

RAINWATER SOLUTIONS

LYSAGHT

QUEENSLAND



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.

Furthermore, in each state and territory it is necessary to satisfy 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).

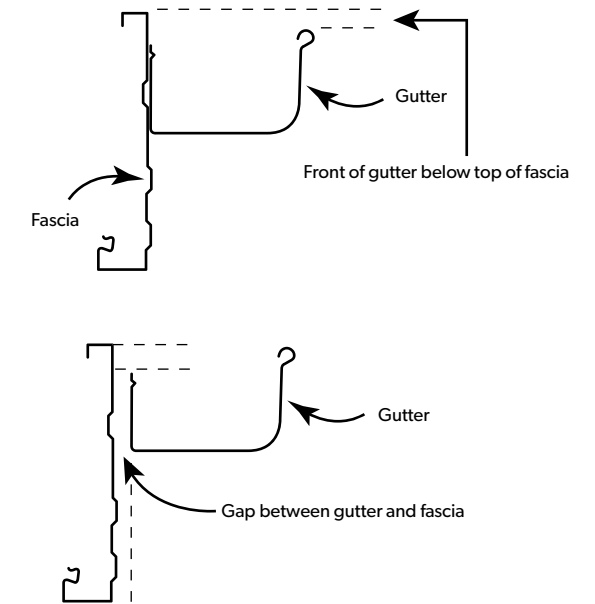
During the installation all debris and loose waste materials (swarf, fasteners, etc.) must be cleaned off at the end of each day and at the completion of the installation to prevent blockages of the drainage system or deterioration of the individual components. Any protective films should also be removed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

MAINTENANCE OF DOMESTIC ROOF DRAINAGE SYSTEMS

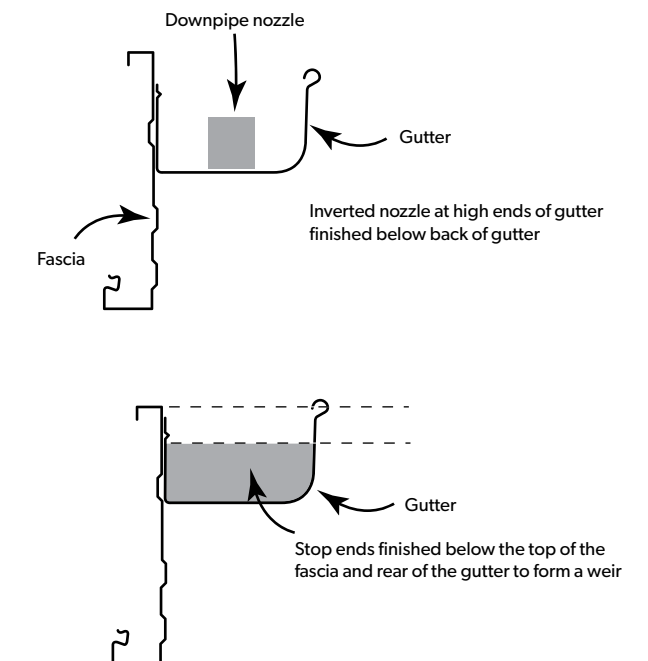
In the longer term, the ability of a roof drainage system to handle overflow will also depend on the regular cleaning of the system. For example the removal of plant or animal matter (leaves, fungal growth, dropping, nests, etc.) and debris from gutters, leaf-guard type systems and the gutter overflow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

	5 minute duration rainfall intensity	
	ARI once in 20 years mm/hr	ARI once in 100 years mm/hr
QLD		
Bamaga	252	298
Brisbane	236	306
Ipswich, Brisbane	211	278
Victoria Point, Brisbane	245	320
Bundaberg	266	339
Cairns	230	279
Cloncurry	219	278
Innisfail	248	302
Mackay	250	315
Mt Isa	201	262
Noosa Heads	258	332
Rockhampton	229	300
Toowoomba	203	268
Townsville	235	300
Weipa	238	281

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 fall ≥ 1:500)			
	Slotted	Effective # cross section	Round (diameter)	Rectangular or square
	yes/no	mm ²	mm	mm
Quad Hi-Front 115	yes	5225	90	100x50
	no	5809	90	100x50
Quad 150	no	8631	125 ▲	100x75
Quad Hi-front 150	yes	6700	100	100x75
	no	7430	100	100x75
Quad 175	no	14,500	150 ▲	125x100 ▲
TRIMLINE®	yes	6244	90	100x50
	no	7800	100	100x75
EMLINE®	yes	6273	100	100x75
	no	9536	125 ▲	100x75
FITFAST®	yes	6723	100	100x75
	no	7209	100	100x75
Half Round Flat Back 150	yes	5580	90*	100x50*
	no	9170	▲	100x75*
Half Round 150	yes	5730	90*	100x50*
	no	9440	▲	100x75*
Half Round Flat Back 190	yes	-	-	-
	no	10750	▲	100x100*
Half Round 190	yes	-	-	-
	no	10475	▲	100x100*

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 downpipe.

Table 3

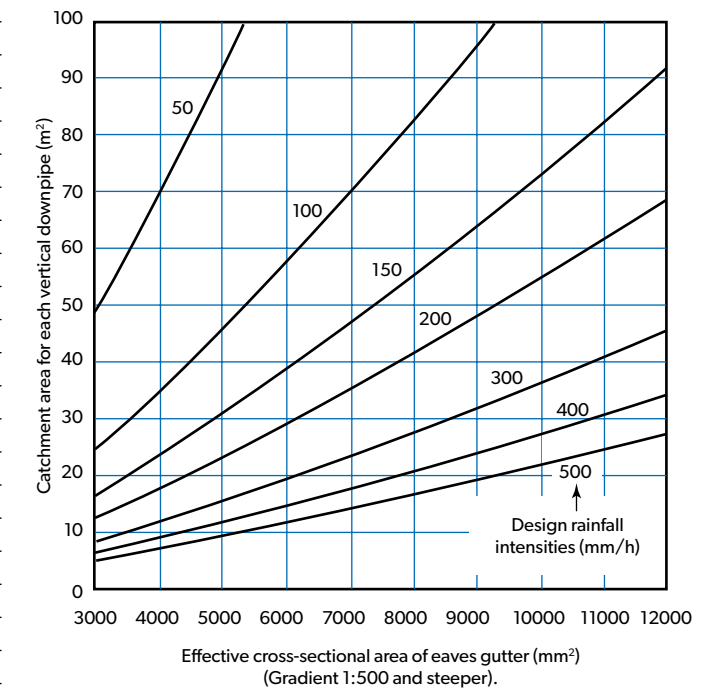
NCC Gutter Type.

Gutter Type	Description	Min. Cross Section (mm ²)	Suitable Gutter Selection
A	Rectangular (Medium)	6500	TRIMLINE®, no slots EMLINE®, no slots EMLINE®, slotted FITFAST®, no slots FITFAST®, slotted
B	Rectangular (Large)	7900	EMLINE®, no slots
C	D gutter (Small)	5200	Quad Hi-Front 115, no slots Quad Hi-Front 115, slotted Quad Hi-front 150, no slots Quad Hi-front 150, slotted Quad 150, no slots
D	D gutter (Medium)	6300	Quad Hi-front 150, no slots Quad Hi-front 150, slotted Quad 150, no slots
E	D gutter (Large)	9000	Quad 175, no slots

Where the roof drainage system is designed and constructed in accordance with the Acceptable Construction Practice given in the NCC the above table lists the gutters that can be used for the different Gutter Types (as described in the ABCB Housing Provisions Standard 2022 7.4.3b).

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/NZ 3500.3).

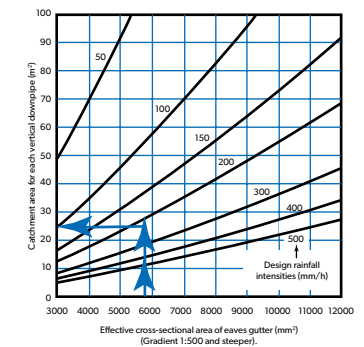


EXAMPLE

Find the minimum catchment area for each downpipe on a house in Mt Isa 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 90° to determine the catchment area for each downpipe.



DATA

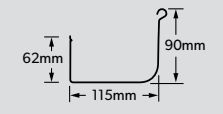
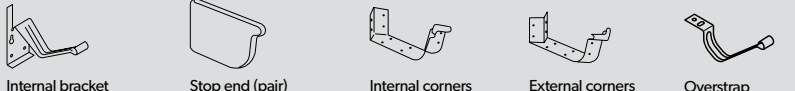
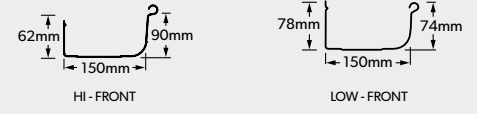



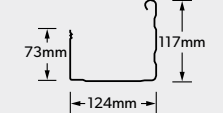

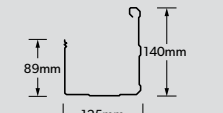

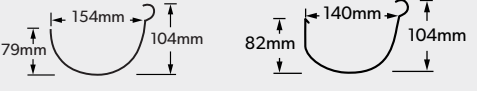
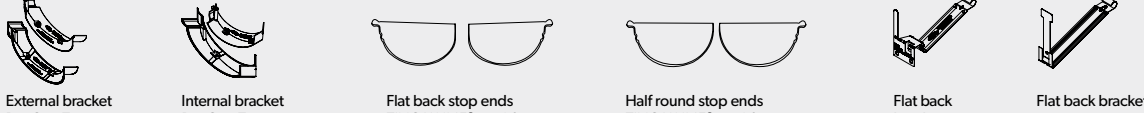
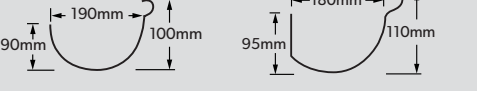
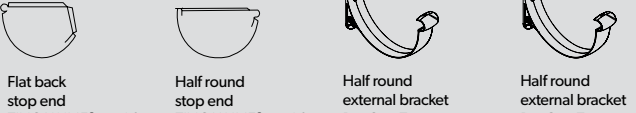
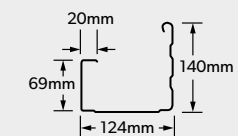

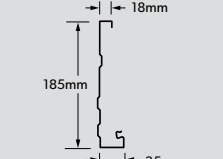
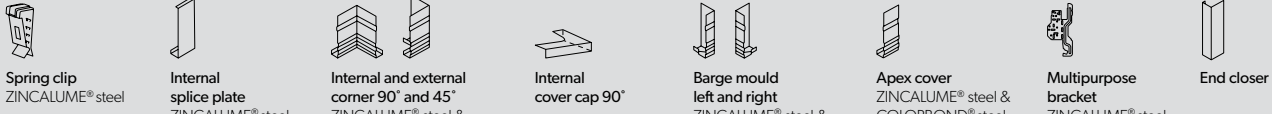
Design rainfall intensity = 199 (Table 1)
Gutter area = 5809 (Table 2)

SOLUTION (From Figure 1)

Catchment area for each downpipe = 27m²

LYSAGHT® GUTTERS, FASCIA AND ACCESSORIES

LYSAGHT® quality gutters and fascia are available in unpainted ZINCALUME® steel and in a range of COLORBOND® steel pre-painted colours to match or contrast your roof. NOTE: Not all gutters are available from all regions. Talk to your sales office for local availability.

<p>QUAD 115 Hi-Front</p>	 <p>Profile shown unslotted for clarity.</p>	<ul style="list-style-type: none"> • Classic design is the leading choice of 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 	<p>ACCESSORIES</p>  <p>Internal bracket ZINCALUME® steel Stop end (pair) ZINCALUME® steel & COLORBOND® steel Internal corners 90° and 45° Unpainted and PC External corners 90° and 45° Unpainted and PC Overstrap ZINCALUME® steel</p>
<p>QUAD 150 Hi/Lo-Front</p>	 <p>HI - FRONT LOW - FRONT</p>	<ul style="list-style-type: none"> • Traditional design that is suitable for new homes or to match existing gutters • Compatible with NOVALINE® Fascia System for quick, easy attachment to the building • Suitable for steel or tile roofs • The high front option obscures the roofline for a more attractive finish 	<p>ACCESSORIES</p>  <p>Internal bracket ZINCALUME® steel Overstrap ZINCALUME® steel Stop end (pair) ZINCALUME® steel & COLORBOND® steel</p>
<p>QUAD 175</p>	 <p>Dimensions may differ from that shown.</p>	<ul style="list-style-type: none"> • Traditional design that is suitable for new homes or to match existing gutters • Popular where high water carrying capacity is of prime concern • Compatible with NOVALINE® Fascia System for quick, easy attachment to the building • Suitable for steel or tile roofs 	<p>ACCESSORIES</p>  <p>Internal/External corners Stop end ZINCALUME® steel & COLORBOND® steel Return stop end ZINCALUME® steel, COLORBOND® steel & Galvanised Overstrap and bracket 2 piece Galvanised Internal bracket ZINCALUME® steel Overstrap ZINCALUME® steel Spike bracket</p>
<p>TRIMLINE®</p>	 <p>Profile shown unslotted for clarity.</p>	<ul style="list-style-type: none"> • 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 	<p>ACCESSORIES</p>  <p>Internal bracket ZINCALUME® steel Overstrap ZINCALUME® steel External end stop ZINCALUME® steel & COLORBOND® steel Capping</p>
<p>EMLINE®</p>	 <p>Profile shown unslotted for clarity.</p>	<ul style="list-style-type: none"> • Strong, attractive 'M' style gutter designed for greater durability and generous rainwater carrying capacity • Compatible with NOVALINE® Fascia System for quick, easy attachment to the building • Concealed fixing offers clean and seamless finish • Available with optional slotting to allow overflow where alternative overflow devices are not installed 	<p>ACCESSORIES</p>  <p>Overstrap EMLINE® bracket End stop Internal/External corners Capping</p>
<p>HALF ROUND 150/ FLAT BACK 150</p>		<ul style="list-style-type: none"> • Large water carrying capacity for high rainfall areas and large roof sizes - ideal for tropical/sub-tropical climates • Unique curved base allows self-cleaning and prevents build-up of water and dirt • Flat Back gutter offers concealed fixing for clean and seamless finish 	<p>ACCESSORIES</p>  <p>External bracket Die Cast Zinc (Half round shown) Internal bracket Die Cast Zinc (Half round flat back shown) Flat back stop ends ZINCALUME® steel & COLORBOND® steel Half round stop ends ZINCALUME® steel & COLORBOND® steel Flat back bracket Flat back bracket/overstrap</p>
<p>HALF ROUND 190/ FLAT BACK 190</p>		<ul style="list-style-type: none"> • Large water carrying capacity for high rainfall areas and large roof sizes - ideal for tropical/sub-tropical climates • Unique curved base allows self-cleaning and prevents build-up of water and dirt • Complemented with a complete range of accessories • Flat Back gutter offers concealed fixing for clean and seamless finish 	<p>ACCESSORIES</p>  <p>Flat back stop end ZINCALUME® steel & COLORBOND® steel Half round stop end ZINCALUME® steel & COLORBOND® steel Half round external bracket Die Cast Zinc Half round external bracket Die Cast Zinc Heavy duty</p>
<p>FITFAST®</p>		<ul style="list-style-type: none"> • Quick and easy way to fit a gutter that saves time and money • Clever mounting bracket ideal for situations where roof overhang prevents connection to a fascia • Elegant style complements LYSAGHT® range of roofing profiles • Available with slotting to allow overflow where alternative overflow devices are not installed 	<p>ACCESSORIES</p>  <p>Mounting bracket End stop</p>
<p>NOVALINE® Fascia</p>		<ul style="list-style-type: none"> • State-of-the-art fascia system integrates perfectly with Quad 115 Hi-front and EMLINE® and TRIMLINE® gutters • Replaces traditional timber fascia which reduces painting and maintenance • Clips make fixing gutters quick and easy • Extensive range of accessories available 	<p>ACCESSORIES</p>  <p>Spring clip ZINCALUME® steel Internal splice plate ZINCALUME® steel Internal and external corner 90° and 45° ZINCALUME® steel & COLORBOND® steel Internal cover cap 90° Barge mould left and right ZINCALUME® steel & COLORBOND® steel Apex cover ZINCALUME® steel & COLORBOND® steel Multipurpose bracket ZINCALUME® steel End closer</p>

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

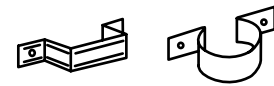


Rectangular or square
100x50
100x75
100x100
125x100
150x100
150x150
*others available



Round
75
90
100
125
150
*others available

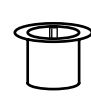
DOWNPIPE ACCESSORIES



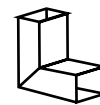
Astragal/brackets



Pops



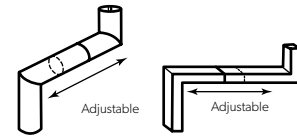
Unidrop



Square corner



Round corner



Offsets

RAINHEADS & TRADEWORK

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.

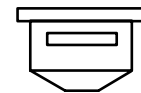
To order non-standard rainwater heads, supply detailed drawings showing front and side elevations with dimensions and nozzle size.

Refer to the Queensland 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



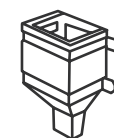
Tapered rainwater heads
(downpipe outlet not included)
Small: 380 x 175 x 200 mm
Large: 450 x 250 x 250 mm
Or to your dimensioned drawing.

MATERIALS FOR TRADEWORK

COLORBOND® steel

ZINCALUME® steel

Stainless steel



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



Custom made round rainwater heads
To your dimensioned drawing.



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 BCA 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 BCA 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:

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AUSTRALIAN STANDARDS

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

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

[WWW.LYSAGHT.COM](https://www.lysaght.com)

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