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# GATIC Slotdrain®

Handling, installation and maintenance guide



Specialised Engineering. Special Advice.



Gatic is a British company renowned for the manufacture and supply of innovative, engineered access covers and surface water drainage systems to the construction, transport and utility markets. The company has established its worldwide reputation by consistently providing high quality, high performance products over more than eighty years.

Today, with offices, production facilities and distributors located throughout the world, Gatic is recognised as a leading global brand for access cover and surface water drainage systems.

## Gatic Slotdrain

Gatic's core business has traditionally been driven by its success in meeting the heavy demands of the world's major air and sea ports. In fact, Slotdrain's unusual channel profile was originally developed in conjunction with leading construction industry professionals from the airport sector.

The concept has, however, proved infinitely scalable and has now been developed into a comprehensive range of products allowing its benefits to be spread to smaller projects such as landscaping schemes, shopping developments and parking facilities.

## Future challenges

We hope you will find what you need in these pages but, despite the wide variety of accessories and systems available, there is always a new challenge to rise to. At Gatic, we never expect to rest on our laurels and intend to continue to supply products that meet and exceed our customers' expectations well into the foreseeable future.

Introduction	2
Contents	3
Handling	4
Planning & Preparation	5
Trench Excavation & Preparation	6
Modular Boxes or Concrete Chambers	7
Excavation Requirements	8
Setting Boxes in Place	9
Connecting Slotdrain to Boxes	10
Covers, Gratings & Flow Regulators	11
Typical Box Installation	12
Concrete Chambers (Cast in Situ & Precast)	13
Channel Installation – General Information	14
Drop Connectors	15
Connection Details	16
Formwork Installation, Channel Setting, Bedding	19
Suspended Installation	22
Expansion Details	24
Finishing	26
Cutting Slotdrain Channels	27
Forming a Radius	28
Positioning Access Units	29
Inspection & Maintenance	30
Technical Support	31



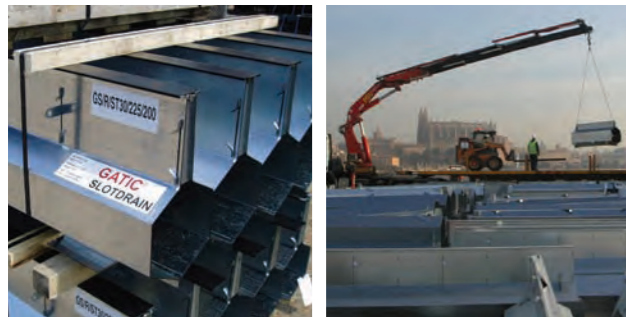
## Transit & Unloading

Your Gatic Slotdrain may be supplied to site either loose or banded together for security during transit. Smaller accessories may be delivered loose or in bags/ boxes.

Channel units should be offloaded safely from the delivery vehicle by mechanical handling equipment.

## Site Storage

Channels should be stored upright on level, solid ground, in a clean and dry area away from possible site damage.



We recommend that no more than two banded packs of channel are stacked securely on top of one another.



Care should be taken when removing straps that hold channel units together.

If being stored for prolonged periods on site before use, we recommend that channels are stored under cover, in dry conditions.

Channels should be stored in the vertical position wherever possible in order to prevent deformation.

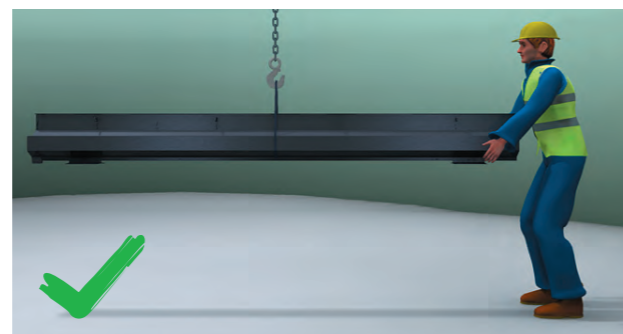
## Lifting & Moving Units

Care should be taken when lifting and moving channel units and accessories, especially if these are large. Units should not be dropped, thrown or dragged, as this may cause damage.

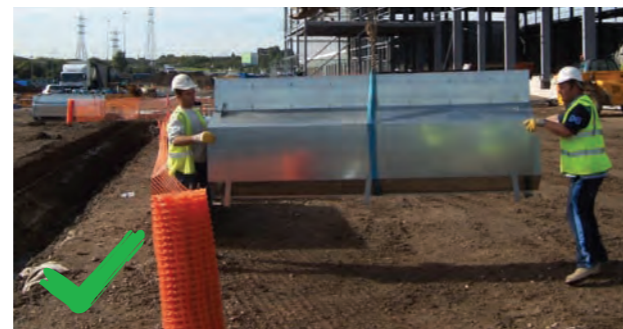
Individual unit weights may necessitate the need for mechanical lifting equipment to comply with Manual Handling Regulations.



Throat spacers and concrete anchors should NOT be used as lifting points on standard channels.



If mechanical lifting equipment is used to move Slotdrain units, in order to prevent possible sliding action, lifting slings or chains should be placed around the complete unit at locations that ensure the unit is restrained in a level position.



Dimensions and weights for the Slotdrain products are available from [www.gatic.com](http://www.gatic.com) and the Slotdrain Technical Brochure.

## Standard Details

Standard drawings giving comprehensive information regarding the installation of Gatic Slotdrain are available for all channel types, sizes and surface finishes. Installation drawings for all system accessories and steel reinforcing are available at [www.gatic.com](http://www.gatic.com).

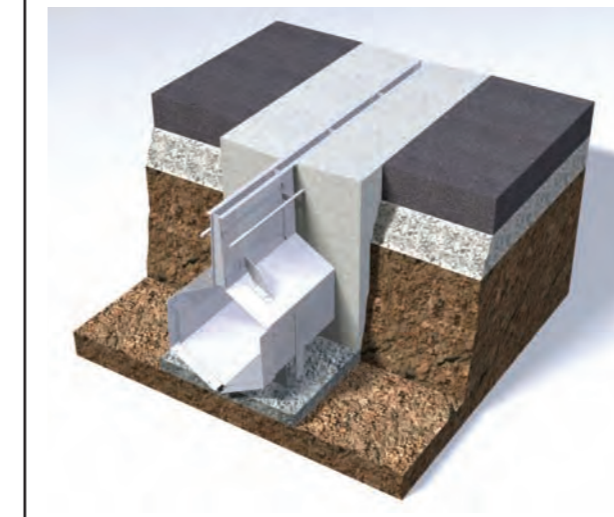
## Site Ground Conditions

Qualified engineering advice may be necessary regarding ground conditions, concrete specification, channel reinforcement and temporary ground support prior to installation.

The adjacent surface finish and its foundation should be designed to withstand the specified service loads, and to prevent ground movement and differential settlement.

The responsibility to design and approve both the steel reinforcing (channel concrete surround) and the foundation beneath the channel should be the responsibility of the project engineer. Please refer to the section on 'Structural Design'.

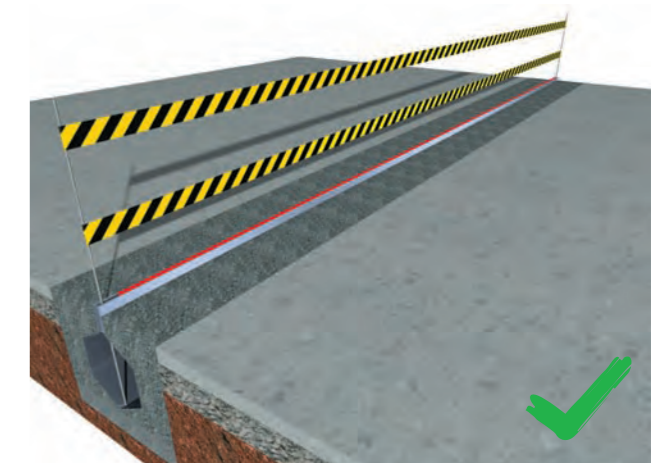
**Important Note:** In F900 applications a flexible asphalt surface should not be installed up to the channel edge, built should be laid to the edge of the concrete surround. This avoids damage to the channel and allows the asphalt to be removed and replaced at a later date without disturbing the channel system.



## Site Trafficking

Gatic Slotdrain channels should **NOT** be trafficked by any vehicle (site machinery or other) until the final surface finish has been applied, this has had time to cure fully, and the installation has been completed.

If it is necessary for vehicles to cross partially installed channel runs on site, sections of channel should not ideally be installed in those locations. If this is not possible, then adequate protection should be put in place around and on top of the exposed channel throat, taking into account the load, size and type of vehicles crossing the channel.





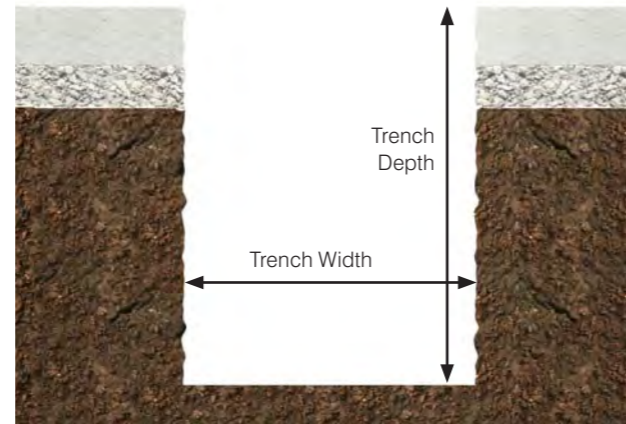
# Trench Excavation & Preparation

If trench excavation is required, the width and depth of the trench should take into account the following:

- Overall depth of channel
- Overall width of the channel
- Adequate working room
- Installation of steel reinforcing
- Installation of concrete base
- Installation of 'formwork' (see Formwork Installation Method)
- Trench supports
- Various depths of channel ('stepped fall' configuration)

If using a bedding method, it is recommended that a concrete base is poured into the trench, and allowed to cure before channel units are set in place. This provides a solid, level platform on which to set out and align the channel units. The solid concrete base will be unaffected by adverse weather conditions (such as rainfall), and this allows for a more precise installation.

The contractor may decide to use a single width trench where a stepped fall configuration is used. For example, in a run incorporating 150mm, 225mm and 300mm channels, a uniform trench based on the 300mm channel could be used.



Minimum trench depths and widths for each Slotdrain type and size are provided in the table below.

Slotdrain Type	Channel Size mm	Trench Depth mm	Trench Width mm
FacadeSlot	50	295	150
	75	350	175
	115	440	215
PaveSlot / UniSlot / CastSlot D400 & UltraSlot 150mm Shallow Inv.	100	355	500
	150	410	550
	225	545	625
	300	660	700
	400	765	800
	500	1030	900
	600	1295	1000
UltraSlot / Treadsafe / CastSlot F900	150	510	550
	225	595	625
	300	800	700
	400	910	800
	500	1030	900
	600	1290	1000

# Modular Boxes or Concrete Chambers

**Modular Box or Concrete Chamber – Which Method?**  
The project engineer and client should decide whether modular boxes supplied by Gatic, or concrete chambers (cast in-place) should be used to form access points and outlet chambers.

- Modular boxes, as recommended by Gatic, can be installed quickly and easily along with the Slotdrain system to achieve a precise, high quality finish.



- Concrete chambers allow the project engineer greater flexibility regarding the size of chambers and type of cover or grating used.



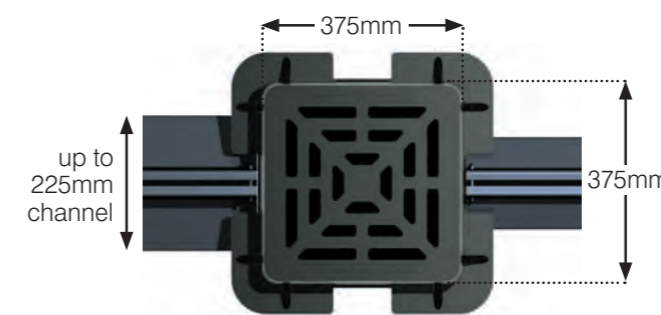
When constructing chambers on site, Gatic can provide Catchpit Connectors and drainage gratings to help ensure that the chambers will connect to the Slotdrain system with minimal effort.

## Modular Boxes

### Planning & Preparation

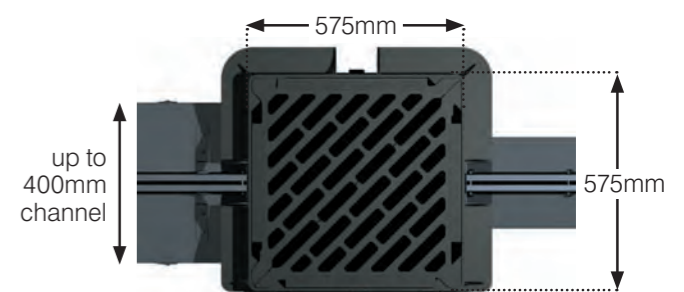
All modular boxes available from Gatic are supplied with gratings or recessed covers. These should not be replaced by anything other than alternatives supplied by Gatic.

A full range of technical drawings are available providing dimensions for all modular boxes.



### Small Boxes

For connecting Gatic Slotdrain channels up to 225mm wide. (Not suitable for FacadeSlot channels.) Available with treadsafe grating, recessed cover or PaveSlot 'slotted' cover.



### Large Boxes

For connecting all Gatic Slotdrain channels up to 400mm wide. (Not suitable for FacadeSlot channels.) Available with double triangular grating only.



Unit Type	Depth (D) mm	Width (W) mm	Length (L) mm
Facadeslot Access Box to 75mm	405	370	460
Facadeslot Access Box to 115mm	490	370	460
Facadeslot Outlet Box to 75mm	550	370	460
Facadeslot Outlet Box to 115mm	635	370	460
Facadeslot Combined Box to 75mm	400	445	370
Facadeslot Combined Box to 115mm	490	445	370
Small Access Box	650	525	525
Small Outlet Box	900	525	525
Small Silt Box	1200	525	525
Large Access Box	950	725	725
Large Outlet Box	1450	725	725
Large Silt Box	1750	725	725

## Concrete Base & Box Surround

### Concrete Base (Beneath Box)

- A15 Loading 100mm Minimum Concrete Depth
- D400 Loading 150mm Minimum Concrete Depth

### Concrete Surround

Surround width to be specified by the project engineer

In heavy-duty areas, a wider concrete surround and/or steel reinforcing may be required around the boxes/chambers to provide adequate support to the cover and frame.

It may be more practical to use a uniform trench width around channels and boxes. However, the concrete surround should always be wide enough to provide adequate support to the cover and frame.

## Ultra Heavy Duty (UHD) Boxes

Unit Type	Depth (D) mm	Width (W) mm	Length (L) mm
UHD Combined Access/Outlet box up to 225mm	725	1475	700
UHD Combined Access/Outlet box up to 400mm	1025	1475	850
UHD Combined Access/Outlet box up to 600mm	1460	1475	1100
UHD Outlet Box up to 225mm	1530	1450	900
UHD Outlet Box up to 400mm	1830	1450	1060
UHD Outlet Box up to 600mm	2210	1450	1200

## Box Preparation

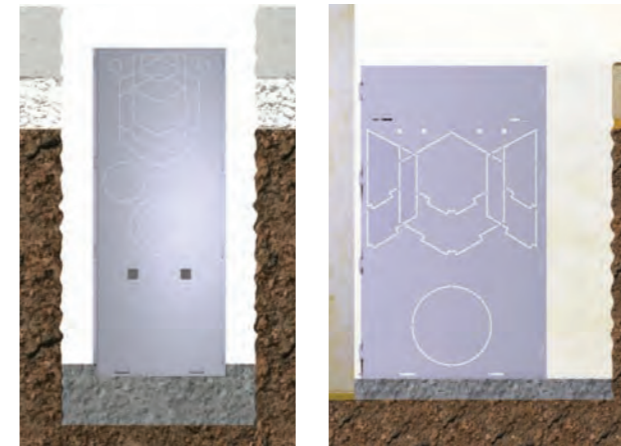
Before placing the unit in the trench:

- The appropriate cut-out sections for the channels to be connected. Channel types and sizes are marked on all sides of each modular box.
- The most effective method to remove pre-formed knock-out sections in modular boxes, is to cut the small number of joining tags with a handheld mechanical cutting tool.
- If installing an outlet unit, remove the appropriate cut-out section for the outlet pipe.

Rainwater pipes can be connected into the side of a box at any height or position by core-drilling a hole into the side of the box, at the relevant position. Care should be taken to ensure sufficient depth of ground cover is provided for the pipe, especially if heavily trafficked.

The larger modular boxes may weigh more than is permitted for manual handling regulations. These should be moved into position by mechanical handling equipment, making use of the cut-out 'lifting holes' incorporated into the wall of each unit. Where cut out lifting holes have been removed, these should be sealed with strong construction tape to avoid ingress of concrete.

Boxes should be set in place on a bed of concrete (refer to 'concrete base' dimensions).

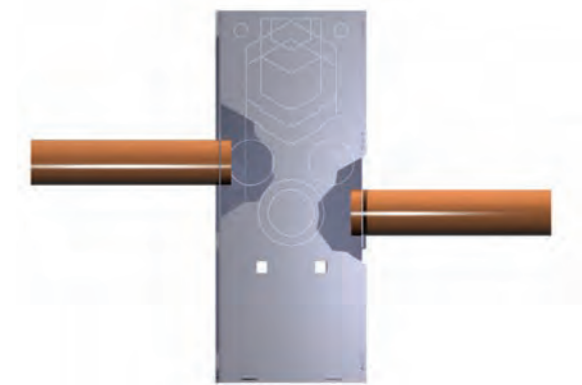
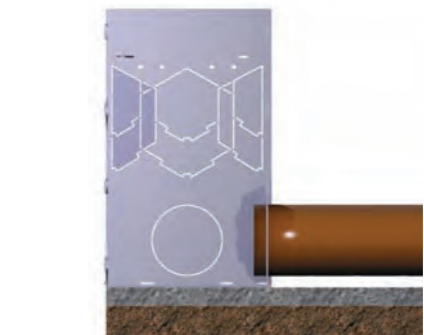
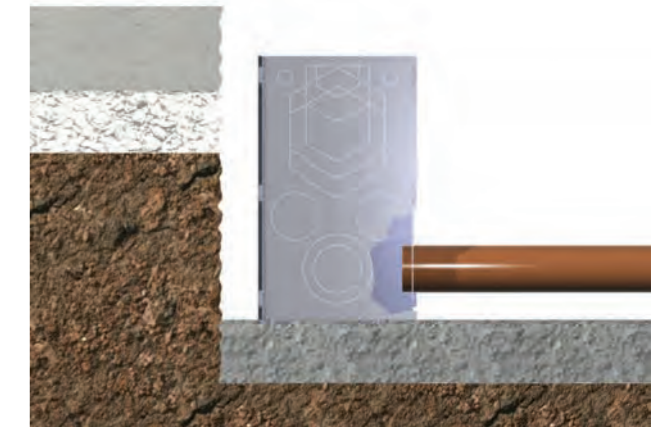


The lower section of the box can be surrounded by concrete (haunched), to hold the box firmly in place. The concrete haunch should be as deep as possible, whilst taking care not to exceed the invert depth of any channel or pipe yet to be connected.



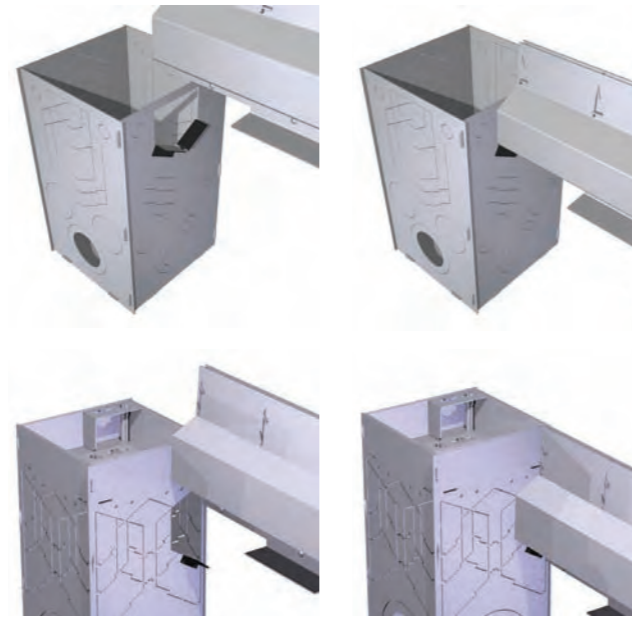
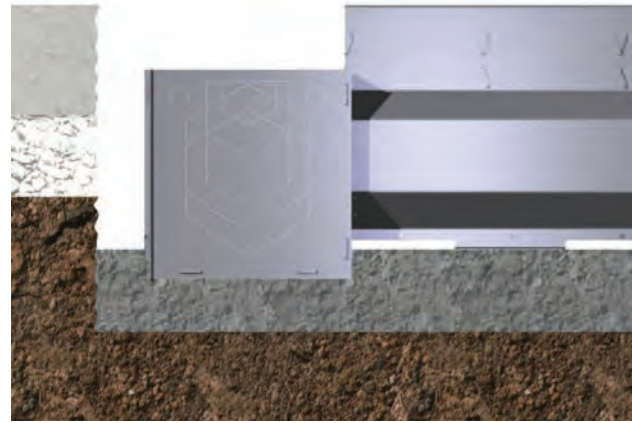
Where an outlet pipe is to be connected, it should now be put into position. The pipe should be pushed through the appropriate hole (25-40mm) and should be sealed with a flexible sealant or construction sealing tape.

## Connecting outlet pipes to boxes



Channel units should also be set against the boxes at this point (see over).

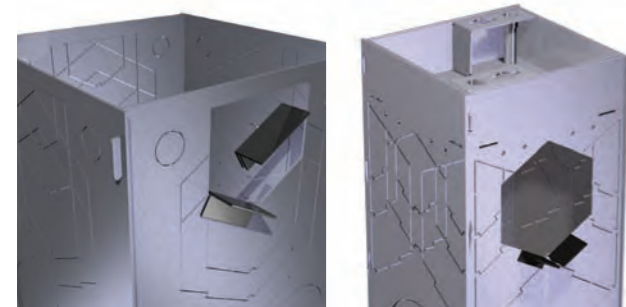
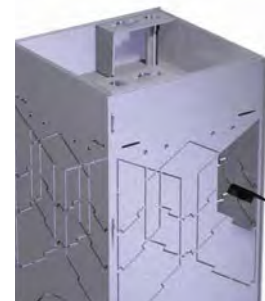




Having removed appropriate cut-out sections:

- Locate the plastic seating profiles affixed to the inside of each box. These profiles create a seating for the adjoining Slotdrain.

For FacadeSlot channels, take one seating profile and push this firmly into place at the lower point of the cut out hole.



For standard Slotdrain channels up to 225mm, take two seating profiles and push these firmly into place at the lower point of the cut-out hole, one on either side of the v-section. For 300mm and 400mm Slotdrain, four seating profiles should be used.

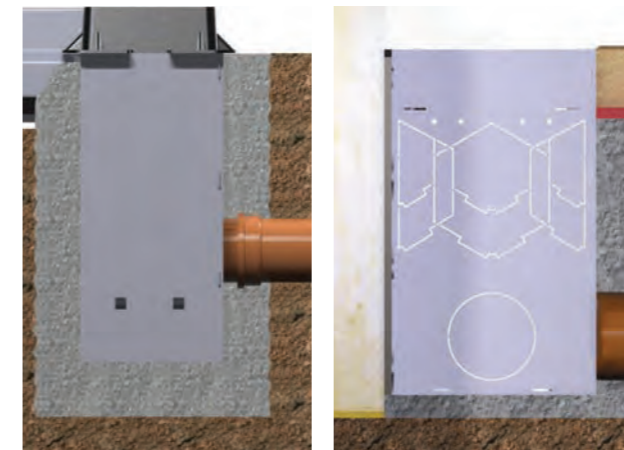
The spigot (male) end of the first channel should then be lowered onto the seating profiles, and set flush against the wall of the box. The joint should be sealed with flexible sealant or construction sealing tape.

If required, the joint should be fitted at this point.



Covers and gratings are locked into place with locking bolts, which require a suitable removal key (Allen Key). Should removal be necessary, please ensure when replacing the cover/grating that the locking bolts are replaced and sufficiently tightened.

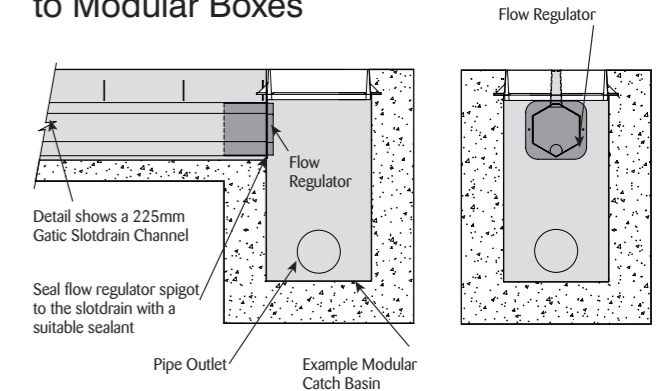
## Backfilling



The void surrounding the box should be filled with concrete up to the underside of the frame. The concrete should be vibrated during pouring to ensure no empty voids exist around the box.

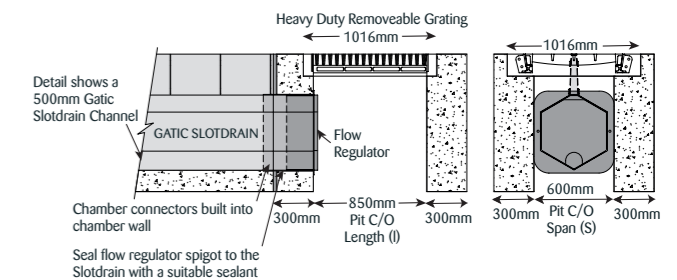
When the back-fill concrete has cured, the area around the frame is ready to receive the appropriate surface finish (asphalt, paving units). Recessed covers can also be filled with the appropriate surface material.

## Connection of Flow Regulators to Modular Boxes



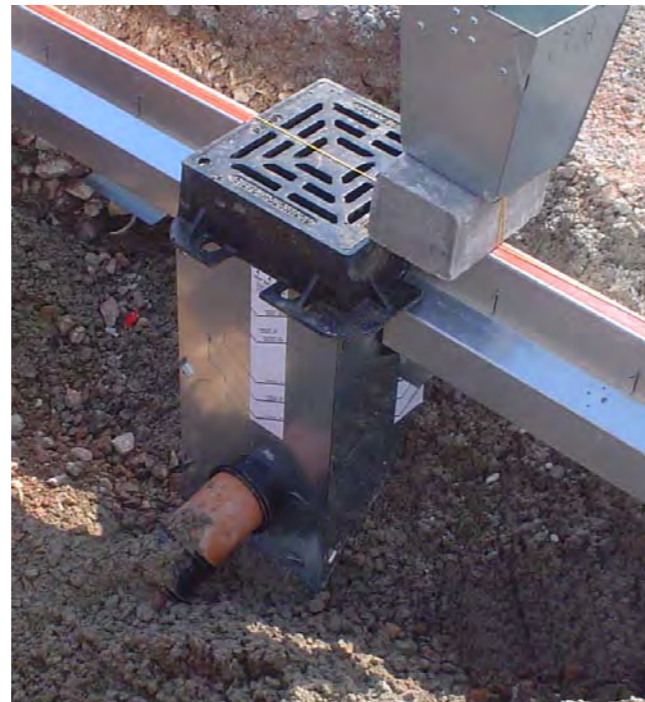
The Flow Regulator should be fitted immediately after the Slotdrain channel has been connected to the silt box (Step 3). Slide the 200mm long spigot section of the unit directly into the channel section of the adjoining Slotdrain until the wall plate is flush with the silt box inner wall. Ensure that the semi-circular shaped orifice is at the bottom. At the position of the fixing holes either side of the wall plate, drill through the wall of the silt box and fix the unit with 2 x M12 concrete anchors or suitable bolts with a wing nut on the reverse side. Tape over any exposed section of thread on the bolt prior to backfilling with concrete. This will enable cleaner and quicker removal of the flow regulator for future maintenance.

## Connection of Flow Regulators to Constructed Catchpits



The Flow Regulator should be fitted when construction of the catchpit is complete. Slide the 200mm long section of the unit directly into the incoming catchpit connector from the adjoining Slotdrain until the wall plate is flush with the internal wall of the catchpit. Ensure that the semi-circular shaped orifice is at the bottom. At the position of the fixing holes either side of the wall plate, drill into the wall of the catchpit and fix the unit with 2 x M12 bolts. The fixings used should facilitate future removal of the flow regulator for maintenance.





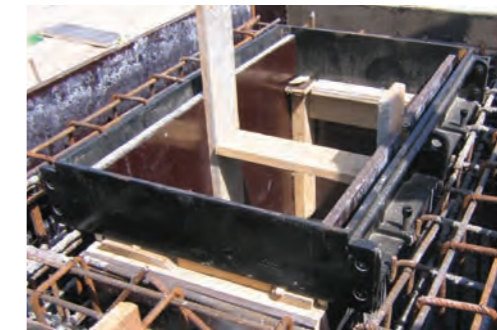
Gatic Slotdrain channels can be connected to concrete chambers, which may be formed from concrete on site, or supplied to site as pre-cast units.

The contractor should decide whether the channel units are installed first, with the concrete chamber formed around the 'Chamber Connector', or whether the concrete chamber should be formed first, with the channel installed after this.

If the latter option is chosen, then a void should be left in the wall of the concrete chamber, to accept the 'Chamber Connector' at a later time. This allows for greater flexibility when installing the channel.



Special 'Chamber Connectors' should be used. Available to suit all channel sizes, these provide a seamless connection through the concrete wall of the chamber.





## Concrete Strength

The channel concrete surround for all Gatic Slotdrain channels should have a Compression Strength of C32/40.

## Channel Throat Protection Strip

UltraSlot channel units can be supplied with a pre-fitted plastic throat protection strip. Please refer to Gatic for details. UniSlot is supplied with protection strip as standard.

## Channel Throat Protection Tape

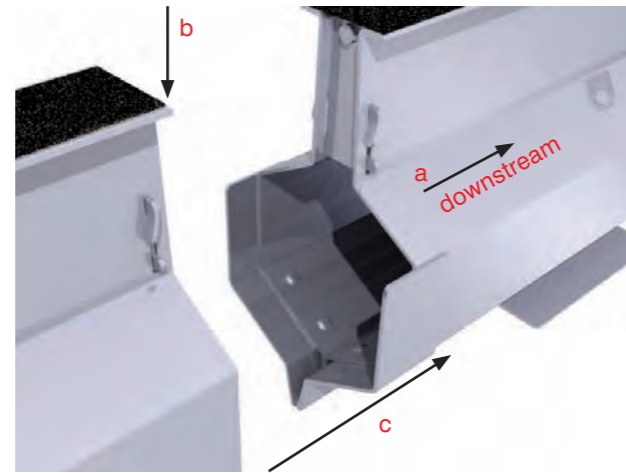
When installing FacadeSlot, PaveSlot and UltraSlot channels, the slot opening at the top of the channel unit can be sealed with a suitable strong construction tape (Gaffer Tape, Cloth Tape), to prevent concrete entering the channel throat during pouring. The tape should be removed before site commissioning and handover to the client.

Construction tape should also be fitted to the top of gratings, supplied with modular boxes, prior to pouring concrete around these units.

## Laying Consecutive Channel Units

The channel installation procedure should begin with the largest channel units installed first, laid away from the catch basin position. The spigot (male) end of the channel should be placed against the D400 modular catch basin wall, or push-fitted within the chamber connector. The socket (female) end of the unit should be positioned up-stream (a).

The spigot (male) end of the successive channels (b) should be lowered into the socket (female) end of the previous channel (c).



Once the Slotdrain has been installed, the protection tape should be removed.



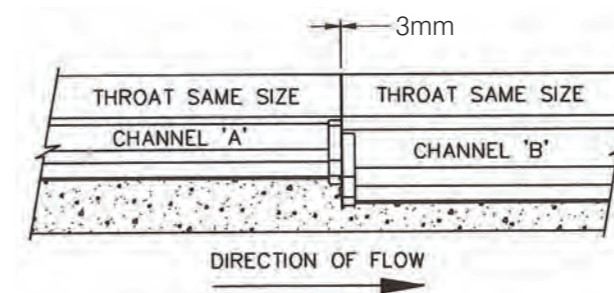
These components provide a smooth transition between different sizes of Gatic Slotdrain channel, whilst the surface detail of the channel run remains the same.



There are two types of Drop Connector:

## Type 1

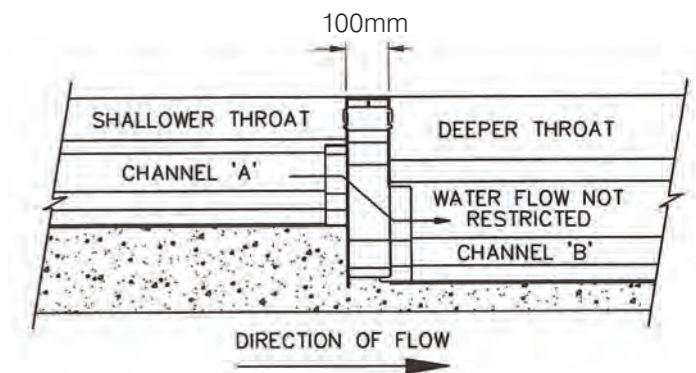
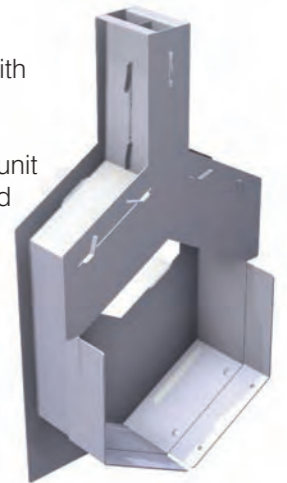
Used to connect channels with the same throat depth.



## Type 2

Used to connect channels with different throat depths.

The wider 'Drop Connector' unit ensures an even flow of liquid through the channel system.



## NOTE

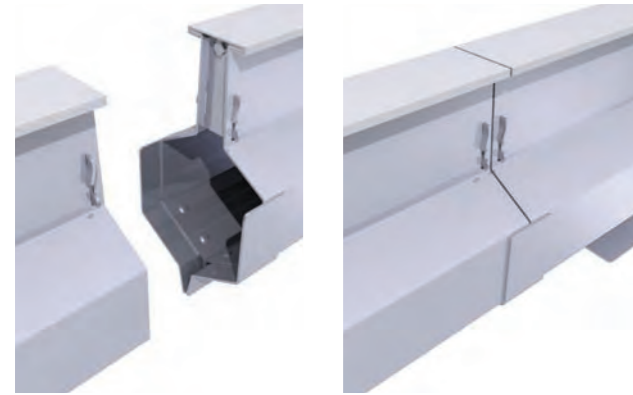
Coupling components at the socket (female) end of the channel will have to be removed in order to attach the 'Drop Connector' unit. This is achieved by removing the joint-coupling rivet heads, with a hand-held mechanical cutting tool.



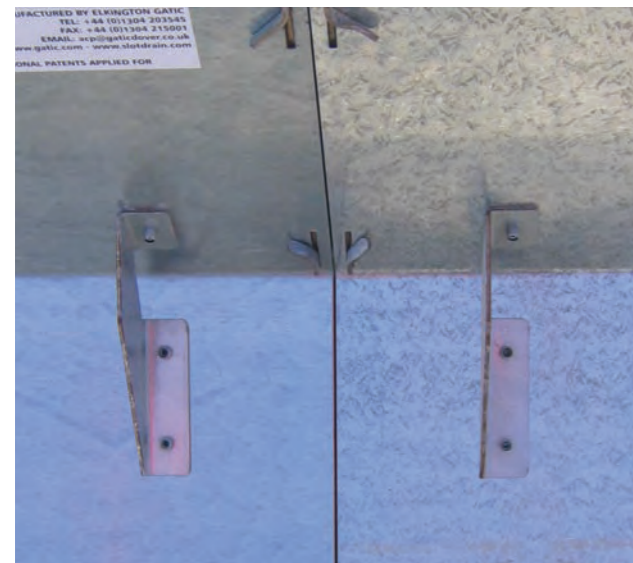
# Connection Details

Channel units are connected with a simple 'butt' connection (push-connection); no additional fixings are required. Units are fitted with 'connection collars' at one end, which help locate and align channels during installation.

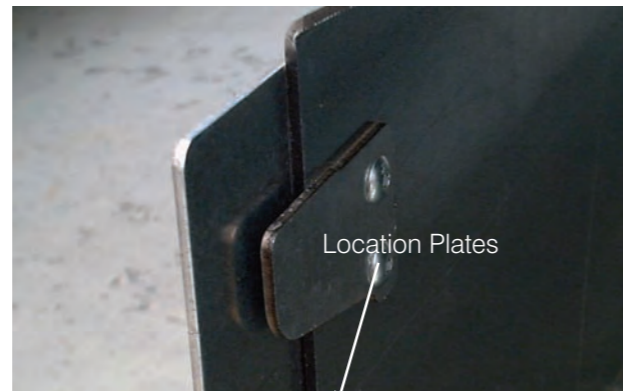
Successive channel units should be pushed into these connection collars until a tight connection is achieved between channel sections.



With Gatic Slotdrain, very precise connections can be achieved, improving the quality and finish of the installation, and reducing the risk of damage to channel units (no raised channel sections). If required, units can be moved together gently with a rubber 'paving' hammer.



If a steel reinforcing cage is fitted around the channel prior to laying the units, this must stop short of the channel ends, to allow room for the connection of channel units.



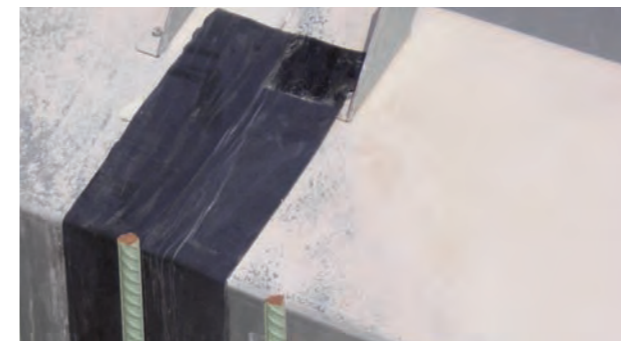
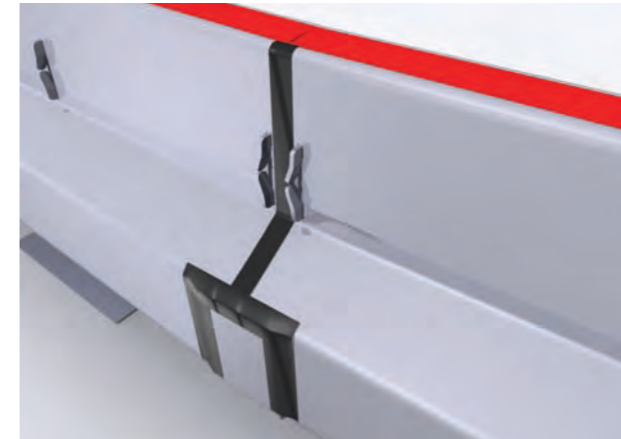
Larger units are fitted with 'Location Plates', riveted to the inner walls of the channel (socket end). These also ensure accurate connection and location of channels when connected, and prevent the channel body from pinching inwards, during the main concrete pour.



Slight adjustment of 'Throat Spacer Tags' may be required to ensure a tight connection.

## Sealing Channels

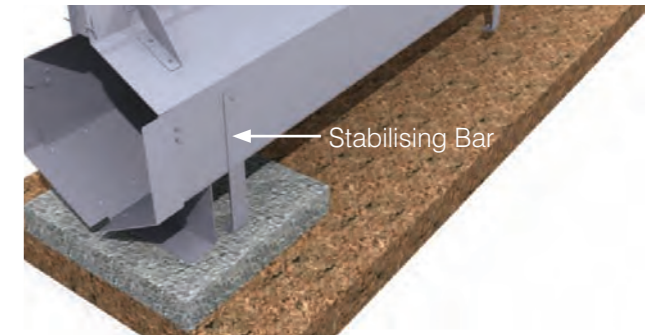
It is recommended that all joints between channel units and where channels meet modular boxes are sealed prior to pouring the concrete surround. This is to prevent the ingress of concrete residue into the channel system. Strong construction tape can be used.



## Stabilising Bars

Larger channel units are fitted with 'Stabilising Bars', which are riveted to the outside of the channel body, along both sizes of the channel.

When channels are transported to site, these bars are fixed in the horizontal position. Prior to making the first concrete pour, 'Stabilising Bars' should be turned to the vertical position.



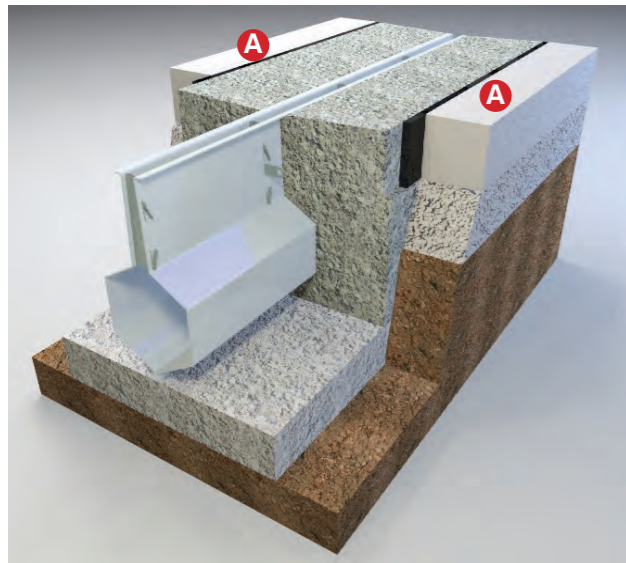
Concrete should then be poured around the 'Channel Feet' and 'Stabilising Bars', to a level just beneath the channel body.

**Installing Steel Reinforcement – Concrete Surround**  
Steel reinforcing should be installed prior to concrete pouring, after channel units and modular boxes have been set in place and aligned.

The design and approval of steel reinforcing is the responsibility of the project engineer.







## Crack Control Joints

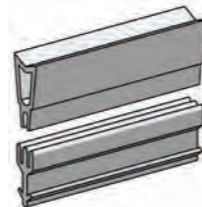
### (Crack Inducers/Shrinkage Joints) **B**

These should be laid either side of the channel at 3m intervals (across the concrete surround). This detail is required for all modular channel systems installed in a concrete pavement.

Crack Control Joints can be formed in a variety of ways, including:

- Use standard expansion joint material.
- Purpose made two-part plastic Crack Control Joints.
- Concrete surround can be cut with a disc cutting tool after the concrete has cured.

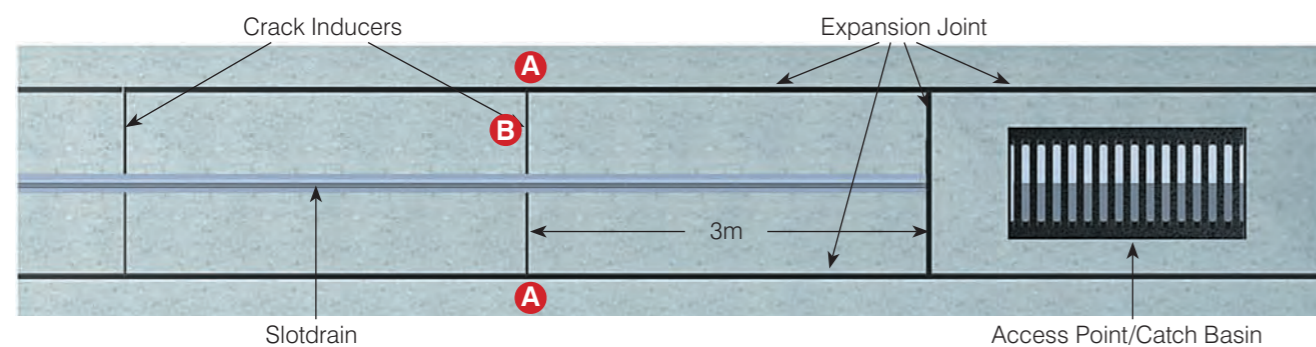
We would recommend the use of a Two-Part Top-Type Crack Inducer similar to the image right. These are pushed into the concrete surface during the pouring and smoothing phase, and the top section is removed after curing to leave a sealant void.



## Longitudinal Joints **A**

For concrete pavement and other rigid surface installations, longitudinal expansion joints should be installed between the channel concrete surround and the adjacent pavement, on either side of the Slotdrain channel, approximately 200mm from the channel body.

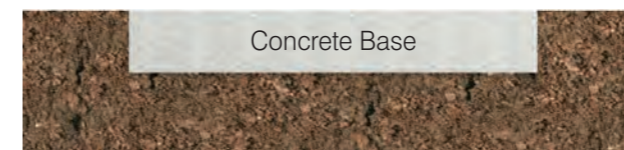
Where access units and catch basins are installed, an expansion joint should be fitted around the outside of these units, between the concrete surround, around the frame and the adjacent pavement.



The 'Formwork Method' of installation is used if adjacent pavements are not yet in place, often when Gatic Slotdrain is to be installed in a new development.

If the Gatic Slotdrain system and concrete surround is to be installed into an existing pavement area, it may be beneficial to use the 'Suspended Method' of installation.

A solid concrete base should be laid (minimum 150mm deep), then a wet mix of concrete is generally poured into a shallow trench. Once cured (dried), this will provide a level and solid base on which to set the channel units.



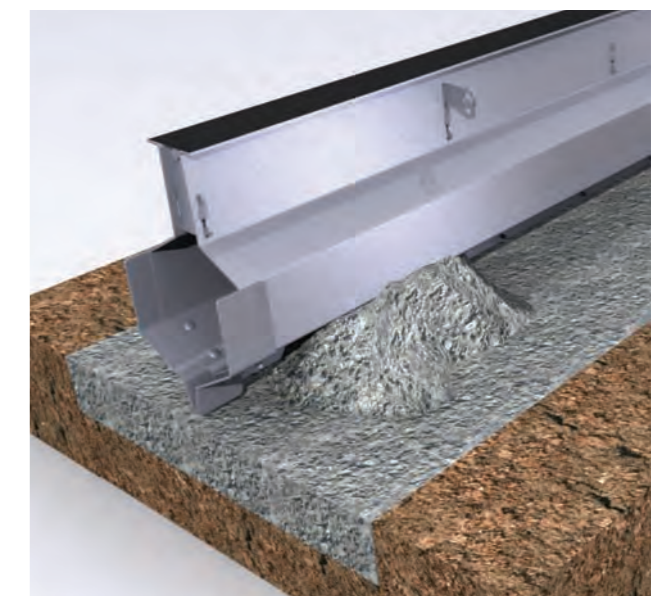
In some applications, the concrete base may need to be reinforced, and/ or may need to have a wide base to withstand the anticipated loading.

The concrete base should be wide enough to allow the installation of steel reinforcing around the channel and formwork on either side of the channel if required.

Once the base has cured, channel units and modular boxes are set in place and aligned on the concrete base. Slight adjustment of channel units may be required. Channel 'Stabilising Bars' should be set in the vertical position.

Throat Protection Strip/Tape should be fitted around the channel at this point. The steel reinforcing bar should be fed through the 'concrete anchors' either side of the channel.

A small amount of concrete may be applied around the 'Channel Feet' and 'Stabiliser Bars' at this point to prevent movement.







**Erection of Formwork**

A formwork system is then erected on either side of the channel units. Timber props may be fitted between the throat section of the channel and the formwork inner wall, to maintain the horizontal position and straight alignment of channel units.

**First Concrete Pour**

To avoid floatation, channel units should be restrained, with additional weight applied to the top of the channel.

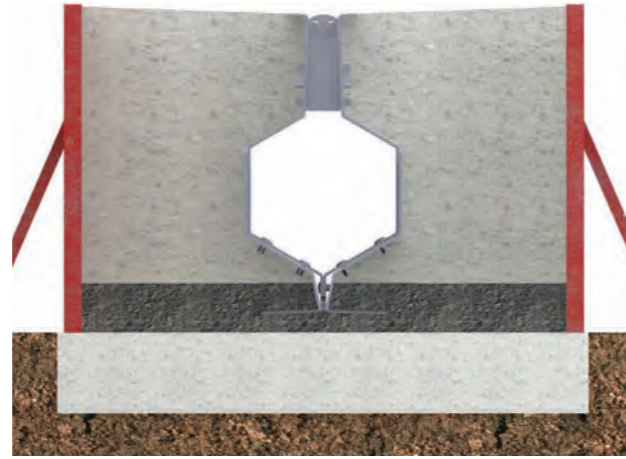
Pour concrete to a depth of 20mm below the underside of the Slotdrain body. The concrete should fully cover the 'Channel Feet' and 'Stabilising Bars' (fitted to larger channel units).



**Note: Large Channels – Concrete Pour**

In order to prevent upward movement of channels when pouring concrete, units will require weights placed on top of the channels. To control the pressure exerted on channel walls during concrete pours, when steel reinforcing is used in the channel concrete surround, we recommend that the concrete is poured in two phases.

This decision should be taken by the project structural engineer, and is subject to their approval. Larger units can be braced across the channel body prior to concrete pours if deemed necessary.



**Second Concrete Pour**

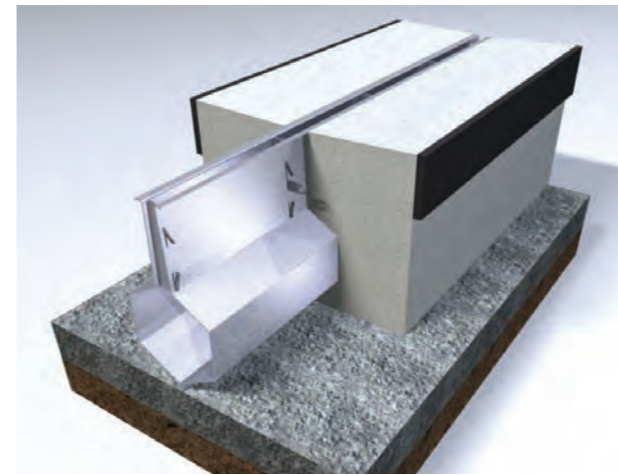
Pour concrete evenly around both sides of the unit, to the top edge of the channel.

Whilst still wet, the top surface of the channel concrete surround should be smoothed with a trowel, ensuring that no voids exist under the channel edge. The specified cross-fall and surface finish should be applied.

Two-part plastic 'Crack Control Joints' can then be applied at each second channel joint, either side of the channel unit. Refer to p19, 'Crack Control Joints'.



**Concrete Finish**

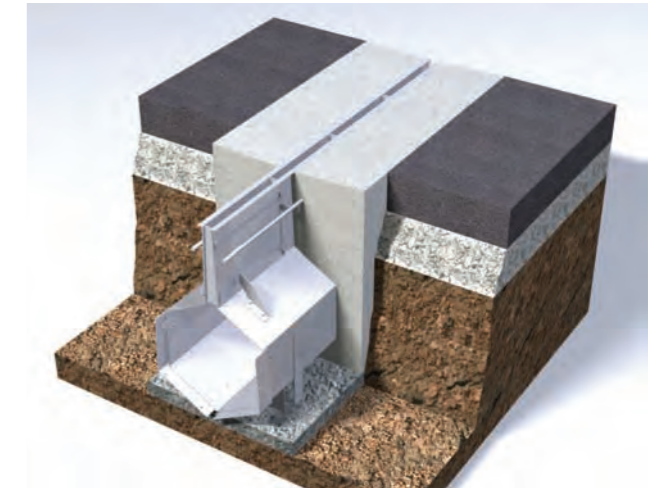


When the concrete has cured, the formwork system is dismantled, leaving the channel and concrete surround in place.

Expansion material can then be attached to the concrete surround, and the adjacent concrete pavements can be laid up to the concrete surround.



**Asphalt Finish**



If an asphalt surface is required, base material and asphalt layers can then be laid to the edge of the concrete surround. A small manual rolling machine should be used to compact the asphalt at the outer edge of the channel concrete surround, to avoid damage to the concrete edge.



Compaction machinery should not be allowed to pass over the channel and channel concrete surround. Machines should be directed along each side of the channel concrete surround, running parallel to the concrete edge.



# Suspended Installation

The 'Suspended Method' of installation is used if the adjacent concrete pavements are already in place, often when a Slotdrain system is installed into an existing pavement area.

If the Gatic Slotdrain system and channel concrete surround is required to be installed first; with the pavement installed afterwards, then the 'Formwork Method' of installation should be used.

## Channel Preparation

The trench should be wide enough to allow adequate working room, and the installation of steel reinforcing (if required).

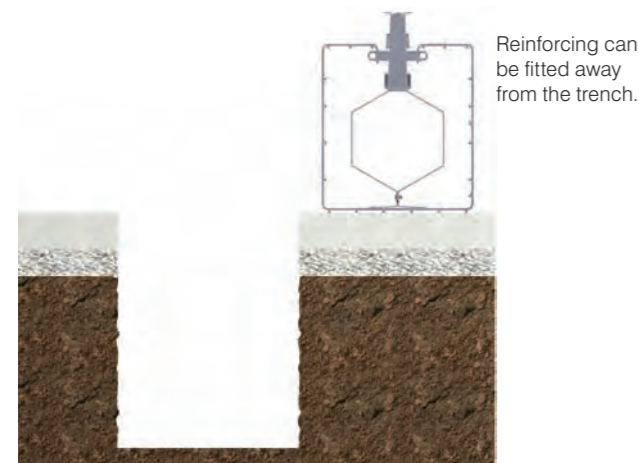
Prepare two metal support bars and hook bolts for each Slotdrain channel. Further information regarding the accessories required is available from Gatic.

The two hook bolts should be passed through the channel throat, and fitted around the throat spacers at either end of the channel (second throat spacer from each end).

To ensure the top edge of the channel is set below the adjacent pavement surface, a plywood packer should be inserted between the metal cross-bars and the top edge of the channel (approx. 100mm thick). The thickness of the packer can be determined by the project engineer.

The hook bolt assembly should be tightened (with nuts) in order to ensure the metal cross-bars are firmly attached, and to prevent movement of channel units when lifted into the trench. Channel units should be lifted into the trench one at a time.

At this stage, the steel reinforcing cage can be erected around the channel prior to movement into the trench; this can save time during installation.



Fitting the metal cross-bars to the channel before lifting into the trench ensures that the channel is placed at the correct level once in position.

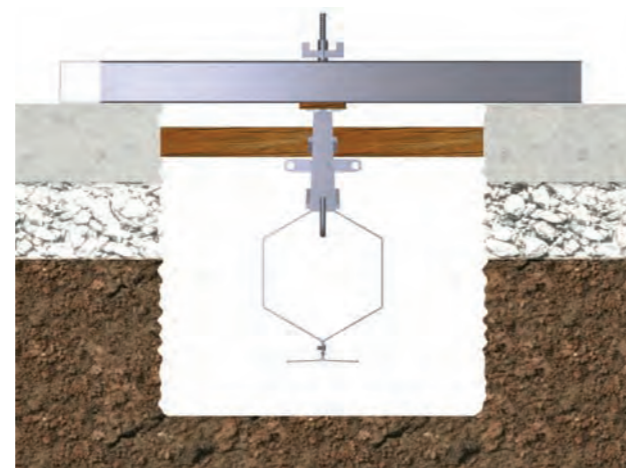


## Channel Positioning

Mechanical lifting gear should be used to lift channel units (with metal cross-bars fitted) into a central position within the trench.

Once lowered into the trench, units should be adjusted and aligned.

Timber props may be fitted between the throat section of the channel and the trench inner wall, to maintain horizontal position and straight alignment of channel.



Longitudinal expansion joints should be fitted at this stage; these can be held in place by the timber props.

Channel 'Stabilising Bars' should be set in the vertical position.

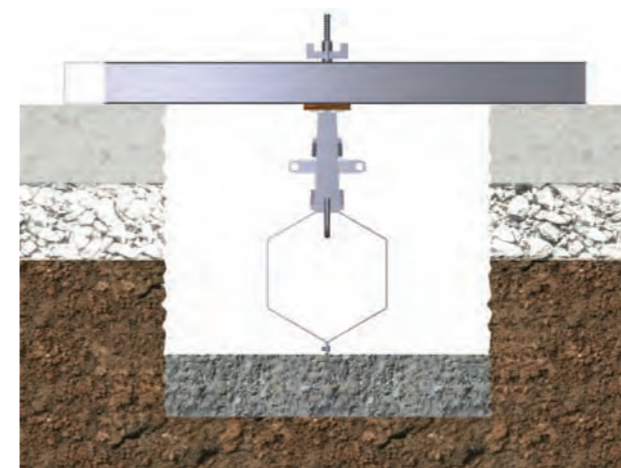
Throat Protection Strip/Tape should be fitted at this stage to prevent ingress of concrete whilst pouring. Construction tape should also be fitted to joints.

## First Concrete Pour

To avoid floatation, channel units should be restrained, with additional weight applied to the top of the channel.



Pour concrete to a depth of 20mm below the underside of the Slotdrain body. The concrete should fully cover the 'Channel Feet' and 'Stabilising Bars' (fitted to larger channel units).

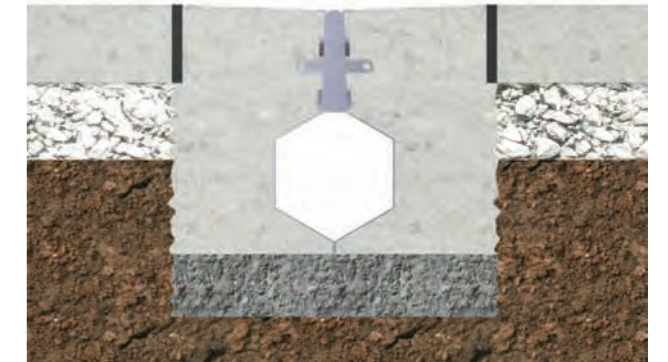


The concrete should be sufficiently vibrated around and under the channel units and steel reinforcing (if fitted), to ensure no voids in the channel concrete surround. Allow the concrete to cure sufficiently.

Metal Cross-Bars can be removed, but weights should still be applied to the top of channel units to prevent movement.

## Second Concrete Pour

Pour concrete evenly around both sides of the unit, to the top edge of the channel.



Whilst still wet, the top surface of the channel concrete surround should be smoothed with a trowel, ensuring that no voids exist under the channel edge. The specified fall and surface finish should be applied.

Two-part plastic 'Crack Control Joints' can then be applied at each second channel joint, either side of the channel unit. Refer to p19, 'Crack Control Joints'.

## Note: Large Channels – Concrete Pour

In order to prevent upward movement of channels when pouring concrete, units will require weights placed on top of the channels. To control the pressure exerted on channel walls during concrete pours, when steel reinforcing is used in the channel concrete surround, we recommend that the concrete is poured in two phases.

This decision should be taken by the project structural engineer, and is subject to their approval. Larger units can be braced across the channel body prior to concrete pours if deemed necessary.



## Expansion – Steel & Concrete

There are a number of considerations to take into account regarding expansion and the installation of Gatic Slotdrain.

### Coefficient of Expansion

The coefficient of thermal expansion for a material is a measure of how much that material will expand for each change in temperature of 1 degree. A table of commonly used materials and their expansion coefficients is set out below:

Material	Expansion (10-6 mm/K)
Steel	13
Concrete	14.5
Polypropylene	100-200
Polyethylene	35-60
Polyester	123

\*Steel has a similar expansion rate to concrete, so Gatic Slotdrain will expand and contract at a similar rate to the channel concrete surround, thereby minimising stresses caused by differential rates of expansion.

### Installation – Expansion Joints

Please refer to the standard construction installation drawings provided by Gatic for details regarding the position of expansion joints.

'Longitudinal' and 'Crack Control Joints' (Crack Inducers/ Shrinkage Joints) are not normally required for installations where asphalt or paving units (with sand filled joints) are the surface finish. This is because these surfaces are 'flexible' and will move naturally when subject to temperature changes.

Expansion joints only need to be considered when the surfaces are rigid such as concrete pavements and paving units with cement joints. In such cases, expansion joints are required to protect the channel from lateral forces (exerted by expansion of the adjacent pavement), and to avoid cracking within the concrete surround due to shrinkage.

The expansion joints highlighted in this section are also required when modular 'grated' trench drain systems are installed on a rigid surface; the installation detail is the same.

We do not recommend that open expansion joints (left unfilled, with no expansion material) are used around Gatic Slotdrain channels. These can become filled with silt and debris over time, and then become ineffective.

## Expansion Joint Material

The type, material and thickness of expansion joints used to provide these construction joints should ultimately be the choice of the project engineer, as they are more familiar with site conditions and characteristics. Most products should be readily available (or easily sourced) from the local market. The performance of the expansion joint product and material within the local environment should be assessed.

The thickness of the expansion joint material used will depend on the anticipated rate of expansion, which is a factor of the temperature differential in the local environment, the type of concrete and aggregate used, the thickness of the concrete pavement, the location and spacing of pavement expansion joints etc. There are many factors involved which may have an influence on the rate of movement of the concrete pavements adjacent to the channel. The expansion material used should be thick enough to cope with the anticipated movement and pressure exerted by the adjacent concrete pavements.

Common expansion materials used are fibre-board and 'Semi Cross Linked Polyethylene (Large Cell) Expansion Material'. We would not recommend that polystyrene is used, since this material does not regain its original dimensions once compressed.



### Cross Section Expansion Joints

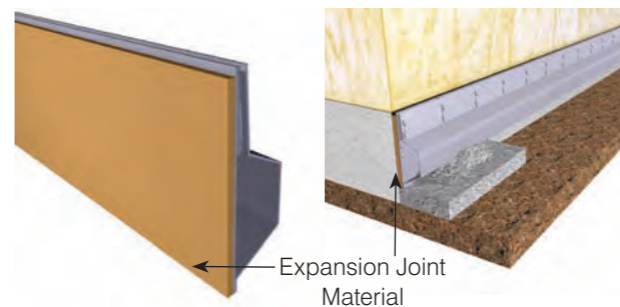
These may be considered when channels are installed in regions that experience very high environmental temperatures.

As Gatic Slotdrain is a modular system, the movement caused by linear expansion of channel units can most often be accommodated within the channel joints.

In regions where temperatures are very high, then linear expansion may be more extreme. The project engineer can consider the inclusion of a Cross-Section expansion joint that is installed between two channel units, to the full depth of the concrete surround. The decision to include these joints, and the intervals at which they should be installed along the channel run, should be determined by the project engineer.

### FacadeSlot – Expansion Joints

An expansion joint will be required between the FacadeSlot channel, and the vertical structure against which the channel is being installed. Please refer to standard installation details provided by Gatic.



### Expansion Joint Sealant

For all expansion joints, a flexible sealant should be used at the top surface to prevent ingress of water into the joint.

## Asphalt & Paving Installations

These are commonly known as 'loose-top' installations, as the surface material is flexible and free to expand and contract when subject to temperature changes. The channel concrete surround beneath the surface of the asphalt or paving will expand and contract at a different rate to the surface, and is not placed under the same lateral pressure as apparent in a concrete pavement installation.

The gaps between paving units generally have a loose infill with a granular base, so expansion and contraction occurs without exerting too much pressure on the channel. The Asphalt surface is also flexible with a granular base, so again this type of installation does not induce the same level of pressure on the channel compared to a concrete pavement installation. Please refer to our installation details relating to Asphalt and Block Paving Installations.



The expansion joint detail relating to Asphalt and Paving Installations should be determined by the project engineer, as the types of installation detail can vary.

If large paving units are installed on a concrete base with mortar infill between joints, then this installation may react similar to a concrete pavement with regard to expansion and contraction. In such cases, it may be necessary to include both longitudinal expansion joints (running parallel to the channel) and cross-section expansion joints (running perpendicular to the channel). There are many decorative and discreet architectural expansion joints that can be used and are readily available on the market.

In a heavy-duty application such as an airport or port, if UltraSlot F900 channels are used and the surface finish is asphalt, then the asphalt surface should be laid to the edge of the channel concrete surround, and not laid directly against the channel edge. Crack Control Joints will still be required at every second channel joint.



## Channel Concrete Surround Cross Fall



The extent of cross fall towards the channel central slot should be specified by the project engineer. For most applications, the finished surface level should be between 2-5mm above the top edge of the channel, to ensure optimum drainage.



The surface finish in the concrete (smooth or textured) should be specified by the project engineer.

## Finishing

Once the installation is complete, Throat Protection Tape or Strip should be removed, and the channel system should be flushed clean with water.



## Installing Slotdrain in other surface finishes

The surface material to be applied should be levelled appropriately. When using asphalt, this should be applied evenly around the channel throat area and levelled with a rake. A small rolling machine should then be used to compact the asphalt around the channel. It is important to note that compaction machinery should not be allowed to pass over the channel slot and throat area during rolling as this can damage the product. Machinery should be carefully directed along each side of the throat running parallel to the channel.

When installing a channel in adjacent paving materials, set the first block adjacent to the Slotdrain channel on a 15mm deep layer of polymer modified mortar, and surrounding materials in accordance with paving supplier's instructions.



## Cutting & Jointing

Slotdrain channels can be cut using a suitable hand-held mechanical cutting unit (with steel cutting disks).

The Slotdrain unit should be clearly marked to ensure a clean, straight cut.

A galvanising repair solution can be applied to the cut ends. The need for this should be determined by the project engineer or contractor.

Cut joints should be butt-jointed and should be sealed using a strong construction tape, to prevent ingress of concrete residue when pouring the concrete surround.

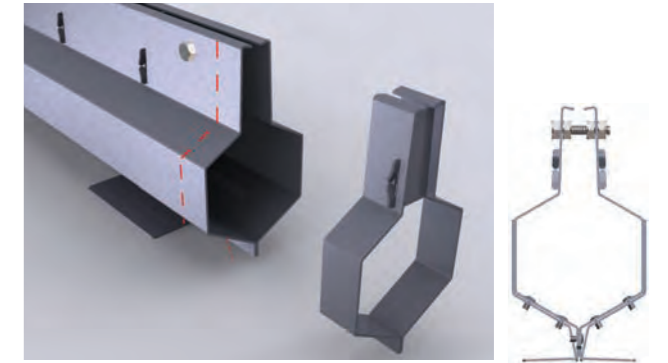
## Remove Joint Coupling

Where Gatic Slotdrain channels are installed between chambers or accessories, the joint coupling components (female end) may need to be removed. This can be achieved by removing the rivet heads with a mechanical cutting unit.

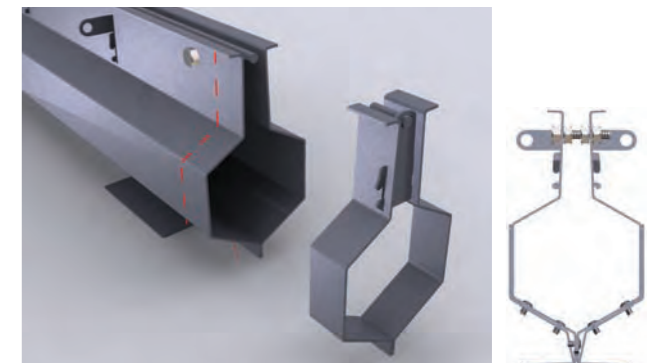
## Open Slot

Where the distance between a cut and the closest end throat spacer exceeds 100mm, in order to maintain a consistent straight slot opening, a simple nut and bolt configuration should be fitted as shown below.

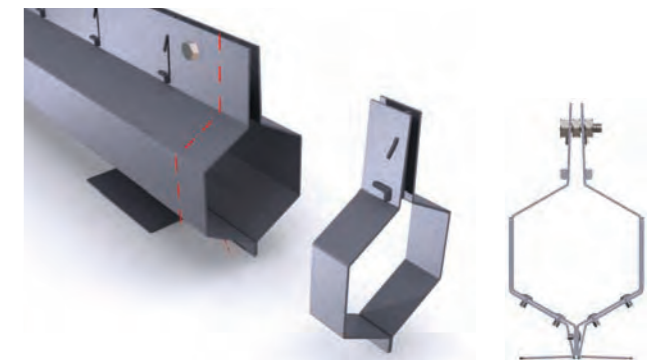
## UniSlot



## UltraSlot



## PaveSlot





# Forming a Radius



In some projects there may be a requirement to install the Gatic Slotdrain system to follow a given radius, for example around the perimeter of a taxi-way on an airport project, or following the curve of a landscape feature.

Gatic Slotdrain channel units are available in straight lengths of 500mm, 1m or 3m.

### Gradual Radii

These can be formed using standard units, with each consecutive channel unit positioned at a slight angle in relation to the previous channel. Please refer to the table below for the achievable radius for standard channels in the range.

When positioning channel units, the gap formed between channels on the outside edge of the radius should not exceed 5mm.



All gaps between the channel joints, on both sides of the channel, should be sealed with a strong construction tape prior to concreting.

Slotdrain Type and Length	Channel Width (mm)									
	50	75	100	115	150	225	300	400	500	600
FacadeSlot System 3m Channels	32m	48m		70m						
FacadeSlot System 1m Channels	13m	17m		25m						
FacadeSlot System 500mm Channels	6m	8m		12m						

Slotdrain Type and Length	Channel Width (mm)									
	50	75	100	115	150	225	300	400	500	600
Other Slotdrain Systems 3m Channels			64m		94m	139m	183m	244m	304m	363m
Other Slotdrain Systems 1m Channels			23m		32m	46m	62m	82m	103m	123m
Other Slotdrain Systems 500mm Channels			11m		16m	23m	31m	41m	51m	61m

# Positioning Access Units

Gatic Slotdrain channel system will require access units to be placed in strategic locations along the channel run, to provide access into the system for cleaning and maintenance.

The position of access units should be determined by the client and project engineer, taking into account the maintenance equipment that will be used.

Specifiers may consider the following:

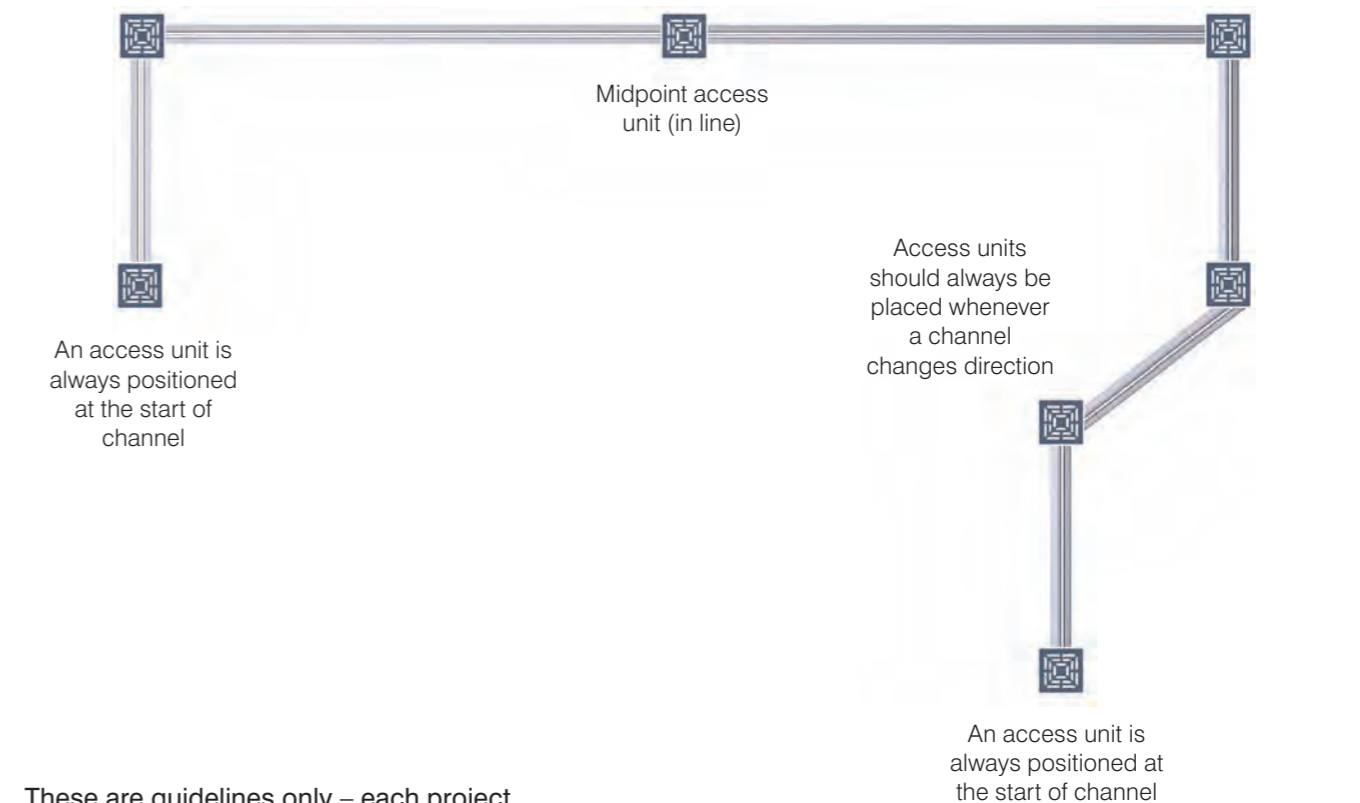
- Access units should be placed at the start of every channel run.
- Access units should be placed at every corner, or at the point where the channel changes direction.

- 100-300mm Wide Channels: Mid-run access units should be placed every 30-50m.
- 400-600mm Wide Channels: Mid-run access units should be placed every 75-100m.
- For short channel runs of 10m long or less, then channel end-caps may be sufficient at the start of the channel run, as cleaning can be carried out from the catch pit end.

Further advice and information is available from Gatic regarding the positioning of access units.

An access unit should always be placed in corner positions

Catch pit can be used as an access point for cleaning and rodding



These are guidelines only – each project should be individually assessed regarding placement of access units.



Gatic Slotdrain channels should be inspected regularly to ensure that the system continues to operate effectively, and is free from damage and blockage by debris or solid objects.

The system should be cleaned at least once a year, and incorporated into a planned maintenance schedule. The frequency of inspection and maintenance depends on the local environment and conditions.

Channel units can be cleaned through the use of a high-pressure hose. This can be fed into the channel system through access units strategically placed along the channel run (see p32, 'Positioning Access Units').

The throat section of channel units should be kept clear at all times to ensure uninterrupted flow of surface liquids into the drainage channel. Any debris within the throat should be removed.

The seating areas for covers and grates should be cleaned before they are replaced. The covers and grates should be locked into position to prevent these being removed, stolen or dislodged by traffic. Locking bolts should be replaced and sufficiently tightened, taking care that the bolt heads do not stand above the top surface of the cover or grate. If grates/ covers are allowed to move within their frame, this may cause damage to the frame or seating.

### Gatic Slotdrain – Health & Safety

'Risk Assessment' information is available from Gatic on request.

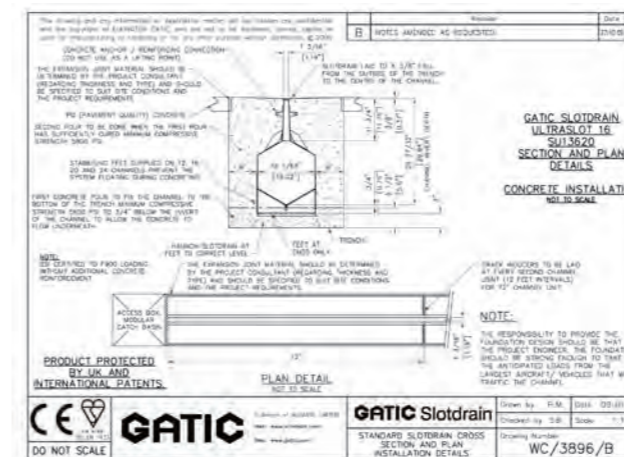


To support construction industry professionals and their clients in the design and installation of Gatic Slotdrain drainage systems, Gatic provides comprehensive technical advice and information.



### Design Service

Gatic offers a comprehensive design service, which is free of charge. After submission of the relevant project information to our technical team, we can provide detailed channel layout drawings (AutoCAD), hydraulic calculation datasheets, system part schedules and product installation drawings. Our team can also check your design and provide a detailed cost estimating service.



To speak with our technical department, forward an enquiry, or to make contact with a sales engineer, please contact Gatic using the details below:

Tel: +44 (0) 1304 203545

Email: [info@gatic.com](mailto:info@gatic.com)

[www.gatic.com](http://www.gatic.com)



### Project References & Case Studies

Please visit the 'Case Studies' section of the website for details of projects where Gatic Slotdrain has been used. These highlight the benefits and savings that can be achieved by using the system.



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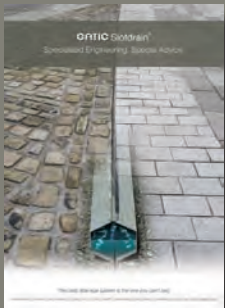
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### Interactive Website

The redesigned GATIC website is ultra user-friendly and offers full details of the entire Slotrain range, its features and benefits, sizes and load categories, as well as design service and contact information. The new website also contains dedicated Access Covers and StreetWise sections.



### Slotrain Lite Brochure

A Lite brochure that offers an overview of the Slotrain product range, including key applications, features and benefits.



### Technical Brochure

Illustrated literature providing comprehensive technical specifications for all our Slotrain products. Designed for specifiers and contractors, this brochure contains a complete Product Selector section, with all the technical details needed to specify the correct Slotrain products for your project requirements.



### Slotrain Design Software

This interactive software allows you to design your own Slotrain system using the same programme as our in-house design engineers. To be sent a CD containing this free software, simply register your details with us. You can do this on the MyGatic section of our website, or by emailing/phoning us using the contact information above.



### Access Covers Product Selector Software

This new Gatic Access Covers Product Selector software is now available and can be sent to you on a CD for free. Simply register your details with us on the MyGatic section of our website, or by emailing / phoning us using the contact information above.



RISK ASSESSMENT REPORT  
THE CONSTRUCTION (DESIGN & MANAGEMENT) REGULATIONS

Gatic Slotdrain Linear Drainage System

This report has been prepared to provide the client with risk assessment information for use during the construction phase of the above project and for inclusion in subsequent Health & Safety files regarding maintenance/cleaning work.

This report relates to the following product:-

- Gatic Slotdrain Linear drainage system manufactured from galvanised mild steel.

1. There are no direct hazards associated with the materials or substances employed in the manufacture of the above products.
2. Gatic Slotdrain should be installed in accordance with the manufacturer's recommendations. Gatic Slotdrain should be installed flush with the surrounding floor to avoid tripping hazards.
3. Component Handling (during installation)

Component parts of the above products may exceed the maximum weight for single person lift recommended under current Health & Safety Legislation.

Care should be exercised when lifting/moving these component parts using:-

- (a) Recommended manual lifting practices, employing adequate number of operatives, or
  - (b) Certified mechanical lifting devices, ensuring that adequate packing is employed to protect the product when using strops, chains, etc.
  - (c) Where lifting strops or chains are used, under no circumstances should these be looped around any throat spacers. We would advise that any such lifting strops or chains are positioned around the complete unit at the central point along the length. Care should be taken to ensure the unit is retained in a level position and prevented from any possible sliding action.
4. Component Handling (after installation) Not applicable. Gatic Slotdrain is permanently fixed in the ground





## Product Health and Safety Data Sheet

Castings, Fabrications and Rolled Steel Products

### Specification

1. Steel castings and products of various shapes and sizes, including Universal Beams and Columns, Joist, Channels, Angles, Flats, Round and Square Bar, Convex, Plates, Sheets, Galvanised, Stainless and Zinc Coated Sheets, Tubes and Hollow Sections etc., delivered in bundles and separately to BS 4360 1449 970 and similar specifications.
2. The castings and steels contain added alloying elements, which can include carbon, manganese, silicon, aluminium, niobium, vanadium, chromium, nickel, titanium, boron and copper. Residual elements also occur in steel and can include sulphur, molybdenum, tin, phosphorus and cobalt.

### Hazards

3. There is a risk of skin laceration from burrs and sharp edges when handling the product.
4. There is a risk that a bundle may break open if it is improperly handled or if the bundle strapping has been damaged. Injury including skin laceration and eye injury may occur when breaking open the strapping due to release of tension.
5. During fabrication rolled structural steel sections can be flame cut, machined, and/or drilled and since they contain residual stresses induced during rolling and cold straightening, precautions are necessary to prevent sudden release of these stresses which can cause significant movement and/or fracture, particularly when dealing with beams and columns.
6. Fumes are produced when steel is subject to elevated temperatures during welding, flame cutting or heat treatment.
7. Fumes are produced when steel that has been oiled, painted, greased or waxed is subject to elevated temperatures as above.
8. Fumes are produced when Galvanised or Zinc coated steel is subject to elevated temperatures as above.



9. Fuming can occur if products that have been oiled, painted, greased or waxed to prevent oxidation are removed chemically.
10. These fumes can contain iron oxide, zinc oxide and other residual elements. The principal mode of entry into the body is by inhalation and potential effects on health that includes irritation of the eyes and upper respiratory tracts and metal fume fever.
11. When cutting or abrading steel, hazardous dust can be given off, again the principal mode of entry to the body is by inhalation.
12. When cutting or drilling there is a risk of laceration to the skin or injury to the eye from steel swarf.

#### Manual Handling

13. Castings and steel products of various shapes, sizes and weights are difficult to move by manual handling. It is strongly recommended to use suitable lifting equipment such as cranes, or hoists with tested and certified lifting slings or chains.

March 2003



## **GATIC SLOTDRAIN – ROUTINE MAINTENANCE**

### **FREQUENCY**

It should be noted that the Gatic Slotdrain has superior hydraulic capabilities but should be maintained to ensure the optimum levels of drainage continue to be achieved.

The system should be cleaned at least twice in any 52 week period and fitted where possible into an existing planned maintenance scheme that may be in operation.

Additional visual inspections are also recommended in addition to the planned maintenance scheme to ensure free flow of the channel at all periods of the year. Reasonable care should be taken not to damage the surface of the Slotdrain with heavy blows or sharp instruments.

### **MAINTENANCE PROCEDURE**

- 1) The throat of the Slotdrain should be kept clear so as to ensure the unobstructed flow of surface water into the drainage system. Any debris that could obstruct the throat should be removed accordingly.
- 2) Gatic Slotdrain can be cleaned by utilising a high powered jet wash. The jet wash should be run through the entire length of the system, ensuring that any detritus that may have settled in the channel is loosened and washed down to the silt boxes where it can be removed.
- 3) Silt boxes should be cleaned thoroughly ensuring that the buckets provided to catch any silt/detritus are replaced after doing so. The seatings of the silt box covers and frames should be thoroughly cleaned before the covers are replaced.

JULY 2002