add the appropriate membrane code to the product code as follows:
 EB - Elastomeric membrane (add EB to 1000, 1001, 1003, 1004, 1005 or 1007)
 PVC - PVC membrane (add PVC to 1000, 1001, 1003, 1004, 1005 or 1007)
 DM - EPDM membrane (add DM to 1000, 1001, 1003, 1004, 1005 or 1007).
 Other membranes available on request.

When using flat grate, add /F to product code reference.

A range of accessories is available for use with special detail requirements (See pages 70).

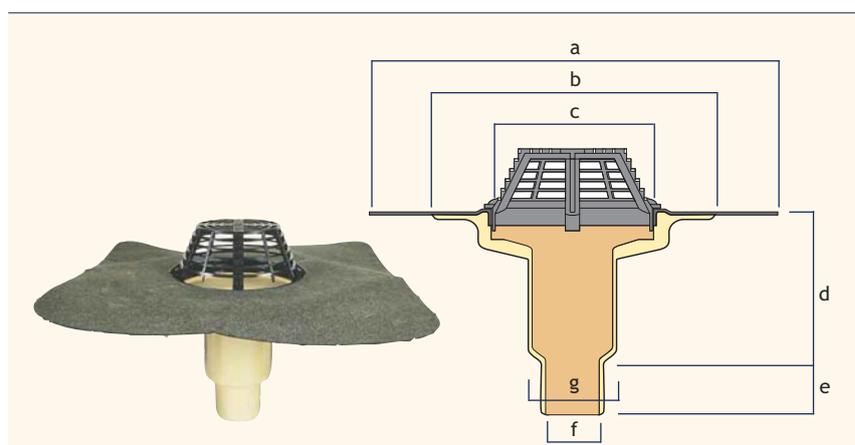
Shallow Sump Graduated Vertical Spigot Outlet – with Membrane

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.

Flow Rate Note 1 (applies to both tables)
 Flow rates are in litres per second based on flow rate test data. Where tested flow rates are greater than pipe capacity limits of BS EN 12056, the pipe capacity limit has been shown. 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)	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 (add EB to 1017)
 PVC - PVC membrane (add PVC to 1017)
 DM - EPDM membrane (add DM to 1017).
 Other membranes available on request.

When using flat grate, add /F to product code reference.

A range of accessories is available for use with special detail requirements (See pages 70).

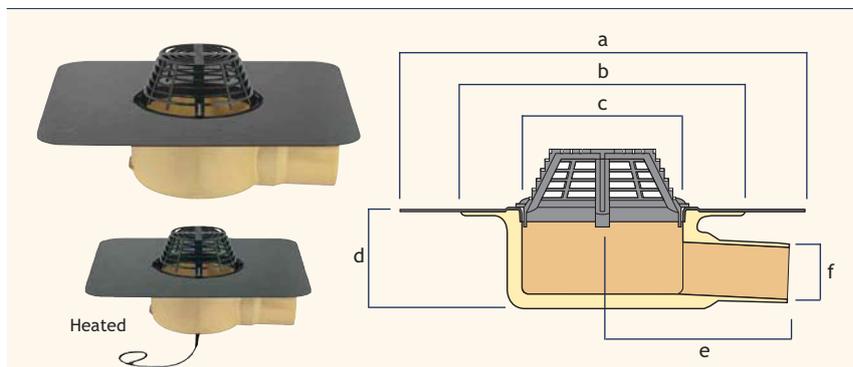
Insulated Roof Outlets - Product Tables

Horizontal Spigot Outlet – with 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 (add EB to 1008, 1009, 1011, or 1012)
 PVC - PVC membrane (add PVC to 1008, 1009, 1011, or 1012)
 DM - EPDM membrane (add DM to 1008, 1009, 1011, or 1012).
 Other membranes available on request.

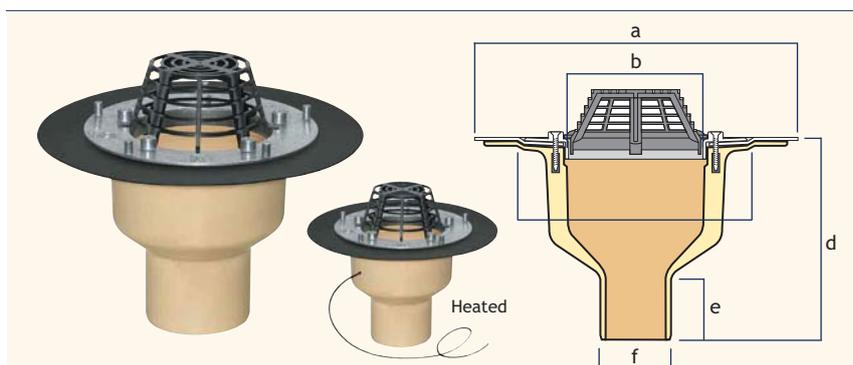
When using flat grate, add /F to product code reference.

A range of accessories is available for use with special detail requirements (See pages 70).

Vertical Spigot Outlet – with 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 main roof membrane securely to the outlet.

The outlets are supplied with a black polyamid domical grate.

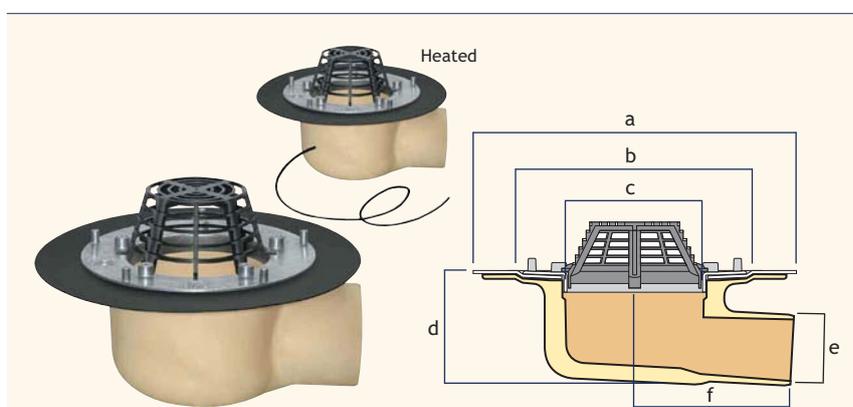


Outlet Size (mm)	a (mm)	b (mm)	c (mm)	d (mm)	e (mm)	f (mm)	Flow Rate ¹ (l/s)	Product Code	
								Unheated	Heated
75	320	144	250	210	63	75	4.97	1502	1503
100	320	144	250	210	75	110	6.53	1504	1505

Horizontal Spigot Outlet – with 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 main 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	250	192	140	110	162	6.10	1516	1517

Flow Rate Note 1 (applies to all 3 tables)
 Flow rates are in litres per second based on flow rate test data. Where tested flow rates are greater than pipe capacity limits of BS EN 12056, the pipe capacity limit has been shown. Contact Harmer Technical Services for variable outlet performance to specific depth of water and rainfall intensity.

Insulated Roof Outlets - Product Tables

SitaEasy

The Harmer insulated standard right angled roof outlet comprises of a rigid formed polyurethane body 22mm thick and with a 300 x 495 x 194mm elastomeric bitumen connecting membrane fused to the body of the outlet. This membrane bonds to 3 layer felts, torch-on roofing and hot asphalt.

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

Specifically designed as a parapet outlet to take rainwater discharge from a roof area, horizontally through the wall combined with associated pipework to the outside of the building.

Outlet Size (mm)	a (mm)	b (mm)	c (mm)	d (mm)	e (mm)	f (mm)	Flow Rate ¹ (l/s)	Product Code
50	142	107	68	300	194	495	0.9	1830*
70	142	107	68	300	194	495	0.9	1832*
100	142	107	68	300	194	495	2.0	1834*

*Available with different membranes

SitaEasy Go

This is a variant on the standard SitaEasy with a 45 degree wedge formation made within the drain body shape to offer easier bonding of roof membranes for sealed roof areas such as balconies and terraces.

The Harmer SitaEasy Go provides the perfect solution for bitumen covered roof areas requiring horizontal rainwater parapet discharge.

The outlet comprises of a rigid formed polyurethane body 22mm thick and with a 274 x 495 x 250mm elastomeric bitumen connecting membrane fused to the body of the outlet. This membrane bonds to 3 layer felts, torch-on roofing and hot asphalt. This model is not available for other versions of roof membranes.

Outlet Size (mm)	a (mm)	b (mm)	c (mm)	d (mm)	e (mm)	f (mm)	Flow Rate ¹ (l/s)	Product Code
100	140	208	110	250	274	495	4.0	183800

SitaEasy Plus

The Harmer SitaEasy Plus is a horizontal overflow outlet for emergency drainage. It comprises of a rigid formed polyurethane body 22mm thick and with an elastomeric bitumen connecting membrane fused to the body of the outlet. This membrane bonds to 3 layer felts, torch-on roofing and hot asphalt.

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

Flow Rate Note 1 (applies to SitaEasy and SitaEasy Go tables only)
Flow rates are in litres per second based on flow rate test data. Where tested flow rates are greater than pipe capacity limits of BS EN 12056, the pipe capacity limit has been shown. 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)	Product Code
70	177	75	300	65	1802*
100	260	105	495	108	1804*
150	293	115	495	146	1808*

*Available with different membranes

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 either connecting membrane or screw flange.

Connection to Outlet

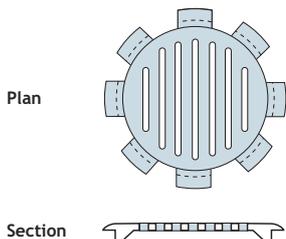
The Extension Piece is sealed into the mouth of the insulated outlet by means of a neoprene seal. See application detail on page 72 showing Extension Piece with EB connecting membrane bonded to three-layer roofing felt.

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.

Product code for Flat Grate - INSUL/FG
Use suffix /F after outlet product code if Flat Grate is required.



Flat Grate & Terrace Kit cannot be used with Screw Flange Outlet Extension Piece.

Extension Piece Type	a (mm)	b (mm)	c (mm)	d (mm)	e (mm)	f (mm)	Product Code
Membrane outlet	459	340	189	50	204	170	1014

Extension Pieces are sized for direct connection to Spigots.

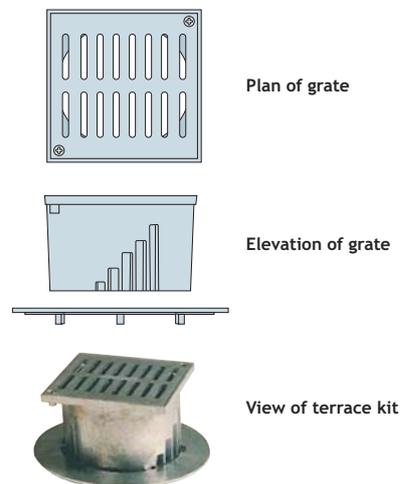
Extension Piece Type	a (mm)	b (mm)	c (mm)	d (mm)	e (mm)	f (mm)	Product Code
Screw flange outlet	320	188	146	50	355	132	152799

Extension Pieces are sized for direct connection to Spigots.

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 remainder of the Terrace Kit 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.

Product code for Terrace Kit - 1016



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 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 INSULATED ROOF OUTLETS

Manufacturer: Alumasc Water Management Solutions,
Station Road, Burton Latimer,
Kettering, NN15 5JP
Tel: 01536 383810
Website: www.harmerdrainage.co.uk, Email: info@alumascwms.co.uk

Outlet: Harmer Insulated Rigid PU

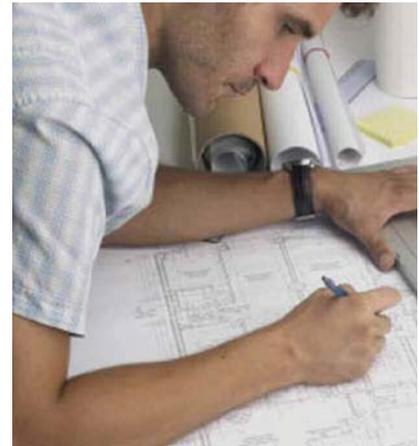
Type: Insulated Spigot Outlets

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.

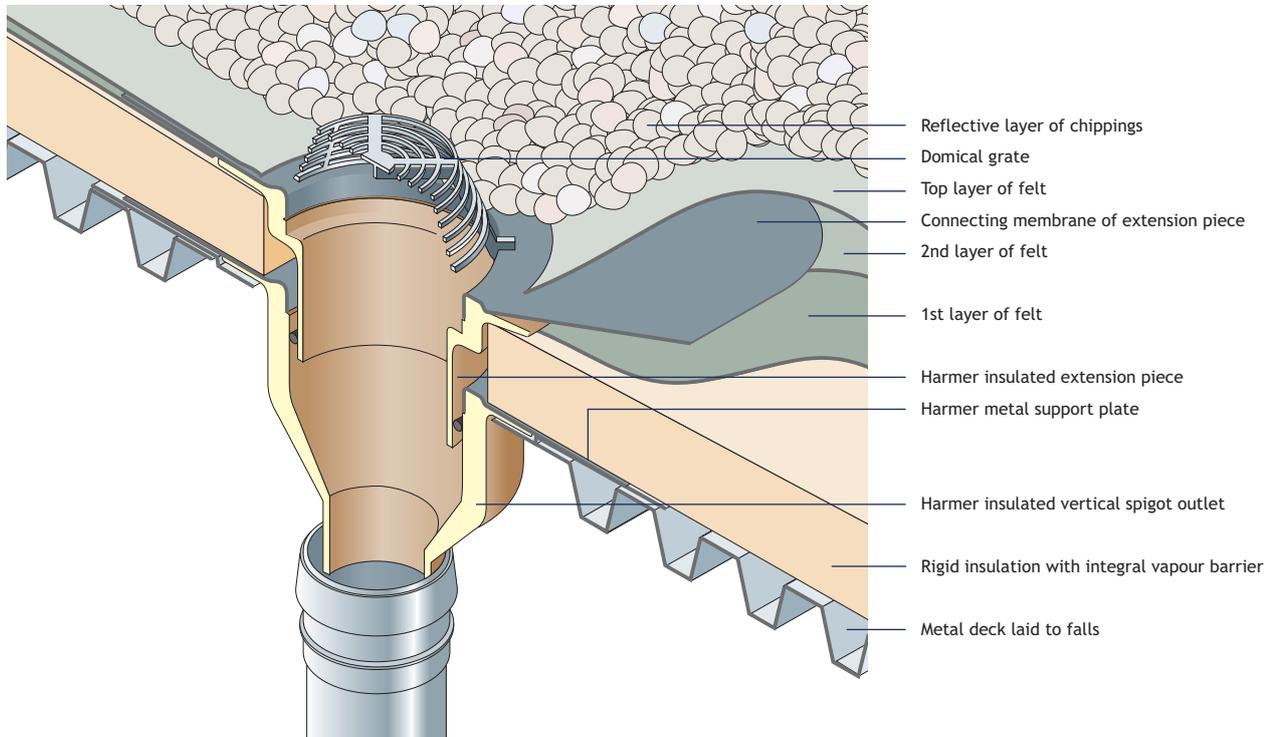
Key Features

- 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

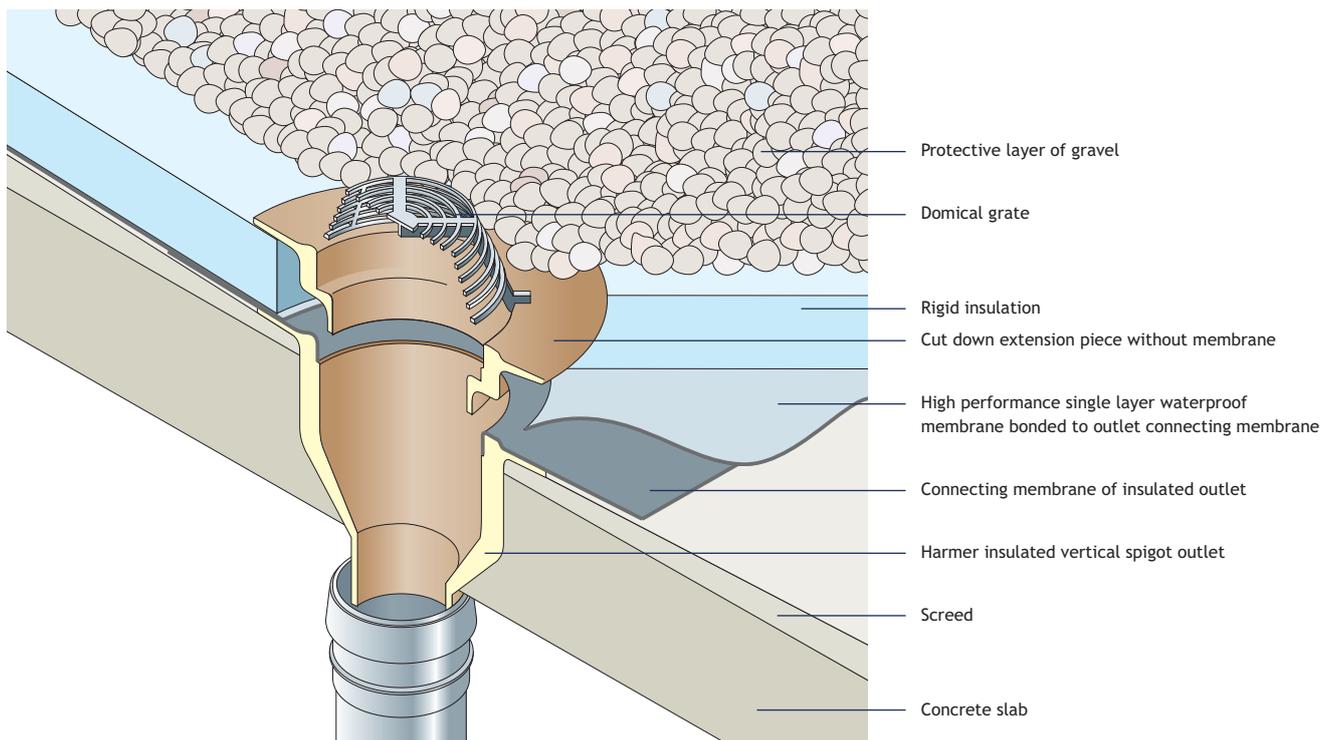


Insulated Roof Outlets - Application Details

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

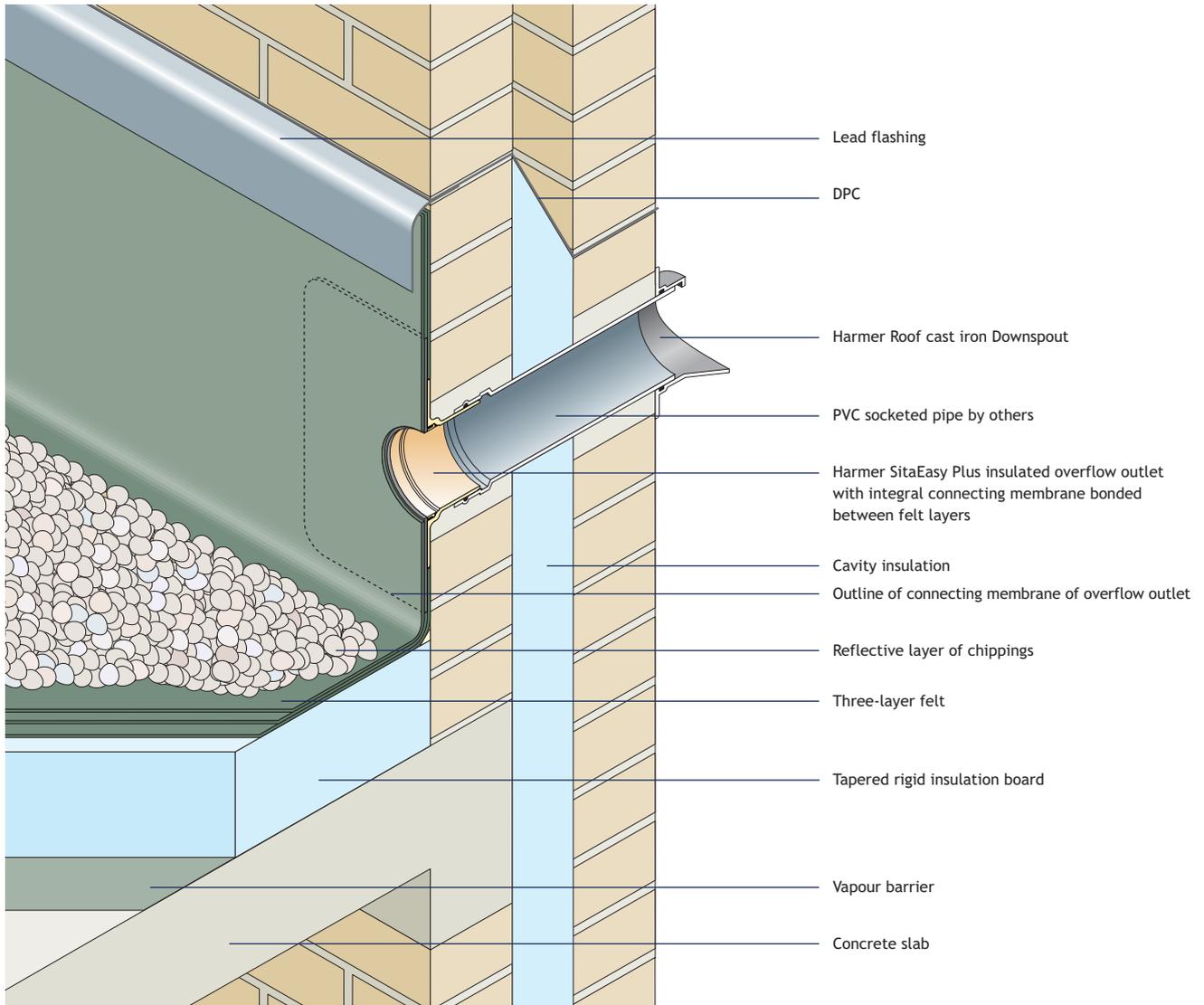


Harmer Insulated Outlet with Connecting Membrane and Cut Down Extension Piece in Inverted Roof Construction



Insulated Roof Outlets - Application Details

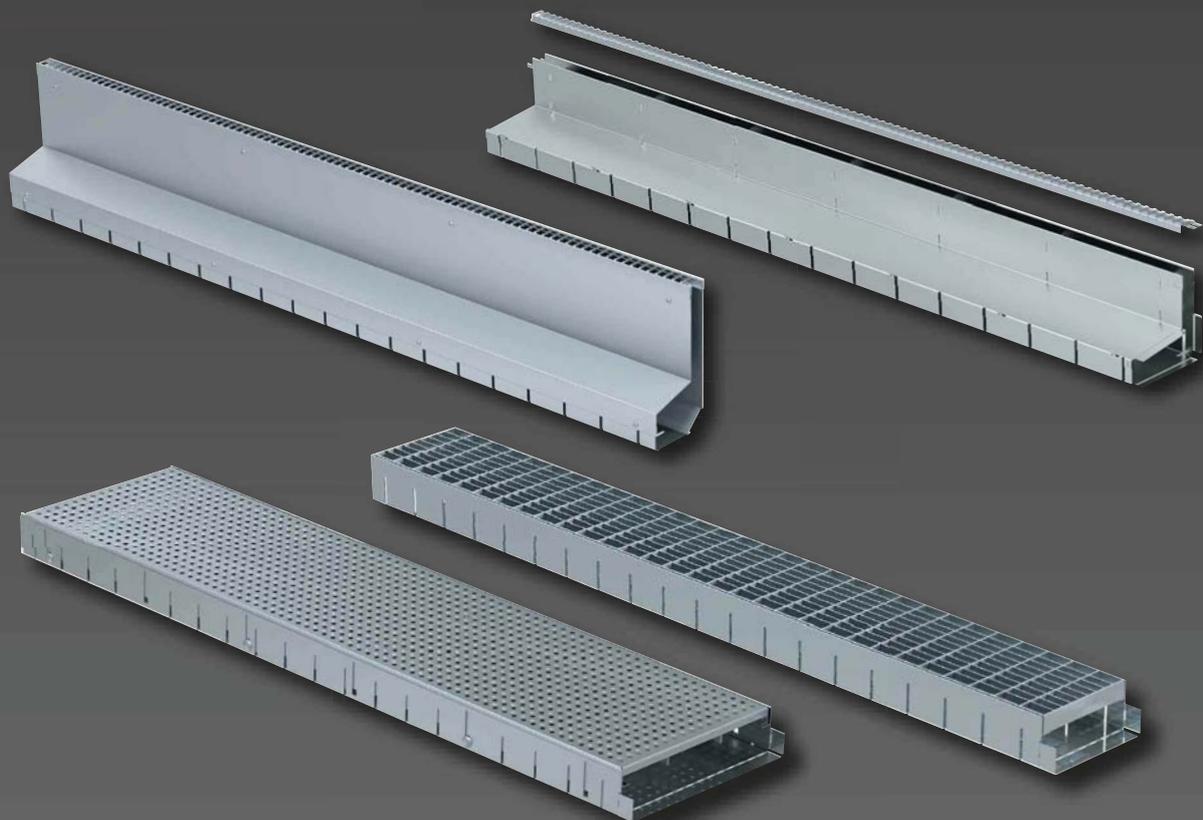
Harmer SitaEasy Plus Insulated Overflow Outlet with Connecting Membrane in Warm Roof Concrete Deck Construction



Harmer Roof Drainage The Modulock Channel Drain Ranges

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

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



Modulock Roof Channel Drains - Benefits

Harmer Modulock Channel Drain ranges are highly versatile linear drainage systems 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, and then ducted away to drainage outlets.

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.

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 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

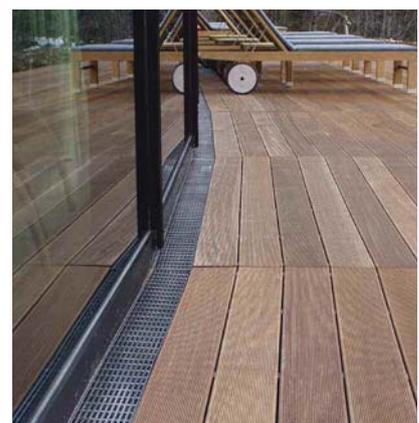
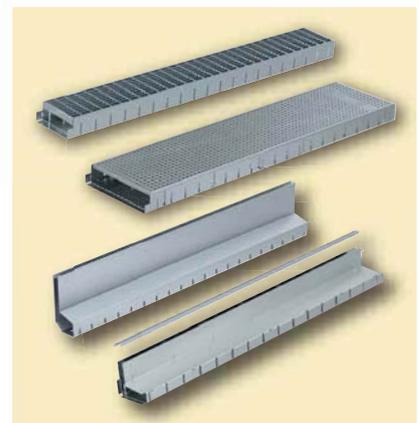
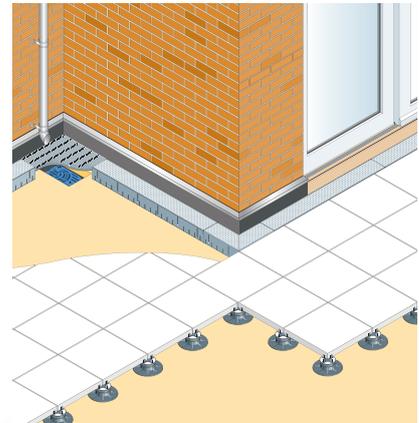
- A rainwater channel system in three nominal width sizes consisting of slotted sides with either a grill or slotted grating. Rainwater runoff is collected at hard surface level whilst percolation is relieved at membrane level.

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, site formed irregular angles accommodate change in direction. Gratings adjust vertically within the channel to elevate and correct cross falls and any irregularities in the supporting surface.



Modulock Roof Channel Drains - Product Range Summary

Designed for perimeter drainage of inverted roof and warm roof constructions, the Harmer Modulock Straight Channel range, manufactured in either stainless steel or galvanised mild steel, is available in 130mm, 200mm and 250mm widths, with either variable or fixed depths.

Two types of Harmer Modulock Slot Channel are also available - Facade and Terrace. The Facade range is manufactured in either stainless or galvanised steel. The Terrace range is manufactured in stainless steel only.

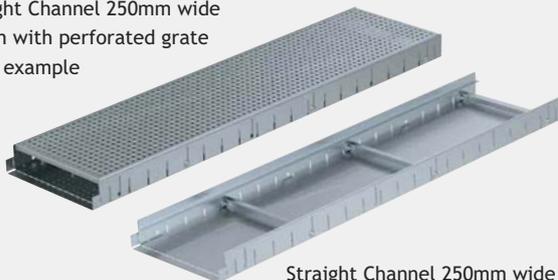
Straight Channels and Grates

Straight Channel 130mm wide
shown with mesh grate
as an example



Straight Channel 130mm wide

Straight Channel 250mm wide
shown with perforated grate
as an example



Straight Channel 250mm wide

2000mm, 1000mm and 500mm long channels in two widths of 130mm and 250mm, available in fixed heights of 55mm, 75mm and 140mm, or with adjustable heights ranging from 55-90mm and 90-150mm. The channels can have either perforated or closed sides. The channels are manufactured in stainless steel Grade 304 or galvanised mild steel.

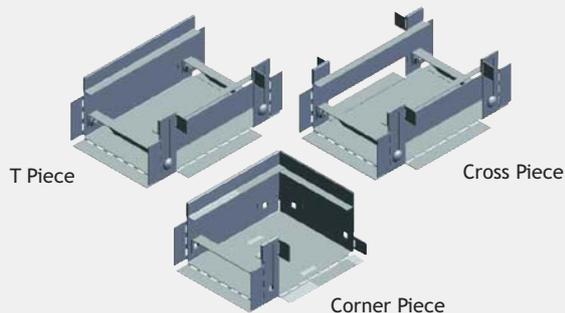
The 130mm wide channels have a choice of 6 types of grate. The 250mm wide channels have a choice of 4 types of grate. The grates have Load Class K3. The grates are manufactured in stainless steel Grade 304 or galvanised mild steel.

A 200mm wide channel in a fixed height of 55mm with a mesh grate is also available in 1000mm and 500mm lengths.

Channel lengths slot together via tongue and groove joints.

See pages 78, 79, 80 and 81.

90° Connections - Corner Pieces, Cross Pieces and T-Pieces for Straight Channels



T Piece

Cross Piece

Corner Piece

Prefabricated 90° Corners, Cross Pieces and T-pieces are used with the 130mm and 250mm wide channels. They have adjustable heights ranging from 55-90mm and 90-150mm. The 90° connections are manufactured in stainless steel Grade 304 or galvanised mild steel.

As with the channels, the 90° connections slot together via tongue and groove joints.

See pages 78 and 80.

Outlet Channels and Drain Trap for Straight Channels



Drain Trap components

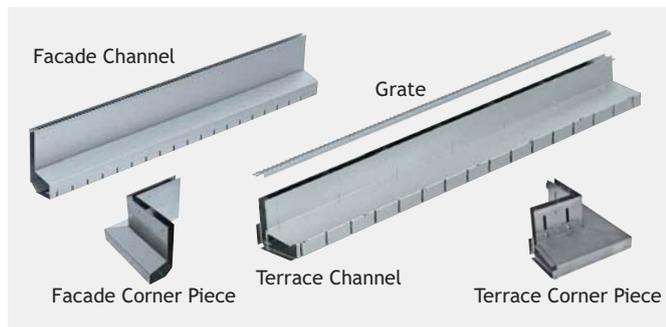
Adjustable height and fixed height channels are available with vertical drainage outlets. They can be used with a drain trap.

See pages 79 and 81.

Modulock Roof Channel Drains - Product Range Summary

130mm and 250mm wide Straight Channels are available in either fixed depth versions or as versions that can be altered in depth using the integral adjustment mechanism. The 200mm wide Straight Channel is only available in a fixed depth version. For the 130mm and 250mm wide Straight Channels, grates are available in six and four different profiles respectively. The 200mm wide version has just one grate profile. All grates can be made in stainless steel or galvanised mild steel. Facade Slot Grates are available in stainless or galvanised steel. Terrace Slot Grates are available in stainless steel only. Laid directly on the structural deck, all Straight and Slot Channels are rated Load Class K3.

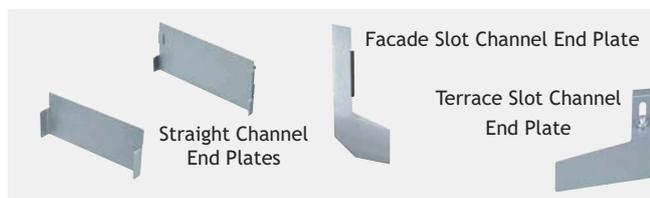
Facade & Terrace Slot Channels, Grate and 90° Corner Pieces



Facade Slot Channels are located directly against a facade where an architectural, narrow slot is required. Channels, Corner Pieces and Grates are available in stainless or galvanised steel. No height adjustment is provided.

Terrace Slot Channels are used for small terrace areas where paving construction depth is shallow (80-130mm). See pages 83 and 84.

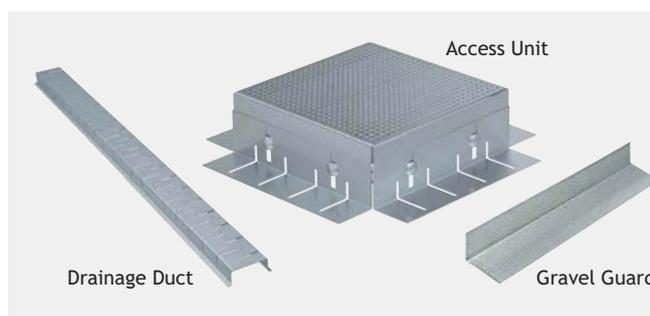
End Plates



End Plates are channel stops that prevent leaves and wind-blown rubbish from congesting the waterway. Vermin are prevented from using the channel as a means of escape.

See pages 79, 81, 83 and 84.

Standard Accessories



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

The range includes Access Units and Grates, Maintenance Units and Grates, Gravel Guard and Drainage Duct.

See page 82.

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 85.

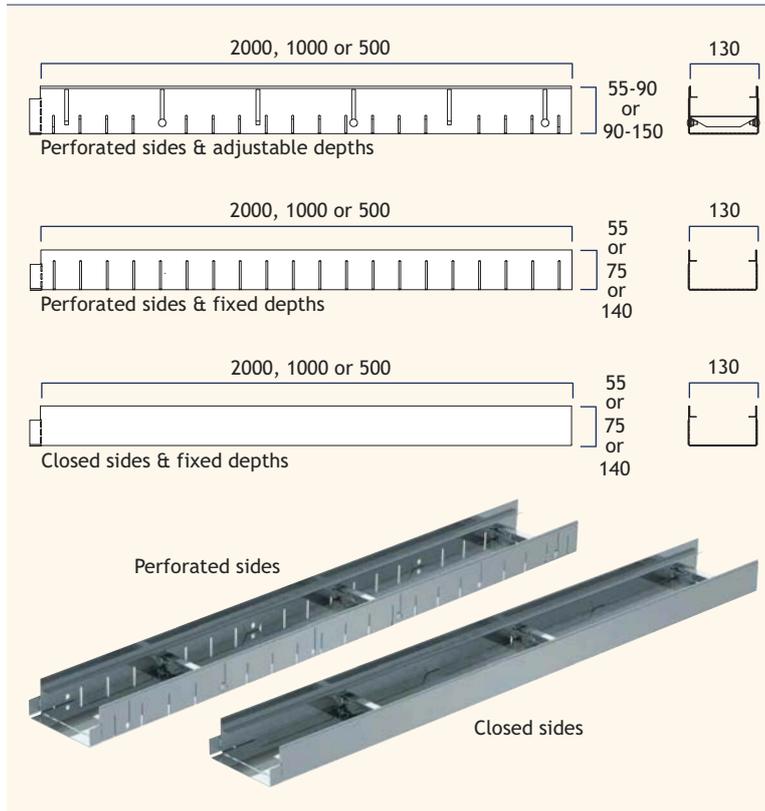


Modulock Roof Channel Drains - Product Tables

Straight Channels: 130mm Wide

130mm Straight Channels

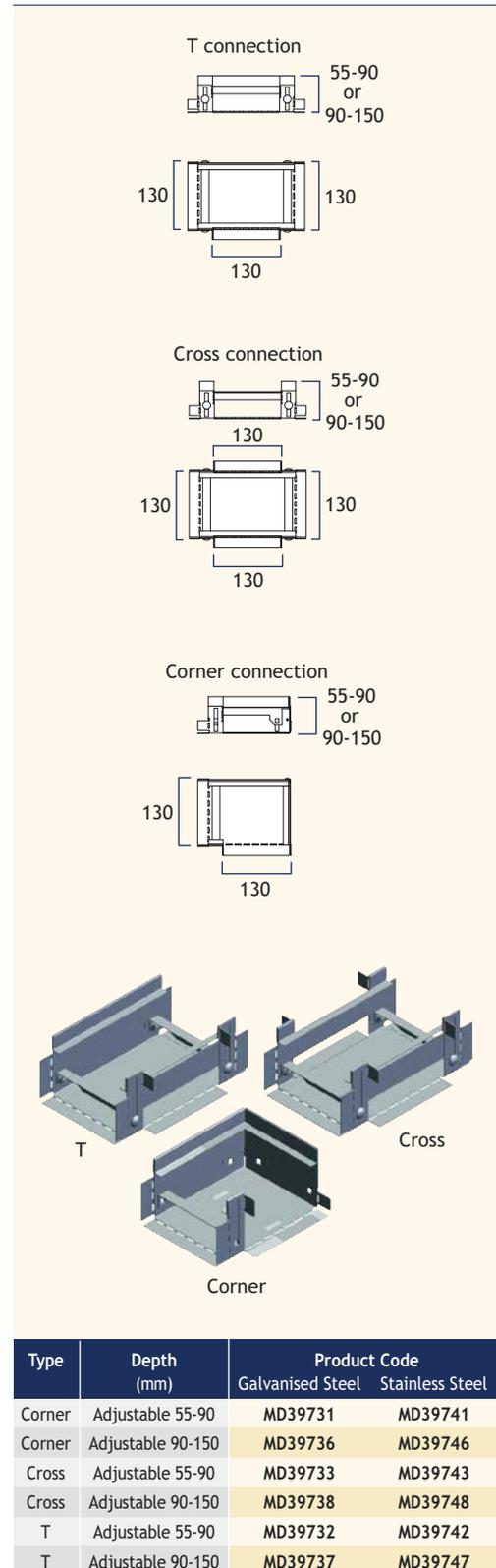
The Channel Drains are 130mm wide and made in 2000mm, 1000mm and 500mm lengths, with a choice of perforated or open sides. The depths of the Channels can be adjustable or fixed. The Channel lengths are slotted together.



Channel Side Type	Length (mm)	Depth (mm)	Product Code	
			Galvanised Steel	Stainless Steel
Perforated	2000	Adjustable 55-90	MD39162	MD39262
Perforated	2000	Adjustable 90-150	MD39182	MD39282
Perforated	2000	Fixed 55	MD39132	MD39232
Perforated	2000	Fixed 75	MD39142	MD39242
Perforated	2000	Fixed 140	MD39152	MD39252
Closed	2000	Fixed 55	MD39135	MD39235
Closed	2000	Fixed 75	MD39145	MD39245
Closed	2000	Fixed 140	MD39155	MD39255
Perforated	1000	Adjustable 55-90	MD39161	MD39261
Perforated	1000	Adjustable 90-150	MD39181	MD39281
Perforated	1000	Fixed 55	MD39131	MD39231
Perforated	1000	Fixed 75	MD39141	MD39241
Perforated	1000	Fixed 140	MD39151	MD39251
Closed	1000	Fixed 55	MD39134	MD39234
Closed	1000	Fixed 75	MD39144	MD39244
Closed	1000	Fixed 140	MD39154	MD39254
Perforated	500	Adjustable 55-90	MD39160	MD39260
Perforated	500	Adjustable 90-150	MD39180	MD30280
Perforated	500	Fixed 55	MD39130	MD39230
Perforated	500	Fixed 75	MD39140	MD39240
Perforated	500	Fixed 140	MD39150	MD39250
Closed	500	Fixed 55	MD39133	MD39233
Closed	500	Fixed 75	MD39143	MD39243
Closed	500	Fixed 140	MD39153	MD39253

Corner, Cross & T Connections

These prefabricated components provide a continuous change of direction and slot together with the Straight Channels. Depths are adjustable.



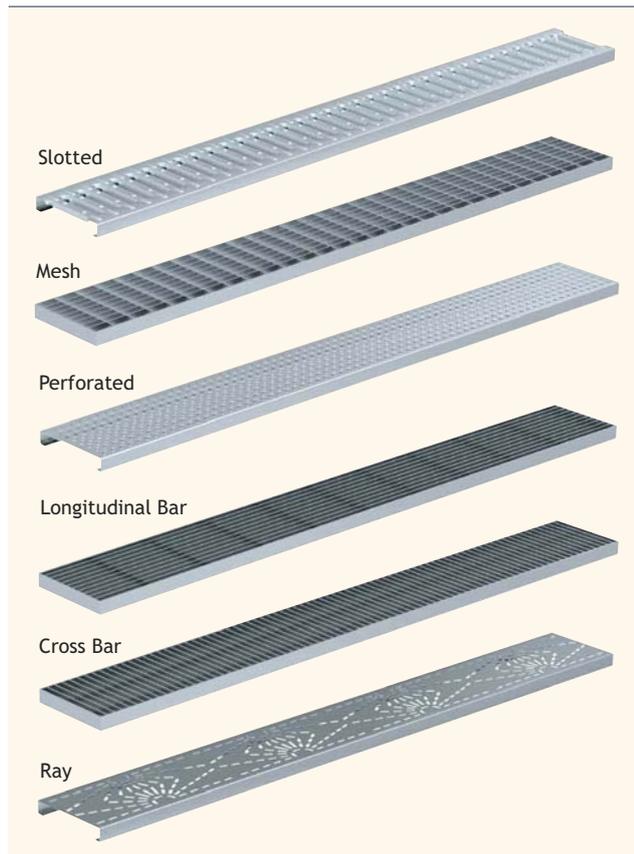
Type	Depth (mm)	Product Code	
		Galvanised Steel	Stainless Steel
Corner	Adjustable 55-90	MD39731	MD39741
Corner	Adjustable 90-150	MD39736	MD39746
Cross	Adjustable 55-90	MD39733	MD39743
Cross	Adjustable 90-150	MD39738	MD39748
T	Adjustable 55-90	MD39732	MD39742
T	Adjustable 90-150	MD39737	MD39747

Modulock Roof Channel Drains - Product Tables

Straight Channels: 130mm and 200mm Wide

Grates

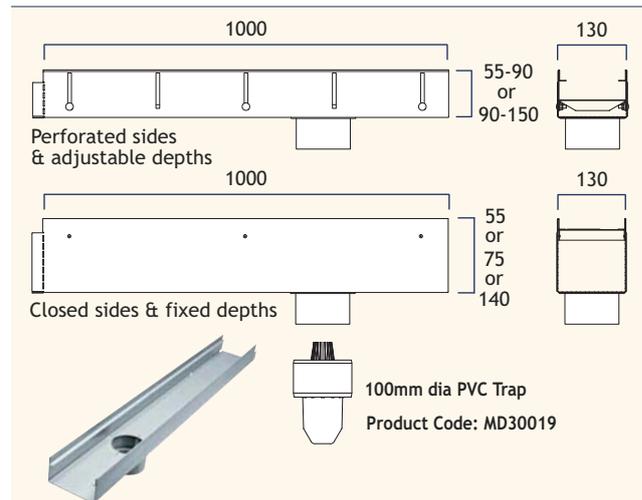
Grates are 130mm wide and available in 6 different designs in either stainless steel or galvanised steel. 90° corners can be butt jointed or mitred on site.



Grate Type	Grate Length (mm)	Product Code	
		Galvanised Steel	Stainless Steel
Slotted	1000	MD37302	MD37332
Slotted	500	MD37303	MD37333
Mesh	1000	MD37300	MD37330
Mesh	500	MD37301	MD37331
Perforated	1000	MD37304	MD37334
Perforated	500	MD37305	MD37335
Longitudinal Bar	1000	MD37306	MD37336
Longitudinal Bar	500	MD37307	MD37337
Cross Bar	1000	MD37308	MD37338
Cross Bar	500	MD37309	MD37339
Ray	1000	MD37310	MD37340
Ray	500	MD37311	MD37341

Outlet Channels & Trap

The Outlet Channels slot together with the Straight Channels. The depths can be adjustable or fixed, with a choice of perforated or open sides. The trap fits inside the outlet of the channel.



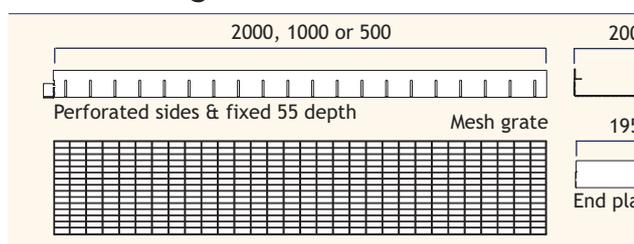
Channel Side Type	Depth (mm)	Product Code	
		Galvanised Steel	Stainless Steel
Perforated	Adjustable 55-90	MD39703	MD39708
Perforated	Adjustable 90-150	MD39704	MD39709
Closed	Fixed 55	MD39700	MD39705
Closed	Fixed 75	MD39701	MD39706
Closed	Fixed 140	MD39702	MD39707

End Plates

End Plates form a stop to the channel drain and are available to suit fixed height or adjustable height Straight Channels. Vermin are prevented from using the channel as a means of escape.

Depth (mm)	Product Code	
	Galvanised Steel	Stainless Steel
Adjustable 55-90	MD39373	MD39383
Adjustable 90-150	MD39374	MD39384
Fixed 55	MD39370	MD39380
Fixed 75	MD39371	MD39381
Fixed 140	MD39372	MD39382

200mm Straight Channel + Grate + End Plate



Component	Type	Length	Depth	Product Code	
				Galvanised Steel	Stainless Steel
Channel	Perforated	2000	Fixed 55	MD42432	MD42532
Channel	Perforated	1000	Fixed 55	MD42431	MD42531
Channel	Perforated	500	Fixed 55	MD42430	MD42530
Grate	Mesh	1000	-	MD42600	MD42630
Grate	Mesh	500	-	MD42601	MD42631
End Plate	-	-	Fixed 55	MD42670	MD42680

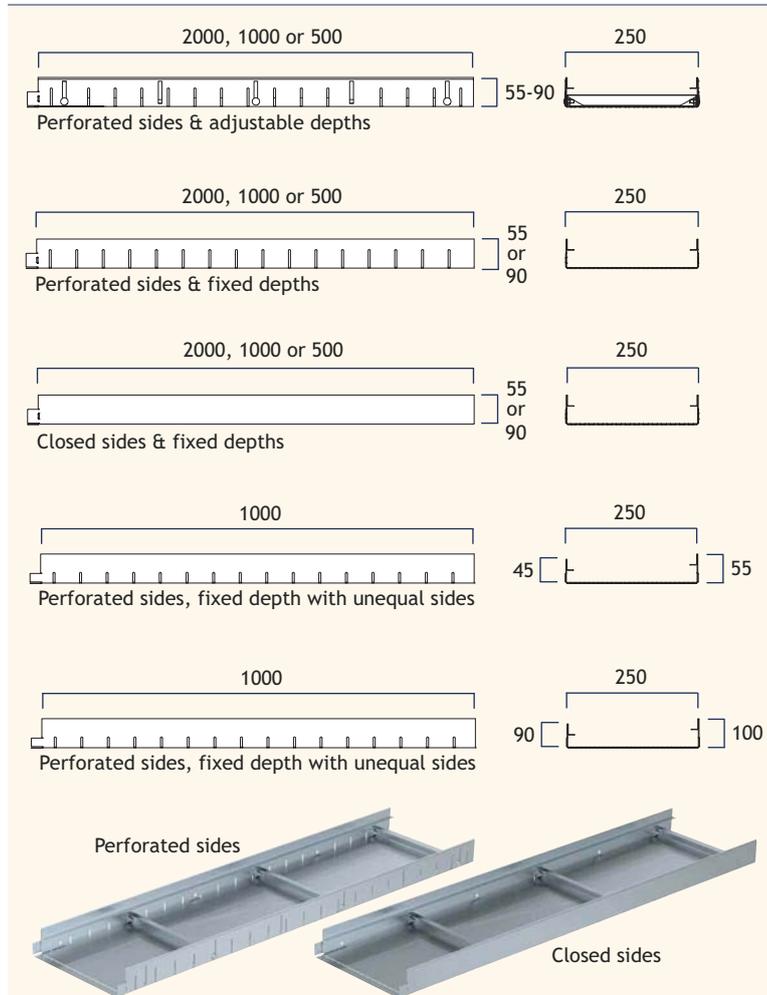


Modulock Roof Channel Drains - Product Tables

Straight Channels: 250mm Wide

250mm Straight Channels

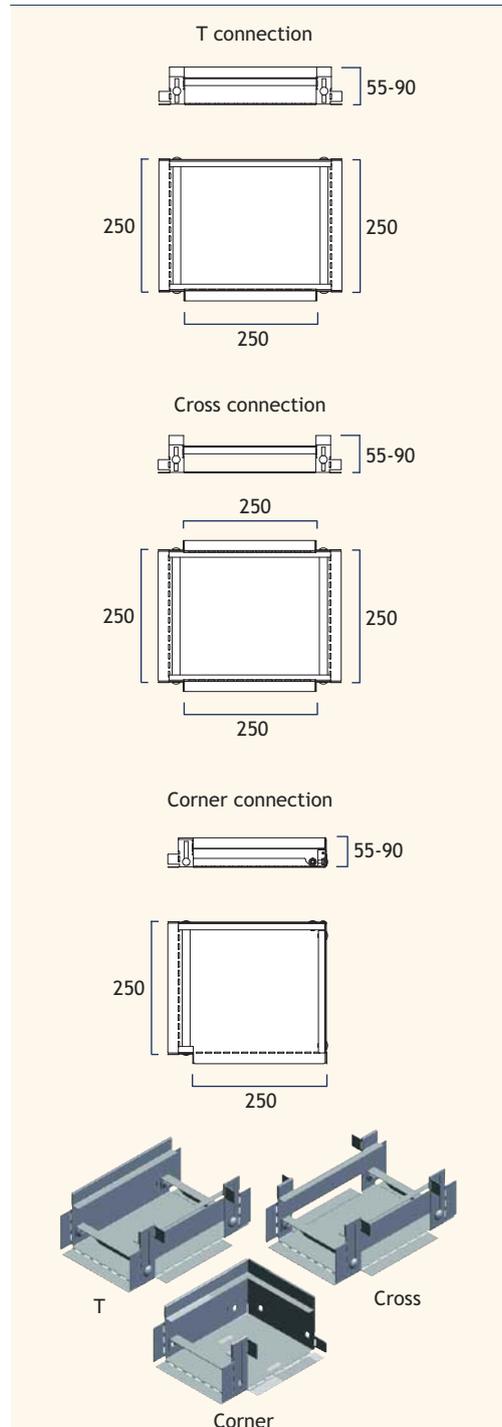
The Channel Drains are 250mm wide and made in 2000mm, 1000mm and 500mm lengths, with a choice of perforated or open sides. The depths of the Channels can be adjustable or fixed. The Channel lengths are slotted together.



Channel Side Type	Channel Length (mm)	Channel Depth (mm)	Product Code	
			Galvanised Steel	Stainless Steel
Perforated	2000	Adjustable 55-90	MD39462	MD39562
Perforated	2000	Fixed 55	MD39432	MD39532
Perforated	2000	Fixed 90	MD39452	MD39552
Closed	2000	Fixed 55	MD39435	MD39535
Closed	2000	Fixed 90	MD39455	MD39555
Perforated	1000	Adjustable 55-90	MD39461	MD39561
Perforated	1000	Fixed 55	MD39431	MD39531
Perforated	1000	Fixed 90	MD39451	MD39551
Perforated	1000	Unequal Fixed 45/55	MD39476	MD39576
Perforated	1000	Unequal Fixed 90/100	MD39471	MD39571
Closed	1000	Fixed 55	MD39434	MD39534
Closed	1000	Fixed 90	MD39454	MD39554
Perforated	500	Adjustable 55-90	MD39460	MD39560
Perforated	500	Fixed 55	MD39430	MD39530
Perforated	500	Fixed 90	MD39450	MD39550
Closed	500	Fixed 55	MD39433	MD39533
Closed	500	Fixed 90	MD39453	MD39553

Corner, Cross & T Connections

These prefabricated components provide a continuous change of direction and slot together with the Straight Channels. Depths are adjustable.



Type	Depth (mm)	Product Code	
		Galvanised Steel	Stainless Steel
Corner	Adjustable 55-90	MD39751	MD39761
Cross	Adjustable 55-90	MD39753	MD39763
T	Adjustable 55-90	MD39752	MD39762

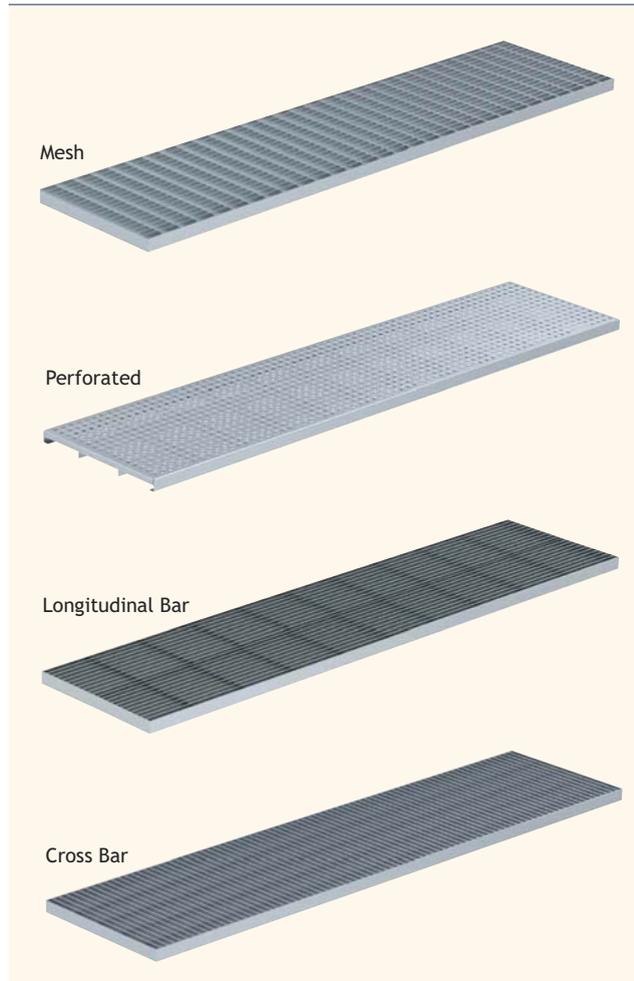


Modulock Roof Channel Drains - Product Tables

Straight Channels: 250mm Wide

Grates

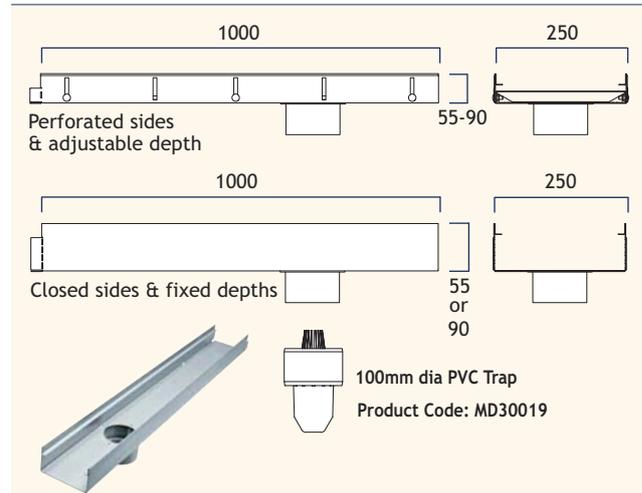
Grates are 250mm wide and available in 4 different designs in either stainless steel or galvanised steel. 90° corners can be butt formed or mitred on site.



Grate Type	Grate Length (mm)	Product Code	
		Galvanised Steel	Stainless Steel
Mesh	1000	MD39600	MD39630
Mesh	500	MD39601	MD39631
Perforated	1000	MD39606	MD39636
Perforated	500	MD39607	MD39637
Longitudinal Bar	1000	MD39602	MD39632
Longitudinal Bar	500	MD39603	MD39633
Cross Bar	1000	MD39604	MD39634
Cross Bar	500	MD39605	MD39635

Outlet Channels & Trap

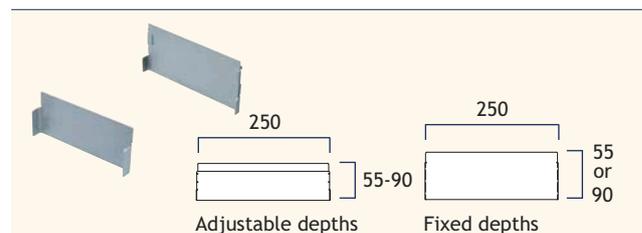
The Outlet Channels slot together with the Straight Channels. The depths can be adjustable or fixed, with a choice of perforated or open sides. The trap fits inside the outlet of the channel.



Channel Side Type	Depth (mm)	Product Code	
		Galvanised Steel	Stainless Steel
Perforated	Adjustable 55-90	MD39713	MD39718
Closed	Fixed 55	MD39711	MD39716
Closed	Fixed 90	MD39714	MD39719

End Plates

End Plates form a stop to the channel drain and are available to suit fixed height or adjustable height Straight Channels. Vermin are prevented from using the channel as a means of escape.



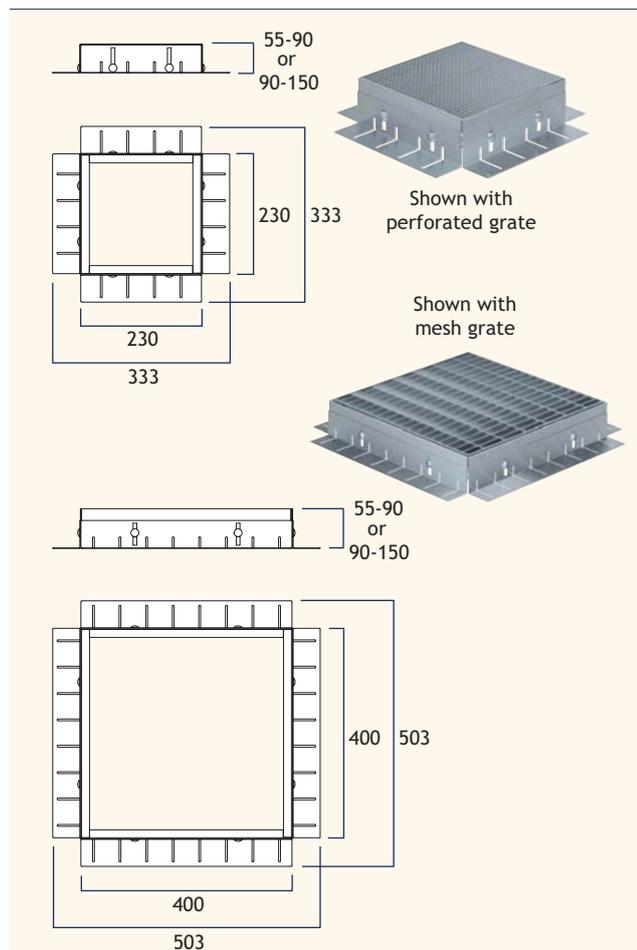
Depth (mm)	Product Code	
	Galvanised Steel	Stainless Steel
Adjustable 55-90	MD39672	MD39682
Fixed 55	MD39670	MD39680
Fixed 90	MD39671	MD39681

Modulock Roof Channel Drains - Product Tables

Accessories for 130mm/200mm/250mm Straight Channels

Maintenance Access Units

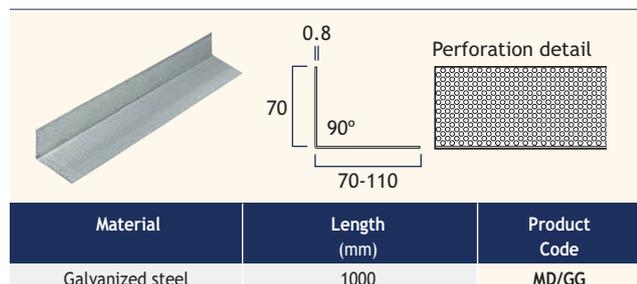
Access Units provide an efficient means of maintaining an unobstructed waterway within the channels.



Size (mm)	Depth (mm)	Product Code	
		Galvanised Steel	Stainless Steel
230 x 230	Adjustable 55-90	MD37801	MD37821
230 x 230	Adjustable 90-150	MD37804	MD37824
400 x 400	Adjustable 55-90	MD37802	MD37822
400 x 400	Adjustable 90-150	MD37805	MD37825

Gravel Guard (Perforated)

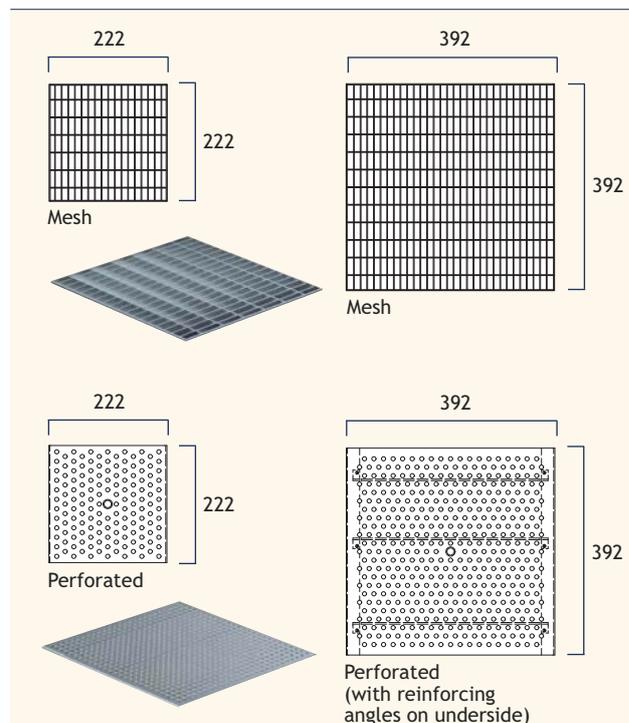
A mesh galvanised steel retaining strip 70mm to 110mm upstand for edge detailing to channel sections where gravel ballast is required.



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

Grates for Maintenance Access Units

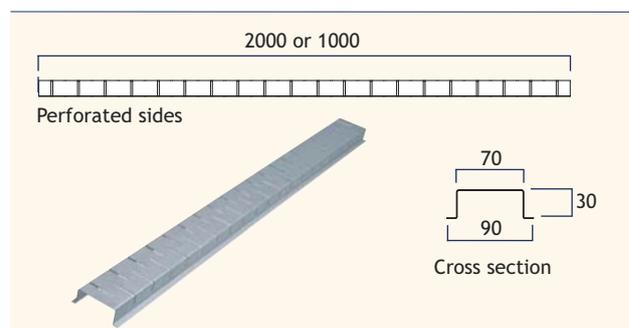
The Grates to the maintenance access units provide protection to the drainage system whilst giving additional rainwater drainage to paved areas.



Grate Type	Grate Size (mm)	Product Code	
		Galvanised Steel	Stainless Steel
Mesh	222 x 222	MD37830	MD37831
Mesh	392 x 392	MD37834	MD37835
Perforated	222 x 222	MD37832	MD37833
Perforated	392 x 392	MD37836	MD37837

Drainage Duct

A slotted drainage duct is laid within the deck build-up to connect between channels and rainwater outlet positions. It can be used as an economical alternative to channels.



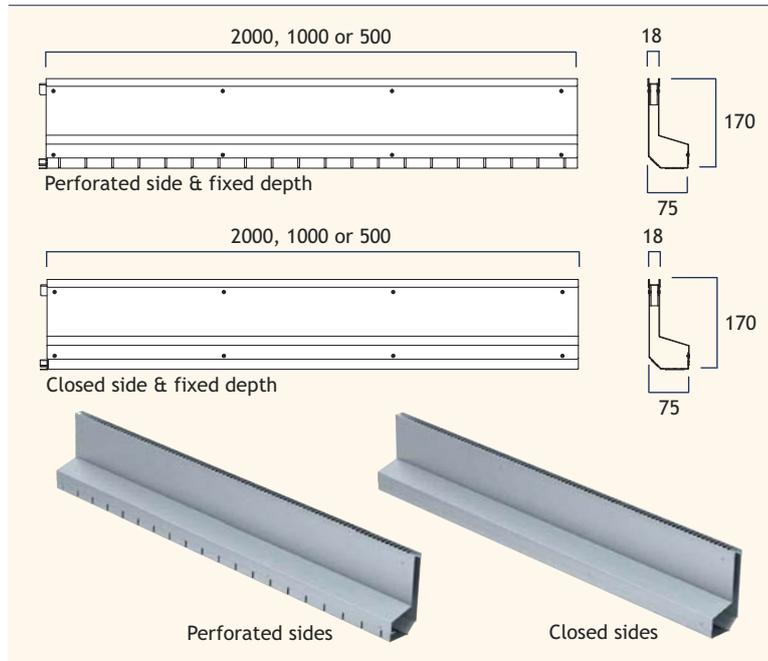
Length (mm)	Product Code	
	Galvanised Steel	Stainless Steel
2000	MD37851	MD37861
1000	MD37852	MD37862

Modulock Roof Channel Drains - Product Tables

Facade Slot Channels

Facade Slot Channels

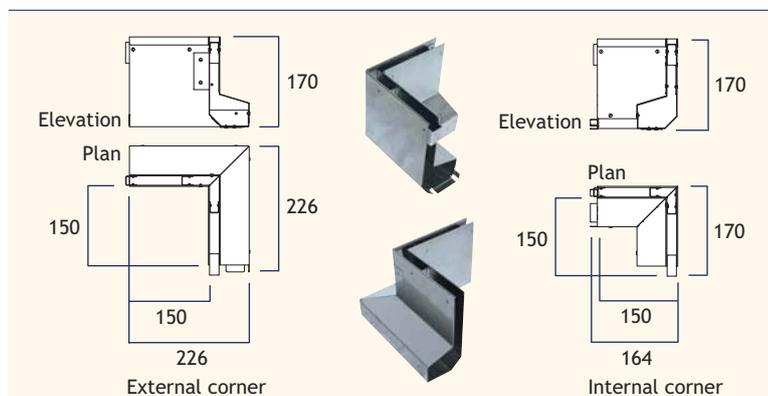
The Slot Channel Drains take up the minimum amount of space to provide drainage of facade rainwater run-off. The channel lengths are connected together via a tongue and groove jointing mechanism.



Channel Side Type	Channel Length (mm)	Channel Depth (mm)	Product Code	
			Galvanised Steel	Stainless Steel
Perforated	2000	Fixed 170	MD37905	MD37925
Closed	2000	Fixed 170	MD37902	MD37922
Perforated	1000	Fixed 170	MD37904	MD37924
Closed	1000	Fixed 170	MD37901	MD37921
Perforated	500	Fixed 170	MD37903	MD37923
Closed	500	Fixed 170	MD37900	MD37920

External and Internal Corner Connections

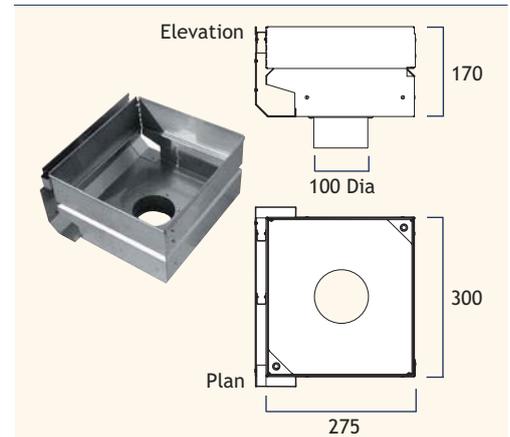
These prefabricated components provide a continuous change of direction and connect to the Channel lengths via a tongue and groove jointing mechanism.



Corner Type	Plan Size (mm)	Depth (mm)	Product Code	
			Galvanised Steel	Stainless Steel
External	226 x 226	Fixed 170	MD37971	MD37981
Internal	170 x 164	Fixed 170	MD37972	MD37982

Maintenance Unit with Outlet

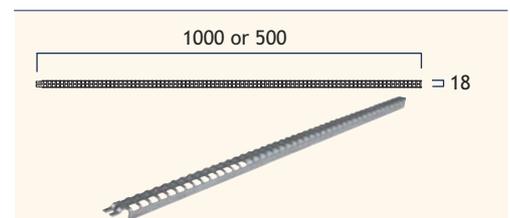
These units provide an efficient means of maintaining an unobstructed waterway within the channels and give direct access to an outlet pipe.



Size (mm)	Depth (mm)	Product Code	
		Galvanised Steel	Stainless Steel
300 x 275	Fixed 170	MD37970	MD37980

Slot Grate

The Slot Grate offers a visually unobtrusive method of providing drainage of rainwater run-off to facade elements.



Grate Type	Length (mm)	Product Code	
		Galvanised Steel	Stainless Steel
Square hole	1000	MD37951	MD37956
Square hole	500	MD37950	MD37955

End Plates

End Plates form a stop to the channel length. Vermin are prevented from using the channel as a means of escape.

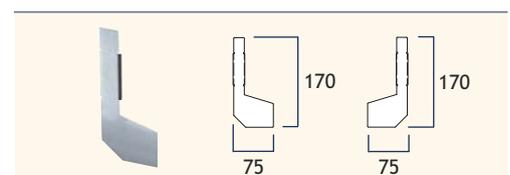


Plate Type	Depth (mm)	Product Code	
		Galvanised Steel	Stainless Steel
Left hand	Fixed 170	MD37973	MD37983
Right hand	Fixed 170	MD37974	MD37984

Note: For Drainage Duct details see page 82.

Modulock Roof Channel Drains - Product Tables

Terrace Slot Channels

Terrace Slot Channels

The stainless steel Slot Channel Drains take up the minimum amount of space to provide drainage of terrace rainwater run-off. The channel lengths are connected together via a tongue and groove jointing mechanism.

Channel Side Type	Channel Length (mm)	Channel Depth (mm)	Product Code Stainless Steel
Perforated	1000	Adjustable 80-130	MD38030
Perforated	1000	Fixed 100	MD38020
Closed	1000	Adjustable 80-130	MD38010
Closed	1000	Fixed 100	MD38000

External and Internal Corner Connections

These prefabricated components provide a continuous change of direction and connect to the Channel lengths via a tongue and groove jointing mechanism.

Corner Type	Plan Size (mm)	Depth (mm)	Product Code Stainless Steel
External	200 x 200	Adjustable 80-130	MD38050
Internal	200 x 200	Adjustable 80-130	MD38055

Maintenance Unit with Outlet

These units provide an efficient means of maintaining an unobstructed waterway within the channels and give direct access to an outlet pipe.

Size (mm)	Depth (mm)	Product Code Stainless Steel
500 x 100	Adjustable 81-130	MD38040

Slot Grate

The Slot Grate offers a visually unobtrusive method of providing drainage of rainwater run-off to terrace paving.

Grate Type	Length (mm)	Product Code Stainless Steel
Square hole	1000	MD37956
Square hole	500	MD37955

End Plates

End Plates form a stop to the channel length. Vermin are prevented from using the channel as a means of escape.

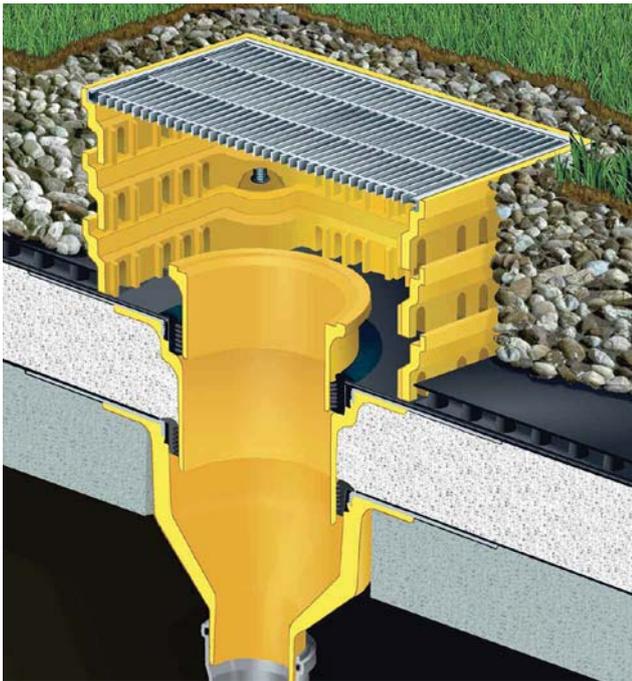
Plate Type	Depth (mm)	Product Code Stainless Steel
Left or right hand	Adjustable 80-130	MD38060

Note: For Drainage Duct details see page 82.

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.

Height Adjustment a (mm)	Body Material	Product Code
50 - 80	Polyurethane	GR400/EP

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.

Height Adjustment a (mm)	Grate Type	Grate Material	Body Material	Product Code
100 - 130	Grid	Galvanised steel	Polyurethane	GR400/AC

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.

Height Adjustment Feet (mm)	Grate Type	Grate/Side Material	Base Material	Product Code
0 - 30	Grid	Galvanised steel	Polyurethane	GR400



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 Water Management Solutions, Station Road, Burton Latimer, Kettering, NN15 5JP
 - Tel: 01536 383810
 - Website: www.harmerdrainage.co.uk, Email: info@alumascwms.co.uk



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

- Outlet: Harmer Stainless Steel Channel Drain
- Grate Type: Slotted MD37332
- Grate Size: 130mm wide x 50mm deep x 1000mm long
- Product Code: Channel MD39261, adjustable 55-90
- Reference: Harmer Modulock Channel Drains
- Accessories: 90° Corner Connection, End Plates, Drainage Duct



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 Considerations for Straight and Slot Channels

These installation considerations conform to currently accepted workmanship standards.

Read the following items with the installation procedure set out on page 88.

- Modulock Channel Drains are set up on a waterproof membrane or in a gravel-bed or in drainage concrete appropriate for local conditions. Channels with a variable height can be adjusted to have a horizontal top edge and a sloping invert level.
- The channels can be used in front of doors on escape routes or buildings with flush thresholds - in these positions use the mesh-type grates.
- Set out the channels from the drainage outlet.
- The joints between the individual channel bodies can be sealed or glued with suitable sealants.
- 90° connections (cross, corner or T pieces) for Straight Channels can be used to alter the configuration of the channel system.
- Similarly, 90° connections (corner pieces only) for Slot Channels can be used to alter the configuration of the channel system.
- Take care to avoid damaging the channels during the laying of the adjacent paving and bedding materials. Before laying the paving and bedding materials, make sure that the grates are temporarily inserted and the channels are braced adequately against compression.
- A timber insert (Product Code: MD37961) is available for temporary use with Slot Channels to protect the channels from detritus during subsequent building works.
- In areas where enhanced chemical attacks (eg de-icing agents, acids, bases, etc.) are to be expected, we recommend to install channels and gratings made out of stainless steel (eg 1.4571 - V4A).

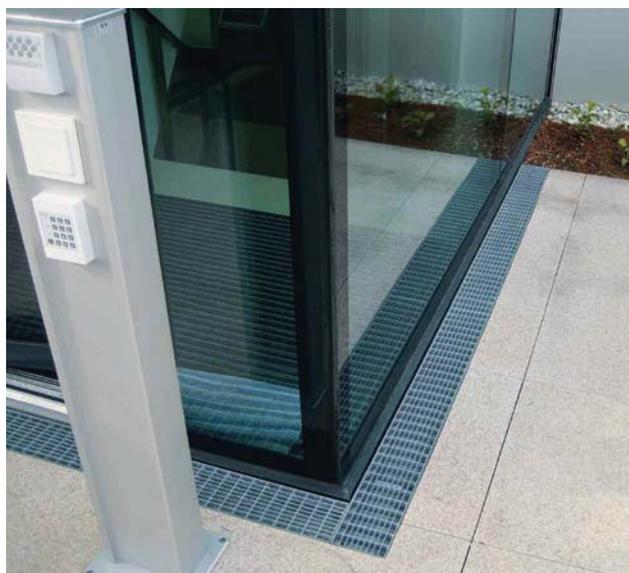
NOTE FOR GALVANISED CHANNELS:

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

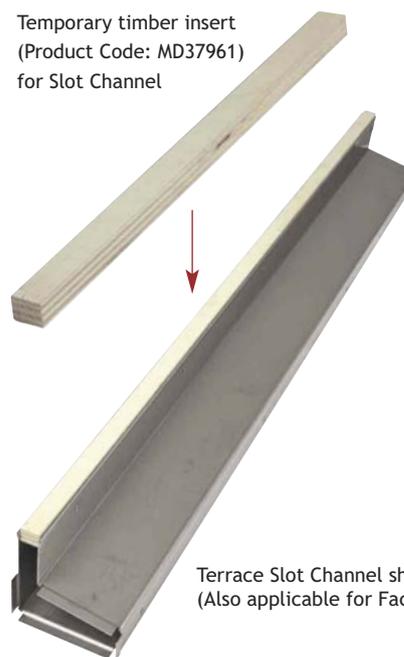
Care and Maintenance

Harmer Modulock Channels only require minimum maintenance but periodic inspection and in areas where leaf congestion might occur it is advisable to 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 a 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.



Temporary timber insert
(Product Code: MD37961)
for Slot Channel



Terrace Slot Channel shown
(Also applicable for Facade Channel)



Modulock Roof Channel Drains - Installation

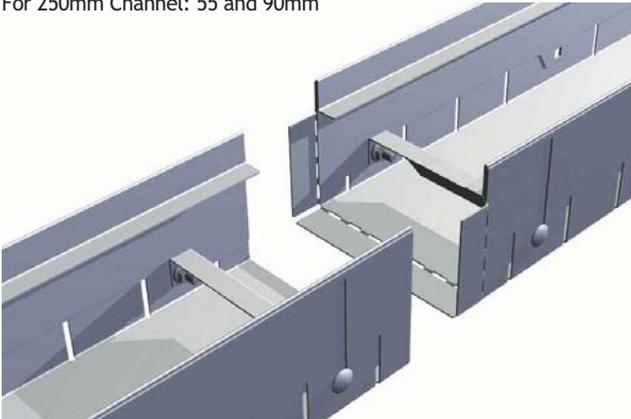
1. Channels are connected together with the integral tongue and groove joints. No tools are necessary. Set out the channels from the drainage outlet. To adjust the overall length of the drainage line, cut the last channel of the line.

Fixed heights available are:

For 130mm Channel: 55, 75 and 140mm

For 200mm Channel: 55mm

For 250mm Channel: 55 and 90mm

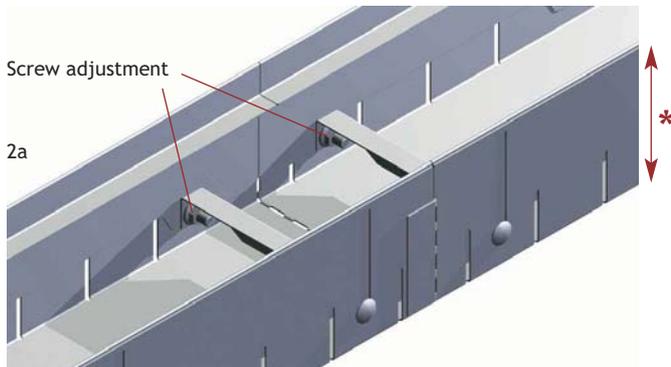


2. Loosen the screws inside the channel to adjust the height of the channel. Tighten the screws to fix the height.

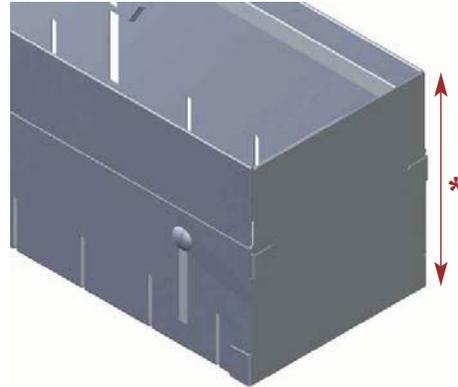
* Variable heights available are:

For 130mm Channel: 55 - 90mm and 90 - 150mm

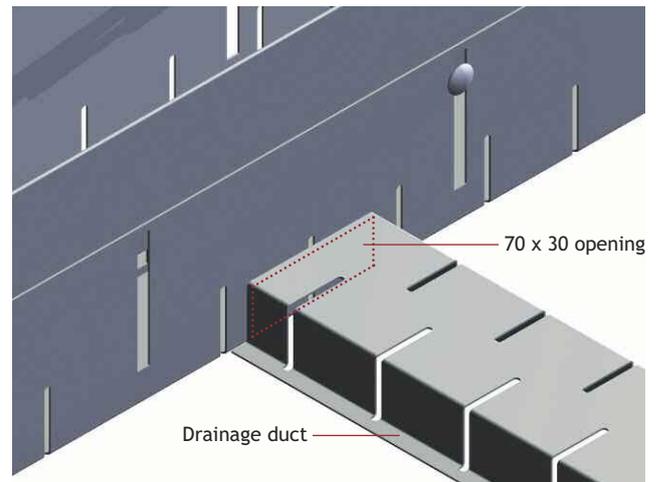
For 250mm Channel: 55 - 90mm



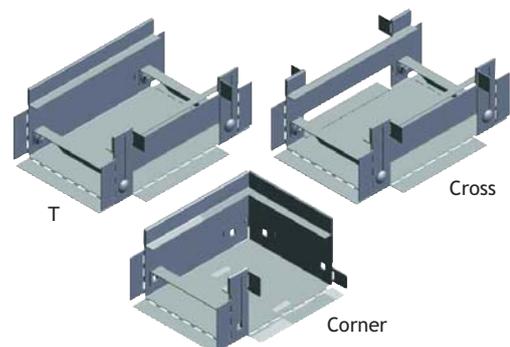
3. The end plate can easily be adjusted to the required height by sliding the two metal sheets together. The end plate can then be fitted onto the channel.



4. If a drainage duct is required to discharge water to a gully to optimize the outflow rate of the channel, an opening (about 70mm wide and 30mm high) should be cut in the side of the channel at the required position.



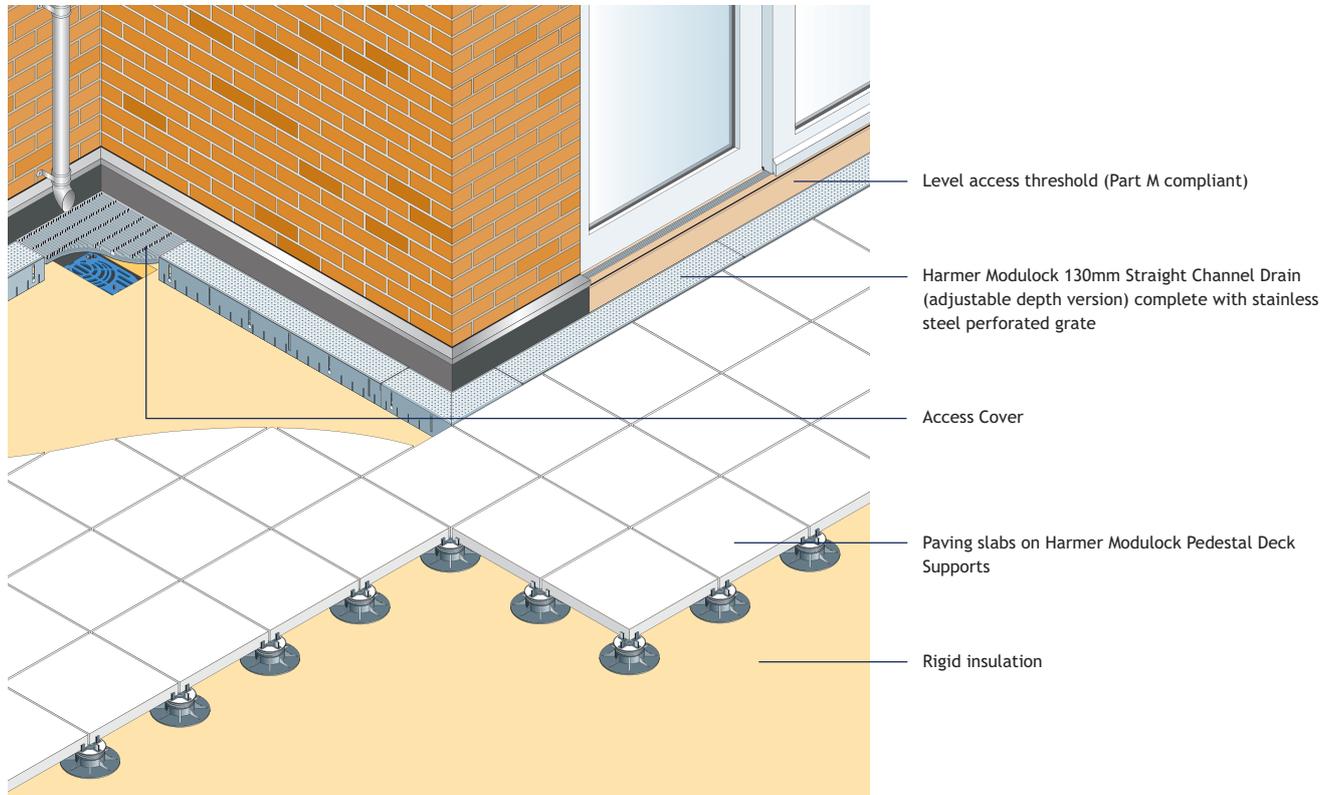
5. Corner, Cross and T pieces are available and are fitted in a similar way as the channels. If two tongues are together cut off one of the tongues and then connect the components.



6. Finally, place the grate of choice on to the channel.

Modulock Roof Channel Drains - Application Details

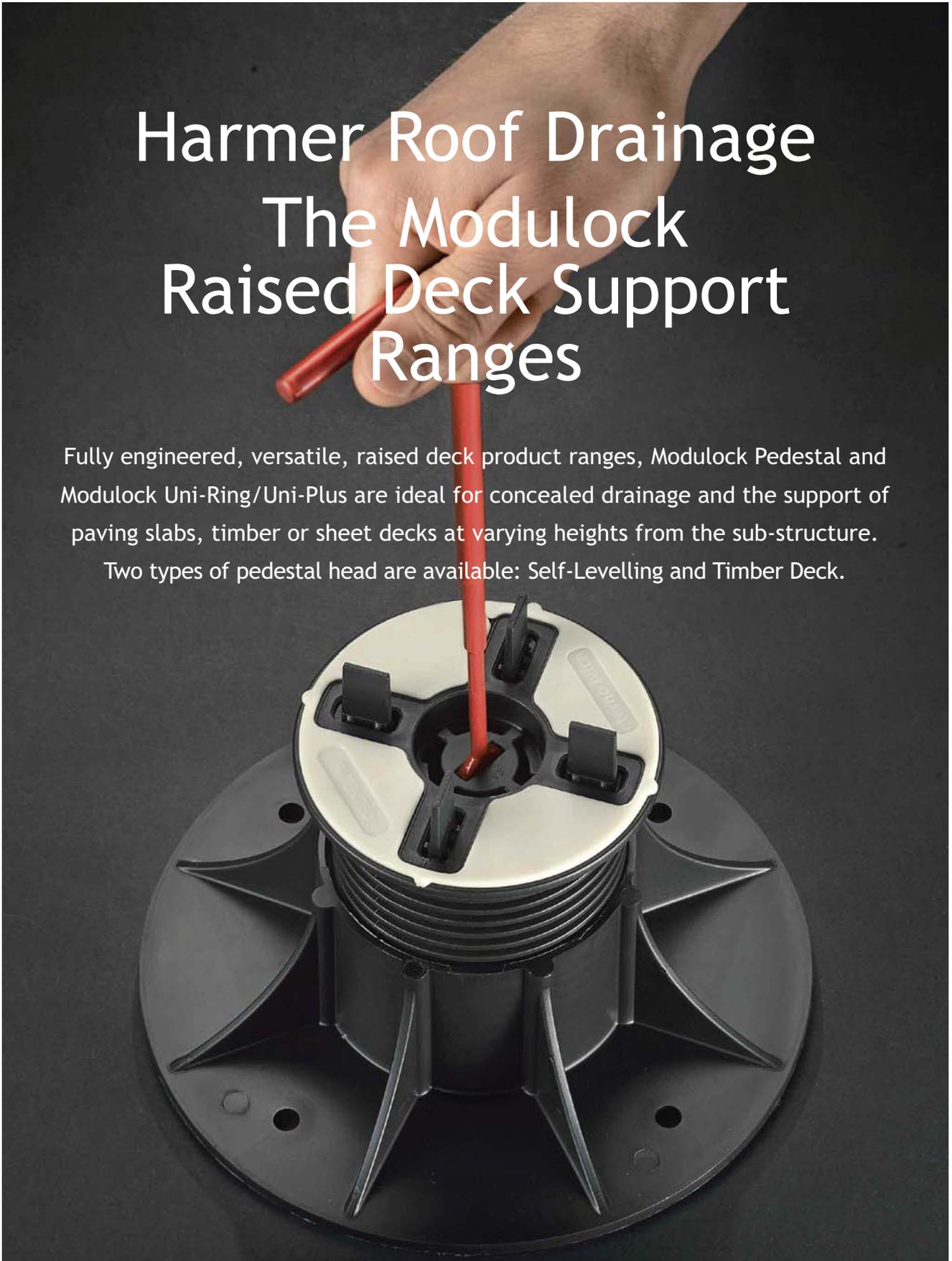
Level Access Threshold using Straight Channels



Harmer Roof Drainage The Modulock Raised Deck Support Ranges

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

Two types of pedestal head are available: Self-Levelling and Timber Deck.



Modulock Raised Deck Supports - Benefits

The Modulock Pedestal and Modulock Uni-Ring/Uni-Plus raised deck supports are designed for use in terraces, walkways, balconies and ballasted flat roof constructions. They provide unique solutions for drainage and accessibility issues.

Modulock Pedestal

- Wide range of height adjustment from 28mm-550mm.
- Fine adjustment for both height and level are possible.
- There are 2 different types of head.

Modulock Pedestal 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.

Modulock Pedestal Timber Deck Head

- This head is specifically designed for use with timber decking construction and is also self-levelling.



Modulock Uni-Ring & Uni-Plus

- Uni-Ring gives a fixed height of 16mm.
- Shims offer fine adjustment in increments of 3mm.
- Uni-Plus provides adjustment of 25-40mm.
- Both are economical paving supports, used where self-levelling adjustment is not required.

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.

Compatibility

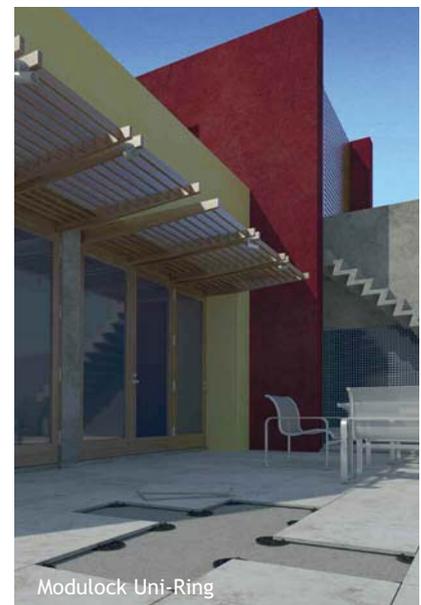
- Harmer Modulock Pedestal and Uni-Ring product ranges are fully compatible with the Modulock Channel Drain ranges.

Robust Construction

- Resists temperatures from -40° to +120°C.
- UV stable and resistant to acids.
- 20-year life expectancy.

Versatile 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
- 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



Modulock Raised Deck Supports - Product Range Summary

Modulock Pedestal

Reinforced adjustment key



Locating blades can be removed if required

Self-Levelling Head

Coupling head

Screw coupling extension component

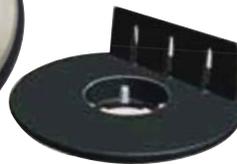
Supporting base with drainage holes



Modulock Uni-Ring



Shims for height adjustment



Self-Levelling Timber Deck Head option

Modulock Uni-Plus

Locating blades can be removed if required



Supporting base with drainage holes

Modulock Raised Deck Supports - Product Range Summary

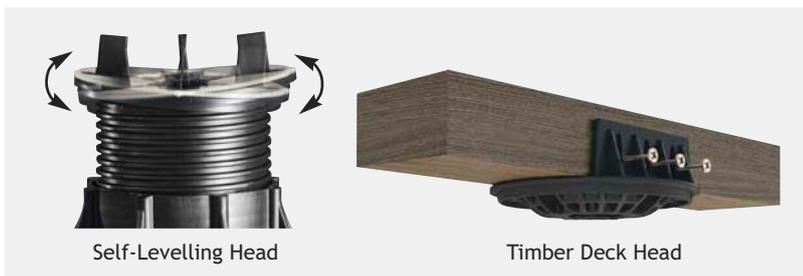
Modulock Pedestal Adjustable Height Supports



Modulock Pedestal comprises 15 basic options, each with supporting head and base component, allowing a wide range of void heights. Pedestals are used to give floor voids ranging from 28mm to 550mm.

See page 94.

Modulock Pedestal Heads



Self-Levelling Head

Timber Deck Head

The Self-Levelling Head can accommodate gradients of up to 5°, and is provided with, or without, locating tabs.

The Timber Deck Head, also self-levelling, incorporates a stop to which timber deck supports are screwed, providing a secure fixing.

See page 95.

Modulock Uni-Ring and Uni-Plus Height Supports



Uni-Ring

Uni-Plus

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.

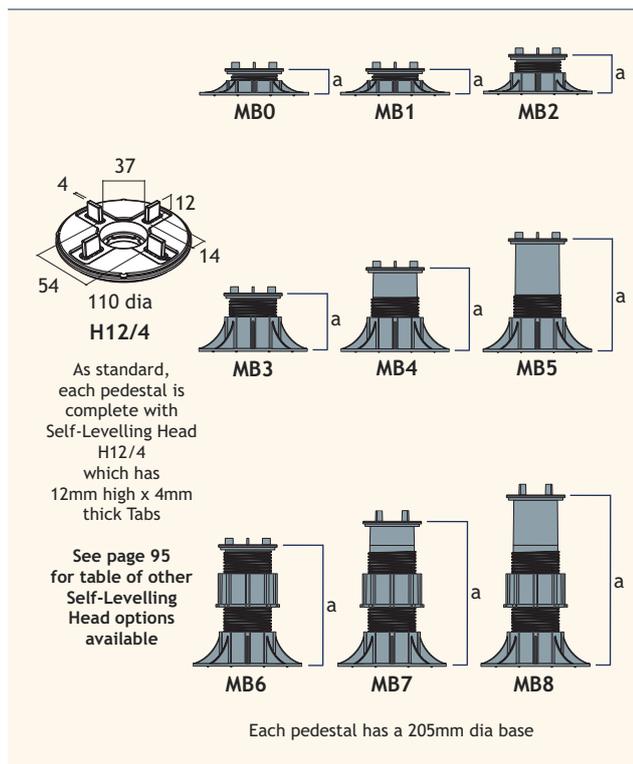
Modulock Uni-Plus is part of the Uni-Ring system and gives floor voids between 25-40mm. See page 96.

Modulock Raised Deck Supports - Product Tables

Pedestals

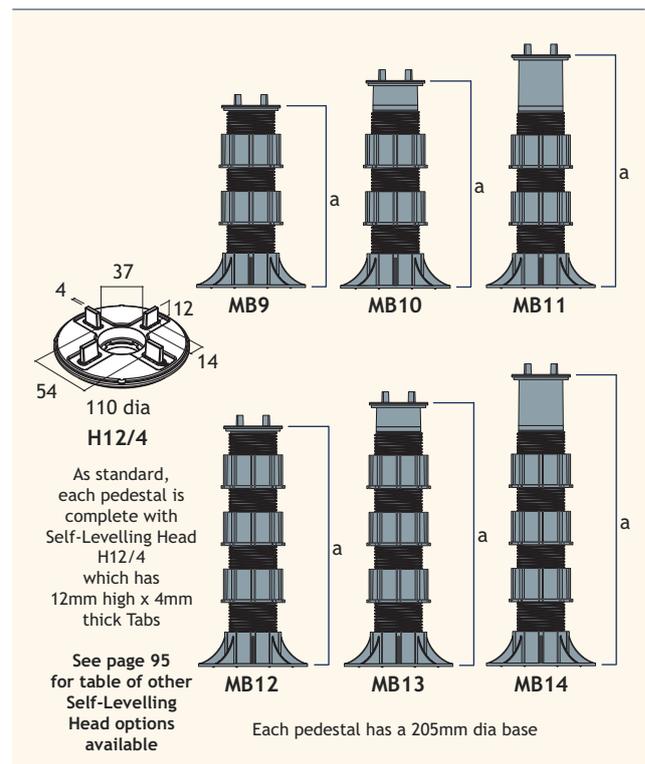
The Pedestal range of deck supports provides a comprehensive range of adjustment from 28mm to 550mm. The system features self-levelling heads with a variety of dividers for preset drainage gaps in supported paving as well as heads without dividers for screw fixing decking battens. An extended key allows for fine adjustment of supports after slab laying.

Pedestals



Pedestal Height Adjustment a (mm)	Standard Head* Type H12/4	Pedestal Product Code
28 - 38	Head with 12mm x 4mm tabs	MB0
35.5 - 50	Head with 12mm x 4mm tabs	MB1
50 - 75	Head with 12mm x 4mm tabs	MB2
75 - 120	Head with 12mm x 4mm tabs	MB3
120 - 170	Head with 12mm x 4mm tabs	MB4
170 - 215	Head with 12mm x 4mm tabs	MB5
140 - 230	Head with 12mm x 4mm tabs	MB6
185 - 275	Head with 12mm x 4mm tabs	MB7
235 - 325	Head with 12mm x 4mm tabs	MB8

Pedestals



Pedestal Height Adjustment a (mm)	Standard Head* Type H12/4	Pedestal Product Code
205 - 345	Head with 12mm x 4mm tabs	MB9
250 - 385	Head with 12mm x 4mm tabs	MB10
300 - 400	Head with 12mm x 4mm tabs	MB11
270 - 455	Head with 12mm x 4mm tabs	MB12
315 - 500	Head with 12mm x 4mm tabs	MB13
365 - 550	Head with 12mm x 4mm tabs	MB14

* Specifying Pedestals with Self-Levelling Heads other than Standard H12/4:
To specify or order an optional head, please add the appropriate head product code (see table on page 95) to the pedestal product code as shown in the following typical examples:

If MB1 is wanted, but using a head with 20mm high x 2mm thick tabs, the complete product code will be MB1/H20/2.

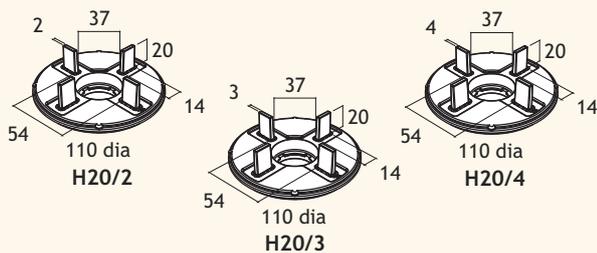
If MB7 is wanted, but using a head with 12mm high x 3mm thick tabs, the complete product code will be MB7/H12/3.

If MB10 is wanted, but using the Flat Head, the complete product code will be MB10/H/F.

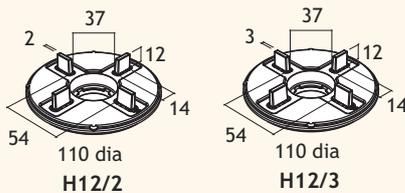
If MB12 is wanted, but using the Timber Deck Head, the complete product code will be MB12/DH.

Modulock Raised Deck Supports - Product Tables Pedestals

Pedestal Self-Levelling Head Options



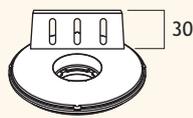
Self-Levelling Heads with 20mm high Tabs



Self-Levelling Heads with 12mm high Tabs



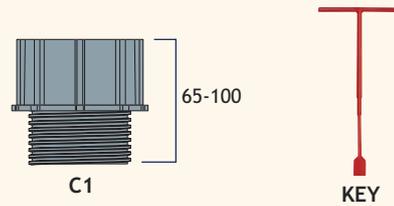
Self-Levelling Flat Head (no tabs)



Self-Levelling Timber Deck Head

Optional Head Types	Head Product Code
Self-Levelling Head with 20mm high x 2mm thick Tabs	H20/2
Self-Levelling Head with 20mm high x 3mm thick Tabs	H20/3
Self-Levelling Head with 20mm high x 4mm thick Tabs	H20/4
Self-Levelling Head with 12mm high x 2mm thick Tabs	H12/2
Self-Levelling Head with 12mm high x 3mm thick Tabs	H12/3
Self-Levelling Flat Head (no tabs)	H/F
Self-Levelling Timber Deck Head	DH

Accessories



Accessory Options	Product Code
Extension Coupler	C1
Adjustment Key	KEY



Modulock Raised Deck Supports - Product Tables

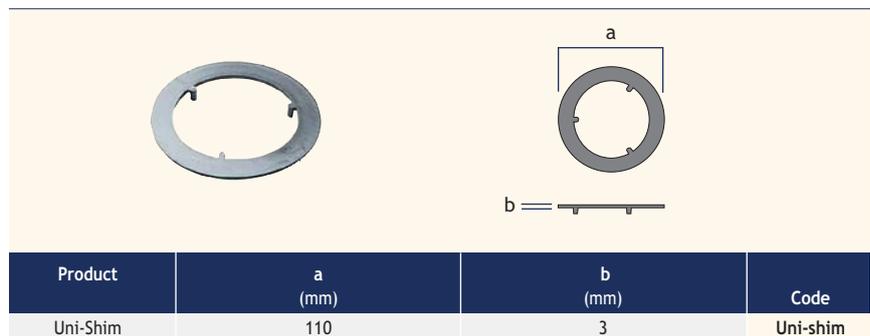
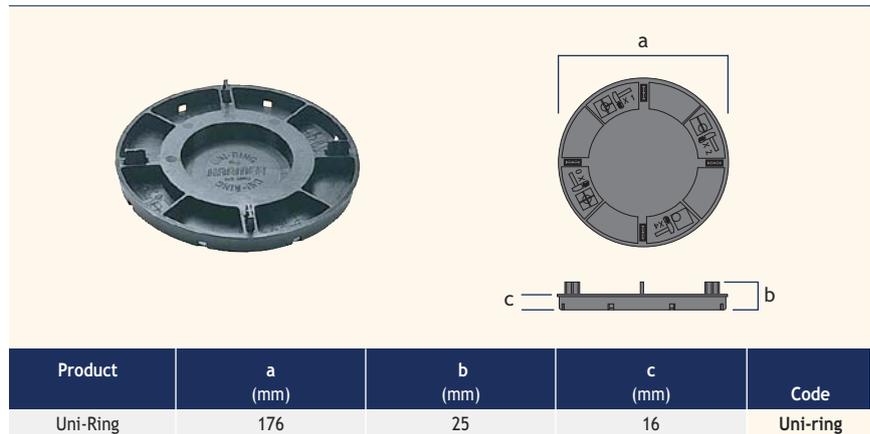
Uni-Ring and Uni-Plus

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 a deck void from 25mm to 40mm.

Uni-Ring

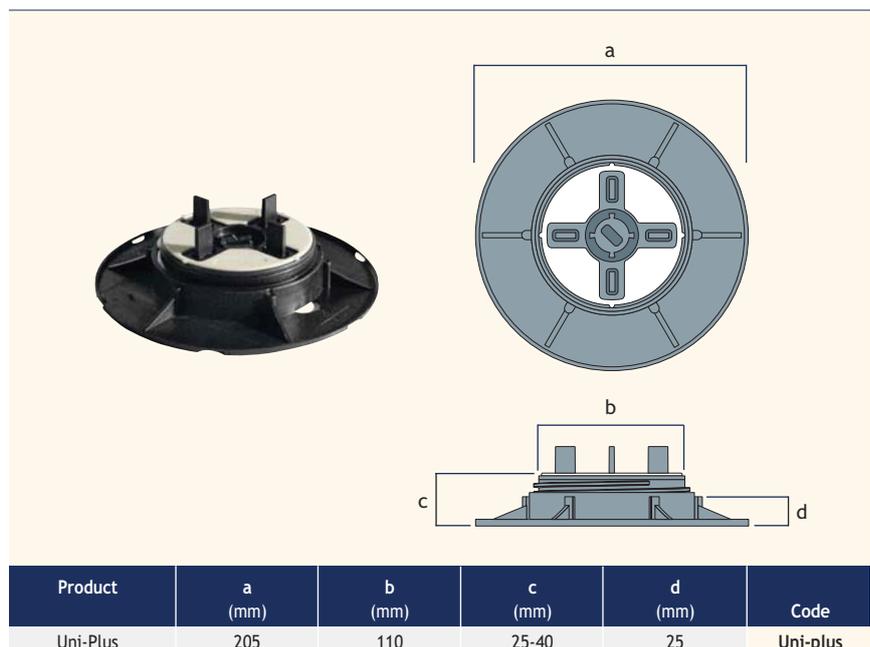
Harmer Uni-Ring is quick and easy to install, and provides fast, efficient drainage through the open joints of the slabs to the concealed drainage below. The system is ideal for any waterproofed substructure and especially for inverted roof constructions where ballasted insulation is laid onto the waterproofing 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 from 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





Modulock Raised Deck Supports - NBS Specification

A typical NBS Specification for Harmer Modulock raised deck supports. A full range of NBS specifications are available via the Harmer online NBS Specification Builder at www.harmerdrainage.co.uk. For project specific specification advice, contact Harmer Technical Services.



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 Water Management Solutions,
Station Road, Burton Latimer,
Kettering, NN15 5JP
Tel: 01536 383810
Website: www.harmerdrainage.co.uk, Email: info@alumascwms.co.uk

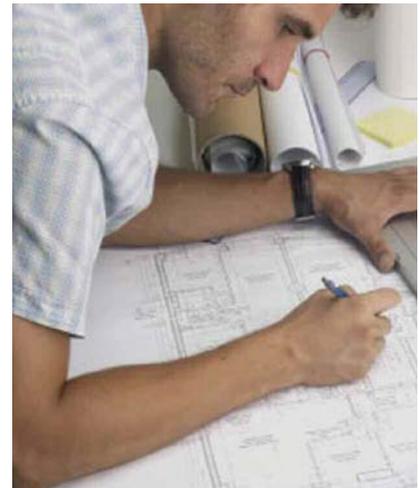
Type: Adjustable deck supports

Size: MB1: 32-50 mm high/MB2: 50-75 mm high/MB3: 75-120 mm high /MB4: 120-170 mm high/MB5: 170-215 mm

Product Code: MB1 -MB5

Reference: Harmer Deck Modulock

Accessories: Adjustment Key



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.

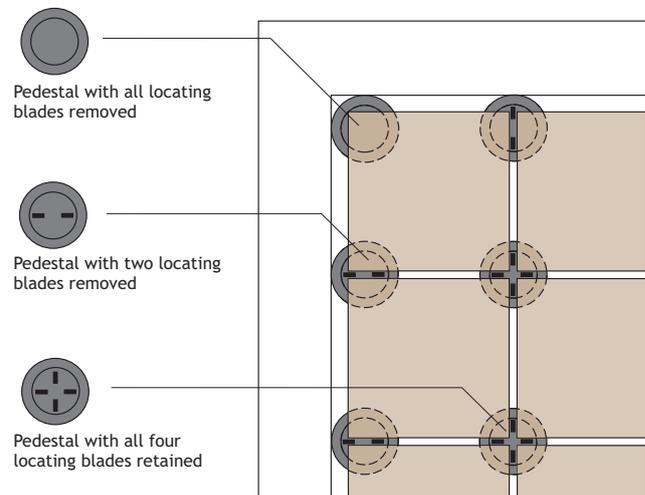
Harmer Uni-Ring

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.

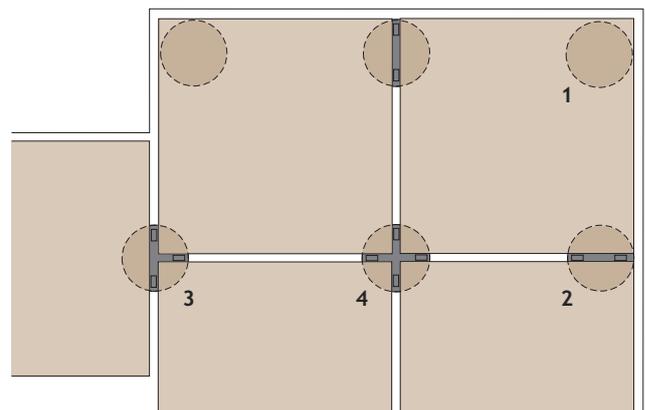
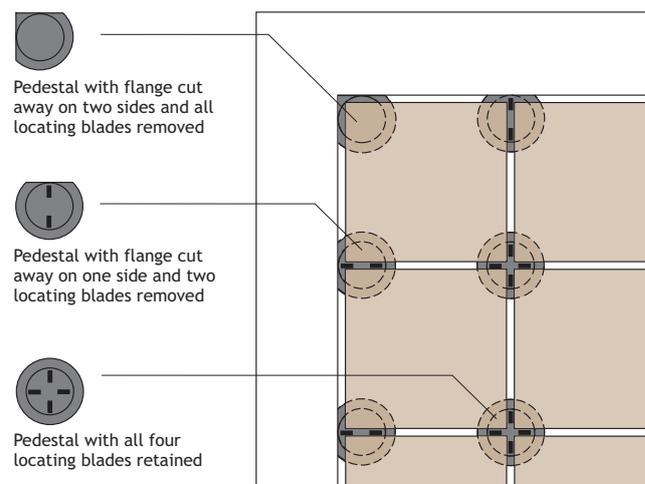
Harmer Uni-Ring can accommodate a variety of paving slab thicknesses. The unit sizes, spanning capacity and loading of the slabs will determine the spacing and layout pattern of a paving slab support system.

Alternative Edge Details

1. With wide open joint at perimeter.

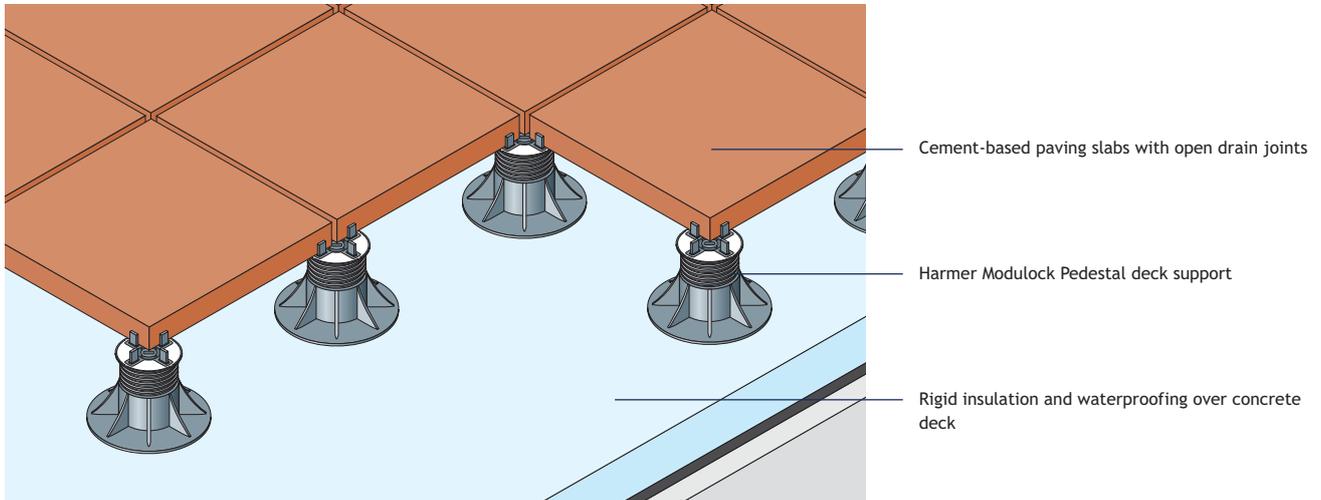


2. With narrow open joint at perimeter.

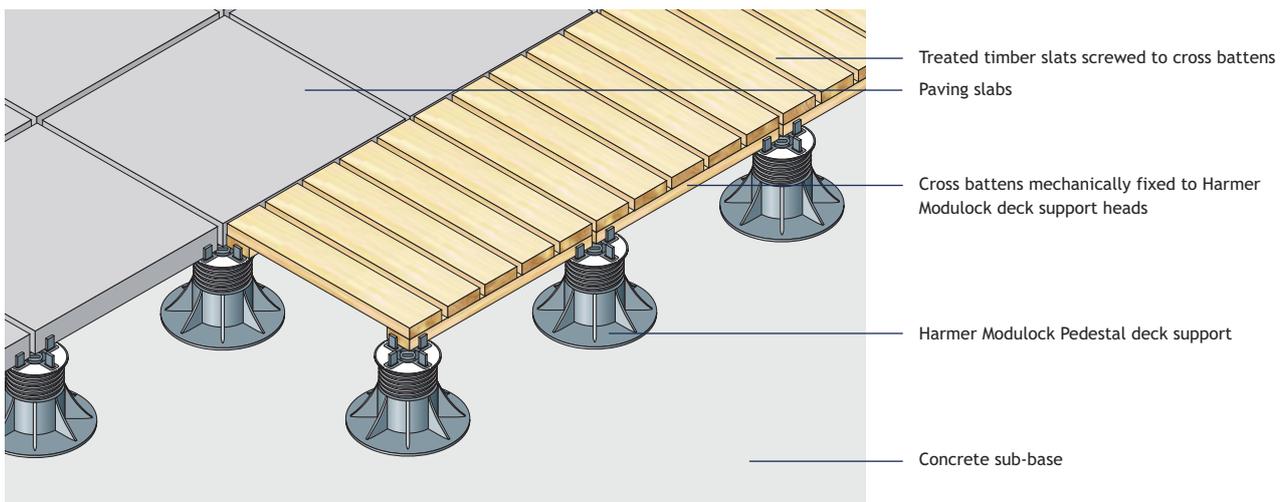


Modulock Raised Deck Supports - Application Details

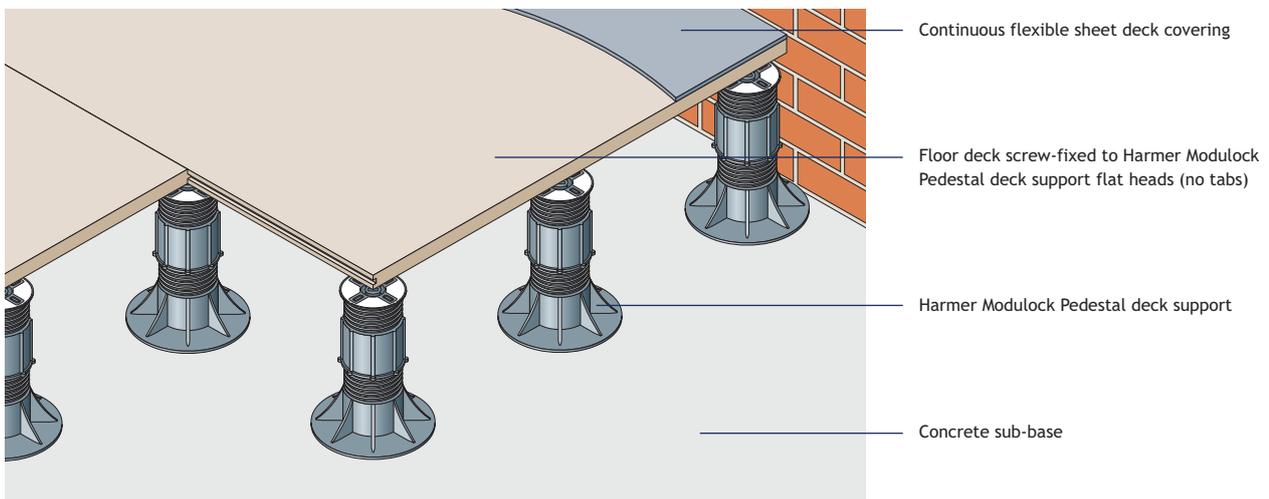
Paving Slabs with Open Joints on Harmer Modulock Pedestal with Self-levelling Head



Timber Slats on Battens + Paving Slabs on Harmer Modulock Pedestal with Self-levelling Head

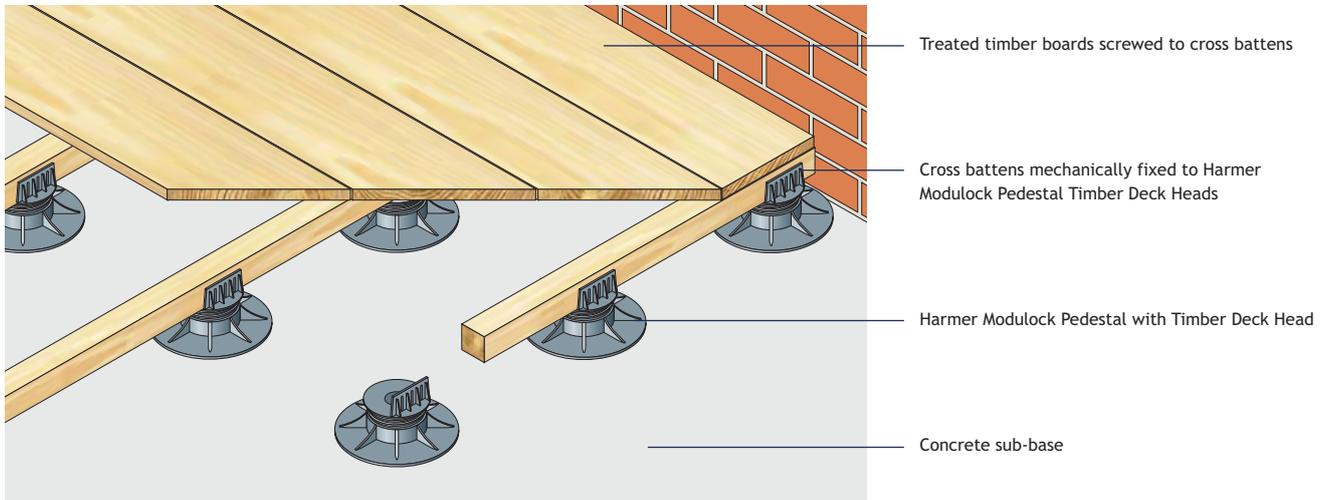


Sheet Decking on Harmer Modulock Pedestal with Self-levelling Flat Head

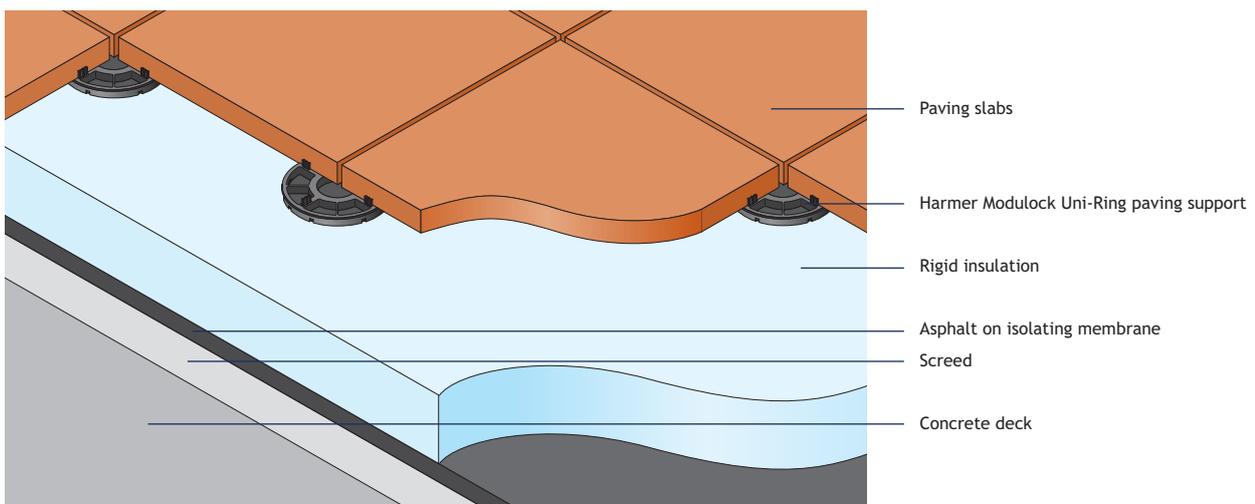


Modulock Raised Deck Supports - Application Details

Open Jointed Boards on Battens on Harmer Modulock Pedestal with Timber Deck Head



Paving Slabs on Harmer Modulock Uni-Ring



Other Harmer Drainage Products

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

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

Harmer SML Above and Below Ground Soil and Waste Systems



Harmer SML Above-Ground 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 SML Below-Ground system is a similarly high performing pipework system eminently suitable for below ground conditions and is fully compatible with the SML Above-Ground system.

The Harmer SML systems consist 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

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



Harmer Floor and Shower Drains



Drain bodies in cast iron, stainless steel and 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. Stainless steel linear drainage components add to the range.

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 Water Management Solutions



Skyline's high performance weatherproofing and integrated guttering systems provide industry leading rainwater protection.

Skyline includes fascia and soffits, copings, cills and surrounds manufactured from high quality, in-house, BBA certified powder-coated aluminium.



- Fascia
 - Soffits
 - Copings
 - Cills and Surrounds
- www.alumascskyline.co.uk

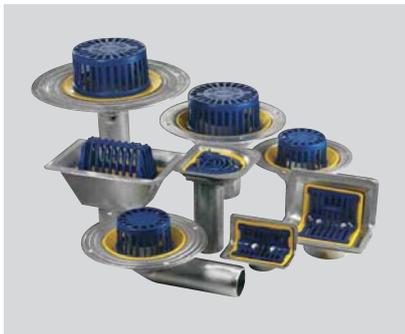


Alumasc is the UK market leader for Aluminium, Cast Iron and Steel gutters and downpipes,

From cutting edge-contemporary to tradition heritage, Alumasc's metal rainwater systems outperform others whatever the weather.



- Aluminium Rainwater Systems
 - Cast Iron Rainwater Systems
 - Steel Rainwater Systems
- www.alumascrainwater.co.uk

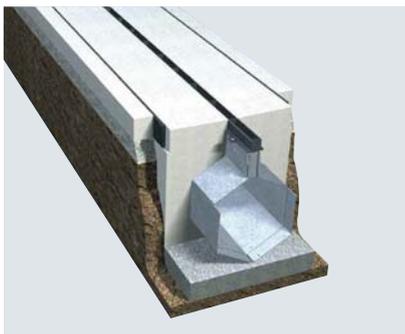


Harmer Building Drainage manages water inside and outside the building.

Its systems allow designers, contractors and clients to realise the design performance and installation benefits of fully integrated drainage solutions.



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



Gatic Civil Drainage specialises in integrated surface water management.

For over 90 years Gatic drainage systems have been used to capture, control and return run-off safely into the natural water cycle.



- Slotdrain
 - Filcoten
 - Proslot
 - Kerb Drainage and Flow Controls
- www.gatic.com



Gatic Engineered Access Covers, the proven international standard for engineered heavy duty access cover solutions.

With a history of installations dating back more than 90 years Gatic offers an engineered solution for all types of applications.



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Technical Support

+44 (0) 1536 383810

Literature Hotline

+44 (0) 808 100 2008

Website

www.harmerdrainage.co.uk

ALUMASC WATER MANAGEMENT SOLUTIONS

Station Road, Burton Latimer,

Kettering, NN15 5JP

United Kingdom

Telephone: +44 (0)1536 383810

Website: www.alumascwms.co.uk

E-mail: info@alumascwms.co.uk



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