RAINWATER SOLUTIONS

LYSAGHT

VICTORIA / TASMANIA

INSPIRATION TO BUILD BETTER

RAINWATER SOLUTIONS

Water overflow in domestic rainwater systems

Under the Environmental Planning and Assessment Act 1979 and its Regulations, all building work must be carried out in accordance with the ABCB National Construction Code (NCC 2022). The compliance requirements for roof drainage systems (i.e. guttering) may be regulated as plumbing work or building work, depending on the local Building Authority. Where roof drainage systems are regulated as plumbing work, NCC Volume Three applies, and where regulated as building work, NCC Volume Two or ABCB Housing Provisions Standard applies. The ABCB Housing Provisions Standard 2022 contains Deemed-to-Satisfy Provisions (DTS) that are considered to be acceptable forms of construction that meet the requirements for complying with Parts H1 to H8 of NCC Volume Two - Building Code of Australia.

Per Section A2G2 of NCC Volume Three - Plumbing Code of Australia, a Performance Solution may be achieved by demonstrating that the solution is at least equivalent to the DTS Provisions of the NCC.

Per Section H2D2 of NCC Volume Two – Building Code of Australia, the roof drainage system may be treated as a DTS solution when designed and constructed in accordance with AS/NZS 3500.3.

The most common means to satisfy these requirements for roof drainage (i.e. guttering) installations is via compliance with AS/NZS 3500.3.

Furthermore, in each state and territory it is necessary to satisfy the relevant regulation.

In the design and detailing of a roof drainage system consideration must be given to a range of the factors such as rainfall intensity, roof catchment area, gutter size/capacity, gutter fall, gutter outlets (sumps, rainheads, nozzles), downpipe size, quantity and placement, overflow consideration, material selection, jointing, etc.

It is the responsibility of designers and installers of roof drainage systems to ensure compliance with these requirements.

IMPORTANT INFORMATION ON OVERFLOW MEASURES

For residential roof drainage systems, high fronted gutters are a popular aesthetic choice to hide the lower edge of tiles or roof cladding. Where high-fronted gutters are installed, the NCC (and reference standards such as ABCB Housing Provisions and AS/NZS 3500.3) requires that provision must be made to avoid any overflow back into the roof or building structure.

Some simple overflow control methods that can be employed on high fronted gutters are listed below. It is important to note that it may be necessary to use more than one of these measures to achieve the necessary result:

A) Methods related to the design and installation of roof drainage systems:

- Slotted front of gutter – simple and popular choice which allows for water overflow through the slots visible on the front face of the gutter;
- Specifically located non-continuous overflows as permitted in the NCC i.e.:
  - Inverted downpipe drop/pop at high points in the gutter but set at a level below the fascia top,
  - Stop ends cut down to a lower level to act as a weir (stop end weirs could be hidden at the high point of the gutter and designed as part of an expansion joint),
  - Rainheads with overflow weir,
  - Holes, slot, or weir at downpipes;
- Gap between the fascia and the gutter back – a packer is inserted between the gutter back and the fascia; or
- Any of a number of other proprietary systems and trade solutions.

B) Methods related to alternative building designs methods:

- Unlined eaves – eliminates the issue where the house design suits.
- Gutter installed such that the gutter front is fully and sufficiently below the top of the fascia (freeboarding).
- Design for a higher rainfall intensity, as used for internal box gutters.
- Back flashing – where gutter support brackets allow back flashing installation (e.g. external brackets).

The following illustrations show some typical continuous and non-continuous overflow measures that may be used in combination with each other or with other overflow measures to meet the necessary requirements.

Please note that non-continuous measures may become blocked anywhere along their length, so non-continuous overflow measures may not be sufficient to prevent water from flowing back into a building.

Slotted gutters may also provide an overflow measure, however slots must be of sufficient size. For this reason, slots alone may not be a sufficient overflow measure in all circumstances. When designing a roof drainage system with slotted gutter, consideration should be given to additional overflow measures.

Typical overflow from slotted gutter.

(Gutter shown is not available in all areas).

DESIGN AND INSTALLATION OF DOMESTIC ROOF DRAINAGE SYSTEMS

The detailing and sizing of the selected overflow method/s is normally completed by the designer/installer, but must be adequate for the situation and must meet the relevant performance requirements of the NCC and Australian Standards, including the requirements noted above.

While there may be some variations from state to state, contractors who install guttering systems are generally required to hold an appropriate licence. Where a license is required, it is an offence to undertake this work without an appropriate licence. The work is required to comply with the appropriate codes and standards.

Statutory warranties normally apply and consumers have a right to lodge a complaint and have it dealt with by the appropriate authority.

In the installation of the roof drainage system, particular focus should be given to the following;

- Attention to the use of compatible materials for drainage system components, leaf-guard type system components and compatible fasteners/sealants to connect and seal the components.
- The position of the gutter in relation to the fascia (particularly, whether there is a gap between the fascia and the gutter back and whether the gutter front is below the top of the fascia).
- Installation of the specified gutter and downpipes, ensuring that downpipes are installed in the correct locations and numbers.
- Gutter fall, ensuring sufficient fall and that it is in the direction of the downpipes.
- Overflow has been considered and specific details are installed where required as described above (such as when the gutter front is higher than the top of the fascia).

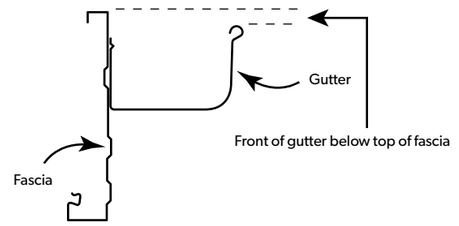
During the installation all debris and loose waste materials (swarf, fasteners, etc.) must be cleaned off at the end of each day and at the completion of the installation to prevent blockages of the drainage system or deterioration of the individual components. Any protective films should also be removed as part of the installation process.

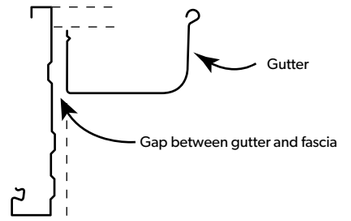
MAINTENANCE OF DOMESTIC ROOF DRAINAGE SYSTEMS

In the longer term, the ability of a roof drainage system to handle overflow will also depend on the regular cleaning of the system. For example the removal of plant or animal matter (leaves, fungal growth, dropping, nests, etc.) and debris from gutters, leaf-guard type systems and the gutter overflow devices to ensure free drainage of water.

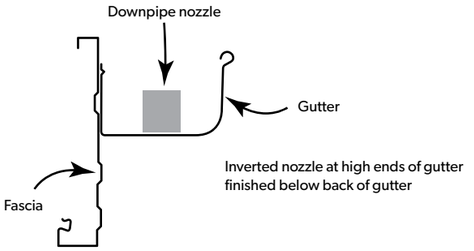
To ensure the long life of the roof drainage system, the maintenance requirements of the roof drainage system should be forwarded to the occupier/owner of the building and should be fulfilled. Adequate maintenance is a requirement of rainwater goods warranties.

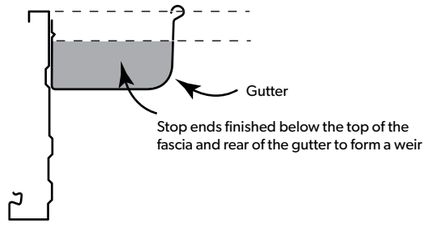
Continuous (full length) overflow measures





Non-continuous (specifically located) overflow measures





Information on designing a perimeter drainage system for a domestic roof

Roof drainage systems can be affected by a number of variables and must be designed and detailed by a suitably qualified trade or professional. The design of roof drainage aims to protect people, property and the building. The designed drainage system must be installed under the supervision of a qualified trade or professional. The steps of the design process are illustrated below.

1. Determine average recurrence interval (ARI).
2. Obtain rainfall intensity of site.
3. Work out roof dimensions.
4. Determine catchment area with slope.
5. Determine area for proposed eaves gutter.
6. Determine catchment area per downpipe.
7. Determine number of downpipes required.
8. Determine location of downpipes and high points.
9. Check catchment area for each downpipe.
10. Determine downpipe size.
11. Determine overflow measures.

Table 1

Design rainfall intensities adopted from Table 7.4.3d of the ABCB Housing Provisions Standard (2022).

	ARI once in 20 years mm/hr	ARI once in 100 years mm/hr
VIC		
Ballarat	134	192
Benalla	146	194
Geelong	103	143
Horsham	121	173
Lakes Entrance	145	199
Melbourne	132	187
Hastings	112	145
Sorrento	106	140
Mildura	142	219
Stawell	130	187
TAS		
Burnie	128	178
Flinders Island	124	167
Hobart	86	120
Launceston	91	123
Queenstown	94	120
St. Marys	150	207

DESIGN PROCEDURE

The steps in the design process are for a perimeter drainage system using the standard roll-formed rainwater products (gutters) installed at the building eaves. Drainage systems for larger roofs use box gutters at the perimeter and internally. Box gutter systems are thoroughly treated in AS/NZS 3500.3.

Diagrams, charts and data extracted from other publications (and reference standards such as ABCB Housing Provisions and AS/NZS 3500.3) are indicative only. Reference should be made to these other publications for the most recent information.

Install gutters with a suitable fall to avoid ponding and to allow water to easily flow away. Steeper falls are preferred for prolonged life of the gutter. Refer to the NCC and the Australian Standards for guidance. Eaves gutters must have a gradient of 1:500 or steeper.

1. Decide on the average recurrence interval (ARI). Where significant inconvenience or injury to people, or damage to property (including contents of a building), is unlikely (typical of an eaves-gutter system) a minimum ARI can be 20 years. If these conditions are likely (typical of box gutters) 100 years is recommended.
2. Determine rainfall intensity for the site from Table 1. More data can be found in AS/NZS 3500.3.
3. Sketch a roof plan showing dimensions in plan view, pitch of roof, layout of ridges and valleys and large roof penetrations.
4. Calculate the catchment area of the roof from the plan. To allow for the slope of the roof, increase the plan area. Refer to AS/NZS 3500.3 for the increased area. As a 'rule of thumb' allow 1% for every degree of pitch up to 36°.
5. Get the effective cross-sectional area of the gutter you intend to use from Table 2.
6. Using the cross-sectional area of the gutter on the graph in Figure 1, determine the catchment area per downpipe.
7. Calculate (as a first test) the minimum number of downpipes required for the selected gutter using the equation:

$$\left.\begin{array}{l}\text{Number of}\\ \text{downpipes (min.)}\end{array}\right\} = \frac{\text{Total catchment area of the roof}}{\text{Catchment area (determined in 6)}}$$

   Round the number of downpipes up to the next whole number.
8. On the plan, select locations for the downpipes and the high points in the gutters. Where practical, the catchments for each downpipe should be about equal in area. When selecting the location of high points and downpipes, consideration should also be given to proximity to high concentrations of water flow (e.g. valley gutters, diversions around large roof penetrations, dormers, etc.). More guidance is given in AS/NZS 3500.3 and the NCC. Calculate the area of each catchment for each downpipe.
9. With the area of your eaves gutter, check that the catchment area for each downpipe, calculated in Step 8, is equal to or less than the catchment area shown by the graph.
   If a catchment area is too big then you can:
   - Increase the number of downpipes;
   - Reposition the downpipes and/or the high points;
   - Choose a gutter with bigger effective cross-sectional area, then repeat the above from Step 6.
10. Decide on the downpipe size. Recommendations in AS/NZS 3500.3 on downpipe sizes. Table 2 gives the standard size downpipes available to suit the requirements given in AS/NZS 3500.3.
11. Consider measures to counter overflow of gutters into the building (see pages 2 and 3). Consideration of overflow at high concentrations of water flow may need to be given.

Table 2

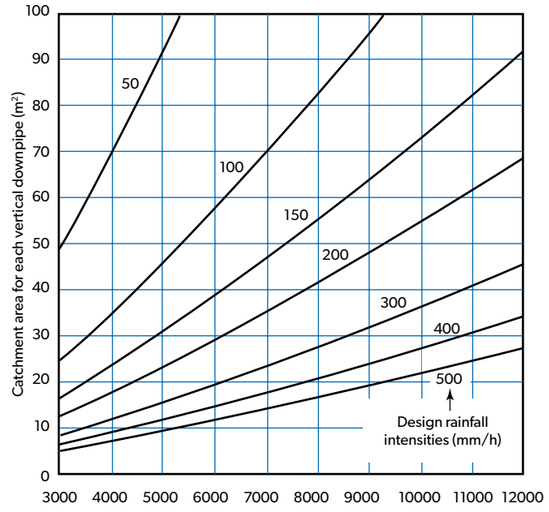
LYSAGHT® gutter cross-sectional areas and downpipes.

		Minimum standard downpipe sizes to suit gutters (gutter gradient ≥ 1:500)		
	Slotted	**Effective # cross section**	**Round (diameter)**	**Rectangular or square**
	yes/no	mm^2	mm	mm
Quad Hi-front	yes	5225	90	100x50
	no	5809	90	100x50
OGEE®	no	5242	-	100x50
150 Half Round	no	9200	§	100x75*
TRIMLINE®	yes	6244	90	100x50
	no	7800	100	100x75
SHEERLINE®	yes	7600	100	100x75
	no	8370	§	100x75

Values calculated in accordance with AS/NZS 3500:3.
§ Non standard downpipe and nozzle/pop is required.
* Non standard nozzle/pop is required to suit rectangular downpipe.

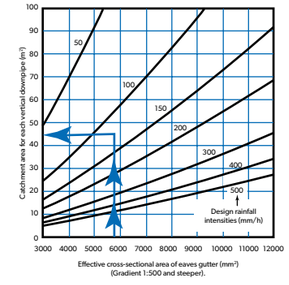
Figure 1

Cross-sectional area of eaves gutters required for various roof catchment areas (where gradient of gutter is 1:500 and steeper). (Adopted from AS/NZS 3500.3).



EXAMPLE
Find the minimum catchment area for each downpipe on a house in Horsham using QUAD Hi-front gutter.

Method
Using the gutter cross sectional area taken from Table 2 (shown across the bottom of the graph) draw a line upwards until it intersects with the Design rainfall intensity (Table 1). Draw a line at 90º to determine the catchment area for each downpipe.



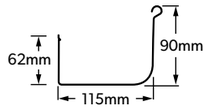
DATA
Design rainfall intensity = 120 (Table 1)
Gutter area = 5809 (Table 2)

SOLUTION (From Figure 1)
Catchment area for each downpipe = 47m^2

LYSAGHT® GUTTERS, FASCIA AND ACCESSORIES

LYSAGHT® quality gutters are available in unpainted ZINCALUME® steel and in a range of COLORBOND® steel pre-painted colours to match or contrast your roof.

QUAD



Profile shown unslotted for clarity.

- Classic design that is the leading choice in new homes
- The high front profile design obscures the roofline for a more attractive finish
- Compatible with NOVALINE® Fascia System for quick, easy attachment to the building
- Available with optional slotting to allow overflow where alternative overflow devices are not installed
- Suitable for steel or tile roofs

ACCESSORIES

Internal GP bracket
ZINCALUME® steel

External T-head bracket
Unpainted & PC

Stop end plates (pair)
ZINCALUME® steel & COLORBOND® steel

Internal corners Diecast 90˚ and 45˚
Unpainted & PC

External corners Diecast 90˚ and 45˚
Unpainted & PC

Overstrap for use with NOVALINE® Fascia
ZINCALUME® steel

OGEE®

- Truly distinctive look compatible with both traditional and modern buildings
- Popular style so a complete range of accessories is available
- Compatible with NOVALINE® Fascia System for quick, easy attachment to the building
- Suitable for steel or tile roofs

ACCESSORIES

Internal corner Diecast 90˚ and 45˚
COLORBOND® steel & Unpainted

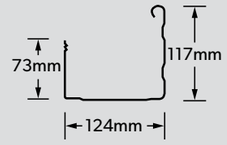
External corner Diecast 90˚ and 45˚
COLORBOND® steel & Unpainted

OG overstrap

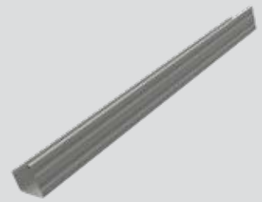
OG external bracket

Stop end LH or RH

TRIMLINE®



Profile shown unslotted for clarity.



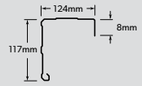
- Slim, elegant square gutter particularly suited to domestic applications that is fast and simple to install
- Concealed fixing offers clean, attractive 'trim' lines
- Compatible with NOVALINE® Fascia System for quick, easy attachment to the building
- Available with optional slotting to allow overflow where alternative overflow devices are not installed
- Suitable for steel or tile roofs

ACCESSORIES

Internal GP bracket
ZINCALUME® steel

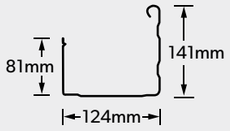
Overstrap for use with NOVALINE® Fascia
ZINCALUME® steel

External end stop (pair)
ZINCALUME® steel & COLORBOND® steel

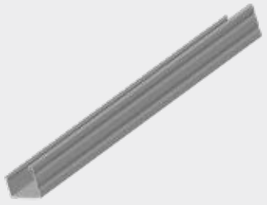


Capping
ZINCALUME® steel & COLORBOND® steel

SHEERLINE®



Profile shown unslotted for clarity.



- Popular for home improvement projects like patios, pergolas and sheds and for use with high profile roofing laid at low pitches or traditional domestic roofs requiring large water carrying capacity
- Concealed fixing offers clean and seamless finish
- SHEERLINE® capping available for trimming roof edges
- Available with optional slotting to allow overflow where alternative overflow devices are not installed

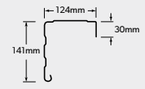
ACCESSORIES

Internal GP bracket
Unpainted & PC

SGCI gutter clip
Unpainted & PC

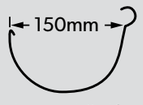
(Also available as internal stop ends)

Fascia style stop end plates (pair)
ZINCALUME® steel & COLORBOND® steel



Capping
ZINCALUME® steel & COLORBOND® steel

HALF ROUND



Profile shown unslotted for clarity.

- Large water carrying capacity for high rainfall areas and large roof sizes
- Unique curved base allows self-cleaning and prevents build-up of water and dirt
- Complemented with a complete range of accessories

ACCESSORIES

Half round nozzle 100x75mm
Unpainted & PC

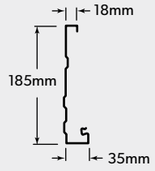
Half round external bracket
Unpainted & PC

Half round nozzle 100x50mm
Unpainted & PC

Half round stop ends (LH/RH)
ZINCALUME® steel & COLORBOND® steel

Half round nozzle 90mm diameter

NOVALINE® Fascia



- State-of-the-art fascia system
- Integrates perfectly with quad, OGEE® and TRIMLINE® gutters
- Replaced traditional timber fascia which reduces painting and maintenance
- Makes fixing gutters quick and easy using spring clips
- Extensive range of accessories available

ACCESSORIES

Spring clip
ZINCALUME® steel

Splice plate
ZINCALUME® steel

External corner 90˚ and 45˚
ZINCALUME® steel & COLORBOND® steel

Internal cover cap

Barge mould left and right
ZINCALUME® steel & COLORBOND® steel

Apex cover
ZINCALUME® steel & COLORBOND® steel

Multipurpose fascia bracket
ZINCALUME® steel

DOWNPIPES & ACCESSORIES

Completing your rainwater system

Finish your roof with the distinctive style of the LYSAGHT® downpipes and accessories. These downpipes and accessories are compatible with the NOVALINE® fascia system, and with a wide range of gutters.

All LYSAGHT® downpipes and accessories are made from galvanised or ZINCALUME® steel, which means they are strong and made to last.

Most downpipes and accessories are available in unpainted ZINCALUME® steel and a range of COLORBOND® steel colours to match or contrast with your roof. They are compatible with steel and tile roofs.

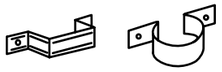
A wide range of rectangular, square and round downpipes available to complement all building styles. Some dimensions and availability may vary slightly from region to region.

DOWNPIPES

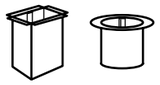
Rectangular or square
100x50
100x75
100x100

Round
75
90
100

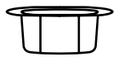
DOWNPIPE ACCESSORIES



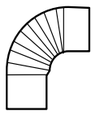
Astragal/brackets



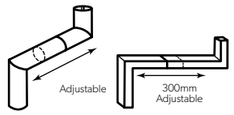
Pops



Unidrop



Bends
(rectangular and circular)



Offsets

TRADEWORK & RAINHEADS

Made to order to your specifications

LYSAGHT® rainwater heads, flashing, tradework and box gutters, are also available made to order. Provide us with a picture, drawing or template and we can manufacture for you.

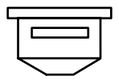
To order non-standard rainwater heads, supply detailed drawings showing front and side elevations with dimensions and nozzle size.

Refer to the Victoria product offer for the full range of tradework and flashing products available. Ask your technical sales representative for details.

TRADEWORK

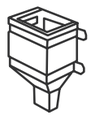
LYSAGHT® standard rainwater heads
390 W x 300 H x 250 D

Materials: COLORBOND® steel, ZINCALUME® steel



Tapered rainwater heads
(downpipe outlet not included)
Small: 380 x 175 x 200 mm
Large: 450 x 250 x 250 mm
Or to your dimensioned drawing.

Materials: COLORBOND® steel, ZINCALUME® steel



Custom made square rainwater heads
(downpipe outlet not included)
To your dimensioned drawing.

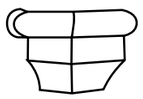
Materials: COLORBOND® steel, ZINCALUME® steel

Custom made round rainwater heads
To your dimensioned drawing.

Materials: COLORBOND® steel, ZINCALUME® steel

Corner OGEE® rainwater head
To your dimensioned drawing.

Materials: Galvanised steel, Copper



OGEE® rainwater head
Small: 310 x 200 mm
Large: 400 x 250 mm
Or to your dimensioned drawing.

Materials: Galvanised steel, Copper

INSTALLATION ADVICE

Get it right first time with LYSAGHT® products

BRACKET SPACING

When the gutters are attached to NOVALINE® fascia, then the gutter bracket spacing should mirror the spacing of the NOVALINE® brackets (i.e. 600mm & 1200mm), and the gutter brackets should be adjacent to the NOVALINE® brackets.

However, when the gutters are fixed to other fascias then the weight of the water carried by the gutter should determine spacing required - however spacing should not exceed 1200mm maximum.

FALL

Install gutters with a suitable fall to avoid ponding and to allow water to easily flow away. Steeper falls are preferred for prolonged life of the gutter. Refer to the NCC and the Australian Standards for guidance.

METAL & TIMBER COMPATIBILITY

Lead, copper, bare steel and green or some chemically-treated timber are not compatible with this product; thus don't allow any contact of the product with those materials, nor discharge of rainwater from them onto the product. If there are doubts about the compatibility of other products being used, ask for advice from our information line.

ROOF DRAINAGE SYSTEM DESIGN

Roof drainage systems should be designed and detailed by a suitably qualified trade or professional in accordance with the NCC and the Australian Standards. Particular reference should be made to the correct sizing of gutter; quantity and placement of downpipes; and the provision of appropriate overflow devices. (Page 2-3).

ADVERSE CONDITIONS

If these products are to be used within 1km of marine, severe industrial, or unusually corrosive environments, ask for advice from our information line.

INSTALLATION ADVICE

The roof drainage system should be installed using good trade practices and by a certified installer.

For sealed joints use screws or rivets and neutral-cure silicone sealant branded as suitable for use with galvanised steel or COLORBOND® steel/ZINCALUME® steel.

CLEAN UP

Remove all plastic cover strips from product and dispose of correctly.

Sweep all metallic swarf and other debris from roof areas, gutters, downpipes, overflow devices and all other roof drainage components at the end of each day and at the completion of the installation.

GUTTER MAINTENANCE

The roof drainage system (gutter, downpipes, overflow devices and all other components) must be cleaned out on a regular basis.

GUTTER MAINTENANCE

Getting the most from LYSAGHT® products

1) A typical suburban gutter clogged with leaf litter prior to cleaning.

2) Wear correct protection when clearing leaves and twigs.

3) When litter is removed, the layer of hardened dirt is revealed below.

4) Rinse the gutter with water to soften and break up the dirt.

5) Use a soft bristle brush and sweep the dirt out. Rinse again.

6) When the gutter has been cleaned, it should look like this.

CLEANING GUTTERS

Twigs, dust, leaves and fungal matter (debris) should be removed regularly from gutters - as failure to do so voids your warranty.

- Sweep debris into a pile using a stiff, soft bristled brush (shovels or hard tools should not be used).
- The whole roof and gutter should then be washed down with a hose, including high ends of gutters (possibly protected by overhangs), rain heads, water spouts and overflow locations.

A well maintained gutter/downpipe will allow your rainwater system provide years and years of trouble-free service.

PRODUCT DESCRIPTIONS

- All descriptions, specifications, illustrations, drawings, data, dimensions, and weights contained in this publication and websites containing information from Lysaght are approximations only. They are intended by Lysaght to be a general description for information and identification purposes and do not create a sale by description. Lysaght reserves the right at any time to:

  a) Supply goods with such minor modifications from its drawings and specifications as it sees fit, and

  b) Alter specifications shown in its publications and websites to reflect changes made after the date of publication.

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- This publication is intended to be an aid for all trades and professionals involved with specifying and installing LYSAGHT® products and not be a substitute for professional judgement.
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AUSTRALIAN STANDARDS

Australian Standard	Definition
AS/NZS 3500.3:2021	Plumbing and Drainage-Part 3: Storm water drainage

BLY0104-07/2025

FOR DETAILED PRODUCT INFORMATION, MANUALS AND PROJECT CASE STUDIES VISIT:

WWW.LYSAGHT.COM

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