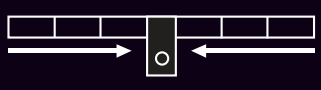
UK SYSTEM

APPLICATIONS: SQUARES, PIPES, HOUSING ESTATES...

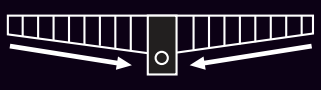
Channels without slope, with continuous and/or cascaded slope, provided with galvanized reinforcement profile, embedded in the channel, which also facilitates the execution on site and proper finishing of the adjacent pavement.

This system allows the use of gratings of up to load class C250, suitable for areas with transverse passage of vehicles, such as housing estates and car parks for light vehicles.



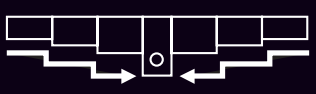
WITHOUT SLOPE

U100K
U150K
U200K
U300K



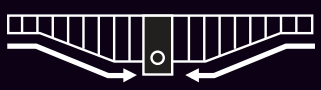
0,5% PRESLOPED

U100K



CASCADED SLOPE

U100K
U150K
U200K
U300K



MIXED SLOPE

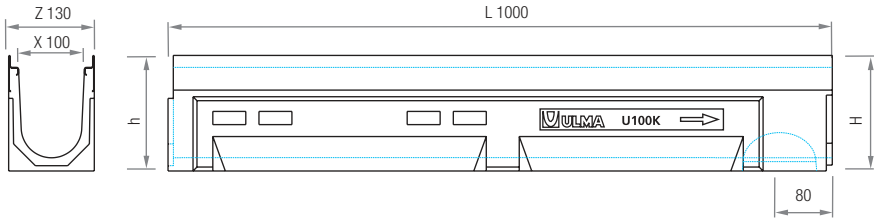
U100K

U100K

LOAD CLASS
UP TO C250
EN-1433 STANDARD

ULMA Linear Drainage Channel type U100K: External width 130 mm; Internal width 100 mm; Available with overall heights between 150 mm and 250 mm for 0,5% presloped channels and between 150 and 300 mm for cascaded slope, to collect rainwater in 1 metre long units; Integrated galvanized steel* edges for lateral protection. Locking system consists of CS100 locking bar and screws.

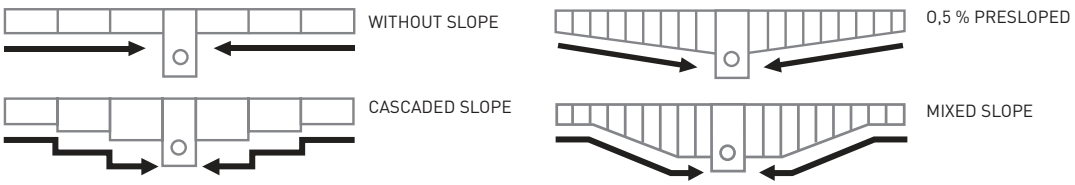
*Also available with stainless steel edge protection.



Channel	L (mm)	Height (mm)		Width (mm)		Ø Outlet* (mm)		Hydraul. Section (cm²)	Pcs. / Pallet
		h	H	Z	X	Vert.	Horiz.		
U100K00R	1000	150	150	130	100	110	-	97	90
U100K01	1000	150	155	130	100	-	-	97	90
U100K02	1000	155	160	130	100	-	-	101	90
U100K03	1000	160	165	130	100	-	-	106	78
U100K04	1000	165	170	130	100	-	-	111	78
U100K05	1000	170	175	130	100	-	-	116	78
U100K05R	1000	175	175	130	100	110	-	120	78
U100K06	1000	175	180	130	100	-	-	120	65
U100K07	1000	180	185	130	100	-	-	125	65
U100K08	1000	185	190	130	100	-	-	130	65
U100K09	1000	190	195	130	100	-	-	135	65
U100K10	1000	195	200	130	100	-	-	140	65
U100K10R	1000	200	200	130	100	110	110	145	65
U100K11	1000	200	205	130	100	-	-	145	65
U100K12	1000	205	210	130	100	-	-	150	65
U100K13	1000	210	215	130	100	-	-	155	65
U100K14	1000	215	220	130	100	-	-	159	65
U100K15	1000	220	225	130	100	-	-	164	65
U100K15R	1000	225	225	130	100	110	110	169	65
U100K16	1000	225	230	130	100	-	-	169	65
U100K17	1000	230	235	130	100	-	-	174	65
U100K18	1000	235	240	130	100	-	-	178	52
U100K19	1000	240	245	130	100	-	-	183	52
U100K20	1000	245	250	130	100	-	-	188	52
U100K20R	1000	250	250	130	100	110	110	193	52
U100K25R	1000	275	275	130	100	110	110	240	52
U100K30R	1000	300	300	130	100	110	110	288	52

*Vert. and horiz. outlets on order.

SLOPE DESIGNS



U100K

GRATINGS

Material	Design	Load	Code	L (mm)	Width (mm)	Opening (mm)	Units (x LM)
DUCTILE IRON	SLOTTED	C250	FNX100KCCM	500	123	14	2
	HEELPROOF SLOTTED	C250	FNHX100KCCM	500	123	5	2
GALVANIZED STEEL	PERFORATED	A15	GP100KCA	1000	123	Ø 6	1
	SLOTTED	A15	GN100KCA	1000	123	9	1
	HEELPROOF MESH	B125	GEHX100KCB	1000	123	30 x 10	1
STAINLESS STEEL	SLOTTED	A15	IN100KCA	1000	123	7	1
	PERFORATED	A15	IP100KCA	1000	123	Ø 6	1
	MESH	B125	IEX100KCB	1000	123	30 x 20	1
COMPOSITE	HEELPROOF SLOTTED	A15	PNH100KCAM-GRIS (1)	500	123	5	2
	MESH	B125	PE100KCBM	500	123	14 X 12,5	2

(1) Available in several colors.

LOCKING SYSTEM

LOCKING BAR.
Two locking bars and two screws per linear metre.


AK100

SUMP UNITS AND ACCESSORIES TABLE

Code	L (mm)	H (mm)	Width (mm)	Ø Outlet (mm)		Sump Units	Bucket
				Lateral	Front		
AK100	500	560	130	110/160	90	1	CU100

*Suitable up to height 20R.

END CAPS


Closed Open

Channel	Code	Type	Ø (mm)
U100K00R	T100K00C	CLOSED	-
	T100K00A	OPEN	110
U100K05R	T100K05C	CLOSED	-
	T100K05A	OPEN	110
U100K10R	T100K10C	CLOSED	-
	T100K10A	OPEN	110
U100K15R	T100K15C	CLOSED	-
	T100K15A	OPEN	110
U100K20R	T100K20C	CLOSED	-
	T100K20A	OPEN	110
U100K25R	T100K25C	CLOSED	-
	T100K25A	OPEN	110
U100K30R	T100K30C	CLOSED	-
	T100K30A	OPEN	110

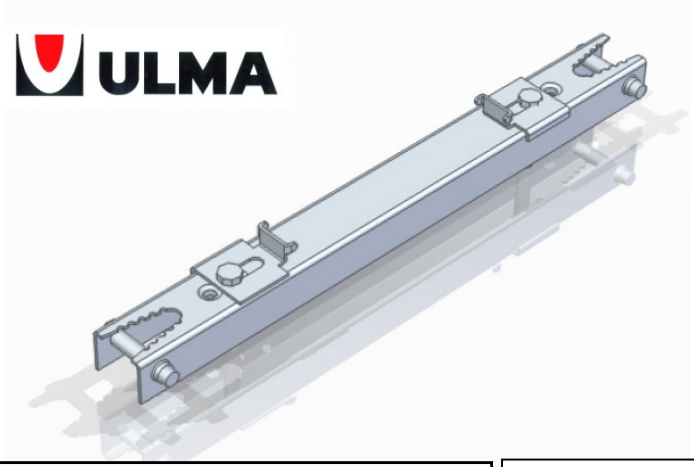
STEP UNITS

Code
CEU100

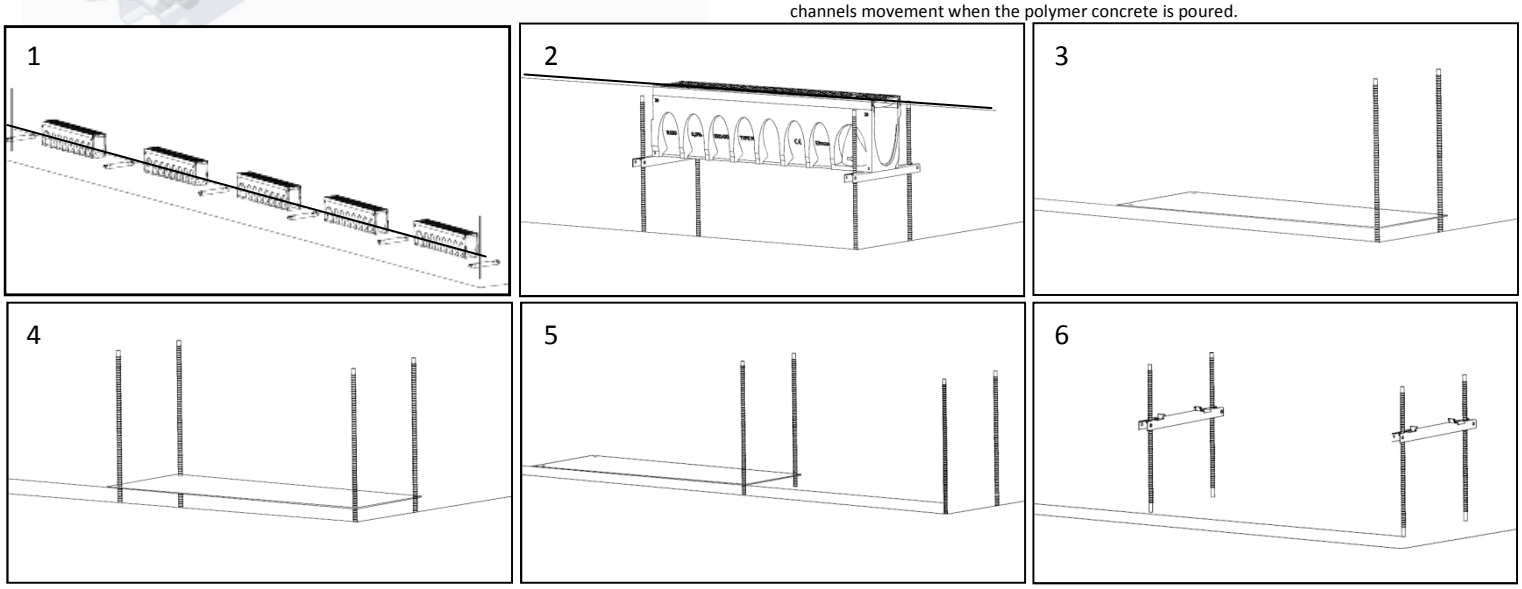
GALVANIZED STEEL BUCKET

Code
CU100

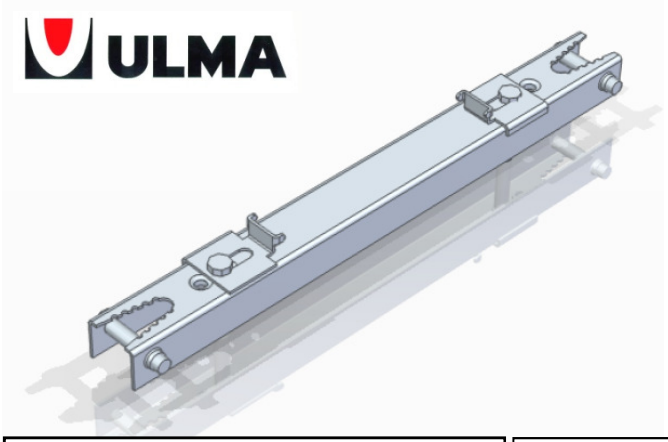
INSTALLATION DEVICE INSTRUCTIONS GUIDE



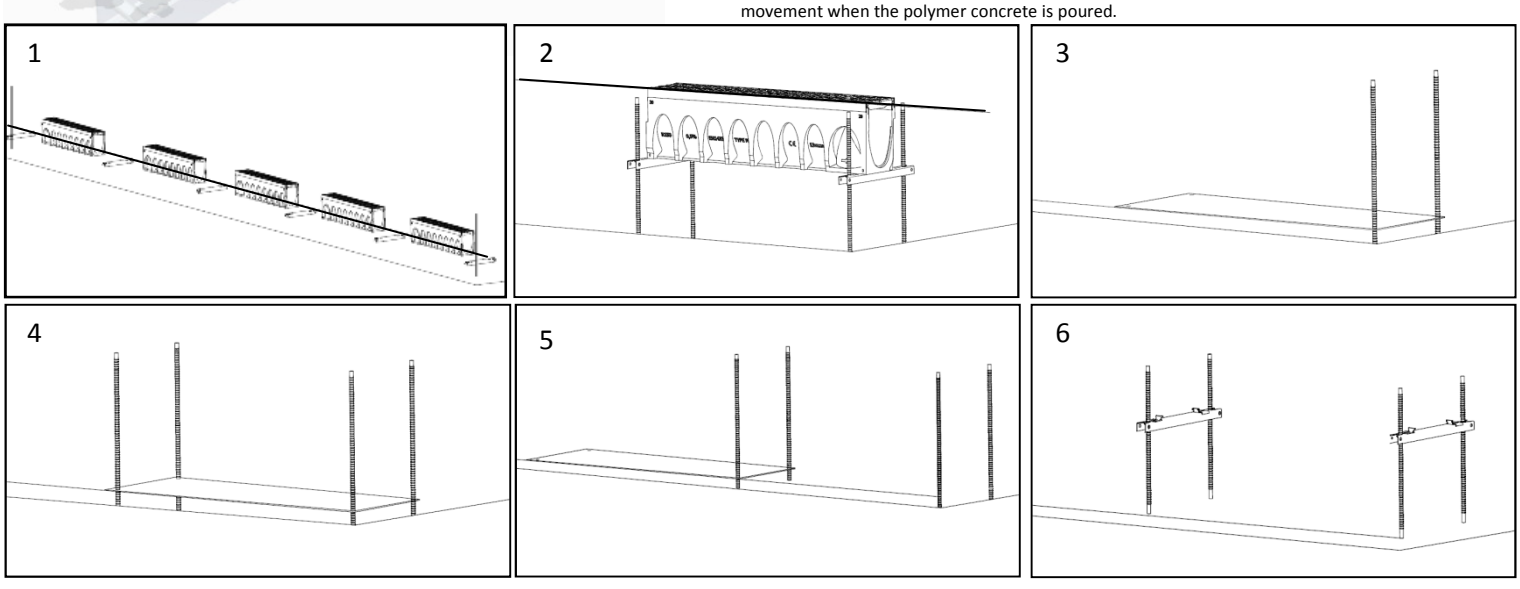
1. Draw a string line using the first and the last rebar. Place the channels to be installed next to the line and one Installation Device between the channels. *For example: 100 channels + 101 ID.*
2. Introduce the rebars to install the first channel in order to assure the correct position of the rebar on the ground and draw a string lines to indicate the top of the channels.
3. Maintain the first two rebars of the first raw and remove the rebars of the second raw. Then, place the corresponding timber and draw a string line on the ground next to the timber. *NOTE: timber template available.*
4. Introduce the rebars on the holes of the second raw. *NOTE: not introduce the rebars until the end in order to let the necessary margin when installing the ID.*
5. Take off the timber and place it in the next row. Introduce the rebars in the third row.
6. Install the first ID in the first raw and the second ID in the second raw.
7. Place the first channel and assure the alignment position between the top of the channel with the top string line.
8. Repeat the process of introducing the rebars on the timber and the ID. Assure that the position of all the channels of the line are according to the string lines.
9. Once the first 5 channels are placed, the clamp and the ID can be adjusted and the channels aligned.
10. When all the steps are finished, the adjustement of the ID to the channels avoids the channels movement when the polymer concrete is poured.

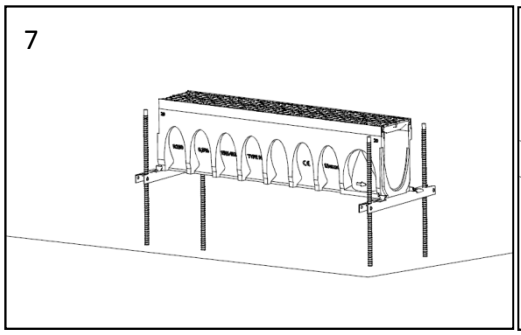


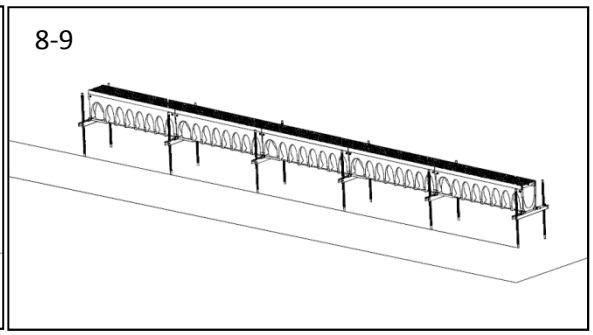
INSTALLATION DEVICE INSTRUCTIONS GUIDE

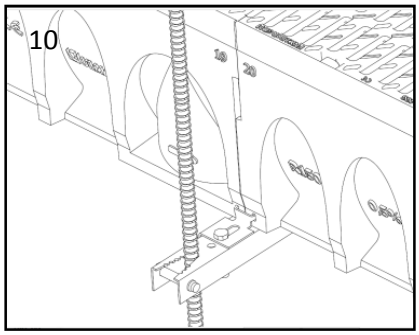


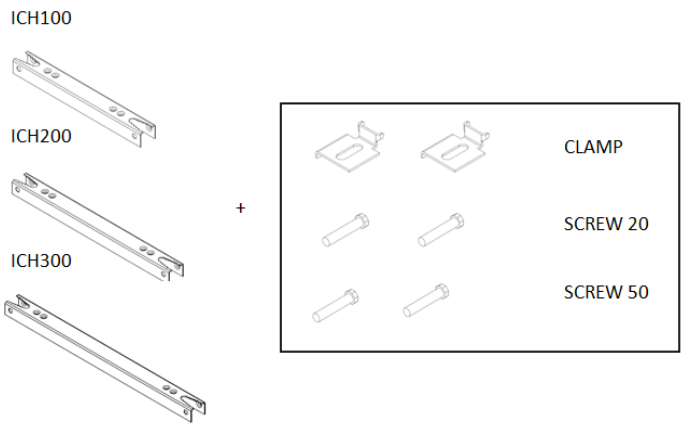
1. Draw a string line using the first and the last rebar. Place the channels to be installed next to the line and one Installation Device between the channels. *For example: 100 channels + 101 ID.*
2. Introduce the rebars to install the first channel in order to assure the correct position of the rebar on the ground and draw a string lines to indicate the top of the channels.
3. Maintain the first two rebars of the first raw and remove the rebars of the second raw. Then, place the corresponding timber and draw a string line on the ground next to the timber. *NOTE: timber template available.*
4. Introduce the rebars on the holes of the second raw. *NOTE: not introduce the rebars until the end in order to let the necessary margin when installing the ID.*
5. Take off the timber and place it in the next row. Introduce the rebars in the third row.
6. Install the first ID in the first raw and the second ID in the second raw.
7. Place the first channel and assure the alignment position between the top of the channel with the top string line.
8. Repeat the process of introducing the rebars on the timber and the ID. Assure that the position of all the channels of the line are according to the string lines.
9. Once the first 5 channels are placed, the clamp and the ID can be adjusted and the channels aligned.
10. When all the steps are finished, the adjustement of the ID to the channels avoids the channels movement when the polymer concrete is poured.







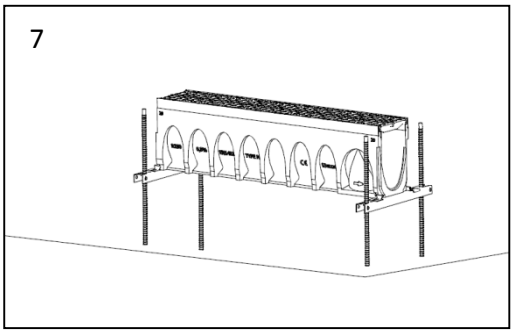


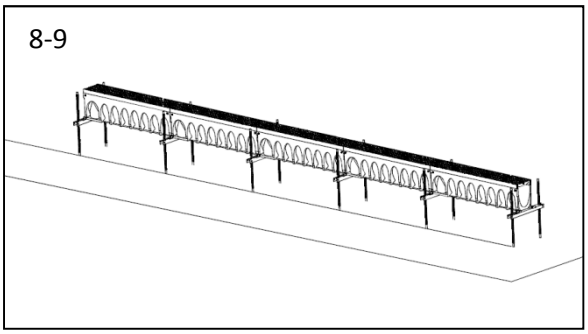


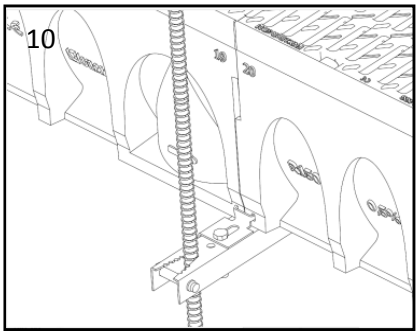
INSTALLATION DEVICES	CHANNELS
ID100	U100K/F100/R100
ID200	F150/R150/R200
ID300	F250/F300

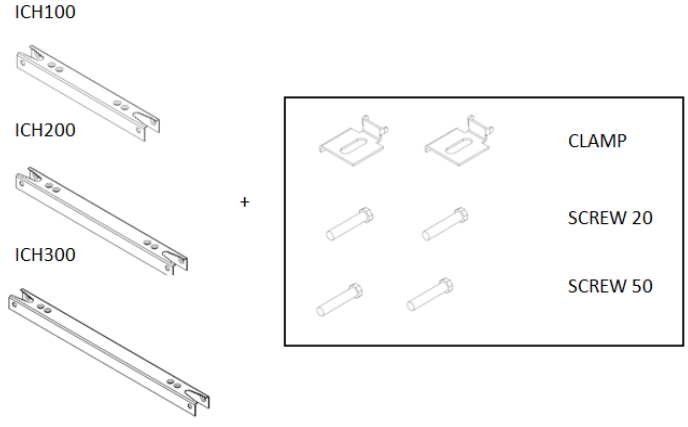
ANNOTATIONS

To clear up any doubts you may have on the subject you get in touch with ULMA Architectural Solutions or visit our website **www.ulmaarchitectural.com**.







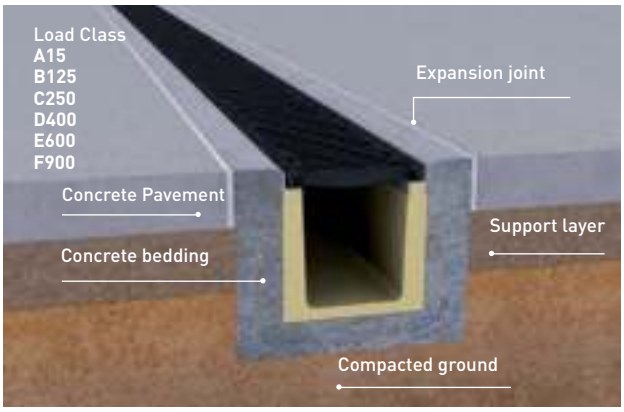


INSTALLATION DEVICES	CHANNELS
ID100	U100K/F100/R100
ID200	F150/R150/R200
ID300	F250/F300

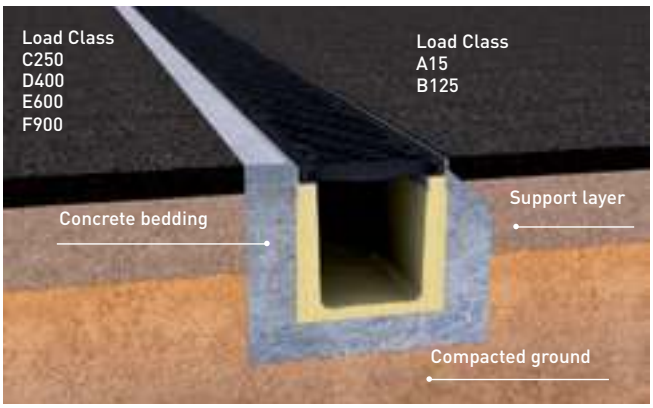
ANNOTATIONS

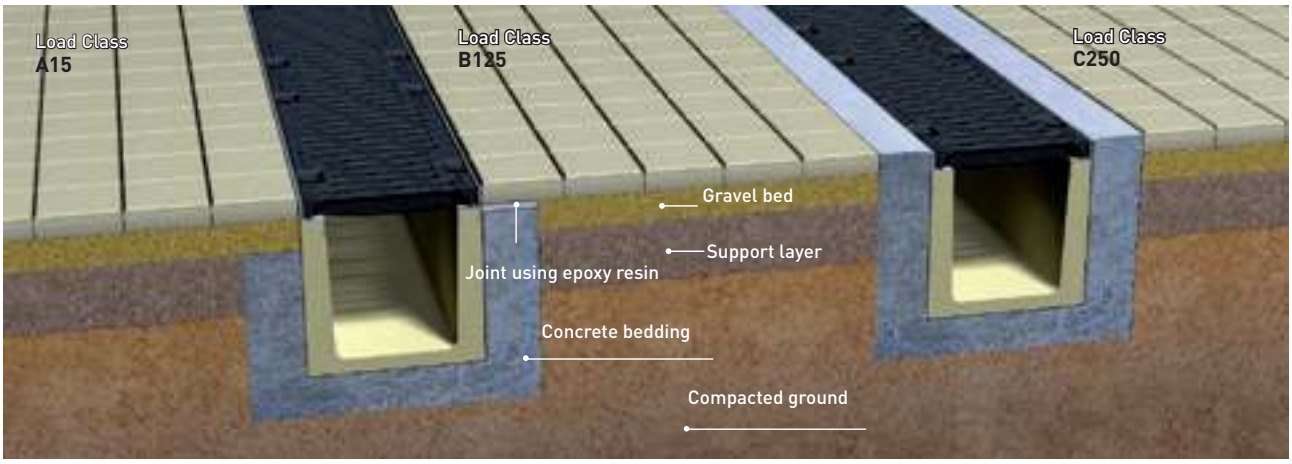
To clear up any doubts you may have on the subject you get in touch with ULMA Architectural Solutions or visit our website **www.ulmaarchitectural.com**.

CONCRETE PAVEMENT



ASPHALTE PAVEMENT





PAVING

GENERAL CONDITIONS

GENERAL ON-SITE LAYOUT CONDITIONS

The ULMA Architectural Solutions drainage system has been designed and tested under the strictest premises of the EN1433 STANDARD, following the constructive details illustrated on the following pages.

The design of the road surface adjacent to the concrete trench drain / concrete bedding (concrete, asphalt or paving) must include the dilation and contraction joints necessary to prevent any tangential or perpendicular force on the concrete trench drain / concrete bedding. Depending on the constructive details of the road surface, the size of said joints shall be the responsibility of the Professional Management or designer.

The following illustrations show what the suitable section to be installed for each type of road surface and load is, along with the recommended constructive details.

TYPES OF **INSTALLATION**

INDICATIONS COMMON TO THE DIFFERENT TYPES OF INSTALLATION

The ditch must have the necessary depth and width to comply with the concrete bedding dimensions recommended in table 1 in accordance with the required load type.

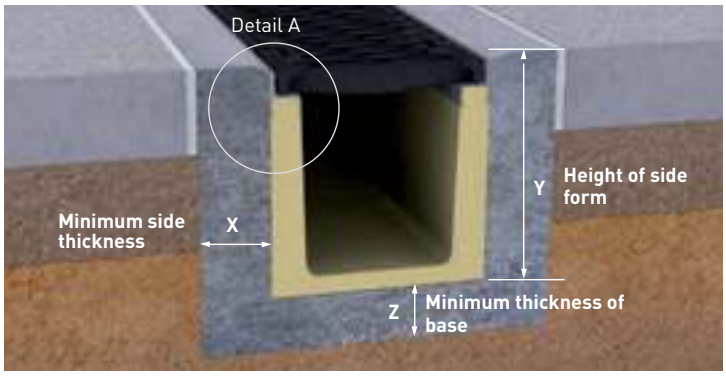
Special care must be taken in the installation of an unprofiled trench drain; the thickness of the grating must be taken into account so that, when the installation is finished, the grating is situated below the level of the road surface as recommended in Detail B.

In the event of a compaction process being required in the proximity of the trench drain (e.g. class A15 and B 125 asphalt surface), special care must be taken not to damage the edge and walls of the trench drain.

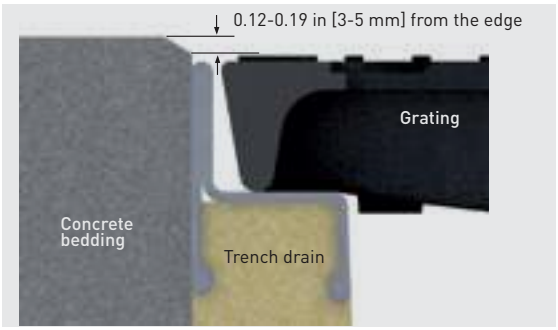
The surrounding road surface and concrete bedding must remain on a plane of between 0.12 and 0.19 inches (3-5mm) above the plane of the upper edge of the trench drain.

TABLE 1: THICKNESS OF CONCRETE BEDDING

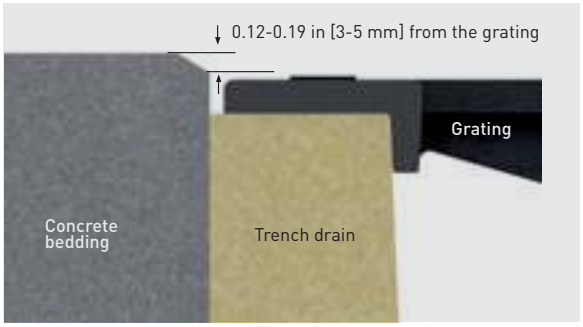
LOAD ACCORDING TO STANDAR **EN-1433**	X MINIMUM SIDE THICKNESS **(in/mm)**	Z MINIMUM THICKNESS OF BASE **(in/mm)**	Y HEIGHT OF SIDE FORM **(in/mm)**	RECOMMENDED WIRE MESH **(in x in x in)**	TYPE OF CONCRETE **(psi)**
A15	3.94 [100]	3.94 [100]	At least at a point located at 1.57 in (40 mm) below the level of the pavement.		2 133.5
B125	3.94 [100]	3.94 [100]			3 556
C250	5.91 [150]	5.91 [150]	Up to the level of the wire mesh and the adjoining pavement.		3 556
D400	5.91 [150]	5.91 [150]		5.9 X 5.9 X 0.24	3 556
E600	5.91 [150]	5.91 [150]		5.9 X 5.9 X 0.40	3 556
F900	7.87 [200]	7.87 [200]		7.87 X 7.87 X 0.47	3 556

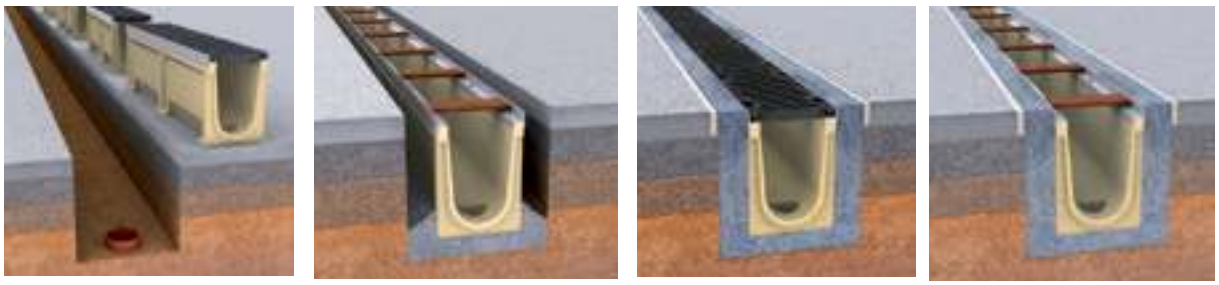


Detail A Trench drain with edge



Detail B Trench drain without edge

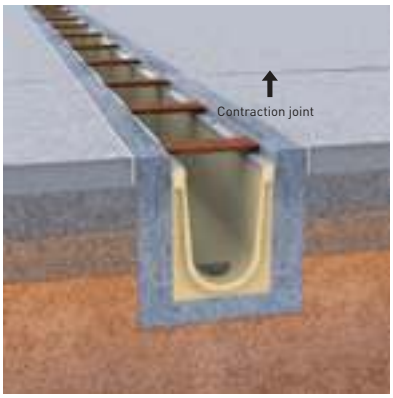




The installation of the trench drains shall be started at the evacuation point or at the deepest point.

In the event of any of the layers adjacent to the concrete bedding also being made of concrete, a dilation joint must always be placed between the concrete bedding and said concrete layer.

Before tipping out the concrete for the concrete bedding place wooden battens or the gratings themselves protected with plastic, in order to prevent deformations which might impede the placement of the gratings.

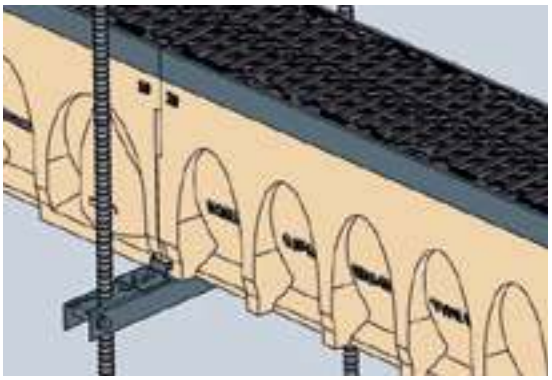


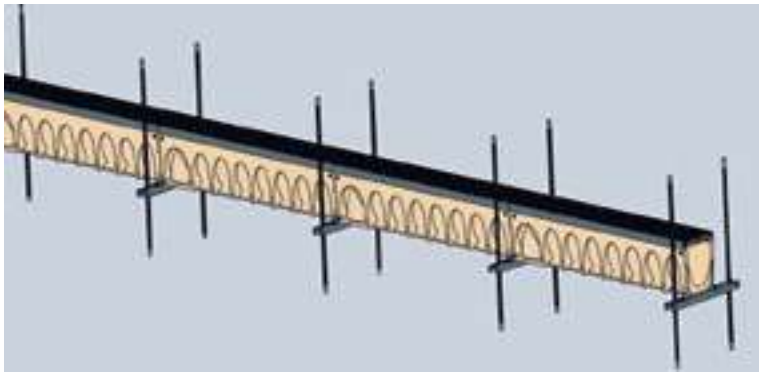
When it comes to opening the pre-marked outlets (vertical or horizontal), it is recommended to mark the perimeter every 1.97 to 2.36 inches (5 to 6 cm) with a drill or rotaflex, in order then to carefully open the pre-marked outlet with a hammer and chisel.

It is advisable for the contraction joint perpendicular to the trench drain to be placed every 236.22 to 275.60 inches (6 to 7 metres) and to be made to coincide with the union between trench drains.

TRENCH DRAIN INSTALLATION USING **ULMA**'S INSTALLATION DEVICE.

Devices are attached to the dimples at the bottom of the trench drain what enables the alignment of the trench drains. One device required for every joint.





Rebars allow the adjustment of the required height

CE

ULMA
ARCHITECTURAL SOLUTIONS

Declaration of Performance

1. No:	PF03 - 0101
2. Product:	**ULMA U100/K to U300/K**
3. Intended use:	Type M drainage channel for the collection and disposal of surface water in areas for pedestrians and vehicular traffic.
4. Manufacturer:	ULMA Architectural Solutions Barrio Zubillaga, 89 Apdo.20 – 20560 Oñati Gipuzkoa – SPAIN
5.Authorised representative:	---
6.Assessment and verification system:	System 3
7. Notified Body:	No. 0370 LGAI TECHNOLOGICAL CENTER, S. A./Applus Campus de la U.A.B. Apartado,18. (08193) BARCELONA.
8. Type Test Ref.:	Various. Available under requirement.
9. Essential Characteristics:	**Water tightness – jointing of drainage channels:** No leakage **Load bearing capacity, deflection under load:** - **Maximun load:** C250 - **Permanent set:** NPD **Durability:** - **Flexural strength** ≥ 22 N/mm² - **Compressive strength** ≥ 90 N/mm²
10. Harmonized Standard:	EN 1433:2002
11. Specific Technical Documentation:	---

The performance of product identified in point 2 is in conformity with the declared performance in point 9.
This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.

Signed for and on behalf of the manufacturer by:

Mikel Izurieta
Director General
ULMA Architectural Solutions

Oñati, July 2013

ulmaarchitectural.com

POLYMER CONCRETE TRENCH DRAIN **CHEMICAL RESISTANCE**

Chemical	Concentration	Long Term exposure	Short Term Exposure 24 hours
Acetaldehyde	100%	NR	NR
Acetic Acid	30%	NR	R
Acetone	10%	NR	R
Ammonia	10%	NR	R
Aniline	100%	NR	R
Benzene	100%	NR	R
Boric Acid	100%	R	R
Butyric Acid	25%	R	R
Butyl Alcohol	100%	R	R
Calcium Chloride	100%	R	R
Calcium Hydroxide	100%	NR	R
Caster Oil	100%	R	R
Chloric Acid	5%	NR	R
Chromic Acid	5%	R	R
Citric Acid	100%	R	R
Diesel Fuel	100%	R	R
Ethanol	100%	NR	R
Ethlendiamine	100%	R	R
Ethyl Acetate	100%	NR	R
Ferrous Sulfate	30%	R	R
Fluorallic Acid	10%	R	R
Formaldehyde	35%	R	R
Formic Acid	10%	NR	R
Fuel Oil	100%	R	R
Gasoline	100%	R	R
n-Heptane	100%	R	R
n-Hexane	100%	R	R
Hydraulic Oil	100%	R	R
Hydrochloric Acid	10%	R	R
Hydrofluoric Acid	5%	NR	R
Lactic Acid	10%	R	R
Methanol	5%	NR	NR

Chemical	Concentration	Long Term exposure	Short Term Exposure 24 hours
Methyl Amine	100%	NR	R
Methyl Ethyl Ketone	100%	NR	R
Mineral oil	100%	R	R
Monochlor Benzene	0.05%	NR	NR
Monochloroacetic Acid	10%	R	R
Nitric Acid	10%	NR	R
n-Nonane	100%	R	R
Iso-Octane	100%	NR	R
Petrol	100%	R	R
Phenol	100%	NR	R
Phosphoric Acid	10%	R	R
Potassium Hydroxide	10%	NR	NR
Sodium Acetate	100%	NR	R
Sodium Carbonate	20%	R	R
Sodium Chloride	100%	R	R
Sodium Hydroxide	15%	NR	R
Sodium Hypochlorite	5%	R	R
Sulfuric Acid	40%	R	R
Tetrafluoroborsaure	20%	NR	R
Toluene	100%	NR	R
Trichloroethylene	100%	NR	NR
Triethylamine	100%	R	R
Water (Deionised)	100%	R	R
Water (Demineralised)	100%	R	R
Xylene	100%	NR	R

NR: Not recommended
R: Resistant

The maximum recommended temperature is 75C / 167F
These recommendations are given for guidance use only.
In applications exposed to corrosive and agressive media, especially if the medium is not listed, please contact the ULMA Technical Department (+34 943 780 600) to check the suitability of the grating, screw, bucket, edge and locking system.