

# ACO Building Drainage Products

External building drainage



## ACO BuildLine

*Technical Handbook and Product Catalogue*



**Shallow drainage channels**

**Door drainage channels**

**Softscape drainage channels**



# The ACO Group

ACO branded drainage and surface water management systems are recognised throughout the world for their innovative design, high quality, environmental benefits and industry leading performance.

The ACO Group has a research and production base that reaches across four continents. This unmatched resource pioneers the development of solutions that are tailored to individual markets, meeting the need for high performance and sustainable products that deliver optimum value throughout their operational life.



The ACO Group - [www.aco.com](http://www.aco.com)

## ACO Pty Ltd

ACO Pty Ltd is part of the ACO Group, a multinational company specialising in products for stormwater, wastewater and cable management.

ACO has been supplying products and solutions to the Australian construction and building industry for over 25 years.

## ACO System Chain



ACO manufactures a range of construction products from polymer concrete, stainless steel, mild steel, ductile iron and moulded plastics. These diverse materials are used to manufacture products for civil, urban and building architectural applications.

ACO is always bringing new products to the Australian market and works in conjunction with the ACO Group's established Research and Development Department responsible for continuous development, quality and testing to ensure ACO products continue to lead the market.

## ACO Service Chain



ACO provides technical support from specification advice to installation expertise. Through dedicated training programs, ACO also provides architects and engineers with surface drainage training sessions.



ACO Pty Ltd, Head Office at Emu Plains NSW Australia



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ACO BuildLine is a range of drainage products designed to protect the building from rain and runoff at and around the building line, from the ground level up to the roofline.

These speciality products intercept and collect surface water typically at thresholds, balconies, green roofs, building facades and other outdoor areas, whilst complying with other construction and user requirements.

### Range

- Shallow drainage channels - BalconyDrain
- Threshold door drainage channels - RainTrak®
- Softscape roof drainage channels - ProfiLine

### Benefits

- WaterMark approved
- A choice of durable stainless steel and galvanised steel linear channels and grates
- Purposed designed product solutions for specialty areas
- Custom solutions, made to measure and delivered from ACO's manufacturing plant
- Grates slip rated and certified to AS 4586
- Fully backed by a complimentary, no obligation hydraulic design service
- Specification and installation tools and guidelines

## ACO BuildLine introduction

As with all services, drainage needs to cater for the requirements of various applications, depending on their specific location within a building.

Drainage can be influenced by site specific requirements such as restricted depth slabs, the position of walls and hydraulics, where the volume of design runoff needs to be calculated to ensure walking surfaces remain free from ponding.

Additionally, the most visible element, the grate, needs special consideration. This is because the grate physically interacts (being constantly walked on) and visually interacts with its environment and surrounds.

All these factors present a challenge to designers who rely on versatile, safe, durable and functional product solutions to maintain the high standard of their design for a sustainable 'as built' result.

ACO's range of product solutions, complete with a choice of grates, are purpose designed to suit the drainage requirements of buildings. ACO's grate options help the designer facilitate access and mobility within and around the building envelope, whilst complying with legal requirements and the aesthetic objectives of the design.



Other ACO products

○ **Selecting the right drainage system**

The requirements of a drainage system differ widely across specific applications within a building. Each drainage element must be carefully considered to assess their visual and functional impact on a building's design.

**Aesthetics**

The aesthetics of a drainage system must be carefully considered to ensure it is consistent with the designer's visual project objectives.

Selecting drainage that enhances or blends with the aesthetic is an important consideration as drainage is used frequently across commercial and residential buildings.

**Sizing and hydraulics**

To ensure a building and its elements have the appropriate barrier protection, an assessment of the hydraulic performance of both the channel and grate is essential.

A correctly specified drainage system stops rainwater transgressing into a building or into other sensitive areas. Catchment hydraulics are site-specific and therefore require specific calculations to ensure drainage systems are correctly selected and sized.

For more information, refer to page 6.

○ **User requirements**

For every application consider:

- Traffic flow: bare feet, heels, vehicles?
- Local environment: proximity to the ocean, a swimming pool or other harsh environment?
- Legislative requirements: slip resistance, aesthetics, load ratings?

For more information, refer to page 9.

There are other application-specific considerations to select the right drainage system:

● **Green roofs**

Water management in a green roof is vital to sustain plants and vegetation with a natural supply of water, whilst protecting users against the effects of standing water.

- Depth of soil overlying the slab?
- How will the drainage interface with the waterproof membrane?

*Refer to page 22 for product solutions.*



● **Balcony or terrace**

- Depth available in the slab for drainage?
- Where should the drainage element be positioned in the slab, relative to the door?

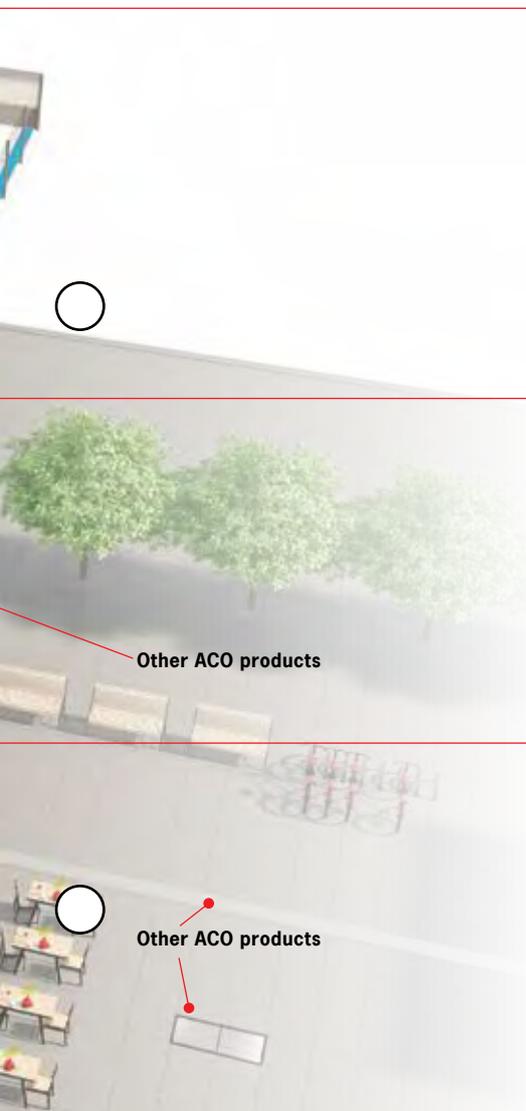
*Refer to page 14 for product solutions.*



● **Door threshold**

- Is a level threshold required for accessibility?
- What door profile is being used and how will it integrate with the drainage element?

*Refer to page 18 for product solutions.*



## Hydraulic considerations

### Level thresholds

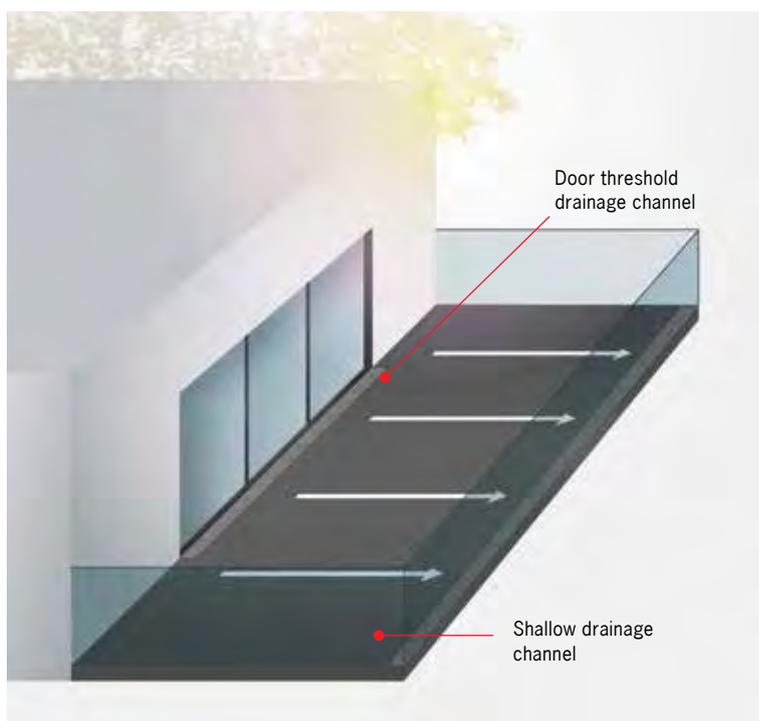
To make the most of the Australian climate, open air living and working areas are popular. This has meant that level thresholds have become a sought-after design feature in many residential and commercial buildings leaving sleek, distinct architectural lines for the designer to integrate. These lines are often the most regularly trafficked access zones of buildings and become the barriers between wet and dry areas.

Stormwater drainage must be effective as water damage repairs are not only disruptive and extremely costly, but can have legal ramifications in the event of structural damage or injury from standing water.

With the increasing regularity and intensity of storm events, linear drainage is an effective barrier to stop water transgression into buildings and other sensitive areas.

Drainage must be correctly specified to ensure performance even during peak storms. Factors to consider are:

- The speed and volume of run off from the exposed pavement or facade
- Relative position of the drain
- The hydraulic performance of the drainage channel
- The inlet performance of the grate



### Pavement catchment design

A flat and level pavement design reduces risks to pedestrian safety, but requires an efficient drainage system. A correctly designed drainage system prevents hazards caused by ponding and standing water, damage to buildings and preserves the life of the pavement.

### Balconies and terraces

Balconies are popular in multi-residential buildings to ensure occupants have access to outdoor space.

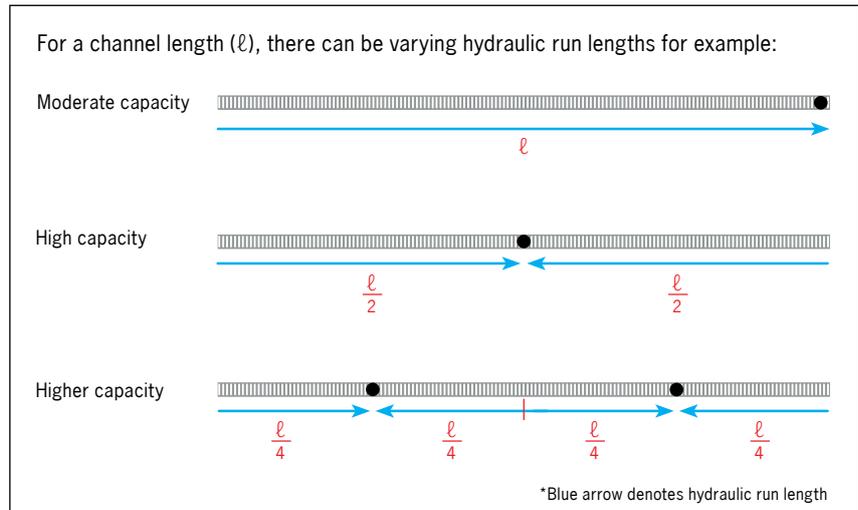
AS 3500.3 specifies that balconies and terraces should be designed with two drainage methods. One designed for a 20 year storm event (to drain rain from walls, windows and wind driven rain collecting on the door frame) and a contingency method designed for a 100 year storm event.

It is imperative that the exposed area falls away from the building, so any threshold drainage is designed to remove only wind driven rain and not surface runoff from the pavement.

## Channel hydraulics

A channel's hydraulic capacity is calculated by the amount of water the channel is able to collect and drain in a given time period. This determines the size of channel required.

A channel's capacity is influenced by changing its physical cross sectional size (width x depth), or by changing its hydraulic run length (the distance water needs to travel before being discharged through an outlet). With all other factors equal, the shorter a hydraulic run length, the higher a channel's capacity to drain.



### Technical support

ACO has considerable experience in channel hydraulics and offers designers a free, no obligation service to calculate the suitability of ACO's drainage channels for individual projects.

ACO uses a purpose-written, hydraulic design program modelled using differential calculus for non-uniform flow in open channels. To help designers specify an appropriately sized channel for a project, the program assesses the effect a slope, a run length and outlet locations have on the capacity of a channel.

## Grate hydraulics

A grate fails hydraulically when water bypass occurs. Consideration must also be given to the inlet size of the grate to ensure it adequately removes water, but not at the expense of introducing litter into the drainage system, or compromise the safety of users.

A grate's hydraulic capacity is calculated by the amount of water it will allow to pass through it in a given time period. Failure to allow passage of water into its underlying channel will result in bypass, regardless of how much capacity the channel has.

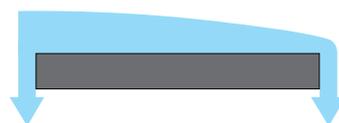
There are three factors that affect the hydraulic capacity of a grate, its size, its collective intake area and the design of its inlets.

For instance, a longitudinal bar grate can have a large cumulative intake area. Between the bars, each slot acts as an individual elongated orifice and the grate will only reach its capacity once each orifice has flooded. The bars also have the effect of slowing down the speed of water, ensuring gravity has enough time to maximise the evacuation of the water between the bars.

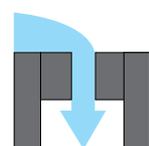


In comparison, the intake areas (and therefore capacity) of tile grates and slotted grates can be much smaller than a longitudinal bar design.

A tile grate has only two openings along the length of the drain, leaving opportunities for water to be evacuated through the inlets.



Furthermore, slotted top styles are the most compromised design as there is only one slot for water to be intercepted.



During heavy storms, water bridging is common due to the increased flow rate. This can result in bypass, so longitudinal bar grates are preferred in vulnerable areas such as thresholds.

### Grate intake testing

Due to the complex nature of water in relation to grate capture, testing is the only way to accurately predict how a grate will perform to intercept surface water run-off.

In conjunction with the University of New South Wales, ACO has independently measured the hydraulic performance of its range of grates. Hydraulic tests were carried out under varying flow rates and catchments.

Based on project specific requirements, results from these empirical tests allow ACO to accurately recommend a grate for designers with specific runoff design requirements. Blockage factors can also be applied.

# Integrated sustainable building designs

## Drainage integration

Building construction requires careful integration of multiple materials across every facet of the construction process. Drainage elements can never be considered in isolation and must be designed to integrate into the building design.

## Waterproof membranes

To prevent water infiltration from damaging a building aesthetically and structurally, waterproofing is a key component of a building's construction. Even a small leak can have catastrophic effects on the structural integrity of a building and lead to costly repairs.

To ensure long-term durability, waterproofing must be used in conjunction with other water control measures, such as water stops and drainage cells.

Waterproofing can be applied either with a painted, or rolled membrane over a slab to prevent water penetrating the slab and causing deterioration over time.

Waterproofing must be turned into, sealed or clamped against every drainage component so that collected water cannot ingress through the concrete slab or timber joisted floor.

Drainage channels can be manufactured with custom configurations of tile upstands and extended edges to provide a membrane flange for waterproofing to adhere to. This reduces reliance on sealants and facilitates a water tight joint.



## Floors

Floor depth is a key consideration in building construction. Designers often want to achieve shallow depths to keep construction costs down. Waterproofing is typically positioned in the screed layer above a structural slab and consequently drainage needs to be compact. Balconies in particular require careful consideration as floor depths often require drainage depths less than 30mm.

## External doorways

Any external doorway is vulnerable to water, but level thresholds are particularly susceptible to failure as there is no physical barrier to intercept water and protect the building. In order to use sliding or bi-fold doors with a level threshold entranceway, a drainage channel must be positioned adjacent, but external to the building.

If this area is trafficked by wheels (e.g. trolleys), consideration must be given to the design of the grate. Contact ACO for more information.

## Sustaining the economy

Since 1994, ACO has manufactured Australian made products and continues to employ from the local community and support local manufacturing partners.

Based in Emu Plains NSW, ACO can provide quick, tailored solutions to meet specific project requirements.

ACO is an advocate of keeping innovation, jobs and skills in Australia.

## Design life

Selecting the correct product for each application is imperative as each project has different requirements. Products need to be manufactured from durable materials to help designers maximise the design life of the building.

ACO offers products manufactured from galvanised steel, Grade 304 stainless steel and Grade 316 stainless steel. Grade 304 stainless steel is suitable for most buildings, however, the operating or living environment can produce corrosive

conditions, for example indoor swimming pools or ocean-side applications.

As members of ASSDA (Australian Stainless Steel Development Association), ACO has access to expert metallurgists for advice on stainless steel suitability for specific applications. Contact ACO for more information and guidance.

All ACO stainless steel products are pickle passivated to remove any impurities introduced during fabrication. Products without pickle passivation will oxidise at

welds, particularly in wet environments.

Electropolishing is an additional, optional process that improves corrosion resistance and lustre, making electropolished Grade 316 ideal for ocean side installations and other projects where additional corrosion resistance and aesthetics are required.



## Warranty

ACO offers a ten year warranty on ACO BuildLine products to guarantee the material properties are as specified and workmanship of the channel and grates are of satisfactory standard.

## Sustainable building design

A building must be relevant, functional and accessible for the duration of its design life. Additionally the building must adapt to the changing needs of occupants.

Eco rated buildings are growing in popularity as Australia's consumers become increasingly aware of sustainable living. Fundamentally, products used in construction must perform without deterioration in both form and function to the appropriate design life. This requires correctly specified, quality manufactured products that are fit for purpose.

To achieve a sustainable drainage design, designers should not only select products that are manufactured from recycled and recyclable materials, but also plan how stormwater can effectively be collected and reused on site.

Considering sustainable surface water management beyond the collection is an integral part of the planning process.

Plastic geocellular systems have been used for a number of years to infiltrate and detain water. Pollutants, debris and sediment can be removed from the water so it can be harvested for reuse in parklands, sports fields, commercial agriculture and residential gardens.

ACO StormBrixx® is a unique, patented plastic geocellular stormwater management system designed for surface water retention, detention and infiltration.

Contact ACO for more information, or visit [www.acostormbrixx.com.au](http://www.acostormbrixx.com.au).



## Green roofs

Green roofs and green walls are growing in popularity. This is because designers not only choose to optimise a building's living space internally, but also see opportunity to contribute externally with outdoor community spaces.

The surge of these 'greener' building elements over the last decade is one example of how designers have helped to reduce the Urban Heat Island Effect by reducing the exposure of concrete spaces in cities. Green roofs, in particular, are

easily integrated into buildings and offer multifunctional spaces for communities to grow herbs, relax and use play spaces and swimming pools.

Draining a green roof can be challenging and to protect the building structure from ingress, proper water management is critical. Surface water must be removed to make the area serviceable and sub-surface water must be removed to prevent root rot in vegetation.

ACO has a product specifically designed to assist designers in managing stormwater in green roofs by maintaining an equilibrium of water in the soft-bedded area. In simple terms, this is done by capturing stormwater both on the surface, via the grate, during intense storm events and at the subsurface, through perforations in the sidewalls of the channel, for low storm events. See page 22 for more information.



## Visual and physical interaction

Buildings visually and physically interact with the environment. The visual integration of drainage into a building's architecture is extremely important.

Visual continuity throughout a project is a subtlety within building design. Designers specifying the same grate type throughout a building, whether it be in a courtyard, balcony or bathroom creates continuity of design.

Grates could either harmonise with the design of the building or become a feature element. For instance, longitudinal grates can accentuate the sleek lines of a building in contrast to tile grates which can be used to blend seamlessly with the pavement and surrounds.

Products must be compliant with Australian Standards. WaterMark is an Australian certification for plumbing products, including drainage. All of ACO's stainless steel drainage products are WaterMark certified for compliance.

## Accessibility

Building thresholds are highly trafficked, making access and mobility an important consideration. Designers must cater for a diverse occupancy driven by a number of factors, including an aging population and disability requirements. Level threshold drainage in buildings facilitates access and eliminates the need to have conventional step downs that were once used to contain stormwater runoff.

## Slip resistance

With the increase in litigation and compensation for injuries caused by slips, trips and falls, designers must consider specifying grates and floor surfaces that comply with AS 4586 – *Slip resistance classifications of new pedestrian surface materials*. It is important for designers to specify a grate that is relevant for the application with a suitable slip resistance rating.

The perception that a higher slip resistance rating will provide a better solution is

incorrect. Trip hazards can be introduced where a grate has a different slip resistance rating than the surrounding floor surface, or vice versa. ACO recommends grates to have the same level of slip resistance as the surrounding floor.

The slip resistance of tile grates and slotted tops depend on the slip resistance of the infill material specified.

In order to measure the slip resistance of a grate or floor surface, three tests are specified in AS 4586.

- **Wet pendulum:** Applied to pedestrian areas that can become wet with rainwater.
- **Wet-barefoot inclining platform:** Applied to wet areas where footwear/shoes are not worn. For instance at pools, waterparks, beach areas etc.
- **Oil-wet inclining platform:** Applied for commercial and industrial areas that can be contaminated with oil or grease e.g commercial kitchens.

## Slip resistance standards

The National Construction Code (NCC) requires and specifies minimum slip classifications for certain high-risk areas. The table below is adapted from the National Construction Code 2016, Volumes 1 and 2.

In 2014, Standards Australia published a supporting handbook, HB 198:2014 *Guide to the specification and testing of slip resistance of pedestrian surfaces*, which provides recommendations and guidance for specifying surface materials that suit different application requirements. The adjacent table details guidance from HB 198.

To assist designers in specifying grates with adequate slip resistance, ACO has commissioned an independent third party authority to test and rate each of its grates to AS 4586.



Location	Wet pendulum test		Wet ramp test	
	Dry surface condition	Wet surface condition	Dry surface condition	Wet surface condition
Ramp steeper than 1:14	P4	P5	R11	R12
Ramp steeper than 1:20, but not steeper than 1:14	P3	P4	R10	R11
Ramp not steeper than 1:8	P4	P5	R10	R12
Tread surface	P3	R10	R10	R11
Nosing or landing edge strip	P3	-	P4	-

NCC 2016, Volumes 1 and 2

Location	Wet pendulum test	Inclining platform test
<b>External Pavements and Ramps</b>		
External ramps including sloping driveways and footpaths steeper than 1:14	P5	R12
External ramps including sloping driveways and footpaths, etc., under 1:14, external sales areas (e.g. markets), external carpark areas, external colonnades, walkways, pedestrian crossings, balconies, verandas, carports, driveways, courtyards and roof decks	P4	R11
Undercover car parks	P3	R10
<b>Hotels, Offices, Public Buildings, Schools and Kindergartens</b>		
Wet areas	P3	R10
Transitional areas	P2	R9
Dry areas	P1	R9
Toilet facilities in offices, hotels and shopping centres	P3	R10
Hotel apartment bathrooms, en-suites and toilets	P2	A
Hotel apartment kitchens and laundries	P2	R9
<b>Supermarkets and Shopping Centres</b>		
Fast food outlets, buffet food areas, food courts and dining areas in shopping centres	P3	R10
Shops and supermarket fresh fruit and vegetable areas	P3	R10
Shop entry areas with external entrances	P3	R10
Supermarket aisles (except fresh food areas)	P1	R9
Other separate shops inside shopping centres – wet	P3	R10
Other separate shops inside shopping centres – dry	P1	R9
<b>Loading Docks, Commercial Kitchens, Cold Stores, Serving Areas</b>		
Loading docks under cover and commercial kitchens	P5	R12
Serving areas behind bars in public hotels and clubs, cold stores and freezers	P4	R11
<b>Swimming Pools and Sporting Facilities</b>		
Swimming pool ramps and stairs leading to water	P5	C
Swimming pool surrounds and communal shower rooms	P4	B
Communal changing rooms	P3	A
Undercover concourse areas of sports stadiums	P3	R10
<b>Hospital and Aged Care Facilities</b>		
Bathrooms and ensuite in hospitals and aged care facilities	P3	B
Wards and corridors in hospitals and aged care facilities	P2	R9

HB 198: 2014

## User requirements

ACO has identified five legislated criteria that grates should satisfy to ensure user safety in and around buildings. Grates should be heel friendly, slip resistant, barefoot friendly and bicycle wheel, wheelchair and walking cane safe.

These five features assist the designer to critically assess the suitability of grates.



Designed to resist the penetration of a 10mm heel and comply with AS 3996.



Apertures less than 8mm (AS 4685) to prevent finger and toe entrapment. Relevant to areas where there are bare feet and/or children.



Slip resistance rated to AS 4586. ACO recommends grates have a similar slip resistance rating to the adjacent pavement.



Complies with wheelchair and walking cane safety requirements of AS 1428.



Complies with bicycle tyre resistance criteria of AS 3996.

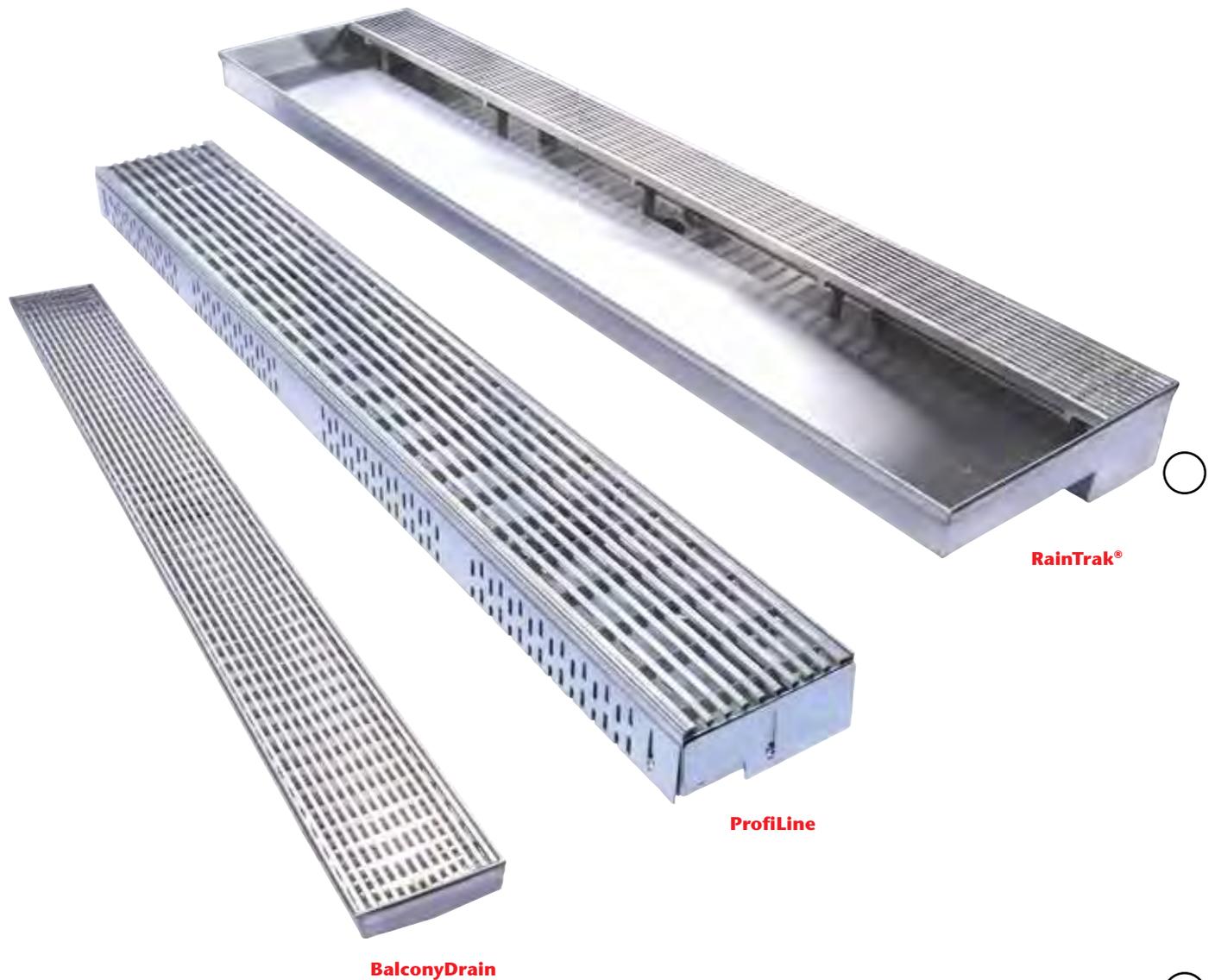
## ACO BuildLine range

ACO BuildLine is a range of drainage systems designed to protect the building from rain and runoff at and around the building line, from the ground level to the roofline.

As slab depths are often restricted in these applications, ACO BuildLine comprises a range of compact drainage solutions designed to fit above the waterproof membrane. These speciality products intercept and collect surface water typically at thresholds, balconies, green roofs, building facade and other outdoor areas, whilst complying with other user requirements.

ACO's range of BuildLine systems include:

- Shallow linear drainage solutions for pavements and floors with restricted slab depths
- Integrated linear threshold drainage solutions for sliding and bi-fold doors
- Perforated linear drainage solution for surface and subsurface drainage
- Slip rated range of grates



**BalconyDrain**

Shallow linear drainage solutions



Refer to page 14 for more information.

**RainTrak®**

Threshold drainage for sliding and bi-fold doors



Refer to page 18 for more information.

**ProfilLine**

Perforated linear drainage for surface and subsurface drainage



Refer to page 22 for more information.

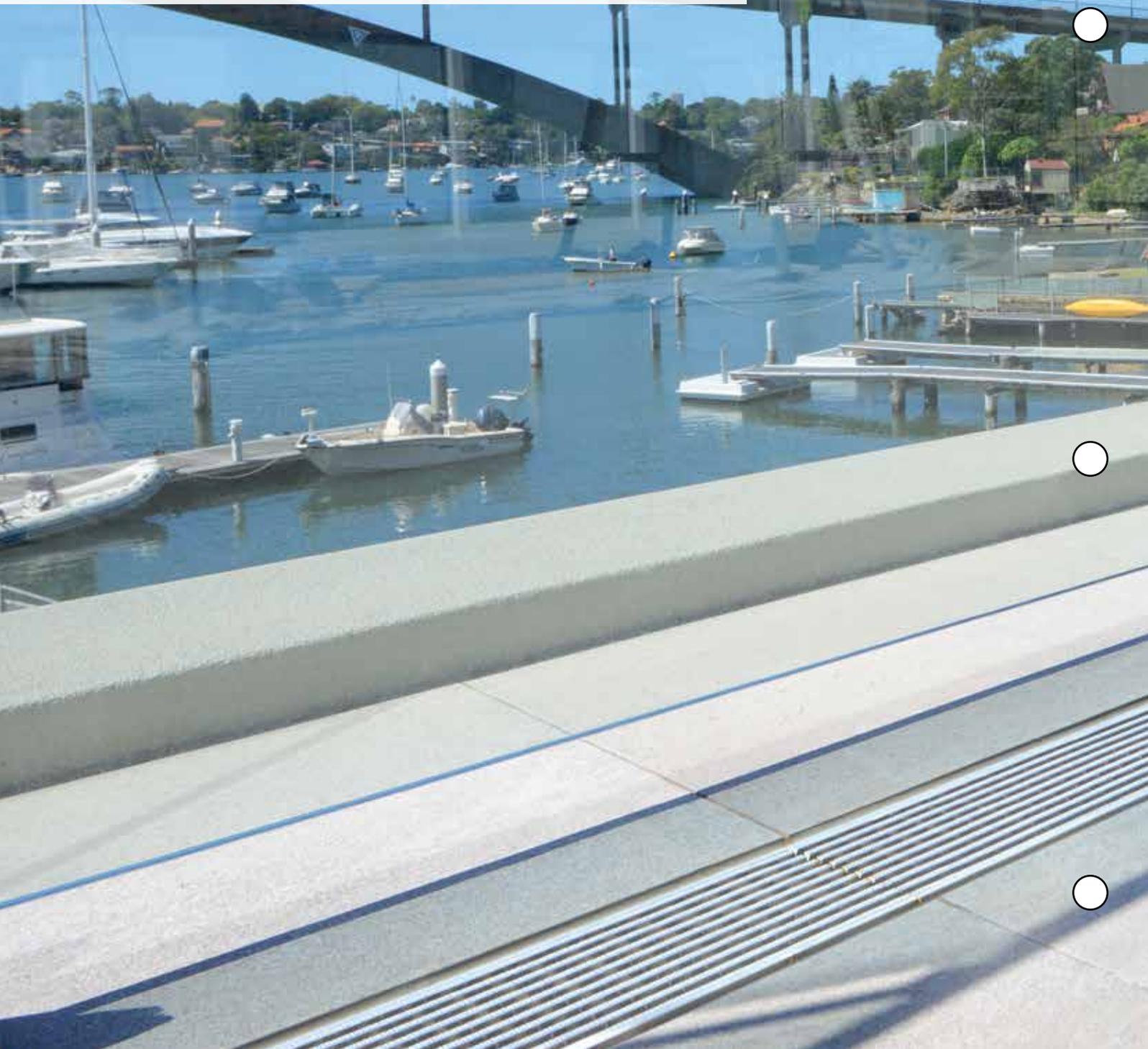
## BalconyDrain

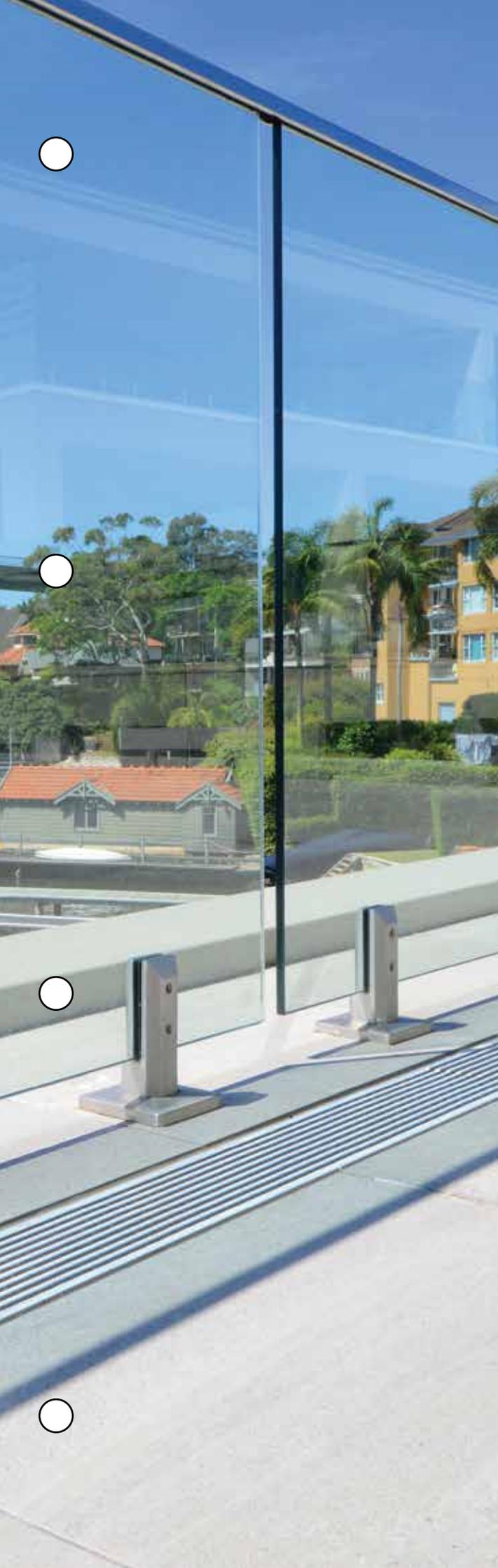
### Shallow linear drainage solutions

BalconyDrain is a range of shallow drainage channels designed for areas that require compact and discreet solutions around the building line.

Typical applications include:

- Balconies
- Terraces
- Patio areas
- Other areas with restricted depth

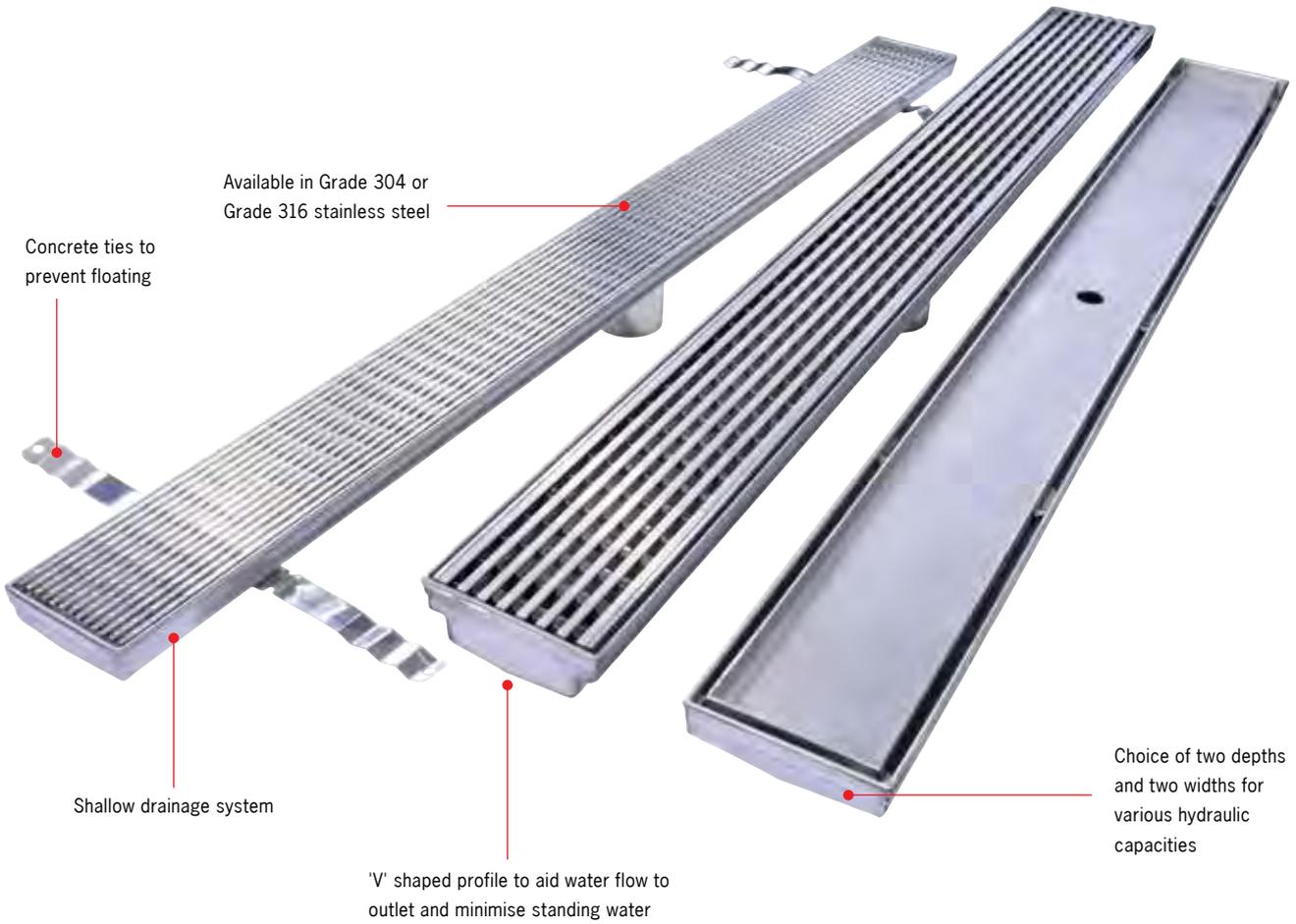




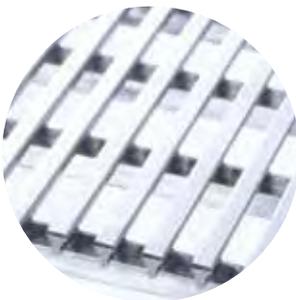
# BalconyDrain

BalconyDrain is not limited to use in balconies. It can also be used in areas along the building line, for example, terraces, patios and other areas with restricted construction depth.

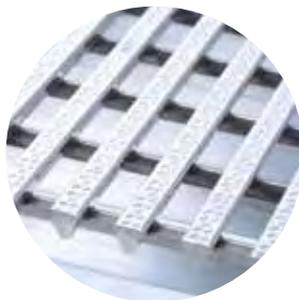
BalconyDrain is available in a choice of depths and widths to suit site, user and hydraulic requirements.



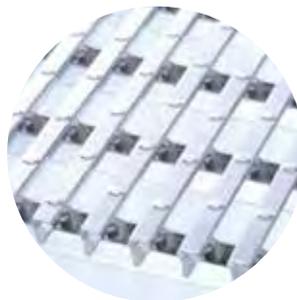
## Range of grates



**Affiner**



**5 Star Heelsafe® Anti-Slip**



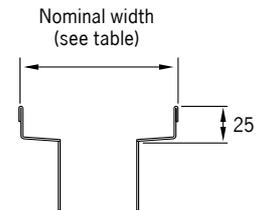
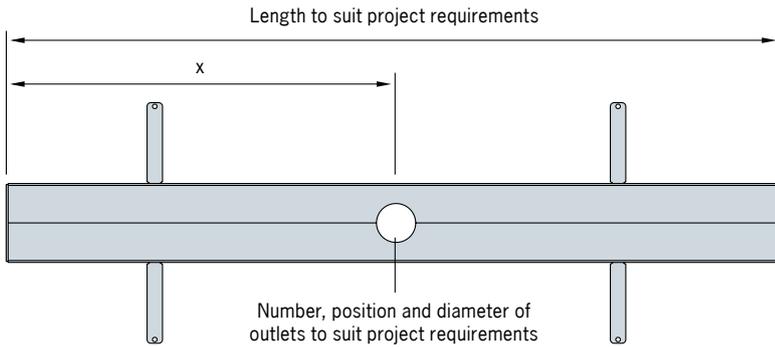
**Linéaire**



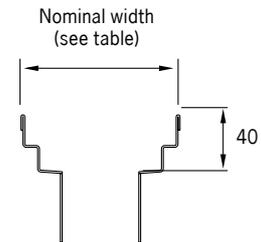
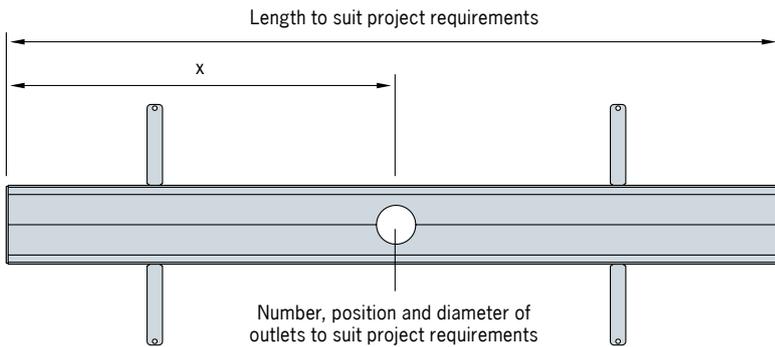
**Tile**



## 25mm deep channels



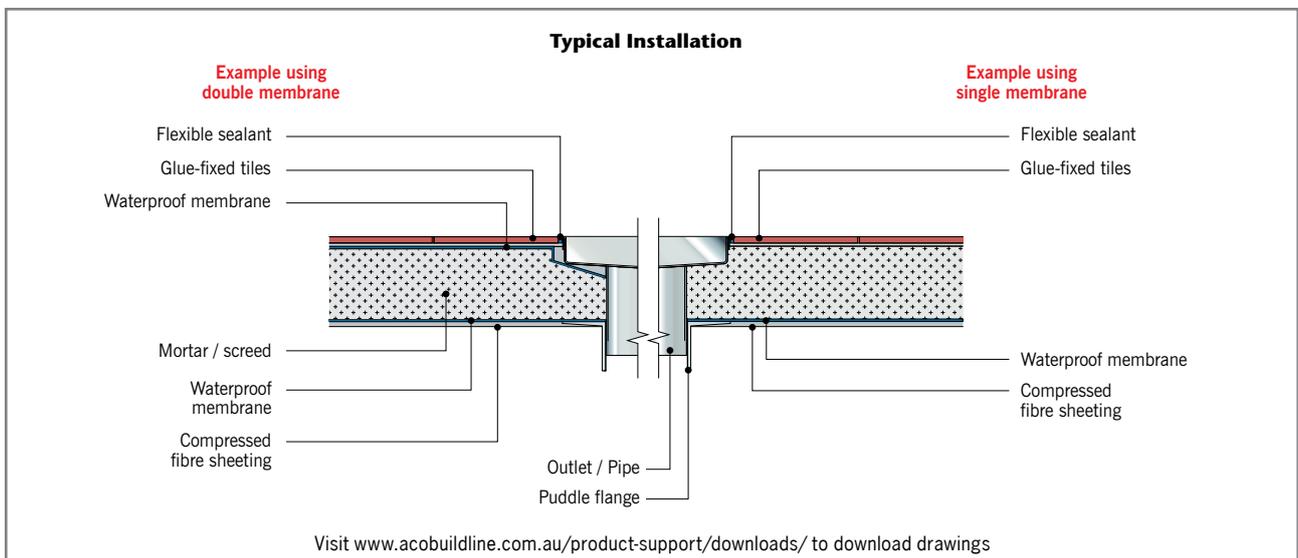
## 40mm deep channels



\* All dimensions in mm

Grate type	Slip resistance rating		Nominal channel width (mm)	Channel depth (nominal) mm	Specification code
	Wet pendulum	Wet barefoot			
Affiner	P1	A	85	25	S85-25-A
			103	25	S103-25-A
			103	40	S103-40-A
5 Star	P4	C	103	40	S103-40-5S
Linéaire	P1	-	85	25	S85-25-L
			103	25	S103-25-L
			103	40	S103-40-L
Tile	The slip resistance of this grate depends on the infill material specified.		85	25	S85-25-T
			103	25	S103-25-T
			103	40	S103-40-T

\* To customise your requirements, contact ACO.



## RainTrak®

### Threshold drainage for sliding and bi-fold doors

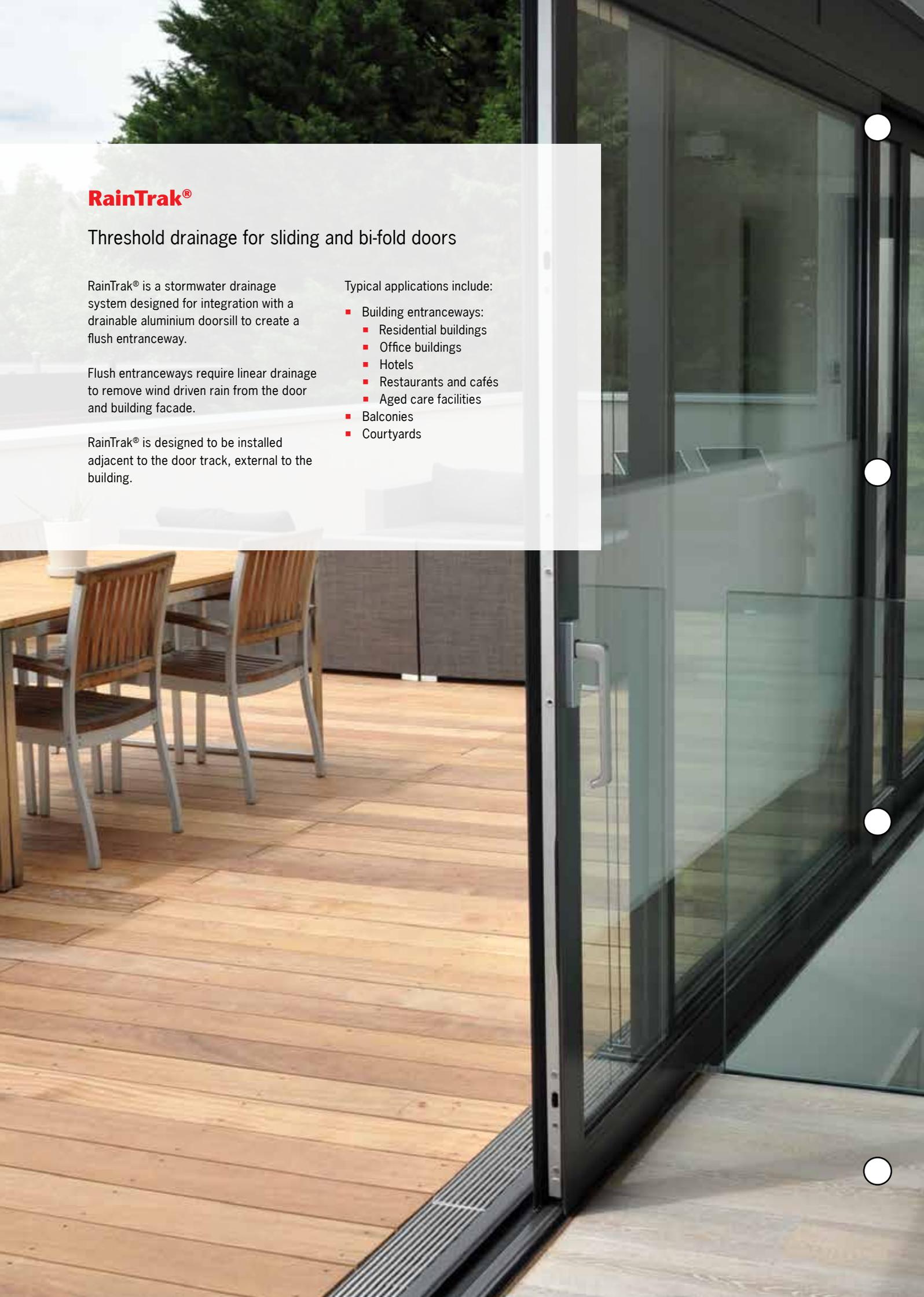
RainTrak® is a stormwater drainage system designed for integration with a drainable aluminium doorsill to create a flush entranceway.

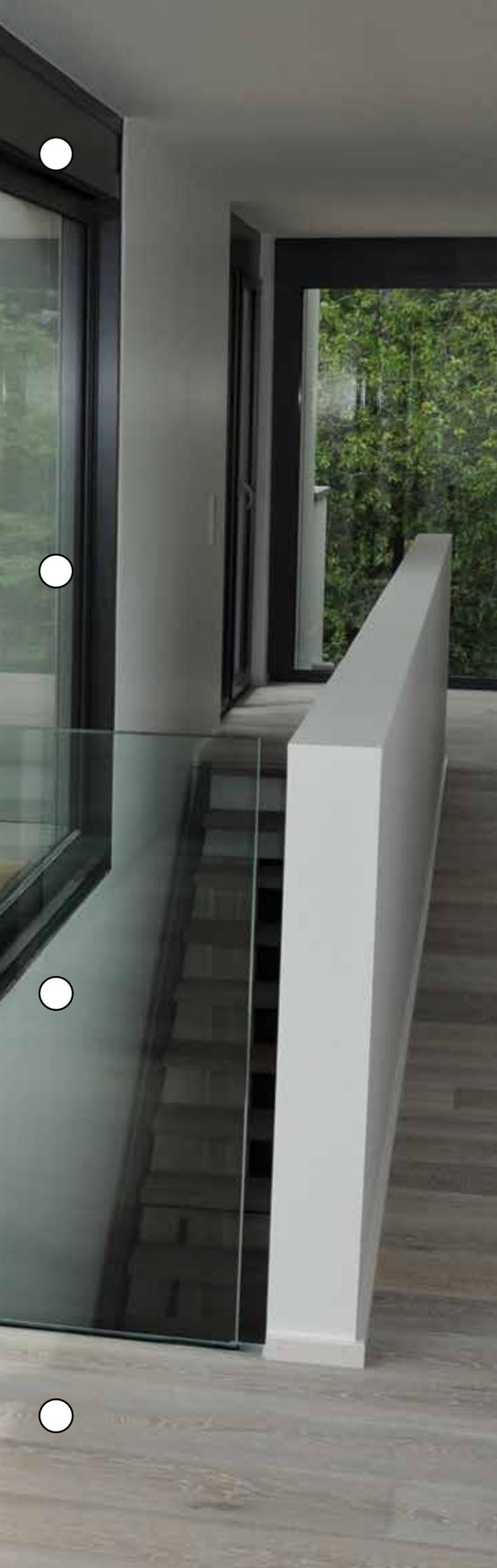
Flush entranceways require linear drainage to remove wind driven rain from the door and building facade.

RainTrak® is designed to be installed adjacent to the door track, external to the building.

Typical applications include:

- Building entranceways:
  - Residential buildings
  - Office buildings
  - Hotels
  - Restaurants and cafés
  - Aged care facilities
- Balconies
- Courtyards





# RainTrak®

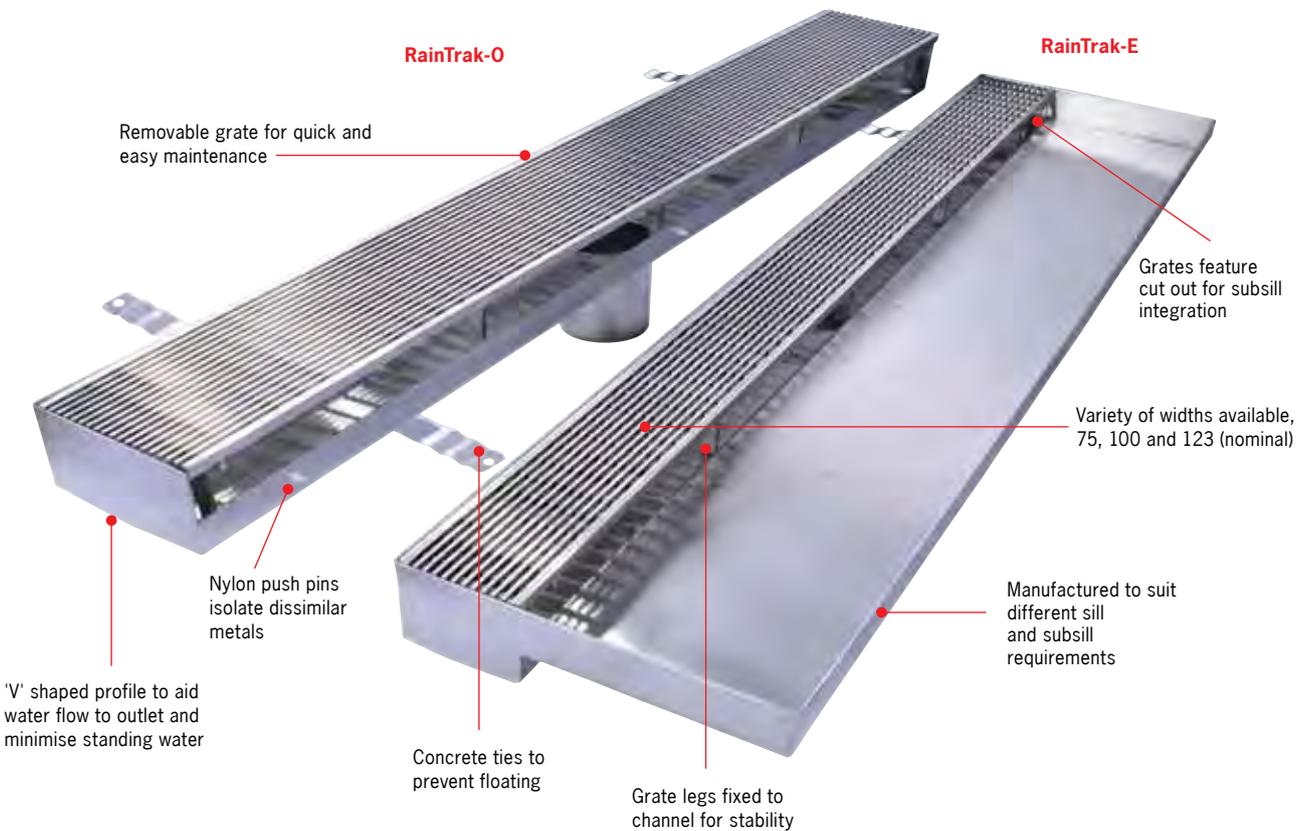
Each door manufacturer has differently designed doors, requiring customised drainage solutions that specifically suit the sill used on each project.

RainTrak® comprises two models:

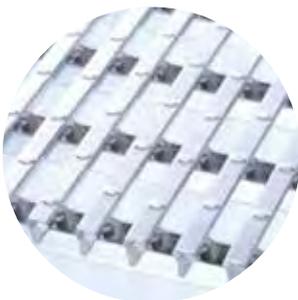
- **RainTrak-O:** Where the sill is not enclosed by the channel system and can be used with multiple door tracks
- **RainTrak-E:** Where the sill is enclosed by the channel system and the channel is made to suit a specific number of door tracks

To isolate the stainless steel channel from the aluminium doorsill, careful consideration has been given to the design of RainTrak®. Dissimilar metals cause galvanic corrosion. RainTrak® features nylon push-pins to ensure critical separation. This arrangement works in conjunction with the packers and sealants used during setup and installation of the sill.

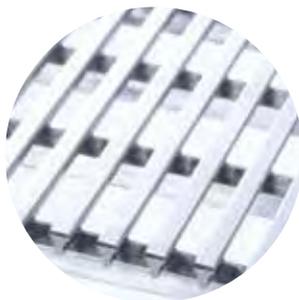
Note: It is the designer's responsibility to ensure that channels are fit-for-purpose and meet all requirements, including sill compatibility and hydraulic performance.



## Range of grates



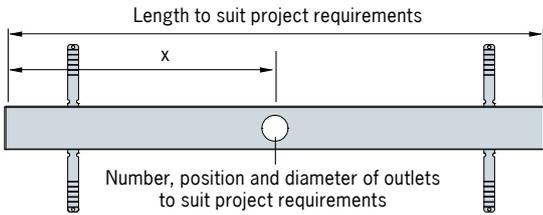
Linéaire



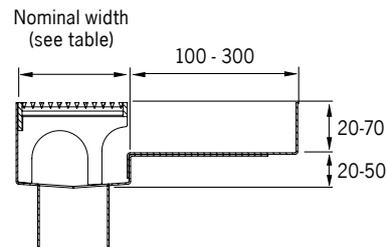
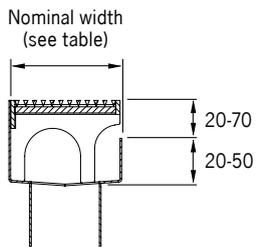
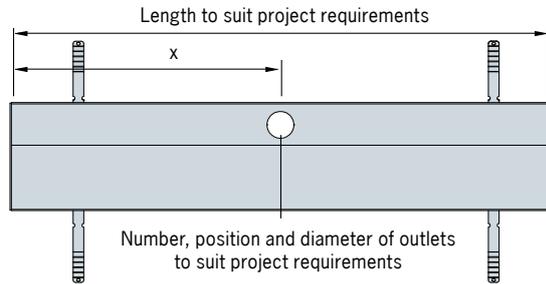
Affiner



## RainTrak-O



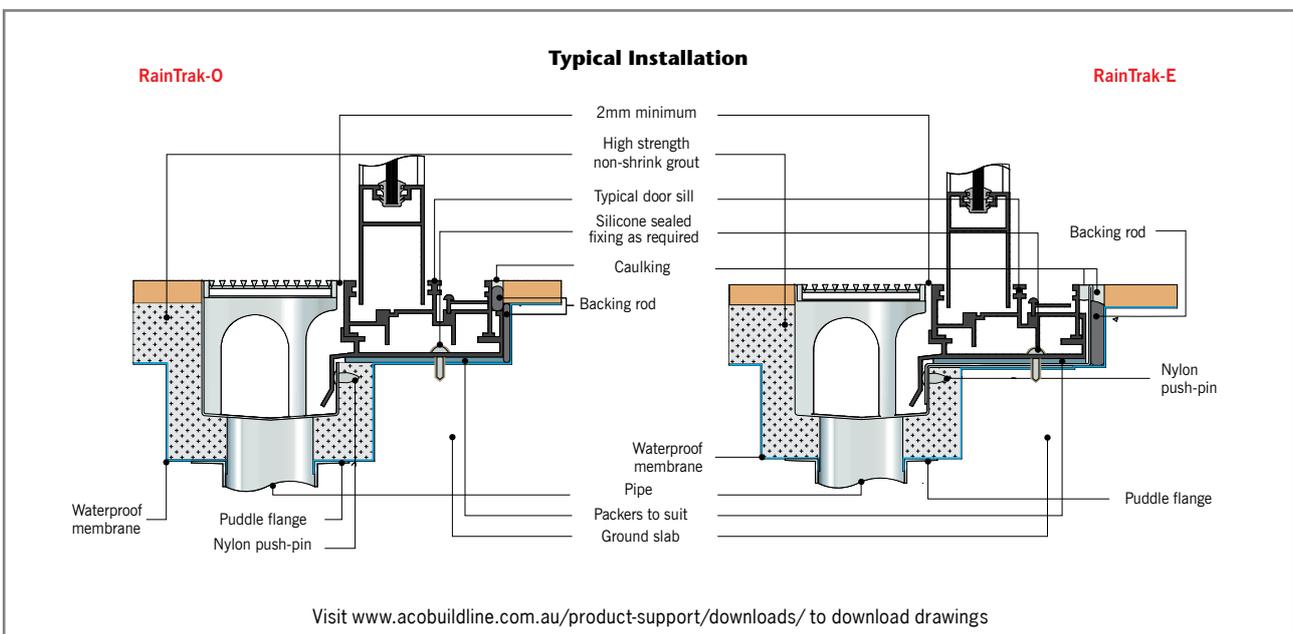
## RainTrak-E



\* All dimensions in mm

Type	Grate type	Slip resistance rating		Nominal channel width (mm)	Specification code
		Wet pendulum	Wet barefoot		
RainTrak-O	Linéaire	P1	-	75	RT075L
				100	RTO100L
				123	RTO123L
RainTrak-O	Affiner	P1	A	75	RT075A
				100	RTO100A
				123	RTO123A
RainTrak-E	Linéaire	P1	-	75	RTE75L
				100	RTE100L
				123	RTE123L
RainTrak-E	Affiner	P1	A	75	RTE75A
				100	RTE100A
				123	RTE123A

\* To customise your requirements, contact ACO.



## ProfiLine

### Perforated linear drain for surface and subsurface drainage

ProfiLine is a system designed for both surface and subsurface drainage.

Positioned above the membrane, the ProfiLine system is designed to collect surface water via the grate, whilst perforations in the side walls of the channel allow subsurface water to pass.

Typical applications include:

- Flat roofs
- Green roofs
- Terraces
- Vertical facades
- Balconies





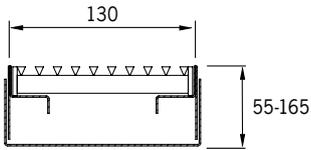
# ProfiLine

ProfiLine is particularly suitable for green roofs that require a balance of draining water, whilst keeping soft bedded areas moist for plants to flourish.

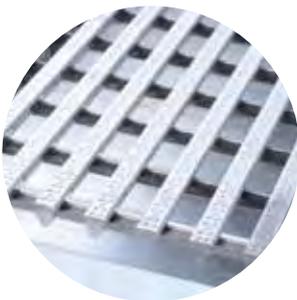
During heavy rain, the landscaping will become saturated and both surface and infiltrated runoff can be directed towards the channel which discharges into a roof or floor drain. During light rain, the water runoff from the surface or facade will percolate out of

the channel side walls and help irrigate the softscape.

An access grate permits entry for maintenance to the main stormwater connection.



## Range of grates



5 Star Heelsafe® Anti-Slip



Slotted



Channels simply 'drop and lock' together with hooks and lugs on channel ends.



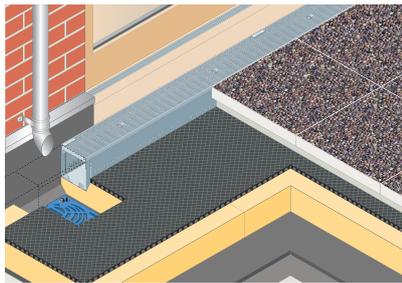
All channels are height adjustable. Each corner can be set independently to allow for both cross and longitudinal pitch if required.

	Slip resistance rating		Part No.		Length mm	Width mm	Height mm	Wgt kg
	Wet pendulum	Wet barefoot	Galv.	S/S				
<b>Grates</b>								
5 Star Heelsafe® Anti-Slip grate	P4	C	–	141709	500	123	20	1.6
5 Star Heelsafe® Anti-Slip grate			–	141710	1000	123	20	3.2
Slotted grate	P3	–	00277	00273	500	123	20	1.0
Slotted grate			00276	00272	1000	123	20	2.2
<b>Access units and grates</b>								
5 Star Heelsafe® Anti-Slip grate	P4	C	–	141851	390	390	20	3.1
Mesh grate	–	–	38570	–	390	390	20	3.8
Access frame	–	–	38801	38803	400	400	75 – 105	3.1
Access frame extension	–	–	38685	38686	395	395	50	1.3
Access frame extension	–	–	38687	38688	395	395	75	1.9

	Part No.		Length mm	Width mm	Height mm	Wgt kg
	Galv.	S/S				
<b>Channels</b>						
Shallow section	36940	36942	500	130	55 – 77	3.1
Shallow section	36941	36943	1000	130	55 – 77	4.9
Intermediate section	36789	36837	500	130	75 – 105	3.3
Intermediate section	36788	36836	1000	130	75 – 105	5.4
Deep section	36807	36855	500	130	105 – 165	3.8
Deep section	36806	36854	1000	130	105 – 165	6.4
<b>Adjustable length channel</b>						
Shallow section	36948	36949	50 – 600	140	55 – 77	2.1
Intermediate section	36790	36838	50 – 600	140	75 – 105	2.2
Deep section	36808	36856	50 – 600	140	105 – 165	2.9
<b>Adjustable corner</b>						
Adjustable corner	38634	38643	300	300	–	1.5
<b>End plates</b>						
Shallow section	36950	36951	n/a	130	55 – 77	0.1
Intermediate section	36793	36841	n/a	130	75 – 105	0.1
Deep section	36811	36859	n/a	130	105 – 165	0.2
<b>Drainage duct</b>						
Drainage duct	00328	00307	2000	100	30	2.4

\* All dimensions in mm

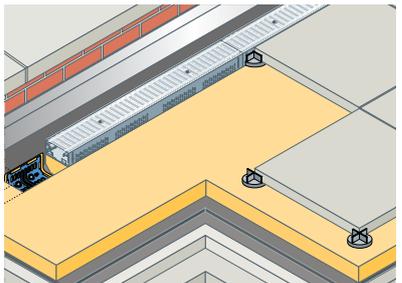
**Typical Installation**



Paved deck on drainage cell



Paved deck with sand bedding



Elevated paver deck

Visit [www.acobuildline.com.au/product-support/downloads/](http://www.acobuildline.com.au/product-support/downloads/) to download drawings

## Technical support and maintenance

ACO has an established Technical Services Department with many years experience advising on surface drainage. Services include advice at the initial design stage through to on-site support when required.

The free service is offered without obligation and is supported with extensive information, brochures and technical documentation.

### Certification

- NATA certified slip resistance certificates to AS 4586
- NATA certified load reports to AS 3996
- WaterMark compliance

### Specification and installation information

- Trench and grate hydraulics to help select the correct size drain for the application. To request assistance, visit [www.acobuildline.com.au/hydraulics](http://www.acobuildline.com.au/hydraulics)
- Product drawings
- Installation drawings

### Project specific services

ACO BuildLine products are customisable to suit your project.

Visit [www.acobuildline.com.au/products/](http://www.acobuildline.com.au/products/) for information on customisation.



### ACO's other building architecture products



**QuARTz By ACO**  
Bathroom drainage systems  
[www.quartzbyaco.com.au](http://www.quartzbyaco.com.au)



**ACO Drain®**  
Commercial trench drain  
[www.acodrain.com.au](http://www.acodrain.com.au)



**ACO Wexel**  
Floor and roof drains  
[www.acowexel.com.au](http://www.acowexel.com.au)

**Care and maintenance**

**Factors affecting maintenance**

To keep the channel and grate's hydraulic performance optimum, regular maintenance is important and must include regularly removing debris like leaves and litter, particularly at the outlet.

**Tea staining**

Tea staining is a cosmetic discolouration of the surface of stainless steel. It most commonly occurs within five kilometres of the ocean, but can affect stainless steel up to 20 kilometres from the ocean. In ocean side projects, Grade 316 stainless steel is recommended and may require electropolishing.



**Cleaning solutions**

Stainless steel is easy to clean. Soap or a mild detergent with warm water, followed by a clean water rinse is usually adequate in most installations. An enhanced aesthetic appearance will be achieved if the cleaned surface is finally wiped dry. Many cleaners, sterilisers and bleaches, when used in accordance with manufacturers' instructions, are safe, but if used incorrectly (e.g. warm or concentrated), can cause discolouration and corrosion on the stainless steel surface.

On building sites, strong acid solutions are sometimes used to clean masonry and tiles. This is evident particularly in a clean-up when construction has ended. These solutions should never be permitted to come into contact with metals. If this should happen, the acid solution must be removed immediately by generous applications of clean water. Wire brushes

and wire wool must not be used as this will only serve to introduce iron impurities onto the material surface.

Acids are only to be used for on-site cleaning when all other methods have failed. Rubber gloves should be used and care taken to ensure acid cleaners are not spilt over adjacent areas. Special precautions are necessary with oxalic acid and solvents must not be used in closed spaces without adequate ventilation. Manufacturer's directions must always be followed.

If the suggestions in the table below have been attempted and the result is still unsatisfactory, stainless steel is able to be mechanically cleaned by specialists on site. Please contact ACO for further information.

<b>Problem</b>	<b>Cleaning agent</b>	<b>Comment</b>
Routine cleaning	Soap or mild detergent and water (such as dishwashing liquid)	Sponge, rinse with clean water, wipe dry if necessary
Fingerprints	Soap or warm water or organic solvent (e.g. acetone, alcohol)	Rinse well with clean water, wipe dry if necessary
Stubborn stains and discolouration	Mild cleaning solutions or cream cleanser	Rinse well with clean water and wipe dry
Oil and grease marks	Organic solvents (e.g. acetone, alcohol)	Clean after soap and water, rinse with cleanwater and dry
Rust and other corrosion	Oxalic acid	Rinse well with clean water. The cleansing solution should be applied with a swab and allowed to stand for 15-20 minutes before being washed away with water. Use a mild cleaning solution to give a final clean if required



## ACO Building Drainage Products

- **ACO Wexel**  
Cast floor and roof drains
- **ACO Stainless**  
Industrial stainless steel linear drainage systems
- **ACO Food**  
Stainless steel drainage systems for food and beverage applications
- **ACO Gully**  
Stainless steel floor gullies
- **ACO Pipe**  
Stainless steel push-fit waste pipes
- **ACO BuildLine**  
Drainage for thresholds, balconies and green roofs
- **QuARTz by ACO**  
Bathroom linear drains and floor wastes
- **ACO Passavant**  
Grease separators

ACO Technical Service Department provides product selection advice to ensure the product meets specification and installation criteria.

Contact ACO for information relating to ACO's Surface Water Management and Utility Enclosure Solutions.

## ACO Pty Ltd

Head Office:  
134-140 Old Bathurst Road  
Emu Plains NSW 2750

Branches in: New South Wales / Australian Capital Territory  
Victoria / Tasmania  
South Australia / Northern Territory  
Queensland  
Western Australia

Tel: 1300 765 226  
+61 2 4747 4000 (International)

Fax: +61 2 4747 4040

Email: [sales@acoaus.com.au](mailto:sales@acoaus.com.au)

Web: [www.acoaus.com.au](http://www.acoaus.com.au)

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