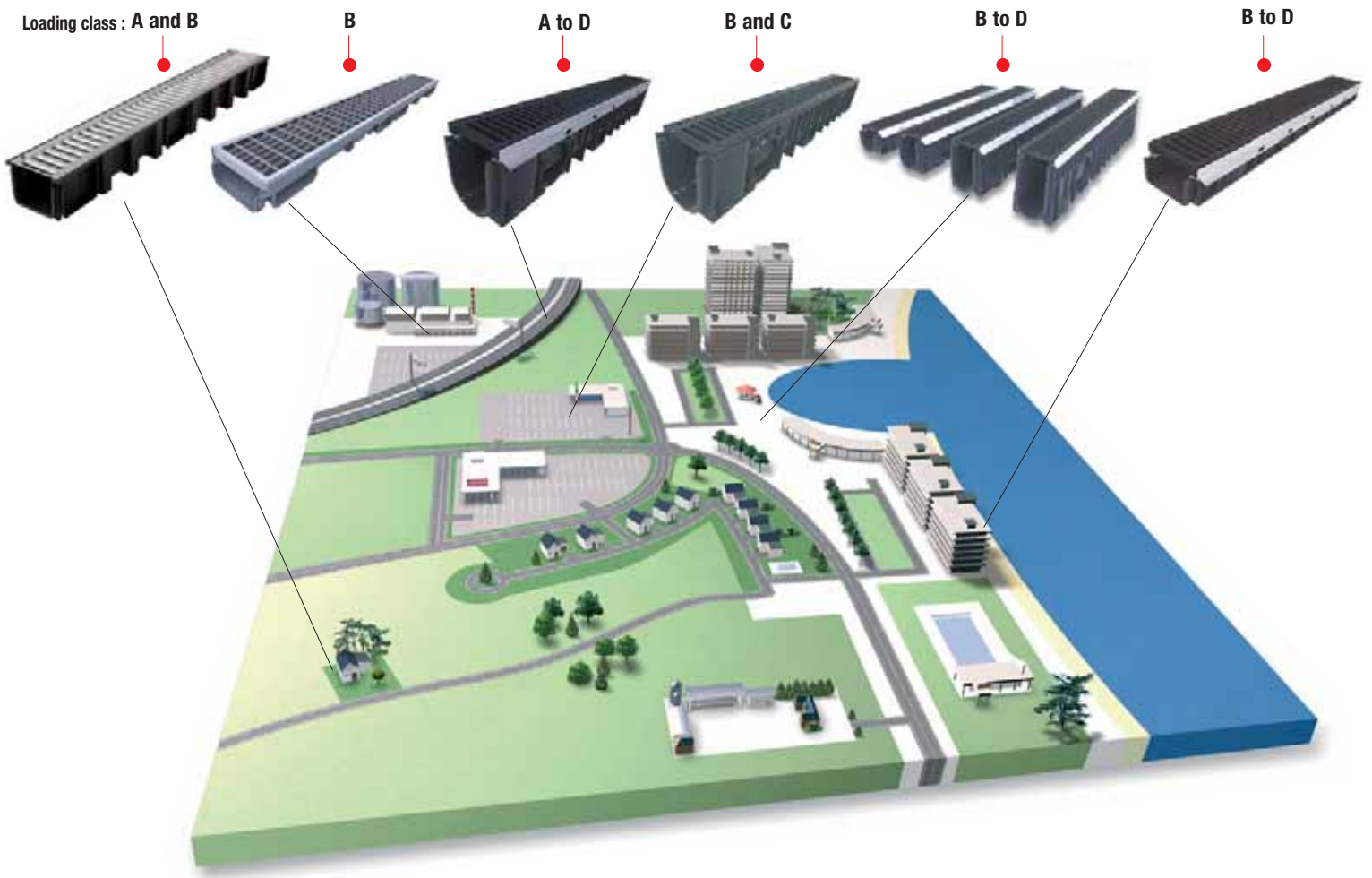


Drainage channel systems 2008

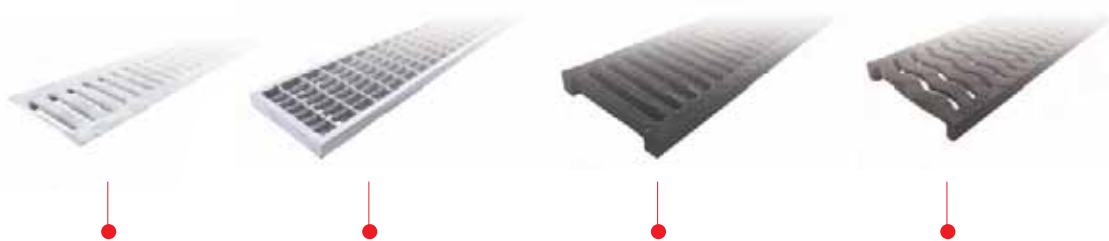


A wide range of drainage channels...

CONNECTO® CONNECTO® shallow		KENADRAIN®		KENADRAIN® STEPPED FALL SYSTEM	KENADRAIN® PARK
		KENADRAIN® HD	KENADRAIN® MD		
		Heavy duty Constant traffic	Medium duty Occasional traffic	HD and MD channels	HD channels
Width :	130-200 130	100-150-200-300	100-150-200	100	100
Height :	115-143 60	170-203-237	150-185-220	130-170-210-250	80
Applications areas :	All housing building surroundings	Public roads Car parks	Pedestrian areas Public buildings Town squares	Wide waterproof areas	Multistorey car parks



of gratings...



Grating type :	Slotted grating	Mesh grating	Slotted ductile iron grating	Ductile iron grating HEEL
Loading class :	A15 - B125	B125 - C250	B125 - C250 - D400	C250
Grating length:	1 m	1 m	0.50 m	0.50 m

Why do we need a drainage channel ?

.... to drain rainwater quickly.

Whether in public, industrial or private fields (pedestrian zones, car parks, public roads, motorways, gas-stations, courtyards etc...), on wide impermeable areas, surface drainage is becoming increasingly important.

For safety and useful reasons, it is essential, to plan a drainage network for rainwater.

Two existing systems :

Point drainage (fig. 1 & 2)

Installation of a point drainage system and an underground network :

- significant and expensive excavations,
- too many unaesthetic slopes very difficult to build,
- major risks of puddles,
- safety risk with waterlogged surfaces which become dangerous in periods of intense rainfall for all types of vehicles.

Linear channel drainage (fig. 3)

Drainage channel system which replaces an underground network :

- easy slopes to be built,
- limited excavation,
- matched to aesthetic urban requirements,
- high catching performance increasing safety for users and minimizing pollution.

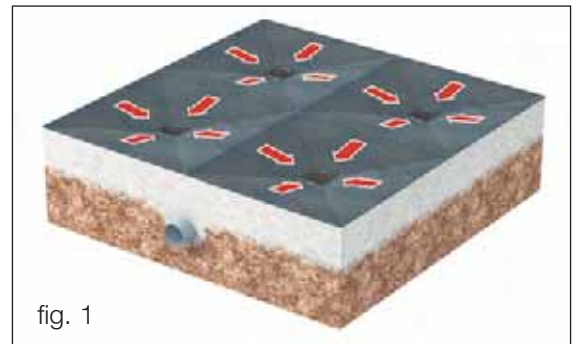


fig. 1

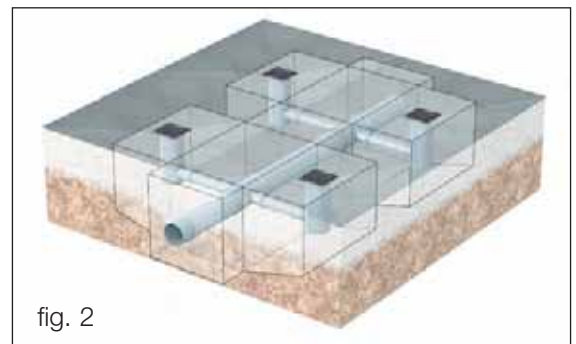


fig. 2

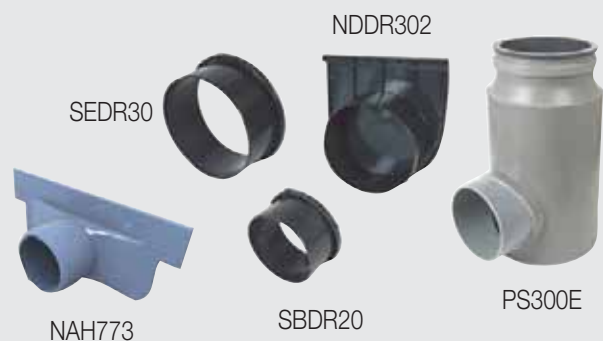


fig. 3

...and accessories.

To connect the channels to the underground network.

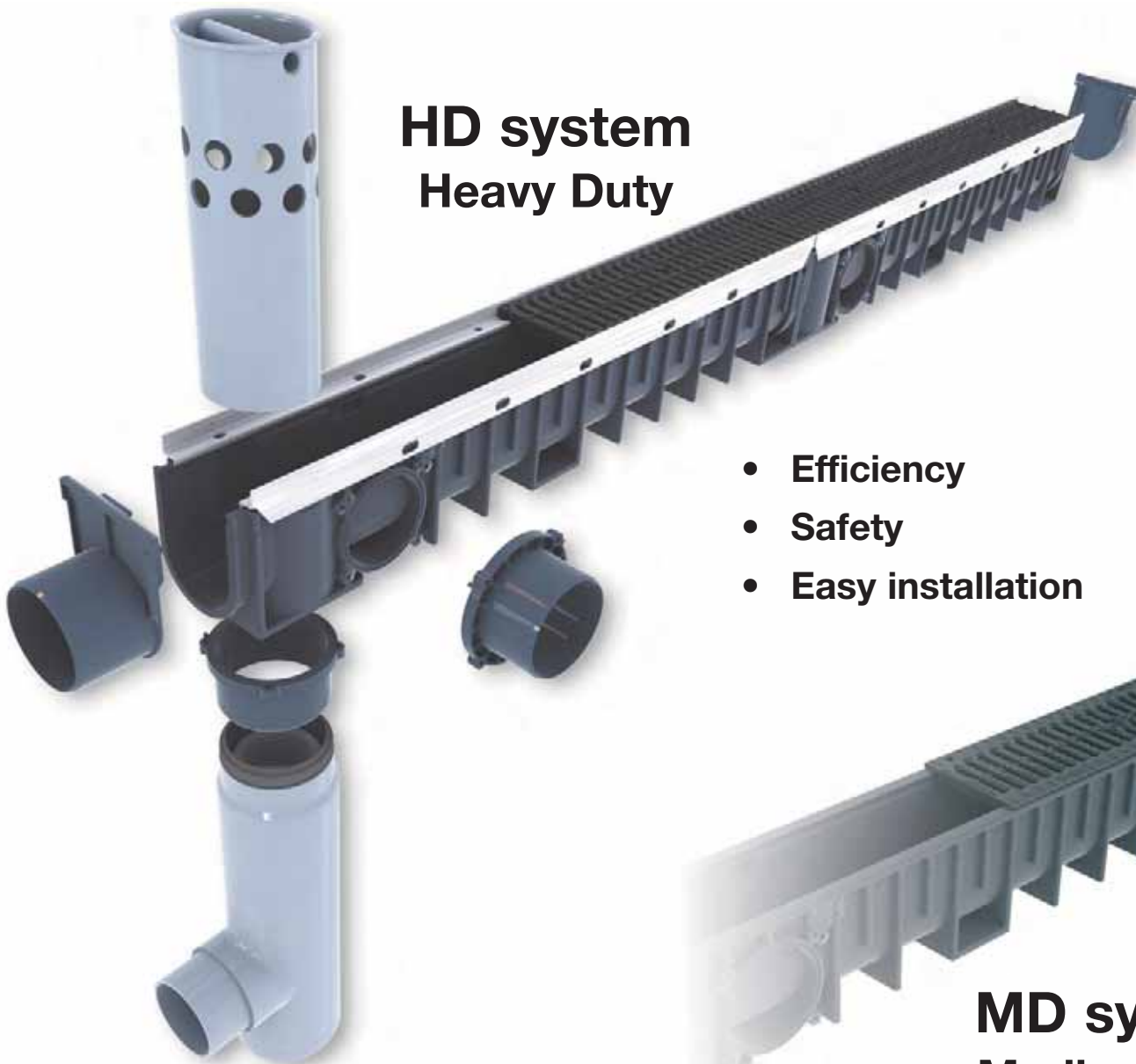
PVC end caps and verticals outlets, EKSO sump units manufactured in PVC, allow an easy and waterproof assembly.



The KENADRAIN® range

A channel drainage system for traffic and urban areas.

HD system Heavy Duty



- Efficiency
- Safety
- Easy installation

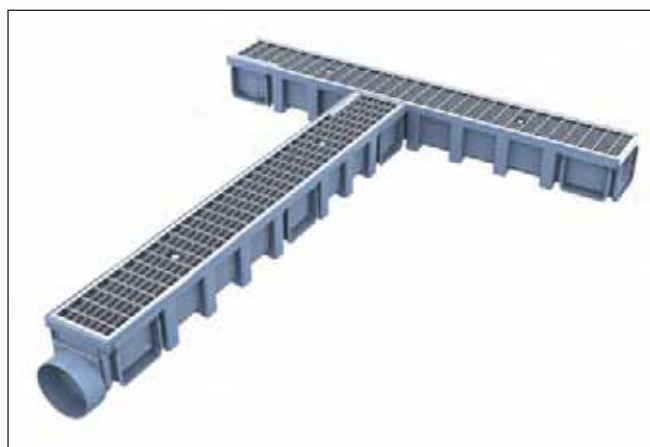
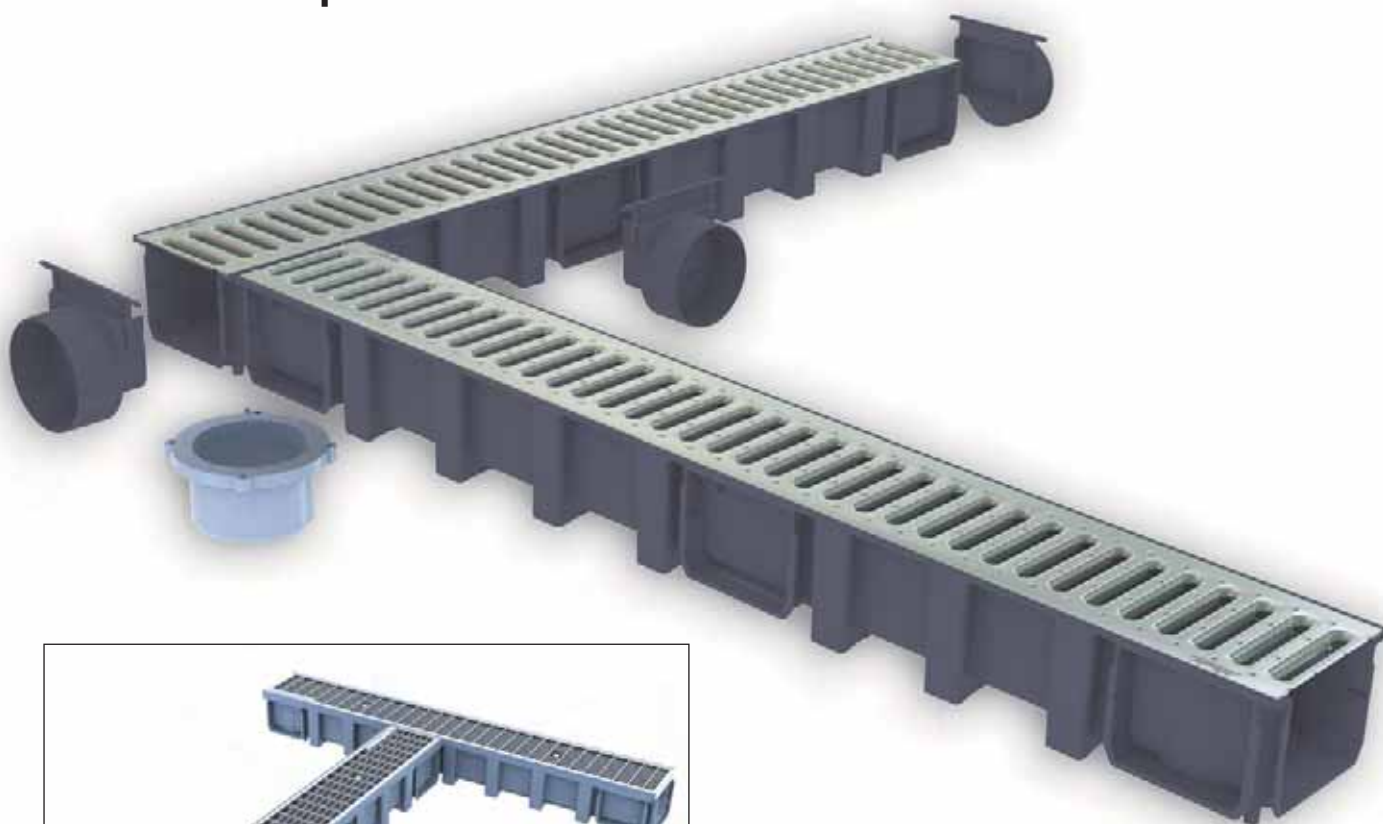
MD system Medium Duty



The CONNECTO® range

An universal system for housing and building surroundings.

- Only 3 Items create numerous installation possibilities.



NICOLL HYDRAULIC CHANNELS...

Designed with injection moulded Polypropylene, a material used for many years, this new generation of Nicoll drainage system offers decisive advantages against traditional materials.



Strength The thick polypropylene gives a high shock resistance to impact (before and after installations).



Light-weight Makes transport, handling and installation operations easier.



Recyclable They are made from recycled products and are recycled again to be reused in the manufacturing process.



Hydraulic The smooth internal surface makes flow rates higher and creates an optimal self-cleaning action. It is possible to make the system watertight.



Functional

- Easy opening with a hammer to the desired drain outlet.
- A range of PVC outlets makes the connection with seal joint or cemented PVC drain pipes easier.



Aesthetic Can be installed in paved, concreted or asphalted surrounding surfaces. A wide choice of different gratings can match to aesthetic requirements.



Totally resistant to frost As the product is not porous, its high resistance to frost can be guaranteed.



Resistant to aggressive materials

- Acids.
- Insensitive to de-icing salts.
- Most chemical agents (a complete table is available on request)

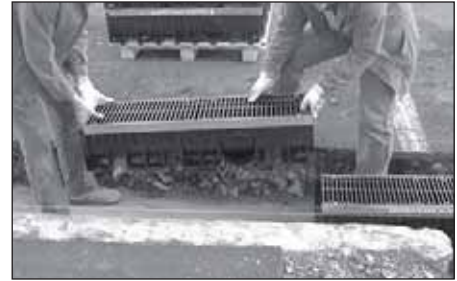
In addition of these above-mentioned advantages, Nicoll channels are Eco-Friendly to their environment and to the fluids they drain (No polymer residue, no water contamination by styrene).



...Easy to install products.

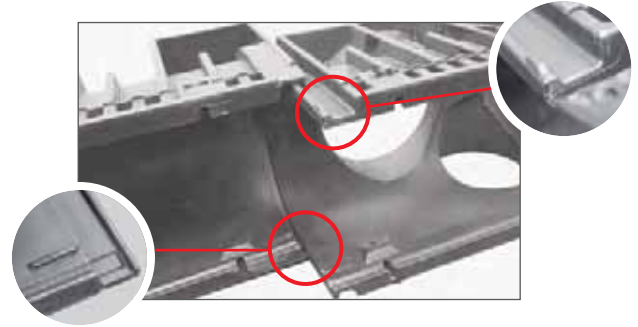
Light-weight, with assembled gratings

- For a quick installation, channels drainage are supplied with gratings locked.
- A minimal weight : 16 kgs for a 100 mm width with a D400 ductile iron grating
25 kgs for a 150 mm width with a D400 ductile iron grating
31 kgs for a 200 mm width with a D400 ductile iron grating
59 kgs for a 300 mm width with a D400 ductile iron grating
- Very easy and safe handling by one or two workers. No lifting equipment is required.



A male/female interlocking joint system

- makes the straightness and the watertightness of the installation easier.
- A 1° angular play per meter allows long radius curved installation .



An easy connection to the drainage-pipe work

- One hammer stroke is enough to take out the outlets.
- Waterproofing guaranteed thanks to specific connecting accessories.

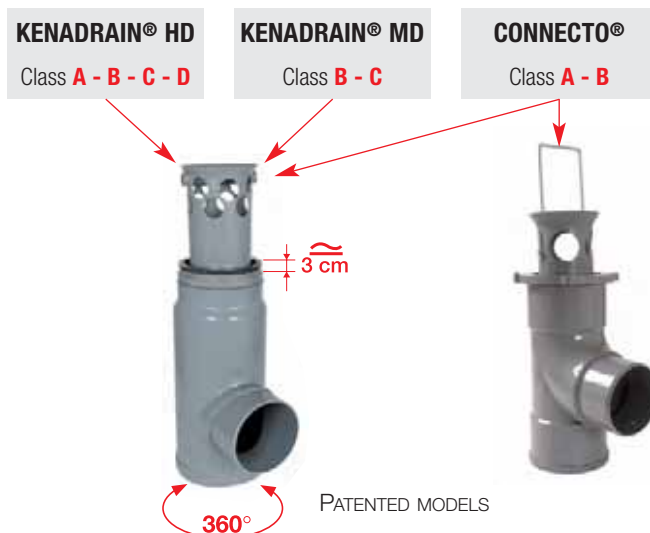


To make the drainage waterproof quality

- Channels could be waterproofed by a seal compression of a 5 mm thickness polyurethane mastic such as Sikaflex 11 FC type, Ayrton PU111 type or similar (Please contact us). Technical data is available on PDF file on request.



The sump units EKS0 range : a universal application



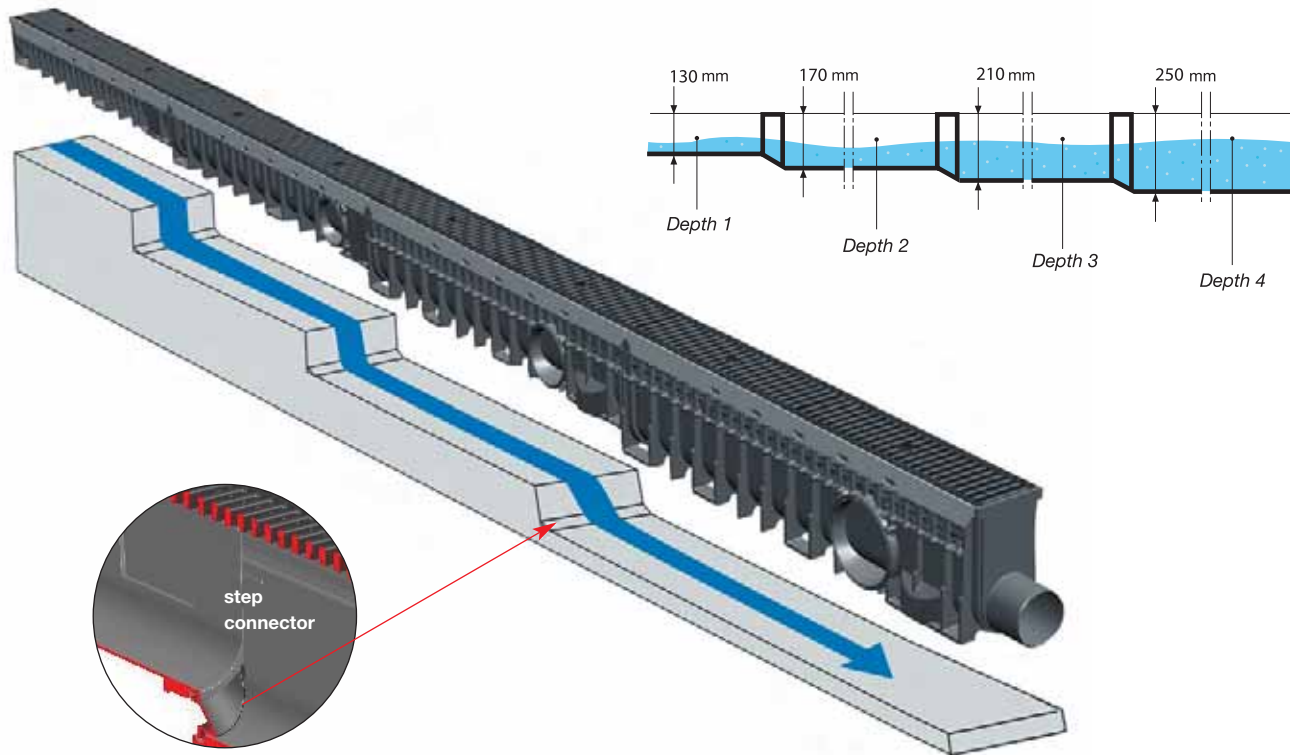
- Adjustable height and swivelling by 360°
- Upper and lower outlets.
- High mechanical resistance to oval-shaped effects and to lateral forces.
- Optimum hydraulic performance thanks to the circular shaped design.
- Universal : 1 sump unit for each width only for all load classes and all grating types.

Technical data is available on PDF file on request.

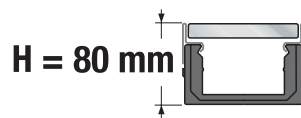
KENADRAIN® Stepped fall system

The 100 mm width Kenadrain® stepped fall system consists of four channel depths. The channels are installed in groups of matching units, successively increasing in depth and giving an acceleration of the run off towards the

outlet. Step connectors, made of PVC are available to fit between the different depths of channels to improve the hydraulic performance.



Kenadrain® Park HD



- Overall height of channel : 80 mm.
- Specially designed for multistorey car parks.
- To built in concrete slabs and screeds.
- Easy to install and to make watertight.



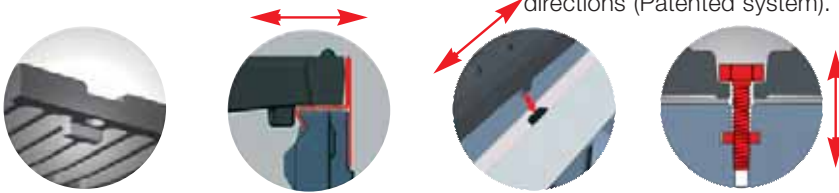
Each depth of the stepped fall Kenadrain® system can be used separately to comply with configurations on construction sites.

The available gratings for Park and Stepped fall Kenadrain® systems are in galvanized steel mesh for the load class B125 and in ductile iron for the load classes C250 and D400. For others gratings, please contact us.

GRATING LOCKS for KENADRAIN® System

HD and MD range – Widths 150, 200 and 300

- Locking system with 4 bolts per grating. Gratings are blocked along the three directions (Patented system).



- Stainless steel security bolts are available on request.



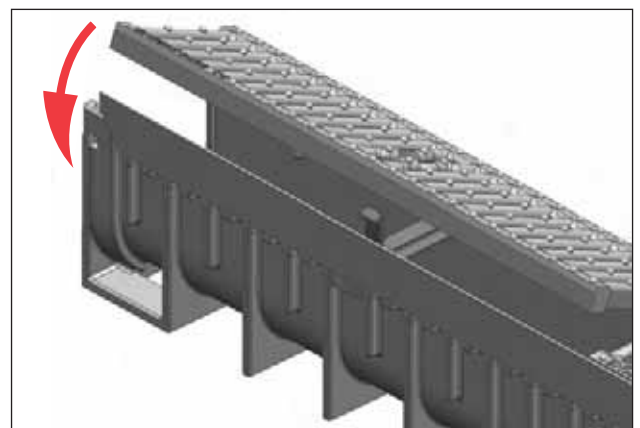
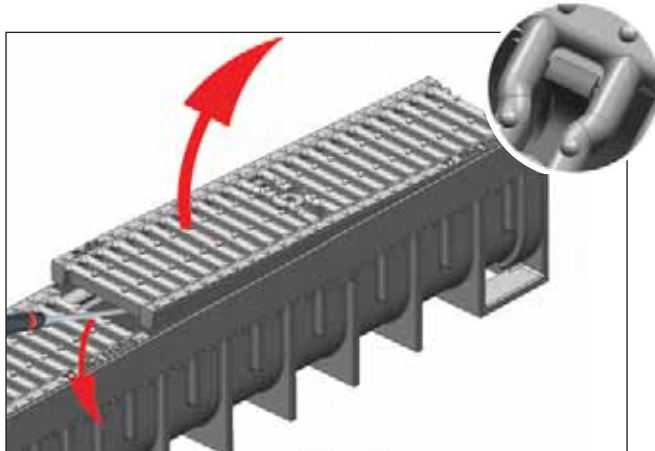
HD and MD, Stepped fall and Park ranges - width 100

- Locking system with metal bar – 1 bolt per grating.



HD range - Eclipse system - width 100

- Locking Clips system with synthetic material bar (2 clips points per grating).



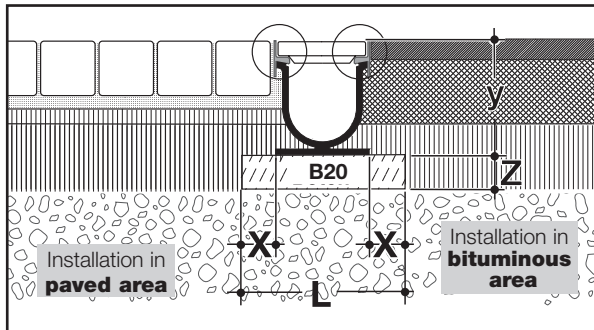
GRATING LOCKS for CONNECTO® System

- Set of brass inserts and stainless steel screws.



Main installation sketches

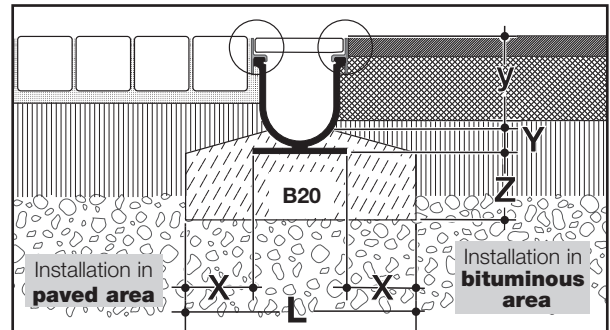
Kenadrain® HD



Range : **KENADRAIN® HD** Class **A15**

Width	Product code	Cement quality	X	L	y	Z
100	DR102AP	200kg/m³/B20	50	230	175	50

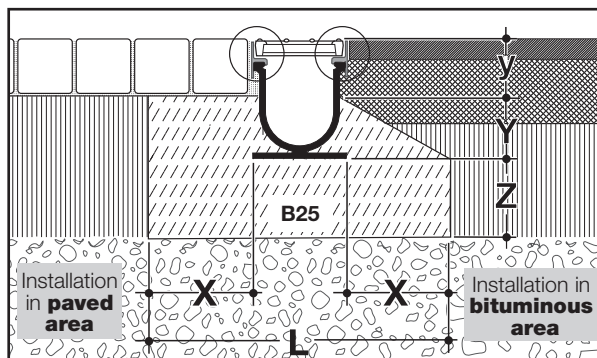
Dimensions in millimetres



Range : **KENADRAIN® HD** Class **B125**

Width	Product code	Cement quality	X	L	Y	y	Z
100	DR102BC/BP	200kg/m³/B20	100	340	50	125	100
150	DR152BC	200kg/m³/B20	100	410	50	160	100
200	DR202BC	200kg/m³/B20	100	450	50	190	100

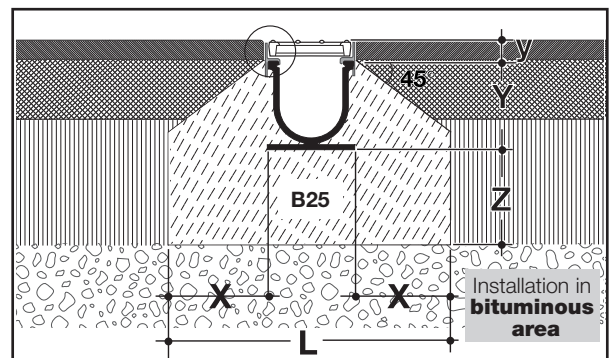
Dimensions in millimetres



Range : **KENADRAIN® HD** Class **C250**

Width	Product code	Cement quality	X	L	Y	y	Z
100	DR102CF/CC/CH	250kg/m³/B25	150	440	90	85	150
150	DR152CF	250kg/m³/B25	150	510	120	85	150
200	DR202CF	250kg/m³/B25	150	550	155	85	150
300	DR302CF	250kg/m³/B25	150	660	190	85	150

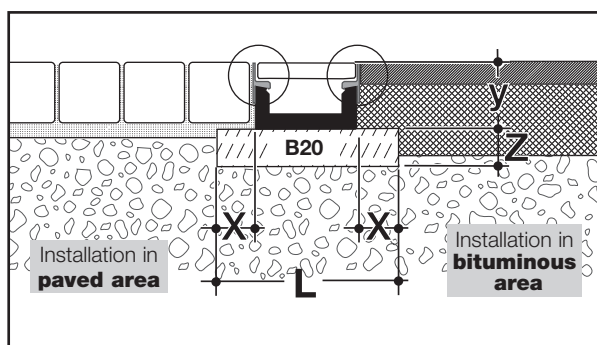
Dimensions in millimetres



Range : **KENADRAIN® HD** Class **D400**

Width	Product code	Cement quality	X	L	Y	y	Z
100	DR102DF	250kg/m³/B25	200	540	140	35	200
150	DR152DF	250kg/m³/B25	200	610	175	35	200
200	DR202DF	250kg/m³/B25	200	650	205	35	200
300	DR302DF	250kg/m³/B25	200	650	340	35	200

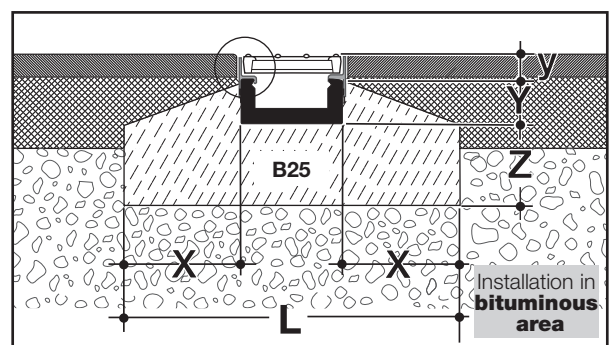
Dimensions in millimetres



Range : **KENADRAIN® PARK HD** Class **B125/C250**

Width	Classe	Product code	Cement quality	X	L	y	Z
	100	B125	DR100BC	200kg/m³/B20	100	330	85
	C250	DR100CH/CF	200kg/m³/B20	150	430	85	150

Dimensions in millimetres

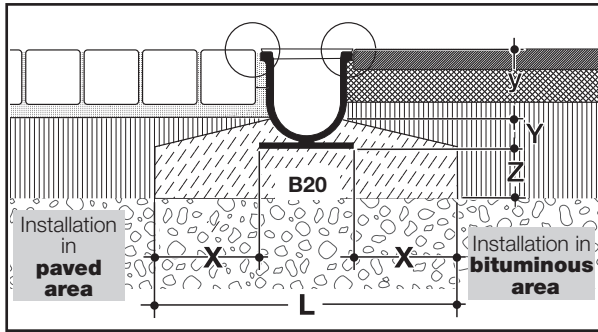


Range : **KENADRAIN® PARK HD** Class **D400**

Width	Product code	Cement quality	X	L	Y	y	Z
100	DR100DF	250kg/m³/B25	200	540	50	35	200

Dimensions in millimetres

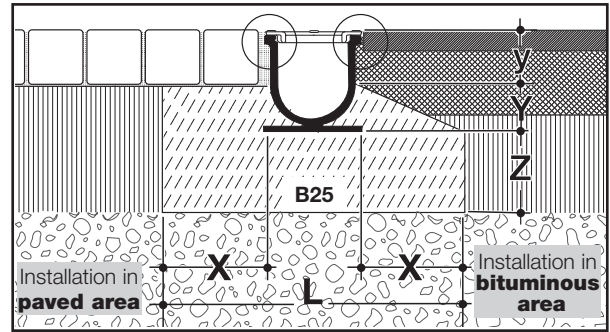
Kenadrain® MD



Range : **KENADRAIN® MD** Class **B125**

Width	Product code	Cement quality	X	L	Y	y	Z
100	DL102BC	200kg/m ³ /B20	100	340	50	105	100
150	DL152BC	200kg/m ³ /B20	100	410	50	140	100
200	DL202BC	200kg/m ³ /B20	100	450	50	175	100

Dimensions in millimetres

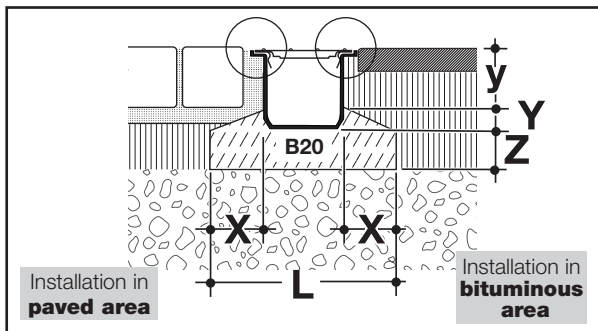


Range : **KENADRAIN® MD** Class **C250**

Width	Product code	Cement quality	X	L	Y	y	Z
100	DL102CF	250kg/m ³ /B25	150	440	80	75	150
150	DL152CF	250kg/m ³ /B25	150	510	125	75	150
200	DL202CFC	250kg/m ³ /B25	150	550	160	75	150

Dimensions in millimetres

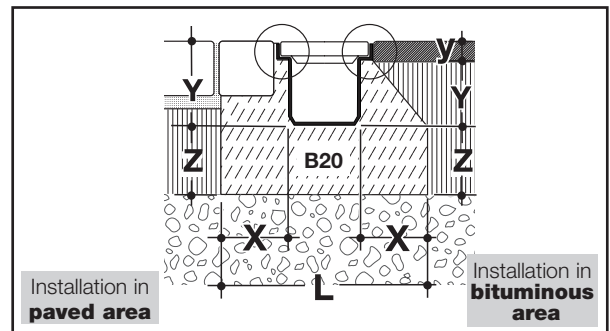
Connecto®



Range : Connecto® / **DRP178** Class **A15**

Width	Product code	Cement quality	X	L	Y	y	Z
130	DRP178	200kg/m ³ /B20	60	250	30	70	20

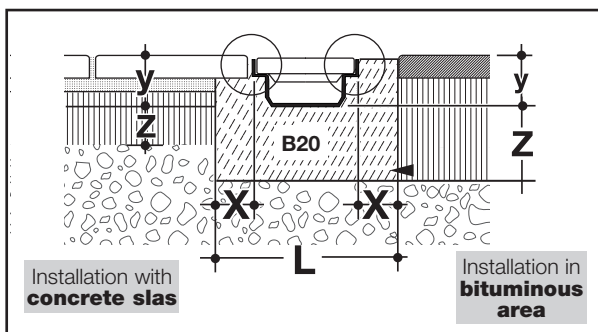
Dimensions in millimetres



Range : Connecto® Class **B125**

Width	Product code	Cement quality	X	L	Y	y	Z
130	CAN10BC/CAL10BF	200kg/m ³ /B20	80	290	95	25	100
200	CAN15BC/CAN15BF	200kg/m ³ /B20	80	370	125	25	100

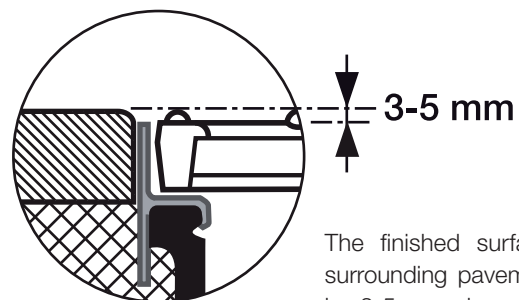
Dimensions in millimetres



Range : Connecto® / **Shallow channe** Class **B125**

Width	Class	Product code	Cement quality	X	L	y	Z
130	B125	CAB10BC	200kg/m ³ /B20	60	250	65	100

Dimensions in millimetres



The finished surface of the surrounding pavement should be 3-5 mm above the grating surface.

All installation examples are available on PDF files on request.

SOME INSTALLATION EXAMPLES

Kenadrain® channel

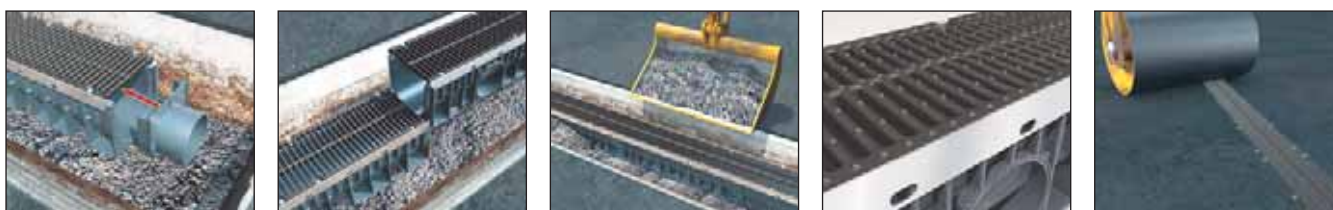
Digging a trench



Setting the outlet



Setting the channel, haunching and filling in



Ensuring watertightness



Setting an Ekso sump unit



Connecto® channel

Digging a trench and setting the outlet



Setting channels



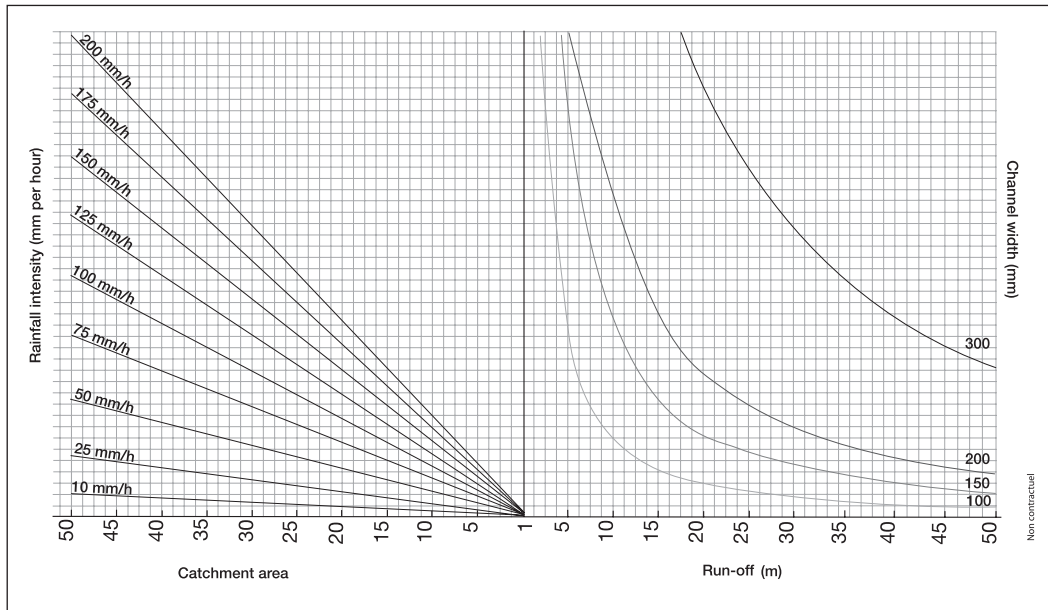
Haunching and filling in



Hydraulic calculations for Kenadrain® channel system

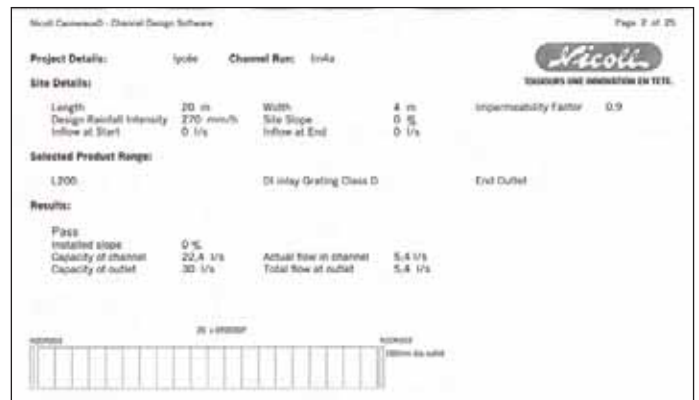
Design approach

In order to design your project, the total length of the run-off, the rainfall intensity, the kind of ground covering and the catchment area to drain must be identified.



Projects

The hydraulic calculations software enables you to check the hydraulic suitability of Nicoll drainage channels to your projects. From our data base, it calculates the channel capacity and specifies the size of channels to be used as well as the distance between two outlets. It checks also the hydraulic capacity of the discharges provided. For more details, please contact our partners.



Requirements for specific parts and coloured ductile iron grating available.



Red laterite

8015



Yellow Pyrites

1015



Blue Basalt

5008



Grey Lunar

7046



Green Malachite

6028

Nearest RAL codes :

A European Standard EN1433 and a CE Mark



The Standard defines the classification and places of installation :

The Standard defines also :



Group 1 : A15 minimum
Areas which can only be used by pedestrians and cyclists only.



Group 2 : B125 minimum
Footways, pedestrian areas and comparable zones, private car parks or car parking decks.



Group 3 : C250 minimum
Kerb sides and non-trafficked areas of hard shoulders and similar.



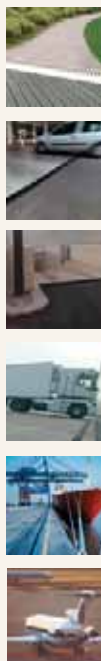
Group 4 : D400 minimum
Carriageways of roads (including pedestrian streets), hard shoulders and parking areas for all types of road vehicles.



Groupe : E600 minimum
Areas subject to high wheel loads, for example ports and dock sides.

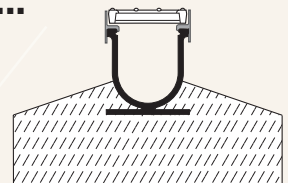


Groupe : F900 minimum
Areas subject to especially high wheel loads, for example aircraft pavement.



• The type of channell...

The Nicoll hydraulic channels are from Mⁿ Type as described by the Standard and requires additional support to withstand.



• Certifications...

Quality

Certified **ISO9001 - 2000 Version (AFAQ)** since January 2003, Nicoll controls the quality of its productions.



Environmental

Nicoll is certified **ISO14001 (AFAQ)**.



The Nicoll drainage channels and the protection of the Environment

Protection of the ground water and rainwater management.

Nicoll drainage channels systems provide an excellent watertightness... no risk of leakage and ground water is saved from pollution by hydrocarbons and heavy metals.

The parts of our system, made of plastic materials, are totally unaffected by corrosion and generate no chemical or aggressive residue in drainage fluids.

Waste and recycling.

All components of our drainage channels (metal and plastic parts) are made of recycled materials. They can be reused in the manufacturing process.

An easy maintenance.

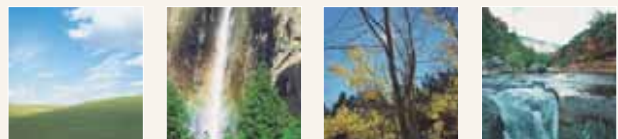
All gratings can be removed and enable the channels to be cleaned efficiently. The Nicoll Ekso sump units catch and retain discharged sediments and debris. This way, obstruction is avoided and sewerage will not be overloaded.

High vibration and noise absorption.

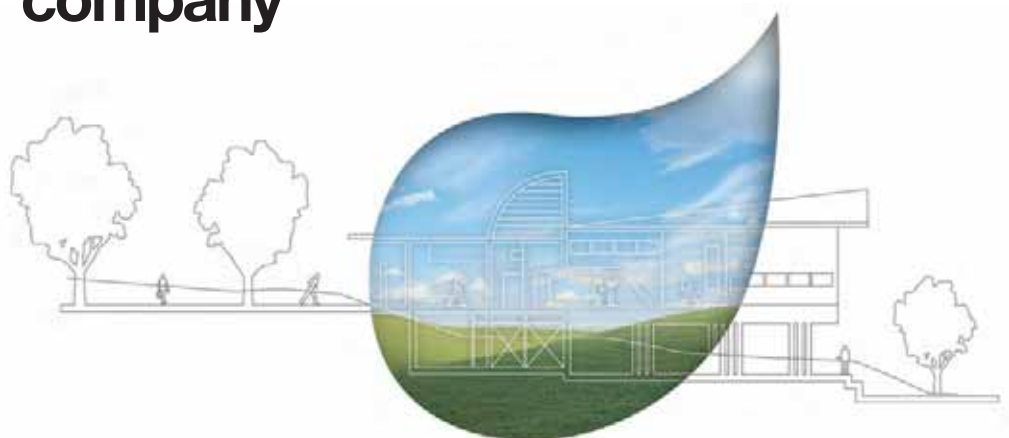
The design of the grates locking system using bolts prevents any play between the channel and grating and avoids noise nuisance when traffic passes over (a patented system).

Work sites with low level of annoyance.

- Light-weight products and easy to install without noisy or dangerous tools.
- Easy to handle (no roughness or sharp edges on the products).
- No noise while cutting and no dust.
- No hand making on work site and very few offcuts and waste.



NICOLL is an ISO14001 certified company





CHRISTCHURCH
Shands Road, Hornby,
PO Box 16233 Christchurch.

AUCKLAND
Mahia Road, Manurewa,
Private Bag 802, Manurewa.

Contact Centre: 0800 222 922
Head Office Tel: 09 279 2799
Freefax: 0800 652 621
Website: www.marley.co.nz

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Head office and plants : P.O. Box 10966 - 37, rue Pierre et Marie Curie - 49309 CHOLET CEDEX FRANCE
Tél. : **33 2 41 63 73 83** - Fax : **33 2 41 63 73 57** - **Website : www.nicoll.fr - www.nicoll.com - e-mail : export.nicoll@alixaxis.com**
SAS au capital de 7 683 431 € - 060 200 128 RCS Angers