

Technical and hydraulic information

QuARTz by ACO bathroom drainage systems are compact enough to be encased neatly in a bathroom's mortar screed bed, beneath the tiles. These systems have integral outlets for a connection of either DN50 or DN100 pipe.

Water containment and drainage plays a vital role in the overall waterproofing of a bathroom. Critical elements are the waterproofing, gradient of the shower floor, size of the waste outlet and the design of the shower screen.

AS3740: Waterproofing of wet areas within residential buildings recommends falls as small as 1:60 for the shower area and up to 1:100 for outer bathroom areas. The drainage and tiling operations must be integrated neatly within these floor gradients.

AS/NZS3500: Plumbing and Drainage requires a minimum DN40 connection for showers. The common industry standard however, is DN50, allowing for greater drainage capacities. In some applications, governed by the standard, bathrooms have shower fixtures that may not require foul air traps. Either way, they discharge directly into the underground pipe, which is often directed into the bathroom's trapped central floor waste.

Hydraulic performance

Grates and channel outlets are necessary water capture and plumbing elements, but may have some restriction on the water flow into the drainage pipe, particularly if debris (scum, hair etc.) is present. Using a debris strainer will reduce debris induced flow restriction. The efficiency of a shower's linear drain or floor waste is critical, particularly for level threshold drainage.

The flow value for a 50mm outlet varies depending upon the head of water (water accumulation) above the grate. In the case of linear drains, a head of water is not typical in practice, due to shallower floor grades. This is different from shower floor wastes, where water can pond due to the 'basin' profile of the shower recess.



Installation against the wall

Outlet flow rate up to 0.6 L/s based on floor grades with 5mm head of water.



Installation at the entrance

Outlet flow rate up to 0.4 L/s based on no water accumulation.

Flow values without any head of water (i.e. 0mm) should be adopted when linear drains are placed around the perimeter of the shower and no shower hob/step down is used. If the drain is installed against a wall, there may be a small head of water depending on the shower layout and floor grade. The tables below give results for a 5mm and 15mm head of water, for both linear drains and floor wastes.

A number of custom solutions are available from ACO for high flow rates or showers with multiple showerheads (see page 14).

When considering hydraulic performance for specific projects, seek professional advice and/or contact ACO for further information.

ShowerChannel – outlet flow rate capacities (L/s)

| Grate | Accumulation (head of water) | | |
|-------------------|------------------------------|------|------|
| | 0mm | 5mm | 15mm |
| Channel body only | 0.42 | 0.60 | 0.73 |

ShowerChannel – effect of grate on outlet flow rate capacities* (L/s)

| Grate | Accumulation (head of water) | | |
|------------|------------------------------|------|------|
| | 0mm | 5mm | 15mm |
| Wave | 0.38 | 0.54 | 0.66 |
| Quadrato | 0.40 | 0.57 | 0.70 |
| Linéaire** | 0.42 | 0.60 | 0.73 |
| Tile | 0.41 | 0.59 | 0.71 |
| Flag | 0.40 | 0.57 | 0.70 |

* Calculated using 1000mm channel and grate

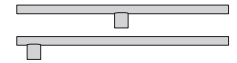
** Capacity is restricted by the channel outlet (see first table).

ShowerPoint – outlet flow rate capacities (L/s)

| Grate | Accumulation (head of water) | |
|----------|------------------------------|------|
| | 5mm | 15mm |
| Wave | 1.1 | 1.3 |
| Quadrato | 0.6 | 1.1 |
| Hawaii | 0.9 | 1.3 |
| Mix | 0.8 | 1.3 |
| Pixel | 0.8 | 1.3 |

The above flow rates are indicative only. Pipework design may further restrict the flow.

Installation: linear drainage



Installation overview

Tiled showers rely on a linear drainage system that is easily integrated into the screed above the waterproofing.

QuARTz by ACO offers a channel profile that ensures compatibility with different floor structures.

The installation details shown, set out to provide the designer with integrated solutions for wet room floor drainage.

The illustrations identify preparation, the installation and construction processes

required to install these products in wet room environments.

For both flooring applications, two alternative positions for the waterproof membrane are illustrated. However for simplicity, the *written* guidelines below and opposite refer to the waterproof membranes that are applied beneath the screed mortar bed only.

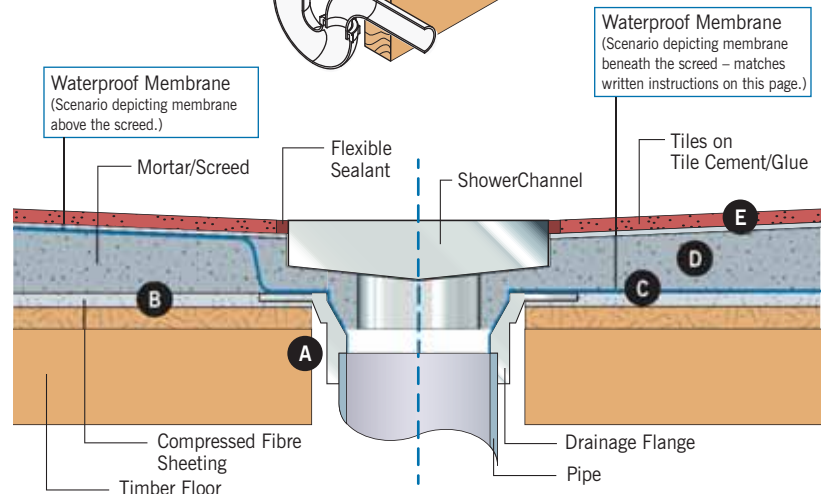
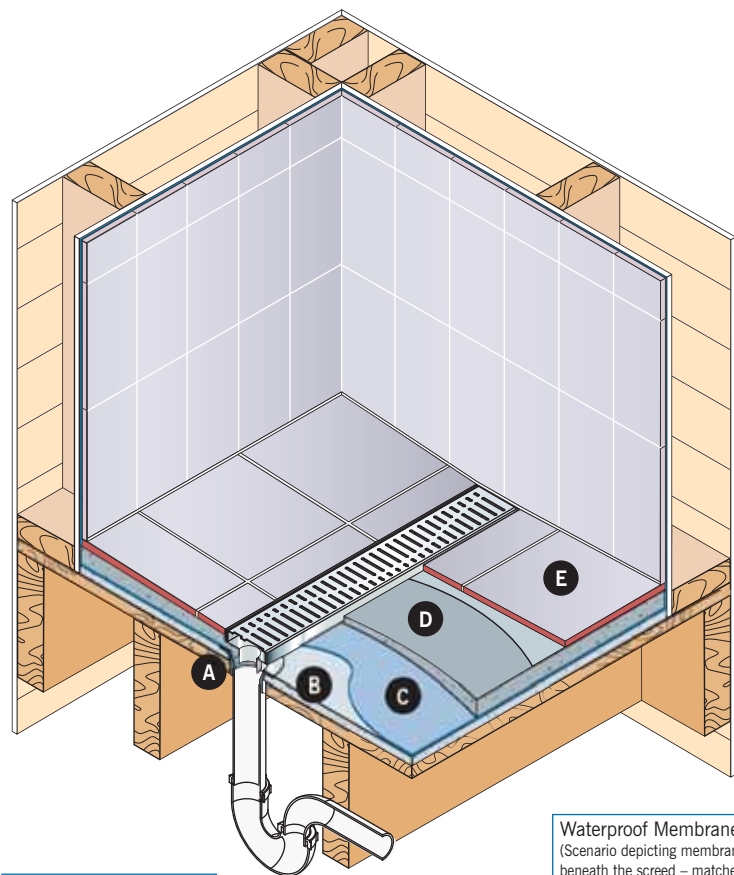
A drainage flange is shown to provide bracing to the connection and control

leakage of the mortar screed bed. It should be recessed into the floor with a router for a timber deck or diamond grinder, for a slab. These details do not cover every possible situation and should only provide a practical reference. ACO recommends designers and installers check local legislative standards and practices or seek specialised engineering advice.

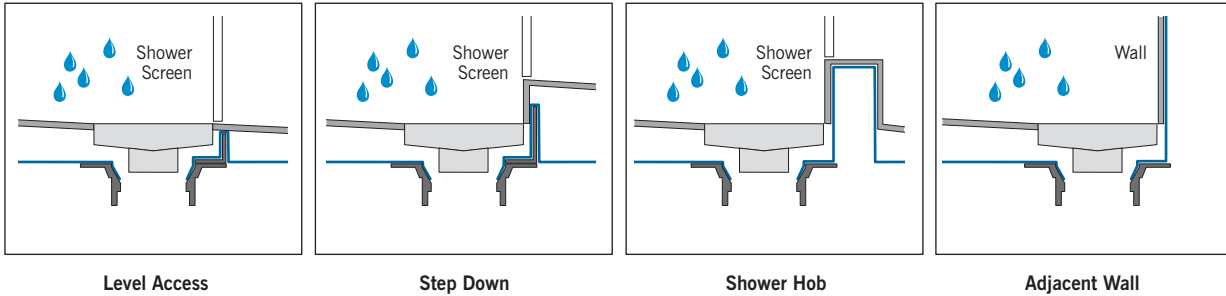
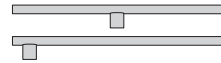
A broad selection of installation scenarios is displayed at www.quartzbyaco.com.au.

Joisted timber floor (for membranes beneath the screed)

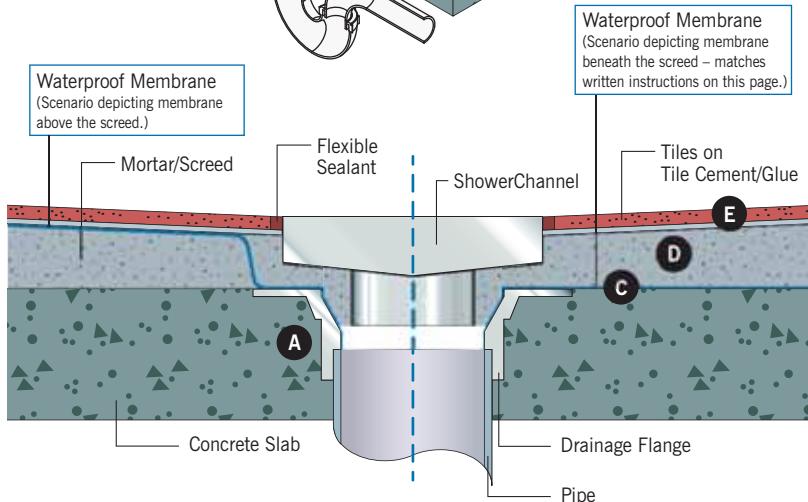
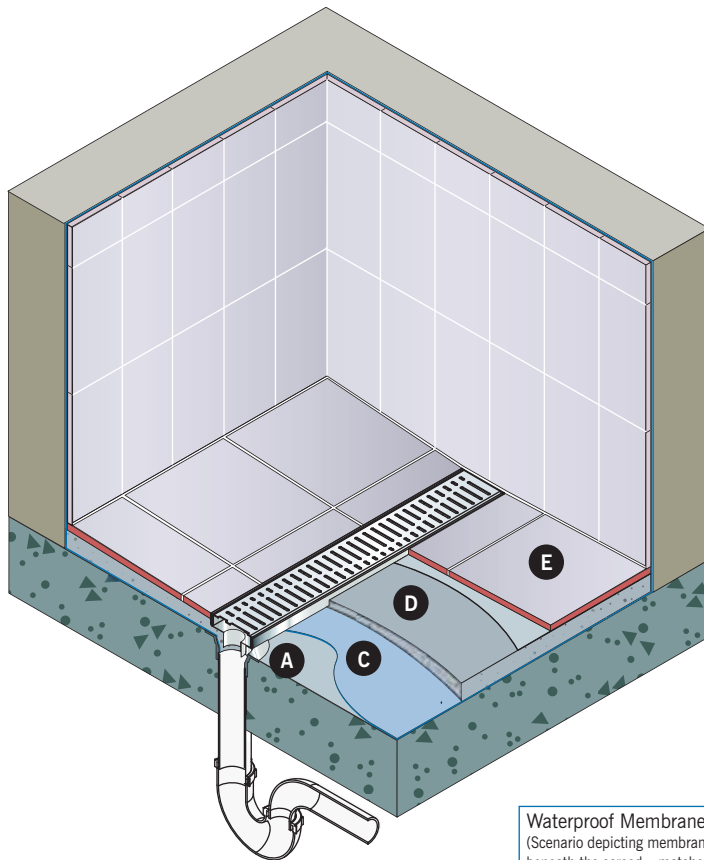
1. Where alterations to floor joists are necessary, consult a structural engineer for advice. Floor joist reinforcement may be necessary.
2. Frame out the shower surround as required, leaving a penetration in the wooden floor for drainage.
3. Connect an appropriately sized drainage flange (A) to the pipework. Ensure it is adequately fastened or bonded in position.
4. Block the drain opening with a rag to prevent floor mortar blocking up the pipe.
5. Lay compressed fibre sheeting (B) (or similar) and create levels if required. Ensure the sheeting is finished flush with the drainage flange and that there are no rough edges for the waterproof membrane to bridge.
6. The waterproof membrane (C) is then applied to the sheeting and continued on to and turned into the drainage flange as well as up the wall, in accordance with AS3740. It is then left to cure before covering.
7. Cut installation feet of the ShowerChannel to height to rest on the membrane and ensure channel is kept at required height and level.
8. A screed is then laid (D) and trowelled to the correct levels and height, allowing for the thickness of the overlying tile layer.
9. After the screed has cured, apply tile cement, tiles and grout (E).
10. Place the grate in the channel.



Typical scenarios



For further information refer to www.quartzbyaco.com.au/selector



Cement concrete floor (for membranes beneath the screed)

1. Frame out the shower surround as required, leaving a penetration in the concrete floor for drainage.
2. Connect an appropriately sized drainage flange (A) to the pipework. Ensure it is adequately fastened or bonded in position and flush with the top of the concrete slab. A drainage flange is particularly recommended for rectification applications.
3. Block the drain opening with a rag to prevent floor mortar blocking up the pipe.
4. The waterproof membrane (C) is then applied to the slab and continued on to and turned into the drainage flange as well as up the wall, in accordance with AS3740. It is then left to cure before covering.
5. Cut installation feet to height to rest on the membrane and ensure channel is kept at required height and level.
6. A screed is then laid (D) and trowelled to the correct levels and height allowing for the thickness of the overlying tile layer.
7. After the screed has cured, apply tile cement, tiles and grout (E).
8. Place the grate in the channel.

Installation: floor wastes



Installation overview

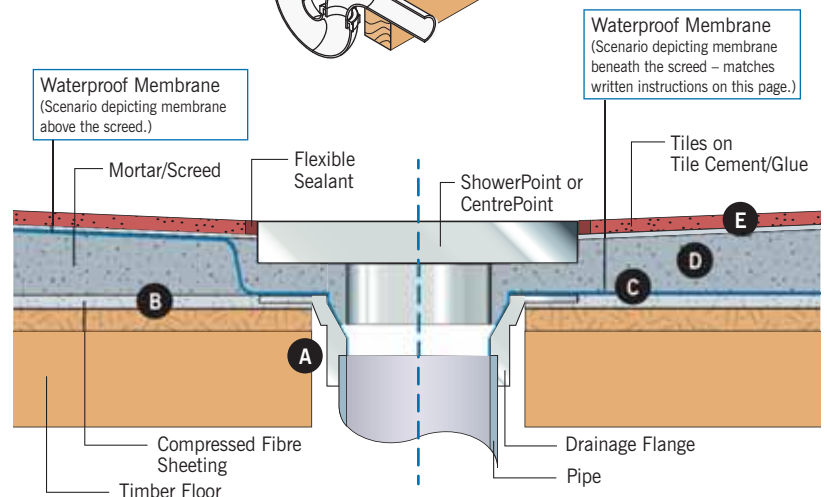
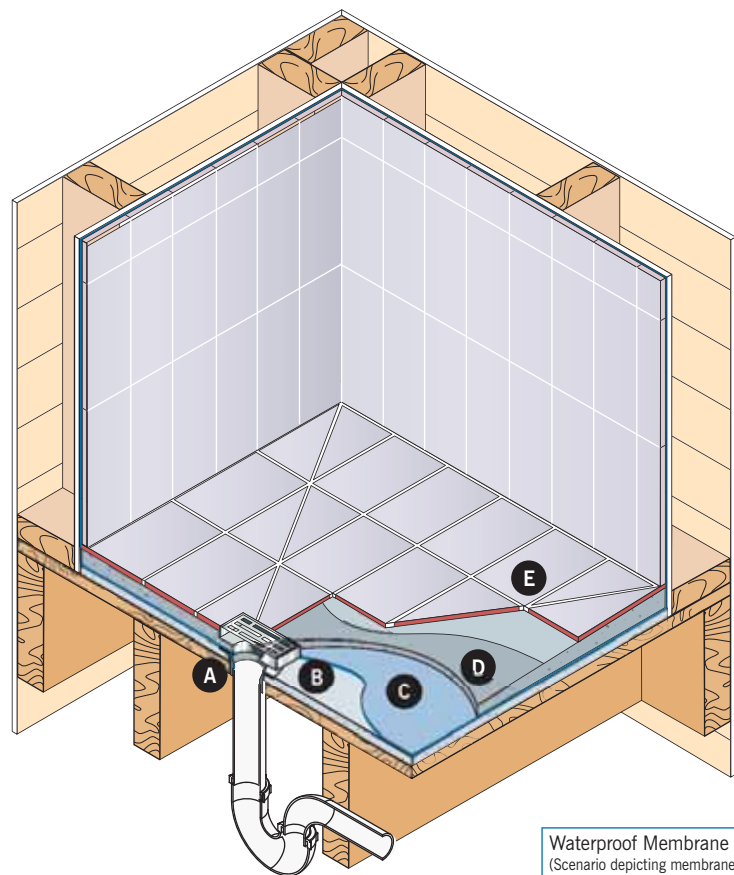
QuARTz by ACO offers floor wastes compatible with different floor structures. The installation details shown, set out to provide the designer with integrated solutions for wet room floor drainage. The illustrations identify preparation, the installation and construction processes required to install these products in wetroom environments. For both flooring applications, two alternative positions for the waterproof membrane are illustrated.

However for simplicity, the *written* guidelines below and opposite refer to the waterproof membranes that are applied beneath the screed mortar bed only. A drainage flange is shown to provide bracing to the connection and control leakage of the mortar screed bed. It should be recessed into the floor with a router for a timber deck or diamond grinder for a slab.

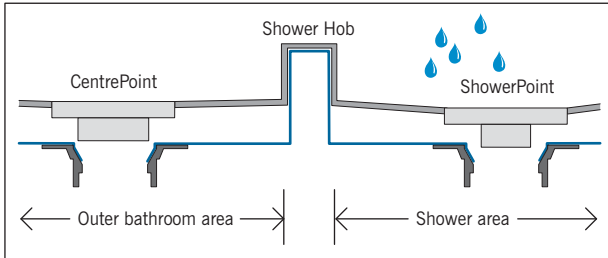
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Joisted timber floor (for membranes beneath the screed)

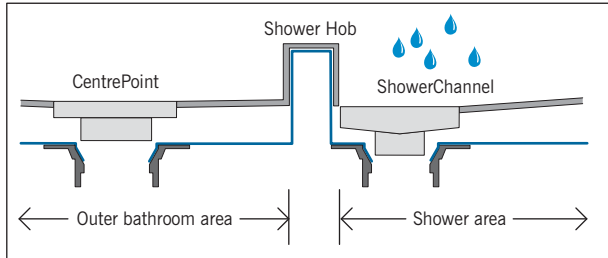
1. Where alterations to floor joists are necessary, consult a structural engineer for advice. Floor joist reinforcement may be necessary.
2. Frame out the shower surround as required, leaving a penetration in the wooden floor for drainage.
3. Connect an appropriately sized drainage flange (A) to the pipework. Ensure it is adequately fastened or bonded in position.
4. Block the drain opening with a rag to prevent floor mortar blocking up the pipe.
5. Lay compressed fibre sheeting (B) (or similar) and create levels if required. Ensure the sheeting is finished flush with the drainage flange and that there are no rough edges for the waterproof membrane to bridge.
6. The waterproof membrane (C) is then applied to the sheeting and continued on to and turned into the drainage flange as well as up the wall, in accordance with AS3740. It is then left to cure before covering.
7. Build up the screed to support the floor waste to the correct finished floor level.
8. A screed is then laid (D) and trowelled to the correct levels and height, allowing for the thickness of the overlying tile layer.
9. After the screed has cured, apply tile cement, tiles and grout (E).
10. Place the grate on the floor waste.



Typical scenarios

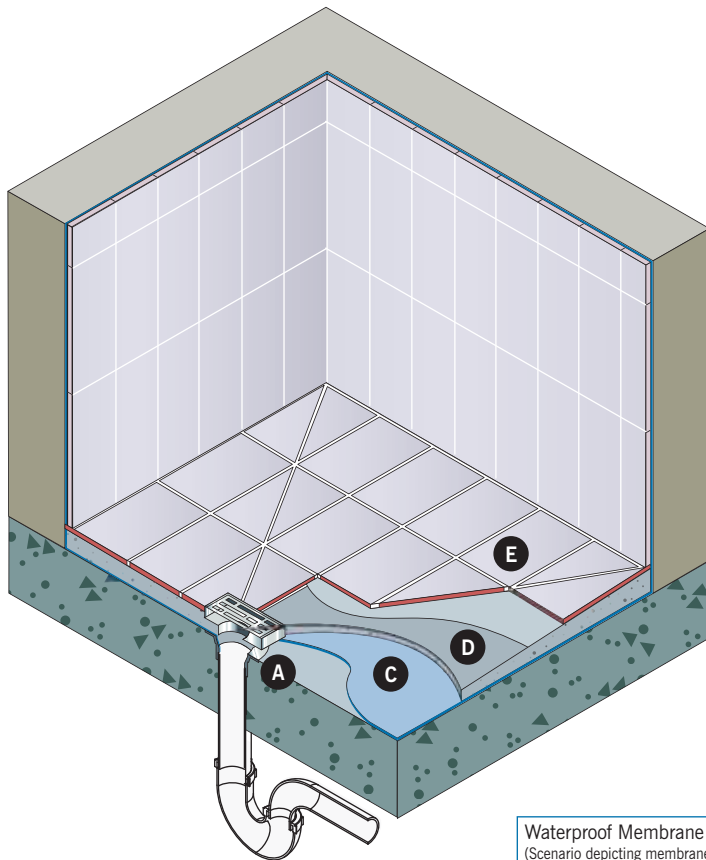


Floor Waste / Floor Waste



Floor Waste / ShowerChannel

For further information refer to www.quartzbyaco.com.au/selector



**Cement concrete floor
(for membranes beneath the screed)**

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3. Block the drain opening with a rag to prevent floor mortar blocking up the pipe.
4. The waterproof membrane (C) is then applied to the slab and continued on to and turned into the drainage flange as well as up the wall, in accordance with AS3740. It is then left to cure before covering.
5. Build up the screed to support the floor waste to the correct finished floor level.
6. A screed (D) is then laid across the floor and trowelled to the correct levels and height allowing for the thickness of the overlying tile layer.
7. After the screed has cured, apply tile cement, tiles and grout (E).
8. Place the grate on the floor waste.

